



Junos[®] OS

Broadband Subscriber Sessions Feature Guide

Release
16.2



Modified: 2016-12-14

Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

Juniper Networks, Junos, Steel-Belted Radius, NetScreen, and ScreenOS are registered trademarks of Juniper Networks, Inc. in the United States and other countries. The Juniper Networks Logo, the Junos logo, and JunosE are trademarks of Juniper Networks, Inc. All other trademarks, service marks, registered trademarks, or registered service marks are the property of their respective owners.

Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

Junos[®] OS Broadband Subscriber Sessions Feature Guide

16.2

Copyright © 2016, Juniper Networks, Inc.

All rights reserved.

The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement ("EULA") posted at <http://www.juniper.net/support/eula.html>. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

Table of Contents

	About the Documentation	xlvi
	Documentation and Release Notes	xlvi
	Supported Platforms	xlvi
	Using the Examples in This Manual	xlvi
	Merging a Full Example	xlvi
	Merging a Snippet	xlvi
	Documentation Conventions	xli
	Documentation Feedback	li
	Requesting Technical Support	li
	Self-Help Online Tools and Resources	li
	Opening a Case with JTAC	li
Part 1	Configuring AAA for Subscriber Management	
Chapter 1	AAA and RADIUS for Subscriber Access Overview	3
	AAA Service Framework Overview	3
	RADIUS Server Options for Subscriber Access	4
	Global RADIUS Options for Subscriber Access	8
	Subscriber Access Interface Description Storage and Reporting Through RADIUS	
	Overview	8
	Interface Description Precedence	9
	Example: Reporting Interface Descriptions on Non-Underlying Logical	
	Interfaces	9
	Reporting Interface Descriptions on Underlying Logical Interfaces	10
	Interface Descriptions on Aggregated Ethernet Physical Interfaces	11
	Interface Descriptions on a Combination of Dynamic and Static	
	Interfaces	11
	Example: Reporting Interface Descriptions on Dynamic VLANs	11
Chapter 2	Configuring RADIUS Attributes and Juniper Networks VSAs	13
	RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service	
	Framework	13
	RADIUS IETF Attributes Supported by the AAA Service Framework	14
	Juniper Networks VSAs Supported by the AAA Service Framework	21
	AAA Access Messages and Supported RADIUS Attributes and Juniper Networks	
	VSAs for Junos OS	33
	AAA Accounting Messages and Supported RADIUS Attributes and Juniper	
	Networks VSAs for Junos OS	39
	Configuring How RADIUS Attributes Are Used for Subscriber Access	43
	Junos OS Predefined Variables That Correspond to RADIUS Attributes and	
	VSAs	49

	DSL Forum Vendor-Specific Attributes	55
	DSL Forum VSAs Support in AAA Access and Accounting Messages for Junos OS	57
	RADIUS Support for Microsoft Corporation VSAs for DNS Server Addresses	58
Chapter 3	Configuring RADIUS NAS-Port Attributes and Options	61
	Manual Configuration of the NAS-Port-ID RADIUS Attribute	61
	Configuring a NAS-Port-ID with Additional Options	63
	Configuring the Order in Which Optional Values Appear in the NAS-Port-ID	64
	Configuring a Calling-Station-ID with Additional Attributes	66
	Enabling Unique NAS-Port Attributes (RADIUS Attribute 5) for Subscribers	69
	RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN Overview	70
	NAS-Port-Type RADIUS Attribute	70
	NAS-Port RADIUS Attribute	71
	NAS-Port Options Configuration and Subscriber Network Access Models	71
	NAS-Port Options Definition	71
	Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN	72
	Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN	73
	Manual Configuration of the NAS-Port-Type RADIUS Attribute	74
	Configuring the RADIUS NAS-Port-Type per Physical Interface	76
	Configuring the RADIUS NAS-Port-Type per VLAN	78
	Configuring the RADIUS NAS-Port-Type per Stacked VLAN	79
	Configuring the RADIUS NAS-Port Extended Format per Physical Interface	81
	Configuring the RADIUS NAS-Port Extended Format per VLAN	82
	Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN	84
	Configuring the RADIUS NAS-Port Extended Format for ATM Interfaces	86
Chapter 4	Configuring RADIUS Authentication for Subscriber Access	89
	Retaining Authentication and Accounting Information During Session Startup	89
	Configuring Authentication and Accounting Parameters for Subscriber Access	90
	Specifying the Authentication and Accounting Methods for Subscriber Access	90
	Specifying RADIUS Authentication and Accounting Servers for Subscriber Access	91
	Example: Configuring RADIUS-Based Subscriber Authentication and Accounting	92
Chapter 5	Configuring RADIUS Accounting for Subscriber Access	95
	RADIUS Accounting Statistics for Subscriber Access Overview	95
	Understanding RADIUS Accounting Duplicate Reporting	97
	Layer 3 Wholesale Scenarios	97
	Other Scenarios	98
	Filters for Duplicate Accounting Reports	98
	Configuring Duplication Filters for RADIUS Accounting Duplicate Reporting	99

	Preservation of RADIUS Accounting Information During an Accounting Server Outage	100
	RADIUS Acct-On and Acct-Off Messages	103
	Configuring Per-Subscriber Session Accounting	104
	Configuring Per-Service Session Accounting	106
	Configuring Service Packet Counting	107
	Configuring Back-up Options for RADIUS Accounting	109
	Processing Cisco VSAs in RADIUS Messages for Service Provisioning	110
	Configuring Service Interim Accounting	113
Chapter 6	Configuring Routers and RADIUS Servers for Subscriber Access	115
	Configuring Router or Switch Interaction with RADIUS Servers	115
	Forcing the Router to Contact the Accounting Server Immediately	117
	Configuring RADIUS Server Parameters for Subscriber Access	118
	Configuring RADIUS Server Options for Subscriber Access	119
	Configuring RADIUS Options for Subscriber Access Globally	122
Chapter 7	Configuring Access Profiles for Subscriber Access	123
	Configuring an Access Profile for Subscriber Management	123
	Attaching Access Profiles	124
Chapter 8	Configuring the Effect of Service Activation Failures on Subscriber Login	125
	Subscriber Session Logins and Service Activation Failures Overview	125
	Service and Network Family Activation Process	126
	Configuring How Service Activation Failures Affect Subscriber Login	130
Chapter 9	Configuring Session Options for Subscriber Access	131
	Understanding Session Options for Subscriber Access	131
	Subscriber Session Timeouts	131
	Subscriber Username Modification	134
	Configuring Subscriber Session Timeout Options	136
	Removing Inactive Dynamic Subscriber VLANs	137
Chapter 10	Receiving DHCP Options From a RADIUS Server	139
	Centrally Configured Opaque DHCP Options	140
	Data Flow for RADIUS-Sourced DHCP Options	142
	Multiple VSA 26-55 Instances Configuration	143
	DHCP Options That Cannot Be Centrally Configured	143
	Monitoring DHCP Options Configured on RADIUS Servers	144
Chapter 11	Configuring RADIUS Logical Line Identification	147
	RADIUS Logical Line Identifier (LLID) Overview	147
	RADIUS Attributes for LLID Preauthentication Requests	148
	Configuring Logical Line Identification (LLID) Preauthentication	150
	Configuring a Port and Password for LLID Preauthentication Requests	151
Chapter 12	Provisioning Subscriber Services Using Cisco VSAs	153
	Processing Cisco VSAs in RADIUS Messages for Service Provisioning	153
	Configuring Service Interim Accounting	156

Chapter 13	Configuring Domain Maps for Subscriber Management	157
	Domain Mapping Overview	158
	Types of Domain Maps and Their Order of Precedence	159
	Wildcard Domain Map	160
	Default Domain Map	160
	Domain Map for Subscriber Usernames With No Domain or Realm Name	160
	Understanding Domain Maps and Logical System/Routing Instance Contexts	161
	Configuring a Domain Map	162
	Configuring a Wildcard Domain Map	163
	Specifying an Access Profile in a Domain Map	164
	Specifying an Address Pool in a Domain Map	165
	Specifying a Dynamic Profile in a Domain Map	166
	Specifying an AAA Logical System/Routing Instance in a Domain Map	167
	Specifying a Target Logical System/Routing Instance in a Domain Map	168
	Configuring Domain and Realm Name Usage for Domain Maps	168
	Specifying Domain and Realm Name Delimiters	169
	Specifying the Parsing Order for Domain and Realm Names	170
	Specifying the Parsing Direction for Domain and Realm Names	171
	Enabling Domain Name Stripping	171
	Specifying a Tunnel Profile in a Domain Map	172
	Specifying a Tunnel Switch Profile in a Domain Map	172
	Configuring PADN Parameters for a Domain Map	173
Chapter 14	Configuring Dynamic Service Activation for Subscriber Access	175
	Using RADIUS Dynamic Requests for Subscriber Access Management	175
	Dynamic Service Activation During Login Overview	176
	Configuring RADIUS-Initiated Dynamic Request Support	176
	RADIUS-Initiated Change of Authorization (CoA) Overview	177
	CoA Messages	177
	Qualifications for Change of Authorization	178
	Message Exchange	179
	Usage Thresholds for Subscriber Services	180
	RADIUS-Initiated Disconnect Overview	181
	Disconnect Messages	181
	Qualifications for Disconnect	181
	Message Exchange	181
	Error-Cause Codes (RADIUS Attribute 101) for Dynamic Requests	182
Chapter 15	Configuring Termination Causes for Protocols	183
	Understanding Session Termination Causes and RADIUS Termination Cause Codes	183
	Mapping Session Termination Causes to Custom Termination Cause Codes	185
	AAA Termination Causes and Code Values	186
	DHCP Termination Causes and Code Values	188
	L2TP Termination Causes and Code Values	189
	PPP Termination Causes and Code Values	209
	VLAN Termination Causes and Code Values	217

Chapter 16	Configuring Extensible Subscriber Services Manager	221
	Extensible Subscriber Services Manager Overview	221
	Understanding the Dictionary File	222
Chapter 17	Monitoring and Managing AAA Information for Subscriber Access	223
	Verifying and Managing Subscriber AAA Information	223
	Monitoring Pending RADIUS Accounting Stop Messages	224
	Verifying and Managing the RADIUS Dynamic-Request Feature	225
	Verifying and Managing Domain Map Configuration	225
	Verifying and Managing LLID Preauthentication Configuration	226
Part 2	Configuring DHCP for Subscriber Management	
Chapter 18	Using DHCP Overview	229
	Extended DHCP Local Server Overview	230
	Interaction Among the DHCP Client, Extended DHCP Local Server, and Address-Assignment Pools	232
	Providing DHCP Client Configuration Information	232
	Minimal Configuration for Clients	234
	DHCP Local Server and Address-Assignment Pools	234
	Extended DHCP Relay Agent Overview	236
	Interaction Among the DHCP Relay Agent, DHCP Client, and DHCP Servers	237
	DHCP Liveness Detection	238
	DHCP Relay Proxy Overview	239
	Interaction Among DHCP Relay Proxy, DHCP Client, and DHCP Servers	239
Chapter 19	Configuring Default Services That are Activated at Subscriber Login	241
	Default Subscriber Service Overview	241
	Configuring a Default Subscriber Service	242
Chapter 20	Assigning IP Addresses	243
	DHCP Attributes for Address-Assignment Pools	243
	Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use	245
	Assign a Specific IP Address to a Client Using DHCP Option 50 and DHCPv6 IA_NA Option	246
	Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address	247
	Specifying the Subnet for DHCP Client Address Assignment	248
	Example: Extended DHCP Local Server Configuration with Optional Pool Matching	248
	DNS Address Assignment Precedence	249
Chapter 21	Configuring Lease Times for IP Addresses	251
	Configuring a DHCP Lease-Time Threshold	251
	DHCP Lease-Time Validation Overview	252
	DHCPv6 Lease Timers	254

Chapter 22	Configuring DHCP Individual and Bulk Leasequery	255
	DHCP Leasequery and Bulk Leasequery	255
	Guidelines for Configuring Support for Leasequery and Bulk Leasequery Operations	256
	Configuring and Using DHCP Individual Leasequery	257
	Configuring and Using DHCP Bulk Leasequery	260
	Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database	263
	Verifying and Managing DHCP Leasequery and Bulk Leasequery Configuration	264
Chapter 23	Requesting DHCP Client Configuration Information From an Address Pool	267
	DHCP Local Server Handling of Client Information Request Messages	267
	Enabling Processing of Client Information Requests	268
Chapter 24	Authenticating DHCP Clients Using An External AAA Authentication Service	271
	Using External AAA Authentication Services with DHCP	271
	Creating Unique Usernames for DHCP Clients	272
	Configuring Passwords for Usernames	275
Chapter 25	Grouping Interfaces and Applying a Common DHCP Configuration to the Group	277
	Grouping Interfaces with Common DHCP Configurations	277
	Guidelines for Configuring Interface Ranges for Groups of DHCP Interfaces	278
	Configuring Group-Specific DHCP Local Server Options	279
	Configuring Group-Specific DHCP Relay Options	280
	Example: Configuring DHCP and DHCPv6 Relay Agent Group-Level Selective Traffic Processing	281
Chapter 26	Configuring the Number of DHCP Clients Per Interface	287
	Specifying the Maximum Number of DHCP Clients Per Interface	287
	Allowing Only One DHCP Client Per Interface	288
Chapter 27	Maintaining Subscribers During Interface Delete Events	291
	Subscriber Binding Retention During Interface Delete Events	291
	Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events	292
	Verifying and Managing the DHCP Maintain Subscribers Feature	292
Chapter 28	Forcing Dynamic Reconfiguration of Clients From a DHCP Local Server	295
	Understanding Dynamic Reconfiguration of Extended DHCP Local Server Clients	295
	Default Client/Server Interaction	295
	Dynamic Client/Server Interaction for DHCPv4	296
	Dynamic Client/Server Interaction for DHCPv6	296
	Manually Forcing the Local Server to Initiate the Reconfiguration Process	297

	Action Taken for Events That Occur During a Reconfiguration	297
	Configuring Dynamic Client Reconfiguration of Extended Local Server Clients	298
	Configuring Dynamic Reconfiguration Attempts for DHCP Clients	300
	Configuring Deletion of the Client When Dynamic Reconfiguration Fails	301
	Configuring Reconfiguration of the Client on Receipt of RADIUS-Initiated Disconnect	301
Chapter 29	Conserving IP Addresses Using DHCP Auto Logout	303
	DHCP Auto Logout Overview	303
	Auto Logout Overview	303
	How DHCP Identifies and Releases Clients	304
	Option 60 and Option 82 Requirements	305
	Automatically Logging Out DHCP Clients	305
	How DHCP Relay Agent Uses Option 82 for Auto Logout	306
	DHCPv6 Match Criteria for Identifying DHCPv6 Subscribers	307
	Automatically Logging Out DHCPv6 Clients	308
Chapter 30	Overriding Default DHCP Local Server Configuration Settings	311
	Overriding Default DHCP Local Server Configuration Settings	311
	Overriding the Default DHCP Relay Configuration Settings	313
	Deleting DHCP Local Server and DHCP Relay Override Settings	315
Chapter 31	Configuring DHCP Renegotiation While in Bound State	317
	DHCP Behavior When Renegotiating While in Bound State	317
Chapter 32	Attaching Access Profiles to DHCP Interfaces	319
	Access Profiles for the DHCP Relay Agent and DHCP Local Server Overview	319
	Attaching Access Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces	320
	Attaching an Access Profile to All DHCP Subscriber or All DHCP Client Interfaces	320
	Attaching an Access Profile to a Group of DHCP Subscribers or a Group of DHCP Clients	320
	Attaching an Access Profile to a Group of DHCP Subscriber Interfaces or a Group of DHCP Client Interfaces	321
Chapter 33	Applying a Common DHCP Relay Agent Configuration to Groups of DHCP Servers	323
	Configuring Named Server Groups	323
	Configuring Active Server Groups to Apply a Common DHCP Relay Agent Configuration to Named Server Groups	323
Chapter 34	Changing the Gateway IP Address (giaddr) Field and DHCP Relay Request and Release Packet Source Address	325
	Changing the Gateway IP Address (giaddr) Field to the giaddr of the DHCP Relay Agent	325
	Replacing the DHCP Relay Request and Release Packet Source Address	325

Chapter 35	Securing DHCP Messages Sent Between DHCP Clients and Servers in Different VRFs	327
	DHCP Message Exchange Between DHCP Clients and DHCP Server in Different VRFs	327
	Configuring DHCP Message Exchange Between DHCP Server and Clients in Different VRFs	328
Chapter 36	Configuring DHCP Relay Agent	333
	DHCP-Initiated Service Change Based on Remote ID	333
	Using Layer 2 Unicast Transmission for DHCP Packets	334
	Trusting Option 82 Information	334
	Sending Release Messages When Clients Are Deleted	335
	Disabling Automatic Binding of Stray DHCP Requests	336
	Using DHCP Relay Agent Option 82 Information	337
	Configuring Option 82 Information	338
	Including a Prefix in DHCP Options	340
	Including a Textual Description in DHCP Options	342
	Using DHCP Option Information to Selectively Process DHCP Client Traffic	344
	Configuring DHCP Relay Agent Source Address	345
	Example: Minimum DHCP Relay Agent Configuration	346
	Example: Configuring DHCP Relay Agent Selective Traffic Processing Based on DHCP Option Strings	346
	Example: DHCP Relay Agent Configuration with Multiple Clients and Servers	351
	Example: Configuring DHCP-Initiated Service Change Based on Remote ID	352
	Disabling DHCP Relay	353
Chapter 37	Configuring DHCP Relay Proxy Mode	355
	Enabling DHCP Relay Proxy Mode	355
Chapter 38	Configuring DHCP Local Server Authentication	357
	Configuring a Token for DHCP Local Server Authentication	357
Chapter 39	Configuring a Minimum DHCP Local Server Configuration	359
	Example: Minimum Extended DHCP Local Server Configuration	359
Chapter 40	Protecting the Routing Engine Using DHCP Firewall Filters	361
	Example: Configuring a DHCP Firewall Filter to Protect the Routing Engine	361
	Port Number Requirements for DHCP Firewall Filters	365
Chapter 41	Monitoring and Managing DHCP	367
	Requesting DHCP Local Server to Initiate Reconfiguration of Client Bindings	367
	Clearing DHCP Bindings for Subscriber Access	368
	Displaying a Count of DHCP Packets That Are Dropped or Forwarded During Selective Processing That Is Based on DHCP Option Strings	370
	Monitoring DHCP Relay Server Responsiveness	370
	Verifying and Managing DHCP Local Server Configuration	371
	Verifying and Managing DHCP Relay Configuration	371

Part 3	Configuring IPv6 for Subscriber Management	
Chapter 42	Migrating to IPv6 Using IPv4 and IPv6 Dual Stack	375
	Why Use IPv4/IPv6 Dual Stack?	375
	Basic Architecture of a Subscriber Access Dual-Stack Network	375
	Terms Used in IPv6 Subscriber Management Documentation	376
	IPv6 Addressing Requirements for a Subscriber Access Network	378
	Alternatives to Using a Global IPv6 Address on the CPE WAN Link	379
Chapter 43	Introduction to IPv6 Addresses	381
	IPv6 Addressing Overview	381
	IPv6 Notation	381
	IPv6 Prefixes	382
	IPv6 Address Types	382
	Unicast Addresses	383
	Multicast Addresses	383
	Anycast Addresses	383
Chapter 44	Using NDRA to Provide IPv6 WAN Link Addressing	385
	Using NDRA to Provide IPv6 WAN Link Addressing Overview	385
	IPv6 Neighbor Discovery Protocol Overview	385
	Neighbor Discovery Messages	386
	How NDRA Works in a Subscriber Access Network	386
	Methods for Obtaining IPv6 Prefixes for NDRA	387
	Using AAA RADIUS Server to Obtain IPv6 Prefixes for NDRA	387
	Duplicate Prefix Protection for NDRA	388
Chapter 45	Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing	389
	Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing Overview	389
	Methods for Obtaining IPv6 Global Addresses for DHCPv6 IA_NA	389
	Using a AAA RADIUS Server to Obtain IPv6 Addresses for DHCPv6 IA_NA	389
Chapter 46	Using DHCPv6 Prefix Delegation to Provide Subscriber LAN Addressing	391
	Using DHCPv6 Prefix Delegation Overview	391
	Using a Delegated Prefix on the CPE Loopback Interface	393
	DHCPv6 Prefix Delegation over PPPoE	393
	Methods for Obtaining IPv6 Prefixes for DHCPv6 Prefix Delegation	394
	Using a AAA RADIUS Server to Obtain IPv6 Prefixes for Prefix Delegation	394
Chapter 47	Using Both DHCPv6 IA_NA and DHCPv6 Prefix Delegation to Provide IPv6 WAN Link and Subscriber LAN Addressing	395
	Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview	395
	Lease Times and Session Timeouts for DHCPv6 IA_NA and DHCPv6 Prefix Delegation	395
	DHCPv6 Options in a DHCPv6 Multiple Address Environment	396

	Methods for Obtaining Addresses for Both DHCPv6 Prefix Delegation and DHCPv6 IA_NA	396
	Address Pools for DHCPv6 Prefix Delegation and DHCPv6 IA_NA	397
	Using a AAA RADIUS Server to Obtain IPv6 Addresses and Prefixes	397
	Junos OS Predefined Variable for Multiple DHCPv6 Address Assignment	397
	Multiple DHCPv6 IA_NA and IA_PD Requests per Client Interface	398
Chapter 48	Designs for IPv6 Addressing in a Subscriber Access Network	399
	Selecting the Type of Addressing Used on the CPE	399
	Selecting the Method of Provisioning a Global IPv6 Address for the WAN Link	399
	Selecting the Method of Assigning Global IPv6 Addresses to Subscribers	400
	Selecting the Method of Obtaining IPv6 Prefixes	400
	Using a AAA RADIUS Server to Obtain Global IPv6 Addresses and IPv6 Prefixes	401
	Design 1: IPv6 Addressing with DHCPv6 IA_NA and DHCPv6 Prefix Delegation	401
	Design 2: IPv6 Addressing with NDRA and DHCPv6 Prefix Delegation	402
	Design 3: IPv6 Addressing with NDRA	403
	Design 4: IPv6 Addressing with DHCPv6 Prefix Delegation and No NDRA Prefix	403
Chapter 49	Dual-Stack Access Models in a DHCP Network	405
	IPv4 and IPv6 Dual Stack in a DHCP Access Network	405
	Support for Demultiplexing Interfaces	405
	AAA Service Framework in a Dual Stack over a DHCP Access Network	406
	Collection of Accounting Statistics in a DHCP Access Network	406
	Change of Authorization (CoA)	407
	Dual-Stack Interface Stack in a DHCP Wholesale Network	407
	Single-Session DHCP Dual-Stack Overview	408
	Configuring Single-Session DHCP Dual-Stack Support	409
	Verifying and Managing DHCP Dual-Stack Configuration	411
Chapter 50	Dual-Stack Access Models in a PPPoE Network	413
	IPv4 and IPv6 Dual Stack in a PPPoE Access Network	413
	Support for Demultiplexing Interfaces	414
	Determining the Status of CPE in a PPPoE Access Network	414
	IPv6 Address Provisioning in the PPPoE Access Network	414
	Authentication in a PPPoE Access Network	415
	Negotiation of Network Control Protocols When Authorized Addresses Are Unavailable	415
	Shared IPv4 and IPv6 Service Sessions on PPP Access Networks	416
	Accounting for Shared IPv4 and IPv6 Service Sessions	416
	Deactivating Shared IPv4 and IPv6 Service Sessions	416
	AAA Service Framework in a Dual Stack over a PPPoE Access Network	416
	Collection of Accounting Statistics in a PPPoE Access Network	417
	Change of Authorization (CoA)	418

	RADIUS Accounting Messages for Dual-Stack PPPoE Subscribers	418
	Accounting Messages for PPPoE Using NDRA Prefixes	419
	Accounting Messages for PPPoE Subscribers That Use DHCPv6 IA_NA Prefixes	424
	Suppressing Accounting Information That Comes from AAA	430
	Avoiding Negotiation of IPv6CP in the Absence of an Authorized Address	430
Chapter 51	Configuring DHCPv6 Local Server	433
	DHCPv6 Local Server Overview	434
	Enabling DHCPv6 Rapid Commit Support	435
	Preventing Binding of Clients That Do Not Support Reconfigure Messages . . .	436
	Configuring the DUID Type Supported by DHCPv6 Servers	437
	Example: Extended DHCPv6 Local Server Configuration	438
Chapter 52	Configuring DHCPv6 Relay Agent	441
	DHCPv6 Relay Agent Overview	441
	DHCPv6 Relay Agent Options	442
	Configuring DHCPv6 Relay Agent Options	442
	Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets	444
	Inserting DHCPv6 Remote-ID Option (Option 37) In DHCPv6 Packets	445
Chapter 53	Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation	447
	Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation	447
	On-Demand IPv4 Address Negotiation and Release for Static PPP Subscribers Overview	448
	IPv4 Address Negotiation for Static PPP Subscribers	448
	IPv4 Address Release for Static PPP Subscribers	450
	On-Demand IPv4 Address Negotiation and Release for Dynamic PPP Subscribers Overview	450
	IPv4 Address Negotiation for Dynamic PPP Subscribers	451
	IPv4 Address Release for Dynamic PPP Subscribers	452
	IPCP Negotiation with Optional Peer IP Address	453
	How RADIUS Attributes Are Used During Authentication When On-Demand Address Allocation is Enabled	454
	Configuring Static On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers	454
	Configuring Dynamic On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers	455
	Configuring Global On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers	455
	Enabling Immediate Interim Accounting Messages for On-Demand IPv4 Address Changes	456
	Enabling Unisphere IPv4 Release Control VSA in RADIUS Messages	456
Chapter 54	Best Practices for Configuring IPv4 and IPv6 Dual Stack in a PPPoE Access Network	457
	Best Practice: Static PPPoE Interfaces with NDRA	457
	Best Practice: DHCPv6 Prefix Delegation over a PPPoE Access Network	458

	Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with NDRA	458
	Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with DHCPv6	459
	Best Practice: IPv4 Addressing for Logical Interfaces in PPPoE Dynamic Profiles	460
	Best Practice: Configuring Authentication for DHCP Subscribers on a PPPoE Access Network	461
Chapter 55	Configuring Dual Stack for PPPoE Access Networks in Which DHCP Is Used	463
	Configuring a DHCPv6 Local Server for DHCPv6 over PPPoE	463
	Configuring a PPPoE Dynamic Profile for Use with DHCP Addressing in a Dual-Stack Network	464
Chapter 56	Configuring Dual Stack for PPPoE Access Networks in Which NDRA Is Used	467
	Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network	467
	Configuring a Static PPPoE Logical Interface for NDRA	469
	Configuring an Address-Assignment Pool Used for Router Advertisements	470
	Configuring Duplicate IPv6 Prefix Protection for Router Advertisement	471
Chapter 57	Configuring Address Assignment Pools for DHCPv6	473
	Configuring an Address-Assignment Pool for Use by DHCPv6 Prefix Delegation	473
	Configuring an Address-Assignment Pool for Use by DHCPv6 IA_NA	474
	Specifying the Delegated Address-Assignment Pool to Be Used for DHCPv6 Prefix Delegation	474
Chapter 58	Configuring the Dynamic Router Advertisement Protocol	477
	Dynamic Router Advertisement Configuration Overview	477
Chapter 59	Examples: IPv4 and IPv6 Dual-Stack Designs	479
	Example: Configuring a Dual Stack That Uses DHCPv6 IA_NA and DHCPv6 Prefix Delegation over PPPoE	479
	Example: Configuring a Dual Stack That Uses ND/RA and DHCPv6 Prefix Delegation Over PPPoE	502
	Example: Configuring a Dual Stack That Uses ND/RA Over PPPoE	523
Chapter 60	Monitoring and Managing Dual Stack Subscribers	541
	Monitoring Active Subscriber Sessions	541
	Monitoring Both IPv4 and IPv6 Address in Correct Routing Instance	542
	Monitoring Dynamic Subscriber Sessions	542
	Monitoring Address Pools Used for Subscribers	543
	Monitoring Specific Subscriber Sessions	544
	Monitoring the Status of the PPPoE Logical Interface	545
	Monitoring Service Sessions for Subscribers	545
	Monitoring PPP Options Negotiated with the Remote Peer	546
	Monitoring the RADIUS Attribute Used for NDRA	547

Chapter 61	Monitoring and Managing DHCPv6	549
	Monitoring Address Bindings on the DHCPv6 Local Server	549
	Verifying and Managing DHCPv6 Local Server Configuration	550
	Verifying and Managing DHCPv6 Relay Configuration	550
Part 4	Configuring Junos OS Enhanced Subscriber Management	
Chapter 62	Configuring Junos OS Enhanced Subscriber Management	553
	Configuring Junos OS Enhanced Subscriber Management	554
	Junos OS Enhanced Subscriber Management Overview	556
	Enhanced Subscriber Management Overview	556
	Supported Hardware Platforms for Enhanced Subscriber Management	557
	Supported Features for Enhanced Subscriber Management	558
	Benefits of Configuring Enhanced Subscriber Management	558
	Verifying and Managing Junos OS Enhanced Subscriber Management	558
	Configuring DTCP-Initiated Subscriber Secure Policy Mirroring Overview	559
	Configuring RADIUS-Initiated Subscriber Secure Policy Mirroring Overview	560
Part 5	Configuring Address-Assignment Pools for Subscriber Management	
Chapter 63	Configuring Address-Assignment Pools for Dynamic and Static Addresses	565
	Address-Assignment Pools Overview	565
	Address-Assignment Pools Licensing Requirements	566
	Configuring Address-Assignment Pools	567
	Example: Configuring an Address-Assignment Pool	567
	Configuring an Address-Assignment Pool Name and Addresses	569
	Configuring a Named Address Range for Dynamic Address Assignment	569
	Configuring Address-Assignment Pool Usage Threshold Traps	570
	Configuring Address-Assignment Pool Linking	571
	Configuring Address-Assignment Pool Hold-Down	572
	Configuring Static Address Assignment	572
	Configuring Duplicate IPv4 Address Protection for AAA	573
Part 6	Configuring DNS Addresses for Subscriber Management	
Chapter 64	Configuring DNS Address Assignments and Session Options	577
	DNS Name Server Address Overview	577
	Configuring DNS Name Server Addresses for Subscriber Management	578
	Ensuring IPCP Negotiation for Primary and Secondary DNS Addresses	580
	Overriding How the DNS Server Address Is Returned in a DHCPv6 Multiple Address Environment	581
	DNS Resolver for IPv6 DNS Overview	582
	Configuring a DNS Server Address for IPv6 Hosts	582

Part 7	Configuring CLI-Based Subscriber Services	
Chapter 65	Configuring CLI-Activated Subscriber Services	587
	CLI-Activated Subscriber Services	587
	Activating and Deactivating Subscriber Services Locally with the CLI	588
	Using the CLI to Modify Traffic-Control Profiles That Are Currently Applied to Subscribers	591
	Using the CLI to Globally Modify a Traffic-Control Profile Currently Applied to Multiple Subscribers	592
	Using the CLI to Modify a Traffic-Control Profile for a Specific Current Subscriber	592
Chapter 66	Configuring Subscriber Services with Multiple Instances	595
	Subscriber Services with Multiple Instances Overview	595
	Subscriber Service Instances and Service Parameters	595
	CLI Deactivation of Subscriber Services with Multiple Instances	596
	Subscriber Services with Multiple Instances in RADIUS Accounting Messages	596
	Deactivating a Single Instance of a Subscriber Service with Multiple Instances	597
	Deactivating All Instances of a Subscriber Service with Multiple Instances	599
Chapter 67	Monitoring and Managing Subscriber Services	603
	Verifying and Managing Subscriber Services with Multiple Instances	603
Part 8	Configuring ANCP and the ANCP Agent for Subscribers	
Chapter 68	Configuring ANCP Agent Neighbors and Operations	607
	ANCP and the ANCP Agent Overview	607
	Overview	608
	Topology Discovery	608
	Subscriber Services	609
	ANCP Interfaces and Access Loop Circuit Identifiers	609
	ANCP Neighbors	610
	Partitions	612
	Generic Response Messages and Result Codes	613
	ANCP Operations in Different Network Configurations	614
	ANCP Network Using N:1 and 1:1 Configuration Models without Interface Sets	618
	Sequence of ANCP Events: Static VLAN or VLAN Demux Interfaces over Ethernet Without Interface Sets	619
	ANCP Network Using N:1 Configuration Model with Interface Sets	620
	Sequence of ANCP Events: Static VLAN Interfaces over Ethernet with Interface Sets	621
	ANCP Network Using 1:1 Configuration Model with Interface Sets	622
	Sequence of ANCP Events: Static VLAN Demux Interfaces over Aggregated Ethernet with Interface Sets	623
	Configuring the ANCP Agent	624
	Configuring ANCP Neighbors	625
	Associating an Access Node with Subscribers for ANCP Agent Operations	626

	Specifying the Interval Between ANCP Adjacency Messages	627
	Specifying the Maximum Number of Discovery Table Entries	628
	Configuring the ANCP Agent for Backward Compatibility	628
	Specifying How Long Processes Wait for the ANCP Agent Restart to Complete	629
	Configuring the ANCP Agent to Learn ANCP Partition IDs	629
	Example: Configuring an ANCP Network with Interface Sets and N:1 Static Demux VLANs over Aggregated Ethernet	630
Chapter 69	Configuring the ANCP Agent Traffic and CoS	653
	Traffic Rate Reporting and Adjustment by the ANCP Agent	653
	Overview	653
	Traffic Rate Adjustment	655
	Recommended Traffic Shaping Rates	655
	ANCP Agent Keepalives for CoS	656
	Preservation of CoS Shaping Across ANCP Agent Restarts	656
	Configuring the ANCP Agent to Report Traffic Rates to CoS	657
	Setting a Recommended Shaping Rate for Traffic on ANCP Interfaces	659
	Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates	660
Chapter 70	Configuring the ANCP Agent and AAA	663
	ANCP Agent Interactions with AAA	663
	ANCP DSL Attributes Mapped to Juniper Networks DSL Vendor-Specific Attributes	665
	Configuring AAA to Include Juniper Networks DSL VSAs in RADIUS Messages	667
	Configuring Immediate Interim Accounting Updates to RADIUS in Response to ANCP Notifications	668
Chapter 71	Monitoring and Managing ANCP for Subscriber Access	671
	Triggering ANCP OAM to Test the Local Loop	671
	Verifying and Monitoring ANCP Neighbors	672
	Clearing ANCP Neighbors	672
	Verifying and Monitoring ANCP Subscribers	673
	Clearing ANCP Subscribers	673
	Verifying and Monitoring CoS for ANCP Subscribers	674
	Clearing and Verifying ANCP Statistics	674
Part 9	Configuring the Diameter Base Protocol and its Applications	
Chapter 72	Configuring the Diameter Base Protocol	679
	Diameter Base Protocol Overview	679
	Messages Used by Diameter Applications	682
	Diameter AVPs and Diameter Applications	687
	Configuring Diameter	699
	Configuring the Origin Attributes of the Diameter Instance	699
	Configuring Diameter Peers	700
	Configuring the Diameter Transport	701
	Configuring Diameter Network Elements	701

Chapter 73	Configuring Gx-Plus for Provisioning Subscribers	703
	Gx-Plus for Provisioning Subscribers Overview	703
	Understanding Gx-Plus Interactions Between the Router and the PCRF	705
	Subscriber Login	705
	Fault Tolerance and Event Notification	707
	PCRF-Generated Discovery	709
	Subscriber Accounting	709
	Subscriber Audit	709
	Subscriber Logout	710
	Configuring Gx-Plus	710
	Configuring the Gx-Plus Partition	711
	Configuring Gx-Plus Global Attributes	712
	Provisioning Subscribers with Gx-Plus	713
Chapter 74	Configuring 3GPP Policy and Charging Control	715
	3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting	715
	Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers	718
	Wireline Access Environment	718
	Junos OS Environment	720
	Understanding Gx Interactions Between the Router and the PCRF	722
	Subscriber Login	722
	Subscriber Update	726
	Subscriber Logout	727
	Subscriber Disconnect	728
	Connectivity Fault Recovery	729
	Understanding Gy Interactions Between the Router and the OCS	730
	First Interrogation to the OCS	730
	Intermediate Interrogation to the OCS	732
	Final Interrogation to the OCS	733
	Connectivity Fault Recovery	734
	Abort Session Requests	734
	Understanding Rule Interactions Between the PCRF, PCEF, and OCS	735
	Login Interactions	736
	Update Interactions	736
	Quota Expiration and Validity-Time Interactions	737
	Connection and Monitoring Interactions	737
	Logout Interactions	738
	Understanding Upstream and Downstream Messages for the PCRF	740
	Common Upstream Messages	741
	Event-Timestamp AVP	741
	Charging Rules Installation Notifications	741
	Event Trigger Commands	742
	Common Downstream Messages	742
	Charging Rule Installation Commands	742
	Charging Rule Removal Commands	742

	Event Trigger Commands	743
	Configuring the OCS Partition	743
	Configuring the PCRF Partition	746
	Configuring OCS Global Parameters	749
Chapter 75	Configuring NASREQ for Authentication and Authorization	751
	Diameter Network Access Server Application (NASREQ)	751
	Configuring the Diameter Network Access Server Application (NASREQ)	753
Chapter 76	Configuring JSRC in Subscriber Access Networks	755
	Juniper Networks Session and Resource Control (SRC) and JSRC Overview	755
	Hardware Requirements for JSRC for Subscriber Access	756
	Understanding JSRC-SAE Interactions	757
	Subscriber Login	757
	Subscriber Service Activation and Deactivation	758
	Subscriber Resynchronization	758
	Subscriber Session Terminated by the SAE	758
	Statistics Collection and Reporting per Service Rule	759
	Subscriber Logout	759
	Configuring JSRC	759
	Configuring the JSRC Partition	760
	Assigning a Partition to JSRC	761
	Authorizing Subscribers with JSRC	761
	Provisioning Subscribers with JSRC	762
Chapter 77	Excluding Diameter AVPs from JSRC Messages	763
	Excluding AVPs from Diameter Messages for JSRC	763
Chapter 78	Configuring Service Accounting with JSRC	765
	Service Accounting with JSRC	765
	Configuring Service Accounting with JSRC	766
Chapter 79	Configuring Subscribers on Static Interfaces	769
	Subscribers on Static Interfaces Overview	769
	Configuring Subscribers over Static Interfaces	772
	Example: Configuring Static Subscribers for Subscriber Access	773
Chapter 80	Configuring the Static Subscribers Global Profile	775
	Specifying the Static Subscriber Global Access Profile	775
	Specifying the Static Subscriber Global Dynamic Profile	775
	Enabling Multiple Subscribers on a VLAN Logical Interface for All Static Subscribers	776
	Configuring the Static Subscriber Global Authentication Password	777
	Configuring the Static Subscriber Global Username	777
Chapter 81	Configuring the Static Subscribers Group Profile	779
	Creating a Static Subscriber Group	779
	Specifying the Static Subscriber Group Access Profile	780
	Specifying the Static Subscriber Group Dynamic Profile	780
	Enabling Multiple Subscribers on a VLAN Logical Interface for a Static Subscriber Group	781
	Configuring the Static Subscriber Group Authentication Password	781

	Configuring the Static Subscriber Group Username	782
Chapter 82	Configuring the PTSP Feature to Support Dynamic Subscribers	783
	PTSP Overview	783
	Hardware Requirements for PTSP for Subscriber Access	784
	Juniper Networks Session and Resource Control (SRC) and PTSP Overview	784
	Understanding PTSP-SAE Interactions	785
	Packet-Triggered Subscribers Services Overview	786
	Subscriber Identification Method for PTSP Partition	788
	PTSP Services on Aggregated and Redundant Services PICs	788
	Configuring the PTSP Application	790
	Configuring PTSP	790
Chapter 83	Configuring the PTSP Partition to Connect to the External Policy Manager	793
	Understanding the Subscriber Profiles for Client Sessions per PTSP Partition	793
	Configuring the PTSP Partition	795
	Assigning the PTSP Partition	796
Chapter 84	Configuring PTSP Services and Rules	797
	Configuring the Multiservices DPC for PTSP	797
	Enabling the PTSP Service Package on the Multiservices DPC	797
	Configuring Services Interface for PTSP	798
	Configuring PTSP Service Rules	798
	Configuring Static PTSP Rules	799
	Configuring PTSP Rule Sets	801
	Configuring PTSP Service Sets	801
	Configuring the PTSP Forwarding Instance	802
Chapter 85	Monitoring and Managing Diameter Information for Subscriber Access	805
	Verifying Diameter Node, Instance, and Route Information	805
	Verifying and Managing Diameter Function Information	806
	Verifying and Managing Diameter Peer Information	807
	Verifying Diameter Network Element Information	808
Chapter 86	Monitoring and Managing Subscriber Information on Static Interfaces	809
	Forcing a Static Subscriber to Be Logged Out	809
	Resetting the State of an Interface for Static Subscriber Login	809
	Forcing a Group of Static Subscribers to Be Logged Out	810
	Resetting the State of an Interface Group for Static Subscriber Login	810
	Verifying Information about Subscriber Sessions on Static Interfaces	810
Chapter 87	Monitoring and Managing Packet-Triggered Subscribers	811
	Verifying and Managing PTSP Configuration	811
Part 10	Troubleshooting	
Chapter 88	Configuring AAA Testing and Troubleshooting	815
	AAA Configuration Testing and Troubleshooting	815
	Testing a Subscriber AAA Configuration	815

Chapter 89	Tracing Extended DHCP Operations	821
	Tracing Extended DHCP Operations	821
	Configuring the Extended DHCP Log Filename	823
	Configuring the Number and Size of Extended DHCP Log Files	823
	Configuring Access to the Extended DHCP Log File	824
	Configuring a Regular Expression for Extended DHCP Messages to Be Logged	824
	Configuring the Extended DHCP Tracing Flags	824
	Configuring the Severity Level to Filter Which Extended DHCP Messages Are Logged	825
	Tracing Extended DHCP Operations for Specific Interfaces	826
	Tracing Extended DHCP Operations for Specific Interfaces	827
Chapter 90	Configuring Subscriber Management Database Log Files	829
	Configuring the Number and Size of Subscriber Management Database Log Files	829
	Configuring Access to the Subscriber Management Database Log File	830
	Configuring a Regular Expression for Subscriber Management Database Messages to Be Logged	830
Chapter 91	Configuring Subscriber Management Database Trace Flags and Operations	831
	Tracing Subscriber Management Database Operations for Subscriber Access	831
	Configuring the Subscriber Management Database Trace Log Filename	832
	Configuring the Subscriber Management Database Tracing Flags	832
Chapter 92	Configuring Subscriber Management Session Database Log Files	833
	Configuring the Number and Size of Subscriber Management Session Database Replication Log Files	833
	Configuring Access to the Subscriber Management Session Database Replication Log File	834
	Configuring a Regular Expression for Subscriber Management Session Database Replication Messages to Be Logged	834
Chapter 93	Configuring Subscriber Management Session Database Trace Flags and Operations	835
	Tracing Subscriber Management Session Database Replication Operations for Subscriber Access	835
	Configuring the Subscriber Management Session Database Replication Trace Log Filename	836
	Configuring the Subscriber Management Session Database Replication Tracing Flags	836
Chapter 94	Configuring Diameter Base Protocol Log Files	839
	Configuring the Number and Size of Diameter Base Protocol Log Files	839
	Configuring Access to the Diameter Base Protocol Log File	840
	Configuring a Regular Expression for Diameter Base Protocol Messages to Be Logged	840
	Configuring the Severity Level to Filter Which Diameter Base Protocol Messages Are Logged	840

Chapter 95	Configuring Diameter Base Protocol Trace Flags and Operations	843
	Tracing Diameter Base Protocol Processes for Subscriber Access	843
	Configuring the Diameter Base Protocol Trace Log Filename	844
	Configuring the Diameter Base Protocol Tracing Flags	844
Chapter 96	Troubleshooting Diameter Networks	847
	Troubleshooting Diameter Network Configuration	847
	Troubleshooting Diameter Network Connectivity	847
Chapter 97	Configuring ANCP Log Files	849
	Configuring the Number and Size of ANCP Log Files	849
	Configuring Access to the ANCP Log File	850
	Configuring a Regular Expression for ANCP Messages to Be Logged	850
	Configuring the Severity Level to Filter Which ANCP Messages Are Logged . . .	850
Chapter 98	Configuring ANCP Trace Flags and Operations	853
	Tracing ANCP Agent Operations for Subscriber Access	853
	Configuring the ANCP Trace Log Filename	854
	Configuring the ANCP Tracing Flags	854
Chapter 99	Configuring General Authentication Service Log Files	857
	Configuring the Number and Size of General Authentication Service Processes Log Files	857
	Configuring Access to the Log File	858
	Configuring a Regular Expression for Lines to Be Logged	858
Chapter 100	Configuring General Authentication Service Trace Flags and Operations	859
	Tracing General Authentication Service Processes	859
	Configuring the General Authentication Service Processes Trace Log Filename	860
	Configuring the Number and Size of General Authentication Service Processes Log Files	860
	Configuring Access to the Log File	861
	Configuring a Regular Expression for Lines to Be Logged	861
	Configuring Subscriber Filtering for General Authentication Service Trace Operations	861
	Configuring the Trace Operation	862
	Configuring the General Authentication Service Processes Trace Log Filename	863
	Configuring the Trace Operation	864
	Configuring Subscriber Filtering for General Authentication Service Trace Operations	864
Chapter 101	Configuring Static Subscriber Interfaces Log Files	867
	Configuring the Number and Size of Static Subscribers Log Files	867
	Configuring Access to the Static Subscribers Log File	868
	Configuring a Regular Expression for Static Subscriber Messages to Be Logged	868
	Configuring the Severity Level to Filter Which Static Subscriber Messages Are Logged	868

Chapter 102	Configuring Static Subscriber Interfaces Trace Flags and Operations . . .	871
	Tracing Static Subscriber Operations	871
	Configuring the Static Subscribers Trace Log Filename	872
	Configuring the Static Subscribers Tracing Flags	872
Chapter 103	Configuring PTSP Tracing Operations	875
	Tracing Packet-Triggered Subscriber Operations	875
	Configuring the Packet-Triggered Subscribers Trace Log Filename	876
	Configuring the Size of Packet-Triggered Subscribers Log Files	876
	Configuring the Packet-Triggered Subscribers Tracing Flags	876
	Configuring a Statistics Profile for PTSP	877
	Configuring the File Properties for Statistics Data Output	877
	Configuring the Profile Properties for Statistics Data Output	878
	Configuring the Record Type for Statistics Data	878
	Tracing PTSP Operations	879
Chapter 104	Overriding PCRF Session Control to Troubleshoot a Session or Services	881
	Disabling PCRF Control of a Subscriber Session	881
Chapter 105	Contacting Juniper Technical Support	883
	Collecting Subscriber Access Logs Before Contacting Juniper Networks Technical Support	883
	Compressing Troubleshooting Logs from /var/logs to Send to Juniper Networks Technical Support	885
Part 11	Configuration Statements and Operational Commands	
Chapter 106	Configuration Statements	889
	aaa-logical-system (Domain Map)	904
	aaa-routing-instance (Domain Map)	905
	abated-utilization (Address-Assignment Pools)	906
	abated-utilization-v6 (Address-Assignment Pools)	906
	accept-max-tcp-connections (System Process)	907
	access-identifier	907
	access-loop-id-local	908
	access-profile	909
	access-profile (Extensible Subscriber Services Manager)	910
	access-profile (Domain Map)	910
	access-profile (Static Subscribers)	911
	access-profile-name (Duplicate Accounting)	912
	accounting (Access Profile)	913
	accounting (Service Accounting)	914
	accounting-backup-options (Access Profile)	914
	accounting-order (Service Accounting)	915
	accounting-port	916
	accounting-retry (RADIUS)	917
	accounting-server	918
	accounting-session-id-format	918
	accounting-stop-on-access-deny	919

accounting-stop-on-failure	919
accounting-timeout (RADIUS)	920
active-server-group	921
address (Diameter Peer)	922
address (Diameter Transport)	922
address-assignment (Address-Assignment Pools)	923
address-change-immediate-update	924
address-pool (Domain Map)	924
address-protection	925
adjacency-timer	926
advisory-options (Traffic Shaping)	927
aggregate-clients (DHCP Relay Agent)	928
aggregate-clients (Static Subscribers)	930
allow-bulk-leasequery (DHCP Local Server)	931
allow-leasequery (DHCP Local Server)	932
always-write-giaddr	933
always-write-option-82	934
ancp	935
ancp-speed-change-immediate-update (ANCP)	936
application-group-any	937
application-groups	937
applications (Services PTSP)	938
attempts (DHCP Local Server)	939
attempts (DHCP Relay Agent)	940
attributes	941
attributes (JSRC Attributes)	941
authentication (DHCP Local Server)	942
authentication (DHCP Relay Agent)	943
authentication (Static Subscribers)	944
authentication-order	945
authentication-server	946
authorization-order	947
autonomous (Dynamic Router Advertisement)	948
boot-file	948
boot-server	949
bulk-leasequery (DHCP Relay Agent)	949
called-station-id (OCS Partition)	950
calling-station-id-delimiter (Subscriber Management)	950
calling-station-id-format (Subscriber Management)	951
chap-challenge-in-request-authenticator (Subscriber Management)	952
charging-id (OCS Partition)	952
charging-service-list	953
circuit-id (DHCP Relay Agent)	954
circuit-id (Address-Assignment Pools)	956
circuit-type (DHCP Local Server)	957
circuit-type (DHCP Relay Agent)	958
clear-on-abort (DHCP Local Server)	959
client-accounting-algorithm	960
client-authentication-algorithm	961

client-discover-match (DHCP Local Server)	962
client-discover-match (DHCP Relay Agent)	963
client-id (DHCP Local Server)	964
client-id (DHCP Relay Agent)	965
client-idle-timeout	966
client-idle-timeout-ingress-only	967
client-negotiation-match (DHCPv6 Local Server)	968
client-negotiation-match (DHCPv6 Relay Agent)	969
client-session-timeout	970
commit-interval	971
coa-dynamic-variable-validation	972
coa-immediate-update	972
coa-no-override service-class-attribute	973
configuration-database (Enhanced Subscriber Management)	973
concurrent-data-sessions	974
connect-actively	974
count-type	975
current-hop-limit (Dynamic Router Advertisement)	976
database-replication (Subscriber Session Database)	976
default-action (DHCP Relay Agent Option)	977
default-lifetime (Dynamic Router Advertisement)	978
delay-advertise (DHCPv6)	979
delay-authentication (DHCP Relay Agent)	980
delay-offer (DHCPv4)	981
delegated-pool (DHCP Local Server)	982
delete-binding-on-renegotiation (DHCP Local Server and Relay Agent)	983
delimiter (DHCP Local Server)	984
delimiter (Domain Map)	985
delimiter (DHCP Relay Agent)	986
demux	987
destination (Diameter Network Element)	988
destination-host	988
destination-host (Gx-Plus)	989
destination-host (OCS Partition)	989
destination-host (PCRF Partition)	990
destination-host (PTSP)	990
destination-realm (JSRC)	991
destination-realm (Gx-Plus)	991
destination-realm (OCS Partition)	992
destination-realm (PCRF Partition)	993
destination-realm (PTSP)	993
dhcp-attributes (Address-Assignment Pools)	994
dhcp-local-server	995
dhcp-relay	1001
dhcp-service	1008
dhcpv6 (DHCP Local Server)	1009
dhcpv6 (DHCP Relay Agent)	1012
diameter	1016
diameter-instance (JSRC)	1017

diameter-instance (Diameter Applications)	1017
diameter-instance (PTSP)	1018
dictionary	1018
disable	1019
disable (Extensible Subscriber Services Manager)	1019
disable-relay	1020
dne-origin (Diameter Network Element)	1021
dns-server	1021
dns-server-address (Dynamic Profiles)	1022
domain (Domain Map)	1023
domain-name (DHCP Local Server)	1024
domain-name (DHCP Relay Agent)	1026
domain-name (Address-Assignment Pools)	1027
domain-name (Static Subscribers)	1028
domain-name-server (Routing Instances and Access Profiles)	1029
domain-name-server-inet (Routing Instances and Access Profiles)	1030
domain-name-server-inet6 (Routing Instances and Access Profiles)	1031
downstream-rate (Traffic Shaping)	1032
draining (Diameter Applications)	1033
draining-response-timeout (Diameter Applications)	1034
drop (DHCP Relay Agent Option)	1035
dual-stack (DHCP Relay Agent Overrides)	1036
dual-stack-group (DHCP Relay Agent)	1037
duplication (Access Profile)	1038
duplication-filter (Access Profile)	1039
duplication-vrf (Duplicate Accounting)	1040
duplication-filter (Access Profile)	1041
dynamic-profile (DHCP Local Server)	1042
dynamic-profile (DHCP Relay Agent)	1043
dynamic-profile (Domain Map)	1044
dynamic-profile (Static Subscribers)	1045
enable	1046
enable (Enhanced Subscriber Management)	1046
equals (DHCP Relay Agent)	1047
ethernet-port-type-virtual	1048
exceed-action	1048
exclude (JSRC Attributes)	1049
exclude (RADIUS)	1050
external-authority	1055
failover (System Process)	1056
family (Address-Assignment Pools)	1057
fast-lookup-filter	1058
final-response-timeout (OCS Partition)	1059
force-continue (OCS Partition)	1060
forward-only (DHCP Relay Agent Option)	1061
forward-only (DHCP Relay Agent)	1062
forward-only-replies (DHCP Relay Agent)	1063
forward-rule (Configuring)	1064
forward-rule (Including in Rule)	1065

forwarding (Diameter Network Element)	1065
from (Forward Rule)	1066
from (Rule)	1067
function (Diameter Network Element)	1068
function (Diameter Route)	1069
ggsn-address (OCS Partition)	1070
ggsn-mcc-mnc (OCS Partition)	1070
global (Gx-Plus)	1071
global (OCS)	1072
global (PCRF)	1073
grace-period	1074
group (DHCP Local Server)	1075
group (DHCP Relay Agent)	1078
group (Static Subscribers)	1081
gsmp-syn-timeout (ANCP)	1082
gsmp-syn-wait (ANCP)	1083
gx-plus (Gx-Plus)	1084
hardware-address	1084
high-utilization (Address-Assignment Pools)	1085
high-utilization-v6 (Address-Assignment Pools)	1085
hold-down (Address-Assignment Pools)	1086
host (Address-Assignment Pools)	1086
host-name (dhcp-relay)	1087
host-name (dhcpv6)	1088
ietf-mode	1088
ignore	1089
immediate-update	1090
include-ipv6 (Gx-Plus)	1090
include-irb-and-l2	1091
include-l2-interface-for-irb (DHCP Relay Agent)	1093
include-option-82 (DHCP Local Server)	1094
interface (DHCP Local Server)	1095
interface (DHCP Relay Agent)	1097
interface (Dynamic Router Advertisement)	1099
interface (Static Subscriber Group)	1100
interface (Static Subscriber Username)	1101
interface-client-limit (DHCP Local Server)	1102
interface-client-limit (DHCP Relay Agent)	1104
interface-delete (Subscriber Management or DHCP Client Management)	1105
interface-delete (Subscriber Management or DHCP Client Management)	1106
interface-description-format	1106
interface-name (DHCP Local Server)	1107
interface-name (DHCP Relay Agent)	1108
interface-mib (Enhanced Subscriber Management)	1109
interface-set (ANCP)	1110
interface-traceoptions (DHCP)	1111
interfaces (ANCP)	1113
ip-address	1113
ip-address-change-notify	1114

ip-address-first	1115
ip-can-type (PCRF Partition)	1116
ipcp-suggest-dns-option	1117
jsrc (JSRC)	1118
jsrc (Access Profile)	1119
jsrc-partition	1119
juniper-dsl-attributes	1120
layer2-unicast-replies	1121
keep-incoming-circuit-id (DHCP Relay Agent)	1122
keep-incoming-interface-id (DHCP Relay Agent)	1123
keep-incoming-remote-id (DHCP Relay Agent)	1124
leasequery (DHCP Relay Agent)	1125
lease-time-threshold (DHCP Local Server and DHCP Relay Agent)	1126
lease-time-validation (DHCP Local Server and DHCP Relay Agent)	1127
limit	1127
link (Address-Assignment Pools)	1128
local-address	1129
local-address-range	1130
local-decision (PCRF Partition)	1131
local-port-range	1132
local-ports	1132
local-prefix-list	1133
local-server-group (DHCP Relay Agent Option)	1133
location (dhcp-relay)	1134
location (dhcpv6)	1135
logical-interface-unit-range	1135
logical-system (Diameter Peer)	1136
logical-system (Diameter Transport)	1137
logical-system (Subscriber Secure Policy)	1138
logical-system-name (Static Subscribers)	1139
logical-system-name (DHCP Local Server)	1140
logical-system-name (DHCP Relay Agent)	1141
logout-response-timeout (PCRF Partition)	1142
ltv-syslog-interval (System Process)	1143
mac-address (DHCP Local Server)	1144
mac-address (DHCP Relay Agent)	1145
maintain-subscriber (Subscriber Management)	1146
managed-configuration (Dynamic Router Advertisement)	1147
map (Domain Map)	1148
mask (Domain Map)	1149
match-direction (Services PTSP)	1149
max-advertisement-interval (Dynamic Router Advertisement)	1150
max-connections (DHCP Local Server)	1151
max-data-sessions-per-subscriber	1152
max-db-size (Enhanced Subscriber Management)	1153
max-empty-replies (DHCP Local Server)	1154
max-outstanding-requests	1155
max-outstanding-requests (Diameter Applications)	1156
max-pending-accounting-stops (Access Profile)	1157

max-withhold-time (Access Profile)	1157
maximum-discovery-table-entries	1158
maximum-helper-restart-time	1158
maximum-lease-time	1159
maximum-subscribers	1159
metric (Diameter Route)	1160
metric (Domain Map)	1160
min-advertisement-interval (Dynamic Router Advertisement)	1161
multi-address-embedded-option-response (DHCP Local Server)	1162
name-server	1162
nas-identifier	1163
nas-port-extended-format	1164
nas-port-extended-format (Interfaces)	1166
nas-port-id-delimiter (Subscriber Management)	1167
nas-port-id-format (Subscriber Management)	1168
nas-port-options (RADIUS Options)	1170
nas-port-type (Subscriber Management)	1171
nas-port-type (RADIUS Options)	1173
nasreq (Diameter Application)	1175
neighbor (Define ANCP)	1176
neighbor-discovery-router-advertisement (Address-Assignment Pools)	1177
netbios-node-type	1177
network	1178
network-element (Diameter Base Protocol)	1179
network-services	1180
no-bind-on-request (DHCP Relay Agent)	1181
no-unsolicited-ra (Enhanced Subscriber Management)	1182
no-vlan-interface-name	1183
ocs (Diameter Applications)	1185
on-demand-ip-address	1186
on-link (Dynamic Router Advertisement)	1187
option	1188
option-60 (DHCP Local Server)	1189
option-60 (DHCP Relay Agent)	1190
option-82 (DHCP Relay Agent)	1191
option-82 (DHCP Local Server Authentication)	1192
option-82 (DHCP Local Server Pool Matching)	1193
option-82 (Address-Assignment Pools)	1194
option-match	1194
option-number (DHCP Relay Agent Option)	1195
options (Access Profile)	1196
order	1198
origin (Diameter Base Protocol)	1199
other-bytes	1200
other-overhead-adjust	1201
other-bytes	1202
other-overhead-adjust	1203
other-stateful-configuration (Dynamic Router Advertisement)	1204
overhead-accounting (ANCP)	1205

overrides (DHCP Local Server)	1206
overrides (DHCP Relay Agent)	1208
overrides (Enhanced Subscriber Management)	1210
override-password (Domain Map)	1210
packet-triggered-subscribers	1211
packet-triggered-subscribers-partition	1211
padn (Domain Map)	1212
parse-direction (Domain Map)	1212
parse-order (Domain Map)	1213
parse-direction (Domain Map)	1214
parse-order (Domain Map)	1215
partition	1216
partition (Gx-Plus)	1216
partition (NASREQ Diameter Application)	1217
partition (OCS)	1218
partition (PCRF)	1220
partition (PTSP)	1221
password (Static Subscribers)	1222
password (DHCP Local Server)	1223
password (DHCP Relay Agent)	1224
pcrf (Diameter Applications)	1225
peer (Diameter Base Protocol)	1226
peer (Diameter Network Element)	1227
peer-ip-address-optional	1228
peer-origin (Diameter Peer)	1229
pool (Address-Assignment Pools)	1230
pool (DHCP Local Server Overrides)	1231
pool-match-order	1232
port	1233
port (Diameter Peer)	1233
pre-ietf-mode	1234
preauthentication-order (Access Profile)	1234
preauthentication-port	1235
preauthentication-secret	1235
preauthentication-server (Access Profile)	1236
preferred-lifetime (Address-Assignment Pools)	1237
preferred-lifetime (Dynamic Router Advertisement)	1238
prefix (DHCP Relay Agent)	1239
prefix (Address-Assignment Pools)	1240
prefix (Dynamic Router Advertisement)	1240
priority (Diameter Peer)	1241
profile (Access)	1242
process-inform	1246
protocol	1247
protocols (Dynamic Profiles)	1248
provisioning-order Diameter Applications)	1250
proxy-mode	1251
qos-adjust	1252
qos-adjust-adsl	1253

qos-adjust-adsl2	1253
qos-adjust-adsl2-plus	1254
qos-adjust-other	1255
qos-adjust-sdsl	1256
qos-adjust-vdsl	1256
qos-adjust-vdsl2	1257
radius (Access Profile)	1258
radius-disconnect (DHCP Local Server)	1260
radius-flow-tap	1261
radius-options (Edit Access)	1262
radius-options (Interfaces)	1263
radius-server	1264
range (Address-Assignment Pools)	1265
rapid-commit (DHCPv6 Local Server)	1266
reachable-time (Dynamic Router Advertisement)	1267
realm-delimiter (Domain Map)	1267
realm-parse-direction (Domain Map)	1268
reconfigure (DHCP Local Server)	1269
relay-agent-interface-id (DHCP Local Server)	1270
relay-agent-interface-id (DHCPv6 Relay Agent)	1271
relay-agent-interface-id (DHCPv6 Relay Agent Username)	1272
relay-agent-remote-id (DHCP Local Server)	1273
relay-agent-remote-id (DHCPv6 Relay Agent)	1274
relay-agent-remote-id (DHCPv6 Relay Agent Username)	1275
relay-agent-subscriber-id (DHCP Local Server)	1276
relay-agent-subscriber-id (DHCPv6 Relay Agent)	1277
relay-option (DHCP Relay Agent)	1278
relay-option-vendor-specific (dhcpv6)	1279
relay-option-82	1280
relay-server-group (DHCP Relay Agent Option)	1281
relay-source	1282
remote-address	1283
remote-address-range	1284
remote-id	1284
remote-id (DHCP Relay Agent)	1285
remote-id-mismatch (DHCP Local Server and DHCP Relay Agent)	1287
remote-port-range	1288
remote-ports	1288
remote-prefix-list	1289
replace-ip-source-with	1290
report-interface-descriptions (Edit Access)	1291
report-local-rule (PCRF Partition)	1292
report-resource-allocation (PCRF Partition)	1293
report-successful-resource-allocation (PCRF Partition)	1294
request-max-tcp-connections (System Process)	1295
request-max-tcp-connections (System Process)	1295
request network-access aaa replay pending-accounting-stops	1296
request network-access aaa subscriber add session-id	1297
request network-access aaa subscriber delete session-id	1299

request network-access aaa subscriber modify session-id	1301
request-rate	1302
requested-ip-network-match (DHCP Local Server)	1303
restricted-requestor (DHCP Local Server)	1304
retransmit-timer (Dynamic Router Advertisement)	1305
retry	1306
revert-interval	1307
route (Diameter Network Element)	1308
router (Address-Assignment Pools)	1308
router-advertisement (Dynamic Profiles)	1309
routing-instance	1309
routing-instance (Subscriber Secure Policy)	1310
routing-instance (Diameter Peer)	1310
routing-instance (Diameter Transport)	1311
routing-instance-name (DHCP Local Server)	1312
routing-instance-name (DHCP Relay Agent)	1314
routing-instance-name (Static Subscribers)	1315
routing-services (Enhanced Subscriber Management)	1316
rule (Configuring)	1317
rule (Including in Rule Set)	1318
rule-set (Services PTSP)	1318
sdsl-bytes	1319
sdsl-overhead-adjust	1319
secret	1320
send-acct-status-on-config-change (Access Profile)	1320
send-dyn-subscription-indicator (PCRF Partition)	1321
send-network-family-indicator (PCRF Partition)	1323
send-origin-state-id (Diameter Applications)	1324
send-release-on-delete (DHCP Relay Agent)	1325
server-duid-type (DHCP Local Server)	1326
server-group	1327
server-identifier (Address-Assignment Pools)	1328
server-id-override	1329
server-response-time (DHCP Relay Agent)	1330
service (Service Accounting)	1331
service-activation (Access Profile)	1332
service-context-id (OCS)	1334
service-profile (DHCP Local Server)	1335
service-profile (DHCP Relay Agent)	1336
services (PTSP)	1337
session-options	1338
shmlog (Shared Memory Log)	1339
sip-server-address	1341
sip-server-domain-name	1341
smg-service (Enhanced Subscriber Management)	1342
source-address	1343
stacked-vlan-ranges (RADIUS Options)	1344
starts-with (DHCP Relay Agent Option)	1345
static-subscribers	1346

statistics (Access Profile)	1347
statistics (Service Accounting)	1347
strict (DHCP Local Server)	1348
strip-domain (Domain Map)	1349
strip-username (Domain Map)	1349
subscriber-identification (PTSP)	1350
subscriber-packet-idle-timeout	1351
subscriber-management (Subscriber Management)	1352
subscriber-profile	1353
subscription-id-data-include (PCRF Partition)	1354
subscription-id-type (PCRF Partition)	1356
t1-percentage (Address-Assignment Pools)	1357
t2-percentage (Address-Assignment Pools)	1358
target-logical-system (Domain Map)	1359
target-routing-instance (Domain Map)	1360
term (Forward Rule)	1361
term (Rule)	1362
terminate-code	1363
tftp-server	1364
then (Forward Rule)	1365
then (Rule)	1366
timeout (RADIUS)	1367
timeout (DHCP Local Server)	1368
timeout (DHCP Local Server Leasequery)	1369
timeout (DHCP Relay Agent Leasequery)	1370
token (DHCP Local Server)	1371
trace (DHCP Local Server)	1372
trace (DHCP Relay Agent)	1373
traceoptions (ANCP)	1374
traceoptions (DHCP)	1376
traceoptions (Diameter Base Protocol)	1379
traceoptions (Extensible Subscriber Services Manager)	1381
traceoptions (Enhanced Subscriber Management)	1382
traceoptions (General Authentication Service)	1384
traceoptions (PTSP)	1386
traceoptions (Static Subscribers)	1388
traceoptions (Subscriber Management)	1390
traceoptions (Subscriber Session Database Replication)	1392
transport (Diameter Base Protocol)	1393
transport (Diameter Peer)	1394
traps	1395
trigger (DHCP Local Server)	1396
trigger (DHCP Relay Agent Leasequery)	1397
trio-flow-offload	1398
trust-option-82	1399
tunnel-profile (Domain Map)	1400
underlying-interface (ANCP)	1400
unique-nas-port	1401
update-interval	1402

update-interval (Service Accounting)	1403
update-response-timeout (PCRF Partition)	1404
upstream-rate (Traffic Shaping)	1405
use-interface-description	1406
user-name-include (OCS Partition)	1408
use-option-82	1410
use-primary (DHCP Relay Agent)	1411
use-vlan-id	1413
user-prefix (DHCP Local Server)	1415
user-prefix (DHCP Relay Agent)	1417
user-prefix (Static Subscribers)	1418
username-include (DHCP Local Server)	1419
username-include (DHCP Relay Agent)	1421
username-include (Static Subscribers)	1422
valid-lifetime (Dynamic Router Advertisement)	1423
valid-lifetime (Address-Assignment Pools)	1424
vdsl-bytes	1425
vdsl-overhead-adjust	1425
vdsl2-bytes	1426
vdsl2-overhead-adjust	1426
vendor-specific (dhcp-relay)	1427
violation-action (DHCP Local Server and DHCP Relay Agent)	1428
vlan-nas-port-stacked-format	1429
vlan-ranges (RADIUS Options)	1430
vrf-name (Duplicate Accounting)	1431
wait-for-acct-on-ack (Access Profile)	1431
wins-server (Access)	1432
Chapter 107	
Operational Commands	1433
clear ancp neighbor	1437
clear ancp statistics	1439
clear ancp subscriber	1441
clear dhcp relay binding	1443
clear dhcp relay statistics	1446
clear dhcp server binding	1449
clear dhcp server statistics	1452
clear dhcpv6 relay binding	1454
clear dhcpv6 relay statistics	1457
clear dhcpv6 server binding	1459
clear dhcpv6 server statistics	1461
clear diameter function statistics	1462
clear diameter peer	1463
clear extensible-subscriber-services counters	1464
clear extensible-subscriber-services sessions	1465
clear ipv6 router-advertisement	1466
clear network-access aaa statistics	1467
clear network-access aaa subscriber	1469
clear network-access gx-plus replay	1470
clear network-access gx-plus statistics	1471

clear network-access ocs statistics	1472
clear network-access pcrf	1473
request services subscribers clear	1474
clear services subscriber sessions	1475
clear system subscriber-management statistics	1476
request ancp oam interface	1477
request ancp oam neighbor	1478
request dhcp relay bulk-leasequery	1479
request dhcp relay leasequery	1480
request dhcp relay bulk-leasequery	1482
request dhcp relay leasequery	1483
request dhcp server reconfigure	1485
request dhcpv6 server reconfigure	1487
request dhcpv6 relay bulk-leasequery	1489
request dhcpv6 relay leasequery	1491
request network-access aaa subscriber set session-id	1492
request services extensible-subscriber-services reload-dictionary	1493
request services static-subscribers login group	1494
request services static-subscribers logout group	1495
request services static-subscribers login interface	1496
request services static-subscribers logout interface	1497
request system reboot	1498
restart extensible-subscriber-services	1503
set request services subscribers	1504
show accounting pending-accounting-stops	1505
show ancp cos	1509
show ancp neighbor	1514
show ancp statistics	1522
show ancp subscriber	1527
show ancp summary	1533
show ancp summary neighbor	1535
show ancp summary subscriber	1537
show class-of-service interface	1538
show class-of-service interface-set	1567
show class-of-service scheduler-map	1570
show class-of-service scheduler-map	1573
show class-of-service traffic-control-profile	1576
show database-replication statistics	1580
show database-replication summary	1582
show network-access aaa accounting	1584
show dhcp relay binding	1585
show dhcp relay statistics	1591
show dhcp server binding	1595
show dhcp server statistics	1601
show dhcpv6 relay binding	1604
show dhcpv6 relay statistics	1612
show dhcpv6 server binding	1616
show dhcpv6 server statistics	1622
show diameter	1625

show diameter function	1631
show diameter function statistics	1635
show diameter instance	1638
show diameter network-element	1640
show diameter network-element map	1643
show diameter peer	1646
show diameter peer map	1651
show diameter peer statistics	1654
show diameter route	1658
show extensible-subscriber-services accounting	1660
show extensible-subscriber-services counters	1663
show extensible-subscriber-services debug-information	1665
show extensible-subscriber-services dictionary	1666
show extensible-subscriber-services dictionary attributes	1670
show extensible-subscriber-services dictionary services	1673
show extensible-subscriber-services sessions	1676
show extensible-subscriber-services service	1678
show ipv6 router-advertisement	1679
show network-access aaa accounting	1682
show network-access aaa radius-servers	1683
show network-access aaa statistics	1690
show network-access aaa statistics authentication	1699
show network-access aaa statistics pending-accounting-stops	1702
show network-access aaa statistics preauthentication	1703
show network-access aaa subscribers	1705
show network-access aaa subscribers session-id	1708
show network-access aaa terminate-code	1715
show network-access address-assignment pool	1720
show network-access domain-map	1721
show network-access gx-plus	1722
show network-access nasreq statistics	1724
show network-access ocs	1728
show network-access pcrf	1730
show ppp address-pool	1733
show route	1735
show route extensive	1743
show services subscriber bandwidth	1761
show services subscriber dynamic-policies	1763
show services subscriber flows	1766
show services subscriber sessions	1768
show services subscriber statistics	1771
show static-subscribers sessions	1773
show subscribers	1775
show subscribers summary	1796
show system subscriber-management route	1802
show system subscriber-management statistics	1806
show system subscriber-management summary	1812
test aaa authd-lite user	1815
test aaa dhcp user	1818

	test aaa ppp user	1822
Part 12	Index	
	Index	1831

List of Figures

Part 1	Configuring AAA for Subscriber Management	
Chapter 5	Configuring RADIUS Accounting for Subscriber Access	95
	Figure 1: Topology with Loss of Access to Accounting Server	101
Chapter 10	Receiving DHCP Options From a RADIUS Server	139
	Figure 2: DHCP Options Data Flow	142
Part 3	Configuring IPv6 for Subscriber Management	
Chapter 42	Migrating to IPv6 Using IPv4 and IPv6 Dual Stack	375
	Figure 3: IPv4 and IPv6 Dual-Stack Architecture in a Subscriber Access Network	376
	Figure 4: IPv6 Address Requirements in a Subscriber Access Network	378
Chapter 46	Using DHCPv6 Prefix Delegation to Provide Subscriber LAN Addressing	391
	Figure 5: Delegated Addressing in a Dual-Stack Network Using DHCPv6	392
Chapter 48	Designs for IPv6 Addressing in a Subscriber Access Network	399
	Figure 6: Subscriber Access Network with DHCPv6 IA_NA and DHCPv6 Prefix Delegation	402
	Figure 7: Subscriber Access Network with NDRA and DHCPv6 Prefix Delegation	402
	Figure 8: Subscriber Access Network with NDRA	403
	Figure 9: Subscriber Access Network with DHCPv6 Prefix Delegation	404
Chapter 49	Dual-Stack Access Models in a DHCP Network	405
	Figure 10: Dual-Stack Interface Stack over a DHCP Access Network	405
	Figure 11: AAA Service Framework in a Dual Stack over a DHCP Access Network	406
	Figure 12: Dual-Stack Interface Stack in a DHCP Wholesale Network	407
Chapter 50	Dual-Stack Access Models in a PPPoE Network	413
	Figure 13: Dual-Stack Interface Stack over a PPPoE Access Network	414
	Figure 14: Dual-Stack Aggregated Ethernet Stack over a PPPoE Access Network	414
	Figure 15: AAA Service Framework in a Dual Stack over a PPPoE Access Network	417
Chapter 59	Examples: IPv4 and IPv6 Dual-Stack Designs	479
	Figure 16: PPPoE Subscriber Access Network with DHCPv6 IA_NA and DHCPv6 Prefix Delegation	480

	Figure 17: PPPoE Subscriber Access Network with ND/RA and DHCPv6 Prefix Delegation	503
	Figure 18: PPPoE Subscriber Access Network with NDRA	524
Part 8	Configuring ANCP and the ANCP Agent for Subscribers	
Chapter 68	Configuring ANCP Agent Neighbors and Operations	607
	Figure 19: Sample ANCP Topology Without Interface Sets (1:1 and N:1 Model) . .	618
	Figure 20: Sample ANCP Topology with Interface Sets (N:1 Model)	620
	Figure 21: Sample ANCP Topology with Interface Sets (1:1 Model)	622
	Figure 22: N:1 ANCP Topology with Interface Sets and VLAN Demux Interface over Aggregated Ethernet	632
Part 9	Configuring the Diameter Base Protocol and its Applications	
Chapter 74	Configuring 3GPP Policy and Charging Control	715
	Figure 23: 3GPP PCC Architecture Overview	716
	Figure 24: 3GPP PCC Architecture Overview	718
	Figure 25: 3GPP PCC Architecture Overview	735

List of Tables

	About the Documentation	xlvi
	Table 1: Notice Icons	xlix
	Table 2: Text and Syntax Conventions	xlix
Part 1	Configuring AAA for Subscriber Management	
Chapter 2	Configuring RADIUS Attributes and Juniper Networks VSAs	13
	Table 3: Supported RADIUS IETF Attributes	14
	Table 4: Supported Juniper Networks VSAs	22
	Table 5: AAA Access Messages—Supported RADIUS Attributes and Juniper Networks VSAs	33
	Table 6: AAA Accounting Messages—Supported RADIUS Attributes and Juniper Networks VSAs	39
	Table 7: Attributes That Can Be Ignored in RADIUS Access-Accept Messages . . .	44
	Table 8: Attributes That Can Be Excluded from RADIUS Messages	44
	Table 9: RADIUS Attributes and Corresponding Junos OS Predefined Variables	49
	Table 10: DSL Forum VSAs	55
	Table 11: DSL Forum VSAs—Supported RADIUS Messages	57
	Table 12: Microsoft Vendor-Specific RADIUS Attributes for DNS Server Addresses	58
Chapter 3	Configuring RADIUS NAS-Port Attributes and Options	61
	Table 13: RADIUS NAS-Port-Type Values	75
Chapter 5	Configuring RADIUS Accounting for Subscriber Access	95
	Table 14: RADIUS Attributes and VSAs Used for Per-Subscriber Session Accounting	96
	Table 15: Duplicate RADIUS Accounting Reporting	97
	Table 16: Juniper Networks VSAs Used for Per-Service Session Accounting . . .	107
	Table 17: Effective Service Accounting Method with CLI and RADIUS Configurations	111
	Table 18: Effective Service Interim Accounting Interval with CLI and RADIUS Configurations	111
Chapter 10	Receiving DHCP Options From a RADIUS Server	139
	Table 19: Unsupported Opaque DHCP Options	144
	Table 20: DHCP Options Description	145
Chapter 11	Configuring RADIUS Logical Line Identification	147
	Table 21: RADIUS Attributes for LLID Preauthentication Requests	149
Chapter 12	Provisioning Subscriber Services Using Cisco VSAs	153

	Table 22: Effective Service Accounting Method with CLI and RADIUS Configurations	154
	Table 23: Effective Service Interim Accounting Interval with CLI and RADIUS Configurations	154
Chapter 13	Configuring Domain Maps for Subscriber Management	157
	Table 24: Domain Map Options and Parameters	159
	Table 25: Precedence Rules for Applying Access Profiles	165
	Table 26: Precedence Rules for Determining the Address Pool to Use	166
	Table 27: Precedence Rules for Applying Dynamic Profiles	166
Chapter 14	Configuring Dynamic Service Activation for Subscriber Access	175
	Table 28: Identification Attributes	178
	Table 29: Session Attributes	178
	Table 30: Juniper Network VSAs Used for Service Thresholds	180
	Table 31: Error-Cause Codes (RADIUS Attribute 101)	182
Chapter 15	Configuring Termination Causes for Protocols	183
	Table 32: RFC-Defined Code Values and Termination Causes	184
	Table 33: Default Mapping Between AAA Termination Causes and Code Values	187
	Table 34: Default Mapping Between DHCP Termination Causes and Code Values	189
	Table 35: Default Mapping Between L2TP Termination Causes and Code Values	190
	Table 36: Default Mapping Between PPP Termination Causes and Code Values	210
	Table 37: Default Mapping Between VLAN Termination Causes and Code Values	218
Part 2	Configuring DHCP for Subscriber Management	
Chapter 18	Using DHCP Overview	229
	Table 38: Comparing the Extended DHCP Local Server to the Traditional DHCP Local Server	231
	Table 39: Information in Authentication Grant	233
Chapter 20	Assigning IP Addresses	243
	Table 40: DHCP Attributes	243
	Table 41: DHCPv6 Attributes	244
Chapter 21	Configuring Lease Times for IP Addresses	251
	Table 42: Lease-Time Violation Event Logging	253
Chapter 28	Forcing Dynamic Reconfiguration of Clients From a DHCP Local Server	295
	Table 43: Action Taken for Events That Occur During a Reconfiguration	297
Chapter 29	Conserving IP Addresses Using DHCP Auto Logout	303
	Table 44: DHCP Relay Agent Option 82 Value for Auto Logout	306

Part 3	Configuring IPv6 for Subscriber Management	
Chapter 42	Migrating to IPv6 Using IPv4 and IPv6 Dual Stack	375
	Table 45: IPv6 Subscriber Management Terms	376
Chapter 48	Designs for IPv6 Addressing in a Subscriber Access Network	399
	Table 46: Choosing the Global IPv6 Address Provisioning Method for the WAN Link	400
	Table 47: RADIUS Attributes Used to Obtain Global IPv6 Addresses and IPv6 Prefixes	401
Chapter 51	Configuring DHCPv6 Local Server	433
	Table 48: RADIUS Attributes and VSAs for DHCPv6 Local Server	434
Chapter 59	Examples: IPv4 and IPv6 Dual-Stack Designs	479
	Table 49: Configuration Components Used in Dual Stack with DHCPv6 IA_NA and DHCPv6 Prefix Delegation	480
	Table 50: Configuration Components Used in Dual Stack with ND/RA and DHCPv6 Prefix Delegation	504
	Table 51: Configuration Components Used in Dual Stack with ND/RA and DHCPv6 Prefix Delegation	524
Part 7	Configuring CLI-Based Subscriber Services	
Chapter 66	Configuring Subscriber Services with Multiple Instances	595
	Table 52: Subscriber Services and Service Parameters in RADIUS Accounting Messages	597
Part 8	Configuring ANCP and the ANCP Agent for Subscribers	
Chapter 68	Configuring ANCP Agent Neighbors and Operations	607
	Table 53: ANCP Failure Result Codes	613
	Table 54: ACI Mapping by Interface Type for the ANCP 1:1 Model	615
	Table 55: ACI Mapping by Interface Set Type for the ANCP N:1 Access Model	616
	Table 56: Configuration Components used in ANCP N:1 Topology Example with Interface Sets	633
Chapter 70	Configuring the ANCP Agent and AAA	663
	Table 57: Mapping ANCP DSL Attributes to Juniper Networks DSL VSAs and DSL Forum VSAs	666
Part 9	Configuring the Diameter Base Protocol and its Applications	
Chapter 72	Configuring the Diameter Base Protocol	679
	Table 58: Diameter Messages and Diameter Applications	682
	Table 59: Standard Diameter AVPs	687
	Table 60: Juniper Networks Diameter AVPs	694
	Table 61: Tekelec Diameter AVPs	698
Chapter 73	Configuring Gx-Plus for Provisioning Subscribers	703
	Table 62: Differences Between Gx-Plus and Junos OS Terminology	703
	Table 63: Router Events, Router Actions, and PCRF Actions	708

Chapter 74	Configuring 3GPP Policy and Charging Control	715
	Table 64: Functionality Comparison Between PCRF and PCEF	717
	Table 65: Allocated Juniper AVPs	719
	Table 66: Family Indicator AVP	720
	Table 67: Initial Set of Fixed Juniper-Parameter VSAs	721
	Table 68: Result-Code-AVP Categories	723
	Table 69: CCA-GX-I Response Processing	724
	Table 70: Result-Code-AVP Categories	727
	Table 71: Result-Code-AVP Categories	728
	Table 72: Result-Code-AVP Categories	729
	Table 73: Event-Timestamp AVP Message Definition	741
Chapter 84	Configuring PTSP Services and Rules	797
	Table 74: PTSP Match Conditions	800
	Table 75: PTSP Actions	800
	Table 76: PTSP Forward Rule Match Conditions	803
Part 11	Configuration Statements and Operational Commands	
Chapter 106	Configuration Statements	889
	Table 77: Service Activation/Deactivation Error Messages	1297
	Table 78: Service Activation/Deactivation Error Messages	1299
	Table 79: Service Activation/Deactivation Error Messages	1301
	Table 80: Allocated Juniper AVPs	1321
	Table 81: Network Family Indicator AVP	1323
Chapter 107	Operational Commands	1433
	Table 82: clear dhcp relay statistics Output Fields	1447
	Table 83: Service Activation/Deactivation Error Messages	1492
	Table 84: show accounting pending-accounting-stops Output Fields	1505
	Table 85: show ancp cos Output Fields	1509
	Table 86: show ancp neighbor Output Fields	1514
	Table 87: show ancp statistics Output Fields	1522
	Table 88: show ancp subscriber Output Fields	1528
	Table 89: show ancp summary Output Fields	1533
	Table 90: show ancp summary neighbor Output Fields	1535
	Table 91: show ancp summary subscriber Output Fields	1537
	Table 92: show class-of-service interface Output Fields	1539
	Table 93: show class-of-service interface-set Output Fields	1567
	Table 94: show class-of-service scheduler-map Output Fields	1570
	Table 95: show class-of-service scheduler-map Output Fields	1573
	Table 96: show class-of-service traffic-control-profile Output Fields	1576
	Table 97: show database-replication statistics Output Fields	1580
	Table 98: show database-replication summary Output Fields	1582
	Table 99: show network-access aaa accounting Output Fields	1584
	Table 100: show dhcp relay binding Output Fields	1586
	Table 101: show dhcp relay statistics Output Fields	1592
	Table 102: show dhcp server binding Output Fields	1596
	Table 103: show dhcp server statistics Output Fields	1602
	Table 104: show dhcpv6 relay binding Output Fields	1605

Table 105: show dhcpv6 relay statistics Output Fields	1613
Table 106: show dhcpv6 server binding Output Fields	1617
Table 107: show dhcpv6 server statistics Output Fields	1623
Table 108: show diameter Output Fields	1625
Table 109: show diameter function Output Fields	1631
Table 110: show diameter function statistics Output Fields	1635
Table 111: show diameter instance Output Fields	1638
Table 112: show diameter network-element Output Fields	1640
Table 113: show diameter network-element map Output Fields	1643
Table 114: show diameter peer Output Fields	1646
Table 115: show diameter peer map Output Fields	1651
Table 116: show diameter peer statistics Output Fields	1654
Table 117: show diameter route Output Fields	1658
Table 118: show extensible-subscriber-services accounting Output Fields	1660
Table 119: show extensible-subscriber-services counters Output Fields	1663
Table 120: show extensible-subscriber-services debug-information Output Fields	1665
Table 121: show extensible-subscriber-services dictionary Output Fields	1666
Table 122: show extensible-subscriber-services dictionary attributes Output Fields	1670
Table 123: show extensible-subscriber-services dictionary services Output Fields	1673
Table 124: show extensible-subscriber-services sessions Output Fields	1676
Table 125: show extensible-subscriber-services service Output Fields	1678
Table 126: show ipv6 router-advertisement Output Fields	1679
Table 127: show network-access aaa accounting Output Fields	1682
Table 128: show network-access aaa radius-servers Output Fields	1683
Table 129: show network-access aaa statistics Output Fields	1691
Table 130: show network-access aaa statistics authentication Output Fields	1699
Table 131: show network-access aaa statistics pending-accounting-stops Output Fields	1702
Table 132: show network-access aaa statistics preauthentication Output Fields	1703
Table 133: show network-access aaa subscribers Output Fields	1705
Table 134: show network-access aaa subscribers session-id Output Fields	1708
Table 135: show network-access aaa terminate-code Output Fields	1716
Table 136: show network-access address-assignment pool Output Fields	1720
Table 137: show network-access domain-map Output Fields	1721
Table 138: show network-access gx-plus Output Fields	1722
Table 139: show network-access nasreq statistics Output Fields	1724
Table 140: show network-access ocs Output Fields	1728
Table 141: show network-access pcrf Output Fields	1731
Table 142: show ppp address-pool Output Fields	1733
Table 143: show route Output Fields	1736
Table 144: show route extensive Output Fields	1743
Table 145: show services subscriber bandwidth Output Fields	1761
Table 146: show services subscriber dynamic-policies Output Fields	1763
Table 147: show services subscriber flows Output Fields	1766
Table 148: show services subscriber sessions Output Fields	1769

Table 149: show services subscriber statistics Output Fields	1771
Table 150: show static-subscribers sessions Output Fields	1773
Table 151: show subscribers Output Fields	1778
Table 152: show subscribers summary Output Fields	1797
Table 153: show system subscriber-management route Output Fields	1803
Table 154: show system subscriber-management statistics Output Fields . . .	1806
Table 155: show system subscriber-management summary Output Fields	1812

About the Documentation

- Documentation and Release Notes on page xlvii
- Supported Platforms on page xlvii
- Using the Examples in This Manual on page xlvii
- Documentation Conventions on page xlix
- Documentation Feedback on page li
- Requesting Technical Support on page li

Documentation and Release Notes

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

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <http://www.juniper.net/books>.

Supported Platforms

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

- MX 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.

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

Merging a Full Example

To merge a full example, follow these steps:

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

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

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

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

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

Merging a Snippet

To merge a snippet, follow these steps:

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

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

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

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

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

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







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

For more information about the **load** command, see [CLI Explorer](#).

Documentation Conventions

[Table 1 on page xlix](#) 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 xlix](#) 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

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

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

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 .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- Online feedback rating system—On any page of the Juniper Networks TechLibrary site at <http://www.juniper.net/techpubs/index.html>, simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at <http://www.juniper.net/techpubs/feedback/>.
- E-mail—Send your comments to techpubs-comments@juniper.net. Include the document or topic name, URL or page number, and software version (if applicable).

Requesting Technical Support

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

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

Self-Help Online Tools and Resources

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

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

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

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

Opening a Case with JTAC

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

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

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

PART 1

Configuring AAA for Subscriber Management

- [AAA and RADIUS for Subscriber Access Overview on page 3](#)
- [Configuring RADIUS Attributes and Juniper Networks VSAs on page 13](#)
- [Configuring RADIUS NAS-Port Attributes and Options on page 61](#)
- [Configuring RADIUS Authentication for Subscriber Access on page 89](#)
- [Configuring RADIUS Accounting for Subscriber Access on page 95](#)
- [Configuring Routers and RADIUS Servers for Subscriber Access on page 115](#)
- [Configuring Access Profiles for Subscriber Access on page 123](#)
- [Configuring the Effect of Service Activation Failures on Subscriber Login on page 125](#)
- [Configuring Session Options for Subscriber Access on page 131](#)
- [Receiving DHCP Options From a RADIUS Server on page 139](#)
- [Configuring RADIUS Logical Line Identification on page 147](#)
- [Provisioning Subscriber Services Using Cisco VSAs on page 153](#)
- [Configuring Domain Maps for Subscriber Management on page 157](#)
- [Configuring Dynamic Service Activation for Subscriber Access on page 175](#)
- [Configuring Termination Causes for Protocols on page 183](#)
- [Configuring Extensible Subscriber Services Manager on page 221](#)
- [Monitoring and Managing AAA Information for Subscriber Access on page 223](#)

CHAPTER 1

AAA and RADIUS for Subscriber Access Overview

- [AAA Service Framework Overview on page 3](#)
- [RADIUS Server Options for Subscriber Access on page 4](#)
- [Global RADIUS Options for Subscriber Access on page 8](#)
- [Subscriber Access Interface Description Storage and Reporting Through RADIUS Overview on page 8](#)

AAA Service Framework Overview

The authentication, authorization, and accounting (AAA) Service Framework provides a single point of contact for all the authentication, authorization, accounting, address assignment, and dynamic request services that the router supports for network access. The framework supports authentication and authorization through external servers, such as RADIUS. The framework also supports accounting and dynamic-request change of authorization (CoA) and disconnect operations through external servers, and address assignment through a combination of local address-assignment pools and RADIUS.

When interacting with external back-end RADIUS servers, the AAA Service Framework supports standard RADIUS attributes and Juniper Networks vendor specific attributes (VSAs). The AAA Service Framework also includes an integrated RADIUS client that is compatible with RADIUS servers that conform to RFC-2865, *Remote Authentication Dial In User Service (RADIUS)*, RFC-2866, *RADIUS Accounting*, and RFC-3576, *Dynamic Authorization Extensions to Remote Authentication Dial In User Service (RADIUS)*, and which can initiate requests.

You create the following types of configurations to manage subscriber access.

- **Authentication**—Authentication parameters defined in the access profile determine the authentication component of the AAA processing. For example, subscribers can be authenticated using an external authentication service such as RADIUS.
- **Accounting**—Accounting parameters in the access profile specify the accounting part of the AAA processing. For example, the parameters determine how the router collects and uses subscriber statistics. You can also configure AAA to enable the router to collect statistics on a per-service session basis for subscribers.

- **RADIUS-initiated dynamic requests**—A list of authentication server IP addresses in the access profile specify the RADIUS servers that can initiate dynamic requests to the router. Dynamic requests include CoA requests, which specify VSA modifications and service changes, and disconnect requests, which terminate subscriber sessions. The list of authentication servers also provide RADIUS-based dynamic service activation and deactivation during subscriber login.
- **Address assignment**—The AAA Service Framework assigns addresses to subscribers based on the configuration of local address-assignment pools. For example, the AAA framework collaborates with RADIUS servers to assign addresses from the specified pools.
- **Subscriber secure policy**—RADIUS VSAs and attributes provide RADIUS-initiated traffic mirroring on a per-subscriber basis.

**Related
Documentation**

- [Configuring Router or Switch Interaction with RADIUS Servers on page 115](#)
- [RADIUS Acct-On and Acct-Off Messages on page 103](#)
- [Configuring Authentication and Accounting Parameters for Subscriber Access on page 90](#)
- [Address-Assignment Pools Overview on page 565](#)
- [RADIUS Accounting Statistics for Subscriber Access Overview on page 95](#)
- [Using RADIUS Dynamic Requests for Subscriber Access Management on page 175](#)
- *Subscriber Secure Policy Overview*

RADIUS Server Options for Subscriber Access

You can specify options that the router uses when communicating with RADIUS authentication and accounting servers for subscriber access.

The following list describes the RADIUS options you can configure:

- **access-loop-id-local**—The Agent-Remote-Id and Agent-Circuit-Id generated locally when these values are not present in the client database. The interface description of the logical interface is used as the Agent-Remote-Id and the interface description portion of the NAS-Port-Id using the format `<underlying-interface-name>:<outer-tag>-<inner-tag>` is used as the Agent-Circuit-Id.



NOTE: The NAS-Port-Id format changes (established by `[set access profile profile-name radius options interface-description-format]`) are applied before generating the Agent-Circuit-Id.

The NAS-Port-Id format (established by `[set access profile profile-name radius options interface-description-format]`) leverages the locally generated Agent-Remote-Id and Agent-Circuit-Id.

- **accounting-session-id-format**—The format the router uses to identify the accounting session. The identifier can be in one of the following formats:
 - **decimal**—The default format. For example, `435264`
 - **description**—In the format, `jnpr interface-specifier:subscriber-session-id`. For example, `jnpr fastEthernet 3/2.6:1010101010101`
- **calling-station-id-delimiter**—The character that the router uses as the separator between concatenated values in the Calling-Station-Id string (RADIUS attribute 31).
- **calling-station-id-format**—Optional information that the router includes in the Calling-Station-Id (RADIUS attribute 31).
- **client-accounting-algorithm** and **client-authentication-algorithm**—The method the router uses to access RADIUS accounting and RADIUS authentication servers. You can specify the following methods:
 - **direct**—The default method, in which there is no load balancing. For example, in the direct method, the router always accesses **server1** (the primary server) first, and uses **server2** and **server3** as backup servers.
 - **round-robin**—The method that provides load balancing by rotating router requests among the list of configured RADIUS servers. For example, if three RADIUS servers are configured to support the router, the router sends the first request to **server1**, and uses **server2** and **server3** as backup servers. The router then sends the second request to **server2**, and uses **server3** and **server1** as backups.



NOTE: When a RADIUS server in the round-robin list becomes unreachable, the next reachable server in the round-robin list is used for the current request. That same server is also used for the next request because it is at the top of the list of available servers. As a result, after a server failure, the server that is used takes up the load of two servers.

- **coa-dynamic-variable-validation**—The optional method that the router uses when processing CoA requests that include changes to a client profile dynamic variable that cannot be applied. The optional configuration specifies that when a CoA operation is unable to apply a requested change to a client profile dynamic variable, subscriber management does not apply any changes to client profile dynamic variables in the CoA request and then responds with a NACK. In the default method, subscriber management does not apply the incorrect update but does apply the other changes to the client profile dynamic variables, and then responds with an ACK message.
- **ethernet-port-type-virtual**—The physical port type of **virtual** that the router uses to authenticate clients. The port type is passed in RADIUS attribute 61 (NAS-Port-Type). By default the router passes a port type of **ethernet** in RADIUS attribute 61.
- **interface-description-format**—The information that is excluded from the interface description that the router passes to RADIUS for inclusion in the RADIUS attribute 87 (NAS-Port-Id). By default, the router includes both the **subinterface** and the **adapter** in the interface description. You can specify:
 - **exclude-adapter**—Exclude the adapter.
 - **exclude-subinterface**—Exclude the subinterface.
- **nas-identifier**—The value for the client RADIUS attribute 32 (NAS-Identifier), which is used for authentication and accounting requests. You can specify a string in the range 1 through 64 characters.
- **nas-port-extended-format**—The extended format for RADIUS attribute 5 (NAS-Port) and for the width of the fields in the NAS-Port attribute that the RADIUS client uses. You can specify:
 - **adapter-width *width***—Number of bits in the adapter field.
 - **port-width *width***—Number of bits in the port field.
 - **pw-width**—Number of bits in the pseudowire field.
 - **slot-width *width***—Number of bits in the slot field.
 - **stacked-vlan-width *width***—Number of bits in the SVLAN ID field.
 - **vlan-width *width***—Number of bits in the VLAN ID field.



NOTE: The total of the widths must not exceed 32 bits, or the configuration fails.

You can configure an extended format for the NAS-Port attribute for both Ethernet subscribers and ATM subscribers. For ATM subscribers, you can specify:

- **adapter-width**—Number of bits in the ATM adapter field, in the range 0 through 32
- **port-width**—Number of bits in the ATM port field, in the range 0 through 32
- **slot-width**—Number of bits in the ATM slot field, in the range 0 through 32

- **vci-width**—Number of bits in the ATM virtual circuit identifier (VCI) field, in the range 0 through 32
- **vpi-width**—Number of bits in the ATM virtual path identifier (VPI) field, in the range 0 through 32



NOTE: For ATM subscribers, the combined total of the widths of all fields must not exceed 32 bits, or the configuration fails. The router may truncate the values of individual fields depending on the bit width you specify.

- **nas-port-id-delimiter**—The character used as the separator between values in the NAS-Port-Id string.
- **nas-port-id-format**—Optional information included in RADIUS attribute 87 (NAS-Port-Id).
- **nas-port-type**—The port type used to authenticate subscribers.
- **revert-interval**—The number of seconds that the router waits after a server has become unreachable. The router rechecks the connection to the server when the **revert-interval** expires. If the server is then reachable, it is used in accordance with the order of the server list. You can configure from 0 (off) through 604800 seconds. The default is 60 seconds.
- **service-activation**—Setting that determines whether newly authenticated subscriber can successfully log in when service activation failures related to configuration errors occur during authd processing of the activation request for the subscriber's address family. You can specify this behavior for services configured in dynamic profiles (**dynamic-profile**) or in Extensible Subscriber Services Manager (ESSM) operation scripts (**extensible-service**):
 - **optional-at-login**—Service activation is optional. Activation failure due to configuration errors does not prevent activation of the address family; it allows subscriber access. Service activation failures due to causes other than configuration errors cause network family activation to fail. The login attempt is terminated unless another address family is already active for the subscriber. This is the default behavior for the **extensible-service** service type.
 - **required-at-login**—Service activation is required. Activation failure for any reason causes network family activation to fail. The login attempt is terminated unless another address family is already active for the subscriber. This is the default value for the **dynamic-profile** service type.
- **vlan-nas-port-stacked-format**—The format that turns off RADIUS attribute 5 (NAS-Port) to include the S-VLAN ID, in addition to the VLAN ID, for subscribers on Ethernet interfaces.

Related Documentation

- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)

Global RADIUS Options for Subscriber Access

You can specify options that the router uses when communicating with all configured RADIUS servers for subscriber access.

The following list describes the global RADIUS options you can configure:

- **revert-interval**—The number of seconds that the router waits after a server has become unreachable. The router rechecks the connection to the server when the **revert-interval** expires. If the server is then reachable, it is used in accordance with the order of the server list. You can configure from 0 (off) through 604800 seconds. The default is 60 seconds.
- **request-rate**—The number of requests per second that the router can send to all configured RADIUS servers collectively. By limiting the flow of requests from the router to the RADIUS servers, you can prevent the RADIUS servers from being flooded with requests. You can configure from 100 through 4000 requests per second. The default is 500 requests per second.

Related Documentation

- [Configuring RADIUS Options for Subscriber Access Globally on page 122](#)
- [request-rate on page 1302](#)
- [revert-interval on page 1307](#)

Subscriber Access Interface Description Storage and Reporting Through RADIUS Overview

You can configure Junos OS to store subscriber access interface descriptions and report the interface description through RADIUS. This capability enables you to uniquely identify subscribers on a particular logical or physical interface. When you enable storing of the interface descriptions, RADIUS requests include the interface description in VSA 26-63, if the subscriber's access interface has been configured with an interface description. All interface descriptions must be statically configured using the Junos OS CLI. Storing and reporting of interface descriptions is supported for DHCP, PPP, and authenticated dynamic VLANs, and applies to any client session that either authenticates or uses the RADIUS accounting service. The description can contain letters, numbers, and hyphens (-), and can be up to 64 characters long.

You can enable or disable storage and reporting of interface descriptions as follows:

- To enable storing and reporting of interface descriptions, include the **report-interface-descriptions** statement at the **[edit access]** hierarchy level.
- To disable storing and reporting of interface descriptions, include the **radius attributes exclude** statement at the **[edit access profile *profile-name*]** hierarchy level.

Interface Description Precedence

The interface description sent in the VSA depends on the configured interface. Two configuration models apply across topologies and protocols for subscriber management.

- Subscriber logical interface directly over a physical interface (non-underlying logical interfaces).
- Subscriber logical interface over an underlying logical interface and physical interface.

In both models, Junos OS selects the interface description to report based on order of precedence. Interfaces not configured with interface descriptions are excluded when selecting an interface by precedence. If no interface description is configured on any of the static interfaces in the subscriber interface hierarchy, VSA 26-63 is not sent in any of the RADIUS messages.

Example: Reporting Interface Descriptions on Non-Underlying Logical Interfaces

This topic shows an example of subscriber access with non-underlying logical interfaces. In this case, the logical interface can be a VLAN or a VLAN demux interface. This example shows a DHCP subscriber logical interface over a VLAN without a demux interface. For non-underlying interfaces, Junos OS selects which interface description to report based on the following order of precedence:

1. Logical interface description
2. Physical interface description

Based on the order of precedence that Junos OS uses to select the interface description for non-underlying interfaces, Junos OS reports subscriber_ifl_descr as the interface description.

```
system {
  services {
    dhcp-local-server {
      group LSG1 {
        authentication {
          password $ABC123;
          username-include {
            user-prefix rich;
          }
        }
      }
      interface ge-1/0/0.100;
    }
  }
}
interfaces {
  ge-1/0/0 {
    description subscriber_ifd_descr;
    vlan-tagging;
    unit 100 {
      description subscriber_ifl_descr;
      vlan-id 100;
      family inet {
        unnumbered-address lo0.0 preferred-source-address 198.51.100.20;
      }
    }
  }
}
```

```

    }
  }
}

```

Reporting Interface Descriptions on Underlying Logical Interfaces

Underlying logical interfaces can apply to both DHCP and PPP.

For DHCP, Junos OS selects which interface description to report based on the following order of precedence:

1. Underlying logical interface description
2. Underlying physical interface description



NOTE: For DHCP, Junos OS does not report the IP demux logical interface description.

For PPP over an underlying VLAN or VLAN demux interface, Junos OS selects which interface description to report based on the following order of precedence:

1. PPP interface description
2. Underlying VLAN without a demux interface or VLAN demux logical interface description
3. Underlying physical interface description

Example: PPP over an Underlying VLAN Demux Interface

The following example shows a PPP subscriber over an underlying VLAN demux interface. This configuration includes three possible interface descriptions. Based on the order of precedence that Junos OS uses to select the interface description for PPP, the interface description is reported as subscriber_ppp_ifl_descr_0.

```

interfaces {
  ge-1/0/0 {
    description subscriber_ifd_descr;
    hierarchical-scheduler maximum-hierarchy-levels 2;
    flexible-vlan-tagging;
  }
  demux0 {
    unit 0 {
      vlan-tags outer 1 inner 1;
      description subscriber_under_ifl_descr_1_1;
      demux-options {
        underlying-interface ge-1/0/0;
      }
      family pppoe {
        duplicate-protection;
      }
    }
    unit 1 {
      vlan-tags outer 1 inner 2;
    }
  }
}

```

```

        description subscriber_under_ifl_descr_1_2;
        demux-options {
            underlying-interface ge-1/0/0;
        }
        family pppoe {
            duplicate-protection;
        }
    }
}
pp0 {
    unit 0 {
        description subscriber_ppp_ifl_descr_0;
        ppp-options {
            chap;
            pap;
        }
        pppoe-options {
            underlying-interface demux0.0;
            server;
        }
    }
    unit 1 {
        description subscriber_ppp_ifl_descr_1;
        ppp-options {
            chap;
            pap;
        }
        pppoe-options {
            underlying-interface demux0.1;
            server;
        }
    }
}
}

```

Interface Descriptions on Aggregated Ethernet Physical Interfaces

For aggregated Ethernet interfaces, the interface description on the aggregated Ethernet interface, for example AE0 or AE1, serves as the physical interface description.

Interface Descriptions on a Combination of Dynamic and Static Interfaces

If the subscriber's access is a combination of dynamic and static interfaces, Junos OS uses the description on the static interface.

Example: Reporting Interface Descriptions on Dynamic VLANs

If you create dynamic VLANs with authentication, Junos OS reports the interface description on the physical interface. In the following example, dynamic VLANs created over the ge-1/2/0 interface are authenticated with an interface description of ge-1/2/0-bos-mktg-group.

```

ge-1/2/0 {
    description ge-1/2/0-bos-mktg-group;
    flexible-vlan-tagging;
    auto-configure {
        vlan-ranges {
            dynamic-profile vlan-prof {
                accept inet;
            }
        }
    }
}

```

```
        ranges {
            any;
        }
    }
    authentication {
        password $ABC123;
        username-include {
            user-prefix rich;
        }
    }
}
}
```

**Related
Documentation**

- [report-interface-descriptions \(Edit Access\) on page 1291](#)
- [exclude on page 1050](#)
- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)
- [Configuring Authentication and Accounting Parameters for Subscriber Access on page 90](#)

CHAPTER 2

Configuring RADIUS Attributes and Juniper Networks VSAs

- [RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework on page 13](#)
- [RADIUS IETF Attributes Supported by the AAA Service Framework on page 14](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework on page 21](#)
- [AAA Access Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 33](#)
- [AAA Accounting Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 39](#)
- [Configuring How RADIUS Attributes Are Used for Subscriber Access on page 43](#)
- [Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs on page 49](#)
- [DSL Forum Vendor-Specific Attributes on page 55](#)
- [DSL Forum VSAs Support in AAA Access and Accounting Messages for Junos OS on page 57](#)
- [RADIUS Support for Microsoft Corporation VSAs for DNS Server Addresses on page 58](#)

RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework

The AAA Service Framework supports RADIUS attributes and vendor-specific attributes (VSAs). This support provides tunable parameters that the subscriber access management feature uses when creating subscribers and services.

RADIUS attributes are carried as part of standard RADIUS request and reply messages. The subscriber management access feature uses the RADIUS attributes to exchange specific authentication, authorization, and accounting information. VSAs allow the subscriber access management feature to pass implementation-specific information that provide extended capabilities, such as service activation or deactivation, and enabling and disabling filters.

When you use dynamic profiles, the AAA Service Framework supports the use of Junos OS predefined variables to specify the RADIUS attribute or VSA for the information obtained from the RADIUS server.

Related Documentation

- [RADIUS IETF Attributes Supported by the AAA Service Framework on page 14](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework on page 21](#)
- [DSL Forum Vendor-Specific Attributes on page 55](#)
- [AAA Access Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 33](#)
- [AAA Accounting Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 39](#)
- [Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs on page 49](#)

RADIUS IETF Attributes Supported by the AAA Service Framework

Table 3 on page 14 describes the RADIUS IETF attributes that the Junos OS AAA Service Framework supports.



NOTE: A “Yes” entry in the Dynamic CoA Support column indicates that the attribute can be dynamically configured by Access-Accept messages and dynamically modified by CoA-Request messages.

Table 3: Supported RADIUS IETF Attributes

Attribute Number	Attribute Name	Description	Dynamic CoA Support
1	User-Name	<ul style="list-style-type: none"> • Name of user to be authenticated. • Configurable username override. • Non-standard use for LLID preauthentication feature. 	No
2	User-Password	<ul style="list-style-type: none"> • Password of user to be authenticated by Password Authentication Protocol (PAP). • Configurable password override. • Non-standard use for LLID preauthentication feature. 	No
4	NAS-IP-Address	IP address of the network access server (NAS) that is requesting authentication of the user.	No

Table 3: Supported RADIUS IETF Attributes (*continued*)

Attribute Number	Attribute Name	Description	Dynamic CoA Support
5	NAS-Port	Physical port number of the NAS that is authenticating the user. For a tunneled PPP user in an L2TP LNS session, there is no physical port. In this case, the port value is reported as 4194303.	No
6	Service-Type	Type of service the user has requested or the type of service to be provided.	No
8	Framed-IP-Address	<ul style="list-style-type: none"> IP address to be configured for the user. 0.0.0.0 or absence is interpreted as 255.255.255.254. 	No
9	Framed-IP-Netmask	<ul style="list-style-type: none"> IP network to be configured for the user when the user is a router or switch to a network. Absence implies 255.255.255.255. 	No
11	Filter-Id	<p>Name of a subscriber firewall filter, formatted as follows:</p> <ul style="list-style-type: none"> For an IPv4 input filter—IPv4-ingress:<i>ingress-filter-name</i> For an IPv4 output filter—IPv4-egress:<i>egress-filter-name</i> For an IPv6 input filter—IPv6-ingress:<i>ingress-filter-name</i> For an IPv6 output filter—IPv6-egress:<i>egress-filter-name</i> <p>RADIUS accounting request messages, Acct-Start and Acct-Stop, can include more than one Filter-Id attribute, one of each of the listed types.</p> <p>However, RADIUS Access-Accept messages can include only one attribute instance. The value is always treated as an IPv4 input filter name.</p>	Yes
18	Reply-Message	<ul style="list-style-type: none"> Text that may be displayed to the user. Only the first instance of this attribute is used. 	No

Table 3: Supported RADIUS IETF Attributes (*continued*)

Attribute Number	Attribute Name	Description	Dynamic CoA Support
22	Framed-Route	String that provides routing information to be configured for the user on the NAS in the format: <code><addr>[/<maskLen>] [<nexthop> [<cost>]] [tag <tagValue>] [distance <distValue>]</code>	Yes
25	Class	Arbitrary value that the NAS includes in all accounting packets for the user if supplied by the RADIUS server.	No
27	Session-Timeout	Maximum number of consecutive seconds of service to be provided to the user before termination of the session.	No
31	Calling-Station-ID	Phone number from which the call originated.	No
32	NAS-Identifier	NAS originating the request.	No
40	Acct-Status-Type	Whether this Accounting-Request marks the beginning of the user service (Start), the end (Stop), or the interim (Interim-Update).	No
41	Acct-Delay-Time	Number of seconds the client has been trying to send a particular record.	No
42	Acct-Input-Octets	Number of octets that have been received from the port during the time this service has been provided.	No
43	Acct-Output-Octets	Number of octets that have been sent to the port during the time this service has been provided.	No
44	Acct-Session-ID	Unique accounting identifier that makes it easy to match start and stop records in a log file. The identifier can be in one of the following formats: <ul style="list-style-type: none"> decimal—For example, 435264 description—In the generic format, jnpr interface-specifier:subscriber-session-id; For example, jnpr fastEthernet 3/2.6:1010101010101 	No

Table 3: Supported RADIUS IETF Attributes (*continued*)

Attribute Number	Attribute Name	Description	Dynamic CoA Support
45	Acct-Authentic	Method by which user was authentication: whether by RADIUS, the NAS itself, or another remote authentication protocol.	No
46	Acct-Session-Time	Number of seconds that the user has received service	No
47	Acct-Input-Packets	Number of packets that have been received from the port during the time this service has been provided to a framed user.	No
48	Acct-Output-Packets	Number of packets that have been sent to the port in the course of delivering this service to a framed user.	No
49	Acct-Terminate-Cause	Reason the service (a PPP session) was terminated. The service can be terminated for the following reasons: <ul style="list-style-type: none"> • User Request (1)—User initiated the disconnect (log out). • Idle Timeout (4)—Idle timer has expired. • Session Timeout (5)—Client reached the maximum continuous time allowed on the service or session. • Admin Reset (6)—System administrator terminated the session. • Port Error (8)—PVC failed; no hardware or no interface. • NAS Error (9)—Negotiation failures, connection failures, or address lease expiration. • NAS Request (10)—PPP challenge timeout, PPP request timeout, tunnel establishment failure, PPP bundle failure, IP address lease expiration, PPP keep-alive failure, tunnel disconnect, or an unaccounted-for error. 	No
52	Acct-Input-Gigawords	Number of times the Acct-Input-Octets counter has wrapped around 2^{32} during the time this service has been provided. Can be present in Accounting-Request records only where the Acct-Status-Type is set to Stop or Interim-Update.	No

Table 3: Supported RADIUS IETF Attributes (*continued*)

Attribute Number	Attribute Name	Description	Dynamic CoA Support
53	Acct-Output-Gigawords	Number of times the Acct-Output-Octets counter has wrapped around 2 ³² in the course of delivering this service. Can be present in Accounting-Request records only where the Acct-Status-Type is set to Stop or Interim-Update.	No
55	Event-Timestamp	Time that this event occurred on the NAS, in seconds, since January 1, 1970 00:00 UTC.	No
61	NAS-Port-Type	Type of physical port the NAS is using to authenticate the user. For a tunneled PPP user in an L2TP LNS session, there is no physical port. In this case, the port type is Virtual .	No
64	Tunnel-Type	<ul style="list-style-type: none"> Tunneling protocol to use (in the case of a tunnel initiator) or the tunneling protocol already in use (in the case of a tunnel terminator). Only L2TP tunnels are currently supported. 	No
65	Tunnel-Medium-Type	<ul style="list-style-type: none"> Transport medium to use when creating a tunnel for protocols that can operate over multiple transports. Only IPv4 is currently supported. 	No
66	Tunnel-Client-Endpoint	Address of the initiator end of the tunnel (LAC).	No
67	Tunnel-Server-Endpoint	Address of the server end of the tunnel (LNS).	No
68	Acct-Tunnel-Connection	Identifier assigned to the tunnel session. Value is the same as the Call Serial Number AVP received from the LAC in the ICRQ message.	No
69	Tunnel-Password	Encrypted password used to authenticate to a remote server. Recommended over using VSA Tunnel-Password [26-9] because of the encryption. Do not use both this attribute and the VSA.	No

Table 3: Supported RADIUS IETF Attributes (*continued*)

Attribute Number	Attribute Name	Description	Dynamic CoA Support
77	Connect-Info	<ul style="list-style-type: none"> Information sent from the NAS that describes the subscriber's connection, such as transmit speed. Non-standard use for LLID preauthentication feature. 	No
82	Tunnel-Assignment -Id	Tunnel to which a session is assigned. When user profiles share the same values for Tunnel-Assignment-Id, Tunnel-Server-Endpoint, and Tunnel-Type, the LAC can group these users into the same tunnel. This grouping enables fewer tunnels to be created. (LAC)	No
83	Tunnel-Preference	<ul style="list-style-type: none"> Included in each set of tunneling attributes to indicate the relative preference assigned to each tunnel when more than one set of tunneling attributes is returned by the RADIUS server to the tunnel initiator. Included in the Tunnel-Link-Start, the Tunnel-Link-Reject, and the Tunnel-Link-Stop packets (LAC only). 	No
85	Acct-Interim-Interval	<p>Number of seconds between each interim accounting update for this session.</p> <p>The router uses the following guidelines for interim accounting:</p> <ul style="list-style-type: none"> Attribute value is within the acceptable range (from 600 through 86,400 seconds)—Accounting is updated at the specified interval. Attribute value of 0—No RADIUS accounting is performed. Attribute value is less than the minimum acceptable value—Accounting is updated at the minimum interval (600 seconds). Attribute value is greater than the maximum acceptable value—Accounting is updated at the maximum interval (86,400 seconds). <p>NOTE: Values are rounded up to the next higher multiple of 10 minutes. For example, a setting of 900 seconds (15 minutes) is rounded up to 20 minutes (1200 seconds).</p>	No

Table 3: Supported RADIUS IETF Attributes (*continued*)

Attribute Number	Attribute Name	Description	Dynamic CoA Support
87	NAS-Port-Id	Text string that identifies the physical interface of the NAS that is authenticating the user. For a tunneled PPP user in an L2TP LNS session, there is no physical port, and the NAS-Port-Id value has the following format: <i>media:local address:peer address:local tunnel id:peer tunnel id:local session id:peer session id:call serial number</i> . For example, Ip:198.51.100.1:192.168.0.2:3341:21031:16138:11846:2431. The local information refers to the LNS and the peer information refers to the LAC.	No
88	Framed-Pool	Name of an assigned address pool to use to assign an address for the user.	No
90	Tunnel-Client-Auth-Id	Name of the tunnel initiator (LAC) used during the authentication phase of tunnel establishment.	No
91	Tunnel-Server-Auth-Id	Name of the tunnel terminator (LNS) used during the authentication phase of tunnel establishment.	No
95	NAS-IPv6-Address	Address of the NAS that is requesting authentication of the user.	No
96	Framed-Interface-ID	Interface identifier that is configured for the user.	No
97	Framed-IPv6-Prefix	IPv6 prefix and address that are configured for the user. Prefix lengths of 128 are associated with host addresses. Prefix lengths less than 128 are associated with NDRA prefixes.	No
98	Login-IPv6-Host	System the user connects to when the Login-Service attribute is included.	No
99	Framed-IPv6-Route	IPv6 routing information that is configured for the user.	Yes
100	Framed-IPv6-Pool	Name of the assigned pool used to assign the address and IPv6 prefix for the user.	No
123	Delegated-IPv6-Prefix	IPv6 prefix that is delegated to the user.	No

Table 3: Supported RADIUS IETF Attributes (*continued*)

Attribute Number	Attribute Name	Description	Dynamic CoA Support
242	Ascend-Data-Filter	Binary data that specifies RADIUS policy definitions.	Yes

Related Documentation

- [AAA Access Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 33](#)
- [AAA Accounting Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 39](#)

Juniper Networks VSAs Supported by the AAA Service Framework

Table 4 on page 22 describes Juniper Networks VSAs supported by the Junos OS AAA Service Framework. The AAA Service Framework uses vendor ID 4874, which is assigned to Juniper Networks by the Internet Assigned Numbers Authority (IANA).



NOTE: A “Yes” entry in the Dynamic CoA Support column indicates that the attribute can be dynamically configured by Access-Accept messages and dynamically modified by CoA-Request messages.

Table 4: Supported Juniper Networks VSAs

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-1	Virtual-Router	<p>Client logical system:routing instance name. Allowed only from AAA server for default logical system:routing instance.</p> <p>When this VSA is not included in the subscriber profile, the routing instance assigned to the subscriber—the one in which the subscriber session comes up—varies by subscriber type.</p> <p>For DHCP and PPPoE subscribers, it is the default routing instance.</p> <p>For L2TP tunnel subscribers, it is the routing instance in which the tunnel resides, whether default or non-default. If the tunnel routing instance is not default and you want the L2TP session to be in the default routing instance, you must use the Virtual-Router VSA to set the desired routing instance.</p>	string: <i>logical system:routing instance</i>	No
26-4	Primary-DNS	Client DNS address negotiated during IPCP.	integer: 4-byte <i>primary-dns-address</i>	No
26-5	Secondary-DNS	Client DNS address negotiated during IPCP	integer: 4-byte <i>secondary-dns-address</i>	No
26-6	Primary-WINS	Client WINS (NBNS) address negotiated during IPCP.	integer: 4-byte <i>primary-wins-address</i>	No
26-7	Secondary-WINS	Client WINS (NBNS) address negotiated during IPCP.	integer: 4-byte <i>secondary-wins-address</i>	No
26-8	Tunnel-Virtual-Router	Virtual router name for tunnel connection.	string: <i>tunnel-virtual-router</i>	No
26-9	Tunnel-Password	<p>Tunnel password in cleartext.</p> <p>Do not use both this VSA and the standard RADIUS attribute Tunnel-Password [69]. We recommend that you use the standard attribute because the password is encrypted when that attribute is used.</p>	string: <i>tunnel-password</i>	No
26-10	Ingress-Policy-Name	Input policy name to apply to client interface.	string: <i>input-policy-name</i>	Yes

Table 4: Supported Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-11	Egress-Policy-Name	Output policy name to apply to client interface.	string: <i>output-policy-name</i>	Yes
26-23	IGMP-Enable	Whether IGMP is enabled or disabled on a client interface.	integer: <ul style="list-style-type: none"> 0=disable 1=enable 	Yes
26-24	PPPoE-Description	Client MAC address.	string: <i>pppoe client-mac-address</i>	No
26-25	Redirect-VRouter-Name	Client logical system:routing instance name indicating to which logical system:routing instance the request is redirected for user authentication.	string: <i>logical-system:routing-instance</i>	No
26-30	Tunnel-Nas-Port-Method	Method that determines whether the RADIUS server conveys to the LNS the physical NAS port number identifier and the type of the physical port, such as Ethernet or ATM. This information is conveyed only when the VSA value is 1. The VSA is formatted such that the first octet indicates the tunnel and the remaining three bytes are the attribute value.	4-octet integer: <ul style="list-style-type: none"> 0 = none 1 = Cisco CLID 	Yes
26-31	Service-Bundle	SSC service bundle.	string <i>bundle-name</i>	No
26-33	Tunnel-Max-Sessions	Maximum number of sessions allowed in a tunnel.	integer: 4-octet	No
26-34	Framed-IP-Route-Tag	Route tag to apply to returned framed-ip-address.	integer: 4-octet	No
26-42	Input-Gigapackets	Number of times the input-packets attribute rolls over its 4-octet field.	integer	No
26-43	Output-Gigapackets	Number of times the output-packets attribute rolls over its 4-octet field.	integer	No
26-47	Ipv6-Primary-DNS	Client primary IPv6 DNS address negotiated by DHCP.	hexadecimal string: <i>ipv6-primary-dns-address</i>	No
26-48	Ipv6-Secondary-DNS	Client secondary IPv6 DNS address negotiated by DHCP.	hexadecimal string: <i>ipv6-secondary-dns-address</i>	No

Table 4: Supported Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-51	Disconnect-Cause	Disconnect cause when a tunneled subscriber is disconnected, and L2TP layer of the LNS initiates the termination. The PPP Disconnect Cause Code (L2TP AVP 46) is included in VSA 26-51 in the Accounting-Stop message that the router sends to the RADIUS server.	hexadecimal string: <i>disconnect-cause</i>	No
26-55	DHCP-Options	Client DHCP options.	string: <i>dhcp-options</i>	No
26-56	DHCP-MAC-Address	Client MAC address.	string: <i>mac-address</i>	No
26-57	DHCP-GI-Address	DHCP relay agent IP address.	integer: 4-octet	No
26-58	LI-Action	<p>Traffic mirroring action.</p> <p>For dynamic CoA, VSA 26-58 changes the action on the mirrored traffic identified by VSA 26-59.</p> <p>CoA-Request messages that include any of the RADIUS-based mirroring attributes (VSAs 26-58, 26-59, 26-60, or 26-61) must always include all four VSAs.</p> <p>If the CoA action is to stop mirroring (VSA 26-58 value is 0), then the values of the other three attributes in the CoA message must match the existing attribute values, or the action fails.</p>	<p>salt-encrypted integer</p> <p>0=stop mirroring 1=start mirroring 2=no action</p>	Yes
26-59	Med-Dev-Handle	<p>Identifier that associates mirrored traffic to a specific subscriber.</p> <p>For dynamic CoA, VSA 26-58 changes the action on the mirrored traffic identified by VSA 26-59.</p> <p>CoA-Request messages that include any of the RADIUS-based mirroring attributes (VSAs 26-58, 26-59, 26-60, or 26-61) must always include all four VSAs.</p>	salt-encrypted string	No

Table 4: Supported Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-60	Med-Ip-Address	<p>IP address of content destination device to which mirrored traffic is forwarded.</p> <p>CoA-Request messages that include any of the RADIUS-based mirroring attributes (VSAs 26-58, 26-59, 26-60, or 26-61) must always include all four VSAs.</p>	salt-encrypted IP address	No
26-61	Med-Port-Number	<p>UDP port in the content destination device to which mirrored traffic is forwarded.</p> <p>CoA-Request messages that include any of the RADIUS-based mirroring attributes (VSAs 26-58, 26-59, 26-60, or 26-61) must always include all four VSAs.</p>	salt-encrypted integer	No
26-63	Interface-Desc	Text string that identifies the subscriber's access interface.	string: <i>interface-description</i>	No
26-64	Tunnel-Group	Name of the tunnel group (profile) assigned to a domain map.	string: <i>tunnel-group-name</i>	No
26-65	Activate-Service	Service to activate for the subscriber. Tagged VSA, which supports 8 tags (1-8).	string: <i>service-name</i>	Yes
26-66	Deactivate-Service	Service to deactivate for the subscriber.	string: <i>service-name</i>	Yes
26-67	Service-Volume	Amount of traffic, in MB, that can use the service; service is deactivated when the volume is exceeded. Tagged VSA, which supports 8 tags (1-8).	<ul style="list-style-type: none"> range = 0 through 16777215 MB 0 = no limit 	Yes
26-68	Service-Timeout	Number of seconds that the service can be active; service is deactivated when the timeout expires. Tagged VSA, which supports 8 tags (1-8).	<ul style="list-style-type: none"> range = 0 through 16777215 seconds 0 = no timeout 	Yes
26-69	Service-Statistics	Whether statistics for the service is enabled or disabled. Tagged VSA, which supports 8 tags (1-8).	<ul style="list-style-type: none"> 0 = disable 1 = enable time statistics 2 = enable time and volume statistics 	Yes
26-71	IGMP-Access-Name	Access list to use for the group (G) filter.	string: 32-octet	Yes

Table 4: Supported Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-72	IGMP-Access-Src-Name	Access list to use for the source-group (S,G) filter.	string: 32-octet	Yes
26-74	MLD-Access-Name	Access list to use for the group (G) filter.	string: 32-octet	Yes
26-75	MLD-Access-Src-Name	Access list to use for the source-group (S,G) filter.	string: 32-octet	Yes
26-77	MLD-Version	MLD protocol version.	integer: 1-octet <ul style="list-style-type: none"> 1=MLD version 1 2=MLD version 2 	Yes
26-78	IGMP-Version	IGMP protocol version.	integer: 1-octet <ul style="list-style-type: none"> 1=IGMP version 1 2=IGMP version 2 3=IGMP version 3 	Yes
26-83	Service-Session	Name of the service.	string: <i>service-name</i>	No
26-84	Mobile-IP-Algorithm	Authentication algorithm used for Mobile IP registration.	integer: 4-octet	No
26-85	Mobile-IP-SPI	Security parameter index number for Mobile IP registration.	integer: 4-octet	No
26-86	Mobile-IP-Key	Security association MD5 key for Mobile IP registration.	string: key	No
26-87	Mobile-IP-Replay	Replay timestamp for Mobile IP registration.	integer: 4-octet	No
26-89	Mobile-IP-Lifetime	Registration lifetime for Mobile IP registration.	integer: 4-octet	No
26-91	Tunnel-Switch-Profile	Tunnel switch profile that determines whether a subscriber session is switched to a second session to a remote LNS. Takes precedence over tunnel switch profiles applied in any other manner.	string: <i>profile-name</i>	No
26-92	L2C-Up-Stream-Data	Actual upstream rate access loop parameter (ASCII encoded) as defined in GSMP extensions for layer2 control (L2C) Topology Discovery and Line Configuration.	string: actual upstream rate access loop parameter (ASCII encoded)	No

Table 4: Supported Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-93	L2C-Down-Stream-Data	Actual downstream rate access loop parameter (ASCII encoded) as defined in GSMP extensions for layer2 control (L2C) Topology Discovery and Line Configuration.	string: actual downstream rate access loop parameter (ASCII encoded)	No
26-94	Tunnel-Tx-Speed-Method	Method that determines the source from which the transmit speed is derived. Overrides global configuration in the CLI.	integer: 4-octet <ul style="list-style-type: none"> • 0 = none • 1 = static Layer 2 • 2 = dynamic layer 2. This method is not supported; the static Layer 2 method is used instead. • 3 = CoS. This method is not supported; the actual method is used instead. • 4 = actual • 5 = ANCP • 6 = PPPoE IA tags 	No
26-97	IGMP-Immediate-Leave	IGMP Immediate Leave.	integer: 4-octet <ul style="list-style-type: none"> • 0=disable • 1=enable 	Yes
26-100	MLD-Immediate-Leave	MLD Immediate Leave.	integer: 4-octet <ul style="list-style-type: none"> • 0=disable • 1=enable 	Yes
26-106	IPv6-Ingress-Policy-Name	Input policy name to apply to a user IPv6 interface.	string: <i>policy-name</i>	Yes
26-107	IPv6-Egress-Policy-Name	Output policy name to apply to a user IPv6 interface.	string: <i>policy-name</i>	Yes

Table 4: Supported Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-108	CoS-Traffic-Control-Profile-Parameter-Type	CoS traffic-shaping parameter type and description: <ul style="list-style-type: none"> T01: Scheduler-map name T02: Shaping rate T03: Guaranteed rate T04: Delay-buffer rate T05: Excess rate T06: Traffic-control profile T07: Shaping mode T08: Byte adjust T09: Adjust minimum T10: Excess-rate high T11: Excess-rate low T12: Shaping rate burst T13: Guaranteed rate burst 	Two parts, delimited by white space: <ul style="list-style-type: none"> Parameter type Parameter value Examples: <ul style="list-style-type: none"> T01 smap_basic T02 50m T03 1m T04 2000 T05 200 T06 tcp-gold T07 frame-mode T08 50 	Yes
26-109	DHCP-Guided-Relay-Server	IP address of DHCP server that DHCP relay agent uses to forward the discover PDUs.	integer: 4-byte <i>ip-address</i>	No
26-110	Acc-Loop-Cir-Id	Identification of the subscriber node connection to the access node.	string: up to 63 ASCII characters	No
26-111	Acc-Aggr-Cir-Id-Bin	Unique identification of the DSL line.	integer: 8-octet	No
26-112	Acc-Aggr-Cir-Id-Asc	Identification of the uplink on the access node, as in the following examples: <ul style="list-style-type: none"> Ethernet access aggregation—ethernet slot/port [:inner-vlan-id] [:outer-vlan-id] ATM aggregation—atm slot/port:vpi.vci 	string: up to 63 ASCII characters	No
26-113	Act-Data-Rate-Up	Actual upstream data rate of the subscriber's synchronized DSL link.	integer: 4-octet	No
26-114	Act-Data-Rate-Dn	Actual downstream data rate of the subscriber's synchronized DSL link.	integer: 4-octet	No
26-115	Min-Data-Rate-Up	Minimum upstream data rate configured for the subscriber.	integer: 4-octet	No
26-116	Min-Data-Rate-Dn	Minimum downstream data rate configured for the subscriber.	integer: 4-octet	No

Table 4: Supported Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-117	Att-Data-Rate-Up	Maximum upstream data rate that the subscriber can attain.	integer: 4-octet	No
26-118	Att-Data-Rate-Dn	Maximum downstream data rate that the subscriber can attain.	integer: 4-octet	No
26-119	Max-Data-Rate-Up	Maximum upstream data rate configured for the subscriber.	integer: 4-octet	No
26-120	Max-Data-Rate-Dn	Maximum downstream data rate configured for the subscriber.	integer: 4-octet	No
26-121	Min-LP-Data-Rate-Up	Minimum upstream data rate in low power state configured for the subscriber.	integer: 4-octet	No
26-122	Min-LP-Data-Rate-Dn	Minimum downstream data rate in low power state configured for the subscriber.	integer: 4-octet	No
26-123	Max-Interlv-Delay-Up	Maximum one-way upstream interleaving delay configured for the subscriber.	integer: 4-octet	No
26-124	Act-Interlv-Delay-Up	Subscriber's actual one-way upstream interleaving delay..	integer: 4-octet	No
26-125	Max-Interlv-Delay-Dn	Maximum one-way downstream interleaving delay configured for the subscriber.	integer: 4-octet	No
26-126	Act-Interlv-Delay-Dn	Subscriber's actual one-way downstream interleaving delay.	integer: 4-octet	No
26-127	DSL-Line-State	State of the DSL line.	integer: 4-octet <ul style="list-style-type: none"> • 1 = Show uptime • 2 = Idle • 3 = Silent 	No
26-128	DSL-Type	Encapsulation used by the subscriber associated with the DSLAM interface from which requests are initiated.	integer: 4-octet	No
26-130	Qos-Set-Name	Interface set to apply to the dynamic profile.	string: <i>interface-set-name</i>	No

Table 4: Supported Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-140	Service-Interim-Acct-Interval	Amount of time between interim accounting updates for this service. Tagged VSA, which supports 8 tags (1-8).	<ul style="list-style-type: none"> range = 600 through 86400 seconds 0 = disabled <p>NOTE: Values are rounded up to the next higher multiple of 10 minutes. For example, a setting of 900 seconds (15 minutes) is rounded up to 20 minutes (1200 seconds).</p>	Yes
26-141	Downstream-Calculated-QoS-Rate	Calculated (adjusted) downstream QoS rate in Kbps as set by the ANCP configuration.	range = 1000 through 4,294,967,295	No
26-142	Upstream-Calculated-QoS-Rate	Calculated (adjusted) upstream QoS rate in Kbps as set by the ANCP configuration.	range = 1000 through 4,294,967,295	No
26-143	Max-Clients-Per-Interface	Maximum allowable client sessions per interface. For DHCP clients, this value is the maximum sessions per logical interface. For PPPoE clients, this value is the maximum sessions (PPPoE interfaces) per PPPoE underlying interface.	integer: 4-octet	No
26-146	CoS-Scheduler-Pmt-Type	<p>CoS scheduler parameter type and description:</p> <ul style="list-style-type: none"> Null: CoS scheduler name T01: CoS scheduler transmit rate T02: CoS scheduler buffer size T03: CoS scheduler priority T04: CoS scheduler drop-profile low T05: CoS scheduler drop-profile medium-low T06: CoS scheduler drop-profile medium-high T07: CoS scheduler drop-profile high T08: CoS scheduler drop-profile any 	<p>Three parts, delimited by white space:</p> <ul style="list-style-type: none"> Scheduler name Parameter type Parameter value <p>Examples:</p> <ul style="list-style-type: none"> be_sched be_sched T01 12m be_sched T02 26 	Yes
26-151	IPv6-Acct-Input-Octets	IPv6 receive octets.	integer	No
26-152	IPv6-Acct-Output-Octets	IPv6 transmit octets.	integer	No

Table 4: Supported Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-153	IPv6-Acct-Input-Packets	IPv6 receive packets.	integer	No
26-154	IPv6-Acct-Output-Packets	IPv6 transmit packets.	integer	No
26-155	IPv6-Acct-Input-Gigawords	IPv6 receive gigawords.	integer	No
26-156	IPv6-Acct-Output-Gigawords	IPv6 transmit gigawords.	integer	No
26-158	PPPoE-Padn	Route add for PPPoE sessions	string	No
26-160	Vlan-Map-Id	Trunk VLAN tag corresponding to the core-facing trunk physical interface.	integer	No
26-161	IPv6-Delegated-Pool-Name	Address pool used to locally allocate a delegated prefix (IA_PD).	string	No
26-162	Tx-Connect-Speed	Indication of transmit speed of the user's connection.	string	No
26-163	Rx-Connect-Speed	Indication of receive speed of the user's connection.	string	No
26-173	Service-Activate-Type	Indication of service activation type. This is a tagged attribute.	integer: 4-octet <ul style="list-style-type: none"> 1 = dynamic-profile for residential services 2 = op-script for business services 	No
26-174	Client-Profile-Name	Enables RADIUS to override an assigned client dynamic profile with the included profile.	string	No
26-177	Cos-Shaping-Rate	Effective downstream shaping rate for subscriber.	string	No
26-179	Service-Volume-Gigawords	Amount of traffic, in 4GB units, that can use the service; service is deactivated when the volume is exceeded. Tagged VSA, which supports 8 tags (1-8).	<ul style="list-style-type: none"> range = 0 through 16777215 4GB units 0 = no limit 	Yes
26-180	Update-Service	New values of service and time quotas for existing service. Tagged VSA, which supports 8 tags (1-8).	string: <i>service-name</i>	Yes

Table 4: Supported Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Description	Value	Dynamic CoA Support
26-181	DHCPv6-Guided-Relay-Server	IPv6 addresses of DHCPv6 servers to which DHCPv6 relay agent forwards the Solicit and subsequent PDUs. Use multiple instances of the VSA to specify a list of servers.	hexadecimal string: <i>ipv6-address</i>	No
26-182	Acc-Loop-Remote-Id	Reports the ANCP Access-Loop-Remote-ID attribute.	string	No
26-183	Acc-Loop-Encap	Reports the ANCP Access-Loop-Encapsulation attribute.	hexadecimal string	No
26-184	Inner-Vlan-Map-Id	Inner VLAN tag allocated from the ranges provisioned on the core-facing physical interface, used to swap (replace) the autosensed VLAN tag on the access interface.	integer	No
26-185	Core-Facing-Interface	Name of the core-facing physical interface that forwards the Layer 2 wholesale session's downstream and upstream traffic relative to the network service provider (NSP) router.	string	No
26-187	DHCP-First-Relay-IPv4-Address	IPv4 address of the first relay link of a client/server binding.	integer: 4-byte <i>ip-address</i>	No
26-188	DHCP-First-Relay-IPv6-Address	IPv6 address of the first relay link of a client/server binding.	hexadecimal string: <i>ipv6-address</i>	No
26-191	Input-Interface-Filter	Name of an input filter to be attached to a family any interface.	string	No
26-192	Output-Interface-Filter	Name of an output filter to be attached to a family any interface.	string	No

- Related Documentation**
- [AAA Access Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 33](#)
 - [AAA Accounting Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 39](#)

AAA Access Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS

Table 5 on page 33 shows the RADIUS attributes and Juniper Networks VSAs support in AAA access messages. A checkmark in a column indicates that the message type supports that attribute.

Table 5: AAA Access Messages—Supported RADIUS Attributes and Juniper Networks VSAs

Attribute Number	Attribute Name	Access Request	Access Accept	Access Reject	Access Challenge	CoA Request	Disconnect Request
1	User-Name	✓	✓	–	–	✓	✓
2	User-Password	✓	–	–	–	–	–
3	CHAP-Password	✓	–	–	–	–	–
4	NAS-IP-Address	✓	–	–	–	–	–
5	NAS-Port	✓	–	–	–	–	–
6	Service-Type	✓	✓	–	–	–	–
7	Framed-Protocol	✓	✓	–	–	–	–
8	Framed-IP-Address	✓	✓	–	–	✓	–
9	Framed-IP-Netmask	–	✓	–	–	–	–
11	Filter-Id	–	✓	–	–	–	–
12	Framed-MTU	✓	–	–	–	–	–
18	Reply-Message	–	✓	✓	✓	–	–
22	Framed-Route	–	✓	–	–	–	–
25	Class	–	✓	–	–	–	–
26-1	Virtual-Router	✓	✓	–	–	–	–
26-4	Primary-DNS	–	✓	–	–	–	–
26-5	Secondary-DNS	–	✓	–	–	–	–
26-6	Primary-WINS	–	✓	–	–	–	–
26-7	Secondary-WINS	–	✓	–	–	–	–

Table 5: AAA Access Messages—Supported RADIUS Attributes and Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Access Request	Access Accept	Access Reject	Access Challenge	CoA Request	Disconnect Request
26-8	Tunnel-Virtual-Router	–	✓	–	–	–	–
26-9	Tunnel-Password	–	✓	–	–	–	–
26-10	Ingress-Policy-Name	–	✓	–	–	–	–
26-11	Egress-Policy-Name	–	✓	–	–	–	–
26-23	IGMP-Enable	–	✓	–	–	–	–
26-24	PPPoE-Description	✓	–	–	–	–	–
26-25	Redirect-VR-Name	–	✓	–	–	–	–
26-31	Service-Bundle	–	✓	–	–	–	–
26-33	Tunnel-Maximum-Sessions	–	✓	–	–	–	–
26-34	Framed-IP-Route-Tag	–	✓	–	–	–	–
26-47	Ipv6-Primary-DNS	–	✓	–	–	–	–
26-48	Ipv6-Secondary-DNS	–	✓	–	–	–	–
26-55	DHCP-Options	✓	–	–	–	–	–
26-56	DHCP-MAC-Address	✓	✓	–	–	–	–
26-57	DHCP-GI-Address	✓	–	–	–	–	–
26-58	LI-Action	–	✓	–	–	✓	–
26-59	Med-Dev-Handle	–	✓	–	–	✓	–
26-60	Med-Ip-Address	–	✓	–	–	✓	–
26-61	Med-Port-Number	–	✓	–	–	✓	–
26-63	Interface-Desc	✓	–	–	–	–	–
26-64	Tunnel-Group	–	✓	–	–	–	–
26-65	Activate-Service	–	✓	–	–	✓	–
26-66	Deactivate-Service	–	✓	–	–	✓	–

Table 5: AAA Access Messages—Supported RADIUS Attributes and Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Access Request	Access Accept	Access Reject	Access Challenge	CoA Request	Disconnect Request
26-67	Service-Volume	–	✓	–	–	✓	–
26-68	Service-Timeout	–	✓	–	–	✓	–
26-69	Service-Statistics	–	✓	–	–	✓	–
26-71	IGMP-Access-Name	–	✓	–	–	–	–
26-72	IGMP-Access-Src-Name	–	✓	–	–	–	–
26-74	MLD-Access-Name	–	✓	–	–	–	–
26-75	MLD-Access-Src-Name	–	✓	–	–	–	–
26-77	MLD-Version	–	✓	–	–	–	–
26-78	IGMP-Version	–	✓	–	–	–	–
26-91	Tunnel-Switch-Profile	–	✓	–	–	–	–
26-94	Tunnel-Tx-Speed-Method	–	✓	–	–	–	–
26-97	IGMP-Immediate-Leave	–	✓	–	–	–	–
26-100	MLD-Immediate-Leave	–	✓	–	–	–	–
26-106	IPv6-Ingress-Policy-Name	–	✓	–	–	–	–
26-107	IPv6-Egress-Policy-Name	–	✓	–	–	–	–
26-108	CoS-Parameter-Type	–	✓	–	–	✓	–
26-109	DHCP-Guided-Relay-Server	–	✓	–	–	–	–
26-110	Acc-Loop-Cir-Id	✓	–	–	–	–	–
26-111	Acc-Aggr-Cir-Id-Bin	✓	–	–	–	–	–
26-112	Acc-Aggr-Cir-Id-Asc	✓	–	–	–	–	–
26-113	Act-Data-Rate-Up	✓	–	–	–	–	–
26-114	Act-Data-Rate-Dn	✓	–	–	–	–	–
26-115	Min-Data-Rate-Up	✓	–	–	–	–	–

Table 5: AAA Access Messages—Supported RADIUS Attributes and Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Access Request	Access Accept	Access Reject	Access Challenge	CoA Request	Disconnect Request
26-116	Min-Data-Rate-Dn	✓	–	–	–	–	–
26-117	Att-Data-Rate-Up	✓	–	–	–	–	–
26-118	Att-Data-Rate-Dn	✓	–	–	–	–	–
26-119	Max-Data-Rate-Up	✓	–	–	–	–	–
26-120	Max-Data-Rate-Dn	✓	–	–	–	–	–
26-121	Min-LP-Data-Rate-Up	✓	–	–	–	–	–
26-122	Min-LP-Data-Rate-Dn	✓	–	–	–	–	–
26-123	Max-Interlv-Delay-Up	✓	–	–	–	–	–
26-124	Act-Interlv-Delay-Up	✓	–	–	–	–	–
26-125	Max-Interlv-Delay-Dn	✓	–	–	–	–	–
26-126	Act-Interlv-Delay-Dn	✓	–	–	–	–	–
26-127	DSL-Line-State	✓	–	–	–	–	–
26-128	DSL-Type	✓	–	–	–	–	–
26-130	QoS-Set-Name	–	✓	–	–	–	–
26-140	Service-Interim-Account-Interval	–	✓	–	–	✓	–
26-141	Downstream-Calculated-QoS-Rate	✓	–	–	–	–	–
26-142	Upstream-Calculated-QoS-Rate	✓	–	–	–	–	–
26-143	Max-Clients-Per-Interface	–	✓	–	–	–	–
26-146	Cos-Scheduler-Pmt-Type	–	✓	–	–	✓	–
26-158	PPPoE-Padn	–	✓	–	–	–	–
26-160	Vlan-Map-ID	–	✓	–	–	–	–
26-161	IPv6-Delegated-Pool-Name	–	✓	–	–	–	–
26-162	Tx-Connect-Speed	✓	–	–	–	–	–

Table 5: AAA Access Messages—Supported RADIUS Attributes and Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Access Request	Access Accept	Access Reject	Access Challenge	CoA Request	Disconnect Request
26-163	Rx-Connect-Speed	✓	–	–	–	–	–
26-173	Service-Activate-Type	–	✓	–	–	✓	–
26-174	Client-Profile-Name	–	✓	–	–	–	–
26-179	Service-Volume-Gigawords	–	✓	–	–	✓	–
26-180	Update-Service	–	–	–	–	✓	–
26-181	DHCPv6-Guided-Relay-Server	–	✓	–	–	–	–
26-182	Acc-Loop-Remote-Id	✓	–	–	–	–	–
26-183	Acc-Loop-Encap	✓	–	–	–	–	–
26-184	Inner-Vlan-Map-Id	–	✓	–	–	–	–
26-185	Core-Facing-Interface	–	–	–	–	–	–
26-187	DHCP-First-Relay-IPv4-Address	✓	–	–	–	–	–
26-188	DHCP-First-Relay-IPv6-Address	✓	–	–	–	–	–
26-191	Input-Interface-Filter	✓	–	–	–	–	–
26-192	Output-Interface-Filter	✓	–	–	–	–	–
27	Session-Timeout	–	✓	–	✓	–	–
31	Calling-Station-ID	✓	–	–	–	✓	–
32	NAS-Identifier	✓	–	–	–	–	–
44	Acct-Session-ID	✓	–	–	–	✓	✓
61	NAS-Port-Type	✓	–	–	–	–	–
64	Tunnel-Type	✓	✓	–	–	–	–
65	Tunnel-Medium-Type	✓	✓	–	–	–	–
66	Tunnel-Client-Endpoint	✓	✓	–	–	–	–
67	Tunnel-Server-Endpoint	✓	✓	–	–	–	–

Table 5: AAA Access Messages—Supported RADIUS Attributes and Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Access Request	Access Accept	Access Reject	Access Challenge	CoA Request	Disconnect Request
68	Acct-Tunnel-Connection-ID	✓	✓	–	–	–	–
68	Acct-Tunnel-Connection	–	✓	–	–	–	–
69	Tunnel-Password	–	✓	–	–	–	–
82	Tunnel-Assignment-Id	✓	✓	–	–	–	–
83	Tunnel-Preference	–	✓	–	–	–	–
85	Acct-Interim-Interval	–	✓	–	–	–	–
87	NAS-Port-Id	✓	–	–	–	✓	–
88	Framed-Pool	–	✓	–	–	–	–
90	Tunnel-Client-Auth-Id	✓	✓	–	–	–	–
91	Tunnel-Server-Auth-Id	✓	✓	–	–	–	–
96	Framed-Interface-ID	–	✓	–	–	–	–
97	Framed-IPv6-Prefix	–	✓	–	–	–	–
99	Framed-IPv6-Route	–	✓	–	–	–	–
100	Framed-IPv6-Pool	–	✓	–	–	–	–
101	Error-Cause	–	–	–	–	✓	✓
123	Delegated-IPv6-Prefix	–	✓	–	–	–	–
242	Ascend-Data-Filter	–	✓	–	–	✓	–

Related Documentation

- [AAA Accounting Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 39](#)
- [RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework on page 13](#)
- [RADIUS IETF Attributes Supported by the AAA Service Framework on page 14](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework on page 21](#)

AAA Accounting Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS

Table 6 on page 39 shows the RADIUS attributes and Juniper Networks VSAs support in AAA accounting messages. A checkmark in a column indicates that the message type supports that attribute.

Table 6: AAA Accounting Messages—Supported RADIUS Attributes and Juniper Networks VSAs

Attribute Number	Attribute Name	Acct Start	Acct Stop	Interim Acct	Acct On	Acct Off
1	User-Name	✓	✓	✓	–	–
3	CHAP-Password	✓	–	–	–	–
4	NAS-IP-Address	✓	✓	✓	✓	✓
5	NAS-Port	✓	✓	✓	–	–
6	Service-Type	✓	✓	✓	–	–
7	Framed-Protocol	✓	✓	✓	–	–
8	Framed-IP-Address	✓	✓	✓	–	–
9	Framed-IP-Netmask	✓	✓	✓	–	–
11	Filter-Id	–	✓	✓	–	–
22	Framed-Route	✓	✓	✓	–	–
25	Class	✓	✓	✓	–	–
26-1	Virtual-Router	✓	✓	✓	–	–
26-10	Ingress-Policy-Name	✓	✓	✓	–	–
26-11	Egress-Policy-Name	✓	✓	✓	–	–
26-24	PPPoE-Description	✓	✓	✓	–	–
26-42	Input-Gigapackets	–	✓	✓	–	–
26-43	Output-Gigapackets	–	✓	✓	–	–
26-47	Ipv6-Primary-DNS	✓	✓	✓	–	–
26-48	Ipv6-Secondary-DNS	✓	✓	✓	–	–

Table 6: AAA Accounting Messages—Supported RADIUS Attributes and Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Acct Start	Acct Stop	Interim Acct	Acct On	Acct Off
26-51	Disconnect-Cause	–	✓	–	–	–
26-55	DHCP-Options	✓	✓	✓	–	–
26-56	DHCP-MAC-Address	✓	✓	✓	–	–
26-57	DHCP-GI-Address	✓	✓	✓	–	–
26-63	Interface-Desc	✓	✓	✓	–	–
26-83	Service-Session	–	✓	✓	–	–
26-110	Acc-Loop-Cir-Id	✓	✓	✓	–	–
26-111	Acc-Aggr-Cir-Id-Bin	✓	✓	✓	–	–
26-112	Acc-Aggr-Cir-Id-Asc	✓	✓	✓	–	–
26-113	Act-Data-Rate-Up	✓	✓	✓	–	–
26-114	Act-Data-Rate-Dn	✓	✓	✓	–	–
26-115	Min-Data-Rate-Up	✓	✓	✓	–	–
26-116	Min-Data-Rate-Dn	✓	✓	✓	–	–
26-117	Att-Data-Rate-Up	✓	✓	✓	–	–
26-118	Att-Data-Rate-Dn	✓	✓	✓	–	–
26-119	Max-Data-Rate-Up	✓	✓	✓	–	–
26-120	Max-Data-Rate-Dn	✓	✓	✓	–	–
26-121	Min-LP-Data-Rate-Up	✓	✓	✓	–	–
26-122	Min-LP-Data-Rate-Dn	✓	✓	✓	–	–
26-123	Max-Interlv-Delay-Up	✓	✓	✓	–	–
26-124	Act-Interlv-Delay-Up	✓	✓	✓	–	–
26-125	Max-Interlv-Delay-Dn	✓	✓	✓	–	–
26-126	Act-Interlv-Delay-Dn	✓	✓	✓	–	–

Table 6: AAA Accounting Messages—Supported RADIUS Attributes and Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Acct Start	Acct Stop	Interim Acct	Acct On	Acct Off
26-127	DSL-Line-State	✓	✓	✓	–	–
26-128	DSL-Type	✓	✓	✓	–	–
26-141	Downstream-Calculated-QoS-Rate	✓	✓	✓	–	–
26-142	Upstream-Calculated-QoS-Rate	✓	✓	✓	–	–
26-151	IPv6-Acct-Input-Octets	–	✓	✓	–	–
26-152	IPv6-Acct-Output-Octets	–	✓	✓	–	–
26-153	IPv6-Acct-Input-Packets	–	✓	✓	–	–
26-154	IPv6-Acct-Output-Packets	–	✓	✓	–	–
26-155	IPv6-Acct-Input-Gigawords	–	✓	✓	–	–
26-156	IPv6-Acct-Output-Gigawords	–	✓	✓	–	–
26-160	Vlan-Map-Id	✓	✓	✓	–	–
26-162	Tx-Connect-Speed	✓	✓	✓	–	–
26-163	Rx-Connect-Speed	✓	✓	✓	–	–
26-177	Cos-Shaping-Rate	✓	✓	✓	–	–
26-182	Acc-Loop-Remote-Id	✓	✓	–	–	–
26-183	Acc-Loop-Encap	✓	✓	–	–	–
26-184	Inner-Vlan-Map-Id	✓	✓	–	–	–
26-185	Core-Facing-Interface	✓	✓	–	–	–
26-187	DHCP-First-Relay-IPv4-Address	✓	✓	✓	–	–
26-188	DHCP-First-Relay-IPv6-Address	✓	✓	✓	–	–
26-191	Input-Interface-Filter	✓	✓	✓	–	–
26-192	Output-Interface-Filter	✓	✓	✓	–	–
31	Calling-Station-ID	✓	✓	✓	–	–

Table 6: AAA Accounting Messages—Supported RADIUS Attributes and Juniper Networks VSAs (continued)

Attribute Number	Attribute Name	Acct Start	Acct Stop	Interim Acct	Acct On	Acct Off
32	NAS-Identifier	✓	✓	✓	–	–
40	Acct-Status-Type	✓	✓	✓	✓	✓
41	Acct-Delay-Time	✓	✓	✓	✓	✓
42	Acct-Input-Octets	–	✓	✓	–	–
43	Acct-Output-Octets	–	✓	✓	–	–
44	Acct-Session-ID	✓	✓	✓	✓	✓
45	Acct-Authentic	✓	✓	✓	✓	✓
46	Acct-Session-Time	–	✓	✓	–	–
47	Acct-Input-Packets	–	✓	✓	–	–
48	Acct-Output-Packets	–	✓	✓	–	–
49	Acct-Terminate-Cause	–	✓	✓	–	–
52	Acct-Input-Gigawords	–	✓	✓	–	–
53	Acct-Output-Gigawords	–	✓	✓	–	–
55	Event-Timestamp	✓	✓	✓	✓	✓
61	NAS-Port-Type	✓	✓	✓	–	–
64	Tunnel-Type	✓	✓	✓	–	–
65	Tunnel-Medium-Type	✓	✓	✓	–	–
66	Tunnel-Client-Endpoint	✓	✓	✓	–	–
67	Tunnel-Server-Endpoint	✓	✓	✓	–	–
68	Acct-Tunnel-Connection	✓	✓	✓	–	–
82	Tunnel-Assignment-Id	✓	✓	✓	–	–
87	NAS-Port-Id	✓	✓	✓	–	–
90	Tunnel-Client-Auth-Id	✓	✓	✓	–	–

Table 6: AAA Accounting Messages—Supported RADIUS Attributes and Juniper Networks VSAs (*continued*)

Attribute Number	Attribute Name	Acct Start	Acct Stop	Interim Acct	Acct On	Acct Off
91	Tunnel-Server-Auth-Id	✓	✓	✓	–	–
99	Framed-IPv6-Route	✓	✓	✓	–	–
100	Framed-IPv6-Pool	✓	✓	✓	–	–
123	Delegated-IPv6-Prefix	✓	✓	✓	–	–

Related Documentation

- [AAA Access Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 33](#)
- [RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework on page 13](#)
- [RADIUS IETF Attributes Supported by the AAA Service Framework on page 14](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework on page 21](#)

Configuring How RADIUS Attributes Are Used for Subscriber Access

You can specify the attributes RADIUS ignores in RADIUS Access-Accept messages, and the attributes RADIUS excludes from specified message types.

To configure the attributes RADIUS ignores or excludes:

1. Specify that you want to configure RADIUS.

```
[edit access profile isp-bos-metro-fiber-basic]
user@host# edit radius
```
2. Specify that you want to configure how RADIUS attributes are ignored or excluded.

```
[edit access profile isp-bos-metro-fiber-basic radius]
user@host# edit attributes
```
3. Specify the attributes you want RADIUS to ignore when the attributes are in Access-Accept messages. See [Table 7 on page 44](#) for the attributes you can configure.

```
[edit access profile isp-bos-metro-fiber-basic radius attributes]
user@host# set ignore input-filter output-filter
```
4. Configure RADIUS to exclude the specified attribute from the specified RADIUS message type. See [Table 8 on page 44](#) for the attributes and message type combinations you can configure.

```
[edit access profile isp-bos-metro-fiber-basic radius attributes]
user@host# set exclude input-filter output-filter
```

You use the **ignore** statement to configure the router or switch to ignore a particular attribute in RADIUS Access-Accept messages. By default, the router or switch processes the attributes received from the external AAA server. [Table 7 on page 44](#) lists the attributes supported in the **ignore** statement.

Table 7: Attributes That Can Be Ignored in RADIUS Access-Accept Messages

CLI Entry	Attribute Name	Attribute Number
dynamic-iflset-name	Interface-Set-Name	Juniper Networks VSA 26-130
framed-ip-netmask	Framed-Ip-Netmask	RADIUS attribute 9
input-filter	Ingress-Policy-Name	Juniper Networks VSA 26-10
logical-system:routing-instance	Virtual-Router	Juniper Networks VSA 26-1
output-filter	Egress-Policy-Name	Juniper Networks VSA 26-11

You use the **exclude** statement to configure the router or switch to exclude the specified attributes from the specified type of RADIUS message. Not all attributes appear in all types of RADIUS messages—the CLI indicates the RADIUS message type. By default, the router or switch includes the specified attributes in RADIUS Access-Request, Accounting-On, Accounting-Off, Accounting-Start, Accounting-Stop, and Interim-Accounting messages. [Table 8 on page 44](#) lists the attributes and message types supported in the **exclude** statement.

Table 8: Attributes That Can Be Excluded from RADIUS Messages

CLI Entry	Attribute Name	Attribute Number	Supported Message Type
accounting-authentic	Acct-Authentic	RADIUS attribute 45	Accounting-On Accounting-Off
accounting-delay-time	Acct-Delay-Time	RADIUS attribute 41	Accounting-On Accounting-Off
accounting-session-id	Acct-Session-Id	RADIUS attribute 44	Access-Request Accounting-On Accounting-Off Accounting-Stop
accounting-terminate-cause	Acct-Terminate-Cause	RADIUS attribute 49	Accounting-Off

Table 8: Attributes That Can Be Excluded from RADIUS Messages (*continued*)

CLI Entry	Attribute Name	Attribute Number	Supported Message Type
called-station-id	Called-Station-Id	RADIUS attribute 30	Access-Request Accounting-Start Accounting-Stop
calling-station-id	Calling-Station-Id	RADIUS attribute 31	Access-Request Accounting-Start Accounting-Stop
class	Class	RADIUS attribute 25	Accounting-Start Accounting-Stop
cos-shaping-rate	Cos-Shaping-Rate	Juniper Networks VSA 26-177	Accounting-Start Accounting-Stop
delegated-ipv6-prefix	Delegated-IPv6-Prefix	RADIUS attribute 123	Accounting-Start Accounting-Stop
dhcp-gi-address	DHCP-GI-Address	Juniper Networks VSA 26-57	Access-Request Accounting-Start Accounting-Stop
dhcp-mac-address	DHCP-MAC-Address	Juniper Networks VSA 26-56	Access-Request Accounting-Start Accounting-Stop
dhcp-options	DHCP-Options	Juniper Networks VSA 26-55	Access-Request Accounting-Start Accounting-Stop
downstream-calculated-qos-rate	Downstream-Calculated-QoS-Rate	Juniper Networks VSA 26-141	Access-Request Accounting-Start Accounting-Stop Interim-Accounting

Table 8: Attributes That Can Be Excluded from RADIUS Messages (*continued*)

CLI Entry	Attribute Name	Attribute Number	Supported Message Type
dsl-forum-attributes	Not applicable	Excludes the DSL Forum VSA (IANA vendor ID 3561)	Access-Request Accounting-Start Accounting-Stop Interim-Accounting
dynamic-iflset-name	Qos-Set-Name	Juniper Networks VSA 26–130	Accounting-Start Accounting-Stop
event-timestamp	Event-Timestamp	RADIUS attribute 55	Accounting-On Accounting-Off Accounting-Start Accounting-Stop
filter-id	Filter-Id	RADIUS attribute 11	Accounting-Start Accounting-Stop
first-relay-ipv4-address	DHCP-First-Relay-IPv4-Address	Juniper Networks VSA 26–187	Accounting-Start Accounting-Stop Interim-Accounting
first-relay-ipv6-address	DHCP-First-Relay-IPv6-Address	Juniper Networks VSA 26–188	Accounting-Start Accounting-Stop Interim-Accounting
framed-ip-address	Framed-IP-Address	RADIUS attribute 8	Accounting-Start Accounting-Stop
framed-ip-netmask	Framed-IP-Netmask	RADIUS attribute 9	Accounting-Start Accounting-Stop
framed-ip-route	Framed-Route	RADIUS attribute 22	Accounting-Start Accounting-Stop
framed-ipv6-pool	Framed-IPv6-Pool	RADIUS attribute 100	Accounting-Start Accounting-Stop

Table 8: Attributes That Can Be Excluded from RADIUS Messages (*continued*)

CLI Entry	Attribute Name	Attribute Number	Supported Message Type
framed-ipv6-prefix	Framed-IPv6-Prefix	RADIUS attribute 97	Accounting-Start Accounting-Stop
framed-ipv6-route	Framed-IPv6-Route	RADIUS attribute 99	Accounting-Start Accounting-Stop
framed-pool	Framed-Pool	RADIUS attribute 88	Accounting-Start Accounting-Stop
input-filter	Ingress-Policy-Name	Juniper Networks VSA 26–10	Accounting-Start Accounting-Stop
input-gigapackets	Acct-Input-Gigapackets	Juniper Networks VSA 26–42	Accounting-Stop
input-gigawords	Acct-Input-Gigawords	RADIUS attribute 52	Accounting-Stop
input-ipv6-gigawords	IPv6-Acct-Input-Gigawords	Juniper Networks VSA 26–155	Accounting-Stop
input-ipv6-octets	IPv6-Acct-Input-Octets	Juniper Networks VSA 26–151	Accounting-Stop
input-ipv6-packets	IPv6-Acct-Input-Packets	Juniper Networks VSA 26–153	Accounting-Stop
interface-description	Interface-Desc	Juniper Networks VSA 26–53	Access-Request Accounting-Start Accounting-Stop
nas-identifier	NAS-Identifier	RADIUS attribute 32	Access-Request Accounting-On Accounting-Off Accounting-Start Accounting-Stop
nas-port	NAS-Port	RADIUS attribute 5	Access-Request Accounting-Start Accounting-Stop

Table 8: Attributes That Can Be Excluded from RADIUS Messages (*continued*)

CLI Entry	Attribute Name	Attribute Number	Supported Message Type
nas-port-id	NAS-Port-Id	RADIUS attribute 87	Access-Request Accounting-Start Accounting-Stop
nas-port-type	NAS-Port-Type	RADIUS attribute 61	Access-Request Accounting-Start Accounting-Stop
output-filter	Egress-Policy-Name	Juniper Networks VSA 26-11	Accounting-Start Accounting-Stop
pppoe-description	PPPoE Description	Juniper Networks VSA 26-24	Access-Request Accounting-Start Accounting-Stop Interim-Accounting
output-gigapackets	Acct-Output-Gigapackets	Juniper Networks VSA 26-43	Accounting-Stop
output-gigawords	Acct-Output-Gigawords	RADIUS attribute 53	Accounting-Stop
output-ipv6-gigawords	IPv6-Acct-Output-Gigawords	Juniper Networks VSA 26-156	Accounting-Stop
output-ipv6-octets	IPv6-Acct-Output-Octets	Juniper Networks VSA 26-152	Accounting-Stop
output-ipv6-packets	IPv6-Acct-Output-Packets	Juniper Networks VSA 26-154	Accounting-Stop
upstream-calculated-qos-rate	Upstream-Calculated-QoS-Rate	Juniper Networks VSA 26-142	Access-Request Accounting-Start Accounting-Stop Interim-Accounting
virtual-router	Virtual-Router	Juniper Networks VSA 26-1	Access-Request Accounting-Start Accounting-Stop

- Related Documentation**
- [Configuring Router or Switch Interaction with RADIUS Servers on page 115](#)
 - [Configuring Authentication and Accounting Parameters for Subscriber Access on page 90](#)
 - [Specifying RADIUS Authentication and Accounting Servers for Subscriber Access on page 91](#)
 - [Configuring RADIUS Server Options for Subscriber Access on page 119](#)
 - [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Junos OS Predefined Variables That Correspond to RADIUS Attributes and VSAs

Table 9 on page 49 lists the RADIUS attributes and Juniper Networks VSAs and their corresponding Junos OS predefined variables that are used in dynamic profiles. When the router instantiates a dynamic profile following subscriber access, the Junos OS uses the predefined variable to specify the RADIUS attribute or VSA for the information obtained from the RADIUS server.

Some predefined variables support the configuration of default values. The configured default value is used in the event that RADIUS fails to return a value for the variable. You configure default values with the **predefined-variable-defaults predefined-variable default-value** statement at the [edit dynamic-profiles] hierarchy level. When you specify the **predefined-variable**, you use the name of the Junos OS predefined variable, but you omit the leading \$junos- prefix.

Table 9: RADIUS Attributes and Corresponding Junos OS Predefined Variables

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
RADIUS Attribute			
Framed-IP-Address (8)	\$junos-framed-route-ip-address	Address for the client	No
Filter-ID (11)	\$junos-input-filter NOTE: Variable is also used for VSA 26–10.	Input filter to apply to client IPv4 interface	Yes
Framed-Route (22)	\$junos-framed-route-ip-address-prefix	(Subattribute 1): Route prefix for access route	No
	\$junos-framed-route-nextthop	(Subattribute 2): Next hop address for access route	No
	\$junos-framed-route-cost	(Subattribute 3): Metric for access route	No

Table 9: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
	\$junos-framed-route-distance	(Subattribute 5): Preference for access route	No
	\$junos-framed-route-tag	(Subattribute 6): Tag for access route	No
Framed-IPv6-Prefix (97)	\$junos-ipv6-ndra-prefix	Prefix value in IPv6 Neighbor Discovery route advertisements	No
Framed-IPv6-Route (99)	\$junos-framed-route-ipv6-address-prefix	(Subattribute 1): Framed IPv6 route prefix configured for the client	No
	\$junos-framed-route-ipv6-cost	(Subattribute 3): Metric for access route	No
	\$junos-framed-route-ipv6-distance	(Subattribute 5): Preference for access route	No
	\$junos-framed-route-ipv6-nexthop	(Subattribute 2): IPv6 routing information configured for the client	No
	\$junos-framed-route-ipv6-tag	(Subattribute 6): Tag for access route	No
Juniper Networks VSA			
Virtual-Router (26–1)	\$junos-routing-instance	Routing instance to which subscriber is assigned	Yes
Ingress-Policy-Name (26–10)	\$junos-input-filter NOTE: Variable is also used for RADIUS attribute 11.	Input filter to apply to client IPv4 interface	Yes
Egress-Policy-Name (26–11)	\$junos-output-filter	Output filter to apply to client IPv4 interface	Yes
IGMP-Enable (26–23)	\$junos-igmp-enable	Enable or disable IGMP on client interface	Yes
IGMP-Access-Name (26–71)	\$junos-igmp-access-group-name	Access list to use for the group (G) filter	Yes

Table 9: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
IGMP-Access-Src-Name (26–72)	\$junos-igmp-access-source-group-name	Access List to use for the source group (S,G) filter	Yes
MLD-Access-Name (26–74)	\$junos-mld-access-group-name	Access list to use for the group (G) filter	Yes
MLD-Access-Src-Name (26–75)	\$junos-mld-access-source-group-name	Access List to use for the source group (S,G) filter	Yes
MLD-Version (26–77)	\$junos-mld-version	MLD protocol version	Yes
IGMP-Version (26–78)	\$junos-igmp-version	IGMP protocol version	Yes
IGMP-Immediate-Leave (26–97)	\$junos-igmp-immediate-leave	IGMP immediate leave	Yes
MLD-Immediate-Leave (26–100)	\$junos-mld-immediate-leave	MLD immediate leave	Yes
IPv6-Ingress-Policy-Name (26–106)	\$junos-input-ipv6-filter	Input filter to apply to client IPv6 interface	Yes
IPv6-Egress-Policy-Name (26–107)	\$junos-output-ipv6-filter	Output filter to apply to client IPv6 interface	Yes
CoS-Traffic-Control-Profile-Parameter-Type (26–108)	\$junos-cos-scheduler-map	(T01: Scheduler-map name) Name of scheduler map configured in traffic-control profile	Yes
	\$junos-cos-shaping-rate	(T02: Shaping rate) Shaping rate configured in traffic-control profile	Yes
	\$junos-cos-guaranteed-rate	(T03: Guaranteed rate) Guaranteed rate configured in traffic-control profile	Yes
	\$junos-cos-delay-buffer-rate	(T04: Delay-buffer rate) Delay-buffer rate configured in traffic-control profile	Yes

Table 9: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
	\$junos-cos-excess-rate	(T05; Excess rate) Excess rate configured in traffic-control profile	Yes
	\$junos-cos-traffic-control-profile	(T06; Traffic-control profile) Name of the traffic-control profile configured in a dynamic profile	Yes
	\$junos-cos-shaping-mode	(T07; Shaping mode) CoS shaping mode configured in a dynamic profile	Yes
	\$junos-cos-byte-adjust	(T08; Byte adjust) Byte adjustments configured for the shaping mode in a dynamic profile	Yes
	\$junos-cos-adjust-minimum	(T09; Adjust minimum) Minimum adjusted value allowed for the shaping rate in a dynamic profile	Yes
	\$junos-cos-excess-rate-high	(T10; Excess rate high) Excess rate configured for high-priority traffic in a dynamic profile	Yes
	\$junos-cos-excess-rate-low	(T11; Excess rate low) Excess rate configured for low-priority traffic in a dynamic profile	Yes
	\$junos-cos-shaping-rate-burst	(T12; Shaping rate burst) Burst size configured for the shaping rate in a dynamic profile	Yes
	\$junos-cos-guaranteed-rate-burst	(T13; Guaranteed rate burst) Burst size configured for the guaranteed rate in a dynamic profile	Yes
Qos-Set-Name (26–130)	\$junos-interface-set-name	Name of an interface set configured in a dynamic profile	Yes

Table 9: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
CoS-Scheduler-Pmt-Type (26–146)	\$junos-cos-scheduler	(Null: Scheduler name) Name of scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-tx	(T01: CoS scheduler transmit rate) Transmit rate for scheduler configured in a dynamic profile	Yes Available for multiple parameters: <ul style="list-style-type: none"> • Percent • Rate
	\$junos-cos-scheduler-bs	(T02: CoS scheduler buffer size) Buffer size for scheduler configured in a dynamic profile	Yes Available for multiple parameters: <ul style="list-style-type: none"> • Percent • Temporal
	\$junos-cos-scheduler-pri	(T03: CoS scheduler priority) Packet-scheduling priority for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-dropfile-low	(T04: CoS scheduler drop-profile low) Name of drop profile for RED loss-priority level low for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-dropfile-medium-low	(T05: CoS scheduler drop-profile medium-low) Name of drop profile for RED loss-priority level medium-low for scheduler configured in a dynamic profile	Yes

Table 9: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
	\$junos-cos-scheduler-dropfile-medium-high	(T06: CoS scheduler drop-profile medium-high) Name of drop profile for RED loss-priority level medium-high for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-dropfile-high	(T07: CoS scheduler drop-profile high) Name of drop profile for RED loss-priority level high for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-dropfile-any	(T08: CoS scheduler drop-profile any) Name of drop profile for RED loss-priority level any for scheduler configured in a dynamic profile	Yes
	\$junos-cos-scheduler-excess-rate	(T09: CoS scheduler excess rate) Excess rate configured for a scheduler in a dynamic profile	Yes Available for multiple parameters: <ul style="list-style-type: none"> • Percent • Proportion
	\$junos-cos-scheduler-shaping-rate	(T10: CoS scheduler shaping rate) Shaping rate configured for a scheduler in a dynamic profile	Yes Available for multiple parameters: <ul style="list-style-type: none"> • Percent • Rate
	\$junos-cos-scheduler-excess-priority	(T11: CoS scheduler excess priority) Excess priority configured for a scheduler in a dynamic profile	Yes
Input-Interface-Filter (26-191)	\$junos-input-interface-filter	Name of an input filter to be attached to a family any interface.	No

Table 9: RADIUS Attributes and Corresponding Junos OS Predefined Variables (*continued*)

RADIUS Attribute or VSA	Junos OS Predefined Variable	Description	Default Value Support for Junos OS Predefined Variable
Output-Interface-Filter (26-192)	\$junos-output-interface-filter	Name of an output filter to be attached to a family any interface.	No

Related Documentation

- [Dynamic Variables Overview](#)
- [Configuring Predefined Dynamic Variables in Dynamic Profiles](#)
- [Junos OS Predefined Variables](#)

DSL Forum Vendor-Specific Attributes

Digital Subscriber Line (DSL) attributes are RADIUS vendor-specific attributes (VSAs) that are defined by the DSL Forum. The attributes transport DSL information that is not supported by standard RADIUS attributes and which convey information about the associated DSL subscriber and data rate. The attributes are defined in RFC 4679, *DSL Forum Vendor-Specific RADIUS Attributes*.



NOTE: Junos OS uses the vendor ID 3561, which is assigned by the Internet Assigned Numbers Authority (IANA), for the DSL Forum VSAs.

Subscriber management does not process DSL values—the router simply passes the values received from the subscriber to the RADIUS server, without performing any parsing or manipulation. However, you can manage the content of DSL VSA values either by using the client configuration to restrict the DSL VSAs that the client sends, or by configuring the RADIUS server to ignore unwanted DSL VSAs.

Table 10 on page 55 describes the DSL Forum VSAs.

Table 10: DSL Forum VSAs

Attribute Number	Attribute Name	Description	Value
[26-1]	Agent-Circuit-Id	Identifier for the subscriber agent circuit ID (ACI) that corresponds to the DSLAM interface from which subscriber requests are initiated. For auto-sensed VLANs, the ACI is extracted from DHCP discover, DHCPv6 solicit, or PPPoE PADI messages, stored in the VLAN shared database entry, and then presented in the RADIUS Access-Request message in this VSA.	string

Table 10: DSL Forum VSAs (continued)

Attribute Number	Attribute Name	Description	Value
[26-2]	Agent-Remote-Id	Unique identifier for the subscriber associated with the DSLAM interface from which requests are initiated. For auto-sensed VLANs, the ARI is extracted from DHCP discover, DHCPv6 solicit, or PPPoE PADI messages, stored in the VLAN shared database entry, and then presented in the RADIUS Access-Request message in this VSA.	string
[26-129]	Actual-Data-Rate-Upstream	Actual upstream data rate of the subscriber's synchronized DSL link	integer: 4-octet
[26-130]	Actual-Data-Rate-Downstream	Actual downstream data rate of the subscriber's synchronized DSL link	integer: 4-octet
[26-131]	Minimum-Data-Rate-Upstream	Minimum upstream data rate configured for the subscriber	integer: 4-octet
[26-132]	Minimum-Data-Rate-Downstream	Minimum downstream data rate configured for the subscriber	integer: 4-octet
[26-133]	Attainable-Data-Rate-Upstream	Upstream data rate that the subscriber can attain	integer: 4-octet
[26-134]	Attainable-Data-Rate-Downstream	Downstream data rate that the subscriber can attain	integer: 4-octet
[26-135]	Maximum-Data-Rate-Upstream	Maximum upstream data rate configured for the subscriber	integer: 4-octet
[26-136]	Maximum-Data-Rate-Downstream	Maximum downstream data rate configured for the subscriber	integer: 4-octet
[26-137]	Minimum-Data-Rate-Upstream-Low-Power	Minimum upstream data rate in low power state configured for the subscriber	integer: 4-octet
[26-138]	Minimum-Data-Rate-Downstream-Low-Power	Minimum downstream data rate in low power state configured for the subscriber	integer: 4-octet
[26-139]	Maximum-Interleaving-Delay-Upstream	Maximum one-way upstream interleaving delay configured for the subscriber	integer: 4-octet
[26-140]	Actual-Interleaving-Delay-Upstream	Subscriber's actual one-way upstream interleaving delay	integer: 4-octet
[26-141]	Maximum-Interleaving-Delay-Downstream	Maximum one-way downstream interleaving delay configured for the subscriber	integer: 4-octet

Table 10: DSL Forum VSAs (continued)

Attribute Number	Attribute Name	Description	Value
[26-142]	Actual-Interleaving-Delay-Downstream	Subscriber's actual one-way downstream interleaving delay	integer: 4-octet
[26-144]	Access-Loop-Encapsulation	Encapsulation used by the subscriber associated with the DSLAM interface from which requests are initiated	string: 3-byte
[26-254]	IWF-Session	Indication that the interworking function (IWF) has been performed for the subscriber's session	No data field required

Related Documentation • [DSL Forum VSAs Support in AAA Access and Accounting Messages for Junos OS on page 57](#)

DSL Forum VSAs Support in AAA Access and Accounting Messages for Junos OS

Table 11 on page 57 lists the DSL Forum VSAs supported by Junos OS in RADIUS Access-Request, Acct-Start, Acct-Stop, Interim-Acct, and CoA-Request messages. A checkmark in a column indicates that the message type supports that attribute. The DSL Forum vendor ID is 3561 (hexadecimal DE9), which is assigned by the IANA.

Table 11: DSL Forum VSAs—Supported RADIUS Messages

Attribute Number	Attribute Name	Access Request	Acct Start	Acct Stop	Interim Acct	CoA Request
[26-1]	Agent-Circuit-Id	✓	✓	✓	✓	✓
[26-2]	Agent-Remote-Id	✓	✓	✓	✓	✓
[26-129]	Actual-Data-Rate-Upstream	✓	✓	✓	✓	–
[26-130]	Actual-Data-Rate-Downstream	✓	✓	✓	✓	–
[26-131]	Minimum-Data-Rate-Upstream	✓	✓	✓	✓	–
[26-132]	Minimum-Data-Rate-Downstream	✓	✓	✓	✓	–
[26-133]	Attainable-Data-Rate-Upstream	✓	✓	✓	✓	–
[26-134]	Attainable-Data-Rate-Downstream	✓	✓	✓	✓	–
[26-135]	Maximum-Data-Rate-Upstream	✓	✓	✓	✓	–
[26-136]	Maximum-Data-Rate-Downstream	✓	✓	✓	✓	–

Table 11: DSL Forum VSAs—Supported RADIUS Messages (*continued*)

Attribute Number	Attribute Name	Access Request	Acct Start	Acct Stop	Interim Acct	CoA Request
[26-137]	Minimum-Data-Rate-Upstream-Low-Power	✓	✓	✓	✓	–
[26-138]	Minimum-Data-Rate-Downstream-Low-Power	✓	✓	✓	✓	–
[26-139]	Maximum-Interleaving-Delay-Upstream	✓	✓	✓	✓	–
[26-140]	Actual-Interleaving-Delay-Upstream	✓	✓	✓	✓	–
[26-141]	Maximum-Interleaving-Delay-Downstream	✓	✓	✓	✓	–
[26-142]	Actual-Interleaving-Delay-Downstream	✓	✓	✓	✓	–
[26-144]	Access-Loop-Encapsulation	✓	✓	✓	✓	–
[26-254]	IWF-Session	✓	✓	✓	✓	–

Related Documentation • [DSL Forum Vendor-Specific Attributes on page 55](#)

RADIUS Support for Microsoft Corporation VSAs for DNS Server Addresses

Starting in Junos OS Release 15.1, the Junos OS AAA implementation supports RADIUS VSAs that identify the primary and secondary DNS servers for IANA private enterprise number 311 (Microsoft Corporation). For example, during PPP authentication, the router receives the VSAs from a RADIUS server and uses the attributes to provision customer premise equipment.

The two VSAs are shown in the following table, and are described in RFC 2548 (*Microsoft Vendor-specific RADIUS Attributes*)

Table 12: Microsoft Vendor-Specific RADIUS Attributes for DNS Server Addresses

Attribute Number	Attribute Name	Description	Value
26-28	MS-Primary-DNS-Server	IP address of the primary Domain Name Server. This VSA can be included in Access-Accept and Accounting-Request packets.	integer: 4-octet <i>primary-dns-address</i>

Table 12: Microsoft Vendor-Specific RADIUS Attributes for DNS Server Addresses (*continued*)

Attribute Number	Attribute Name	Description	Value
26-29	MS-Secondary-DNS-Server	IP address of the secondary Domain Name Server. This VSA can be included in Access-Accept and Accounting-Request packets.	integer: 4-octet <i>secondary-dns-address</i>

Release History Table

Release	Description
15.1	Starting in Junos OS Release 15.1, the Junos OS AAA implementation supports RADIUS VSAs that identify the primary and secondary DNS servers for IANA private enterprise number 311 (Microsoft Corporation).

Related Documentation

- [DNS Address Assignment Precedence on page 249](#)

CHAPTER 3

Configuring RADIUS NAS-Port Attributes and Options

- [Manual Configuration of the NAS-Port-ID RADIUS Attribute on page 61](#)
- [Configuring a NAS-Port-ID with Additional Options on page 63](#)
- [Configuring the Order in Which Optional Values Appear in the NAS-Port-ID on page 64](#)
- [Configuring a Calling-Station-ID with Additional Attributes on page 66](#)
- [Enabling Unique NAS-Port Attributes \(RADIUS Attribute 5\) for Subscribers on page 69](#)
- [RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN Overview on page 70](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Manual Configuration of the NAS-Port-Type RADIUS Attribute on page 74](#)
- [Configuring the RADIUS NAS-Port-Type per Physical Interface on page 76](#)
- [Configuring the RADIUS NAS-Port-Type per VLAN on page 78](#)
- [Configuring the RADIUS NAS-Port-Type per Stacked VLAN on page 79](#)
- [Configuring the RADIUS NAS-Port Extended Format per Physical Interface on page 81](#)
- [Configuring the RADIUS NAS-Port Extended Format per VLAN on page 82](#)
- [Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN on page 84](#)
- [Configuring the RADIUS NAS-Port Extended Format for ATM Interfaces on page 86](#)

Manual Configuration of the NAS-Port-ID RADIUS Attribute

Subscriber management uses the NAS-Port-ID (RADIUS attribute 87) to provide an interface description that identifies the physical interface that is used to authenticate subscribers. The NAS-Port-ID is included in RADIUS Access-Request, Acct-Start, Acct-Stop, Acct-On, and Acct-Off messages.

You can configure access profiles to specify additional information in the NAS-Port-ID. The additional information can be any combination of the interface description (the default value), the Agent Circuit ID, the Agent Remote ID, and the NAS identifier. You can

also specify an optional delimiter character, which separates the values in a NAS-Port-ID. The default delimiter character is the hash character (#).

A default NAS-Port-ID consists of the following **interface-description** string:

[physical-interface].<interface-type>-<slot>/<adapter>/<port><.subinterface>[:<svlan>-<vlan>]

For example: **ge-1/2/0.100:100**

You might optionally configure an access profile that specifies that the NAS-Port-ID includes the NAS identifier, the Agent Circuit ID, and the Agent Remote ID, in addition to the default interface description. For this configuration, the NAS-Port-ID consists of the following string:

nas-identifier#interface-description#agent-circuit-id#agent-remote-id

For example:

retailer25#ge-1/2/0.100:100#ACI 12/1/22/1230:1.1.23#ARI 55/2/23.9999:10.11.1923



NOTE: The NAS-Port-ID displays the configured values in the following order (where # is the delimiter):

nas-identifier#interface-description#agent-circuit-id#agent-remote-id

**Related
Documentation**

- [Configuring a NAS-Port-ID with Additional Options on page 63](#)
- [RADIUS Server Options for Subscriber Access on page 4](#)

Configuring a NAS-Port-ID with Additional Options

The NAS-Port-ID (RADIUS attribute 87) identifies the physical interface that subscriber management uses to authenticate subscribers. By default, the NAS-Port-ID includes the **interface-description** value that describes the physical interface. You can include the following optional values in the NAS-Port-ID:

- **agent-circuit-id**
- **agent-remote-id**
- **interface-description**
- **interface-text-description**
- **nas-identifier**
- **postpend-vlan-tags**



NOTE: If you specify any optional values, the default **interface-description** value is no longer automatically included. You must explicitly specify the **interface-description** value if you want it to appear in the NAS-Port-ID.

When you specify optional values, the router arranges the values in the following default order, where the **#** character is the default delimiter:

nas-identifier # interface-description # interface-text-description # agent-circuit-id # agent-remote-id # postpend-vlan-tags

You can use the **order** option to configure the explicit order in which the specified optional values appear in the NAS-Port-ID string.

To configure optional values in the NAS-Port-ID string:

1. Specify the access profile you want to configure.

```
[edit]
user@host# edit access profile retailer25
```

2. Specify that you want to configure RADIUS options.

```
[edit access profile retailer25]
user@host# edit radius options
```

3. Specify the character to use as the delimiter between the different attribute values in the NAS-Port-ID. By default, subscriber management uses the hash character (**#**).

```
[edit access profile retailer25 radius options]
user@host# set nas-port-delimiter %
```

4. Specify that you want to configure the format of the NAS-Port-ID.

```
[edit access profile retailer25 radius options]
user@host# edit nas-port-id-format
```

5. (Optional) Specify the optional values you want to include in the NAS-Port-ID string. The optional values appear in the default order.

```
[edit access profile retailer25 radius options nas-port-id-format]
user@host# set interface-description nas-identifier agent-remote-id agent-circuit id
```

6. (Optional) To specify an explicit non-default order in which the optional values appear in the NAS-Port-ID string, include the **order** option before each optional value. Specify the values in the order you want them to appear.

See “Configuring the Order in Which Optional Values Appear in the NAS-Port-ID” on page 64.

Related Documentation

- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)
- [Configuring RADIUS Server Parameters for Subscriber Access on page 118](#)
- [Configuring the Order in Which Optional Values Appear in the NAS-Port-ID on page 64](#)

Configuring the Order in Which Optional Values Appear in the NAS-Port-ID

In addition to specifying the values that you want to include in the NAS-Port-ID, you can use the **order** option to specify the explicit order in which you want the values to appear.

By default, the router arranges the specified values in the following order, where the **#** character is the delimiter:

```
nas-identifier # interface-description # interface-text-description #
agent-circuit-id # agent-remote-id # postpend-vlan-tags
```



NOTE: The default order and the customized order are mutually exclusive. The configuration fails if you try to specify both.

To configure the specific order in which you want the optional values to appear in the NAS-Port-ID:

1. Specify that you want to configure the format of the NAS-Port-ID.

```
[edit access profile retailer25 radius options]
user@host# edit nas-port-id-format
```

2. Include the **order** option before each optional value that you want to include in the NAS-Port-ID. Specify the optional values in the order in which you want them to appear.

```
[edit access profile retailer25 radius options nas-port-id-format]
user@host# set order interface-description order nas-identifier order agent-remote-id
order interface-text-description
```

This configuration configures the following NAS-Port-ID string, where the % character is the delimiter:

```
interface-description % nas-identifier % agent-remote-id % interface-text-description
```

3. (Optional) To add an optional value to an existing NAS-Port-ID string:

Use the **order** option and the name of the optional value to add the new value to the existing NAS-Port-ID. The new value is added at the end of the string. For example:

```
[edit access profile retailer25 radius options nas-port-id-format]
user@host# set order agent-circuit-id
```

This configuration modifies the example in the previous step by adding the **agent-circuit-id** to the end of the NAS-Port-ID string:

```
interface-description % nas-identifier % agent-remote-id % interface-text-description
% agent-circuit-id
```



NOTE: If you attempt to add an optional value that already exists in the NAS-Port-ID string, the new specification is ignored and the existing value remains in the order in which it was originally configured.

If you want to modify the existing order, delete the existing specification and define the new order.

Related Documentation

- [Configuring a NAS-Port-ID with Additional Options on page 63](#)

Configuring a Calling-Station-ID with Additional Attributes

You can configure an alternative value for the Calling-Station-ID (RADIUS IETF attribute 31) in an access profile on the MX Series router.

By default, the Calling-Station-ID includes the **agent-circuit-id** string. Optionally, you can configure the Calling-Station-ID to include one or more of the following attributes, in any combination:

- Agent circuit identifier (**agent-circuit-id**)—Identifier of the subscriber's access node and the digital subscriber line (DSL) on the access node. The agent circuit identifier (ACI) string is stored in either the DHCP option 82 field of DHCP messages for DHCP traffic, or in the DSL Forum Agent-Circuit-ID VSA [26-1] of PPPoE Active Discovery Initiation (PADI) and PPPoE Active Discovery Request (PADR) control packets for PPPoE traffic.
- Agent remote identifier (**agent-remote-id**)—Identifier of the subscriber on the digital subscriber line access multiplexer (DSLAM) interface that initiated the service request. The agent remote identifier (ARI) string is stored in either the DHCP option 82 field for DHCP traffic, or in the DSL Forum Agent-Remote-ID VSA [26-2] for PPPoE traffic.
- Interface description (**interface-description**)—Value of the interface.
- Interface text description (**interface-text-description**)—Text description of the interface. The interface text description is configured separately, using either the **set interfaces interface-name description description** statement or the **set interfaces interface-name unit unit-number description description** statement
- MAC address (**mac-address**)—MAC address of the source device for the subscriber.
- NAS identifier (**nas-identifier**)—Name of the NAS that originated the authentication or accounting request. NAS-Identifier is RADIUS IETF attribute 32.
- Stacked VLAN (**stacked-vlan**)—Stacked VLAN ID.
- VLAN (**vlan**)—VLAN ID.

If you configure the format of the Calling-Station-ID with more than one optional value, a hash character (#) is the default delimiter that the router uses as a separator between the concatenated values in the resulting Calling-Station-ID string. Optionally, you can configure an alternative delimiter character for the Calling-Station-ID to use. The following example shows the order of output when you configure multiple optional values:

```
nas-identifier#interface description#interface text
description#agent-circuit-id#agent-remote-id#mac address#stacked vlan#vlan
```

To configure an access profile to provide additional attributes in the Calling-Station-ID:

1. Specify the access profile you want to configure.

```
[edit]
user@host# edit access profile profile-name
```

2. Specify that you want to configure RADIUS options.

```
[edit access profile profile-name]
user@host# edit radius options
```

3. Specify the nondefault character to use as the delimiter between the different attribute values in the Calling-Station-ID.

By default, subscriber management uses the hash character (#) as the delimiter in Calling-Station-ID strings that contain more than one optional value.

```
[edit access profile profile-name radius options]
user@host# set calling-station-id-delimiter delimiter-character
```

4. Configure the value for the NAS-Identifier (RADIUS attribute 32), which is used for authentication and accounting requests.

```
[edit access profile profile-name radius options]
user@host# set nas-identifier identifier-value
```

5. Specify that you want to configure the format of the Calling-Station-ID.

```
[edit access profile profile-name radius options]
user@host# edit calling-station-id-format
```

6. (Optional) Include the interface text description in the Calling-Station-ID.

```
[edit access profile profile-name radius options calling-station-id-format]
user@host# set interface-text-description
```

7. (Optional) Include the interface description value in the Calling-Station-ID.

```
[edit access profile profile-name radius options calling-station-id-format]
user@host# set interface-description
```

8. (Optional) Include the agent circuit identifier in the Calling-Station-ID.

```
[edit access profile profile-name radius options calling-station-id-format]
user@host# set agent-circuit-id
```

9. (Optional) Include the agent remote identifier in the Calling-Station-ID.

```
[edit access profile profile-name radius options calling-station-id-format]
user@host# set agent-remote-id
```

10. (Optional) Include the configured NAS identifier value in the Calling-Station-ID.

```
[edit access profile profile-name radius options calling-station-id-format]
user@host# set nas-identifier
```

11. (Optional) Include the stacked VLAN ID in the Calling-Station-ID.

```
[edit access profile profile-name radius options calling-station-id-format]
user@host# set stacked-vlan
```

12. (Optional) Include the VLAN ID in the Calling-Station-ID.

```
[edit access profile profile-name radius options calling-station-id-format]
user@host# set vlan
```

13. (Optional) Include the MAC address in the Calling-Station-ID.

```
[edit access profile profile-name radius options calling-station-id-format]
user@host# set mac-address
```

Example:
Calling-Station-ID with

Additional Attributes in an Access Profile

The following example creates an access profile named `retailer01` that configures a Calling-Station-ID string that includes the NAS-Identifier (**fox**), interface description, agent circuit identifier, and agent remote identifier optional attributes.

```
[edit access profile retailer01 radius options]
nas-identifier "fox";
calling-station-id-delimiter "*";
calling-station-id format {
  nas-identifier;
  interface-description;
  agent-circuit-id;
  agent-remote-id;
}
```

The resulting Calling-Station-ID string is formatted as follows:

fox*ge-1/2/0.100:100*as007*ar921

where:

- The NAS-Identifier value is **fox**.
- The Calling-Station-ID delimiter character is ***** (asterisk).
- The interface description value is **ge-1/2/0.100:100**.
- The agent circuit identifier value is **as007**.
- The agent remote identifier value is **ar921**.

Consider an example where all options are configured, but no values are available for the Agent-Circuit-ID, the Agent-Remote-Id, or the stacked VLAN identifier. The other values are as follows:

- NAS identifier—**solarium**
- interface description—**ge-1/0/0.1073741824:101**
- interface text description—**example-interface**
- MAC address—**00:00:5E:00:53:00**
- VLAN identifier—**101**

These values result in the following Calling-Station-ID:

solarium#ge-1/0/0.1073741824:101#example-interface###00-00-5E-00-53-00##101

Related Documentation

- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)
- [RADIUS Server Options for Subscriber Access on page 4](#)

Enabling Unique NAS-Port Attributes (RADIUS Attribute 5) for Subscribers

Typically, the router derives the RADIUS NAS-Port attribute (attribute 5) value from a subscriber's physical port, as shown in the following list.

- Subscribers over Ethernet interfaces—combination of **slot/adaptor/port/SVLAN ID/VLAN ID**
- Subscribers over ATM interfaces—combination of **slot/adaptor/port/VPI/VCI**

However, in some customer environments, a NAS-Port attribute that is based on the physical port might not be unique, and multiple subscribers might have the same NAS-Port value. To avoid the duplicate use of a NAS-Port attribute, you can configure the router to provide unique NAS-Port attributes. The unique NAS-Port attribute consists of 32 bits (the most significant bit [MSB] is always 0), which make up two parts— a unique number that the router internally generates, and an optional unique chassis ID that you specify.

If you create the NAS-Port value based on the internally generated number only, the resulting NAS-Port value is unique within the router only. If your implementation requires NAS-Port values to be unique across all MX series routers in the network, you must also configure the unique chassis ID.

Uniqueness across all routers—To configure a NAS-Port attribute that is unique across all routers in the network, you use the following procedure:

- Configure the chassis ID width (1–7 bits)—You must use the same width for all routers in the network.
- Configure the chassis ID—You must ensure that you configure a unique ID for each router.
- The router uses the remainder of the 31 bits (minus the MSB and the number of bits used for the chassis ID width) for the internally generated number.

Uniqueness within the local router—To configure a NAS-Port attribute that is unique within the local router only, you use the following procedure:

- Do not configure the chassis ID width or chassis ID.
- The router uses all 31 bits for the internally generated number. The resulting NAS-Port attribute is unique only within the router and cannot be guaranteed to be unique for any other routers in the network.

To configure unique NAS-Port attribute values for subscribers:



NOTE: Before configuring the unique NAS-Port attribute, ensure that neither the `nas-port-extended-format` statement or the `vlan-nas-port-stacked-format` statement is configured at the `[edit access profile profile-name radius options]` hierarchy level. Otherwise, the commit operation will fail.

1. Specify that you want to configure RADIUS options at the `[edit access]` hierarchy level.

```
[edit access]
user@host# edit radius-options
```

2. Specify that you want to enable unique NAS-Port attribute support.

```
[edit access radius-options]
user@host# edit unique-nas-port
```



NOTE: This step configures the router to generate a unique number, which creates a NAS-Port value that is unique within the router.

3. (Optional) If you want to provide NAS-Port values that are unique across all MX series routers in the network, complete the following additional steps.

- Specify the number of bits used in the chassis ID portion of the NAS-Port attribute. You can specify 1-7 bits. You must use the same chassis ID width for all routers across the network.

```
[edit access radius-options unique-nas-port]
user@host# set chassis-id-width chassis-id-width
```

- Specify the value you want to use for chassis ID portion of the NAS-Port attribute. The chassis ID can be in the range from 0-127 bits. You must configure a unique chassis ID for each MX router in the network.

```
[edit access radius-options unique-nas-port]
user@host# set chassis-id chassis-id
```

Related Documentation

- [unique-nas-port on page 1401](#)

RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN Overview

On MX Series routers with Modular Port Concentrator/Modular Interface Card (MPC/MIC) interfaces, you can configure the NAS-Port-Type (61) RADIUS IETF attribute, and an extended format for the NAS-Port (5) RADIUS IETF attribute, on a per-interface, per-VLAN, or per-stacked VLAN basis. The router passes the NAS-Port and NAS-Port-Type attributes to the RADIUS server during the authentication, authorization, and accounting (AAA) process.

This overview covers the following topics:

- [NAS-Port-Type RADIUS Attribute on page 70](#)
- [NAS-Port RADIUS Attribute on page 71](#)
- [NAS-Port Options Configuration and Subscriber Network Access Models on page 71](#)
- [NAS-Port Options Definition on page 71](#)

NAS-Port-Type RADIUS Attribute

The NAS-Port-Type attribute specifies the type of physical port that the network access server (NAS) uses to authenticate the subscriber. When you use the **nas-port-type**

statement to configure the NAS-Port-Type, you can specify one of several predefined port types, or a user-defined port type value in the range 0 through 65535.

NAS-Port RADIUS Attribute

The NAS-Port attribute specifies the physical port number of the NAS that is authenticating the user, and is formed by a combination of the physical port's slot number, port number, adapter number, VLAN ID, and S-VLAN ID. The NAS-Port extended format, which you configure with the **nas-port-extended-format** statement, specifies the number of bits (bit width) for each field in the NAS-Port attribute: slot, adapter, port, VLAN, and S-VLAN.

To include stacked VLAN IDs, in addition to VLAN IDs, in the NAS-Port extended format, use the **stacked** option as part of the **nas-port-extended-format** statement. If you do not configure the **stacked** option, stacked VLAN IDs are not included in the extended format.

NAS-Port Options Configuration and Subscriber Network Access Models

Configuring the NAS-Port-Type and the extended format for NAS-Port on a per-VLAN, per-stacked VLAN, or per-physical interface basis is useful in network configurations that use the following subscriber access models:

- 1:1 access model (per-VLAN basis)—In a 1:1 access model, dedicated customer VLANs (C-VLANs) provide a one-to-one correspondence between an individual subscriber and the VLAN encapsulation.
- N:1 access model (per-S-VLAN basis)—In an N:1 access model, service VLANs are dedicated to a particular service, such as video, voice, or data, instead of to a particular subscriber. Because a service VLAN is typically shared by many subscribers within the same household or in different households, the N:1 access model provides a many-to-one correspondence between individual subscribers and the VLAN encapsulation.
- 1:1 or N:1 access model (per-physical interface basis)—You can configure the NAS-Port-Type and NAS-Port format on a per-physical interface basis for both the 1:1 access model and the N:1 access model.

NAS-Port Options Definition

As an alternative to globally configuring the NAS-Port-Type and NAS-Port extended format in an access profile, you can configure these attributes on a per-interface, per-VLAN, or per-stacked VLAN basis. To do so, you must create a *NAS-Port options definition*, which includes some or all of the following components:

- NAS-Port-Type value—Specifies the type of physical port that the network access server (NAS) uses to authenticate the subscriber.
- NAS-Port extended format—Configures the number of bits (bit width) for each field in the NAS-Port attribute, including: slot, adapter, port, VLAN, and S-VLAN. Optionally, you can also use the **stacked** option as part of the **nas-port-extended-format** statement to include S-VLAN IDs, in addition to VLAN IDs, in the extended format. If you do not configure the **stacked** option, stacked VLAN IDs are not included in the extended format.

- VLAN ranges or S-VLAN ranges—Defines the VLAN range of subscribers or stacked VLAN range of subscribers to which each NAS-Port options definition applies.

**Related
Documentation**

- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)

Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN

The following guidelines apply when you configure the NAS-Port-Type attribute and the extended format for the NAS-Port attribute on a per-VLAN, per-stacked VLAN, or per-physical interface basis:

- You can create a maximum of 16 NAS-Port options definitions per physical interface. Each definition can include either a maximum of 32 VLAN ranges or a maximum of 32 stacked VLAN ranges, but cannot include a combination of VLAN ranges and stacked VLAN ranges.
- Configuring the NAS-Port-Type attribute and NAS-Port extended format on a per-VLAN, per-stacked VLAN, or per-physical interface basis overrides the global settings for these attributes configured in an access profile.
- If the NAS-Port-Type attribute and the NAS-Port extended format are not configured on a per-VLAN basis (in a 1:1 access model) or on a per-stacked VLAN basis (in an N:1 access model), the router uses the global settings configured for these attributes in an access profile for all RADIUS request messages.

**Related
Documentation**

- [RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN Overview on page 70](#)
- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)

Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN

On MX Series routers with MPC/MIC interfaces, you can configure the NAS-Port-Type (61) RADIUS IETF attribute, and an extended format for the NAS-Port (5) RADIUS IETF attribute, on a per-physical interface, per-VLAN, or per-stacked VLAN (S-VLAN) basis. The router passes the NAS-Port-Type and NAS-Port attributes to the RADIUS server during the authentication, authorization, and accounting (AAA) process.

To configure the NAS-Port-Type and NAS-Port extended format on a per-physical interface, per-VLAN, or per-stacked VLAN basis, you must create a NAS-Port options definition, which includes the following components:

- NAS-Port-Type value—Specifies the type of physical port that the network access server (NAS) uses to authenticate the subscriber.
- NAS-Port extended format—Configures the number of bits (bit width) for each field in the NAS-Port attribute, which specifies the physical port number of the NAS that is authenticating the subscriber. Fields in the NAS-Port attribute include: slot, adapter, port, VLAN, and S-VLAN. Optionally, you can also use the **stacked** option as part of the **nas-port-extended-format** statement to include S-VLAN IDs, in addition to VLAN IDs, in the extended format. If you do not configure the **stacked** option, stacked VLAN IDs are not included in the extended format.
- VLAN ranges or S-VLAN ranges—Defines the VLAN range of subscribers or stacked VLAN range of subscribers to which each NAS-Port options definition applies.



NOTE: You can create a maximum of 16 NAS-Port options definitions per physical interface. Each definition can include a maximum of 32 VLAN ranges or 32 stacked VLAN ranges, but *cannot* include a combination of VLAN ranges and stacked VLAN ranges.

To configure the NAS-Port-Type and NAS-Port extended format on a per-physical interface, per-VLAN, or per-stacked VLAN basis:

1. Specify the physical interface you want to configure.
2. Enable VLAN tagging, stacked VLAN tagging, or flexible VLAN tagging on the interface.
 - For VLAN tagging, see *Enabling VLAN Tagging*.
 - For stacked VLAN tagging, see *Configuring Stacked VLAN Tagging*
 - For flexible VLAN tagging, also referred to as mixed tagging, see *Enabling VLAN Tagging*.
3. Specify that you want to configure RADIUS options for a physical interface, VLAN, or S-VLAN.

```
[edit interfaces interface-name]
user@host> edit radius-options
```

4. Create a named NAS-Port options definition.

```
[edit interfaces interface-name radius-options]  
user@host# edit nas-port-options nas-port-options-name
```

5. Configure the NAS-Port-Type, and the VLAN ranges or stacked VLAN ranges to which the named NAS-Port options definition applies.
 - For per-physical interface configurations, see [“Configuring the RADIUS NAS-Port-Type per Physical Interface” on page 76](#).
 - For per-VLAN configurations, see [“Configuring the RADIUS NAS-Port-Type per VLAN” on page 78](#).
 - For per-stacked VLAN configurations, see [“Configuring the RADIUS NAS-Port-Type per Stacked VLAN” on page 79](#).
6. Configure the NAS-Port extended format, and the VLAN ranges or stacked VLAN ranges to which the named NAS-Port options definition applies.
 - For per-physical interface configurations, see [“Configuring the RADIUS NAS-Port Extended Format per Physical Interface” on page 81](#).
 - For per-VLAN configurations, see [“Configuring the RADIUS NAS-Port Extended Format per VLAN” on page 82](#).
 - For per-stacked VLAN configurations, see [“Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN” on page 84](#).

**Related
Documentation**

- [RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN Overview on page 70](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring the RADIUS NAS-Port-Type per Physical Interface on page 76](#)
- [Configuring the RADIUS NAS-Port-Type per VLAN on page 78](#)
- [Configuring the RADIUS NAS-Port-Type per Stacked VLAN on page 79](#)
- [Configuring the RADIUS NAS-Port Extended Format per Physical Interface on page 81](#)
- [Configuring the RADIUS NAS-Port Extended Format per VLAN on page 82](#)
- [Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN on page 84](#)

Manual Configuration of the NAS-Port-Type RADIUS Attribute

Subscriber management uses the NAS-Port-Type (RADIUS attribute 61) to identify the type of physical port that is used to authenticate subscribers. By default, subscriber management uses a NAS-Port-Type of **ethernet**.

You can optionally configure access profiles to provide the value for the NAS-Port-Type attribute, which enables you to explicitly specify the NAS port type that is used for a given connection. For example, you might configure an access profile that specifies that a NAS

port type of **wireless** is used for all Ethernet connections that are managed by that access profile.



NOTE: The **ethernet-port-type-virtual** configuration statement takes precedence over the **nas-port-type** statement when you include both statements in the same access profile. When you include the **ethernet-port-type-virtual** statement, subscriber management uses the RADIUS attribute value of 5, which specifies a NAS port type of **virtual**.

Table 13 on page 75 shows the supported port type values for RADIUS attribute 61 (NAS-Port-Type) that you can include in an access profile.

Table 13: RADIUS NAS-Port-Type Values

Statement Option	NAS-Port-Type Value	Description
<i>value</i>	0–65535	Number that indicates either the IANA-assigned value for the RADIUS port type or a custom number-to-port type defined by the user
adsl-cap	12	Asymmetric DSL, carrierless amplitude phase (CAP) modulation
adsl-dmt	13	Asymmetric DSL, discrete multitone (DMT)
async	0	Asynchronous
cable	17	Cable
ethernet	15	Ethernet
fdi	21	Fiber Distributed Data Interface
g3-fax	10	G.3 Fax
hdlc-clear-channel	7	HDLC Clear Channel
iapp	25	Inter-Access Point Protocol (IAPP)
idsl	14	ISDN DSL
isdn-sync	2	ISDN Synchronous
isdn-v110	4	ISDN Async V.110
isdn-v120	3	ISDN Async V.120
piafs	6	Personal Handyphone System (PHS) Internet Access Forum Standard

Table 13: RADIUS NAS-Port-Type Values (*continued*)

Statement Option	NAS-Port-Type Value	Description
sdsl	11	Symmetric DSL
sync	1	Synchronous
token-ring	20	Token Ring
virtual	5	Virtual
wireless	18	Other wireless
wireless-1x-ev	24	Wireless 1xEV
wireless-cdma2000	22	Wireless code division multiple access (CDMA) 2000
wireless-ieee80211	19	Wireless 802.11
wireless-umts	23	Wireless universal mobile telecommunications system (UMTS)
x25	8	X.25
x75	9	X.75
xdsl	16	DSL of unknown type

Related Documentation

- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)

Configuring the RADIUS NAS-Port-Type per Physical Interface

As an alternative to globally configuring the NAS-Port-Type (61) RADIUS attribute in an access profile, you can configure the NAS-Port-Type on a per-physical interface basis as part of a NAS-Port options definition. The NAS-Port-Type specifies the type of physical port that the network access server (NAS) uses to authenticate the subscriber.

Configuring NAS-Port options definitions on a per-physical interface basis is useful in network configurations that use a 1:1 access model or an N:1 access model.

To configure the NAS-Port-Type RADIUS attribute per physical interface:

1. Specify the interface you want to configure.

```
[edit]
user@host# edit interfaces interface-name
```

2. Enable VLAN tagging on the interface.

```
[edit interfaces interface-name]
user@host# set vlan-tagging
```

Setting VLAN tagging enables the reception and transmission of 802.1Q VLAN-tagged frames on the interface. You must enable VLAN tagging before you can configure the VLAN ranges to which the NAS-Port options definition applies.

3. Specify that you want to configure RADIUS options for a physical interface.

```
[edit interfaces interface-name]
user@host# edit radius-options
```

4. Create a named NAS-Port options definition.

```
[edit interfaces interface-name radius-options]
user@host# edit nas-port-options nas-port-options-name
```

5. Configure the NAS-Port-Type.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set nas-port-type port-type
```

6. Configure the VLAN range or ranges to which the NAS-Port options definition applies.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set vlan-ranges (any | low-tag-high-tag)
```

Per-physical interface configurations typically require you to create a VLAN range that consists of all VLAN IDs on the physical interface. To do so, use the **any** option with the **vlan-ranges** statement.

The following example shows a per-interface NAS-Port options definition named **subscribers-east** that configures the **wireless-umts** NAS-Port-Type for a VLAN range consisting of all VLAN IDs on Gigabit Ethernet physical interface **ge-1/0/0**.

```
[edit interfaces ge-1/0/0 radius-options]
nas-port-options subscribers-east {
  nas-port-type wireless-umts;
  vlan-ranges {
    any;
  }
}
```

Related Documentation

- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring the RADIUS NAS-Port-Type per VLAN on page 78](#)
- [Configuring the RADIUS NAS-Port-Type per Stacked VLAN on page 79](#)
- [Configuring the RADIUS NAS-Port Extended Format per Physical Interface on page 81](#)
- [Configuring the RADIUS NAS-Port Extended Format per VLAN on page 82](#)
- [Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN on page 84](#)

Configuring the RADIUS NAS-Port-Type per VLAN

As an alternative to globally configuring the NAS-Port-Type (61) RADIUS attribute in an access profile, you can configure the NAS-Port-Type on a per-VLAN basis as part of a NAS-Port options definition. The NAS-Port-Type specifies the type of physical port that the network access server (NAS) uses to authenticate the subscriber.

Configuring NAS-Port options definitions on a per-VLAN basis is useful in network configurations that use a 1:1 access model.

To configure the NAS-Port-Type RADIUS attribute per VLAN:

1. Specify the interface you want to configure.

```
[edit]
user@host# edit interfaces interface-name
```

2. Enable VLAN tagging on the interface.

```
[edit interfaces interface-name]
user@host# set vlan-tagging
```

Setting VLAN tagging enables the reception and transmission of 802.1Q VLAN-tagged frames on the interface. You must enable VLAN tagging before you can configure the VLAN ranges to which the NAS-Port options definition applies.

3. Specify that you want to configure RADIUS options for a VLAN interface.

```
[edit interfaces interface-name]
user@host# edit radius-options
```

4. Create a named NAS-Port options definition.

```
[edit interfaces interface-name radius-options]
user@host# edit nas-port-options nas-port-options-name
```

5. Configure the NAS-Port-Type.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set nas-port-type port-type
```

6. Configure the VLAN range or ranges to which the NAS-Port options definition applies.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set vlan-ranges (any | low-tag-high-tag)
```

Per-VLAN configurations typically require you to create a VLAN range that consists of a single VLAN ID on the physical interface. To do so, set the **low-tag** and **high-tag** options in the **vlan-ranges** statement to the same value, as shown in the following example.

The following example shows a per-VLAN NAS-Port options definition named **subscribers-west** that configures the **ethernet** NAS-Port-Type for VLAN ID 3 on Gigabit Ethernet physical interface ge-1/1/0.

```
[edit interfaces ge-1/1/0 radius-options]
nas-port-options subscribers-west {
  nas-port-type ethernet;
```

```

vlan-ranges {
  3-3;
}

```

Related Documentation

- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring the RADIUS NAS-Port-Type per Physical Interface on page 76](#)
- [Configuring the RADIUS NAS-Port-Type per Stacked VLAN on page 79](#)
- [Configuring the RADIUS NAS-Port Extended Format per Physical Interface on page 81](#)
- [Configuring the RADIUS NAS-Port Extended Format per VLAN on page 82](#)
- [Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN on page 84](#)

Configuring the RADIUS NAS-Port-Type per Stacked VLAN

As an alternative to globally configuring the NAS-Port-Type (61) RADIUS attribute in an access profile, you can configure the NAS-Port-Type on a per-stacked VLAN basis as part of a NAS-Port options definition. The NAS-Port-Type specifies the type of physical port that the network access server (NAS) uses to authenticate the subscriber.

Configuring NAS-Port options definitions on a per-stacked VLAN basis is useful in network configurations that use an N:1 access model.

To configure the NAS-Port-Type RADIUS attribute per stacked VLAN:

1. Specify the interface you want to configure.

```

[edit]
user@host# edit interfaces interface-name

```

2. Enable stacked VLAN tagging on the interface.

```

[edit interfaces interface-name]
user@host# set stacked-vlan-tagging

```

Setting stacked VLAN tagging enables you to configure dual VLAN tags for all logical interfaces on the physical interface. You must enable stacked VLAN tagging before you can configure the stacked VLAN ranges to which the NAS-Port options definition applies.

3. Specify that you want to configure RADIUS options for a stacked VLAN interface.

```

[edit interfaces interface-name]
user@host# edit radius-options

```

4. Create a named NAS-Port options definition.

```

[edit interfaces interface-name radius-options]
user@host# edit nas-port-options nas-port-options-name

```

5. Configure the NAS-Port-Type.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set nas-port-type port-type
```

6. Configure the stacked VLAN range or ranges to which the NAS-Port options definition applies.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set stacked-vlan-ranges (any | low-outer-tag-high-outer-tag),any
```

Per-stacked VLAN configurations require you to create a stacked VLAN range of subscribers to which the NAS-Port options definition applies. You must configure the low and high outer tags (VLAN IDs) in the range 1 through 4094, and the inner tag (S-VLAN ID) as **any** to represent all S-VLAN ID tags.

7. Repeat Steps 3 through 6 to configure additional NAS-Port options definitions on this interface.

The following example creates two NAS-Port options definitions, subscribers-north and subscribers-south, configured on a per-stacked VLAN basis on Gigabit Ethernet physical interface ge-1/1/0.

The subscribers-north definition configures a NAS-Port-Type user-defined value (4711) for a stacked VLAN range with outer VLAN ID 1 and all inner S-VLAN IDs. The subscribers-south definition configures a NAS-Port-Type user-defined value (4722) for a stacked VLAN range with outer VLAN IDs in the range 2 through 10, and all inner S-VLAN IDs.

```
[edit interfaces ge-2/0/1 radius-options]
nas-port-options subscribers-north {
  nas-port-type 4711;
  stacked-vlan-ranges {
    1-1,any;
  }
}
nas-port-options subscribers-south {
  nas-port-type 4722;
  stacked-vlan-ranges {
    2-10,any;
  }
}
```

Related Documentation

- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring the RADIUS NAS-Port-Type per Physical Interface on page 76](#)
- [Configuring the RADIUS NAS-Port-Type per VLAN on page 78](#)
- [Configuring the RADIUS NAS-Port Extended Format per Physical Interface on page 81](#)
- [Configuring the RADIUS NAS-Port Extended Format per VLAN on page 82](#)
- [Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN on page 84](#)

Configuring the RADIUS NAS-Port Extended Format per Physical Interface

As an alternative to globally configuring the extended format for the NAS-Port (5) RADIUS attribute in an access profile, you can configure the NAS-Port extended format on a per-physical interface basis as part of a NAS-Port options definition. The NAS-Port extended format configures the number of bits (bit width) in each field in the NAS-Port attribute, including: slot, adapter, port, VLAN, and S-VLAN.

Configuring NAS-Port options definitions on a per-physical interface basis is useful in network configurations that use a 1:1 access model or an N:1 access model.

To configure an extended format for the NAS-Port RADIUS attribute per physical interface:

1. Specify the interface you want to configure.

```
[edit]
user@host# edit interfaces interface-name
```

2. Enable VLAN tagging on the interface.

```
[edit interfaces interface-name]
user@host# set vlan-tagging
```

Setting VLAN tagging enables the reception and transmission of 802.1Q VLAN-tagged frames on the interface. You must enable VLAN tagging before you can configure the VLAN ranges to which the NAS-Port options definition applies.

3. Specify that you want to configure RADIUS options for a physical interface.

```
[edit interfaces interface-name]
user@host# edit radius-options
```

4. Create a named NAS-Port options definition.

```
[edit interfaces interface-name radius-options]
user@host# edit nas-port-options nas-port-options-name
```

5. Configure the NAS-Port extended format.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set nas-port-extended-format slot-width width adapter-width width
port-width width vlan-width width
```

6. Configure the VLAN range or ranges to which the NAS-Port options definition applies.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set vlan-ranges (any | low-tag-high-tag)
```

Per-physical interface configurations typically require you to create a VLAN range that consists of all VLAN IDs on the physical interface. To do so, use the **any** option with the **vlan-ranges** statement.

The following example shows a per-interface NAS-Port options definition named *boston-subscribers* that configures a NAS-Port extended format consisting of an 8-bit slot field, 8-bit adapter field, 8-bit port field, and 4-bit VLAN field. The *boston-subscribers* definition applies to a VLAN range consisting of all VLAN IDs on Gigabit Ethernet physical interface *ge-2/0/1*.

```
[edit interfaces ge-2/0/1 radius-options]
nas-port-options boston-subscribers {
  nas-port-extended-format {
    slot-width 8;
    adapter-width 8;
    port-width 8;
    vlan-width 4;
  }
  vlan-ranges {
    any;
  }
}
```

Related Documentation

- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring the RADIUS NAS-Port-Type per Physical Interface on page 76](#)
- [Configuring the RADIUS NAS-Port-Type per VLAN on page 78](#)
- [Configuring the RADIUS NAS-Port-Type per Stacked VLAN on page 79](#)
- [Configuring the RADIUS NAS-Port Extended Format per VLAN on page 82](#)
- [Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN on page 84](#)

Configuring the RADIUS NAS-Port Extended Format per VLAN

As an alternative to globally configuring the extended format for the NAS-Port (5) RADIUS attribute in an access profile, you can configure the NAS-Port extended format on a per-VLAN basis as part of a NAS-Port options definition. The NAS-Port extended format configures the number of bits (bit width) in each field in the NAS-Port attribute, including: slot, adapter, port, VLAN, and S-VLAN.

Configuring NAS-Port options definitions on a per-VLAN basis is useful in network configurations that use a 1:1 access model.

To configure an extended format for the NAS-Port RADIUS attribute per VLAN:

1. Specify the interface you want to configure.

```
[edit]
user@host# edit interfaces interface-name
```

2. Enable VLAN tagging on the interface.

```
[edit interfaces interface-name]
user@host# set vlan-tagging
```

Setting VLAN tagging enables the reception and transmission of 802.1Q VLAN-tagged frames on the interface. You must enable VLAN tagging before you can configure the VLAN ranges to which the NAS-Port options definition applies.

3. Specify that you want to configure RADIUS options for a VLAN interface.

```
[edit interfaces interface-name]
user@host# edit radius-options
```

4. Create a named NAS-Port options definition.

```
[edit interfaces interface-name radius-options]
user@host# edit nas-port-options nas-port-options-name
```

5. Configure the NAS-Port extended format.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set nas-port-extended-format slot-width width adapter-width width
port-width width vlan-width width
```

6. Configure the VLAN range or ranges to which the NAS-Port options definition applies.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set vlan-ranges (any | low-tag-high-tag)
```

Per-VLAN configurations typically require you to create a VLAN range that consists of a single VLAN ID on the physical interface. To do so, set the **low-tag** and **high-tag** options in the **vlan-ranges** statement to the same value, as shown in the following example.

The following example shows a per-VLAN NAS-Port options definition named *paris-subscribers* that configures a NAS-Port extended format consisting of a 4-bit slot field, 2-bit adapter field, 4-bit port field, and 2-bit VLAN field. The *paris-subscribers* definition applies to VLAN ID 1 on Gigabit Ethernet physical interface *ge-1/0/1*.

```
[edit interfaces ge-1/0/1 radius-options]
nas-port-options paris-subscribers {
  nas-port-extended-format {
    slot-width 4;
    adapter-width 2;
    port-width 4;
    vlan-width 2;
  }
  vlan-ranges {
    1-1;
  }
}
```

Related Documentation

- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring the RADIUS NAS-Port-Type per Physical Interface on page 76](#)
- [Configuring the RADIUS NAS-Port-Type per VLAN on page 78](#)
- [Configuring the RADIUS NAS-Port-Type per Stacked VLAN on page 79](#)
- [Configuring the RADIUS NAS-Port Extended Format per Physical Interface on page 81](#)
- [Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN on page 84](#)

Configuring the RADIUS NAS-Port Extended Format per Stacked VLAN

As an alternative to globally configuring the extended format for the NAS-Port (5) RADIUS attribute in an access profile, you can configure the NAS-Port extended format on a per-stacked VLAN basis as part of a NAS-Port options definition. The NAS-Port extended format configures the number of bits (bit width) in each field in the NAS-Port attribute, including: slot, adapter, port, VLAN, and S-VLAN.

Configuring NAS-Port options definitions on a per-stacked VLAN basis is useful in network configurations that use an N:1 access model.

To configure an extended format for the NAS-Port RADIUS attribute per stacked VLAN:

1. Specify the interface you want to configure.

```
[edit]
user@host# edit interfaces interface-name
```

2. Enable stacked VLAN tagging on the interface.

```
[edit interfaces interface-name]
user@host# set stacked-vlan-tagging
```

Setting stacked VLAN tagging enables you to configure dual VLAN tags for all logical interfaces on the physical interface. You must enable stacked VLAN tagging before you can configure the stacked VLAN ranges to which the NAS-Port options definition applies.

3. Specify that you want to configure RADIUS options for a stacked VLAN interface.

```
[edit interfaces interface-name]
user@host# edit radius-options
```

4. Create a named NAS-Port options definition.

```
[edit interfaces interface-name radius-options]
user@host# edit nas-port-options nas-port-options-name
```

5. Configure the NAS-Port extended format.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set nas-port-extended-format slot-width width adapter-width width
port-width width vlan-width width stacked
```

To include S-VLAN IDs, in addition to VLAN IDs, in the NAS-Port extended format, include the **stacked** option in the **nas-port-extended-format** statement.

6. Configure the stacked VLAN range or ranges to which the NAS-Port options definition applies.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
user@host# set stacked-vlan-ranges (any | low-outer-tag-high-outer-tag),any
```

Per-stacked VLAN configurations require you to create a stacked VLAN range of subscribers to which the NAS-Port options definition applies. You must configure the

low and high outer tags (VLAN IDs) in the range 1 through 4094, and the inner tag (S-VLAN ID) as **any** to represent all S-VLAN ID tags.

7. Repeat Steps 3 through 6 to configure additional NAS-Port options definitions on this interface.

The following example creates two NAS-Port options definitions, `chicago-subscribers` and `barcelona-subscribers`, configured on a per-stacked VLAN basis on Gigabit Ethernet physical interface `ge-3/2/1`.

The `chicago-subscribers` definition configures a NAS-Port extended format consisting of a 8-bit slot field, 8-bit adapter field, 8-bit port field, 4-bit stacked VLAN field, and 4-bit VLAN field. Because the **stacked** option is configured in this definition, S-VLAN IDs, in addition to VLAN IDs, are included in the extended format. The `chicago-subscribers` definition applies to a stacked VLAN range with outer VLAN ID 1, and all inner S-VLAN IDs.

The `barcelona-subscribers` definition configures a NAS-Port extended format consisting of a 8-bit slot field, 8-bit adapter field, 8-bit port field, 4-bit stacked VLAN field, and 4-bit VLAN field. Because the **stacked** option is *not* configured in this definition, S-VLAN IDs are not included in the extended format. The `barcelona-subscribers` definition applies to a stacked VLAN range with outer VLAN IDs in the range 2 through 10, and all inner S-VLAN IDs.

```
[edit interfaces ge-3/2/1 radius-options]
nas-port-options chicago-subscribers {
  nas-port-extended-format {
    slot-width 8;
    adapter-width 8;
    port-width 8;
    stacked-vlan-width 4;
    vlan-width 4;
    stacked;
  }
  stacked-vlan-ranges {
    1-1,any;
  }
}
nas-port-options barcelona-subscribers {
  nas-port-extended-format {
    slot-width 8;
    adapter-width 8;
    port-width 8;
    stacked-vlan-width 4;
    vlan-width 4;
  }
  stacked-vlan-ranges {
    2-10,any;
  }
}
```

Related Documentation

- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)

- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)
- [Configuring the RADIUS NAS-Port-Type per Physical Interface on page 76](#)
- [Configuring the RADIUS NAS-Port-Type per VLAN on page 78](#)
- [Configuring the RADIUS NAS-Port-Type per Stacked VLAN on page 79](#)
- [Configuring the RADIUS NAS-Port Extended Format per Physical Interface on page 81](#)
- [Configuring the RADIUS NAS-Port Extended Format per VLAN on page 82](#)

Configuring the RADIUS NAS-Port Extended Format for ATM Interfaces

As an alternative to globally configuring an extended format for the NAS-Port (5) RADIUS attribute in an access profile, you can configure the NAS-Port extended format on a per-physical interface basis for both Ethernet subscribers and ATM subscribers as part of a NAS-Port options definition. The NAS-Port extended format configures the number of bits (bit width) in each field of the NAS-Port attribute, including: slot, adapter, port, ATM virtual path identifier (VPI), and ATM virtual circuit identifier (VCI).

To configure the NAS-Port extended format for an ATM interface, include one or both of the following options in the **nas-port-extended-format** statement along with the other options as appropriate for your needs:

- **vpi-width**—Number of bits in the ATM VPI field, in the range 1 through 32
- **vci-width**—Number of bits in the ATM VCI field, in the range 1 through 32



NOTE: For ATM subscribers, the combined total of the widths of all fields must not exceed 32 bits, or the configuration fails. The router may truncate the values of individual fields depending on the bit width you specify.

To configure an extended format for the NAS-Port RADIUS attribute for an ATM interface:

1. Specify the ATM interface you want to configure.

```
[edit]
user@host# edit interfaces interface-name
```

2. Specify that you want to configure RADIUS options for a physical interface.

```
[edit interfaces interface-name]
user@host# edit radius-options
```

3. Create a named NAS-Port options definition.

```
[edit interfaces interface-name radius-options]
user@host# edit nas-port-options nas-port-options-name
```

4. Configure the NAS-Port extended format.

```
[edit interfaces interface-name radius-options nas-port-options nas-port-options-name]
```

```
user@host# set nas-port-extended-format slot-width width adapter-width width  
port-width width vpi-width width vci-width width
```

The following example shows a NAS-Port options definition named boston-subscribers for ATM interface at-1/0/4 that configures a NAS-Port extended format with an ATM slot width of 6 bits, ATM adapter width of 3 bits, ATM port width of 4 bits, ATM VPI width of 12 bits, and ATM VCI width of 24 bits.

```
[edit interfaces at-1/0/4 radius-options]  
nas-port-options boston-subscribers {  
  nas-port-extended-format {  
    slot-width 6;  
    adapter-width 3;  
    port-width 4;  
    vpi-width 12;  
    vci-width 24;  
  }  
}
```

**Related
Documentation**

- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [RADIUS Server Options for Subscriber Access on page 4](#)
- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)

CHAPTER 4

Configuring RADIUS Authentication for Subscriber Access

- [Retaining Authentication and Accounting Information During Session Startup on page 89](#)
- [Configuring Authentication and Accounting Parameters for Subscriber Access on page 90](#)
- [Specifying the Authentication and Accounting Methods for Subscriber Access on page 90](#)
- [Specifying RADIUS Authentication and Accounting Servers for Subscriber Access on page 91](#)
- [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Retaining Authentication and Accounting Information During Session Startup

At subscriber session startup, the Junos OS **authd** process sends an Acct-On message to the RADIUS server and the new session starts authentication and accounting operations. However, in some service provider environments, upon receipt of the Acct-On message, the RADIUS server cleans up the previous session state and removes accounting statistics. In this scenario, the RADIUS server's cleanup operation can inadvertently delete the new session's authentication and accounting information, which might include customer billing information.

To ensure that the new session's authentication and accounting information is not deleted, you can optionally use the **wait-for-acct-on-ack** statement to configure the **authd** process to wait for an Acct-On-Ack response message from the RADIUS accounting server, so the RADIUS cleanup can finish before **authd** sends any new authentication and accounting updates.

You configure this feature for an access profile for a logical system and routing instance context. All authentication requests fail until the router receives an Acct-On-Ack response from a RADIUS accounting server that is configured in the access profile. If multiple RADIUS accounting servers are configured for the access profile, **authd** waits until the first response is received.

You can also configure the **authd** process to send accounting messages when the RADIUS server status changes for an access profile. This configuration enables you to monitor

whether the access profile has an active RADIUS server. You use the **send-acct-status-on-config-change** statement to specify that **authd** send an Acct-On message when the first RADIUS server is added to an access profile, and to send an Acct-Off message when the last RADIUS server is deleted from the access profile.

- Related Documentation**
- [Configuring Per-Subscriber Session Accounting on page 104](#)

Configuring Authentication and Accounting Parameters for Subscriber Access

You use an access profile to configure authentication and accounting support for the subscriber access management feature. The access profile enables you to specify the type of methods used for authentication and accounting. You can also configure how subscriber access management collects and uses accounting statistics.

To configure authentication and accounting for subscriber access:

1. Specify the authentication and accounting methods to use.
[See “Specifying the Authentication and Accounting Methods for Subscriber Access” on page 90.](#)
2. Specify how accounting statistics are collected.
[See “Configuring Per-Subscriber Session Accounting” on page 104.](#)

- Related Documentation**
- [AAA Service Framework Overview on page 3](#)
 - [Configuring Router or Switch Interaction with RADIUS Servers on page 115](#)
 - [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Specifying the Authentication and Accounting Methods for Subscriber Access

You can specify the authentication and accounting methods that subscriber access management uses.

You can configure multiple authentication and accounting methods—the **authentication-order** and **accounting order** statements specify the order in which the subscriber access management feature uses the methods. For example, an authentication entry of **radius password** specifies that RADIUS authentication is performed first and, if it fails, local authentication (**password**) is done.

You can specify the following authentication methods:



NOTE: You must always specify the radius authentication method. Subscriber access management does not support the **password** keyword (the default), and authentication fails when no method is specified.

- **password**—Local authentication
- **radius**—RADIUS-based authentication

You can specify the following accounting methods:

- **radius**—RADIUS-based accounting

To configure the authentication and accounting methods for subscriber access management:

1. Specify the authentication methods and the order in which they are used. Only **radius** is supported.

```
[edit access profile isp-bos-metro-fiber-basic]
user@host# set authentication-order radius
```

2. Specify the accounting method.

```
[edit access profile isp-bos-metro-fiber-basic]
user@host# set accounting order radius
```

Related Documentation

- [Configuring Router or Switch Interaction with RADIUS Servers on page 115](#)
- [Configuring Authentication and Accounting Parameters for Subscriber Access on page 90](#)
- [Configuring Per-Subscriber Session Accounting on page 104](#)
- [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Specifying RADIUS Authentication and Accounting Servers for Subscriber Access

You can specify one or more RADIUS authentication or accounting servers to use for subscriber access management.

To configure RADIUS authentication and accounting support:

1. Specify that you want to configure RADIUS support.

```
[edit access profile isp-bos-metro-fiber-basic]
user@host# edit radius
```

2. Specify the IP address of the RADIUS server used for authentication.

```
[edit access profile isp-bos-metro-fiber-basic radius]
user@host# set authentication-server 192.168.1.251
```

3. Specify the IP address of the RADIUS server used for accounting.

```
[edit access profile isp-bos-metro-fiber-basic radius]
user@host# set accounting-server 192.168.1.250
```

To configure multiple RADIUS authentication or accounting servers:

- Specify the IP addresses of all RADIUS servers used for authentication or accounting.

```
[edit access profile isp-bos-metro-fiber-basic radius]
user@host# set authentication-server 192.168.1.251 192.168.1.252
user@host# set accounting-server 192.168.1.250 192.168.1.251
```

**Related
Documentation**

- [Attaching Access Profiles on page 124](#)
- [Configuring Router or Switch Interaction with RADIUS Servers on page 115](#)
- [Configuring Authentication and Accounting Parameters for Subscriber Access on page 90](#)
- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)
- [Configuring How RADIUS Attributes Are Used for Subscriber Access on page 43](#)
- [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Example: Configuring RADIUS-Based Subscriber Authentication and Accounting

This example shows a RADIUS-based authentication and accounting configuration.

```
[edit access]
radius-server {
  192.168.1.250 {
    port 1812;
    accounting-port 1813;
    accounting-retry 6;
    accounting-timeout 20;
    retry 3;
    secret $ABC123$ABC123;
    source-address 192.168.1.100;
    timeout 45;
  }
  192.168.1.251 {
    port 1812;
    accounting-port 1813;
    accounting-retry 6;
    accounting-timeout 20;
    retry 3;
    secret $ABC123;
    source-address 192.168.1.100;
    timeout 30;
  }
}
2001:DB8:0f101::2{
  port 1812;
  accounting-port 1813;
```

```

    accounting-retry 6;
    accounting-timeout 20;
    retry 4;
    secret $ABC123$ABC123$ABC123-;
    source-address 2001:DB8:0f101::1;
    timeout 20;
  }
}
profile isp-bos-metro-fiber-basic {
  authentication-order radius;
  accounting {
    order radius;
    accounting-stop-on-access-deny;
    accounting-stop-on-failure;
    immediate-update;
    statistics time;
    update-interval 12;
    wait-for-acct-on-ack;
    send-acct-status-on-config-change;
  }
}
radius {
  authentication-server 192.168.1.251 192.168.1.252;
  accounting-server 192.168.1.250 192.168.1.251;
  options {
    accounting-session-id-format decimal;
    client-accounting-algorithm round-robin;
    client-authentication-algorithm round-robin;
    nas-identifier 56;
    nas-port-id-delimiter %;
    nas-port-id-format {
      nas-identifier;
      interface-description;
    }
    nas-port-type {
      ethernet {
        wireless-80211;
      }
    }
  }
}
attributes {
  ignore {
    framed-ip-netmask;
  }
  exclude {
    accounting-delay-time [accounting-start accounting-stop];
    accounting-session-id [access-request accounting-on accounting-off
    accounting-start accounting-stop];
    dhcp-gi-address [access-request accounting-start accounting-stop];
    dhcp-mac-address [access-request accounting-start accounting-stop];
    nas-identifier [access-request accounting-start accounting-stop];
    nas-port [accounting-start accounting-stop];
    nas-port-id [accounting-start accounting-stop];
    nas-port-type [access-request accounting-start accounting-stop];
  }
}
}
}

```

```
}
[edit logical-systems isp-bos-metro-12 routing-instances isp-cmbrg-12-32]
interfaces {
  lo0 {
    unit 0 {
      family inet {
        address 192.168.1.100/24;
      }
    }
  }
  ge-0/0/0 {
    vlan-tagging;
    unit 0 {
      vlan-id 200;
      family inet {
        unnumbered-address lo0.0;
      }
    }
  }
}
```

**Related
Documentation**

- [Configuring Router or Switch Interaction with RADIUS Servers on page 115](#)

CHAPTER 5

Configuring RADIUS Accounting for Subscriber Access

- [RADIUS Accounting Statistics for Subscriber Access Overview on page 95](#)
- [Understanding RADIUS Accounting Duplicate Reporting on page 97](#)
- [Configuring Duplication Filters for RADIUS Accounting Duplicate Reporting on page 99](#)
- [Preservation of RADIUS Accounting Information During an Accounting Server Outage on page 100](#)
- [RADIUS Acct-On and Acct-Off Messages on page 103](#)
- [Configuring Per-Subscriber Session Accounting on page 104](#)
- [Configuring Per-Service Session Accounting on page 106](#)
- [Configuring Service Packet Counting on page 107](#)
- [Configuring Back-up Options for RADIUS Accounting on page 109](#)
- [Processing Cisco VSAs in RADIUS Messages for Service Provisioning on page 110](#)
- [Configuring Service Interim Accounting on page 113](#)

RADIUS Accounting Statistics for Subscriber Access Overview

The AAA Service Framework enables you to configure how the router collects and uses accounting statistics for subscriber management.

For example, you can specify when statistics collection is terminated, the order in which different accounting methods are used, the types of statistics collected, and how often statistics are collected. You can also configure the router to request that the RADIUS server immediately update the accounting statistics when certain events occur, such as when a subscriber logs in or when a change of authorization (CoA) occurs.

Subscriber management provides two levels of subscriber accounting—subscriber session and service session. In subscriber session accounting, the router collects statistics for the entire subscriber session. In service session accounting, the router collects statistics for specific service sessions for the subscriber.



NOTE: Subscriber management counts forwarded packets only. Dropped traffic (for example, as a result of a filter action) and control traffic are not included in the accounting statistics.

The router uses the RADIUS attributes and Juniper Networks VSAs listed in [Table 14 on page 96](#) to provide the accounting statistics for subscriber and service sessions. If the session has both IPv4 and IPv6 families enabled, the router reports statistics for both families.



NOTE:

RADIUS reports subscriber statistics as an aggregate of both IPv4 statistics and IPv6 statistics.

- For an IPv4-only configuration, the standard RADIUS attributes report the IPv4 statistics and the IPv6 VSA results are all reported as 0.
- For an IPv6-only configuration, the standard RADIUS attributes and the IPv6 VSA statistics are identical, both reporting the IPv6 statistics.
- When both IPv4 and IPv6 are configured, the standard RADIUS attributes report the combined IPv4 and IPv6 statistics. The IPv6 VSAs report IPv6 statistics.

Table 14: RADIUS Attributes and VSAs Used for Per-Subscriber Session Accounting

Attribute Number	Attribute Name	Type of Statistics
26–151	IPv6-Acct-Input-Octets	IPv6
26–152	IPv6-Acct-Output-Octets	IPv6
26–153	IPv6-Acct-Input-Packets	IPv6
26–154	IPv6-Acct-Output-Packets	IPv6
26–155	IPv6-Acct-Input-Gigawords	IPv6
26–156	IPv6-Acct-Output-Gigawords	IPv6
47	Acct-Input-Packets	IPv4 and IPv6 aggregation
48	Acct-Output-Packets	IPv4 and IPv6 aggregation
52	Acct-Input-Gigawords	IPv4 and IPv6 aggregation
53	Acct-Output-Gigawords	IPv4 and IPv6 aggregation

- Related Documentation**
- [Configuring Per-Subscriber Session Accounting on page 104](#)
 - [Configuring Per-Service Session Accounting on page 106](#)
 - [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Understanding RADIUS Accounting Duplicate Reporting

When you configure RADIUS accounting, by default the router sends the accounting reports to the accounting servers in the context in which the subscriber was last authenticated. You can configure RADIUS accounting to send duplicate accounting reports to other servers in the same context or in other contexts.

Layer 3 Wholesale Scenarios

In a Layer 3 wholesale network environment, the wholesaler and retailer might use different RADIUS accounting servers, and both might want to receive accounting reports. In this situation, you can configure RADIUS accounting duplicate reporting, which sends reports to both the wholesaler and the retailer accounting servers. The target to which the duplicate accounting records are sent must be in the default:default logical system:routing instance combination (LS:RI) , also called the *default VRF*.

Table 15 on page 97 shows where subscriber management sends the accounting reports when you enable duplicate reporting. Subscriber management sends duplicate reports based on the access profile in which you configure the **duplication** statement at the **[edit access profile *profile-name* accounting]** hierarchy level, where the subscriber resides, and how the subscriber is authenticated.



NOTE: You can also enable accounting duplicate reporting based on the domain map configuration—you configure subscribers to authenticate with a nondefault routing instance and a target logical system:routing instance of default:default. The accounting reports are then sent to both the authentication context and the default:default context.

Table 15: Duplicate RADIUS Accounting Reporting

Access Profile in Which Duplication Is Configured	Where Subscriber Is Authenticated	Subscriber's Target Logical System/Routing Instance	Accounting Servers Where Accounting Reports Are Sent
retailer A	wholesaler	retailer A	wholesaler and retailer A

Table 15: Duplicate RADIUS Accounting Reporting (*continued*)

Access Profile in Which Duplication Is Configured	Where Subscriber Is Authenticated	Subscriber's Target Logical System/Routing Instance	Accounting Servers Where Accounting Reports Are Sent
retailer A	retailer A	retailer A	wholesaler (default/default context) NOTE: This is the domain map configuration described in the Note preceding this table.
wholesaler	wholesaler and retailer A	retailer A	wholesaler and retailer A
wholesaler and retailer B	wholesaler and retailer A	retailer B	wholesaler, retailer A, and retailer B
not configured (default)	any	any	single report sent to accounting servers in the context in which subscriber was last authenticated

Other Scenarios

For scenarios that are not in a Layer 3 wholesale network environment, you might want to send duplicate accounting records to a different set of RADIUS servers that reside in either the same or a different routing context. Unlike the Layer 3 wholesale scenario, the target for the duplicate RADIUS accounting records does not have to be the default VRF. You can specify a single nondefault VRF—that is, other than the default:default LS:RI combination—as the target. Additionally, you can specify up to five access profiles in the target VRF that list the RADIUS accounting servers that receive the duplicate reports.

For example, you might have a lawful intercept scenario where the subscriber is authenticated in the default domain. An authorized law enforcement organization needs duplicate accounting records for the subscriber to be sent to a mediation device that resides in the organization's networking domain, which lies in a nondefault VRF.

Subscriber management sends duplicate reports to the VRF that you specify with the **vrf-name** statement at the **[edit access profile *profile-name* accounting duplication-vrf]** hierarchy level. Include the **access-profile-name** statement at the same level to designate the access profiles that in turn specify the RADIUS servers that receive the duplicate reports.

Filters for Duplicate Accounting Reports

Subscriber management provides a duplication filter feature that enables you to specify which accounting servers receive the RADIUS accounting interim reports when RADIUS

accounting duplicate reporting is active. You configure the filters in the AAA access profile, and the router then applies the filters to subscribers associated with that profile.

Subscriber management supports the following filtering for RADIUS accounting duplicate reporting:

- Duplicated accounting interim messages— The router filters duplicate accounting messages. The accounting messages are sent only to RADIUS accounting servers in the subscriber's access profile.
- Original accounting interim messages—The router filters accounting messages destined for original RADIUS accounting servers, which are accounting servers in the subscriber's access profile. The accounting messages are sent only to duplication accounting servers (servers in a duplication access profile other than the subscriber's access profile).
- Excluded RADIUS attributes—The router filters the RADIUS attributes in the accounting messages based on the **exclude** statement configuration in the access profile under the duplication context. You can use the exclude filter alone, or with the duplicated or original accounting message filters.

- Related Documentation**
- [Configuring Per-Subscriber Session Accounting on page 104](#)
 - [Configuring Duplication Filters for RADIUS Accounting Duplicate Reporting on page 99](#)

Configuring Duplication Filters for RADIUS Accounting Duplicate Reporting

You can use duplication filters to specify the RADIUS accounting servers that receive RADIUS accounting interim reports when accounting duplicate reporting is enabled. You configure the filters in a AAA access profile, and the router applies the filters to subscribers associated with that profile.

To configure duplication filters for accounting duplicate reporting:

1. At the **[edit access profile *profile-name*]** hierarchy level, specify that you want to configure accounting.

```
[edit access profile profile-name]
user@host# edit accounting
```

2. Configure the duplication filter you want the router to use.

The following examples show the three types of filters and describe the results for each filter:

- Specify that the router does not send the accounting interim messages to duplicate RADIUS accounting servers.

Duplicate RADIUS accounting servers are those that are not in the subscriber's access profile. The router still sends the accounting interim messages to accounting servers that reside in the subscriber's access profile.

```
[edit access profile profile-name accounting]
user@host# set duplication-filter interim-duplicated
```

- Specify that the router does not send the accounting interim messages to original RADIUS accounting servers.

Original accounting servers are those that reside in the subscriber's AAA routing context. The router still sends the accounting interim messages to duplicate accounting servers, which are those servers that do not reside in a duplication context other than the subscriber's access profile.

```
[edit access profile profile-name accounting]
user@host# set duplication-filter interim-original
```

- Specify how the router uses the **exclude** statement configuration to filter RADIUS attributes from accounting interim messages.

The router uses the configuration for the **exclude** statement in the duplication access profile to determine which RADIUS attributes are not included in the accounting interim messages.

```
[edit access profile profile-name accounting]
user@host# set duplication-filter exclude-attributes
```

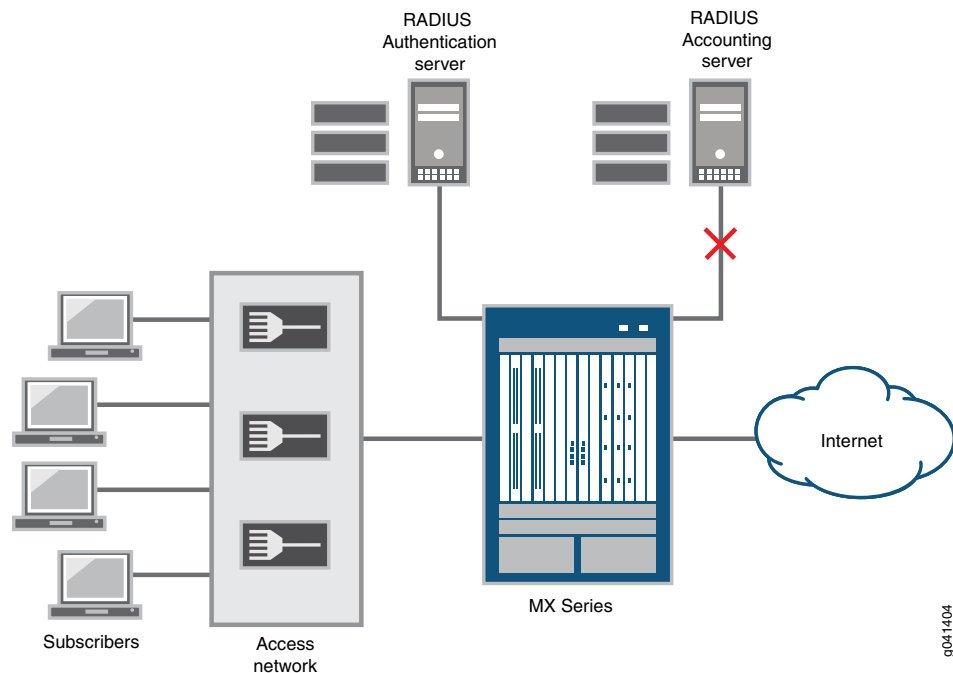
**Related
Documentation**

- [Understanding RADIUS Accounting Duplicate Reporting on page 97](#)
- [Configuring Per-Subscriber Session Accounting on page 104](#)

Preservation of RADIUS Accounting Information During an Accounting Server Outage

If the router loses contact with the RADIUS accounting server, as represented in [Figure 1 on page 101](#), whether due to a server outage or a problem in the network connecting to the server, you can lose all the billing information that would have been received by the server. RADIUS accounting backup preserves the accounting data that accumulates during the outage. If you have not configured RADIUS accounting backup, the accounting data is lost for the duration of the outage from the time when the router has exhausted its attempts to resume contact with the RADIUS server. The configurable retry value determines the number of times the router attempts to contact the server.

Figure 1: Topology with Loss of Access to Accounting Server



By default, the router must wait until the revert timer expires before it can attempt to contact the non-responsive server again. However, when you configure accounting backup, the revert timer is disabled and the router immediately retries its accounting requests as soon as the router fails to receive accounting acknowledgments. Accounting backup follows this sequence:

1. The router fails to receive accounting acknowledgments from the server.
2. The router immediately attempts to contact the accounting server and marks the server as offline if the router does not receive an acknowledgment before exhausting the number of retries.
3. The router next attempts to contact in turn each additional accounting server configured in the RADIUS profile.

If a server is reached, then the router resumes sending accounting requests to this server.

4. If none of the servers responds or if no other servers are in the profile, the router declares a timeout and begins backing up the accounting data. It withholds all accounting stop messages and does not forward new accounting requests to the server.
5. During the outage, the router sends a single pending accounting stop message to the servers at periodic intervals.
6. If one of the servers acknowledges receipt, then the router sends all the pending stop messages to that server in batches at the same interval until all the stored stop messages have been sent. However, any new accounting requests are sent immediately rather being held and sent periodically.

The router replays accounting stop messages to the server in the correct order because it preserves both the temporal order among subscribers and the causal order between service and session stop requests for each subscriber. Only accounting stop messages are backed up, because they include the start time and duration of sessions and all the accounting statistics. This makes it unnecessary to withhold the accounting start messages, which eventually time out. Interim updates are not backed up and time out as well; if the session remains active, then the next interim update after the server connection is restored provides the interim accounting information.

You can configure the number of accounting stop messages that the router can queue pending restoration of contact with the accounting server. To preserve current accounting data in preference to collecting new accounting data, subscriber logins fail as soon as the maximum number of messages has been withheld. Subscriber logins resume immediately when the pending queue drops below the queue limit.



NOTE: Service accounting stop messages are withheld for a maximum of ten services per subscriber. If a subscriber attempts to activate an eleventh service while that accounting server is offline, the activation fails.

The router can hold the pending accounting messages for up to 24 hours. When the configurable maximum holding period passes, all accounting stop messages still in the pending queue are flushed, even if the accounting server has come back online. A consequence of this is that subscriber logins resume immediately if they were failing because the maximum pending limit had been reached.

All pending messages are also flushed in either of the following circumstances:

- If you remove the last accounting server from the access profile, because then there is no place to send the messages.
- If you remove the accounting backup configuration.

While the router is withholding accounting stop messages, you can force the router to attempt contact with the accounting server immediately, rather than allowing it to wait until the periodic interval has expired. When you do so, the router first replays a batch of stop messages to the server, with one of the following outcomes:

- If the router receives an acknowledgment of receipt, then it marks the server as online and begins replaying all remaining pending stop messages in batches.
- If the router does not receive the acknowledgment, then it resumes sending a single pending accounting stop message at the periodic interval.

When a subscriber logs out while the accounting server is offline, the accounting stop requests for the subscriber and the session are queued and replayed to the server when it comes online. In this case, the subscriber session and service session information is retained, so that the router can send a correct accounting request when the server comes back online.

In the event of a graceful Routing Engine switchover while the accounting server is offline, the pending stop messages can be replayed from the active Routing Engine when the server is online again.



NOTE: When RADIUS accounting backup is configured, you must use different servers for RADIUS authentication and accounting. Subscriber authentication fails when the same server is configured for both authentication and accounting.

If the RADIUS server acts on behalf of other back-end RADIUS accounting or authentication servers and forwards requests to them, subscribers can be authenticated but accounting requests are not sent out.

Use the `show network-access aaa statistics` command to view backup accounting statistics.

Related Documentation

- [Configuring Back-up Options for RADIUS Accounting on page 109](#)
- [Forcing the Router to Contact the Accounting Server Immediately on page 117](#)

RADIUS Acct-On and Acct-Off Messages

Subscriber management supports RADIUS Acct-On and Acct-Off messages to indicate the current state of RADIUS accounting support.

RADIUS Acct-On messages indicate that accounting is being supported. Subscriber management issues Acct-On messages in the following situations:

- Accounting is enabled through configuration (for example, an accounting server is configured).
- A new access profile is configured and committed for a logical system/routing instance context. However, no Acct-On message is sent if the accounting server exists prior to the access profile and if it is simply modified.
- The router performs a cold reboot.
- The router performs a warm reboot and there are no subscribers currently logged in.
- The Authd process restarts and there are no active subscribers.

RADIUS Acct-Off messages indicate that accounting is not supported. Subscriber management issues Acct-Off messages in the following situations:

- The Authd process is terminated and there are no active subscribers.
- The router is shut down and accounting servers are currently configured (this action also logs out all current subscribers).
- The router is rebooted and redundancy is disabled.

- Related Documentation**
- [AAA Service Framework Overview on page 3](#)
 - [Configuring Per-Subscriber Session Accounting on page 104](#)
 - [AAA Accounting Messages and Supported RADIUS Attributes and Juniper Networks VSAs for Junos OS on page 39](#)

Configuring Per-Subscriber Session Accounting

To configure accounting for a subscriber session, you use an access profile, and specify how the subscriber access management feature collects and uses the accounting statistics. The router uses the RADIUS attributes and Juniper Networks VSAs discussed in [“RADIUS Accounting Statistics for Subscriber Access Overview” on page 95](#) to provide the accounting statistics for the subscriber session.

To configure accounting for a subscriber session:

1. At the **[edit access profile *profile-name*]** hierarchy level, specify that you want to configure accounting.

```
[edit access profile profile-name]  
user@host# edit accounting
```

2. (Optional) Configure AAA to issue an Acct-Stop message if the AAA server denies access to the subscriber.

```
[edit access profile profile-name accounting]  
user@host# set accounting-stop-on-access-deny
```

3. (Optional) Configure AAA to send an Acct-Stop message if the subscriber fails AAA but is granted access by the AAA server.

```
[edit access profile profile-name accounting]  
user@host# set accounting-stop-on-failure
```

4. (Optional) Configure the router or switch to send an Acct-Update message to the RADIUS accounting server when a CoA occurs.

```
[edit access profile profile-name accounting]  
user@host# set coa-immediate-update
```

5. (Optional) Configure subscriber management to send the RADIUS accounting report to both the wholesaler and the retailer accounting servers.

```
[edit access profile profile-name accounting]  
user@host# set duplication
```

6. (Optional) Configure the duplication filtering action you want the router to perform when the RADIUS duplication accounting operation is enabled.

```
[edit access profile profile-name accounting]  
user@host# set duplication-filter interim-duplicated exclude-attributes
```

7. (Optional) Configure the router to send the RADIUS accounting report to multiple accounting servers listed in access profiles in a nondefault VRF (LS:RI).

```
[edit access profile profile-name accounting duplication-vrf]  
user@host# set vrf-name vrf-name
```

```
user@host# set access-profile-name profile-name
```

8. (Optional) Configure the router or switch to send an Acct-Update message to the RADIUS accounting server when the router or switch receives a response (for example, an ACK or timeout) to the Acct-Start message.

```
[edit access profile profile-name accounting]
user@host# set immediate-update
```

9. (Optional) Configure the order in which multiple accounting methods are used.

```
[edit access profile profile-name accounting]
user@host# set order [ accounting-order ]
```

10. (Optional) Configure the types of statistics to gather. You can specify that the router or switch collect both volume and time statistics or only time statistics for subscriber sessions. When you change the type of statistics being collected, current subscribers continue to use the previous collection specification. Subscribers who log in after the change use the new specification.

```
[edit access profile profile-name accounting]
user@host# set statistics (time | volume-time)
```

11. (Optional) Override the default behavior and specify that, after a CoA action that changes the RADIUS Class attribute, accounting reports for the subscriber's service sessions continue to use the original Class attribute that was assigned when the service sessions were created. The new Class attribute value is used in accounting reports for the subscriber session only. By default, the accounting reports for both the subscriber session and the subscriber's service sessions use the new Class attribute value.

```
[edit access profile profile-name accounting]
user@host# set coa-no-override service-class-attribute
```

12. (Optional) Configure the number of minutes between accounting updates. You can configure an interval from 10 through 1440 minutes. All values are rounded up to the next higher multiple of 10. For example, the values 811 through 819 are all accepted by the CLI, but are all rounded up to 820.

```
[edit access profile profile-name accounting]
user@host# set update-interval minutes
```

13. (Optional) Configure AAA to send an immediate interim accounting update to the RADIUS server when AAA receives a rate change notification from the ANCP agent on the router.

```
[edit access profile profile-name accounting]
user@host# set ancp-speed-change-immediate-update
```

14. (Optional) Configure the authd process to wait for an Acct-On-Ack response message from RADIUS before sending any new authentication and accounting updates to the RADIUS server. This configuration ensures that when a new subscriber session starts, the authentication and accounting information for the new session does not get deleted when RADIUS clears previously existing session state information.

```
[edit access profile profile-name accounting]
user@host# set wait-for-acct-on-ack
```

15. (Optional) Configure the `authd` process to send an `Acct-On` message when the first RADIUS server is added to the access profile, and to send an `Acct-Off` message when the last RADIUS server is removed from the access profile. This configuration enables you to monitor whether the access profile has an active RADIUS server.

```
[edit access profile profile-name accounting]
user@host# set send-acct-status-on-config-change
```

**Related
Documentation**

- [RADIUS Accounting Statistics for Subscriber Access Overview on page 95](#)
- [Understanding RADIUS Accounting Duplicate Reporting on page 97](#)
- [Configuring Per-Service Session Accounting on page 106](#)
- [Retaining Authentication and Accounting Information During Session Startup on page 89](#)
- [Configuring Duplication Filters for RADIUS Accounting Duplicate Reporting on page 99](#)
- [Configuring Immediate Interim Accounting Updates to RADIUS in Response to ANCP Notifications on page 668](#)
- [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Configuring Per-Service Session Accounting

Subscriber management enables you to configure the router to collect statistics on a per-service session basis for subscribers. Per-service session accounting requires two operations. First, RADIUS must be configured to provide the name of the service, the accounting interval to use, and the type of statistics to collect (either time statistics or a combination of time and volume statistics). Second, if RADIUS VSA 26-69 is configured for time and volume statistics, you must also configure a firewall or fast update firewall filter that counts service packets—the service packet information provides the volume statistics.

The router uses the RADIUS attributes and Juniper Networks VSAs discussed in “[RADIUS Accounting Statistics for Subscriber Access Overview](#)” on page 95 to provide the accounting statistics for the subscriber session.



.....

NOTE: The collection of time-only service statistics is supported for all service sessions. However, time and volume statistics are provided for only firewall and fast update firewall service sessions.

.....

To configure the router to provide per-service accounting statistics:

1. Ensure that the required RADIUS VSAs are configured.
See [Table 16 on page 107](#) for the VSAs that the router uses for per-service accounting.
2. Configure the classic firewall filter or fast update filter to count the service packets.
See “[Configuring Service Packet Counting](#)” on page 107.

Table 16: Juniper Networks VSAs Used for Per-Service Session Accounting

Attribute Number	Attribute Name	Description	Value
26-69	Service-Statistics	Enable or disable statistics for the service	<ul style="list-style-type: none"> 0 = disable 1 = enable time statistics 2 = enable time and volume statistics
26-83	Service-Session	Service string sent in accounting stop and start messages from the router to the RADIUS server	string: service-name, with parameter values that are sent from RADIUS server in attribute 26-65.
26-140	Service-Interim-Acct-Interval	Amount of time between interim accounting updates for this service	<ul style="list-style-type: none"> range = 600–86400 seconds 0 = disabled <p>NOTE: Values are rounded up to the next higher multiple of 10 minutes. For example, a setting of 900 seconds (15 minutes) is rounded up to 20 minutes (1200 seconds).</p>

- Related Documentation**
- [Configuring Service Packet Counting on page 107](#)
 - [RADIUS Accounting Statistics for Subscriber Access Overview on page 95](#)
 - [Configuring Per-Subscriber Session Accounting on page 104](#)
 - [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Configuring Service Packet Counting

Subscriber management uses service packet counting to report volume statistics for subscribers on a per-service session basis. To configure service packet counting, you specify the accounting action, and subscriber management then applies the results to a specific named counter (`_junos-dyn-service-counter`) for use by RADIUS.

The accounting action you configure specifies the counting mechanism that subscriber management uses when capturing statistics—either inline counters or deferred counters. Inline counters are captured when the event occurs, and do not include any additional packet processing that might occur after the event. Deferred counters (also called accurate accounting) are not incremented until the packet is queued for transmission, and therefore include the entire packet processing. Deferred counters provide a more accurate count of the packets than inline counters, and are more useful for subscriber accounting and billing.

You configure the accounting mechanism by specifying either the **service-accounting-deferred** action (for deferred counters) or the **service-accounting** action (for inline counters) at the `[edit firewall family family-name filter filter-name term term-name then]` hierarchy level.

The two accounting mechanisms are mutually exclusive, both on a per-term basis and a per-filter basis. Also, both accounting actions are mutually exclusive with the count action on a per-term basis.



NOTE: You can define deferred counters for the inet and inet6 families for classic filters only. Fast update filters do not support deferred counters.

To enable service packet counting:

1. Configure any match conditions that you want to count using the service accounting action. For example:

```
[edit firewall family inet filter filtername term term-name]  
user@host# set from source-address address
```

2. Specify the accounting action for the filter.

To use deferred counters:

```
[edit firewall family inet filter filtername term term-name]  
user@host# set then service-accounting-deferred
```

To use inline counters:

```
[edit firewall family inet filter filtername term term-name]  
user@host# set then service-accounting
```

When the match conditions for the filter are met, the packet is counted and applied to the well-known service counter (`_junos-dyn-service-counter`) for use by the RADIUS server. This counter provides the volume statistics for per-service accounting.



TIP: You cannot use the service-accounting action or the service-accounting-deferred action in the same term as a count action.

Related Documentation

- [Classic Filters Overview](#)
- [Defining Dynamic Filter Processing Order](#)
- [RADIUS Accounting Statistics for Subscriber Access Overview on page 95](#)
- [Configuring Per-Service Session Accounting on page 106](#)
- [Configuring Per-Subscriber Session Accounting on page 104](#)
- [Guidelines for Configuring Firewall Filters](#)
- [Guidelines for Applying Standard Firewall Filters](#)
- [Firewall Filter Terminating Actions](#)
- [Firewall Filter Nonterminating Actions](#)

Configuring Back-up Options for RADIUS Accounting

You can configure RADIUS accounting backup to preserve accounting data when the accounting server is unavailable because of a server or network outage. When backup is configured, RADIUS accounting stop messages are withheld and queued to be sent when connectivity is restored. You can specify the maximum number of stop messages that can be queued. When this maximum is reached, subsequent new subscriber logins fail because there is no remaining capacity to preserve accounting data for new sessions.

You can also configure how long the queued messages can be held. When this period expires, all pending accounting stops are flushed from the queue, even if the accounting server has come back online.



NOTE: Configuring accounting backup disables the revert timer. An error message is generated if you attempt to configure the `revert-interval` statement at the [edit access profile *profile-name* options] or [edit access radius-options] hierarchy levels.



CAUTION: Before you configure RADIUS accounting backup, ensure that RADIUS accounting and RADIUS authentication are configured on different servers. Subscriber authentication fails when the same server is configured for both authentication and accounting.

1. Enable accounting backup to use the default values.

```
[edit access ]
user@host# set accounting-backup-options
```

2. (Optional) Configure the number of accounting stops that the router can preserve while the accounting server is offline.

```
[edit access accounting-backup-options]
user@host# set max-pending-accounting-stops number
```

3. (Optional) Configure how long the router holds pending accounting stops before flushing them.

```
[edit access accounting-backup-options]
user@host# set max-withhold-time hold-time
```

For example, the following statements configure the backup options for all subscriber accounting; these statements specify that the router holds no more than 32,000 pending accounting stops—at which point all subsequent subscriber logins fail—and holds them no longer than 6 hours—at which point all pending messages are flushed and subscriber logins resume if they were failing:

```
[edit access accounting-backup-options]
user@host# set max-pending-accounting-stops 32000
user@host# set max-withhold-time 360
```

Use the [show network-access aaa statistics](#) command to view backup accounting statistics.

Related Documentation

- [Preservation of RADIUS Accounting Information During an Accounting Server Outage on page 100](#)
- [Forcing the Router to Contact the Accounting Server Immediately on page 117](#)

Processing Cisco VSAs in RADIUS Messages for Service Provisioning

You can use Cisco VSAs in RADIUS messages to provision and manage services in a subscriber access network. In the topology for this deployment, the broadband network gateway (BNG) is connected to:

- A RADIUS server, such as the Steel-Belted Radius Carrier (SBRC), that is used to authentication and accounting.
- A Cisco BroadHop application that is used as the Policy Control and Charging Rules Function (PCRF) server for provisioning services using RADIUS change of authorization (CoA) messages

Cisco BroadHop does not support Juniper VSAs and it uses Cisco VSAs (Cisco Vendor ID 9) to activate and deactivate the services.

The following Cisco VSAs are used together to activate a service:

- Cisco-AVPair (26-1) with the value of the *subscriber:command=activate-service* parameter
- Cisco-AVPair(26-1) with the value the *subscriber:service-name=service-name* parameter

The following Cisco VSAs are used in together to deactivate a service:

- Cisco-AVPair (26-1) with the value of the *subscriber:command=deactivate-service* parameter
- Cisco-AVPair (26-1) with the value of *subscriber:service-name=service-name* parameter

In such a deployment, you can also enable and disable service accounting and specify service interim accounting interval using the CLI interface because Cisco Broadhop does not send attributes related to service accounting in RADIUS messages to the BNG.

You cannot modify any attributes in authentication, accounting, or CoA responses in the RADIUS messages that the BNG sends. Any Cisco VSAs other than the ones used to provision the services are considered as unsupported attributes.

[Table 17 on page 111](#) describes the service accounting type that becomes effective for different configuration combinations of the service accounting method or type using the local CLI settings and RADIUS attributes:

Table 17: Effective Service Accounting Method with CLI and RADIUS Configurations

Service Accounting-Type Local Configuration	Service Accounting-Type RADIUS Configuration	Service Accounting-Type Applicable
Not configured	Not configured	No service accounting
Not configured	Method configured using RADIUS attributes	Service accounting configured using RADIUS
Method configured using the CLI	Not configured	Service accounting configured using the CLI
Method configured using the CLI	Method configured using RADIUS attributes	Service accounting configured using RADIUS
Method configured using the CLI	Explicitly disabled with a value of 0	No service accounting

[Table 18 on page 111](#) describes the service interim accounting interval that becomes effective for different configuration combinations of the service accounting method or type using the local CLI settings and RADIUS attributes:

Table 18: Effective Service Interim Accounting Interval with CLI and RADIUS Configurations

Service Interim Accounting Interval Using Local Configuration	Service Interim Accounting Interval Using RADIUS Configuration	Service Interim Accounting Interval Applicable
Not configured	Not configured	No service interim accounting
Not configured	Interval configured using RADIUS attributes	Service interim accounting configured using RADIUS
Interval configured using the CLI	Not configured	Service interim accounting configured using the CLI
Interval configured using the CLI	Interval configured using RADIUS attributes	Service interim accounting configured using RADIUS
Interval configured using the CLI	Explicitly disabled with a value of 0	No service interim accounting

By default, service accounting is disabled. If you configure service accounting using both RADIUS attributes and the CLI interface, the RADIUS setting takes precedence over the CLI setting. To enable service accounting using the CLI, include the **accounting** statement at the **[edit access profile *profile-name* service]** hierarchy level.

```
[edit access]
profile profile-name {
  service {
```

```
        accounting;
    }
}
```

To enable interim service accounting updates and configure the amount of time that the router waits before sending a new service accounting update, include the **update-interval minutes** statement at the **[edit access profile *profile-name* service accounting]** hierarchy level.

```
[edit access]
profile profile-name {
  service {
    accounting {
      update-interval minutes;
    }
  }
}
```

You can configure the router to collect time statistics, or both volume and time statistics, for the service accounting sessions being managed by AAA. To configure the collection of statistical details that are time-based only, include the **statistics time** statement at the **[edit access profile *profile-name* service accounting]** hierarchy level. To configure the collection of statistical details that are both volume-time-based only, include the **statistics volume-time** statement at the **[edit access profile *profile-name* service accounting]** hierarchy level.

```
[edit access]
profile profile-name {
  service {
    accounting {
      statistics (time | volume-time);
    }
  }
}
```

You can define the UDP port number to configure the port on which the router that functions as the RADIUS dynamic-request server must receive requests from RADIUS servers. By default, the router listens on UDP port 3799 for dynamic requests from remote RADIUS servers. You can configure the UDP port number to be used for dynamic requests for a specific access profile or for all of the access profiles on the router. To define the UDP port number, include the **dynamic-request-port *port-number*** statement at the **[edit access profile *profile-name* radius-server *server-address*]** or the **[edit access radius-server *server-address*]** hierarchy level.

To specify the UDP port for all of the access profiles:

```
[edit access]
radius-server server-address {
  dynamic-request-port port-number;
}
```

To specify the UDP port for a specific access profile:

```
[edit access]
profile profile-name {
```

```
radius-server server-address {
    dynamic-request-port port-number;
}
}
```

Related Documentation • [Configuring Service Interim Accounting on page 113](#)

Configuring Service Interim Accounting

By default, service accounting is disabled. If you configure service accounting using both RADIUS attributes and the CLI interface, the RADIUS setting takes precedence over the CLI setting.

To configure service accounting for an access profile for a subscriber:

1. At the **[edit access profile *profile-name* service]** hierarchy level, specify that you want to configure service accounting.

```
[edit access profile profile-name service]
user@host# edit accounting
```

2. (Optional) Enable interim service accounting updates and configure the amount of time that the router or switch waits before sending a new service accounting update. You can configure an interval from 10 through 1440 minutes. All values are rounded up to the next higher multiple of 10. For example, the values 811 through 819 are all accepted by the CLI, but are all rounded up to 820.

```
[edit access profile profile-name service accounting]
user@host# set update-interval minutes
```

3. (Optional) Configure the types of statistics to gather. You can specify that the router or switch collect both volume and time statistics or only time statistics for subscriber sessions. When you change the type of statistics being collected, current subscribers continue to use the previous collection specification. Subscribers who log in after the change use the new specification.

```
[edit access profile profile-name accounting service]
user@host# set statistics (time | volume-time)
```

Related Documentation • [Processing Cisco VSAs in RADIUS Messages for Service Provisioning on page 110](#)

CHAPTER 6

Configuring Routers and RADIUS Servers for Subscriber Access

- [Configuring Router or Switch Interaction with RADIUS Servers on page 115](#)
- [Forcing the Router to Contact the Accounting Server Immediately on page 117](#)
- [Configuring RADIUS Server Parameters for Subscriber Access on page 118](#)
- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)
- [Configuring RADIUS Options for Subscriber Access Globally on page 122](#)

Configuring Router or Switch Interaction with RADIUS Servers

You specify the RADIUS servers that the router or switch can use and you also configure how the router or switch interacts with the specified servers. You can configure the router or switch to connect to multiple RADIUS servers on IPv4 and IPv6 networks. You can configure the RADIUS server connectivity at the **[edit access]** hierarchy level or for a specific dynamic profile at the **[edit access profile]** hierarchy level.

To configure connectivity to a RADIUS server and to specify how the router or switch interacts with the server:

1. Specify the IP address of the RADIUS server.

The example in this step shows the configuration statement for two RADIUS servers, one with an IPv4 address and the other with an IPv6 address. All other examples in this topic show an IPv4 address. The configuration is similar for IPv6.

For an IPv4 RADIUS server:

```
[edit access]
user@host# edit radius-server 192.168.1.250
```

For an IPv6 RADIUS server:

```
user@host# edit radius-server 2001:DB8:0:f101::2
```

2. (Optional) Configure the RADIUS server accounting port number. The default accounting port number is 1813.

```
[edit access radius-server 192.168.1.250]
user@host# set accounting-port 1813
```

3. (Optional) Configure the port number the router or switch uses to contact the RADIUS server. The default port number is 1812.

```
[edit access radius-server 192.168.1.250]
user@host# set port 18914
```

4. Configure the required secret (password) that the local router or switch passes to the RADIUS client. Secrets enclosed in quotation marks can contain spaces.

```
[edit access radius-server 192.168.1.250]
user@host# set secret $ABC123$ABC123
```

5. (Optional) Configure the maximum number of outstanding requests that a RADIUS server can maintain. An outstanding request is a request to which the RADIUS server has not yet responded. You can limit the number from 0 through 2000 outstanding requests per RADIUS server. The default setting is 1000 outstanding requests per server.

```
[edit access radius-server 192.168.1.250]
user@host# set max-outstanding-requests 500
```

6. Configure the source address for the RADIUS server. Each RADIUS request sent to a RADIUS server uses the specified source address. The source address is a valid IPv4 or IPv6 address configured on one of the router or switch interfaces.

For an IPv4 source address:

```
[edit access radius-server 192.168.1.250]
user@host# set source-address 192.168.1.100
```

For an IPv6 source address:

```
[edit access radius-server 2001:DB8:0:f101::2]
user@host# set source-address 2001:DB8:0:f101::1
```

7. (Optional) Configure retry and timeout values for authentication and accounting messages.
 - a. Configure how many times the router or switch attempts to contact a RADIUS server when it has received no response. You can configure the router or switch to retry from 1 through 100 times. The default setting is 3 retry attempts.

```
[edit access radius-server 192.168.1.250]
user@host# set retry 4
```

- b. Configure how long the router or switch waits to receive a response from a RADIUS server before retrying the contact. By default, the router or switch waits 3 seconds. You can configure the timeout to be from 1 through 1000 seconds.

```
[edit access radius-server 192.168.1.250]
user@host# set timeout 20
```



NOTE: The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.



NOTE: The **retry** and **timeout** settings apply to both authentication and accounting messages unless you configure both the **accounting-retry** statements and the **accounting-timeout** statement. In that case, the **retry** and **timeout** settings apply only to authentication messages.

8. (Optional) Configure **retry** and **timeout** values for accounting messages separate from the settings for authentication messages.



NOTE: You must configure both of these options. If you do not, then the value you configure is ignored in favor of the values configured with the **retry** and **timeout** statements.

- a. Configure how many times the router attempts to send accounting messages to the RADIUS accounting server when it has received no response. You can configure the router to **retry** from 0 through 100 times. The default setting is 0, meaning that this option is disabled.

```
[edit access radius-server 192.168.1.250]
user@host# set accounting-retry 6
```

- b. Configure how long the router waits to receive a response from a RADIUS accounting server before retrying the request. You can configure the **timeout** to be from 0 through 1000 seconds. The default setting is 0, meaning that this option is disabled.

```
[edit access radius-server 192.168.1.250]
user@host# set accounting-timeout 20
```

Related Documentation

- [AAA Service Framework Overview on page 3](#)
- [Configuring Authentication and Accounting Parameters for Subscriber Access on page 90](#)
- [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Forcing the Router to Contact the Accounting Server Immediately

In the event of an accounting server outage while RADIUS accounting backup is enabled, by default the router waits for a time interval to expire before contacting the offline server. Rather than waiting for that interval to pass, you can force the router to immediately contact the server by issuing the **request network-access aaa replay pending-accounting-stops** command. The router sends a batch of pending accounting stop requests to the server. If the router receives an acknowledgment from the server, then the router continues to replay the pending messages to the server in batches at the periodic interval. If the router does not get that acknowledgment, then it resumes sending a single pending accounting stop message at the periodic interval.

To force the router to immediately contact the offline accounting server:

- Request the messages to be replayed.

```
user@host> request network-access aaa replay pending-accounting-stops
```

**Related
Documentation**

- [Preservation of RADIUS Accounting Information During an Accounting Server Outage on page 100](#)

Configuring RADIUS Server Parameters for Subscriber Access

Include the **radius** statement at the **[edit access profile *profile-name*]** hierarchy level to specify the RADIUS parameters for the subscriber access manager feature. The following list provides an overview of the parameters you can configure:

- The IP addresses of one or more RADIUS authentication and accounting servers.
- Options for the RADIUS servers, such as the following:
 - Format (decimal or description) used for the accounting session
 - Method (round-robin or direct) the router or switch uses to communicate with the servers
 - NAS identifier to use for RADIUS requests
 - Revert time setting that specifies when the router or switch reverts to using the primary RADIUS server
 - Delimiter character and format for the NAS-Port-ID (RADIUS attribute 87) and Calling-Station-ID (RADIUS attribute 31)
- The RADIUS attributes to be ignored or excluded from RADIUS messages.

To configure RADIUS server parameters:

1. Specify that you want to configure RADIUS support.

```
[edit access profile isp-bos-metro-fiber-basic]  
user@host# edit radius
```

2. Specify the addresses of RADIUS authentication and accounting servers.

See [“Specifying RADIUS Authentication and Accounting Servers for Subscriber Access” on page 91](#).

3. Configure the RADIUS server options.

See [“Configuring RADIUS Server Options for Subscriber Access” on page 119](#).

4. Configure RADIUS attributes that are ignored or excluded from RADIUS messages.

See [“Configuring How RADIUS Attributes Are Used for Subscriber Access” on page 43](#).

**Related
Documentation**

- [Specifying RADIUS Authentication and Accounting Servers for Subscriber Access on page 91](#)

- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)
- [Configuring How RADIUS Attributes Are Used for Subscriber Access on page 43](#)

Configuring RADIUS Server Options for Subscriber Access

You can specify options that the router or switch uses when communicating with RADIUS authentication and accounting servers for subscriber access.

To configure RADIUS authentication and accounting server options:

1. Specify that you want to configure RADIUS.

```
[edit access profile isp-bos-metro-fiber-basic]
user@host# edit radius
```

2. Specify that you want to configure RADIUS options.

```
[edit access profile isp-bos-metro-fiber-basic radius]
user@host# edit options
```

3. (Optional) Configure the method the router or switch uses to access RADIUS accounting servers.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set client-accounting-algorithm round-robin
```

4. (Optional) Configure the method the router or switch uses to access RADIUS authentication servers.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set client-authentication-algorithm round-robin
```

5. (Optional) Configure the format the router or switch uses to identify the accounting session.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set accounting-session-id-format decimal
```

6. (Optional) Specify that the Agent-Remote-Id and Agent-Circuit-Id are generated locally when these values are not present in the client database.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set access-loop-id-local
```

7. (Optional) Specify the information that is excluded from the interface description that the router or switch passes to RADIUS for inclusion in RADIUS attribute 87 (NAS-Port-Id).

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set interface-description-format exclude-adapter
```

8. (Optional) Configure the value for the client RADIUS attribute 32 (NAS-Identifier), which is used for authentication and accounting requests.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set nas-identifier 56
```

9. (Optional) Configure the RADIUS client to use the extended format for RADIUS attribute 5 (NAS-Port) and specify the width of the fields in the NAS-Port attribute. The total of the widths must not exceed 32 bits, or the configuration fails.

- For Ethernet subscribers:

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set nas-port-extended-format ae-width 10 slot-width 4 adapter-width
2 port-width 4 pw-width 12 stacked-vlan-width 10 vlan-width 2
```

The width value appears in the Cisco NAS-Port-Info AVP (100).

- For ATM subscribers:

```
[edit access profile retailer01 radius options]
user@host# set nas-port-extended-format atm slot-width 3 adapter-width 2
port-width 3 vpi-width 8 vci-width 16
```

10. (Optional) Configure the delimiter character that the router inserts between values in RADIUS attribute 87 (NAS-Port-Id).

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set nas-port-id-delimiter %
```

11. (Optional) Configure the information that the router includes in RADIUS attribute 87 (NAS-Port-Id).

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set nas-port-id-format agent-circuit-id agent-remote-id
```

12. (Optional) Configure the delimiter character that the router inserts between values in RADIUS attribute 31 (Calling-Station-Id).

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set calling-station-id-delimiter "%"
```

13. (Optional) Configure the information that the router includes in RADIUS attribute 31 (Calling-Station-Id).

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set calling-station-id-format agent-circuit-id agent-remote-id
```

14. (Optional) Configure the port type that is included in RADIUS attribute 61 (NAS-Port-Type). This specifies the port type the router uses to authenticate subscribers.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set nas-port-type ethernet wireless-ieee80211
```



NOTE: This statement is ignored if you configure the **ethernet-port-type-virtual** in the same access profile.

15. (Optional) Configure the router or switch to use a port type of **virtual** to authenticate clients.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set ethernet-port-type-virtual
```



NOTE: This statement takes precedence over the `nas-port-type` statement if you include both in the same access profile.

16. (Optional) Configure the number of seconds that the router or switch waits after a server has become unreachable.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set revert-interval 259200
```

17. (Optional) Specify that RADIUS attribute 5 (NAS-Port) includes the S-VLAN ID, in addition to the VLAN ID, for subscribers on Ethernet interfaces.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set vlan-nas-port-stacked-format
```

18. (Optional) Configure the router to use the optional behavior when processing CoA requests that include changes to client profile dynamic variables.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set coa-dynamic-variable-validation
```

19. (Optional) Configure the router to use the optional behavior that inserts the random challenge generated by the NAS into the Request Authenticator field of Access-Request packets, rather than sending the random challenge as the CHAP-Challenge attribute (RADIUS attribute 60) in Access-Request packets. This optional behavior requires that the value of the challenge must be 16 bytes; otherwise the statement is ignored and the challenge is sent as the CHAP-Challenge attribute.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set chap-challenge-in-request-authenticator
```

20. (Optional) Configure whether subscribers can successfully log in even when service activation failures related to configuration errors occur during family activation request processing by authd for a newly authenticated subscriber.

```
[edit access profile isp-bos-metro-fiber-basic radius options]
user@host# set service-activation dynamic-profile optional-at-login
```

Related Documentation

- [Attaching Access Profiles on page 124](#)
- [RADIUS Server Options for Subscriber Access on page 4](#)
- [Configuring Router or Switch Interaction with RADIUS Servers on page 115](#)
- [Manual Configuration of the NAS-Port-Type RADIUS Attribute on page 74](#)
- [Configuring a NAS-Port-ID with Additional Options on page 63](#)
- [Configuring a Calling-Station-ID with Additional Attributes on page 66](#)
- [Subscriber Session Logins and Service Activation Failures Overview on page 125](#)
- [Example: Configuring RADIUS-Based Subscriber Authentication and Accounting on page 92](#)

Configuring RADIUS Options for Subscriber Access Globally

You can configure RADIUS options that apply to all RADIUS servers globally.

To configure RADIUS options globally:

1. Specify that you want to configure RADIUS options.

```
[edit access ]  
user@host# edit radius-options
```

2. (Optional) Configure the number of requests per second that the router can send to all the RADIUS servers collectively.

```
[edit access radius-options]  
user@host# set request-rate 1000
```

3. (Optional) Configure the number of seconds that the router or switch waits after a server has become unreachable.

```
[edit access radius-options]  
user@host# set revert-interval 86400
```

Related Documentation

- [Global RADIUS Options for Subscriber Access on page 8](#)

CHAPTER 7

Configuring Access Profiles for Subscriber Access

- [Configuring an Access Profile for Subscriber Management on page 123](#)
- [Attaching Access Profiles on page 124](#)

Configuring an Access Profile for Subscriber Management

Access profiles enable you to specify subscriber access authentication and accounting parameters.

To configure an access profile:

1. Specify an existing or new access profile name.
`[edit access]
user@host# edit profile profile-name`
2. Specify any desired subscriber access authentication and accounting parameters for the access profile.
3. After you create an access profile, you must attach it before it can take effect.
See [“Attaching Access Profiles” on page 124](#).

Related Documentation

- [Attaching Access Profiles on page 124](#)
- [Specifying RADIUS Authentication and Accounting Servers for Subscriber Access on page 91](#)
- [Configuring Dynamic Authentication for VLAN Interfaces](#)

Attaching Access Profiles

After you have created the access profile that specifies the subscriber authentication and accounting parameters, you must specify where the profile is used. Authentication and accounting will not run unless you specify the profile. Subscriber management supports attaching access profiles at the following hierarchy levels:

- `[edit]`
- `[edit routing-instances routing-instance-name]`
- `[edit logical-systems logical-system-name routing-instances routing-instance-name]`
- `[edit interfaces interface-name auto-configure vlan-ranges]`
- `[edit interfaces interface-name auto-configure stacked-vlan-ranges]`

To attach an access profile:

1. Edit the desired hierarchy level.

```
[edit]
user@host# edit logical-systems LS1 routing-instances R11
```

2. Specify the name of the access profile that you want to attach. For example:

```
[edit logical-systems logical-system-name routing-instances routing-instance-name]
user@host# set access-profile vz-bos-metro-fios-basic
```

Related Documentation

- [Configuring an Access Profile for Subscriber Management on page 123](#)
- [AAA Service Framework Overview on page 3](#)

CHAPTER 8

Configuring the Effect of Service Activation Failures on Subscriber Login

- [Subscriber Session Logins and Service Activation Failures Overview on page 125](#)
- [Configuring How Service Activation Failures Affect Subscriber Login on page 130](#)

Subscriber Session Logins and Service Activation Failures Overview

When a subscriber attempts to log in and is authenticated by RADIUS, the Access-Accept message may include services in the RADIUS Activate-Service VSA (26-65) to be activated for a particular network family. Depending on the configuration and service type, failure to activate a service can result in denial of the subscriber login.

You can use the **service activation** statement at the [\[edit access profile *profile-name* radius options\]](#) hierarchy level to configure the behavior subsequent to an activation failure.

Use the following options to configure this behavior separately for two types of services:

- **dynamic-profile**—This service type is configured in the dynamic profile that is applied by the subscriber access profile.
- **extensible-service**—This service type is configured in an Extensible Subscriber Services Manager (ESSM) operation script. These services often configure new interfaces for business subscribers.

Use the following options to specify whether successful activation of these services is required or optional for subscriber login access:

- **required-at-login**—Activation is required. Failure for any reason causes the Network-Family-Activate-Request for that network family to fail. If no other network family is already active for the subscriber, then the client application logs out the subscriber. This is the default behavior for the **dynamic-profile** service type.
- **optional-at-login**—Activation is optional. Failure due to configuration errors does not prevent activation of the address family; it allows subscriber access. Failure for any other reason causes network family activation to fail. If no other network family is already active for the subscriber, then the client application logs out the subscriber. This is the default behavior for the **extensible-service** service type.



NOTE: Failures associated with the activation of subscriber secure policies (for mirroring traffic to a mediation device) have no effect on access by subscribers subject to the policy.

This configuration does not apply to services activated by means of RADIUS CoA requests, JSRC Push-Profile-Request (PPR) messages, or subscriber secure policies.

For the **dynamic-profile** service type, configuration errors include the following:

- Parsing errors of the dynamic profile and its attributes.
- Missing mandatory user variables.
- References to dynamic profiles that do not exist.
- Semantic check failures in the dynamic profile.

For the **extensible-service** service type, configuration errors include the following:

- Parsing errors of the operation script.
- Commit failures.

To activate a service, `authd` sends an activation request for the appropriate services to the subscriber management infrastructure (SMI). For example, if the request is for the IPv4 family, then it requests activation of only the IPv4 services. In turn, the SMI sends requests to the server daemons associated with the service, such as `cosd` or `filterd`. The results returned by the daemons determine whether the service activation is a success or a failure.

- When all server daemons report success, then SMI reports success to `authd` and the service is activated.
- If any server daemon reports a configuration error and no daemons report a nonconfiguration error, then SMI reports a configuration error to `authd`. The service is not activated, but depending on the configuration, the network family activation may succeed.
- If any server daemon reports a nonconfiguration error, then SMI reports failure to `authd` and the service is not activated.

Service and Network Family Activation Process

When a subscriber logs in, `authd` has to activate the corresponding address family after the subscriber is authenticated. The client application, such as DHCP or PPP, can request activation of a single network family, IPv4 or IPv6, or it can sequentially request both families to be activated. Successful network family activation is related to the activation of associated services. The following steps describe the process when `authd` is configured to use RADIUS for authentication:

1. A subscriber attempts to log in.
 - a. The client application requests authentication from authd.
 - b. authd sends an Access-Request message to the RADIUS server.
 - c. The RADIUS server sends an Access-Accept message to authd that includes the RADIUS Activate-Service VSA (26-65).
 - d. authd caches the service activation attributes and sends a grant to the client application.
2. The client application sends the first Network-Family-Activate request, for either the IPv4 or IPv6 address family. This request is sometimes referred to as the client-activate request.
3. authd reviews the cached service activation attributes and sends an activation request for the appropriate services to the subscriber management infrastructure (SMI). For example, if the request is for the IPv4 family, then it requests activation of only the IPv4 services. In turn, the SMI sends requests to the server daemons associated with the service, such as cosd or filterd.
4. What authd does next depends on whether the service activation request fails and whether the service is optional or required.
 - When the service activation fails due to a configuration error and the service is optional:
 - a. authd deletes the cached service activation attributes for the service.



NOTE: This deletion enables you to re-issue the service request by using a RADIUS change of authorization (CoA) request or a CLI command, without interference from the failed service.

- b. authd sends an ACK in response to the family activation request and the family is activated.
 - c. The subscriber login proceeds.
- When the service activation fails due to a configuration error and the service is required:
 - a. authd deletes the cached service activation attributes for the service.



NOTE: This deletion enables you to re-issue the service request by using a RADIUS change of authorization (CoA) request or a CLI command, without interference from the failed service.

- b. authd sends a NACK in response to the family activation, which causes the client application to terminate the subscriber's login.

- When the service activation fails due to a nonconfiguration error and the service is either optional or required:

- a. authd deletes the cached service activation attributes for the service.



NOTE: This deletion enables you to re-issue the service request by using a RADIUS change of authorization (CoA) request or a CLI command, without interference from the failed service.

- b. authd sends a NACK in response to the family activation, which causes the client application to terminate the subscriber's login.

- When the service activation succeeds:

- a. authd activates the service.
- b. authd sends an ACK in response to the family activation request and the family is activated.
- c. The subscriber login proceeds.

5. Unless service activation was required and failed, causing the family activation to fail in the first request, the client application may send a second request, but only for the family not requested the first time. If the first request was for IPv4, then the second request can only be for IPv6. If the first request was for IPv6, then the second request can only be for IPv4.

6. authd reviews the cached service activation attributes and requests activation for the services associated with the requested address family.

7. What authd does next depends on whether the service activation request fails and whether the service is optional or required.

- When the service activation fails due to a configuration error and the service is optional:

- a. authd deletes the cached service activation attributes for the service.



NOTE: This deletion enables you to re-issue the service request by using a RADIUS change of authorization (CoA) request or a CLI command, without interference from the failed service.

- b. authd sends an ACK in response to the family activation request and the family is activated.

- c. The subscriber login proceeds.

- When the service activation fails due to a configuration error and the service is required:

- a. authd deletes the cached service activation attributes for the service.



NOTE: This deletion enables you to re-issue the service request by using a RADIUS change of authorization (CoA) request or a CLI command, without interference from the failed service.

- b. authd sends a NACK in response to the family activation. Because this is the second family activation request, the result of the first family activation determines what happens next:
 - If the first family activation was successful and that subscriber logged in, failure of the second request does not halt the current subscriber login. This event also does not cause authd to log out the previous (first request) subscriber.
 - If the first family activation was unsuccessful, failure of the second request causes the client application to terminate the current subscriber login.
- When the service activation fails due to a nonconfiguration error and the service is either optional or required:
 - a. authd deletes the cached service activation attributes for the service.



NOTE: This deletion enables you to re-issue the service request by using a RADIUS change of authorization (CoA) request or a CLI command, without interference from the failed service.

- b. authd sends a NACK in response to the family activation, which causes the client application to terminate the subscriber's login.
- c.
- When the service activation succeeds:
 - a. authd activates the service.
 - b. authd sends an ACK in response to the family activation request and the family is activated.
 - c. The subscriber login proceeds.

Related Documentation • [service-activation on page 1332](#)

Configuring How Service Activation Failures Affect Subscriber Login

You can configure how an activation failure of optional services during subscriber login affects the outcome of the login. These optional services are those referenced by the RADIUS Activate-Service VSA (26-65) that appears in the RADIUS Access-Accept message during the subscriber's initial login.

You can configure these two service-activation types to be required or optional.

- **dynamic-profile**—These services are configured in the dynamic profile that is applied by the subscriber access profile to provide subscriber access and services for broadband applications. By default, service activation is required for successful login. A configuration error during service activation prevents the network family from being activated and causes the subscriber login to fail.
- **extensible-service**—These services are applied by operation scripts handled by the Extensible Subscriber Services Manager (ESSM) daemon (essmd) for business subscribers. By default, service activation is optional for successful subscriber login.



NOTE: The service-activation statement configuration affects only activation failures due to configuration errors in the dynamic profile or the ESSM operation script. Failures due to nonconfiguration errors always result in denial of access for the subscriber and termination of the login attempt.

To configure the behavior for dynamic profile services, do one of the following:

- Specify that service activation is optional.

```
[edit access profile profile-name radius options service-activation]
user@host# set dynamic-profile optional-at-login
```

- Specify that service activation is required (the default).

```
[edit access profile profile-name radius options service-activation]
user@host# set dynamic-profile required-at-login
```

To configure the behavior for ESSM services, do one of the following:

- Specify that service activation is required.

```
[edit access profile profile-name radius options service-activation]
user@host# set extensible-service required-at-login
```

- Specify that service activation is optional (the default).

```
[edit access profile profile-name radius options service-activation]
user@host# set extensible-service optional-at-login
```

Related Documentation

- [Subscriber Session Logins and Service Activation Failures Overview on page 125](#)

CHAPTER 9

Configuring Session Options for Subscriber Access

- [Understanding Session Options for Subscriber Access on page 131](#)
- [Configuring Subscriber Session Timeout Options on page 136](#)
- [Removing Inactive Dynamic Subscriber VLANs on page 137](#)

Understanding Session Options for Subscriber Access

You can configure several characteristics of the sessions that are created for DHCP, L2TP, and terminated PPP subscribers. You can place limits on subscriber access based on how long the session has been up, how long the user has been inactive, or both. You can also set parameters that modify a subscriber's username at login based on the subscriber's access profile.

Subscriber Session Timeouts

You can limit subscriber access by configuring a session timeout or an idle timeout. Use a session timeout to specify a fixed period of time that the subscriber is permitted to have access. Use an idle timeout to specify a maximum period of time that the subscriber can be idle. You can use these timeouts separately or together. By default, neither timeout is present.



NOTE: For all subscriber types other than DHCP (such as L2TP-tunneled and PPP-terminated subscribers), the session timeout value limits the subscriber session. For DHCP subscribers, the session timeout value is used to limit the lease when no other lease time configuration is present. The lease expires when the timeout value expires. If this value is not supplied by either the CLI or RADIUS, the DHCP lease does not expire.

The idle timeout is based on accounting statistics for the subscriber. The router determines subscriber inactivity by monitoring data traffic, both upstream from the user (ingress) and downstream to the user (egress). Control traffic is ignored. The subscriber is not considered idle as long as data traffic is detected in either direction.

Optionally, you can specify that only subscriber ingress traffic is monitored; egress traffic is ignored. This configuration is useful in cases where the LNS sends traffic to the remote

peer even when the peer is not up, such as when the LNS does not have PPP keepalives enabled and therefore cannot detect that the peer is not up. In this situation, because by default the LAC monitors both ingress and egress traffic, it detects the egress traffic from the LNS and either does not log out the subscriber or delays detection of inactivity until the egress traffic ceases. When you specify that only ingress traffic is monitored, the LAC can detect that the peer is inactive and then initiate logout.

When either timeout period expires, the non-DHCP subscribers are gracefully logged out, similarly to a RADIUS-initiated disconnect or a CLI-initiated logout. DHCP subscribers are disconnected. The Acct-Terminate-Cause [RADIUS attribute 49] value includes a reason code of 5 for a session timeout and a code of 4 for an idle timeout.

You can configure these limitations to subscriber access on a per-subscriber basis by using the RADIUS attributes Session-Timeout [27] and Idle-Timeout [28]. RADIUS returns these attributes in Access-Accept messages in response to Access-Request messages from the access server.

Service providers often choose to apply the same limitations to large numbers of subscribers. You can reduce the RADIUS provisioning effort for this scenario by defining the limitations for subscribers in an access profile on a per-routing-instance basis. If you do so, RADIUS attributes subsequently returned for a particular subscriber logged in with the profile override the per-routing-instance values.



BEST PRACTICE: We recommend that you do not configure a session timeout for subscribers receiving voice services. Because the session timeout is based only on time and not user activity, it is likely to interrupt subscribers actively using a voice service and terminate their calls unexpectedly (from the subscriber viewpoint). This result is a particular concern for emergency services calls.



BEST PRACTICE: We recommend that you do not configure an idle timeout for DHCP subscribers. When the timeout expires with no activity and the connection is terminated, the protocol has no means to inform the client. Consequently, these subscribers are forced to reboot their CPE device the next time they attempt to access the Internet.

Contrast the behavior when an idle timeout is configured for PPP subscribers. In this case, timeout expiration causes PPP to terminate the link with the peer. Depending on the CPE device, this termination enables the peer to automatically retry the connection either on demand or immediately. In either case, no subscriber intervention is required.

The available range for setting a timeout is the same whether you configure it in the CLI or through the RADIUS attributes:

- Session timeouts can be set for 1 minute through 527,040 minutes in the CLI and the corresponding number of seconds (60 through 31,622,400) in the Session-Timeout attribute [27].
- Idle timeouts can be set for 10 minutes through 1440 minutes in the CLI and the corresponding number of seconds (600 through 86,400) in the Idle-Timeout attribute [28].

The router interprets the values in the attributes to conform to the supported ranges. For example, for Session-Timeout [27]:

- A value of zero is treated as no timeout.
- A value in the range 1 through 59 is raised to 60 seconds.
- A value that exceeds 31,622,400 is reduced to 31,622,400 seconds.

For Idle-Timeout [28]:

- A value of zero is treated as no timeout.
- A value in the range 1 through 599 is raised to 600 seconds.
- A value that exceeds 86,400 is reduced to 86,400 seconds.

In configurations using dynamically created subscriber VLANs, the idle timeout also deletes the inactive subscriber VLANs when the inactivity threshold has been reached. In addition to deleting inactive dynamic subscriber VLANs, the idle timeout also removes dynamic VLANs when no client sessions were ever created (for example, in the event no client sessions are created on the dynamic VLAN or following the occurrence of an error during session creation or client authentication where no client sessions are created on the dynamic VLAN).

Session and idle timeouts for deleting dynamic subscriber VLANs are useful only in very limited use cases; typically neither timeout is configured for this purpose.

A possible circumstance when they might be useful is when the dynamic VLANs have no upper layer protocol that helps determine when the VLAN is removed with the **remove-when-no-subscribers** statement; for example, when the VLAN is supporting IP over Ethernet without DHCP in a business access model with fixed addresses. However, business access is generally a higher-tier service than residential access and as such typically is not subject to timeouts due to inactivity as might be desired for residential subscribers.

An idle timeout might be appropriate in certain Layer 2 wholesale situations, where the connection can be regenerated when any packet is received from the CPE.

When using the idle timeout for dynamic VLAN removal, keep the following in mind:

- The idle timeout period begins after a dynamic subscriber VLAN interface is created or traffic activity stops on a dynamic subscriber VLAN interface.

- If a new client session is created or a client session is reactivated successfully, the client idle timeout resets.
- The removal of inactive subscriber VLANs functions only with VLANs that have been authenticated.



Subscriber Username Modification

For Layer 2 wholesale applications, some network service providers employ username modification to direct subscribers to the appropriate retail enterprise network. This modification is also called username *stripping*, because some of the characters in the username are stripped away and discarded. The remainder of the string becomes the new, modified username. The modified username is used by an external AAA server for session authentication and accounting. The modification parameters are applied according to a subscriber access profile that also determines the subscriber and session context; that is, the logical system:routing instance (LS:RI) used by the subscriber. Only the default (master) logical system is supported. Because the wholesaler differentiates between multiple retailers by placing each in a different LS:RI, the usernames are appropriately modified for each retailer.

You can select up to eight characters as delimiters to mark the boundary between the discarded and retained portions of the original username; there is no default delimiter. The portion of the name to the right of the selected delimiter is discarded along with the delimiter. By configuring multiple delimiters, a given username structure can result in different modified usernames. You can configure the direction in which the original name is parsed to determine which delimiter marks the boundary. By default, the parse direction is from left to right.



Consider the following examples:

- You specify one delimiter, @. The username is user1@example.com. In this case, the parse direction does not matter. In either case, the single delimiter is found and example.com is discarded. The modified username is user1.

parse direction	identify delimiter	modified username
left-to-right		user1
right-to-left		user1



pg043376

- You specify one delimiter, @. The username is user1@test@example.com. In this case, the parse direction results in different usernames.
 - Parse direction is left-to-right—The left-most @ is identified as the delimiter and test@example.com is discarded. The modified username is user1.
 - Parse direction is right-to-left—The right-most @ is identified as the delimiter and example.com is discarded. The modified username is user1@test.

parse direction	identify delimiter	modified username
left-to-right		user1
right-to-left		user1@test

8043377

- You specify two delimiters, @ and /. The username is user1@bldg1/example.com. The parse direction results in different usernames.
 - Parse direction is left-to-right—The @ is identified as the delimiter and bldg1/example.com is discarded. The modified username is user1.
 - Parse direction is right-to-left—The / is identified as the delimiter and example.com is discarded. The modified username is user1@bldg1.

parse direction	identify delimiter	modified username
left-to-right		user1
right-to-left		user1@bldg1

8043378

You can configure a subscriber access profile so that a portion of each subscriber login string is stripped and subsequently used as a modified username by an external AAA server for session authentication and accounting. The modified username appears, for example, in RADIUS Access-Request, Acct-Start, and Acct-Stop messages, as well as RADIUS-initiated disconnect requests and change of authorization (CoA) requests.

Related Documentation

- [RADIUS IETF Attributes Supported by the AAA Service Framework on page 14](#)
- [Configuring Subscriber Session Options on page 136](#)
- [Configuring Username Modification for Subscriber Sessions](#)
- [Removing Inactive Dynamic Subscriber VLANs on page 137](#)

Configuring Subscriber Session Timeout Options

Subscriber session timeout options enable you to place limits on subscriber access based on how long the session has been up, how long the user has been inactive, or both. The subscriber session options apply to both L2TP-tunneled and PPP-terminated subscriber sessions. For DHCP subscribers, the session timeout limits the DHCP lease time.



NOTE: To configure the timeout attributes in RADIUS, refer to the documentation for your RADIUS server.

To configure limitations on subscriber sessions, configure the session options in the client profile that applies to the subscriber:

- Terminate the subscriber when the configured session timeout expires, regardless of activity.

```
[edit access profile profile-name session-options]
user@host# set client-session-timeout minutes
```

- Terminate the subscriber when there is no ingress or egress data traffic for the duration of the configured idle timeout.

```
[edit access profile profile-name session-options]
user@host# set client-idle-timeout minutes
```

- Terminate the subscriber when there is no ingress data traffic for the duration of the configured idle timeout; ignore egress traffic.

```
[edit access profile profile-name session-options]
user@host# set client-idle-timeout minutes
user@host# set client-idle-timeout-ingress-only
```

For example, to configure session timeout options in the **acc-prof** client profile, specifying an idle timeout of 15 minutes, that only ingress traffic is monitored, and that the session times out after 120 minutes:

```
[edit]
access {
  profile {
    acc-prof {
      session-options {
        client-idle-timeout 15;
        client-idle-timeout-ingress-only;
        client-session-timeout 120;
      }
    }
  }
}
```

Related Documentation

- [Understanding Session Options for Subscriber Access on page 131](#)
- [Configuring Username Modification for Subscriber Sessions](#)
- [Removing Inactive Dynamic Subscriber VLANs on page 137](#)

- [Removing Inactive Dynamic Subscriber VLANs on page 137](#)

Removing Inactive Dynamic Subscriber VLANs

Subscriber session timeouts enable you to place limits on subscriber access based on how long the session has been up, how long the user has been inactive, or both. In configurations using dynamically created subscriber VLANs, the idle timeout also:

- Deletes the inactive subscriber VLANs when the inactivity threshold has been reached.
- Removes dynamic VLANs when no client sessions were ever created (for example, in the event no client sessions are created on the dynamic VLAN or following the occurrence of an error during session creation or client authentication where no client sessions are created on the dynamic VLAN).



NOTE: Session timeouts are typically not used for deleting dynamic subscriber VLANs. The timeout might be useful only in very limited use cases. One case might be when the dynamic VLANs have no upper layer protocol that helps determine when the VLAN is removed with the `remove-when-no-subscribers` statement; for example, when the VLAN is supporting IP over Ethernet without DHCP in a business access model with fixed addresses.



NOTE: To configure the idle timeout attribute in RADIUS, refer to the documentation for your RADIUS server.

To remove inactive dynamic subscriber VLANs:

1. Edit session options for the router access profile.

```
[edit]
user@host# edit access profile profile-name session-options
```

2. Configure the maximum period a subscriber session can remain idle.

```
[edit access profile profile-name session-options]
user@host# set client-idle-timeout minutes
```

Related Documentation

- [Understanding Session Options for Subscriber Access on page 131](#)
- [Configuring Subscriber Session Options on page 136](#)
- [client-idle-timeout on page 966](#)

CHAPTER 10

Receiving DHCP Options From a RADIUS Server

- [Centrally Configured Opaque DHCP Options on page 140](#)
- [Monitoring DHCP Options Configured on RADIUS Servers on page 144](#)

Centrally Configured Opaque DHCP Options

Subscriber management (on the routers) or DHCP management (on the switches) enables you to centrally configure DHCP options on a RADIUS server and then distribute the options on a per-subscriber or per DHCP-client basis. This method results in RADIUS-sourced DHCP options—the DHCP options originate at the RADIUS server and are sent to the subscriber (or DHCP client). This differs from the traditional client-sourced method (also called DHCP-sourced) of configuring DHCP options, in which the options originate at the client and are sent to the RADIUS server. The subscriber management (DHCP management) RADIUS-sourced DHCP options are also considered to be *opaque*, because DHCP local server performs minimal processing and error checking for the DHCP options string before passing the options to the subscriber (DHCP client).

Subscriber management (or DHCP management) uses Juniper Networks VSA 26-55 (DHCP-Options) to distribute the RADIUS-sourced DHCP options. The RADIUS server includes VSA 26-55 in the Access-Accept message that the server returns during subscriber authentication or DHCP client authentication. The RADIUS server sends the Access-Accept message to the RADIUS client, and then on to DHCP local server for return to the DHCP subscriber. The RADIUS server can include multiple instances of VSA 26-55 in a single Access-Accept message. The RADIUS client concatenates the multiple instances and uses the result as a single instance.

There is no CLI configuration required to enable subscriber management (DHCP management) to use the centrally configured DHCP options—the procedure is triggered by the presence of VSA 26-55 in the RADIUS Access-Accept message.

When building the offer packet for the DHCP client, DHCP local server uses the following sequence:

1. Processes any RADIUS-configured parameters that are passed as separate RADIUS attributes; for example, RADIUS attribute 27 (Session Timeout).
2. Processes any client-sourced parameters; for example, RADIUS attributes 53 (DHCP Message Type) and 54 (Server Identifier).
3. Appends (without performing any processing) the opaque DHCP options string contained in the VSA 26-55 received from the RADIUS server.

In addition to supporting central configuration of DHCP options directly on the RADIUS server (RADIUS-sourced options), subscriber management (DHCP management) also supports the traditional client-sourced options configuration, in which the router's (switch's) DHCP component sends the options to the RADIUS server. The client-sourced DHCP options method is supported for both DHCP local server and DHCP relay agent; however, the RADIUS-sourced central configuration method is supported on DHCP local server only. Both the RADIUS-sourced and client-sourced methods support DHCPv4 and DHCPv6 subscribers (clients).



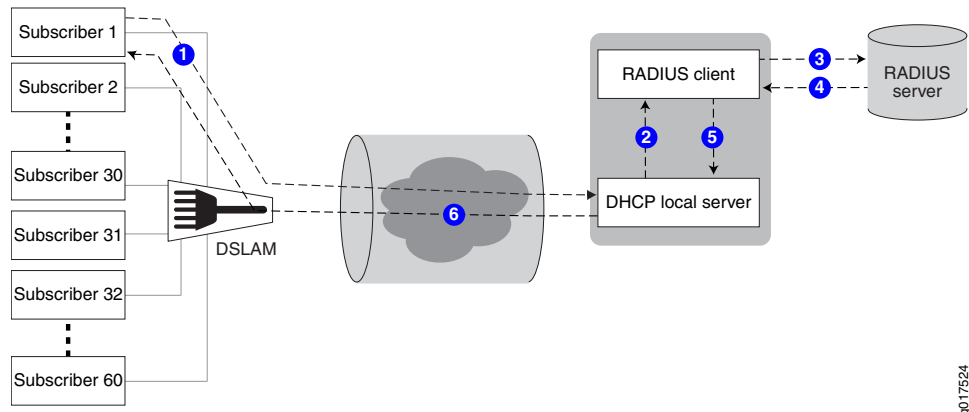
NOTE: You can use the RADIUS-sourced and client-sourced methods simultaneously on DHCP local server. However, you must ensure that the central configuration method does not include options that override client-sourced DHCP options, because this can create unpredictable results.

- [Data Flow for RADIUS-Sourced DHCP Options on page 142](#)
- [Multiple VSA 26-55 Instances Configuration on page 143](#)
- [DHCP Options That Cannot Be Centrally Configured on page 143](#)

Data Flow for RADIUS-Sourced DHCP Options

Figure 2 on page 142 shows the procedure subscriber management (DHCP management) uses when configuring DHCP options for subscribers (DHCP clients).

Figure 2: DHCP Options Data Flow



The following general sequence describes the data flow when subscriber management (DHCP management) uses RADIUS-sourced DHCP options and VSA 26-55 to configure a DHCP subscriber (client):

1. The subscriber (DHCP client) sends a DHCP discover message (or DHCPv6 solicit message) to the DHCP local server. The message includes client-sourced DHCP options.
2. The DHCP local server initiates authentication with the Junos OS RADIUS client.
3. The RADIUS client sends an Access-Request message on behalf of the subscriber (DHCP client) to the external RADIUS server. The message includes the subscriber's (DHCP client's) client-sourced DHCP options.
4. The external RADIUS server responds by sending an Access-Accept message to the RADIUS client. The Access-Accept message includes the RADIUS-sourced opaque DHCP options in VSA 26-55.
5. The RADIUS client sends the DHCP options string to DHCP local server. If there are multiple VSA 26-55 instances, the RADIUS client first assembles them into a single options string.
6. DHCP local server processes all options into the DHCP offer (or DHCPv6 reply) message, except for the RADIUS-sourced VSA 26-55 DHCP options. After processing all other options, DHCP local server then appends the unmodified VSA 26-55 DHCP options to the message and sends the message to the subscriber (DHCP client).

7. The subscriber (DHCP client) is configured with the DHCP options.
8. The following operations occur after the subscriber (DHCP client) receives the DHCP options:
 - Accounting—The RADIUS client sends Acct-Start and Interim-Accounting requests to the RADIUS server, including the RADIUS-sourced DHCP options in VSA 26-55. By default, the DHCP options are included in accounting requests.
 - Renewal—When the subscriber (DHCP client) renews, the cached DHCP options value is returned in the DHCP renew (or DHCPv6 ACK) message. The originally assigned DHCP options cannot be modified during a renew cycle.
 - Logout—When the subscriber (DHCP client) logs out, the RADIUS client sends an Acct-Stop message to the RADIUS server, including the RADIUS-sourced VSA 26-55.

Multiple VSA 26-55 Instances Configuration

VSA 26-55 supports a maximum size of 247 bytes. If your RADIUS-sourced DHCP options field is greater than 247 bytes, you must break the field up and manually configure multiple instances of VSA 26-55 for the RADIUS server to return. When using multiple instances for an options field, you must place the instances in the packet in the order in which the fragments are to be reassembled by the RADIUS client. The fragments can be of any size of 247 bytes or less.



BEST PRACTICE: For ease of configuration and management of your DHCP options, you might want to have one DHCP option per VSA 26-55 instance, regardless of the size of the option field.

When the RADIUS client returns a reassembled opaque options field in an accounting request to the RADIUS server, the client uses 247-byte fragments. If you had originally created instances of fewer than 247 bytes, the returned fragments might not be the same as you originally configured on the RADIUS server.



NOTE: If you are configuring Steel-Belted Radius (SBR) to support multiple VSA 26-55 instances, ensure that you specify VSA 26-55 with the RO flags in the Subscriber Management RADIUS dictionary file. The R value indicates a multivalued reply attribute and the O value indicates an ordered attribute.

DHCP Options That Cannot Be Centrally Configured

Table 19 on page 144 shows the DHCP options that you must not centrally configure on the RADIUS server.

Table 19: Unsupported Opaque DHCP Options

DHCP Option	Option Name	Comments
Option 0	Pad Option	Not supported.
Option 51	IP Address Lease Time	Value is provided by RADIUS attribute 27 (Session-Timeout).
Option 52	Option Overload	Not supported.
Option 53	DHCP Message Type	Value is provided by DHCP local server.
Option 54	Server Identifier	Value is provided by DHCP local server.
Option 55	Parameter Request List	Value is provided by DHCP local server.
Option 255	End	Value is provided by DHCP local server.
–	DHCP magic cookie	Not supported.

Related Documentation • [Monitoring DHCP Options Configured on RADIUS Servers on page 144](#)

Monitoring DHCP Options Configured on RADIUS Servers

Purpose View information for DHCP options that are centrally configured on a RADIUS server and that are distributed using Juniper Networks VSA 26-55 (DHCP-Options).

Action To display information for opaque DHCP options:

```

user@host> show subscribers detail
Type: DHCP
IP Address: 192.168.9.7
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-prof-23
MAC Address: 00:00:5E:00:53:98
State: Active
Radius Accounting ID: jnpr :2304
Session Timeout (seconds): 3600
Idle Timeout (seconds): 600
Login Time: 2011-08-25 14:43:52 PDT
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 08 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 36 2f
33 2d 37 2d 30 37 05 01 06 0f 21 2c

```

Meaning DHCP Options: len 52
 35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 08 33 04 00 00
 00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 36 2f
 33 2d 37 2d 30 37 05 01 06 0f 21 2c

The DHCP options output provides the following information:

- The **len** field is the total number of hex values in the message.
- The hex values specify the type, length, and value (TLV) of DHCP options, and are converted to decimal to identify the DHCP options, as defined in RFC 2132.

The number of hex values that make up a particular DHCP option varies, depending on the length of the option. For example, the first DHCP option specified in the output includes three sets of hex values (**35 01 01**). The first hex value (**35**) identifies the option type, the second value (**01**) indicates the length of the value entry, which in this case is one set of hex values. The third hex value (**01**) specifies the value for the DHCP option.

In the second DHCP option specification (**39 02 02 40**), the hex value **39** is the type, and the length of **02** specifies that two sets of hex entries make up the value for the option. Therefore, this option specification uses four sets of hex entries; one for the type (**39**), one to specify the length (**02**), and two for the option value (**02 40**).

The third DHCP option is specified by the hex values **3d 07 01 00 10 94 00 00 08**. The hex value **3d** is the type, followed by the length (**07**), which specifies that the next seven sets of hex entries make up the value for the option. Therefore, this option specification uses a total of nine sets of hex entries; one for the type (**3d**), one to specify the length (**07**), and seven for the value of the DHCP option (**01 00 10 94 00 00 08**).

Table 20 on page 145 describes the first two options in more detail.

Table 20: DHCP Options Description

Option	Type	Length	Value
35 01 01	35 = decimal 53 (Code 53 in RFC 2132 is the DHCP Message Type option)	01 = the length of the option is one set of hex values (the next set in the list)	01 = value of the message type that is described in RFC 2132. The code 01 specifies a message type of DHCPDISCOVER.
39 02 02 40	39 = decimal 57 (Code 57 is the Maximum DHCP Message Size option)	02 = the length of the option is two sets of hex values (the next two sets in the list)	0240 = converted to a length of 576 octets

- Related Documentation**
- [Centrally Configured Opaque DHCP Options on page 140](#)
 - [show subscribers on page 1775](#)

Configuring RADIUS Logical Line Identification

- [RADIUS Logical Line Identifier \(LLID\) Overview on page 147](#)
- [RADIUS Attributes for LLID Preauthentication Requests on page 148](#)
- [Configuring Logical Line Identification \(LLID\) Preauthentication on page 150](#)
- [Configuring a Port and Password for LLID Preauthentication Requests on page 151](#)

RADIUS Logical Line Identifier (LLID) Overview

The logical line identification (LLID) feature helps service providers maintain a reliable and up-to-date customer database for those subscribers who frequently move from one physical line to another. The LLID feature is based on a virtual port — the LLID — rather than the physical line used by the subscriber.

The LLID is an alphanumeric string that is based on the subscriber user name and circuit ID. The LLID logically identifies the subscriber line, and is mapped to the subscriber's physical line in the service provider customer database. When the subscriber moves to a different location and different physical line, the database is updated to map the LLID to the new physical line. Because the subscriber's LLID remains constant, it provides service providers with a secure and reliable means for tracking subscribers and maintaining an accurate customer database. Subscriber management supports the LLID feature for PPP subscribers over PPPoE, PPPoA, and LAC.

To assign an LLID to a subscriber, the router issues two RADIUS access requests. The first request is a preauthentication request, which obtains the LLID from a RADIUS preauthentication server. The second request is the standard authentication request sent to the RADIUS authentication server.

The following sequence of steps describes how subscriber management obtains and uses the LLID. The procedure assumes that preauthentication is enabled on the router and that the RADIUS preauthentication and authentication servers are configured.

1. The PPP subscriber sends an Authentication-Request message to the router.
2. The router sends an Access-Request message to the RADIUS preauthentication server to obtain an LLID for the subscriber.

3. The preauthentication server returns the LLID to the router in the Calling-Station-Id attribute (RADIUS attribute 31) in the Access-Accept message.



NOTE: This step includes a non-standard use of the Calling-Station-Id attribute. This attribute is typically present in RADIUS request messages, such as an Access-Request, not in response messages. Also, the router ignores all RADIUS attributes, other than the Calling-Station-Id, that are returned in the preauthentication Access-Accept message. In addition, any radius options that are configured on the router, such as **calling-station-id-format**, have no effect on the Calling-Station-Id attribute in the preauthentication request.

4. The router encodes the Calling-Station-Id (the LLID) in a second Access-Request message and sends the message to the RADIUS authentication server. This authentication request is the standard use of the Calling-Station-Id attribute.
5. The RADIUS authentication server returns an Access-Accept message to the router. The Access-Accept message includes attributes for the subscriber session.



NOTE: Once the preauthenticated subscriber has been successfully authenticated by the RADIUS authentication server, all subsequent RADIUS request messages, such as Accounting-Request messages, will include the LLID in the Calling-Station-Id attribute.



NOTE: For tunneled PPP subscribers, the router, acting as an L2TP access concentrator (LAC), encodes the LLID into Calling Number AVP (L2TP attribute 22) and sends the attribute to the L2TP network server (LNS) in an Incoming-Call-Request (ICRQ) packet. After a successful preauthentication request, the router always encodes the LLID in the L2TP Calling Number AVP.

**Related
Documentation**

- [RADIUS Attributes for LLID Preauthentication Requests on page 148](#)
- [Configuring Logical Line Identification \(LLID\) Preauthentication on page 150](#)

RADIUS Attributes for LLID Preauthentication Requests

Table 21 on page 149 lists the RADIUS IETF attributes used in a preauthentication request to obtain a subscriber's LLID, and describes the information that is included in the attributes. In some cases, preauthentication uses an attribute for information that is different than the IETF description—the table indicates any non-standard use of RADIUS attributes.

Table 21: RADIUS Attributes for LLID Preauthentication Requests

Attribute Number	Attribute Name	Description
1	User-Name	<p>(Non-standard use of attribute.) Identifying information for the user associated with the LLID, in the following format.</p> <p><i>nas-port:nas-ip-address:nas-port-id</i></p> <p>Example: nas-port:198.51.100.117:ge-1/0/5:100</p> <p>NOTE: The router strips any dynamically generated information from the User-Name attribute during preauthentication.</p>
2	User-Password	<p>(Non-standard use of attribute.) Password of the user to be authenticated.</p> <p>Example: Always set to juniper</p>
4	NAS-IP-Address	<p>IP address of the network access server (NAS) that is requesting authentication of the user</p> <p>Example: 198.51.100.117</p>
5	NAS-Port	Physical port number of the NAS that is authenticating the user. Always interpreted as a bit field
6	Service-Type	<p>Type of service the user requested or the type of service to be provided.</p> <p>Example: gold-service</p>
61	NAS-Port-Type	Type of physical port the NAS is using to authenticate the user. You can use the ethernet-port-type-virtual statement to configure this to virtual (type 5).
77	Connect-Info	<p>(Non-standard use of attribute.) The user name.</p> <p>Example: jdoe@xyzcorp.example.com</p>
87	NAS-Port-Id	<p>Text string that identifies the physical interface of the NAS that is authenticating the user. Includes any dynamically generated information.</p> <p>Example: ge 1/0/5:100</p>

Related Documentation

- [RADIUS Logical Line Identifier \(LLID\) Overview on page 147](#)
- [Configuring Logical Line Identification \(LLID\) Preauthentication on page 150](#)

Configuring Logical Line Identification (LLID) Preauthentication

The logical line identification (LLID) feature enables service providers to track subscribers on the basis of a virtual port — the LLID — rather than by the physical port used by the subscriber. The LLID is assigned by a RADIUS preauthentication server, which you configure in an access profile.

To configure the router to support preauthentication for the LLID feature:



NOTE: You cannot configure the preauthentication statements in this procedure if you have configured the radius attributes `exclude` statement to exclude the Calling-Station-ID attribute from RADIUS Access-Request messages.

1. Specify the access profile you want to use for the subscriber preauthentication support.

```
[edit]
user@host# edit access profile PreAuthLlid
```

2. Specify the order in which the router uses the supported preauthentication methods. **radius** is the only supported authentication method.

```
[edit access profile PreAuthLlid]
user@host# set preauthentication-order radius
```

3. Specify that you want to configure RADIUS support.

```
[edit access profile PreAuthLlid]
user@host# edit radius
```

4. Specify the IP address of the RADIUS server used for preauthentication.

```
[edit access profile PreAuthLlid radius]
user@host# set preauthentication-server 192.168.100.10
```



NOTE: The preauthentication feature uses the **retry** and **timeout** parameters that are configured for the RADIUS authentication server.

5. (Optional) Display AAA preauthentication statistics.

```
user@host> show network-access aaa statistics preauthentication
Preauthentication module statistics
  Requests received: 2118
  Multistack requests: 0
  Accepts: 261
  Rejects: 975
  Challenges: 0
  Requests timed out: 882
```

6. (Optional) Verify configuration of the RADIUS preauthentication server.

```
user@host1> show radius pre-authentication servers
```

RADIUS Pre-Authentication Configuration						
IP Address	Udp Port	Retry Count	Timeout	Maximum Sessions	Dead Time	Secret
203.0.113.168	1812	3	3	255	0	radius

- Related Documentation**
- [RADIUS Logical Line Identifier \(LLID\) Overview on page 147](#)
 - [RADIUS Attributes for LLID Preauthentication Requests on page 148](#)

Configuring a Port and Password for LLID Preauthentication Requests

You can configure a router that operates as the RADIUS client to contact a RADIUS server for authentication and preauthentication requests on two different UDP ports and using different secret passwords. Similar to configuring the port numbers for authentication and accounting requests, you can define a unique port number that the router uses to contact the RADIUS server for logical line identification (LLID) preauthentication requests. You can also define a unique password for preauthentication requests. If you do not configure a separate UDP port or secret for preauthentication purposes, the same UDP port and secret that you configure for authentication messages is used.

To configure a unique UDP port number to be used to contact the RADIUS server for preauthentication requests, include the **preauthentication-port *port-number*** statement at the **[edit access radius-server *server-address*]** or **[edit access profile *profile-name* radius-server *server-address*]** hierarchy level.

- To specify the UDP port for all of the access profiles:

```
[edit access]
radius-server server-address {
  preauthentication-port port-number;
}
```

- To specify the UDP port for a specific access profile:

```
[edit access]
profile profile-name {
  radius-server server-address {
    preauthentication-port port-number;
  }
}
```

To configure the password to be used to contact the RADIUS preauthentication server, include the **preauthentication-secret *password*** statement at the **[edit access radius-server *server-address*]** or **[edit access profile *profile-name* radius-server *server-address*]** hierarchy level.

- To specify the password for all of the access profiles:

```
[edit access]
radius-server server-address {
  preauthentication-secret password;
}
```

- To specify the password for a specific access profile:

```
[edit access]
profile profile-name {
  radius-server server-address {
    preauthentication-secret password;
  }
}
```

**Related
Documentation**

- [RADIUS Logical Line Identifier \(LLID\) Overview on page 147](#)
- [RADIUS Attributes for LLID Preauthentication Requests on page 148](#)

CHAPTER 12

Provisioning Subscriber Services Using Cisco VSAs

- [Processing Cisco VSAs in RADIUS Messages for Service Provisioning on page 153](#)
- [Configuring Service Interim Accounting on page 156](#)

Processing Cisco VSAs in RADIUS Messages for Service Provisioning

You can use Cisco VSAs in RADIUS messages to provision and manage services in a subscriber access network. In the topology for this deployment, the broadband network gateway (BNG) is connected to:

- A RADIUS server, such as the Steel-Belted Radius Carrier (SBRC), that is used to authentication and accounting.
- A Cisco BroadHop application that is used as the Policy Control and Charging Rules Function (PCRF) server for provisioning services using RADIUS change of authorization (CoA) messages

Cisco BroadHop does not support Juniper VSAs and it uses Cisco VSAs (Cisco Vendor ID 9) to activate and deactivate the services.

The following Cisco VSAs are used together to activate a service:

- Cisco-AVPair (26-1) with the value of the *subscriber:command=activate-service* parameter
- Cisco-AVPair(26-1) with the value the *subscriber:service-name=service-name* parameter

The following Cisco VSAs are used in together to deactivate a service:

- Cisco-AVPair (26-1) with the value of the *subscriber:command=deactivate-service* parameter
- Cisco-AVPair (26-1) with the value of *subscriber:service-name=service-name* parameter

In such a deployment, you can also enable and disable service accounting and specify service interim accounting interval using the CLI interface because Cisco Broadhop does not send attributes related to service accounting in RADIUS messages to the BNG.

You cannot modify any attributes in authentication, accounting, or CoA responses in the RADIUS messages that the BNG sends. Any Cisco VSAs other than the ones used to provision the services are considered as unsupported attributes.

[Table 17 on page 111](#) describes the service accounting type that becomes effective for different configuration combinations of the service accounting method or type using the local CLI settings and RADIUS attributes:

Table 22: Effective Service Accounting Method with CLI and RADIUS Configurations

Service Accounting-Type Local Configuration	Service Accounting-Type RADIUS Configuration	Service Accounting-Type Applicable
Not configured	Not configured	No service accounting
Not configured	Method configured using RADIUS attributes	Service accounting configured using RADIUS
Method configured using the CLI	Not configured	Service accounting configured using the CLI
Method configured using the CLI	Method configured using RADIUS attributes	Service accounting configured using RADIUS
Method configured using the CLI	Explicitly disabled with a value of 0	No service accounting

[Table 18 on page 111](#) describes the service interim accounting interval that becomes effective for different configuration combinations of the service accounting method or type using the local CLI settings and RADIUS attributes:

Table 23: Effective Service Interim Accounting Interval with CLI and RADIUS Configurations

Service Interim Accounting Interval Using Local Configuration	Service Interim Accounting Interval Using RADIUS Configuration	Service Interim Accounting Interval Applicable
Not configured	Not configured	No service interim accounting
Not configured	Interval configured using RADIUS attributes	Service interim accounting configured using RADIUS
Interval configured using the CLI	Not configured	Service interim accounting configured using the CLI
Interval configured using the CLI	Interval configured using RADIUS attributes	Service interim accounting configured using RADIUS
Interval configured using the CLI	Explicitly disabled with a value of 0	No service interim accounting

By default, service accounting is disabled. If you configure service accounting using both RADIUS attributes and the CLI interface, the RADIUS setting takes precedence over the CLI setting. To enable service accounting using the CLI, include the **accounting** statement at the **[edit access profile *profile-name* service]** hierarchy level.

```
[edit access]
profile profile-name {
  service {
    accounting;
  }
}
```

To enable interim service accounting updates and configure the amount of time that the router waits before sending a new service accounting update, include the **update-interval *minutes*** statement at the **[edit access profile *profile-name* service accounting]** hierarchy level.

```
[edit access]
profile profile-name {
  service {
    accounting {
      update-interval minutes;
    }
  }
}
```

You can configure the router to collect time statistics, or both volume and time statistics, for the service accounting sessions being managed by AAA. To configure the collection of statistical details that are time-based only, include the **statistics *time*** statement at the **[edit access profile *profile-name* service accounting]** hierarchy level. To configure the collection of statistical details that are both volume-time-based only, include the **statistics *volume-time*** statement at the **[edit access profile *profile-name* service accounting]** hierarchy level.

```
[edit access]
profile profile-name {
  service {
    accounting {
      statistics (time | volume-time);
    }
  }
}
```

You can define the UDP port number to configure the port on which the router that functions as the RADIUS dynamic-request server must receive requests from RADIUS servers. By default, the router listens on UDP port 3799 for dynamic requests from remote RADIUS servers. You can configure the UDP port number to be used for dynamic requests for a specific access profile or for all of the access profiles on the router. To define the UDP port number, include the **dynamic-request-port *port-number*** statement at the **[edit access profile *profile-name* radius-server *server-address*]** or the **[edit access radius-server *server-address*]** hierarchy level.

To specify the UDP port for all of the access profiles:

```
[edit access]
radius-server server-address {
  dynamic-request-port port-number;
}
```

To specify the UDP port for a specific access profile:

```
[edit access]
profile profile-name {
  radius-server server-address {
    dynamic-request-port port-number;
  }
}
```

Related Documentation • [Configuring Service Interim Accounting on page 113](#)

Configuring Service Interim Accounting

By default, service accounting is disabled. If you configure service accounting using both RADIUS attributes and the CLI interface, the RADIUS setting takes precedence over the CLI setting.

To configure service accounting for an access profile for a subscriber:

1. At the **[edit access profile *profile-name* service]** hierarchy level, specify that you want to configure service accounting.

```
[edit access profile profile-name service]
user@host# edit accounting
```

2. (Optional) Enable interim service accounting updates and configure the amount of time that the router or switch waits before sending a new service accounting update. You can configure an interval from 10 through 1440 minutes. All values are rounded up to the next higher multiple of 10. For example, the values 811 through 819 are all accepted by the CLI, but are all rounded up to 820.

```
[edit access profile profile-name service accounting]
user@host# set update-interval minutes
```

3. (Optional) Configure the types of statistics to gather. You can specify that the router or switch collect both volume and time statistics or only time statistics for subscriber sessions. When you change the type of statistics being collected, current subscribers continue to use the previous collection specification. Subscribers who log in after the change use the new specification.

```
[edit access profile profile-name accounting service]
user@host# set statistics (time | volume-time)
```

Related Documentation • [Processing Cisco VSAs in RADIUS Messages for Service Provisioning on page 110](#)

CHAPTER 13

Configuring Domain Maps for Subscriber Management

- [Domain Mapping Overview on page 158](#)
- [Understanding Domain Maps and Logical System/Routing Instance Contexts on page 161](#)
- [Configuring a Domain Map on page 162](#)
- [Configuring a Wildcard Domain Map on page 163](#)
- [Specifying an Access Profile in a Domain Map on page 164](#)
- [Specifying an Address Pool in a Domain Map on page 165](#)
- [Specifying a Dynamic Profile in a Domain Map on page 166](#)
- [Specifying an AAA Logical System/Routing Instance in a Domain Map on page 167](#)
- [Specifying a Target Logical System/Routing Instance in a Domain Map on page 168](#)
- [Configuring Domain and Realm Name Usage for Domain Maps on page 168](#)
- [Specifying Domain and Realm Name Delimiters on page 169](#)
- [Specifying the Parsing Order for Domain and Realm Names on page 170](#)
- [Specifying the Parsing Direction for Domain and Realm Names on page 171](#)
- [Enabling Domain Name Stripping on page 171](#)
- [Specifying a Tunnel Profile in a Domain Map on page 172](#)
- [Specifying a Tunnel Switch Profile in a Domain Map on page 172](#)
- [Configuring PADN Parameters for a Domain Map on page 173](#)

Domain Mapping Overview

Domain mapping enables you to configure a map that specifies access options and session-specific parameters. The map is based on the domain name of subscriber sessions — the router applies the mapped options and parameters to sessions for subscribers that have the specified domains. For example, you might configure a domain map that is based on the domain name **example.com**. The options and parameters in that domain map are then applied when subscribers with the specified domain name (for example, **bob@example.com**, **raj@example.com**, and **juan@example.com**) request an AAA service.



NOTE: A subscriber's username is typically made up of two parts — the user's name followed by the user's domain name, which are separated by a delimiter character. The domain name is always to the right of the domain delimiter. For example, in the username, **juan@example.com**, the user's name, **juan** is followed by the domain name **example.com**, and the two are separated by the **@** delimiter character.

However, some systems use a username format in which the domain name *precedes* the user's name. To avoid confusion with the typical domain name usage, this type of preceding domain name is referred to as a realm name, and the realm name is to the left of the realm delimiter. For example, in the username, **top321-example.com/mary**, the **top321-example.com** part is the realm name, **mary** is the user's name, and the **/** character is the delimiter character.

The domain map provides efficiency, and enables you to make changes for a large number of subscribers in one operation. For example, if an address assignment pool becomes exhausted due to the number of subscribers obtaining addresses from the pool, you can create a domain map that specifies that subscribers in a particular domain obtain addresses from a different pool. In another use of the domain map, you might create a new dynamic profile and then configure the domain map to specify which subscribers (by their domain) use that dynamic profile.



NOTE: Subscriber management is supported in the default logical system only. The documentation for the subscriber management domain mapping feature describes using the **aaa-logical-system** and **target-logical-system** statements to configure mapping to a non-default logical system. These statements are for future extensions of subscriber management.

Table 24 on page 159 describes the access options and parameters you can configure in the domain map.

Table 24: Domain Map Options and Parameters

Option	Description
AAA logical system/routing instance	Logical system/routing instance in which AAA sends authentication and accounting requests for the subscriber sessions. Subscriber management is supported in the default logical system only.
Access profile	Access profile applied to subscriber sessions.
Address pool	Address pool used to allocate addresses to subscribers.
Domain and realm name rules	Rules for domain and realm name usage, including domain name stripping, supported delimiters, and parse direction (delimiters and the parse direction are configured globally).
Dynamic profile	Dynamic profile applied to subscriber sessions.
PADN parameters	PPPoE route information for subscriber sessions.
Target logical system/routing instance	Logical system/routing instance to which the subscriber interface is attached. Subscriber management is supported in the default logical system only.
Tunnel profile	Tunnel profile applied to subscriber sessions.

Types of Domain Maps and Their Order of Precedence

Starting in Junos OS Release 16.1, subscriber management uses a specific order when searching for a domain map that matches the subscriber domain name. The following list shows that order:

- Exact match domain map—The subscriber domain name is an exact match to a configured domain map.
- Wildcard domain map—The subscriber domain name is a partial match to a wildcard domain map.
- **default** domain map—The subscriber domain name is neither an exact match nor a partial wildcard match to a domain map.



NOTE: If the subscriber username does not have a domain name, then no search is performed and the subscriber is associated with the none domain map, if configured.

Wildcard Domain Map

Starting in Junos OS Release 16.1, the wildcard domain map feature enables you to specify a domain name that is used by subscribers when there is no exact match to the subscriber's domain name. For example, if you create a wildcard domain map with the name **xyz*example.com**, subscribers with the domain names **xyz.example.com**, **xyz-1234.example.com**, **xyz-eastern.example.com**, and **xyz-northern.example.com** are all mapped to that wildcard domain if there was no exact match for the subscribers' domain names. You can insert the asterisk wildcard character anywhere within the domain map to create the desired matching specification. Wildcard domain mapping is also used in cases where subscriber names are derived from the DHCPv4 Agent Remote ID (option 82 suboption 2) or the DHCPv6 Remote-ID (option 37).

Default Domain Map

You can configure a default domain map that the router uses for subscribers whose domain or realm name does not explicitly match any existing domain map, and also is not a partial match to a wildcard domain map. Specify the name **default** as the **domain map domain-map-name**.

For example, you might configure the default domain map to provide limited feature support for guest subscribers, such as a specific address pool used for guests or the routing instance that provides AAA services. When the router is unable to provide an exact or wildcard match for the guest subscriber, the router then uses the rules specified in the default domain map configuration to handle the guest subscriber's request.

Domain Map for Subscriber Usernames With No Domain or Realm Name

In some cases a subscriber username might not include a domain name or realm name—you can configure a specific domain map that the router uses for these subscribers. Specify the name **none** as the **domain map domain-map-name**.

Release History Table

Release	Description
16.1	Starting in Junos OS Release 16.1, subscriber management uses a specific order when searching for a domain map that matches the subscriber domain name.
16.1	Starting in Junos OS Release 16.1, the wildcard domain map feature enables you to specify a domain name that is used by subscribers when there is no exact match to the subscriber's domain name.

Related Documentation

- [Configuring a Domain Map on page 162](#)

Understanding Domain Maps and Logical System/Routing Instance Contexts

You can use a domain map to manage the logical system/routing instance that subscriber management uses for AAA and subscriber contexts. Subscriber management is supported in the default logical system only, so you manage the contexts by configuring the routing instance. The following list describes the two types of contexts.

- **Subscriber context**—The logical system/routing instance in which the subscriber interface is placed. For most dynamic subscriber sessions, the initial subscriber session context is the default logical system and default routing instance. One exception is LNS, in which the initial context for a dynamic LNS session (PPP over L2TP) is the same as the peer interface (the LAC facing interface). Therefore, for LNS sessions, if the peer interface uses a non-default routing instance, then the initial context of the subscriber session also uses that non-default routing instance.
- **AAA context**—The logical system/routing instance that the subscriber session uses for RADIUS interactions, such as authentication and accounting requests. By default, the AAA context is the same as the initial subscriber context. Therefore, for all subscriber sessions other than dynamic LNS sessions, authentication and authorization is performed in the default logical system/routing instance context, unless the default routing instance is explicitly changed.

You can optionally configure a domain map to use a specific subscriber or AAA context. For example, if a dynamic LNS session is initially created in a non-default routing instance (because the initial subscriber context uses the non-default routing instance), you might use the **target-routing-instance** statement to configure the domain map to place the subscriber in the default routing instance. Or, for security reasons, you might want to have all RADIUS interactions in a particular context. In this case, you would use the **aaa-routing-instance** statement to configure the domain map to change the initial AAA context to the new routing instance.

Using domain maps to manage AAA and subscriber contexts is also useful in layer 3 wholesale environments. For example, you might want to place dynamic VLAN interfaces in different non-default routing instances, while maintaining all RADIUS interactions in the default routing-instance. In this example, the initial AAA context is in the default routing instance, but RADIUS authorization places the subscriber VLAN session in a non-default routing instance. You can then include the **aaa-routing-instance** statement in the domain map, to specify that the AAA context uses the default routing instance for the dynamic VLAN session. The subscriber session is unchanged and remains in the non-default routing instance.

Related Documentation

- [Domain Mapping Overview on page 158](#)
- [Specifying a Target Logical System/Routing Instance in a Domain Map on page 168](#)

Configuring a Domain Map

To configure a domain map for subscriber management:

1. Create the domain map. For the map name, specify the domain name that you want the domain map to use. (Use **default** for the name of the default domain map.)

```
[edit access]
user@host# edit domain map domain-map-name
```

- For example, to create a domain map to be mapped to subscribers with the domain name **example.com**:

```
[edit access]
user@host# edit domain map example.com
```

- To create a wildcard domain map to be mapped to subscribers whose domain name is not an exact match, but is a partial match:

```
[edit access]
user@host# edit domain map premiumTier*
```

See [“Configuring a Wildcard Domain Map” on page 163](#).

- To create a default domain map to be mapped to subscribers with non-matching domain names:

```
[edit access]
user@host# edit domain map default
```

- To create a domain map to be mapped to subscribers without a domain or realm name:

```
[edit access]
user@host# edit domain map none
```

2. (Optional) Specify the access profile used to apply access rules for the domain map.

See [“Specifying an Access Profile in a Domain Map” on page 164](#).

3. (Optional) For dynamic profiles, clarify the provided dynamic configuration for the subscriber session.

See [“Specifying a Dynamic Profile in a Domain Map” on page 166](#).

4. (Optional) Specify the address pool used to allocate address for the domain map.

See [“Specifying an Address Pool in a Domain Map” on page 165](#).

5. (Optional) Configure the target logical system/routing instance for the subscriber context.

See [“Specifying an AAA Logical System/Routing Instance in a Domain Map” on page 167](#).

6. (Optional) Configure the target logical system/routing instance in which AAA requests are sent for the domain map.

See [“Specifying a Target Logical System/Routing Instance in a Domain Map” on page 168](#).

7. (Optional) Configure rules for domain names; for example; delimiters, parsing direction, and domain stripping. Delimiters and parsing direction are configured globally for all domain maps. Domain stripping is enabled in the domain map.

See [“Configuring Domain and Realm Name Usage for Domain Maps” on page 168](#).

8. (Optional) Configure rules to remove the domain portion from the username for authentication, accounting, and display purposes.

See [“Enabling Domain Name Stripping” on page 171](#).

9. (Optional) Configure rules to strip the user portion of the username for authentication only. You can also use a directional option to configure a left-to-right (default) or right-to-left application.

See [strip-username](#).

10. (Optional) Specify a password to use for all subscriber authentications. This option affects only the username/password sent in the access-request to external policy/RADIUS servers.

See [override-password](#).

11. (Optional) Assign a tunnel profile that provides tunnel definitions for the domain map.

See [“Specifying a Tunnel Profile in a Domain Map” on page 172](#).

12. (Optional) Assign a tunnel switch profile to be applied by the domain map.

See [“Specifying a Tunnel Switch Profile in a Domain Map” on page 172](#).

13. (Optional) Configure the PADN parameters used for PPPoE route information for the domain map.

See [“Configuring PADN Parameters for a Domain Map” on page 173](#).

**Related
Documentation**

- [Domain Mapping Overview on page 158](#)
- [Verifying and Managing Domain Map Configuration on page 225](#)

Configuring a Wildcard Domain Map

Subscriber management supports a wildcard domain map feature that enables you to configure a domain mapping that is based on a partial wildcard match. When there is no exact match between the subscriber domain name and a configured domain map, subscriber management next looks for a partial match between the subscriber domain name and a wildcard domain map.

To create the wildcard domain map, you include the asterisk wildcard character when you configure the domain map name, such as, **domain map example***. You can insert the wildcard character anyplace within the domain map, and the wildcard can represent zero or any number of characters. The asterisk is the only supported wildcard character.

For example, the configuration statement **domain map example*northern.com** creates a wildcard domain map that is a partial match for all domain names beginning with **example** and ending with **northern.com**, such as **examplenorthern.com**,

example-northern.com, and **example1234northern.com**. However if you move the wildcard character in the domain map name to **domain map example-northern*.com**, this creates a more restrictive match that requires the partial matching domain names to start with **example-northern**, such as **example-northern555.com** or **example-northern-alpha.com**.

Wildcard domain mapping is also useful when subscriber management derives subscriber usernames from the DHCPv4 Agent Remote ID (option 82 suboption 2) or the DHCPv6 Remote-ID (option 37). In these cases, the resultant username is in the format **subscriberID|service-plan|accountID|unused**; for example, **EricSmith|premiumTier1|314159265|0000** (where the | character is the delimiter). In this example, subscriber management parses the username left-to-right, and identifies the subscriber's domain as **premiumTier1|314159265|0000**. To create a wildcard domain map that is used for this subscriber, you might configure **domain map premiumTier1***.

The following example describes how four subscribers are mapped to different domains.

For this example, there are three domain maps configured; the **default** domain map, a domain map named **example3000.com**, and a wildcard domain map named **example***. The subscribers are mapped as shown in the following list:

- **eric@example3000.com**—There is an exact domain map match, so the subscriber is mapped to domain **example3000.com**.
- **jack@example1001.com**—There is no exact match, but there is a partial match to the wildcard domain, so the subscriber is mapped to the wildcard domain **example***.
- **ginger@example-western.com**—There is no exact match, but there is a partial match to the wildcard domain, so the subscriber is also mapped to the wildcard domain **example***.
- **sunshine@test.com**—There is no exact match, nor is there a partial match to the wildcard domain, so the subscriber is mapped to the **default** domain.

To configure a wildcard domain map:

1. Specify the domain map name, including the wildcard character.

[edit access]

user@host# edit domain map premiumTier*

2. Specify the optional characteristics for the wildcard domain map.

See “Configuring a Domain Map” on page 162.

Related Documentation

- [Domain Mapping Overview on page 158](#)
- [Configuring a Domain Map on page 162](#)

Specifying an Access Profile in a Domain Map

You use access profiles to specify the access rules and options (for example, the RADIUS authentication server and attributes) that the router applies to subscriber sessions. The

domain map feature enables you to apply a specific access profile for subscribers in a particular domain.

Access profiles can be specified or modified in several different ways. If conflicts occur, the router applies the access profiles based on the precedence rules shown in [Table 25 on page 165](#).

Table 25: Precedence Rules for Applying Access Profiles

Precedence (High to Low)	How the Access Profile Is Applied
1	Specified by the RADIUS Redirect-VRouter-Name attribute (VSA 26-25)
2	Specified in the domain map configuration stanza
3	Indirectly specified in the domain map configuration stanza by the AAA logical system/routing instance mapping
4	Specified in the client configuration stanza
5	Specified in the logical system/routing instance configuration stanza

To include an access profile in a domain map:

1. Specify the domain map you want to configure.

```
[edit access]
user@host# edit domain map domain-map-name
```

2. Specify the access profile you want to include in the domain map.

```
[edit access domain map domain-map-name]
user@host# set access-profile profile-name
```

- Related Documentation**
- [Domain Mapping Overview on page 158](#)
 - [Configuring a Domain Map on page 162](#)

Specifying an Address Pool in a Domain Map

You can use the domain map feature to specify the address pool that the router uses to allocate address for subscriber sessions. The address pool can include both IPv4 and IPv6 address ranges.

Address pools can be specified or modified in several different ways. If conflicts occur, the router applies the address pool based on the precedence rules shown in [Table 26 on page 166](#).

Table 26: Precedence Rules for Determining the Address Pool to Use

Precedence (High to Low)	How the Address Pool Reference Is Provided
1	Specified by the RADIUS Framed-Pool attribute (RADIUS attribute 88)
2	Configured in the domain map configuration stanza
3	Specified in the client configuration stanza (by address match rules)

To specify the address pool used for a domain map:

1. Specify the domain map you want to configure.

```
[edit access]
user@host# edit domain map domain-map-name
```

2. Specify the address pool you want to use for the domain map.

```
[edit access domain map domain-map-name]
user@host# set address-pool pool-name
```

Related Documentation

- [Domain Mapping Overview on page 158](#)
- [Configuring a Domain Map on page 162](#)

Specifying a Dynamic Profile in a Domain Map

A dynamic profile defines the set of characteristics that provide dynamic access and services for subscriber sessions (such as class-of-service, protocols, and interface support). The domain map feature enables you to apply a specific dynamic profile based on subscriber domains.

Dynamic profiles are configured at the **[edit dynamic-profiles]** hierarchy, and can be specified or modified in several different ways. If conflicts occur, the router applies the dynamic profiles based on the precedence rules shown in [Table 27 on page 166](#).

Table 27: Precedence Rules for Applying Dynamic Profiles

Precedence (High to Low)	How the Dynamic Profile Is Applied
1	Specified by the RADIUS Virtual-Router attribute (VSA 26-1) or the Redirect-VRouter-Name attribute (VSA 26-25)
2	Specified in the domain map configuration stanza
3	Specified in the client configuration stanza

To include a dynamic profile in a domain map:

1. Specify the domain map you want to configure.

```
[edit access]
user@host# edit domain map domain-map-name
```

- Specify the dynamic profile you want to include in the domain map.

```
[edit access domain map domain-map-name]
user@host# set dynamic-profile profile-name
```

Related Documentation

- [Domain Mapping Overview on page 158](#)
- [Configuring a Domain Map on page 162](#)

Specifying an AAA Logical System/Routing Instance in a Domain Map

By default, a domain map uses the subscriber logical system/routing instance as the context in which the **authd** daemon sends AAA authentication and accounting requests. You can optionally configure the domain map to direct AAA requests to a particular context, based on the subscriber domain name. Specifying a non-default AAA context enables you to manage workflow and traffic load, and to efficiently make changes for a large number of subscribers. For example, after upgrading your RADIUS services, you might configure a domain map to specify that all subscribers in the domain **example.com** are now authenticated by a RADIUS server in a particular AAA context.



NOTE: Changing the AAA context does not change the subscriber context. You use the **target-logical-system** statement to explicitly configure the logical system/routing instance for subscribers.

To configure the logical system/routing instance context used for AAA requests:

- Specify the domain map you want to configure.

```
[edit access]
user@host# edit domain map domain-map-name
```

- Specify the routing instance. If a non-default routing instance is currently configured, you can use the **default** option to specify that the domain map use the default routing instance. The AAA logical system is automatically set to the default.

```
[edit access domain map domain-map-name]
user@host# set aaa-routing-instance (routing-instance-name | default)
```



NOTE: Subscriber management is supported in the default logical system only.

Related Documentation

- [Domain Mapping Overview on page 158](#)
- [Understanding Domain Maps and Logical System/Routing Instance Contexts on page 161](#)
- [Configuring a Domain Map on page 162](#)
- [Understanding Domain Maps and Logical System/Routing Instance Contexts on page 161](#)

- [Specifying a Target Logical System/Routing Instance in a Domain Map on page 168](#)

Specifying a Target Logical System/Routing Instance in a Domain Map

By default, the router places a subscriber in the logical system/routing instance context of the interface on which the subscriber negotiations start. You can later change the routing instance of the subscriber's context through the use of either a domain map or the RADIUS authentication server.

Subscriber management is supported in the default logical system only, however you can configure the domain map to use a non-default routing instance. Also, if a non-default routing instance is already configured, you can configure the domain map to use the default routing instance.

To configure the logical system/routing instance context used for a subscriber's interface :

1. Specify the domain map you want to configure.

[edit access]

user@host# **edit domain map** *domain-map-name*

2. Specify the target routing instance (the default logical system is used by default). If a non-default routing instance is currently configured, you can use the **default** option to specify that the domain map use the default routing instance.

[edit access domain map *domain-map-name*]

user@host# **set target-routing-instance** (*routing-instance-name* | **default**)



NOTE: Subscriber management is supported in the default logical system only.

Related Documentation

- [Domain Mapping Overview on page 158](#)
- [Understanding Domain Maps and Logical System/Routing Instance Contexts on page 161](#)
- [Configuring a Domain Map on page 162](#)
- [Understanding Domain Maps and Logical System/Routing Instance Contexts on page 161](#)

Configuring Domain and Realm Name Usage for Domain Maps

You can configure how the router determines the domain names that are used for the domain mapping feature. At the global level, you can specify rules that are used for domain maps. The global rules enable you to specify additional characters that the router can recognize as domain or realm name delimiters and to specify the direction the router uses to parse domain or realm names. The purpose of parsing a domain or realm name is to identify a single, unique name that the router uses as the subscriber's domain name, regardless of whether the source of the name is in the typical domain name format (joseph@example.com) or in the realm name format (example.com\marilyn). The router

uses the resulting domain name for operations such as domain map lookup and processing. At the domain map level, you can also enable domain name stripping. Domain name stripping specifies that the router remove the parsed domain or realm name from the subscriber username prior to performing any additional processing for the domain map.

To configure domain name usage rules for domain maps:

1. (Optional) For domain or realm names, configure the parsing order, which specifies whether the router searches for the domain name or the realm name first.
See [“Specifying the Parsing Order for Domain and Realm Names” on page 170](#).
2. (Optional) For domain or realm names, configure the delimiters you want the router to recognize for domain maps.
See [“Specifying Domain and Realm Name Delimiters” on page 169](#).
3. (Optional) For domain or realm names, configure the parse direction you want the router to use when determining domain names for domain maps.
See [“Specifying the Parsing Direction for Domain and Realm Names” on page 171](#).
4. (Optional) For domain names, configure the router to remove the parsed domain or realm name from usernames in the domain map before using AAA services.
See [“Enabling Domain Name Stripping” on page 171](#).

- Related Documentation**
- [Domain Mapping Overview on page 158](#)
 - [Configuring a Domain Map on page 162](#)

Specifying Domain and Realm Name Delimiters

A delimiter is the character that separates a subscriber username from the domain or realm name. Delimiters are commonly used for domain or realm name parsing or domain name stripping. You can specify a maximum of eight delimiters that the router uses to recognize domain or realm names for a domain map. If you do not configure any delimiters, the router uses the @ character by default for domain names. There is no default delimiter for realm names.

For example, your network might include the subscribers **bob@test.com**, **pete!example.com**, and **test.net\maria**. In this case, you would configure the router to recognize the characters @ and ! as domain name delimiters, and the \ character as a realm name delimiter.

Keep the following guidelines in mind when specifying delimiters:

- You cannot use the semicolon (;) as a delimiter.
- If you configure optional domain name delimiters, you must also specify the @ character (the default delimiter) if you want to continue to use it as a delimiter.

- If you configure optional domain name delimiters and then unconfigure them, the router sets the domain map delimiter back to the default @ character.

To configure domain and realm name delimiters for domain maps:

1. Specify that you want to configure domain attributes.

```
[edit]
user@host# edit access domain
```

2. Specify the characters you want to use as domain name delimiters. Do not include spaces between the delimiters.

```
[edit access domain]
user@host# set delimiter @!
```

3. Specify the characters you want to use as realm name delimiters. Do not include spaces between the delimiters.

```
[edit access domain]
user@host# set realm-delimiter \
```

Related Documentation • [Configuring Domain and Realm Name Usage for Domain Maps on page 168](#)

Specifying the Parsing Order for Domain and Realm Names

The router parses the username domain or realm name in order to identify a single, unique name that the router uses as the subscriber's domain name, regardless of whether the source of the name is in the typical domain name format (joseph@example.com) or in the realm name format (example.com\marilyn). You can specify whether the router first searches the subscriber username for a domain name or for a realm name. If the router does not find the specified name (for example, you specify **realm-first** and there is no realm name in the username), then the router searches for the second type of name (domain name, in this case). If the router does not find either a realm-name or a domain name, then there is no domain that can be used for domain mapping operations.

To configure the domain name parsing direction for domain maps:

1. Specify that you want to configure domain attributes.

```
[edit]
user@host# edit access domain
```

2. Specify the parsing order you want the router to use, either the domain name first or the realm name first.

```
[edit access domain]
user@host# set parse-order domain-first
```

Related Documentation • [Configuring Domain and Realm Name Usage for Domain Maps on page 168](#)

Specifying the Parsing Direction for Domain and Realm Names

You can specify the direction in which the router performs the parsing operation it uses to identify subscriber domain or realm names for domain maps. During the parsing operation, the router searches the username until it recognizes a delimiter. It then considers anything to the right of the delimiter as the domain. By default, the router parses from right to left, starting at the right-most character in the username.

The router uses a subscriber's domain name to perform domain map lookup and processing operations. You can configure how the router identifies a unique domain name when the user's name is presented in a traditional domain name format or a realm name. In the traditional domain name format, the user's name is followed by the domain name; for example, `joe@example.com`. In the realm name format, the user's name is preceded by the domain name, referred to as the realm name; for example, `example.com@joe`. The purpose of parsing a domain or realm name is to identify a single name that the router uses as the subscriber's domain name, regardless if the source of the name is the user's original domain name or realm name. The router uses the resulting domain name for operations such as domain map lookup and processing. At the domain map level, you can also enable domain name stripping.

The domain parsing direction you use is important when there are nested domain names. For example, for the username `user1@test.com@example.com`, right-to-left parsing produces a domain name of `example.com`. For the same username, left-to-right parsing produces a domain name of `test.com@example.com`.

To configure the domain name parsing direction for domain maps:

1. Specify that you want to configure domain attributes.

```
[edit]
user@host# edit access domain
```

2. Specify the parsing direction you want the router to use if the username uses the typical domain name format, in which the domain name follows the user's name.

```
[edit access domain]
user@host# set parse-direction left-to-right
```

3. Specify the parsing direction you want the router to use if the username uses the realm name format, in which the realm name precedes the user's name.

```
[edit access domain]
user@host# set realm-parse-direction right-to-left
```

Related Documentation

- [Configuring Domain and Realm Name Usage for Domain Maps on page 168](#)

Enabling Domain Name Stripping

You can configure the router to strip the domain name from usernames before any AAA services are used. Domain name stripping is done for domain maps. The router uses the delimiters and parsing direction you globally configure to determine the domain name

that is removed. For example, if the router uses the default delimiter and parsing direction **right-to-left**, the username **user1@example.com** is stripped to be **user1**.

To configure the router to strip the domain name from usernames in a domain map:

1. Specify the domain map for the stripping operation.

```
[edit]
user@host# edit access domain map domain-map-name
```

2. Enable domain name stripping.

```
[edit access domain map domain-map-name]
user@host# set strip-domain
```

**Related
Documentation**

- [Configuring Domain and Realm Name Usage for Domain Maps on page 168](#)

Specifying a Tunnel Profile in a Domain Map

Tunnel profiles specify tunnel definitions (for example, a set of L2TP tunnels and their attributes) that the router applies to subscriber sessions. The domain map feature enables you to apply a specific tunnel profile to subscribers in a particular domain.



NOTE: A tunnel profile specified by a RADIUS server in the Tunnel-Group attribute (VSA 26-64) takes precedence over the tunnel profile specified in the domain map.

To include a tunnel profile in a domain map:

1. Specify the domain map you want to configure.

```
[edit access]
user@host# edit domain map domain-map-name
```

2. Specify the tunnel profile you want to include in the domain map.

```
[edit access domain map domain-map-name]
user@host# set tunnel-profile profile-name
```

**Related
Documentation**

- [Domain Mapping Overview on page 158](#)
- [Configuring a Domain Map on page 162](#)
- [Configuring a Tunnel Profile for Subscriber Access](#)

Specifying a Tunnel Switch Profile in a Domain Map

Tunnel switch profiles determine whether packets in an L2TP subscriber session from a LAC are switched to another session that has a different destination LNS. The tunnel switch profile can also specify how certain L2TP AVPs are handled when the packets

are switched to a second tunnel. The domain map feature enables you to apply a specific tunnel switch profile to subscribers in a particular domain.



NOTE: A tunnel switch profile specified by a RADIUS server in the Tunnel Switch-Profile VSA (26-91) takes precedence over the tunnel switch profile specified in the domain map. If the Tunnel-Group VSA (26-64) is received in addition to the Tunnel Switch-Profile VSA (26-91), the Tunnel Switch-Profile VSA (26-91) takes precedence over the Tunnel-Group VSA (26-64), ensuring that the subscribers are tunnel switched rather than LAC tunneled.

To include a tunnel switch profile in a domain map:

1. Specify the domain map you want to configure.

```
[edit access]
user@host# edit domain map domain-map-name
```

2. Specify the tunnel switch profile you want to include in the domain map.

```
[edit access domain map domain-map-name]
user@host# set tunnel-switch-profile profile-name
```

Related Documentation

- [Domain Mapping Overview on page 158](#)
- [Configuring a Domain Map on page 162](#)
- [Configuring L2TP Tunnel Switching](#)

Configuring PADN Parameters for a Domain Map

You can configure PPPoE to receive PPPoE Active Discovery Network (PADN) messages when a subscriber connects to a PPPoE server. The PADN information associates the PPPoE session with a set of routes that the session can use. You can configure the route information in a domain map, which enables you to apply specific PADN information to subscribers in a particular domain. You can configure a maximum of 16 routes in a domain map.

To configure PADN parameters in a domain map:

1. Specify the domain map you want to configure.

```
[edit access]
user@host# edit domain map domain-map-name
```

2. Specify the PADN route information you want to include in the domain map. For each route, include the destination IP address, subnet mask, and route metric.

```
[edit access domain map domain-map-name]
user@host# set padn destination-address mask destination-mask metric route-metric
```

- Related Documentation**
- [Domain Mapping Overview on page 158](#)
 - [Configuring a Domain Map on page 162](#)

Configuring Dynamic Service Activation for Subscriber Access

- [Using RADIUS Dynamic Requests for Subscriber Access Management on page 175](#)
- [Dynamic Service Activation During Login Overview on page 176](#)
- [Configuring RADIUS-Initiated Dynamic Request Support on page 176](#)
- [RADIUS-Initiated Change of Authorization \(CoA\) Overview on page 177](#)
- [Usage Thresholds for Subscriber Services on page 180](#)
- [RADIUS-Initiated Disconnect Overview on page 181](#)
- [Error-Cause Codes \(RADIUS Attribute 101\) for Dynamic Requests on page 182](#)

Using RADIUS Dynamic Requests for Subscriber Access Management

RADIUS dynamic requests provide an efficient way to centrally manage subscriber sessions. The AAA Service Framework's RADIUS dynamic request support allows RADIUS servers to initiate user-related operations, such as a termination operation, by sending unsolicited request messages to the router. Without the RADIUS dynamic request feature, the only way to disconnect a RADIUS user is from the router, which can be cumbersome and time-consuming in large networks.

In a typical client-server RADIUS environment, the router functions as the client and initiates requests sent to the remote RADIUS server. However, when using RADIUS dynamic requests, the roles are reversed. For example, during a disconnect operation, the remote RADIUS server performs as the client and initiates the request (the disconnect action) — the router functions as the server in the relationship.

You create an access profile to configure the router to support RADIUS dynamic requests. This configuration enables the router to receive and act on the following types of messages from remote RADIUS servers:

- Access-Accept messages—Dynamically activate services based on attributes in RADIUS Access-Accept messages received when a subscriber logs in.
- Change-of-Authorization (CoA) messages—Dynamically modify active sessions based on attributes in CoA messages. CoA messages can include service creation requests, deletion requests, RADIUS attributes, and Juniper Networks VSAs.
- Disconnect messages—Immediately terminate specific subscriber sessions.

Related Documentation

- [Dynamic Service Activation During Login Overview on page 176](#)
- [RADIUS-Initiated Change of Authorization \(CoA\) Overview on page 177](#)
- [RADIUS-Initiated Disconnect Overview on page 181](#)
- [Configuring RADIUS-Initiated Dynamic Request Support on page 176](#)
- [RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework on page 13](#)
- [Error-Cause Codes \(RADIUS Attribute 101\) for Dynamic Requests on page 182](#)

Dynamic Service Activation During Login Overview

The AAA Service Framework enables the router to dynamically activate subscriber services as part of a subscriber login operation.

The framework sets up the subscriber session and then completes the service action specified by the Juniper Networks VSA 26–65 that is received in the Access-Accept message. If the service request is unsuccessful, the framework logs out the subscriber.

As part of dynamic service activation, you can also specify usage thresholds for the service—when the threshold is reached, the service is deactivated. You use Juniper Networks VSAs to set the thresholds for the maximum traffic volume for a service and for the length of time the service can be active.

Related Documentation

- [Using RADIUS Dynamic Requests for Subscriber Access Management on page 175](#)
- [Configuring RADIUS-Initiated Dynamic Request Support on page 176](#)
- [RADIUS-Initiated Disconnect Overview on page 181](#)
- [RADIUS-Initiated Change of Authorization \(CoA\) Overview on page 177](#)
- [Usage Thresholds for Subscriber Services on page 180](#)

Configuring RADIUS-Initiated Dynamic Request Support

The router uses the list of specified RADIUS authentication servers for both authentication and dynamic request operations. The router listens on UDP port 3799 for dynamic requests.

To configure RADIUS dynamic request support:

- Specify the IP address of the RADIUS server.

```
[edit access profile isp-bos-metro-fiber-basic radius]  
user@host# set authentication-server 192.168.1.3
```

To configure the router to support dynamic requests from more than one RADIUS server:

- Specify the IP addresses of multiple RADIUS servers.

```
[edit access profile isp-bos-metro-fiber-basic radius]
```

```
user@host# set authentication-server 192.168.1.3 192.168.10.15
```

You can define the UDP port number to configure the port on which the router that functions as the RADIUS dynamic-request server must receive requests from RADIUS servers. By default, the router listens on UDP port 3799 for dynamic requests from remote RADIUS servers. You can configure the UDP port number to be used for dynamic requests for a specific access profile or for all of the access profiles on the router. To define the UDP port number, include the **dynamic-request-port *port-number*** statement at the **[edit access profile *profile-name* radius-server *server-address*]** or the **[edit access radius-server *server-address*]** hierarchy level.

To specify the UDP port for all of the access profiles:

```
[edit access]
radius-server server-address {
  dynamic-request-port port-number;
}
```

To specify the UDP port for a specific access profile:

```
[edit access]
profile profile-name {
  radius-server server-address {
    dynamic-request-port port-number;
  }
}
```

Related Documentation

- [Using RADIUS Dynamic Requests for Subscriber Access Management on page 175](#)
- [Dynamic Service Activation During Login Overview on page 176](#)
- [RADIUS-Initiated Change of Authorization \(CoA\) Overview on page 177](#)
- [RADIUS-Initiated Disconnect Overview on page 181](#)
- [RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework on page 13](#)
- [Error-Cause Codes \(RADIUS Attribute 101\) for Dynamic Requests on page 182](#)

RADIUS-Initiated Change of Authorization (CoA) Overview

The AAA Service Framework uses CoA messages to dynamically modify active subscriber sessions. For example, RADIUS attributes in CoA messages might instruct the framework to create, modify, or terminate a subscriber service. You can also use CoA messages to set or modify usage thresholds for current subscriber services.

CoA Messages

Dynamic request support enables the router to receive and process unsolicited CoA messages from external RADIUS servers. RADIUS-initiated CoA messages use the following codes in request and response messages:

- CoA-Request (43)

- CoA-ACK (44)
- CoA-NAK (45)

Qualifications for Change of Authorization

To complete the change of authorization for a user, you specify identification attributes and session attributes. The identification attributes identify the subscriber. Session attributes specify the operation (activation or deactivation) to perform on the subscriber's session and also include any client attributes for the session (for example, QoS attributes). The AAA Service Framework handles the actual request.

Table 28 on page 178 shows the identification attributes for CoA operations.



NOTE: Using the Acct-Session-ID attribute to identify the subscriber session is more explicit than using the User-Name attribute. When you use the User-Name as the identifier, the CoA operation is applied to the first session that was logged in with the specified username. However, because a subscriber might have multiple sessions associated with the same username, the first session might not be the correct session for the CoA operation.

When you use the Acct-Session-ID attribute, it identifies the specific subscriber session, avoiding that potential error. Although the Acct-Session-ID attribute can include an interface specifier in addition to the session ID—when the attribute is in the description format—only the session ID is used for subscriber matching. For example, if the subscriber has a subscriber session ID of 54785, then the subscriber is matched when the Acct-Session-ID attribute is 54785 (decimal format), or `jnpr demux0.1073759682:54785` (description format), or indeed *any value:54785* (description format).

Table 28: Identification Attributes

Attribute	Description
User-Name [RADIUS attribute 1]	Subscriber username.
Acct-Session-ID [RADIUS attribute 44]	Specific subscriber session.

Table 29 on page 178 shows the session attributes for CoA operations. Any additional client attributes that you include depend on your particular session requirements.

Table 29: Session Attributes

Attribute	Description
Activate-Service [Juniper Networks VSA 26–65]	Service to activate for the subscriber.
Deactivate-Service [Juniper Networks VSA 26–66]	Service to deactivate for the subscriber.

Table 29: Session Attributes (*continued*)

Attribute	Description
Service-Volume [Juniper Networks VSA 26-67]	Amount of traffic, in MB, that can use the service; service is deactivated when the volume is exceeded.
Service-Timeout [Juniper Networks VSA 26-68]	Number of seconds that the service can be active; service is deactivated when the timeout expires.
Service-Volume-Gigawords [Juniper Networks VSA 26-179]	Amount of traffic, in 4GB units, that can use the service; service is deactivated when the volume is exceeded.
Update-Service [Juniper Networks VSA 26-180]	New values of service and time quotas for existing service.

Message Exchange

The RADIUS server and the AAA Service Framework on the router exchange messages using UDP. The CoA-Request message sent by the RADIUS server has the same format as the Disconnect-Request packet that is sent for a disconnect operation.

The response is either a CoA-ACK or a CoA-NAK message:

- If the AAA Service Framework successfully changes the authorization, the response is a RADIUS-formatted packet with a CoA-ACK message, and the data filter is applied to the session.
- If AAA Service Framework is unsuccessful, the request is malformed, or attributes are missing, the response is a RADIUS-formatted packet with a CoA-NAK message.



NOTE: The AAA Service Framework processes one dynamic request at a time per subscriber. If the framework receives a second dynamic request (either another CoA or a Disconnect-Request) while processing a previous request for the same subscriber, the framework responds with a CoA-NAK message.

Related Documentation

- [Using RADIUS Dynamic Requests for Subscriber Access Management on page 175](#)
- [Dynamic Service Activation During Login Overview on page 176](#)
- [RADIUS-Initiated Disconnect Overview on page 181](#)
- [Configuring RADIUS-Initiated Dynamic Request Support on page 176](#)
- [Usage Thresholds for Subscriber Services on page 180](#)

Usage Thresholds for Subscriber Services

Starting in Junos OS Release 14.1, subscriber management enables you to manage subscriber services by establishing usage thresholds when a service is dynamically activated or when an existing service is modified by a RADIUS CoA action. The service is deactivated when the specified threshold is reached.

Subscriber management supports two types of usage thresholds—traffic volume and time. You use Juniper Networks VSAs to set the usage thresholds. The VSAs are transmitted in RADIUS Access-Accept messages for dynamically activated services, or in RADIUS-initiated CoA-Request messages for existing services. The volume threshold sets the maximum amount of the total input and output traffic that can use the service before the service is deactivated. A time threshold sets the maximum length of time that the service can be active. [Table 30 on page 180](#) shows the VSAs used for volume and time thresholds.

Table 30: Juniper Network VSAs Used for Service Thresholds

Attribute Number	Attribute Name	Description	Value
26-67	Service-Volume	Amount of input and output traffic, in MB, that can use the service; service is deactivated when the volume is exceeded. Tagged VSA, which supports 8 tags (1-8). The router polls the traffic in 10 minute intervals.	<ul style="list-style-type: none"> range = 0 through 16777215 MB 0 = no limit
26-68	Service-Timeout	Number of seconds that the service can be active; service is deactivated when the timeout expires. Tagged VSA, which supports 8 tags (1-8).	<ul style="list-style-type: none"> range = 0 through 16777215 seconds 0 = no timeout
26-179	Service-Volume-Gigawords	Amount of input and output traffic, in 4GB units, that can use the service; service is deactivated when the volume is exceeded. Tagged VSA, which supports 8 tags (1-8). The router polls the traffic in 10 minute intervals.	<ul style="list-style-type: none"> range = 0 through 16777215 4GB units 0 = no limit
26-180	Update-Service	New values of service and time quotas for an existing service. Tagged VSA, which supports 8 tags (1-8).	string: <i>service-name</i>

Release History Table

Release	Description
14.1	Starting in Junos OS Release 14.1, subscriber management enables you to manage subscriber services by establishing usage thresholds when a service is dynamically activated or when an existing service is modified by a RADIUS CoA action.

Related Documentation

- [Dynamic Service Activation During Login Overview on page 176](#)

- [RADIUS-Initiated Change of Authorization \(CoA\) Overview on page 177](#)

RADIUS-Initiated Disconnect Overview

This section describes the AAA Service Framework's support for RADIUS-initiated disconnect dynamic requests. The AAA Service Framework uses disconnect messages to dynamically terminate active subscriber sessions.

Disconnect Messages

To centrally control the disconnection of remote access subscribers, the RADIUS dynamic request feature on the router receives and processes unsolicited messages from RADIUS servers.

The dynamic request feature uses the existing format of RADIUS disconnect request and response messages. RADIUS-initiated disconnect uses the following codes in its RADIUS request and response messages:

- Disconnect-Request (40)
- Disconnect-ACK (41)
- Disconnect-NAK (42)

Qualifications for Disconnect

For the AAA Service Framework to disconnect a user, the Disconnect-Request message must contain an attribute with an accounting session ID. The Disconnect-Request message can contain an Acct-Session-Id (44) attribute or an Acct-Multi-Session-Id (50) attribute for the session ID or both. If both the Acct-Session-Id and Acct-Multi-Session-Id attributes are present in the request, the router uses both attributes. If the User-Name (1) attribute is also present in the request, the username and accounting session ID are used to perform the disconnection. The AAA Service Framework handles the actual request.

Message Exchange

The RADIUS server and the AAA Service Framework exchange messages using UDP. The Disconnect-Request message sent by the RADIUS server has the same format as the CoA-Request packet that is sent for a change of authorization operation.

The disconnect response is either a Disconnect-ACK or a Disconnect-NAK message:

- If the AAA Service Framework successfully disconnects the user, the response is a RADIUS-formatted packet with a Disconnect-ACK message.
- If the AAA Service Framework cannot disconnect the user, the request is malformed, or attributes are missing from the request, the response is a RADIUS-formatted packet with a Disconnect-NAK message.



NOTE: The AAA Service Framework processes one dynamic request at a time per subscriber. If the framework receives a second dynamic request while processing a previous request (either a CoA or another Disconnect-Request) for the same subscriber, the framework responds with a Disconnect-NAK message.

Related Documentation

- [Using RADIUS Dynamic Requests for Subscriber Access Management on page 175](#)
- [Dynamic Service Activation During Login Overview on page 176](#)
- [Configuring RADIUS-Initiated Dynamic Request Support on page 176](#)

Error-Cause Codes (RADIUS Attribute 101) for Dynamic Requests

When a RADIUS-initiated CoA or disconnect operation is unsuccessful, the router includes an error-cause attribute (RADIUS attribute 101) in the CoA-NAK or Disconnect-NAK message that it sends back to the RADIUS server. If the detected error does not map to one of the supported error-cause attributes, the router sends the message without an error-cause attribute. [Table 31 on page 182](#) describes the error-cause codes.

Table 31: Error-Cause Codes (RADIUS Attribute 101)

Code	Value	Description
401	Unsupported attribute	The request contains an attribute that is not supported (for example, a third-party attribute).
402	Missing attribute	A critical attribute (for example, the session identification attribute) is missing from a request.
404	Invalid request	Some other aspect of the request is invalid, such as if one or more attributes are not formatted properly.
503	Session context not found	The session context identified in the request does not exist on the router.
504	Session context not removable	The subscriber identified by attributes in the request is owned by a component that is not supported.
506	Resources unavailable	A request could not be honored due to lack of available NAS resources (such as memory).

Related Documentation

- [RADIUS-Initiated Change of Authorization \(CoA\) Overview on page 177](#)
- [RADIUS-Initiated Disconnect Overview on page 181](#)

Configuring Termination Causes for Protocols

- [Understanding Session Termination Causes and RADIUS Termination Cause Codes on page 183](#)
- [Mapping Session Termination Causes to Custom Termination Cause Codes on page 185](#)
- [AAA Termination Causes and Code Values on page 186](#)
- [DHCP Termination Causes and Code Values on page 188](#)
- [L2TP Termination Causes and Code Values on page 189](#)
- [PPP Termination Causes and Code Values on page 209](#)
- [VLAN Termination Causes and Code Values on page 217](#)

Understanding Session Termination Causes and RADIUS Termination Cause Codes

When a RADIUS Acct-Stop message is issued as a result of the termination of a subscriber session or service session, the RADIUS Acct-Terminate-Cause attribute (49) reports the cause or reason for the termination. This attribute is included only in RADIUS Acct-Stop messages. The termination cause is conveyed as a code value in the attribute. *RFC 2866, RADIUS Accounting*, defines the standard mapping between 18 code values and termination causes.

Junos OS defines a set of internal termination cause codes that are mapped to the RFC-defined code values. Default mappings exist for AAA, DHCP, L2TP, PPP, and VLAN subscriber and service sessions. When a subscriber or service session is terminated, the router logs a message for the internal termination cause and logs another message for the RADIUS Acct-Terminate-Cause attribute.

You can use the logged information to help monitor and troubleshoot the events. For example, the AAA termination causes include session and service terminations as well as access denials. You might want to route the access failures to a team that monitors attempts to hack the network, the timeout failures to a AAA server team, and resource failures to a team that manages the routers.

Because there are many different Junos OS internal identifiers for termination causes and only 18 standard code values defined in the RFC, by default a given code value can map to multiple identifiers. Instead of using the default code values, you can optionally map any of the internally defined termination causes to any 32-bit number (1 through

4,294,967,295). The flexibility of customized mapping greatly increases the possibilities for fine-grained analytics and failure tracking.



NOTE: A single mapping for RADIUS account termination is shared by all clients.

Table 32 on page 184 lists the RFC-defined standard RADIUS Acct-Terminate-Cause codes and the corresponding causes.

Table 32: RFC-Defined Code Values and Termination Causes

Code Value	Termination Cause	Description
1	User Request	User initiated the disconnect (logout).
2	Lost Carrier	DCD was dropped on the port.
3	Lost Service	Service can no longer be provided; for example, the user's connection to a host was interrupted.
4	Idle Timeout	Idle timer expired.
5	Session Timeout	Subscriber reached the maximum continuous time allowed for the service or session.
6	Admin Reset	System administrator reset the port or session.
7	Admin Reboot	System administrator terminated the session on the NAS; for example, prior to rebooting the NAS.
8	Port Error	NAS detected an error on the port that required ending the session.
9	NAS Error	NAS detected an error (other than on the port) that required ending the session.
10	NAS Request	NAS ended the session for a non-error reason.
11	NAS Reboot	NAS ended the session due to a non-administrative reboot.
12	Port Unneeded	NAS ended the session because the resource usage fell below the low threshold; for example, the bandwidth-on-demand algorithm determined that the port was no longer needed.
13	Port Preempted	NAS ended the session to allocate the port to a higher-priority use.
14	Port Suspended	NAS ended the session to suspend a virtual session.

Table 32: RFC-Defined Code Values and Termination Causes (*continued*)

Code Value	Termination Cause	Description
15	Service Unavailable	NAS was unable to provide the requested service.
16	Callback	NAS is terminating the current session in order to perform callback for a new session.
17	User Error	Error in the user input caused the session to be terminated.
18	Host Request	Login host terminated the session normally.

Related Documentation

- [Configuring Custom Terminate Reason Mappings on page 185](#)
- [AAA Terminate Reasons on page 186](#)
- [DHCP Terminate Reasons on page 188](#)
- [L2TP Terminate Reasons on page 189](#)
- [PPP Terminate Reasons on page 209](#)
- [VLAN Termination Causes and Code Values on page 217](#)

Mapping Session Termination Causes to Custom Termination Cause Codes

By default, Junos OS uses the RFC-defined termination cause codes for the internal identifiers that identify the causes of session termination and that are reported in the RADIUS Acct-Terminate-Cause attribute (49). Internal identifiers are available for AAA, DHCP, L2TP, PPP, and VLAN subscriber and service session failures. When a subscriber or service session is terminated or denied, the router logs a message for the internal termination cause and logs another message for the RADIUS Acct-Terminate-Cause attribute. The Acct-Terminate-Cause attribute is included in RADIUS Acct-Stop messages. You can use the logged information to help monitor and troubleshoot terminated sessions.

You can optionally create customized mappings between any of the internal termination cause identifiers for the protocol and termination cause codes. You can specify any 32-bit value for the code, enabling you to track and analyze particular termination events at a more fine-grained level.

To configure customized mappings between a termination cause and a RADIUS cause code:

1. Edit the **access** hierarchy.

```
[edit]
user@host# edit access
```
2. Edit the **terminate-code** statement.



NOTE: Termination cause codes do not appear as options on platforms where they are not supported.

```
[edit access]
user@host# edit terminate-code
```

3. Specify the protocol option (**aaa (deny | service-shutdown | shutdown) | dhcp | l2tp | ppp | vlan**) that you want to modify.

```
[edit access terminate-code]
user@host# edit protocol-option
```

4. Specify an existing termination cause that you want to remap.

```
[edit access terminate-code protocol-option]
user@host# edit term-reason
```



NOTE: Attempts to remap a termination cause to its default code value are rejected by the CLI. You must delete a custom mapping to restore the default mapping.

5. Specify the RADIUS termination cause code value (from 1 through 4,294,967,295) that you want to map to the termination cause.

```
[edit access terminate-code protocol-option term-reason]
user@host# set radius term-cause
```

Use the **show network-access aaa terminate-code** command to display the mapping between AAA termination causes and cause code values.

Related Documentation

- [Mapping Application Terminate Reasons and RADIUS Terminate Codes on page 183](#)
- [AAA Terminate Reasons on page 186](#)
- [DHCP Terminate Reasons on page 188](#)
- [L2TP Terminate Reasons on page 189](#)
- [PPP Terminate Reasons on page 209](#)
- [VLAN Termination Causes and Code Values on page 217](#)

AAA Termination Causes and Code Values

When a AAA event terminates a subscriber or service session, causing a RADIUS Acct-Stop message to be issued, the RADIUS Acct-Terminate-Cause attribute (49) reports the cause or reason for the termination. This attribute is included only in RADIUS Acct-Stop messages. The termination cause is conveyed as a code value in the attribute. *RFC 2866, RADIUS Accounting*, defines the standard mapping between 18 code values and termination causes.

Junos OS defines a set of internal termination cause codes that are mapped to the RFC-defined code values. When a subscriber or service session is terminated, the router logs a message for the internal termination cause and logs another message for the RADIUS Acct-Terminate-Cause attribute. You can use the logged information to help monitor and troubleshoot terminated sessions.

Table 33 on page 187 lists the default mapping between the internal identifier for AAA termination causes and the code values that represent them in the RADIUS Acct-Terminate-Cause attribute (49).



NOTE: You can remap the internal identifiers to a custom code value in the range 1 through 4,294,967,295 by using the `terminate-code` statement at the `[edit access]` hierarchy level. You can view the current mapping by issuing the `show network-access terminate-code aaa detail` command.

Table 33: Default Mapping Between AAA Termination Causes and Code Values

Internal AAA Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
deny-authentication-denied	17	Subscriber access denied due to authentication failure.
deny-no-resources	10	Subscriber access denied for reasons such as no RADIUS server exists.
deny-server-request-timeout	17	Subscriber access denied because the BNG retried the Access-Request to the authentication server for the configured number of retries without receiving a response.
service-shutdown-network-logout	6	Service session termination initiated by deactivation of a family (network), typically triggered by termination of the corresponding Layer 3 access protocol.
service-shutdown-remote-reset	10	Service session termination initiated by an external authority, such as a CoA service deactivation.
service-shutdown-subscriber-logout	Inherited from the parent subscriber session.	Overrides the default value. This code is displayed only when you map it to a custom value.

Table 33: Default Mapping Between AAA Termination Causes and Code Values (*continued*)

Internal AAA Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
service-shutdown-time-limit	5	Service session termination initiated because the service time limit was reached.
service-shutdown-volume-limit	10	Service session termination initiated because the service traffic volume limit was reached.
shutdown-administrative-reset	6	Admin Reset
shutdown-idle-timeout	4	Idle Timeout
shutdown-remote-reset	10	NAS Request
shutdown-session-timeout	5	Session Timeout

Related Documentation

- [Mapping Application Terminate Reasons and RADIUS Terminate Codes on page 183](#)
- [Configuring Custom Terminate Reason Mappings on page 185](#)

DHCP Termination Causes and Code Values

When a DHCP event terminates a subscriber session, causing a RADIUS Acct-Stop message to be issued, the RADIUS Acct-Terminate-Cause attribute (49) reports the cause or reason for the termination. This attribute is included only in RADIUS Acct-Stop messages. The termination cause is conveyed as a code value in the attribute. *RFC 2866, RADIUS Accounting*, defines the standard mapping between 18 code values and termination causes.

Junos OS defines a set of internal termination cause codes that are mapped to the RFC-defined code values. When a subscriber session is terminated, the router logs a message for the internal termination cause and logs another message for the RADIUS Acct-Terminate-Cause attribute. You can use the logged information to help monitor and troubleshoot terminated sessions.

[Table 34 on page 189](#) lists the default mapping between the internal identifier for DHCP termination causes and the code values that represent them in the RADIUS Acct-Terminate-Cause attribute (49).



NOTE: You can remap the internal identifiers to a custom code value in the range 1 through 4,294,967,295 by using the `terminate-code` statement at the `[edit access]` hierarchy level. You can view the current mapping by issuing the `show network-access terminate-code dhcp detail` command.

Table 34: Default Mapping Between DHCP Termination Causes and Code Values

Internal DHCP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
client request	1	User Request
lost-carrier	2	Lost Carrier
nak	15	Service Unavailable
nas logout	10	NAS Request
no offers	4	Idle Timeout

Related Documentation

- [Mapping Application Terminate Reasons and RADIUS Terminate Codes on page 183](#)
- [Configuring Custom Terminate Reason Mappings on page 185](#)

L2TP Termination Causes and Code Values

When an L2TP event terminates a subscriber session, causing a RADIUS Acct-Stop message to be issued, the RADIUS Acct-Terminate-Cause attribute (49) reports the cause or reason for the termination. This attribute is included only in RADIUS Acct-Stop messages. The termination cause is conveyed as a code value in the attribute. *RFC 2866, RADIUS Accounting*, defines the standard mapping between 18 code values and termination causes.

Junos OS defines a set of internal termination cause codes that are mapped to the RFC-defined code values. When a subscriber session is terminated, the router logs a message for the internal termination cause and logs another message for the RADIUS Acct-Terminate-Cause attribute. You can use the logged information to help monitor and troubleshoot terminated sessions.

[Table 35 on page 190](#) lists the default mapping between the internal identifier for L2TP termination causes and the code values that represent them in the RADIUS Acct-Terminate-Cause attribute (49).



NOTE: You can remap the internal identifiers to a custom code value in the range 1 through 4,294,967,295 by using the `terminate-code` statement at the [edit access] hierarchy level. You can view the current mapping by issuing the `show network-access terminate-code l2tp detail` command.

Table 35: Default Mapping Between L2TP Termination Causes and Code Values

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
issu in progress	9	NAS Error
session access interface down	8	Port Error
session admin close	6	Admin Reset
session admin drain	6	Admin Reset
session call down	10	NAS Request
session call failed	15	Service Unavailable
session create failed limit reached	9	NAS Error
session create failed no resources	9	NAS Error
session create failed single shot tunnel already fired	9	NAS Error
session create failed too busy	9	NAS Error
session failover protocol resync disconnect	6	Admin Reset
session hardware unavailable	8	Port Error
session no resources server port	9	NAS Error
session not ready	9	NAS Error
session rx cdn	10	NAS Request
session rx cdn avp bad hidden	10	NAS Request
session rx cdn avp bad value assigned session id	10	NAS Request

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
session rx cdn avp duplicate value assigned session id	10	NAS Request
session rx cdn avp malformed bad length	10	NAS Request
session rx cdn avp malformed truncated	10	NAS Request
session rx cdn avp missing mandatory assigned session id	10	NAS Request
session rx cdn avp missing mandatory result code	10	NAS Request
session rx cdn avp missing random vector	10	NAS Request
session rx cdn avp missing secret	10	NAS Request
session rx cdn avp unknown	10	NAS Request
session rx cdn no resources	10	NAS Request
session rx iccn avp bad hidden	10	NAS Request
session rx iccn avp bad value framing type	10	NAS Request
session rx iccn avp bad value proxy authen type	10	NAS Request
session rx iccn avp bad value unsupported proxy authen type	10	NAS Request
session rx iccn avp malformed bad length	10	NAS Request
session rx iccn avp malformed truncated	10	NAS Request
session rx iccn avp missing mandatory connect speed	10	NAS Request
session rx iccn avp missing mandatory framing type	10	NAS Request
session rx iccn avp missing mandatory proxy authen challenge	10	NAS Request

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
session rx iccn avp missing mandatory proxy authen id	10	NAS Request
session rx iccn avp missing mandatory proxy authen name	10	NAS Request
session rx iccn avp missing mandatory proxy authen response	10	NAS Request
session rx iccn avp missing random vector	10	NAS Request
session rx iccn avp missing secret	10	NAS Request
session rx iccn avp unknown	10	NAS Request
session rx iccn no resources	10	NAS Request
session rx iccn unexpected	10	NAS Request
session rx icrp avp bad hidden	10	NAS Request
session rx icrp avp bad value assigned session id	10	NAS Request
session rx icrp avp duplicate value assigned session id	10	NAS Request
session rx icrp avp malformed bad length	10	NAS Request
session rx icrp avp malformed truncated	10	NAS Request
session rx icrp avp missing mandatory assigned session id	10	NAS Request
session rx icrp avp missing random vector	10	NAS Request
session rx icrp avp missing secret	10	NAS Request
session rx icrp avp unknown	10	NAS Request
session rx icrp no resources	10	NAS Request
session rx icrp unexpected	10	NAS Request

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
session rx icrq admin close	6	Admin Reset
session rx icrq authenticate failed host	10	NAS Request
session rx icrq avp bad hidden	10	NAS Request
session rx icrq avp bad value assigned session id	10	NAS Request
session rx icrq avp bad value bearer type	10	NAS Request
session rx icrq avp bad value cisco nas port	10	NAS Request
session rx icrq avp duplicate value assigned session id	10	NAS Request
session rx icrq avp malformed bad length	10	NAS Request
session rx icrq avp malformed truncated	10	NAS Request
session rx icrq avp missing mandatory assigned session id	10	NAS Request
session rx icrq avp missing mandatory call serial number	10	NAS Request
session rx icrq avp missing random vector	10	NAS Request
session rx icrq avp missing secret	10	NAS Request
session rx icrq avp unknown	10	NAS Request
session rx icrq no resources	10	NAS Request
session rx icrq unexpected	10	NAS Request
session rx occn avp bad hidden	10	NAS Request
session rx occn avp bad value framing type	10	NAS Request
session rx occn avp malformed bad length	10	NAS Request
session rx occn avp malformed truncated	10	NAS Request

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
session rx occn avp missing mandatory connect speed	10	NAS Request
session rx occn avp missing mandatory framing type	10	NAS Request
session rx occn avp missing random vector	10	NAS Request
session rx occn avp missing secret	10	NAS Request
session rx occn avp unknown	10	NAS Request
session rx occn no resources	10	NAS Request
session rx occn unexpected	10	NAS Request
session rx ocrp avp bad hidden	10	NAS Request
session rx ocrp avp bad value assigned session id	10	NAS Request
session rx ocrp avp duplicate value assigned session id	10	NAS Request
session rx ocrp avp malformed bad length	10	NAS Request
session rx ocrp avp malformed truncated	10	NAS Request
session rx ocrp avp missing mandatory assigned session id	10	NAS Request
session rx ocrp avp missing random vector	10	NAS Request
session rx ocrp avp missing secret	10	NAS Request
session rx ocrp avp unknown	10	NAS Request
session rx ocrp no resources	10	NAS Request
session rx ocrp unexpected	10	NAS Request
session rx ocrq admin close	10	Admin Reset
session rx ocrq authenticate failed host	10	NAS Request

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
session rx ocrq avp bad hidden	10	NAS Request
session rx ocrq avp bad value assigned session id	10	NAS Request
session rx ocrq avp bad value bearer type	10	NAS Request
session rx ocrq avp bad value framing type	10	NAS Request
session rx ocrq avp duplicate value assigned session id	10	NAS Request
session rx ocrq avp malformed bad length	10	NAS Request
session rx ocrq avp malformed truncated	10	NAS Request
session rx ocrq avp missing mandatory assigned session id	10	NAS Request
session rx ocrq avp missing mandatory bearer type	10	NAS Request
session rx ocrq avp missing mandatory call serial number	10	NAS Request
session rx ocrq avp missing mandatory called number	10	NAS Request
session rx ocrq avp missing mandatory framing type	10	NAS Request
session rx ocrq avp missing mandatory maximum bps	10	NAS Request
session rx ocrq avp missing mandatory minimum bps	10	NAS Request
session rx ocrq avp missing random vector	10	NAS Request
session rx ocrq avp missing secret	10	NAS Request
session rx ocrq avp unknown	10	NAS Request
session rx ocrq no resources	10	NAS Request

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
session rx ocrq unexpected	10	NAS Request
session rx ocrq unsupported	9	NAS Error
session rx sli avp bad hidden	10	NAS Request
session rx sli avp bad value accm	10	NAS Request
session rx sli avp malformed bad length	10	NAS Request
session rx sli avp malformed truncated	10	NAS Request
session rx sli avp missing mandatory accm	10	NAS Request
session rx sli avp missing random vector	10	NAS Request
session rx sli avp missing secret	10	NAS Request
session rx sli avp unknown	10	NAS Request
session rx sli no resources	10	NAS Request
session rx unexpected packet lac incoming	10	NAS Request
session rx unexpected packet lac outgoing	10	NAS Request
session rx unexpected packet lns incoming	10	NAS Request
session rx unexpected packet lns outgoing	10	NAS Request
session rx unknown session id	10	NAS Request
session rx wen avp bad hidden	10	NAS Request
session rx wen avp malformed bad length	10	NAS Request
session rx wen avp malformed truncated	10	NAS Request
session rx wen avp missing mandatory call errors	10	NAS Request
session rx wen avp missing random vector	10	NAS Request

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
session rx wen avp missing secret	10	NAS Request
session rx wen avp unknown	10	NAS Request
session rx wen no resources	10	NAS Request
session timeout connection	10	NAS Request
session timeout inactivity	4	idle timeout
session timeout session	5	session timeout
session timeout upper create	9	NAS Error
session transmit speed unavailable	9	NAS error
session tunnel down	15	Service Unavailable
session tunnel failed	15	Service Unavailable
session tunnel switch profile deleted	6	Admin Reset
session tunneled interface down	8	Port Error
session unknown cause	9	NAS Error
session upper create failed	9	NAS Error
session upper removed	15	Service Unavailable
session warmstart not operational	15	Service Unavailable
session warmstart recovery error	15	Service Unavailable
session warmstart upper not restacked	10	NAS request
tunnel admin close	6	Admin Reset
tunnel admin drain	6	Admin Reset
tunnel control channel failed	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel created no sessions	1	User Request
tunnel destination address changed	6	Admin Reset
tunnel destination down	10	NAS Request
tunnel failover protocol no resources for recovery tunnel	15	Service Unavailable
tunnel failover protocol no resources for session resync	15	Service Unavailable
tunnel failover protocol not supported	15	Service Unavailable
tunnel failover protocol not supported by peer	15	Service Unavailable
tunnel failover protocol recovery control channel failed	15	Service Unavailable
tunnel failover protocol recovery tunnel failed	15	Service Unavailable
tunnel failover protocol recovery tunnel finished	1	User Request
tunnel failover protocol recovery tunnel primary down	1	User Request
tunnel failover protocol session resync failed	15	Service Unavailable
tunnel host profile changed	6	Admin Reset
tunnel host profile deleted	6	Admin Reset
tunnel rx scccn authenticate failed challenge	17	User Error
tunnel rx scccn avp bad hidden	15	Service Unavailable
tunnel rx scccn avp bad value challenge response	15	Service Unavailable
tunnel rx scccn avp malformed bad length	15	Service Unavailable
tunnel rx scccn avp malformed truncated	15	Service Unavailable
tunnel rx scccn avp missing challenge response	17	User Error

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx scccn avp missing random vector	15	Service Unavailable
tunnel rx scccn avp missing secret	15	Service Unavailable
tunnel rx scccn avp unexpected challenge response	15	Service Unavailable
tunnel rx scccn avp unknown	15	Service Unavailable
tunnel rx scccn no resources	15	Service Unavailable
tunnel rx scccn session id not null	15	Service Unavailable
tunnel rx scccn unexpected	15	Service Unavailable
tunnel rx sccrp authenticate failed challenge	17	User Error
tunnel rx sccrp authenticate failed host	17	User Error
tunnel rx sccrp avp bad hidden	15	Service Unavailable
tunnel rx sccrp avp bad value assigned tunnel id	15	Service Unavailable
tunnel rx sccrp avp bad value bearer capabilities	15	Service Unavailable
tunnel rx sccrp avp bad value challenge	15	Service Unavailable
tunnel rx sccrp avp bad value challenge response	15	Service Unavailable
tunnel rx sccrp avp bad value failover capability	15	Service Unavailable
tunnel rx sccrp avp bad value framing capabilities	15	Service Unavailable
tunnel rx sccrp avp bad value protocol version	15	Service Unavailable
tunnel rx sccrp avp bad value receive window size	15	Service Unavailable
tunnel rx sccrp avp duplicate value assigned tunnel id	15	Service Unavailable
tunnel rx sccrp avp malformed bad length	15	Service Unavailable
tunnel rx sccrp avp malformed truncated	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx sccrp avp missing challenge response	17	User Error
tunnel rx sccrp avp missing mandatory assigned tunnel id	15	Service Unavailable
tunnel rx sccrp avp missing mandatory framing capabilities	15	Service Unavailable
tunnel rx sccrp avp missing mandatory host name	15	Service Unavailable
tunnel rx sccrp avp missing mandatory protocol version	15	Service Unavailable
tunnel rx sccrp avp missing random vector	15	Service Unavailable
tunnel rx sccrp avp missing secret	15	Service Unavailable
tunnel rx sccrp avp unexpected challenge response	15	Service Unavailable
tunnel rx sccrp avp unexpected challenge without secret	15	Service Unavailable
tunnel rx sccrp avp unknown	15	Service Unavailable
tunnel rx sccrp no resources	15	Service Unavailable
tunnel rx sccrp session id not null	15	Service Unavailable
tunnel rx sccrp unexpected	15	Service Unavailable
tunnel rx sccrq admin close	6	Admin Reset
tunnel rx sccrq authenticate failed host	17	User Error
tunnel rx sccrq avp bad hidden	15	Service Unavailable
tunnel rx sccrq avp bad value assigned tunnel id	15	Service Unavailable
tunnel rx sccrq avp bad value bearer capabilities	15	Service Unavailable
tunnel rx sccrq avp bad value challenge	15	Service Unavailable
tunnel rx sccrq avp bad value failover capability	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx sccrq avp bad value framing capabilities	15	Service Unavailable
tunnel rx sccrq avp bad value protocol version	15	Service Unavailable
tunnel rx sccrq avp bad value receive window size	15	Service Unavailable
tunnel rx sccrq avp duplicate value assigned tunnel id	15	Service Unavailable
tunnel rx sccrq avp malformed bad length	15	Service Unavailable
tunnel rx sccrq avp malformed truncated	15	Service Unavailable
tunnel rx sccrq avp missing mandatory assigned tunnel id	15	Service Unavailable
tunnel rx sccrq avp missing mandatory framing capabilities	15	Service Unavailable
tunnel rx sccrq avp missing mandatory host name	15	Service Unavailable
tunnel rx sccrq avp missing mandatory protocol version	15	Service Unavailable
tunnel rx sccrq avp missing random vector	15	Service Unavailable
tunnel rx sccrq avp missing secret	15	Service Unavailable
tunnel rx sccrq avp unexpected challenge without secret	15	Service Unavailable
tunnel rx sccrq avp unknown	15	Service Unavailable
tunnel rx sccrq bad address	15	Service Unavailable
tunnel rx sccrq no resources	15	Service Unavailable
tunnel rx sccrq no resources max tunnels	15	Service Unavailable
tunnel rx sccrq session id not null	15	Service Unavailable
tunnel rx sccrq unexpected	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx stopccn	1	User Request
tunnel rx stopccn avp bad hidden	15	Service Unavailable
tunnel rx stopccn avp bad value assigned tunnel id	15	Service Unavailable
tunnel rx stopccn avp duplicate value assigned tunnel id	15	Service Unavailable
tunnel rx stopccn avp malformed bad length	15	Service Unavailable
tunnel rx stopccn avp malformed truncated	15	Service Unavailable
tunnel rx stopccn avp missing mandatory assigned tunnel id	15	Service Unavailable
tunnel rx stopccn avp missing mandatory result code	15	Service Unavailable
tunnel rx stopccn avp missing random vector	15	Service Unavailable
tunnel rx stopccn avp missing secret	15	Service Unavailable
tunnel rx stopccn avp unknown	15	Service Unavailable
tunnel rx stopccn no resources	15	Service Unavailable
tunnel rx stopccn session id not null	15	Service Unavailable
tunnel rx frs avp malformed truncated	15	Service Unavailable
tunnel rx frs avp missing mandatory failover session state	15	Service Unavailable
tunnel rx frs avp missing random vector	15	Service Unavailable
tunnel rx frs avp missing secret	15	Service Unavailable
tunnel rx frs avp unknown	15	Service Unavailable
tunnel rx frs no resources	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx frs session id not null	15	Service Unavailable
tunnel rx fsq avp bad hidden	15	Service Unavailable
tunnel rx fsq avp malformed bad length	15	Service Unavailable
tunnel rx fsq avp malformed truncated	15	Service Unavailable
tunnel rx fsq avp missing mandatory failover session state	15	Service Unavailable
tunnel rx fsq avp missing random vector	15	Service Unavailable
tunnel rx fsq avp missing secret	15	Service Unavailable
tunnel rx fsq avp unknown	15	Service Unavailable
tunnel rx fsq no resources	15	Service Unavailable
tunnel rx fsq session id not null	15	Service Unavailable
tunnel rx fsr avp bad hidden	15	Service Unavailable
tunnel rx fsr avp malformed bad length	15	Service Unavailable
tunnel rx unexpected packet	15	Service Unavailable
tunnel rx unexpected packet for session	15	Service Unavailable
tunnel rx unknown packet message type indecipherable	15	Service Unavailable
tunnel rx unknown packet message type unrecognized	15	Service Unavailable
tunnel rx recovery sccn authenticate failed challenge	17	User Error
tunnel rx recovery sccn avp bad hidden	15	Service Unavailable
tunnel rx recovery sccn avp bad value challenge response	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx recovery sccn avp malformed bad length	15	Service Unavailable
tunnel rx recovery sccn avp malformed truncated	15	Service Unavailable
tunnel rx recovery sccn avp missing challenge response	17	User Error
tunnel rx recovery sccn avp missing random vector	15	Service Unavailable
tunnel rx recovery sccn avp missing secret	15	Service Unavailable
tunnel rx recovery sccn avp unexpected challenge response	15	Service Unavailable
tunnel rx recovery sccn avp unknown	15	Service Unavailable
tunnel rx recovery sccn no resources	15	Service Unavailable
tunnel rx recovery sccn session id not null	15	Service Unavailable
tunnel rx recovery sccrp authenticate failed challenge	17	User Error
tunnel rx recovery sccrp avp bad hidden	15	Service Unavailable
tunnel rx recovery sccrp avp bad value assigned tunnel id	15	Service Unavailable
tunnel rx recovery sccrp avp bad value bearer capabilities	15	Service Unavailable
tunnel rx recovery sccrp avp bad value challenge	15	Service Unavailable
tunnel rx recovery sccrp avp bad value challenge response	15	Service Unavailable
tunnel rx recovery sccrp avp bad value framing capabilities	15	Service Unavailable
tunnel rx recovery sccrp avp bad value protocol version	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx recovery sccrp avp bad value receive window size	15	Service Unavailable
tunnel rx recovery sccrp avp bad value suggested control sequence	15	Service Unavailable
tunnel rx recovery sccrp avp duplicate value assigned tunnel id	15	Service Unavailable
tunnel rx recovery sccrp avp malformed bad length	15	Service Unavailable
tunnel rx recovery sccrp avp malformed truncated	15	Service Unavailable
tunnel rx recovery sccrp avp mismatched host name	15	Service Unavailable
tunnel rx recovery sccrp avp mismatched vendor name	15	Service Unavailable
tunnel rx recovery sccrp avp missing challenge response	17	User Error
tunnel rx recovery sccrp avp missing mandatory assigned tunnel id	15	Service Unavailable
tunnel rx recovery sccrp avp missing mandatory framing capabilities	15	Service Unavailable
tunnel rx recovery sccrp avp missing mandatory host name	15	Service Unavailable
tunnel rx recovery sccrp avp missing mandatory protocol version	15	Service Unavailable
tunnel rx recovery sccrp avp missing random vector	15	Service Unavailable
tunnel rx recovery sccrp avp missing secret	15	Service Unavailable
tunnel rx recovery sccrp avp unexpected challenge response	15	Service Unavailable
tunnel rx recovery sccrp avp unexpected challenge without secret	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx recovery sccrp avp unknown	15	Service Unavailable
tunnel rx recovery sccrp no resources	15	Service Unavailable
tunnel rx recovery sccrp session id not null	15	Service Unavailable
tunnel rx recovery sccrq admin close	6	Admin Reset
tunnel rx recovery sccrq avp bad hidden	15	Service Unavailable
tunnel rx recovery sccrq avp bad value assigned tunnel id	15	Service Unavailable
tunnel rx recovery sccrq avp bad value bearer capabilities	15	Service Unavailable
tunnel rx recovery sccrq avp bad value challenge	15	Service Unavailable
tunnel rx recovery sccrq avp bad value framing capabilities	15	Service Unavailable
tunnel rx recovery sccrq avp bad value protocol version	15	Service Unavailable
tunnel rx recovery sccrq avp bad value receive window size	15	Service Unavailable
tunnel rx recovery sccrq avp bad value tunnel recovery	15	Service Unavailable
tunnel rx recovery sccrq avp duplicate value assigned tunnel id	15	Service Unavailable
tunnel rx recovery sccrq avp duplicate value tie breaker	15	Service Unavailable
tunnel rx recovery sccrq avp malformed bad length	15	Service Unavailable
tunnel rx recovery sccrq avp malformed truncated	15	Service Unavailable
tunnel rx recovery sccrq avp mismatched host name	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx recovery sccrq avp mismatched vendor name	15	Service Unavailable
tunnel rx recovery sccrq avp missing mandatory assigned tunnel id	15	Service Unavailable
tunnel rx recovery sccrq avp missing mandatory framing capabilities	15	Service Unavailable
tunnel rx recovery sccrq avp missing mandatory host name	15	Service Unavailable
tunnel rx recovery sccrq avp missing mandatory protocol version	15	Service Unavailable
tunnel rx recovery sccrq avp missing mandatory tunnel recovery	15	Service Unavailable
tunnel rx recovery sccrq avp missing random vector	15	Service Unavailable
tunnel rx recovery sccrq avp missing secret	15	Service Unavailable
tunnel rx recovery sccrq avp missing tie breaker	15	Service Unavailable
tunnel rx recovery sccrq avp unexpected challenge without secret	15	Service Unavailable
tunnel rx recovery sccrq avp unknown	15	Service Unavailable
tunnel rx recovery sccrq no resources	15	Service Unavailable
tunnel rx recovery sccrq session id not null	15	Service Unavailable
tunnel rx recovery sccrq tunnel id not null	15	Service Unavailable
tunnel rx recovery stopccn avp bad hidden	15	Service Unavailable
tunnel rx recovery stopccn avp bad value assigned tunnel id	15	Service Unavailable
tunnel rx recovery stopccn avp duplicate value assigned tunnel id	15	Service Unavailable

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (*continued*)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel rx recovery stopccn avp malformed bad length	15	Service Unavailable
tunnel rx recovery stopccn avp malformed truncated	15	Service Unavailable
tunnel rx recovery stopccn avp missing mandatory assigned tunnel id	15	Service Unavailable
tunnel rx recovery stopccn avp missing mandatory result code	15	Service Unavailable
tunnel rx recovery stopccn avp missing random vector	15	Service Unavailable
tunnel rx recovery stopccn avp missing secret	15	Service Unavailable
tunnel rx recovery stopccn avp unknown	15	Service Unavailable
tunnel rx recovery stopccn no resources	15	Service Unavailable
tunnel rx recovery stopccn session id not null	15	Service Unavailable
tunnel rx recovery unexpected packet	15	Service Unavailable
tunnel rx recovery unknown packet message type indecipherable	15	Service Unavailable
tunnel rx recovery unknown packet message type unrecognized	15	Service Unavailable
tunnel rx session packet null sid invalid	15	Service Unavailable
tunnel rx session packet null sid without assigned session id	15	Service Unavailable
tunnel timeout connection	15	Service Unavailable
tunnel timeout connection recovery tunnel	15	Service Unavailable
tunnel timeout idle	1	User Request
tunnel unknown cause	9	NAS Error

Table 35: Default Mapping Between L2TP Termination Causes and Code Values (continued)

Internal L2TP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
tunnel warmstart not operational	15	Service Unavailable
tunnel warmstart recovery error	15	Service Unavailable

Related Documentation

- [Mapping Application Terminate Reasons and RADIUS Terminate Codes on page 183](#)
- [Configuring Custom Terminate Reason Mappings on page 185](#)

PPP Termination Causes and Code Values

When a PPP event terminates a subscriber session, causing a RADIUS Acct-Stop message to be issued, the RADIUS Acct-Terminate-Cause attribute (49) reports the cause or reason for the termination. This attribute is included only in RADIUS Acct-Stop messages. The termination cause is conveyed as a code value in the attribute. *RFC 2866, RADIUS Accounting*, defines the standard mapping between 18 termination causes and code values.

Junos OS defines a set of internal termination cause codes that are mapped to the RFC-defined code values. When a subscriber session is terminated, the router logs a message for the internal termination cause and logs another message for the RADIUS Acct-Terminate-Cause attribute. You can use the logged information to help monitor and troubleshoot terminated sessions.

[Table 36 on page 210](#) lists the default mapping between the internal identifier for PPP termination causes and the code values that represent them in the RADIUS Acct-Terminate-Cause attribute (49).



NOTE: You can remap the internal identifiers to a custom code value in the range 1 through 4,294,967,295 by using the `terminate-code` statement at the `[edit access]` hierarchy level. You can view the current mapping by issuing the `show network-access terminate-code ppp detail` command.

[Table 36 on page 210](#) lists the default PPP terminate mappings. The table indicates the supported PPP terminate reasons and the RADIUS Acct-Terminate-Cause attributes they are mapped to by default.

Table 36: Default Mapping Between PPP Termination Causes and Code Values

Internal PPP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
admin logout	10	NAS Request
authenticate authenticator timeout	17	User Error
authenticate challenge timeout	10	NAS Request
authenticate chap no resources	10	NAS Request
authenticate chap peer authenticator timeout	17	User Error
authenticate deny by peer	17	User Error
authenticate inactivity timeout	4	Idle Timeout
authenticate max requests	10	NAS Request
authenticate no authenticator	10	NAS Request
authenticate pap peer authenticator timeout	17	User Error
authenticate pap request timeout	10	NAS Request
authenticate Session Timeout	5	Session Timeout
authenticate too many requests	10	NAS Request
authenticate tunnel fail immediate	10	NAS Request
authenticate tunnel unsupported tunnel type	10	NAS Request
bundle fail create	10	NAS Request
bundle fail engine add	10	NAS Request
bundle fail fragment size mismatch	10	NAS Request
bundle fail fragmentation location	10	NAS Request
bundle fail fragmentation mismatch	10	NAS Request
bundle fail join	10	NAS Request

Table 36: Default Mapping Between PPP Termination Causes and Code Values (*continued*)

Internal PPP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
bundle fail link selection mismatch	10	NAS Request
bundle fail local mped not set yet	10	NAS Request
bundle fail local mrru mismatch	10	NAS Request
bundle fail local mru mismatch	10	NAS Request
bundle fail peer mrru mismatch	10	NAS Request
bundle fail reassembly location	10	NAS Request
bundle fail reassembly mismatch	10	NAS Request
bundle fail record network	10	NAS Request
bundle fail server location mismatch	10	NAS Request
bundle fail static link	10	NAS Request
failover during authentication	6	Admin Reset
interface admin disable	6	Admin Reset
interface down	2	Lost Carrier
interface no hardware	8	Port Error
ip admin disable	10	NAS Request
ip inhibited by authentication	10	NAS Request
ip link down	10	NAS Request
ip max configure exceeded	10	NAS Request
ip no local ip address	10	NAS Request
ip no local ip address mask	10	NAS Request
ip no local primary dns address	10	NAS Request

Table 36: Default Mapping Between PPP Termination Causes and Code Values (*continued*)

Internal PPP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
ip no local primary nbns address	10	NAS Request
ip no local secondary dns address	10	NAS Request
ip no local secondary nbns address	10	NAS Request
ip no peer ip address	10	NAS Request
ip no peer ip address mask	10	NAS Request
ip no peer primary dns address	10	NAS Request
ip no peer primary nbns address	10	NAS Request
ip no peer secondary dns address	10	NAS Request
ip no peer secondary nbns address	10	NAS Request
ip no service	10	NAS Request
ip peer renegotiate rx conf ack	10	NAS Request
ip peer renegotiate rx conf nak	10	NAS Request
ip peer renegotiate rx conf rej	10	NAS Request
ip peer renegotiate rx conf req	10	NAS Request
ip peer terminate term ack	10	NAS Request
ip peer terminate code rej	10	NAS Request
ip peer terminate term req	10	NAS Request
ip service disable	10	NAS Request
ip stale stacking	10	NAS Request
ipv6 admin disable	10	NAS Request
ipv6 inhibited by authentication	10	NAS Request

Table 36: Default Mapping Between PPP Termination Causes and Code Values (*continued*)

Internal PPP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
ipv6 link down	10	NAS Request
ipv6 local and peer interface ids identical	10	NAS Request
ipv6 max configure exceeded	10	NAS Request
ipv6 no local ipv6 interface id	10	NAS Request
ipv6 no peer ipv6 interface id	10	NAS Request
ipv6 no service	10	NAS Request
ipv6 peer renegotiate rx conf ack	10	NAS Request
ipv6 peer renegotiate rx conf nak	10	NAS Request
ipv6 peer renegotiate rx conf rej	10	NAS Request
ipv6 peer renegotiate rx conf req	10	NAS Request
ipv6 peer terminate code rej	10	NAS Request
ipv6 peer terminate term ack	10	NAS Request
ipv6 peer terminate term req	10	NAS Request
ipv6 service disable	10	NAS Request
ipv6 stale stacking	10	NAS Request
lcp authenticate terminate hold	10	NAS Request
lcp configured mrru too small	10	NAS Request
lcp configured mru invalid	10	NAS Request
lcp configured mru too small	10	NAS Request
lcp dynamic interface hold	10	NAS Request
lcp keepalive failure	10	NAS Request

Table 36: Default Mapping Between PPP Termination Causes and Code Values (*continued*)

Internal PPP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
lcp loopback rx conf req	10	NAS Request
lcp loopback rx echo reply	10	NAS Request
lcp loopback rx echo req	10	NAS Request
lcp max configure exceeded	10	NAS Request
lcp mru changed	10	NAS Request
lcp negotiation timeout	10	NAS Request
lcp no localacm	10	NAS Request
lcp no localacfc	10	NAS Request
lcp no local authentication	10	NAS Request
lcp no local endpoint discriminator	10	NAS Request
lcp no local magic number	10	NAS Request
lcp no local mrru	10	NAS Request
lcp no local mru	10	NAS Request
lcp no localpfc	10	NAS Request
lcp no peer accm	10	NAS Request
lcp no peer authentication	10	NAS Request
lcp no peer endpoint discriminator	10	NAS Request
lcp no peer magicnumber	10	NAS Request
lcp no peer mrru	10	NAS Request
lcp no peer mru	10	NAS Request
lcp no peer pfc	10	NAS Request

Table 36: Default Mapping Between PPP Termination Causes and Code Values (*continued*)

Internal PPP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
lcp peer terminate code rej	1	User Request
lcp peer terminate term ack	1	User Request
lcp peer terminate term req	1	User Request
lcp peer terminate protocol reject	1	User Request
lcp peer renegotiate rx conf ack	1	User Request
lcp peer renegotiate rx conf nak	1	User Request
lcp peer renegotiate rx conf rej	1	User Request
lcp peer renegotiate rx conf req	1	User Request
lcp tunnel disconnected	10	NAS Request
lcp tunnel failed	10	NAS Request
link interface no hardware	8	Port Error
lower interface attach failed	2	Lost Carrier
lower interface teardown	2	Lost Carrier
mpls admin disable	10	NAS Request
mpls link down	10	NAS Request
mpls max configure exceeded	10	NAS Request
mpls no service	10	NAS Request
mpls peer renegotiate rx conf ack	10	NAS Request
mpls peer renegotiate rx conf nak	10	NAS Request
mpls peer renegotiate rx conf rej	10	NAS Request
mpls peer renegotiate rx conf req	10	NAS Request

Table 36: Default Mapping Between PPP Termination Causes and Code Values (*continued*)

Internal PPP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
mpls peer terminate code rej	10	NAS Request
mpls peer terminate term ack	10	NAS Request
mpls peer terminate term req	10	NAS Request
mpls service disable	10	NAS Request
mpls stale stacking	10	NAS Request
network interface admin disable	6	Admin Reset
no bundle	10	NAS Request
no interface	8	Port Error
no link interface	8	Port Error
no ncps available	10	NAS Request
no network interface	10	NAS Request
no upper interface	9	NAS Error
osi admin disable	10	NAS Request
osi link down	10	NAS Request
osi max configure exceeded	10	NAS Request
osi no local align npdu	10	NAS Request
osi no peer align npdu	10	NAS Request
osi no service	10	NAS Request
osi peer renegotiate rx conf ack	10	NAS Request
osi peer renegotiate rx conf nak	10	NAS Request
osi peer renegotiate rx conf rej	10	NAS Request

Table 36: Default Mapping Between PPP Termination Causes and Code Values (*continued*)

Internal PPP Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
osi peer renegotiate rx conf req	10	NAS Request
osi peer terminate code rej	10	NAS Request
osi peer terminate term ack	10	NAS Request
osi peer terminate term req	10	NAS Request
osi service disable	10	NAS Request
osi stale stacking	10	NAS Request
recovery active state cleanup	9	NAS Error
recovery configured state cleanup	9	NAS Error
recovery init state cleanup	9	NAS Error
recovery terminated state cleanup	9	NAS Error
recovery terminating state cleanup	9	NAS Error
session init failed	9	NAS Error
subscriber mgr activation failed	9	NAS Error
subscriber mgr get credentials failed	9	NAS Error
subscriber mgr link interface not found	9	NAS Error
subscriber mgr set state active failed	9	NAS Error

Related Documentation

- [Mapping Application Terminate Reasons and RADIUS Terminate Codes on page 183](#)
- [Configuring Custom Terminate Reason Mappings on page 185](#)

VLAN Termination Causes and Code Values

When a VLAN event terminates a subscriber session, causing a RADIUS Acct-Stop message to be issued, the RADIUS Acct-Terminate-Cause attribute (49) reports the cause or reason for the termination. This attribute is included only in RADIUS Acct-Stop

messages. The termination cause is conveyed as a code value in the attribute. *RFC 2866, RADIUS Accounting*, define the standard mapping between 18 code values and termination causes.

Junos OS defines a set of internal termination cause codes that are mapped to the RFC-defined code values. When a subscriber session is terminated, the router logs a message for the internal termination cause and logs another message for the RADIUS Acct-Terminate-Cause attribute. You can use the logged information to help monitor and troubleshoot terminated sessions.

Table 34 on page 189 lists the default mapping between the internal identifier for VLAN termination causes and the code values that represent them in the RADIUS Acct-Terminate-Cause attribute (49).



NOTE: You can remap the internal identifiers to a custom code value in the range 1 through 4,294,967,295 by using the `terminate-code` statement at the `[edit access]` hierarchy level. You can view the current mapping by issuing the `show network-access terminate-code vlan detail` command.

Table 37: Default Mapping Between VLAN Termination Causes and Code Values

Internal VLAN Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
vlan admin-logout	6	VLAN session termination initiated by the subscriber being administratively logged out.
vlan admin-reconnect	16	VLAN session termination initiated by the subscriber being administratively reconnected.
vlan other	9	VLAN session termination initiated by an otherwise undefined cause.
vlan out-of-band-access-interface-down	2	VLAN out-of-band session termination initiated by the access-facing interface going down.
vlan out-of-band-admin-access-interface-down	6	VLAN out-of-band session termination initiated by the access-facing interface being brought down administratively.

Table 37: Default Mapping Between VLAN Termination Causes and Code Values (*continued*)

Internal VLAN Termination Cause	RADIUS Acct-Terminate-Cause Attribute	
	Code Value	RADIUS Termination Cause
vlan out-of-band-admin-core-interface-down	6	VLAN out-of-band session termination initiated by the core-facing interface being brought down administratively.
vlan out-of-band-ancp-port-down	1	VLAN out-of-band session termination initiated by the receipt of an ANCP Port Down message.
vlan out-of-band-ancp-port-vlan-id-change	1	VLAN out-of-band session termination initiated by a change in the port VLAN ID, which is treated as a logical Port Down message.
vlan out-of-band-core-interface-down	2	VLAN out-of-band session termination initiated by the core-facing interface going down.
vlan out-of-band-l2-wholesale-no-free-vlans	15	VLAN out-of-band session termination initiated by the lack of any remaining available VLAN IDs.
vlan profile-request-error	9	VLAN session termination initiated by an error when requesting the dynamic profile associated with the VLAN range.
vlan sdb-error	9	VLAN session termination initiated by an error in the session database.
vlan subscriber-activate-error	9	VLAN session termination initiated by an error while attempting to activate the subscriber services for the session.

Related Documentation

- [Mapping Application Terminate Reasons and RADIUS Terminate Codes on page 183](#)
- [Configuring Custom Terminate Reason Mappings on page 185](#)

Configuring Extensible Subscriber Services Manager

- [Extensible Subscriber Services Manager Overview on page 221](#)
- [Understanding the Dictionary File on page 222](#)

Extensible Subscriber Services Manager Overview

Extensible Subscriber Services Manager (ESSM) is a background process that is part of the Intelligent Customer Extendable authentication, authorization, and accounting (ICE-AAA) framework, which supports customer extensible services for both business and residential subscribers. Services are classified as residential or business on the basis of the value specified for the RADIUS VSA (26-173) **ERX-Service-Activate-Type** that is received in the Access-Accept message.

Extensible Subscriber Services Manager uses the ICE-AAA framework, which comprises a dictionary, operation scripts, and RADIUS vendor-specific attributes (VSAs), to create business services for subscribers without modifying Junos OS. Extensible Subscriber Services Manager supports only the **ERX-Activate** service type.

Using the Extensible Subscriber Services Manager, you can create business services using the following sources:

- The dictionary that refers to or invokes the operation scripts.
- The operation scripts that you use to create subscriber-specific configuration
- The VSAs that the RADIUS server sends that contain configuration values for provisioning services

Related Documentation

- [Understanding the Dictionary File on page 222](#)
- [show subscribers on page 1775](#)
- [show subscribers summary on page 1796](#)
-

Understanding the Dictionary File

The XML-based dictionary specifies the action to be taken by ESSMD when it receives a service request. The dictionary contains provisioning, deprovisioning, and operation scripts. ESSMD parses the dictionary file during initialization and stores the parsed information in the database. Extensible Subscriber Services Manager acts on the extensible-subscriber-service requests on the basis of the services configured in the dictionary file.

During a commit operation, essmd verifies the path and the filename of the dictionary file. If the path or the filename is invalid, the commit operation fails and the error is logged in a system log message. Restarting the daemon or performing a graceful Routing Engine switchover (GRES) operation forces essmd to use the new dictionary. Ensure that you always configure a valid dictionary for essmd.

When loading the dictionary file after a successful commit operation, essmd validates whether:

- There are errors in parsing the dictionary file.
- The operation scripts specified in the dictionary file are available on the router.
- Any active services are modified.

If the validation fails, an error is logged in a system log message, and essmd continues to use the existing version of the dictionary file. Use the [request services extensible-subscriber-services reload-dictionary](#) command to reload the dictionary file after resolving the errors.

Related Documentation

- [dictionary on page 1018](#)
- [show extensible-subscriber-services dictionary on page 1666](#)
- [show extensible-subscriber-services dictionary attributes on page 1670](#)
- [show extensible-subscriber-services dictionary services on page 1673](#)

Monitoring and Managing AAA Information for Subscriber Access

- [Verifying and Managing Subscriber AAA Information on page 223](#)
- [Monitoring Pending RADIUS Accounting Stop Messages on page 224](#)
- [Verifying and Managing the RADIUS Dynamic-Request Feature on page 225](#)
- [Verifying and Managing Domain Map Configuration on page 225](#)
- [Verifying and Managing LLID Preauthentication Configuration on page 226](#)

Verifying and Managing Subscriber AAA Information

Purpose View or clear subscriber access statistics and information.

- Action**
- To display subscriber AAA statistics:
user@host> [show network-access aaa statistics](#)
user@host> [show network-access aaa statistics authentication](#)
 - To display RADIUS server status and information:
user@host> [show network-access aaa radius-servers](#)
 - To display subscriber access AAA information:
user@host> [show network-access aaa subscribers](#)
 - To display subscriber session information:
user@host> [show network-access aaa subscribers session-id session-id](#)
 - To clear subscriber access statistics and to log out specific subscribers:
user@host> [clear network-access aaa subscriber](#)
 - To clear AAA accounting statistics:
user@host> [clear network-access aaa statistics accounting](#)
 - To clear AAA address-assignment statistics for a client:
user@host> [clear network-access aaa statistics address-assignment client](#)
 - To clear AAA address-assignment pool statistics:
user@host> [clear network-access aaa statistics address-assignment pool pool-name](#)

- To clear AAA authentication statistics:

```
user@host> clear network-access aaa statistics authentication
```

Related Documentation

- [CLI Explorer](#)

Monitoring Pending RADIUS Accounting Stop Messages

Purpose Display information about RADIUS accounting stop messages that are being withheld due to an inability to contact the RADIUS accounting server.

Action When you want to know whether the number of pending accounting-stop messages is nearing the maximum, you can display a simple count of pending requests:

```
user@host> show network-access aaa statistics pending-accounting-stops
Pending accounting stops: 10,000
```

You can use other commands to display more information about the accounting messages. The next example displays information for all services in the accounting session for the user, `vjshah29@example.com`. Although this example shows only one user, this command actually displays the information for all subscribers for whom accounting is being backed up.

```
user@host> show accounting pending-accounting-stops detail
Type: pppoe
Username: vjshah29@example.com
AAA Logical system/Routing instance: default:default
Access-profile: ce-ppp-profile
Session ID: 84
Accounting Session ID: 84
IP Address: 192.168.0.25
IPv6 Prefix: 2001:db8:2010:9999:18::/48
Authentication State: AuthAcctStopAckWait
Accounting State: Acc-Stop-Stats-Pending
Service name: cos-service
  Service State: SvcInactive
  Session ID: 94
  Session uptime: 00:08:02
  Accounting status: on/time
  Service accounting session ID: 84:94-1352294677
  Service accounting state: Acc-Stop-Stats-Pending
  Accounting interim interval: 600
Service name: filter-service
  Service State: SvcInactive
  Session ID: 93
  Session uptime: 00:08:02
  Accounting status: on/volume+time
  Service accounting session ID: 84:93-1352294677
  Service accounting state: Acc-Stop-Stats-Pending
  Accounting interim interval: 600
Service name: filter-service6
  Service State: SvcInactive
  Session ID: 95
  Session uptime: 00:08:02
  Accounting status: on/volume+time
  Service accounting session ID: 84:95-1352294677
```

Service accounting state: Acc-Stop-Stats-Pending
Accounting interim interval: 600

You can display summary information for all users with a particular access profile. In the following example, only a single user, vjshah29@example.com, has the specified access profile, ce-ppp-profile:

user@host> **show accounting pending-accounting-stops ce-ppp-profile**

Type:	Username:	Session ID:	Service ID:	Service
pppoe	vjshah29@example.com	84		
pppoe	vjshah29@example.com	84	94	cos-service
pppoe	vjshah29@example.com	84	93	filter-service
pppoe	vjshah29@example.com	84	95	filter-service6

You can also display summary information for all subscribers that have accounting-stop messages pending, regardless of access profile. The next example displays information for two users. Because the subscriber larry@example.com is not shown in the previous example, he must have a different access profile than vjshah29@example.com, even though he has received the same services.

user@host> **show accounting pending-accounting-stops terse**

Type:	Username:	Session ID:	Service ID:	Service
pppoe	vjshah29@example.com	84		
pppoe	vjshah29@example.com	84	94	cos-service
pppoe	vjshah29@example.com	84	93	filter-service
pppoe	vjshah29@example.com	84	95	filter-service6
pppoe	larry@example.com	85		
pppoe	larry@example.com	85	94	cos-service
pppoe	larry@example.com	85	93	filter-service
pppoe	larry@example.com	85	95	filter-service6

- Related Documentation**
- [Preservation of RADIUS Accounting Information During an Accounting Server Outage on page 100](#)
 - [Configuring Back-up Options for RADIUS Accounting on page 109](#)

Verifying and Managing the RADIUS Dynamic-Request Feature

Purpose Display RADIUS dynamic request statistics and information.

Action • To display RADIUS dynamic request statistics:

user@host> **show network-access aaa statistics dynamic-requests**

- Related Documentation**
- [CLI Explorer](#)

Verifying and Managing Domain Map Configuration

Purpose Display information related to a domain map.

Action • To display statistics for the domain map:

user@host> **show network-access domain-map**

- To display domain map information for a specific subscriber session:

user@host> [show network-access aaa subscribers session-id](#)

**Related
Documentation**

- [Domain Mapping Overview on page 158](#)
- [Configuring a Domain Map on page 162](#)

Verifying and Managing LLID Preauthentication Configuration

Purpose Display statistics and configuration information related to logical line identification (LLID) preauthentication.

Action

- To display LLID preauthentication statistics:
user@host> [show network-access aaa statistics preauthentication](#)
- To display information about preauthentication servers:
user@host> [show network-access aaa radius-servers](#)

**Related
Documentation**

- [RADIUS Logical Line Identifier \(LLID\) Overview on page 147](#)
- [Configuring Logical Line Identification \(LLID\) Preauthentication on page 150](#)

PART 2

Configuring DHCP for Subscriber Management

- [Using DHCP Overview on page 229](#)
- [Configuring Default Services That are Activated at Subscriber Login on page 241](#)
- [Assigning IP Addresses on page 243](#)
- [Configuring Lease Times for IP Addresses on page 251](#)
- [Configuring DHCP Individual and Bulk Leasequery on page 255](#)
- [Requesting DHCP Client Configuration Information From an Address Pool on page 267](#)
- [Authenticating DHCP Clients Using An External AAA Authentication Service on page 271](#)
- [Grouping Interfaces and Applying a Common DHCP Configuration to the Group on page 277](#)
- [Configuring the Number of DHCP Clients Per Interface on page 287](#)
- [Maintaining Subscribers During Interface Delete Events on page 291](#)
- [Forcing Dynamic Reconfiguration of Clients From a DHCP Local Server on page 295](#)
- [Conserving IP Addresses Using DHCP Auto Logout on page 303](#)
- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
- [Configuring DHCP Renegotiation While in Bound State on page 317](#)
- [Attaching Access Profiles to DHCP Interfaces on page 319](#)
- [Applying a Common DHCP Relay Agent Configuration to Groups of DHCP Servers on page 323](#)
- [Changing the Gateway IP Address \(giaddr\) Field and DHCP Relay Request and Release Packet Source Address on page 325](#)
- [Securing DHCP Messages Sent Between DHCP Clients and Servers in Different VRFs on page 327](#)
- [Configuring DHCP Relay Agent on page 333](#)
- [Configuring DHCP Relay Proxy Mode on page 355](#)
- [Configuring DHCP Local Server Authentication on page 357](#)
- [Configuring a Minimum DHCP Local Server Configuration on page 359](#)
- [Protecting the Routing Engine Using DHCP Firewall Filters on page 361](#)
- [Monitoring and Managing DHCP on page 367](#)

CHAPTER 18

Using DHCP Overview

- [Extended DHCP Local Server Overview on page 230](#)
- [Extended DHCP Relay Agent Overview on page 236](#)
- [DHCP Relay Proxy Overview on page 239](#)

Extended DHCP Local Server Overview

Junos OS includes an extended DHCP local server that enhances traditional DHCP server operation by providing additional address assignment and client configuration functionality and flexibility in a subscriber-aware environment. The extended DHCP local server enables service providers to take advantage of external address-assignment pools and integrated RADIUS-based configuration capabilities in addition to the continued support of traditional local address pools. The address-assignment pools are considered external because they are external to the DHCP local server. The pools are managed independently of the DHCP local server, and can be shared by different client applications, such as DHCP or PPPoE access. [Table 38 on page 231](#) provides a comparison of the extended DHCP local server and a traditional DHCP local server.

The extended DHCP local server provides an IP address and other configuration information in response to a client request. The server supports the attachment of dynamic profiles and also interacts with the local AAA Service Framework to use back-end authentication servers, such as RADIUS, to provide DHCP client authentication. You can configure the dynamic profile and authentication support on a global basis or for a specific group of interfaces.

Table 38: Comparing the Extended DHCP Local Server to the Traditional DHCP Local Server

Feature	Extended DHCP Local Server	Traditional DHCP Local Server
Local address pools	X	X
External, centrally-managed address pools	X	—
Local configuration	X	X
External configuration using information from address-assignment pools or RADIUS servers	X	—
Dynamic-profile attachment	X	—
RADIUS-based subscriber authentication, and configuration using RADIUS attributes and Juniper Networks VSAs	X	—
IPv6 client support	X	—
Default minimum client configuration	X	X

You can also configure the extended DHCP local server to support IPv6 clients. Both DHCP local server and DHCPv6 local server support the specific address request feature, which enables you to assign a particular address to a client.



NOTE: If you delete the DHCP server configuration, DHCP server bindings might still remain. To ensure that DHCP bindings are removed, issue the `clear dhcp server binding` command before you delete the DHCP server configuration.

This overview covers:

- [Interaction Among the DHCP Client, Extended DHCP Local Server, and Address-Assignment Pools on page 232](#)
- [Providing DHCP Client Configuration Information on page 232](#)
- [Minimal Configuration for Clients on page 234](#)
- [DHCP Local Server and Address-Assignment Pools on page 234](#)

Interaction Among the DHCP Client, Extended DHCP Local Server, and Address-Assignment Pools

The pattern of interaction between the DHCP local server, the DHCP client, and address-assignment pools is the same regardless of whether you are using a router or a switch. However, there are some differences in the details of usage.

- On routers—In a typical carrier edge network configuration, the DHCP client is on the subscriber's computer or customer premises equipment (CPE), and the DHCP local server is configured on the router.
- On switches—In a typical network configuration, the DHCP client is on an access device, such as a personal computer, and the DHCP local server is configured on the switch.

The following steps provide a high-level description of the interaction among the DHCP local server, DHCP client, and address-assignment pools:

1. The DHCP client sends a discover packet to one or more DHCP local servers in the network to obtain configuration parameters and an IP address for the subscriber (or DHCP client).
2. Each DHCP local server that receives the discover packet then searches its address-assignment pool for the client address and configuration options. Each local server creates an entry in its internal client table to keep track of the client state, then sends a DHCP offer packet to the client.
3. On receipt of the offer packet, the DHCP client selects the DHCP local server from which to obtain configuration information and sends a request packet indicating the DHCP local server selected to grant the address and configuration information.
4. The selected DHCP local server sends an acknowledgement packet to the client that contains the client address lease and configuration parameters. The server also installs the host route and ARP entry, and then monitors the lease state.

Providing DHCP Client Configuration Information

When the extended DHCP application receives a response from an external authentication server, the response might include information in addition to the IP address and subnet

mask. The extended DHCP application uses the information from the authentication grant for the response the DHCP application sends to the DHCP client. The DHCP application can either send the information in its original form or the application might merge the information with local configuration specifications. For example, if the authentication grant includes an address pool name and a local configuration specifies DHCP attributes for that pool (such as, DNS server address), the extended DHCP application merges the authentication results and the attributes in the reply that the server sends to the client.

A local configuration is optional — a client can be fully configured by the external authentication service. However, if the external authentication service does not provide client configuration, you might need to configure the local address-assignment pool to provide the configuration information, such as DNS server, for the client. When a local configuration specifies options, the extended DHCP application adds the local configuration options to the offer PDU the server sends to the client. If the two sets of options overlap, the options in the authentication response from the external service take precedence.

When you use RADIUS to provide the authentication, the additional information might be in the form of RADIUS attributes and Juniper Networks VSAs. [Table 39 on page 233](#) lists the information that RADIUS might include in the authentication grant. See [“RADIUS Attributes and Juniper Networks VSAs Supported by the AAA Service Framework” on page 13](#) for a complete list of RADIUS attributes and Juniper Networks VSAs that the extended DHCP applications supports for subscriber access management or DHCP management.

Table 39: Information in Authentication Grant

Attribute Number	Attribute Name	Description
RADIUS attribute 8	Framed-IP-Address	Client IP address
RADIUS attribute 9	Framed-IP-Netmask	Subnet mask for client IP address (DHCP option 1)
Juniper Networks VSA 26-4	Primary-DNS	Primary domain server (DHCP option 6)
Juniper Networks VSA 26-5	Secondary-DNS	Secondary domain server (DHCP option 6)
Juniper Networks VSA 26-6	Primary-WINS	Primary WINS server (DHCP option 44)
Juniper Networks VSA 26-7	Secondary-WINS	Secondary WINS server (DHCP option 44)
RADIUS attribute 27	Session-Timeout	Lease time
RADIUS attribute 88	Framed-Pool	Address assignment pool name
Juniper Networks VSA 26-109	DHCP-Guided-Relay-Server	DHCP relay server

Minimal Configuration for Clients

The extended DHCP local server provides a minimal configuration to the DHCP client if the client does not have DHCP option 55 configured. The server provides the subnet mask of the address-assignment pool that is selected for the client. In addition to the subnet mask, the server provides the following values to the client if the information is configured in the selected address-assignment pool:

- **router**—A router located on the client's subnet. This statement is the equivalent of DHCP option 3.
- **domain name**—The name of the domain in which the client searches for a DHCP server host. This is the default domain name that is appended to hostnames that are not fully qualified. This is equivalent to DHCP option 15.
- **domain name server**—A Domain Name System (DNS) name server that is available to the client to resolve hostname-to-client mappings. This is equivalent to DHCP option 6.

DHCP Local Server and Address-Assignment Pools

In the traditional DHCP server operation, the client address pool and client configuration information reside on the DHCP server. With the extended DHCP local server, the client address and configuration information reside in external address-assignment pools (external to the DHCP local server). The external address-assignment pools are managed by the **authd** process, independently of the DHCP local server, and can be shared by different client applications.

The extended DHCP local server also supports advanced pool matching and the use of named address ranges. You can also configure the local server to use DHCP option 82 information in the client PDU to determine which named address range to use for a particular client. The client configuration information, which is configured in the address-assignment pool, includes user-defined options, such as boot server, grace period, and lease time.

Configuring the DHCP environment that includes the extended DHCP local server requires two independent configuration operations, which you can complete in any order. In one operation, you configure the extended DHCP local server on the router and specify how the DHCP local server determines which address-assignment pool to use. In the other operation, you configure the address-assignment pools used by the DHCP local server. The address-assignment pools contain the IP addresses, named address ranges, and configuration information for DHCP clients.



NOTE: The extended DHCP local server and the address-assignment pools used by the server must be configured in the same logical system and routing instance.

Related Documentation

- [Address-Assignment Pools Overview on page 565](#)

- [Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use on page 245](#)
- *Dynamic Profile Attachment to DHCP Subscriber Interfaces Overview*
- [Using External AAA Authentication Services with DHCP on page 271](#)
- [Assign a Specific IP Address to a Client Using DHCP Option 50 and DHCPv6 IA_NA Option on page 246](#)
- *Graceful Routing Engine Switchover for DHCP*
- *High Availability Using Unified ISSU in the PPP Access Network*
- [Tracing Extended DHCP Operations on page 821](#)
- [Verifying and Managing DHCP Local Server Configuration on page 371](#)
- [Example: Minimum Extended DHCP Local Server Configuration on page 359](#)
- [Example: Extended DHCP Local Server Configuration with Optional Pool Matching on page 248](#)
- [Example: Configuring a DHCP Firewall Filter to Protect the Routing Engine on page 361](#)

Extended DHCP Relay Agent Overview

You can configure extended DHCP relay options on the router or on the switch and enable the router (or 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.

DHCP relay supports the attachment of dynamic profiles and also interacts with the local AAA Service Framework to use back-end authentication servers, such as RADIUS, to provide subscriber authentication or DHCP client authentication. You can attach dynamic profiles and configure authentication support on a global basis or for a specific group of interfaces.



NOTE: The PTX Series Packet Transport Routers do not support authentication for DHCP relay agents.

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

On the switches, you can use DHCP relay to obtain configuration parameters including an IP address for DHCP clients.



NOTE: 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, you cannot enable both the extended DHCP relay agent and the DHCP/BOOTP relay agent on the router at the same time.

For information about the DHCP/BOOTP relay agent, see *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*.

You can also configure the extended DHCP relay agent to support IPv6 clients. See “[DHCPv6 Relay Agent Overview](#)” on [page 441](#) for information about the DHCPv6 relay agent feature.

To configure the extended DHCP relay agent on the router (or switch), include the `dhcp-relay` statement at the `[edit forwarding-options]` hierarchy level.

You can also include the `dhcp-relay` statement at the following hierarchy levels:

- `[edit logical-systems logical-system-name forwarding-options]`
- `[edit logical-systems logical-system-name routing-instances routing-instance-name forwarding-options]`
- `[edit routing-instances routing-instance-name forwarding-options]`

This overview covers:

- [Interaction Among the DHCP Relay Agent, DHCP Client, and DHCP Servers on page 237](#)
- [DHCP Liveness Detection on page 238](#)

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

The pattern of interaction among the DHCP Relay agent, DHCP client, and DHCP servers is the same regardless of whether the software installation is on a router or a switch. However, there are some difference in the details of usage.

On routers—In a typical carrier edge network configuration, the DHCP client is on the subscriber's computer, and the DHCP relay agent is configured on the router between the DHCP client and one or more DHCP servers.

On switches—In a typical network configuration, the DHCP client is on an access device such as a personal computer and the DHCP relay agent is configured on the switch between the DHCP client and one or more 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 for the subscriber (or DHCP client), including an IP address.
2. The DHCP relay agent receives the discover packet and forwards copies 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 receipt of 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.
6. The DHCP relay agent receives the request packet and forwards copies 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" on all of the packets unicast between the client and the server that

pass through the router (or switch) to determine when the lease for this client has expired or been released. This process is referred to as *lease shadowing* or *passive snooping*.

DHCP Liveness Detection

Liveness detection for DHCP subscriber or DHCP client IP sessions utilizes an active liveness detection protocol to institute liveness detection checks for relevant clients. Clients are expected to respond to liveness detection requests within a specified amount of time. If the responses are not received within that time for a given number of consecutive attempts, then the liveness detection check fails and a failure action is implemented.



NOTE: DHCP liveness detection either globally or per DHCP group.

Related Documentation

- [DHCPv6 Relay Agent Overview on page 441](#)
- [Access and Access-Internal Routes for Subscriber Management](#)
- [Dynamic Profile Attachment to DHCP Subscriber Interfaces Overview](#)
- [Using External AAA Authentication Services with DHCP on page 271](#)
- [DHCP Relay Proxy Overview on page 239](#)
- [Graceful Routing Engine Switchover for DHCP](#)
- [High Availability Using Unified ISSU in the PPP Access Network](#)
- [Verifying and Managing DHCP Relay Configuration on page 371](#)
- [Tracing Extended DHCP Operations on page 821](#)
- [Example: Minimum DHCP Relay Agent Configuration on page 346](#)
- [Example: DHCP Relay Agent Configuration with Multiple Clients and Servers on page 351](#)
- [Example: Configuring DHCP Relay Agent Selective Traffic Processing Based on DHCP Option Strings on page 346](#)
- [Example: Configuring DHCP and DHCPv6 Relay Agent Group-Level Selective Traffic Processing on page 281](#)
- [Example: Configuring a DHCP Firewall Filter to Protect the Routing Engine on page 361](#)

DHCP Relay Proxy Overview

DHCP relay proxy mode is an enhancement to extended DHCP relay. DHCP relay proxy supports all DHCP relay features while providing additional features and benefits.

Normally, extended DHCP relay operates as a helper application for DHCP operations. Except for the ability to add DHCP relay agent options and the gateway address (giaddr) to DHCP packets, DHCP relay is transparent to DHCP clients and DHCP servers, and simply forwards messages between DHCP clients and servers.

When you configure DHCP relay to operate in proxy mode, the relay is no longer transparent. In proxy mode, DHCP relay conceals DHCP server details from DHCP clients, which interact with a DHCP relay in proxy mode as though it is the DHCP server. For DHCP servers there is no change, because proxy mode has no effect on how the DHCP server interacts with the DHCP relay.

DHCP relay proxy provides the following benefits:

- DHCP server isolation and DoS protection—DHCP clients are unable to detect the DHCP servers, learn DHCP server addresses, or determine the number of servers that are providing DHCP support. Server isolation also provides denial-of-service (DoS) protection for the DHCP servers.
- Multiple lease offer selection—DHCP relay proxy receives lease offers from multiple DHCP servers and selects a single offer to send to the DHCP client, thereby reducing traffic in the network. Currently, the DHCP relay proxy selects the first offer received.
- Support for both numbered and unnumbered Ethernet interfaces—For DHCP clients connected through Ethernet interfaces, when the DHCP client obtains an address, the DHCP relay proxy adds an access internal host route specifying that interface as the outbound interface. The route is automatically removed when the lease time expires or when the client releases the address.
- Logical system support—DHCP relay proxy can be configured in a logical system, whereas a non-proxy mode DHCP relay cannot.



NOTE: You cannot configure both DHCP relay proxy and extended DHCP local server on the same interface.

Interaction Among DHCP Relay Proxy, DHCP Client, and DHCP Servers

The DHCP relay agent is configured on the router (or switch), which operates between the DHCP client and one or more DHCP servers.

The following steps provide a high-level description of how DHCP relay proxy interacts with DHCP clients and DHCP servers.

1. The DHCP client sends a discover packet to locate a DHCP server in the network from which to obtain configuration parameters for the subscriber.
2. The DHCP relay proxy receives the discover packet from the DHCP client and forwards copies of the packet to each supporting DHCP server. The DHCP relay proxy then creates a client table entry to keep track of the client state.
3. In response to the discover packet, each DHCP server sends an offer packet to the client, which the DHCP relay proxy receives. The DHCP relay proxy does the following:
 - a. Selects the first offer received as the offer to sent to the client
 - b. Replaces the DHCP server address with the address of the DHCP relay proxy
 - c. Forwards the offer to the DHCP client.
4. The DHCP client receives the offer from the DHCP relay proxy.
5. The DHCP client sends a request packet that indicates the DHCP server from which to obtain configuration information—the request packet specifies the address of the DHCP relay proxy.
6. The DHCP relay proxy receives the request packet and forwards copies, which include the address of selected server, to all supporting DHCP servers.
7. The DHCP server requested by the client sends an acknowledgement (ACK) packet that contains the client configuration parameters.
8. The DHCP relay proxy receives the ACK packet, replaces the DHCP server address with its own address, and forwards the packet 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 proxy installs a host route and Address Resolution Protocol (ARP) entry for the DHCP client.
11. After the initial DHCP lease is established, the DHCP relay proxy receives all lease renewals and lease releases from the DHCP client and forwards them to the DHCP server.

**Related
Documentation**

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Enabling DHCP Relay Proxy Mode on page 355](#)
- *Configuring Detection of DHCP Relay or DHCP Relay Proxy Client Connectivity*

Configuring Default Services That are Activated at Subscriber Login

- [Default Subscriber Service Overview on page 241](#)
- [Configuring a Default Subscriber Service on page 242](#)

Default Subscriber Service Overview

Subscriber management enables you to specify a default subscriber service for DHCP subscribers. The default service (dynamic profile) is applied to subscribers when the subscriber logs in. By configuring a default service, you can apply a particular service (for example, a basic service) to subscribers who are not explicitly assigned a service.

When a subscriber logs in, the configured default service is always activated, even when remote service provisioning or RADIUS service activation is configured for the subscriber. The default service is deactivated only when the subscriber is successfully provisioned by the PCRF by means of the GX-Plus application. (Remote provisioning is configured by the **provisioning-order** statement at the **[edit access profile]** hierarchy level.)

In all other cases, the default service remains active. For example, if RADIUS authentication is configured but service activation is not, the default subscriber service remains activated. Likewise, if RADIUS authentication is not configured, the default subscriber service remains activated.

Default services can also be deactivated either with a RADIUS CoA deactivate request or with the **request network-access aaa subscriber delete session-id** command.

To create and assign a default subscriber service, you must complete the following operations:

- Create the service—Ensure that the service you want to use has been configured in a dynamic profile. The actual service is no different than any other service used for subscriber management.
- Specify the default service—Use the Junos OS CLI to specify the service that is used as the default service.
- Specify the interfaces on which the default service is assigned —Use the Junos OS CLI to specify that the default service is used globally, for a group of interfaces, or for a specific interface.

- Related Documentation**
- [Configuring a Default Subscriber Service on page 242](#)
 - [CLI-Activated Subscriber Services on page 587](#)
 - [Activating and Deactivating Subscriber Services Locally with the CLI on page 588](#)
 - [Understanding Gx-Plus Interactions Between the Router and the PCRF on page 705](#)

Configuring a Default Subscriber Service

Subscriber management enables you to specify a default subscriber service for DHCP (and DHCPv6) local server and DHCP relay agent. The default service is the service (dynamic profile) that is applied to subscribers when they log in.

Default services are subsequently deactivated in any of the following circumstances:

- A PCRF responds to AAA for the subscriber.
- A RADIUS CoA deactivation request is issued.
- You deactivate the service manually through the CLI.

To configure a default subscriber service:

1. Ensure that the service you want to use as the default has been configured in a dynamic profile.
2. Specify the default service.

The following example configures the default service for DHCP local server subscribers.

```
[edit system services dhcp-local-server]
user@host# set service-profile retailer1-subscriber
```

3. Attach the default service—you can attach the profile globally, for a group of interfaces, or for a specific interface.

The following example attaches the profile to a named group of interfaces for DHCP local server.

- Specify the group to which the default service is attached.

```
[edit system services dhcp-local-server]
user@host# set group subscriber-svl
```

- Specify the dynamic profile that defines the default service.

```
[edit system services dhcp-local-server group subscriber-svl]
user@host# set dynamic-profile retailer1-subscriber
```

- Related Documentation**
- [Default Subscriber Service Overview on page 241](#)
 - [Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces](#)

CHAPTER 20

Assigning IP Addresses

- [DHCP Attributes for Address-Assignment Pools on page 243](#)
- [Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use on page 245](#)
- [Assign a Specific IP Address to a Client Using DHCP Option 50 and DHCPv6 IA_NA Option on page 246](#)
- [Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address on page 247](#)
- [Specifying the Subnet for DHCP Client Address Assignment on page 248](#)
- [Example: Extended DHCP Local Server Configuration with Optional Pool Matching on page 248](#)
- [DNS Address Assignment Precedence on page 249](#)

DHCP Attributes for Address-Assignment Pools

Table 40 on page 243 describes the DHCP client attributes that you can use with the **dhcp-attributes** statement when you configure address-assignment pools. Table 41 on page 244 describes the DHCPv6 client attributes for configuring IPv6 address-assignment pools.

Table 40: DHCP Attributes

Attribute	Description	DHCP Option
boot-file	Boot filename advertised to the client, and used by the client to complete configuration.	67
boot-server	Boot server containing the boot file.	66
domain-name	Domain in which clients search for a DHCP server host.	15
grace-period	Grace period offered with the lease.	—
maximum-lease-time	Maximum lease time allowed by the DHCP server.	51

Table 40: DHCP Attributes (*continued*)

Attribute	Description	DHCP Option
<code>name-server</code>	IP address of DNS server to which clients can send DNS queries.	6
<code>netbios-node-type</code>	NetBIOS node type.	46
<code>option</code>	User-defined options.	—
<code>option-match</code>	Option 82 value is mapped to named address range.	—
<code>router</code>	IP address for routers on the subnetwork.	3
<code>server-identifier</code>	IP address used as the DHCP source address	54
<code>tftp-server</code>	Trivial File Transfer Protocol (TFTP) server that the client uses to obtain the client configuration file.	150
<code>wins-server</code>	IP address of the Windows NetBIOS name server.	44

Table 41: DHCPv6 Attributes

Attribute	Description	DHCPv6 Option
<code>dns-server</code>	IPv6 address of DNS server to which clients can send DNS queries.	23
<code>grace-period</code>	Grace period offered with the lease.	—
<code>maximum-lease-time</code>	Maximum lease time allowed by the DHCP server.	—
<code>option</code>	User-defined options.	—
<code>preferred-lifetime</code>	Length of time that a valid address is in the preferred state. When the preferred lifetime expires, the address becomes deprecated.	—
<code>sip-server-address</code>	IPv6 address of SIP outbound proxy server.	22
<code>sip-server-domain-name</code>	Domain name of the SIP outbound proxy server.	21
<code>t1-percentage</code>	Percentage of the preferred-lifetime that the client (router) waits before sending renew messages to the DHCPv6 server that granted the original lease to extend the client's lease.	—
<code>t2-percentage</code>	Percentage of the preferred-lifetime that the client (router) waits before sending rebind messages to any available DHCPv6 server to extend the client's lease.	—

Table 41: DHCPv6 Attributes (*continued*)

Attribute	Description	DHCPv6 Option
<code>valid-lifetime</code>	Length of time that the address remains in the valid state. When the lifetime expires, the address becomes invalid.	—

**Related
Documentation**

- [Address-Assignment Pools Overview on page 565](#)
- [Configuring Address-Assignment Pools on page 567](#)
- [Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address on page 247](#)
- [dhcp-attributes \(Address-Assignment Pools\) on page 994](#)

Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use

You can specify the match order in which the extended DHCP local server uses the client data to determine the address-assignment pool that provides the IP address and configuration for a DHCP client. You use the **pool-match-order** statement to specify the match order. If you do not specify the **pool-match-order**, the router (or switch) uses the default **ip-address-first** matching to select the address pool. After DHCP local server determines the address assignment pool to use, the server performs the matching based on the criteria you specified in the pool configuration.

In the default **ip-address-first** matching, the server selects the address-assignment pool to use by matching the IP address in the client DHCP request with the network address of the address-assignment pool. If the client request contains the gateway IP address (giaddr), the local server matches the giaddr to the address-assignment pool's address. If there is no giaddr in the request, then the DHCP local server matches the IP address of the receiving interface to the address of the address-assignment pool.

In **external-authority** matching, the DHCP local server receives the address assignment from an external authority, such as RADIUS or Diameter. If RADIUS is the external authority, the DHCP local server uses the Framed-IPv6-Pool attribute (RADIUS attribute 100) to select the pool. If Diameter is the external authority, the server uses the Diameter counterpart of the Framed-IPv6-Pool attribute to determine the pool.

For IPv4 address-assignment pools, you can optionally configure the extended DHCP local server to match the DHCP relay agent information option (option 82) in the client DHCP packets to a named range in the address-assignment pool used for the client. Named ranges are subsets within the overall address-assignment pool address range, which you can configure when you create the address-assignment pool.



NOTE: To use the DHCP local server option 82 matching feature with an IPv4 address-assignment pool, you must ensure that the **option-82** statement is included in the **dhcp-attributes** statement for the address-assignment pool.

To configure the matching order the extended DHCP local server uses to determine the address-assignment pool used for a client:

1. Access the **pool-match-order** configuration.

```
[edit system services dhcp-local-server]
user@host# edit pool-match-order
```

2. Specify the pool matching methods in the order in which the router (switch) performs the methods. You can specify the methods in any order. All methods are optional—the router (switch) uses the **ip-address-first** method by default.

- Configure the router (switch) to use an external addressing authority.

```
[edit system services dhcp-local-server pool-match-order]
user@host# set external-authority
```

- Configure the router (switch) to use the ip-address-first method.

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

- (IPv4 address-assignment pools only) Specify the option 82 matching method.

```
[edit system services dhcp-local-server pool-match-order]
user@host# set option-82
```

**Related
Documentation**

- [Address-Assignment Pools Overview on page 565](#)
- [Configuring Address-Assignment Pools on page 567](#)
- [Extended DHCP Local Server Overview on page 230](#)
- [Example: Extended DHCP Local Server Configuration with Optional Pool Matching on page 248](#)

Assign a Specific IP Address to a Client Using DHCP Option 50 and DHCPv6 IA_NA Option

Subscriber management or DHCP management enables you to specify that DHCP local server assign a particular address to a client. For example, if a client is disconnected, you might use this capability to assign the same address that the client was using prior to being disconnected. If the requested address is available, DHCP assigns it to the client. If the address is unavailable, the DHCP local server offers another address, based on the address allocation process.

Both DHCP local server and DHCPv6 local server support the specific address request feature. DHCP local server uses DHCP option 50 in DHCP DISCOVER messages to request a particular address, while DHCPv6 local server uses the IA_NA option (Identity Association for Non-Temporary Addresses) in DHCPv6 SOLICIT messages.



NOTE: Subscriber management (DHCP management) supports only one address for each of the DHCPv6 IA_NA or IA_PD address types. If the DHCPv6 client requests more than one address for a given type, the DHCPv6 local server uses only the first address and ignores the other addresses.

**Related
Documentation**

- [Extended DHCP Local Server Overview on page 230](#)
- [DHCPv6 Local Server Overview on page 434](#)

Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address

You use the address-assignment pool feature to include application-specific attributes when clients obtain an address. The client application, such as DHCP, uses the attributes to determine how addresses are assigned, and to also provide optional application-specific characteristics to the client. For example, the DHCP application might specify that a client that matches certain prerequisite information is dynamically assigned an address from a particular named range. Based on which named range is used, DHCP specifies additional DHCP attributes such as the boot file that the client uses, the lease grace period, and the maximum lease time.

You use the `dhcp-attributes` statement to configure DHCP client-specific attributes for address-assignment pools. “[DHCP Attributes for Address-Assignment Pools](#)” on page 243 describes the supported attributes you can configure for IPv4 and IPv6 address-assignment pools.

To configure address-assignment pool attributes for DHCP clients:

1. Specify the name and IP family of the address-assignment pool.

[edit access]

user@host# **edit** `address-assignment pool isp_1 family inet`

2. Configure optional DHCP client attributes.

[edit access address-assignment pool isp_1 family inet]

user@host# **set** `dhcp-attributes boot-server 192.168.200.100 grace-period 3600 maximum-lease-time 18000`



NOTE: The DNS name server addresses that are configurable as DHCP attributes can also be configured globally at the routing instance level and in access profiles. For more information, see “[DNS Name Server Address Overview](#)” on page 577.

**Related
Documentation**

- [Address-Assignment Pools Overview on page 565](#)
- [Configuring Address-Assignment Pools on page 567](#)
- [DHCP Attributes for Address-Assignment Pools on page 243](#)

Specifying the Subnet for DHCP Client Address Assignment

Subscriber management enables you to explicitly specify the subnet to which the DHCP local server matches the requested IP address. The server accepts and uses an active client's requested IP address for address assignment only when the requested address and the IP address of the DHCP server interface are in the same subnet. The server accepts and uses a passive client's requested IP address only when the requested address and the IP address of the relay interface are in the same subnet. The DHCPv6 local server supports the same process for DHCPv6 clients and addresses.

To specify the subnet used for client address assignment:

- For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# set requested-ip-network-match 10
```

- For DHCPv6 local server:

```
[edit forwarding-options dhcp-local-server dhcpv6]
user@host# set requested-ip-network-match 30
```

Related Documentation

- [Extended DHCP Local Server Overview on page 230](#)
- [requested-ip-network-match on page 1303](#)

Example: Extended DHCP Local Server Configuration with Optional Pool Matching

This example shows an extended DHCP local server configuration that includes optional IPv4 address-assignment pool matching and interface groups. For pool matching, this configuration specifies that the DHCP local server first check the response from an external authentication authority (for example, RADIUS) and use the Framed-IPv6-Pool attribute to determine the address-assignment pool to use for the client address. If no external authority match is found, the DHCP local server then uses ip-address-first matching together with the option 82 information to match the named address range for client IPv4 address assignment. The option 82 matching must also be included in the address-assignment pool configuration.

```
[edit system services]
dhcp-local-server {
  group group_one {
    interface fe-0/0/2.0;
    interface fe-0/0/2.1;
  }
  group group_two {
    interface fe-0/0/3.0;
    interface fe-0/0/3.1;
  }
  pool-match-order {
    external-authority
    ip-address-first;
    option-82;
  }
}
```

```
}
}
```



NOTE: The interface type in this topic is just an example. The fe- interface type is not supported by EX Series switches.

**Related
Documentation**

- [Extended DHCP Local Server Overview on page 230](#)
- [Address-Assignment Pools Overview on page 565](#)

DNS Address Assignment Precedence

Subscriber management supports four methods for assigning addresses to DHCP clients. When multiple methods are configured, the router uses the following precedence to determine which address to assign to the client.

1. Address defined on the RADIUS server by Internet Assigned Numbers Authority (IANA) vendor ID 4874 attributes 26-4 (Primary-DNS) and 26-5 (Secondary-DNS).
2. Address defined on the RADIUS server by IANA vendor ID 2636 attributes 26-31 (Primary-DNS) and 26-33 (Secondary-DNS).
3. Address defined on the RADIUS server by IANA vendor ID 311 attributes 26-28 (MS-Primary-DNS-Server) and 26-29 (MS-Secondary-DNS-Server).
4. Address defined in the local address pool on the router.

**Related
Documentation**

- [Juniper Networks VSAs Supported by the AAA Service Framework on page 21](#)
- [RADIUS Support for Microsoft Corporation VSAs for DNS Server Addresses on page 58](#)
- [Address-Assignment Pools Overview on page 565](#)

Configuring Lease Times for IP Addresses

- [Configuring a DHCP Lease-Time Threshold on page 251](#)
- [DHCP Lease-Time Validation Overview on page 252](#)
- [DHCPv6 Lease Timers on page 254](#)

Configuring a DHCP Lease-Time Threshold

Starting in Junos OS Release 14.1, subscriber management provides a lease-time validation feature that enables you to specify the minimum DHCP lease time allowed in your subscriber access environment. When you configure lease-time validation, you specify the lease-time threshold and the action the router performs when an offered lease time is less than the threshold (such as dropping the lease).

Lease-time validation ensures that leases that are offered by third-party DHCP servers or address assignment pools always meet the requirements of your network. For example, you want short leases to be rejected because they can result in excessive renewal traffic that can impact network performance.

You can configure lease-time validation on DHCPv4 and DHCPv6 local servers, and DHCPv4 and DHCPv6 relay agents, and for individual interfaces or interface groups. DHCP relay proxy also supports lease-time validation.

The following procedure describes the steps you use to configure lease-time validation. This example describes a configuration for DHCP relay agent. You use similar steps at the appropriate hierarchy levels for DHCP local server, DHCPv6 local server, and DHCPv6 relay agent.

To configure lease time validation for DHCP relay agent:

1. Specify that you want to configure DHCP relay agent support.

```
[edit forwarding-options]  
user@host# edit dhcp-relay
```

2. Specify that you want to configure the DHCP lease time validation feature.

```
[edit forwarding-options dhcp-relay]  
user@host# set lease-time-validation
```

3. Configure the threshold that specifies the minimum DHCP client lease time allowed in your network.

```
[edit forwarding-options dhcp-relay lease-time-validation]
user@host# set lease-time-threshold 3600
```

4. Configure the action the router takes when a lease time violation occurs.

```
[edit forwarding-options dhcp-relay lease-time-validation]
user@host# set violation-action drop
```



NOTE: DHCP relay agent and DHCP local server support different violation actions. See the [violation-action](#) statement for descriptions of the actions.

If you do not specify a violation action, DHCP binds the client using the third-party lease but marks the binding as lease-time violating.

5. (Optional) Configure how often you want the router to consolidate and log syslog warning messages.

```
[edit system processes dhcp-service]
user@host# set ltv-syslog-interval 3600
```

Release History Table

Release	Description
14.1	Starting in Junos OS Release 14.1, subscriber management provides a lease-time validation feature that enables you to specify the minimum DHCP lease time allowed in your subscriber access environment.

Related Documentation

- [DHCP Lease-Time Validation Overview on page 252](#)
- [Extended DHCP Local Server Overview on page 230](#)
- [Extended DHCP Relay Agent Overview on page 236](#)

DHCP Lease-Time Validation Overview

In a subscriber access environment, a DHCP server obtains an address lease from either local configuration or from an external DHCP server, and assigns the lease to the DHCP client address.

Obtaining leases from external sources can present issues when the external source is owned or managed by a third party—the third party might configure the external source to provide address leases that are unsuitable for the subscriber access environment. For example, extremely short lease times can create unnecessary traffic that results in reduced performance in the network.

To avoid potential issues caused by short DHCP lease times, subscriber management provides a lease-time validation feature. Lease-time validation enables you to explicitly configure a threshold for the minimum lease time allowed in your subscriber access environment, and to specify a violation action (such as dropping the lease offer) the router takes when a short lease time is offered by a third party. You can specify the following violation actions:

- **drop**—(DHCPv4 and DHCPv6 relay agent) The third-party lease offer is dropped and the client binding fails.
- **override-lease**—(DHCPv4 and DHCPv6 local server) The third-party lease time is overridden by the specified threshold value.
- **strict**—(DHCPv4 and DHCPv6 local server) The third-party lease is ignored and the client binding fails.
- **no action**—If you do not specify a violation action, DHCP binds the client using the third-party lease but marks the binding as lease-time violating.

A lease-time violation can occur during the initial lease grant or during a rebinding or renewal operation. To reduce excessive and redundant log messages, the router consolidates lease-time violation reporting, as shown in [Table 42 on page 253](#).

Table 42: Lease-Time Violation Event Logging

Event	syslog	Extended DHCP Traceoptions
Initial lease-time violation for the specific DHCP server	warning	warning
Number of lease-time violations return to zero for the specific DHCP server	warning	warning
Status of lease-time violations caused by specific DHCP server, reported in the interval configured in ltv-syslog-interval command	warning	—
Violation action of drop occurred, or the DHCP packet was not generated	—	warning
Violation action of override-lease occurred (DHCP local server only)	—	warning
Lease-time violation	—	warning

Related Documentation

- [Configuring a DHCP Lease-Time Threshold on page 251](#)
- [Extended DHCP Local Server Overview on page 230](#)
- [DHCPv6 Local Server Overview on page 434](#)
- [Extended DHCP Relay Agent Overview on page 236](#)
- [DHCPv6 Relay Agent Overview on page 441](#)

DHCPv6 Lease Timers

Subscriber management supports configurable timers that you can use to manage the DHCPv6 address leases provided by address-assignment pools. In addition to the maximum-lease-time timer, which sets the maximum time for which the DHCPv6 server can grant a lease, you can use DHCP client-specific attributes to configure timers that govern the lifetimes of existing leases that have been obtained from an address-assignment pool.

The following list describes the configurable timers for DHCPv6 address-assignment pools:

- **preferred-lifetime**—Length of time that a valid address is in the preferred state and can be used without any restrictions. When the preferred-lifetime expires, the address becomes deprecated. A deprecated address should not be used for new communications, but might continue to be used for existing communications in certain cases.

If the valid-lifetime is also configured, the preferred-lifetime must be less than the valid-lifetime. The preferred-lifetime and the maximum-lease-time are mutually exclusive and cannot both be configured.

- **valid-lifetime**—Length of time that an address remains in the valid state, during which the address can be used for new or existing communications. When the valid-lifetime expires, the address becomes invalid, and can no longer be used.

If the preferred-lifetime is also configured, the valid-lifetime must be greater than the preferred-lifetime. The valid-lifetime and the maximum-lease-time are mutually exclusive and cannot both be configured.

- **t1 percentage**—Percentage of the **preferred-lifetime** that the client waits before contacting the DHCPv6 server that originally granted the lease to request that the address lease be extended. This timer is also called the renewal time.
- **t2 percentage**—Percentage of the **preferred-lifetime** that the client waits before sending a request to any available DHCPv6 server to extend the address lease. This timer is also called the rebind time.

Related Documentation

- [Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address on page 247](#)
- [DHCP Attributes for Address-Assignment Pools on page 243](#)

CHAPTER 22

Configuring DHCP Individual and Bulk Leasequery

- [DHCP Leasequery and Bulk Leasequery on page 255](#)
- [Guidelines for Configuring Support for Leasequery and Bulk Leasequery Operations on page 256](#)
- [Configuring and Using DHCP Individual Leasequery on page 257](#)
- [Configuring and Using DHCP Bulk Leasequery on page 260](#)
- [Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263](#)
- [Verifying and Managing DHCP Leasequery and Bulk Leasequery Configuration on page 264](#)

DHCP Leasequery and Bulk Leasequery

In a subscriber access network, a DHCP server maintains a significant amount of information related to the IP addresses or DHCPv6 delegated prefixes that the server has leased to DHCP clients. When DHCP clients are connected to the DHCP server by way of a DHCP relay, the DHCP relay also maintains the same lease and route information as the DHCP server, and uses that information when providing subscriber services for the clients.

Starting in Junos OS Release 16.1, subscriber management supports the leasequery feature to enable the DHCP relay to quickly and efficiently obtain the current lease information from a DHCP server. DHCP relay typically uses leasequery to restore the relay's lease information database when the information has been lost; such as after the DHCP relay has been rebooted or replaced. Subscriber management supports two types of leasequery operations—the traditional individual leasequery, which updates lease information related to a specific client, and a more powerful bulk leasequery.

Bulk leasequery enables the DHCP relay agent to retrieve bulk lease information for a group of subscribers from a configured DHCP server in a programmed manner that is more resource-efficient than the individual leasequery method. Bulk leasequery uses a TCP connection between the DHCP relay agent and a configured DHCP server in the same logical system/routing instance. The TCP connection is more reliable and consumes less resources than the UDP connection used for the individual leasequery process. Bulk leasequery also extends the individual leasequery by providing additional query options

and functionality, as opposed to the individual leasequery, which queries the individual binding for a known target only.

To configure either type of leasequery operation, you enable support on both the DHCP relay agent and the DHCP server, and you specify the query options you want the query operation to use. Once the options are configured, you invoke the appropriate CLI **request** command to initiate the bulk or individual leasequery operation.

For a DHCPv6 bulk leasequery, you can optionally configure the DHCPv6 relay agent to automatically initiate the bulk leasequery operation whenever the **jdhcpd** process starts a connection with the session database (SDB) and there are no bound subscribers in the database. For example, the automatic process would ensure that the bulk leasequery always updates the DHCP relay information after a reboot, GRES, or ISSU operation, and if there are no bound subscribers.

Release History Table

Release	Description
16.1	Starting in Junos OS Release 16.1, subscriber management supports the leasequery feature to enable the DHCP relay to quickly and efficiently obtain the current lease information from a DHCP server.

Related Documentation

- [Guidelines for Configuring Support for Leasequery and Bulk Leasequery Operations on page 256](#)
- [Configuring and Using DHCP Individual Leasequery on page 257](#)
- [Configuring and Using DHCP Bulk Leasequery on page 260](#)

Guidelines for Configuring Support for Leasequery and Bulk Leasequery Operations

When configuring individual or bulk leasequery support, consider the following guidelines:

- The router supports simultaneous configuration of both leasequery and bulk leasequery, and simultaneous dual-stack configuration for both DHCPv4 and DHCPv6. However, for dual stack environments, you must trigger the DHCPv4 and DHCPv6 leasequery (or bulk leasequery) operations separately.
- DHCP relay agent supports leasequery or bulk leasequery over static and dynamic interfaces.
- DHCP local server supports bulk leasequery on static relay-facing interfaces only.
- DHCP local server listens for bulk leasequery requests from the DHCP relay agent on TCP port 547 for DHCPv6, and on TCP port 67 for DHCPv4.
- Bulk leasequery is not supported for DHCP over PPP/PPPoE.
- If the network includes integrated routing and bridging (IRB) interfaces, you must configure DHCP relay agent to include the layer 2 interface name along with IRB name in the circuit ID of option 82. DHCP relay agent uses the layer 2 interface name when using leasequery or bulk leasequery to restore the lease database.

- Related Documentation**
- [DHCP Leasequery and Bulk Leasequery on page 255](#)
 - [Configuring and Using DHCP Individual Leasequery on page 257](#)
 - [Configuring and Using DHCP Bulk Leasequery on page 260](#)

Configuring and Using DHCP Individual Leasequery

The individual leasequery operation updates a DHCP relay agent's lease database with information related to a single, specified subscriber. You identify DHCPv4 subscribers by IPv4 address, MAC address, or client ID. You identify DHCPv6 subscribers by IPv6 address or client ID.

You use the following steps to configure and use the individual leasequery operation.

1. Ensure that the following required support is configured on the DHCP relay agent.
 - (DHCPv4 only) DHCP relay agent inserts option 82 suboption 1 (Agent Circuit ID), in the DHCP packets that the relay forwards to DHCP servers. See ["Using DHCP Relay Agent Option 82 Information" on page 337](#).

If the network includes integrated routing and bridging (IRB) interfaces, you must also include the **include-l2-interface-for-irb** statement, as shown in the following example. This statement configures DHCP relay agent to include the layer 2 interface name along with IRB name in the circuit ID of option 82. DHCP relay agent uses the layer 2 interface name when restoring the lease database using leasequery or bulk leasequery.

```
[edit forwarding-options dhcp-relay]
user@host# set relay-option-82 circuit-id include-l2-interface-for-irb
```

- (DHCPv4 only) DHCP relay agent always includes the new option 82 information in the DHCP packets that the relay forwards to DHCP servers. See *Overriding Option 82 Information*.

```
[edit forwarding-options dhcp-relay]
user@host# set overrides always-write-option-82
```

- (DHCPv6 only) DHCP relay agent inserts the DHCPv6 Interface-ID (option 18) in the packets that the relay forwards to DHCPv6 servers. See ["Inserting DHCPv6 Interface-ID Option \(Option 18\) In DHCPv6 Packets" on page 444](#).

If your network includes integrated routing and bridging (IRB) interfaces, you must also include the **include-l2-interface-for-irb** statement, as shown in the following example. This statement configures DHCPv6 relay agent to include the layer 2 interface name along with IRB name in the circuit ID of option 82. DHCP relay agent uses the layer 2 interface name when using leasequery or bulk leasequery to restore the lease database.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set relay-agent-interface-id include-l2-interface-for-irb
```

2. Configure DHCP relay agent to support leasequery:

Configure the leasequery parameters the DHCP relay agent uses when querying the DHCP local servers. The following steps describe the configuration for DHCPv4. For DHCPv6, use the procedure at the **[edit forwarding-options dhcp-relay dhcpv6]** hierarchy level.

- Specify that you want to configure leasequery options for the DHCP relay agent.

```
[edit forwarding-options dhcp-relay]
user@host# edit leasequery
```

- Specify the number of seconds DHCP relay waits before resending leasequery messages to the configured DHCP servers in the same logical system/routing instance.

```
[edit forwarding-options dhcp-relay leasequery]
user@host# set timeout 8
```

- Specify the number of times DHCP relay resends leasequery messages. DHCP relay resends the messages when the configured timeout value expires. The messages are resent if the DHCP relay has not received confirmed lease information for a client.

```
[edit forwarding-options dhcp-relay leasequery]
user@host# set attempts 3
```

3. Configure DHCP local server to support leasequery:

Configure the leasequery parameters the DHCP local server uses when responding to leasequery messages from a DHCP relay. The following steps describe the configuration for DHCPv4. For DHCPv6, use the procedure at the **[edit system services dhcp-local-server dhcpv6]** hierarchy level.

- Enable leasequery support for the DHCP local server.

```
[edit system services dhcp-local-server]
user@host# edit allow-leasequery
```

- (Optional) Specify that the DHCP local server responds to a leasequery by sending the binding information only to restricted requestors. For DHCPv4, restricted requestors are those whose giaddr matches the giaddr of the client. For DHCPv6, the client ID of the request must match the relay ID of the client. This step provides additional security by ensuring that the requestor is the originator of the binding request.

```
[edit system services dhcp-local-server allow-leasequery]
user@host# set restricted-requestor
```

4. Initiate the leasequery operation on the DHCP relay agent.

See [“Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database” on page 263](#). DHCP relay agent uses the specified options when sending the leasequery

messages to all configured DHCP local servers in the same logical system/routing instance.

5. (Optional) Display and manage statistics and information for the leasequery operation.

Use the supported **show** and **clear** commands to manage and display information about the leasequery operation for the DHCP relay agent and the DHCP local server. See [“Verifying and Managing DHCP Leasequery and Bulk Leasequery Configuration” on page 264](#).

**Related
Documentation**

- [DHCP Leasequery and Bulk Leasequery on page 255](#)
- [Configuring and Using DHCP Bulk Leasequery on page 260](#)
- [Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263](#)
- [Verifying and Managing DHCP Leasequery and Bulk Leasequery Configuration on page 264](#)

Configuring and Using DHCP Bulk Leasequery

The bulk leasequery operation updates a DHCP relay agent's lease database with information for multiple subscribers, as opposed to the individual leasequery, which queries individual bindings for known targets only. Bulk leasequery also extends the individual leasequery by providing additional query options and functionality.

You use the following steps to configure and use bulk leasequery.

1. Ensure that the following required support is configured on the DHCP relay agent.

- (DHCPv4 only) DHCP relay agent inserts option 82 suboption 1 (Agent Circuit ID), in the DHCP packets that the relay forwards to DHCP servers. See [“Using DHCP Relay Agent Option 82 Information” on page 337](#).

If the network includes integrated routing and bridging (IRB) interfaces, you must also include the **include-l2-interface-for-irb** statement, as shown in the following example. This statement configures DHCPv6 relay agent to include the layer 2 interface name along with IRB name in the circuit ID of option 82. DHCP relay agent uses the layer 2 interface name when using leasequery or bulk leasequery to restore the lease database.

```
[edit forwarding-options dhcp-relay]
user@host# set relay-option-82 circuit-id include-l2-interface-for-irb
```

- (DHCPv4 only) DHCP relay agent always includes the new option 82 information in the DHCP packets that the relay forwards to DHCP servers. See [Overriding Option 82 Information](#).

```
[edit forwarding-options dhcp-relay]
user@host# set overrides always-write-option-82
```

- (DHCPv6 only) DHCP relay agent inserts the DHCPv6 Interface-ID (option 18) in packets forwarded to DHCPv6 servers. See [“Inserting DHCPv6 Interface-ID Option \(Option 18\) In DHCPv6 Packets” on page 444](#).

If your network includes integrated routing and bridging (IRB) interfaces, you must also include the **include-l2-interface-for-irb** statement, as shown in the following example. This statement configures DHCPv6 relay agent to include the layer 2 interface name along with IRB name in the circuit ID of option 82. DHCP relay agent uses the layer 2 interface name when using leasequery or bulk leasequery to restore the lease database.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set relay-agent-interface-id include-l2-interface-for-irb
```

2. Configure the number of connections that the router can use for bulk leasequery.

Specify the maximum number of TCP connections the DHCP local server can simultaneously accept for bulk leasequery operations, and the number of simultaneous connections that the DHCP relay agent can request for bulk leasequery. This is a chassis-wide configuration and includes all logical systems/routing instances, and all address families.

```
[edit system processes dhcp-service]
```

```

user@host# set accept-max-tcp-connections 6
user@host# set request-max-tcp-connections 7

```

3. Configure DHCP relay agent to support bulk leasequery:

Configure the bulk leasequery parameters the DHCP relay agent uses when querying the DHCP local servers. The following steps describe the configuration for DHCPv4. For DHCPv6, use the procedure at the **[edit forwarding-options dhcp-relay dhcpv6]** hierarchy level.

- Specify that you want to configure bulk leasequery options for the DHCP relay agent.

```

[edit forwarding-options dhcp-relay]
user@host# edit bulk-leasequery

```

- Specify the number of seconds DHCP relay waits before retrying the TCP connection to send bulk leasequery messages to the configured DHCP servers in the same logical system/routing instance.

```

[edit forwarding-options dhcp-relay bulk-leasequery]
user@host# set timeout 5

```

- Specify the number of times DHCP relay attempts the TCP connection with the server to send bulk leasequery messages. DHCP relay resends the messages when the configured timeout value expires. The TCP connection is reestablished only to DHCP servers to which the connection failed or was abruptly closed.

```

[edit forwarding-options dhcp-relay bulk-leasequery]
user@host# set attempts 6

```

- (Optional, DHCPv6 only) Specify the optional automatic trigger. The automatic trigger configures DHCPv6 relay agent to automatically initiate bulk leasequery whenever the jdhcp daemon starts (for example, after a reboot, a graceful Routing Engine switchover, or unified ISSU) and there are no bound subscribers in the session database. When the automatic trigger support is configured, you can still use the CLI command to manually trigger bulk leasequery.

```

[edit forwarding-options dhcp-relay bulk-leasequery]
user@host# set trigger automatic

```

4. Configure DHCP local server to support bulk-leasequery:

Configure the parameters the DHCP local server uses when responding to bulk leasequery messages from a DHCP relay. The following steps describe the configuration for DHCPv4. For DHCPv6, use the procedure at the **[edit system services dhcp-local-server dhcpv6]** hierarchy level.

- Enable bulk leasequery support for the DHCP local server.

```

[edit system services dhcp-local-server]
user@host# edit allow-bulk-leasequery

```

- (Optional) Specify the maximum number of concurrent TCP connections allowed in the DHCP local server's logical system/routing instance:

```

[edit system services dhcp-local-server allow-bulk-leasequery]

```

```
user@host# set max-connections 5
```

- (Optional) Specify the maximum number of empty replies that the DHCP local server sends to a specific requestor. When the maximum number of replies is reached, the DHCP server closes the connection.

An empty reply is a response that contains no bindings or has an option status code error. Empty replies are often a response to an unauthorized requestor that has sent an invalid or incorrect query. By limiting the number of empty replies that the DHCP local server sends, you prevent the connection from being consumed by unauthorized or malicious requesters.

```
[edit system services dhcp-local-server allow-bulk-leasequery]
user@host# set max-empty-replies 4
```

- (Optional) Specify that the DHCP local server sends the binding information to restricted requestors only. This step ensures that the requestor is the originator of the binding request,

For DHCPv4 leasequery and bulk leasequery requests, the giaddr of the requestor must match the giaddr of the client. For DHCPv6 bulk leasequery requests, the requestor's client ID in the bulk leasequery message must match the relay ID that was sent during binding creation.

```
[edit system services dhcp-local-server allow-bulk-leasequery]
user@host# set restricted-requestor
```

- (Optional) Specify the number of seconds that a connection on the TCP socket is idle before the DHCP local server closes the connection.

```
[edit system services dhcp-local-server allow-bulk-leasequery]
user@host# set timeout 90
```

5. Initiate the bulk leasequery operation on the DHCP relay agent.

DHCP relay agent uses the specified options when sending the bulk leasequery messages to all configured DHCP local servers in the same logical system/routing instance.

- Automatically initiating bulk leasequery—When the automatic trigger feature is configured, DHCP relay agent initiates the bulk leasequery whenever the jdhcp process starts and there are no bound subscribers in the session database.
- Manually initiating bulk leasequery—Use the appropriate CLI command to manually initiate bulk leasequery. See [“Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database” on page 263](#).

6. Display and manage statistics and information for the bulk leasequery operation.

Use the supported **show** and **clear** commands to manage and display information about the bulk leasequery operation for the DHCP relay agent and the DHCP local server. See [“Verifying and Managing DHCP Leasequery and Bulk Leasequery Configuration” on page 264](#).

- Related Documentation**
- [DHCP Leasequery and Bulk Leasequery on page 255](#)
 - [Configuring and Using DHCP Individual Leasequery on page 257](#)
 - [Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263](#)
 - [Verifying and Managing DHCP Leasequery and Bulk Leasequery Configuration on page 264](#)

Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database

You can manually request that DHCP relay agent initiate an individual leasequery or bulk leasequery operation, which requests current lease information from DHCP local servers.

A leasequery updates the DHCP relay agent's lease database with information for an individual client—for DHCPv4, you can specify clients by IP address, MAC address or client ID. For DHCPv6, you can identify clients by IPv6 prefix or client ID.

A bulk leasequery updates the relay agent's lease database for a group of clients—for DHCPv4, you can specify clients by IPv4 address, MAC address or client ID. For DHCPv6, you can identify clients by IPv6 prefix, client ID, Relay-ID option, Relay Agent Remote-ID option, or IPv6 link address.

When you initiate a leasequery or bulk leasequery, you can optionally specify a particular DHCP server (by address), server group, routing instance, or logical system to be queried.

To initiate a DHCPv4 individual leasequery to update binding information:

- For a DHCPv4 client, based on the client's IP address:

```
user@host> request dhcp relay leasequery 192.168.10.34
```
- For a DHCPv4 client, based on the client's MAC address:

```
user@host> request dhcp relay leasequery 00:00:5E:00:53:cd
```
- For a DHCPv4 client, based on the client identifier option (option 61):

```
user@host> request dhcp relay leasequery 4/1224
```

To initiate a DHCPv6 individual leasequery to update binding information:

- For a DHCPv6 client, based on the client's IPv6 address:

```
user@host> request dhcpv6 relay leasequery 2001:db8:1001::1
```
- For a DHCPv6 client, based on the client ID option (option 1):

```
user@host> request dhcpv6 relay leasequery 4/1224
```

To initiate a DHCPv4 bulk leasequery to update binding information:

- For a DHCPv4 client, based on the client identifier option (option 61):

```
user@host> request dhcp relay leasequery 4/1224
```
- For a DHCPv4 client, based on the client's MAC address:

```
user@host> request dhcp relay bulk-leasequery 00:00:5E:00:53:cd
```

To initiate a DHCPv6 bulk leasequery to update binding information:

- For a DHCPv6 client, based on the client ID option (option 1):

```
user@host> request dhcpv6 relay bulk-leasequery 4/1223
```

- For DHCPv6 clients, based on IPv6 prefix:

```
user@host> request dhcpv6 relay bulk-leasequery 2001:db8:1001::1
```

- For DHCPv6 clients associated with the DHCPv6 relay identified in the specified Relay-ID option:

```
user@host> request dhcpv6 relay bulk-leasequery relay-id 4/2121
```

- For DHCPv6 clients associated with the specified IPv6 link address:

```
user@host> request dhcpv6 relay bulk-leasequery link-address 2001:db8:1001:1::1
```

- For DHCPv6 clients associated with the specified Relay Agent Remote-ID option:

```
user@host> request dhcpv6 relay bulk-leasequery remote-id host:ge-1/0/0:100
```



NOTE: If you use the `bulk-leasequery` command without specifying a remote ID, by default the DHCPv6 relay queries its one relay ID.

Related Documentation

- [Configuring and Using DHCP Individual Leasequery on page 257](#)
- [Configuring and Using DHCP Bulk Leasequery on page 260](#)

Verifying and Managing DHCP Leasequery and Bulk Leasequery Configuration

Purpose View or clear information about DHCP leasequery and bulk leasequery operations.

Use the supported **show** and **clear** commands to manage and display information about the leasequery and bulk leasequery operations; for the DHCP relay agent and the DHCP local server.

Action • To display leasequery and bulk leasequery information for DHCPv4 or DHCPv6 relay agent:

```
user@host> show dhcp relay statistics (leasequery | bulk-leasequery-connections)
user@host> show dhcpv6 relay statistics (leasequery | bulk-leasequery-connections)
```

- To clear leasequery and bulk leasequery information for DHCPv4 or DHCPv6 relay agent:

```
user@host> clear dhcp relay statistics (leasequery | bulk-leasequery-connections)
user@host> clear dhcpv6 relay statistics (leasequery | bulk-leasequery-connections)
```

- To display leasequery and bulk leasequery information for DHCPv4 or DHCPv6 local server:

```
user@host> show dhcp server statistics bulk-leasequery-connections
user@host> show dhcpv6 server statistics bulk-leasequery-connections
```

- To clear leasequery and bulk leasequery information for DHCPv4 or DHCPv6 local server:

```
user@host> clear dhcp server statistics bulk-leasequery-connections
user@host> clear dhcpv6 server statistics bulk-leasequery-connections
```

**Related
Documentation**

- [Configuring and Using DHCP Individual Leasequery on page 257](#)
- [Configuring and Using DHCP Bulk Leasequery on page 260](#)

Requesting DHCP Client Configuration Information From an Address Pool

- [DHCP Local Server Handling of Client Information Request Messages on page 267](#)
- [Enabling Processing of Client Information Requests on page 268](#)

DHCP Local Server Handling of Client Information Request Messages

DHCP clients that already have externally provided addresses may solicit further configuration information from a DHCP server by sending a DHCP information request that indicates what information is desired. By default, DHCP local server and DHCPv6 local server ignore any DHCP information requests that they receive. You can override this default behavior to enable processing of these messages.

If you enable processing of information requests, DHCP local server responds to the client with a DHCP acknowledgment message that includes the requested information—if it is available. DHCPv6 local server responds in the same manner but uses a DHCP reply message. No subscriber management or DHCP-management is applied as a result of the DHCP information request message.

By default, DHCP relay and DHCP relay proxy automatically forward DHCP information request messages without modification if the messages are received on an interface configured for a DHCP server group. DHCP relay and relay proxy drop information request messages received on any other interfaces. You cannot disable this default DHCP relay and relay proxy behavior.

The information requested by these clients has typically been configured with the **dhcp-attributes** statement for an address pool defined by the **address-assignment pool** *pool-name* statement at the **[edit access]** hierarchy level.

When you enable processing of DHCP information requests, you can optionally specify the name of the pool from which the local server retrieves the requested configuration information for the client. If you do not specify a local pool, then the local server requests that AAA selects and returns only the name of the relevant pool.



NOTE: PPP interfaces are not supported on EX Series switches.

When DHCPv6 is configured over PPP interfaces, the PPP RADIUS authentication data can be used to select the pool from which the response information is taken. Additionally other RADIUS attributes can also be inserted into the DHCPv6 reply message. If an overlap exists between RADIUS attributes and local pool attributes, the RADIUS values are used instead of the local configuration data. If no RADIUS information is received from the underlying PPP interface, then the behavior is the same as described previously for non-PPP interfaces.

**Related
Documentation**

- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
- [Enabling Processing of Client Information Requests on page 268](#)

Enabling Processing of Client Information Requests

By default, DHCP local server and DHCPv6 local server do not respond to information request messages from the client. You can enable DHCP local server and DHCPv6 local server to process these messages and respond to them with an acknowledgment (ack or reply message, respectively) and the requested information.

DHCP relay agent automatically forwards the information request messages without modification to the configured server group by means of the interfaces configured for the respective server group. The messages are dropped if they are received on an unconfigured interface. DHCP relay proxy also supports forwarding these messages. You cannot disable forwarding of the information request messages.

Configure one or more local address pools if you want to use a local pool rather than one provided by AAA. See [“Configuring an Address-Assignment Pool Name and Addresses” on page 569](#). For processing information request messages, the address configuration is not necessary. For DHCP local server, you must specify the IPv4 family; for DHCPv6 local server, you must specify the IPv6 family.

See [“Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address” on page 247](#) for details about how to configure the information sought by clients that send information request messages.

To enable processing of DHCP client information request messages:

1. Specify that you want to configure override options.
 - For DHCP local server:

```
[edit system services dhcp-local-server overrides]
user@host# set process-inform
```
 - For DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6 overrides]
user@host# set process-inform
```
2. (Optional) Specify a pool name from which DHCP information is returned to the client.
 - For DHCP local server:

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

- For DHCPv6 local server:

[edit system services dhcp-local-server dhcpv6 overrides process-inform]

user@host# set *pool* *pool-name*

**Related
Documentation**

- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
- [Deleting DHCP Local Server and DHCP Relay Override Settings on page 315](#)
- [Extended DHCP Local Server Overview on page 230](#)
- [Extended DHCP Relay Agent Overview on page 236](#)

Authenticating DHCP Clients Using An External AAA Authentication Service

- Using External AAA Authentication Services with DHCP on page 271
- Creating Unique Usernames for DHCP Clients on page 272
- Configuring Passwords for Usernames on page 275

Using External AAA Authentication Services with DHCP

The extended DHCP local server, including DHCPv6 local server, and the extended DHCP relay agent, including DHCPv6 relay agent, support the use of external AAA authentication services, such as RADIUS, to authenticate DHCP clients. When the extended DHCP local server or relay agent receives a discover PDU from a client, the extended DHCP application contacts the AAA server to authenticate the DHCP client. The extended DHCP application can obtain client addresses and DHCP configuration options from the external AAA authentication server.



NOTE: This section uses the term *extended DHCP application* to refer to both the extended DHCP local server and the extended DHCP relay agent.

The external authentication feature also supports AAA directed logout. If the external AAA service supports a user logout directive, the extended DHCP application honors the logout and responds as though it were requested by a CLI management command. All of the client state information and allocated resources are deleted at logout. The extended DHCP application supports directed logout using the list of configured authentication servers you specify with the **authentication-server** statement at the **[edit access profile profile-name]** hierarchy level.

You can configure either global authentication support or group-specific support.

You must configure the **username-include** statement to enable the use of authentication. The **password** statement is not required and does not cause DHCP to use authentication if the **username-include** statement is not included.

To configure DHCP local server and DHCP relay agent authentication support:

1. Specify that you want to configure authentication options.

- For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# edit authentication
```

- For DHCP relay agent:

```
[edit forwarding-options dhcp-relay]
user@host# edit authentication
```

- For DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit authentication
```

- For DHCPv6 relay agent:

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit authentication
```

2. (Optional) Configure a password that authenticates the username to the external authentication service.

See [“Configuring Passwords for Usernames” on page 275](#).

3. (Optional) Configure optional features to create a unique username.

See [“Creating Unique Usernames for DHCP Clients” on page 272](#).

Related Documentation

- [Extended DHCP Local Server Overview on page 230](#)
- [Extended DHCP Relay Agent Overview on page 236](#)
- [DHCPv6 Local Server Overview on page 434](#)
- [DHCPv6 Relay Agent Overview on page 441](#)

Creating Unique Usernames for DHCP Clients

You can configure the extended DHCP application to include additional information in the username that is passed to the external AAA authentication service when the DHCP client logs in. This additional information enables you to construct usernames that uniquely identify subscribers (DHCP clients).



.....

NOTE: If you do not include a username in the authentication configuration, the router (or switch) does not perform authentication; however, the IP address is provided by the local pool if it is configured.

When you use the DHCPv6 local server, you must configure authentication and the client username; otherwise client login fails.

.....

The following list describes the optional information that you can include as part of the username:

- **circuit-type**—The circuit type used by the DHCP client, for example **enet**.
- **client-id**—The client identifier option (option 1). (DHCPv6 local server DHCPv6 relay agent only)
- **delimiter**—The delimiter character that separates components that make up the concatenated username. The default delimiter is a period (.). The semicolon (;) is not supported as a delimiter character.
- **domain-name**—The client domain name as a string. The router adds the @ delimiter to the username.
- **interface-name**—The interface name, including the interface device and associated VLAN IDs.
- **logical-system-name**—The name of the logical system, if the receiving interface is in a logical system.
- **mac-address**—The client MAC address, in a string of the format *xxxx.xxxx.xxxx*. (Not supported for DHCPv6 local server)
- **option-60**—The portion of the option 60 payload that follows the length field. (Not supported for DHCPv6 local server)
- **option-82 <circuit-id> <remote-id>**—The specified contents of the option 82 payload. (Not supported for DHCPv6 local server)
 - **circuit-id**—The payload of the Agent Circuit ID suboption.
 - **remote-id**—The payload of the Agent Remote ID suboption.
 - Both **circuit-id** and **remote-id**—The payloads of both suboptions, in the format: **circuit-id[delimiter]remote-id**.
 - Neither **circuit-id** or **remote-id**—The raw payload of the option 82 from the PDU is concatenated to the username.



NOTE: For DHCP relay agent, the option 82 value used in creating the username is based on the option 82 value that is encoded in the outgoing (relayed) PDU.

- **relay-agent-interface-id**—The Interface-ID option (option 18). (DHCPv6 local server or relay agent)
- **relay-agent-remote-id**—The DHCPv6 Relay Agent Remote-ID option (option 37). (DHCPv6 local server or relay agent)
- **relay-agent-subscriber-id**—(On routers only) The DHCPv6 Relay Agent Subscriber-ID option (option 38). (DHCPv6 local server or relay agent)

- **routing-instance-name**—The name of the routing instance, if the receiving interface is in a routing instance.
- **user-prefix**—A string indicating the user prefix.

The router (switch) creates the unique username by including the specified additional information in the following order, with the fields separated by a delimiter.

For DHCP local server and DHCP relay agent:

```
user-prefix[delimiter]mac-address[delimiter]logical-system-name[delimiter]
routing-instance-name[delimiter]circuit-type[delimiter]interface-name[delimiter]option-82[delimiter]
option-60@domain-name
```

For DHCPv6 local server:

```
user-prefix[delimiter]logical-system-name[delimiter]routing-instance-name[delimiter]
circuit-type[delimiter]interface-name[delimiter]relay-agent-remote-id[delimiter]
relay-agent-subscriber-id[delimiter]relay-agent-interface-id[delimiter]client-id@domain-name
```

To configure a unique username:

1. Specify that you want to configure authentication.

- For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# edit authentication
```

- For DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit authentication
```

- For DHCP relay agent:

```
[edit forwarding-options dhcp-relay]
user@host# edit authentication
```

2. Specify that you want to include optional information in the username. (DHCP local server, DHCPv6 local server, and DHCP relay agent all support the **username-include** statement.)

```
[edit system services dhcp-local-server authentication]
user@host# set username-include
```

3. (Optional) Specify the optional information you want to include in the username.

```
[edit system services dhcp-local-server authentication username-include]
user@host# set username-include circuit-type
user@host# set username-include domain-name example.com
user@host# set username-include mac-address
user@host# set username-include user-prefix wallybrown
```

The previous **username-include** configuration produces this unique username:

```
wallybrown.0090.1a01.1234.enet@example.com
```

Related Documentation

- [Extended DHCP Local Server Overview on page 230](#)
- [DHCPv6 Local Server Overview on page 434](#)

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Using External AAA Authentication Services with DHCP on page 271](#)

Configuring Passwords for Usernames

You can configure an optional password that the extended DHCP application presents to the external AAA authentication service to authenticate the specified username.

To configure a password that authenticates the username:

1. Specify that you want to configure authentication options.

- For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# edit authentication
```

- For DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit authentication
```

- For DHCP relay agent:

```
[edit forwarding-options dhcp-relay]
user@host# edit authentication
```

2. Configure the password. (DHCP local server, DHCPv6 local server, and DHCP relay agent all support the **password** statement.)

```
[edit system services dhcp-local-server authentication]
user@host# set password $ABC123
```

Related Documentation

- [Extended DHCP Local Server Overview on page 230](#)
- [DHCPv6 Local Server Overview on page 434](#)
- [Extended DHCP Relay Agent Overview on page 236](#)
- [Using External AAA Authentication Services with DHCP on page 271](#)
- [*Special Requirements for Junos OS Plain-Text Passwords*](#)

CHAPTER 25

Grouping Interfaces and Applying a Common DHCP Configuration to the Group

- [Grouping Interfaces with Common DHCP Configurations on page 277](#)
- [Guidelines for Configuring Interface Ranges for Groups of DHCP Interfaces on page 278](#)
- [Configuring Group-Specific DHCP Local Server Options on page 279](#)
- [Configuring Group-Specific DHCP Relay Options on page 280](#)
- [Example: Configuring DHCP and DHCPv6 Relay Agent Group-Level Selective Traffic Processing on page 281](#)

Grouping Interfaces with Common DHCP Configurations

You use the group feature to group a set of interfaces and then apply a common DHCP configuration to the named interface group. The extended DHCP local server, DHCPv6 local server, DHCP relay agent, and DHCPv6 relay agent all support interface groups.

The following steps create a DHCP local server group; the steps are similar for the DHCPv6 local server, DHCP relay agent, and DHCPv6 relay agent.

To configure a DHCP local server interface group:

1. Specify that you want to configure DHCP local server.

```
[edit system services]
user@host# edit dhcp-local-server
```

2. Create the group and assign a name.

```
[edit system services dhcp-local-server]
user@host# edit group boston
```

3. Specify the names of one or more interfaces on which the extended DHCP application is enabled. You can repeat the `interface interface-name` statement to specify multiple interfaces within the group, but you cannot use the same interface in more than one group.

```
[edit system services dhcp-local-server group boston]
user@host# set interface fe-1/0/1.1
user@host# set interface fe-1/0/1.2
```

4. (Optional) You can use the **upto** option to specify a range of interfaces for a group.

```
[edit system services dhcp-local-server group boston]
user@host# set interface fe-1/0/1.3 upto fe-1/0/1.9
```

5. (Optional) You can use the **exclude** option to exclude a specific interface or a specified range of interfaces from the group. For example:

```
[edit system services dhcp-local-server group boston]
user@host# set interface fe-1/0/1.1 upto fe-1/0/1.102
user@host# set interface fe-1/0/1.6 exclude
user@host# set interface fe-1/0/1.70 upto fe-1/0/1.80 exclude
```

**Related
Documentation**

- [Extended DHCP Local Server Overview on page 230](#)
- [Extended DHCP Relay Agent Overview on page 236](#)
- [DHCPv6 Local Server Overview on page 434](#)
- [DHCPv6 Relay Agent Overview on page 441](#)
- [Configuring Group-Specific DHCP Local Server Options on page 279](#)
- [Configuring Group-Specific DHCP Relay Options on page 280](#)
- [Guidelines for Configuring Interface Ranges for Groups of DHCP Interfaces on page 278](#)

Guidelines for Configuring Interface Ranges for Groups of DHCP Interfaces

This topic describes guidelines to consider when configuring interface ranges for named interface groups for DHCP local server and DHCP relay. The guidelines refer to the following configuration statement:

```
user@host# set interface interface-name upto upto-interface-name
```

- The start subunit, **interface *interface-name***, serves as the key for the stanza. The remaining configuration settings are considered attributes.
- If the subunit is not included, an implicit **.0** subunit is enforced. The implicit subunit is applied to all interfaces when autoconfiguration is enabled. For example, **interface ge-2/2/2** is treated as **interface ge-2/2/2.0**.
- Ranged entries contain the **upto** option, and the configuration applies to all interfaces within the specified range. The start of a ranged entry must be less than the end of the range. Discrete entries apply to a single interface, except in the case of autoconfiguration, in which a **0** (zero) subunit acts as a wildcard.
- Interface stanzas defined within the same router or switch context are dependent and can constrain each other—both DHCP local server and DHCP relay are considered. Interface stanzas defined across different router (switch) contexts are independent and do not constrain one another.
- Each interface stanza, whether discrete or ranged, has a unique start subunit across a given router context. For example, the following configuration is not allowed within the same group because **ge-1/0/0.10** is the start subunit for both.

```
interface ge-1/0/0.10 upto ge-1/0/0.30
```

```
interface ge-1/0/0.10
```

- Two groups cannot share interface space. For example, the following configuration is not allowed because the three stanzas share the same space and interfere with one another—interface **ge-1/0/0.26** is common to all three.

```
dhcp-relay group diamond interface ge-1/0/0.10 upto ge-1/0/0.30
dhcp-local-server group ruby interface ge-1/0/0.26
dhcp-relay group sapphire interface ge-1/0/0.25 upto ge-1/0/0.35
```

- Two ranges cannot overlap, either within a group or across groups. Overlapping occurs when two interface ranges share common subunit space but neither range is a proper subset of the other. The following ranges overlap:

```
interface ge-1/0/0.10 upto ge-1/0/0.30
interface ge-1/0/0.20 upto ge-1/0/0.40
```

- A range can contain multiple nested ranges. A nested range is a proper subset of another range. When ranges are nested, the smallest matching range applies.

In the following example, the three ranges nest properly:

```
interface ge-1/0/0.10 upto ge-1/0/0.30
interface ge-1/0/0.12 upto ge-1/0/0.15 exclude
interface ge-1/0/0.25 upto ge-1/0/0.29 exclude
```

- Discrete interfaces take precedence over ranges. In the following example, interface **ge-1/0/0.20** takes precedence and enforces an interface client limit of 5.

```
interface ge-1/0/0.10 upto ge-1/0/0.30
interface ge-1/0/0.15 upto ge-1/0/0.25 exclude
interface ge-1/0/0.20 overrides interface-client-limit 5
```

Related Documentation

- [Grouping Interfaces with Common DHCP Configurations on page 277](#)

Configuring Group-Specific DHCP Local Server Options

You can include the following statements at the **[edit system services dhcp-local-server group group-name]** hierarchy level to set group-specific DHCP local server configuration options. Statements configured at the **[edit system services dhcp-local-server group group-name]** hierarchy level apply only to the named group of interfaces, and override any global DHCP local server settings configured with the same statements at the **[edit system services dhcp-local-server]** hierarchy level.

DHCPv6 local server supports the same set of statements with the exception of the **dynamic-profile** statement.

- **authentication**—Configure the parameters the router sends to the external AAA server.
- **dynamic-profile**—Specify the dynamic profile that is attached to a group of interfaces.

- **interface**—Specify one or more interfaces, or a range of interfaces, that are within the specified group.
- **overrides**—Override the default configuration settings for the extended DHCP local server. For information, see [“Overriding Default DHCP Local Server Configuration Settings” on page 311](#).

**Related
Documentation**

- [Grouping Interfaces with Common DHCP Configurations on page 277](#)

Configuring Group-Specific DHCP Relay Options

You can include the following statements at the **[edit forwarding-options dhcp-relay group group-name]** hierarchy level to set group-specific DHCP relay agent configuration options. Group-specific statements apply only to the named group of interfaces, and override any global DHCP relay agent settings for the same statement.

Include the statements at the **[edit forwarding-options dhcp-relay dhcpv6 group group-name]** hierarchy level to configure group-specific options for DHCPv6 relay agent.

- **active-server-group**—Configure an active server group to apply a common DHCP relay agent configuration to a named group of DHCP server addresses. For information, see [“Configuring Active Server Groups to Apply a Common DHCP Relay Agent Configuration to Named Server Groups” on page 323](#).
- **authentication**—Configure the parameters the router (or switch) sends to the external AAA server.
- **dynamic-profile**—Specify the dynamic profile that is attached to a group of interfaces.
- **interface**—Specify one or more interfaces, or a range of interfaces, that are within the specified group.
- **liveness-detection**—Configure bidirectional failure detection timers and authentication criteria for static routes. For more information, see *DHCP Liveness Detection Overview*.
- **overrides**—Override the default configuration settings for the extended DHCP relay agent. For information, see [“Overriding the Default DHCP Relay Configuration Settings” on page 313](#).
- **relay-agent-interface-id**—(DHCPv6 only) Insert the DHCPv6 Relay Agent Interface-ID option (option 18) in DHCPv6 packets destined for the DHCPv6 server.
- **relay-agent-remote-id**—(DHCPv6 only) Insert the DHCPv6 Relay Agent Remote-ID option (option 37) in DHCPv6 packets destined for the DHCPv6 server.
- **relay-option**—Configure selective processing, which uses DHCP options in client packets to identify and filter client traffic, and to specify the action DHCP relay agent takes with the traffic. For more information, see [“Using DHCP Option Information to Selectively Process DHCP Client Traffic” on page 344](#).

- **relay-option-82**—(DHCPv4 only) Enable or disable the insertion of option 82 information in packets destined for a DHCP server. For information, see [“Using DHCP Relay Agent Option 82 Information” on page 337](#).
- **service-profile**—Specify the default subscriber service, (or default profile) which is activated when the subscriber (or DHCP client) logs in and no other service is activated by a RADIUS server or a provisioning server. For more information, see [“Default Subscriber Service Overview” on page 241](#).

**Related
Documentation**

- [Grouping Interfaces with Common DHCP Configurations on page 277](#)

Example: Configuring DHCP and DHCPv6 Relay Agent Group-Level Selective Traffic Processing

This example shows how to configure named interface group-based support for DHCPv6 relay agent selective processing, which uses DHCP option strings to identify, filter, and process client traffic.

This example describes DHCPv6 relay agent configuration—you can configure the related procedure for DHCP relay agent groups at the **[edit forwarding-options dhcp-relay]** hierarchy level. DHCPv6 selective processing supports DHCPv6 options 15 and 16. DHCP selective processing supports option 60 (MX Series routers only) and option 77.

- [Requirements on page 281](#)
- [Overview on page 282](#)
- [Configuration on page 282](#)
- [Verification on page 284](#)

Requirements

This example uses the following hardware and software components:

- MX Series 3D Universal Edge Routers or PTX Series Packet Transport Routers

Before you configure DHCPv6 relay agent selective processing support, be sure you:

- Configure DHCPv6 relay agent.

See [“Extended DHCP Relay Agent Overview” on page 236](#) and [“DHCPv6 Relay Agent Overview” on page 441](#).

- Configure the DHCPv6 named interface groups used for the configuration.

See [“Grouping Interfaces with Common DHCP Configurations” on page 277](#).

- Configure the DHCPv6 server groups used for the processing actions.

See [“Grouping Interfaces with Common DHCP Configurations” on page 277](#).

Overview

In this example, you configure group-level DHCPv6 relay agent named interface support for selective processing of client packets based on DHCPv6 option strings. To configure selective processing, you perform the following procedures:

1. Identify the client traffic—Specify the DHCPv6 option that DHCPv6 relay agent uses to identify the client traffic you want to process. The DHCPv6 option you specify matches the option in the client traffic.
2. Configure the default action—Specify the default processing action, which DHCPv6 relay uses for identified client traffic that does not satisfy any configured match criteria.
3. Create match filters and associate an action with each filter—Specify match criteria that filters the client traffic. The criteria can be an exact match or a partial match with the DHCPv6 option string in the client traffic. Associate a processing action with each match criteria.

Configuration

To configure group-level DHCPv6 relay agent selective processing based on DHCPv6 option information, perform these tasks:

- [Configuring a DHCPv6 Relay Agent Named Interface Group To Selectively Process Client Traffic Based on DHCPv6 Option Strings on page 282](#)
- [Results on page 283](#)

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them in a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the command into the CLI at the **[edit]** hierarchy level. The quick configuration assumes that the named interface group and the DHCP server groups have been previously configured.

```
set forwarding-options dhcp-relay dhcpv6 group groupv6-east-27
set forwarding-options dhcp-relay dhcpv6 relay-option option-number 15
set forwarding-options dhcp-relay dhcpv6 relay-option equals ascii triple-gold
  relay-server-group relayserver-triple-8
set forwarding-options dhcp-relay dhcpv6 relay-option equals ascii triple-silver
  relay-server-group relayserver-triple-23
set forwarding-options dhcp-relay dhcpv6 relay-option starts-with ascii single
  relay-server-group relayserver-1-aa
set forwarding-options dhcp-relay dhcpv6 relay-option default-action drop
```

[Configuring a DHCPv6 Relay Agent Named Interface Group To Selectively Process Client Traffic Based on DHCPv6 Option Strings](#)

Step-by-Step Procedure

This procedure assumes that you have previously created the named interface group and the DHCPv6 server groups. To configure DHCPv6 relay group-level selective processing:

1. Specify that you want to configure DHCPv6 relay agent support.
[edit forwarding-options]

```
user@host# edit dhcp-relay dhcpv6
```

- Specify that you want to configure group-level DHCPv6 relay agent support.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit group groupv6-east-27
```

- Specify the DHCPv6 option number that DHCPv6 relay agent uses to identify incoming client traffic.

```
[edit forwarding-options dhcp-relay dhcpv6 group groupv6-east-27]
user@host# set relay-option option-number 15
```

- Configure the default action, which DHCPv6 relay agent uses when the incoming client traffic does not satisfy any configured match criteria.

```
[edit forwarding-options dhcp-relay dhcpv6 group groupv6-east-27]
user@host# set relay-option default-action relay-server-group relayserver-def-4
```

- Configure an exact match condition and associated action that DHCPv6 relay uses to process the identified client traffic.

```
[edit forwarding-options dhcp-relay dhcpv6 group groupv6-east-27]
user@host# set relay-option equals ascii triple-gold relay-server-group
relayserver-triple-8
```

- Configure a second exact match condition and associated action that DHCPv6 relay uses to process client traffic.

```
[edit forwarding-options dhcp-relay dhcpv6 group groupv6-east-27]
user@host# set relay-option equals ascii triple-silver relay-server-group
relayserver-triple-23
```

- Configure a partial match criteria and associated action that DHCPv6 relay uses to process client traffic.

```
[edit forwarding-options dhcp-relay dhcpv6 group groupv6-east-27]
user@host# set relay-option starts-with ascii single relay-server-group
relayserver-1-aa
```

Results

From configuration mode, confirm the results of your configuration by issuing the **show** statement at the **[edit forwarding-options dhcp]** hierarchy level. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
dhcpv6 {
  group test-1 {
    relay-option {
      option-number 15;
      equals {
        ascii triple-gold {
          relay-server-group relayserver-triple-8;
        }
        ascii triple-silver {
          relay-server-group relayserver-triple-23;
        }
      }
    }
  }
}
```

```
    default-action {
        relay-server-group relayserver-def-4;
    }
    starts-with {
        ascii single {
            relay-server-group relayserver-1-aa;
        }
    }
}
interface ge-1/0/0.0 upto ge-1/1/0.0;
}
server-group {
    relayserver-1-aa;
    relayserver-triple-8;
    relayserver-triple-23;
    relayserver-def-4;
}
}
```

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

Verification

To verify the status of DHCPv6 relay agent selective traffic processing, perform this task:

- [Verifying the Status of DHCPv6 Relay Agent Selective Traffic Processing on page 284](#)

Verifying the Status of DHCPv6 Relay Agent Selective Traffic Processing

Purpose Verify the DHCPv6 relay agent selective traffic processing status.

Action Display statistics for DHCPv6 relay agent.

```
user@host> show dhcpv6 relay statistics
```

```
DHCPv6 Packets dropped:
```

```
    Total                               0
```

```
Messages received:
```

```
    DHCPV6_DECLINE                      0
    DHCPV6_SOLICIT                      10
    DHCPV6_INFORMATION_REQUEST          0
    DHCPV6_RELEASE                      0
    DHCPV6_REQUEST                      10
    DHCPV6_CONFIRM                      0
    DHCPV6_RENEW                        0
    DHCPV6_REBIND                       0
    DHCPV6_RELAY_REPL                   0
```

```
Messages sent:
```

```
    DHCPV6_ADVERTISE                    0
    DHCPV6_REPLY                        0
    DHCPV6_RECONFIGURE                  0
    DHCPV6_RELAY_FORW                   0
```

```
Packets forwarded:
```

```
    Total                               4
    FWD REQUEST                         2
    FWD REPLY                           2
```

Meaning The **Packets forwarded** field in the **show dhcpv6 relay statistics** command output displays the number of client packets that have been forwarded as a result of the selective traffic processing configuration. In this example, the output indicates the total number of packets that DHCPv6 relay agent has forwarded, as well as a breakdown for the number of **FWD REQUEST** and **FWD REPLY** packets forwarded.

Related Documentation

- [Extended DHCP Relay Agent Overview on page 236](#)
- [DHCPv6 Relay Agent Overview on page 441](#)
- *DHCP Options and Selective Traffic Processing Overview*
- [Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344](#)
- [Grouping Interfaces with Common DHCP Configurations on page 277](#)
- [Displaying a Count of DHCP Packets That Are Dropped or Forwarded During Selective Processing That Is Based on DHCP Option Strings on page 370](#)
- [Example: Configuring DHCP Relay Agent Selective Traffic Processing Based on DHCP Option Strings on page 346](#)

Configuring the Number of DHCP Clients Per Interface

- [Specifying the Maximum Number of DHCP Clients Per Interface on page 287](#)
- [Allowing Only One DHCP Client Per Interface on page 288](#)

Specifying the Maximum Number of DHCP Clients Per Interface

By default, there is no limit to the number of DHCP local server or DHCP relay clients allowed on an interface. However, you can override the default setting and specify the maximum number of clients allowed per interface, in the range 1 through 500,000. When the number of clients on the interface reaches the specified limit, no additional DHCP Discover PDUs or DHCPv6 Solicit PDUs are accepted. When the number of clients subsequently drops below the limit, new clients are again accepted.



NOTE: The maximum number of DHCP (and DHCPv6) local server clients or DHCP (and DHCPv6) relay clients can also be specified by Juniper Networks VSA 26-143 during client login. The VSA-specified value always takes precedence if the `interface-client-limit` statement specifies a different number.

If the VSA-specified value differs with each client login, DHCP uses the largest limit set by the VSA until there are no clients on the interface.

To configure the maximum number of DHCP clients allowed per interface:

1. Specify that you want to configure override options.

- For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# edit overrides
```

- For DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit overrides
```

- For DHCP relay agent:

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

```
user@host# edit overrides
```

- For DHCPv6 relay agent:

```
[edit forwarding-options dhcp-relay dhcpv6]
```

```
user@host# edit overrides
```

2. Configure the maximum number of clients allowed per interface. (DHCP local server, DHCPv6 local server, DHCP relay agent and DHCPv6 relay agent all support the **interface-client-limit** statement.)

```
[edit system services dhcp-local-server overrides]
```

```
user@host# set interface-client-limit number
```



NOTE: For DHCP local server and DHCP relay agent, you can use either the **interface-client-limit** statement or the **client-discover-match incoming-interface** statement to set a limit of one client per interface. The **interface-client-limit** statement with a value of 1 retains the existing client and rejects any new client connections. The **client-discover-match incoming-interface** statement deletes the existing client and allows a new client to connect.

Related Documentation

- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
- [Allowing Only One DHCP Client Per Interface on page 288](#)
- [Deleting DHCP Local Server and DHCP Relay Override Settings on page 315](#)
- [Extended DHCP Local Server Overview on page 230](#)
- [Extended DHCP Relay Agent Overview on page 236](#)

Allowing Only One DHCP Client Per Interface

Subscriber management provides two methods that you can use to configure DHCP local server and DHCP relay agent to allow only one DHCP client per interface. The two methods differ on which client is allowed on the interface—the new client or the existing client. The two methods are supported by both DHCP local server and DHCP relay agent, and can be configured globally, for a group of interfaces, or for a specific interface.

- **Accept new client**—Delete the existing client binding and allow the new client to connect. To configure this action, use the ... **overrides client-discover-match incoming-interface** statement.
- **Keep existing client**—Retain the existing client binding on the interface and reject any requests from new DHCP clients. To configure this action, use the ... **overrides interface-client-limit 1** statement to specify a maximum of one client.

To configure the router to delete the existing client binding on the interface and allow the new client to connect:

1. Specify that you want to configure override options.
 - For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# edit overrides
```

- For DHCP relay agent:

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

2. Configure the router to view all client connections on the interface as coming from the same client, which allows a new client to replace the existing client. This example shows the DHCP local server configuration. The DHCP relay agent configuration is similar.

```
[edit system services dhcp-local-server overrides]
user@host# set client-discover-match incoming-interface
```

To configure the router to keep the existing client binding on the interface and refuse connections from new clients:

1. Specify that you want to configure override options.

- For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# edit overrides
```

- For DHCP relay agent:

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

2. Set the maximum number of clients allowed per interface to one. This example shows the DHCP local server configuration. The DHCP relay agent configuration is similar.

```
[edit system services dhcp-local-server overrides]
user@host# set interface-client-limit 1
```

Related Documentation

- [DHCP Auto Logout Overview on page 303](#)
- [Automatically Logging Out DHCP Clients on page 305](#)

Maintaining Subscribers During Interface Delete Events

- [Subscriber Binding Retention During Interface Delete Events on page 291](#)
- [Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events on page 292](#)
- [Verifying and Managing the DHCP Maintain Subscribers Feature on page 292](#)

Subscriber Binding Retention During Interface Delete Events

You can configure the router to maintain DHCP subscribers when an event occurs that normally results in the router deleting the subscriber. For example, by default, the router logs out DHCP subscribers when an interface delete event occurs, such as a line card reboot or failure. However, if you configure the router to maintain subscribers, the router identifies each subscriber that was on the deleted interface, and resumes normal packet processing for the subscriber when the interface is restored. This procedure does not maintain subscribers that are deleted during router reboots or failures.



NOTE: Subscribers are logged off as usual when their lease expires, even if the router is configured to maintain subscribers and the subscriber is on a deleted interface that has not yet been restored.

You configure the router to maintain subscribers on a global basis— the configuration applies to DHCP local server, DHCPv6 local server, and DHCP relay clients in all logical routers and routing instances. When you enable the maintain subscribers feature, the router applies the feature to existing subscribers as well as subscribers who later connect.

If the maintain subscribers feature is enabled on the router, you can explicitly delete a subscriber binding and log out the subscriber by either specifying a lease expiration timeout or using one of the following commands, as appropriate:

- `clear dhcp server binding`
- `clear dhcpv6 server binding`
- `clear dhcp relay binding`

- Related Documentation**
- [Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events on page 292](#)
 - [Verifying and Managing the DHCP Maintain Subscribers Feature on page 292](#)

Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events

You can specify a configuration in which the router does not log out a subscriber when the subscriber's interface is deleted.



NOTE: This procedure does not maintain subscribers during router reboots or failures.

To configure the router to maintain DHCP subscribers when the subscriber interface is deleted:

1. Specify that you want to configure subscriber management.

```
[edit system services]  
user@host# edit subscriber-management
```
2. Configure the router to support the maintain-subscriber feature.

```
[edit system services subscriber-management]  
user@host# edit maintain-subscriber
```
3. Configure the router to enable the maintain-subscriber feature when an interface-delete event occurs.

```
[edit system services subscriber-management maintain-subscriber]  
user@host# set interface-delete
```

- Related Documentation**
- [Subscriber Binding Retention During Interface Delete Events on page 291](#)
 - [Verifying and Managing the DHCP Maintain Subscribers Feature on page 292](#)

Verifying and Managing the DHCP Maintain Subscribers Feature

- Purpose** Display information related to the DHCP maintain-subscribers feature and explicitly log out maintained clients.
- Action**
- To display DHCP local server binding information for the DHCP maintain subscribers feature:

```
user@host>show dhcp server binding detail
```
 - To display DHCPv6 local server binding information for the DHCP maintain subscribers feature:

```
user@host>show dhcpv6 server binding detail
```
 - To display DHCP relay binding information for the DHCP maintain subscribers feature:

user@host>**show dhcp relay binding detail**

- To explicitly log out a DHCP local server subscriber when the maintain subscriber feature is enabled:

user@host>**clear dhcp server binding *binding-type***

- To explicitly log out a DHCPv6 local server subscriber when the maintain subscriber feature is enabled:

user@host>**clear dhcpv6 server binding *binding-type***

- To explicitly log out a DHCP relay subscriber when the maintain subscriber feature is enabled:

user@host>**clear dhcp relay binding *binding-type***

**Related
Documentation**

- [Subscriber Binding Retention During Interface Delete Events on page 291](#)
- [Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events on page 292](#)

CHAPTER 28

Forcing Dynamic Reconfiguration of Clients From a DHCP Local Server

- [Understanding Dynamic Reconfiguration of Extended DHCP Local Server Clients on page 295](#)
- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)
- [Configuring Dynamic Reconfiguration Attempts for DHCP Clients on page 300](#)
- [Configuring Deletion of the Client When Dynamic Reconfiguration Fails on page 301](#)
- [Configuring Reconfiguration of the Client on Receipt of RADIUS-Initiated Disconnect on page 301](#)

Understanding Dynamic Reconfiguration of Extended DHCP Local Server Clients

Dynamic reconfiguration of clients enables the extended DHCP local server to initiate a client update without waiting for the client to initiate a request.

Default Client/Server Interaction

Typically the DHCP client initiates all of the basic DHCP client/server interactions. The DHCP server sends information to a client only in response to a request from that client. This behavior does not enable a client to be quickly updated with its network address and configuration in the event of server changes:



NOTE: Technically, the DHCP client/server interactions are the same on routers and switches. However, the primary usage of this technology on the routers is for subscriber management. The switches are not used for subscriber management. Therefore, this topic provides two sample scenarios. The actions are the same, but the implementation details are different.

- On routers—Suppose a service provider restructures its addressing scheme or changes the server IP addresses that it provided to clients. Without dynamic reconfiguration, the service provider typically clears the DHCP server binding table, but cannot inform the DHCP clients that their bindings have been cleared. Consequently, the DHCP client operates as though its IP address is still valid, but it is now unable to communicate over the access network, resulting in an outage. The DHCP local server needs to wait for the client to send a message to renew its lease or rebind to the server. In response,

the server sends a NAK message to the client to force it to begin the DHCP connection process again. Alternatively, the provider can wait for customers to make a service call about the network failures and then instruct them to power cycle their customer premises equipment to reinitiate the connection. Neither of these actions is timely or convenient for customers.

- On switches—Suppose you restructure the addressing scheme or change the server IP addresses that the DHCP server provides to clients. Without dynamic reconfiguration, the network typically clears the DHCP server binding table, but cannot inform the DHCP clients that their bindings have been cleared. Consequently, the DHCP client operates as though its IP address is still valid, but it is now unable to communicate over the access network, resulting in an outage. The DHCP local server needs to wait for the client to send a message to renew its lease or rebind to the server. In response, the server sends a NAK message to the client to force it to begin the DHCP connection process again. Alternatively, you can wait for users to notify you of the network failures and then instruct them to power cycle their equipment to reinitiate the connection. Neither of these actions is timely or convenient for users.

Dynamic Client/Server Interaction for DHCPv4

Dynamic reconfiguration for DHCPv4 is available through a partial implementation of RFC 3203, *DHCP Reconfigure Extension* for DHCPv4. It enables the DHCPv4 local server to send a message to the client to force reconfiguration.

The server sends a `forcerenew` message to a DHCPv4 client, initiating a message exchange. In response, DHCPv4 clients that support the `forcerenew` message then send a lease renewal message to the server. The server rejects the lease renewal request and sends a NAK to the client, causing the client to reinitiate the DHCP connection. A successful reconnection results in the reconfiguration of the DHCP client. Only the exchange of `forcerenew`, `renew`, and NAK messages is supported from RFC 3202. DHCP relay and DHCP relay proxy do not participate in the client reconfiguration or react to `forcerenew` messages other than to forward them to the client.

When the local server state machine starts the reconfiguration process on a bound client, the client transitions to the reconfiguring state and the local server sends a `forcerenew` message to the client. Because the client was in the bound state before entering the reconfiguring state, all subscriber services or DHCP-managed services, such as forwarding and statistics, continue to work. Client statistics are not maintained in the interval between a successful reconfiguration and the subsequent client binding. When the server responds to the client renewal request with a NAK, the client entry is removed from the binding table and final statistics are reported. New statistics are collected when the client sends a discover message to establish a new session.

Dynamic Client/Server Interaction for DHCPv6

Dynamic reconfiguration for DHCPv6 is available through a partial implementation of RFC 3315, *Dynamic Host Configuration Protocol for IPv6 (DHCPv6)*. It enables the DHCPv6 local server to send a message to the client to force reconfiguration.

DHCPv6 servers send reconfigure messages to DHCPv6 clients, initiating a message exchange. In response, DHCPv6 clients that support the reconfigure message transition

to the renewing state and send a renew message to the server. The server returns a reply message with a lifetime of zero (0). The client transitions to the init state and sends a solicit message. The server sends an advertise message to indicate that it is available for service. The client sends a request for configuration parameters, which the server then includes in its reply. DHCP relay and DHCP relay proxy do not participate in the client reconfiguration or react to reconfigure messages other than to forward them to the client.

When a DHCPv6 server is triggered to initiate reconfiguration on a bound DHCPv6 client, the client transitions to the reconfigure state. All subscriber services, such as forwarding and statistics, continue to work. The server then sends the reconfigure message to the client. If the DHCPv6 client is already in the reconfigure state, the DHCPv6 server ignores the reconfiguration trigger. For clients in any state other than bound or reconfigure, the server clears the binding state of the client, as if the **clear dhcpv6 server binding** command had been issued.

Manually Forcing the Local Server to Initiate the Reconfiguration Process

You can force the local server to initiate the reconfiguration process for clients by issuing the **request dhcp server reconfigure** command for DHCPv4 clients, and the **request dhcpv6 server reconfigure** command for DHCPv6 clients. Command options determine whether reconfiguration is then attempted for all clients or specified clients.

Action Taken for Events That Occur During a Reconfiguration

Events that take place while a reconfiguration is in process take precedence over the reconfiguration. [Table 43 on page 297](#) lists the actions taken in response to several different events.

Table 43: Action Taken for Events That Occur During a Reconfiguration

Event	Action
Server receives a discover (DHCPv4) or solicit (DHCPv6) message from the client.	Server drops packet and deletes client.
Server receives a request, renew, rebind, or init-reboot message from the client.	DHCPv4—Server sends NAK message and deletes client. DHCPv6—Server drops packet and deletes client. Server replies to renew message with lease time of zero (0).
Server receives a release or decline message from the client.	Server deletes client.
The client lease times out.	Server deletes client.
The clear dhcp server binding command is issued.	Server deletes client.
The request dhcp server reconfigure (DHCPv4) or request dhcpv6 server reconfigure (DHCPv6) command is issued.	Command is ignored.

Table 43: Action Taken for Events That Occur During a Reconfiguration (*continued*)

Event	Action
GRES or DHCP restart occurs.	Reconfiguration process is halted.

Related Documentation

- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)

Configuring Dynamic Client Reconfiguration of Extended Local Server Clients

The DHCP local server can initiate reconfiguration of its clients to avoid extended outages because of server configuration changes. You can enable dynamic reconfiguration for all DHCP clients or only the DHCP clients serviced by a specified group of interfaces, and you can modify the behavior accordingly.

Starting in Junos OS Release 14.1, you can modify the behavior of the process in which the DHCP local server initiates reconfiguration of its clients by including the appropriate configuration statements. You can provide the statements at the **[edit system services dhcp-local-server reconfigure]** hierarchy level for all DHCPv4 clients, and at the **[edit system services dhcp-local-server dhcpv6 reconfigure]** hierarchy level for all DHCPv6 clients. To override this global configuration for only the DHCP clients serviced by a specified group of interfaces, you can include the statements with different values at the **[edit system services dhcp-local-server group group-name reconfigure]** hierarchy level for DHCPv4 clients, and at the **[edit system services dhcp-local-server dhcpv6 group group-name reconfigure]** hierarchy level for DHCPv6 clients.

To configure dynamic reconfiguration of DHCP clients:

1. Enable dynamic reconfiguration with default values for all clients.

For DHCPv4:

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

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6]
user@host# set reconfigure
```

2. (Optional) Enable dynamic reconfiguration for only the DHCP clients serviced by a group of interfaces.

For DHCPv4:

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

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6 group group-name]
user@host# set reconfigure
```

3. (Optional) Configure an authentication token. The DHCP local server then includes this token inside the authentication option when it sends `forcerenew` or `reconfigure` messages. If the service provider has previously configured the DHCP client with this token, then the client can compare that token against the newly received token, and reject the message if the tokens do not match. This functionality corresponds to RFC 3118, *Authentication for DHCP Messages*, section 4.

- a. For all clients:

For DHCPv4:

```
[edit system services dhcp-local-server reconfigure]
user@host# set token token-value
```

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6 reconfigure]
user@host# set token token-value
```

- b. For only the DHCP clients serviced by a group of interfaces:

For DHCPv4:

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

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6 group group-name reconfigure]
user@host# set token token-value
```

4. For the DHCPv6 server only, you can include the `strict` statement. By default, the server accepts solicit messages from clients that do not support server-initiated reconfiguration. Including this statement causes the server to discard solicit messages from nonsupporting clients; consequently the server does not bind these clients.

For all DHCPv6 clients:

```
[edit system services dhcp-local-server dhcpv6 reconfigure]
user@host# set strict
```

For only the DHCPv6 clients serviced by a group of interfaces:

```
[edit system services dhcp-local-server dhcpv6 group group-name reconfigure]
user@host# set strict
```

5. (Optional) Configure how the server attempts reconfiguration.
See [“Configuring Dynamic Reconfiguration Attempts for DHCP Clients” on page 300](#).
6. (Optional) Configure the response to a failed reconfiguration.
See [“Configuring Deletion of the Client When Dynamic Reconfiguration Fails” on page 301](#).
7. (Optional) Configure the behavior in response to a RADIUS-initiated disconnect.
See [“Configuring Reconfiguration of the Client on Receipt of RADIUS-Initiated Disconnect” on page 301](#).
8. (Optional) Configure a token for rudimentary server authentication.

See [“Configuring a Token for DHCP Local Server Authentication”](#) on page 357.

9. (Optional) Initiate reconfiguration of some or all client bindings.

See [“Requesting DHCP Local Server to Initiate Reconfiguration of Client Bindings”](#) on page 367.

10. (Optional) Prevent DHCPv6 clients from binding if they do not support reconfigure messages.

See [“Preventing Binding of Clients That Do Not Support Reconfigure Messages”](#) on page 436.

Release History Table

Release	Description
14.1	Starting in Junos OS Release 14.1, you can modify the behavior of the process in which the DHCP local server initiates reconfiguration of its clients by including the appropriate configuration statements.

Configuring Dynamic Reconfiguration Attempts for DHCP Clients

You can configure how many attempts the local server makes to initiate reconfiguration of the DHCP client by sending `forcerenew` or `reconfigure` messages. You can also specify how long the server waits between attempts. By default, eight attempts are made and the initial interval is two seconds.

Each successive attempt doubles the interval between attempts. For example, if the first value is 2, the first retry is attempted 2 seconds after the first attempt fails. The second retry is attempted 4 seconds after the first retry fails. The third retry is attempted 8 seconds after the second retry fails, and so on. A group configuration takes precedence over a DHCP local server configuration.

(Optional) To configure DHCP local server reconfiguration behavior for all DHCP clients:

1. Specify the number of reconfiguration attempts.

For DHCPv4:

```
[edit system services dhcp-local-server reconfigure]
user@host# set attempts 5
```

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6 reconfigure]
user@host# set attempts 5
```

2. Specify the interval between reconfiguration attempts.

For DHCPv4:

```
[edit system services dhcp-local-server reconfigure]
user@host# set timeout 8
```

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6 reconfigure]
user@host# set timeout 8
```

To override the global configuration for a particular group of clients, include the statements at the `[edit system services dhcp-local-server group group-name reconfigure]` hierarchy level or the `[edit system services dhcpv6 dhcp-local-server group group-name reconfigure]` hierarchy level.

Related Documentation

- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)

Configuring Deletion of the Client When Dynamic Reconfiguration Fails

You can configure the local server to delete the client when the maximum number of reconfiguration attempts has been made without success. By default, the client's original configuration is restored.

(Optional) To configure the DHCP local server to delete the client when reconfiguration is not successful, for all clients:

- Specify the client deletion.

For DHCPv4:

```
[edit system services dhcp-local-server reconfigure]
user@host# set clear-on-abort
```

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6 reconfigure]
user@host# set clear-on-abort
```

To override the global configuration for a particular group of clients, include the statement at the `[edit system services dhcp-local-server group group-name reconfigure]` hierarchy level or the `[edit system services dhcpv6 dhcp-local-server group group-name reconfigure]` hierarchy level.

Related Documentation

- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)
- [clear-on-abort on page 959](#)

Configuring Reconfiguration of the Client on Receipt of RADIUS-Initiated Disconnect

You can configure the local server to reconfigure the client when the client receives a RADIUS-initiated disconnect. By default, the client is deleted when a RADIUS-initiated disconnect is received.

(Optional) To configure the DHCP local server to reconfigure the client instead of deleting the client when a RADIUS-initiated disconnect is received, for all clients:

- Specify the RADIUS-initiated disconnect trigger.

For DHCPv4:

```
[edit system services dhcp-local-server reconfigure trigger]
user@host# set radius-disconnect
```

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6 reconfigure trigger]
user@host# set radius-disconnect
```

To override the global configuration for a particular group of clients, include the statement at the `[edit system services dhcp-local-server group group-name reconfigure trigger]` hierarchy level or the `[edit system services dhcpv6 dhcp-local-server group group-name reconfigure trigger]` hierarchy level.

**Related
Documentation**

- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)
- [radius-disconnect on page 1260](#)
- [trigger on page 1396](#)

CHAPTER 29

Conserving IP Addresses Using DHCP Auto Logout

- [DHCP Auto Logout Overview on page 303](#)
- [Automatically Logging Out DHCP Clients on page 305](#)
- [How DHCP Relay Agent Uses Option 82 for Auto Logout on page 306](#)
- [DHCPv6 Match Criteria for Identifying DHCPv6 Subscribers on page 307](#)
- [Automatically Logging Out DHCPv6 Clients on page 308](#)

DHCP Auto Logout Overview

This topic provides an introduction to the DHCP auto logout feature and includes the following sections:

- [Auto Logout Overview on page 303](#)
- [How DHCP Identifies and Releases Clients on page 304](#)
- [Option 60 and Option 82 Requirements on page 305](#)

Auto Logout Overview

Auto logout is supported for DHCP local server and DHCP relay agent. It improves the efficiency of DHCP IP address assignment by allowing IP addresses to be immediately released and returned to the address pool when DHCP clients are no longer using the addresses. DHCP can then assign the addresses to other clients. Without auto logout, an IP address is blocked for the entire lease period, and DHCP must wait until the address lease time expires before reusing the address.

Auto logout is particularly useful when DHCP uses long lease times for IP address assignments and to help avoid allocating duplicate IP addresses for a single client.

For example, you might have an environment that includes set-top boxes (STB) that are often upgraded or replaced. Each time a STB is changed, the new STB repeats the DHCP discover process to obtain client configuration information and an IP address. DHCP views the new STB as a completely new client and assigns a new IP address—the previous IP address assigned to the client (the old STB) remains blocked and unavailable until the lease expires. If auto logout is configured in this situation, DHCP recognizes that the new STB is actually the same client and then immediately releases the original IP address.

DHCP relay agent acts as a proxy client for auto logout and sends a DHCP release message to the DHCP server.

How DHCP Identifies and Releases Clients

The auto logout feature requires that DHCP explicitly identify clients. By default, DHCP local server and DHCP relay agent identify clients based on MAC address or Client Identifier, and subnet. However, in some cases this type of identification might not be sufficient. For example, in the previous STB example, each STB has a different MAC address, so DHCP incorrectly assumes that an upgraded or replacement STB is a new client.

In order to explicitly identify clients, auto logout uses a secondary identification method when the primary identification method is unsuccessful—the primary method is considered unsuccessful if the MAC address or Client Identifier does not match that of an existing client. Subscriber management supports two secondary identification methods that you can configure.

- Incoming interface method—DHCP views a new client connection on the interface as if it comes from the same client. DHCP deletes the existing client binding before creating a binding for the newly connected device. This method allows only one client device to connect on the interface.



NOTE: The incoming interface method differs from the `overrides interface-client-limit 1` statement, which retains the existing binding and rejects the newly connected client.

- Option 60 and option 82 method—DHCP considers two clients as different if they have the same option 60 and option 82 information, but different subnets.

DHCP local server and DHCP relay agent perform the following operations when auto logout is enabled and the secondary identification method identifies a duplicate client (that is, the Discover packet is from an existing client).

- DHCP local server immediately releases the existing address.
- DHCP relay agent immediately releases the existing client and then sends a DHCP release packet to the DHCP server. Sending the release packet ensures that DHCP relay and the DHCP server are synchronized.

If the DHCP relay receives a Discover message from an existing client, the DHCP relay forwards the Discover message to the DHCP server. The DHCP relay preserves the binding if the client's existing IP address is returned by the DHCP server. This behavior is not applicable if the proxy-mode override or client-discover-match functionality are enabled.



NOTE: If the DHCP relay agent is in snoop mode, DHCP relay releases the client but does not send a release packet to the DHCP server if the discover packet is for a passive client (a client added as a result of snooped packets) or if the discover packet is a snooped packet.

Option 60 and Option 82 Requirements

DHCP local server requires that the received discover packet include both DHCP option 60 and option 82. If either option is missing, DHCP local server cannot perform the secondary identification method and auto logout is not used.

DHCP relay agent requires that the received discover packet contain DHCP option 60. DHCP relay determines the option 82 value based on the guidelines provided in [“How DHCP Relay Agent Uses Option 82 for Auto Logout” on page 306](#).

Related Documentation

- [Automatically Logging Out DHCP Clients on page 305](#)
- [How DHCP Relay Agent Uses Option 82 for Auto Logout on page 306](#)
- [Allowing Only One DHCP Client Per Interface on page 288](#)
- [Clearing DHCP Bindings for Subscriber Access on page 368](#)

Automatically Logging Out DHCP Clients

You can configure the extended DHCP local server and extended DHCP relay to automatically log out DHCP clients. Auto logout immediately releases an existing client when DHCP receives a discover packet from a client whose identity matches an existing client. DHCP then releases the existing client IP address without waiting for the normal lease expiration.



NOTE: When the existing client is released, the new client undergoes the normal authentication process. The new client might not receive the same IP address as the original client.

To configure DHCP client auto logout:

1. Specify that you want to configure override options.
 - For DHCP local server:


```
[edit system services dhcp-local-server]
user@host# edit overrides
```
 - For DHCP relay agent:


```
[edit forwarding-options dhcp-relay]
user@host# edit overrides
```
2. Enable auto logout and specify the secondary identification method you want to use when the primary identification method is unsuccessful.
 - For example, to configure DHCP local server to use the incoming interface method:


```
[edit system services dhcp-local-server overrides]
user@host# set client-discover-match incoming-interface
```
 - For example, to configure DHCP relay agent to use the option 60 and option 82 method:

[edit forwarding-options dhcp-relay overrides]
 user@host# set **client-discover-match** option60-and-option82



NOTE: If you change the auto logout configuration, existing clients continue to use the auto logout setting that was configured when they logged in. New clients use the new setting.

Related Documentation

- [DHCP Auto Logout Overview on page 303](#)
- [How DHCP Relay Agent Uses Option 82 for Auto Logout on page 306](#)
- [Allowing Only One DHCP Client Per Interface on page 288](#)
- [Deleting DHCP Local Server and DHCP Relay Override Settings on page 315](#)
- [Extended DHCP Local Server Overview on page 230](#)
- [Extended DHCP Relay Agent Overview on page 236](#)

How DHCP Relay Agent Uses Option 82 for Auto Logout

Table 44 on page 306 indicates how the DHCP relay agent determines the option 82 value used for the client auto logout feature. Depending on the configuration settings, DHCP relay agent takes the action indicated in the right column.

Table 44: DHCP Relay Agent Option 82 Value for Auto Logout

DHCP Relay Agent Configuration Settings				giaddr in non-snooped packet	Action Taken
DHCP Relay Configured with Option 82	Discover Packet Contains Option 82	Override "trust-option-82"	Override "always-write-option-82"		
No	No	—	—	—	No secondary search performed
No	Yes	Yes	—	—	Use option 82 from packet
No	Yes	No	—	Zero	Drop packet
No	Yes	No	—	Non-zero	Use option 82 from packet
Yes	No	—	—	—	Use configured option 82
Yes	Yes	No	—	Zero	Drop packet

Table 44: DHCP Relay Agent Option 82 Value for Auto Logout (*continued*)

DHCP Relay Agent Configuration Settings				giaddr in non-snooped packet	Action Taken
DHCP Relay Configured with Option 82	Discover Packet Contains Option 82	Override "trust-option-82"	Override "always-write-option-82"		
Yes	Yes	No	No	Non-zero	Use option 82 from packet
Yes	Yes	No	Yes	Non-zero	Overwrite the configured option 82
Yes	Yes	Yes	No	—	Use option 82 from packet
Yes	Yes	Yes	Yes	—	Overwrite the configured option 82

- Related Documentation**
- [DHCP Auto Logout Overview on page 303](#)
 - [Automatically Logging Out DHCP Clients on page 305](#)

DHCPv6 Match Criteria for Identifying DHCPv6 Subscribers

By default, the DHCPv6 local server and the DHCPv6 relay agent identify clients on the basis of the client identifier. The DHCPv6 local server and the DHCPv6 relay agent can also identify a DHCPv6 client by the incoming interface. You use the **incoming-interface** option with the **client-negotiation-match** statement so that only one client device connects on the interface. If the client device changes, the router deletes the existing client binding and creates a binding for the newly connected device.

For example, consider an environment that includes a set-top box (STB) or any other such customer premises equipment (CPE) device configured to get configuration information from the DHCPv6 server. In the network configuration, one CPE device is supported over an interface. The DHCPv6 server is configured to provide the CPE devices with long lease timers. If the CPE device is disconnected for repair or upgraded, the new CPE device goes through the DHCPv6 Solicit process to receive the configuration information from the DHCPv6 server. Because the client identifier is different from that of the previous device, the DHCPv6 local server or the DHCPv6 relay agent treats the DHCPv6 Solicit message as a new client and adds the new binding. Because the old device might not gracefully log out, the old IP address is not released until the lease expires.

If the **client-negotiation-match incoming-interface** statement is configured, on receiving a DHCPv6 Solicit message, the DHCPv6 clients are searched on the basis of their client identifiers and the incoming interface option. If an existing DHCPv6 client binding is found

based on the match criteria, the binding is removed and the new client is processed. If the old CPE device is disconnected and a DHCPv6 Solicit message is received for the new CPE device, the feature uses the incoming interface to identify the client and remove the binding of the old CPE device, which allows for the release of the old IP address. The binding of the new CPE device replaces the old binding.

**Related
Documentation**

- [Automatically Logging Out DHCPv6 Clients on page 308](#)
- [Clearing DHCP Bindings for Subscriber Access on page 368](#)
- [Automatically Logging Out DHCP Clients on page 305](#)

Automatically Logging Out DHCPv6 Clients

You can configure the extended DHCPv6 local server and extended DHCPv6 relay agent to automatically log out DHCPv6 clients based on DHCPv6 subscriber-match criteria. The automatic logout feature immediately releases an existing client when DHCPv6 receives a Solicit packet from a client whose incoming interface matches that of an existing client. DHCPv6 then releases the existing client IP address without waiting for the normal lease expiration.



NOTE: When the existing client is released, the new client undergoes the normal authentication process. The new client might not receive the same IP address as the original client.

To configure automatic logout of DHCPv6 clients:

1. Specify that you want to configure override options to override the default configuration settings.
 - For the DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit overrides
```
 - For the DHCPv6 relay agent:

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit overrides
```
2. Enable automatic logout and specify the incoming interface as the secondary identification method you want to use.
 - For the DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6 overrides]
user@host# set client-negotiation-match incoming-interface
```
 - For the DHCPv6 relay agent:

```
[edit forwarding-options dhcp-relay dhcpv6 overrides]
user@host# set client-negotiation-match incoming-interface
```



NOTE: If you change the automatic logout configuration, existing clients continue to use the automatic logout setting that was configured when they logged in. New clients use the new setting.

**Related
Documentation**

- [DHCPv6 Match Criteria for Identifying DHCPv6 Subscribers on page 307](#)
- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

Overriding Default DHCP Local Server Configuration Settings

- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)
- [Deleting DHCP Local Server and DHCP Relay Override Settings on page 315](#)

Overriding Default DHCP Local Server Configuration Settings

Subscriber management enables you to override certain default DHCP and DHCPv6 local server configuration settings. You can override settings at the global level, for a named group of interfaces, or for a specific interface within a named group.

- To override global default DHCP local server configuration options, include the **overrides** statement and its subordinate statements at the **[edit system services dhcp-local-server]** or **[edit system services dhcp-local-server dhcpv6]** hierarchy level.
- To override DHCP local server configuration options for a named group of interfaces, include the statements at the **[edit system services dhcp-local-server group *group-name*]** or **[edit system services dhcp-local-server dhcpv6 group]** hierarchy level.
- To override DHCP local server 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]** or **[edit system services dhcp-local-server dhcpv6 group *group-name* interface]** hierarchy level.

To override default DHCP local server configuration settings:

1. Specify that you want to configure override options.

Global override:

```
[edit system services dhcp-local-server]
user@host# edit overrides
```

Group level override:

```
[edit system services dhcp-local-server]
user@host# edit group boston overrides
```

Per-interface override:

```
[edit system services dhcp-local-server]
user@host# edit group boston overrides interface fe-1/0/1.1
```

2. (Optional) Override the maximum number of DHCP clients allowed per interface.
See [“Specifying the Maximum Number of DHCP Clients Per Interface” on page 287](#).
3. (Optional) Configure DHCP client auto logout.
See [“Automatically Logging Out DHCP Clients” on page 305](#).
4. (Optional) Enable processing of information requests from clients.
See [“Enabling Processing of Client Information Requests” on page 268](#).
5. (Optional) Specify that DHCP NAK and FORCERENEW messages support option 82 information.
See [“Configuring DHCP Message Exchange Between DHCP Server and Clients in Different VRFs” on page 328](#).
6. (Optional, DHCPv6 only) Specify a delegated pool name to use for DHCPv6 multiple address assignment.
See [“Specifying the Delegated Address-Assignment Pool to Be Used for DHCPv6 Prefix Delegation” on page 474](#).
7. (Optional, DHCPv6 only) Enable DHCPv6 rapid commit support.
See [“Enabling DHCPv6 Rapid Commit Support” on page 435](#).
8. (Optional, DHCPv6 only) Specify that DHCPv6 local server return DNS server addresses as IA_NA or IA_PD suboptions rather than as a global DHCPv6 option.
See [“Overriding How the DNS Server Address Is Returned in a DHCPv6 Multiple Address Environment” on page 581](#).
9. (Optional, DHCPv6 only) Automatically log out existing client when new client solicits on same interface.
See [“Automatically Logging Out DHCPv6 Clients” on page 308](#).
10. (Optional) Specify that when the DHCP or DHCPv6 local server receives a Discover or Solicit message that has a client ID that matches the existing client entry, the local server deletes the existing client entry.
See [“DHCP Behavior When Renegotiating While in Bound State” on page 317](#).
11. (Optional) Delete DHCP override settings.
See [“Deleting DHCP Local Server and DHCP Relay Override Settings” on page 315](#).

**Related
Documentation**

- [Configuring Group-Specific DHCP Local Server Options on page 279](#)
- [Deleting DHCP Local Server and DHCP Relay Override Settings on page 315](#)

Overriding the Default DHCP Relay Configuration Settings

You can override the default DHCP and DHCPv6 relay agent configuration settings at the global level, for a named group of interfaces, or for a specific interface within a named group.

- To override global default DHCP relay agent configuration options, include the **overrides** statement and its subordinate statements at the **[edit forwarding-options dhcp-relay]** hierarchy level.
- To override DHCP relay configuration options for a named group of interfaces, include the statements at the **[edit forwarding-options dhcp-relay group group-name]** hierarchy level.
- To override DHCP relay configuration options for a specific interface within a named group of interfaces, include the statements at the **[edit forwarding-options dhcp-relay group group-name interface]** hierarchy level.
- To configure overrides for DHCPv6 relay, use the supported statements at the **[edit forwarding-options dhcp-relay dhcpv6]** hierarchy level.

To override default DHCP relay agent configuration settings:

1. Specify that you want to configure override options.

Global override:

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

Group-level override:

```
[edit forwarding-options dhcp-relay]
user@host# edit group boston overrides
```

Per-interface override:

```
[edit forwarding-options dhcp-relay]
user@host# edit group boston interface fe-1/0/1.2 overrides
```

2. (DHCPv4 only) Enable DHCP relay proxy mode.

See [“Enabling DHCP Relay Proxy Mode” on page 355](#).

3. (DHCPv4 only) Overwrite the giaddr in DHCP packets that the DHCP relay agent forwards.

See [“Changing the Gateway IP Address \(giaddr\) Field to the giaddr of the DHCP Relay Agent” on page 325](#).

4. (DHCPv4 only) Replace the IP source address in DHCP relay request and release packets with the gateway IP address (giaddr).

See [“Replacing the DHCP Relay Request and Release Packet Source Address” on page 325](#).

5. (DHCPv4 only) Override the DHCP relay agent information option (option 82) in DHCP packets.
See [Overriding Option 82 Information](#).
6. (DHCPv4 only) Override the setting of the broadcast bit in DHCP request packets and use the Layer 2 unicast transmission method.
See [Using Layer 2 Unicast Transmission for DHCP Packets](#) on page 334.
7. (DHCPv4 only) Trust DHCP client packets that have a giaddr of 0 and that contain option 82 information.
See [Trusting Option 82 Information](#) on page 334.
8. (DHCPv4 and DHCPv6) Override the maximum number of DHCP clients allowed per interface.
See [Specifying the Maximum Number of DHCP Clients Per Interface](#) on page 287.
9. (DHCPv4 only) Configure client auto logout.
See [DHCP Auto Logout Overview](#) on page 303.
10. (DHCPv4 and DHCPv6) Enable or disable support for DHCP snooped clients on interfaces.
See [Enabling and Disabling DHCP Snooped Packets Support for DHCP Relay Agent](#).
11. (DHCPv4 and DHCPv6) Delay authentication of subscribers until the DHCP client sends a Request packet.
See the [delay-authentication](#) statement.
12. (DHCPv4 and DHCPv6) Send release messages to the DHCP server when clients are deleted.
See [Sending Release Messages When Clients Are Deleted](#) on page 335.
13. (Optional) Specify that when the DHCP or DHCPv6 relay agent receives a Discover or Solicit message that has a client ID that matches the existing client entry, the relay agent deletes the existing client entry.
See [DHCP Behavior When Renegotiating While in Bound State](#) on page 317.
14. (DHCPv6 only) Automatically log out existing client when new client solicits on same interface.
See [Automatically Logging Out DHCPv6 Clients](#) on page 308.
15. (DHCPv4 only) Disable the DHCP relay agent on specific interfaces.
See [Disabling DHCP Relay](#) on page 353.
16. (DHCPv4 and DHCPv6) Disable automatic binding of stray DHCP requests.
See [Disabling Automatic Binding of Stray DHCP Requests](#) on page 336.
17. (DHCPv4 and DHCPv6) Assign a single-session DHCP dual-stack group to a specified group of subscribers. You must assign the group to both legs of the DHCP dual stack.
See [Configuring Single-Session DHCP Dual-Stack Support](#) on page 409.

- Related Documentation**
- [Configuring Group-Specific DHCP Relay Options on page 280](#)
 - [Deleting DHCP Local Server and DHCP Relay Override Settings on page 315](#)

Deleting DHCP Local Server and DHCP Relay Override Settings

You can delete override settings for DHCP local server and DHCP relay globally, for a named group, or for a specific interface within a named group. You can delete a specific override setting or all overrides.

- To delete a specific DHCP override setting at a particular hierarchy level, include the **overrides** statement with the appropriate subordinate statements. For example, to delete the DHCP local server override **interface-client-limit** setting for a group named **marin20**:

```
[edit system services dhcp-local-server]
user@host# delete group marin20 overrides interface-client-limit
```

- To delete all DHCP override settings at a hierarchy level, include the **overrides** statement without any subordinate statements. For example, to delete all DHCP relay overrides for interface **fxp0.0**, which is in group **marin20**:

```
[edit forwarding-options dhcp-relay]
user@host# delete group marin20 interface fxp0.0 overrides
```

- Related Documentation**
- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
 - [Extended DHCP Local Server Overview on page 230](#)
 - [Extended DHCP Relay Agent Overview on page 236](#)

Configuring DHCP Renegotiation While in Bound State

- [DHCP Behavior When Renegotiating While in Bound State on page 317](#)

DHCP Behavior When Renegotiating While in Bound State

All DHCP models (DHCPv4 and DHCPv6 local server and relay agent) use the same default behavior when receiving a DHCPv4 Discover or DHCPv6 Solicit message while in a bound state. In the default behavior, DHCP maintains the existing client entry when receiving a new Discover or Solicit message that has a client ID that matches the existing client.

You can use the **delete-binding-on-renegotiation** statement to configure DHCP local server and relay agent to override the default behavior. You can configure the override on a global or group basis. In the override configuration, when DHCP is in a bound state and receives a Discover or Solicit message with a matching client entry, DHCP tears down the existing entry and sends (DHCP local server) or forwards (relay agent) a new Offer (DHCPv4) or Advertise (DHCPv6) message.



NOTE: In Junos OS releases prior to 15.1, DHCPv6 local server uses the opposite default behavior, and tears down the existing client entry when receiving a Solicit message while in a bound state.

For example, to configure DHCPv4 local server to override the default renegotiation behavior globally:

1. Specify that you want to configure a DHCP local server.

```
[edit system services]
user@host# edit dhcp-local-server
```

2. Specify that you want to configure an override action.

```
[edit system services dhcp-local-server]
user@host# edit overrides
```

3. Specify that you want DHCP local server to override the default renegotiation behavior.

```
[edit system services dhcp-local-server overrides]
```

```
user@host# set delete-binding-on-renegotiation
```

For example, to configure DHCPv6 relay agent to override the default renegotiation behavior for an interface group:

1. Specify that you want to configure DHCPv6 relay agent.

```
[edit forwarding-options]  
user@host# edit dhcp-relay dhcpv6
```

2. Specify that the configuration is for an interface group.

```
[edit forwarding-options dhcp-relay dhcpv6]  
user@host# edit group boston
```

3. Specify that you want to configure an override action.

```
[edit forwarding-options dhcp-relay dhcpv6 group]  
user@host# edit overrides
```

4. Specify that you want DHCPv6 relay agent to override the default renegotiation behavior.

```
[edit forwarding-options dhcp-relay dhcpv6 group overrides]  
user@host# set delete-binding-on-renegotiation
```

**Related
Documentation**

- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

Attaching Access Profiles to DHCP Interfaces

- [Access Profiles for the DHCP Relay Agent and DHCP Local Server Overview on page 319](#)
- [Attaching Access Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces on page 320](#)

Access Profiles for the DHCP Relay Agent and DHCP Local Server Overview

Starting in Junos OS Release 14.2, access profiles enable you to specify subscriber access authentication and accounting parameters. After access profiles are created, you can attach them at the **[edit system services dhcp-local-server]** hierarchy level on a DHCP local server for DHCP or DHCPv6 subscribers and at the **[edit forwarding-options dhcp-relay]** hierarchy level on a DHCP relay agent for DHCP or DHCPv6 subscribers, group of subscribers, or group of interfaces.

If you configured a global access profile at the **[edit access profile profile-name]** hierarchy level for all DHCP or DHCPv6 clients on a router that functions as a DHCP local server or a DHCP relay agent, the access profile configured at the **[edit system services dhcp-local-server]** hierarchy level on a DHCP local server for DHCP or DHCPv6 subscribers and at the **[edit forwarding-options dhcp-relay]** hierarchy level on a DHCP relay agent for DHCP or DHCPv6 subscribers take precedence over the global access profile.

Configuring an access profile for DHCP subscribers at the DHCP relay agent level or the DHCP local server level provide you with the flexibility and effectiveness of enabling DHCP authentication and accounting for specific subscribers instead of enabling them at a global level. If no access profile is configured at the DHCP relay agent level or the DHCP local server level, the global access profile becomes effective.

Release History Table

Release	Description
14.2	Starting in Junos OS Release 14.2, access profiles enable you to specify subscriber access authentication and accounting parameters.

Related Documentation

- [Attaching Access Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces on page 320](#)

Attaching Access Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces

Starting in Junos OS Release 14.2, you can attach an access profile to a DHCP subscriber interface, to a DHCP client interface, to a group of subscriber interfaces, and to a specific subscriber or groups of subscribers. When a DHCP subscriber or DHCP client logs in, the specified access profile is instantiated and the services defined in the profile are applied to the interface, subscriber, or the group of interfaces or subscribers.

This topic contains the following sections:

- [Attaching an Access Profile to All DHCP Subscriber or All DHCP Client Interfaces on page 320](#)
- [Attaching an Access Profile to a Group of DHCP Subscribers or a Group of DHCP Clients on page 320](#)
- [Attaching an Access Profile to a Group of DHCP Subscriber Interfaces or a Group of DHCP Client Interfaces on page 321](#)

Attaching an Access Profile to All DHCP Subscriber or All DHCP Client Interfaces

To attach an access profile to all DHCP subscribers or all DHCP client interfaces:

- For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# set access-profile profile-name
```
- For DHCP relay agent:

```
[edit forwarding-options dhcp-relay]
user@host# set access-profile profile-name
```

Attaching an Access Profile to a Group of DHCP Subscribers or a Group of DHCP Clients

You use the group feature to group together a set of subscriber access profiles and then apply a common DHCP configuration to the named subscriber profile group. The extended DHCP local server, DHCPv6 local server, DHCP relay agent, and DHCPv6 relay agent all support groups.

Before you begin:

- Configure the group by entering the **group group-name** statement at the **[edit system services dhcp-local-server]** or the **[edit forwarding-options dhcp-relay]** hierarchy level. For DHCPv6 subscriber profiles, use the **dhcpv6** option at this hierarchy level.

To attach an access profile to a group of subscribers:

- At the DHCP configuration hierarchy, specify the name of the group and the access profile to attach to the group.
 - For DHCP local server:

```
[edit system services dhcp-local-server]
user@host# set group boston access-profile profile-name
```

- For DHCP relay agent:

```
[edit forwarding-options dhcp-relay]  
user@host# set group quebec access-profile profile-name
```
- For DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6]  
user@host# set group boston access-profile profile-name
```
- For DHCPv6 relay agent:

```
[edit forwarding-options dhcp-relay dhcpv6]  
user@host# set group quebec access-profile profile-name
```

Attaching an Access Profile to a Group of DHCP Subscriber Interfaces or a Group of DHCP Client Interfaces

Before you begin:

- Configure the interface group.
See “[Grouping Interfaces with Common DHCP Configurations](#)” on page 277.

To attach an access profile to a group of interfaces:

- At the DHCP configuration hierarchy, specify the name of the interface group and the access profile to attach to the group.
 - For DHCP local server:

```
[edit system services dhcp-local-server]  
user@host# set group boston interface interface-name access-profile profile-name
```
 - For DHCP relay agent:

```
[edit forwarding-options dhcp-relay]  
user@host# set group quebec interface interface-name access-profile profile-name
```
 - For DHCPv6 local server:

```
[edit system services dhcp-local-server dhcpv6]  
user@host# set group boston interface interface-name access-profile profile-name
```
 - For DHCPv6 relay agent:

```
[edit forwarding-options dhcp-relay dhcpv6]  
user@host# set group quebec interface interface-name access-profile profile-name
```

Release History Table

Release	Description
14.2	Starting in Junos OS Release 14.2, you can attach an access profile to a DHCP subscriber interface, to a DHCP client interface, to a group of subscriber interfaces, and to a specific subscriber or groups of subscribers.

Related Documentation

- [Access Profiles for the DHCP Relay Agent and DHCP Local Server Overview on page 319](#)

Applying a Common DHCP Relay Agent Configuration to Groups of DHCP Servers

- [Configuring Named Server Groups on page 323](#)
- [Configuring Active Server Groups to Apply a Common DHCP Relay Agent Configuration to Named Server Groups on page 323](#)

Configuring Named Server Groups

You can configure a named group of DHCP servers for use by the extended DHCP relay agent on the router or switch.

You specify the name of the DHCP server group and the IP addresses of one or more DHCP servers that belong to this group. You can configure a maximum of five IP addresses per named server group.

To configure a named server group:

1. Specify the name of the server group.

```
[edit forwarding-options dhcp-relay]  
user@host# set server-group myServerGroup
```

2. Add the IP addresses of the DHCP servers belonging to the group.

```
[edit forwarding-options dhcp-relay server-group myServerGroup]  
user@host# set 192.168.100.50  
user@host# set 192.168.100.75
```

Related Documentation

- [Extended DHCP Relay Agent Overview on page 236](#)

Configuring Active Server Groups to Apply a Common DHCP Relay Agent Configuration to Named Server Groups

You can configure an active server group. Using an active server group enables you to apply a common DHCP relay agent configuration to a named group of DHCP server addresses.

Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

To configure an active server group:

- Specify the name of the active server group.

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

To create an active server group as a global DHCP relay agent configuration option, include the **active-server-group** statement at the **[edit forwarding-options dhcp-relay]** hierarchy level. To have the group apply only to a named group of interfaces, include the **active-server-group** statement at the **[edit forwarding-options dhcp-relay group *group-name*]** hierarchy level.

Including the **active-server-group** statement at the **[edit forwarding-options dhcp-relay group *group-name*]** hierarchy level (as a group-specific option) overrides the effect of including the **active-server-group** statement at the **[edit forwarding-options dhcp-relay]** hierarchy level as a global option.

**Related
Documentation**

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Grouping Interfaces with Common DHCP Configurations on page 277](#)

CHAPTER 34

Changing the Gateway IP Address (giaddr) Field and DHCP Relay Request and Release Packet Source Address

- [Changing the Gateway IP Address \(giaddr\) Field to the giaddr of the DHCP Relay Agent on page 325](#)
- [Replacing the DHCP Relay Request and Release Packet Source Address on page 325](#)

Changing the Gateway IP Address (giaddr) Field to the giaddr of the DHCP Relay Agent

You can configure the DHCP relay agent to change the gateway IP address (giaddr) field in packets that it forwards between a DHCP client and a DHCP server.

To overwrite the giaddr of every DHCP packet with the giaddr of the DHCP relay agent before forwarding the packet to the DHCP server:

1. Specify that you want to configure override options.

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

2. Specify that the giaddr of DHCP packets is overwritten.

```
[edit forwarding-options dhcp-relay overrides]
user@host# set always-write-giaddr
```

Related Documentation

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

Replacing the DHCP Relay Request and Release Packet Source Address

You can configure the DHCP relay agent to replace request and release packets with the gateway IP address (giaddr) before forwarding the packet to the DHCP server.

To replace the source address with giaddr:

1. Specify that you want to configure override options.

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

```
user@host# edit overrides
```

2. Specify that you want to replace the IP source address in DHCP relay request and release packets with the gateway IP address (giaddr).

```
[edit forwarding-options dhcp-relay overrides]  
user@host# set replace-ip-source-with giaddr
```

**Related
Documentation**

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

Securing DHCP Messages Sent Between DHCP Clients and Servers in Different VRFs

- [DHCP Message Exchange Between DHCP Clients and DHCP Server in Different VRFs on page 327](#)
- [Configuring DHCP Message Exchange Between DHCP Server and Clients in Different VRFs on page 328](#)

DHCP Message Exchange Between DHCP Clients and DHCP Server in Different VRFs

In some service provider networks, the service network in which the DHCP server resides is isolated from the actual subscriber network. This separation of the service and subscriber networks can sometimes introduce potential security issues, such as route leaking. Starting in Junos OS Release 14.2, you can use the DHCP relay agent to provide additional security when exchanging DHCP messages between different VRFs. The DHCP relay agent can ensure that there is no direct routing between the client virtual routing and forwarding instance (VRF) and the DHCP server VRF, and that only acceptable DHCP packets are relayed across the two VRFs. Subscriber management supports the cross-VRF message exchange for both DHCP and DHCPv6 packets.

To exchange DHCP messages between different VRFs, you must enable both the server side and the client side of the DHCP relay agent to recognize and forward acceptable traffic based on DHCP option information in the packets. The message exchange uses the Agent Circuit ID (DHCP option 82 suboption 1) for DHCPv4 packets and the Relay Agent Interface-ID (DHCPv6 option 18) for DHCPv6 packets to identify traffic to be relayed.

Statistics for DHCP packets using the cross-VRF message exchange are counted in the client VRF.

The following list describe how DHCP relay agent exchanges messages between the DHCP clients and DHCP server in different VRFs:

- Packets from DHCP client to DHCP server—DHCP relay agent receives the DHCP packet from the client in the client VRF, and then inserts the appropriate DHCP option 82

suboption 1 or DHCPv6 option 18 attribute into the packet. The relay agent then forwards the packet to the DHCP server in the server's VRF.

- Packets from DHCP server to DHCP client—DHCP relay agent receives the DHCP reply message from the DHCP server in the server VRF. The relay agent derives the client's interface, including VRF, from the DHCP option 82 suboption 1 or DHCPv6 option 18 attribute in the packet in the DHCP server VRF. The relay agent then forwards the reply message to the DHCP client in the client's VRF.

Release History Table

Release	Description
14.2	Starting in Junos OS Release 14.2, you can use the DHCP relay agent to provide additional security when exchanging DHCP messages between different VRFs.

Related Documentation

- [Configuring DHCP Message Exchange Between DHCP Server and Clients in Different VRFs on page 328](#)
- [Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344](#)

Configuring DHCP Message Exchange Between DHCP Server and Clients in Different VRFs

Starting in Junos OS Release 14.2, you can configure DHCP relay agent to provide additional security when exchanging DHCP messages between a DHCP server and DHCP clients that reside in different virtual routing and forwarding instances (VRFs).

To enable the DHCP message exchange between the two VRFs, you configure each side of the DHCP relay to recognize and forward acceptable traffic based on the DHCP option information in the packets. The acceptable traffic is identified by either the Agent Circuit ID (DHCP option 82 suboption 1) for DHCPv4 packets or the Relay Agent Interface-ID (DHCPv6 option 18) for DHCPv6 packets.

The following list provides an overview of the tasks required to create the DHCP message exchange between the different VRFs:

- Client-side support—Configure the DHCP relay agent **forward-only** statement to specify the VRF location of the DHCP server, to which the DHCP relay agent forwards the client packets with the appropriate DHCP option information. The **forward-only** statement ensures that DHCP relay agent does not create a new session or perform any other subscriber management operations (such as creating dynamic interfaces or maintaining leases).

You can optionally configure a specific logical system and routing instance for the server VRF. If you do not specify a logical system or routing instance, then DHCP uses the local logical system and routing instance from which the configuration is added.

- Server-side support—Configure the DHCP relay agent **forward-only-replies** statement so the DHCP relay agent forwards the reply packets that have the appropriate DHCP option information. This statement also ensures that DHCP relay agent does not create a new session or perform any other subscriber management operations.



NOTE: You do not need to configure the **forward-only-replies** statement if the DHCP client and DHCP server reside in the same logical system/routing instance.

- DHCP local server support—Configure the DHCP local server to support option 82 information in DHCP NAK and forcerenew messages. By default, the two message types do not support option 82.
- Additional support—Ensure that the following required support is configured:
 - Proxy ARP support must be enabled on the server-facing interface in the DHCP server VRF so that the DHCP relay agent can receive and respond to the ARP requests for clients and the client-facing interface in the DHCP server VRF.
 - Routes must be available to receive the DHCP packets from the DHCP server in the server VRF for the clients reachable in the client VRF.

The following procedures describe the configuration tasks for creating the DHCP message exchange between the DHCP server and clients in different VRFs.

Client-side Support—To configure support on the client side of the DHCP relay agent:

1. Enable DHCP relay agent configuration.

```
[edit forwarding-options]
user@host# edit dhcp-relay
```

2. Specify the DHCP server VRF to which the DHCP relay agent forwards the packets from the DHCP client. DHCP relay agent forwards the acceptable packets that have the appropriate DHCP option information, but does not perform any additional subscriber management operations. You can configure the **forward-only** statement globally or for a named group of interfaces, and for DHCPv4 or DHCPv6. You can specify the current, default, or a specific logical system or routing instance for the server VRF.

The following example configures the **forward-only** statement globally for DHCPv4, and specifies the default logical system and routing instance:

```
[edit forwarding-options dhcp-relay]
user@host# set forward-only logical-system default routing-instance default
```



NOTE: For local DHCPv4 clients, the DHCP relay agent adds the Agent Circuit ID option. However, if the Agent Circuit ID option is already present in the packet, you must ensure that the DHCP server supports the option 82 Vendor-Specific Information suboption (suboption 9).

If the **forward-only** statement is configured at the `[edit forwarding-options dhcp-relay relay-option]` hierarchy level, then that relay-option action takes precedence over the configuration of the **forward-only** statement for the DHCP cross-VRF message exchange.

Server-side Support—To configure the cross-VRF message exchange support on the server side of the DHCP relay:



NOTE: You do not need to configure the **forward-only-replies** statement if the DHCP client and DHCP server reside in the same logical system/routing instance.

1. Enable DHCP relay agent configuration.

```
[edit forwarding-options]
user@host# edit dhcp-relay
```

2. Configure the DHCP relay agent to forward the DHCP packets from the DHCP server VRF to the client. DHCP relay agent only forwards the packets, and does not perform any additional subscriber management operations. You can configure the **forward-only-replies** statement globally for DHCPv4 and DHCPv6.

The following example configures the **forward-only-replies** statement globally for DHCPv4.

```
[edit forwarding-options dhcp-relay]
user@host# set forward-only-replies
```

DHCP Local Server Support—To configure the DHCP local server to support option 82 information in NAK and forcerenew messages; the cross-VRF message exchange feature uses the option 82 or DHCPv6 option 18 information to determine the client VRF:

1. Enable DHCP local server configuration.

```
[edit system services]
user@host# edit dhcp-local-server
```

2. Specify that you want to configure an override option.

```
[edit system services dhcp-local-server]
user@host# edit overrides
```

3. Configure DHCP local server to override the default behavior and support option 82 information in DHCP NAK and forcerenew messages. You can configure the override action globally, for a group of interfaces, or for a specific interface.

```
[edit system services dhcp-local-server overrides]
user@host# edit include-option-82 forcerenew nak
```

Release History Table

Release	Description
14.2	Starting in Junos OS Release 14.2, you can configure DHCP relay agent to provide additional security when exchanging DHCP messages between a DHCP server and DHCP clients that reside in different virtual routing and forwarding instances (VRFs).

Related Documentation

- [DHCP Message Exchange Between DHCP Clients and DHCP Server in Different VRFs on page 327](#)

- [Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344](#)

Configuring DHCP Relay Agent

- [DHCP-Initiated Service Change Based on Remote ID on page 333](#)
- [Using Layer 2 Unicast Transmission for DHCP Packets on page 334](#)
- [Trusting Option 82 Information on page 334](#)
- [Sending Release Messages When Clients Are Deleted on page 335](#)
- [Disabling Automatic Binding of Stray DHCP Requests on page 336](#)
- [Using DHCP Relay Agent Option 82 Information on page 337](#)
- [Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344](#)
- [Configuring DHCP Relay Agent Source Address on page 345](#)
- [Example: Minimum DHCP Relay Agent Configuration on page 346](#)
- [Example: Configuring DHCP Relay Agent Selective Traffic Processing Based on DHCP Option Strings on page 346](#)
- [Example: DHCP Relay Agent Configuration with Multiple Clients and Servers on page 351](#)
- [Example: Configuring DHCP-Initiated Service Change Based on Remote ID on page 352](#)
- [Disabling DHCP Relay on page 353](#)

DHCP-Initiated Service Change Based on Remote ID

Subscriber management enables you to update a DHCP client's current service through the use of the client's remote ID. The remote ID can be in the option 82, suboption 2 for DHCPv4 clients, or the DHCPv6 option 37 for DHCPv6 clients.

When a DHCP client is initially established, DHCP preserves the client's incoming remote ID in the DHCP client database. When receiving a Rebind or Renew message for that client, DHCP compares the client's initial remote ID to the remote ID in the DHCP Renew or Rebind message. If the two remote IDs do not match, DHCP local server tears down the existing binding and sends a NAK message (or logical NAK for DHCPv6), which causes the client to initiate a reconnect sequence. When the client reconnects, the DHCP local server activates the new service, which is encoded within the new remote ID string.

You can configure the router to support the remote ID service change feature globally or for a specific group, and you can configure the support on DHCP local server and DHCP relay agent.

In a dual-stack environment, the DHCP-initiated service change feature requires that a client's DHCPv4 and DHCPv6 sessions reside over the same VLAN (1:1 mapping) and that the remote ID strings for the two sessions are identical. The dual-stack support also requires that the same dynamic client profile is applied to both the DHCPv4 and DHCPv6 networks, to ensure remote ID consistency between the two networks. When DHCP detects a remote ID mismatch in one session of the dual stack, DHCP tears down that session. The incoming remote ID is then compared to the other session of the dual stack, and if there is a mismatch, that other session is torn down gracefully.

During the graceful teardown process, if the other session is currently in the bound state, that session then transitions to the deferred delete state. The deferred delete state allows the session that detected the change to be reestablished immediately with the new service plan, while enabling the router to gracefully tear down the other session by sending NAK messages in response to the subsequent Renew and Rebind messages.

As part of the DHCP-initiated service change feature, AAA can set a session's client profile. AAA obtains the client profile from the remote-ID, and writes the profile into the session database. A client profile that AAA writes into the database always takes precedence over any local DHCP configuration.

Related Documentation

- [Example: Configuring DHCP-Initiated Service Change Based on Remote ID on page 352](#)

Using Layer 2 Unicast Transmission for DHCP Packets

You can configure the DHCP relay agent to override the setting of the broadcast bit in DHCP request packets. DHCP relay agent then instead uses the Layer 2 unicast transmission method to send DHCP Offer reply packets and DHCP ACK reply packets from the DHCP server to DHCP clients during the discovery process.

To override the default setting of the broadcast bit in DHCP request packets:

1. Specify that you want to configure override options.

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

2. Specify that the DHCP relay agent uses the Layer 2 unicast transmission method.

```
[edit forwarding-options dhcp-relay overrides]
user@host# set layer2-unicast-replies
```

Related Documentation

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

Trusting Option 82 Information

By default, the DHCP relay agent treats client packets with a giaddr of 0 (zero) and option 82 information as if the packets originated at an untrusted source, and drops them without further processing. You can override this behavior and specify that the DHCP

relay agent process DHCP client packets that have a giaddr of 0 (zero) and contain option 82 information.

To configure DHCP relay agent to trust option 82 information:

1. Specify that you want to configure override options.

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

2. Specify that the DHCP relay agent process DHCP client packets with a giaddr of 0 and that contain option 82 information.

```
[edit forwarding-options dhcp-relay overrides]
user@host# set trust-option-82
```

Related Documentation

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

Sending Release Messages When Clients Are Deleted

By default, when DHCP relay and relay proxy delete a client, they do not send a release message to the DHCP server. You can override the default behavior and configure DHCP relay and relay proxy to send a release message whenever they delete a client. The release message sent by DHCP relay and relay proxy includes option 82 information.



NOTE: You must include the `send-release-on-delete` statement to configure DHCP relay and relay proxy to send the release message when the `client-discover-match` statement is included.

You can use the `[edit forwarding-options dhcp-relay dhcpv6]` hierarchy level to override the default behavior for DHCPv6 relay agent.

To send a release message:

1. Specify that you want to configure override options.

- For DHCP relay agent:

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

- For DHCPv6 relay agent:

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit overrides
```

2. Specify that you want DHCP relay and relay proxy (or DHCPv6 relay agent) to send a release message when clients are deleted.

```
[edit forwarding-options dhcp-relay overrides]
user@host# set send-release-on-delete
```

- Related Documentation**
- [Extended DHCP Relay Agent Overview on page 236](#)
 - [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

Disabling Automatic Binding of Stray DHCP Requests

DHCP requests that are received but have no entry in the database are known as stray requests. By default, DHCP relay, DHCP relay proxy, and DHCPv6 relay agent attempt to bind the requesting client by creating a database entry and forwarding the request to the DHCP server. If the server responds with an ACK, the client is bound and the ACK is forwarded to the client. If the server responds with a NAK, the database entry is deleted and the NAK is forwarded to the client. This behavior occurs regardless of whether authentication is configured.

You can override the default configuration at the global level, for a named group of interfaces, or for a specific interface within a named group. Overriding the default causes DHCP relay, DHCP relay proxy, and DHCPv6 relay agent to drop all stray requests instead of attempting to bind the clients.



NOTE: Automatic binding of stray requests is enabled by default.

- To disable automatic binding behavior, include the **no-bind-on-request** statement when you configure DHCP overrides at the global, group, or interface level.

```
[edit forwarding-options dhcp-relay overrides]
user@host# set no-bind-on-request
```

- To override the default behavior for DHCPv6 relay agent, configure the override at the **[edit forwarding-options dhcp-relay dhcpv6]** hierarchy level.

```
[edit forwarding-options dhcp-relay dhcpv6 overrides]
user@host# set no-bind-on-request
```

The following two examples show a configuration that disables automatic binding of stray requests for a group of interfaces and a configuration that disables automatic binding on a specific interface.

To disable automatic binding of stray requests on a group of interfaces:

1. Specify the named group.

```
[edit forwarding-options dhcp-relay]
user@host# edit group boston
```

2. Specify that you want to configure overrides.

```
[edit forwarding-options dhcp-relay group boston]
user@host# edit overrides
```

3. Disable automatic binding for the group.

```
[edit forwarding-options dhcp-relay group boston overrides]
user@host# set no-bind-on-request
```

To disable automatic binding of stray requests on a specific interface:

1. Specify the named group of which the interface is a member.

```
[edit forwarding-options dhcp-relay]
user@host# edit group boston
```

2. Specify the interface on which you want to disable automatic binding.

```
[edit forwarding-options dhcp-relay group boston]
user@host# edit interface fe-1/0/1.2
```

3. Specify that you want to configure overrides.

```
[edit forwarding-options dhcp-relay group boston interface fe-1/0/1.2]
user@host# edit overrides
```

4. Disable automatic binding on the interface.

```
[edit forwarding-options dhcp-relay group boston interface fe-1/0/1.2 overrides]
user@host# set no-bind-on-request
```

Related Documentation

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

Using DHCP Relay Agent Option 82 Information

Subscriber management enables you to configure the DHCP relay agent to include additional option 82 information in the DHCP packets that the relay agent receives from clients and forwards to a DHCP server. The DHCP server uses the additional information to determine the IP address to assign to the client. The server might also use the information for other purposes—for example, to determine which services to grant the client, or to provide additional security against threats such as address spoofing. The DHCP server sends its reply back to the DHCP relay agent, and the agent removes the option 82 information from the message and forwards the packet to the client.

To configure support for the DHCP relay agent information option 82, you use the **relay-option-82** statement. You can configure the DHCP relay agent to include the following suboptions in the packet the relay agent sends to the DHCP server:

- Agent Circuit ID (suboption 1)—An ASCII string that identifies the interface on which the client DHCP packet is received.
- Agent Remote ID (suboption 2)—An ASCII string assigned by the DHCP relay agent that securely identifies the client.

You can configure the option 82 support globally or for a named group of interfaces.

To restore the default behavior, in which option 82 information is not inserted into DHCP packets, you use the **delete relay-option-82** statement.



NOTE: The DHCPv6 relay agent provides similar Agent Circuit ID and Agent Remote ID support for DHCPv6 clients. For DHCPv6, subscriber management uses DHCPv6 option 18 to include the circuit ID in the packets that the relay agent sends to a DHCPv6 server, and option 37 to include the remote ID in the packets. See “[DHCPv6 Relay Agent Options](#)” on page 442.

The following sections describe the option 82 operations you can configure:

- [Configuring Option 82 Information on page 338](#)
- [Including a Prefix in DHCP Options on page 340](#)
- [Including a Textual Description in DHCP Options on page 342](#)

Configuring Option 82 Information

You use the **relay-option-82** statement to configure the DHCP relay agent to insert option 82 information in DHCP packets that the relay agent receives from clients and forwards to a DHCP server. When you configure option 82, you can include one of the suboption statements to specify the type of information you want to include in the DHCP packets. If you configure option 82 without including one of the suboption statements, the Agent Circuit ID option is included by default. Use the **circuit-id** statement to include the Agent Circuit ID (suboption 1) in the packets, or the **remote-id** statement to include the Agent Remote ID (suboption 2).

You can optionally configure DHCP relay agent to include a prefix or the interface description as part of the suboption information. If you specify the **circuit-id** or **remote-id** statement without including any of the optional **prefix**, **use-interface-description**, **use-vlan-id**, **include-irb-and-l2**, or **no-vlan-interface-name** statements, the format of the Agent Circuit ID or Agent Remote ID information for Fast Ethernet (fe), Gigabit Ethernet (ge), and integrated routing and bridging (irb) interfaces is one of the following, depending on your network configuration:



NOTE: Integrated routing and bridging (IRB) provides simultaneous support for Layer 2 bridging and Layer 3 IP routing on the same interface. IRB enables you to route local packets to another routed interface or to another bridging domain that has a Layer 3 protocol configured.

The interface to bridge domain relationship might be implicit (the interface is mapped to the bridge domain by the system based on the 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.

- For Fast Ethernet or Gigabit Ethernet interfaces that do not use VLANs, stacked VLANs (S-VLANs), or bridge domains:

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



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

- For Fast Ethernet or Gigabit Ethernet interfaces that use VLANs:

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

- For Fast Ethernet or Gigabit Ethernet interfaces that use S-VLANs:

(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

To enable insertion of option 82 information:

1. Specify that you want to configure option 82 support.

```
[edit forwarding-options dhcp-relay]
user@host# edit relay-option-82
```

2. Configure the DHCP relay agent to insert the Agent Circuit ID suboption, the Agent Remote ID suboption, or both.

- To insert the Agent Circuit ID:

```
[edit forwarding-options dhcp-relay relay-option-82]
user@host# set circuit-id
```

- To insert the Agent Remote ID:

```
[edit forwarding-options dhcp-relay relay-option-82]
user@host# set remote-id
```

- To insert both, configure both set commands.
- 3. (Optional) Configure a prefix that is used in the option 82 information in the DHCP packets.
See [“Including a Prefix in DHCP Options” on page 340](#).
- 4. (Optional) Configure the DHCP relay agent to include the interface's textual description instead of the interface identifier in the option 82 information.
See [“Including a Textual Description in DHCP Options” on page 342](#).

Including a Prefix in DHCP Options

When you configure the DHCP relay agent to include DHCP options in the packets that the relay agent sends to a DHCP server, you can specify that the relay agent add a prefix to the DHCP option. You can add a prefix to the following DHCP options:

- DHCPv4 option 82 Agent Circuit ID (suboption 1)
- DHCPv4 option 82 Agent Remote ID (suboption 2)
- DHCPv6 option 18 Relay Agent Interface-ID
- DHCPv6 option 37 Relay Agent Remote-ID

The prefix is separated from the DHCP option information by a colon (:), and it can include any combination of the **host-name**, **logical-system-name**, and **routing-instance-name** options. The DHCP relay agent obtains the values for the **host-name**, **logical-system-name**, and **routing-instance-name** as follows:

- If you include the **host-name** option, the DHCP relay agent uses the hostname of the device configured with the **host-name** statement at the **[edit system]** hierarchy level.
- If you include the **logical-system-name** option, the DHCP relay agent uses the logical system name configured with the **logical-system** statement at the **[edit logical-system]** hierarchy level.
- If you include the **routing-instance-name** option, the DHCP relay agent uses the routing instance name configured with the **routing-instance** statement at the **[edit routing-instances]** hierarchy level or at the **[edit logical-system logical-system-name routing-instances]** hierarchy level.

If you include the hostname and either or both of the logical system name and the routing instance name in the prefix, the hostname is followed by a forward slash (/). If you include both the logical system name and the routing instance name in the prefix, these values are separated by a semicolon (;).

The following examples show several possible formats for the DHCP option information when you specify the **prefix** statement for Fast Ethernet (fe) or Gigabit Ethernet (ge) interfaces with S-VLANs.

- If you include only the hostname in the prefix for Fast Ethernet or Gigabit Ethernet interfaces with S-VLANs:

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

- If you include only the logical system name in the prefix for Fast Ethernet or Gigabit Ethernet interfaces with S-VLANs:

```
logical-system-name:(fe | ge)-fpc/pic/port:svlan-id-vlan-id
```

- If you include only the routing instance name in the prefix for Fast Ethernet or Gigabit Ethernet interfaces with S-VLANs:

```
routing-instance-name:(fe | ge)-fpc/pic/port:svlan-id-vlan-id
```

- If you include both the hostname and the logical system name in the prefix for Fast Ethernet or Gigabit Ethernet interfaces with S-VLANs:

```
host-name/logical-system-name:(fe | ge)-fpc/pic/port:svlan-id-vlan-id
```

- If you include both the logical system name and the routing instance name in the prefix for Fast Ethernet or Gigabit Ethernet interfaces with S-VLANs:

```
logical-system-name;routing-instance-name:(fe | ge)-fpc/pic/port:svlan-id-vlan-id
```

- If you include the hostname, logical system name, and routing instance name in the prefix for Fast Ethernet or Gigabit Ethernet interfaces with S-VLANs:

```
host-name/logical-system-name;routing-instance-name:(fe | ge)-fpc/pic/port:svlan-id-vlan-id
```

For Fast Ethernet or Gigabit Ethernet interfaces that use VLANs but not S-VLANs, only the *vlan-id* value appears in the DHCP option format.

(DHCPv4) To configure a prefix with the option 82 information:

1. Specify that you want to configure option 82 support.

```
[edit forwarding-options dhcp-relay]
user@host# edit relay-option-82
```

2. Configure DHCP relay agent to insert the Agent Circuit ID, the Agent Remote ID, or both.

- To configure the Agent Circuit ID:

```
[edit forwarding-options dhcp-relay relay-option-82]
user@host# edit circuit-id
```

- To configure the Agent Remote ID:

```
[edit forwarding-options dhcp-relay relay-option-82]
user@host# edit circuit-id
```

3. Specify that the prefix be included in the option 82 information. In this example, the prefix includes the hostname and logical system name.

- To include the prefix with the Agent Circuit ID:

```
[edit forwarding-options dhcp-relay relay-option-82 circuit-id]
user@host# set prefix host-name logical-system-name
```

- To include the prefix with the Agent Remote ID:

```
[edit forwarding-options dhcp-relay relay-option-82 remote-id]
user@host# set prefix host-name logical-system-name
```

(DHCPv6) To use a prefix with the DHCPv6 option 18 or option 37 information:

1. Specify that you want to configure DHCPv6 relay agent support.

```
[edit forwarding-options dhcp-relay]
user@host# edit dhcpv6
```

2. Configure DHCPv6 relay agent to insert option 18 (Relay Agent Interface-ID), option 37 (Relay Agent Remote-ID), or both.

- To configure option 18:

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit relay-agent-interface-id
```

- To configure option 37:

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit relay-agent-interface-id
```

3. Specify that the prefix is included in the option information. In this example, the prefix includes the hostname and logical system name

- To include the prefix with option 18:

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id]
user@host# set prefix host-name logical-system-name
```

- To include the prefix with option 37:

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id]
user@host# set prefix host-name logical-system-name
```

Including a Textual Description in DHCP Options

By default, when DHCP relay agent inserts option information in the packets sent to a DHCP server, the options include the interface identifier. However, you can configure the DHCP relay agent to include the textual description that is configured for the interface instead of the interface identifier. You can use the textual description for either the logical interface or the device interface.

You can include the textual interface description in the following DHCP options:

- DHCPv4 option 82 Agent Circuit ID (suboption 1)
- DHCPv4 option 82 Agent Remote ID (suboption 2)
- DHCPv6 option 18 Relay Agent Interface-ID
- DHCPv6 option 37 Relay Agent Remote-ID

The textual description is configured separately, using the **description** statement at the **[edit interfaces interface-name]** hierarchy level. If you specify that the textual description is used and no description is configured for the interface, DHCP relay defaults to using the Layer 2 interface name.

In the case of integrated routing and bridging (IRB) interfaces, the textual description of the Layer 2 interface is used instead of the textual description of the IRB interface. If there is no description configured, the Layer 2 logical interface name is used.



NOTE: For 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.

You can use the textual description with the following DHCP options:

- DHCPv4 Option 82 Agent Circuit ID (suboption 1)
- DHCPv4 Option 82 Agent Remote ID (suboption 2)
- DHCPv6 Relay Agent Interface-ID (option 18)
- DHCPv6 Relay Agent Remote-ID (option 37)

(DHCPv4) To configure the DHCP relay option 82 suboption to include the textual interface description:

1. Specify that you want to configure option 82 support.

```
[edit forwarding-options dhcp-relay]
user@host# edit relay-option-82
```

2. Configure DHCP relay agent to insert the Agent Circuit ID, Agent Remote ID, or both.

```
[edit forwarding-options dhcp-relay relay-option-82]
user@host# edit circuit-id
```

3. Specify that the textual description is included in the option 82 information. In this example, the option 82 information includes the description used for the device interface.

```
[edit forwarding-options dhcp-relay relay-option-82 circuit-id]
user@host# set use-interface-description device
```

(DHCPv6) To configure the DHCPv6 option 18 or option 37 to include the textual interface description:

1. Specify that you want to configure DHCPv6 relay agent support.

```
[edit forwarding-options dhcp-relay]
user@host# edit dhcpv6
```

2. Configure DHCPv6 relay agent to insert option 18 (Relay Agent Interface-ID), option 37 (Relay Agent Remote-ID), or both.

- To configure option 18:

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit relay-agent-interface-id
```

- To configure option 37:

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit relay-agent-interface-id
```

3. Specify that the textual description is included in the option information. In the following example, the option information includes the description used for the device interface.

- To include the textual description in option 18:

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id]
user@host# set use-interface-description device
```

- To include the textual description in option 37:

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id]
user@host# set use-interface-description device
```

Using DHCP Option Information to Selectively Process DHCP Client Traffic

Starting in Junos OS Release 15.1, you can configure the DHCP relay agent to selectively process client traffic. Selective processing uses DHCP or DHCPv6 option information to identify, filter, and process client traffic. To configure DHCPv6 support you use the procedure at the **[edit forwarding-options dhcp-relay dhcpv6]** hierarchy level.

To configure DHCP relay agent to use option information to selectively process DHCP client traffic:

1. Specify that you want to configure DHCP relay agent support.

```
[edit forwarding-options]
user@host# edit dhcp-relay
```

2. Specify that you want to use the DHCP option feature to selectively process incoming DHCP traffic.

```
[edit forwarding-options dhcp-relay]
user@host# edit relay-option
```

3. Specify the DHCP or DHCPv6 option number DHCP relay uses to identify and process the client traffic. You can specify options 60 and 77 for DHCP relay agent, and options 15 and 16 for DHCPv6 relay agent.

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

For example, to identify traffic that has DHCP option 60 information:

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

4. (Optional) Configure the default action that DHCP relay uses when the incoming client traffic does not satisfy any configured match or partial match criteria.

For example, to configure DHCP relay to drop traffic by default:

```
[edit forwarding-options dhcp-relay relay-option]
user@host# set default-action drop
```

5. (Optional) Configure an exact match condition that filters the client traffic and specifies the associated action for DHCP relay agent to take.

For example, to select traffic that has an option 60 (configured in the previous step) ASCII string of **video25**, and then forward that traffic to a named local server group:

```
[edit forwarding-options dhcp-relay relay-option]
user@host# set equals ascii video25 local-server-group servergroup-east-video
```

- 6. (Optional) Configure a partial match condition that filters the client traffic and specifies the associated action.

For example, to select traffic that has an option 60 hexadecimal string that starts with **766964656F** (left to right), and then forward that traffic without creating a new session:

```
[edit forwarding-options dhcp-relay relay-option]
user@host# edit starts-with hexadecimal 766964656F forward-only
```

Release History Table

Release	Description
15.1	Starting in Junos OS Release 15.1, you can configure the DHCP relay agent to selectively process client traffic.

Related Documentation

- [DHCP Options and Selective Traffic Processing Overview](#)
- [Example: Configuring DHCP Relay Agent Selective Traffic Processing Based on DHCP Option Strings on page 346](#)
- [Example: Configuring DHCP and DHCPv6 Relay Agent Group-Level Selective Traffic Processing on page 281](#)

Configuring DHCP Relay Agent Source Address

In network configurations where a firewall on the broadband network gateway (BNG) is between the DHCP relay agent and the DHCP server, only the BNG loopback address passes through the firewall. In that case, DHCP unicast packets are discarded. To enable DHCP unicast packets to pass through the BNG firewall, configure the source address in DHCP packets and DHCP messages to be the configured loopback address.

In addition to configuring the IP source address, on the DHCPv4 relay server, configure Link Selection (suboption 5) in option 82 information to cause the DHCP server to locate the correct address pool for the DHCP client when the server receives a forwarded packet, and Server ID Override (suboption 11) in option 82 information to set the server ID option in the DHCP packet.

To configure DHCPv4 relay agent to use the loopback address as the source address:

- 1. Configure the DHCPv4 relay agent to set the IP source address of DHCP packets to the configured loopback address.

```
[edit forwarding options dhcp-relay overrides]
user@host# set relay-source lo0
```

2. Configure the DHCPv4 relay agent to add Server ID and Link Selection suboptions to option 82 information:

```
[edit forwarding options dhcp-relay relay-option-82]
user@host# set server-id-override
```

To configure DHCPv6 relay agent to use the loopback address as the source address:

1. Configure the DHCPv6 relay agent to set the IP source address of DHCP packets to the configured loopback address.

```
[edit forwarding options dhcp-relay dhcpv6 overrides]
user@host# set relay-source lo0
```

Related Documentation

- [Configuring Option 82 Information on page 338](#)

Example: Minimum DHCP Relay Agent Configuration

This example shows the minimum configuration you need to use the extended DHCP relay agent on the router or switch:

```
[edit forwarding-options]
dhcp-relay {
  server-group {
    test 203.0.113.21;
  }
  active-server-group test;
  group all {
    interface fe-0/0/2.0;
  }
}
```



NOTE: The interface type in this topic is just an example. The **fe-** interface type is not supported by EX Series switches.

This example creates a server group and an active server group named **test** with IP address 203.0.113.21. The DHCP relay agent configuration is applied to a group named **all**. Within this group, the DHCP relay agent is enabled on interface fe-0/0/2.0.

Related Documentation

- [Extended DHCP Relay Agent Overview on page 236](#)

Example: Configuring DHCP Relay Agent Selective Traffic Processing Based on DHCP Option Strings

This example shows how to configure DHCP relay agent to use DHCP option strings to selectively identify, filter, and process client traffic.

- [Requirements on page 347](#)
- [Overview on page 347](#)

- [Configuration on page 347](#)
- [Verification on page 349](#)

Requirements

This example uses the following hardware and software components:

- MX Series 3D Universal Edge Routers or EX Series Switches

Before you configure DHCP relay agent selective processing support, be sure you:

- Configure DHCP relay agent.

See [“Extended DHCP Relay Agent Overview” on page 236](#).

- (Optional) Configure a named DHCP local server group if you want to forward client traffic to a server group.

See [“Grouping Interfaces with Common DHCP Configurations” on page 277](#).

Overview

In this example, you configure DHCP relay agent to use DHCP option strings in client packets to selectively identify, filter, and process client traffic. To configure selective processing, you perform the following procedures:

1. Identify the client traffic—Specify the DHCP option that DHCP relay agent uses to identify the client traffic you want to process. The option you specify matches the option in the client traffic.
2. Configure a default action—Specify the default processing action, which DHCP relay uses for identified client traffic that does not satisfy any configured match criteria.
3. Create match filters and associate an action with each filter—Specify match criteria that filter the client traffic. The criteria can be an exact match or a partial match with the option string in the client traffic. Associate a processing action with each match criterion.

Configuration

To configure DHCP relay agent selective processing based on DHCP option information, perform these tasks:

- [Configuring DHCP Relay Agent To Selectively Process Client Traffic Based on DHCP Option Strings on page 348](#)
- [Results on page 348](#)

CLI Quick Configuration

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

```
set forwarding-options dhcp-relay relay-option option-number 60
set forwarding-options dhcp-relay relay-option equals ascii video-gold forward-only
```

```
set forwarding-options dhcp-relay relay-option equals ascii video-bronze local-server-group
servergroup-15
set forwarding-options dhcp-relay relay-option starts-with hexadecimal ffff
local-server-group servergroup-east
set forwarding-options dhcp-relay relay-option default-action drop
```

Configuring DHCP Relay Agent To Selectively Process Client Traffic Based on DHCP Option Strings

Step-by-Step Procedure

To configure DHCP relay selective processing:

1. Specify that you want to configure DHCP relay agent support.

```
[edit forwarding-options]
user@host# edit dhcp-relay
```
2. Specify the DHCP option that DHCP relay agent uses to identify incoming client traffic.

```
[edit forwarding-options dhcp-relay]
user@host# set relay-option option-number 60
```
3. Configure a default action, which DHCP relay agent uses when the incoming client traffic does not satisfy any configured match criteria.

```
[edit forwarding-options dhcp-relay]
user@host# set relay-option default-action drop
```
4. Configure an exact match condition and associated action that DHCP relay uses to process the identified client traffic.

```
[edit forwarding-options dhcp-relay]
user@host# set relay-option equals ascii video-gold forward-only
```
5. Configure a second exact match condition and associated action that DHCP relay uses to process client traffic.

```
[edit forwarding-options dhcp-relay]
user@host# set relay-option equals ascii video-bronze local-server-group
servergroup-15
```
6. Configure a partial match criteria and associated action that DHCP relay uses to process client traffic.

```
[edit forwarding-options dhcp-relay]
user@host# set relay-option starts-with hexadecimal ffff local-server-group
servergroup-east
```

Results

From configuration mode, confirm the results of your configuration by issuing the **show** statement at the **[edit forwarding-options]** hierarchy level. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit forwarding-options]
user@host# show
dhcp-relay {
```

```
relay-option {  
  option-number 60;  
  equals {  
    ascii video-gold {  
      forward-only;  
    }  
  }  
  equals {  
    ascii video-bronze {  
      local-server-group servergroup-15;  
    }  
  }  
  default-action {  
    drop;  
  }  
  starts-with {  
    hexadecimal ffff {  
      local-server-group servergroup-east;  
    }  
  }  
}
```

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

Verification

To verify the status of DHCP relay agent selective traffic processing, perform this task:

- [Verifying the Status of DHCP Relay Agent Selective Traffic Processing on page 349](#)

Verifying the Status of DHCP Relay Agent Selective Traffic Processing

Purpose Verify the DHCP relay agent selective traffic processing status.

Action Display statistics for DHCP relay agent.

```
user@host> show dhcp relay statistics
Packets dropped:
  Total                30
  Bad hardware address  1
  Bad opcode            1
  Bad options           3
  Invalid server address 5
  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
```

Meaning The **Packets forwarded** field in the **show dhcp relay statistics** command output displays the number of client packets that have been forwarded as a result of the selective traffic processing configuration. In this example, the output indicates the total number of packets that DHCP relay agent has forwarded, as well as a breakdown for the number of **BOOTREQUEST** and **BOOTREPLY** packets forwarded.

- Related Documentation**
- [Extended DHCP Relay Agent Overview on page 236](#)
 - [DHCP Options and Selective Traffic Processing Overview](#)
 - [Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344](#)
 - [Displaying a Count of DHCP Packets That Are Dropped or Forwarded During Selective Processing That Is Based on DHCP Option Strings on page 370](#)
 - [Example: Configuring DHCP and DHCPv6 Relay Agent Group-Level Selective Traffic Processing on page 281](#)

Example: DHCP Relay Agent Configuration with Multiple Clients and Servers

This example shows an extended DHCP relay agent configuration for a network that includes multiple DHCP clients and DHCP servers. Additional details follow the example.

```
[edit forwarding-options]
dhcp-relay {
  server-group {
    sp-1 {
      203.0.113.21;
      203.0.113.22;
    }
    sp-2 {
      203.0.113.31;
      203.0.113.32;
      203.0.113.33;
    }
  }
  active-server-group sp-1;
  overrides layer2-unicast-replies;
  group clients_a {
    relay-option-82 circuit-id;
    interface fe-1/0/1.1;
    interface fe-1/0/1.2;
    interface fe-1/0/1.3;
  }
  group clients_b {
    relay-option-82 {
      circuit-id {
        prefix routing-instance-name;
      }
    }
    interface fe-1/0/1.4;
    interface fe-1/0/1.5;
    interface fe-1/0/1.6;
  }
  group eth_dslam_relay {
    active-server-group sp-2;
    overrides {
      trust-option-82;
      layer2-unicast-replies;
    }
    interface fe-1/0/1.7;
    interface fe-1/0/1.8;
    interface fe-1/0/1.9;
  }
}
```

This example creates two server-groups: **sp-1**, which includes DHCP server addresses 203.0.113.21 and 203.0.113.22, and **sp-2**, which includes DHCP server addresses 203.0.113.31, 203.0.113.32, and 203.0.113.33. The active server group to which the DHCP relay agent configuration applies is **sp-1**. A global override is set that causes the DHCP relay agent to use Layer 2 unicast transmission to send DHCP reply packets from the DHCP server to DHCP clients during the discovery process.

The example also creates three groups of subscribers and their associated Fast Ethernet interfaces: **clients_a**, **clients_b**, and **eth_dslam_relay**. These groups are configured to meet different needs, as follows:

- The **clients_a** and **clients_b** groups consist of basic subscribers. The service provider for these groups inserts option 82 information in the DHCP packets that are destined for the DHCP server.
- The subscribers in **eth_dslam_relay** are connected to an Ethernet digital subscriber line access multiplexer (DSLAM) that functions as a Layer 2 DHCP relay agent. The active server group for **eth_dslam_relay** is **sp-2**. Overrides are set for the **eth_dslam_relay** group that enable the DHCP relay agent to trust option 82 information and to use Layer 2 unicast transmission to send DHCP reply packets to DHCP clients during discovery.

**Related
Documentation**

- [Extended DHCP Relay Agent Overview on page 236](#)

Example: Configuring DHCP-Initiated Service Change Based on Remote ID

This topic describes how to configure support for DHCP-initiated service change on the DHCP local server and the DHCP relay agent.

Configuring DHCP local server

You can configure support for DHCP-initiated service change for DHCP local server and DHCPv6 local server globally, or for a named group of interfaces.

To configure DHCP local server to support DHCP-initiated service change for a named group:

1. Before starting the configuration for the DHCP-initiated service change feature, ensure that the DHCP or DHCPv6 relay agent is configured to override the default behavior and send a Release message to the DHCP server when a remote ID mismatch occurs. This configuration is required because the relay agent cannot directly tear down client bindings – the Release packet signals the DHCP server to tear down the original binding.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set overrides send-release-on-delete
```

2. Specify that you want to configure DHCP local server.

```
[edit system services]
user@host# edit dhcp-local-server
```

3. Specify the named group that you want to configure.

```
[edit system services dhcp-local-server]
user@host# edit group northwest-321
```

4. Specify that, for the named group, DHCP local server matches the initial and new client remote IDs, and then performs the **disconnect** action when a mismatch occurs.

```
[edit system services dhcp-local-server group northwest-321]
user@host# set remote-id-mismatch disconnect
```

When a Remote ID mismatch occurs, DHCP local server tears down the existing binding and sends a NAK message to the client, which initiates the client reconnect sequence. The new service, which is encoded in the Remote ID string, is then activated when the client reconnects.

Configuring DHCP relay agent

You can configure support for DHCP-initiated service change for DHCP relay agent and DHCPv6 relay agent globally, or for a named group of interfaces.

The following example shows the steps to configure DHCPv6 relay agent to support DHCP-initiated service change on a global basis.

1. Before starting the configuration for the DHCP-initiated service change feature, ensure that the DHCPv6 relay agent is configured to override the default behavior and send a Release message to the DHCP server when a remote ID mismatch occurs. This configuration is required because the relay agent cannot directly tear down client bindings – the Release packet signals the DHCP server to tear down the original binding.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set dhcp-relay overrides send-release-on-delete
```

2. Specify that you want to configure DHCP relay agent.

```
[edit forwarding-options]
user@host# edit dhcp-relay
```

3. Specify that you want to configure DHCPv6 relay agent.

```
[edit forwarding-options dhcp-relay]
user@host# edit dhcpv6
```

4. Specify that DHCPv6 relay agent matches the initial and new client remote IDs, and then performs the **disconnect** action when a mismatch occurs.

```
[edit system services dhcp-local-server group northwest-321]
user@host# set remote-id-mismatch disconnect
```

When a mismatch occurs, DHCPv6 relay agent sends the Release message to the DHCPv6 local server and a logical NAK message (a Reply packet with a 0 lifetime) to the client. The server then tears down the existing binding, and the client initiates the reconnect sequence. The new service, which is encoded in the Remote ID string, is activated when the client reconnects.

Related Documentation

- [DHCP-Initiated Service Change Based on Remote ID on page 333](#)
- [Sending Release Messages When Clients Are Deleted on page 335](#)

Disabling DHCP Relay

You can disable DHCP relay on all interfaces or a group of interfaces.

To disable DHCP relay agent:

1. Specify that you want to configure override options.

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

2. Disable the DHCP relay agent.

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

**Related
Documentation**

- [Extended DHCP Relay Agent Overview on page 236](#)
- [Deleting DHCP Local Server and DHCP Relay Override Settings on page 315](#)

Configuring DHCP Relay Proxy Mode

- [Enabling DHCP Relay Proxy Mode on page 355](#)

Enabling DHCP Relay Proxy Mode

You can enable DHCP relay proxy mode on all interfaces or a group of interfaces.

To enable DHCP relay proxy mode:

1. Specify that you want to configure override options.

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

2. Enable DHCP relay proxy mode.

```
[edit forwarding-options dhcp-relay overrides]  
user@host# set proxy-mode
```

Related Documentation

- [DHCP Relay Proxy Overview on page 239](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

CHAPTER 38

Configuring DHCP Local Server Authentication

- [Configuring a Token for DHCP Local Server Authentication on page 357](#)

Configuring a Token for DHCP Local Server Authentication

You can configure the local server to include a constant, unencoded token in the DHCP `forcerenew` message as part of the authentication option it sends to clients. The client compares the received token with a token already configured on the client. If the tokens do not match, the DHCP client discards the `forcerenew` message. Use of the token provides rudimentary protection against inadvertently instantiated DHCP servers.

(Optional) To configure the DHCP local server to include a token in the `forcerenew` message sent to the client, for all clients:

- Specify the token.

For DHCPv4:

```
[edit system services dhcp-local-server reconfigure]
user@host# set token 8ysIU9E32k8r
```

For DHCPv6:

```
[edit system services dhcp-local-server dhcpv6 reconfigure]
user@host# set token 8ysIU9E32k8r
```

To override the global configuration for a particular group of clients, include the statement at the `[edit system services dhcp-local-server group group-name reconfigure]` hierarchy level or the `[edit system services dhcpv6 dhcp-local-server group group-name reconfigure]` hierarchy level.

Related Documentation

- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)
- [token on page 1371](#)

Configuring a Minimum DHCP Local Server Configuration

- [Example: Minimum Extended DHCP Local Server Configuration on page 359](#)

Example: Minimum Extended DHCP Local Server Configuration

This example shows the minimum configuration you need to use for the extended DHCP local server on the router or switch:

```
[edit system services]
dhcp-local-server {
  group group_one {
    interface fe-0/0/2.0;
  }
}
```



NOTE: The interface type in this topic is just an example. The **fe-** interface type is not supported by EX Series switches.

This example creates the server group named **group_one**, and specifies that the DHCP local server is enabled on interface **fe-0/0/2.0** within the group. The DHCP local server uses the default pool match configuration of **ip-address-first**.



NOTE: If you delete the DHCP server configuration, DHCP server bindings might still remain. To ensure that DHCP bindings are removed, issue the **clear dhcp server binding** command before you delete the DHCP server configuration.

Related Documentation

- [Extended DHCP Local Server Overview on page 230](#)

CHAPTER 40

Protecting the Routing Engine Using DHCP Firewall Filters

- [Example: Configuring a DHCP Firewall Filter to Protect the Routing Engine on page 361](#)
- [Port Number Requirements for DHCP Firewall Filters on page 365](#)

Example: Configuring a DHCP Firewall Filter to Protect the Routing Engine

This example shows how to configure a firewall filter to ensure that proper DHCP packets can reach the Routing Engine on MX Series routers.

- [Requirements on page 361](#)
- [Overview on page 361](#)
- [Configuration on page 362](#)
- [Verification on page 364](#)

Requirements

This configuration example applies only to routers where DHCP local server and DHCP relay agent services are provided by the `jdhcpd` process rather than the legacy `dhcpcd` process or `fud` (UDP forwarding) process. MX Series routers, M120 routers, and M320 routers use `jdhcpd`. For DHCP relay, that means the configuration is required only at the **[edit forwarding-options dhcp-relay]** hierarchy level and not at the **[edit forwarding-options helpers bootp]** hierarchy level.

No special configuration beyond device initialization is required before you can configure this feature.

Overview

Firewall filters that perform some action on DHCP packets at the Routing Engine, such as a filter to protect the Routing Engine by allowing only proper DHCP packets, require that both port 67 (bootps) and port 68 (bootpc) are configured as both source and destination ports.

DHCP packets received on the line cards are encapsulated by `jdhcpd` with a new UDP header where their source and destination addresses are set to port 68 before being forwarded to the Routing Engine. For DHCP relay and DHCP proxy, packets sent to the

DHCP server from the router have both the source and destination UDP ports set to 67. The DHCP server responds using the same ports. However, when the line card receives these DHCP response packets, it changes both port numbers from 67 to 68 before passing the packets to the Routing Engine. Consequently the filter needs to accept port 67 for packets relayed from the client to the server, and port 68 for packets relayed from the server to the client.

In this example, you configure two filter terms, **dhcp-client-accept** and **dhcp-server-accept**. The match conditions for **dhcp-client-accept** specify a source address and destination address for broadcast packets, the UDP protocol used for DHCP packets, and the bootpc (68) source port and bootps (67) destination port. Packets that match these conditions are counted and accepted.

The match conditions for **dhcp-server-accept** specify the UDP protocol used for DHCP packets, and both port 67 and 68 for both source port and destination port. Packets that match these conditions are counted and accepted.



NOTE: This example does not show all possible configuration choices, nor does it show how the filter is applied in your configuration. This example applies to both static application of the filter as well as dynamic application with a dynamic profile.

Configuration

CLI Quick Configuration

To quickly configure the sample Routing Engine DHCP filter, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

```
[edit]
edit firewall family inet filter RE-protect
edit term dhcp-client-accept
set from source-address 0.0.0.0/32
set from destination-address 255.255.255.255/32
set from protocol udp
set from source-port 68
set from destination-port 67
set then count dhcp-client-accept
set then accept
up
edit term dhcp-server-accept
set from protocol udp
set from source-port 67
set from source-port 68
set from destination-port 67
set from destination-port 68
set then count dhcp-server-accept
set then accept
top
```

Step-by-Step Procedure The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode*.

To configure a DHCP firewall filter to protect the Routing Engine:

1. Create or specify a firewall filter.

```
[edit firewall]
user@host# edit family inet filter RE-protect
```
2. Create a filter term for the client.

```
[edit firewall family inet filter RE-protect]
user@host# edit term dhcp-client-accept
```
3. Specify the match conditions for DHCP packets.

```
[edit firewall family inet filter RE-protect term dhcp-client-accept]
user@host# set from source-address 0.0.0.0/32
user@host# set from destination-address 255.255.255.255/32
user@host# set from protocol udp
user@host# set from source-port 68
user@host# set from destination-port 67
```
4. Specify the action to take for matched packets.

```
[edit firewall family inet filter RE-protect term dhcp-client-accept]
user@host# set then count dhcp-client-accept
user@host# set then accept
```
5. Create a filter term for the server.

```
[edit firewall family inet filter RE-protect]
user@host# edit term dhcp-server-accept
```
6. Specify the match conditions for DHCP packets.

```
[edit firewall family inet filter RE-protect term dhcp-server-accept]
user@host# set from protocol udp
user@host# set from source-port [67 68]
user@host# set from destination-port [67 68]
```
7. Specify the action to take for matched packets.

```
[edit firewall family inet filter RE-protect term dhcp-server-accept]
user@host# set then count dhcp-client-accept
user@host# set then accept
```

Results From configuration mode, confirm your configuration by entering the **show firewall** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show firewall
family inet {
  filter RE-protect {
    term dhcp-client-accept {
      from {
        source-address {
```

```

        0.0.0.0/32;
    }
    destination-address {
        255.255.255.255/32;
    }
    protocol udp;
    source-port 68;
    destination-port 67;
}
then {
    count dhcp-client-accept;
    accept;
}
}
term dhcp-server-accept {
    from {
        protocol udp;
        source-port [ 67 68 ];
        destination-port [ 67 68 ];
    }
    then {
        count dhcp-server-accept;
        accept;
    }
}
}
}
}

```

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

Verification

To confirm that the Routing Engine DHCP protection filter is properly passing DHCP packets, perform these tasks:

- [Verifying the DHCP Filter Operation on page 364](#)

Verifying the DHCP Filter Operation

Purpose Verify that both counters increment as DHCP traffic passes to the Routing Engine.

Action From operational mode, enter the **show firewall family inet filter RE-protect** command.

```
user@host> show firewall family inet filter RE-protect
```

```
Filter: RE-protect
```

```
Counters:
```

Name	Bytes	Packets
dhcp-client-accept	328	1
dhcp-server-accept	574	1

```
user@host> show firewall family inet filter RE-protect
```

```
Filter: RE-protect
```

```
Counters:
```

Name	Bytes	Packets
dhcp-client-accept	660	2
dhcp-server-accept	1152	2

Meaning The output lists both configured counters, dhcp-client-accept and dhcp-server-accept. By issuing the command more than once, you can see that the byte and packet fields both show that traffic is being accepted and counted.

- Related Documentation**
- [Port Number Requirements for DHCP Firewall Filters on page 365](#)
 - [Understanding Dynamic Firewall Filters](#)
 - [Understanding Dynamic Firewall Filters](#)
 - [Routing Policies, Firewall Filters, and Traffic Policers Feature Guide](#)
 - [Extended DHCP Local Server Overview on page 230](#)
 - [Extended DHCP Relay Agent Overview on page 236](#)

Port Number Requirements for DHCP Firewall Filters

When you configure a firewall filter to perform some action on DHCP packets at the Routing Engine, such as protecting the Routing Engine by allowing only proper DHCP packets, you must specify both port 67 (bootps) and port 68 (bootpc) for both the source and destination. The firewall filter acts at both the line cards and the Routing Engine.

This requirement applies to both DHCP local server and DHCP relay, but it applies only when DHCP is provided by the jdhcpd process. MX Series routers use jdhcpd. For DHCP relay, that means the configuration is required only at the **[edit forwarding-options dhcp-relay]** hierarchy level and not at the **[edit forwarding-options helpers bootp]** hierarchy level.

DHCP packets received on the line cards are encapsulated by jdhcpd with a new UDP header where their source and destination addresses are set to port 68 before being forwarded to the Routing Engine.

For DHCP relay and DHCP proxy, packets sent to the DHCP server from the router have both the source and destination UDP ports set to 67. The DHCP server responds using the same ports. However, when the line card receives these DHCP response packets, it changes both port numbers from 67 to 68 before passing the packets to the Routing Engine. Consequently the filter needs to accept port 67 for packets relayed from the client to the server, and port 68 for packets relayed from the server to the client.

Failure to include both port 67 and port 68 as described here results in most DHCP packets not being accepted.

For complete information about configuring firewall filters in general, see *Routing Policies, Firewall Filters, and Traffic Policers Feature Guide*.

- Related Documentation**
- [Example: Configuring a DHCP Firewall Filter to Protect the Routing Engine on page 361](#)
 - [Extended DHCP Local Server Overview on page 230](#)
 - [Extended DHCP Relay Agent Overview on page 236](#)
 - [Understanding Dynamic Firewall Filters](#)

Monitoring and Managing DHCP

- [Requesting DHCP Local Server to Initiate Reconfiguration of Client Bindings on page 367](#)
- [Clearing DHCP Bindings for Subscriber Access on page 368](#)
- [Displaying a Count of DHCP Packets That Are Dropped or Forwarded During Selective Processing That Is Based on DHCP Option Strings on page 370](#)
- [Monitoring DHCP Relay Server Responsiveness on page 370](#)
- [Verifying and Managing DHCP Local Server Configuration on page 371](#)
- [Verifying and Managing DHCP Relay Configuration on page 371](#)

Requesting DHCP Local Server to Initiate Reconfiguration of Client Bindings

You can request that the DHCP local server initiate reconfiguration of all of clients or only specified clients.

To request reconfiguration of all clients:

- Specify the **all** option.

For DHCPv4:

```
user@host> request dhcp server reconfigure all
```

For DHCPv6:

```
user@host> request dhcpv6 server reconfigure all
```

You can use any of the following methods to request reconfiguration of specific clients:

- Specify the IP address of the DHCP client.

For DHCPv4:

```
user@host> request dhcp server reconfigure 192.168.27.3
```

For DHCPv6:

```
user@host> request dhcpv6 server reconfigure 2001:db8:1111:2222::
```

- Specify the client ID of a DHCPv6 client.

```
user@host> request dhcpv6 server reconfigure  
LL_TIME0x1-0x2e159c0-00:10:94:00:00:02
```

- Specify the session ID of a DHCPv6 client.
`user@host> request dhcpv6 server reconfigure 5`
- Specify the MAC address of a DHCPv4 client.
`user@host> request dhcp server reconfigure 00:00:5E:00:53:67`
- Specify an interface; reconfiguration is attempted for all clients on this interface.
`user@host> request dhcp server reconfigure interface fe-0/0/0.100`
- Specify a logical system; reconfiguration is attempted for all clients or the specified clients in this logical system.
`user@host> request dhcp server reconfigure all logical-system ls-bldg5`
- Specify a routing instance; reconfiguration is attempted for all clients or the specified clients in this routing instance.
`user@host> request dhcp server reconfigure all routing-instance ri-boston`

**Related
Documentation**

- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)
- [request dhcp server reconfigure on page 1485](#)

Clearing DHCP Bindings for Subscriber Access

This topic provides the procedure you use to display current DHCP bindings, clear selected bindings, and verify that the specified bindings are successfully cleared.

Subscriber management enables you to clear DHCP bindings at several different levels for DHCP local server and DHCP relay agent. For example, you can clear the DHCP bindings on all interfaces, a group of interfaces, or a specific interface. You can also clear DHCP bindings based on IP address, MAC address, session-ID, DHCPv6 prefix, DHCPv6 Client ID, FPC, PIC, port, VLAN, or stacked VLAN (S-VLAN).

This topic includes examples to show several variations of the clear DHCP binding feature. The examples use DHCP local server commands; however, the procedure and commands are similar for DHCP relay agent, DHCPv6 local server, and DHCPv6 relay agent.

To clear bindings and verify the results for a specific IP address:

1. Display current bindings. Issue the appropriate variation of the **show dhcp server binding** command.

```
user@host> show dhcp server binding
2 clients, (2 bound, 0 selecting, 0 renewing, 0 rebinding)

IP address      Hardware address  Type    Lease expires at
192.168.32.1    00:00:5E:00:53:01 active    2011-10-17 11:38:47 PST
192.168.32.3    00:00:5E:00:53:02 active    2011-00-17 11:38:41 PST
```

2. Clear the binding you want to remove.
`user@host> clear dhcp server binding 192.168.32.1`
3. Verify that the binding has been cleared.

```

user@host> show dhcp server binding
1 clients, (1 bound, 0 selecting, 0 renewing, 0 rebinding)

IP address      Hardware address  Type    Lease expires at
192.168.32.3    00:00:5E:00:53:01 active    2011-00-17 11:38:41 PST

```

The following examples show variations of the clear DHCP binding feature. The examples use the DHCP local server version of the commands.



NOTE: IP demux interfaces are not supported by the show and clear DHCP bindings commands for DHCP local server and DHCP relay agent.

To clear all bindings:

```
user@host> clear dhcp server binding all
```

To clear bindings on a specific interface:

```
user@host> clear dhcp server binding interface fe-0/0/2
```

To clear all bindings over an interface. This example uses the wildcard option.

```
user@host> clear dhcp server binding ge-1/0/0. *
```

To clear bindings on top of a specific VLAN. This example clears all bindings on top of VLAN 100.

```
user@host> clear dhcp server binding ge-1/0/0:100
```

To clear bindings for a specific S-VLAN. This example clears bindings on S-VLAN 100-200.

```
user@host> clear dhcp server binding ge-1/0/0:100-200
```

To clear all bindings on top of all demux VLANs:

```
user@host> clear dhcp server binding demux0
```

To clear all bindings on top of an underlying interface. This example clears the bindings on all demux VLANs on top of interface ae0:

```
user@host> clear dhcp server binding ae0
```

To clear PPP bindings. This example uses the wildcard feature and clears the PPP bindings over interface pp0.100 and pp0.200.

```
user@host> clear dhcp server binding pp0.*
```

To clear all bindings on an FPC. This example uses the wildcard feature and clears all DHCP bindings on FPC 1.

```
user@host> clear dhcp server binding ge-1/*
```

To clear all bindings on a PIC. This example uses the wildcard feature and clears all DHCP bindings on FPC 1, PIC 0.

```
user@host> clear dhcp server binding ge-1/0/*
```

To clear all bindings on a port. This example uses the wildcard feature and clears all DHCP bindings on FPC 1, PIC 0, port 0.

```
user@host> clear dhcp server binding ge-1/0/0.*
```

**Related
Documentation**

- [DHCP Auto Logout Overview on page 303](#)
- [Automatically Logging Out DHCP Clients on page 305](#)

Displaying a Count of DHCP Packets That Are Dropped or Forwarded During Selective Processing That Is Based on DHCP Option Strings

To display the number of DHCP or DHCPv6 client packets that are dropped or forwarded during selective processing, use the following operational commands:

- [show dhcp relay statistics](#)
- [show dhcpv6 relay statistics](#)

**Related
Documentation**

- [DHCP Options and Selective Traffic Processing Overview](#)
- [Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344](#)
- [Example: Configuring DHCP Relay Agent Selective Traffic Processing Based on DHCP Option Strings on page 346](#)

Monitoring DHCP Relay Server Responsiveness

You can configure DHCP relay agent and DHCPv6 relay agent to enable the router to monitor DHCP server responsiveness. To monitor DHCP server responsiveness, you specify the length of time during which the router tracks how DHCP servers respond to relayed packets. If a configured DHCP server within the routing instance fails to respond to all relayed packets during the specified time period, the router generates the `DH_SVC_EXTERN_SERVER_STATE_CHG` system log message. When the DHCP server begins responding successfully, the router generates the log message again to indicate that responsiveness is restored. You can also use [show dhcp relay statistics](#) and [show dhcpv6 relay statistics](#) commands to display DHCP server responsiveness statistics.

The following procedure describes how to configure DHCP relay agent to enable the router to monitor DHCP server responsiveness. To configure DHCPv6 server responsiveness, include the `server-response-time` statement at the `[edit forwarding-options dhcp-relay]` hierarchy level.

To monitor DHCP server responsiveness:

1. Specify that you want to configure DHCP relay agent.

```
[edit forwarding-options]  
user@host# edit dhcp-relay
```

2.

```
[edit forwarding-options dhcp-relay]  
user@host# set server-response-time 86,400
```

- Related Documentation**
- [Extended DHCP Relay Agent Overview on page 236](#)
 - [show dhcp relay statistics on page 1591](#)
 - [show dhcpv6 relay statistics on page 1612](#)

Verifying and Managing DHCP Local Server Configuration

Purpose View or clear information about client address bindings and statistics for the extended DHCP local server.



NOTE: If you delete the DHCP server configuration, DHCP server bindings might still remain. To ensure that DHCP bindings are removed, issue the `clear dhcp server binding` command before you delete the DHCP server configuration.

- Action**
- To display the address bindings in the client table on the extended DHCP local server:

```
user@host> show dhcp server binding routing-instance customer routing instance
```
 - To display extended DHCP local server statistics:

```
user@host> show dhcp server statistics routing-instance customer routing instance
```
 - To clear the binding state of a DHCP client from the client table on the extended DHCP local server:

```
user@host> clear dhcp server binding routing-instance customer routing instance
```
 - To clear all extended DHCP local server statistics:

```
user@host> clear dhcp server statistics routing-instance customer routing instance
```

- Related Documentation**
- [CLI Explorer](#)

Verifying and Managing DHCP Relay Configuration

Purpose View or clear address bindings or statistics for extended DHCP relay agent clients:

- Action**
- To display the address bindings for extended DHCP relay agent clients:

```
user@host> show dhcp relay binding routing-instance customer routing instance
```
 - To display extended DHCP relay agent statistics:

```
user@host> show dhcp relay statistics routing-instance customer routing instance
```
 - To clear the binding state of DHCP relay agent clients:

```
user@host> clear dhcp relay binding routing-instance customer routing instance
```
 - To clear all extended DHCP relay agent statistics:

```
user@host> clear dhcp relay statistics routing-instance customer routing instance
```

Related • [CLI Explorer](#)
Documentation

PART 3

Configuring IPv6 for Subscriber Management

- [Migrating to IPv6 Using IPv4 and IPv6 Dual Stack on page 375](#)
- [Introduction to IPv6 Addresses on page 381](#)
- [Using NDRA to Provide IPv6 WAN Link Addressing on page 385](#)
- [Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing on page 389](#)
- [Using DHCPv6 Prefix Delegation to Provide Subscriber LAN Addressing on page 391](#)
- [Using Both DHCPv6 IA_NA and DHCPv6 Prefix Delegation to Provide IPv6 WAN Link and Subscriber LAN Addressing on page 395](#)
- [Designs for IPv6 Addressing in a Subscriber Access Network on page 399](#)
- [Dual-Stack Access Models in a DHCP Network on page 405](#)
- [Dual-Stack Access Models in a PPPoE Network on page 413](#)
- [Configuring DHCPv6 Local Server on page 433](#)
- [Configuring DHCPv6 Relay Agent on page 441](#)
- [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)
- [Best Practices for Configuring IPv4 and IPv6 Dual Stack in a PPPoE Access Network on page 457](#)
- [Configuring Dual Stack for PPPoE Access Networks in Which DHCP Is Used on page 463](#)
- [Configuring Dual Stack for PPPoE Access Networks in Which NDRA Is Used on page 467](#)
- [Configuring Address Assignment Pools for DHCPv6 on page 473](#)
- [Configuring the Dynamic Router Advertisement Protocol on page 477](#)
- [Examples: IPv4 and IPv6 Dual-Stack Designs on page 479](#)
- [Monitoring and Managing Dual Stack Subscribers on page 541](#)
- [Monitoring and Managing DHCPv6 on page 549](#)

Migrating to IPv6 Using IPv4 and IPv6 Dual Stack

- [Why Use IPv4/IPv6 Dual Stack? on page 375](#)
- [Basic Architecture of a Subscriber Access Dual-Stack Network on page 375](#)
- [Terms Used in IPv6 Subscriber Management Documentation on page 376](#)
- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)

Why Use IPv4/IPv6 Dual Stack?

As a service provider, you can use the Junos OS IPv4/IPv6 dual-stack feature to begin your migration from IPv4 to IPv6 by implementing IPv6 alongside IPv4 in your existing subscriber networks. The feature allows you to implement IPv6 so that you can provide the same subscriber services over IPv6—video, voice, high-quality data—that you currently provide in your IPv4 networks. You can then perform incremental upgrades to IPv6 and avoid service disruptions while migrating from IPv4 to IPv6.

Related Documentation

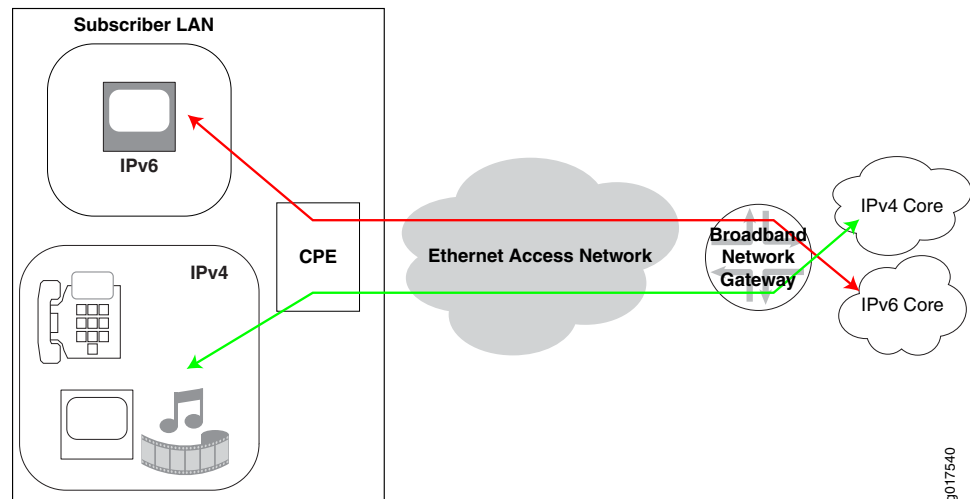
- [Basic Architecture of a Subscriber Access Dual-Stack Network on page 375](#)
- [Terms Used in IPv6 Subscriber Management Documentation on page 376](#)

Basic Architecture of a Subscriber Access Dual-Stack Network

This Juniper Networks dual-stack architecture is designed for either DHCP-based or PPP/PPPoE-based subscriber access networks. In addition, this design allows you to layer DHCPv6 over PPPoE-based networks.

[Figure 3 on page 376](#) shows the components of a basic subscriber access network in which the subscriber LAN is running both IPv4 and IPv6 and is connected to the IPv4 and IPv6 core using a broadband network gateway (BNG) configured for dual stack. Using IPv4/IPv6 dual stack, the BNG can provide both IPv4 and IPv6 services over the access network to the subscriber LAN. A single interface can operate simultaneously in IPv4 and IPv6 modes.

Figure 3: IPv4 and IPv6 Dual-Stack Architecture in a Subscriber Access Network



- Related Documentation**
- [Why Use IPv4/IPv6 Dual Stack? on page 375](#)
 - [Terms Used in IPv6 Subscriber Management Documentation on page 376](#)

Terms Used in IPv6 Subscriber Management Documentation

Table 45 on page 376 defines terms used in the IPv6 subscriber management documentation.

Table 45: IPv6 Subscriber Management Terms

Term	Definition
BNG	Broadband network gateway. An IP edge router in which bandwidth and QoS policies may be applied. The BNG may encompass any or all of the functionality of B-RAS.
CPE	Customer premises equipment on the subscriber network that connects the subscriber network to the BNG.
Delegated addressing	Method of address assignment in which a host uses IPv6 prefixes to delegate IPv6 global addresses. In a dual-stack network, the CPE uses IPv6 prefixes that it receives to delegate global IPv6 addresses to individual subscriber equipment.
Delegating router	Role of the BNG when it delegates IPv6 prefixes to the requesting router (the CPE).
DHCPv6 IA	Identity association. A collection of addresses assigned to a client. Each IA contains one type of address. For example, IA_NA carries assigned addresses that are nontemporary addresses; IA_PD carries a prefix.
DHCPv6 IA_PD	IA for prefix delegation. An IA that carries a prefix that is assigned to the requesting router. Instead of assigning a single address, IA_PD assigns a prefix or a complete subnet. Referred to as DHCPv6 prefix delegation.

Table 45: IPv6 Subscriber Management Terms (*continued*)

Term	Definition
DHCPv6 IA_NA	<p>IA for nontemporary addresses. An IA that carries assigned addresses that are not temporary addresses.</p> <p>DHCPv6 IA_NA is used to assign global IPv6 addresses.</p>
Global IPv6 address	Unique IPv6 address that identifies a single interface and allows the interface to access the IPv6 internet.
IPv6 address prefix/prefix length	<p>Combination of an IPv6 prefix (address) and a prefix length.</p> <p>The prefix takes the form <i>ipv6-prefix/prefix-length</i> and represents a block of address space (or a network).</p> <p>The <i>/prefix-length</i> indicates the number of contiguous, higher-order bits of the address that make up the network portion of the address.</p> <p>For example, 2001:DB8::/32 is an IPv6 prefix.</p>
IPCP	IPv4 Control Protocol. A PPP protocol that establishes the IPv4 link between the BNG and the CPE if you are using PPPoE in your access network.
IPv6CP	IPv6 Control Protocol. A PPP protocol that establishes the IPv6 link between the BNG and the CPE if you are using PPPoE in your access network.
Link-local address	<p>Locally derived address that is designed to be used for addressing on a single link for purposes such as automatic address configuration, Neighbor Discovery, or when no routers are present. It is indicated by the prefix FE80::/10.</p> <p>In your dual-stack network, you can use a link-local address on the interface that connects the CPE and the BNG.</p>
NDRA	Neighbor Discovery Router Advertisement. An IPv6 protocol that is used in the dual-stack network to allow automatic addressing on the CPE WAN link.
Neighbor discovery	Protocol in the IPv6 protocol suite that allows nodes on the same link to advertise their existence to their neighbors, and to learn about the existence of their neighbors.
Prefix list	Table that contains IPv6 prefixes.
Requesting router	Role of the CPE when it requests IPv6 prefixes from the delegating router (the BNG).
Router Advertisement (RA)	<p>Message that the BNG periodically sends to hosts or sends in response to Router Solicitation (RS) requests from another host. The message includes IPv6 prefixes and other autoconfiguration information.</p> <p>In a dual-stack network, the router sends RAs to CPE devices on its access network.</p>
Router Solicitation (RS)	Message that hosts send to discover the presence of on-link routers. In a dual-stack network, CPE devices send RS messages to the BNG.
Unnumbered address	Address that can be used on the router's PPPoE loopback interface that connects to the CPE.

- Related Documentation**
- [Why Use IPv4/IPv6 Dual Stack? on page 375](#)
 - [Basic Architecture of a Subscriber Access Dual-Stack Network on page 375](#)

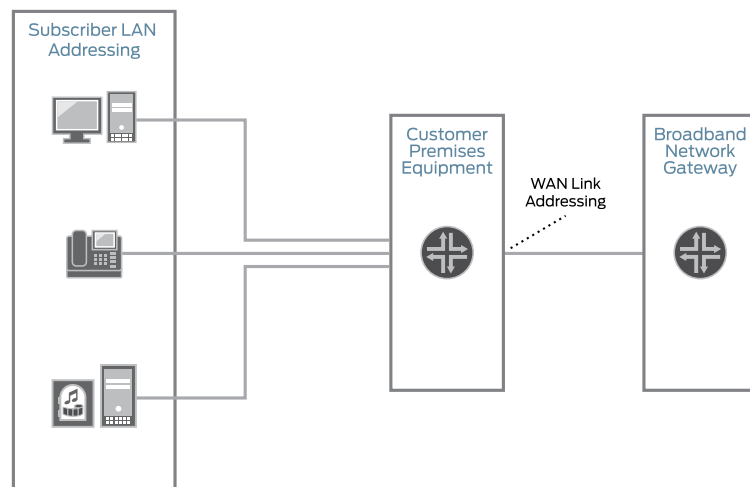
IPv6 Addressing Requirements for a Subscriber Access Network

You need to implement two types of addressing for IPv6 in a subscriber access network:

- WAN link addressing—For the WAN interface on the CPE (CPE upstream interface).
- Subscriber LAN addressing—For devices connected to the CPE on the subscriber LAN (CPE downstream interfaces).

Figure 4 on page 378 shows where WAN link addressing and subscriber addressing are assigned in a dual-stack network.

Figure 4: IPv6 Address Requirements in a Subscriber Access Network



g017542

You can use the following methods for assigning IPv6 addresses:

- For WAN link addressing, you can use Neighbor Discovery Router Advertisement (NDRA) or DHCPv6 Identity association for nontemporary addresses (IA_NA) to provision a global IPv6 address.
- For subscriber LAN addressing, you can use DHCPv6 prefix delegation to provision global IPv6 addresses to subscribers on the LAN.

Alternatives to Using a Global IPv6 Address on the CPE WAN Link

If the CPE is supplied by or recommended by the service provider, you do not need to provision a unique global IPv6 address on the CPE. In this case, the broadband network gateway (BNG) can use the loopback interface to manage the CPE. You can use one of the following methods to provision an address on the loopback interface:

- Link-local IPv6 address—Can be used on PPPoE access networks. The link-local address is provisioned by appending the interface identifier negotiated by IPv6CP with the IPv6 link-local prefix (FE80::/10).
- Address derived from DHCPv6 prefix delegation—Can be used on PPPoE access networks or on DHCP access networks. If you use DHCPv6 prefix delegation for subscriber addressing, the CPE can use the prefix it receives from the BNG to assign an IPv6 address on the loopback interface between the CPE and the BNG. This address can be used to manage the CPE, and the CPE uses it as a source address when it communicates with the BNG.

Related Documentation

- [Using NDRA to Provide IPv6 WAN Link Addressing Overview on page 385](#)
- [Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing Overview on page 389](#)
- [Using DHCPv6 Prefix Delegation Overview on page 391](#)
- [Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview on page 395](#)

CHAPTER 43

Introduction to IPv6 Addresses

- [IPv6 Addressing Overview on page 381](#)
- [IPv6 Notation on page 381](#)
- [IPv6 Prefixes on page 382](#)
- [IPv6 Address Types on page 382](#)

IPv6 Addressing Overview

IPv6 uses a 128-bit addressing model compared with the 32-bit addresses used for IPv4. In addition to being larger, IPv6 addresses differ from IPv4 addresses in several ways:

- Notation
- Prefixes
- Address types

These differences give IPv6 addressing greater simplicity and scalability than IPv4 addressing gives.

Related Documentation

- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)
- [IPv6 Notation on page 381](#)
- [IPv6 Prefixes on page 382](#)
- [IPv6 Address Types on page 382](#)

IPv6 Notation

IPv6 addresses are 128 bits long (expressed as 32 hexadecimal numbers) and consist of eight colon-delimited sections. Each section contains 2 bytes, and each byte is expressed as a hexadecimal number from 0 through FF.

An IPv6 address looks like this:

2001:0db8:0000:0000:0000:0800:200c:7334

By omitting the leading zeroes from each section or substituting contiguous sections that contain zeroes with a double colon, you can write the example address as:

2001:db8:0:0:0:800:200c:7334 or 2001:db8::800:200c:7334

You can use the double-colon delimiter only once within a single IPv6 address. For example, you cannot express the IPv6 address 2001:db8:0000:0000:ea34:0000:71ff:fe01 as 2001:db8::ea34::71ff:fe01.

**Related
Documentation**

- [IPv6 Addressing Overview on page 381](#)
- [IPv6 Prefixes on page 382](#)
- [IPv6 Address Types on page 382](#)
- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)

IPv6 Prefixes

An IPv6 address prefix represents a block of address space or a network. The prefix is a combination of an IPv6 prefix (address) and a prefix length. It takes the form *ipv6-prefix/prefix-length*.

IPv6 addresses can be broken into prefixes of varying length. The prefix length is a decimal value that specifies the number of the leftmost bits in the address that make up the prefix. The prefix length follows a forward slash and, in most cases, identifies the portion of the address owned by an organization. All remaining bits (up to the right-most bit) represent individual nodes or interfaces.

For example, 2001:db8:0000:0000:250:af:34ff:fe26/64 has a prefix length of 64.

The first 64 bits of this address (2001:db8:0000:0000) are the prefix. The rest (250:af:34ff:fe26) identify the interface.

**Related
Documentation**

- [IPv6 Addressing Overview on page 381](#)
- [IPv6 Notation on page 381](#)
- [IPv6 Address Types on page 382](#)
- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)

IPv6 Address Types

There are three major categories of IPv6 addresses:

- Unicast—For a single interface.
- Multicast—For a set of interfaces on the same physical medium. A packet is sent to all interfaces associated with the address.
- Anycast—For a set of interfaces on different physical media. A packet is sent to only one of the interfaces associated with this address, not to all the interfaces.

Unicast Addresses

A unicast address identifies a single interface. When a network device sends a packet to a unicast address, the packet goes only to the specific interface identified by that address. Unicast addresses support a global address scope and two types of local address scopes.

A unicast address consists of n bits for the prefix, and $128 - n$ bits for the interface ID.

In the IPv6 implementation for a subscriber access network, the following types of unicast addresses can be used:

- Global unicast address—A unique IPv6 address assigned to a host interface. These addresses have a global scope and essentially the same purposes as IPv4 public addresses. Global unicast addresses are routable on the Internet.
- Link-local IPv6 address—An IPv6 address that allows communication between neighboring hosts that reside on the same link. Link-local addresses have a local scope, and cannot be used outside the link. They always have the prefix FE80::/10.
- Loopback IPv6 address—An IPv6 address used on a loopback interfaces. The IPv6 loopback address is 0:0:0:0:0:0:0:1, which can be notated as ::1/128.
- Unspecified address—An IPv6 unspecified address is 0:0:0:0:0:0:0:0, which can be notated as ::/128.

Multicast Addresses

A multicast address identifies a set of interfaces that typically belong to different nodes. When a network device sends a packet to a multicast address, the device broadcasts the packet to all interfaces identified by that address. IPv6 does not support broadcast addresses, but instead uses multicast addresses in this role.

Multicast addresses support 16 different types of address scope, including node, link, site, organization, and global scope. A 4-bit field in the prefix identifies the address scope.

The following types of multicast addresses can be used in an IPv6 subscriber access network:

- Solicited-node multicast address—Neighbor Solicitation (NS) messages are sent to this address.
- All-nodes multicast address—Router Advertisement (RA) messages are sent to this address.
- All-routers multicast address—Router Solicitation (RS) messages are sent to this address.

Multicast addresses use the prefix FF00::/8.

Anycast Addresses

An anycast address identifies a set of interfaces that typically belong to different nodes. Anycast addresses are similar to multicast addresses, except that packets are sent only to one interface, not to all interfaces. The routing protocol used in the network usually

determines which interface is physically closest within the set of anycast addresses and routes the packet along the shortest path to its destination.

There is no difference between anycast addresses and unicast addresses except for the subnet-router address. For an anycast subnet-router address, the low-order bits, typically 64 or more, are zero. Anycast addresses are taken from the unicast address space.

For more information about anycast addresses, see RFC 2526, *Reserved IPv6 Subnet Anycast Addresses*.

**Related
Documentation**

- [IPv6 Addressing Overview on page 381](#)
- [IPv6 Notation on page 381](#)
- [IPv6 Prefixes on page 382](#)
- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)

Using NDRA to Provide IPv6 WAN Link Addressing

- [Using NDRA to Provide IPv6 WAN Link Addressing Overview on page 385](#)
- [IPv6 Neighbor Discovery Protocol Overview on page 385](#)
- [How NDRA Works in a Subscriber Access Network on page 386](#)
- [Methods for Obtaining IPv6 Prefixes for NDRA on page 387](#)
- [Duplicate Prefix Protection for NDRA on page 388](#)

Using NDRA to Provide IPv6 WAN Link Addressing Overview

In a dual-stack network, NDRA provides a lightweight address assignment method for autoconfiguration of the global IPv6 address on the CPE WAN link. The CPE device can construct its own IPv6 global address by combining the interface ID that is negotiated by IPv6CP and the prefix obtained through NDRA.

Related Documentation

- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)
- [IPv6 Neighbor Discovery Protocol Overview on page 385](#)
- [How NDRA Works in a Subscriber Access Network on page 386](#)
- [Design 2: IPv6 Addressing with NDRA and DHCPv6 Prefix Delegation on page 402](#)
- [Design 3: IPv6 Addressing with NDRA on page 403](#)
- [Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network on page 467](#)

IPv6 Neighbor Discovery Protocol Overview

Neighbor Discovery is a protocol in the IPv6 protocol suite that allows nodes on the same link to advertise their existence to their neighbors and to learn about the existence of their neighbors. Neighbor Discovery is built on top of Internet Control Message Protocol version 6 (ICMPv6). It replaces the following IPv4 protocols: Router Discovery (RDISC), Address Resolution Protocol (ARP), and ICMPv4 redirect.

Neighbor Discovery uses router advertisement messages to detect neighbors, advertise IPv6 prefixes, assist in address provisioning, and share link parameters such as MTU, hop limit, advertisement intervals, and lifetime.

Neighbor Discovery Messages

Neighbor Discovery uses the following message types:

- Router advertisement (RA)—Messages sent to announce the presence of the router, advertise prefixes, assist in address configuration, and share other link information such as MTU size and hop limit. The IPv6 nodes on the link can use this information to configure themselves with an IPv6 address and routing information such as the default gateway.
- Router solicitation (RS)—Messages sent by IPv6 nodes when they come online to solicit immediate router advertisements from the router.
- Neighbor solicitation (NS)—Messages used for duplicate address detection and to test reachability of neighbors.

A host can verify that its address is unique by sending a neighbor solicitation message destined to the new address. If the host receives a neighbor advertisement in reply, the address is a duplicate.

- Neighbor advertisement (NA)—Messages used for duplicate address detection and to test reachability of neighbors. Neighbor advertisements are sent in response to neighbor solicitation messages.

You can specify the information that is sent in router advertisements.

Related Documentation

- [Using NDRA to Provide IPv6 WAN Link Addressing Overview on page 385](#)
- [How NDRA Works in a Subscriber Access Network on page 386](#)

How NDRA Works in a Subscriber Access Network

Before NDRA can provide IPv6 address information to the CPE, you need to first obtain a link-local address for the CPE WAN link. NDRA provides address assignment in two phases:

1. Link-local address assignment for local connectivity to the BNG
2. Global address assignment for global connectivity

The process is as follows:

1. During IPv6CP negotiation to establish the PPPoE link between the BNG and the CPE, an interface identifier is negotiated for the CPE.
2. The CPE creates a link-local address by appending the interface identifier with the IPv6 link-local prefix (FE80::/10).



NOTE: When the interface ID is 0, such as for Windows 7 clients, PPP uses the subscriber's session ID in place of the interface ID.

The CPE now has IPv6 connectivity to the BNG, and it can use NDRA to obtain its global IPv6 address.

3. The CPE sends a router solicitation message to the BNG.
4. The BNG responds with a router advertisement message that includes an IPv6 prefix with a length of /64.

This prefix can come directly from a local NDRA address pool configured on the BNG.

If you are using AAA, a RADIUS server can specify the prefix in the *Framed-Ipv6-Prefix* attribute, or it can specify an NDRA pool on the BNG from which the prefix is assigned in the *Framed-Ipv6-Pool* attribute.

5. When the CPE receives the 64-bit prefix, it appends its interface ID to the supplied prefix to form a globally routable 128-bit address.
6. The CPE verifies that the global address is unique by sending a neighbor solicitation message destined to the new address. If there is a reply, the address is a duplicate. The process stops and requires operator intervention.

Related Documentation

- [Using NDRA to Provide IPv6 WAN Link Addressing Overview on page 385](#)
- [IPv6 Neighbor Discovery Protocol Overview on page 385](#)
- [Methods for Obtaining IPv6 Prefixes for NDRA on page 387](#)

Methods for Obtaining IPv6 Prefixes for NDRA

You can set up the BNG to select IPv6 prefixes used for NDRA through one of the following methods:

- An external source such as a AAA RADIUS server.
- Dynamic assignment from a local pool of NDRA prefixes that is configured on the BNG

Using AAA RADIUS Server to Obtain IPv6 Prefixes for NDRA

When the BNG needs to obtain a prefix for NDRA, it uses the values in one of the following RADIUS attributes that it receives in Access-Accept messages from the RADIUS server:

- *Framed-IPv6-Prefix*—The attribute contains an IPv6 prefix that the BNG can send to the CPE in router advertisement messages.
- *Framed-IPv6-Pool*—The attribute contains the name of an NDRA pool configured on the BNG from which the BNG can select a prefix to include in router advertisements.

Related Documentation

- [Using NDRA to Provide IPv6 WAN Link Addressing Overview on page 385](#)

- [How NDRA Works in a Subscriber Access Network on page 386](#)
- [Configuring an Address-Assignment Pool Used for Router Advertisements on page 470](#)

Duplicate Prefix Protection for NDRA

If you are using AAA to supply IPv6 prefixes for NDRA, you can enable duplicate prefix protection for NDRA. If enabled, the BNG checks the following attributes received from external servers:

- *Framed-IPv6-Prefix*
- *Framed-IPv6-Pool*

The router then takes one of the following actions:

- If a prefix overlaps with a prefix in an address pool, the prefix is taken from the pool if it is available.
- If the prefix is already in use, it is rejected as unavailable.
- If the prefix length requested from the external server does not match the pool's prefix length exactly, the authentication request is denied. If configured, the Acct-Stop message includes a termination cause.

Related Documentation

- [Methods for Obtaining IPv6 Prefixes for NDRA on page 387](#)
- [Configuring Duplicate IPv6 Prefix Protection for Router Advertisement on page 471](#)

CHAPTER 45

Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing

- [Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing Overview on page 389](#)
- [Methods for Obtaining IPv6 Global Addresses for DHCPv6 IA_NA on page 389](#)

Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing Overview

You can use DHCPv6 IA_NA to assign a global IPv6 address to the CPE WAN link. If the CPE sends a Solicit message that contains the IA_NA option to the BNG, the BNG acts as a DHCPv6 server and assigns a single IPv6/128 address to the WAN interface of the CPE.

Related Documentation

- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)
- [Design 1: IPv6 Addressing with DHCPv6 IA_NA and DHCPv6 Prefix Delegation on page 401](#)
- [Methods for Obtaining IPv6 Global Addresses for DHCPv6 IA_NA on page 389](#)
- [Selecting the Method of Provisioning a Global IPv6 Address for the WAN Link on page 399](#)
- [Configuring an Address-Assignment Pool for Use by DHCPv6 IA_NA on page 474](#)

Methods for Obtaining IPv6 Global Addresses for DHCPv6 IA_NA

You can set up the BNG to select global IPv6 addresses to be delegated to the requesting router in one the following ways:

- An external source such as a AAA RADIUS server or a DHCP server using the DHCPv6 relay agent.
- Dynamic assignment from a local pool of addresses that is configured on the BNG

Using a AAA RADIUS Server to Obtain IPv6 Addresses for DHCPv6 IA_NA

When the BNG needs to obtain a global IPv6 for the CPE WAN link and optionally a DHCPv6 prefix, it uses the values in one of the following RADIUS attributes:

- *Framed-IPv6-Prefix*—The attribute contains a global IPv6 address with a prefix length of 128.

- *Framed-IPv6-Pool*—The attribute contains the name of an address-assignment pool configured on the BNG from which the BNG can select a global IPv6 address to send to the CPE.

Both attributes are sent from the RADIUS server to the BNG in RADIUS Access-Accept messages.

**Related
Documentation**

- [Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing Overview on page 389](#)
- [Configuring an Address-Assignment Pool for Use by DHCPv6 IA_NA on page 474](#)

CHAPTER 46

Using DHCPv6 Prefix Delegation to Provide Subscriber LAN Addressing

- [Using DHCPv6 Prefix Delegation Overview on page 391](#)
- [Using a Delegated Prefix on the CPE Loopback Interface on page 393](#)
- [DHCPv6 Prefix Delegation over PPPoE on page 393](#)
- [Methods for Obtaining IPv6 Prefixes for DHCPv6 Prefix Delegation on page 394](#)

Using DHCPv6 Prefix Delegation Overview

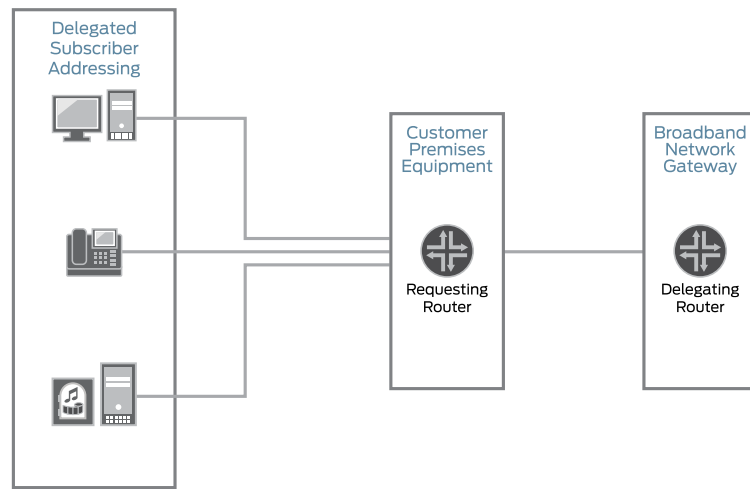
You can use DHCPv6 prefix delegation to automate the delegation of IPv6 prefixes to the CPE. With prefix delegation, a delegating router (the BNG) delegates IPv6 prefixes to a requesting router (the CPE). The requesting router then uses the prefixes to assign global IP addresses to the devices on the subscriber LAN. The requesting router can also assign subnet addresses to subnets on the LAN.

DHCPv6 prefix delegation is useful when the delegating router does not have information about the topology of the networks in which the requesting router is located. In such cases, the delegating router requires only the identity of the requesting router to choose a prefix for delegation.

DHCPv6 prefix delegation replaces the need for NAT in an IPv6 network.

[Figure 5 on page 392](#) shows how DHCPv6 prefix delegation is used in a dual-stack network.

Figure 5: Delegated Addressing in a Dual-Stack Network Using DHCPv6



g017543

DHCPv6 prefix delegation operates as follows:

1. A delegating router is provided with IPv6 prefixes to be delegated to requesting routers. These prefixes can come from a local address-assignment pool or an external AAA server.

Each prefix has an associated valid and preferred lifetime, which can be extended.

2. A requesting router requests one or more prefixes from the delegating router.
3. The delegating router chooses prefixes for delegation, and responds with prefixes to the requesting router.
4. The requesting router is then responsible for the delegated prefixes.

The address allocation mechanism in the subscriber network can be performed with ICMPv6 Neighbor Discovery in router advertisements, DHCPv6, or a combination of these two methods.

Related Documentation

- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)
- [Design 1: IPv6 Addressing with DHCPv6 IA_NA and DHCPv6 Prefix Delegation on page 401](#)
- [Design 2: IPv6 Addressing with NDRA and DHCPv6 Prefix Delegation on page 402](#)
- [Design 4: IPv6 Addressing with DHCPv6 Prefix Delegation and No NDRA Prefix on page 403](#)
- [Methods for Obtaining IPv6 Prefixes for DHCPv6 Prefix Delegation on page 394](#)
- [Selecting the Method of Assigning Global IPv6 Addresses to Subscribers on page 400](#)

Using a Delegated Prefix on the CPE Loopback Interface

For networks in which the service provider directly controls the CPE, a delegated prefix can be used to create an IPv6 address on the loopback interface between the CPE and the BNG. This address can be used to manage the CPE, and the CPE uses it as a source address when it communicates with the BNG.

- Related Documentation**
- [Using DHCPv6 Prefix Delegation Overview on page 391](#)
 - [Selecting the Type of Addressing Used on the CPE on page 399](#)

DHCPv6 Prefix Delegation over PPPoE

The process of DHCPv6 prefix delegation when DHCPv6 is running over a PPPoE access network is as follows:

1. The CPE obtains a link-local address by appending the interface ID that it receives through IPv6CP negotiation to the IPv6 link-local prefix (FE80::/10). The link-local address provides an initial path for protocol communication between the BNG and CPE.
2. The CPE sends a DHCPv6 Solicit message that includes an IA_PD option.
3. The BNG chooses a prefix for the CPE with information from an external AAA server or from a local prefix pool.
4. The BNG sends an Advertise message to the CPE. The message includes the delegated prefix, an IA_PD option, and an IA_PD prefix option. The prefix length in the IA_PD prefix option is 48. The message can also contain other configuration information, such as a maximum lease time.
5. The CPE sends a Request message to the BNG. The message requests the prefix that was advertised.
6. The BNG returns the delegated prefix to the CPE in a Reply message. This message also contains the delegated prefix, an IA_PD option, and an IA_PD prefix option. The prefix length in the IA_PD prefix option is 48. The message can also contain other configuration information, such as a maximum lease time.
7. The CPE uses the delegated prefix to allocate global IPv6 addresses to host devices on the subscriber network. It can use router advertisements, DHCPv6, or a combination of these two methods to allocate addresses on the subscriber LAN.

- Related Documentation**
- [Using DHCPv6 Prefix Delegation Overview on page 391](#)
 - [Example: Configuring a Dual Stack That Uses NDRA and DHCPv6 Prefix Delegation over PPPoE on page 502](#)

Methods for Obtaining IPv6 Prefixes for DHCPv6 Prefix Delegation

You can set up the BNG to select IPv6 prefixes to be delegated to the requesting router in one of the following ways:

- An external source such as a AAA RADIUS server or a DHCP server using the DHCPv6 relay agent.
- Dynamic assignment from a local pool of prefixes that is configured on the BNG

You can specify the name of a delegated pool to use for prefix delegation, which means that you do not need to use AAA to obtain the pool name. In this configuration, if you have also specified a pool match order, the specified delegated pool takes precedence.

Using a AAA RADIUS Server to Obtain IPv6 Prefixes for Prefix Delegation

When the BNG needs to obtain a prefix for DHCPv6 prefix delegation, it uses the values in one of the following RADIUS attributes:

- *Delegated-IPv6-Prefix*—The attribute contains an IPv6 prefix that the BNG can send to the CPE.
- *Inpr-IPv6-Delegated-Pool-Name*—The attribute contains the name of an address-assignment pool configured on the BNG from which the BNG can select a prefix to send to the CPE.

Both attributes are sent from the RADIUS server to the BNG in RADIUS Access-Accept messages.

Related Documentation

- [Using DHCPv6 Prefix Delegation Overview on page 391](#)
- [Selecting the Method of Obtaining IPv6 Prefixes on page 400](#)
- [Configuring an Address-Assignment Pool for Use by DHCPv6 Prefix Delegation on page 473](#)

Using Both DHCPv6 IA_NA and DHCPv6 Prefix Delegation to Provide IPv6 WAN Link and Subscriber LAN Addressing

- [Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview on page 395](#)
- [DHCPv6 Options in a DHCPv6 Multiple Address Environment on page 396](#)
- [Methods for Obtaining Addresses for Both DHCPv6 Prefix Delegation and DHCPv6 IA_NA on page 396](#)
- [Multiple DHCPv6 IA_NA and IA_PD Requests per Client Interface on page 398](#)

Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview

You can use DHCPv6 IA_NA to assign a global IPv6 address to the CPE WAN link and DHCPv6 prefix delegation to provide prefixes for use on the subscriber LAN. DHCPv6 IA_NA and DHCPv6 prefix delegation are done in a single DHCPv6 session. If the CPE sends both the IA_NA and IA_PD options in the same DHCPv6 Solicit message, the BNG returns both a single IPv6/128 address and an IPv6 prefix.

When at least one address is successfully allocated, the router creates a subscriber entry and binds the entry to the assigned address. If both addresses are successfully allocated, the router creates a single subscriber entry and binds both addresses to that entry.

Lease Times and Session Timeouts for DHCPv6 IA_NA and DHCPv6 Prefix Delegation

When you use DHCPv6 IA_NA together with DHCPv6 prefix delegation, note the following about session timeouts and lease times:

- A session timeout from AAA has the highest precedence and overrides local pool lease times.
- For DHCPv6 local server, the minimum lease time associated with an address pool takes precedence over pools with longer lease times. For example, if a CPE obtains an IA_NA address from a pool with a lease time of 3600, and a prefix from a pool with a lease time of 7200, the lease time returned in the Reply message from the BNG is 3600.
- If AAA does not return a session timeout and the address pool does not have a configured lease time, the default setting of 86,400 (one day) is used.

- Related Documentation**
- [Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing Overview on page 389](#)
 - [Using DHCPv6 Prefix Delegation Overview on page 391](#)
 - [Design 1: IPv6 Addressing with DHCPv6 IA_NA and DHCPv6 Prefix Delegation on page 401](#)
 - [Example: Configuring a Dual Stack That Uses DHCPv6 IA_NA and DHCPv6 Prefix Delegation over PPPoE on page 479](#)

DHCPv6 Options in a DHCPv6 Multiple Address Environment

In a DHCPv6 environment, DHCPv6 clients can use a single DHCPv6 Solicit message to request multiple addresses (for example, IA_NA address, IA_PD address, or both), as well as the DNS server address (DHCPv6 attribute 23). When a client requests multiple addresses, DHCPv6 uses the following guidelines to determine how options are returned to the client.

- **DNS server address**—Whenever a client requests an IA_PD address (either alone or with an IA_NA address) and also requests a DNS server address, DHCPv6 returns a DNS address only when one is specified in the IA_PD pool. If the IA_PD pool does not include a DNS address, DHCPv6 ignores any DNS address configured in the IA_NA pool.

If the client requests an IA_NA address (but not an IA_PD address) and also a DNS server address, DHCPv6 returns a DNS address if one is configured in the IA_NA pool.
- **Lease time**—DHCPv6 returns the shortest value of the lease times configured in the IA_NA pool, the IA_PD pool, and **authd**. DHCPv6 uses this value to set the lifetimes and the Renew and Rebind timers.



NOTE: By default, DHCPv6 local server returns the DNS server address as a global DHCPv6 option. You can override the current default behavior if you want DHCPv6 to return the DNS server address at the suboption level.

- Related Documentation**
- [Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview on page 395](#)
 - [Methods for Obtaining Addresses for Both DHCPv6 Prefix Delegation and DHCPv6 IA_NA on page 396](#)
 - [Overriding How the DNS Server Address Is Returned in a DHCPv6 Multiple Address Environment on page 581](#)

Methods for Obtaining Addresses for Both DHCPv6 Prefix Delegation and DHCPv6 IA_NA

You can set up the BNG to select global IPv6 addresses to be delegated to the requesting router in one the following ways:

- An external source such as a AAA RADIUS server or a DHCP server using the DHCPv6 relay agent.

- Dynamic assignment from a local pool of prefixes or global IPv6 addresses that is configured on the BNG

Address assignment for prefix delegation and IA_NA are independent. For example, you can use AAA RADIUS for DHCPv6 IA_NA, and use a local pool for prefix delegation.

Address Pools for DHCPv6 Prefix Delegation and DHCPv6 IA_NA

You need two separate address pools for prefix delegation and IA_NA. The pool used for IA_NA contains /128 addresses, and the pool for prefix delegation contains /56 or /48 addresses.

You can specify the name of a delegated pool to use for prefix delegation, which means that you do not need to use AAA to obtain the pool name. In this configuration, if you have also specified a pool match order, the specified delegated pool takes precedence.

You can configure pool attributes so that the IA_NA pool and the prefix delegation pool can specify different SIP servers for DNS addresses. DHCPv6 options that the BNG returns to the CPE are based on the pool from which the addresses were allocated. These options that are returned are based on the DHCPv6 Option Request option (ORO), which can be configured globally or within the IA_NA and IA_PD request.

Using a AAA RADIUS Server to Obtain IPv6 Addresses and Prefixes

When the BNG needs to obtain a global IPv6 address for the CPE WAN link and a DHCPv6 prefix, it uses the values in one of the following RADIUS attributes:

- *Framed-IPv6-Prefix*—The attribute contains a global IPv6 address and a prefix. A prefix length of 128 is associated with the global IPv6 address. Prefix lengths less than 128 are associated with prefixes.
- *Framed-IPv6-Pool*—The attribute contains the name of an address-assignment pool configured on the BNG, from which the BNG can select a global IPv6 address or an IPv6 prefix to send to the CPE.

Both attributes are sent from the RADIUS server to the BNG in RADIUS Access-Accept messages.

Junos OS Predefined Variable for Multiple DHCPv6 Address Assignment

To configure dynamic DHCPv6 address assignment for both DHCPv6 IA_NA and DHCPv6 prefix delegation, use the `$junos-subscriber-ipv6-multi-address` predefined variable in your dynamic profile. You use this variable in place of the `$junos-subscriber-ipv6-address` variable, which supports a single IPv6 address or prefix. The `$junos-subscriber-ipv6-multi-address` variable is applied as a demultiplexing source address, and is expanded to include both the host and prefix addresses.

You include the `$junos-subscriber-ipv6-multi-address` variable at the `[edit dynamic-profile profile-name interfaces interface-name unit logical-unit-number family inet6 demux-source]` hierarchy level.

Related Documentation

- [Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview on page 395](#)

- [DHCPv6 Options in a DHCPv6 Multiple Address Environment on page 396](#)
- [Configuring an Address-Assignment Pool for Use by DHCPv6 Prefix Delegation on page 473](#)
- [Configuring an Address-Assignment Pool for Use by DHCPv6 IA_NA on page 474](#)

Multiple DHCPv6 IA_NA and IA_PD Requests per Client Interface

DHCPv6 relay agent supports multiple IA_NA and IA_PD requests within a single DHCPv6 Solicit message. The requests can be any combination of IA_NA and IA_PD addresses, up to a maximum of eight requests. As part of the multiple IA request support, each address lease is assigned its own lease time expiration, independent of the other leases. The use of independent lease timers ensures that when one lease is torn down, the other active leases are maintained. You can use the **show dhcpv6 relay binding** and **show dhcpv6 relay binding detail** commands to display the status of the individual lease times.

The DHCPv6 support for multiple IA requests enables you to use prefix delegation to designate blocks of addresses, as described in RFC 3633, *IPv6 Prefix Options for DHCPv6*. For example, you might want to delegate multiple address blocks to a customer premises equipment (CPE) router as a means to simplify flow classification and service monetization in your IPv6 environment.

Related Documentation

- [show dhcpv6 relay binding on page 1604](#)

CHAPTER 48

Designs for IPv6 Addressing in a Subscriber Access Network

- [Selecting the Type of Addressing Used on the CPE on page 399](#)
- [Selecting the Method of Provisioning a Global IPv6 Address for the WAN Link on page 399](#)
- [Selecting the Method of Assigning Global IPv6 Addresses to Subscribers on page 400](#)
- [Selecting the Method of Obtaining IPv6 Prefixes on page 400](#)
- [Design 1: IPv6 Addressing with DHCPv6 IA_NA and DHCPv6 Prefix Delegation on page 401](#)
- [Design 2: IPv6 Addressing with NDRA and DHCPv6 Prefix Delegation on page 402](#)
- [Design 3: IPv6 Addressing with NDRA on page 403](#)
- [Design 4: IPv6 Addressing with DHCPv6 Prefix Delegation and No NDRA Prefix on page 403](#)

Selecting the Type of Addressing Used on the CPE

In some networks, you do not need to assign a global IPv6 address on the CPE WAN link. Your decision depends on the type of CPE being used:

- If the CPE is purchased by the subscriber, and is not a device specifically recommended by the service provider, you need to assign a global IPv6 address that can be routed on the Internet.
- If the CPE is supplied by or recommended by the service provider, you can use the loopback interface to manage the CPE.

In this case, you can use a link-local address or you can use an address that is derived from DHCPv6 prefix delegation.

Related Documentation

- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)

Selecting the Method of Provisioning a Global IPv6 Address for the WAN Link

To assign a global IPv6 address to the WAN link of the CPE device, you can choose one of the methods described in [Table 46 on page 400](#).

Table 46: Choosing the Global IPv6 Address Provisioning Method for the WAN Link

NDRA Features	DHCPv6 IA_NA Features
Provides address autoconfiguration of the WAN link by means of router advertisements.	Provides a single IPv6/128 address to the WAN interface of the CPE by the BNG acting as a DHCPv6 server.
Supported on PPPoE access networks.	Supported on PPPoE and DHCP access networks.
Provides duplicate prefix prevention.	Provides the ability to use one DHCPv6 message to solicit both a global IPv6 address for the WAN link, and a prefix used to provision addresses on the subscriber LAN.
Use if the CPE does not support DHCP.	--

- Related Documentation**
- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)
 - [Using NDRA to Provide IPv6 WAN Link Addressing Overview on page 385](#)
 - [Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing Overview on page 389](#)

Selecting the Method of Assigning Global IPv6 Addresses to Subscribers



BEST PRACTICE: For addressing on the subscriber LAN, we recommend that you provision a global IP address for each device on the LAN. IPv6 was designed to allow every IP-capable device on a subscriber LAN to obtain a globally unique address, which avoids the use of NAT between the subscriber LAN and the service provider.

DHCPv6 prefix delegation automates the delegation of IPv6 prefixes to the CPE. The CPE can then use these prefixes to assign global IPv6 addresses for use in a subscriber LAN. DHCPv6 prefix delegation is useful when the delegating router (the BNG) does not have information about the topology of the networks in which the requesting router (the CPE) is located. In such cases, the delegating router requires only the identity of the requesting router to choose a prefix for delegation.

- Related Documentation**
- [Using DHCPv6 Prefix Delegation Overview on page 391](#)
 - [Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview on page 395](#)

Selecting the Method of Obtaining IPv6 Prefixes

You can set up the BNG to select IPv6 prefixes through one of the following methods:

- An external source such as a AAA RADIUS server or a DHCP server using the DHCPv6 relay agent.
- Dynamic assignment from a local pool of global IPv6 addresses or prefixes that is configured on the BNG

Using a AAA RADIUS Server to Obtain Global IPv6 Addresses and IPv6 Prefixes

Table 47 on page 401 describes the RADIUS attributes used in a dual-stack network. These attributes are sent from the RADIUS server to the BNG in RADIUS Access-Accept messages.

Table 47: RADIUS Attributes Used to Obtain Global IPv6 Addresses and IPv6 Prefixes

RADIUS Attribute	Address Assignment Type	Attribute Description
Framed-IPv6-Prefix	NDRA	IPv6 prefix with a prefix length less than 128.
	DHCPv6 IA_NA	IPv6 prefix with a length of 128.
Framed-IPv6-Pool	NDRA	Name of an NDRA pool configured on the BNG from which the BNG selects a prefix.
	DHCPv6 IA_NA	Name of an address-assignment pool configured on the BNG from which the BNG selects a global IPv6 address.
Delegated-IPv6-Prefix	DHCPv6 prefix delegation	IPv6 prefix.
Jnpr-IPv6-Delegated-Pool-Name	DHCPv6 prefix delegation	Name of an address-assignment pool configured on the BNG from which the BNG delegates a prefix.

Related Documentation

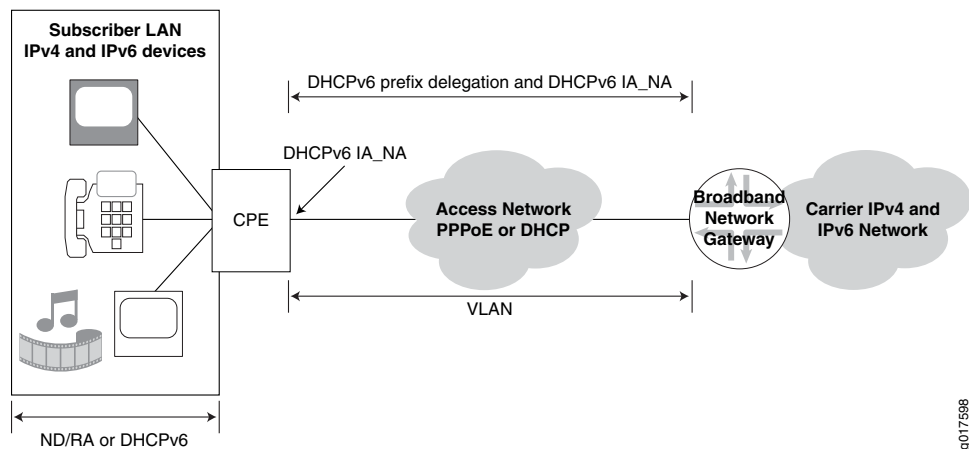
- [IPv6 Addressing Requirements for a Subscriber Access Network on page 378](#)
- [Using DHCPv6 Prefix Delegation Overview on page 391](#)

Design 1: IPv6 Addressing with DHCPv6 IA_NA and DHCPv6 Prefix Delegation

This design ([Figure 6 on page 402](#)) uses DHCPv6 IA_NA and DHCPv6 prefix delegation in your subscriber access network as follows:

- DHCPv6 IA_NA is used to assign a global IPv6 address on the WAN link. The address can come from a local pool or AAA RADIUS.
- DHCPv6 prefix delegation is used for host device addressing. The delegated prefix can come from a local pool or from AAA RADIUS. The CPE uses the delegated prefix for subscriber addressing. The CPE can use NDRA or DHCPv6 to allocate IPv6 addresses on the LAN.

Figure 6: Subscriber Access Network with DHCPv6 IA_NA and DHCPv6 Prefix Delegation



Related Documentation

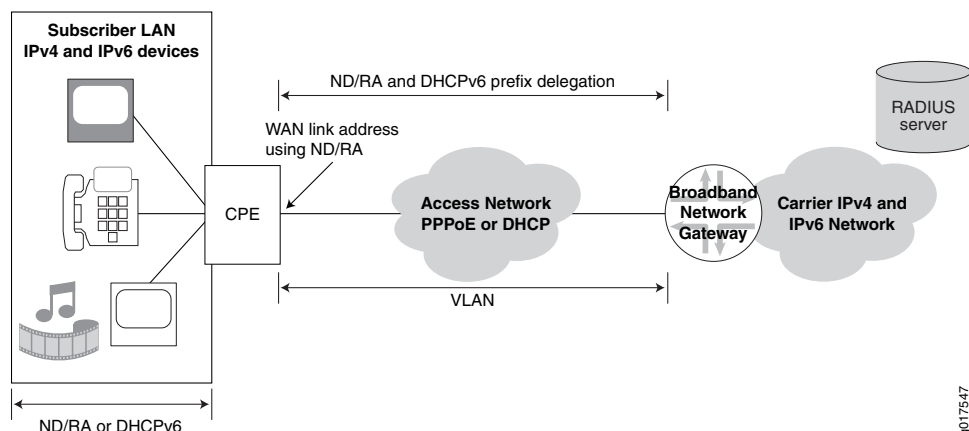
- [Example: Configuring a Dual Stack That Uses DHCPv6 IA_NA and DHCPv6 Prefix Delegation over PPPoE on page 479](#)
- [Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview on page 395](#)

Design 2: IPv6 Addressing with NDRA and DHCPv6 Prefix Delegation

This design (Figure 7 on page 402) uses NDRA and DHCPv6 prefix delegation in your subscriber access network as follows:

- NDRA addressing is used to provision a global IPv6 address on the WAN link. IPv6 prefixes for NDRA come from a local pool or AAA RADIUS.
- DHCPv6 prefix delegation is used for host device addressing. The delegated prefix can come from a local pool or from AAA RADIUS. The CPE uses the delegated prefix for subscriber addressing. The CPE can use NDRA or DHCPv6 to allocate IPv6 addresses on the LAN.

Figure 7: Subscriber Access Network with NDRA and DHCPv6 Prefix Delegation



If you have a network with a combination of subscriber LANs and single PCs, you can use a combination of design 2 and design 3.

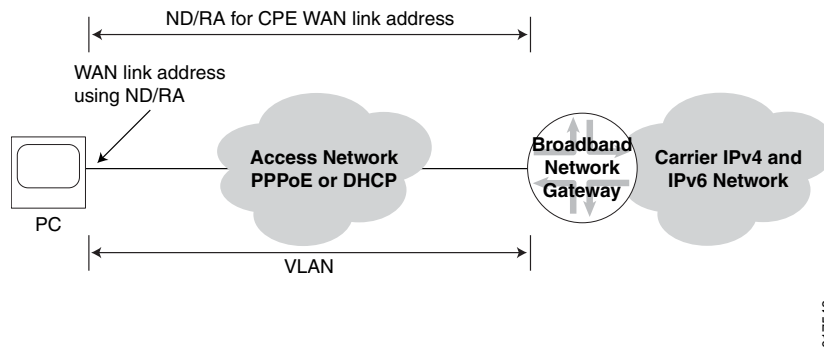
Related Documentation

- [Example: Configuring a Dual Stack That Uses NDRA and DHCPv6 Prefix Delegation over PPPoE on page 502](#)
- [How NDRA Works in a Subscriber Access Network on page 386](#)
- [Using DHCPv6 Prefix Delegation Overview on page 391](#)

Design 3: IPv6 Addressing with NDRA

In this design ([Figure 8 on page 403](#)), NDRA is used for addressing a global IPv6 on the WAN link with prefixes from a local pool or AAA RADIUS. The PC does not need a delegated prefix.

Figure 8: Subscriber Access Network with NDRA



If you have a network with a combination of subscriber LANs and single PCs, you can use a combination of Design 2 and Design 3.

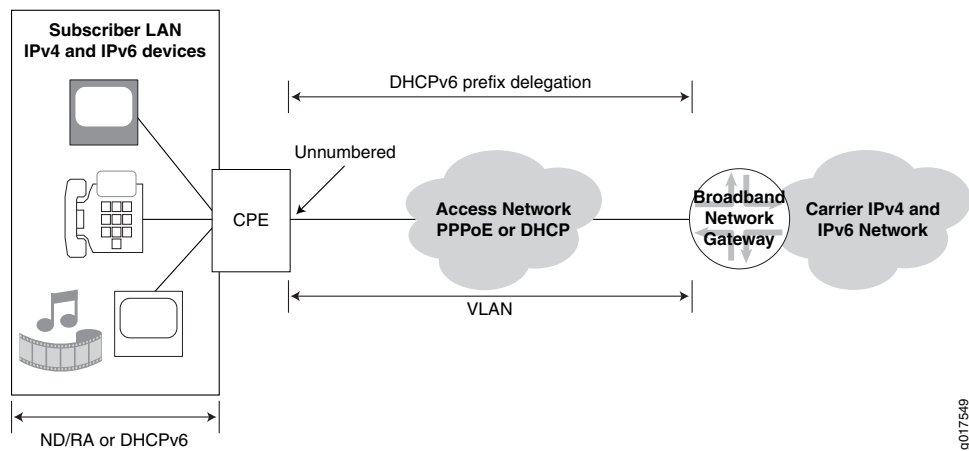
Related Documentation

- [Example: Configuring a Dual Stack That Uses NDRA over PPPoE on page 523](#)
- [How NDRA Works in a Subscriber Access Network on page 386](#)

Design 4: IPv6 Addressing with DHCPv6 Prefix Delegation and No NDRA Prefix

In this design ([Figure 9 on page 404](#)), the CPE is a model that is sold by or specified by the service provider. The CPE uses an unnumbered WAN interface. The BNG delegates an IPv6 prefix to the CPE with DHCPv6 prefix delegation. The CPE uses the delegated prefix for subscriber addressing. It can use NDRA or DHCPv6 to allocate the IPv6 addresses on the LAN.

Figure 9: Subscriber Access Network with DHCPv6 Prefix Delegation



Related Documentation

- [Using DHCPv6 Prefix Delegation Overview on page 391](#)

9017549

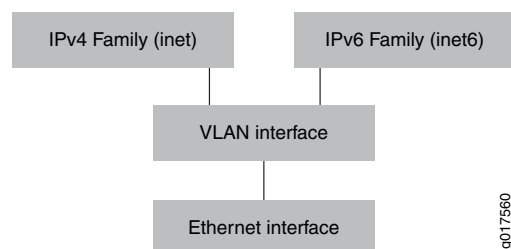
Dual-Stack Access Models in a DHCP Network

- [IPv4 and IPv6 Dual Stack in a DHCP Access Network on page 405](#)
- [AAA Service Framework in a Dual Stack over a DHCP Access Network on page 406](#)
- [Dual-Stack Interface Stack in a DHCP Wholesale Network on page 407](#)
- [Single-Session DHCP Dual-Stack Overview on page 408](#)
- [Configuring Single-Session DHCP Dual-Stack Support on page 409](#)
- [Verifying and Managing DHCP Dual-Stack Configuration on page 411](#)

IPv4 and IPv6 Dual Stack in a DHCP Access Network

Figure 10 on page 405 shows a dual-stack interface stack in a DHCP access network. The IPv4 family (inet) and the IPv6 family (inet6) can reside on the same VLAN interface.

Figure 10: Dual-Stack Interface Stack over a DHCP Access Network



NOTE: When you are using IPv4 and IPv6 dual stack on the same DHCP interface, you must configure one dynamic profile for both the IPv4 and IPv6 subscribers. You cannot run IPv4 and IPv6 subscriber sessions over the same interface if you configure separate dynamic profiles for IPv4 and IPv6.

Support for Demultiplexing Interfaces

IPv4 and IPv6 dual stack is supported on VLAN demultiplexing (demux) interfaces. Dual stack is not supported on IP demux interfaces.

- Related Documentation**
- [Basic Architecture of a Subscriber Access Dual-Stack Network on page 375](#)
 - [AAA Service Framework in a Dual Stack over a DHCP Access Network on page 406](#)
 - [Dual-Stack Interface Stack in a DHCP Wholesale Network on page 407](#)

AAA Service Framework in a Dual Stack over a DHCP Access Network

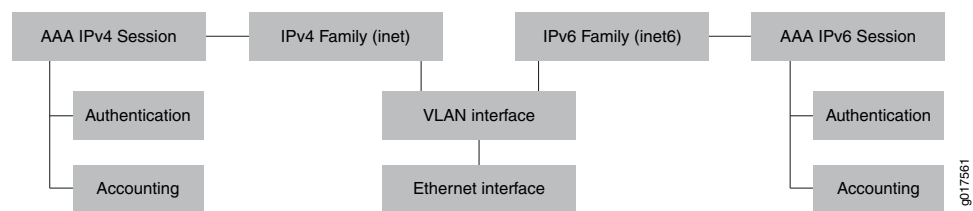
You can use the AAA Service Framework for all authentication, authorization, accounting, address assignment, and dynamic request services that the BNG uses for network access. The framework supports authentication and authorization through external RADIUS servers. It also supports accounting and dynamic-request change of authorization (CoA) and disconnect operations through external servers, and address assignment through a combination of local address-assignment pools and RADIUS servers.

The BNG interacts with external servers to determine how individual subscribers access the broadband network. The BNG can also obtain information from external servers for the following:

- How subscribers are authenticated.
- How accounting statistics are collected and used.
- How dynamic requests, such as CoA, are handled.

As shown in [Figure 11 on page 406](#), an implementation of dual stack over a DHCP access network, there are separate AAA sessions for IPv4 and IPv6 authentication and accounting.

Figure 11: AAA Service Framework in a Dual Stack over a DHCP Access Network



Collection of Accounting Statistics in a DHCP Access Network

AAA provides support for IPv4 and IPv6 statistics in separate accounting sessions.

The following RADIUS attributes are included by default (when available) in Acct-Start, Interim, and Acct-Stop messages:

- Framed-IPv6-Prefix
- Framed-IPv6-Pool
- Delegated-Ipv6-Prefix
- Framed-IPv4-Route
- Framed-IPv6-Route

You can configure the BNG to exclude these attributes in accounting Acct-Start and Acct-Stop messages.

Change of Authorization (CoA)

RADIUS servers can initiate dynamic requests to the BNG. Dynamic requests include CoA requests, which specify VSA modifications and service changes.

In your access profile configuration, you specify the IP addresses of RADIUS authentication servers that can initiate dynamic requests to the router. The list of authentication servers also provides RADIUS-based dynamic service activation and deactivation during subscriber login.

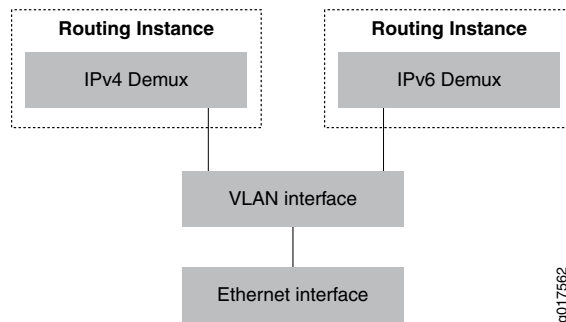
Related Documentation

- [IPv4 and IPv6 Dual Stack in a DHCP Access Network on page 405](#)

Dual-Stack Interface Stack in a DHCP Wholesale Network

Figure 12 on page 407 shows a dual-stack interface stack in a DHCP wholesale network. In this scenario, the IPv4 and IPv6 demux interfaces are configured on the same VLAN interface. The demux interfaces are configured in a separate logical system: routing instance.

Figure 12: Dual-Stack Interface Stack in a DHCP Wholesale Network



Related Documentation

- [IPv4 and IPv6 Dual Stack in a DHCP Access Network on page 405](#)
- [AAA Service Framework in a Dual Stack over a DHCP Access Network on page 406](#)

Single-Session DHCP Dual-Stack Overview

Junos OS supports a single-session DHCP dual-stack, which simplifies management of dual-stack subscribers, and improves performance and session requirements when compared to the traditional dual-stack support.

In a DHCP dual-stack environment, a DHCP server supports both DHCPv4 and DHCPv6 subscribers. The DHCP server provides services, such as authentication and accounting, for both the DHCPv4 and DHCPv6 legs of the dual-stack. In a traditional implementation, the two legs of the dual-stack legs are viewed as being independent. The presence of separate legs for DHCPv4 and DHCPv6 creates inefficiencies, since separate, and multiple, sessions can be required to provide similar support for each leg of the dual-stack. For example, to provide authentication for a traditional dual-stack over a dynamic VLAN requires three separate sessions, one for DHCPv4, one for DHCPv6, and one for the authenticated dynamic VLAN. Similarly, multiple sessions might be required as well, for dual-stack accounting operations.

In the dual-stack over a dynamic VLAN, the single-session dual-stack requires only a single session for authentication, as opposed to the three sessions required for the traditional dual-stack configuration. Accounting support for the dual-stack also uses a single session. In addition to reducing the number of sessions required, the single-session feature also simplifies router configuration, reduces RADIUS message load, and improves accounting session performance for households with dual-stack environments.

In the single-session dual-stack environment, the first DHCP session that negotiates will trigger the dynamic VLAN creation (if required) and is authorized at the DHCP application. The second leg of the dual-stack is held off until the authorization point is complete. When the second leg of the dual stack is established, the DHCP client inherits all common subscriber database values, such as circuit-id, remote-id, username, and interface name from the first leg.

To configure single-session dual-stack subscriber settings, you use the **dual-stack-group** statement at the **[edit forwarding-options dhcp-relay]** hierarchy level to create a named group that specifies the values for dual stack subscribers. Then, you use the **dual-stack** statement at the **[edit forwarding-options dhcp-relay ... overrides]** hierarchy level to specify the name of the dual stack group and assign the group to subscribers at the global, group, or interface level.

You can configure the following common DHCP settings for the single-session dual-stack model. In most cases, these settings are similar to those used for separate DHCPv4 and DHCPv6 legs in a traditional dual-stack configuration.

- **access-profile**—Access profile that provides authentication and accounting parameters for the dual-stack group that take precedence over those configured in a global access profile or in a profile configured for the DHCP relay agent.
- **authentication**—Authentication-related parameters (such as password and username) the router sends to the external AAA server.

The **dual-stack authentication** stanza is identical to the **[edit forwarding-options dhcp-relay dhcpv6]** stanza, with the added benefit that when the **username-include**

configuration syntax is used for the DHCPv4 leg of the dual-stack, the **relay-agent-interface-id** is equivalent to the DHCPv4 **option-82 circuit-id** statement, and the **relay-agent-remote-id** is equivalent to the DHCPv4 **option-82 remote-id** statement. You do not have to configure the two DHCPv4 options separately.

- **dynamic-profile**—Dynamic profile that is attached to all interfaces, to a named group of interfaces, or to a specific interface.
- **relay-agent-interface-id**—Includes Relay Agent Interface-ID (option 18) in DHCPv6 packets destined for the DHCPv6 server.

For the DHCPv4 leg of the dual-stack, this statement includes the DHCPv4 **option-82 circuit-id** in packets destined for the DHCPv4 server.

- **relay-agent-remote-id**—Includes Relay Agent Remote-ID (option 37) in DHCPv6 packets destined for a DHCPv6 server.

For the DHCPv4 leg of the dual-stack, this statement includes the DHCPv4 **option-82 remote-id** in packets destined for the DHCPv4 server.

- **service-profile**—Dynamic profile for the default subscriber service (or the default DHCP client management service), which is activated when the subscriber (or client) logs in.

Related Documentation

- [Configuring Single-Session DHCP Dual-Stack Support on page 409](#)

Configuring Single-Session DHCP Dual-Stack Support

Configuring single-session dual-stack support is a two-step process. You first create the dual-stack group that specifies the configuration parameters that are shared between the DHCPv4 and DHCPv6 legs of the DHCP dual stack. Then, you attach the dual-stack group to DHCP subscriber interfaces by overriding the default DHCP configurations for the DHCPv4 and DHCPv6 subscribers. You must reference the dual-stack group for both legs of the dual stack. If you attach the group to one leg only, the router rejects the other leg. You can attach the dual-stack group globally, for a specified DHCP group of interfaces, or for a specific interface.

To configure single-session dual-stack group support.

1. Specify that you want to configure DHCP relay agent.

```
[edit forwarding-options]
user@host# edit dhcp-relay
```

2. Create and name the dual-stack group.

```
[edit forwarding-options dhcp-relay]
user@host# edit dual-stack-group dual-stack-group-name
```

3. Attach an access profile to the dual-stack group to override the corresponding authentication and accounting properties configured in a global access profile or DHCP relay agent access profile.

```
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name]
user@host# set access-profile profile-name
```

See [“Attaching Access Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces”](#) on page 320.

4. Configure the authentication username values and password for the dual-stack group.

```
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name]
user@host# edit authentication
```

See [“Using External AAA Authentication Services with DHCP”](#) on page 271.

- Configure the unique username.

```
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name
authentication]
user@host# set username-include <username-include-configuration>
```

See [“Creating Unique Usernames for DHCP Clients”](#) on page 272.

- Configure the password that authenticates the username to the external authentication service.

```
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name
authentication]
user@host# set password password-string
```

See [“Configuring Passwords for Usernames”](#) on page 275.

5. Specify the dynamic profile associated with the dual-stack group.

```
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name]
user@host# set dynamic-profile <dynamic-profile configuration>
```

See [Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces](#).

6. Specify the service profile associated with the dual-stack group.

```
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name]
user@host# set service-profile dynamic-profile-name
```

See [Defining Various Levels of Services for DHCP Subscribers](#).

7. Specify the relay-agent-interface-id for the dual-stack group.

```
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name]
user@host# set relay-agent-interface-id <relay-agent-interface-id configuration>
```

See [“Inserting DHCPv6 Interface-ID Option \(Option 18\) In DHCPv6 Packets”](#) on page 444.



NOTE: For the DHCPv4 leg of the dual-stack, this step specifies the Option 82 Agent Circuit ID (suboption 1) for DHCPv4 clients. See [“Using DHCP Relay Agent Option 82 Information”](#) on page 337.

8. Specify the relay-agent-remote-id for the dual-stack group.

```
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name]
user@host# set relay-agent-remote-id <relay-agent-remote-id configuration>
```

See [“Inserting DHCPv6 Remote-ID Option \(Option 37\) In DHCPv6 Packets”](#) on page 445.



NOTE: For the DHCPv4 leg of the dual-stack, this step specifies the Option 82 Agent Remote ID (suboption 2) for DHCPv4 clients. See [“Using DHCP Relay Agent Option 82 Information” on page 337](#).

9. Use the override feature to override the default DHCP relay behavior and assign the dual-stack group to DHCPv4 and DHCPv6 clients. You must perform separate steps for each leg of the dual stack.

- To assign the dual-stack group to DHCPv4 clients:

```
[edit forwarding-options dhcp-relay]
user@host# set overrides dual-stack dual-stack-group-name
```

See [“Overriding the Default DHCP Relay Configuration Settings” on page 313](#).

- To assign the dual-stack group to DHCPv6 clients:

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set overrides dual-stack dual-stack-group-name
```

See [“Overriding the Default DHCP Relay Configuration Settings” on page 313](#).

10. (Optional) Verify your dual-stack group configuration for DHCPv4 and DHCPv6.

See [Verifying and Managing the DHCP Single-Session Dual-Stack Feature](#).

```
user@host> show dhcp relay binding
user@host> show dhcpv6 relay binding
user@host> show subscribers
```

Related Documentation

- [Single-Session DHCP Dual-Stack Overview on page 408](#)

Verifying and Managing DHCP Dual-Stack Configuration

Purpose Display information related to the DHCP single-session dual-stack configuration.

- Action**
- To display DHCP relay agent binding information for dual-stack clients:

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

- To display DHCPv6 relay agent binding information for dual-stack clients:

```
user@host> show dhcpv6 relay binding detail
```

- To display assigned IP4 and IPv6 addresses for DHCP dual-stack clients:

```
user@host> show subscribers
```

- To show IPv4 and IPv6 addresses for a specific session:

```
user@host> show network-access aaa subscribers session-id session-id session-id
detail
```

- To all clear DHCPv4 relay bindings and associated DHCPv6 bindings for the dual-stack in the default routing instance. This command does not effect DHCPv6-only stacks that are not associated with the dual-stack.

```
user@host>clear dhcp relay binding dual-stack all
```

Alternatively, you can limit clearing to an address, VLAN interface, logical system, or routing instance.

- To clear all DHCPv6 relay bindings and associated DHCPv4 bindings for the dual-stack in the default routing instance. This command does not effect DHCPv4-only stacks that are not associated with the dual-stack.

```
user@host>clear dhcpv6 relay binding dual-stack all
```

Alternatively, you can limit clearing to an address, VLAN interface, logical system, or routing instance.

**Related
Documentation**

- [Single-Session DHCP Dual-Stack Overview on page 408](#)
- [Configuring Single-Session DHCP Dual-Stack Support on page 409](#)

Dual-Stack Access Models in a PPPoE Network

- [IPv4 and IPv6 Dual Stack in a PPPoE Access Network on page 413](#)
- [Shared IPv4 and IPv6 Service Sessions on PPP Access Networks on page 416](#)
- [AAA Service Framework in a Dual Stack over a PPPoE Access Network on page 416](#)
- [RADIUS Accounting Messages for Dual-Stack PPPoE Subscribers on page 418](#)
- [Accounting Messages for PPPoE Using NDRA Prefixes on page 419](#)
- [Accounting Messages for PPPoE Subscribers That Use DHCPv6 IA_NA Prefixes on page 424](#)
- [Suppressing Accounting Information That Comes from AAA on page 430](#)
- [Avoiding Negotiation of IPv6CP in the Absence of an Authorized Address on page 430](#)

IPv4 and IPv6 Dual Stack in a PPPoE Access Network

In a dual-stack architecture with a PPPoE access network that connects the CPE to the BNG, IPv4 and IPv6 connectivity are provided over a single PPP logical link. The PPP IPv4 control protocol (IPCP) and the IPv6 control protocol (IPv6CP) provide independent IPv4 and IPv6 connectivity over the logical link.

The BNG and the CPE handle both IPCP and IPv6CP identically and simultaneously over a single PPP connection. The BNG or the CPE can open and close any Network Control Protocol (NCP) session without affecting the other sessions. This capability allows for a dynamic setup where IPv4 (family inet) and IPv6 (family inet6) sessions can be brought up and down individually. As long as one family is active, the subscriber remains active.

[Figure 13 on page 414](#) shows a dual-stack interface stack in a PPPoE access network. The IPv4 family (inet) and the IPv6 family (inet6) can reside on the same PPPoE logical interfaces. The family inet and family inet6 parts of dynamic profiles are applied, and services are activated when each individual family is negotiated.

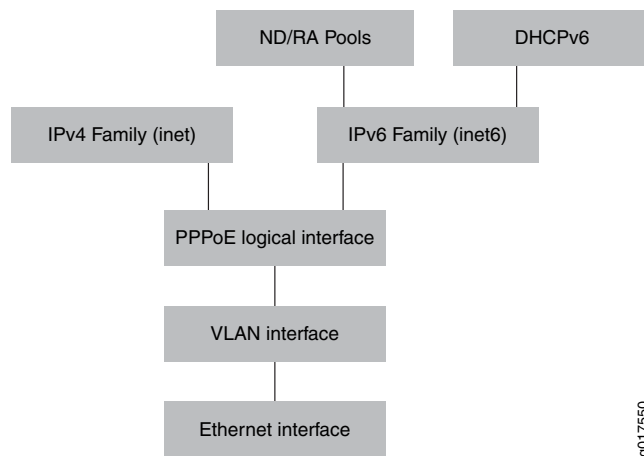
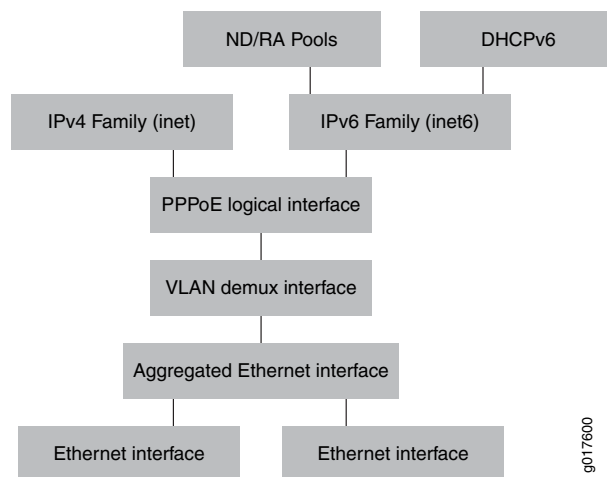
Figure 13: Dual-Stack Interface Stack over a PPPoE Access Network

Figure 14 on page 414 shows a dual-stack interface stack over aggregated Ethernet in a PPPoE access network.

Figure 14: Dual-Stack Aggregated Ethernet Stack over a PPPoE Access Network

Support for Demultiplexing Interfaces

IPv4 and IPv6 dual stack is supported on VLAN demultiplexing (demux) interfaces. Dual stack is not supported on IP demux interfaces.

Determining the Status of CPE in a PPPoE Access Network

In a PPPoE access network, you can enable keepalives to determine the status of the CPE.

IPv6 Address Provisioning in the PPPoE Access Network

IPv6CP negotiates the interface identifier, which can be used to provision link-local addresses that are used for direct connectivity between the BNG and the CPE. Because

PPPoE negotiates only interface IDs and does not negotiate IPv6 addresses, PPPoE relies on other protocols for addressing. The protocols you can use are DHCPv6 and NDRA.

Authentication in a PPPoE Access Network

In a PPPoE network, you can use PAP and CHAP to identify and authenticate the CPE and subscriber sessions.

You can also use AAA for authentication and authorization through external RADIUS servers.

Negotiation of Network Control Protocols When Authorized Addresses Are Unavailable

NCP negotiation is initiated for subscriber sessions by default, even when authorized addresses are not available. An example of this situation is when the DHCPv6 local server is configured with an override so that the jpppd process never receives an IPv6 address or prefix from AAA, although the DHCPv6 local server receives a prefix from a delegated pool. In this situation, the client attempts to negotiate IPv6CP with the jpppd process.

By default, when IPCP negotiation is attempted for an IPv4-only PPPoE subscriber session on a dynamic interface, the jpppd process issues a Protocol-Reject message if AAA does not provide an IPv4 address. However, negotiation is allowed to proceed when the **on-demand-ip-address** statement is included at the **[edit protocols ppp-service]** or **[edit dynamic-profiles *profile-name* interfaces pp0 unit \$junos-interface-unit ppp-options]** hierarchy level.

IPCP negotiation is enabled by default for an IP destination address defined on a static interface.

In contrast, IPv6CP negotiation is enabled to proceed by default for an IPv6-only session when AAA has not provided an appropriate IPv6 address or prefix. To prevent endless client negotiation of IPv6CP, you can alter the behavior by including the **reject-unauthorized-ipv6cp** statement at the **[edit protocols ppp-service]** hierarchy level. This statement enables the jpppd process to reject the negotiation attempt.

When IPv6CP rejection is enabled, jpppd also issues a Protocol-Reject message when router advertisement is not enabled in the dynamic profile that instantiates the interface but only a Framed-IPv6-Prefix attribute is received.

Related Documentation

- [AAA Service Framework in a Dual Stack over a PPPoE Access Network on page 416](#)
- [Basic Architecture of a Subscriber Access Dual-Stack Network on page 375](#)
- [Configuring a PPPoE Dynamic Profile for Use with DHCP Addressing in a Dual-Stack Network on page 464](#)
- [Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network on page 467](#)
- [Avoiding Negotiation of IPv6CP in the Absence of an Authorized Address on page 430](#)
- [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)

Shared IPv4 and IPv6 Service Sessions on PPP Access Networks

You can configure one dynamic service profile that supports IPv4, IPv6, or both IPv4 and IPv6. It allows subscribers to share the same service session using IPv4 and IPv6 address families. If you define IPv4 and IPv6 in the dynamic service profile, one address family or both address families can be activated for the service. When the service is activated, matched packets are tagged with the same traffic class and treated the same way for both IPv4 and IPv6 traffic.

Accounting for Shared IPv4 and IPv6 Service Sessions

When service sessions are shared for both IPv4 and IPv6 subscribers, only one Accounting-Start message is sent for each service session regardless of the number of address families that are active. Statistics for each address family of a service session are cumulative across service activations and deactivations of the service.

Deactivating Shared IPv4 and IPv6 Service Sessions

If both IPv4 and IPv6 service sessions are active, and a deactivation message is received for one of the address families (IPv4 or IPv6), all active services for that address family are deactivated. If one address family remains active on the service, the service session remains in the ACTIVE state. If the address family that is deactivated is the only family currently running on the service session, the service returns to the INIT state.

Related Documentation

- [IPv4 and IPv6 Dual Stack in a PPPoE Access Network on page 413](#)
- [Configuring a PPPoE Dynamic Profile for Use with DHCP Addressing in a Dual-Stack Network on page 464](#)
- [Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network on page 467](#)

AAA Service Framework in a Dual Stack over a PPPoE Access Network

You can use the AAA Service Framework for all authentication, authorization, accounting, address assignment, and dynamic request services that the BNG uses for network access. The framework supports authentication and authorization through external RADIUS servers. It also supports accounting and dynamic-request change of authorization (CoA) and disconnect operations through external servers, and address assignment through a combination of local address-assignment pools and RADIUS servers.

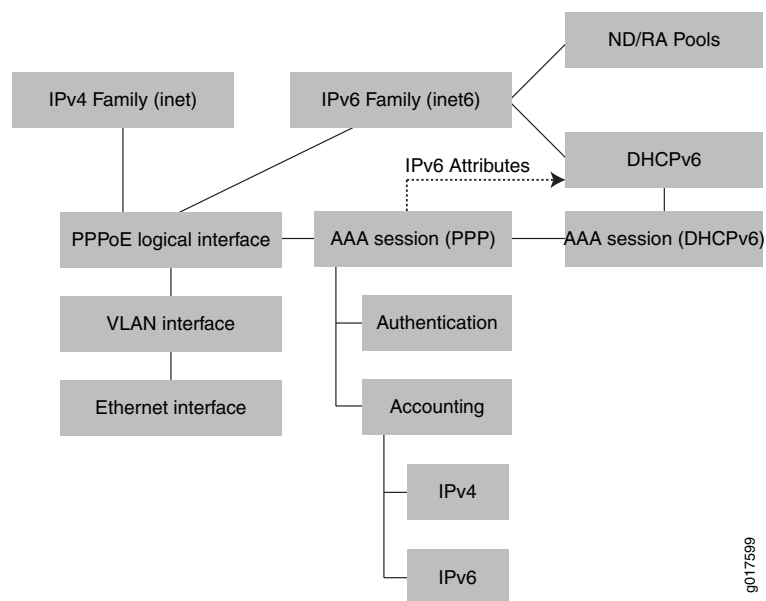
The BNG interacts with external servers to determine how individual subscribers access the broadband network. The BNG can also obtain information from external servers for the following:

- How subscribers are authenticated.
- How accounting statistics are collected and used.
- How dynamic requests, such as CoA, are handled.

As shown in [Figure 15 on page 417](#), implementing a dual stack over a PPPoE access network that uses AAA can have the following characteristics:

- DHCPv6—If used, it runs over the IPv6 family session, and it inherits attributes from the underlying PPPoE session.
- NDRA—If used, it runs over the IPv6 family session.
- IPv4 and IPv6 accounting—One accounting session handles both IPv4 and IPv6 accounting information.

Figure 15: AAA Service Framework in a Dual Stack over a PPPoE Access Network



Collection of Accounting Statistics in a PPPoE Access Network

AAA provides support for both IPv4 and IPv6 statistics in one accounting session. On MX Series 3D Universal Edge routers AAA also provides support for separate IPv4 and IPv6 accounting statistics.

The following RADIUS attributes are included by default (when available) in Acct-Start, Interim, and Acct-Stop messages:

- Framed-IPv6-Prefix
- Framed-IPv6-Pool
- Delegated-Ipv6-Prefix
- Framed-IPv4-Route
- Framed-IPv6-Route

You can configure the BNG to exclude these attributes in Acct-Start and Acct-Stop messages.

Change of Authorization (CoA)

RADIUS servers can initiate dynamic requests to the BNG. Dynamic requests include CoA requests, which specify vendor-specific attribute (VSA) modifications and service changes.

In your access profile configuration, you specify the IP addresses of RADIUS authentication servers that can initiate dynamic requests to the router. The list of authentication servers also provides RADIUS-based dynamic service activation and deactivation during subscriber login.

Related Documentation

- [IPv4 and IPv6 Dual Stack in a PPPoE Access Network on page 413](#)

RADIUS Accounting Messages for Dual-Stack PPPoE Subscribers

Acct-Start messages sent to the RADIUS server contain all the learned and allocated addresses. Subsequent negotiation or allocation of addresses results in optionally sending immediate Acct-Interim-Update messages that contain all the negotiated and allocated addresses. For the dual-stack PPPoE subscriber, the following types of addresses are provided:

- IP address—negotiated during the IPCP (NCP) phase of PPP
- Interface identifier—negotiated during the IPv6CP (NCP) phase of PPP
- NDRA prefix—sent during router advertisement after IPv6CP
- DHCPv6 IA_NA address—negotiated by the DHCPv6 Solicit, Advertise, Request, Reply (SARR) phase after IPv6CP
- DHCPv6 IA_PD prefix—negotiated by the DHCPv6 SARR phase after IPv6CP

The BNG identifies addresses by the following methods:

- Addresses or prefixes returned from an external authority, such as RADIUS
- Addresses allocated locally using the pool names specified by external authority
- Addresses allocated from a local pool not specified for PPP authorization
- Addresses allocated by an external server outside of the BNG or RADIUS, such as a DHCPv6 external server (DHCPv6 relay or relay proxy)

IPCP and IPv6CP negotiation occur at the PPP NCP phase and can occur in any order. However, DHCPv6 PD or DHCPv6 IA_NA allocation and negotiation occur only after IPv6CP.

The following table lists the RADIUS attributes and their mapping:

Number	RADIUS Attribute	Address Type
1	Framed-IP-Address	IP Address
2	Framed-Pool	IP Address Pool

Number	RADIUS Attribute	Address Type
3	Framed-IPv6-Prefix	NDRA_Prefix (prefix < 128) IA_NA (prefix = 128)
4	Framed-IPv6-Pool	NDRA Prefix pool IA_NA pool
5	Framed-Interface-Id	IPv6 Interface Identifier
6	Delegated-IPv6-Prefix	IA_PD Prefix
7	Jnpr-Delegated-IPv6-Pool (VSA 26-161)	IA_PD Pool
8	Jnpr-IPv6-Ndra-Pool-Name (VSA 26-157) NOTE. Not supported: Use Framed-IPv6-Pool to specify the NDRA pool. Alternatively, configure it locally by using the neighbor-discovery-router-advertisement pool statement.	NDRA Pool

- Related Documentation**
- [Accounting Messages for PPPoE Using NDRA Prefixes on page 419](#)
 - [Accounting Messages for PPPoE Subscribers That Use DHCPv6 IA_NA Prefixes on page 424](#)
 - [Suppressing Accounting Information That Comes from AAA on page 430](#)

Accounting Messages for PPPoE Using NDRA Prefixes

In the following tables, you can compare PPPoE dual-stack address allocation using Stateless Address Autoconfiguration (SLAAC) NDRA.

The following table lists SLAAC (NDRA) prefixes from RADIUS:

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
1	Framed-IPv6-Prefix (used for NDRA Prefix) Framed-Interface-Id Delegated-IPv6-Prefix (used for DHCPv6 IA_PD)	IPv6NCP	Because the required attributes are learned prior to the Acct-Start messages, these attributes are sent in Acct-Start messages and no immediate Acct-Interim-Update message is sent.

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
2	Framed-IPv6-Prefix (used for NDRA Prefix) Framed-Interface-Id Delegated-IPv6-Prefix (used for DHCPv6 IA_PD)	IPv6NCP + DHCPv6	Because the required attributes are learned prior to the Acct-Start messages, these attributes are sent in Acct-Start messages and no immediate Acct-Interim-Update message is sent. No immediate Acct-Interim-Update message is sent after DHCPv6.
3	Framed-IPv6-Prefix (used for NDRA Prefix) Framed-Interface-Id not sent Delegated-IPv6-Prefix (used for DHCPv6 IA_PD)	IPv6NCP	Acct-Start message contains only iFramed-IPv6-Prefix and Delegated-IPv6-Prefix. No immediate Acct-Interim-Update message is sent. Next periodic Acct-Interim-Update message (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix and Delegated-IPv6-Prefix.
4	Framed-IPv6-Prefix (used for NDRA Prefix) Framed-Interface-Id not sent Delegated-IPv6-Prefix (used for DHCPv6 IA_PD)	IPv6NCP + DHCPv6	Acct-Start message contains Framed-IPv6-Prefix and Delegated-IPv6-Prefix. No immediate Acct-Interim-Update message is sent upon IPv6NCP. No immediate Acct-Interim-Update message is sent upon DHCPv6. Next periodic Acct-Interim-Update message (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix and Delegated-IPv6-Prefix.

The following table lists prefixes from RADIUS selected pools:

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
1	<p>Framed-IPv6-Pool (used for NDRA Prefix)</p> <p>NOTE: If RADIUS does not return Framed-IPv6-Pool, you can configure this locally using the neighbor-discovery-router-advertisement pool statement, which is used for allocating an NDRA prefix from the local pool.</p> <p>Framed-Interface-Id</p> <p>Jnpr-Delegated-IPv6-pool (used for DHCPv6 IA_PD)</p>	IPv6NCP	<p>Acct-Start message contains Framed-IPv6-Prefix, Framed-IPv6-Pool, Delegated-IPv6-Prefix, and Framed-Interface-Id.</p> <p>Framed-IPv6-Prefix is based on the configuration present in the dynamic profile IPv6 prefix that was allocated and sent in Acct-Start message.</p> <p>Framed-IPv6-Pool is learned from RADIUS.</p> <p>Delegated-IPv6-Prefix is pre-allocated.</p> <p>Framed-Interface-Id is sent in Acct-Start message because it is learned from RADIUS.</p> <p>No Acct-Interim-Update message is sent.</p>
2	<p>Framed-IPv6-Pool (used for NDRA Prefix)</p> <p>NOTE: If RADIUS does not return Framed-IPv6-Pool, you can configure this locally using the neighbor-discovery-router-advertisement pool statement, which is used for allocating an NDRA prefix from the local pool.</p> <p>Framed-Interface-Id</p> <p>Jnpr-Delegated-IPv6-Pool (used for DHCPv6 IA_PD)</p>	IPv6NCP + DHCPv6	<p>Acct-Start message contains Framed-IPv6-Prefix, Framed-IPv6-Pool, Delegated-IPv6-Prefix, and Framed-Interface-Id.</p> <p>Framed-IPv6-Prefix and Framed-IPv6-Pool are based on the configuration present in dynamic profile IPv6 prefix and is allocated prior and sent in Acct-Start message.</p> <p>Delegated-IPv6-Prefix is pre-allocated.</p> <p>Framed-Interface-Id is sent in Acct-Start message because it is learned from RADIUS.</p> <p>No immediate Acct-Interim-Update message is sent upon IPv6NCP.</p> <p>No immediate Acct-Interim-Update message is sent upon DHCPv6.</p>

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
3	<p>Framed-IPv6-Pool (used for NDRA Prefix)</p> <p>NOTE: If RADIUS does not return Framed-IPv6-Pool, you can configure this locally using the neighbor-discovery-router-advertisement pool statement, which is used for allocating an NDRA prefix from the local pool.</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool (used for DHCPv6 IA_PD)</p>	IPv6NCP	<p>Acct-Start message contains Framed-IPv6-Prefix, Framed-IPv6-Pool, and Delegated-IPv6-Prefix.</p> <p>Delegated-IPv6-Prefix is pre-allocated.</p> <p>No immediate Acct-Interim-Update message is sent.</p> <p>Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix, Framed-IPv6-Pool, and Delegated-IPv6-Prefix. (This value is learned during IPv6NCP negotiation with the peer.)</p>
4	<p>Framed-IPv6-Pool (used for NDRA Prefix)</p> <p>NOTE: If RADIUS does not return Framed-IPv6-Pool, you can configure this locally using the neighbor-discovery-router-advertisement pool statement, which is used for allocating an NDRA prefix from the local pool.</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool (used for DHCPv6 IA_PD)</p>	IPv6NCP + DHCPv6	<p>Acct-Start message contains Framed-IPv6-Prefix, Framed-IPv6-Pool, and Delegated-IPv6-Prefix.</p> <p>Delegated-IPv6-Prefix is pre-allocated.</p> <p>No immediate Acct-Interim-Update message is sent upon IPv6NCP.</p> <p>No immediate Acct-Interim-Update message is sent upon DHCPv6.</p> <p>Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix, Framed-IPv6-Pool, and Delegated-IPv6-Prefix. (This value is learned during IPv6NCP negotiation with the peer.)</p>

The following table lists prefixes from a local pool or an external server:

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
1	<p>Framed-IPv6-Pool (used for NDRA Prefix)</p> <p>NOTE: If RADIUS does not return Framed-IPv6-Pool, you can configure this locally using the neighbor-discovery-router-advertisement pool statement, which is used for allocating an NDRA prefix from the local pool.</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool not sent</p>	IPv6NCP	<p>Acct-Start message contains Framed-IPv6-Prefix and Framed-IPv6-Pool.</p> <p>No immediate Acct-Interim-Update message is sent.</p> <p>Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix and Framed-IPv6-Pool.</p>
2	<p>Framed-IPv6-Pool (used for NDRA Prefix)</p> <p>NOTE: If RADIUS does not return Framed-IPv6-Pool, you can configure this locally using the neighbor-discovery-router-advertisement pool statement, which is used for allocating an NDRA prefix from the local pool.</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool not sent</p> <p>[IA_PD prefix is learned from DHCPv6 External Server (DHCPv6 Relay / Relay Proxy model) or reservation from a local pool by DHCPv6]</p>	IPv6NCP + DHCPv6	<p>Acct-Start message contains Framed-IPv6-Prefix and Framed-IPv6-Pool.</p> <p>No immediate Acct-Interim-Update message is sent upon DHCPv6.</p> <p>Upon DHCPv6, immediate Acct-Interim-Update is sent which contains Framed-IPv6-Pool, Framed-IPv6-Prefix, Framed-Interface-Id, and DHCPv6 IA_PD Prefix.</p> <p>Framed-Interface-Id value is learned during IPv6NCP negotiation with the peer.</p> <p>DHCPv6 IA_PD is learned by DHCPv6 either by DHCPv6 external server or reservation from a local pool during DHCPv6 SARR phase.</p> <p>Any periodic Acct-Interim-Update before DHCPv6 completion contains Framed-Interface-Id in addition to the attributes of the Acct-Start message. (This can occur if DHCPv6 occurs after periodic interval.)</p>

Related Documentation

- [RADIUS Accounting Messages for Dual-Stack PPPoE Subscribers on page 418](#)
- [Accounting Messages for PPPoE Subscribers That Use DHCPv6 IA_NA Prefixes on page 424](#)
- [Suppressing Accounting Information That Comes from AAA on page 430](#)

Accounting Messages for PPPoE Subscribers That Use DHCPv6 IA_NA Prefixes

In the following tables, you can compare PPPoE dual-stack address allocation using DHCPv6 IA_NA prefixes.

The following table lists DHCPv6 IA_NA prefixes from RADIUS:

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
1	Framed-IPv6-Prefix (used for IA_NA prefix) Framed-Interface-Id Delegated-IPv6-Prefix (used for DHCPv6 IA_PD)	IPv6NCP	Because the required attributes are learned prior to Acct-Start message, these attributes are sent in Acct-Start message and no immediate Acct-Interim-Update message is sent.
2	Framed-IPv6-Prefix (used for IA_NA Prefix) Framed-Interface-Id Delegated-IPv6-Prefix (used for DHCPv6 IA_PD)	IPv6NCP + DHCPv6	Because the required attributes are learned prior to Acct-Start message, these attributes are sent in Acct-Start message and no immediate Acct-Interim-Update message is sent. There is no immediate Acct-Interim-Update message sent after DHCPv6.
3	Framed-IPv6-Prefix (used for IA_NA Prefix) Framed-Interface-Id not sent Delegated-IPv6-Prefix (used for DHCPv6 IA_PD)	IPv6NCP	Acct-Start message message contains Framed-IPv6-Prefix and Delegated-IPv6-Prefix. No immediate Acct-Interim-Update message is sent. Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix and Delegated-IPv6-Prefix.
4	Framed-IPv6-Prefix (used for IA_NA Prefix) Framed-Interface-Id not sent Delegated-IPv6-Prefix (used for DHCPv6 IA_PD)	IPv6NCP + DHCPv6	Acct-Start message message contains iFramed-IPv6-Prefix and Delegated-IPv6-Prefix. No immediate Acct-Interim-Update message is sent upon IPv6NCP. No immediate Acct-Interim-Update message is sent upon DHCPv6. Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix and Delegated-IPv6-Prefix.

The following table lists prefixes from RADIUS selected pools:

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
1	Framed-IPv6-Pool (used for IA_NA Prefix) Framed-Interface-Id Jnpr-Delegated-IPv6-Pool (used for DHCPv6 IA_PD)	IPv6NCP	Acct-Start message contains Framed-IPv6-Prefix, Framed-IPv6-Pool, Delegated-IPv6-Prefix, and Framed-Interface-Id . Framed-IPv6 Prefix is pre-allocated. Framed-IPv6-Pool is learned from RADIUS. Delegated-IPv6-Prefix is pre-allocated . Framed-Interface-Id is sent in Acct-Start message because it is learned from RADIUS. No Acct-Interim-Update message is sent.
2	Framed-IPv6-Pool (used for IA_NAPrefix) Framed-Interface-Id Jnpr-Delegated-IPv6-Pool (used for DHCPv6 IA_PD)	IPv6NCP + DHCPv6	Acct-Start message contains Framed-IPv6-Prefix, Framed-IPv6-Pool, Delegated-IPv6-Prefix, and Framed-Interface-Id. Framed-IPv6 is pre-allocated. Framed-IPv6-Pool is learned from RADIUS. Delegated-IPv6-Prefix is pre-allocated. Framed-Interface-Id is sent in Acct-Start message because it is learned from RADIUS. No immediate Acct-Interim-Update message is sent upon IPv6NCP. No immediate Acct-Interim-Update message is sent upon DHCPv6.

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
3	<p>Framed-IPv6-Pool (used for IA_NA Prefix)</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool (used for DHCPv6 IA_PD)</p>	IPv6NCP	<p>Acct-Start message contains Framed-IPv6-Prefix, Framed-IPv6-Pool, and Delegated-IPv6-Prefix.</p> <p>Framed-IPv6-Prefix is pre-allocated.</p> <p>Framed-IPv6-Pool is learned from RADIUS.</p> <p>Delegated-IPv6-Prefix is pre-allocated.</p> <p>No immediate Acct-Interim-Update message is sent.</p> <p>Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix, Framed-IPv6-Pool, and Delegated-IPv6-Prefix. (This value is learned during IPv6NCP negotiation with the peer.)</p>
4	<p>Framed-IPv6-Pool (used for IA_NA Prefix)</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool (used for DHCPv6 IA_PD)</p>	IPv6NCP + DHCPv6	<p>Acct-Start message contains Framed-IPv6-Prefix, Framed-IPv6-Pool, and Delegated-IPv6-Prefix.</p> <p>Framed-IPv6-Prefix is pre-allocated.</p> <p>Framed-IPv6-Pool is learned from RADIUS.</p> <p>Delegated-IPv6-Prefix is pre-allocated.</p> <p>No immediate Acct-Interim-Update message is sent upon IPv6NCP.</p> <p>No immediate Acct-Interim-Update message is sent upon DHCPv6.</p> <p>Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix, Framed-IPv6-Pool, and Delegated-IPv6-Prefix. (This value is learned during IPv6NCP negotiation with the peer.)</p>

The following table lists prefixes from a local pool or an external server:

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
1	<p>Framed-IPv6-Pool (used for IA_NA Prefix)</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool not sent</p>	IPv6NCP	<p>Acct-Start message contains Framed-IPv6-Prefix and Framed-IPv6-Pool.</p> <p>Framed-IPv6-Prefix is pre-allocated.</p> <p>Framed-IPv6-Pool is learned from RADIUS.</p> <p>No immediate Acct-Interim-Update message is sent.</p> <p>Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id in addition to Framed-IPv6-Prefix and Framed-IPv6-Pool. (This value is learned during IPv6NCP negotiation with the peer.)</p>
2	<p>Framed-IPv6-Pool (used for IA_NA Prefix)</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool not sent</p> <p>[IA_PD prefix is learned from DHCPv6 External Server (DHCPv6 Relay / Relay Proxy model) or reservation from a local pool by DHCPv6]</p>	IPv6NCP + DHCPv6	<p>Acct-Start message contains Framed-IPv6-Prefix and Framed-IPv6-Pool.</p> <p>Framed-IPv6-Prefix is pre-allocated.</p> <p>Framed-IPv6-Pool is learned from RADIUS.</p> <p>No immediate Acct-Interim-Update message is sent upon DHCPv6.</p> <p>Upon DHCPv6, an immediate Acct-Interim-Update is sent that contains Framed-IPv6-Pool, Framed-IPv6-Prefix, Framed-Interface-Id, and DHCPv6 IA_PD Prefix.</p> <p>Framed-Interface-Id value is learned during IPv6NCP negotiation with the peer.</p> <p>DHCPv6 IA_PD is learned by DHCPv6 either by DHCPv6 External Server or reservation from a local pool during DHCPv6 SARR phase.</p> <p>Any periodic Acct-Interim-Update before DHCPv6 completion contains Framed-Interface-Id in addition to the attributes of Acct-Start message. (This can occur if DHCPv6 occurs after periodic interval.)</p>

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
3	<p>Framed-IPv6-Pool not sent</p> <p>[IA_NA Prefix is learned from DHCPv6 External Server (DHCPv6 Relay / Relay Proxy model) or reservation from a local pool by DHCPv6]</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool not sent</p> <p>[IA_PD prefix is learned from DHCPv6 External Server (DHCPv6 Relay / Relay Proxy model) or reservation from a local pool by DHCPv6]</p>	IPv6NCP	<p>Acct-Start message does not contain any of the IPv6-related prefixes and addresses or pool names.</p> <p>No immediate Acct-Interim-Update message is sent upon IPv6NCP.</p> <p>Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id. (This value is learned during IPv6NCP negotiation with the peer.)</p>

Number	RADIUS Attributes	IPv6 Address Negotiation Type	RADIUS Accounting Messages
4	<p>Framed-IPv6-Pool not sent</p> <p>[IA_NA Prefix is learned from DHCPv6 External Server (DHCPv6 Relay / Relay Proxy model) or reservation from a local pool by DHCPv6]</p> <p>Framed-Interface-Id not sent</p> <p>Jnpr-Delegated-IPv6-Pool not sent</p> <p>[IA_PD prefix is learned from DHCPv6 External Server (DHCPv6 Relay / Relay Proxy model) or reservation from a local pool by DHCPv6]</p>	IPv6NCP+DHCPv6	<p>Acct-Start message does not contain any of the IPv6-related prefixes and addresses or pool names.</p> <p>No immediate Acct-Interim-Update message is sent upon IPv6NCP.</p> <p>Next periodic Acct-Interim-Update (based on interval) contains Framed-Interface-Id. (This value is learned during IPv6NCP negotiation with the peer.)</p> <p>Upon DHCPv6, immediate Acct-Interim-Update is sent which contains Framed-IPv6-Prefix, Framed-IPv6-Pool, Framed-Interface-Id, and DHCPv6 IA_PD.</p> <p>Framed-IPv6-Prefix is the IA_NA prefix learned by DHCPv6 (either by external server or reservation from a local pool).</p> <p>Framed-IPv6-Pool is sent only if there is a reservation of an IA_NA prefix from local pool by DHCPv6.</p> <p>Framed-Interface-Id value is learned during IPv6NCP negotiation with the peer.</p> <p>DHCPv6 IA_PD prefix is learned by DHCPv6 either by DHCPv6 external server or reservation from a local pool during DHCPv6 SARR phase.</p> <p>Any periodic Acct-Interim-Update before DHCPv6 completion contains Framed-Interface-Id only. (This can occur if DHCPv6 occurs after periodic interval.)</p>

- Related Documentation**
- [RADIUS Accounting Messages for Dual-Stack PPPoE Subscribers on page 418](#)
 - [Accounting Messages for PPPoE Using NDRA Prefixes on page 419](#)
 - [Suppressing Accounting Information That Comes from AAA on page 430](#)

Suppressing Accounting Information That Comes from AAA

The following standard and vendor-specific IPv6 RADIUS attributes are included by default (when available) in Acct-Start and Acct-Stop messages:

- Framed-IPv6-Prefix
- Framed-IPv6-Pool
- Delegated-Ipv6-Prefix
- Framed-IPv4-Route
- Framed-IPv6-Route

You can configure the software to exclude these attributes from Acct-Start or Acct-Stop messages. To do so, configure the access profile:

1. Access the access profile.

```
[edit]
user@host# edit access profile dual-stack radius attributes
```

2. The following examples show how to use the **exclude** statement to exclude attributes from messages.

```
[edit access profile dual-stack radius attributes]
user@host# set exclude delegated-ipv6-prefix accounting-start
```

```
[edit access profile dual-stack radius attributes]
user@host# set exclude framed-ipv6-pool [accounting-start accounting-stop]
```

```
[edit access profile dual-stack radius attributes]
user@host# set exclude framed-ipv6-prefix accounting-start framed-ipv6-route
accounting-start
```

```
[edit access profile dual-stack radius attributes]
user@host# set exclude framed-ipv6-prefix accounting-start framed-ipv6-route
accounting-start
```

Related Documentation

- [RADIUS Accounting Messages for Dual-Stack PPPoE Subscribers on page 418](#)
- [Accounting Messages for PPPoE Using NDRA Prefixes on page 419](#)
- [Accounting Messages for PPPoE Subscribers That Use DHCPv6 IA_NA Prefixes on page 424](#)

Avoiding Negotiation of IPv6CP in the Absence of an Authorized Address

You can control the behavior of the router in a situation where IPv6CP negotiation is initiated for subscriber sessions when no authorized addresses are available.

By default, IPv6CP negotiation is enabled to proceed for an IPv6-only session when AAA has not provided an appropriate IPv6 address or prefix. In the absence of the address, the negotiation cannot successfully complete. To prevent endless client negotiation of IPv6CP, include the **reject-unauthorized-ipv6cp** statement at the **[edit protocols**

ppp-service] hierarchy level, which enables the jpppd process to reject the negotiation attempt.

To configure the router to reject IPv6CP negotiation messages when no IPv6 address is available for a dynamic interface:

- Enable rejection of unauthorized IPv6CP negotiation messages.

```
[edit protocols ppp-service]  
user@host# set reject-unauthorized-ipv6cp
```



NOTE: The `reject-unauthorized-ipv6cp` statement does not prevent IPv6CP negotiation for static interfaces, because the jpppd process cannot determine whether router advertisement of DHCPv6 is configured to run above the PPP interface.

**Related
Documentation**

- [IPv4 and IPv6 Dual Stack in a PPPoE Access Network on page 413](#)

CHAPTER 51

Configuring DHCPv6 Local Server

- [DHCPv6 Local Server Overview on page 434](#)
- [Enabling DHCPv6 Rapid Commit Support on page 435](#)
- [Preventing Binding of Clients That Do Not Support Reconfigure Messages on page 436](#)
- [Configuring the DUID Type Supported by DHCPv6 Servers on page 437](#)
- [Example: Extended DHCPv6 Local Server Configuration on page 438](#)

DHCPv6 Local Server Overview

The DHCPv6 local server is compatible with the DHCP local server and the DHCP relay agent, and can be enabled on the same interface as either the extended DHCP local server or DHCP relay agent.

The DHCPv6 local server provides many of the same features as the DHCP local server, including:

- Configuration for a specific interface or for a group of interfaces
- Site-specific usernames and passwords
- Numbered Ethernet interfaces
- Statically configured CoS and filters
- AAA directed login
- Use of the IA_NA option to assign a specific address to a client

When a DHCPv6 client logs in, the DHCPv6 local server can optionally use the AAA service framework to interact with the RADIUS server. The RADIUS server, which is configured independently of DHCP, authenticates the client and supplies the IPv6 prefix and client configuration parameters.

The client username, which uniquely identifies a subscriber or a DHCP client, must be present in the configuration in order for DHCPv6 local server to use RADIUS authentication.

You can configure DHCPv6 local server to communicate the following attributes to the AAA service framework and RADIUS at login time:

- Client username
- Client password

Based on the attributes that the DHCPv6 local server provides, RADIUS returns the information listed in [Table 48 on page 434](#) to configure the client:

Table 48: RADIUS Attributes and VSAs for DHCPv6 Local Server

Attribute Number	Attribute Name	Description
27	Session-Timeout	Lease time, in seconds. If not supplied, the lease does not expire
123	Delegated-IPv6-Prefix	Prefix that is delegated to the client
26-143	Max-Clients-Per-Interface	Maximum number of clients allowed per interface

To configure the extended DHCPv6 local server on the router (or switch), you include the **dhcpv6** statement at the **[edit system services dhcp-local-server]** hierarchy level.

You can also include the **dhcpv6** statement at the following hierarchy levels:

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

Related Documentation

- [Extended DHCP Local Server Overview on page 230](#)
- [Using External AAA Authentication Services with DHCP on page 271](#)
- [Assign a Specific IP Address to a Client Using DHCP Option 50 and DHCPv6 IA_NA Option on page 246](#)
- [Configuring the DUID Type Supported by DHCPv6 Servers on page 437](#)
- [Verifying and Managing DHCPv6 Local Server Configuration on page 550](#)
- [Example: Extended DHCPv6 Local Server Configuration on page 438](#)

Enabling DHCPv6 Rapid Commit Support

You can configure the DHCPv6 local server to support the DHCPv6 Rapid Commit option (DHCPv6 option 14). When rapid commit is enabled, the server recognizes the Rapid Commit option in Solicit messages sent from the DHCPv6 client. (DHCPv6 clients are configured separately to include the DHCPv6 Rapid Commit option in the Solicit messages.) The server and client then use a two-message exchange (Solicit and Reply) to configure clients, rather than the default four-message exchange (Solicit, Advertise, Request, and Reply). The two-message exchange provides faster client configuration, and is beneficial in environments in which networks are under a heavy load.

You can configure the DHCPv6 local server to support the Rapid Commit option globally, for a specific group, or for a specific interface. By default, rapid commit support is disabled on the DHCPv6 local server.

To configure the DHCPv6 local server to support the DHCPv6 Rapid Commit option:

1. Specify that you want to configure the **overrides** options:

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit overrides
```

2. Enable rapid commit support:

```
[edit system services dhcp-local-server dhcpv6 overrides]
user@host# set rapid-commit
```

Related Documentation

- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)
- [Deleting DHCP Local Server and DHCP Relay Override Settings on page 315](#)
- [Extended DHCP Local Server Overview on page 230](#)

Preventing Binding of Clients That Do Not Support Reconfigure Messages

The DHCPv6 client and server negotiate the use of reconfigure messages. When the client can accept reconfigure messages from the server, then the client includes the Reconfigure Accept option in both solicit and request messages sent to the server.

By default, the DHCPv6 server accepts solicit messages from clients regardless of whether they support reconfiguration. You can specify that the server require clients to accept reconfigure messages. In this case, the DHCPv6 server includes the Reconfigure Accept option in both advertise and reply messages when reconfiguration is configured for the client interface. Solicit messages from nonsupporting clients are discarded and the clients are not allowed to bind.

To configure the DHCPv6 local server to require that all clients accept reconfiguration:

- Specify strict reconfiguration.

```
[edit system services dhcp-local-server dhcpv6 reconfigure]
user@host# set strict
```

To override the global configuration for a group of clients, include the statement at the **[edit system services dhcp-local-server dhcpv6 group *group-name* reconfigure]** hierarchy level.

The **show dhcpv6 server statistics** command displays a count of solicit messages that the server has discarded.

Related Documentation

- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)

Configuring the DUID Type Supported by DHCPv6 Servers

Every DHCPv6 client and server has a DHCP unique identifier (DUID). Each DUID is globally unique across all DHCPv6 clients and servers in an administrative domain. Messages between clients and servers can carry the client DUID in the Client-Identifier option and the server DUID in the Server-Identifier option. Clients and servers may require that some message types that include different messages may be accepted or discarded based on whether they include one or both of these DUIDs. A server or client may discard some message types when the DUID option value does not match the server's DUID or the client's DUID, respectively.

The DUIDs facilitate communication between client/server pairs by providing a means for each to determine whether it is the intended recipient of a message and also identifying where to forward a response. For example, a server uses the server DUID received in a message from a client to determine whether the message is intended for it. Then it can compare the client DUID it has received against its database. When it finds a match, the server sends the associated configuration information to the client. The server also uses the client DUID to select clients for an Identity Association.

The server DUID conveyed to the client enables the client to distinguish between servers. To target a single server, it may include that DUID when it sends multicast messages; only the server identified by the DUID responds.

RFC, 3315, Dynamic Host Configuration Protocol for IPv6 (DHCPv6) defines three types of DUIDs, but we support only the DUID-EN and DUID-LL types:

- DUID-EN—(Supported) A device vendor assigns a DUID of this type when the device is manufactured. The value consists of the vendor's IANA enterprise number followed by a unique number. This is the default type.
- DUID-LL—(Supported) This type of DUID includes a hardware type code recognized by IANA, followed by the link-layer address of any network interface permanently connected to the device. DUID-LL is supported only for DHCPv6 servers.
- DUID-LLT—(Not supported). This type is similar to the DUID-LL type, but additionally includes the time that the DUID is generated relative to a specific date and time.

The DUID type is specified per routing instance.

To configure the router to use the DUID-LL type:

- Specify the type.

```
[edit system services dhcp-local-server dhcpv6]
user@host# set server-duid-type duid-ll
```

Remove this configuration to return to supporting the DUID-EN type.

Related Documentation

- [DHCPv6 Local Server Overview on page 434](#)

Example: Extended DHCPv6 Local Server Configuration

This example shows a sample extended DHCPv6 local server configuration. The second part of the example shows a sample RADIUS authentication configuration—authentication must be configured for DHCPv6 local server operations.

```
[edit system services]
dhcp-local-server {
  dhcpv6 {
    authentication {
      password $ABC123;
      username-include {
        user-prefix wallybrown;
        domain-name example.com;
      }
    }
    group group_two {
      authentication {
        password $ABC123$ABC123;
        username-include {
          user-prefix south5;
          domain-name example.com;
        }
      }
    }
    interface ge-1/0/3.0;
  }
}
```

The following is a sample RADIUS authentication configuration.

```
[edit access]
radius-server {
  192.168.1.250 {
    port 1812;
    secret $ABC123;
  }
}
profile isp-bos-metro-fiber-basic {
  accounting-order radius;
  authentication-order radius;
  radius {
    authentication-server 192.168.1.250;
    accounting-server 192.168.1.250;
  }
  accounting {
    order radius;
    accounting-stop-on-failure;
    accounting-stop-on-access-deny;
    update-interval 10;
    statistics time;
  }
}
```

Related Documentation

- [DHCPv6 Local Server Overview on page 434](#)

Configuring DHCPv6 Relay Agent

- [DHCPv6 Relay Agent Overview on page 441](#)
- [DHCPv6 Relay Agent Options on page 442](#)
- [Configuring DHCPv6 Relay Agent Options on page 442](#)
- [Inserting DHCPv6 Interface-ID Option \(Option 18\) In DHCPv6 Packets on page 444](#)
- [Inserting DHCPv6 Remote-ID Option \(Option 37\) In DHCPv6 Packets on page 445](#)

DHCPv6 Relay Agent Overview

The DHCPv6 relay agent enhances the DHCP relay agent by providing support in an IPv6 network. The DHCPv6 relay agent passes messages between the DHCPv6 client and the DHCPv6 server, similar to the way DHCP relay agent supports an IPv4 network.

When a DHCPv6 client logs in, the DHCPv6 relay agent uses the AAA service framework to interact with the RADIUS server to provide authentication and accounting. The RADIUS server, which is configured independently of DHCP, authenticates the client and supplies the IPv6 prefix and client configuration parameters, such as session timeout and the maximum number of clients allowed per interface.



NOTE: The PTX Series Packet Transport Routers do not support authentication for DHCPv6 relay agents.

The DHCPv6 relay agent is compatible with the DHCP local server and the DHCP relay agent, and can be enabled on the same interface as either the DHCP local server or DHCP relay agent.

To configure the DHCPv6 relay agent on the router (or switch), you include the **dhcpv6** statement at the **[edit forwarding-options dhcp-relay]** hierarchy level.

You can also include the **dhcpv6** statement at the following hierarchy levels:

- **[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]**

Related Documentation

- [Grouping Interfaces with Common DHCP Configurations on page 277](#)
- [Configuring Group-Specific DHCP Relay Options on page 280](#)
- [Overriding the Default DHCP Relay Configuration Settings on page 313](#)
- [Configuring Passwords for Usernames on page 275](#)
- [Creating Unique Usernames for DHCP Clients on page 272](#)
- [Example: Extended DHCPv6 Local Server Configuration on page 438](#)

DHCPv6 Relay Agent Options

You can configure DHCPv6 relay agent to include additional information in the client-originated DHCP packets that the relay agent forwards to a DHCPv6 server. This support is equivalent to the option 82 support provided by the DHCPv4 relay agent. The DHCPv6 server uses the additional information in the packets to determine the IPv6 address to assign to the client. The server might also use the information for other purposes; for example, to determine which services to grant the client, or to provide additional security against threats such as address spoofing. The DHCPv6 server sends its reply back to the DHCPv6 relay agent, and the agent removes the option information from the message, and then forwards the packet to the client.

You can configure the DHCPv6 relay agent to include the following options in the packet the relay agent sends to the DHCPv6 server:

- Relay Agent Interface-ID (option 18)—An ASCII string that identifies the interface on which the client DHCPv6 packet is received. This is the equivalent of the DHCPv4 relay agent option 82 Agent Circuit ID suboption (suboption 1).
- Relay Agent Remote-ID (option 37)—An ASCII string assigned by the DHCPv6 relay agent that securely identifies the client. This is the equivalent of the DHCPv4 relay agent option 82 Agent Remote ID suboption (suboption 2).

Related Documentation

- [Configuring DHCPv6 Relay Agent Options on page 442](#)
- [Inserting DHCPv6 Interface-ID Option \(Option 18\) In DHCPv6 Packets on page 444](#)
- [Inserting DHCPv6 Remote-ID Option \(Option 37\) In DHCPv6 Packets on page 445](#)

Configuring DHCPv6 Relay Agent Options

You can configure DHCPv6 relay agent to insert optional information in the DHCPv6 packets that the relay receives from clients and forwards to a DHCPv6 server. To configure the optional information, you specify the type of information you want to include in the packets. You use the **relay-agent-interface-id** statement to include Relay Agent Interface-ID (option 18) in the packets, or the **relay-agent-remote-id** statement to include Relay Agent Remote-ID (option 37).

When you enable the DHCPv6 options support, you can optionally configure DHCPv6 relay agent to include a prefix or the interface description as part of the option information.

For dual-stack environments, you can also specify that the DHCPv6 relay agent use the DHCPv4 option 82 information to populate DHCPv6 option 18 or option 37.

To enable insertion of DHCPv6 options:

1. Specify that you want to configure DHCPv6 relay agent support.

```
[edit forwarding-options dhcp-relay]
user@host# edit dhcpv6
```

2. Configure DHCPv6 relay agent to insert the Relay Agent Interface-ID option, the Relay Agent Remote-ID option, or both.

- To insert Relay Agent Interface-ID (option 18):

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set relay-agent-interface-id
```

- To insert Relay Agent Remote-ID (option 37):

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set relay-agent-remote-id
```

3. (Optional) Specify additional information that you want to include in option 18 or option 37. The **relay-agent-interface-id** and **relay-agent-remote-id** statements both support inclusion of a prefix, interface description, or the DHCPv4 option 82 information. For example:

- To prepend prefix information—This example prepends a prefix that consists of the hostname and logical system name to option 18. You use the **relay-agent-remote-id** statement to add the prefix to option 37.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set relay-agent-interface-id prefix host-name logical-system-name
```

- To include the textual interface description—This example uses the description for the device interface instead of the interface identifier in option 18. You use the **relay-agent-remote-id** statement to add the interface description to option 37.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set relay-agent-interface-id use-interface-description device
```

- To use the DHCPv4 option-82 value—This example uses the DHCPv4 option-82 (suboption 2) value for the DHCPv6 option 37 value. You use the **relay-agent-interface-id** statement to use DHCPv4 option 82 (suboption 1) in DHCPv6 option 18.

This example also includes the optional **strict** keyword to specify that the router drops Solicit packets if the packets do not include an option 82 value. If you do not include the **strict** keyword, the router sends the RELAY-FORW message without adding option 37. The **strict** keyword is not supported for the **relay-agent-interface-id** statement.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# set relay-agent-remote-id use-option-82 strict
```

Related Documentation

- [Inserting DHCPv6 Interface-ID Option \(Option 18\) In DHCPv6 Packets on page 444](#)

- [Inserting DHCPv6 Remote-ID Option \(Option 37\) In DHCPv6 Packets on page 445](#)
- [Including a Prefix in DHCP Options on page 340](#)
- [Including a Textual Description in DHCP Options on page 342](#)

Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets

You can configure DHCPv6 relay agent to insert the DHCPv6 Interface-ID (option 18) in the packets that the relay sends to a DHCPv6 server. You can configure the option 18 support at either the DHCPv6 global or group level.

When you configure option 18 support, you can optionally include the following additional information:

- Prefix—Specify the **prefix** option to add a prefix to the interface identifier. The prefix can be any combination of hostname, logical system name, and routing instance name.
- Interface description—Specify the **use-interface-description** option to include the textual interface description instead of the interface identifier. You can include either the device interface description or the logical interface description.
- Option 82 Agent Circuit ID suboption (suboption 1)—Specify the **use-option-82** option to include the DHCPv4 Option 82 Agent Circuit ID suboption (suboption 1). This configuration is useful in a dual-stack environment, which has both DHCPv4 and DHCPv6 subscribers that reside over the same underlying logical interface. The router checks for the option 82 suboption 1 value and inserts it into the outgoing packets. If no DHCPv4 binding exists or if the binding does not have an option 82 suboption 1 value, the router sends the packets without adding an option 18.



NOTE: If you specify one of the optional configurations, and the specified information does not exist (for example, there is no interface description), DHCPv6 relay ignores the optional configuration and inserts the default interface identifier in the packets.

To insert the DHCPv6 Interface-ID option (option 18) in DHCPv6 packets:

1. Configure the DHCPv6 relay to include option 18.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit relay-agent-interface-id
```

2. (Optional) Specify the prefix to include in option 18.

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id]
user@host# set prefix prefix
```

3. (Optional) Specify that option 18 include the textual description of the interface. You can specify either the **logical** interface description or the **device** interface description.

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id]
user@host# set use-interface-description (logical | device)
```

4. (Optional) Specify that option 18 use the DHCPv4 Option 82 Agent Circuit ID suboption (suboption 1) value.

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id]
user@host# set use-option-82
```

Related Documentation

- [DHCPv6 Relay Agent Options on page 442](#)
- [Configuring DHCPv6 Relay Agent Options on page 442](#)
- [Including a Prefix in DHCP Options on page 340](#)
- [Including a Textual Description in DHCP Options on page 342](#)

Inserting DHCPv6 Remote-ID Option (Option 37) In DHCPv6 Packets

Starting in Junos OS Release 14.1, you can configure DHCPv6 relay agent to insert DHCPv6 Remote-ID (option 37) in the packets that the relay sends to a DHCPv6 server. You can configure option 37 support at either the DHCPv6 global or group level.

When you configure option 37 support, you can optionally include the following information:

- Prefix—Specify the **prefix** option to add a prefix to the interface identifier. The prefix can be any combination of hostname, logical system name, and routing instance name.
- Interface description—Specify the **use-interface-description** option to include the textual interface description instead of the interface identifier. You can include either the device interface description or the logical interface description.
- Option 82 Agent Remote-ID suboption (suboption 2)—Specify the **use-option-82** option to use the value of the DHCPv4 option 82 Remote-ID suboption (suboption 2). This configuration is useful in a dual-stack environment, which has both DHCPv4 and DHCPv6 subscribers that reside over the same underlying logical interface. The router checks for the option 82 suboption 2 value and inserts it into the outgoing packets.



NOTE: If you specify one of the optional configurations, and the specified information does not exist (for example, there is no interface description), DHCPv6 relay ignores the optional configuration and inserts the default interface identifier in the packets.

To insert the DHCPv6 Remote-ID option (option 37) in DHCPv6 packets:

1. Configure the DHCPv6 relay to include option 37.

```
[edit forwarding-options dhcp-relay dhcpv6]
user@host# edit relay-agent-remote-id
```

2. (Optional) Specify the prefix to include with the option 37 information.

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id]
user@host# set prefix prefix
```

3. (Optional) Specify that option 37 include the textual description of the interface. You can specify either the **logical** interface description or the **device** interface description.

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id]
user@host# set use-interface-description (logical | device)
```

4. (Optional) Specify that option 37 use the DHCPv4 option 82 Remote-ID suboption (suboption 2) value.

If no DHCPv4 binding exists, or if the binding does not include an option 82 suboption 2 value, by default the router sends the packets without adding option 37. However, you can use the optional **strict** keyword to specify that the router drop packets that do not have a suboption 2 value.

```
[edit forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id]
user@host# set use-option-82 strict
```

Release History Table

Release	Description
14.1	Starting in Junos OS Release 14.1, you can configure DHCPv6 relay agent to insert DHCPv6 Remote-ID (option 37) in the packets that the relay sends to a DHCPv6 server.

**Related
Documentation**

- [DHCPv6 Relay Agent Options on page 442](#)
- [Configuring DHCPv6 Relay Agent Options on page 442](#)

Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation

- [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)
- [On-Demand IPv4 Address Negotiation and Release for Static PPP Subscribers Overview on page 448](#)
- [On-Demand IPv4 Address Negotiation and Release for Dynamic PPP Subscribers Overview on page 450](#)
- [IPCP Negotiation with Optional Peer IP Address on page 453](#)
- [How RADIUS Attributes Are Used During Authentication When On-Demand Address Allocation is Enabled on page 454](#)
- [Configuring Static On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 454](#)
- [Configuring Dynamic On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 455](#)
- [Configuring Global On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 455](#)
- [Enabling Immediate Interim Accounting Messages for On-Demand IPv4 Address Changes on page 456](#)
- [Enabling Unisphere IPv4 Release Control VSA in RADIUS Messages on page 456](#)

Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation

In a dual stack over PPP access network scenario, the dual-stack session remains running as long as either the IPv4 or IPv6 session is active. By default, when a subscriber terminates the IPv4 session, the BNG retains the IPv4 address that was allocated by AAA at login. The address is not released while the dual-stack PPP session is running. If the IPv4 session is renegotiated while the session is running, the same IPv4 address is assigned to the subscriber's IPv4 session. This functionality results in inefficient use of IPv4 addresses.

You can conserve IPv4 addresses by configuring the router to release the IPv4 address if a subscriber is no longer using an IPv4 service. This feature provides on-demand IP address allocation or de-allocation after the initial PPP authentication and IPv6 address or prefix allocation.

The on-demand configuration does not take effect when the destination (peer) IP address is statically configured in the inet family of the PPP interface.

Related Documentation

- [On-Demand IPv4 Address Negotiation and Release for Static PPP Subscribers Overview on page 448](#)
- [On-Demand IPv4 Address Negotiation and Release for Dynamic PPP Subscribers Overview on page 450](#)
- [How RADIUS Attributes Are Used During Authentication When On-Demand Address Allocation is Enabled on page 454](#)
- [Configuring Static On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 454](#)
- [Configuring Dynamic On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 455](#)
- [Configuring Global On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 455](#)

On-Demand IPv4 Address Negotiation and Release for Static PPP Subscribers Overview

This topic describes how on-demand IPv4 address allocation and de-allocation works for static dual-stack PPP subscribers.

- [IPv4 Address Negotiation for Static PPP Subscribers on page 448](#)
- [IPv4 Address Release for Static PPP Subscribers on page 450](#)

IPv4 Address Negotiation for Static PPP Subscribers

The process for IPv4 address negotiation for a static inet family and address over a static PPP interface is as follows:

1. PPP Link Control Protocol (LCP) is established and an IPv6 control protocol is successfully negotiated.
2. The broadband network gateway (BNG) receives an Internet Protocol Control Protocol (IPCP) Configure Request with a 0.0.0.0 IPv4 address option from the customer premises equipment (CPE).
3. The BNG sends an IPCP Configure Request with a local IPv4 address option to the CPE.
4. The BNG sends an Access-Request message with the Unisphere-Ipv4-release-control VSA (if configured) to the RADIUS server.
5. The BNG receives an IPCP Configure ACK from the CPE.
6. The BNG receives an Access-Accept message from the RADIUS server.

- If a Framed-IP-Address attribute is received, the BNG performs a duplicate address check (if configured). If a duplicate address check is completed successfully, PPP continues IPCP negotiation with the CPE. Otherwise, the entire PPP session is brought down by sending an LCP terminate request to the CPE.
- If a Framed-Pool attribute is received, then the IPv4 address is allocated from the specified local address pool configured in the BNG. If the IP pool is not configured in the BNG and there is no other IP pool available, the BNG sends an LCP Protocol-Reject message to the CPE.
- If neither a Framed-IP-Address attribute nor a Framed-Pool attribute is received, then the BNG allocates an IPv4 address from one of the configured local address pools. If the BNG cannot allocate an IPv4 address, the BNG sends an LCP Protocol-Reject message to the CPE.
- If ADFv4 filters are present in the Access-Accept message, they need to be reinstalled for that subscriber in the BNG.
- If both IPv4 primary and secondary DNS addresses are present in the Access-Accept message, then both need to be updated for that subscriber in the BNG. If either an IPv4 primary DNS address or an IPv4 secondary DNS address is present in the Access-Accept message, then only the corresponding DNS address needs to be updated for that subscriber.

If an IPv4 address is not available, and the BNG receives an Access-Reject message from the RADIUS server, the following occurs:

- If the Access-Reject message includes the Unisphere-Ipv4-release-control VSA, the BNG sends an IPCP terminate request to the CPE. The CPE is then allowed to renegotiate IP NCP.
- If the Access-Reject message does not include the Unisphere-Ipv4-release-control VSA, the BNG sends an LCP Protocol-Reject message to the CPE. The CPE must renegotiate the LCP link before it is allowed to renegotiate IP NCP.

If the RADIUS Access-Reject message includes the IPCP Terminate-Request field, the text of Reply Message attribute #18 is appended to the information in the Terminate-Request field, and will be shown in PPP data.

If there is no response from the RADIUS server, then IPCP is terminated.

7. The BNG sends an IPCP Configure NACK with the new IPv4 address option to the CPE.
8. The subscriber secure policy service (if present for inet family) is activated.

The BNG sends an immediate Interim-Accounting message (if configured) with the Unisphere-Ipv4-release-control VSA (if configured) and the Framed-IP-Address attribute to the RADIUS server.
9. The BNG receives an IPCP Configure Request with new IPv4 address option from the CPE.
10. The BNG receives an Interim-Accounting response from the RADIUS server.
11. The BNG sends an IPCP Configure ACK to the CPE.

IPv4 Address Release for Static PPP Subscribers

The process for IPv4 address release for static inet family and address over static PPP interface is as follows:

1. The BNG receives an IPCP terminate request from the CPE.
2. The BNG sends an IPCP terminate ACK to the CPE.
3. The following actions occur:
 - The subscriber secure policy service (if present for inet family) is de-instantiated.
 - If an IPv4 address was allocated from local address pool, the address then becomes available.
 - The IPv4 address entry is cleared from the subscriber record.
 - The BNG sends an immediate Interim-Accounting message (if configured) with the Unisphere-lpv4-release-control VSA (if configured) to the RADIUS server and the Framed-IP-Address attribute is not included.
 - User Session Statistics are retained for the entire PPP session and are not cleared when the IPv4 address is released.
4. The BNG receives an Interim-Accounting response from the RADIUS server.

No action is taken in the BNG whether or not it receives a response from the RADIUS server.

Related Documentation

- [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)
- [On-Demand IPv4 Address Negotiation and Release for Dynamic PPP Subscribers Overview on page 450](#)

On-Demand IPv4 Address Negotiation and Release for Dynamic PPP Subscribers Overview

This topic describes how on-demand IPv4 address allocation and de-allocation works for static dual-stack PPP subscribers.

- [IPv4 Address Negotiation for Dynamic PPP Subscribers on page 451](#)
- [IPv4 Address Release for Dynamic PPP Subscribers on page 452](#)

IPv4 Address Negotiation for Dynamic PPP Subscribers

The process for IPv4 address negotiation for a dynamic inet family and address over a static PPP interface is as follows:

1. PPP Link Control Protocol (LCP) is established and IPv6 control protocol is successfully negotiated.
2. The broadband network gateway (BNG) receives an Internet protocol Control Protocol (IPCP) Configure Request with a 0.0.0.0 IPv4 address option from the CPE.
3. The BNG sends an Access-Request message with the Unisphere-Ipv4-release-control VSA (if configured) to the RADIUS server.
4. The BNG receives an Access-Accept message from the RADIUS server.
 - If a Framed-IP-Address attribute is received, then a duplicate address check (if configured) is performed on the BNG. If a duplicate address check is completed successfully, then PPP continues IPCP negotiation with the CPE. Otherwise, the entire PPP session is brought down by sending an LCP terminate request to the CPE.
 - If Framed-Pool attribute is received, then the IPv4 address is allocated from the specified local address pool configured in the BNG. If the pool is not configured in the BNG and there is no other IP pool available, then an IPCP protocol reject is sent to the CPE.
 - If neither a Framed-IP-Address attribute nor a Framed-Pool attribute is received, then the BNG allocates an IPv4 address from one of the configured local address pools. If the BNG cannot allocate an IPv4 address, then an IPCP protocol reject is sent to the CPE.
 - If ADFv4 filters are present in the Access-Accept message, then they need to be reinstalled for that subscriber in the BNG.
 - If both IPv4 primary and secondary DNS addresses are present in the Access-Accept message, then both of them need to be updated for that subscriber in the BNG. If either an IPv4 primary DNS address or an IPv4 secondary DNS address is present in the Access-Accept message, then only the corresponding DNS address needs to be updated for that subscriber.

If an IPv4 address is not available, and the BNG receives an Access-Reject message from the RADIUS server, the following occurs:

- If the Access-Reject message includes the Unisphere-Ipv4-release-control VSA, the BNG sends an IPCP terminate request to the CPE. The CPE is then allowed to renegotiate IP NCP.
- If the Access-Reject message does not include the Unisphere-Ipv4-release-control VSA, the BNG sends an LCP Protocol-Reject message to the CPE. The CPE must renegotiate the LCP link before it is allowed to renegotiate IP NCP.

If the RADIUS Access-Reject message includes the IPCP Terminate-Request field, the text of Reply Message attribute #18 is appended to the information in the Terminate-Request field, and will be shown in PPP data.

If an Access-Challenge message is received instead of an Access-Accept, then the IPCP protocol reject is sent to the CPE.

If there is no response from the RADIUS server, then IPCP is terminated.

5. The BNG sends an IPCP Configure NACK with the new IPv4 address option to the CPE.
6. The dynamic inet family and local address are added and all IPv4 (family inet) services for the dynamic client profile are instantiated.

The BNG sends an IPCP Configure Request with a local IPv4 address option to the CPE.

7. The BNG sends an immediate Interim-Accounting message (if configured) with the Unisphere-Ipv4-release-control VSA (if configured) and a Framed-IP-Address attribute to the RADIUS server.
8. All IPv4 services, such as ascend data filters (ADF) and firewall filters, for the dynamic service profile and the lawful intercept service (if present for inet family) are instantiated and the Service Accounting-Start messages (if service accounting is configured and IPv4 service is not part of a multi-family service profile) are sent to the RADIUS server. If service instantiation fails, then IPCP is terminated and an IPv4 address release process is initiated.
9. The BNG receives an IPCP Configure Request with a new IPv4 address option from the CPE.
10. The BNG sends an IPCP Configure ACK to the CPE.
11. The BNG receives a Service Accounting-Start response from the RADIUS server.
12. The BNG receives an Interim-Accounting response from the RADIUS server.
13. The BNG receives an IPCP Configure ACK from the CPE.

IPv4 Address Release for Dynamic PPP Subscribers

The process for IPv4 address release for dynamic inet family and address over static PPP interface is as follows:

1. The BNG receives an IPCP terminate request from the CPE.
2. The BNG sends an IPCP terminate ACK to the CPE.
3. The following actions occur:
 - All IPv4 (family inet) services for the dynamic client profile are de-instantiated and the dynamic inet family and local address are removed.
 - All IPv4 services, such as ascend data filters (ADF) and firewall filters, for a dynamic service profile and the lawful intercept service (if present for inet family) are de-instantiated. The Service Accounting-Stop messages (if service accounting is configured and IPv4 service is not part of a multi-family service profile) is sent to the RADIUS server.
 - If an IPv4 address was allocated from a local address pool, then it is available.
 - The IPv4 address entry is cleared from the subscriber record

4. The BNG sends an immediate Interim-Accounting message (if configured) with the Unisphere-Ipv4-release-control VSA (if configured) to the RADIUS server and the Framed-IP-Address attribute must not be included.

User Session Statistics and service session statistics for multi-family service are retained for the entire PPP session and is not cleared when the IPv4 address is released.

5. The BNG receives an Interim-Accounting response from the RADIUS server.

No action taken in the BNG whether or not it receives a response from the RADIUS server.

Related Documentation

- [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)
- [On-Demand IPv4 Address Negotiation and Release for Static PPP Subscribers Overview on page 448](#)

IPCP Negotiation with Optional Peer IP Address

During normal operation for an Internet Protocol Control Protocol (IPCP) negotiation, if the Point-to-Point Protocol (PPP) client does not request a specific IP address, the MX Series server sends an IP address obtained from RADIUS or from the local address pool.

If the PPP client seeks a specific IP address, on receiving a NAK from the server, it sends a confReq message without specifying the IP address option. In this case, even though the server sends an IPCP confAck message, the server terminates the client because the server requires an IP address from the client.

You can configure the **peer-ip-address-optional** statement to enable the IPCP negotiation to succeed even though the peer does not include the IP address option in an IPCP configuration request for static and dynamic, and terminated and tunneled, Point-to-Point Protocol over Ethernet (PPPoE) subscribers. By default, this statement is disabled. This feature also supports high availability (HA) and unified in-service software upgrade (unified ISSU).

If the client does not include the IP address option in an IPCP configuration request and the IPCP negotiation succeeds by configuring the **peer-ip-address-optional** statement, then the server does not have the client IP address.



NOTE: If the client does include the IP address option in an IPCP configuration request, it does not matter whether the **peer-ip-address-optional** statement is configured because the subscriber is always available and the server has the client IP address.

An IP address from RADIUS or from the local pool is allocated to the client and the route towards this is added on the server even though the client is not assigned with this address. IPCP is successful and the subscriber becomes available. If you want the server to have the route to the client-requested IP address, use the Framed-Route RADIUS attribute or

configure static routes. The client adds or configures static routes towards the server for proper forwarding.

- Related Documentation**
- [peer-ip-address-optional on page 1228](#)
 - *Dynamic Profiles Overview*

How RADIUS Attributes Are Used During Authentication When On-Demand Address Allocation is Enabled

The following describes the behavior of the border network gateway (BNG) during authentication when on-demand IP address allocation is enabled:

- If the RADIUS server returns a Framed-IP-Address attribute, the BNG does not go to the RADIUS server for address allocation on the first Internet Protocol Control Protocol (IPCP) negotiation. It uses the Framed-IP-Address attribute returned in the initial Access-Accept message. Accounting-Start and periodic Interim-Accounting messages include the Framed-IP-Address attribute. Immediate Interim Accounting messages are not sent to RADIUS server. Address allocation is similar to the process described for a static or dynamic subscriber.

When a Framed-IP-Address is returned from the RADIUS server during authentication and the customer premises equipment (CPE) does not negotiate IPCP, the IPv4 address is not released whether or not the on-demand IP address allocation is enabled.

- If the RADIUS server returns a Framed-Pool attribute, the BNG does not go to the RADIUS server for address allocation upon first IPCP negotiation and it allocates an IPv4 address from the specified local address pool. Accounting-Start and periodic Interim-Accounting messages do not include the Framed-IP-Address attribute until IPCP negotiation. Immediate Interim Accounting messages (if configured) are sent to the RADIUS server. Address allocation is similar to the process described for a static or dynamic subscriber.
- If the RADIUS server does not return either the Framed-IP-Address attribute or the Framed-Pool attribute, address allocation is similar to the process described for a static or dynamic subscriber. Because IPCP is the only Network Control Protocol (NCP) active for these subscribers, the entire PPP session is terminated upon an IPCP terminate request and an Accounting-stop message is sent to the RADIUS server. Immediate Interim-Accounting messages to release the IPv4 address are not sent in this case.

- Related Documentation**
- [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)

Configuring Static On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers

To configure static on-demand IPv4 address allocation for dual-stack PPP subscribers:

1. Specify the name and logical unit number of the interface.

[edit]

```
user@host# edit interfaces pp0 unit 1000
```

2. Enable on-demand IP address allocation.

```
[edit interfaces pp0 unit 1000]  
user@host# set ppp-options on-demand-ip-address
```

Related Documentation • [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)

Configuring Dynamic On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers

To configure dynamic on-demand IPv4 address allocation for dual-stack PPP subscribers:

1. Access the dynamic profile.

```
[edit]  
user@host# edit dynamic profiles ppp-dyn-ipv4
```

2. Specify the name and logical unit number of the interface.

```
[edit dynamic profiles ppp-dyn-ipv4]  
user@host# edit interfaces ppp unit 1000
```

3. Enable on-demand IP address allocation.

```
[edit dynamic profiles ppp-dyn-ipv4 interfaces pp0 unit 1000]  
user@host# set ppp-options on-demand-ip-address
```

Related Documentation • [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)

Configuring Global On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers

To configure static on-demand IP address IPv4 address allocation for dual-stack PPP subscribers at the system level:

1. Specify the protocol.

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

2. Specify the ppp-service option.

```
[edit protocols]  
user@host# edit ppp-service
```

3. Enable on-demand IP address allocation.

```
[edit protocols ppp-service]  
user@host# set on-demand-ip-address
```

Related Documentation • [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)

Enabling Immediate Interim Accounting Messages for On-Demand IPv4 Address Changes

To enable the BNG to send an interim accounting messages an immediate interim accounting message:

1. Create a profile and assign a name to it.

```
[edit access]
user@host# edit profile profile1
```

2. Under accounting, specify the address-change-immediate-update option.

```
[edit access profile profile1]
user@host# edit accounting
user@host# set address-change-immediate-update
```

Related Documentation • [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)

Enabling Unisphere IPv4 Release Control VSA in RADIUS Messages

This procedure shows how to enable the Unisphere IPv4 release control VSA in RADIUS messages:

To configure a RADIUS message:

1. Create a profile and assign a name to it.

```
[edit access]
user@host# edit profile profile1
```

2. Specify that you want to configure RADIUS.

```
[edit access profile profile1]
user@host# edit radius
```

3. (Optional) Configure the message RADIUS message.

```
user@host# set ip-address-change-notify message
```

Related Documentation • [Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447](#)

Best Practices for Configuring IPv4 and IPv6 Dual Stack in a PPPoE Access Network

- [Best Practice: Static PPPoE Interfaces with NDRA on page 457](#)
- [Best Practice: DHCPv6 Prefix Delegation over a PPPoE Access Network on page 458](#)
- [Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with NDRA on page 458](#)
- [Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with DHCPv6 on page 459](#)
- [Best Practice: IPv4 Addressing for Logical Interfaces in PPPoE Dynamic Profiles on page 460](#)
- [Best Practice: Configuring Authentication for DHCP Subscribers on a PPPoE Access Network on page 461](#)

Best Practice: Static PPPoE Interfaces with NDRA

When you use static PPPoE interfaces with NDRA, the prefix configured for router advertisement must match the source address specified under family inet6 in the logical pp0 interface configuration. If these values do not match, the prefix is not advertised correctly.

For example:

```
[edit protocols router-advertisement]
interface pp0.2004 {
  prefix 2001:db8:2040:2004::/64;
}

[edit interface pp0]
unit 2004 {
  family inet6 {
    address 2001:db8:2040:2004::1.1.1/64;
  }
}
```

To view the prefix in the ICMPv6 packet, use the **monitor traffic interface pp0.xxx extensive** command. If the prefix is missing, make sure that there is not a mismatch between the

family inet6 address configured for the interface and the prefix configured for the interface in the router advertisement configuration.

Related Documentation • [Configuring a Static PPPoE Logical Interface for NDRA on page 469](#)

Best Practice: DHCPv6 Prefix Delegation over a PPPoE Access Network

When you use DHCPv6 prefix delegation over a PPPoE access network, you need to enable unnumbered addressing in the family inet6 configuration.

For dynamic PPPoE interfaces, enable unnumbered addressing in the dynamic profile. For example:

```
[edit dynamic-profiles]
PPPoE-dyn-ipv4v6-dhcp {
  interfaces {
    pp0 {
      unit "$junos-interface-unit" {
        ...
        family inet6 {
          unnumbered-address lo0.0;
        }
      }
    }
  }
}
```

For static PPPoE interfaces, enable unnumbered addressing in the interface configuration. For example:

```
[edit interface pp0]
unit 2004 {
  family inet6 {
    unnumbered-address lo0.0;
  }
}
```

Related Documentation • [Configuring a PPPoE Dynamic Profile for Use with DHCP Addressing in a Dual-Stack Network on page 464](#)

Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with NDRA

When you use NDRA, always set the IPv6 internet address in dynamic profiles to the `$junos-ipv6-address` predefined variable. This variable is replaced with the IPv6 address of the interface used for router advertisements.

```
[edit dynamic-profiles]
dyn-v4v6-ndra {
  interfaces {
    pp0 {
      unit "$junos-interface-unit" {
        family inet6 {
          address "$junos-ipv6-address ";
        }
      }
    }
  }
}
```

```

    }
  }
}
}

```

**Related
Documentation**

- [Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network on page 467](#)

Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with DHCPv6

The IPv6 address configuration for logical interfaces in PPPoE dynamic profiles when you are using DHCPv6 depends on whether or not you are using routing instances.

If you are using routing instances, use the `$junos-loopback-interface` predefined variable for the IPv6 address. For example:

```

[edit dynamic-profiles]
dyn-v4v6-ri {
  routing-instances {
    "$junos-routing-instance" {
      interface "$junos-interface-name";
    }
  }
  interfaces {
    pp0 {
      unit "$junos-interface-unit" {
        family inet6 {
          unnumbered-address "$junos-loopback-interface";
        }
      }
    }
  }
}

```

If you are not using routing instances, use the unnumbered address for the IPv6 address. The unnumbered address enables the local address to be derived from the specified interface and allows IP processing on the interface without assigning an explicit IP address to the interface. For example:

```

[edit dynamic-profiles]
dyn-v4v6-ndra {
  interfaces {
    pp0 {
      unit "$junos-interface-unit" {
        pppoe-options {
          underlying-interface "$junos-underlying-interface";
          server;
        }
        family inet6 {
          unnumbered-address lo0.0;
        }
      }
    }
  }
}

```

```

    }
  }
}

```

**Related
Documentation**

- [Configuring a PPPoE Dynamic Profile for Use with DHCP Addressing in a Dual-Stack Network on page 464](#)

Best Practice: IPv4 Addressing for Logical Interfaces in PPPoE Dynamic Profiles

The IPv4 address configuration for logical interfaces in PPPoE dynamic profiles depends on whether or not you are using routing instances.

If you are using routing instances, use the `$junos-loopback-interface` variable for the IPv6 address.

```

[edit dynamic-profiles]
dyn-v4v6-ri {
  routing-instances {
    "$junos-routing-instance" {
      interface "$junos-interface-name";
    }
  }
  interfaces {
    pp0 {
      unit "$junos-interface-unit" {
        family inet {
          unnumbered-address "$junos-loopback-interface";
        }
      }
    }
  }
}

```

If you are not using routing instances, use the unnumbered address for the IPv6 address. The unnumbered address enables the local address to be derived from the specified interface and allows IP processing on the interface without assigning an explicit IP address to the interface.

```

[edit dynamic-profiles]
dyn-v4v6-ndra {
  interfaces {
    pp0 {
      unit "$junos-interface-unit" {
        pppoe-options {
          underlying-interface "$junos-underlying-interface";
          server;
        }
        family inet {
          unnumbered-address lo0.0;
        }
      }
    }
  }
}

```

- Related Documentation**
- [Configuring a PPPoE Dynamic Profile for Use with DHCP Addressing in a Dual-Stack Network on page 464](#)
 - [Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network on page 467](#)

Best Practice: Configuring Authentication for DHCP Subscribers on a PPPoE Access Network

In most cases PPPoE is used to authenticate subscribers in a PPPoE access network. However, if you wish to use DHCP to perform the authentication, do not configure subscriber authentication at the **[edit system services dhcp-local-server]** or the **[edit system services dhcp-local-server dhcpv6]** hierarchy levels. Instead configure subscriber authentication at the **[edit system services dhcp-local-server dhcpv6 group]** hierarchy level. For example:

```
[edit system services dhcp-local-server dhcpv6]
group v6-dhcp-client {
  authentication {
    password $ABC123;
    username-include {
      user-prefix StaticUser;
    }
  }
}
```

- Related Documentation**
- [Configuring a DHCPv6 Local Server for DHCPv6 over PPPoE on page 463](#)

Configuring Dual Stack for PPPoE Access Networks in Which DHCP Is Used

- [Configuring a DHCPv6 Local Server for DHCPv6 over PPPoE on page 463](#)
- [Configuring a PPPoE Dynamic Profile for Use with DHCP Addressing in a Dual-Stack Network on page 464](#)

Configuring a DHCPv6 Local Server for DHCPv6 over PPPoE

To layer DHCPv6 above the PPPoE IPv6 family (inet6), create a DHCPv6 local server and associate DHCPv6 with the PPPoE interfaces by adding the PPPoE interfaces to the DHCPv6 local server configuration. Specify static and dynamic PPPoE interfaces as follows:

- **Dynamic**—Use the pp0.0 (PPPoE) logical interface as a wildcard to indicate that a DHCPv6 binding can be made on top of a PPPoE interface.
- **Static**—Use unit numbers to explicitly specify static interfaces; for example, pp0.2000.

To configure a DHCPv6 local server:

1. Access the DHCPv6 local server configuration.

```
[edit]
user@host# edit system services dhcp-local-server dhcpv6
[edit system services dhcp-local-server dhcpv6]
```

2. Create a group for dynamic PPPoE interfaces and assign a name.

The group feature groups a set of interfaces and then applies a common DHCP configuration to the named interface group.

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit group group-pppoe
```

3. For dynamic PPPoE logical interfaces, add an interface.

```
[edit system services dhcp-local-server dhcpv6 group group-pppoe]
user@host# set interface pp0.0
```

4. For static PPPoE, add a range of interfaces.

```
[edit system services dhcp-local-server dhcpv6 group group-pppoe]
user@host# set interface pp0.2000 upto pp0.2999
```

- Related Documentation**
- [IPv4 and IPv6 Dual Stack in a PPPoE Access Network on page 413](#)
 - [Best Practice: Configuring Authentication for DHCP Subscribers on a PPPoE Access Network on page 461](#)

Configuring a PPPoE Dynamic Profile for Use with DHCP Addressing in a Dual-Stack Network

Configure a dynamic profile for IPv4 and IPv6 subscribers that access the network. The dynamic profile defines the attributes of the dynamic PPPoE logical subscriber interface.

To configure a PPPoE dynamic profile for both IPv4 and IPv6 subscribers:

1. Create and name the dynamic profile.

```
[edit]
user@host# edit dynamic profiles PPPOE-dyn-ipv4v6
```

2. If you are using routing instances, add a routing instance to the profile, and add an interface to the routing instance.
 - Specify the **\$junos-routing-instance** variable for the routing instance. The routing instance variable is dynamically replaced with the routing instance the accessing subscriber uses when connecting to the BNG.
 - Specify the **\$junos-interface-name** variable for the interface. The interface variable is dynamically replaced with the interface that the accessing subscriber uses when connecting to the BNG.

```
[edit dynamic profiles PPPOE-dyn-ipv4v6]
user@host# set routing-instances $junos-routing-instance interface
$junos-interface-name
```

3. Add a PPPoE logical interface (pp0) to the profile, and specify **\$junos-interface-unit** as the predefined variable to represent the logical unit number for the interface. The variable is dynamically replaced with the actual unit number supplied by the network when the subscriber logs in.

```
[edit dynamic profiles PPPOE-dyn-ipv4v6]
user@host# edit interfaces pp0 unit $junos-interface-unit
```

4. Configure the IPv4 family for the pp0 interface as follows:

- If you are not using routing instances, assign an unnumbered address. The unnumbered address enables the local address to be derived from the specified interface and allows IP processing on the interface without an explicit IP address assigned to the interface.

For example:

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6 interfaces pp0 unit "$junos-interface-unit"]
user@host# set family inet unnumbered-address lo0.0
```

- If you are using routing instances, assign the predefined variable **\$junos-loopback-interface**.

For example:

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6 interfaces pp0 unit "$junos-interface-unit"]
user@host# set family inet unnumbered-address $junos-loopback-interface
```

5. Configure the IPv6 family for the pp0 interface as follows:

- If you are not using routing instances, assign an unnumbered address that specifies the loopback interface. The unnumbered address enables the local address to be derived from the loopback interface and allows IP processing on the interface without an explicit IP address assigned to the interface.

For example:

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6 interfaces pp0 unit "$junos-interface-unit"]
user@host# set family inet6 unnumbered-address lo0.0
```

- If you are using routing instances, assign the predefined variable **\$junos-loopback-interface**.

For example:

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6 interfaces pp0 unit "$junos-interface-unit"]
user@host# set family inet6 unnumbered-address $junos-loopback-interface
```

6. Specify **\$junos-underlying-interface** as the predefined variable to represent the name of the underlying Ethernet interface on which the router creates the dynamic PPPoE logical interface. The variable is dynamically replaced with the actual name of the underlying interface.

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6 interfaces pp0 unit "$junos-interface-unit"]
user@host# set pppoe-options underlying-interface $junos-underlying-interface
```

7. Define the router to act as a PPPoE server when a PPPoE logical interface is dynamically created.

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6 interfaces pp0 unit "$junos-interface-unit"]
user@host# set pppoe-options server
```

8. (Optional) Configure the PPP authentication protocol for the pp0 interface. Specify either **chap** or **pap** (or both).

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6 interfaces pp0 unit "$junos-interface-unit"]
user@host# set ppp-options chap
user@host# set ppp-options pap
```

9. (Optional) Enable keepalives and set an interval for keepalives. We recommend an interval of 30 seconds. For example:

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6 interfaces pp0 unit "$junos-interface-unit"]
user@host# set keepalives interval 30
```

Related Documentation

- [Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with DHCPv6 on page 459](#)

Configuring Dual Stack for PPPoE Access Networks in Which NDRA Is Used

- [Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network on page 467](#)
- [Configuring a Static PPPoE Logical Interface for NDRA on page 469](#)
- [Configuring an Address-Assignment Pool Used for Router Advertisements on page 470](#)
- [Configuring Duplicate IPv6 Prefix Protection for Router Advertisement on page 471](#)

Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network

Configure a dynamic profile for IPv4 and IPv6 PPPoE subscribers that access the network. The dynamic profile defines the attributes of the dynamic PPPoE logical subscriber interface.

This dynamic profile is for configurations that use NDRA to assign a global IP address to the CPE WAN link.

To configure a PPPoE dynamic profile for NDRA:

1. Create and name the dynamic profile.

```
[edit]  
user@host# edit dynamic profiles PPPOE-dyn-ipv4v6-ndra
```

2. If you are using routing instances, add a routing instance to the profile and add an interface to the routing instance.
 - Specify the **\$junos-routing-instance** variable for the routing instance. The routing instance variable is dynamically replaced with the routing instance the accessing subscriber uses when connecting to the BNG.
 - Specify the **\$junos-interface-name** variable for the interface. The interface variable is dynamically replaced with the interface that the accessing subscriber uses when connecting to the BNG.

```
[edit dynamic profiles PPPOE-dyn-ipv4v6-ndra]  
user@host# set routing-instances $junos-routing-instance interface  
$junos-interface-name
```

3. Add a PPPoE logical interface (pp0) to the profile, and specify **\$junos-interface-unit** as the predefined variable to represent the logical unit number for the interface. The variable is dynamically replaced with the actual unit number supplied by the network when the subscriber logs in.

```
[edit dynamic profiles PPPOE-dyn-ipv4v6-ndra]
user@host# edit interfaces pp0 unit $junos-interface-unit
```

4. Configure the IPv4 family for the pp0 interface as follows:

- If you are not using routing instances, assign an unnumbered address. The unnumbered address enables the local address to be derived from the specified interface and allows IP processing on the interface without assigning an explicit IP address to the interface.

For example:

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6-ndra interfaces pp0 unit
"$junos-interface-unit"]
user@host# set family inet unnumbered-address lo0.0
```

- If you are using routing instances, assign the predefined variable **\$junos-loopback-interface**.

For example:

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6-ndra interfaces pp0 unit
"$junos-interface-unit"]
user@host# set family inet unnumbered-address $junos-loopback-interface
```

5. Configure the IPv6 family for the pp0 interface, and assign **\$junos-ipv6-address** as the predefined variable. Use this variable when you are using router advertisement with or without routing instances. This variable is replaced with the IPv6 address of the interface used for router advertisements.

```
[edit dynamic profiles PPPOE-dyn-ipv4v6-ndra interfaces pp0 unit
"$junos-interface-unit"]
user@host# set family inet6 address $junos-ipv6-address
```

6. Specify **\$junos-underlying-interface** as the predefined variable to represent the name of the underlying Ethernet interface on which the router creates the dynamic PPPoE logical interface. The variable is dynamically replaced with the actual name of the underlying interface.

```
[edit dynamic profiles PPPOE-dyn-ipv4v6-ndra pp0 interfaces pp0 unit
"$junos-interface-unit"]
user@host# set pppoe-options underlying-interface $junos-underlying-interface
```

7. Define the router to act as a PPPoE server when a PPPoE logical interface is dynamically created.

```
[edit dynamic profiles PPPOE-dyn-ipv4v6-ndra interfaces pp0 unit
"$junos-interface-unit"]
user@host# set pppoe-options server
```

8. (Optional) Configure the PPP authentication protocol that is used to identify and authenticate the CPE. Specify either **chap** or **pap** (or both).

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6-ndra interfaces pp0 unit
"$junos-interface-unit"]
user@host# set ppp-options chap
user@host# set ppp-options pap
```

9. (Optional) Enable keepalives and set an interval for keepalives. We recommend an interval of 30 seconds. For example:

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6-ndra interfaces pp0 unit
"$junos-interface-unit"]
user@host# set keepalives interval 30
```

10. Configure the router advertisement protocol.

- a. Access the router advertisement configuration.

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6-ndra]
user@host# edit protocols router-advertisement
```

- b. Specify the interface on which the NDRA configuration is applied. Assign **\$junos-interface-name** as the predefined variable. The variable is replaced with the actual name of the interface.

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6-ndra protocols router-advertisement]
user@host# edit interface $junos-interface-name
```

- c. Specify a prefix value contained in router advertisement messages sent to the CPE on interfaces created with this dynamic profile.

If you specify the **\$junos-ipv6-ndra-prefix** predefined variable, the actual value is obtained from a local pool or through AAA.

```
[edit dynamic-profiles PPPOE-dyn-ipv4v6-ndra protocols router-advertisement]
user@host# set prefix $junos-ipv6-ndra-prefix
```

Related Documentation

- [Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with NDRA on page 458](#)
- [IPv4 and IPv6 Dual Stack in a PPPoE Access Network on page 413](#)

Configuring a Static PPPoE Logical Interface for NDRA

To configure a static PPPoE logical interface for static NDRA configurations:

1. Specify the name and logical unit number of the interface.

```
[edit]
user@host# edit interfaces pp0 unit 1000
```

2. Configure a description for the interface.

```
[edit interfaces pp0 unit 1000]
user@host# set description "static IPv4v6 dual stack, NDRA"
```

3. Specify the family inet6 source address.

```
[edit interfaces pp0 unit 1000]
user@host# set family inet6 address 2001:db8:2040:2004::1.1.1/64
```

4. Configure an unnumbered address for family inet.

```
[edit interfaces pp0 unit 1000]
user@host# set family inet unnumbered-address lo0.0
```

5. Specify the underlying Ethernet interface.

```
[edit interfaces pp0 unit 1000]
user@host# set pppoe-options underlying-interface ge-1/0/0.1000
```

6. Define the router to act as a PPPoE server when the PPPoE logical interface is created.

```
[edit interfaces pp0 unit 1000]
user@host# set pppoe-options server
```

7. Access the router advertisement configuration, and specify the prefixes that the BNG sends in router advertisements for the static interface. Make sure that the prefixes match the source address configured for the static PPPoE logical interface configured in Step 3.

```
[edit]
user@host# edit protocols router-advertisement
user@host# set interface pp0.1000 prefix 2001:db8:2040:2004::/64
```

Related Documentation • [Best Practice: Static PPPoE Interfaces with NDRA on page 457](#)

Configuring an Address-Assignment Pool Used for Router Advertisements

If you are using local address-assignment pools to be used for router advertisement, create a pool and add IPv6 prefixes to the pool.

You must configure separate pools for DHCPv6 prefix delegation, DHCPv6 IA_NA, and router advertisement.

To configure an NDRA address-assignment pool.

1. Create a pool for IPv6 prefixes used by NDRA.

```
[edit]
user@host# edit access address-assignment pool ndra-2010 family inet6
```

2. Add IPv6 network prefixes to the pool.

```
[edit access address-assignment pool ndra-2010 family inet6]
user@host# set prefix 2001:db8::/64
```

3. Configure the name of the IPv6 address range and define the range. For NDRA pools, specify the range by setting a prefix length of 64.

```
[edit access address-assignment pool ndra-2010 family inet6]
user@host# set range ndra-range prefix-length 64
```

4. Specify that the address-assignment pool is used for NDRA.

```
[edit access address-assignment]
user@host# set neighbor-discovery-router-advertisement ndra-2010
```

- Related Documentation**
- [How NDRA Works in a Subscriber Access Network on page 386](#)
 - [Methods for Obtaining IPv6 Prefixes for NDRA on page 387](#)

Configuring Duplicate IPv6 Prefix Protection for Router Advertisement

If you are using AAA to supply IPv6 prefixes for router advertisement, you can enable duplicate prefix protection to prevent prefixes from being used more than once. If enabled, the following attributes received from external servers are checked:

- *Framed-IPv6-Prefix*
- *Framed-IPv6-Pool*

If a prefix matches a prefix in an address pool, the prefix is taken from the pool if it is available. If the prefix is already in use, it is rejected as unavailable. If the prefix length requested from the external server does not match the pool's prefix length exactly, the authentication request is denied. If configured, the Acct-Stop message will include a termination cause.

To configure duplicate prefix protection:

1. Enter the **access** configuration.

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

2. Enable duplicate prefix protection.

```
[edit access]  
user@host# address-protection
```

- Related Documentation**
- [How NDRA Works in a Subscriber Access Network on page 386](#)
 - [Duplicate Prefix Protection for NDRA on page 388](#)

Configuring Address Assignment Pools for DHCPv6

- [Configuring an Address-Assignment Pool for Use by DHCPv6 Prefix Delegation on page 473](#)
- [Configuring an Address-Assignment Pool for Use by DHCPv6 IA_NA on page 474](#)
- [Specifying the Delegated Address-Assignment Pool to Be Used for DHCPv6 Prefix Delegation on page 474](#)

Configuring an Address-Assignment Pool for Use by DHCPv6 Prefix Delegation

This procedure shows how to configure IPv6 local addresspools to allocate IPv6 prefixes for use by DHCPv6 prefix delegation.

You must configure separate pools for DHCPv6 prefix delegation, DHCPv6 IA_NA, and NDRA.

To configure the pool to be used for prefix delegation:

1. Create a pool and assign a name to it.

```
[edit access]
user@host# edit address-assignment pool v6-prefix-pool-2001
```

2. Under family inet6, add IPv6 prefixes to the pool.

```
[edit access address-assignment pool v6-prefix-pool-2001]
user@host# edit family inet6
user@host# set prefix 2001:db8:0000:0000:0000::/64
```

3. Configure the name of the IPv6 prefix range, and define the range by setting a prefix length of 64.

```
[edit access address-assignment pool v6-prefix-pool-2001 family inet6]
user@host# edit range prefix-range
user@host# set prefix-length 64
```

Related Documentation

- [Using DHCPv6 Prefix Delegation Overview on page 391](#)
- [Methods for Obtaining IPv6 Prefixes for DHCPv6 Prefix Delegation on page 394](#)

Configuring an Address-Assignment Pool for Use by DHCPv6 IA_NA

This procedure shows how to configure IPv6 local address pools to allocate global IPv6 addresses to the CPE WAN link.

You must configure separate pools for DHCPv6 prefix delegation, DHCPv6 IA_NA, and NDRA.

To configure the pool to be used for DHCPv6 IA_NA:

1. Create a pool and assign a name to it.

```
[edit access]
user@host# edit address-assignment pool v6-ia-na-pool
```

2. Under family inet6, add IPv6 network prefixes to the pool.

```
[edit access address-assignment pool v6-ia-na-pool]
user@host# edit family inet6
user@host# set prefix 2001:db8:0000::/64
```

3. Configure the name of the IPv6 address range, and define the range by setting a low and high range of /128 addresses.

```
[edit access address-assignment pool v6-ia-na-pool family inet6]
user@host# edit range v6-range
user@host# set low 2001:db8::1/128
user@host# set high 2001:db8::ffff:ffff/128
```

Related Documentation

- [Using DHCPv6 IA_NA to Provide IPv6 WAN Link Addressing Overview on page 389](#)
- [Methods for Obtaining IPv6 Global Addresses for DHCPv6 IA_NA on page 389](#)

Specifying the Delegated Address-Assignment Pool to Be Used for DHCPv6 Prefix Delegation

You can explicitly specify which address pool the BNG uses to assign IPv6 prefixes for use by DHCPv6 prefix delegation. This feature enables you to identify the address pool without using RADIUS or a network match.



NOTE: You can also use by Juniper Networks VSA 26-161 to specify the delegated address pool. The VSA-specified value takes precedence over the delegated-address statement.

To specify the pool to be used for prefix delegation:

1. Specify that you want to configure override options for DHCPv6 local server.

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit overrides
```

2. Specify the name of the delegated address pool.

```
[edit system services dhcp-local-server overrides]  
user@host# set delegated-pool paris-cable-12
```

- Related Documentation**
- [Using DHCPv6 Prefix Delegation Overview on page 391](#)
 - [Configuring an Address-Assignment Pool for Use by DHCPv6 Prefix Delegation on page 473](#)

Configuring the Dynamic Router Advertisement Protocol

- [Dynamic Router Advertisement Configuration Overview on page 477](#)

Dynamic Router Advertisement Configuration Overview

In a network deployment where router interfaces are configured statically, you might need to configure the Router Advertisement Protocol on only a small number of interfaces on which it might run. However, in a subscriber access network, static configuration of the Router Advertisement Protocol becomes impractical because the number of interfaces that potentially need the Router Advertisement Protocol increases substantially. In addition, deploying services in a dynamic environment requires dynamic modifications to interfaces as they are created.

Subscriber access supports the configuration of the Router Advertisement Protocol at the **[edit dynamic-profiles *profile-name* protocols]** hierarchy level. By specifying Router Advertisement Protocol statements within a dynamic profile, you can dynamically apply a Router Advertisement configuration when a subscriber connects to an interface using a particular access technology (for example, DHCP), enabling the subscriber to access a carrier (multicast) network.

To minimally configure the Router Advertisement Protocol requires that you include the **router-advertisement** statement at the **[edit dynamic-profiles *profile-name* protocols]** hierarchy level and the **interface** statement along with the *\$junos-interface-name* dynamic variable. All other statements are optional.



NOTE: Statements used for Router Advertisement Protocol configuration at the **[edit dynamic-profiles *profile-name* protocols]** hierarchy level are identical in function to those same statements used for static Router Advertisement Protocol configuration, with the exception of the **interface** and **prefix** statements, which use dynamic variables.

Related Documentation

- [Dynamic Profiles Overview](#)
- [Configuring Dynamic DHCP Client Access to a Multicast Network](#)
- [Configuring an Address-Assignment Pool Used for Router Advertisements on page 470](#)

CHAPTER 59

Examples: IPv4 and IPv6 Dual-Stack Designs

- [Example: Configuring a Dual Stack That Uses DHCPv6 IA_NA and DHCPv6 Prefix Delegation over PPPoE on page 479](#)
- [Example: Configuring a Dual Stack That Uses ND/RA and DHCPv6 Prefix Delegation Over PPPoE on page 502](#)
- [Example: Configuring a Dual Stack That Uses ND/RA Over PPPoE on page 523](#)

Example: Configuring a Dual Stack That Uses DHCPv6 IA_NA and DHCPv6 Prefix Delegation over PPPoE

- [Requirements on page 479](#)
- [Overview on page 479](#)
- [Configuration on page 482](#)
- [Verification on page 498](#)

Requirements

This example uses the following hardware and software components:

- MX Series 3D Universal Edge Router
- Junos OS Release 11.4 or later

Overview

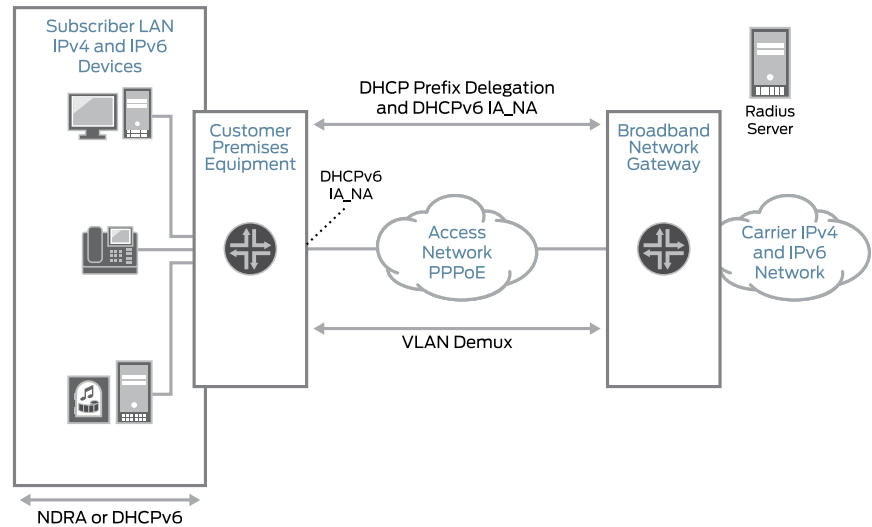
This design uses DHCPv6 IA_NA and DHCPv6 prefix delegation in your subscriber access network as follows:

- The access network is PPPoE.
- DHCPv6 IA_NA is used to assign a global IPv6 address on the WAN link. The address comes from a local pool that is specified using AAA RADIUS.
- DHCPv6 prefix delegation is used for subscriber LAN addressing. It used a delegated prefix from a local pool that is specified using AAA RADIUS.

- DHCPv4 is used for subscriber LAN addressing.
- DHCPv6 subscriber sessions are layered over an underlying PPPoE subscriber session.

Topology

Figure 16: PPPoE Subscriber Access Network with DHCPv6 IA_NA and DHCPv6 Prefix Delegation



8017755

Table 49 on page 480 describes the configuration components used in this example.

Table 49: Configuration Components Used in Dual Stack with DHCPv6 IA_NA and DHCPv6 Prefix Delegation

Configuration Component	Component Name	Purpose
Dynamic Profile	pppoe-subscriber-profile	Profile that creates a PPPoE logical interface when the subscriber logs in.
Interfaces	ge-0/2/5	Interface used for communication with the RADIUS server.
	ge-0/3/0	Underlying Ethernet interface.
	demux0	VLAN demux interface that runs over the underlying Ethernet interface.
	lo0	Loopback interface for use in the access network. The loopback interface is automatically used for unnumbered interfaces.

Table 49: Configuration Components Used in Dual Stack with DHCPv6 IA_NA and DHCPv6 Prefix Delegation (*continued*)

Configuration Component	Component Name	Purpose
Address-Assignment Pools	pool v4-pool	Pool that provides IPv4 addresses for the subscriber LAN.
	pool v6-ia-na-pool	Pool that provides a global IPv6 address to the CPE WAN link.
	pool v6-pd-pool	Pool that provides a pool of prefixes that are delegated to the CPE and used for assigning IPv6 global addresses on the subscriber LAN.

Configuration

- [Configuring a DHCPv6 Local Server for DHCPv6 over PPPoE on page 485](#)
- [Configuring a Dynamic Profile for the PPPoE Logical Interface on page 486](#)
- [Configuring a Loopback Interface on page 488](#)
- [Configuring a VLAN Demux Interface over an Ethernet Underlying Interface on page 490](#)
- [Configuring an Interface for Communication with RADIUS Server on page 492](#)
- [Specifying the BNG IP Address on page 492](#)
- [Configuring RADIUS Server Access on page 493](#)
- [Configuring RADIUS Server Access Profile on page 494](#)
- [Configuring Local Address-Assignment Pools on page 495](#)

CLI Quick Configuration

The following is the complete configuration for this example:

```
dynamic-profiles {
  pppoe-subscriber-profile {
    routing-instances {
      "$junos-routing-instance" {
        interface "$junos-interface-name";
      }
    }
    interfaces {
      pp0 {
        unit "$junos-interface-unit" {
          ppp-options {
            chap;
            pap;
          }
          pppoe-options {
            underlying-interface "$junos-underlying-interface";
            server;
          }
          keepalives interval 30;
          family inet {
            unnumbered-address "$junos-loopback-interface";
          }
          family inet6 {
            unnumbered-address "$junos-loopback-interface";
          }
        }
      }
    }
  }
}

system {
  services {
    dhcp-local-server {
      dhcpv6 {
        group v6-ppp-subscriber {
          interface pp0.0;
        }
      }
    }
  }
}
```

```

    }
  }
}
interfaces {
  ge-0/2/5 {
    gigether-options {
      no-auto-negotiation;
    }
    unit 0 {
      family inet {
        address 203.0.113.99/32;
      }
    }
  }
  ge-0/3/0 {
    hierarchical-scheduler maximum-hierarchy-levels 2;
    flexible-vlan-tagging;
    encapsulation flexible-ethernet-services;
    unit 1;
  }
  demux0 {
    unit 1 {
      proxy-arp;
      vlan-tags outer 1 inner 1;
      demux-options {
        underlying-interface ge-0/3/0;
      }
      family pppoe {
        duplicate-protection;
        dynamic-profile pppoe-subscriber-profile;
      }
    }
  }
  lo0 {
    unit 0 {
      family inet {
        address 203.0.113.1/32 {
          primary;
          preferred;
        }
      }
      family inet6 {
        address 2001:db8:0::1/128 {
          primary;
          preferred;
        }
      }
    }
  }
}
routing-options {
  router-id 203.0.113.0;
}
access {
  radius-server {

```

```
203.0.113.99 {
    secret "$ABC123$ABC123$ABC123"; ## SECRET-DATA
    timeout 45;
    retry 4;
    source-address 203.0.113.1;
}
}
profile Access-Profile {
    authentication-order radius;
    radius {
        authentication-server 203.0.113.99;
        accounting-server 203.0.113.99;
    }
    accounting {
        order [ radius none ];
        update-interval 120;
        statistics volume-time;
    }
}
address-assignment {
    pool v4-pool {
        family inet {
            network 203.0.113.161/32;
            range v4-range-0 {
                low 203.0.113.161;
                high 203.0.113.255;
            }
            dhcp-attributes {
                maximum-lease-time 99999;
            }
        }
    }
    pool v6-ia-na-pool {
        family inet6 {
            prefix 2001:db8:1000:0000::/64;
            range v6-range-0 {
                low 2001:db8:1000::1/128;
                high 2001:db8:1000::ffff:ffff/128;
            }
        }
    }
    pool v6-pd-pool {
        family inet6 {
            prefix 2001:db8:2012::/48;
            range v6-pd prefix-length 64;
        }
    }
}
address-protection;
}
```

Configuring a DHCPv6 Local Server for DHCPv6 over PPPoE

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

```
edit system services dhcp-local-server dhcpv6
edit group v6-ppp-subscriber
set interface pp0.0
```

Step-by-Step Procedure To layer DHCPv6 above the PPPoE IPv6 family (inet6), associate DHCPv6 with the PPPoE interfaces by adding the PPPoE interfaces to the DHCPv6 local server configuration. Because this example uses a dynamic PPPoE interface, we are using the pp0.0 (PPPoE) logical interface as a wildcard to indicate that a DHCPv6 binding can be made on top of a PPPoE interface.

To configure a DHCPv6 local server:

1. Access the DHCPv6 local server configuration.

```
[edit]
user@host# edit system services dhcp-local-server dhcpv6
```

2. Create a group for dynamic PPPoE interfaces and assign a name.

The group feature groups a set of interfaces and then applies a common DHCP configuration to the named interface group.

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit group v6-ppp-subscriber
```

3. Add an interface for dynamic PPPoE logical interfaces.

```
[edit system services dhcp-local-server dhcpv6 group v6-ppp-subscriber]
user@host# set interface pp0.0
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit]
user@host# show
system {
  services {
    dhcp-local-server {
      dhcpv6 {
        group v6-ppp-subscriber {
          interface pp0.0;
        }
      }
    }
  }
}
```

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

Configuring a Dynamic Profile for the PPPoE Logical Interface

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

```
edit dynamic-profiles pppoe-subscriber-profile
edit routing-instances $junos-routing-instance
set interface $junos-interface-name
exit
edit interfaces pp0 unit $junos-interface-unit
set family inet unnumbered-address "$junos-loopback-interface"
set family inet6 unnumbered-address "$junos-loopback-interface"
set pppoe-options underlying-interface "$junos-underlying-interface"
set pppoe-options server
set ppp-options pap
set ppp-options chap
set keepalives interval 30
```

Step-by-Step Procedure Create a dynamic profile for the PPPoE logical interface. This dynamic profile supports both IPv4 and IPv6 sessions on the same logical interface.

To configure the dynamic profile:

1. Create and name the dynamic profile.

```
[edit]
user@host# edit dynamic-profiles pppoe-subscriber-profile
```

2. Add a routing instance to the profile.

```
[edit dynamic-profiles pppoe-subscriber-profile]
user@host# edit routing-instances $junos-routing-instance
user@host# set interface $junos-interface-name
```

3. Configure a PPPoE logical interface (pp0) that is used to create logical PPPoE interfaces for the IPv4 and IPv6 subscribers.

```
[edit dynamic-profiles pppoe-subscriber-profile]
user@host# edit interfaces pp0
```

4. Specify **\$junos-interface-unit** as the predefined variable to represent the logical unit number for the **pp0** interface. The variable is dynamically replaced with the actual unit number supplied by the network when the subscriber logs in.

```
[edit dynamic-profiles pppoe-subscriber-profile interfaces pp0]
user@host# edit unit $junos-interface-unit
```

5. Specify **\$junos-underlying-interface** as the predefined variable to represent the name of the underlying Ethernet interface on which the router creates the dynamic PPPoE logical interface. The variable is dynamically replaced with the actual name of the underlying interface supplied by the network when the subscriber logs in.

```
[edit dynamic-profiles pppoe-subscriber-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# set pppoe-options underlying-interface $junos-underlying-interface
```

6. Configure the router to act as a PPPoE server when a PPPoE logical interface is dynamically created.

```
[edit dynamic-profiles pppoe-subscriber-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# set pppoe-options server
```
7. Configure the IPv4 family for the pp0 interface. Specify the unnumbered address to dynamically create loopback interfaces. Because the example uses routing instances, assign the predefined variable `$junos-loopback-interface`.

```
[edit dynamic-profiles pppoe-subscriber-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# set family inet unnumbered-address $junos-loopback-interface
```
8. Configure the IPv6 family for the pp0 interface. Specify the unnumbered address to dynamically create loopback interfaces. Because the example uses routing instances without router advertisement, assign the predefined variable `$junos-loopback-interface`.

```
[edit dynamic-profiles pppoe-subscriber-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# set family inet6 unnumbered-address $junos-loopback-interface
```
9. Configure one or more PPP authentication protocols for the pp0 interface.

```
[edit dynamic-profiles pppoe-subscriber-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# set ppp-options chap
user@host# set ppp-options pap
```
10. Enable keepalives and set an interval for keepalives. We recommend an interval of 30 seconds.

```
[edit dynamic-profiles pppoe-subscriber-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# set keepalives interval 30
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit dynamic-profiles pppoe-subscriber-profile]
user@host# show
routing-instances {
  "$junos-routing-instance" {
    interface "$junos-interface-name";
  }
}
interfaces {
  pp0 {
    unit "$junos-interface-unit" {
      ppp-options {
        chap;
        pap;
      }
      pppoe-options {
        underlying-interface "$junos-underlying-interface";
        server;
      }
    }
  }
}
```

```
    keepalives interval 30;
    family inet {
        unnumbered-address "$junos-loopback-interface";
    }
    family inet6 {
        unnumbered-address "$junos-loopback-interface";
    }
}
}
```

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

Configuring a Loopback Interface

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

```
edit interfaces lo0
set unit 0 family inet address 203.0.113.1/32 primary
set unit 0 family inet address 203.0.113.1/32 preferred
set unit 0 family inet6 address 2001:db8:0::1/128 primary
set unit 0 family inet6 address 2001:db8:0::1/128 preferred
```

Step-by-Step Procedure To configure a loopback interface:

1. Create the loopback interface and specify a unit number.

```
[edit]
user@host# edit interfaces lo0 unit 0
```

2. Configure the interface for IPv4.

```
[edit interfaces lo0 unit 0]
user@host# set family inet address 203.0.113.1/32 primary preferred
```

3. Configure the interface for IPv6.

```
[edit interfaces lo0 unit 0]
user@host# set family inet6 address 2001:db8:0::1/128 primary preferred
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit interfaces lo0]
user@host# show
unit 0 {
    family inet {
        address 203.0.113.1/32 {
            primary;
            preferred;
        }
    }
    family inet6 {
        address 2001:db8:0::1/128 {
            primary;
        }
    }
}
```

```
        preferred;  
    }  
}
```

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

Configuring a VLAN Demux Interface over an Ethernet Underlying Interface

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

```
edit interfaces
set ge-0/3/0 hierarchical-scheduler maximum-hierarchy-levels 2
set ge-0/3/0 flexible-vlan-tagging
set ge-0/3/0 encapsulation flexible-ethernet-services
exit
edit interfaces demux0 unit 1
set vlan-tags outer 1
set vlan-tags inner 1
set demux-options underlying-interface ge-0/3/0
set family pppoe dynamic-profile pppoe-subscriber-profile
set family pppoe duplicate-protection
set proxy-arp
```

Step-by-Step Procedure To configure a VLAN demux interface over an Ethernet underlying interface:

1. Configure the underlying Ethernet interface.

```
[edit]
user@host# edit interfaces ge-0/3/0
user@host# set flexible-vlan-tagging
user@host# set encapsulation flexible-ethernet-services
user@host# set hierarchical-scheduler maximum-hierarchy-levels 2
```
2. Create the VLAN demux interface, and specify a unit number.

```
[edit]
user@host# edit interfaces demux0 unit 1
```
3. Configure the VLAN tags.

```
[edit interfaces demux0 unit 1]
user@host# set vlan-tags outer 1 inner 1
```
4. Specify the underlying Ethernet interface.

```
[edit interfaces demux0 unit 1]
user@host# set demux-options underlying-interface ge-0/3/0
```
5. Specify the dynamic profile.

```
[edit interfaces demux0 unit 1]
user@host# set family pppoe dynamic-profile pppoe-subscriber-profile
```
6. Prevent multiple PPPoE sessions from being created for the same PPPoE subscriber on the same VLAN interface.

```
[edit interfaces demux0 unit 1]
user@host# set family pppoe duplicate-protection
```
7. (Optional) Specify that you want the demux interface to use Proxy ARP.

```
[edit interfaces demux0 unit 1]
```

```
user@host# set proxy-arp
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit interfaces]
user@host# show
ge-0/3/0 {
  hierarchical-scheduler maximum-hierarchy-levels 2;
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
}
demux0 {
  unit 1 {
    proxy-arp;
    vlan-tags outer 1 inner 1;
    demux-options {
      underlying-interface ge-0/3/0;
    }
    family pppoe {
      duplicate-protection;
      dynamic-profile pppoe-subscriber-profile;
    }
  }
}
```

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

Configuring an Interface for Communication with RADIUS Server

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

```
edit interfaces ge-0/2/5
set unit 0 family inet address 203.0.113.99
set gigether-options no-auto-negotiation
```

Step-by-Step Procedure To configure the interface:

1. Create the interface, specify a unit number, and configure the address.

```
[edit]
user@host# edit interfaces ge-0/2/5
```
2. Configure the interface for IPv4 and specify the address.

```
[edit interfaces ge-0/2/5]
user@host# set unit 0 family inet address 203.0.113.99
```
3. Specify that Gigabit Ethernet options are not automatically negotiated.

```
[edit interfaces ge-0/2/5]
user@host# set gigether-options no-auto-negotiation
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit interfaces ge-0/2/5]
user@host# show
gigether-options {
  no-auto-negotiation;
}
unit 0 {
  family inet {
    address 203.0.113.99/32;
  }
}
```

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

Specifying the BNG IP Address

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

```
edit routing-options
set router-id 203.0.113.0
```



BEST PRACTICE: We strongly recommend that you configure the BNG IP address, thereby avoiding unpredictable behavior if the interface address on a loopback interface changes.

Step-by-Step Procedure

To configure the IP address of the BNG:

1. Access the routing-options configuration.

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

2. Specify the IP address of the BNG.

```
[edit routing-options]
user@host# set router-id 203.0.113.0
```

Results

From configuration mode, confirm your configuration by entering the **show** command.

```
[edit routing-options]
user@host# show
router-id 203.0.113.0;
```

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

Configuring RADIUS Server Access

CLI Quick Configuration

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

```
edit access radius-server 203.0.113.99
set secret "$ABC123$ABC123$ABC123"
set timeout 45
set retry 4
set source-address 203.0.113.1
```

Step-by-Step Procedure

To configure RADIUS servers:

1. Create a RADIUS server configuration, and specify the address of the server.

```
[edit]
user@host# edit access radius-server 203.0.113.99
```

2. Configure the required secret (password) for the server. Secrets enclosed in quotation marks can contain spaces.

```
[edit access radius-server 203.0.113.99]
user@host# set secret "$ABC123$ABC123$ABC123"
```

3. Configure the source address that the BNG uses when it sends RADIUS requests to the RADIUS server.

```
[edit access radius-server 203.0.113.99]
```

```
user@host# set source address 203.0.113.1
```

4. (Optional) Configure the number of times that the router attempts to contact a RADIUS accounting server. You can configure the router to retry from 1 through 16 times. The default setting is 3 retry attempts.

```
[edit access radius-server 203.0.113.99]  
user@host# set retry 4
```

5. (Optional) Configure the length of time that the local router or switch waits to receive a response from a RADIUS server. By default, the router or switch waits 3 seconds. You can configure the timeout to be from 1 through 90 seconds.

```
[edit access radius-server 203.0.113.99]  
user@host# set timeout 45
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]  
user@host# show  
radius-server {  
  203.0.113.99 {  
    secret "$ABC123$ABC123$ABC123"; ## SECRET-DATA  
    timeout 45;  
    retry 4;  
    source-address 203.0.113.1;  
  }  
}
```

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

Configuring RADIUS Server Access Profile

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

```
edit access profile Access-Profile  
set authentication-order radius  
set radius authentication-server 203.0.113.99  
set radius accounting-server 203.0.113.99  
set accounting order radius  
set accounting order none  
set accounting update-interval 120  
set accounting statistics volume-time
```

Step-by-Step Procedure To configure a RADIUS server access profile:

1. Create a RADIUS server access profile.

```
[edit]  
user@host# edit access profile Access-Profile
```
2. Specify the order in which authentication methods are used.

```
[edit access profile Access-Profile]
```

```
user@host# set authentication-order radius
```

3. Specify the address of the RADIUS server used for authentication and the server used for accounting.

```
[edit access profile Access-Profile]
user@host# set radius authentication-server 203.0.113.99
user@host# set radius accounting-server 203.0.113.99
```

4. Configure RADIUS accounting values for the access profile.

```
[edit access profile Access-Profile]
user@host# set accounting order [ radius none ]
user@host# set accounting update-interval 120
user@host# set accounting statistics volume-time
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]
user@host# show
profile Access-Profile {
  authentication-order radius;
  radius {
    authentication-server 203.0.113.99;
    accounting-server 203.0.113.99;
  }
  accounting {
    order [ radius none ];
    update-interval 120;
    statistics volume-time;
  }
}
```

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

Configuring Local Address-Assignment Pools

CLI Quick Configuration

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

```
edit access address-assignment
set pool v4-pool family inet network 203.0.113.161/32
set pool v4-pool family inet range v4-range-0 low 203.0.113.161
set pool v4-pool family inet range v4-range-0 high 203.0.113.255
set pool v4-pool family inet dhcp-attributes maximum-lease-time 99999
set pool v6-ia-na-pool family inet6 prefix 2001:db8:1000:0000::/64
set pool v6-ia-na-pool family inet6 range v6-range-0 low 2001:db8:1000::1/128
set pool v6-ia-na-pool family inet6 range v6-range-0 high 2001:db8:1000::ffff:ffff/128
set pool v6-pd-pool family inet6 prefix 2001:db8:2012::/48
set pool v6-pd-pool family inet6 range v6-pd prefix-length 64
```

Step-by-Step Procedure Configure three address-assignment pools for DHCPv4, DHCPv6 IA_NA, and DHCPv6 prefix delegation.

To configure the address-assignment pools:

1. Configure the address-assignment pool for DHCPv4.

```
[edit]
user@host# edit access address-assignment pool v4-pool
user@host# edit family inet
user@host# set network 203.0.113.161
user@host# set range v4-range-0 low 203.0.113.161
user@host# set range v4-range-0 high 203.0.113.255
user@host# set dhcp-attributes maximum-lease-time 99999
```

2. Configure the address-assignment pool for DHCPv6 IA_NA.

```
[edit]
user@host# edit access address-assignment pool v6-ia-na-pool
user@host# edit family inet6
user@host# set prefix 2001:db8:1000:0000::/64
user@host# set range v6-range-0 low 2001:db8:1000::1/128
user@host# set range v6-range-0 high 2001:db8:1000::ffff:ffff/128
```

3. Configure the address-assignment pool for DHCPv6 prefix delegation.

```
[edit]
user@host# edit access address-assignment pool v6-pd-pool
user@host# edit family inet6
user@host# set prefix 2001:db8:2012::/48
user@host# set range v6-pd prefix-length 64
```

4. (Optional) Enable duplicate prefix protection.

```
[edit access]
user@host# set address-protection
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]
user@host# show
address-assignment {
  pool v4-pool {
    family inet {
      network 203.0.113.161/32;
      range v4-range-0 {
        low 203.0.113.161;
        high 203.0.113.255;
      }
      dhcp-attributes {
        maximum-lease-time 99999;
      }
    }
  }
  pool v6-ia-na-pool {
    family inet6 {
      prefix prefix 2001:db8:1000:0000::/64 ;
      range v6-range-0 {
```

```
        low 2001:db8:1000::1/128;
        high 2001:db8:1000::ffff:ffff/128;
    }
}
pool v6-pd-pool {
    family inet6 {
        prefix 2001:db8:2012::/48;
        range v6-pd prefix-length 64;
    }
}
address-protection;
}
```

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

Verification

Confirm that the configuration is working properly.

- [Verifying Active Subscriber Sessions on page 498](#)
- [Verifying Both IPv4 and IPv6 Address in Correct Routing Instance on page 498](#)
- [Verifying Dynamic Subscriber Sessions on page 499](#)
- [Verifying DHCPv6 Address Pools Used for DHCPv6 Prefix Delegation on page 500](#)
- [Verifying DHCPv6 Address Bindings on page 501](#)
- [Verifying PPP Options Negotiated with the Remote Peer on page 502](#)

Verifying Active Subscriber Sessions

Purpose Verify active subscriber sessions.

Action From operational mode, enter the **show subscribers summary** command.

```
user@host>show subscribers summary
Subscribers by State
  Active: 2
  Total: 2
```

```
Subscribers by Client Type
  DHCP: 1
  PPPoE: 1
  Total: 2
```

Meaning The fields under **Subscribers by State** show the number of active subscribers.

The fields under **Subscribers by Client Type** show the number of active DHCP and PPPoE subscriber sessions.

Verifying Both IPv4 and IPv6 Address in Correct Routing Instance

Purpose Verify that the subscriber has both an IPv4 and IPv6 address and is placed in the correct routing instance.

Action From operational mode, enter the **show subscribers** command.

```
user@host>show subscribers
Interface          IP Address/VLAN ID    User Name          LS:RI
pp0.1073741825     203.0.113.162         SBRSTATICUSER     default:default
pp0.1073741825     2001:db8:1000::1      default:default
```

Meaning The **Interface** field shows that two subscriber sessions are running on the same interface. The **IP Address** field shows that one session is assigned an IPv4 address, and the second session is assigned an IPv6 address by DHCPv6 IA_NA.

The **LS:RI** field shows that the subscriber is placed in the correct routing instance and that traffic can be sent and received.

Verifying Dynamic Subscriber Sessions

Purpose Verify dynamic PPPoE and DHCPv6 subscriber sessions. In this example configuration the DHCPv6 subscriber session should be layered over the underlying PPPoE subscriber session.

Action From operational mode, enter the **show subscribers detail** command.

```
user@host>show subscribers detail
Type: PPPoE
User Name: SBRSTATICUSER
IP Address: 203.0.113.162
IP Netmask: 255.0.0.0
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: pppoe-subscriber-profile
MAC Address: 00:00:5E:00:53:01
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-12-08 09:11:41 PST

Type: DHCP
IPv6 Address: 2001:db8:1000::1
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:5E:00:53:31
State: Active
Radius Accounting ID: 3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-12-08 09:12:11 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 01 02 00 00 01
00 06 00 02 00 03 00 03 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

Meaning When a subscriber has logged in and started both an IPv4 and an IPv6 session, the output shows the active underlying PPPoE session and the active DHCPv6 session.

The **Session ID** field for the PPPoE session is 2. The **Underlying Session ID** for the DHCP session is 2, which shows that the PPPoE session is the underlying session.

Verifying DHCPv6 Address Pools Used for DHCPv6 Prefix Delegation

Purpose Verify the delegated address pool used for DHCPv6 prefix delegation and the length of the IPv6 prefix that was delegated to the CPE.

Action From operational mode, enter the **show subscribers extensive** command.

```
user@host>show subscribers extensive
Type: PPPoE
User Name: SBRSTATICUSER
IP Address: 203.0.113.162
IP Netmask: 255.0.0.0
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: pppoe-subscriber-profile
MAC Address: 00:00:5E:00:53:31
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-12-08 09:11:41 PST
IPv6 Delegated Address Pool: v6-na-pool

Type: DHCP
IPv6 Address: 2001:db8:1000::1
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:5E:00:53:31
State: Active
Radius Accounting ID: 3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-12-08 09:12:11 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 01 02 00 00 01
00 06 00 02 00 03 00 03 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
IPv6 Delegated Address Pool: v6-na-pool
IPv6 Delegated Network Prefix Length: 64
```

Meaning The **IPv6 Delegated Address Pool** field shows the name of the pool that DHCPv6 used to assign the IPv6 address for this subscriber session.

Verifying DHCPv6 Address Bindings

Purpose Display the address bindings in the client table on the DHCPv6 local server.

Action From operational mode, enter the **show dhcpv6 server binding detail** command.

```
user@host>show dhcpv6 server binding detail
Session Id: 580547
  Client IPv6 Address:      2001:db8:1000::4/128
  Client DUID:              LL0x1-00:01:02:00:00:01
  State:                    BOUND(DHCPV6_LOCAL_SERVER_STATE_BOUN
D)
  Lease Expires:            2012-01-05 07:06:04 PST
  Lease Expires in:         82943 seconds
  Lease Start:              2012-01-04 07:06:04 PST
  Last Packet Received:     2012-01-04 07:06:04 PST
  Incoming Client Interface: pp0.1073926645
  Server Ip Address:        0.0.0.0
  Client Pool Name:         v6-na-pool-0
  Client Id Length:         10
  Client Id:                /0x00030001/0x00010200/0x0001
```

Meaning The **Client IPv6 Address** field shows the /128 address that was assigned to the CPE WAN link using DHCPv6 IA_NA.

The **Client Pool Name** field shows the name of the address pool that was used to assign the **Client IPv6 Address**.

Verifying PPP Options Negotiated with the Remote Peer

Purpose Verify PPP options negotiated with the remote peer.

Action From operational mode, enter the **show ppp interface *interface* extensive** command.

```
user@host>show ppp interface pp0.1073741825 extensive
  Session pp0.1073926645, Type: PPP, Phase: Network
    LCP
      State: Opened
      Last started: 2012-01-04 07:05:33 PST
      Last completed: 2012-01-04 07:05:33 PST
      Negotiated options:
        Authentication protocol: pap, Magic number: 191301485, Local MRU: 1492,
        Peer MRU: 65531
    Authentication: PAP
      State: Grant
      Last started: 2012-01-04 07:05:33 PST
      Last completed: 2012-01-04 07:05:33 PST
    IPCP
      State: Opened
      Last started: 2012-01-04 07:05:34 PST
      Last completed: 2012-01-04 07:05:34 PST
      Negotiated options:
        Local address: 203.0.113.1, Remote address: 203.0.113.162
    IPV6CP
      State: Opened
      Last started: 2012-01-04 07:05:34 PST
      Last completed: 2012-01-04 07:05:34 PST
      Negotiated options:
        Local interface identifier: 2a0:a50f:fc71:e049,
        Remote interface identifier: 201:2ff:fe00:1
```

Meaning The output shows the PPP options that were negotiated with the remote peer.

Under IPCP, the **Negotiated options** field shows the IPv4 local and remote addresses that were negotiated by IPCP.

Under IPV6CP, the **Negotiated options** field shows the IPv6 local and remote interface identifier that were negotiated by IPV6CP.

- Related Documentation**
- [Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview on page 395](#)
 - [Design 1: IPv6 Addressing with DHCPv6 IA_NA and DHCPv6 Prefix Delegation on page 401](#)

Example: Configuring a Dual Stack That Uses ND/RA and DHCPv6 Prefix Delegation Over PPPoE

- [Requirements on page 503](#)
- [Overview on page 503](#)
- [Configuration on page 505](#)
- [Verification on page 519](#)

Requirements

This example uses the following hardware and software components:

- MX Series 3D Universal Edge Router
- Junos OS Release 11.4 or later

Overview

This design uses ND/RA and DHCPv6 prefix delegation in your subscriber access network as follows:

- The access network is PPPoE.
- ND/RA is used to assign a global IPv6 address on the WAN link. The prefixes used in router advertisements come from a local pool that is specified using AAA RADIUS.
- DHCPv6 prefix delegation is used for subscriber LAN addressing. It used a delegated prefix from a local pool that is specified using AAA RADIUS.
- DHCPv4 is used for subscriber LAN addressing.
- DHCPv6 subscriber sessions are layered over an underlying PPPoE subscriber session.

Topology

Figure 17: PPPoE Subscriber Access Network with ND/RA and DHCPv6 Prefix Delegation

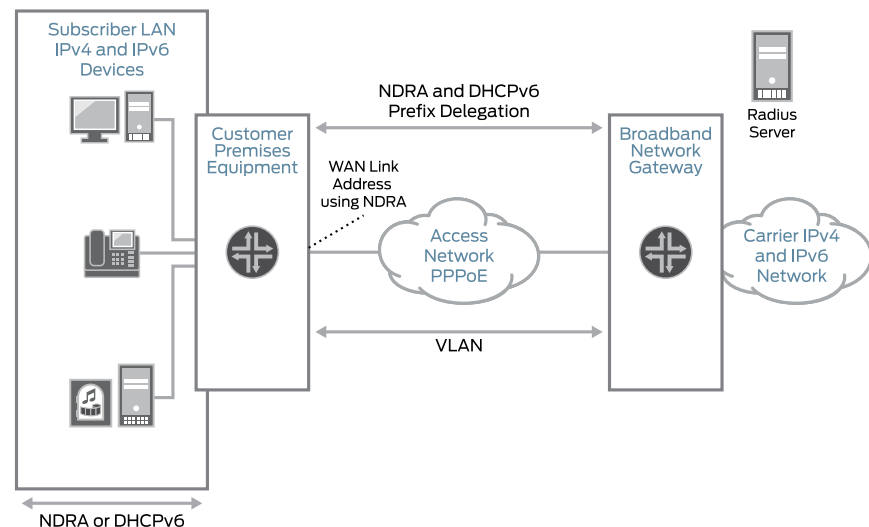


Table 50 on page 504 describes the configuration components used in this example.

Table 50: Configuration Components Used in Dual Stack with ND/RA and DHCPv6 Prefix Delegation

Configuration Component	Component Name	Purpose
Dynamic Profiles	DS-dyn-ipv4v6-ndra	Profile that creates a PPPoE logical interface when the subscriber logs in.
Interfaces	ge-3/3/0	Underlying Ethernet interface.
	lo0	Loopback interface for use in the access network. The loopback interface is automatically used for unnumbered interfaces.
Address-Assignment Pools	default-ipv4-pool-2	Pool that provides IPv4 addresses for the subscriber LAN.
	ndra-2010	Pool that provides IPv6 prefixes used in router advertisements. These prefixes are used to create a global IPv6 address that is assigned to the CPE WAN link.
	delegated-pool	Pool that provides a pool of prefixes that are delegated to the CPE and are used for assigning IPv6 global addresses on the subscriber LAN.

Configuration

- [Configuring a DHCPv6 Local Server for DHCPv6 over PPPoE on page 507](#)
- [Configuring a Dynamic Profile for the PPPoE Logical Interface on page 508](#)
- [Configuring a Loopback Interface on page 511](#)
- [Configuring a Static Underlying Ethernet Interface for Dynamic PPPoE Subscriber Interfaces on page 512](#)
- [Specifying the BNG IP Address on page 513](#)
- [Configuring RADIUS Server Access on page 513](#)
- [Configuring RADIUS Server Access Profile on page 515](#)
- [Specifying the RADIUS Server Access Profile to Use on page 516](#)
- [Configuring Local Address-Assignment Pools on page 516](#)
- [Specifying the Address-Assignment Pool to Be Used for DHCPv6 Prefix Delegation on page 518](#)

CLI Quick Configuration

The following is the complete configuration for this example:

```
dynamic-profiles {
  DS-dyn-ipv4v6-ra {
    interfaces {
      pp0 {
        unit "$junos-interface-unit" {
          ppp-options {
            chap;
            pap;
          }
          pppoe-options {
            underlying-interface "$junos-underlying-interface";
            server;
          }
          keepalives interval 30;
          family inet {
            unnumbered-address lo0.0;
          }
          family inet6 {
            address $junos-ipv6-address;
          }
        }
      }
    }
  }
}
protocols {
  router-advertisement {
    interface "$junos-interface-name" {
      prefix $junos-ipv6-ndra-prefix;
    }
  }
}
}
system {
```

```
services {
  dhcp-local-server {
    dhcpv6 {
      overrides {
        delegated-pool dhcpv6-pd-pool;
      }
      group DHCPv6-over-pppoe {
        interface pp0.0;
      }
    }
  }
}
access-profile Access-Profile;
interfaces {
  ge-3/3/0 {
    unit 1109 {
      description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd";
      encapsulation ppp-over-ether;
      vlan-id 1109;
      pppoe-underlying-options {
        duplicate-protection;
        dynamic-profile DS-dyn-ipv4v6-ra;
      }
    }
  }
  lo0 {
    description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd";
    unit 0 {
      family inet {
        address 192.0.2.77/32 {
          primary;
        }
      }
      family inet6 {
        address 2001:db8:2030:0:0::1/64 {
          primary;
        }
      }
    }
  }
}
routing-options {
  router-id 203.0.113.0;
}
access {
  radius-server {
    203.0.113.99 {
      secret "$ABC123$ABC123ABC123"; ## SECRET-DATA
      timeout 45;
      retry 4;
      source-address 203.0.113.1;
    }
  }
  profile Access-Profile {
    authentication-order radius;
  }
}
```

```

radius {
    authentication-server 203.0.113.99;
    accounting-server 203.0.113.99;
}
accounting {
    order [ radius none ];
    update-interval 120;
    statistics volume-time;
}
}
address-assignment {
    pool default-ipv4-pool-2 {
        family inet {
            network 203.0.113.10/16;
            range r5 {
                low 203.0.113.11;
                high 203.0.113.150;
            }
        }
    }
    pool delegated-pool {
        family inet6 {
            prefix 2001:db8:2040:2000::/48;
            range r1 prefix-length 64;
        }
    }
    pool ndra-2010 {
        family inet6 {
            prefix 2001:db8:2010:0:0:0::/48;
            range L prefix-length 64;
        }
    }
}
address-protection;
}

```

Configuring a DHCPv6 Local Server for DHCPv6 over PPPoE

CLI Quick Configuration

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

```

edit system services dhcp-local-server dhcpv6
edit group DHCPv6-over-pppoe
set interface pp0.0

```

Step-by-Step Procedure To layer DHCPv6 above the PPPoE IPv6 family (inet6), associate DHCPv6 with the PPPoE interfaces by adding the PPPoE interfaces to the DHCPv6 local server configuration. Because this example uses a dynamic PPPoE interface, we are using the pp0.0 (PPPoE) logical interface as a wildcard to indicate that a DHCPv6 binding can be made on top of a PPPoE interface.

To configure a DHCPv6 local server:

1. Access the DHCPv6 local server configuration.

```
[edit]
user@host# edit system services dhcp-local-server dhcpv6
```

2. Create a group for dynamic PPPoE interfaces and assign a name.

The group feature groups a set of interfaces and then applies a common DHCP configuration to the named interface group.

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit group DHCPv6-over-pppoe
```

3. Add an interface for dynamic PPPoE logical interfaces.

```
[edit system services dhcp-local-server dhcpv6 group DHCPv6-over-pppoe]
user@host# set interface pp0.0
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit]
user@host# show
system {
  services {
    dhcp-local-server {
      dhcpv6 {
        group DHCPv6-over-pppoe {
          interface pp0.0;
        }
      }
    }
  }
}
```

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

Configuring a Dynamic Profile for the PPPoE Logical Interface

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

```
edit dynamic-profiles DS-dyn-ipv4v6-ra
edit interfaces pp0 unit $junos-interface-unit
set family inet unnumbered-address lo0.0
set family inet6 address $junos-ipv6-address
set pppoe-options underlying-interface "$junos-underlying-interface"
```

```

set pppoe-options server
set ppp-options pap
set ppp-options chap
set keepalives interval 30
up 3
edit protocols router-advertisement
edit interface $junos-interface-name
set prefix $junos-ipv6-ndra-prefix

```

Step-by-Step Procedure Create a dynamic profile for the PPPoE logical interface. This dynamic profile supports both IPv4 and IPv6 sessions on the same logical interface.

To configure the dynamic profile:

1. Create and name the dynamic profile.

```

[edit]
user@host# edit dynamic-profiles DS-dyn-ipv4v6-ra

```

2. Configure a PPPoE logical interface (pp0) that is used to create logical PPPoE interfaces for the IPv4 and IPv6 subscribers.

```

[edit dynamic-profiles DS-dyn-ipv4v6-ra]
user@host# edit interfaces pp0

```

3. Specify **\$junos-interface-unit** as the predefined variable to represent the logical unit number for the **pp0** interface. The variable is dynamically replaced with the actual unit number supplied by the network when the subscriber logs in.

```

[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0]
user@host# edit unit $junos-interface-unit

```

4. Specify **\$junos-underlying-interface** as the predefined variable to represent the name of the underlying Ethernet interface on which the router creates the dynamic PPPoE logical interface. The variable is dynamically replaced with the actual name of the underlying interface supplied by the network when the subscriber logs in.

```

[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set pppoe-options underlying-interface $junos-underlying-interface

```

5. Configure the router to act as a PPPoE server when a PPPoE logical interface is dynamically created.

```

[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set pppoe-options server

```

6. Configure the IPv4 family for the pp0 interface. Specify the unnumbered address to dynamically create loopback interfaces.

```

[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set family inet unnumbered-address lo0.0

```

7. Configure the IPv6 family for the pp0 interface. Because the example uses router advertisement, assign the predefined variable **\$junos-ipv6-address**.

```

[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set family inet6 unnumbered-address $junos-ipv6-address

```

8. Configure one or more PPP authentication protocols for the pp0 interface.

- ```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set ppp-options chap
user@host# set ppp-options pap
```
9. Enable keepalives and set an interval for keepalives. We recommend an interval of 30 seconds.
 

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set keepalives interval 30
```
  10. Access the router advertisement configuration.
 

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra]
user@host# edit protocols router-advertisement
```
  11. Specify the interface on which the ND/RA configuration is applied.
 

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra protocols router-advertisement]
user@host# edit interface $junos-interface-name
```
  12. Specify a prefix value contained in router advertisement messages sent to the CPE on interfaces created with this dynamic profile. If you specify the \$junos-ipv6-ndra-prefix predefined variable, the actual value is obtained from a local pool or through AAA.
 

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra protocols router-advertisement interface
"$junos-interface-name"]
user@host# set prefix $junos-ipv6-ndra-prefix
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra]
user@host# show
interfaces {
 pp0 {
 unit "$junos-interface-unit" {
 ppp-options {
 chap;
 pap;
 }
 pppoe-options {
 underlying-interface "$junos-underlying-interface";
 server;
 }
 keepalives interval 30;
 family inet {
 unnumbered-address lo0.0;
 }
 family inet6 {
 address $junos-ipv6-address;
 }
 }
 }
}
protocols {
 router-advertisement {
 interface "$junos-interface-name" {
 prefix $junos-ipv6-ndra-prefix;
 }
 }
}
```

```

 }
 }
}

```

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

### Configuring a Loopback Interface

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

```

edit interfaces lo0 unit 0
set family inet address 192.0.2.77/32 primary
set family inet6 address 2001:db8:2030:0:0::1/64 primary

```

**Step-by-Step Procedure** To configure a loopback interface:

1. Create the loopback interface and specify a unit number.

```

[edit]
user@host# edit interfaces lo0 unit 0

```

2. Configure the interface for IPv4.

```

[edit interfaces lo0 unit 0]
user@host# set family inet address 192.0.2.77/32 primary

```

3. Configure the interface for IPv6.

```

[edit interfaces lo0 unit 0]
user@host# set family inet6 address 2001:db8:2030:0:0::1/64 primary

```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```

[edit interfaces lo0]
user@host# show
unit 0 {
 family inet {
 address 192.0.2.77/32 {
 primary;
 }
 }
 family inet6 {
 address 2001:db8:2030:0:0::1/64 {
 primary;
 }
 }
}

```

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

## Configuring a Static Underlying Ethernet Interface for Dynamic PPPoE Subscriber Interfaces

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

```
edit interfaces ge-3/3/0 unit 1109
set description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd"
set encapsulation ppp-over-ether
set vlan-id 1109
set pppoe-underlying-options duplicate-protection
set pppoe-underlying-options dynamic-profile DS-dyn-ipv4v6-ra
```

**Step-by-Step Procedure** To configure the underlying Ethernet interface:

1. Specify the name and logical unit number of the static underlying Ethernet interface to which you want to attach the IPv4 and IPv6 dynamic profile.

```
[edit]
user@host# edit interfaces ge-3/3/0 unit 1109
```

2. Configure a description for the interface.

```
[edit interfaces ge-3/3/0 unit 1109]
user@host# set description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd"
```

3. Configure PPPoE encapsulation on the underlying interface.

```
[edit interfaces ge-3/3/0 unit 1109]
user@host# set encapsulation ppp-over-ether
```

4. Configure the VLAN Id.

```
[edit interfaces ge-3/3/0 unit 1109]
user@host# set vlan-id 1109
```

5. Attach the dynamic profile to the underlying interface.

```
[edit interfaces ge-3/3/0 unit 1109]
user@host# set pppoe-underlying-options dynamic-profile DS-dyn-ipv4v6-ra
```

6. (Optional) Prevent multiple PPPoE sessions from being created for the same PPPoE subscriber on the same VLAN interface.

```
[edit interfaces ge-3/3/0 unit 1109]
user@host# set pppoe-underlying-options duplicate-protection
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit interfaces]
user@host# show
ge-3/3/0 {
 unit 1109 {
 description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd";
 encapsulation ppp-over-ether;
 vlan-id 1109;
```

```

pppoe-underlying-options {
 duplicate-protection;
 dynamic-profile DS-dyn-ipv4v6-ra;
}
}
}

```

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

### Specifying the BNG IP Address

#### CLI Quick Configuration

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

```

edit routing-options
set router-id 203.0.113.0

```



**BEST PRACTICE:** We strongly recommend that you configure the BNG IP address to avoid unpredictable behavior if the interface address on a loopback interface changes.

#### Step-by-Step Procedure

To configure the IP address of the BNG:

1. Access the routing-options configuration.

```

[edit]
user@host# edit routing-options

```

2. Specify the IP address of the BNG.

```

[edit routing-options]
user@host# set router-id 203.0.113.0

```

#### Results

From configuration mode, confirm your configuration by entering the **show** command.

```

[edit routing-options]
user@host# show
router-id 203.0.113.0;

```

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

### Configuring RADIUS Server Access

#### CLI Quick Configuration

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

```

edit access radius-server 203.0.113.99
set secret "$ABC123$ABC123ABC123"

```

```
set timeout 45
set retry 4
set source-address 203.0.113.1
```

**Step-by-Step Procedure** To configure RADIUS servers:

**Step-by-Step Procedure** To configure RADIUS servers:

1. Create a RADIUS server configuration, and specify the address of the server.  

```
[edit]
user@host# edit access radius-server 203.0.113.99
```
2. Configure the required secret (password) for the server. Secrets enclosed in quotation marks can contain spaces.  

```
[edit access radius-server 203.0.113.99]
user@host# set secret "$ABC123$ABC123ABC123"
```
3. Configure the source address that the BNG uses when it sends RADIUS requests to the RADIUS server.  

```
[edit access radius-server 203.0.113.99]
user@host# set source address 203.0.113.1
```
4. (Optional) Configure the number of times that the router attempts to contact a RADIUS accounting server. You can configure the router to retry from 1 through 16 times. The default setting is 3 retry attempts.  

```
[edit access radius-server 203.0.113.99]
user@host# set retry 4
```
5. (Optional) Configure the length of time that the local router or switch waits to receive a response from a RADIUS server. By default, the router or switch waits 3 seconds. You can configure the timeout to be from 1 through 90 seconds.  

```
[edit access radius-server 203.0.113.99]
user@host# set timeout 45
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]
user@host# show
radius-server {
 203.0.113.99 {
 secret "$ABC123$ABC123ABC123"; ## SECRET-DATA
 timeout 45;
 retry 4;
 source-address 203.0.113.1;
 }
}
```

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

### Configuring RADIUS Server Access Profile

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

```
edit access profile Access-Profile
set authentication-order radius
set radius authentication-server 203.0.113.99
set radius accounting-server 203.0.113.99
set accounting order radius
set accounting order none
set accounting update-interval 120
set accounting statistics volume-time
top
set access-profile Access-Profile
```

**Step-by-Step Procedure** To configure a RADIUS server access profile:

1. Create a RADIUS server access profile.  

```
[edit]
user@host# edit access profile Access-Profile
```
2. Specify the order in which authentication methods are used.  

```
[edit access profile Access-Profile]
user@host# set authentication-order radius
```
3. Specify the address of the RADIUS server used for authentication and the server used for accounting.  

```
[edit access profile Access-Profile]
user@host# set radius authentication-server 203.0.113.99
user@host# set radius accounting-server 203.0.113.99
```
4. Configure RADIUS accounting values for the access profile.  

```
[edit access profile Access-Profile]
user@host# set accounting order [radius none]
user@host# set accounting update-interval 120
user@host# set accounting statistics volume-time
```
5. At the top of the configuration hierarchy, enter the following command to enable the access profile.  

```
[edit]
user@host# set access-profile Access-Profile
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]
user@host# show
profile Access-Profile {
 authentication-order radius;
 radius {
```

```
authentication-server 203.0.113.99;
accounting-server 203.0.113.99;
}
accounting {
 order [radius none];
 update-interval 120;
 statistics volume-time;
}
}
```

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

---

### Specifying the RADIUS Server Access Profile to Use

**CLI Quick Configuration** To quickly configure this example, copy the following command and paste it into the CLI at the **[edit]** hierarchy level.

```
set access-profile Access-Profile
```

**Step-by-Step Procedure** To specify the RADIUS server access profile to use for authentication:

1. Specify the access profile.

```
[edit]
user@host# set access-profile Access-Profile
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit]
user@host# show
...
access-profile Access-Profile;
...
```

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

---

### Configuring Local Address-Assignment Pools

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

```
edit access
set address-assignment pool default-ipv4-pool-2 family inet network 203.0.113.10/16
set address-assignment pool default-ipv4-pool-2 family inet range r5 low 203.0.113.11
set address-assignment pool default-ipv4-pool-2 family inet range r5 high 203.0.113.150
set address-assignment pool delegated-pool family inet6 prefix
 2001:db8:2040:2000:2000::/48
set address-assignment pool delegated-pool family inet6 range r1 prefix-length 64
set address-assignment pool ndra-2010 family inet6 prefix 2001:db8:2010:0:0:0::/48
set address-assignment pool ndra-2010 family inet6 range L prefix-length 64
set address-protection
```

**Step-by-Step Procedure** Configure three address-assignment pools for DHCPv4, DHCPv6 prefix delegation, and ND/RA.

To configure the address-assignment pools:

1. Configure the address-assignment pool for DHCPv4.
 

```
[edit]
user@host# edit access address-assignment pool default-ipv4-pool-2
user@host# edit family inet
user@host# set network 203.0.113.10/16
user@host# set range r5 low 203.0.113.11
user@host# set range r5 high 203.0.113.150
```
2. Configure the address-assignment pool for DHCPv6 prefix delegation
 

```
[edit]
user@host# edit access address-assignment pool delegated-pool
user@host# edit family inet6
user@host# set prefix 2001:db8:2040:2000:2000::/48
user@host# set range r1 prefix-length 64
```
3. Configure the address-assignment pool for ND/RA.
 

```
[edit]
user@host# edit access address-assignment pool ndra-2010
user@host# edit family inet6
user@host# set prefix 2001:db8:2010:0:0:0::/48
user@host# set range L prefix-length 64
```
4. (Optional) Enable duplicate prefix protection.
 

```
[edit access]
user@host# set address-protection
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]
user@host# show
address-assignment {
 pool default-ipv4-pool-2 {
 family inet {
 network 203.0.113.10/16;
 range r5 {
 low 203.0.113.11;
 high 203.0.113.150;
 }
 }
 }
 pool delegated-pool {
 family inet6 {
 prefix 2001:db8:2040:2000:2000::/48;
 range r1 prefix-length 64;
 }
 }
 pool ndra-2010 {
 family inet6 {
 prefix 2001:db8:2010:0:0:0::/48;
 }
 }
}
```

```
 range L prefix-length 64;
 }
}
address-protection;
```

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

### Specifying the Address-Assignment Pool to Be Used for DHCPv6 Prefix Delegation

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

```
edit system services dhcp-local-server dhcpv6
set overrides delegated-pool dhcpv6-pd-pool
```

**Step-by-Step Procedure** To specify that the dhcp-pd-pool is used for DHCPv6 prefix delegation:

1. Access the DHCPv6 local server configuration.  

```
[edit]
user@host# edit system services dhcp-local-server dhcpv6
```
2. Specify the address pool that assigns the delegated prefix.  

```
[edit system services dhcp-local-server dhcpv6]
user@host# set overrides delegated-pool dhcpv6-pd-pool
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit system]
user@host# show
services {
 dhcp-local-server {
 dhcpv6 {
 overrides {
 delegated-pool dhcpv6-pd-pool;
 }
 }
 }
}
```

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

## Verification

Confirm that the configuration is working properly.

- [Verifying Active Subscriber Sessions on page 519](#)
- [Verifying Both IPv4 and IPv6 Address in Correct Routing Instance on page 519](#)
- [Verifying Dynamic Subscriber Sessions on page 520](#)
- [Verifying DHCPv6 Address Pools Used for NDRA and DHCPv6 Prefix Delegation on page 521](#)
- [Verifying DHCPv6 Address Bindings on page 522](#)
- [Verifying Router Advertisements on page 522](#)
- [Verifying the Status of the PPPoE Logical Interface on page 522](#)

### Verifying Active Subscriber Sessions

**Purpose** Verify active subscriber sessions.

**Action** From operational mode, enter the **show subscribers summary** command.

```
user@host>show subscribers summary
Subscribers by State
 Active: 2
 Total: 2

Subscribers by Client Type
 DHCP: 1
 PPPoE: 1
 Total: 2
```

**Meaning** The fields under **Subscribers by State** show the number of active subscribers.

The fields under **Subscribers by Client Type** show the number of active DHCP and DHCPoE subscriber sessions.

### Verifying Both IPv4 and IPv6 Address in Correct Routing Instance

**Purpose** Verify that the subscriber has both an IPv4 and IPv6 address and is placed in the correct routing instance.

**Action** From operational mode, enter the **show subscribers** command.

```
user@host>show subscribers
Interface IP Address/VLAN ID User Name LS:RI
pp0.1073741864 203.0.113.5 dual-stack-v4v6-pd default:default
* 2001:db8:2010:0:0:8::/64
pp0.1073741864 2001:db8:2040:2000:2000:5::/64
default:default
```

**Meaning** The **Interface** field shows that there are two subscriber sessions running on the same interface. The **IP Address** field shows that one session is assigned an IPv4 address, and one session is assigned on IPv6 address.

The **LS:RI** field shows that the subscriber is placed in the correct routing instance and that traffic can be sent and received.

### Verifying Dynamic Subscriber Sessions

---

**Purpose** Verify dynamic PPPoE and DHCPv6 subscriber sessions. In this example configuration the DHCPv6 subscriber session should be layered over the underlying PPPoE subscriber session.

**Action** From operational mode, enter the **show subscribers detail** command.

```
user@host>show subscribers detail
Type: PPPoE
User Name: dual-stack-v4v6-pd
IP Address: 203.0.113.5
IP Netmask: 255.255.0.0
IPv6 User Prefix: 2001:db8:2010:0:0:8::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073741864
Interface type: Dynamic
Dynamic Profile Name: DS-dyn-ipv4v6-ra
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 87
Session ID: 87
Login Time: 2012-01-17 14:45:30 PST

Type: DHCP
IPv6 Prefix: 2001:db8:2040:2000:2000:5::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073741864
Interface type: Static
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 88
Session ID: 88
Underlying Session ID: 87
Login Time: 2012-01-17 14:46:00 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 07 64 11 07 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

**Meaning** When a subscriber has logged in and started both an IPv4 and an IPv6 session, the output shows the active underlying PPPoE session and the active DHCPv6 session.

The **Session ID** field for the PPPoE session is 87. The **Underlying Session ID** for the DHCP session is 87, which shows that the PPPoE session is the underlying session.

### Verifying DHCPv6 Address Pools Used for NDRA and DHCPv6 Prefix Delegation

**Purpose** Verify the pool used for ND/RA, the delegated address pool used for DHCPv6 prefix delegation and the length of the IPv6 prefixes that were delegated to the CPE.

**Action** From operational mode, enter the **show subscribers extensive** command.

```
user@host>show subscribers extensive
Type: PPPoE
User Name: dual-stack-v4v6-pd
IP Address: 203.0.113.5
IP Netmask: 255.255.0.0
IPv6 User Prefix: 2001:db8:2010:0:0:8::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073741864
Interface type: Dynamic
Dynamic Profile Name: DS-dyn-ipv4v6-ra
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 87
Session ID: 87
Login Time: 2012-01-17 14:45:30 PST
IPv6 Delegated Address Pool: delegated-pool
IPv6 Delegated Address Pool: ndra-2010
IPv6 Delegated Network Prefix Length: 48
IPv6 Interface Address: 2010:0:0:8::1/64

Type: DHCP
IPv6 Prefix: 2001:db8:2040:2000:2000:5::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073741864
Interface type: Static
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 88
Session ID: 88
Underlying Session ID: 87
Login Time: 2012-01-17 14:46:00 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 07 64 11 07 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00
00 00
IPv6 Delegated Address Pool: delegated-pool
IPv6 Delegated Network Prefix Length: 64
IPv6 Delegated Network Prefix Length: 48
```

**Meaning** Under the PPPoE session, the **IPv6 Delegated Address Pool** fields show the names of the pools used for DHCPv6 prefix delegation and for ND/RA prefixes. The **IPv6 Delegated Network Prefix Length** field shows the length of the prefix used to assign the IPv6 address for this subscriber session. The **IPv6 Interface Address** field shows the IPv6 address assigned to the CPE interface from the ND/RA pool.

Under the DHCP session, the **IPv6 Delegated Address Pool** fields show the name of the pool used for DHCPv6 prefix delegation. The **IPv6 Delegated Network Prefix Length** fields shows the length of the prefix used in DHCPv6 prefix delegation.

### Verifying DHCPv6 Address Bindings

---

**Purpose** Display the address bindings in the client table on the DHCPv6 local server.

**Action** From operational mode, enter the **show dhcpv6 server binding** command.

```
user@host>show dhcpv6 server binding
Prefix Session Id Expires State Interface Client DUID
2001:db8:2040:2000:2000:5::/64 88 86189 BOUND pp0.1073741864
LL0x1-00:07:64:11:07:02
```

If you have many active subscriber sessions, you can display the server binding for a specific interface.

```
user@host>show dhcpv6 server binding interface pp0.1073741864
Prefix Session Id Expires State Interface Client DUID
2001:db8:2040:2000:2000:5::/64 88 86182 BOUND pp0.1073741864
LL0x1-00:07:64:11:07:02
```

**Meaning** The **Prefix** field shows the DHCPv6 prefix assigned to the subscriber session from the pool used for DHCPv6 prefix delegation.

### Verifying Router Advertisements

---

**Purpose** Verify that router advertisements are being sent, and router solicits are being received.

**Action** From operational mode, enter the **show ipv6 router-advertisement** command.

```
user@host>show ipv6 router-advertisement
Interface: pp0.1073741864
 Advertisements sent: 3, last sent 00:03:29 ago
 Solicits received: 0
 Advertisements received: 0
```

If you have a large number of subscriber interfaces, you can display router advertisements for a specific interface.

```
user@host>show ipv6 router-advertisement interface pp0.1073741864
Interface: pp0.1073741864
 Advertisements sent: 3, last sent 00:03:34 ago
 Solicits received: 0
 Advertisements received: 0
```

**Meaning** The display shows the number of advertisements that the router sent, the number of solicits and advertisements that the router received.

### Verifying the Status of the PPPoE Logical Interface

---

**Purpose** Display status information about the PPPoE logical interface (pp0).

**Action** From operational mode, enter the **show interfaces pp0.logical** command.

```
user@host>show interfaces pp0.1073741864
Logical interface pp0.1073741864 (Index 388) (SNMP ifIndex 681)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
PPPoE:
```

```

State: SessionUp, Session ID: 10,
Session AC name: almach, Remote MAC address: 00:00:5E:00:53:02,
Underlying interface: ge-3/3/0.1109 (Index 367)
Bandwidth: 1000mbps
Input packets : 22
Output packets: 50
Keepalive settings: Interval 30 seconds, Up-count 1, Down-count 3
LCP state: Opened
NCP state: inet: Opened, inet6: Opened, iso: Not-configured, mpls: Not-configured

CHAP state: Closed
PAP state: Success
Protocol inet, MTU: 65531
Flags: Sendbroadcast-pkt-to-re
Addresses, Flags: Is-Primary
Local: 192.0.2.77
Protocol inet6, MTU: 65531
Addresses, Flags: Is-Preferred Is-Primary
Destination: 2001:db8:2010:0:8::/64, Local: 2001:db8:2010:0:8::1
Local: fe80::2a0:a50f:fc63:a842

```

**Meaning** The **Underlying interface** field shows the underlying Ethernet interface configured in the example.

The **Destination** field under **Protocol inet6** shows the IPv6 address obtained through ND/RA. This is the value of the *\$junos-ipv6-ndra-prefix* variable configured in the dynamic profile.

The **Local** field under **Protocol inet6** shows the value of the *\$junos-ipv6-address* variable configured for family inet6 in the ppo configuration of the dynamic profile.

- Related Documentation**
- [Design 2: IPv6 Addressing with NDRA and DHCPv6 Prefix Delegation on page 402](#)
  - [How NDRA Works in a Subscriber Access Network on page 386](#)
  - [DHCPv6 Prefix Delegation over PPPoE on page 393](#)

## Example: Configuring a Dual Stack That Uses ND/RA Over PPPoE

This example shows a dual stack configuration for a residential subscriber with a single PC. It uses ND/RA to provide a prefix used to obtain a global IPv6 address for the PC.

- [Requirements on page 523](#)
- [Overview on page 524](#)
- [Configuration on page 525](#)
- [Verification on page 537](#)

### Requirements

This example uses the following hardware and software components:

- MX Series 3D Universal Edge Router
- Junos OS Release 11.4 or later

## Overview

This design uses ND/RA in your subscriber access network as follows:

- The access network is PPPoE.
- ND/RA is used to assign a global IPv6 address on the WAN link. The prefixes used in router advertisements come from a local pool that is specified using AAA RADIUS.

## Topology

**Figure 18: PPPoE Subscriber Access Network with NDRA**

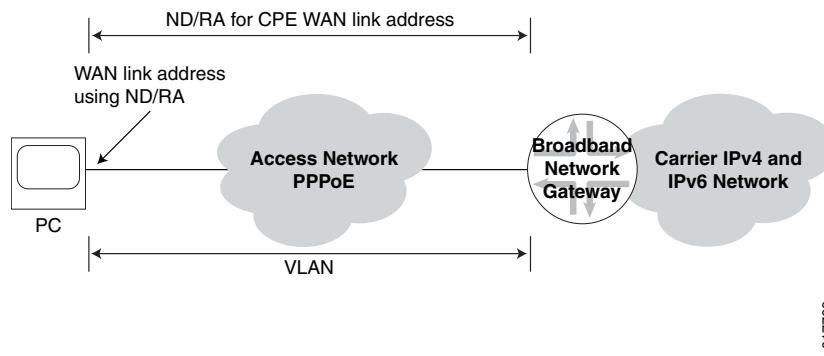


Table 51 on page 524 describes the configuration components used in this example.

**Table 51: Configuration Components Used in Dual Stack with ND/RA and DHCPv6 Prefix Delegation**

| Configuration Component  | Component Name      | Purpose                                                                                                                                                       |
|--------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dynamic Profiles         | DS-dyn-ipv4v6-ndra  | Profile that creates a PPPoE logical interface when the subscriber logs in.                                                                                   |
| Interfaces               | ge-3/3/0            | Underlying Ethernet interface.                                                                                                                                |
|                          | lo0                 | Loopback interface for use in the access network. The loopback interface is automatically used for unnumbered interfaces.                                     |
| Address-Assignment Pools | default-ipv4-pool-2 | Pool that provides IPv4 addresses for the subscriber LAN.                                                                                                     |
|                          | ndra-2010           | Pool that provides IPv6 prefixes used in router advertisements. These prefixes are used to create a global IPv6 address that is assigned to the CPE WAN link. |

## Configuration

To configure this example, perform these tasks:

- [Configuring a Dynamic Profile for the PPPoE Logical Interface on page 527](#)
- [Configuring a Loopback Interface on page 529](#)
- [Configuring a Static Underlying Ethernet Interface for Dynamic PPPoE Subscriber Interfaces on page 530](#)
- [Specifying the BNG IP Address on page 531](#)
- [Configuring RADIUS Server Access on page 532](#)
- [Configuring RADIUS Server Access Profile on page 533](#)
- [Specifying the RADIUS Server Access Profile to Use on page 534](#)
- [Configuring Local Address-Assignment Pools on page 535](#)

### CLI Quick Configuration

The following is the complete configuration for this example:

```
dynamic-profiles {
 DS-dyn-ipv4v6-ra {
 interfaces {
 pp0 {
 unit "$junos-interface-unit" {
 ppp-options {
 chap;
 pap;
 }
 pppoe-options {
 underlying-interface "$junos-underlying-interface";
 server;
 }
 keepalives interval 30;
 family inet {
 unnumbered-address lo0.0;
 }
 family inet6 {
 address $junos-ipv6-address;
 }
 }
 }
 }
 }
}
protocols {
 router-advertisement {
 interface "$junos-interface-name" {
 prefix $junos-ipv6-ndra-prefix;
 }
 }
}
}
system {
 services {
 dhcp-local-server {
 dhcpv6 {
```

```
 group DHCPv6-over-pppoe {
 interface pp0.0;
 }
 }
}
access-profile Access-Profile;
interfaces {
 ge-3/3/0 {
 unit 1004 {
 description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd";
 encapsulation ppp-over-ether;
 vlan-id 1004;
 pppoe-underlying-options {
 duplicate-protection;
 dynamic-profile DS-dyn-ipv4v6-ra;
 }
 }
 }
 lo0 {
 description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd";
 unit 0 {
 family inet {
 address 192.0.2.77/32 {
 primary;
 }
 }
 family inet6 {
 address 2001:db8:2030:0:0:0::1/64 {
 primary;
 }
 }
 }
 }
}
routing-options {
 router-id 203.0.113.0;
}
access {
 radius-server {
 203.0.113.99 {
 secret "$ABC123$ABC123ABC123"; ## SECRET-DATA
 timeout 45;
 retry 4;
 source-address 203.0.113.1;
 }
 }
 profile Access-Profile {
 authentication-order radius;
 radius {
 authentication-server 203.0.113.99;
 accounting-server 203.0.113.99;
 }
 accounting {
 order [radius none];
 }
 }
}
```

```

 update-interval 120;
 statistics volume-time;
 }
}
address-assignment {
 neighbor-discovery-router-advertisement ndra-2010;
 pool default-ipv4-pool-2 {
 family inet {
 network 203.0.113.10/16;
 range r5 {
 low 203.0.113.11;
 high 203.0.113.150;
 }
 }
 }
 pool ndra-2010 {
 family inet6 {
 prefix 2001:db8:2010:0:0:0::/48;
 range L prefix-length 64;
 }
 }
}
address-protection;
}

```

### Configuring a Dynamic Profile for the PPPoE Logical Interface

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

```

edit dynamic-profiles DS-dyn-ipv4v6-ra
edit interfaces pp0 unit $junos-interface-unit
set family inet unnumbered-address lo0.0
set family inet6 address $junos-ipv6-address
set pppoe-options underlying-interface "$junos-underlying-interface"
set pppoe-options server
set ppp-options pap
set ppp-options chap
set keepalives interval 30
up 3
edit protocols router-advertisement
edit interface $junos-interface-name
set prefix $junos-ipv6-ndra-prefix

```

**Step-by-Step Procedure** Create a dynamic profile for the PPPoE logical interface. This dynamic profile supports both IPv4 and IPv6 sessions on the same logical interface.

To configure the dynamic profile:

1. Create and name the dynamic profile.

```

[edit]
user@host# edit dynamic-profiles DS-dyn-ipv4v6-ra

```

2. Configure a PPPoE logical interface (pp0) that is used to create logical PPPoE interfaces for the IPv4 and IPv6 subscribers.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra]
user@host# edit interfaces pp0
```

3. Specify **\$junos-interface-unit** as the predefined variable to represent the logical unit number for the pp0 interface. The variable is dynamically replaced with the actual unit number supplied by the network when the subscriber logs in.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0]
user@host# edit unit $junos-interface-unit
```

4. Specify **\$junos-underlying-interface** as the predefined variable to represent the name of the underlying Ethernet interface on which the router creates the dynamic PPPoE logical interface. The variable is dynamically replaced with the actual name of the underlying interface supplied by the network when the subscriber logs in.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set pppoe-options underlying-interface $junos-underlying-interface
```

5. Configure the router to act as a PPPoE server when a PPPoE logical interface is dynamically created.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set pppoe-options server
```

6. Configure the IPv4 family for the pp0 interface. Specify the unnumbered address to dynamically create loopback interfaces.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set family inet unnumbered-address lo0.0
```

7. Configure the IPv6 family for the pp0 interface. Because the example uses router advertisement, assign the predefined variable **\$junos-ipv6-address**.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set family inet6 unnumbered-address $junos-ipv6-address
```

8. Configure one or more PPP authentication protocols for the pp0 interface.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set ppp-options chap
user@host# set ppp-options pap
```

9. Enable keepalives and set an interval for keepalives. We recommend an interval of 30 seconds.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra interfaces pp0 unit "$junos-interface-unit"]
user@host# set keepalives interval 30
```

10. Access the router advertisement configuration.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra]
user@host# edit protocols router-advertisement
```

11. Specify the interface on which the ND/RA configuration is applied.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra protocols router-advertisement]
user@host# edit interface $junos-interface-name
```

12. Specify a prefix value contained in router advertisement messages sent to the CPE on interfaces created with this dynamic profile. If you specify the `$junos-ipv6-ndra-prefix` predefined variable, the actual value is obtained from a local pool or through AAA.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra protocols router-advertisement interface
 "$junos-interface-name"]
user@host# set prefix $junos-ipv6-ndra-prefix
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit dynamic-profiles DS-dyn-ipv4v6-ra]
user@host# show
interfaces {
 pp0 {
 unit "$junos-interface-unit" {
 ppp-options {
 chap;
 pap;
 }
 pppoe-options {
 underlying-interface "$junos-underlying-interface";
 server;
 }
 keepalives interval 30;
 family inet {
 unnumbered-address lo0.0;
 }
 family inet6 {
 address $junos-ipv6-address;
 }
 }
 }
}
protocols {
 router-advertisement {
 interface "$junos-interface-name" {
 prefix $junos-ipv6-ndra-prefix;
 }
 }
}
```

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

### Configuring a Loopback Interface

#### CLI Quick Configuration

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

```
edit interfaces lo0 unit 0
set family inet address 192.0.2.77/32 primary
set family inet6 address 2001:db8:2030:0:0::1/64 primary
```

**Step-by-Step  
Procedure**

To configure a loopback interface:

1. Create the loopback interface and specify a unit number.  

```
[edit]
user@host# edit interfaces lo0 unit 0
```
2. Configure the interface for IPv4.  

```
[edit interfaces lo0 unit 0]
user@host# set family inet address 192.0.2.77/32 primary
```
3. Configure the interface for IPv6.  

```
[edit interfaces lo0 unit 0]
user@host# set family inet6 address 2001:db8:2030:0:0::1/64 primary
```

**Results**

From configuration mode, confirm your configuration by entering the **show** command.

```
[edit interfaces lo0]
user@host# show
unit 0 {
 family inet {
 address 192.0.2.77/32 {
 primary;
 }
 }
 family inet6 {
 address 2001:db8:2030:0:0::1/64 {
 primary;
 }
 }
}
```

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

### Configuring a Static Underlying Ethernet Interface for Dynamic PPPoE Subscriber Interfaces

---

**CLI Quick  
Configuration**

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

```
edit interfaces ge-3/3/0 unit 1004
set description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd"
set encapsulation ppp-over-ether
set vlan-id 1004
set pppoe-underlying-options duplicate-protection
set pppoe-underlying-options dynamic-profile DS-dyn-ipv4v6-ra
```

**Step-by-Step  
Procedure**

To configure the underlying Ethernet interface:

1. Specify the name and logical unit number of the static underlying Ethernet interface to which you want to attach the IPv4 and IPv6 dynamic profile.  

```
[edit]
```

```
user@host# edit interfaces ge-3/3/0 unit 1004
```

2. Configure a description for the interface.

```
[edit interfaces ge-3/3/0 unit 1004]
user@host# set description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd"
```

3. Configure PPPoE encapsulation on the underlying interface.

```
[edit interfaces ge-3/3/0 unit 1004]
user@host# set encapsulation ppp-over-ether
```

4. Configure the VLAN Id.

```
[edit interfaces ge-3/3/0 unit 1004]
user@host# set vlan-id 1004
```

5. Attach the dynamic profile to the underlying interface.

```
[edit interfaces ge-3/3/0 unit 1004]
user@host# set pppoe-underlying-options dynamic-profile DS-dyn-ipv4v6-ra
```

6. (Optional) Prevent multiple PPPoE sessions from being created for the same PPPoE subscriber on the same VLAN interface.

```
[edit interfaces ge-3/3/0 unit 1004]
user@host# set pppoe-underlying-options duplicate-protection
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit interfaces]
user@host# show
ge-3/3/0 {
 unit 1004 {
 description "dynamic ipv4v6 dual stack, ndra, dhcpv6 pd";
 encapsulation ppp-over-ether;
 vlan-id 1004;
 pppoe-underlying-options {
 duplicate-protection;
 dynamic-profile DS-dyn-ipv4v6-ra;
 }
 }
}
```

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

### Specifying the BNG IP Address

#### CLI Quick Configuration

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

```
edit routing-options
set router-id 203.0.113.0
```



**BEST PRACTICE:** We strongly recommend that you configure the BNG IP address to avoid unpredictable behavior if the interface address on a loopback interface changes.

---

**Step-by-Step  
Procedure**

To configure the IP address of the BNG:

1. Access the routing-options configuration.

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

2. Specify the IP address of the BNG.

```
[edit routing-options]
user@host# set router-id 203.0.113.0
```

**Results**

From configuration mode, confirm your configuration by entering the **show** command.

```
[edit routing-options]
user@host# show
router-id 203.0.113.0;
```

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

---

### Configuring RADIUS Server Access

---

**CLI Quick  
Configuration**

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

```
edit access radius-server 203.0.113.99
set secret "$ABC123$ABC123ABC123"
set timeout 45
set retry 4
set source-address 203.0.113.1
```

**Step-by-Step  
Procedure**

To configure RADIUS servers:

**Step-by-Step  
Procedure**

To configure RADIUS servers:

1. Create a RADIUS server configuration, and specify the address of the server.

```
[edit]
user@host# edit access radius-server 203.0.113.99
```

2. Configure the required secret (password) for the server. Secrets enclosed in quotation marks can contain spaces.

```
[edit access radius-server 203.0.113.99]
user@host# set secret "$ABC123$ABC123ABC123"
```

3. Configure the source address that the BNG uses when it sends RADIUS requests to the RADIUS server.

```
[edit access radius-server 203.0.113.99]
user@host# set source address 203.0.113.1
```

4. (Optional) Configure the number of times that the router attempts to contact a RADIUS accounting server. You can configure the router to retry from 1 through 16 times. The default setting is 3 retry attempts.

```
[edit access radius-server 203.0.113.99]
user@host# set retry 4
```

5. (Optional) Configure the length of time that the local router or switch waits to receive a response from a RADIUS server. By default, the router or switch waits 3 seconds. You can configure the timeout to be from 1 through 90 seconds.

```
[edit access radius-server 203.0.113.99]
user@host# set timeout 45
```

**Results** From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]
user@host# show
radius-server {
 203.0.113.99 {
 secret "$ABC123$ABC123ABC123"; ## SECRET-DATA
 timeout 45;
 retry 4;
 source-address 203.0.113.1;
 }
}
```

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

### Configuring RADIUS Server Access Profile

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

```
edit access profile Access-Profile
set authentication-order radius
set radius authentication-server 203.0.113.99
set radius accounting-server 203.0.113.99
set accounting order radius
set accounting order none
set accounting update-interval 120
set accounting statistics volume-time
```

**Step-by-Step Procedure** To configure a RADIUS server access profile:

1. Create a RADIUS server access profile.
- ```
[edit]
```

```
user@host# edit access profile Access-Profile
```

2. Specify the order in which authentication methods are used.

```
[edit access profile Access-Profile]
user@host# set authentication-order radius
```

3. Specify the address of the RADIUS server used for authentication and the server used for accounting.

```
[edit access profile Access-Profile]
user@host# set radius authentication-server 203.0.113.99
user@host# set radius accounting-server 203.0.113.99
```

4. Configure RADIUS accounting values for the access profile.

```
[edit access profile Access-Profile]
user@host# set accounting order [ radius none ]
user@host# set accounting update-interval 120
user@host# set accounting statistics volume-time
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]
user@host# show
profile Access-Profile {
  authentication-order radius;
  radius {
    authentication-server 203.0.113.99;
    accounting-server 203.0.113.99;
  }
  accounting {
    order [ radius none ];
    update-interval 120;
    statistics volume-time;
  }
}
```

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

Specifying the RADIUS Server Access Profile to Use

CLI Quick Configuration To quickly configure this example, copy the following command and paste it into the CLI at the **[edit]** hierarchy level.

```
set access-profile Access-Profile
```

Step-by-Step Procedure To specify the RADIUS server access profile to use for authentication:

1. Specify the access profile.

```
[edit]
user@host# set access-profile Access-Profile
```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit]
```

```

user@host# show
...
access-profile Access-Profile;
...

```

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

Configuring Local Address-Assignment Pools

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

```

edit access
set address-assignment pool default-ipv4-pool-2 family inet network 203.0.113.10/16
set address-assignment pool default-ipv4-pool-2 family inet range r5 low 203.0.113.11
set address-assignment pool default-ipv4-pool-2 family inet range r5 high 203.0.113.150
set address-assignment pool ndra-2010 family inet6 prefix 2001:db8:2010:0:0:0::/48
set address-assignment pool ndra-2010 family inet6 range L prefix-length 64
set address-assignment neighbor-discovery-router-advertisement ndra-2010
set address-protection

```

Step-by-Step Procedure Configure three address-assignment pools for DHCPv4, DHCPv6 prefix delegation, and ND/RA.

To configure the address-assignment pools:

1. Configure the address-assignment pool for DHCPv4.

```

[edit]
user@host# edit access address-assignment pool default-ipv4-pool-2
user@host# edit family inet
user@host# set network 203.0.113.10/16
user@host# set range r5 low 203.0.113.11
user@host# set range r5 high 203.0.113.150

```

2. Configure the address-assignment pool for ND/RA.

```

[edit]
user@host# edit access address-assignment pool ndra-2010
user@host# edit family inet6
user@host# set prefix 2001:db8:2010:0:0:0::/48
user@host# set range L prefix-length 64

```

3. Specify that the address-assignment pool is used for NDRA.

```

[edit]
user@host# edit access address-assignment
user@host# set neighbor-discovery-router-advertisement ndra-2010

```

4. (Optional) Enable duplicate prefix protection.

```

[edit access]
user@host# set address-protection

```

Results From configuration mode, confirm your configuration by entering the **show** command.

```
[edit access]
user@host# show
address-assignment {
  neighbor-discovery-router-advertisement ndra-2010;
  pool default-ipv4-pool-2 {
    family inet {
      network 203.0.113.10/16;
      range r5 {
        low 203.0.113.11;
        high 203.0.113.150;
      }
    }
  }
  pool ndra-2010 {
    family inet6 {
      prefix 2001:db8:2010:0:0:0::/48;
      range L prefix-length 64;
    }
  }
}
address-protection;
```

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

Verification

Confirm that the configuration is working properly.

- [Verifying Active Subscriber Sessions on page 537](#)
- [Verifying Both IPv4 and IPv6 Address in Correct Routing Instance on page 537](#)
- [Verifying Dynamic Subscriber Sessions on page 538](#)
- [Verifying the ND/RA Prefix Pool and Prefix Length on page 538](#)
- [Verifying the Status of the PPPoE Logical Interface on page 539](#)
- [Verifying Router Advertisements on page 539](#)

Verifying Active Subscriber Sessions

Purpose Verify active subscriber sessions.

Action From operational mode, enter the **show subscribers summary** command.

```
user@host>show subscribers summary
Subscribers by State
  Active: 2
  Total: 2
```

```
Subscribers by Client Type
  DHCP: 1
  PPPoE: 1
  Total: 2
```

Meaning The fields under **Subscribers by State** show the number of active subscribers.

The fields under **Subscribers by Client Type** show the number of active DHCP and DHCPoE subscriber sessions.

Verifying Both IPv4 and IPv6 Address in Correct Routing Instance

Purpose Verify that the subscriber has both an IPv4 and IPv6 address and is placed in the correct routing instance.

Action From operational mode, enter the **show subscribers** command.

```
user@host>show subscribers
Interface      IP Address/VLAN ID  User Name      LS:RI
pp0.1073741864 192.0.2.5           dual-stack-v4v6-pd default:default
*              2001:db8:2010:0:0:8::/64
pp0.1073741864 2001:db8:2040:2000:2000:5::/64
default:default
```

Meaning The **Interface** field shows that there are two subscriber sessions running on the same interface. The **IP Address** field shows that one session is assigned an IPv4 address, and one session is assigned on IPv6 address.

The **LS:RI** field shows that the subscriber is placed in the correct routing instance and that traffic can be sent and received.

Verifying Dynamic Subscriber Sessions

Purpose Verify that the dynamic subscriber session is active, and the IPv6 prefix obtained from the ND/RA pool.

Action From operational mode, enter the **show subscribers detail** command.

```
user@host>show subscribers detail
Type: PPPoE
User Name: dual-stack-v4v6-nas
IP Address: 192.0.2.4
IP Netmask: 255.255.0.0
IPv6 User Prefix: 2001:db8:2010:0:0:6::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073741859
Interface type: Dynamic
Dynamic Profile Name: DS-dyn-ipv4v6-ra
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 81
Session ID: 81
Login Time: 2012-01-17 14:19:41 PST
```

Meaning The **IPv6 User Prefix** field shows the prefix that was obtained from the ND/RA pool. The **State** field shows that the session is active.

Verifying the ND/RA Prefix Pool and Prefix Length

Purpose Verify the pool used for ND/RA and the prefix length used with the pool

Action From operational mode, enter the **show subscribers extensive** command.

```
user@host>show subscribers extensive
Type: PPPoE
User Name: dual-stack-v4v6-nas
IP Address: 192.0.2.4
IP Netmask: 255.255.0.0
IPv6 User Prefix: 2001:db8:2010:0:0:6::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073741859
Interface type: Dynamic
Dynamic Profile Name: DS-dyn-ipv4v6-ra
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 81
Session ID: 81
Login Time: 2012-01-17 14:19:41 PST
IPv6 Delegated Address Pool: ndra-2010
IPv6 Delegated Network Prefix Length: 48
IPv6 Interface Address: 2001:db8:2010:0:0:6::1/64
```

Meaning Under the PPPoE session, the **IPv6 Delegated Address Pool** field shows the name of the pool used for ND/RA prefixes. The **IPv6 Delegated Network Prefix Length** field shows the length of the prefix used to assign the IPv6 address for this subscriber session. The **IPv6**

Interface Address field shows the IPv6 address assigned to the CPE interface from the ND/RA pool.

Verifying the Status of the PPPoE Logical Interface

Purpose Display status information about the PPPoE logical interface (pp0).

Action From operational mode, enter the **show interfaces pp0.logical** command.

```
user@host>show interfaces pp0.1073741859
Logical interface pp0.1073741859 (Index 388) (SNMP ifIndex 674)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
  PPPoE:
    State: SessionUp, Session ID: 10,
    Session AC name: almach, Remote MAC address: 00:00:5E:00:53:02,
    Underlying interface: ge-3/3/0.1004 (Index 354)
  Bandwidth: 1000mbps
  Input packets : 15
  Output packets: 44
  Keepalive settings: Interval 30 seconds, Up-count 1, Down-count 3
  LCP state: Opened
  NCP state: inet: Opened, inet6: Opened, iso: Not-configured, mp1s: Not-configured

  CHAP state: Closed
  PAP state: Success
  Protocol inet, MTU: 65531
    Flags: Sendbcst-pkt-to-re
    Addresses, Flags: Is-Primary
      Local: 192.0.2.77
  Protocol inet6, MTU: 65531
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 2001:db8:2010:0:0:6::/64, Local: 2001:db8:2010:0:0:6::1
      Local: fe80::2a0:a50f:fc63:a842
```

Meaning The **Local** field under **Protocol inet** shows the IPv4 address of the pp0 interface. This is the IPv4 address configured for the loopback interface.

The **Destination** field under **Protocol inet6** shows the IPv6 address obtained through ND/RA. This is the value of the *\$junos-ipv6-ndra-prefix* variable configured in the dynamic profile.

The **Local** field under **Protocol inet6** shows the value of the *\$junos-ipv6-address* variable configured for family inet6 in the pp0 configuration of the dynamic profile.

Verifying Router Advertisements

Purpose Verify that router advertisements are being sent, and router solicits are being received.

Action From operational mode, enter the **show ipv6 router-advertisement** command.

```
user@host>show ipv6 router-advertisement
Interface: pp0.1073741859
  Advertisements sent: 3, last sent 00:09:53 ago
  Solicits received: 0
  Advertisements received: 0
```

If you have a large number of subscriber interfaces, you can display router advertisements for a specific interface.

```
user@host>show ipv6 router-advertisement interface pp0.1073741859
Interface: pp0.1073741859
  Advertisements sent: 3, last sent 00:10:31 ago
  Solicits received: 0
  Advertisements received: 0
```

Meaning The display shows the number of advertisements that the router sent, the number of solicits and advertisements that the router received.

Related Documentation

- [How NDRA Works in a Subscriber Access Network on page 386](#)
- [Design 3: IPv6 Addressing with NDRA on page 403](#)
- [Best Practice: IPv6 Addressing for Logical Interfaces in PPPoE Dynamic Profiles with NDRA on page 458](#)

CHAPTER 60

Monitoring and Managing Dual Stack Subscribers

- [Monitoring Active Subscriber Sessions on page 541](#)
- [Monitoring Both IPv4 and IPv6 Address in Correct Routing Instance on page 542](#)
- [Monitoring Dynamic Subscriber Sessions on page 542](#)
- [Monitoring Address Pools Used for Subscribers on page 543](#)
- [Monitoring Specific Subscriber Sessions on page 544](#)
- [Monitoring the Status of the PPPoE Logical Interface on page 545](#)
- [Monitoring Service Sessions for Subscribers on page 545](#)
- [Monitoring PPP Options Negotiated with the Remote Peer on page 546](#)
- [Monitoring the RADIUS Attribute Used for NDRA on page 547](#)

Monitoring Active Subscriber Sessions

Purpose View a summary of active subscriber sessions.

Action From operational mode, enter the **show subscribers summary** command.

```
user@host>show subscribers summary
```

```
Subscribers by State
```

```
Active: 2
```

```
Total: 2
```

```
Subscribers by Client Type
```

```
DHCP: 1
```

```
PPPoE: 1
```

```
Total: 2
```

Meaning The output under **Subscribers by State** shows the number of active subscriber sessions.

The output under **Subscribers by Client Type** shows the number of active sessions by type. The two subscriber sessions above represent a DHCPv6 subscriber on a PPPoE access network. When DHCPv6 is layered over PPPoE, two separate subscriber sessions are created for a subscriber.

Related Documentation • [show subscribers summary on page 1796](#)

Monitoring Both IPv4 and IPv6 Address in Correct Routing Instance

Purpose Verify that the subscriber has both an IPv4 and an IPv6 address and is placed in the correct routing-instance.

Action From operational mode, enter the **show subscribers** command.

```
user@host>show subscribers
Interface      IP Address/VLAN ID  User Name      LS:RI
pp0.1073741825 203.0.113.162      ipv4-v6-subscriber default:default
pp0.1073741825 2001:DB8::1        default:default
```

Meaning The **Interface** field shows that there are two subscriber sessions running on the same interface. The **IP Address** field shows that one session is assigned an IPv4 address, and one session is assigned on IPv6 address.

The **LS:RI** field shows that the subscriber is placed in the correct routing instance and that traffic can be sent and received.

Related Documentation

- [show subscribers on page 1775](#)

Monitoring Dynamic Subscriber Sessions

Purpose Display dynamic PPPoE and DHCPv6 subscriber sessions.

Action From operational mode, enter the **show subscribers detail** command.

```
user@host>show subscribers detail
Type: PPPoE
User Name: SBRSTATICUSER
IP Address: 203.0.113.162
IP Netmask: 255.0.0.0
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: pppoe-subscriber-profile
MAC Address: 00:00:5E:00:53:01
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-12-08 09:11:41 PST

Type: DHCP
IPv6 Address: 2001:DB8::1
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:5E:00:53:01
State: Active
Radius Accounting ID: 3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-12-08 09:12:11 PST
```

```

DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 01 02 00 00 01
00 06 00 02 00 03 00 03 00 0c 00 00 00 00 00 00 00 00 00 00
00 00

```

Meaning If you are using DHCPv6 over a PPPoE access network, the output shows the relationship of the DHCPv6 subscriber session with its underlying PPPoE subscriber session. In the output for the PPPoE session, the **Session ID** is 2. The output of the DHCP session shows that the **Underlying Session ID** is 2.

Related Documentation • [show subscribers on page 1775](#)

Monitoring Address Pools Used for Subscribers

Purpose Verify the pool used for NDRA, the delegated address pool used for DHCPv6 prefix delegation, and the length of the IPv6 prefixes that were delegated to the CPE.

Action From operational mode, enter the **show subscribers extensive** command.

```

user@host>show subscribers extensive
Type: PPPoE
User Name: dual-stack-v4v6-pd
IP Address: 2.2.0.5
IP Netmask: 255.255.0.0
IPv6 User Prefix: 2001:db8:2010:0:0:8::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073741864
Interface type: Dynamic
Dynamic Profile Name: DS-dyn-ipv4v6-ra
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 87
Session ID: 87
Login Time: 2012-01-17 14:45:30 PST
IPv6 Delegated Address Pool: dhcpv6-pd-pool
IPv6 Delegated Address Pool: ndra-2010
IPv6 Delegated Network Prefix Length: 48
IPv6 Interface Address: 2001:db8:2010:0:0:8::1/64

Type: DHCP
IPv6 Prefix: 2001:db8:2040:2000:2000:5::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073741864
Interface type: Static
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 88
Session ID: 88
Underlying Session ID: 87
Login Time: 2012-01-17 14:46:00 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 07 64 11 07 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
IPv6 Delegated Address Pool: dhcpv6-pd-pool

```

IPv6 Delegated Network Prefix Length: 64
IPv6 Delegated Network Prefix Length: 48

Meaning Under the PPPoE session, the **IPv6 Delegated Address Pool** fields show the names of the pools used for DHCPv6 prefix delegation and for NDRA prefixes. The **IPv6 Delegated Network Prefix Length** field shows the length of the prefix used to assign the IPv6 address for this subscriber session. The **IPv6 Interface Address** field shows the IPv6 address assigned to the CPE interface from the NDRA pool.

Under the DHCP session, the **IPv6 Delegated Address Pool** fields show the name of the pool used for DHCPv6 prefix delegation. The **IPv6 Delegated Network Prefix Length** fields shows the length of the prefix used in DHCPv6 prefix delegation.

Related Documentation • [show subscribers on page 1775](#)

Monitoring Specific Subscriber Sessions

Purpose Display information about specific subscriber sessions. If you have many subscriber sessions running, you can use this command to display specific sessions.

Action From operational mode, enter the **show subscribers extensive id** command.

```
user@host>show subscribers extensive id 2
Type: PPPoE
User Name: SBRSTATICUSER
IP Address: 203.0.113.162
IP Netmask: 255.0.0.0
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: pppoe-subscriber-profile
MAC Address: 00:00:5E:00:53:01
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-12-08 09:11:41 PST

user@host> show subscribers extensive id 3
Type: DHCP
IPv6 Address: 2001:DB8::1
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:5E:00:53:01
State: Active
Radius Accounting ID: 3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-12-08 09:12:11 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 01 02 00 00 01
00 06 00 02 00 03 00 03 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

Meaning The output shows details about specific subscriber sessions.

Related Documentation • [show subscribers on page 1775](#)

Monitoring the Status of the PPPoE Logical Interface

Purpose Display status information about the PPPoE logical interface.

Action `user@host> show interfaces pp0.1073741888`

```

Logical interface pp0.1073741888 (Index 123) (SNMP ifIndex 707)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
  PPPoE:
    State: SessionUp, Session ID: 16,
    Session AC name: centaurus, Remote MAC address: 00:00:5E:00:53:02,
    Underlying interface: ge-1/0/0.1104 (Index 95)
    Input packets : 8
    Output packets: 51816
  LCP state: Opened
  NCP state: inet: Opened, inet6: Opened, iso: Not-configured, mp1s:
  Not-configured
  CHAP state: Closed
  PAP state: Success
    Protocol inet, MTU: 1500
      Flags: Sendbcst-pkt-to-re
      Addresses, Flags: Is-Primary
        Local: 192.0.2.77
    Protocol inet6, MTU: 1500
      Addresses, Flags: Is-Preferred Is-Primary
        Destination: 2001:DB8:0:21::/64, Local: 2001:DB8:0:21::1
      Addresses, Flags: Is-Preferred
        Destination: fe80::/64, Local: fe80::2a0:a50f:fc61:6d0

```

Meaning Displays session information about the ppp0 interface.

Related Documentation • [show interfaces \(PPPoE\)](#)

Monitoring Service Sessions for Subscribers

Purpose Display a details about dual-stack subscriber session.

Action user@host> **show subscribers interface pp0.1073741888 extensive**

```
Type: PPPoE
User Name: dual-stack-v4v6-2svc-good
IP Address: 203.0.113.140
Logical System: default
Routing Instance: default
Interface: pp0.1073741888
Interface type: Dynamic
Dynamic Profile Name: DS-dyn-ipv4v6-ra
MAC Address: 00:00:5E:00:53:02
State: Active
Radius Accounting ID: 155
Session ID: 155
Login Time: 2011-01-30 20:36:53 PST
Service Sessions: 2

Service Session ID: 174
Service Session Name: l3-v4-service
State: Active
IPv4 Input Filter Name: upstrm-filter-ge-1/0/0.1104-in
IPv4 Output Filter Name: dwnstrm-filter-ge-1/0/0.1104-out

Service Session ID: 175
Service Session Name: l3-v6-service
State: Active
IPv6 Input Filter Name: v6-up-filter-ge-1/0/0.1104-in
IPv6 Output Filter Name: v6-dn-filter-ge-1/0/0.1104-out
```

Meaning The highlighted output includes details about a subscriber's service sessions.

Related Documentation • [show subscribers on page 1775](#)

Monitoring PPP Options Negotiated with the Remote Peer

Purpose Display the PPP options that were negotiated with the CPE. You can also view the IPv4 address that was negotiated with the remote peer. This address matches the address returned from AAA. You can also see this address by using the **show subscribers** command.

Note that this is the only command that will provide the details about the negotiated interface IDs.

Action user@host> **show ppp interface pp0.1073741888 extensive**
 Session pp0.1073741888, Type: PPP, Phase: Network
 LCP
 State: Opened
 Last started: 2011-01-30 20:36:53 PST
 Last completed: 2011-01-30 20:36:53 PST
 Negotiated options:
 Authentication protocol: pap, Magic number: 1174596353, MRU: 1492
 Authentication: PAP
 State: Grant
 Last started: 2011-01-30 20:36:53 PST
 Last completed: 2011-01-30 20:36:53 PST
 IPCP
 State: Opened
 Last started: 2011-01-30 20:36:54 PST
 Last completed: 2011-01-30 20:36:54 PST
 Negotiated options:
 Local address: 192.0.2.77, Remote address: 192.0.2.140
 IPV6CP
 State: Opened
 Last started: 2011-01-30 20:36:54 PST
 Last completed: 2011-01-30 20:36:54 PST
 Negotiated options:
 Local interface identifier: 2a0:a50f:fc61:6d0,
 Remote interface identifier: 200:64ff:fe01:602

Related Documentation • [show ppp interface](#)

Monitoring the RADIUS Attribute Used for NDRA

Purpose Display the RADIUS attribute used for IPv6 NDRA.

Action To display the RADIUS attribute used for IPv6 Neighbor Discovery router advertisements:
 host1#show aaa ipv6-nd-ra-prefix
 IPv6 ND RA Prefix : IPv6-NdRa-Prefix (Juniper VSA)

Related Documentation • [Configuring a PPPoE Dynamic Profile for Use with NDRA in a Dual-Stack Network on page 467](#)

Monitoring and Managing DHCPv6

- [Monitoring Address Bindings on the DHCPv6 Local Server on page 549](#)
- [Verifying and Managing DHCPv6 Local Server Configuration on page 550](#)
- [Verifying and Managing DHCPv6 Relay Configuration on page 550](#)

Monitoring Address Bindings on the DHCPv6 Local Server

Purpose Display address bindings in the client table on the DHCPv6 local server.

Action To display address bindings in the client table on the DHCPv6 local server:

```

user@host>show dhcpv6 server binding detail
user@host> show dhcpv6 server binding detail
Session Id: 6
  Client IPv6 Prefix:          2001:db8:1111:2222::/64
  Client DUID:                 LL_TIME0x1-0x2e159c0-00:10:94:00:00:01

  State:
BOUND(LOCAL_SERVER_STATE_BOUND_ON_INTF_DELETE)
  Lease Expires:              2009-07-21 10:41:15 PDT
  Lease Expires in:           86308 seconds
  Lease Start:                2009-07-20 10:41:15 PDT
  Incoming Client Interface:  ge-1/0/0.0
  Server Ip Address:          0.0.0.0
  Server Interface:           none
  Client Id Length:           14
  Client Id:
/0x00010001/0x02e159c0/0x00109400/0x0001

Session Id: 7
  Client IPv6 Prefix:          2001:db8:1111:2222::/64
  Client DUID:                 LL_TIME0x1-0x2e159c0-00:10:94:00:00:02

  State:
BOUND(LOCAL_SERVER_STATE_BOUND_ON_INTF_DELETE)
  Lease Expires:              2009-07-21 10:41:15 PDT
  Lease Expires in:           86308 seconds
  Lease Start:                2009-07-20 10:41:15 PDT
  Incoming Client Interface:  ge-1/0/0.0
  Server Ip Address:          0.0.0.0
  Server Interface:           none
  Client Id Length:           14
  Client Id:
/0x00010001/0x02e159c0/0x00109400/0x0002

```

Related Documentation • [show dhcpv6 server binding on page 1616](#)

Verifying and Managing DHCPv6 Local Server Configuration

Purpose View or clear information about client address bindings and statistics for the DHCPv6 local server.

- Action**
- To display the address bindings in the client table on the DHCPv6 local server:
user@host> [show dhcpv6 server binding](#)
 - To display DHCPv6 local server statistics:
user@host> [show dhcpv6 server statistics](#)
 - To clear all DHCPv6 local server statistics:
user@host> [clear dhcpv6 server binding](#)
 - To clear all DHCPv6 local server statistics:
user@host> [clear dhcpv6 server statistics](#)

Related Documentation • [CLI Explorer](#)

Verifying and Managing DHCPv6 Relay Configuration

Purpose View or clear address bindings or statistics for extended DHCPv6 relay agent clients:

- Action**
- To display the address bindings for extended DHCPv6 relay agent clients:
user@host> [show dhcpv6 relay binding](#)
 - To display extended DHCPv6 relay agent statistics:
user@host> [show dhcpv6 relay statistics](#)
 - To clear the binding state of DHCPv6 relay agent clients:
user@host> [clear dhcpv6 relay binding](#)
 - To clear all extended DHCPv6 relay agent statistics:
user@host> [clear dhcpv6 relay statistics](#)

Related Documentation • [CLI Explorer](#)

PART 4

Configuring Junos OS Enhanced Subscriber Management

- [Configuring Junos OS Enhanced Subscriber Management on page 553](#)

CHAPTER 62

Configuring Junos OS Enhanced Subscriber Management

- [Configuring Junos OS Enhanced Subscriber Management on page 554](#)
- [Junos OS Enhanced Subscriber Management Overview on page 556](#)
- [Verifying and Managing Junos OS Enhanced Subscriber Management on page 558](#)
- [Configuring DTCP-Initiated Subscriber Secure Policy Mirroring Overview on page 559](#)
- [Configuring RADIUS-Initiated Subscriber Secure Policy Mirroring Overview on page 560](#)

Configuring Junos OS Enhanced Subscriber Management

Junos OS enhanced subscriber management is a next-generation broadband edge software architecture for wireline subscriber management. With enhanced subscriber management, you can take advantage of optimized scaling and performance for configuration and management of dynamic interfaces and services for subscriber management.

You can configure enhanced subscriber management on all MX Series 3D Universal Edge Routers with Modular Port Concentrators (MPCs) installed.



NOTE: You *must* configure enhanced subscriber management in order to use dynamic profiles for creating and managing dynamic subscriber interfaces and services.

Before you begin:

- Download and install Junos OS Release 15.1R3 or later.

See *Migration, Upgrade, and Downgrade Instructions* in the *Junos OS 15.1R3 Release Notes*. You must reboot the router after the upgrade is validated and installed.



CAUTION: Because unified in-service software upgrade (unified ISSU) is not supported when you upgrade to Junos OS Release 15.1R3, all subscriber sessions and subscriber state are lost after the upgrade.

To configure Junos OS enhanced subscriber management for the first time:

1. Configure enhanced IP network services on the router.
 - a. Specify that you want to configure chassis properties for the router.

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

- b. Configure enhanced IP network services.

```
[edit chassis]
user@host# set network-services enhanced-ip
```

2. Enable enhanced subscriber management.
 - a. Specify that you want to configure global services for the router.

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

- b. Enable enhanced subscriber management.

```
[edit system services]
user@host# set subscriber-management enable
```

3. Allocate shared memory for both the configuration database and enhanced subscriber management by setting a maximum size for the configuration database. Juniper recommends that you give 300 MB to the configuration database for MX240, MX480, and MX960 routers, and 100 MB for MX5, MX10, MX40, MX80 and MX104 routers. Once the size of the configuration database is set, the remaining resources are automatically allocated to enhanced subscriber management. For example:

```
user@host# set system configuration-database max-db-size 300M
```

4. (Optional) Enable traffic-accounting and rate-monitoring for the given interface:

```
[edit dynamic-profiles profile-name interfaces unit "$junos-interface-unit"]
user@host# set actual-transit-statistics
```

5. (Optional) Enable graceful Routing Engine switchover (GRES) and nonstop active routing (NSR).

- a. Enable GRES.

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

- b. Enable NSR (recommended if you enable GRES).

```
[edit routing-options]
user@host# set nonstop-routing
```

- c. Configure **commit** operations to automatically synchronize the configuration between the master Routing Engine and the standby Routing Engine.

```
[edit system]
user@host# set commit synchronize
```

6. Commit the configuration.

After you commit the configuration, the software prompts you to initiate a system reboot.

7. Reboot the router software to enable enhanced subscriber management.

- a. Access operational mode.

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

- b. Reboot the software.

```
user@host> request system reboot
```

Example The following example shows a typical configuration to enable enhanced subscriber management.

```
[edit]
chassis {
  network-services {
    enhanced-ip;
  }
  redundancy {
    graceful-switchover;
  }
}
```

```
}
routing-options {
  nonstop-routing;
}
system {
  commit synchronize;
  configuration-database {
    max-db-size 300M;
  }
  services {
    subscriber-management {
      enable;
    }
  }
}
```

**Related
Documentation**

- [Verifying and Managing Junos OS Enhanced Subscriber Management on page 558](#)
- [Junos OS Enhanced Subscriber Management Overview on page 556](#)

Junos OS Enhanced Subscriber Management Overview

Junos OS enhanced subscriber management is a next-generation broadband edge software architecture for wireline subscriber management. Enhanced subscriber management enables you to take advantage of increased scaling and performance for configuring and managing dynamic interfaces and services for subscriber management.

- [Enhanced Subscriber Management Overview on page 556](#)
- [Supported Hardware Platforms for Enhanced Subscriber Management on page 557](#)
- [Supported Features for Enhanced Subscriber Management on page 558](#)
- [Benefits of Configuring Enhanced Subscriber Management on page 558](#)

Enhanced Subscriber Management Overview

Enhanced subscriber management delivers optimized scaling and performance for the existing dynamic subscriber management feature set, including the following:

- Authentication, authorization, and accounting (AAA)
- Dynamic Host Configuration Protocol (DHCP)
- Layer 2 Tunneling Protocol (L2TP), including L2TP access concentrator (LAC) and L2TP network server (LNS)
- Point-to-Point Protocol (PPP)
- Point-to-Point Protocol over Ethernet (PPPoE)
- Other subscriber access models provided by the legacy subscriber management infrastructure

In order to use dynamic profiles to create and manage dynamic subscriber interfaces and services, you *must* explicitly configure and enable enhanced subscriber management.

When enhanced subscriber management is enabled, it handles all subscriber-management control protocol traffic (DHCP, PPP, PPPoE, L2TP, and dynamic VLAN creation) to direct the creation of subscriber sessions and their associated dynamic interfaces.

If you are using only static network configurations and static services in a business edge environment, you do not need to enable enhanced subscriber management to configure these static topologies. When enhanced subscriber management is *not* enabled, the following client applications do not support the use of dynamic profiles, the creation of dynamic interfaces, or dynamic authentication services:

- Dynamic VLANs
- PPPoE
- PPP
- L2TP
- DHCP

From an operational perspective, enhanced subscriber management introduces only minimal changes to existing subscriber management configuration and verification procedures. For example, enhanced subscriber management consolidates several subscriber management components previously distributed across multiple processes into a single process. As a result, enhanced subscriber management can display consolidated information for subscriber management in a single **show** command.

Supported Hardware Platforms for Enhanced Subscriber Management

Enhanced subscriber management is supported on the following hardware platforms.

- MX Series 3D Universal Edge Routers:
 - MX5, MX10, MX40, and MX80 routers
 - MX104 routers
 - MX240, MX480, and MX960 routers
 - MX2010 and MX2020 routers
- Routing Engines:
 - RE-S-2000 (supports up to 64,000 sessions per chassis)
 - RE-S-1800x4-16G (supports up to 256,000 sessions per chassis)
 - RE-S-1800x4-32G (supports up to 512,000 sessions per chassis)
- Interface modules:
 - Modular Port Concentrators (MPCs) including MPC1s, MPC2s, MPC3, MPC4s, and MPC5s
 - MS-MPCs and MS-MICs
 - MS-DPCs (supported only for static interface configurations)

- MPC1 Q, MPC2 Q, MPC2 EQ, MPC5E (supported for access-facing and uplink-facing applications)
- MPC6E supported for uplink-facing applications)

Supported Features for Enhanced Subscriber Management

Enhanced subscriber management provides feature parity with the legacy Junos OS subscriber management feature set, with certain exceptions. For a list of these feature exceptions, see the latest *Junos OS Release Notes for MX Series 3D Universal Edge Routers* for your Junos OS software.

Benefits of Configuring Enhanced Subscriber Management

Configuring enhanced subscriber management provides the following benefits:

- Delivers improved subscriber scaling and performance that addresses the increasing demand for residential broadband services such as high-speed Internet access, video on demand (VoD), IPTV, and transactional services.
- Reduces bottlenecks to obtaining maximum subscriber performance, scaling, and availability.
- Leverages increasing capabilities of Juniper Networks hardware to provide continued improvements to subscriber scaling and performance.
- Provides feature parity with the Junos OS subscriber management feature set.
- Integrates configuration and operation as seamlessly as possible with the existing subscriber management feature set.

Related Documentation

- [Configuring Junos OS Enhanced Subscriber Management on page 554](#)
- [Verifying and Managing Junos OS Enhanced Subscriber Management on page 558](#)

Verifying and Managing Junos OS Enhanced Subscriber Management

- | | |
|----------------|---|
| Purpose | View information about class of service (CoS), routing tables, active subscribers, and the subscriber database for Junos OS enhanced subscriber management. |
| Action | <ul style="list-style-type: none">• To display dynamic subscriber interface associations for CoS classifiers, rewrite rules, and scheduler maps:
<code>user@host> show class-of-service interface <i>interface-name</i></code>• To display CoS associations for a dynamic interface set:
<code>user@host> show class-of-service interface-set <i>interface-set-name</i></code>• To display the mapping of CoS schedulers to forwarding classes:
<code>user@host> show class-of-service scheduler-map</code>• To display CoS traffic shaping and scheduling profiles:
<code>user@host> show class-of-service traffic-control-profile</code>• To display the active entries in the routing table: |

```
user@host> show route
```

- To display detailed information about active subscribers whose IP address matches the specified address:

```
user@host> show subscribers address address detail
```

- To display information about how routes are mapped to specific enhanced subscriber management interfaces:

```
user@host> show system subscriber-management route
```

- To display summary information for the subscriber management database:

```
user@host> show system subscriber-management summary
```

Related Documentation

- [Configuring Junos OS Enhanced Subscriber Management on page 554](#)
- [Junos OS Enhanced Subscriber Management Overview on page 556](#)

Configuring DTCP-Initiated Subscriber Secure Policy Mirroring Overview

Before you configure subscriber secure policy traffic mirroring, note the following:

- Subscriber secure policy mirroring runs on the radius-flow-tap service infrastructure. To configure the subscriber secure policy service, you need the same privileges that are required to configure the radius-flow-tap service.
- The subscriber secure policy feature requires some system resources while mirroring, encrypting, and sending traffic to the mediation device. For example, you might elect to use a 10-Gigabit Ethernet interface for the tunnel and mediation device if you expect the amount of traffic you plan to mirror to approach 1 Gbps of actual user data.

To configure DTCP-initiated subscriber secure policy service:

1. Configure the radius-flow-tap service support for secure subscriber policy. This support includes configuring the tunnels and optional forwarding-class information that the subscriber secure policy service uses to send mirrored traffic to the content destination device.

See [Configuring Support for Subscriber Secure Policy Mirroring](#).

2. Configure the mediation device as a user on the router. This user account allows the router to receive DTCP messages from the mediation device.

See [Configuring the Mediation Device as a User on the Router](#).

3. Configure the mediation device to provision traffic mirroring on the router.

See [Configuring the Mediation Device to Provision Traffic Mirroring](#).

4. Configure a DTCP-over-SSH connection to the mediation device.

See [Configuring a DTCP-over-SSH Connection to the Mediation Device](#).

5. (Optional) Enable mirroring of IPv4 multicast traffic on the router.

See *Enabling Subscriber Secure Policy Mirroring for IPv4 Multicast Traffic*

6. Configure SNMPv3 trap support to report mirroring information to an external device.

See *Configuring SNMPv3 Traps for Subscriber Secure Policy Mirroring*.

You can terminate an active subscriber mirroring session at any time.

See *Terminating DTCP-Initiated Subscriber Traffic Mirroring Sessions*.

**Related
Documentation**

- *DTCP-Initiated Subscriber Secure Policy Overview*
- *Intercept-Related Events Transmitted to the Mediation Device*

Configuring RADIUS-Initiated Subscriber Secure Policy Mirroring Overview

Before you configure subscriber secure policy traffic mirroring, note the following:

- Subscriber secure policy mirroring runs on the radius-flow-tap service infrastructure. To configure the subscriber secure policy service, you must have the same privileges that are required to configure the radius-flow-tap service.
- The subscriber secure policy feature requires some system resources while mirroring, encrypting, and sending traffic to the mediation device. For example, you might elect to use a 10-Gigabit Ethernet interface for the tunnel to the mediation device if you expect the amount of traffic you plan to mirror to approach 1 Gbps of actual user data.

To configure the subscriber secure policy service:

1. Configure radius-flow-tap service support for secure subscriber policy. This support includes optional forwarding-class information that the subscriber secure policy service uses to send mirrored traffic to the content destination device.

See *Configuring Support for Subscriber Secure Policy Mirroring*.

2. Configure an access profile that specifies the RADIUS-related support for subscriber secure policy on the router, including a list of one or more RADIUS authentication servers. The router uses the list of specified servers for both authentication and dynamic request operations. You must also configure the RADIUS dynamic request feature, which provides the CoA message support used in-session traffic mirroring.

See *Configuring RADIUS Server Support for Subscriber Secure Policy Mirroring*.

3. Ensure that the following support is also configured:

- The RADIUS record of the mirrored subscriber must include the RADIUS attributes and VSAs required for subscriber secure policy mirroring. See *RADIUS Attributes Used for Subscriber Secure Policy* for descriptions of the supported attributes used in RADIUS Accept-Accept and CoA messages.

- The mediation device must be configured to accept the mirrored content.

4. (Optional) Enable the mirroring of IPv4 multicast traffic on the router.

See Enabling Subscriber Secure Policy Mirroring for IPv4 Multicast Traffic.

5. (Optional) Configure SNMPv3 trap support to report mirroring-related events to the mediation device.

See Configuring SNMPv3 Traps for Subscriber Secure Policy Mirroring.

To terminate an active subscriber mirroring session at any time.

See Terminating RADIUS-Initiated Subscriber Traffic Mirroring .

**Related
Documentation**

- *RADIUS Attributes Used for Subscriber Secure Policy*
- *Guidelines for Configuring Subscriber Secure Policy Mirroring*
- *Intercept-Related Events Transmitted to the Mediation Device*
- *Terminating RADIUS-Initiated Subscriber Traffic Mirroring*

PART 5

Configuring Address-Assignment Pools for Subscriber Management

- [Configuring Address-Assignment Pools for Dynamic and Static Addresses on page 565](#)

Configuring Address-Assignment Pools for Dynamic and Static Addresses

- [Address-Assignment Pools Overview on page 565](#)
- [Address-Assignment Pools Licensing Requirements on page 566](#)
- [Configuring Address-Assignment Pools on page 567](#)
- [Example: Configuring an Address-Assignment Pool on page 567](#)
- [Configuring an Address-Assignment Pool Name and Addresses on page 569](#)
- [Configuring a Named Address Range for Dynamic Address Assignment on page 569](#)
- [Configuring Address-Assignment Pool Usage Threshold Traps on page 570](#)
- [Configuring Address-Assignment Pool Linking on page 571](#)
- [Configuring Address-Assignment Pool Hold-Down on page 572](#)
- [Configuring Static Address Assignment on page 572](#)
- [Configuring Duplicate IPv4 Address Protection for AAA on page 573](#)

Address-Assignment Pools Overview

The address-assignment pool feature supports subscriber management and DHCP management functionality by enabling you to create centralized IPv4 and IPv6 address pools independently of the client applications that use the pools. The authd process manages the pools and the address allocation, whether the addresses come from local pools or from a RADIUS server. For example, multiple client applications, such as DHCP, can use the same address-assignment pool to provide addresses for their particular clients. Client applications can acquire addresses for either authenticated or unauthenticated clients.

Address-assignment pools support both dynamic and static address assignment. In dynamic address assignment, a client is automatically assigned an address from the address-assignment pool. In static address assignment, which is supported for IPv4 pools only, you reserve an address that is then always used by a particular client. Addresses that are reserved for static assignment are removed from the dynamic address pool and cannot be assigned to other clients.

You can configure named address ranges within an address-assignment pool. A named range is a subset of the overall address range. A client application can use named ranges

to manage address assignment based on client-specific criteria. For example, for IPv4 address-assignment pools, you might create a named range that is based on a specific DHCP option 82 value. Then, when a DHCP client request matches the specified option 82 value, an address from the specified range is assigned to the client.

You can link address-assignment pools together to provide backup pools for address assignment. When the primary pool is fully allocated, the router or switch automatically switches to the linked, or secondary, pool and begins allocating addresses from that pool.

The address-assignment pool hold-down feature enables you to specify that no additional address are allocated from an existing active address-assignment pool. This configuration gracefully transforms the active pool to an inactive state as the previously allocated addresses are returned to the pool. When the pool is inactive, you can safely perform maintenance on the pool without affecting any active subscribers.

You can also explicitly identify that an address-assignment pool is used for ND/RA.

**Related
Documentation**

- [Configuring Address-Assignment Pools on page 567](#)
- [Address-Assignment Pools Licensing Requirements on page 566](#)
- [Example: Configuring an Address-Assignment Pool on page 567](#)

Address-Assignment Pools Licensing Requirements

The address-assignment pool feature is part of the Junos OS Subscriber Management Feature Pack license. You must install and properly configure the license to meet the requirements for using the address-assignment pool feature.

**Related
Documentation**

- [*Junos OS Feature Licenses*](#)

Configuring Address-Assignment Pools

The address-assignment pool feature supports subscriber management functionality by enabling you to create address pools that can be shared by different client applications. An address-assignment pool can support either IPv4 address or IPv6 addresses. You cannot use the same pool for both types of address.



NOTE: Address-assignment pools are completely separate from services PIC-based L2TP LNS address pools, which you create with the `address-pool` statement at the `[edit access]` hierarchy level, and NAT pools, which you create with the `pool` statement at the `[edit services nat]` hierarchy level.

To configure an address-assignment pool:

1. Configure the address-assignment pool name and specify the addresses for the pool.
See [“Configuring an Address-Assignment Pool Name and Addresses” on page 569](#).
2. (Optional) Configure named ranges (subsets) of addresses.
See [“Configuring a Named Address Range for Dynamic Address Assignment” on page 569](#).
3. (Optional) Configure address-assignment pool linking and specify the secondary pool to use when the primary pool is fully allocated.
See [“Configuring Address-Assignment Pool Linking” on page 571](#).
4. (Optional) Create static address bindings (IPv4 only).
See [“Configuring Static Address Assignment” on page 572](#).
5. (Optional) Configure address-assignment pool hold-down, so that no additional addresses are allocated from the identified pool.
See [“Configuring Address-Assignment Pool Hold-Down” on page 572](#).
6. (Optional) Configure attributes for DHCP clients.
See [“Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address” on page 247](#).

Related Documentation

- [Address-Assignment Pools Overview on page 565](#)
- [Address-Assignment Pools Licensing Requirements on page 566](#)
- [Example: Configuring an Address-Assignment Pool on page 567](#)

Example: Configuring an Address-Assignment Pool

This example shows an address-assignment pool configuration that creates two pools, one for IPv4 DHCP clients (`isp_1`), and a second pool (`chi-fiber-ra`) that is used for router advertisement.

```
[edit access]
address-assignment {
  network-discovery-router-advertisement chi-fiber-ra;
  pool isp_1 {
    family inet {
      network 192.168.0.0/16;
      range southeast {
        low 192.168.102.2 high 192.168.102.254;
      }
      range northeast {
        low 192.168.119.2 high 192.168.119.250;
      }
      host sval6.boston.example.net {
        hardware-address 00:00:5E:00:53:90;
        ip-address 192.168.44.12;
      }
      dhcp-attributes {
        option-match {
          option-82 {
            circuit-id fiber range northeast;
          }
          option-82 {
            circuit-id cable_net range southeast;
          }
        }
        boot-file boot.client;
        boot-server 192.168.200.100;
        grace-period 3600;
        maximum-lease-time 18000;
        netbios-node-type p-node;
        router 192.168.44.44 192.168.44.45;
      }
    }
  }
  pool chi-fiber-ra {
    family inet6 {
      prefix 2001:db8:2008:2009:2010::/48;
      range fiber3 {
        low 2001:db8:2008:2009:2010::1/64;
        high 2001:db8:2008:2009:2010::5/64;
      }
    }
  }
}
```

This example creates an IPv4 address-assignment pool named **isp-1**, which contains two named address ranges, **southeast** and **northeast**. The address-assignment pool also contains a static binding for client **host sval6.boston.example.net**. The **ISP_1** pool configuration also includes the **dhcp-attributes** statement, indicating that the pool is used for DHCP clients. If the option 82 **circuit-id** entry matches the string **fiber**, then DHCP assigns the client an address from the **northeast** range. If the option 82 **circuit-id** matches the string **cable_net**, DHCP assigns an address from the **southeast** range.

The second address-assignment pool created in this example is **chi-fiber-ra**. The **neighbor-discovery-router-advertisement** statement at the beginning of the syntax specifies

that this named address-assignment pool is used for router advertisement. The syntax at the end of the example configures the address-assignment pool named **chi-fiber-ra**.

- Related Documentation**
- [Address-Assignment Pools Overview on page 565](#)
 - [Configuring Address-Assignment Pools on page 567](#)

Configuring an Address-Assignment Pool Name and Addresses

To configure an address-assignment pool, you must specify the name of the pool and configure the addresses for the pool.

To configure an IPv4 address-assignment pool:

1. Configure the name of the pool and specify the IPv4 family.

```
[edit access]
user@host# edit address-assignment pool isp_1 family inet
```

2. Configure the network address and the prefix length of the addresses in the pool.

```
[edit access address-assignment pool isp_1 family inet]
user@host# set network 192.168.0.0/16
```

To configure an IPv6 address-assignment pool:

1. Configure the name of the pool and specify the IPv6 family.

```
[edit access]
user@host# edit address-assignment pool isp_2 family inet6
```

2. Configure the IPv6 network prefix for the address pool. The prefix specification is required when you configure an IPv6 address-assignment pool.

```
[edit access address-assignment pool isp_2 family inet6]
user@host# set prefix 2001:db8:2008:2009::/32
```

- Related Documentation**
- [Address-Assignment Pools Overview on page 565](#)
 - [Configuring Address-Assignment Pools on page 567](#)

Configuring a Named Address Range for Dynamic Address Assignment

You can optionally configure multiple named ranges, or subsets, of addresses within an address-assignment pool. During dynamic address assignment, a client can be assigned an address from a specific named range. To create a named range, you specify a name for the range and define the address range.

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

1. Specify the name of the address-assignment pool and the IPv4 family.

```
[edit access]
user@host# edit address-assignment pool isp_1 family inet
```

2. Configure the name of the range and the lower and upper boundaries of the addresses in the range.

```
[edit access address-assignment pool isp_1 family inet]
user@host# set range southeast low 192.168.102.2 high 192.168.102.254
```

To create a named range within an IPv6 address-assignment pool:

1. Specify the name of the address-assignment pool and the IPv6 family.

```
[edit access]
user@host# edit address-assignment pool isp_2 family inet6
```

2. Configure the name of the range and define the range. You can define the range based on the lower and upper boundaries of the prefixes in the range, or based on the length of the prefixes in the range.

```
[edit access address-assignment pool isp_2 family inet6]
user@host# set range dsl-range low 2001:db8:2008:2010:2011:0100::/64 high
2001:db8:2008:2010:2011:ffff::/64
user@host# set range fiber-east prefix-length 48
```

- Related Documentation**
- [Address-Assignment Pools Overview on page 565](#)
 - [Configuring Address-Assignment Pools on page 567](#)

Configuring Address-Assignment Pool Usage Threshold Traps

You can receive advanced warning that an address pool or linked set of address pools is running short on available addresses by setting usage threshold traps. An address pool has SNMP thresholds associated with it that allow the local address server to signal SNMP traps when certain conditions exist. These thresholds include high utilization threshold and abated utilization threshold. If a pool's outstanding addresses exceed the high utilization threshold and the SNMP trap signaling is enabled, SNMP is notified. Likewise, when a pool's utilization drops below the abated threshold utilization threshold, SNMP is notified. When the system reaches the high utilization value, it sends warning messages. When memory usage falls to the abated utilization value, the system stops sending warning messages.

To set the usage for threshold traps:

- Specify the percentage after which the address pool usage is exceeded that an SNMP trap is generated.

```
[edit access]
user@host# edit address-assignment high-utilization 95
```

To set the abated value for the trap:

- Specify the percentage below which the address pool usage is abated that an SNMP trap is generated.

```
[edit access]
user@host# edit address-assignment abated-utilization 80
```

Related Documentation • [Address-Assignment Pools Overview on page 565](#)

Configuring Address-Assignment Pool Linking

Address-assignment pool linking enables you to specify a secondary address pool for the router to use when the primary address-assignment pool is fully allocated. When the primary pool is has no available addresses, the router automatically switches over to the linked secondary pool and begins allocating addresses from that pool. The router uses a secondary pool only when the primary address-assignment pool is fully allocated.

You can create a chain of multiple linked pools. For example you can link pool A to pool B, and link pool B to pool C. When pool A has no available addresses, the router switches to using pool B for addresses. When pool B is exhausted, the router switches to pool C. There is no limit to the number of linked pools in a chain. However, you cannot create multiple links to or from the same pool—a pool can be linked to only one secondary pool, and a secondary pool can be linked from only one primary pool. Also, two linked primary and secondary pools must be of the same family type, either IPv4 or IPv6.

To link an address-assignment pool to a secondary pool:

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

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

2. Configure the secondary pool to which the primary pool will be linked.

```
[edit access address-assignment pool isp_1]
user@host# set link pool-name
```

Related Documentation • [Address-Assignment Pools Overview on page 565](#)
• [Address-Assignment Pools Licensing Requirements on page 566](#)

Configuring Address-Assignment Pool Hold-Down

The address-assignment pool hold-down feature enables you to gracefully transition an active address pool to an inactive state. When the pool is in the inactive state, you can safely perform maintenance on the pool without affecting any current subscribers (such as adding, changing, or deleting addresses).

When an address-assignment pool is in the hold-down state, no additional addresses are allocated from that pool. However, the hold-down state does not affect any existing subscribers that are using addresses previously assigned from the pool. As the existing subscribers disconnect, their IP addresses are marked as free in the pool, but the addresses are not reallocated due to the pool's hold-down state. Eventually, when all subscribers have disconnected and their addresses are returned to the pool, the pool becomes inactive.

To place an active address-assignment pool in the hold-down state:

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

```
[edit access]
user@host# edit address-assignment pool isp_1
```

2. Specify that the pool is in the hold-down state so that no additional addresses can be allocated from the pool.

```
[edit access address-assignment pool isp_1]
user@host# set hold-down
```

Related Documentation

- [Address-Assignment Pools Overview on page 565](#)
- [Address-Assignment Pools Licensing Requirements on page 566](#)
- [Example: Configuring an Address-Assignment Pool on page 567](#)

Configuring Static Address Assignment

You can optionally create a static IPv4 address binding by reserving a specific address for a particular client. The address is removed from the address-assignment pool so that it is not assigned to another client. When you reserve an address, you identify the client host and create a binding between the client MAC address and the assigned IP address. IPv6 address-assignment pools do not support static address binding.

To configure a static binding for an IPv4 address:

1. Specify the name of the IPv4 address-assignment pool containing the IP address you want to reserve for the client.

```
[edit access]
user@host# edit address-assignment pool isp_1 family inet
```

2. Specify the name of the client for the static binding, the client MAC address, and the IP address to reserve for the client. This configuration specifies that the client with MAC address 00:00:5E:00:53:90 is always assigned IP address 192.168.44.12.

```
[edit access address-assignment pool isp_1 family inet]
user@host# set host svale6_boston_net hardware-address
00:00:5E:00:53:90ip-address 192.168.44.12
```

- Related Documentation**
- [Address-Assignment Pools Overview on page 565](#)
 - [Configuring Address-Assignment Pools on page 567](#)

Configuring Duplicate IPv4 Address Protection for AAA

Starting in Junos OS Release 14.1, if you are using AAA to supply IPv4 addresses, you can enable duplicate address protection to prevent addresses from being used more than once. If enabled, the following attributes received from external servers are checked:

- *Framed-IP-Address*
- *Framed-Pool*

The router then takes one of the following actions:

- If an address matches an address in an address pool, the address is taken from the pool, provided it is available.
- If the address is already in use, it is rejected as unavailable.

To configure duplicate address protection:

1. Enter the **access** configuration.

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

2. Enable duplicate address protection.

```
[edit access]
user@host# address-protection
```

Release History Table

Release	Description
14.1	Starting in Junos OS Release 14.1, if you are using AAA to supply IPv4 addresses, you can enable duplicate address protection to prevent addresses from being used more than once.

- Related Documentation**
- [Configuring Duplicate IPv6 Prefix Protection for Router Advertisement on page 471](#)

PART 6

Configuring DNS Addresses for Subscriber Management

- [Configuring DNS Address Assignments and Session Options on page 577](#)

Configuring DNS Address Assignments and Session Options

- [DNS Name Server Address Overview on page 577](#)
- [Configuring DNS Name Server Addresses for Subscriber Management on page 578](#)
- [Ensuring IPCP Negotiation for Primary and Secondary DNS Addresses on page 580](#)
- [Overriding How the DNS Server Address Is Returned in a DHCPv6 Multiple Address Environment on page 581](#)
- [DNS Resolver for IPv6 DNS Overview on page 582](#)
- [Configuring a DNS Server Address for IPv6 Hosts on page 582](#)

DNS Name Server Address Overview

When a client attempts to access a domain—for example, `www.example.com`—a request is sent to a Domain Name System (DNS) name server. The name server stores information that correlates domain names with IP addresses; the IP address is used to reach the requested domain. In response to the client request, the name server looks up the IP address for the domain—`192.0.2.10` for `www.example.com`—and returns it to the client.

In your network configuration, you must configure the address of one or more name servers locally on the router or on your RADIUS server. The local configuration supports the following subscriber types:

- DHCPv4 or DHCPv6
- IP over Ethernet (VLAN)
- Terminated PPPoE (IPv4 or IPv6)
- Tunneled PPPoE (IPv4 or IPv6)

You can configure the name server addresses globally (per routing instance), per access profile, or, for DHCP only, per address pool. You can configure more than one name server in a routing instance or access profile by repeating the statement for each address.

Because you can configure name server addresses at more than one level, the address returned to the client is determined by the order of preference among the levels. The preference depends on the client type.

- For DHCP subscribers, the preference in descending order is
RADIUS > DHCP address pool > access profile > global
- For non-DHCP subscribers, the preference in descending order is
RADIUS > access profile > global

According to the preference order, a name server address configured in RADIUS is preferred by all subscriber types over all other configuration levels. For all subscriber types, the global name server address is used only when no other name server addresses are configured. When a name server address is configured only in a DHCP address pool, then no address is available to non-DHCP subscribers.

When you configure multiple addresses for a name server, the order in which you configure them determines the preference within that configuration. The preference according to configuration level supersedes this ordering.

There is no restriction on the number of DNS name server addresses that you can configure. For DHCP subscribers, all the addresses are sent in DHCP messages. However, only two addresses—determined by preference order—are sent to PPP subscribers.

All changes in these locally configured DNS name servers affect only new subscribers that subsequently log in. Existing subscribers are not affected by the changes.

**Related
Documentation**

- [Configuring DNS Name Server Addresses for Subscriber Management on page 578](#)
- [DHCP Attributes for Address-Assignment Pools on page 243](#)
- [Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address on page 247](#)

Configuring DNS Name Server Addresses for Subscriber Management

This topic describes the procedure for configuring DNS name server addresses at the access profile and routing instance levels. For information about configuring addresses in DHCP address pools, see the DHCP topics referenced in the *Related Documentation* section. For information about configuring addresses on your RADIUS server, refer to your RADIUS software documentation. The order in which the name server configurations at different levels are preferred is described in “[DNS Name Server Address Overview](#)” on [page 577](#).



BEST PRACTICE: In practice, choose either the `domain-name-server` statement or the `domain-name-server-inet` statement for IPv4 addresses. They both have the same effect and there is no need to use both statements. If you do use both statements, addresses configured with `domain-name-server-inet` are preferred over addresses configured with `domain-name-server`.

For example, the following sample configuration specifies two IPv4 domain name servers. The server configured with the `domain-name-server-inet` statement, 192.168.21.23, is preferred over the server configured with the `domain-name-server` statement, 198.51.100.31.

```
[edit access]
user@host# set domain-name-server 198.51.100.31
user@host# set domain-name-server-inet 192.168.21.23
```

To configure DNS name server addresses globally:

1. Configure an IPv4 address.

```
[edit access]
user@host# set domain-name-server-inet dns-address
```

Alternatively, you can use a different statement to configure an IPv4 address.

```
[edit access]
user@host# set domain-name-server dns-address
```

2. Configure an IPv6 address.

```
[edit access]
user@host# set domain-name-server-inet6 dns-address
```

For example, to configure multiple addresses of each type:

```
[edit access]
user@host# set domain-name-server-inet 1928.51.100.31
user@host# set domain-name-server-inet 1928.51.100.100
user@host# set domain-name-server-inet6 2001:db8:85a3::8a2e:370:81ca
user@host# set domain-name-server-inet6 2001:db8:85a3::8a2e:370:7334
```

To configure DNS name server addresses in an access profile:

1. Configure an IPv4 address.

```
[edit access profile profile-name]
user@host# set domain-name-server-inet dns-address
```

Alternatively, you can use a different statement to configure an IPv4 address.

```
[edit access profile profile-name]
user@host# set domain-name-server dns-address
```

2. Configure an IPv6 address.

```
[edit access profile profile-name]
user@host# set domain-name-server-inet6 dns-address
```

For example, to configure multiple addresses of each type:

```
[edit access profile vrf-s-access]
user@host# set domain-name-server-inet 1928.51.100.01
user@host# set domain-name-server-inet 1928.51.100.100
user@host# set domain-name-server-inet6 2001:db8:85a3::8a2e:370:ac81
user@host# set domain-name-server-inet6 2001:db8:85a3::8a2e:370:71bfd
```

- Related Documentation**
- [DNS Name Server Address Overview on page 577](#)
 - [DHCP Attributes for Address-Assignment Pools on page 243](#)
 - [Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address on page 247](#)

Ensuring IPCP Negotiation for Primary and Secondary DNS Addresses

Starting in Junos OS Release 15.1, you can configure a router to prompt any customer premises equipment (CPE) to send the IPv4 primary or secondary DNS address options in the next configuration request if the options are not included in an initial IPCP configuration request during IPCP negotiations or if the router rejects the request. This DNS option enables the router to control IPv4 DNS address provisioning for dynamic and static, terminated PPPoE and LNS subscribers. The router includes the address options in the IPCP configuration NAK message that it sends to the CPE. The CPE then negotiates both primary and secondary IPv4 DNS addresses. Using this option avoids a situation in which the CPE does not take advantage of the DNS addresses available at the router.

To configure the router to prompt the CPE to negotiate the DNS addresses for dynamic PPPoE subscribers:

- Specify the DNS negotiation option.

```
[edit dynamic-profiles profile-name interfaces pp0 unit "$junos-interface-unit"  
  ppp-options]  
user@host# set ipcp-suggest-dns-option
```

To configure the router to prompt the CPE to negotiate the DNS addresses for static PPPoE subscribers:

- Specify the DNS negotiation option.

```
[edit interfaces interface-name ppp-options]  
user@host# set ipcp-suggest-dns-option
```

To configure the router to prompt the CPE to negotiate the DNS addresses for dynamic LNS subscribers:

- Specify the DNS negotiation option.

```
[edit dynamic-profiles profile-name interfaces "$junos-interface-ifd-name" unit  
  "$junos-interface-unit" ppp-options]  
user@host# set ipcp-suggest-dns-option
```

To configure the router to prompt the CPE to negotiate the DNS addresses for static LNS subscribers:

- Specify the DNS negotiation option.

```
[edit interfaces si-slot/pic/port unit logical-unit-number ppp-options]  
user@host# set ipcp-suggest-dns-option
```

To configure the router to prompt the CPE to negotiate the DNS addresses for tunneled PPP subscribers with an LNS user group profile:

- Specify the DNS negotiation option.

```
[edit access group-profile profile-name ppp-options]
user@host# set ipcp-suggest-dns-option
```

Release History Table

Release	Description
15.1	Starting in Junos OS Release 15.1, you can configure a router to prompt any customer premises equipment (CPE) to send the IPv4 primary or secondary DNS address options in the next configuration request if the options are not included in an initial IPCP configuration request during IPCP negotiations or if the router rejects the request.

Related Documentation

- *Configuring the Group Profile for Defining L2TP Attributes*
- *Applying PPP Attributes to L2TP LNS Subscribers with a User Group Profile*
- *Dynamic Profiles Overview*
- *Configuring Dynamic Authentication for PPP Subscribers*
- *Applying PPP Attributes to L2TP LNS Subscribers per Inline Service Interface*

Overriding How the DNS Server Address Is Returned in a DHCPv6 Multiple Address Environment

In a DHCPv6 environment, DHCPv6 clients can use a single Solicit message to request multiple addresses (an IA_NA address, an IA_PD address, or both), as well as the DNS server address (DHCPv6 attribute 23). By default, the DHCPv6 local server returns the DNS server address as a global DHCPv6 option.

You can override the default behavior and specify that the DHCPv6 local server returns DNS server addresses as their respective IA_NA and IA_PD suboptions. You can configure the DHCPv6 local server to support the override globally, for a specific group, or for a specific interface.



CAUTION: Some customer premises equipment (CPE) cannot recognize the DNS server address when the address is returned as an IA_NA or IA_PD suboption, which can create interoperability issues.

To configure the DHCPv6 local server to return the DNS server address as an IA_NA or IA_PD suboption.

1. Specify that you want to configure DHCPv6 override options.

```
[edit system services dhcp-local-server dhcpv6]
user@host# edit overrides
```

2. Override the default behavior. DHCPv6 local server now returns DNS server addresses as the respective IA_PD or IA_NA suboption.

```
[edit system services dhcp-local-server dhcpv6 overrides]
user@host# set multi-address-embedded-option-response
```

**Related
Documentation**

- [Using DHCPv6 IA_NA with DHCPv6 Prefix Delegation Overview on page 395](#)
- [DHCPv6 Options in a DHCPv6 Multiple Address Environment on page 396](#)

DNS Resolver for IPv6 DNS Overview

In a network that uses Neighbor Discovery Router Advertisement (NDRA) to provide IPv6 addressing, the DNS server address can be provided in Router Advertisements sent to IPv6 hosts. The address is included in a field called Recursive DNS Server (RDNSS). This feature is useful in networks that are not running DHCPv6.

RADIUS can populate the RDNSS field dynamically when an IPv6 subscriber logs in. On the RADIUS server, you can configure a primary and secondary DNS address in the following VSAs, which are stored in the `$junos-ipv6-dns-server` variable:

- Unisphere-Ipv6-Primary-Dns
- Unisphere-Ipv6-Secondary-Dns

When a subscriber logs in, RADIUS provides the actual DNS server address in the Access-Accept message.

You can also configure a static IPv6 address for DNS servers.

After the subscriber session is established, the DNS address is stored in the session database. When the router sends IPv6 router advertisements, it uses this DNS address in the RDNSS field in the Router Advertisement option.

**Related
Documentation**

- [Configuring a DNS Server Address for IPv6 Hosts on page 582](#)
- [Configuring DNS Name Server Addresses for Subscriber Management on page 578](#)

Configuring a DNS Server Address for IPv6 Hosts

To configure a dynamic DNS server address for IPv6 hosts:

1. Specify that the router receives the DNS server address in the `$junos-ipv6-dns-server-address` variable sent from RADIUS servers in the Access-Accept message when the subscriber logs in.

```
[edit dynamic-profiles dynamic-profile-name protocols router-advertisement interface
interface-name]
user@host# set dns-server-address $junos-ipv6-dns-server-address
```

2. Specify the time in seconds for which the DNS server address remains valid.

```
[edit dynamic-profiles dynamic-profile-name protocols router-advertisement interface
interface-name dns-server-address address]
user@host# set lifetime 2400
```

The default value of the lifetime is 1800 seconds.

To configure a static DNS server address for IPv6 hosts:

1. Specify the IPv6 address of the DNS server.

```
[edit dynamic-profiles dynamic-profile-name protocols router-advertisement interface
interface-name]
user@host# set dns-server-address ipv6-address
```

2. Specify the time in seconds for which the DNS server address remains valid.

```
[edit dynamic-profiles dynamic-profile-name protocols router-advertisement interface
interface-name dns-server-address address]
user@host# set lifetime 2400
```

The default value of the lifetime is 1800 seconds.

Related Documentation

- [DNS Resolver for IPv6 DNS Overview on page 582](#)

PART 7

Configuring CLI-Based Subscriber Services

- [Configuring CLI-Activated Subscriber Services on page 587](#)
- [Configuring Subscriber Services with Multiple Instances on page 595](#)
- [Monitoring and Managing Subscriber Services on page 603](#)

Configuring CLI-Activated Subscriber Services

- [CLI-Activated Subscriber Services on page 587](#)
- [Activating and Deactivating Subscriber Services Locally with the CLI on page 588](#)
- [Using the CLI to Modify Traffic-Control Profiles That Are Currently Applied to Subscribers on page 591](#)

CLI-Activated Subscriber Services

Subscriber management enables you to use the Junos OS CLI to locally activate and deactivate dynamic subscriber services. CLI-based activation and deactivation provides local control for dynamic subscriber services that is similar to subscriber management's change of authorization (CoA) feature. CoA is considered a remote activation method because the commands, or triggers, are received from a remote server, such as a RADIUS or provisioning server. Both the CoA and CLI-based methods enable you to manage services for subscribers who are currently logged in to the network—you can activate a new service for the subscriber or deactivate a current service.

The CLI-based feature activates the specified service—you cannot use it to modify a subscriber's dynamic profile instantiation or to modify user-defined variables in a dynamic profile. You can, however, include variables that are defined for the service in the dynamic profile.

Subscriber management does not support accounting for CLI-activated subscriber services. Accounting for any service is disabled by default. Therefore when you use the CLI to activate a service, it is activated with accounting disabled, and there is no way to explicitly enable accounting for the service. CLI deactivation of a service previously activated (such as by RADIUS) has no effect on accounting for that service.

CLI-based activation and deactivation is useful in service provider networks that do not use provisioning servers or RADIUS servers to activate and deactivate subscriber services. The local control provided by the CLI-based operations enables service providers to add and remove services for existing subscribers without requiring that the subscriber log out and then log in again to complete the change. For example, a service provider might allow subscribers to log in and initially use the default service, which provides basic features. After the default service is established, the provider might then use CLI-activation to upgrade qualified subscribers to an advanced service, in addition to retaining the initial

service. Later, the provider can use CLI-deactivation to terminate the subscriber's advanced service session. The subscriber retains the initial service until the service is deactivated.

CLI-based activation or deactivation of a subscriber service fails if any of the following conditions exist:

- A RADIUS CoA operation or a previous CLI-based activation or deactivation is currently in progress for the subscriber. Only one dynamic request can be active for the subscriber.
- A unified in-service software upgrade (unified ISSU) operation is active.
- The specified service could not be activated or deactivated.

A CLI-based activation or deactivation of a subscriber service also fails if a PCRF has successfully activated any services for the subscriber. You must override the PCRF provisioning to be able to activate or deactivate services for such a subscriber. For more information, see [“Disabling PCRF Control of a Subscriber Session” on page 881](#).

Related Documentation

- [Activating and Deactivating Subscriber Services Locally with the CLI on page 588](#)
- [Using the CLI to Modify Traffic-Control Profiles That Are Currently Applied to Subscribers on page 591](#)
- [Default Subscriber Service Overview on page 241](#)

Activating and Deactivating Subscriber Services Locally with the CLI

Subscriber management enables you to use the Junos OS CLI to locally activate or deactivate dynamic subscriber services for subscribers who are currently logged in to the network. You can activate an initial service for the subscriber, provide an additional service, or deactivate the subscriber's current service.



NOTE:

A CLI-based activation or deactivation of a subscriber service fails if any of the following conditions exist:

- A RADIUS CoA operation or a previous CLI-based activation or deactivation is active for the subscriber.
- A unified in-service software upgrade (unified ISSU) operation is active.
- The specified service could not be activated or deactivated.

A CLI-based activation or deactivation of a subscriber service also fails if a PCRF has successfully activated any services for the subscriber. You must override the PCRF provisioning to be able to activate or deactivate services for such a subscriber. For more information, see [“Disabling PCRF Control of a Subscriber Session” on page 881](#).

To use the CLI to activate a subscriber service:

1. (Optional) Verify the subscriber's ID, and ensure that provisioning is not enabled. To display the session IDs of all current subscribers, use the **show subscribers detail** or **show network-access aaa subscribers** command.

```
user@host> show network-access aaa subscribers session-id 55 detail
Type: dhcp
Username: user23@example.net
Stripped username: user23
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:retail-onlinecompany-ca
Access-profile:retailer-onlinecompany-sjc
Session ID: 55
Accounting Session ID: 55
Multi Accounting Session ID: 0
IP Address: 192.168.44.104
Authentication State: AuthStateActive
Accounting State: Acc-Start-Send
Provisioning-type: none
Service name: basic-service
  Service State: SvcActive
  Session ID: 56
  Session uptime: 00:01:45
```

2. Activate the service for the subscriber.

```
user@host> request network-access aaa subscriber add session-id 55 service-profile
gold-service
```

3. (Optional) Verify that the new service is activated for the subscriber. (The initial **basic-service** is also listed because it has not been deactivated.)

```
user@host> show network-access aaa subscribers session-id 55 detail
Type: dhcp
Username: user23@example.net
Stripped username: user23
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:retail-onlinecompany-ca
Access-profile:retailer-onlinecompany-sjc
Session ID: 55
Accounting Session ID: 55
Multi Accounting Session ID: 0
IP Address: 192.168.44.104
Authentication State: AuthStateActive
Accounting State: Acc-Start-Send
Provisioning-type: none
Service name: basic-service
  Service State: SvcActive
  Session ID: 56
  Session uptime: 00:02:15
Service name: gold-service
  Service State: SvcActive
  Session ID: 57
  Session uptime: 00:00:30
```

To use the CLI to deactivate a subscriber service:

1. Display the active services for the specified subscriber. The following example shows that the **basic-service** and **gold-service** are active.

```
user@host> show network-access aaa subscribers session-id 55 detail
Type: dhcp
Username: user23@example.net
Stripped username: user23
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:retail-onlinecompany-ca
Access-profile:retailer-onlinecompany-sjc
Session ID: 55
Accounting Session ID: 55
Multi Accounting Session ID: 0
IP Address: 192.168.44.104
Authentication State: AuthStateActive
Accounting State: Acc-Start-Send
Provisioning-type: none
Service name: basic-service
  Service State: SvcActive
  Session ID: 56
  Session uptime: 00:02:15
Service name: gold-service
  Service State: SvcActive
  Session ID: 57
  Session uptime: 00:00:30
```

2. Deactivate the service for the subscriber. The following example deletes the subscriber's **basic-service** service.

```
user@host> request network-access aaa subscriber delete session-id 55 service-profile
basic-service
```

3. (Optional) Verify that the deleted service is no longer active for the subscriber. (The **gold-service** is still listed because it has not been deactivated.)

```
user@host> show network-access aaa subscribers session-id 55 detail
Type: dhcp
Username: user23@example.net
Stripped username: user23
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:retail-onlinecompany-ca
Access-profile:retailer-onlinecompany-sjc
Session ID: 55
Accounting Session ID: 55
Multi Accounting Session ID: 0
IP Address: 192.168.44.104
Authentication State: AuthStateActive
Accounting State: Acc-Start-Send
Provisioning-type: none
Service name: gold-service
  Service State: SvcActive
  Session ID: 57
  Session uptime: 00:00:30
```

Related Documentation

- [CLI-Activated Subscriber Services on page 587](#)
- [Using the CLI to Modify Traffic-Control Profiles That Are Currently Applied to Subscribers on page 591](#)
- [Default Subscriber Service Overview on page 241](#)

Using the CLI to Modify Traffic-Control Profiles That Are Currently Applied to Subscribers

Subscriber management enables you to use the CLI to modify a traffic-control profile that is currently applied to existing subscribers. This feature allows you to update subscribers who are initially assigned the default traffic-control profile, which might have limited features.



TIP: You specify the default traffic-control profile with the **predefined-variable-defaults** statement and the **cos-traffic-control-profile** variable at the **[edit dynamic-profiles *profile-name* class-of-service]** hierarchy level.

There are two methods you can use to modify an traffic-control profile that is in use—global and per-subscriber. The global method modifies the traffic-control profile for all subscribers currently using the traffic-control profile. The per-subscriber method modifies the traffic-control profile for a particular subscriber—all other subscribers currently using the traffic-control profile remain unaffected.

The global and per-subscriber methods share the following characteristics:

- They modify traffic-control profiles that are currently applied to active subscribers.
- Neither method creates new traffic-control profiles; they modify existing traffic-control profiles that have been previously created using the **traffic-control-profiles** statement at the **[edit dynamic-profiles *profile-name* class-of-service]** hierarchy level.
- Modifications are transparent to the active subscribers who are using the modified profile. The modified traffic-control profile is assigned without requiring any action by the subscriber.
- Both methods are useful when updating subscribers who are initially assigned the default traffic-control profile, which might have limited features. You specify the default traffic-control profile with the **predefined-variable-defaults** statement and the **cos-traffic-control-profile** variable at the **[edit dynamic-profiles *profile-name* class-of-service]** hierarchy level.



NOTE: To support CLI modification of traffic-control profiles in an IPv4/IPv6 dual-stack environment, you must have the `aggregate-clients replace` statement enabled at the `[edit system services dhcp-local-server group group-name dynamic-profile profile-name]` hierarchy

This topic includes the following tasks:

- [Using the CLI to Globally Modify a Traffic-Control Profile Currently Applied to Multiple Subscribers on page 592](#)
- [Using the CLI to Modify a Traffic-Control Profile for a Specific Current Subscriber on page 592](#)

Using the CLI to Globally Modify a Traffic-Control Profile Currently Applied to Multiple Subscribers

To make a global modification for all current subscribers assigned a particular traffic-control profile, you change one or more parameters for the traffic-control profile and **commit** the changes.

In this example, the statement changes the shaping rate for the existing traffic-control profile named **TCP-silver**. After the change, the new shaping rate applies to all subscribers currently using **TCP-silver**.

1. Access the traffic-control profile you want to modify.

```
[edit dynamic-profiles business-profile class-of-service]
user@host# edit traffic-control-profiles TCP-silver
```

2. Specify the parameters that you want to modify in the traffic-control profile.

```
[edit dynamic-profiles business-profile class-of-service traffic-control-profiles
TCP-silver]
user@host# set shaping-rate 20m
```

3. Commit the configuration change to update the traffic-control profile. All current subscribers using **TCP-silver** now have the new **shaping-rate**.

Using the CLI to Modify a Traffic-Control Profile for a Specific Current Subscriber

To make a per-subscriber modification for a specific subscriber that is currently assigned a traffic-control profile, you specify the name of the new traffic-control profile to use.

In this example, the command replaces the existing traffic-control profile with the profile named **TCP-gold**. The new traffic-control profile applies only to the subscriber identified by session ID **2551**.

- Request that the traffic-control profile named **TCP-gold** be applied to session ID 2551.

```
user@host> request network-access aaa subscriber modify session-id 2551
junos-cos-traffic-control-profile TCP-gold
```

The system then displays the status message, **Successful completion**, indicating that the modification is successful. The subscriber identified by session ID 2551 now uses the **TCP-gold** traffic-control profile.

CHAPTER 66

Configuring Subscriber Services with Multiple Instances

- [Subscriber Services with Multiple Instances Overview on page 595](#)
- [Deactivating a Single Instance of a Subscriber Service with Multiple Instances on page 597](#)
- [Deactivating All Instances of a Subscriber Service with Multiple Instances on page 599](#)

Subscriber Services with Multiple Instances Overview

Services are activated for subscribers either at login, or by using Change of Authorization (CoA) RADIUS messages or command-line interface (CLI) requests. A subscriber can have multiple instances of the same named service, provided that each instance of the subscriber service has a different set of parameters. Support for multiple instances of a subscriber service enables you to use service parameters to customize the same service to meet different needs for a particular subscriber.

- [Subscriber Service Instances and Service Parameters on page 595](#)
- [CLI Deactivation of Subscriber Services with Multiple Instances on page 596](#)
- [Subscriber Services with Multiple Instances in RADIUS Accounting Messages on page 596](#)

Subscriber Service Instances and Service Parameters

In a subscriber access network, each subscriber has its own set of services. You can configure a specific *service instance* for a particular subscriber by specifying a *service name*, also referred to as a *service profile*, and unique service parameters for that service instance. *Service parameters* can include a combination of policy lists, filters, rate-limit profiles, class of service (CoS) profiles, and interface profiles.

For example, `filter-service(up-filter,down-filter)` and `filter-service(upstream-filter,downstream-filter)` are considered two different instances of the same service (`filter-service`) because their parameters, enclosed in parentheses after the service name, are different.

Each service instance is uniquely identified by the combination of its service name and service parameters. In CoA messages, the router identifies a subscriber service by its complete activation string, which consists of the service name and, if configured, one or more service parameters in the order specified.

CLI Deactivation of Subscriber Services with Multiple Instances

You can use the Junos OS CLI to deactivate subscriber services with multiple instances in either of the following ways:

- Deactivate a single instance of a subscriber service by specifying the name and parameters of the service to be deactivated.

With this feature, you can deactivate a particular instance of a subscriber service while other instances of that same service remain active. For example, assume that a subscriber identified by a particular session ID has two instances of filter-service activated: filter-service(up-filter,down-filter) and filter-service(upstream-filter,downstream-filter). If you specify “filter-service(up-filter,down-filter)” in the **request network-access aaa subscriber delete session-id** command, the router deactivates only filter-service(up-filter,down-filter); filter-service(upstream-filter,downstream-filter) remains active.

The ability to use both service names and service parameters to identify the particular service instance to be deactivated is analogous to the subscriber service deactivation feature in use on Juniper Networks E Series Broadband Services Routers that run JunosE Software.

- Deactivate all instances of a subscriber service by specifying only the name of the service to be deactivated, with no service parameters.

With this feature, you can deactivate all instances of the same subscriber service with a single operational command. Using the same subscriber service example, if you specify “filter-service” in the **request network-access aaa subscriber delete session-id** command, the router deactivates both filter-service(up-filter,down-filter) and filter-service(upstream-filter,downstream-filter).

Subscriber Services with Multiple Instances in RADIUS Accounting Messages

RADIUS Acct-Start, Interim-Acct, and Acct-Stop accounting messages include the subscriber service name and, if configured, service parameters. If RADIUS logging is enabled, the router logs all subscriber service attributes, including service names and parameters, in messages sent to and received from the RADIUS authentication server.

For example, assume that the router receives the following RADIUS Access-Accept message from the RADIUS server:

```
Jul 13 12:37:02 radius-access-accept: Activate-Service (Juniper-ERX-VSA) received:  
Tag (1) filter-service(up-filter,down-filter)
```

Table 52 on page 597 shows sample logged RADIUS Acct-Start, Interim-Acct, and Acct-Stop messages that the router sends to the RADIUS server in response to the Access-Accept message. In each of these accounting messages, the Activate-Service-Session-Name is the full activation string that includes both the service name (filter-service) and service parameters (up-filter,down-filter) to identify the service instance.

Table 52: Subscriber Services and Service Parameters in RADIUS Accounting Messages

RADIUS Accounting Message Type	RADIUS Accounting Message Text
Acct-Start	Jul 13 12:37:02 radius-acct-start: Activate-Service-Session-Name (Juniper-ERX-VSA) added: filter-service(up-filter,down-filter)
Interim-Acct	Jul 13 12:47:00 radius-acct-interim: Activate-Service-Session-Name (Juniper-ERX-VSA) added: filter-service(up-filter,down-filter)
Acct-Stop	Jul 13 12:53:59 radius-acct-stop: Activate-Service-Session-Name (Juniper-ERX-VSA) added: filter-service(up-filter,down-filter)

Related Documentation

- [Deactivating a Single Instance of a Subscriber Service with Multiple Instances on page 597](#)
- [Deactivating All Instances of a Subscriber Service with Multiple Instances on page 599](#)
- [Verifying and Managing Subscriber Services with Multiple Instances on page 603](#)

Deactivating a Single Instance of a Subscriber Service with Multiple Instances

For subscriber services that have multiple instances, you can use the Junos OS CLI to deactivate a service in either of the following ways:

- Deactivate a single instance of a service by specifying the name and parameters of the service to be deactivated.
- Deactivate all instances of a service by specifying only the name of the service to be deactivated.

This topic describes how to deactivate a single instance of a subscriber service.

To use the Junos OS CLI to deactivate a single instance of a subscriber service with multiple instances:

1. Display the active services for the subscriber identified by the specified session ID.

```
user@host> show network-access aaa subscribers session-id subscriber-session-id detail
```

For example, the following command displays the active services for the DHCP subscriber identified by session ID 6. In this example, two instances of economy-service are active: **economy-service(up-filter,down-filter)** and **economy-service(upstrm-filter,dwnstrm-filter)**. A single instance of premium-service named **premium-service(up-filter,down-filter)** is also active.

```
user@host> show network-access aaa subscribers session-id 6 detail
Type: dhcp
Stripped username: fran2
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:default
```

```

Access-profile: attr_test_profile1
Session ID: 6
Accounting Session ID: 6
Multi Accounting Session ID: 0
IP Address: 198.51.100.10
Authentication State: AuthStateActive
Accounting State: Acc-Interim-Sent
Provisioning Type: None
Service name: economy-service(up-filter,down-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 7
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:7-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600
Service name: economy-service(upstrm-filter,dwnstrm-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 8
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:8-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600
Service name: premium-service(up-filter,down-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 9
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:9-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600

```

2. Deactivate the specified instance of a subscriber service by specifying its service name and parameters.

```

user@host> request network-access aaa subscriber delete session-id subscriber-session-id
service-profile "profile-name(parameters)"

```

For example, the following command deactivates only the instance of economy-service named economy-service(up-filter,down-filter).

```

user@host> request network-access aaa subscriber delete session-id 6 service-profile
"economy-service(up-filter,down-filter)"

```

3. (Optional) Verify that the deactivated service instance is no longer active for the subscriber.

```

user@host> show network-access aaa subscribers session-id subscriber-session-id detail

```

For example, the following command displays the services still active for the DHCP subscriber identified by session ID 6. In this example, **economy-service(up-filter,down-filter)** is no longer listed because it was deactivated, but **economy-service(upstrm-filter,dwnstrm-filter)** and **premium-service(up-filter,down-filter)** are still active.

```

user@host> show network-access aaa subscribers session-id 6 detail

```

```

Type: dhcp
Stripped username: fran2
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:default
Access-profile: attr_test_profile1
Session ID: 6
Accounting Session ID: 6
Multi Accounting Session ID: 0
IP Address: 198.51.100.13.10
Authentication State: AuthStateActive
Accounting State: Acc-Interim-Sent
Provisioning Type: None
Service name: economy-service(upstrm-filter,dwnstrm-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 8
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:8-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600
Service name: premium-service(up-filter,down-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 9
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:9-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600

```

- Related Documentation**
- [Deactivating All Instances of a Subscriber Service with Multiple Instances on page 599](#)
 - [Verifying and Managing Subscriber Services with Multiple Instances on page 603](#)
 - [Subscriber Services with Multiple Instances Overview on page 595](#)

Deactivating All Instances of a Subscriber Service with Multiple Instances

For subscriber services that have multiple instances, you can use the Junos OS CLI to deactivate a service in either of the following ways:

- Deactivate a single instance of a service by specifying the name and parameters of the service to be deactivated.
- Deactivate all instances of a service by specifying only the name of the service to be deactivated.

This topic describes how to deactivate all instances of a subscriber service.

To use the Junos OS CLI to deactivate all instances of a subscriber service with multiple instances:

1. Display the active services for the subscriber identified by the specified session ID.

```
user@host> show network-access aaa subscribers session-id subscriber-session-id detail
```

For example, the following command displays the active services for the DHCP subscriber identified by session ID 6. In this example, two instances of economy-service are active: **economy-service(up-filter,down-filter)** and **economy-service(upstrm-filter,dwnstrm-filter)**. A single instance of premium-service named **premium-service(up-filter,down-filter)** is also active.

```
user@host> show network-access aaa subscribers session-id 6 detail
```

```
Type: dhcp
Stripped username: fran2
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:default
Access-profile: attr_test_profile1
Session ID: 6
Accounting Session ID: 6
Multi Accounting Session ID: 0
IP Address: 198.51.100.10
Authentication State: AuthStateActive
Accounting State: Acc-Interim-Sent
Provisioning Type: None
Service name: economy-service(up-filter,down-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 7
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:7-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600
Service name: economy-service(upstrm-filter,dwnstrm-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 8
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:8-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600
Service name: premium-service(up-filter,down-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 9
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:9-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600
```

2. Deactivate all instances of the specified service by specifying the service name without parameters.

```
user@host> request network-access aaa subscriber delete session-id subscriber-session-id
service-profile "profile-name"
```

For example, the following command deactivates both instances of economy-service.

```
user@host> request network-access aaa subscriber delete session-id 6 service-profile
"economy-service"
```

3. (Optional) Verify that all instances of the deactivated service are no longer active for the subscriber.

```
user@host> show network-access aaa subscribers session-id subscriber-session-id detail
```

In the following example, only **premium-service(up-filter,down-filter)** is still active. Neither **economy-service(up-filter,down-filter)** nor **economy-service(upstrm-filter,dwnstrm-filter)** is listed because all instances of economy-service were deactivated.

```
user@host> show network-access aaa subscribers session-id 6 detail
```

```
Type: dhcp
Stripped username: fran2
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:default
Access-profile: attr_test_profile1
Session ID: 6
Accounting Session ID: 6
Multi Accounting Session ID: 0
IP Address: 198.51.100.10
Authentication State: AuthStateActive
Accounting State: Acc-Interim-Sent
Provisioning Type: None
Service name: premium-service(up-filter,down-filter)
  Service State: SvcActive
    Service Family: inet
    Service Activation Source: Radius
    Session ID: 9
    Session uptime: 00:04:36
    Accounting status: on/volume+time
    Service accounting session ID: 6:9-1354811427
    Service accounting state: Acc-Start-Sent
    Accounting interim interval: 600
```

- Related Documentation**
- [Deactivating a Single Instance of a Subscriber Service with Multiple Instances on page 597](#)
 - [Verifying and Managing Subscriber Services with Multiple Instances on page 603](#)
 - [Subscriber Services with Multiple Instances Overview on page 595](#)

Monitoring and Managing Subscriber Services

- [Verifying and Managing Subscriber Services with Multiple Instances on page 603](#)

Verifying and Managing Subscriber Services with Multiple Instances

Purpose Display information about the active services for a subscriber identified by the specified session ID.

Action The following example displays information about the active services for the DHCP subscriber identified by session ID 6.

```
user@host> show network-access aaa subscribers session-id 6 detail
```

```
Type: dhcp
```

```
Stripped username: fms2
```

```
AAA Logical system/Routing instance: default:default
```

```
Target Logical system/Routing instance: default:default
```

```
Access-profile: attr_test_profile1
```

```
Session ID: 6
```

```
Accounting Session ID: 6
```

```
Multi Accounting Session ID: 0
```

```
IP Address: 198.51.100.10
```

```
Authentication State: AuthStateActive
```

```
Accounting State: Acc-Interim-Sent
```

```
Provisioning Type: None
```

```
Service name: economy-service(up-filter,down-filter)
```

```
Service State: SvcActive
```

```
Service Family: inet
```

```
Service Activation Source: Radius
```

```
Session ID: 7
```

```
Session uptime: 00:04:36
```

```
Accounting status: on/volume+time
```

```
Service accounting session ID: 6:7-1354811427
```

```
Service accounting state: Acc-Start-Sent
```

```
Accounting interim interval: 600
```

```
Service name: economy-service(upstrm-filter,dwnstrm-filter)
```

```
Service State: SvcActive
```

```
Service Family: inet
```

```
Service Activation Source: Radius
```

```
Session ID: 8
```

```
Session uptime: 00:04:36
```

```
Accounting status: on/volume+time
```

```
Service accounting session ID: 6:8-1354811427
```

```
Service accounting state: Acc-Start-Sent
```

```
Accounting interim interval: 600
Service name: premium-service
Service State: SvcActive
Service Family: inet
Service Activation Source: Radius
Session ID: 9
Session uptime: 00:04:36
Accounting status: on/volume+time
Service accounting session ID: 6:9-1354811427
Service accounting state: Acc-Start-Sent
Accounting interim interval: 600
```

Meaning If parameters are configured when a subscriber service with multiple instances is activated, the **Service name** field in the **show network-access aaa subscribers session-id** command displays both the service name and, in parentheses following the service name, the service parameters. If parameters are not configured for a particular service, the **show network-access aaa subscribers session-id** command displays only the service name. The value **SvcActive** in the **Service State** field indicates that the service is active.

In this example, two instances of economy-service are active: **economy-service(up-filter,down-filter)** and **economy-service(upstrm-filter,dwnstrm-filter)**. For **premium-service**, which is also active, the command output displays only the service name, indicating that no parameters were configured for this service.

- Related Documentation**
- [Deactivating a Single Instance of a Subscriber Service with Multiple Instances on page 597](#)
 - [Deactivating All Instances of a Subscriber Service with Multiple Instances on page 599](#)

PART 8

Configuring ANCP and the ANCP Agent for Subscribers

- [Configuring ANCP Agent Neighbors and Operations on page 607](#)
- [Configuring the ANCP Agent Traffic and CoS on page 653](#)
- [Configuring the ANCP Agent and AAA on page 663](#)
- [Monitoring and Managing ANCP for Subscriber Access on page 671](#)

CHAPTER 68

Configuring ANCP Agent Neighbors and Operations

- [ANCP and the ANCP Agent Overview on page 607](#)
- [ANCP Operations in Different Network Configurations on page 614](#)
- [Configuring the ANCP Agent on page 624](#)
- [Configuring ANCP Neighbors on page 625](#)
- [Associating an Access Node with Subscribers for ANCP Agent Operations on page 626](#)
- [Specifying the Interval Between ANCP Adjacency Messages on page 627](#)
- [Specifying the Maximum Number of Discovery Table Entries on page 628](#)
- [Configuring the ANCP Agent for Backward Compatibility on page 628](#)
- [Specifying How Long Processes Wait for the ANCP Agent Restart to Complete on page 629](#)
- [Configuring the ANCP Agent to Learn ANCP Partition IDs on page 629](#)
- [Example: Configuring an ANCP Network with Interface Sets and N:1 Static Demux VLANs over Aggregated Ethernet on page 630](#)

ANCP and the ANCP Agent Overview

This topic describes the Access Node Control Protocol (ANCP) and the *ANCP agent*. The ANCP agent is the Junos OS process that manages subscriber access lines with ANCP. The agent monitors subscriber access lines, reports subscriber traffic rates on the access lines between the subscribers and the access nodes, and modifies the traffic rates, all in support of CoS traffic shaping.

- [Overview on page 608](#)
- [Topology Discovery on page 608](#)
- [Subscriber Services on page 609](#)
- [ANCP Interfaces and Access Loop Circuit Identifiers on page 609](#)
- [ANCP Neighbors on page 610](#)
- [Partitions on page 612](#)
- [Generic Response Messages and Result Codes on page 613](#)

Overview

ANCP acts as a control plane between a service-oriented Layer 3 edge device and a Layer 2 access node. The access nodes—ANCP *neighbors*—are network devices that terminate access loops from subscribers; for DSL access loops, the access node is a DSL access multiplexer (DSLAM). Queuing and scheduling mechanisms for subscriber traffic must avoid congestion within the access network while contending with multiple flows and distinct CoS requirements. These mechanisms require the edge device—a router acting as a broadband network gateway (BNG), often also called a network access server (NAS)—to provide information about the access network and subscriber traffic.

The ANCP agent can map an access line to an interface or interface set either statically or dynamically. The agent provides that information to both CoS and AAA. The agent passes on to both CoS and AAA the traffic shaping attributes for each subscriber access line that the access node sent to the ANCP agent. In addition, the agent sends to AAA all DSL Forum attributes that were sent by the access node. AAA can use these attributes during RADIUS accounting and authentication for both DHCP IP demux and PPPoE subscriber sessions. The traffic rates can also be used for shaping L2TP tunnel traffic.

You can monitor ANCP agent events and operations by including the **traceoptions** statement at the **[edit protocols ancp]** hierarchy level.

Junos OS supports the following interface types for ANCP:

- Static VLAN interfaces
- Static VLAN demux interfaces
- Static interface sets
- Dynamic interface sets
- Dynamic VLAN-tagged interface sets
- Dynamic agent circuit identifier (ACI) interface sets, also known as ACI sets or ACI VLANs
- Dynamic PPPoE and DHCP IP demux subscriber interfaces

ANCP was developed as an extension of *RFC 3292, General Switch Management Protocol (GSMP) V3*, but is now defined in *RFC 6320, Protocol for Access Node Control Mechanism in Broadband Networks*.

Topology Discovery

The router uses topology discovery to collect information from the access node. The information includes the following:

- Topology of the access network
- DSL line state
- Actual upstream and downstream net data rates of a synchronized DSL link

- Maximum attainable upstream and downstream net data rates
- Interleaving delay

Subscriber Services

The router receives the service profile for the subscribers from a RADIUS server. Most of the services are enforced by the router itself. The router shapes the aggregate egress traffic to subscribers based on the local loop throughput reported by the DSLAM. This traffic shaping optimizes traffic flow while avoiding traffic drops in the access node.

Some service attributes, such as interleaving delay and multicast channel information, are enforced at the access node. The ANCP agent provides the line configuration mechanism that the edge device can use to pass the line configuration to the access nodes. Typically, multiple profiles are provisioned on the access node. The router instructs the access node which profile to use for a given subscriber.

Subscribers typically receive some combination of voice, data, and video services. Each service can be provisioned on a VLAN. A subscriber might receive only a single service over a single VLAN configured on a logical interface. A group of VLANs carrying services to a subscriber is an *interface set*.

Subscribers have operational states, but they do not have administrative states because they cannot be configured in the CLI.

Subscribers have one of the following operational states which represent the DSL line state as it is reported in the ANCP Port Up and Port Down messages sent by an access node:

- Idle—Ports are not configured and the subscriber cannot log in.
- Silent—Ports are configured and the subscriber is connected, but the DSL modem is not ready to transfer data.
- Showtime—Ports are configured, the subscriber is connected, and the DSL modem is online and ready to transfer data.

ANCP Interfaces and Access Loop Circuit Identifiers

The access loop or access line in an ANCP topology consists of the physical elements between the subscriber device (CPE) and the access node. An identifier associated with the access loop serves to identify the subscriber as well. This identifier is an alphanumeric string that actually identifies the interface on the DSLAM from which subscriber requests originate. It can be referred to by various names.

- In ANCP messages, a TLV carries the access loop circuit ID, also referred to as the access line identifier, access loop circuit identifier, or access identifier.
- DHCP discovery packets can identify the line with the Agent Circuit ID suboption in the Option 82 field.
- PPPoE discovery packets can identify the line with the Agent-Circuit-ID subattribute in the DSL Forum vendor-specific tag.

Each of these identifiers is abbreviated as ACI. When the ANCP agent receives a port management message from an access node, it uses the access loop circuit identifier contained in the message to determine which logical interface or interface set corresponds to the subscriber.

You can associate an identifier with an ANCP access line by static configuration. When you configure a logical interface by specifying the interface name at the **[edit protocols ancp interfaces]** hierarchy level, include the **access-identifier** statement to associate the access loop circuit identifier with the interface. When you configure an interface set by including the **interface-set** statement at the **[edit protocols ancp interfaces]** hierarchy level, associate the access loop circuit identifier with the interface set by including the **access-identifier** statement at the **[edit protocols ancp interfaces interface-set interface-set-name]** hierarchy level.

When the DHCP or PPPoE discovery packet includes an ACI, the ANCP agent can dynamically map the ACI to the subscriber interface or interface set. VLANs for the subscribers are created according to a dynamic profile; these are called agent circuit identifier-based or ACI-based dynamic VLANs.

ANCP agent support for RADIUS authentication and accounting requires that both static and dynamic ACIs must be unique across the network. No two interfaces across multiple neighbors (access nodes) can share the same identifier. The DHCP and PPPoE processes do not have information about the access node IP addresses and consequently cannot distinguish between duplicate identifiers. This situation prevents the AAA services framework from correlating a DHCP or PPPoE client session with an access line for RADIUS authentication and accounting.

ANCP Neighbors

The ANCP agent can report traffic only for access nodes that are configured as ANCP neighbors (also referred to as ANCP peers). Neighbors can establish TCP connections with the router. Include the **neighbor** statement at the **[edit protocols ancp]** hierarchy level to configure an access node as an ANCP neighbor.

The ANCP agent exchanges adjacency messages with neighbors. If an adjacency message is not received from a neighbor within the expected period, then the neighbor is considered to be down and is disconnected. You can adjust how long the ANCP agent waits for adjacency messages from all neighbors by including the **adjacency-timer** statement at the **[edit protocols ancp]** hierarchy level. The interval between adjacency messages is negotiated between router and the neighbor during adjacency establishment. The larger of two timer values—either the value received in the ANCP SYN message or the configured value—is selected. Loss of synchronization between the router and a neighbor is declared when no valid messages are received for a period of time that exceeds three times the negotiated value.

**NOTE:**

The ANCP TCP connection is not established and consequently ANCP neighbors do not come up in either of the following circumstances:

- When the neighbor address (numbered or unnumbered) has a /32 mask.
- When the unnumbered local address for ANCP dynamic logical interfaces is configured to use a preferred source address.

ANCP neighbors have one of the following administrative states, which simply represent the configuration of the neighbor:

- **enabled**—The neighbor is configured in the CLI.
- **disabled**—The neighbor is not configured, meaning either that it has never been configured or that the configuration has been deleted.

ANCP neighbors in the enabled state have one of the following operational states, which represent the state of adjacency negotiations:

- **Configured**—The neighbor has been configured, but has never established an adjacency.
- **Establishing**—Adjacency negotiations are in progress.
- **Established**—Adjacency negotiations have succeeded and an ANCP session has been established.
- **Not Established**—The neighbor has lost a previously established adjacency, but is ready to begin negotiations.

You can also configure parameters for a specific neighbor that override global or default configurations by including any of the following statements at the **[edit protocols ancp neighbor ip-address]** hierarchy level:

- **adjacency-timer**—Adjust the interval between adjacency messages exchanged with this neighbor.
- **ietf-mode**—Prevent the ANCP agent from operating in a backward-compatible mode for this neighbor; for neighbors that use the current IETF implementation of ANCP.
- **maximum-discovery-table-entries**—Specify how many discovery table entries are accepted from this neighbor. Include this statement at the **[edit protocols ancp]** hierarchy level to set the number of entries globally for all neighbors.
- **pre-ietf-mode**—Enable the ANCP agent to operate in a backward-compatible mode for this neighbor; for neighbors that use the original IETF implementation of ANCP (GSMPv2) rather than the current implementation. Include this statement at the **[edit protocols ancp]** hierarchy level to operate in backward-compatible mode globally for all neighbors.

RFC 6320, Protocol for Access Node Control Mechanism in Broadband Networks, defines ANCP Version 1. ANCP was originally implemented based on General Switch Management Protocol (GSMP) version 3, sub-version 1. However, the Internet community has made

so many extensions and modifications to GSMPv3 in the course of developing ANCP that ANCP is no longer interoperable with GSMPv3. Consequently, ANCP neighbors must be able to dynamically detect the version that each peer supports. A joint registry codifies the GSMP and ANCP version numbers.

When an ANCP neighbor opens adjacency negotiations, it indicates the highest version of ANCP that it supports, either 0x31 for GSMPv3 or 0x32 for ANCP Version 1. (Version 1 may also be called Version 50, referring to the decimal conversion from the hexadecimal value.) If the receiving neighbor supports that version of ANCP, it returns that value when it responds to the sending neighbors. If it does not support that version, the receiving neighbor simply drops the message.

The ANCP agent stores information about active ANCP subscribers in the Junos shared database, including DSL attributes for the access lines. This storage is persistent and is removed from the database only when you delete the interface or interface set for the access line or issue one of the following commands:

- `clear ancp neighbor`
- `clear ancp subscriber`

The persistence of the storage enables PPPoE and DHCP IP demux subscribers to be properly managed by RADIUS for authentication and accounting, with their DSL attributes, even when the ANCP connection has been temporarily terminated.

Partitions

ANCP supports the division of an access node into logical partitions. Each partition creates an adjacency with a router; each partition on an access node can form adjacencies with different routers.

Each partition has an identifier carried in ANCP messages. A partition type field in ANCP messages indicates whether the access node is partitioned and how the partition identifier is negotiated. The field has one of the following values negotiated during the formation of the adjacency:

- 0—The access node is not partitioned or does not support partitions.
- 1—The number of partitions is fixed and the router requests the access node to use the identifier it places in the partition identifier field.
- 2—The number of partitions is fixed and the access node has assigned the partition identifier.

ANCP messages include a partition ID field that indicates one of the following scenarios for ANCP agent support of the neighbor:

- Zero partition ID—The ANCP agent supports each neighbor on an IP address over a single TCP session with a partition ID of zero. This is the default support case.
- Single nonzero partition ID—The ANCP agent supports each neighbor on an IP address over a single TCP session with a nonzero partition ID. This case requires partition ID learning to be enabled with the `gsmp-syn-wait` statement at the `[edit protocols ancp]` hierarchy level.

Generic Response Messages and Result Codes

ANCP neighbors and the router can reply to messages either with a specific response message or a generic response message. A generic response message is typically sent when no information needs to be sent to the peer other than a success or failure result. If the response is about a failure, then a result code is included that specifies the kind of failure; a limited amount of diagnostic data can also be included. A generic response message can also be sent independently of a request if the adjacency is being shut down because of the failure. In this case, the sender of the message zeros out the Transaction ID field in the message header and the Message Type field in the Status-Info TLV.

[Table 53 on page 613](#) describes the result codes that can be included in a generic response message.

Table 53: ANCP Failure Result Codes

Code Value	Description	Detected By
0x02	Although the request message is properly formed, it is invalid because it violates the protocol, either because of timing issues such as a race condition or the direction in which the message was transmitted.	ANCP agent
0x06	One or more of the specified ports is down because of a state mismatch between the router and an ANCP control application.	Control applications (none yet available)
0x13	ANCP is out of resources. This result code is sent only by the access node; the problem is probably not related to the access lines, but can be related to a specific request.	ANCP protocol layer or control applications (none yet available)
0x51	The type of request message is not implemented because of a mismatch in protocol versions or capability state between the peers, or possibly because the message type is optional for an ANCP capability.	ANCP agent
0x53	The message is malformed either because it was corrupted in transit or an implementation error occurred at one end of the connection.	ANCP agent
0x54	One or more mandatory TLVs is missing from the request.	ANCP agent
0x55	The contents of one or more TLVs in the request are invalid because they do not match the TLV specification.	ANCP agent

Table 53: ANCP Failure Result Codes (*continued*)

Code Value	Description	Detected By
0x500	One or more of the ports specified in a request does not exist, possibly because of a configuration mismatch between the access node and the router or AAA.	Control applications (none yet available)



NOTE: Although Junos OS supports both sending and receiving generic response messages, currently the ANCP agent only receives these messages. When one of these messages is received, the router generates a system log, increments the generic message counters, and increments the result code counters. When the ANCP agent receives an incorrect or unexpected generic response message from an ANCP neighbor, it immediately drops the packet, generates a system log notice message, and takes no further action.

Generic response messages usually include the Status-Info TLV, which includes supplemental information about a warning or error condition. The Status-Info TLV is required when the result code indicates any of the following: a port is down or does not exist, a mandatory TLV is missing, or a TLV is invalid. The Status-Info TLV can also be included in other ANCP message types.

Related Documentation

- [Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653](#)
- [Configuring the ANCP Agent on page 624](#)
- [Triggering ANCP OAM to Test the Local Loop on page 671](#)
- [Agent Circuit Identifier-Based Dynamic VLANs Overview](#)

ANCP Operations in Different Network Configurations

This topic describes different types of supported network configurations and the sequence of events for ANCP operations in representative sample network topologies.

You can configure the ANCP agent for any of the following interface types:

- Static VLAN interfaces
- Static VLAN demux interfaces
- Static interface sets
- Dynamic interface sets
- Dynamic VLAN-tagged interface sets
- Dynamic agent circuit identifier (ACI) interface sets, also known as ACI sets or ACI VLANs
- Dynamic PPPoE and DHCP IP demux subscriber interfaces

Subscriber sessions are dynamically created as needed for each of the devices in a household. Each household can include multiple CPE devices that access the Internet. In all cases, each household is identified by a unique ACI that is assigned by the access node. Additional identifiers are used in some configurations.

The 1:1 and N:1 configuration models determine how VLANs are correlated with households. A network can include one or both of the models:

- **1:1 model**—A household has only one PPPoE or DHCP IP demux subscriber session. One or more such households can exist on a single VLAN or VLAN demux interface. In the case of a single household, either the subscriber interface or its underlying VLAN or VLAN demux interface can represent the household. In the case of multiple households, the corresponding subscriber interfaces represent the households. In either case, the interface representing a household must be mapped to the ACI for its access line.

[Table 54 on page 615](#) describes the types of interfaces supported for the ANCP 1:1 access model when interface sets are not involved, and whether the PPPoE or DHCP IP demux discovery packets must include the ACI for the subscriber access lines.

Table 54: ACI Mapping by Interface Type for the ANCP 1:1 Model

Interface Type	Description	Presence of ACI in Discovery Packets
Dynamic PPPoE or DHCP IP demux interface	When ACI is present in discovery packets, the ANCP agent maps the ACI to the subscriber interface. The name of the interface is automatically generated and nondeterministic.	Required.
Static VLAN or VLAN demux interface	The name of the interface is statically configured. The ANCP agent configuration must include the access-identifier statement to statically map the ACI to the interface.	Not present.

- **N:1 model**—A household can have more than one PPPoE or DHCP IP demux subscriber session. The household can have more than one VLAN or VLAN demux interface. In either case, all the interfaces must be grouped into an interface set. The interface set in turn must be mapped to the ACI for the household's access line.

An interface set groups the dynamic PPPoE or DHCP IP demux sessions for a household. The subscribers are placed into interface sets by one several methods.

[Table 55 on page 616](#) describes the types of interface sets supported in the ANCP N:1 access model, how they are created, and how the ACI is mapped to the interface set.

Table 55: ACI Mapping by Interface Set Type for the ANCP N:1 Access Model

Type of Interface Set	Description	Interface Type	Presence of ACI in Discovery Packets
ACI-based VLAN interface sets	<p>When the router receives a DHCP or PPPoE discovery packet that includes an ACI embedded within the DSL Forum vendor-specific tag, it dynamically creates the VLAN and the interface set. The router generates a nondeterministic name for the interface set, such as aci-1003-ge-1/0/0.1073741832.</p> <p>The ANCP agent automatically maps the ACI from the discovery packet to the dynamically created interface set.</p> <p>All DHCP IP demux or PPPoE sessions that have the same ACI are mapped to the same interface set.</p>	Dynamic VLAN and VLAN demux interfaces.	Required.
Dynamic interface sets	<p>A dynamic profile dynamically creates the interface set and places interfaces in the set. The profile can either have the name of the interface set explicitly configured or a variable that represents the interface set name. If a variable is used, then the interface set name is provided by RADIUS when it returns an Access-Accept message for the subscriber.</p> <p>The ANCP agent configuration must include the access-identifier statement to statically map the ACI to the interface set.</p> <p>All DHCP IP demux and PPPoE sessions are mapped to an interface set according to the rules of the dynamic profile.</p>	DHCP IP demux subscriber interfaces, PPPoE subscriber interfaces, or VLAN interfaces.	Irrelevant.
Static interface sets	<p>The interface set and set name are statically configured and include multiple static interfaces.</p> <p>The ANCP agent configuration must include the access-identifier statement to statically map the ACI to the interface set.</p>	Static VLAN and VLAN demux interfaces.	Irrelevant.
VLAN-tagged interface sets	<p>When the router receives a DHCP or PPPoE discovery packet that includes a VLAN ID, it dynamically creates the VLAN and the interface set. The interface set is given a deterministic name consisting of the physical interface name and the VLAN tags, for example, ge-1/0/0-101.</p> <p>The ANCP agent configuration must include the access-identifier statement to statically map the ACI to the interface set.</p> <p>All DHCP IP demux or PPPoE sessions that have the same VLAN ID tag are mapped to the same interface set.</p>	Dynamic VLAN and VLAN demux interfaces.	Irrelevant.

CoS traffic shaping is based on the subscriber downstream traffic rate that the ANCP agent receives from the access node and then passes to CoS. CoS can shape subscriber traffic at the level of the household or the session:

- Household shaping—Only aggregate traffic to the household is shaped. Household shaping results from applying a CoS traffic-control profile to the static VLAN or VLAN demux interface or to the interface set.

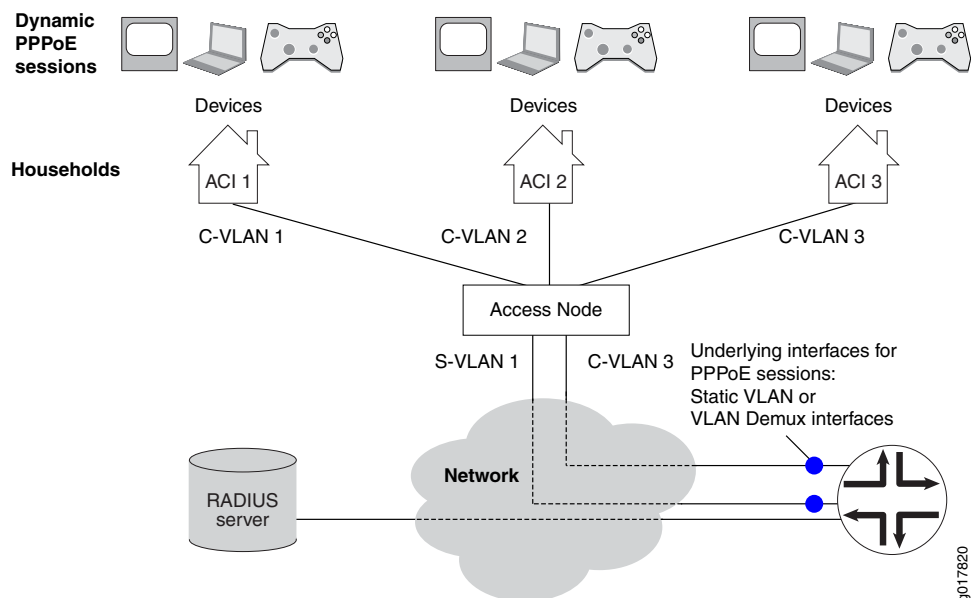
- Session shaping—The traffic rate to individual devices in the household is shaped. Session shaping results from specifying a CoS traffic-control profile in the dynamic PPPoE profile that creates the subscriber session. Depending on the network configuration, session shaping may employ shared priority queues to shape all sessions identically or individual priority queues to shape the sessions separately.

The following sections illustrate several possible configurations and lists the sequence of events for the ANCP operations in each case. Not every possible configuration is presented.

ANCP Network Using N:1 and 1:1 Configuration Models without Interface Sets

In this sample topology, two households are configured for one underlying static VLAN or VLAN demux interface (N:1; dual-tagged VLAN) and a single household is configured for another underlying interface (1:1; single-tagged VLAN) (Figure 19 on page 618). In addition to the unique ACI assigned by the access node, each household is further identified by the VLAN, which is mapped to the identifier in the ANCP agent configuration. CoS traffic shaping for sessions can employ only shared priority queues to shape all sessions identically; individual priority queues to shape the sessions separately are not supported.

Figure 19: Sample ANCP Topology Without Interface Sets (1:1 and N:1 Model)



Sequence of ANCP Events: Static VLAN or VLAN Demux Interfaces over Ethernet Without Interface Sets

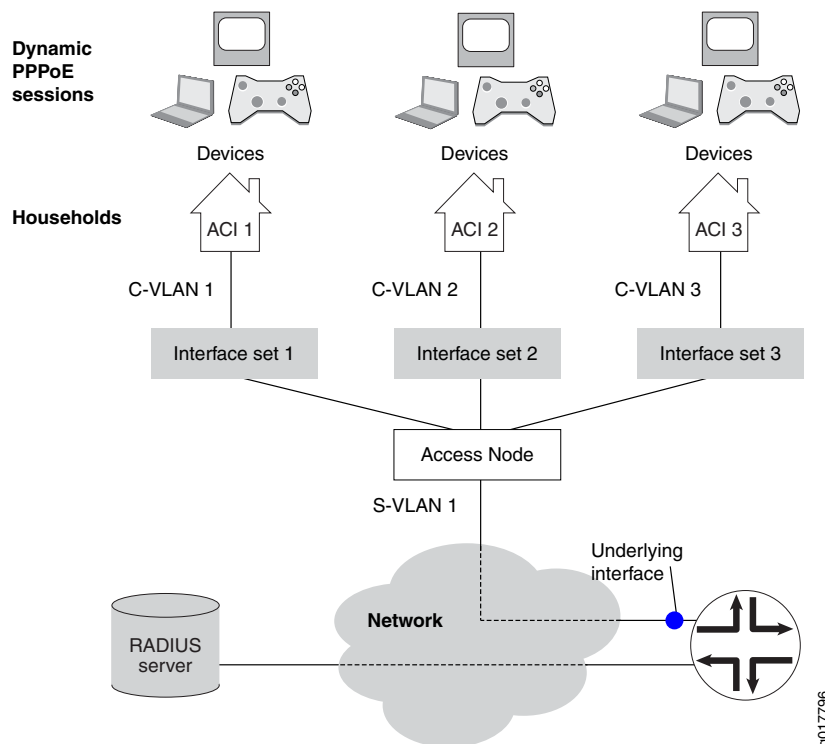
The following sequence of events is for the topology in [Figure 19 on page 618](#) with static VLAN interfaces over Ethernet without interface sets.

1. A network device in the household initiates PPPoE discovery.
2. PPPoE creates a dynamic PPPoE session on the underlying static VLAN or VLAN demux interface and applies the advisory options configured on the VLAN to the session.
3. The access node independently provides the ANCP agent with the ANCP DSL attributes for an access line identified by an ACI.
4. The ANCP agent sends CoS the adjusted downstream data rate for the static VLAN or demux VLAN mapped to the ACI. The ANCP agent stores all DSL attributes, including the adjusted upstream data rate, in the router's shared database.
5. AAA correlates the dynamic PPPoE session with the access line by matching the underlying interface of the session to the static VLAN or VLAN demux interface associated with the ACI in the ANCP agent configuration.
6. AAA retrieves the ANCP DSL attributes for the access line from the router's shared database and maps them to the Juniper Networks DSL VSAs in the RADIUS Access-Request and Accounting-Request messages. If the DSL attributes are unavailable, the session's advisory upstream and downstream data rates are mapped to the Upstream-Calculated-Qos-Rate VSA (26-142) and Downstream-Calculated-Qos-Rate (26-141) VSAs, respectively. These VSAs are then included in the RADIUS messages.

ANCP Network Using N:1 Configuration Model with Interface Sets

In this topology, multiple households are configured for each underlying static VLAN or VLAN demux interface (Figure 20 on page 620). The VLANs are dual-tagged. Each household includes several CPE devices that access the Internet. In addition to the unique ACI assigned by the access node, the household is further identified by the interface set. The interface set groups the dynamic PPPoE sessions for the individual subscriber devices. It is either explicitly configured in the dynamic PPPoE profile or specified in the RADIUS Access-Accept message during PPPoE session authentication. Session shaping can employ shared priority queues to shape all sessions identically or individual queues to shape the sessions separately.

Figure 20: Sample ANCP Topology with Interface Sets (N:1 Model)



In this N:1 model with interface sets, the access node must add the DSL Forum VSA to the PPPoE PADI and PADR discovery packets that it passes to the router during the establishment of dynamic PPPoE sessions. The VSA includes the ACI for the household. This inclusion enables AAA to correlate the PPPoE sessions with their respective subscriber access lines and DSL attributes during RADIUS authentication and accounting. If the ACI is not present, AAA cannot make the correlation and subsequently reports only the advisory upstream and downstream data rates to RADIUS Authentication and Accounting.

When the dynamic PPPoE profile is configured with the **\$junos-interface-set-name** predefined variable, the configuration of the access node, router, and RADIUS server must be synchronized with regard to the ACI and interface set:

- The RADIUS Access-Accept message must contain the Juniper Networks Qos-Interface-Set-Name VSA (26-130).
- The CoS Layer 2 configuration must explicitly identify the interface set that is named in the Qos-Interface-Set-Name VSA (26-130).
- The ANCP agent configuration must map an ACI to the interface set that is named in the Qos-Interface-Set-Name VSA (26-130).

Sequence of ANCP Events: Static VLAN Interfaces over Ethernet with Interface Sets

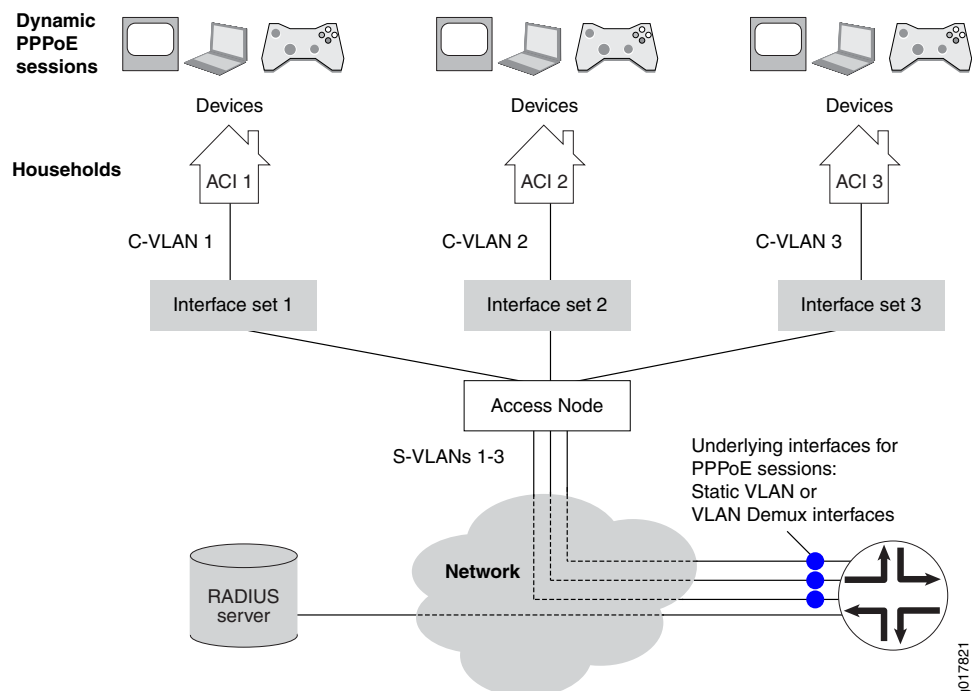
The following sequence of events is for the topology in [Figure 20 on page 620](#) with static VLAN interfaces over Ethernet with interface sets.

1. A network device in the household initiates PPPoE discovery.
2. The access node adds the DSL Forum VSA tag with the ACI for the household to the PPPoE PADI and PADR discovery packets. (The identifier is known to PPPoE as the agent circuit identifier.)
3. PPPoE creates a dynamic PPPoE session with the provided ACI on the underlying static VLAN and applies the advisory options configured on the VLAN to the session.
4. The access node independently provides the ANCP agent with the ANCP DSL attributes for an access line identified by an ACI.
5. The ANCP agent provides CoS with the adjusted downstream data rate for the interface set mapped to the ACI. The ANCP agent stores all ANCP DSL attributes, including the adjusted upstream and downstream data rates, in the router's shared database.
6. AAA correlates the dynamic PPPoE session with the access line by matching the session identifier received in the DSL Forum VSA to the ACI configured for the interface set in the ANCP agent configuration.
7. AAA retrieves the ANCP DSL attributes for the access line from the router's shared database and maps them to the Juniper Networks DSL VSAs in the RADIUS Access-Request and Accounting-Request messages. If the DSL attributes are unavailable, the session's advisory upstream and downstream data rates are mapped to the Upstream-Calculated-Qos-Rate VSA (26-142) and Downstream-Calculated-Qos-Rate (26-141) VSAs, respectively. These VSAs are then included in the RADIUS messages.
8. When authentication is completed, the dynamic PPPoE session is placed into the interface set configured in the dynamic PPPoE profile. The profile specifies a named interface set or the **\$junos-interface-set-name** predefined variable, which indicates that the interface set is named in the RADIUS Access-Accept message.

ANCP Network Using 1:1 Configuration Model with Interface Sets

In this topology, a single household is configured for each underlying static VLAN or VLAN demux interface (Figure 21 on page 622). The VLANs are dual-tagged. Each household includes several CPE devices that access the Internet. In addition to the unique ACI assigned by the access node, the household is further identified by the interface set. The interface set is either explicitly configured in the dynamic PPPoE profile or specified in the RADIUS Access-Accept message during PPPoE session authentication. Session shaping can employ shared priority queues to shape all sessions identically or individual queues to shape the sessions separately.

Figure 21: Sample ANCP Topology with Interface Sets (1:1 Model)



In this 1:1 model with interface sets, the ANCP agent configuration must map the underlying interface for the PPPoE sessions in an interface set to both the ACI and the interface set. This configuration enables AAA to correlate the PPPoE sessions with their respective subscriber access lines and DSL attributes during RADIUS authentication and accounting.

When the dynamic PPPoE profile is configured with the `$junos-interface-set-name` predefined variable, the configuration of the access node, router, and RADIUS server must be synchronized with regard to the ACI and interface set:

- The RADIUS Access-Accept message must contain the Juniper Networks Qos-Interface-Set-Name VSA (26-130).
- The CoS Layer 2 configuration must explicitly identify the interface set that is named in the Qos-Interface-Set-Name VSA (26-130).
- The ANCP agent configuration must map an ACI to the interface set that is named in the Qos-Interface-Set-Name VSA (26-130).

Sequence of ANCP Events: Static VLAN Demux Interfaces over Aggregated Ethernet with Interface Sets

The following sequence of events is for the topology in [Figure 21 on page 622](#) with static VLAN demux interfaces over aggregated Ethernet with interface sets.

1. A network device in the household initiates PPPoE discovery.
2. PPPoE creates a dynamic PPPoE session with the provided ACI on the underlying static VLAN demux interface and applies the advisory options configured on the VLAN to the session.
3. The access node independently provides the ANCP agent with the ANCP DSL attributes for an access line identified by an ACI.
4. The ANCP agent provides CoS with the adjusted downstream data rate for the interface set mapped to the ACI. The ANCP agent stores all ANCP DSL attributes, including the adjusted upstream and downstream data rates, in the router's shared database.
5. AAA correlates the dynamic PPPoE session with the access line by matching the underlying interface of the session to the underlying interface configured for the interface set in the ANCP agent configuration.
6. AAA retrieves the ANCP DSL attributes for the access line from the router's shared database and maps them to the Juniper Networks DSL VSAs in the RADIUS Access-Request and Accounting-Request messages. If the DSL attributes are unavailable, the session's advisory upstream and downstream data rates are mapped to the Upstream-Calculated-Qos-Rate VSA (26-142) and Downstream-Calculated-Qos-Rate (26-141) VSAs, respectively. These VSAs are then included in the RADIUS messages.
7. When authentication is completed, the dynamic PPPoE session is placed into the interface set configured in the dynamic PPPoE profile. The profile specifies a named interface set or the `$junos-interface-set-name` predefined variable, which indicates that the interface set is named in the RADIUS Access-Accept message.

Related Documentation

- [ANCP and the ANCP Agent Overview on page 607](#)
- [Configuring the ANCP Agent on page 624](#)
- [Example: Configuring an ANCP Network with Interface Sets and N:1 Static Demux VLANs over Aggregated Ethernet on page 630](#)

Configuring the ANCP Agent

You can configure the ANCP agent to enable a service-oriented Layer 3 edge device to discover information about the topology of a connected access network. The ANCP agent can also provide details about subscriber traffic and enable the adjustment of QoS traffic shaping for subscribers.

To configure the ANCP agent:

1. Specify each ANCP neighboring access node to be monitored and optionally configure neighbor parameters.
[See “Configuring ANCP Neighbors” on page 625.](#)
2. Specify the subscribers reached by a VLAN or a set of VLANs through a particular access node.
[See “Associating an Access Node with Subscribers for ANCP Agent Operations” on page 626.](#)
3. (Optional) Configure the adjacency timer.
[See “Specifying the Interval Between ANCP Adjacency Messages” on page 627.](#)
4. (Optional) Specify the maximum number of discovery table entries that are accepted.
[See “Specifying the Maximum Number of Discovery Table Entries” on page 628](#)
5. (Optional) Configure the ANCP agent to work with an early IETF draft.
[See “Configuring the ANCP Agent for Backward Compatibility” on page 628.](#)
6. (Optional) Configure the graceful restart timer.
[See “Specifying How Long Processes Wait for the ANCP Agent Restart to Complete” on page 629.](#)
7. (Optional) Configure the ANCP agent to learn partition IDs from neighbors.
[See “Configuring the ANCP Agent to Learn ANCP Partition IDs” on page 629.](#)
8. (Optional) Configure an adjustment factor per DSL line type for the downstream and upstream data rates that the ANCP agent reports to AAA.
[See “Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates” on page 660.](#)
9. (Optional) Configure the ANCP agent to report unadjusted downstream traffic rates to CoS.
[See “Configuring the ANCP Agent to Report Traffic Rates to CoS” on page 657.](#)
10. (Optional) Specify a recommended shaping rate to be applied by RADIUS to downstream or upstream traffic per ANCP interface.
[See “Setting a Recommended Shaping Rate for Traffic on ANCP Interfaces” on page 659.](#)
11. (Optional) Configure AAA to Include or Exclude Juniper Networks DSL VSAs in RADIUS authentication and accounting messages.

See [“Configuring AAA to Include Juniper Networks DSL VSAs in RADIUS Messages” on page 667.](#)

12. (Optional) Configure AAA to send an immediate interim accounting update to the RADIUS server when AAA receives a rate change notification from the ANCP agent on the router.

See [“Configuring Immediate Interim Accounting Updates to RADIUS in Response to ANCP Notifications” on page 668.](#)

13. (Optional) Configure the ANCP agent to associate a neighbor with an access-facing physical interface for the creation of autosensed dynamic VLANs on the interface.

See *Configuring the ANCP Agent for ANCP-Triggered, Autosensed Dynamic VLANs.*

14. (Optional) Configure the ANCP agent to dampen the effect of short-term adjacency losses for all neighbors.

See *Configuring the ANCP Agent to Dampen the Effects of Short-Term Adjacency Losses.*

15. (Optional) Configure trace options for troubleshooting the configuration.

See [“Tracing ANCP Agent Operations for Subscriber Access” on page 853.](#)

Related Documentation

- [ANCP and the ANCP Agent Overview on page 607](#)
- [Triggering ANCP OAM to Test the Local Loop on page 671](#)

Configuring ANCP Neighbors

Starting in Junos OS Release 16.1, you must configure each neighboring access node that you want the ANCP agent to monitor and potentially shape traffic for. Some neighbor settings override globally configured values.

To configure an ANCP neighbor:

1. Specify the IP address of the neighbor.

```
[edit protocols ancp]
user@host# set neighbor 203.0.113.234
```

2. (Optional) Configure the neighbor to operate in a backward-compatible mode when it does not support the current IETF standard and the backward-compatible mode is not configured globally.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set pre-ietf-mode
```

3. (Optional) Override the globally configured backward-compatible mode when the neighbor supports the current IETF standard.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set ietf-mode
```

4. (Optional) Configure the interval in seconds between ANCP adjacency messages exchanged with this neighbor.

```
[edit protocols ancp neighbor 203.0.113.234]
```

```
user@host# set adjacency-timer 20
```

5. (Optional) Specify the maximum number of discovery table entries that are accepted from this neighbor.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set maximum-discovery-table-entries 10000
```

6. (Optional) Enable out-of-band ANCP triggering of autosensed, dynamic VLANs on the physical interface.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set auto-configure-trigger interface ge-1/0/0
```

7. (Optional) Configure how long the ANCP agent maintains a Layer 2 wholesale session when an adjacency loss occurs.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set adjacency-loss-hold-time 10
```

Related Documentation

- [Configuring the ANCP Agent on page 624](#)
- [Configuring the ANCP Agent for Backward Compatibility on page 628](#)
- [Specifying the Interval Between ANCP Adjacency Messages on page 627](#)
- [Specifying the Maximum Number of Discovery Table Entries on page 628](#)
- [Configuring the ANCP Agent to Dampen the Effects of Short-Term Adjacency Losses](#)

Associating an Access Node with Subscribers for ANCP Agent Operations

The ANCP agent on the router uses the access loop circuit identifier (ACI) to distinguish individual ANCP subscribers. Because the agent uses the ACI to associate (map) each subscriber to an interface or interface set, each ACI must be unique across all ANCP neighbors connected to the router.



NOTE: We recommend that the ACIs be unique across your ANCP network.

The ACIs can be statically or dynamically configured. When the subscriber's DHCP or PPPoE discovery packets contain the ACI, then the agent can dynamically map it to the interface or interface set. Otherwise, the ACI must be statically configured. A static configuration overrides dynamic mapping of ACIs—and therefore subscribers—to interfaces or sets.

To associate an ACI with a set of VLAN interfaces for subscribers:

- Specify the name of the interface set and the unique ACI for the access node.

```
[edit protocols ancp interfaces]
user@host# set interface-set vlan5 access-identifier "dslam port 2/3"
```

To associate an ACI with a single VLAN:

- Specify the logical interface and the unique ACI for the access node.

```
[edit protocols ancp interfaces]
user@host# set ge-1/0/4.12 access-identifier "dslam port-2-10"
```

To associate an ACI with a static VLAN demux interface:

- Specify the logical interface and the unique ACI for the access node.

```
[edit protocols ancp interfaces]
user@host# set demux0.100 access-identifier aci_100_1_0
```

- Related Documentation**
- [Configuring the ANCP Agent on page 624](#)
 - [interfaces on page 1113](#)

Specifying the Interval Between ANCP Adjacency Messages

When the ANCP agent and a neighbor negotiate to establish an adjacency, each proposes a value for the interval between the adjacency messages that they exchange after it is established. The larger of the values proposed by the agent and the neighbor is selected for the interval between subsequent adjacency messages exchanged by the agent and the neighbor. You can specify the interval value that the ANCP agent proposes for either all neighbors or a specific neighbor.

To configure the proposed interval between ANCP adjacency messages for all neighbors:

- Specify the time in seconds.

```
[edit protocols ancp]
user@host# set adjacency-timer 20
```

To configure the proposed interval between ANCP adjacency messages for a specific neighbor:

- Specify the time in seconds.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set adjacency-timer 20
```

- Related Documentation**
- [Configuring the ANCP Agent on page 624](#)
 - [Configuring ANCP Neighbors on page 625](#)

Specifying the Maximum Number of Discovery Table Entries

You can specify the maximum number of discovery table entries accepted from all neighbors or from a particular neighbor.

To configure the maximum number of entries for all neighbors:

- Specify the number of entries.

```
[edit protocols ancp]
user@host# set maximum-discovery-table-entries 5000
```

To configure the maximum number of entries for a specific neighbor:

- Specify the number of entries.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set maximum-discovery-table-entries 5000
```

- Related Documentation**
- [Configuring the ANCP Agent on page 624](#)
 - [Configuring ANCP Neighbors on page 625](#)

Configuring the ANCP Agent for Backward Compatibility

You can configure the ANCP agent to operate in a mode compatible with the protocol as it was initially proposed to operate. This backward-compatible or pre-IETF mode is compatible with Internet draft draft-wadhwa-gsmp-l2control-configuration-00.txt, *GSMP extensions for layer2 control (L2C)*. Setting this backward-compatible mode enables interoperation with devices that are not compatible with the later ANCP Internet drafts or RFC 6320, *Protocol for Access Node Control Mechanism in Broadband Networks*.

When this mode is configured globally for all neighbors, you can override it for a particular neighbor that supports the IETF draft or standard.

To configure the ANCP agent to operate in a backward-compatible mode for all neighbors:

- Specify the pre-IETF mode.

```
[edit protocols ancp]
user@host# set pre-ietf-mode
```

To configure the ANCP agent to operate in a backward-compatible mode for a specific neighbor:

- Specify the pre-IETF mode.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set pre-ietf-mode
```

- To override the globally configured backward-compatible mode for a specific neighbor:
Specify the IETF mode.

```
[edit protocols ancp neighbor 203.0.113.234]
user@host# set ietf-mode
```

- Related Documentation**
- [Configuring the ANCP Agent on page 624](#)
 - [Configuring ANCP Neighbors on page 625](#)

Specifying How Long Processes Wait for the ANCP Agent Restart to Complete

You can specify how long other processes wait for the ANCP agent to restart. The ANCP agent sends a keepalive message to CoS at intervals equal to one-third the value of the maximum helper restart time. For example, when you configure the maximum restart time to 120 seconds, the ANCP agent sends a keepalive message every 40 seconds.

If CoS does not receive a keepalive message within the maximum helper restart time, it considers the ANCP agent to be down and immediately reverts any traffic shaping updates that were implemented as a result of ANCP agent monitoring to the configured values. Consequently, traffic to the subscribers is not effectively shaped, potentially resulting in traffic drops in the DSLAMs. The configured values are maintained until the ANCP agent comes back up and sends fresh traffic shaping updates to CoS.

To configure how long other processes wait for the ANCP agent to restart:

- Specify the time in seconds.

```
[edit protocols ancp]
user@host# set maximum-helper-restart-time 150
```

- Related Documentation**
- [Configuring the ANCP Agent on page 624](#)
 - [Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657](#)

Configuring the ANCP Agent to Learn ANCP Partition IDs

By default, the ANCP agent expects ANCP partition IDs to be zero, meaning that the access node is not divided into logical partitions that can each form adjacencies with routers. You can configure the ANCP agent to support nonzero partition IDs. When you do so, the agent waits a configurable period to receive a SYN message from a neighbor during adjacency initiation. When the agent receives such a message, it uses the partition information contained in the Partition ID, PType, and PFlag fields to generate in turn a SYN message that it sends to the neighbor to continue adjacency negotiation.

To configure the ANCP agent to learn partition ID information from neighbors:

1. Enable partition ID learning.

```
[edit protocols ancp]
user@host# set gsmp-syn-wait
```

2. (Optional) Specify the maximum time the ANCP agent waits to receive a SYN message from a neighbor during the formation of an adjacency.

```
[edit protocols ancp]
user@host# set gsmp-syn-timeout seconds
```

For example, to enable partition ID learning and force the ANCP agent to wait 45 seconds for a SYN message:

```
[edit protocols ancp]
user@host# set gsmp-syn-wait
user@host# set gsmp-syn-timeout 45
```

**Related
Documentation**

- [Configuring the ANCP Agent on page 624](#)
- [ANCP and the ANCP Agent Overview on page 607](#)

Example: Configuring an ANCP Network with Interface Sets and N:1 Static Demux VLANs over Aggregated Ethernet

This example describes how to configure an ANCP network topology that manages subscriber access for several households by grouping individual devices into interface sets, providing access and services through one dedicated C-VLAN per household, and shaping traffic on a per-household basis. In this N:1 configuration, dual-tagged VLANs are configured over a single, underlying, static VLAN demux interfaces over aggregated Ethernet.

- [Requirements on page 630](#)
- [Overview on page 631](#)
- [Configuration on page 636](#)
- [Verification on page 648](#)

Requirements

This example uses the following hardware and software components:

- MX Series 3D Universal Edge Router with only MPCs installed for VLAN demux support
- RADIUS server
- DSLAM access node

Before you begin configuring the example, be sure you have:

- Thoroughly read and understood the following topics:
 - [ANCP and the ANCP Agent Overview on page 607](#)
 - [ANCP Operations in Different Network Configurations on page 614](#)
- Configured your access node.
- Configured your RADIUS server.

Overview

ANCP provides a means to configure, maintain, and monitor local access lines between access nodes (DSLAMs) and subscribers. Associated CoS configurations shape the downstream subscriber traffic. ANCP can enable more accurate traffic shaping by adjusting net data rates to discount the packet overhead of the access lines and then providing these adjusted rates to CoS.

The network topology in this example includes a dual-tagged (C-VLAN/S-VLAN) VLAN configuration over a static VLAN demux interface that is in turn configured over aggregated Ethernet for redundancy. This topology is an N:1 configuration model because—although each C-VLAN corresponds to one subscriber household—all the C-VLANs are configured over the same underlying VLAN demux interface. Multiple end-user devices in each household—or rather the dynamic PPPoE sessions established by each device—are grouped by household into interface sets. The grouping is accomplished by a separate dynamic profile configured for each C-VLAN. The ANCP agent configuration maps the ACI for the household's access line to an interface set. CoS applies a traffic-control profile to each interface set to shape the subscriber-directed traffic on a per-household basis. The CoS shaping rate is dynamically updated based upon the DSL attributes provided by the access node for each household's access line.

[Figure 22 on page 632](#) shows S-VLAN 103, configured on demux0, servicing the access node. C-VLANs 1, 2, and 3 each service a single household (subscriber). The respective households are identified by unique ACIs. The dynamic PPPoE sessions for devices in each household are grouped for monitoring and traffic shaping into interface sets 10301, 10302, and 10303.

Figure 22: N:1 ANCP Topology with Interface Sets and VLAN Demux Interface over Aggregated Ethernet

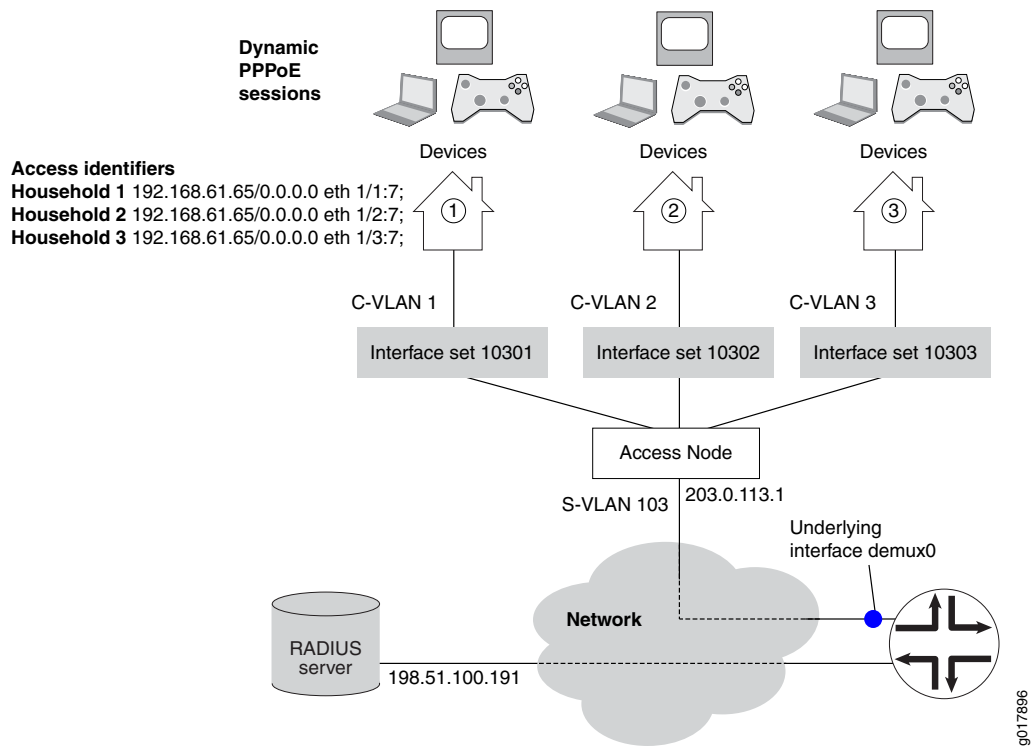


Table 56 on page 633 describes the configuration components used in this example.

Table 56: Configuration Components used in ANCP N:1 Topology Example with Interface Sets

Configuration Component or Property	Component Name or Setting	Description
Dynamic profiles	ancp-10301	<p>Each profile defines the dynamic PPPoE session created when any of the devices for a particular subscriber household accesses the network.</p> <p>Each profile specifies the following:</p> <ul style="list-style-type: none"> • A set of interfaces in which the sessions are created. • Dynamic instantiation of both the logical interfaces for the sessions and the underlying PPPoE logical interfaces on which the subscribers log in. • CHAP and PAP authentication for the sessions. • The interval between successive PPP keepalive messages. • The loopback address for the dynamic PPPoE logical interfaces.
	ancp-10302	
	ancp-10303	
Predefined variables	\$junos-interface-unit	Instantiates the logical interface for each PPPoE session.
	\$junos-underlying-interface	Instantiates the logical underlying PPP interface on which each dynamic PPPoE logical interface is created when a subscriber logs in.

Table 56: Configuration Components used in ANCP N:1 Topology Example with Interface Sets (*continued*)

Configuration Component or Property	Component Name or Setting	Description
Interfaces	ae0	<p>Aggregated Ethernet interface that is the underlying interface for the VLAN demux interfaces.</p> <p>The interface includes the following configuration:</p> <ul style="list-style-type: none"> • CoS hierarchical scheduling. • Stacked VLAN tagging for all logical interfaces on top of ae0. • Link protection.
	demux0	VLAN demux interface that runs over the underlying aggregated Ethernet interface.
	demux0.10301	<p>VLAN demux logical interfaces that correspond to the C-VLANs for individual subscriber households.</p> <p>Each logical interface includes the following configuration:</p> <ul style="list-style-type: none"> • Inner (C-VLAN) and outer VLAN (S-VLAN) tags. • The underlying physical interface, ae0. • The dynamic profile that creates PPPoE sessions on the C-VLAN. • Downstream and upstream advisory traffic rates. • Proxy ARP and protection against duplicate sessions on the interface.
	demux0.10302	
	demux0.10303	
	ge-1/0/1	Primary member link in the aggregated Ethernet bundle.
	ge-1/0/2	Backup member link in the aggregated Ethernet bundle.
	lo0.0	Loopback interface for use in the access network. The loopback interface is automatically used for unnumbered interfaces.
	pp0	PPP interface on which the PPPoE subscriber logical interfaces are created.

Table 56: Configuration Components used in ANCP N:1 Topology Example with Interface Sets (*continued*)

Configuration Component or Property	Component Name or Setting	Description
Interface sets	10301	Set of interfaces in which the sessions for the devices in a particular household are created. Each interface set is specified in a dynamic profile for that household. ANCP associates each interface set with an ACI and a VLAN demux logical interface (C-VLAN). CoS applies a traffic-control profile to each interface set.
	10302	
	10303	
Advisory traffic rates	downstream-rate	Recommended rate for downstream traffic in the absence of traffic rate information from the access node.
	upstream-rate	Recommended rate for upstream traffic in the absence of traffic rate information from the access node.
Traffic-control profile	tcp1	CoS profile that shapes the downstream subscriber traffic rate; in this example, shaping is adjusted for ATM packet overhead. The profile is applied to the interface sets.
IP addresses	203.0.113.1	Address of the ANCP access node that monitors the subscriber households.
	127.0.50.1/28	Address of the loopback interface, lo0.
	198.51.100.191	Address of the RADIUS accounting server and authentication server.
Access circuit loop identifiers	192.168.61.65/0.0.0.0 eth 1/1:7;	Identifier for the local access circuit from the access node to the subscriber household. It identifies the household. ANCP associates each identifier with an interface set.
	192.168.61.65/0.0.0.0 eth 1/2:7;	
	192.168.61.65/0.0.0.0 eth 1/3:7;	

The ANCP agent configuration includes the following elements:

- The IP address for the access node (DSLAM) is specified as 203.0.113.1. The interval between ANCP adjacency messages sent between neighbors is set to 5 seconds.
- The ANCP agent is enabled to report adjusted data rates to CoS to improve the accuracy of downstream traffic shaping. The ANCP agent adjusts the net data rates for ADSL lines by ninety percent and for ADSL2 lines by ninety-five percent.
- Each interface set is associated with both the ACI unique to the subscriber household and the relevant underlying VLAN demux interface.

The RADIUS configuration on the router includes the following elements:

- The IP address (198.51.100.191) for the authentication and accounting server, as well as the secret password for accessing the server.
- The subscriber access profile, radius-profile, specifies that RADIUS is used for authentication.
- Juniper Networks DSL VSAs are included in RADIUS request messages, but the DSL Forum VSA attributes are excluded from RADIUS messages
- Accounting sessions are configured to be recognized in decimal format.

Configuration

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode*.

To configure an ANCP network with static N:1 demux VLANs to the subscriber households, perform these tasks:

- [Configuring the Dynamic PPPoE Profiles on page 638](#)
- [Configuring the Static VLAN Demux Interface over Aggregated Ethernet on page 640](#)
- [Configuring Class of Service on page 644](#)
- [Configuring ANCP on page 645](#)
- [Configuring RADIUS Authentication and Accounting on page 646](#)

CLI Quick Configuration

To quickly configure the ANCP network described in this example, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

```
# Dynamic Profiles
edit dynamic-profiles ancp-10301
set interfaces interface-set 10301 interface pp0 unit "$junos-interface-unit"
edit interfaces pp0 unit "$junos-interface-unit"
set ppp-options chap
set ppp-options pap
set pppoe-options underlying-interface "$junos-underlying-interface"
set keepalives interval 30
set family inet unnumbered-address lo0.0
top
edit dynamic-profiles ancp-10302
set interfaces interface-set 10302 interface pp0 unit "$junos-interface-unit"
edit interfaces pp0 unit "$junos-interface-unit"
set ppp-options chap
set ppp-options pap
set pppoe-options underlying-interface "$junos-underlying-interface"
set keepalives interval 30
set family inet unnumbered-address lo0.0
top
edit dynamic-profiles ancp-10303
set interfaces interface-set 10303 interface pp0 unit "$junos-interface-unit"
edit interfaces pp0 unit "$junos-interface-unit"
```

```

set ppp-options chap
set ppp-options pap
set pppoe-options underlying-interface "$junos-underlying-interface"
set keepalives interval 30
set family inet unnumbered-address lo0.0
top
#
# Aggregated Ethernet Interfaces and VLAN Demux Interfaces
set interfaces ge-1/0/1 hierarchical-scheduler
set interfaces ge-1/0/1 gigether-options 802.3ad ae0
set interfaces ge-1/0/1 gigether-options 802.3ad primary
set interfaces ge-1/0/2 hierarchical-scheduler
set interfaces ge-1/0/2 gigether-options 802.3ad ae0
set interfaces ge-1/0/2 gigether-options 802.3ad backup
set interfaces ae0 hierarchical-scheduler
set interfaces ae0 stacked-vlan-tagging
set interfaces ae0 aggregated-ether-options link-protection
set interfaces demux0 unit 10301 proxy-arp
set interfaces demux0 unit 10301 vlan-tags outer 103
set interfaces demux0 unit 10301 vlan-tags inner 1
set interfaces demux0 unit 10301 demux-options underlying-interface ae0
set interfaces demux0 unit 10301 family pppoe duplicate-protection
set interfaces demux0 unit 10301 family pppoe dynamic-profile ancp-10301
set interfaces demux0 unit 10301 advisory-options downstream-rate 16m
set interfaces demux0 unit 10301 advisory-options upstream-rate 1m
set interfaces demux0 unit 10302 proxy-arp
set interfaces demux0 unit 10302 vlan-tags outer 103
set interfaces demux0 unit 10302 vlan-tags inner 2
set interfaces demux0 unit 10302 demux-options underlying-interface ae0
set interfaces demux0 unit 10302 family pppoe duplicate-protection
set interfaces demux0 unit 10302 family pppoe dynamic-profile ancp-10302
set interfaces demux0 unit 10302 advisory-options downstream-rate 16m
set interfaces demux0 unit 10302 advisory-options upstream-rate 1m
set interfaces demux0 unit 10303 proxy-arp
set interfaces demux0 unit 10303 vlan-tags outer 103
set interfaces demux0 unit 10303 vlan-tags inner 3
set interfaces demux0 unit 10303 demux-options underlying-interface ae0
set interfaces demux0 unit 10303 family pppoe duplicate-protection
set interfaces demux0 unit 10303 family pppoe dynamic-profile ancp-10303
set interfaces demux0 unit 10303 advisory-options downstream-rate 16m
set interfaces demux0 unit 10303 advisory-options upstream-rate 1m
set interfaces lo0 unit 0 family inet address 127.0.50.1/28
top
#
# Class of Service
edit class-of-service
set traffic-control-profiles tcp1 shaping-rate 16m
set traffic-control-profiles tcp1 overhead-accounting cell-mode
set interfaces interface-set 10301 output-traffic-control-profile tcp1
set interfaces interface-set 10302 output-traffic-control-profile tcp1
set interfaces interface-set 10303 output-traffic-control-profile tcp1
top
#
# ANCP
edit protocols ancp
set traceoptions file ancpd

```

```
set traceoptions file size 512m
set traceoptions flag config
set traceoptions flag cos
set qos-adjust
set adjacency-timer 5
set maximum-helper-restart-time 90
set qos-adjust-adsl 90
set qos-adjust-adsl2 95
set interfaces interface-set 10301 access-identifier "192.168.61.65/0.0.0.0 eth 1/1:7;"
set interfaces interface-set 10302 access-identifier "192.168.61.65/0.0.0.0 eth 1/2:7;"
set interfaces interface-set 10303 access-identifier "192.168.61.65/0.0.0.0 eth 1/3:7;"
set interfaces interface-set 10301 underlying-interface demux0.10301
set interfaces interface-set 10302 underlying-interface demux0.10302
set interfaces interface-set 10303 underlying-interface demux0.10303
set neighbor 203.0.113.1
top
#
# RADIUS
edit access
set radius-server 198.51.100.191 secret "$ABC123$ABC123$ABC123"
edit access profile radius-profile
set authentication-order radius
set radius authentication-server 198.51.100.191
set radius accounting-server 198.51.100.191
set radius options accounting-session-id-format decimal
set radius options juniper-dsl-attributes
set radius attributes exclude dsl-forum-attributes access-request
set radius attributes exclude dsl-forum-attributes accounting-start
set radius attributes exclude dsl-forum-attributes accounting-stop
top
```

Configuring the Dynamic PPPoE Profiles

Step-by-Step Procedure

In this procedure, you configure a dynamic profile for each C-VLAN: ancp-10301, ancp-10302, and ancp-10303.

1. Configure the interface set that the PPPoE sessions on this C-VLAN are placed in.

```
[edit dynamic-profiles ancp-10301]
user@host1# edit interfaces interface-set 10301
```
2. Configure the logical interfaces to be dynamically instantiated for the interface set.

```
[edit dynamic-profiles ancp-10301 interfaces interface-set 10301]
user@host1# set interface pp0 unit "$junos-interface-unit"
```
3. Configure CHAP and PAP authentication as properties of the dynamic PPPoE logical interfaces.

```
[edit dynamic-profiles ancp-10301 interfaces pp0 unit "$junos-interface-unit"]
user@host1# set ppp-options chap
user@host1# set ppp-options pap
```
4. Configure the logical underlying interface on which the router creates the dynamic PPPoE logical interface; this is the interface on which the subscriber logs in.

```
[edit dynamic-profiles ancp-10301 interfaces pp0 unit "$junos-interface-unit"]
user@host1# set pppoe-options underlying-interface "$junos-underlying-interface"
```

- Specify the interval between successive keepalive requests.

```
[edit dynamic-profiles ancp-10301 interfaces pp0 unit "$junos-interface-unit"]
user@host1# set keepalives interval 30
```

- Configure the IPv4 protocol family and that the local (unnumbered) address can be derived from the loopback address for the dynamic PPPoE logical interfaces.

```
[edit dynamic-profiles ancp-10301 interfaces pp0 unit "$junos-interface-unit"]
user@host1# set family inet unnumbered-address lo0.0
```

- Repeat Steps 1 through 6 for the second dynamic profile, ancp-10302, and the third dynamic profile, ancp-10303.

Results From configuration mode, confirm the dynamic profile configuration by entering the **show dynamic-profiles** command.

```
[edit]
user@host# show dynamic-profiles
ancp-10301 {
  interfaces {
    interface-set 10301 {
      interface pp0 {
        unit "$junos-interface-unit";
      }
    }
  }
  pp0 {
    unit "$junos-interface-unit" {
      ppp-options {
        chap;
        pap;
      }
      pppoe-options {
        underlying-interface "$junos-underlying-interface";
      }
      keepalives interval 30;
      family inet {
        unnumbered-address lo0.0;
      }
    }
  }
}
ancp-10302 {
  interfaces {
    interface-set 10302 {
      interface pp0 {
        unit "$junos-interface-unit";
      }
    }
  }
  pp0 {
    unit "$junos-interface-unit" {
      ppp-options {
        chap;
        pap;
      }
    }
  }
}
```

```

    pppoe-options {
        underlying-interface "$junos-underlying-interface";
    }
    keepalives interval 30;
    family inet {
        unnumbered-address lo0.0;
    }
}
}
}
}
ancp-10303 {
    interfaces {
        interface-set 10303 {
            interface pp0 {
                unit "$junos-interface-unit";
            }
        }
        pp0 {
            unit "$junos-interface-unit" {
                ppp-options {
                    chap;
                    pap;
                }
                pppoe-options {
                    underlying-interface "$junos-underlying-interface";
                }
                keepalives interval 30;
                family inet {
                    unnumbered-address lo0.0;
                }
            }
        }
    }
}

```

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

Configuring the Static VLAN Demux Interface over Aggregated Ethernet

Step-by-Step Procedure

1. Enable hierarchical scheduling on this interface.

```
[edit interfaces ge-1/0/1]  
user@host1# set hierarchical-scheduler
```
2. Specify this interface as the primary member of the aggregated Ethernet bundle.

```
[edit interfaces ge-1/0/1]  
user@host1# set gigheter-options 802.3ad ae0 primary
```
3. Enable hierarchical scheduling on a second interface.

```
[edit interfaces ge-1/0/2]  
user@host1# set hierarchical-scheduler
```
4. Specify this interface as the backup member of the aggregated Ethernet bundle.

```
[edit interfaces ge-1/0/2]
```

```
user@host1# set gigheter-options 802.3ad ae0 backup
```

5. Enable hierarchical scheduling on the aggregated Ethernet interface.

```
[edit interfaces ae0]
user@host1# set hierarchical-scheduler
```

6. Enable stacked VLAN tagging for all logical interfaces on the aggregated Ethernet interface.

```
[edit interfaces ae0]
user@host1# set stacked-vlan-tagging
```

7. Enable link protection as a property of the aggregated Ethernet interface.

```
[edit interfaces ae0]
user@host1# set aggregated-ether-options link-protection
```

8. Configure VLAN demux interface demux0.10301.

- a. Configure the router to respond to ARP requests on the interface.

```
[edit interfaces demux0 unit 10301]
user@host1# set proxy-arp
```

- b. Configure the outer VLAN tag to identify the access node (S-VLAN) and the inner VLAN tag to identify the subscriber port on the access node (C-VLAN).

```
[edit interfaces demux0 unit 10301]
user@host1# set vlan tags outer 103 inner 1
```

- c. Specify that the VLAN demux interface runs on the underlying aggregated Ethernet interface.

```
[edit interfaces demux0 unit 10301]
user@host1# set demux-options underlying-interface ae0
```

- d. Prevent multiple PPPoE sessions from being created for the same PPPoE subscriber on this VLAN demux interface.

```
[edit interfaces demux0 unit 10301]
user@host1# set family pppoe duplicate-protection
```

- e. Configure the dynamic profile that is instantiated on the VLAN demux interface.

```
[edit interfaces demux0 unit 10301]
user@host1# set family pppoe dynamic-profile ancp-10301
```

- f. Configure the recommended upstream and downstream traffic rates.

```
[edit interfaces demux0 unit 10301]
user@host1# set advisory-options upstream-rate 1m
user@host1# set advisory-options downstream-rate 16m
```

9. Configure VLAN demux interface demux0.10302.

- a. Configure the router to respond to ARP requests on the interface.

```
[edit interfaces demux0 unit 10302]
user@host1# set proxy-arp
```

- b. Configure the outer VLAN tag to identify the access node (S-VLAN) and the inner VLAN tag to identify the subscriber port on the access node (C-VLAN).

```
[edit interfaces demux0 unit 10302]
user@host1# set vlan tags outer 103 inner 2
```

- c. Specify that the VLAN demux interface runs on the underlying aggregated Ethernet interface.

```
[edit interfaces demux0 unit 10302]
user@host1# set demux-options underlying-interface ae0
```

- d. Prevent multiple PPPoE sessions from being created for the same PPPoE subscriber on this VLAN demux interface.

```
[edit interfaces demux0 unit 10302]
user@host1# set family pppoe duplicate-protection
```

- e. Configure the dynamic profile that is instantiated on the VLAN demux interface.

```
[edit interfaces demux0 unit 10302]
user@host1# set family pppoe dynamic-profile ancp-10302
```

- f. Configure the recommended upstream and downstream traffic rates.

```
[edit interfaces demux0 unit 10302]
user@host1# set advisory-options upstream-rate 1m
user@host1# set advisory-options downstream-rate 16m
```

- 10. Configure VLAN demux interface demux0.10303.

- a. Configure the router to respond to ARP requests on the interface.

```
[edit interfaces demux0 unit 10303]
user@host1# set proxy-arp
```

- b. Configure the outer VLAN tag to identify the access node (S-VLAN) and the inner VLAN tag to identify the subscriber port on the access node (C-VLAN).

```
[edit interfaces demux0 unit 10303]
user@host1# set vlan tags outer 103 inner 3
```

- c. Specify that the VLAN demux interface runs on the underlying aggregated Ethernet interface.

```
[edit interfaces demux0 unit 10303]
user@host1# set demux-options underlying-interface ae0
```

- d. Prevent multiple PPPoE sessions from being created for the same PPPoE subscriber on this VLAN demux interface.

```
[edit interfaces demux0 unit 10303]
user@host1# set family pppoe duplicate-protection
```

- e. Configure the dynamic profile that is instantiated on the VLAN demux interface.

```
[edit interfaces demux0 unit 10303]
user@host1# set family pppoe dynamic-profile ancp-10303
```

- f. Configure the recommended upstream and downstream traffic rates.

```
[edit interfaces demux0 unit 10303]
user@host1# set advisory-options upstream-rate 1m
user@host1# set advisory-options downstream-rate 16m
```

- 11. Configure the IPv4 protocol family and the address of the loopback interface.

```
[edit interfaces lo0]
user@host1# set unit 0 family inet address 127.0.50.1/28
```

Results From configuration mode, confirm the static VLAN demux configuration by entering the **show interfaces** command.

```
[edit]
user@host# show interfaces
ge-1/0/1 {
  hierarchical-scheduler;
  gigether-options {
    802.3ad {
      ae0;
      primary;
    }
  }
}
ge-1/0/2 {
  hierarchical-scheduler;
  gigether-options {
    802.3ad {
      ae0;
      backup;
    }
  }
}
ae0 {
  hierarchical-scheduler;
  stacked-vlan-tagging;
  aggregated-ether-options {
    link-protection;
  }
}
demux0 {
  unit 10301 {
    proxy-arp;
    vlan-tags outer 103 inner 1;
    demux-options {
      underlying-interface ae0;
    }
    family pppoe {
      duplicate-protection;
      dynamic-profile ancp-10301;
    }
    advisory-options {
      downstream-rate 16m;
      upstream-rate 1m;
    }
  }
  unit 10302 {
    proxy-arp;
    vlan-tags outer 103 inner 2;
    demux-options {
      underlying-interface ae0;
    }
  }
}
```

```

family pppoe {
    duplicate-protection;
    dynamic-profile ancp-10302;
}
advisory-options {
    downstream-rate 16m;
    upstream-rate 1m;
}
}
unit 10303 {
    proxy-arp;
    vlan-tags outer 103 inner 3;
    demux-options {
        underlying-interface ae0;
    }
    family pppoe {
        duplicate-protection;
        dynamic-profile ancp-10303;
    }
    advisory-options {
        downstream-rate 16m;
        upstream-rate 1m;
    }
}
lo0 {
    unit 0 {
        family inet {
            address 127.0.50.1/28
        }
    }
}
}

```

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

Configuring Class of Service

- | | |
|-------------------------------|---|
| Step-by-Step Procedure | <ol style="list-style-type: none"> Configure the traffic-control profile with the shaping rate and specify the overhead accounting mode to account for ATM cell encapsulation.

 <pre> [edit class-of-service] user@host1# set traffic-control-profiles tcp1 shaping-rate 16m user@host1# set traffic-control-profiles tcp1 overhead-accounting cell-mode </pre> Apply the traffic-control profile to the interface sets.

 <pre> [edit class-of-service] user@host1# set interfaces interface-set 10301 output-traffic-control-profile tcp1 user@host1# set interfaces interface-set 10302 output-traffic-control-profile tcp1 user@host1# set interfaces interface-set 10303 output-traffic-control-profile tcp1 </pre> |
| Results | <p>From configuration mode, confirm the class of service configuration by entering the show class-of-service command.</p> <pre> [edit] user@host# show class-of-service </pre> |

```

traffic-control-profiles {
  tcp1 {
    shaping-rate 16m;
    overhead-accounting cell-mode;
  }
}
interfaces {
  interface-set 10301 {
    output-traffic-control-profile tcp1;
  }
  interface-set 10302 {
    output-traffic-control-profile tcp1;
  }
  interface-set 10303 {
    output-traffic-control-profile tcp1;
  }
}

```

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

Configuring ANCP

Step-by-Step Procedure

1. Configure the access node address.

```

[edit protocols ancp]
user@host1# set neighbor 203.0.113.1

```
2. Configure the ANCP agent to report adjusted downstream traffic rates to CoS.

```

[edit protocols ancp]
user@host1# set qos-adjust

```
3. Specify an overhead adjustment of the traffic on ADSL and ADSL2 lines to 90 percent and 95 percent, respectively, of the net data rate.

```

[edit protocols ancp]
user@host1# set qos-adjust-adsl 90
user@host1# set qos-adjust-adsl2 95

```
4. Specify an interval of 5 seconds between adjacency messages sent to all ANCP neighbors.

```

[edit protocols ancp]
user@host1# set adjacency-timer 5

```
5. Associate the ACI with the interface sets for each C-VLAN.

```

[edit protocols ancp]
user@host1# set interfaces interface-set 10301 access-identifier
"192.168.61.65/0.0.0.0 eth 1/1:7;"
user@host1# set interfaces interface-set 10302 access-identifier
"192.168.61.65/0.0.0.0 eth 1/2:7;"
user@host1# set interfaces interface-set 10303 access-identifier
"192.168.61.65/0.0.0.0 eth 1/3:7;"

```
6. Specify the underlying interface for the interface sets.

```

[edit protocols ancp]
user@host1# set interfaces interface-set 10301 underlying-interface demux0.10301

```

```
user@host1# set interfaces interface-set 10302 underlying-interface demux0.10302
user@host1# set interfaces interface-set 10303 underlying-interface demux0.10303
```

7. Configure the size of the ANCP trace log files.

```
[edit protocols ancp traceoptions]
user@host1# set file ancpd size 512m
```

8. Configure flags for tracing ANCP configuration and CoS operations.

```
[edit protocols ancp traceoptions]
user@host1# set flag config
user@host1# set flag cos
```

Results From configuration mode, confirm the ANCP agent configuration by entering the **show ancp** command.

```
[edit]
user@host# show ancp
traceoptions {
  file ancpd size 512m;
  flag config;
  flag cos;
}
qos-adjust;
adjacency-timer 5;
qos-adjust-adsl 90;
qos-adjust-adsl2 95;
interfaces {
  interface-set {
    10301 {
      access-identifier "192.168.61.65/0.0.0.0 eth 1/1:7;";
      underlying-interface demux0.10301;
    }
    10302 {
      access-identifier "192.168.61.65/0.0.0.0 eth 1/2:7;";
      underlying-interface demux0.10302;
    }
    10303 {
      access-identifier "192.168.61.65/0.0.0.0 eth 1/3:7;";
      underlying-interface demux0.10303;
    }
  }
}
neighbor 203.0.113.1;
```

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

Configuring RADIUS Authentication and Accounting

Step-by-Step Procedure

1. Configure the password for the RADIUS server.

```
[edit access]
user@host1# set radius-server 198.51.100.191 secret "$ABC123$ABC123$ABC123"
```
2. Specify that RADIUS is used to authenticate subscribers.

```
[edit access]
```

```
user@host1# set profile radius-profile authentication-order radius
```

3. Configure the RADIUS authentication and accounting server.

```
[edit access]
user@host1# set profile radius-profile radius authentication-server 198.51.100.191
user@host1# set profile radius-profile radius accounting-server 198.51.100.191
```

4. Configure options for the RADIUS server: The format used to identify the accounting session and that Juniper Networks DSL VSAs are added to RADIUS request messages.

```
[edit access]
user@host1# set profile radius-profile radius options accounting-session-id-format decimal
user@host1# set profile radius-profile radius options juniper-dsl-attributes
```

5. Exclude DSL Forum VSA attributes from being included in RADIUS messages.

```
[edit access]
user@host1# set profile radius-profile radius attribute exclude dsl-forum-attributes access-request
user@host1# set profile radius-profile radius attribute exclude dsl-forum-attributes accounting-start
user@host1# set profile radius-profile radius attribute exclude dsl-forum-attributes accounting-stop
```

Results From configuration mode, confirm the RADIUS configuration by entering the **show access** command.

```
[edit]
user@host# show access
radius-server {
  198.51.100.191 secret "$ABC123$ABC123$ABC123"; ## SECRET-DATA
}
profile radius-profile {
  radius {
    authentication-server 198.51.100.191;
    accounting-server 198.51.100.191;
    options {
      accounting-session-id-format decimal;
      juniper-dsl-attributes;
    }
    attributes {
      exclude {
        dsl-forum-attributes [ access-request accounting-start accounting-stop ];
      }
    }
  }
}
```

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

Verification

To confirm that the configuration is working properly, perform these tasks:

- [Verifying the Aggregated Ethernet Interface Configuration on page 648](#)
- [Verifying the Traffic Scheduling and Shaping Parameters for the Interface Set on page 648](#)
- [Verifying the demux0 Interface Configuration on page 649](#)
- [Verifying the pp0 Interface Configuration on page 649](#)
- [Verifying the ANCP Agent Configuration on page 650](#)

Verifying the Aggregated Ethernet Interface Configuration

Purpose Verify that the interface values match your configuration, the link is up, and traffic is flowing.

Action From operational mode, enter the **show interfaces redundancy** command.

```
user@host> show interfaces redundancy
Interface  State           Last change  Primary    Secondary  Current status
ae0        On primary          ge-1/0/1     ge-1/0/2   both up
```

From operational mode, enter the **show interfaces ae0** command.

```
user@host> show interfaces ae0
Physical interface: ae0, Enabled, Physical link is Up
  Interface index: 128, SNMP ifIndex: 606
  Link-level type: Ethernet, MTU: 1522, Speed: 1Gbps, BPDU Error: None,
  MAC-REWRITE Error: None, Loopback: Disabled, Source filtering: Disabled,
  Flow control: Disabled, Minimum links needed: 1, Minimum bandwidth needed: 0
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Current address: 00:00:5E:00:53:c0, Hardware address: 00:00:5E:00:53:c0
  Last flapped   : 2012-03-11 13:24:18 PST (2d 03:34 ago)
  Input rate     : 1984 bps (2 pps)
  Output rate    : 0 bps (0 pps)
```

```
Logical interface ae0.32767 (Index 69) (SNMP ifIndex 709)
  Flags: SNMP-Traps 0x4004000 VLAN-Tag [ 0x0000.0 ] Encapsulation: ENET2
  Statistics          Packets      pps      Bytes      bps
  Bundle:
    Input :           371259         2    46036116    1984
    Output:              0         0         0         0
  Protocol multiservice, MTU: Unlimited
  Flags: Is-Primary
```

Meaning The **show interfaces redundancy** output shows the redundant link configuration and that both link interfaces are up. The **show interfaces ae0** output shows that the aggregated Ethernet interface is up and that traffic is being received on the logical interface.

Verifying the Traffic Scheduling and Shaping Parameters for the Interface Set

Purpose Verify that the traffic scheduling and shaping parameters are configured and applied properly.

Action user@host> show class-of-service

Verifying the demux0 Interface Configuration

Purpose Verify that the VLAN demux interface displays the configured PPPoE family attributes and the member links in the aggregated Ethernet bundle.

Action From operational mode, enter the **show interfaces demux0** command for each VLAN.

```
user@host> show interfaces demux0.10301
Logical interface demux0.10301 (Index 76) (SNMP ifIndex 61160)
  Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.100 ]
  Encapsulation: ENET2
  Demux:
    Underlying interface: ae0 (Index 199)
  Link:
    ge-1/0/1
    ge-1/0/2
  Input packets : 2
  Output packets: 18575
  Protocol pppoe
    Dynamic Profile: ancp-10301,
    Service Name Table: None,
    Max Sessions: 16000, Duplicate Protection: On,
    AC Name: pppoe-server-1
```

Alternatively, you can enter **show pppoe underlying-interfaces detail** to display the state and PPPoE family configuration for all configured underlying interfaces.

Meaning The output shows the name of the underlying interface, the member links of the aggregated bundle, and the PPPoE family configuration. The output shows packet counts when traffic is present on the logical interface.

Verifying the pp0 Interface Configuration

Purpose Verify that the interface values match your configuration.

Action From operational mode, enter the **show interfaces pp0** command.

```
user@host> show interfaces pp0.100
Logical interface pp0.100 (Index 71) (SNMP ifIndex 710)
  Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
  PPPoE:
    State: SessionUp, Session ID: 1,
    Session AC name: pppoe-server-1, Remote MAC address: 00:00:5E:00:53:34,
    Underlying interface: demux0.10301 (Index 70)
  Link:
    ge-5/0/3.32767
    ge-5/1/2.32767
  Input packets : 18572
  Output packets: 18572
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 0 (never), Output: 18566 (00:00:02 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
  Not-configured
```

```

CHAP state: Closed
PAP state: Success
  Protocol inet, MTU: 1500
    Flags: Sendbcast-pkt-to-re
    Addresses, Flags: Is-Primary
    Local: 203.0.113.45

```

Meaning This output shows information about the PPPoE logical interface created on the underlying VLAN demux interface. The output includes the PPPoE family and aggregated Ethernet redundant link information, and shows input and output traffic for the PPPoE interface.

Verifying the ANCP Agent Configuration

Purpose Verify that the ANCP values match your configuration and that traffic is flowing.

Action From operational mode, enter the **show ancp subscriber** command.

```

user@host> show ancp subscriber detail
Interface  State           Last change  Primary    Secondary  Current status
ae0        On primary      ge-1/0/1    ge-1/0/2   both up

```

From operational mode, enter the **show ancp cos** command.

```

user@host> show ancp cos

Qos Adjust Flag:      TRUE
Keepalive Timer:      30 secs
Cos State:             WRITE_READY
Connect Time:         Mon Mar 19 15:03:01 2012
Session Time:         Mon Mar 19 15:03:13 2012
Routing Instance Time: Mon Mar 19 15:03:14 2012
Keepalive Time:       Not Set
Rate Update Time:     Mon Mar 19 15:03:15 2012

```

Type	Name	Index	Pending Update	Last Update
iflset	10301	1	None	64 Kbps
iflset	10302	2	None	64 Kbps
iflset	10303	71	None	64 Kbps

Meaning The **show ancp subscriber** output shows subscriber line information such as state and the various traffic rates collected by the ANCP agent—displayed for each subscriber as identified by the ACI. The **show ancp cos** output shows that the ANCP agent is configured to send adjusted rate data to CoS, that keepalives are configured for a 30-second interval, and that the interface sets 10301, 10302, and 10303 are configured and their traffic rates are updating

Related Documentation

- [Dynamic Profiles Overview](#)
- [Configuring Dynamic DHCP Client Access to a Multicast Network](#)
- [Subscriber Interfaces and Demultiplexing Overview](#)
- [ANCP Agent Interactions with AAA on page 663](#)
- [ANCP DSL Attributes Mapped to Juniper Networks DSL Vendor-Specific Attributes on page 665](#)

- [Configuring the ANCP Agent on page 624](#)
- [AAA Service Framework Overview on page 3](#)

CHAPTER 69

Configuring the ANCP Agent Traffic and CoS

- [Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653](#)
- [Preservation of CoS Shaping Across ANCP Agent Restarts on page 656](#)
- [Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657](#)
- [Setting a Recommended Shaping Rate for Traffic on ANCP Interfaces on page 659](#)
- [Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates on page 660](#)

Traffic Rate Reporting and Adjustment by the ANCP Agent

The ANCP agent monitors the subscriber access lines and reports to AAA and CoS information about the lines that it receives from the access node.

- [Overview on page 653](#)
- [Traffic Rate Adjustment on page 655](#)
- [Recommended Traffic Shaping Rates on page 655](#)
- [ANCP Agent Keepalives for CoS on page 656](#)

Overview

The ANCP agent reports two kinds of data rates:

- The *net data rate* is the portion of the total data rate that can be used to transmit user information. The net data rate is also called the *unadjusted* traffic rate.
- Because each DSL line type has a certain technology overhead, the actual rate for user data is less than the net data rate. The *adjusted* or *calculated* rate is the net data rate reduced by the amount of technology overhead incurred by each DSL line type. The result is a closer approximation of the actual rate of subscriber data traffic. You can configure the ANCP agent to adjust the net data rate for each line type to generate the adjusted rate. The ANCP agent can adjust the rates it reports to AAA by a percentage for all DSL types. For only frame-mode DSL types (SDSL, VDSL, VDSL2, and OTHER), the agent can adjust the rates it reports to CoS by a percentage and it can adjust the number of overhead bytes per frame up or down.

The ANCP agent reports traffic rates differently to AAA and CoS:

- The agent always reports both unadjusted and adjusted rates for both upstream and downstream traffic to AAA in response to a AAA request.
- The agent always reports only downstream traffic rates to CoS in support of CoS traffic shaping. It never reports upstream traffic rates to CoS because CoS does not shape upstream traffic. The agent also reports to CoS the overhead mode and bytes for the access line; CoS can use this information when it subsequently shapes the traffic.

When configured to do so, the agent adjusts the traffic rate, the overhead bytes, or both for only frame-mode DSL types (SDSL, VDSL, VDSL2, and OTHER) before it sends the information to CoS. The agent cannot adjust the rate or bytes that it reports to CoS for non-frame-mode DSL types (ADSL, ADSL2, ADSL2+).

When you remove a shaping rate configuration that the ANCP agent previously applied, the traffic shaping rate reverts to the CoS session shaping as determined by the CoS traffic-control profiles specified in the dynamic profile. If the ANCP agent remains running but loses a connection to a particular neighbor whose subscriber traffic has been adjusted as a result of ANCP agent action, the adjusted rate remains in effect. The rate currently in effect changes only when the ANCP agent restores the connection and sends fresh updates to CoS, or when you remove the **qos-adjust** statement.

Because CoS can perform traffic shaping only when a traffic-control profile has been applied to the interface or interface set, you might expect the ANCP agent to always influence traffic shaping when the ANCP subscriber interface or interface set has a traffic-control profile. This behavior is not always true.

Consider a configuration where a subscriber logical interface is a member of an ACI-based VLAN (interface set); all members share the same ACI. The dynamic profile that instantiates the subscriber interface applies a traffic-control profile to the interface. The profile that instantiates the VLAN applies an interface-shared filter instead of a traffic-control profile.

The following sequence of events takes place when the subscriber logs in.

1. The first packet creates the auto-sensed, underlying VLAN.
2. The second packet creates the ACI-based subscriber VLAN
3. The third packet creates the subscriber logical interface.

Because the VLAN comes up first, the ANCP agent attaches to the VLAN and not to the interface. Consequently, the agent reports to CoS the downstream data rate only for the VLAN, not for the logical interface. CoS has no information to adjust the shaping rate for the interface, so it shapes traffic for the interface only according to the interface's traffic-control profile.

Although the agent does report the downstream rate for the VLAN, CoS cannot use that information to shape the VLAN traffic, because the VLAN does not have a traffic-control profile. Consequently, the VLAN rate does not affect the logical interface's rate even though the logical interface is a member of that interface set.

Traffic Rate Adjustment

When a DSLAM determines the data rate on the subscriber local loop, it ignores the additional headers on the DSL line that are associated with the overhead of the access mode (ATM or Ethernet) and the technology of the DSL line type. When the ANCP agent subsequently reports a net data rate, by default it includes this overhead, reporting a slightly higher value than the actual subscriber data rate seen by the DSLAM.

You can configure the ANCP agent to dynamically adjust the net data rate it reports to AAA by a fixed percentage to account for the traffic overhead. To do so, include one or more of the **qos-adjust-dsl-line-type** statements at the **[edit protocols ancp]** hierarchy level. Each of these statements sets an adjustment factor for a particular DSL line type such as ADSL or VDSL2. The adjustment factor is a percentage value that the ANCP agent applies to the traffic rates it receives from the DSLAM. The percentage accounts for the traffic overhead for that line type. The adjustment factor applies globally for all subscribers of the particular DSL line type associated with the statement: ADSL, ADSL2, ADSL2+, SDSL, VDSL, VDSL2, or OTHER. The ANCP agent subsequently reports the adjusted rate to AAA in addition to the unadjusted data rate.

The **qos-adjust-dsl-line-type** statements are enabled by default with an adjustment factor of 100 percent; by default the ANCP agent effectively makes no adjustment to the rates.

The ANCP agent reports traffic rates to CoS only when you have included the **qos-adjust** statement at the **[edit protocols ancp]** hierarchy level. By default, these are unadjusted rates. CoS attempts to avoid traffic drops in the access node by itself adjusting the traffic shaping rate that it applies to downstream traffic for a particular VLAN or set of VLANs. The discrepancy between the actual user data rate and the agent-reported net data rate reduces the accuracy of CoS traffic shaping.

For frame-mode DSL types, you can increase the accuracy of CoS traffic shaping by configuring the agent to do one or both of the following before it reports the values to CoS:

- Adjust the net data rates by a percentage.
- Adjust the frame overhead bytes by adding or subtracting a specified number of bytes.

Include the **other-overhead-adjust**, **sdsl-overhead-adjust**, **vdsl-overhead-adjust**, or **vdsl2-overhead-adjust** statements to adjust the rates. Include the **other-bytes**, **sdsl-bytes**, **vdsl-bytes**, or **vdsl2-bytes** statements to adjust the bytes. These statements are all at the **[edit protocols ancp qos-adjust]** hierarchy level.

Recommended Traffic Shaping Rates

To handle a situation where the router does not receive information from the access node about the downstream and upstream calculated traffic rates for an interface, you can specify recommended *advisory* values for shaping the traffic sent to the interface so that it matches the subscriber local loop speed.

The transmit speed is the recommended traffic value in bits per second used for downstream traffic for an ANCP interface, and is conveyed in the Juniper Networks VSA,

Downstream-Calculated-Qos-Rate (IANA 4874, 26-141). The receive speed is the recommended traffic value in bits per second used for upstream traffic for an ANCP interface, and is conveyed in the Juniper Networks VSA, Upstream-Calculated-Qos-Rate VSA (IANA 4874, 26-142).

To set the recommended shaping rates that are used as the default values for these VSAs in static configurations, include the **downstream-rate** and **upstream-rate** statements at the **[edit interfaces *interface-name* unit *logical-unit-number* advisory-options]** hierarchy level.

To configure the recommended rates on dynamically created VLAN interfaces, include the **upstream-rate** or **downstream-rate** statements at the **[edit dynamic-profiles *profile-name* interfaces \$junos-interface-ifd-name unit \$junos-interface-unit advisory-options]** hierarchy level.

To configure the recommended rates on dynamically created ACI interface sets, include the **upstream-rate** or **downstream-rate** statements at the **[edit dynamic-profiles *profile-name* interface-set \$junos-interface-set-name interfaces \$junos-interface-ifd-name advisory-options]** hierarchy level.

ANCP Agent Keepalives for CoS

The ANCP agent sends a keepalive message to CoS at specific intervals. If CoS does not receive a keepalive in the expected time, it reverts the shaping rate changes it made in response to the ANCP agent. You can adjust how long CoS waits for a keepalive message by including the **maximum-helper-restart-time** statement at the **[edit protocols ancp]** hierarchy level. The interval between keepalive messages is automatically set to one-third the value of the maximum helper restart time. For example, if you set the maximum helper restart time to 120 seconds, then the ANCP agent sends keepalive messages every 40 seconds. In this example, if CoS does not receive a keepalive message within 120 seconds, then it reverts any policy changes derived from the ANCP agent.

Related Documentation

- [ANCP and the ANCP Agent Overview on page 607](#)
- [Configuring the ANCP Agent on page 624](#)
- [*Shaping Rate Adjustments for Subscriber Local Loops Overview*](#)
- [*Guidelines for Configuring Shaping-Rate Adjustments for Subscriber Local Loops*](#)
- [ANCP DSL Attributes Mapped to Juniper Networks DSL Vendor-Specific Attributes on page 665](#)
- [Preservation of CoS Shaping Across ANCP Agent Restarts on page 656](#)

Preservation of CoS Shaping Across ANCP Agent Restarts

When the ANCP agent stops due to a process or GRES, CoS enforces the ANCP downstream shaping-rates until the CoS keepalive timer expires. When the timer expires, CoS reverts to the CoS shaping-rate configured for the interfaces.

You configure the CoS keepalive timer by including the **maximum-helper-restart-time seconds** statement at the **[edit protocols ancp]** hierarchy level. It specifies how much time other daemons such as CoS wait for the ANCP agent to restart and is used to configure the CoS rate update keepalive timer.

The ANCP agent does not maintain TCP sessions from neighbors across the restart or GRES. When it restarts, it must re-establish sessions with neighbors and subscriber sessions before the timer expires. For all the re-established sessions, the ANCP agent updates CoS with the updated downstream shaping rates and provides DSL line attributes to the session database for AAA.

If CoS stops or restarts while ANCP is up, the ANCP agent retransmits all known subscriber downstream rates to CoS. Any existing adjusted shaping rates that have not been updated revert to the configured CoS shaping rates when the CoS restart timer expires.

Related Documentation

- [ANCP and the ANCP Agent Overview on page 607](#)
- [Configuring the ANCP Agent on page 624](#)
- [Specifying How Long Processes Wait for the ANCP Agent Restart to Complete on page 629](#)

Configuring the ANCP Agent to Report Traffic Rates to CoS

By default, the ANCP agent does not report the traffic rate on subscriber access lines to CoS. You can include the **qos-adjust** statement at the **[edit protocols ancp]** hierarchy level to configure the ANCP agent to report downstream data rates received in ANCP Port Up messages to CoS for all subscribers in the network. This information enables CoS to subsequently shape the traffic on these access lines—but only if a shaping rate is configured in a CoS traffic-control profile for the access lines.

When a DSLAM calculates the data rate on the subscriber local loop, it ignores the additional headers on the DSL line that are associated with the overhead of the access mode (ATM or Ethernet). The unadjusted downstream data rate includes these headers in its calculation and reports a slightly higher value than that calculated by the DSLAM. The ANCP agent also reports to CoS the traffic mode and the traffic rate overhead.



NOTE: The ANCP agent never reports upstream traffic rates to CoS.

For frame-mode DSL types only—SDSL, VDSL, VDSL2, and OTHER—you can also configure the ANCP agent to adjust the actual (net) downstream data rates, the overhead bytes, or both. The ANCP agent adjusts the rate by the specified percentage. It adjusts the frame overhead by adding or subtracting the specified number of bytes. By default the adjustment is 100 percent and 0 bytes, meaning that the agent does not adjust the net values before it reports them to CoS.

If CoS does not receive a keepalive message within the maximum helper restart time, it considers the ANCP agent to be down and immediately reverts to the configured values for any traffic shaping updates that were modified as a result of traffic reports from the

ANCP agent. The configured values are maintained until the ANCP agent comes back up and sends fresh traffic updates to CoS.

If the ANCP agent remains running but loses the connection to a neighbor, CoS does not revert to its configured values. In this case, CoS changes the shaping rate for the subscriber traffic only if the ANCP agent restores the connection to that neighbor and reports new traffic rates to CoS or if you remove the **qos-adjust** statement.



NOTE: Always configure the **qos-adjust** statement for normal ANCP operations. You may want to disable it for debugging purposes.

To configure the ANCP agent to report downstream traffic rates to CoS for traffic shaping:

- Enable rate reporting.

```
[edit protocols ancp]
user@host# set qos-adjust
```

To configure byte adjustment values for frame-mode DSL types (SDSL, VDSL, VDSL2, or OTHER):

- (Optional) Specify the number of bytes to add or subtract per frame for one or more line types.

```
[edit protocols ancp qos-adjust]
user@host# set sdsl-bytes bytes
          vdsl-bytes bytes
          vdsl2-bytes bytes
          set other-bytes bytes
```

You can configure both rate and byte adjustments for the same line type. Adjustments take effect immediately when they are configured.

To configure percentage adjustment values for frame-mode DSL types (SDSL, VDSL, VDSL2, or OTHER):

- (Optional) Specify the percentage for one or more line types.

```
[edit protocols ancp qos-adjust]
set sdsl-overhead-adjust percentage
set vdsl-overhead-adjust percentage
set vdsl2-overhead-adjust percentage;
set other-overhead-adjust percentage;
```

Related Documentation

- [Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653](#)
- [Configuring the ANCP Agent on page 624](#)
- [ANCP and the ANCP Agent Overview on page 607](#)
- [Shaping Rate Adjustments for Subscriber Local Loops Overview](#)
- [Guidelines for Configuring Shaping-Rate Adjustments for Subscriber Local Loops](#)
- [Enabling Shaping-Rate Adjustments for Subscriber Local Loops](#)

- *Disabling Shaping-Rate Adjustments for Subscriber Local Loops*
- [Specifying How Long Processes Wait for the ANCP Agent Restart to Complete on page 629](#)
- [maximum-helper-restart-time on page 1158](#)

Setting a Recommended Shaping Rate for Traffic on ANCP Interfaces

When the access node sends information about the downstream and upstream calculated traffic rates for an interface, those values are used to shape the traffic sent to the interface so that it matches the subscriber local loop speed. You can specify recommended values that are used when the router does not receive this information from the access node. In this event, these recommended values are used as the default values for the following Juniper VSAs:

- Downstream-Calculated-Qos-Rate (IANA 4871, 26-141)—Conveys the transmit speed, which is the recommended traffic value in bits per second used for downstream traffic for an ANCP interface.
- Upstream-Calculated-Qos-Rate (IANA 4874, 26-142)—Conveys the receive speed, which is the recommended traffic value in bits per second used for upstream traffic for an ANCP interface.

You can configure the recommended rates either on static VLAN and VLAN demux interfaces, or you can specify them in a dynamic profile for dynamic VLAN and VLAN demux interfaces or interface sets.

To configure recommended traffic shaping values for a static interface:

1. Set the rate in bits per second for downstream traffic for the interface.

```
[edit interfaces interface-name unit logical-unit-number advisory-options]
user@host# set downstream-rate rate
```

2. Set the rate in bits per second for upstream traffic for the interface.

```
[edit interfaces interface-name unit logical-unit-number advisory-options]
user@host# set upstream-rate rate
```

For example, to set the recommended downstream rate to 16 Mbps and the recommended upstream rate to 1 Mbps on VLAN demux interface demux0.10301:

```
[edit interfaces demux0 unit 10301 advisory-options]
user@host# set downstream-rate 16M
user@host# set upstream-rate 1M
```

To configure recommended traffic shaping values for a dynamic interface:

1. Set the rate in bits per second for downstream traffic in the dynamic profile.

```
[edit dynamic-profiles profile-name interfaces $junos-interface-ifd-name unit
  $junos-interface-unit advisory-options]
user@host# set downstream-rate rate
```

2. Set the rate in bits per second for upstream traffic in the dynamic profile.

```
[edit dynamic-profiles profile-name interfaces $junos-interface-ifd-name unit
$junos-interface-unit advisory-options]
user@host# set upstream-rate rate
```

For example, to configure the dynamic profile ancp-dyn-vlan2 to set the recommended downstream rate to 10 Mbps and the recommended upstream rate to 1 Mbps on all interfaces in the dynamically created interface set:

```
[edit dynamic-profiles ancp-dyn-vlan2 interfaces $junos-interface-ifd-name unit
$junos-interface-unit advisory-options]
user@host# set downstream-rate 10M
user@host# set upstream-rate 1M
```

To configure recommended traffic shaping values for a dynamic interface set:

1. Set the rate in bits per second for downstream traffic in the dynamic profile.

```
[edit dynamic-profiles profile-name interfaces interface-set $junos-interface-set-name
interface $junos-interface-ifd-name advisory-options]
user@host# set downstream-rate rate
```

2. Set the rate in bits per second for upstream traffic in the dynamic profile.

```
[edit dynamic-profiles profile-name interfaces interface-set $junos-interface-set-name
interface $junos-interface-ifd-name advisory-options]
user@host# set upstream-rate rate
```

For example, to configure the dynamic profile ancp-dyn-vlan1 to set the recommended downstream rate to 12 Mbps and the recommended upstream rate to 2 Mbps on all interfaces in the dynamically created interface set:

```
[edit dynamic-profiles ancp-dyn-vlan1 interfaces interface-set $junos-interface-set-name
interface $junos-interface-ifd-name advisory-options]
user@host# set downstream-rate 12M
user@host# set upstream-rate 2M
```

Related Documentation

- [Configuring the ANCP Agent on page 624](#)
- [Configuring AAA to Include Juniper Networks DSL VSAs in RADIUS Messages on page 667](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework on page 21](#)
- [ANCP and the ANCP Agent Overview on page 607](#)

Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates

The ANCP agent always reports both upstream and downstream rates to AAA. When a DSLAM calculates the data rate on the subscriber local loop, it ignores the additional headers on the DSL line that are associated with the overhead of the access mode (ATM or Ethernet). When the ANCP agent reports the net upstream data rate or the net downstream data rate, it includes the headers in its calculation and reports a slightly higher value than that calculated by the DSLAM; this is the unadjusted data rate.

The ANCP agent also reports adjusted data rates to AAA. You can configure the agent to adjust the traffic rate to account for the header overhead by including one or more of the **qos-adjust-dsl-line-type** statements. Each of these statements sets an adjustment factor for a particular DSL line type that applies a percentage value to the total downstream and upstream data rates reported by the ANCP agent. The adjustment factor applies globally for all subscribers of that DSL line type. By default, the ANCP agent applies an adjustment factor of 100 percent to all DSL lines, meaning that no adjustment is made. The ANCP agent simply passes on the DSL line rates that include the header information.



NOTE: These statements affect only the rates reported to AAA. The ANCP agent reports downstream data rates to CoS only when you include the **qos-adjust** statement at the **[edit protocols ancp]** hierarchy level.

To apply a global adjustment factor for DSL subscriber lines to be reported to AAA:

- Specify the adjustment factor percentage for the desired subscriber line.

```
[edit protocols ancp]
user@host# set qos-adjust-adsl adjustment-factor
user@host# set qos-adjust-adsl2 adjustment-factor
user@host# set qos-adjust-adsl2-plus adjustment-factor
user@host# set qos-adjust-other adjustment-factor
user@host# set qos-adjust-sds1 adjustment-factor
user@host# set qos-adjust-vds1 adjustment-factor
user@host# set qos-adjust-vds2 adjustment-factor
```

Related Documentation

- [Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653](#)
- [Configuring the ANCP Agent on page 624](#)
- [ANCP and the ANCP Agent Overview on page 607](#)

CHAPTER 70

Configuring the ANCP Agent and AAA

- [ANCP Agent Interactions with AAA on page 663](#)
- [ANCP DSL Attributes Mapped to Juniper Networks DSL Vendor-Specific Attributes on page 665](#)
- [Configuring AAA to Include Juniper Networks DSL VSAs in RADIUS Messages on page 667](#)
- [Configuring Immediate Interim Accounting Updates to RADIUS in Response to ANCP Notifications on page 668](#)

ANCP Agent Interactions with AAA

The ANCP agent reports both unadjusted (net) data rates and adjusted data rates for subscriber traffic to AAA for RADIUS authentication and accounting of subscriber sessions. The adjusted data rate enables RADIUS to allocate the appropriate services (including class of service) to PPPoE sessions during authentication. The rate reports also enable RADIUS accounting to track the class of service actually provided for the PPPoE sessions, which in turn enables accurate billing for subscriber services.

The access nodes send ANCP DSL attributes in ANCP messages to the router, where they are stored in the shared database. AAA maps the ANCP DSL attributes to both the Juniper Networks DSL VSAs (used by RADIUS) and the DSL Forum VSA subattributes (also called the DSL Forum VSAs). RADIUS uses these attributes during authentication and accounting for PPPoE sessions on the subscriber access line. The attributes persist even when the ANCP session to a given node has ended, enabling RADIUS to later apply these attributes to new sessions on that subscriber access line. To remove the attributes, you must delete the interface or interface set for the access line from the ANCP agent configuration.

The RADIUS profile must be configured to include the **juniper-dsl-attributes** option, or AAA does not report the attributes to RADIUS. If the ANCP DSL attributes are unavailable, AAA maps the session's advisory upstream and downstream data rates (as configured on the session's underlying interface) to the Juniper Networks VSAs, Upstream-Calculated-Qos-Rate [26-142] and Downstream-Calculated-Qos-Rate [26-141], respectively. AAA subsequently provides only these VSAs to RADIUS.

For successful authentication and accounting by RADIUS, AAA has to correlate PPPoE and DHCP IP demux sessions with their access lines and their associated DSL attributes.

Some access nodes provide the ACI in PADI/PADR packets for the PPPoE sessions or in the DHCP discovery packets for DHCP IP demux sessions.

When the ACI is not provided in a 1:1 VLAN model with interface sets, you must associate the underlying interface for the sessions with the identifier and the interface set. If you do not configure this association, then only the advisory traffic rates are provided to RADIUS. This configuration has no effect when the identifier is provided by the access node.

For the N:1 VLAN model with interface sets, the access node must provide the ACI. If you configure the underlying interface for this model when the access node does not provide the identifier, the subscriber sessions can be incorrectly correlated with access lines.

AAA reports values to RADIUS for the Juniper Networks VSAs 26-141 and 26-142 according to the following scheme:

1. When the PPPoE or DHCP IP demux subscriber session can be correlated with an access line, then the ANCP agent adjusts the downstream and upstream traffic rates reported by the access node according to the ANCP agent CoS configuration. The agent then maps the adjusted rates to Upstream-Calculated-Qos-Rate [26-142] and Downstream-Calculated-Qos-Rate [26-141].
2. If the session cannot be correlated with an access line, but the PPPoE or DHCP discovery packet includes the DSL Forum VSA and the Access-Loop-Encapsulation subattribute includes a value for the AAL5 data link, then the ANCP agent adjusts the Actual-Data-Rate-Downstream and Actual-Data-Rate-Upstream subattributes to account for the ATM 48/53 cell tax. The adjusted rates mapped to Upstream-Calculated-Qos-Rate [26-142] and Downstream-Calculated-Qos-Rate [26-141].
3. If neither of the preceding sets of conditions is satisfied, then the ANCP agent simply maps the recommended downstream and upstream data rates to Upstream-Calculated-Qos-Rate [26-142] and Downstream-Calculated-Qos-Rate [26-141]. The recommended rates are either configured statically for the VLAN or VLAN demux interfaces or are in the dynamic profile that creates the interfaces.

To map an ACI to a static VLAN demux interface, include the **access-identifier *identifier*** statement at the **[edit protocols ancp interfaces demux0.logical-unit-number]** hierarchy level.

To configure advisory upstream and downstream data rates on a static VLAN demux interface, include the **upstream-rate *rate*** or **downstream-rate *rate*** statements at the **[edit interfaces demux0 unit *logical-unit-number*]** hierarchy level.

To configure an underlying interface for the PPPoE sessions in an interface set, include the **underlying-interface *interface-name*** statement at the **[edit protocols ancp interfaces interface-set *interface-set-name*]** hierarchy level.

When an ACI, and therefore a subscriber access line, has been mapped to an interface or interface set, the ACI can be re-mapped to a different interface or set. When this happens, traffic shaping is adjusted accordingly for the interfaces or interface sets involved. This capability is useful for the Business Services model, where a PPPoE session

that is initially classified as a residential household can be reclassified as a business subscriber during RADIUS authentication by using a Junos OS ICE AAA framework Op-Script application.

In the Business Services Model, the PPPoE session initially represents a residential household until RADIUS authentication and authorization takes place. The ANCP agent dynamically maps the household's access line to the appropriate subscriber interface and applies CoS traffic shaping to the interface. During authentication and authorization, the Op-Script application may classify the PPPoE session as a business subscriber rather than a residential subscriber. If this occurs, the application creates multiple static VLANs and groups them into an interface set. Based on the ANCP agent configuration, the application then statically maps the subscriber's access line to this static interface set. This interface set can include only static interfaces.

The ANCP agent reverts CoS traffic shaping from the interface previously used by the subscriber and instead applies the shaping to the interface set. This reversion means that the CoS process applies to the interface the next shaping rate in its adjustment control profile.

Related Documentation

- [ANCP and the ANCP Agent Overview on page 607](#)
- [ANCP DSL Attributes Mapped to Juniper Networks DSL Vendor-Specific Attributes on page 665](#)
- [Configuring the ANCP Agent on page 624](#)
- [Configuring AAA to Include Juniper Networks DSL VSAs in RADIUS Messages on page 667](#)

ANCP DSL Attributes Mapped to Juniper Networks DSL Vendor-Specific Attributes

Digital Subscriber Line (DSL) attributes are RADIUS vendor-specific attributes (VSAs) that are defined by the DSL Forum in RFC 4679, *DSL Forum Vendor-Specific RADIUS Attributes*. The attributes transport DSL information that is not supported by standard RADIUS attributes and which conveys details about the associated DSL subscriber line and traffic. These attributes are contained as subattributes in the single DSL Forum VSA (IANA vendor ID 3561). An ANCP access node can provide this information to the router in a PPPoE PADI message during PPPoE subscriber discovery.

The access node can also report the same information about the DSL subscriber line and traffic information by means of the ANCP DSL TLVs or attributes carried in ANCP messages to the router. The ANCP attributes are defined in RFC 6320, *Protocol for Access Node Control Mechanism in Broadband Networks*. These ANCP DSL attributes correspond to Juniper Networks (IANA vendor ID 4874) DSL VSAs and to DSL Forum VSAs.

The router simply passes the DSL line and traffic information that it receives from the access node to the RADIUS server, without performing any parsing or manipulation. A RADIUS authentication or accounting message can contain any combination of the DSL Forum VSAs and the Juniper Networks DSL VSAs. You can configure the RADIUS access profile to exclude one or more individual attributes, or all DSL Forum attributes, from being included in RADIUS messages.

The DSL Forum attribute and subattributes received by the router during PPPOE and DHCP client discovery are not updated after discovery, whereas the equivalent ANCP DSL attributes are updated whenever there is a change to the access line.

[Table 57 on page 666](#) shows the relationship between the ANCP DSL attributes, Juniper Networks DSL VSAs, and DSL Forum VSAs.

Table 57: Mapping ANCP DSL Attributes to Juniper Networks DSL VSAs and DSL Forum VSAs

ANCP DSL Attribute Name	Juniper Networks VSA Name [Number]	DSL Forum VSA Name [Number]
Access-Aggregation-Circuit-ID-ASCII	Acc-Aggr-Cir-Id-Asc [26-112]	Access-Loop-Encapsulation [26-144]
Access-Aggregation-Circuit-ID-Binary	Acc-Aggr-Cir-Id-Bin [26-111]	Agent-Remote-Id [26-2]
Access-Loop-Circuit-ID	Acc-Loop-Cir-Id [26-110]	Agent-Circuit-Id [26-1]
Actual-Interleaving-Delay-Downstream	Act-Interlv-Delay-Dn [26-126]	Actual-Interleaving-Delay-Downstream [26-142]
Actual-Interleaving-Delay-Upstream	Act-Interlv-Delay-Up [26-124]	Actual-Interleaving-Delay-Upstream [26-140]
Actual-Net-Data-Rate-Downstream	<ul style="list-style-type: none"> L2C-Down-Stream-Data [26-93]—Unadjusted rate Act-Data-Rate-Dn [26-114]—Unadjusted rate Downstream-Calculated-Qos-Rate [26-141]—Rate as adjusted by ANCP 	Actual-Data-Rate-Downstream [26-130]
Actual-Net-Data-Rate-Upstream	<ul style="list-style-type: none"> L2C-Up-Stream-Data [26-92]—Unadjusted rate Act-Data-Rate-Up [26-113]—Unadjusted rate Upstream-Calculated-Qos-Rate [26-142]—Rate as adjusted by ANCP 	Actual-Data-Rate-Upstream [26-129]
Attainable-Net-Data-Rate-Downstream	Att-Data-Rate-Dn [26-118]	Attainable-Data-Rate-Downstream [26-134]
Attainable-Net-Data-Rate-Upstream	Att-Data-Rate-Up [26-117]	Attainable-Data-Rate-Upstream [26-133]
DSL-Line-State	DSL-Line-State [26-127]	—
DSL-Type	DSL-Type [26-128]	—
Maximum-Net-Data-Rate-Downstream	Max-Data-Rate-Dn [26-120]	Maximum-Data-Rate-Downstream [26-136]
Maximum-Net-Data-Rate-Upstream	Max-Data-Rate-Up [26-119]	Maximum-Data-Rate-Upstream [26-135]

Table 57: Mapping ANCP DSL Attributes to Juniper Networks DSL VSAs and DSL Forum VSAs (*continued*)

ANCP DSL Attribute Name	Juniper Networks VSA Name [Number]	DSL Forum VSA Name [Number]
Maximum-Interleaving-Delay-Downstream	Max-Interlv-Delay-Dn [26–125]	Maximum-Interleaving-Delay-Downstream [26–141]
Maximum-Interleaving-Delay-Upstream	Max-Interlv-Delay-Up [26–123]	Maximum-Interleaving-Delay-Upstream [26–139]
Minimum-Net-Low-Power-Data-Rate-Downstream	Min-LP-Data-Rate-Dn [26–122]	Minimum-Data-Rate-Downstream-Low-Power [26–138]
Minimum-Net-Low-Power-Data-Rate-Upstream	Min-LP-Data-Rate-Up [26–121]	Minimum-Data-Rate-Upstream-Low-Power [26–137]
Minimum-Net-Data-Rate-Downstream	Min-Data-Rate-Dn [26–116]	Minimum-Data-Rate-Downstream [26–132]
Minimum-Net-Data-Rate-Upstream	Min-Data-Rate-Up [26–115]	Minimum-Data-Rate-Upstream [26–131]

- Related Documentation**
- [Juniper Networks VSAs Supported by the AAA Service Framework on page 21](#)
 - [Configuring AAA to Include Juniper Networks DSL VSAs in RADIUS Messages on page 667](#)

Configuring AAA to Include Juniper Networks DSL VSAs in RADIUS Messages

You can include the **juniper-dsl-attributes** statement to configure AAA to add the set of Juniper Networks DSL VSAs to the RADIUS authentication and accounting request messages for subscribers. By default, these VSAs are not added to any RADIUS message. See “[ANCP DSL Attributes Mapped to Juniper Networks DSL Vendor-Specific Attributes](#)” on page 665 for a table of the Juniper Networks DSL VSAs.

After you have configured the inclusion of the Juniper Networks VSAs, you can subsequently exclude one or more of the VSAs from being transmitted. To do so, include the **exclude** statement at the **[edit access profile *profile-name* radius attributes]** hierarchy level, and specify which VSAs to exclude.

In contrast to the Juniper Networks DSL VSAs (vendor ID 4874), the DSL Forum VSA (vendor ID 3561) is added to all RADIUS messages by default. The DSL Forum VSA conveys individual DSL Forum attributes. See “[DSL Forum Vendor-Specific Attributes](#)” on page 55 for a table of these VSAs. You can use the **exclude** statement at the **[edit access profile *profile-name* radius attributes]** hierarchy level to prevent this VSA from being included in any RADIUS message.

To add the Juniper Networks DSL VSAs to RADIUS messages:

- Configure the inclusion trigger.
[edit access profile *profile-name* radius options]

```
user@host# set juniper-dsl-attributes
```

To exclude specific Juniper Networks DSL VSAs from RADIUS messages:

- Configure the exclusion trigger.

```
[edit access profile profile-name radius attributes]  
user@host# set exclude vsa-option
```

For example, to exclude the interleaving delay VSAs, configure the following statements:

```
[edit access profile profile-name radius attributes]  
user@host# set exclude max-interlv-delay-dn  
user@host# set excludemax-interlv-delay-up
```

To exclude the DSL Forum (RFC 4679) VSA from RADIUS messages:

- Configure the exclusion trigger.

```
[edit access profile profile-name radius attributes]  
user@host# set exclude dsl-forum-attributes
```

Related Documentation

- [Configuring the ANCP Agent on page 624](#)
- [Setting a Recommended Shaping Rate for Traffic on ANCP Interfaces on page 659](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework on page 21](#)
- [ANCP DSL Attributes Mapped to Juniper Networks DSL Vendor-Specific Attributes on page 665](#)
- [ANCP and the ANCP Agent Overview on page 607](#)

Configuring Immediate Interim Accounting Updates to RADIUS in Response to ANCP Notifications

When an ANCP neighbor reports a change in the upstream traffic rate or downstream traffic rate of an access line, the ANCP agent immediately passes the information to AAA. By default, AAA does not pass this information on to the RADIUS server until the next accounting update. However, you can configure AAA to report the rate change immediately.

When you include the **ancp-speed-change-immediate-update** statement in the subscriber session access profile, receipt of the notification from the ANCP agent triggers AAA to send an interim update Accounting-Request message to the RADIUS server for the PPPoE and DHCP IP demux subscribers associated with that access line. The interim update request includes the new access line parameters and the adjusted upstream and downstream traffic rates.

To configure AAA to immediately send rate change information from the ANCP agent to the RADIUS server with interim accounting updates:

- Specify the immediate update.

```
[edit access profile profile-name accounting]  
user@host# set ancp-speed-change-immediate-update
```

- Related Documentation**
- [Configuring the ANCP Agent on page 624](#)
 - [Configuring Per-Subscriber Session Accounting on page 104](#)

Monitoring and Managing ANCP for Subscriber Access

- [Triggering ANCP OAM to Test the Local Loop on page 671](#)
- [Verifying and Monitoring ANCP Neighbors on page 672](#)
- [Clearing ANCP Neighbors on page 672](#)
- [Verifying and Monitoring ANCP Subscribers on page 673](#)
- [Clearing ANCP Subscribers on page 673](#)
- [Verifying and Monitoring CoS for ANCP Subscribers on page 674](#)
- [Clearing and Verifying ANCP Statistics on page 674](#)

Triggering ANCP OAM to Test the Local Loop

You can trigger ANCP OAM to perform a loopback test on the local loop between the access node and the CPE to help isolate simple faults. On an ATM-based local loop, the ANCP operation triggers the access node to generate ATM (F4/F5) loopback cells on the local loop. On an Ethernet-based local loop, the ANCP operation triggers the access node to generate an Ethernet loopback message on the local loop. When the test completes, the access node sends a message to the router with the results.

Issue the **request ancp oam neighbor** command from CLI operational mode to initiate testing of a local loop identified by the IP address or system name of the ANCP neighbor and the ACI for a subscriber on that access node.

Issue the **request ancp oam interface** command from CLI operational mode to initiate testing of a local loop identified by the ANCP interface or interface set associated with a subscriber and the ACI for a subscriber on that access node.

With both commands, you can also specify how many times the test must be run and how long the router waits for a response to the OAM request.

To initiate ANCP local loop testing:

- Identify the loop by the subscriber identifier and the neighbor's IP address; optionally specify how many times the test runs and the timeout period.

```
user@host> request ancp oam neighbor ip-address 192.168.32.5 subscriber "dslam  
port-2-10" count 5 timeout 600
```

- Identify the loop by the subscriber identifier and the neighbor's system name; optionally specify how many times the test runs and the timeout period.

```
user@host> request ancp oam neighbor system-name 00:00:5E:00:53:ba subscriber  
"dslam port-2-10" count 10 timeout 600
```

- Identify the loop by the subscriber identifier and the interface associated with the subscriber; optionally specify how many times the test runs and the timeout period.

```
user@host> request ancp oam interface ge-1/0/2.12 identifier-string timeout 15
```

- Identify the loop by the subscriber identifier and the set of interfaces associated with the subscriber; optionally specify how many times the test runs and the timeout period.

```
user@host> request ancp oam interface interface-set vlan5 identifier-string count 3
```

**Related
Documentation**

- [ANCP and the ANCP Agent Overview on page 607](#)
- [Configuring the ANCP Agent on page 624](#)

Verifying and Monitoring ANCP Neighbors

Purpose View ANCP neighbor information:

- Action**
- To display summary information about all ANCP neighbors:

```
user@host> show ancp neighbor
```

- To display information about a specific ANCP neighbor, add the IP address or MAC address to the command:

```
user@host> show ancp neighbor ip-address 203.0.113.64  
user@host> show ancp neighbor system-name 00:00:5E:00:53:ba
```

- To display detailed information, add **detail** to the command:

```
user@host> show ancp neighbor detail  
user@host> show ancp neighbor system-name 00:00:5E:00:53:ba detail
```

- To display a count of ANCP neighbors in various states and the total number of neighbors, or a count of DSL lines in various states for all subscribers for a particular neighbor:

```
user@host> show ancp summary neighbor  
user@host> show ancp summary neighbor 203.0.113.64
```

- To display total and state-wise counts of both ANCP neighbors and subscribers:

```
user@host> show ancp summary
```

**Related
Documentation**

- [CLI Explorer](#)

Clearing ANCP Neighbors

Purpose Clear ANCP neighbor information.

- Action**
- To clear connections with all ANCP neighbors:

```
user@host> clear ancp neighbor
```
 - To clear the connection with a specific ANCP neighbor, add the IP address or MAC address to the command:

```
user@host> clear ancp neighbor ip-address 203.0.113.64
```

```
user@host> clear ancp neighbor system-name 00:00:5E:00:53:ba
```
 - To verify that the connection has been cleared:

```
user@host> show ancp neighbor
```

```
user@host> show ancp neighbor 203.0.113.64
```

```
user@host> show ancp neighbor 00:00:5E:00:53:ba
```

Related Documentation

- [CLI Explorer](#)

Verifying and Monitoring ANCP Subscribers

Purpose View ANCP subscriber (local access loop) information:

- Action**
- To display summary information about all ANCP subscribers:

```
user@host> show ancp subscriber
```
 - To display information about all ANCP subscribers connected through a particular ANCP neighbor:

```
user@host> show ancp subscriber neighbor 203.0.113.64
```
 - To display information about an ANCP subscriber specified by the ACI:

```
user@host> show ancp subscriber "port-2-11"
```
 - To display detailed information, add **detail** to the command:

```
user@host> show ancp subscriber detail
```

```
user@host> show ancp subscriber neighbor 203.0.113.64 detail
```
 - To display a count of subscribers in various states and the total number of subscribers:

```
user@host> show ancp summary subscriber
```
 - To display total and state-wise counts of both ANCP neighbors and subscribers:

```
user@host> show ancp summary
```

Related Documentation

- [CLI Explorer](#)

Clearing ANCP Subscribers

Purpose Clear ANCP subscriber information.

- Action**
- To clear connections with all ANCP subscribers:

user@host> **clear ancp subscriber**

- To clear the connection with an ANCP subscriber identified by a particular ACI on all neighbors, add the identifier to the command:

user@host> **clear ancp subscriber identifier port-2-10**

- To clear the connection with an ANCP subscriber identified by a particular ACI on a specific neighbor, add the identifier and either the IP address or MAC address to the command:

user@host> **clear ancp subscriber identifier port-2-10 ip-address 203.0.113.64**

user@host> **clear ancp subscriber identifier port-2-10 system-name 00:00:5E:00:53:ba**

- To verify that the connection has been cleared:

user@host> **show ancp subscriber**

Related Documentation

- [CLI Explorer](#)

Verifying and Monitoring CoS for ANCP Subscribers

Purpose View ANCP CoS state information:

- Action**
- To display summary information about the CoS state for all ANCP subscribers:

user@host> **show ancp cos**

- To display information about the CoS state for an ANCP subscriber specified by the ACI:

user@host> **show ancp cos "port-2-11"**

- To display the most recently updated CoS information:

user@host> **show ancp cos last-update**

- To display the CoS information that is pending (will be used to update the fields):

user@host> **show ancp cos pending-update**

Related Documentation

- [CLI Explorer](#)

Clearing and Verifying ANCP Statistics

Purpose Clear ANCP statistics.

- Action**
- To clear all ANCP statistics:

user@host> **clear ancp statistics**

- To clear statistics for a specific ANCP neighbor, add the IP address or MAC address to the command:

user@host> **clear ancp statistics ip-address 203.0.113.64**

```
user@host> clear ancp statistics system-name 00:00:5E:00:53:ba
```

- To verify that the connection has been cleared:

```
user@host> show ancp neighbor
```

**Related
Documentation**

- [ANCP and the ANCP Agent Overview on page 607](#)

PART 9

Configuring the Diameter Base Protocol and its Applications

- [Configuring the Diameter Base Protocol on page 679](#)
- [Configuring Gx-Plus for Provisioning Subscribers on page 703](#)
- [Configuring 3GPP Policy and Charging Control on page 715](#)
- [Configuring NASREQ for Authentication and Authorization on page 751](#)
- [Configuring JSRC in Subscriber Access Networks on page 755](#)
- [Excluding Diameter AVPs from JSRC Messages on page 763](#)
- [Configuring Service Accounting with JSRC on page 765](#)
- [Configuring Subscribers on Static Interfaces on page 769](#)
- [Configuring the Static Subscribers Global Profile on page 775](#)
- [Configuring the Static Subscribers Group Profile on page 779](#)
- [Configuring the PTSP Feature to Support Dynamic Subscribers on page 783](#)
- [Configuring the PTSP Partition to Connect to the External Policy Manager on page 793](#)
- [Configuring PTSP Services and Rules on page 797](#)
- [Monitoring and Managing Diameter Information for Subscriber Access on page 805](#)
- [Monitoring and Managing Subscriber Information on Static Interfaces on page 809](#)
- [Monitoring and Managing Packet-Triggered Subscribers on page 811](#)

CHAPTER 72

Configuring the Diameter Base Protocol

- [Diameter Base Protocol Overview on page 679](#)
- [Messages Used by Diameter Applications on page 682](#)
- [Diameter AVPs and Diameter Applications on page 687](#)
- [Configuring Diameter on page 699](#)
- [Configuring the Origin Attributes of the Diameter Instance on page 699](#)
- [Configuring Diameter Peers on page 700](#)
- [Configuring the Diameter Transport on page 701](#)
- [Configuring Diameter Network Elements on page 701](#)

Diameter Base Protocol Overview

The Diameter protocol is defined in *RFC 3588, Diameter Base Protocol*, and provides an alternative to RADIUS that is more flexible and extensible. The Diameter base protocol provides basic services to one or more applications (also called functions) that each runs in a different Diameter instance. The individual application provides the extended AAA functionality. Applications that use Diameter include Gx-Plus, JSRC, NASREQ, and PTSP.

Diameter peers communicate over a reliable TCP transport layer connection by exchanging Diameter messages that convey status, requests, and acknowledgments by means of standard Diameter AVPs and application-specific AVPs. The Diameter transport layer configuration is based on Diameter network elements (DNEs); multiple DNEs per Diameter instance are supported. Currently only the predefined *master* Diameter instance is supported, but you can configure alternative values for many of the master Diameter instance values.

Each DNE consists of a prioritized list of peers and a set of routes that define how traffic is forwarded. Each route associates a destination with a function, a function partition, and a metric. When an application sends a message to a routed destination, all routes within the Diameter instance are examined for a match. When the best route to the destination has been selected, the message is forwarded by means of the DNE that includes that route.

Multiple routes to the same destination can exist within a given DNE and in different DNEs. In the case of multiple routes that match a request for forwarding, the best route is selected as follows:

1. The route with the lowest metric is selected.
2. In the event of a tie, the route with the highest specification score is selected.
3. In the event of another tie, then the names of the DNEs are compared in lexicographical order. The route in the DNE with the lowest value is selected. For example, dne-austin has a lower value than dne-boston.
4. If the routes are tied within the same DNE, then the route names are compared in lexicographical order. The route with the lowest value is selected.

The specification score of a route is 0 by default. Points are added to the score as follows:

- If the destination realm matches the request, add 1.
- If the destination host matches the request, add 2.
- If the function matches the request, add 3.
- If the function partition matches the request, add 4.

Multiple routes to the same destination can exist within a given DNE and in different DNEs. In the case of multiple routes that match a request for forwarding, Diameter selects the best route as follows:

1. Diameter compares the metric of the routes and selects the route with the lowest metric.
2. If multiple routes have the same lowest metric, then Diameter selects the most-qualified route. Diameter evaluates multiple attributes of the route to determine a score that reflects how specifically each route matches the request. By default, the score of a route is 0. Points are added to the score as follows:
 - If the destination realm matches the request, add 1.
 - If the destination host matches the request, add 2.
 - If the function matches the request, add 3.
 - If the function partition matches the request, add 4.
3. If multiple routes are equally qualified, then Diameter compares the names of the DNEs in lexicographical order and selects the route in the DNE that has the lowest value. For example, dne-austin has a lower value than dne-boston.
4. If the routes are tied within the same DNE, then Diameter compares the route names in lexicographical order and selects the route with the lowest value.

When the state of any DNE changes, the route lookup for all destinations is reevaluated. All outstanding messages to routed destinations are rerouted as needed, or discarded.

To configure a Diameter network element, include the **network-element** statement at the **[edit diameter]** hierarchy level, then include the **route** statement at the **[edit diameter network-element *element-name* forwarding]** hierarchy level.

To configure a route for the DNE, include the **destination** (optional), **function** (optional), and **metric** statements at the **[edit diameter network-element *element-name* forwarding route *dne-route-name*]** hierarchy level.

Specify the Diameter peers associated with the DNE by including one or more **peer** statements at the **[edit diameter network-element *element-name*]** hierarchy level.

Specify the Diameter peers associated with the DNE by including one or more **peer** statements at the **[edit diameter network-element *element-name*]** hierarchy level.

Set the priority for each peer with the **priority** statement at the **[edit diameter network-element *element-name* peer *peer-name*]** hierarchy level.

Diameter requires you to configure information about the origin node; this is the endpoint node that originates Diameter for the Diameter instance. Include the **host** and **realm** statements at the **[edit diameter]** hierarchy level to configure the Diameter origin.

You can optionally configure one or more **transports** to specify the source (local) address of the transport layer connection. To configure a Diameter transport, include the **transport** statement at the **[edit diameter]** hierarchy level. Then include the **address** statement at the **[edit diameter transport *transport-name*]** hierarchy level.

You can optionally specify a logical system and routing instance for the connection by including the **logical-system** and **routing-instance** statements at the **[edit diameter transport *transport-name*]** hierarchy level. By default, Diameter uses the *default* logical system and *master* routing instance. The logical system and routing instance for the transport connection must match that for the peer, or a configuration error is reported.

Each Diameter peer is specified by a name. Peer attributes include address and the destination TCP port used by active connections to this peer. To configure a Diameter peer, include the **peer** statement at the **[edit diameter]** hierarchy level, and then include the **address** and **connect-actively** statements at the **[edit diameter peer *peer-name*]** hierarchy level.

To configure the active connection, include the **port** and **transport** statements at the **[edit diameter peer *peer-name* connect-actively]** hierarchy level. The assigned transport identifies the transport layer source address used to establish active connections to the peers. **transport** statements.

Related Documentation

- [Configuring Diameter on page 699](#)
- [Messages Used by Diameter Applications on page 682](#)
- [Diameter AVPs and Diameter Applications on page 687](#)
- [Juniper Networks Session and Resource Control \(SRC\) and JSRC Overview on page 755](#)
- [Juniper Networks Session and Resource Control \(SRC\) and PTSP Overview on page 784](#)
- [Gx-Plus for Provisioning Subscribers Overview on page 703](#)

Messages Used by Diameter Applications

Junos OS supports the following Diameter applications:

- JSRC—A Juniper Networks Diameter application registered with the IANA (<http://www.iana.org>) as Juniper Policy-Control-JSRC, with an ID of 16777244. It communicates with the SAE (remote SRC peer).
- PTSP—A Juniper Networks Diameter application registered with the IANA (<http://www.iana.org>) as Juniper JGx, with an ID of 16777273. It communicates with the SAE (remote SRC peer).
- Gx-Plus—An application that extends the 3GPP Gx interface for wireline use cases. 3GPP Gx is registered with the IANA (<http://www.iana.org>). It communicates with a PCRF.

If data for a particular AVP included in a message is not available to the router, Gx-Plus simply omits the AVP from the message it sends to the PCRF. If the PCRF determines it has insufficient information to make a determination, it may deny the request. The Diameter answer messages include the Result-Code AVP (AVP 268); the values of this AVP convey success, failure, or errors to the requestor.

- NASREQ—A Diameter-based authentication, authorization, and accounting protocol defined in RFC 7155. Junos OS supports authentication and authorization only.

Juniper Networks has also registered the Juniper-Session-Recovery application (16777296) and two new command codes (8388628 for Juniper-Session-Events and 8388629 for Juniper-Session-Discovery) with the IANA (<http://www.iana.org>).

Table 58 on page 682 describes Diameter messages the applications use.

Table 58: Diameter Messages and Diameter Applications

Diameter Message	Code	Application	Description
AA-Request (AAR)	265	JSRC, NASREQ, PTSP	Request from the application to the SAE at new subscriber login or during SAE-application synchronization. The request can be one of three types: address-authorization, provisioning-request, or synchronization.
AA-Answer (AAA)	265	JSRC, NASREQ, PTSP	Response from the SAE to the application's AA-Request message.
Abort-Session-Request (ASR)	274	JSRC, NASREQ, PTSP	Request from the SAE to the application to log out a provisioned subscriber.

Table 58: Diameter Messages and Diameter Applications (*continued*)

Diameter Message	Code	Application	Description
Abort-Session-Answer (ASA)	274	JSRC, NASREQ, PTSP	Response from the application to the SAE's ASR message. If the application sends the logout request to AAA, the ASA message includes a success notification (ACK). If the logout failed, the ASA message includes a failure notification (NAK).
Accounting-Request (ACR)	271	JSRC, PTSP	Request from the SAE to the application or from the application to the SAE for statistics.
Accounting-Answer (ACA)	271	JSRC, PTSP	Response to the ACR message to provide statistics for each installed policy (service).

Table 58: Diameter Messages and Diameter Applications (*continued*)

Diameter Message	Code	Application	Description
Credit-Control-Request (CCR)	272	Gx-Plus	<p>Request from Gx-Plus to the PCRF at subscriber login, logout, or update.</p> <p>An initial request (CCR-I) is sent when a subscriber logs in and AAA is requested to activate the subscriber's session. Gx-Plus retries the CCR-I message if a CCA-I message is not received from the PCRF within 10 seconds. The CCR-I message is retried up to 3 times.</p> <p>If no CCA-I is received after the 4 CCR-I messages have been sent—the first message plus 3 retries—then Gx-Plus starts sending CCR-N messages. CCR-N messages are retried forever until a success or failure response is received from the PCRF. CCR-N messages include the Juniper-Provisioning-Source AVP (AVP code 2101) set to local to notify the PCRF that the router has the authority to make a local decision regarding subscriber service activation.</p> <p>An update request (CCR-U) message is sent when a usage threshold is reached. The CCR-U reports the actual usage for all statistics. The PCRF may return a CCA-U message that includes new monitoring thresholds, service activations, service deactivations.</p> <p>A CCR-U is also sent to report the status of service activation or deactivation.</p> <p>A termination request (CCR-T) is sent at subscriber logout to inform the PCRF that a provisioned subscriber session is being terminated. CCR-T messages are retried forever until a success response is received from the PCRF.</p>

Table 58: Diameter Messages and Diameter Applications (*continued*)

Diameter Message	Code	Application	Description
Credit-Control-Answer (CCA)	272	Gx-Plus	<p>Reply from the PCRF to a CCR message.</p> <p>In response to a CCR-I, the PCRF returns a CCA-I message that indicates success (DIAMETER_SUCCESS) or failure (DIAMETER_AUTHORIZATION_REJECTED) depending on whether the subscriber has sufficient credit for the requested services. All other responses are ignored and the CCR-I is retried.</p> <p>In response to a CCR-T, the PCRF returns a CCA-T message that indicates a successful termination with a value of 2001 (DIAMETER_SUCCESS) in the Result-Code AVP. All other responses are ignored and the CCR-T is retried.</p> <p>A CCA-N is a response to a CCR-N.</p>
Juniper-Session-Discovery-Request (JSDR)	8388629	Gx-Plus	Discovery request from the PCRF to Gx-Plus to discover subscriber sessions on the router.
Juniper-Session-Discovery-Answer (JSDA)	8388629	Gx-Plus	<p>Reply from router to a JSDR message; describes session information. The Result-Code AVP includes one of the following values, or an error value:</p> <ul style="list-style-type: none"> • 2001—DIAMETER_SUCCESS; the end of the database was reached, meaning all information has been sent. • 2002—DIAMETER_LIMITED_SUCCESS; some of the session information was sent, but more remains to be sent.
Juniper-Session-Event-Request (JSER)	8388628	Gx-Plus	Request from router to PCRF regarding events that take place on the router. Notifies the PCRF of certain events on the router by including the Juniper-Event-Type AVP (AVP code 2103). Events reported include cold or warm boots, explicit discovery requests, substantial configuration changes, non-response or error response from PCRF, and exhaustion of fault-tolerant resources.
Juniper-Session-Event-Answer (JSEA)	8388628	Gx-Plus	Reply from PCRF to a JSER message.
Push-Profile-Request (PPR)	288	JSRC, PTSP	Request from the SAE to the router to activate or deactivate services for a subscriber.

Table 58: Diameter Messages and Diameter Applications (*continued*)

Diameter Message	Code	Application	Description
Push-Profile-Answer (PPA)	288	JSRC, PTSP	Response from the router to the SAE's PPR message. Includes success or failure notification for each of the service activation or deactivation commands in the request.
Re-Auth-Request (RAR)	258	Gx-Plus	Audit request from the PCRF to router to determine whether a specific subscriber is still present.
Re-Auth-Answer (RAA)	258	Gx-Plus	Reply from router to a RAR message; indicates whether the subscriber is active. The Result-Code AVP includes one of the following values: <ul style="list-style-type: none"> • 2001—DIAMETER_SUCCESS; subscriber entry was found. • 5002—DIAMETER_UNKNOWN_SESSION_ID; subscriber entry was not found. • 3002—DIAMETER_UNABLE_TO_DELIVER; Gx-Plus is not configured.
Session-Resource-Query (SRQ)	277	JSRC, PTSP	Request from the router to the SAE or from the SAE to the router to initiate synchronization between router and the SAE.
Session-Resource-Reply (SRR)	277	JSRC, PTSP	Response to the SRQ message to begin synchronization.
Session-Termination-Request (STR)	275	JSRC, NASREQ, PTSP	Notification from the router to the SAE that a provisioned subscriber has logged out.
Session-Termination-Answer (STA)	275	JSRC, NASREQ, PTSP	Response from the SAE to the router's STR message. Includes success or failure notification.

Related Documentation

- [Juniper Networks Session and Resource Control \(SRC\) and JSRC Overview on page 755](#)
- [Understanding JSRC-SAE Interactions on page 757](#)
- [Juniper Networks Session and Resource Control \(SRC\) and PTSP Overview on page 784](#)
- [Understanding PTSP-SAE Interactions on page 785](#)
- [Gx-Plus for Provisioning Subscribers Overview on page 703](#)
- [Understanding Gx-Plus Interactions Between the Router and the PCRF on page 705](#)

Diameter AVPs and Diameter Applications

Diameter conveys information by including various attribute-value pairs (AVPs) in Diameter messages. [Table 59 on page 687](#) lists the standard Diameter AVPs used in interactions with the supported Diameter applications. Diameter reserves AVP code numbers 0 through 255 for RADIUS AVPs that are implemented in Diameter.

Table 59: Standard Diameter AVPs

Attribute Number	Diameter AVP	Application	Description	Type
1	User-Name	Gx-Plus, JSRC, NASREQ	Specifies the username. For a subscriber managed by AAA, the value is the subscriber's login name. For a static interface, the value is the interface name, which is used as the subscriber's login name.	UTF8String
2	User-Password	NASREQ	Specifies the password of the user to be authenticated or the user's input in a multi-round authentication exchange.	OctetString
4	NAS-IP-Address	NASREQ	Specifies the IP address of the the NAS that is authenticating the user.	IPAddress
6	Service-Type	NASREQ	Specifies the type of service the user has requested or the type of service to be provided. One such AVP may be present in an authentication or authorization request or response. A NAS is not required to implement all of these service types.	Enumerated
8	Framed-IP-Address	Gx-Plus, JSRC, NASREQ, PTSP	Identifies the IPv4 address configured for the subscriber. This is the same value as for RADIUS Framed-IP-Address attribute [8].	OctetString
9	Framed-IP-Netmask	NASREQ	Identifies the four octets of the IPv4 netmask.	OctetString
11	Filter-ID	NASREQ	Specifies the name of the filter list for a user. It is intended to be human readable. Zero or more Filter-Id AVPs may be sent in an authorization answer message.	UTF8String
12	Framed-MTU	NASREQ	Specifies the maximum transmission unit (MTU) to be configured for the user, when it is not negotiated by some other means (such as PPP).	Unsigned32
22	Framed-Route	NASREQ	Specifies the 7-bit US-ASCII routing information.	UTF8String

Table 59: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
25	Class	NASREQ	Returns state information from a Diameter server to the access device.	OctetString
27	Session-Timeout	NASREQ	Specifies the maximum number of seconds of service provided to the user before termination of the session.	Unsigned32
28	Idle-Timeout	NASREQ	Specifies the maximum number of consecutive seconds of idle connection allowable to the user before termination of the session or before a prompt is issued.	Unsigned32
32	NAS-Identifier	NASREQ	Specifies the identity of the NAS that provides service to the user.	DiamIdent
44	Acct-Session-ID	NASREQ	Specifies the contents of the RADIUS Acct-Session-Id attribute.	OctetString
50	Acct-Multi-Session-ID	NASREQ	Links multiple related accounting sessions, where each session has a unique Session-Id but the same Acct-Multi-Session-Id AVP.	UTF8String
55	Event-Timestamp	Gx-Plus, JSRC, PTSP	Specifies the time of the event that triggered the message in which this AVP is included. Time is indicated in seconds since January 1, 1900, 00:00 UTC.	Time
60	CHAP-Challenge	NASREQ	Specifies the PPP Challenge-Handshake Authentication Protocol (CHAP) challenge sent by the NAS to the CHAP peer.	OctetString
61	NAS-Port-Type	NASREQ	Specifies the type of the port on which the NAS is authenticating the user.	Enumerated
62	Port-Limit	NASREQ	Specifies the maximum number of ports the NAS provides to the user.	Unsigned32
78	Configuration-Token	NASREQ	Indicates the type of user profile used.	OctetString

Table 59: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
85	Acct-Interim-Interval	JSRC, PTSP	<p>Specifies the number of seconds between each interim accounting update for this session.</p> <p>The router uses the following guidelines for interim accounting:</p> <ul style="list-style-type: none"> Attribute value is within the acceptable range (600 through 86,400 seconds)—Accounting is updated at the specified interval. Attribute value is less than the minimum acceptable value—Accounting is updated at the minimum interval (600 seconds). Attribute value is greater than the maximum acceptable value—Accounting is updated at the maximum interval (86,400 seconds). 	Unsigned32
87	NAS-Port-Id	Gx-Plus, JSRC, NASREQ, PTSP	Identifies the port of the NAS that authenticates the user. This is the same value as for RADIUS NAS-Port-Id attribute [87].	UTF8String
88	Framed-Pool	NASREQ	Specifies the name of an assigned address pool to use to assign an address for the user. If a NAS does not support multiple address pools, the NAS disregards this AVP. Address pools are usually used for IP addresses but can be used for other protocols if the NAS supports pools for those protocols.	OctetString
97	Framed-IPv6-Prefix	NASREQ	Specifies the IPv6 prefix configured for the user.	OctetString
99	Framed-IPv6-Route	NASREQ	Specifies the US-ASCII routing information configured for the user on the NAS.	UTF8String
100	Framed-IPv6-Pool	NASREQ	Specifies the name of an assigned pool to use to assign an IPv6 prefix for the user. If the access device does not support multiple prefix pools, it must disregard this AVP.	OctetString
258	Auth-Application-ID	NASREQ	Specifies support of the Authentication and Authorization portion of an application.	Unsigned32

Table 59: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
263	Session-ID	Gx-Plus, JSRC, NASREQ, PTSP	Specifies the subscriber session identifier. The router assigns the value to uniquely identify a subscriber session.	UTF8String
264	Origin-Host	NASREQ	Specifies the host that originates a Diameter message.	DiamIdent

Table 59: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
268	Result-Code	Gx-Plus, JSRC, NASREQ, PTSP	<p>Indicates whether a request completed successfully. Provides an error code if the request failed.</p> <p>The following classes are recognized by Diameter:</p> <ul style="list-style-type: none"> • 1xxx—Informational • 2xxx—Success • 3xxx—Protocol errors • 4xxx—Transient errors • 5xxx—Permanent failures <p>Unrecognized classes, which begin with numerals 6–9 or 0, are handled as permanent failures.</p> <p>JSRC and PTSP support the following values; all non-success values are treated as permanent failures:</p> <ul style="list-style-type: none"> • 1001—DIAMETER MULTI ROUND AUTH • 2001—DIAMETER SUCCESS • 5002—DIAMETER UNKNOWN SESSION ID • 5012—DIAMETER UNABLE TO COMPLY <p>JSRC also supports the following value, which is treated as a permanent failure:</p> <ul style="list-style-type: none"> • 3004—DIAMETER TOO BUSY; this is a transient condition, typically when the router already has a request in process for a specified subscriber. <p>Gx-Plus supports the following values for errors in a PCRF response; when these values are received or the response is malformed or unrecognizable, the request is retried.</p> <ul style="list-style-type: none"> • 3001—DIAMETER COMMAND NOT SUPPORTED; the application is not running or the command is not recognized. • 3004—DIAMETER TOO BUSY; the received message is above either the quota of downstream transactions or the outstanding message memory limit for messages from the network. • 5012—DIAMETER UNABLE TO COMPLY; the received message is greater than the local limit. 	Unsigned32

Table 59: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
277	Auth-Session-State	JSRC, NASREQ, PTSP	Indicates whether AAA session state is maintained. <ul style="list-style-type: none"> 0—STATE MAINTAINED 1—NO STATE MAINTAINED 	Enumerated
279	Failed-AVP	NASREQ	Specifies debugging information in cases where a request is rejected or not fully processed due to erroneous information in a specific AVP. The value of the Result-Code AVP provides information on the reason for the Failed-AVP AVP.	Grouped
281	Error-Message	NASREQ	Specifies a human-readable error message that may accompany a Result-Code AVP. The Error-Message AVP is not intended to be useful in real-time; do not expect network entities to parse the message.	UTF8String
283	Destination-Realm	NASREQ	Specifies the Diameter realm to which the Diameter message is routed.	DiamIdent
293	Destination-Host	NASREQ	Specifies the host to which a Diameter message is routed.	DiamIdent
295	Termination-Cause	JSRC, NASREQ, PTSP	Indicates the reason why a session was terminated on the access device. <ul style="list-style-type: none"> 1—DIAMETER LOGOUT 2—DIAMETER SERVICE NOT PROVIDED 3—DIAMETER BAD ANSWER 4—DIAMETER ADMINISTRATIVE 5—DIAMETER LINK BROKEN 6—DIAMETER AUTH EXPIRED 7—DIAMETER USER MOVED 8—DIAMETER SESSION TIMEOUT 	Enumerated
296	Origin-Realm	NASREQ	Identifies the Diameter realm of the originator of a Diameter message.	DiamIdent
402	CHAP-Auth	NASREQ	Specifies the information necessary to authenticate a user using CHAP.	Grouped
415	CC-Request-Number	Gx-Plus	Identifies a request within a session. The combination of Session-Id and CC-Request-Type is globally unique. The number is incremented for each request during the course of a session. The number is reset when a router high availability event takes place.	Unsigned32

Table 59: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
416	CC-Request-Type	Gx-Plus	Specifies the type of credit control request: <ul style="list-style-type: none"> INITIAL REQUEST (1) UPDATE REQUEST (2) TERMINATION_REQUEST (3) EVENT REQUEST (4) 	Enumerated
431	Granted-Service-Unit	Gx-Plus	Contains the amount that can be provided of one or more of the following requested units specified by the client: CC-Input-Octets, CC-Output-Octets, CC-Time, or CC-Total-Octets. Included in CCA-I messages, and may be included in CCA-U messages.	Grouped
446	Used-Service-Unit	Gx-Plus	Contains the amount of the requested units that have been actually used; measured from 4 when the service is activated. The units are one or more of the following requested units specified by the client: CC-Input-Octets, CC-Output-Octets, CC-Time, or CC-Total-Octets. Included in CCR-U messages.	Grouped
480	Accounting-Record-Type	JSRC, PTSP	Specifies the type of account record for service accounting: <ul style="list-style-type: none"> INTERIM_RECORD—Accounting record sent between the start and stop records, at intervals specified by the Acct-Interim-Interval AVP (AVP code 85). It contains cumulative accounting data for the existing accounting session. START_RECORD—Accounting record sent when the service is activated to initiate the accounting session. It contains accounting data relevant to the initiation of that session. STOP_RECORD—Accounting record sent when the service is deactivated to terminate the accounting session. It contains cumulative data relevant to that session. 	Enumerated
1001	Charging-Rule-Install	Gx-Plus, NASREQ	Requests the installation of the rule (activation of the service) designated by the included Charging-Rule-Name AVP (1005). This AVP has a vendor ID of 10415 (3GPP).	Grouped

Table 59: Standard Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
1002	Charging-Rule-Remove	Gx-Plus	Requests the removal of the rule (deactivation of the service) designated by the included Charging-Rule-Name AVP (1005). This AVP has a vendor ID of 10415 (3GPP).	Grouped
1005	Charging-Rule-Name	Gx-Plus, NASREQ	Specifies the name of a specific rule that has been installed, modified, or removed.	OctetString
1066	Monitoring-Key	Gx-Plus	Specifies which of the monitoring structures to use. Included in Charging-Rule-Install AVP (1001). The MX router does not support aggregation of statistics across services, so the value of this AVP must be different for each service. This AVP has a vendor ID of 10415 (3GPP).	OctetString
1067	Usage-Monitoring-Information	Gx-Plus	Sets monitoring thresholds. When service statistics match at least one of the granted service values, the router sends a CCR-U report with the current statistics to the PCRF. Includes the Monitoring-Key AVP (1066) and the Granted-Service-Unit AVP (431). This AVP has a vendor ID of 10415 (3GPP).	Grouped

Juniper Networks AVPs are used in addition to the standard Diameter AVPs. These AVPs have an enterprise number of 2636. [Table 60 on page 694](#) lists the Juniper Networks AVPs that the supported Diameter applications use.

Table 60: Juniper Networks Diameter AVPs

Attribute Number	Diameter AVP	Application	Description	Type
2004	Juniper-Service-Bundle	JSRC	Specifies the name of the service bundle.	OctetString
2010	Juniper-DHCP-Options	JSRC	Specifies the client's DHCP options.	OctetString
2011	Juniper-DHCP-GI-Address	JSRC	Specifies the DHCP relay agent's IP address.	OctetString
2020	Juniper-Policy-Install	JSRC, PTSP	Specifies policies to be activated for the subscriber. Includes Juniper-Policy-Name and Juniper-Policy-Definition	Grouped
2021	Juniper-Policy-Name	JSRC, PTSP	Defines the name of a policy decision.	OctetString
2022	Juniper-Policy-Definition	JSRC, PTSP	Defines a policy decision. Includes Juniper-Policy-Name, Juniper-Template-Name, and Juniper-Substitution.	Grouped

Table 60: Juniper Networks Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
2023	Juniper-Template-Name	JSRC, PTSP	Specifies the profile name defined by the router. PTSP supports only the <code>__svc_rule__</code> policy template.	UTF8String
2024	Juniper-Substitution	JSRC, PTSP	Defines the substitution attributes. Includes Juniper-Substitution-Name and Juniper-Substitution-Value.	OctetString
2025	Juniper-Substitution-Name	JSRC, PTSP	Defines the name of the variable to be replaced.	OctetString
2026	Juniper-Substitution-Value	JSRC, PTSP	Defines the value of the variable to be replaced.	OctetString
2027	Juniper-Policy-Remove	JSRC, PTSP	Specifies policies to be deactivated for the subscriber. Includes Juniper-Policy-Name.	Grouped
2035	Juniper-Policy-Failed	JSRC, PTSP	Specifies the name of the policy activation or deactivation that failed.	OctetString
2038	Juniper-Policy-Success	JSRC, PTSP	Specifies the name of the policy activation or deactivation that succeeded.	OctetString
2046	Juniper-Logical-System	JSRC, PTSP	Specifies the logical system.	UTF8String
2047	Juniper-Routing-Instance	JSRC, PTSP	Specifies the routing instance.	UTF8String
2048	Juniper-Jsrc-Partition	JSRC, PTSP	Specifies the logical system and routing instance for the subscriber or request. Includes Juniper-Logical-System and Juniper-Routing-Instance	Grouped
2050	Juniper-Request-Type	JSRC, PTSP	Describes the type of request: <ul style="list-style-type: none"> 1—ADDRESS_AUTHORIZATION 2—PROVISIONING_REQUEST 3—SYNCHRONIZATION 	Enumerated
2051	Juniper-Synchronization-Type	JSRC, PTSP	Describes the type of synchronization: <ul style="list-style-type: none"> 1—FULL-SYNC 2—FAST-SYNC 3—NO-STATE-TO-SYNC 	Enumerated
2052	Juniper-Synchronization	JSRC, PTSP	Describes the state of synchronization: <ul style="list-style-type: none"> 1—NO-SYNC; this is the default state 2—SYNC-IN-PROGRESS 3—SYNC-COMPLETE 	Enumerated

Table 60: Juniper Networks Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
2053	Juniper-Acct-Record	JSRC, PTSP	Specifies the statistics data for each policy installed for this subscriber. Includes Juniper-Policy-Name.	Grouped
2054	Juniper-Acct-Collect	JSRC, PTSP	Specifies whether to collect accounting data for the installed policy (service) when included in the Juniper-Policy-Install AVP: <ul style="list-style-type: none"> 1—COLLECT_ACCT 2—NOT_COLLECT_ACCT 	Enumerated
2058	Juniper-State-ID	JSRC, PTSP	Specifies the value assigned to each synchronization cycle for the purpose of identifying which messages to discard. All solicited requests containing the same Juniper-State-ID belong to the same Session-Resource-Query (SRQ) synchronization cycle. Messages from a previous synchronization cycle are discarded. When a new cycle begins, the value of the Juniper-State-ID AVP is increased by 1. NOTE: For solicited synchronization requests, the SRQ message contains the incremented Juniper-State-ID value. For unsolicited synchronization requests, the Session-Resource-Reply (SRR) message contains the incremented Juniper-State-ID value.	Unsigned32
2100	Juniper-Virtual-Router	Gx-Plus, JSRC	Specifies the name of the virtual router associated with the session.	UTF8String
2101	Juniper-Provisioning-Source	Gx-Plus	Specifies the provisioning source for the session in CCR-N and JSDA messages: <ul style="list-style-type: none"> 1—Local 2—Remote 	Enumerated
2102	Juniper-Provisioning-Descriptor	Gx-Plus	Defines the group used in JSDA messages that includes the session ID, and optionally Juniper-Provisioning-Source and subscriber data.	Grouped

Table 60: Juniper Networks Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
2103	Juniper-Event-Type	Gx-Plus	<p>Communicates the event type in JSER messages:</p> <ul style="list-style-type: none"> 1—Cold boot; all sessions are lost 2—Warm boot; sessions are preserved 3—Discovery requested by the operator 4—<i>Are you there?</i> (AYT); application level ping sent when the notification is due to no response or an erroneous response from the PCRF, or due to a configuration change. 5—AWD; application-level watchdog sent by the router when there has been no other activity for 15 seconds. The watchdog is sent every 5 seconds unless preempted by higher-priority synchronization event. 	Enumerated
2104	Juniper-Discovery-Descriptor	Gx-Plus	<p>Defines the group used in JSER and JSDA messages that includes parameters of a discovery request: discovery type, request string, verbosity, max results.</p>	Grouped
2105	Juniper-Discovery-Type	Gx-Plus	<p>Specifies the discovery subcommand for JSER and JSDA messages:</p> <ul style="list-style-type: none"> 1—Exact: look up the data for the specified session. 2—Bulk: Provide get-bulk kinds of information after the specified string. 3—Done: Stop retries for all sessions up to the specified session. 	Enumerated
2106	Juniper-Verbosity-Level	Gx-Plus	<p>Specifies the verbosity level for JSER and JSDA messages:</p> <ul style="list-style-type: none"> 1—Summary; include only the Session-Id AVP. 2—Brief; include the Session-Id, Juniper-Virtual-Router, and Framed-IP-Address AVPs. 3—Detail; include the Session-Id, Juniper-Provisioning-Source, Juniper-Virtual-Router, Framed-IP-Address, and Event-Timestamp AVPs. 4—Extensive; include all available session information. 	Enumerated
2107	Juniper-String-A	Gx-Plus	<p>Specifies a generic string that is interpreted according to the context.</p>	UTF8String
2108	Juniper-String-B	Gx-Plus	<p>Specifies a generic string that is interpreted according to the context.</p>	UTF8String

Table 60: Juniper Networks Diameter AVPs (*continued*)

Attribute Number	Diameter AVP	Application	Description	Type
2109	Juniper-String-C	Gx-Plus	Specifies a generic string that is interpreted according to the context.	UTF8String
2110	Juniper-Unsigned32-A	Gx-Plus	Specifies a generic, unsigned 32-bit integer that is interpreted according to the context.	Unsigned32
2111	Juniper-Unsigned32-B	Gx-Plus	Specifies a generic, unsigned 32-bit integer that is interpreted according to the context.	Unsigned32
2112	Juniper-Unsigned32-C	Gx-Plus	Specifies a generic, unsigned 32-bit integer that is interpreted according to the context.	Unsigned32

Telelec AVPs are used only for Gx-Plus. These AVPs have an enterprise number of 21274. [Table 61 on page 698](#) lists the Telelec AVPs. These four variables are used to provide substitution values for user-defined CoS service variables.

Table 61: Telelec Diameter AVPs

Attribute Number	Diameter AVP	Application	Description	Type
5555	Telelec-Charging-Rule-Argument-Name	Gx-Plus	Defines the name of the service variable to be replaced.	OctetString
5556	Telelec-Charging-Rule-Argument-Value	Gx-Plus	Defines the value of the service variable to be replaced.	OctetString
5557	Telelec-Charging-Rule-Argument	Gx-Plus	Defines the substitution attributes used to replace service variables. Includes Telelec-Charging-Rule-Argument-Name AVP (5555) and Telelec-Charging-Rule-Argument-Value AVP (5556).	Grouped
5558	Telelec-Charging-Rule-With-Arguments	Gx-Plus	Requests the installation of the rule (activation of the service) designated by the included Charging-Rule-Name AVP (1005). Requested service variable substitutions are provided by the optionally included Telelec-Charging-Rule-Argument AVP (5557).	Grouped

Related Documentation

- [Understanding JSRC-SAE Interactions on page 757](#)
- [Understanding PTSP-SAE Interactions on page 785](#)
- [Understanding Gx-Plus Interactions Between the Router and the PCRF on page 705](#)
- [Diameter Base Protocol Overview on page 679](#)

- [Juniper Networks Session and Resource Control \(SRC\) and JSRC Overview on page 755](#)
- [Juniper Networks Session and Resource Control \(SRC\) and PTSP Overview on page 784](#)
- [Gx-Plus for Provisioning Subscribers Overview on page 703](#)

Configuring Diameter

You configure Diameter by specifying the endpoint origin, the remote peers, the transport layer connection, and network elements that associate routes with peers. Only the master Diameter instance is currently supported. You can configure alternative values for the master instance only in the context of the master routing instance

To configure Diameter base protocol:

1. Configure the origin realm and origin host of the Diameter master instance.
See [“Configuring the Origin Attributes of the Diameter Instance” on page 699](#)
2. Configure the Diameter peers.
See [“Configuring Diameter Peers” on page 700](#)
3. (Optional) Configure the Diameter transport layer elements.
See [“Configuring the Diameter Transport” on page 701](#)
4. (Optional) Configure the Diameter network elements.
See [“Configuring Diameter Network Elements” on page 701](#)
5. (Optional) Configure trace options for troubleshooting the configuration.
See [“Tracing Diameter Base Protocol Processes for Subscriber Access” on page 843](#).

Related Documentation

- [Diameter Base Protocol Overview on page 679](#)

Configuring the Origin Attributes of the Diameter Instance

You can configure the identifying characteristics of the endpoint node that originates Diameter messages for the Diameter instance. The hostname is supplied as the value for the Origin-Host AVP by the Diameter instance. The realm is supplied as the value for the Origin-Realm AVP by the Diameter instance.

To configure the origin attributes for a Diameter instance:

1. Specify the name of the host that originates the Diameter message.
[edit diameter origin]
user@host# **set host host14**
2. Specify the realm of the host that originates the Diameter message.
[edit diameter origin]
user@host# **set realm example.com**

- Related Documentation
- [Configuring Diameter on page 699](#)
 - [origin on page 1199](#)

Configuring Diameter Peers ---

You can configure the peers to which Diameter sends messages. By default, logical system *default* and routing instance *master* are used. Port 3868 is used for active connections to peers by default.

To configure a remote peer for a Diameter instance:

1. Specify the name of the Diameter peer.

```
[edit diameter]
user@host# set peer p3
```

2. Specify the address of the Diameter peer.

```
[edit diameter peer p3]
user@host# set address 192.168.23.10
```

3. (Optional) Specify a routing instance, a logical system, or a logical system and routing instance for the Diameter peer.

```
[edit diameter peer p3]
user@host# set routing-instance ri8
```

```
[edit diameter peer p3]
user@host# set logical-system ls10
```

```
[edit diameter peer p3]
user@host# set logical-system ls10 routing-instance ri8
```

4. (Optional) Specify the port that Diameter uses for active connections to the peer.

```
[edit diameter peer p3]
user@host# set connect-actively port 49152
```

5. Specify the transport that Diameter uses for active connections to the peer.

```
[edit diameter peer p3]
user@host# set connect-actively transport t6
```

6. (Optional) Specify the name of the peer host and the name of the peer realm.



NOTE: You must specify both the host and realm for the peer origin.

```
[edit diameter peer p3]
user@host# set peer-origin host hostname
user@host# set peer-origin realm realm name
```

- Related Documentation
- [Configuring Diameter on page 699](#)

Configuring the Diameter Transport

You can configure one or more transports for a Diameter instance to set the IP address for the local connection, and optionally configure a logical system or routing instance context. By default, the logical system *default* and the routing instance *master* are used. The logical system and routing instance for the transport connection must match that for the peer, or a configuration error is reported. Multiple peers can share the same transport.

To configure a transport for a Diameter instance:

1. Configure the transport name.

```
[edit diameter]
user@host# set transport t1
```

2. Configure the local IP address for the Diameter local transport connection.

```
[edit diameter transport t1]
user@host# set address 203.0.113.200
```

3. (Optional) Configure a logical system and optionally a routing instance for the transport.

```
[edit diameter transport t1]
user@host# set logical-system ls5
```

4. (Optional) Configure a routing instance for the transport.

```
[edit diameter transport t1]
user@host# set routing-instance ri10
```

Related Documentation

- [Configuring Diameter on page 699](#)

Configuring Diameter Network Elements

A Diameter network element (DNE) consists of associated functions, a list of prioritized peers, and a set of forwarding rules. The forwarding rules define individual routes through a set of associated destinations, functions, and metrics. At least one DNE must be configured per chassis to start the Diameter process (jdiameterd).

Before you configure Diameter network elements, perform the following task:

- Define the Diameter peers. See [“Configuring Diameter Peers” on page 700](#).

To configure a Diameter network element:

1. Specify the name of the network element.

```
[edit diameter]
user@host# set network-element dne25
```

2. (Optional) Associate one or more functions with the network element. All functions are associated by default.

```
[edit diameter network-element dne25]
user@host# set function jsrc
```

3. Associate a Diameter peer with the network element and set the priority for the peer.

```
[edit diameter network-element dne25]
user@host# set peer peer1 priority 1
```

4. Specify a route that is reachable through the network element based on the forwarding rules that you define.

```
[edit diameter network-element dne25]
user@host# set forwarding route dne-route2
```

5. Specify a metric for the route.

```
[edit diameter network-element dne25 forwarding route dne-route2]
user@host# set metric 15
```

6. (Optional) Associate the route with a destination host and realm.

```
[edit diameter network-element dne25 forwarding route dne-route2]
user@host# set destination host host5 realm example.com
```

7. (Optional) Specify a function (application) associated with the route.

```
[edit diameter network-element dne25 forwarding route dne-route2]
user@host# set function jsrc
```

8. (Optional) Specify the realm of the network element origin and optionally also specify the name of the element host.



NOTE: Only the realm name is required.

```
[edit diameter peer p3]
user@host# set dne-origin realm realm-name <host hostname>
```

Related Documentation

- [Configuring Diameter on page 699](#)

Configuring Gx-Plus for Provisioning Subscribers

- [Gx-Plus for Provisioning Subscribers Overview on page 703](#)
- [Understanding Gx-Plus Interactions Between the Router and the PCRF on page 705](#)
- [Configuring Gx-Plus on page 710](#)
- [Configuring the Gx-Plus Partition on page 711](#)
- [Configuring Gx-Plus Global Attributes on page 712](#)
- [Provisioning Subscribers with Gx-Plus on page 713](#)

Gx-Plus for Provisioning Subscribers Overview

Gx-Plus is a Diameter-based application that extends the capability of the Gx interface. The 3rd Generation Partnership Project (3GPP) defined Gx as the online policy interface between the Policy Control and Charging Rules Function (PCRF) and the Policy and Charging Enforcement Function (PCEF), to provide control over policy and flow-based charges for subscribers. The PCRF is a centralized policy decision point that deploys business policy rules to allocate broadband network resources and manages flow-based charges for subscribers and services. The router functions as the PCEF in this environment.

Gx-Plus provides provisioning, activation, and deactivation of services; threshold triggers for service statistics processing; service accounting; subscriber session termination; fault recovery; and event (subscriber login and logout) notifications. The terminology typically used for PCRFs varies slightly from standard Junos OS terminology. The terms listed in [Table 62 on page 703](#) are interchangeable.

Table 62: Differences Between Gx-Plus and Junos OS Terminology

Gx-Plus	Junos OS
policy	service
rule	service
rule install or installation	service activation or instantiation
rule uninstall	service deactivation

Table 62: Differences Between Gx-Plus and Junos OS Terminology (*continued*)

Gx-Plus	Junos OS
usage monitoring	service accounting
<p>Gx-Plus enables the router acting as a PCEF to exchange Diameter Credit-Control Application (DCCA) messages with a PCRF residing on a server to request credit authorization and service provisioning for authenticated subscribers. When an application requests AAA to activate a subscriber's session, the router sends a Credit-Control-Request (CCR) message to determine whether the subscriber has credit for the desired services and to request provisioning of those services from the PCRF policy manager.</p> <p>The PCRF responds with a Credit-Control-Answer (CCA) message that indicates success or failure for credit authorization. If the subscriber has sufficient credit for the requested services, credit is authorized. If the subscriber has insufficient credit for the services, credit authorization fails.</p> <p>The CCA can include services to be activated for the subscriber. If the response times out, the subscriber is logged in but only default services—if present—are activated for the subscriber. The router interprets the omission of the Result-Code AVP from the CCA as a provisioning authorization failure and does not allow the subscriber to log in.</p> <p>When a subscriber client application, such as DHCP, sends a subscriber logout notice to AAA, the router in turn sends a CCR message to the PCRF to request subscriber termination. The PCRF acknowledges the logout with a CCA message.</p> <p>Different Diameter message types exchanged by the router and the PCRF contain different sets of attribute-value pairs (AVPs). If data for an AVP is not available for a request to the PCRF, that AVP is omitted from the message. If the PCRF subsequently has insufficient information to decide on the request, it may deny the request.</p> <p>Gx-Plus establishes sessions that correspond to IPv4 DHCP sessions on dual-stack IPv6/IPv4 or IPv4-only subscriber interfaces, depending on the access profile. By default, IPv6 information is not communicated to the PCRF. You must explicitly configure Gx-Plus to include IPv6 information. When you do so, Gx-Plus can establish sessions that correspond to DHCPv6 sessions on IPv6-enabled subscriber interfaces and on dual-stack IPv6/IPv4-enabled interfaces.</p> <p>For dual-stack DHCP subscribers (DHCPv4 and DHCPv6 on the same VLAN), each DHCP session is treated as a separate Gx-Plus session. However, only a single Gx-Plus session exists for dual-stack PPP sessions.</p> <p>Gx-Plus includes the following fault tolerance and recovery capabilities:</p> <ul style="list-style-type: none"> • Unlimited retries of unacknowledged provisioning requests • Unlimited retries of logout requests • Router event notification • Router discovery 	



NOTE: More than one Diameter-based application (function), such as Gx-Plus or JSRC, can run on a router simultaneously.

Related Documentation

- [Messages Used by Diameter Applications on page 682](#)
- [Diameter AVPs and Diameter Applications on page 687](#)
- [Understanding Gx-Plus Interactions Between the Router and the PCRF on page 705](#)
- [Configuring Gx-Plus on page 710](#)

Understanding Gx-Plus Interactions Between the Router and the PCRF

This topic describes the sequences of Diameter messages exchanged by means of Gx-Plus between the Policy Control and Rules Charging Function (PCRF) and the router acting as a Policy and Charging Enforcement Function (PCEF) as they interact to perform the following tasks for subscriber access:

- Subscriber login
- Fault tolerance and event notification
- Subscriber audit
- Subscriber logout

Subscriber Login

Gx-Plus provisioning is enabled for subscribers when you include the **provisioning-order gx-plus** statement at the **[edit access profile *profile-name*]** hierarchy level. When an application requests AAA to activate the subscriber's session, the router sends a CCR-I message to the PCRF to request provisioning for the subscriber session. The CCR-I message must include the Juniper-Virtual-Router, Framed-IP-Address, and NAS-Port-ID AVPs. The request is not generated when no IPv4 address has been assigned to the subscriber, when IPv6 is enabled and an IPv6 address has been assigned, or when the NAS-Port-ID is unknown.

The PCRF returns a CCA-I message that includes the Result-Code AVP (AVP code 268). The router considers a CCA-I that does not include the Result-Code AVP as a failed response. The CCA-I can return the Charging-Rule-Install AVP (AVP code 1001), which identifies services to be activated.

If the Result-Code value is DIAMETER_SUCCESS (2001), the router communicates to AAA that the requested service is activated. If the Result-Code value is DIAMETER_AUTHORIZATION_REJECTED, the router communicates to AAA that the service activation is not permitted. If the Result-Code AVP has any other value, or is missing, the request is retried. A total of three CCR-I messages can be sent.

If the PCRF does not indicate success or failure, then by default the router continues to send requests, but the retry requests are CCR-N messages (no-response notifications) that include the Juniper-Provisioning-Source AVP (AVP code 2101). This AVP indicates

that the router has local decision-making authority to provision services in the absence of a PCRF response to the CCR-I. This AVP is not present in the CCR-I message.

A subscriber login initiates the following sequence of events:


1. A client application—such as DHCP, PPP, or static subscriber sessions—requests AAA to authenticate the subscriber.
2. Authentication begins if the subscriber access profile specifies RADIUS authentication. Login continues when the authentication is successful. Login fails when the **authentication-order** statement in the profile does not specify RADIUS authentication or no authentication. Login fails unless the **authentication-order** statement in the profile specifies RADIUS authentication or no authentication. Login also fails when authentication fails.
3. Default services are activated for the subscriber. Any services that the authentication server includes in the authentication grant are activated. Additionally, a default service may have been configured for the client application.
4. If the subscriber access profile specifies Gx-Plus provisioning, the router initiates the Gx-Plus message exchange by sending a CCR-I message to the PCRF. The router waits for the PCRF to respond with a CCA-I message within a non-configurable timeout period.

When the PCRF responds within the timeout period and includes the Charging-Rule-Install AVP in the CCA-I message, subscriber login is delayed while the router deactivates any default services and attempts to activate the specified services.

- If all the specified services are activated, then the login completes.
- If any of the services cannot be activated, the router sends the PCRF a CCR-U message with the status of the services (a rule report). The PCRF responds to this message with a CCA-U that can contain a new set of services for activation.
- The router ignores any default services, even if the CCA-I message does not include any services. In this circumstance, no services are activated.

If the PCRF does not return a CCA-I within the timeout period, subscriber login completes.

- The router searches first for services returned from the authentication server and activates any it finds. If no such services are found, then the router activates any locally configured default services. Subscriber login completes when default service activation is successful, but fails when any default service fails to activate. Because default services are not required to be present, login also completes when no default services are found.
- If login completes (with or without a default service), the router periodically resends the CCR-I message to the PCRF. If the PCRF subsequently returns a CCA-I, the router deactivates the default service, if any, and then activates any services included in the CCA-I. If the message does not include any services, then no services are activated, not even a default service.

- If any of the services contained in the CCA-I cannot be activated, the router sends the PCRF a CCR-U message with the status of the services (a rule report). The PCRF responds to this message with a CCA-U that can contain a new set of services for activation.
5. The router begins to monitor session accounting statistics if the CCA-I message includes any threshold triggers for usage monitoring. The Usage-Monitoring-Information AVP (AVP code 1067) contains the threshold triggers in the Granted-Service-Unit AVP (AVP code 431). The triggers are the values granted by the PCRF for the following statistics: duration of the session, input octets count, output octets count, and total octets count.
 - a. If the service statistics meet or exceed any of these trigger thresholds during the session, the router sends a CCR-U message to the PCRF with accounting information in the Usage-Monitoring-Information AVP (AVP code 1067). The AVP now contains the Used-Service-Unit AVP (AVP code 446) to report the current values for all four statistics.
 - b. In response, the PCRF may return a CCA-U message with the Usage-Monitoring-Information AVP, which can include any of the following: the Granted-Service-Unit AVP with new threshold triggers (absolute values rather than increments to the previous thresholds), the Charging-Rule-Install AVP (AVP code 1001) for service activations, or the Charging-Rule-Remove AVP (AVP code 1002) for service deactivations.
-
- 

NOTE: The router does not aggregate statistics across services.
-
6. When the subscriber logs out, the router sends a CCR-T message (termination notice) to the PCRF, which responds with a CCA-T message.

Fault Tolerance and Event Notification

Although the probability is low, the PCRF and the router can have different values for the number of subscribers. This error can arise from the following scenarios:

- CCA-I loss: if no CCA-I is delivered to the router, then the PCRF considers a subscriber as provisioned whereas the router considers it not provisioned.
- CCR-T loss: if no CCR-T is delivered to the PCRF, then the PCRF considers a subscriber to be provisioned whereas the router considers the subscriber not provisioned (logged out).

Loss of messages can be greater during cold boots and high availability events. Unacknowledged CCR-I and CCR-T requests are retransmitted forever until a satisfactory response is received to reduce the incidence of failure, and significant events are reported to Gx-Plus. By default, the number of outstanding requests is limited to 40 to avoid overloading the PCRF. This limit reduces the possibility of losing requests. You can modify this number by including the **max-outstanding-requests** statement at the **[edit access-gx-plus global]** hierarchy level.

Gx-Plus does not rely on the connection state between devices to detect router or PCRF outages, because some events do not affect the connection state and others are not detected when there is a Diameter relay or proxy between the devices. Event notifications (JSER messages) are sent when certain events take place on the router. The Juniper-Event-Type AVP (AVP code 2103) in the message describes the event.

Event notifications are retried until Gx-Plus returns a JSEA message with a Result-Code value of DIAMETER_SUCCESS (2001) to acknowledge receipt of the event notification. When retrying notifications, one notification is sent for each outstanding event. No other request are sent as long as there is any outstanding event other than an application watch dog (AWD).

Table 63 on page 708 lists router events and the subsequent router and PCRF actions.

Table 63: Router Events, Router Actions, and PCRF Actions

Router Event	Router Action	PCRF Action
The router receives no response from the PCRF or an error response.	Send event notification.	Respond to event notification.
The configuration changes. Significant changes such as the origin host or realm and the Gx-Plus partition destination host or realm also increment the value of the Origin-State-Id AVP.	Send event notification.	Respond to event notification and perform discovery.
The router receives an explicit discovery request from the PCRF.	Send event notification.	Respond to event notification.
The router undergoes a cold boot and all sessions are lost. This can result from a catastrophic failure or power cycle.	Send event notification.	Respond to event notification and clear the database.
The router undergoes a warm boot.	Send event notification.	Respond to event notification and clear the database.
Recovery resources that are needed to continuously retry unacknowledged requests (CCR-N and CCR-T messages) are exhausted. The value of the Origin-State-Id AVP is incremented. This event is unlikely to occur.	Send event notification.	Respond to event notification and perform discovery.

An important aspect of Gx-Plus fault tolerance is that subscriber login and termination requests are retried (replayed) forever until a satisfactory response is received from the PCRF. In rare circumstances, this can result in a stack of pending requests being replayed over and over.

You can issue the **clear network-access gx-plus replay** command to clear all pending requests. This command causes Gx-Plus to send a JSER message to PCRF that includes the Juniper-Event-Type AVP (AVP code 2103) with a value of 3 indicating a discovery request. The PCRF then returns a JDER message to initiate discovery of all subscribers. When this discovery completes, all pending subscriber requests are cleared.

PCRF-Generated Discovery

The PCRF runs a discovery process in response to data loss, exhaustion of router resources, operator request, or router request. The JS DR message specifies the level of verbosity desired in the reply from Gx-Plus. The message also specifies whether the request is for data about a particular session or information similar to an SNMP Get-Bulk for all sessions. Gx-Plus returns a JS DA message that indicates complete success, limited success, or an error. In the event of success, the requested data is also returned.

Subscriber Accounting

When the PCRF returns a CCA-I message to the router, the message may contain thresholds for any of several usage statistics for a subscriber service: Duration, input data, output data, or total data for the service session. Upon receipt of a threshold, the router begins monitoring the subscriber's service session activity for that statistic. When the usage statistic reaches the threshold, it triggers the router to send a Gx-Plus usage notification message (CCR-U) to the PCRF. In response, the PCRF may send a CCA-U message to specify a new threshold, activate new services, or deactivate current services.

The PCRF can also send a CCR-U message that explicitly requests usage monitoring for statistics at different levels. The router can monitor usage at the subscriber level or at the service level. The Granted-Service-Unit AVP in the message specifies one or more of the following the statistics:

- CC-Input-Octets
- CC-Output-Octets
- CC-Total-Octets
- CC-Time

If any other statistics are specified, the router sends the PCRF a CCA message indicating that incorrect statistics were requested. When the specified threshold for a monitored statistic is reached, the router sends a CCR-U that contains the usage report for the statistics. In response, the PCRF sends another CCA-R with new thresholds or a request to activate or deactivate services.

Subscriber Audit

The PCRF can send a reauthorization request (RAR message) to Gx-Plus at any time to determine whether a particular subscriber is still logged in. You can also manually trigger the PCRF to do so by issuing the **clear network-access aaa gx-plus replay** command.

The Session-Id AVP identifies the subscriber session. Gx-Plus returns an RAA message to provide status on the subscriber session. When the session is still up (found in the session database) the Result-Code AVP value in the RAA message is DIAMETER_SUCCESS (2001). When the session is not found, the Result-Code value is DIAMETER_UNKNOWN_SESSION_ID (5002). A Result-Code value of DIAMETER_UNABLE_TO_DELIVER (3002) indicates that Gx-Plus is not configured.

Subscriber Logout

When the client application sends a subscriber logout notice to AAA, Gx-Plus sends a CCR-T message to notify the PCRF that the provisioned subscriber session is being terminated. The PCRF returns a CCA-T message that includes the Result-Code AVP. If the Result-Code value is DIAMETER_SUCCESS, Gx-Plus notifies AAA, and AAA notifies the application that the logout is complete. If Gx-Plus does not receive a CCA-T message, or if the Result-Code AVP has any other value or is missing, then the termination request is retried until the CCA-T message is returned with DIAMETER_SUCCESS.

Related Documentation

- [Gx-Plus for Provisioning Subscribers Overview on page 703](#)
- [Messages Used by Diameter Applications on page 682](#)
- [Diameter AVPs and Diameter Applications on page 687](#)
- [Configuring Gx-Plus on page 710](#)
- [Default Subscriber Service Overview on page 241](#)
- [Configuring a Default Subscriber Service on page 242](#)

Configuring Gx-Plus

You can configure the Gx-Plus client application to work with a PCRF policy manager residing on a server. The PCRF is a centralized policy decision point that deploys business rules to allocate broadband network resources and manage subscribers and services. AAA on the router (acting as the PCEF) uses Gx-Plus to request service provisioning from the PCRF.



NOTE: Contact the Juniper Networks Technical Assistance Center (JTAC) for information on supported PCRFs.

To configure Gx-Plus:

1. Configure the Gx-Plus partition.
See [“Configuring the Gx-Plus Partition” on page 711](#).
2. Configure Gx-Plus global attributes: the number of outstanding requests permitted and the inclusion of IPv6 subscribers.
See [“Configuring Gx-Plus Global Attributes” on page 712](#).
3. Configure Gx-Plus provisioning for subscribers.
See [“Provisioning Subscribers with Gx-Plus” on page 713](#).
4. (Optional) Override PCRF control of a subscriber session to correct services or troubleshoot a problem.

See [“Disabling PCRF Control of a Subscriber Session” on page 881](#).

5. (Optional) Configure Gx-Plus event tracing as part of general authentication service tracing operations.

See [“Tracing General Authentication Service Processes” on page 859](#).

Related Documentation

- [Gx-Plus for Provisioning Subscribers Overview on page 703](#)

Configuring the Gx-Plus Partition

Gx-Plus works within a specific logical system: routing instance context, called a partition.



NOTE: Currently, only a single partition is supported; you must configure it within the default logical system: routing instance context.

Before you configure the Gx-Plus partition, perform the following task:

- Configure the Diameter instance at the **[edit diameter]** hierarchy level. See [“Configuring Diameter” on page 699](#).

Configuration for the Gx-Plus partition consists of naming the partition and then associating a Diameter instance, the PCRF hostname, and the PCRF realm with the partition.

To configure the Gx-Plus partition:

1. Create the partition or specify the name of an existing partition.

```
[edit access gx-plus]
user@host# set partition partition-name
```

2. Specify the Diameter instance for the Gx-Plus partition.



NOTE: Currently, only the default Diameter instance, *master*, is supported.

```
[edit access gx-plus partition partition-name]
user@host# set diameter-instance instance-name
```

3. (Optional) Configure the destination host for the Gx-Plus partition.

```
[edit access gx-plus partition partition-name]
user@host# set destination-host hostname
```

4. Configure the destination realm for the Gx-Plus partition.

```
[edit access gx-plus partition partition-name]
user@host# set destination-realm realm
```

The following example shows a Gx-Plus partition configuration.

```
gx-plus {
```

```
partition partition1 {  
    diameter-instance master;  
    destination-host pcrf1;  
    destination-realm generic.example.com;  
}  
}
```

- Related Documentation**
- [Configuring Gx-Plus on page 710](#)
 - [Gx-Plus for Provisioning Subscribers Overview on page 703](#)

Configuring Gx-Plus Global Attributes

You can configure attributes that apply to all Gx-Plus partitions globally.

When a request from Gx-Plus to the PCRF is not answered or is improperly answered, Gx-Plus keeps retrying the request until it receives an appropriate answer. If the number of requests grows too large, the PCRF can become overloaded and messages can be lost. To reduce this risk, you can set a limit on the number of outstanding requests to the PCRF that Gx-Plus can retry.

By default, Gx-Plus does not include IPv6 subscribers in Gx-Plus provisioning requests to the PCRF. Instead, Gx-Plus only establishes sessions that correspond to IPv4 DHCP sessions on dual-stack IPv6/IPv4 or IPv4-only subscriber interfaces. You must explicitly configure Gx-Plus to include IPv6 information. When you do so, Gx-Plus can establish sessions that correspond to DHCPv6 sessions on IPv6-enabled subscriber interfaces and on dual-stack IPv6/IPv4-enabled interfaces.

To configure Gx-Plus global attributes:

1. (Optional) Set a limit on the number of outstanding requests.

```
[edit access gx-plus global]  
user@host# set max-outstanding-requests number
```

2. (Optional) Include IPv6 subscribers in provisioning requests.

```
[edit access gx-plus global]  
user@host# set include-ipv6
```

For example to limit the number of outstanding requests to 30 and to include IPv6 subscribers:

```
[edit access gx-plus global]  
user@host# set max-outstanding-requests 30  
user@host# set include-ipv6
```

- Related Documentation**
- [Configuring Gx-Plus on page 710](#)
 - [Gx-Plus for Provisioning Subscribers Overview on page 703](#)

Provisioning Subscribers with Gx-Plus

You can configure AAA to use Gx-Plus to request provisioning from a PCRF to instantiate services for an authenticated subscriber.

Before you configure Gx-Plus provisioning for subscribers, perform the following task:

- Create the subscriber access profile at the **[edit access profile]** hierarchy level. See [“Configuring an Access Profile for Subscriber Management” on page 123](#).

To configure Gx-Plus provisioning:

- Specify **gx-plus** as the provisioning method in the profile.

```
[edit access profile profile-name]  
user@host# set provisioning-order gx-plus
```

Related Documentation

- [Configuring Gx-Plus on page 710](#)
- [Gx-Plus for Provisioning Subscribers Overview on page 703](#)

CHAPTER 74

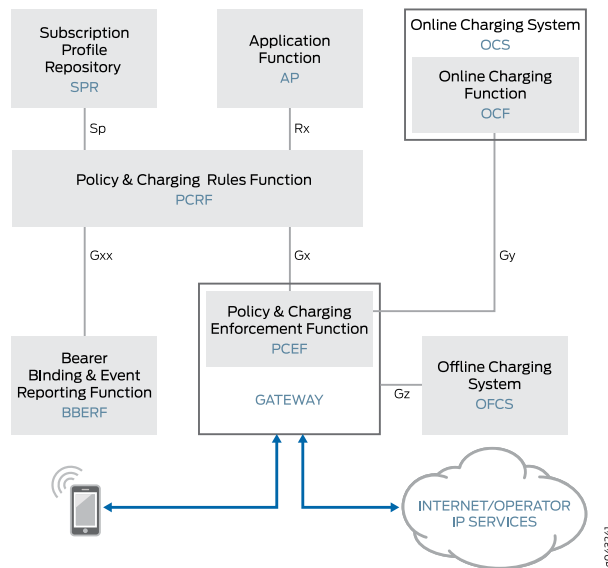
Configuring 3GPP Policy and Charging Control

- [3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715](#)
- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
- [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
- [Understanding Gy Interactions Between the Router and the OCS on page 730](#)
- [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)
- [Understanding Upstream and Downstream Messages for the PCRF on page 740](#)
- [Configuring the OCS Partition on page 743](#)
- [Configuring the PCRF Partition on page 746](#)
- [Configuring OCS Global Parameters on page 749](#)

3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting

The 3rd Generation Partnership Project (3GPP) Policy and Charging Control (PCC) provides the unification of wireline provisioning and accounting for customers. [Figure 23 on page 716](#) shows the components of an overall 3GPP PCC architecture.

Figure 23: 3GPP PCC Architecture Overview



The four major components of the PCC architecture are:

- **Policy and Charging Rules Function (PCRF)**—A centralized policy decision point that deploys business policy and charging rules to allocate broadband network resources and manages flow-based charges for subscribers and services. PCRF pushes the rules down to the Policy and Charging Enforcement Function (PCEF) using the 3GPP Gx protocol and online policy interface.
- **Policy and Charging Enforcement Function (PCEF)**—A function that provides user traffic handling and QoS at the gateway, provides service data flow detection, and applies the rules received from the PCRF. PCEF optionally interacts with the Online Charging Function (OCF) within the Online Charging System (OCS) using the 3GPP Gy protocol to retrieve policy and charging authorization for quotas and credit control.
- **Online Charging System (OCS)**—The component responsible for interacting with the PCEF. The PCEF optionally reports usage and receives additional authorizations from the OCS using the 3GPP Gy protocol. Broadband PCEF (BPCEF) interactions with the OCS use online session charging with centralized unit determination and centralized rating.
- **Offline Charging System (OFCS)**—A process where charging information for network resource usage is collected concurrently with that resource usage. If credit-based authorization is not required, the PCEF applies policies and report usage to the OFCS using the 3GPP Gz protocol. You can also use the OCS as the primary accounting destination and use the OFCS as a backup.

Table 64 on page 717 lists the functionality differences between PCRF and PCEF.

Table 64: Functionality Comparison Between PCRF and PCEF

Functionality	PCRF	PCEF
Charging policing implementation	Involved at different levels; aggregates information inside the hosting network and is considered part of the PCC architecture.	Involved at different levels; located at the gateway.
Functions included	Includes mainly policy control decision and flow-based control functions.	Includes policy enforcement and flow-based charging functions.
Predefined PCC rules	Activation or deactivation of predefined PCC rules can only be done by the PCRF.	Preconfigured by the PCEF.
Online and offline charging interactions	Not supported	Supported

The three other components that make up the PCC architecture in [Figure 23 on page 716](#) are:

- **Application Function (AF)**—The Application Function interacts with applications or services that require dynamic PCC. The Application Function extracts session information from the application signalling and provides application session-related information to the PCRF using the Rx protocol.
- **Subscription Profile Repository (SPR)**—SPR contains subscriber and subscription information on a per-packet data network (PDN) basis. The Sp protocol enables the PCRF to request subscription information related to a subscriber's service or session.
- **Bearer Binding and Event Reporting Function (BBERF)**—The PCC rule needs to be mapped to a particular IP bearer to ensure the packets receive the appropriate QoS treatment. The association between a PCC rule and a bearer is referred to as *bearer binding*. The BBERF location depends on the access technology. For 3GPP, the BBERF is located in the serving gateway and uses the Gxx protocol.

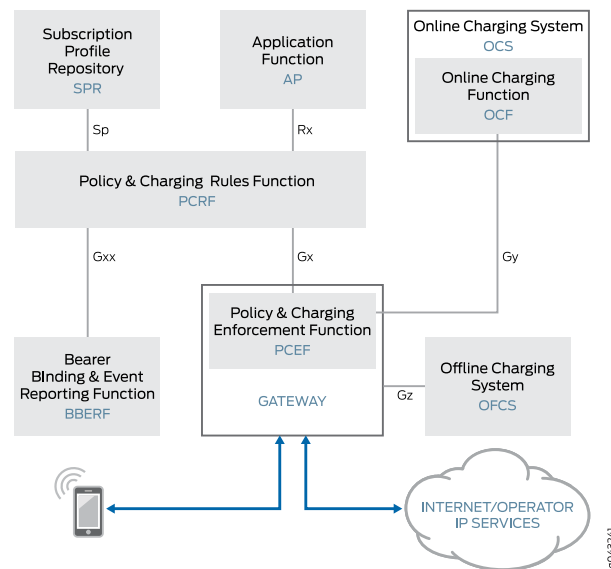
Related Documentation

- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
- [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
- [Understanding Gy Interactions Between the Router and the OCS on page 730](#)
- [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)

Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers

The Policy and Charging Enforcement Function (PCEF) is one of four major components of the 3rd Generation Partnership Project (3GPP) Policy and Charging Control (PCC) architecture in [Figure 24 on page 718](#).

Figure 24: 3GPP PCC Architecture Overview



PCEF provides user traffic handling and quality of service (QoS) at the gateway, provides service data flow detection, and applies the rules received from the Policy Control and Charging Rules Function (PCRF). 3GPP defines Gx as the online policy protocol between the PCRF and the PCEF to provide control over policy and flow-based charges for subscribers. The PCRF is a centralized policy decision point that deploys business policy rules to allocate broadband network resources and manages flow-based charges for subscribers and services. Optionally, the PCEF interacts with the Online Charging System (OCS) using the 3GPP Gy protocol to retrieve policy and charging authorization for quotas and credit control.

PCEF provides support for the following environments:

- [Wireline Access Environment on page 718](#)
- [Junos OS Environment on page 720](#)

Wireline Access Environment

For mobile subscribers, the user equipment requests services; for broadband wireline subscribers, the PCRF requests services. In the wireline environment, PCRF functions as the service requester, and the PCEF functions as the service receiver and enforcer.

Adapting the PCC model in a wireline environment provides these benefits:

- Convenience
- Advanced technology
- Already implemented by the wireless branch of the carrier that often provides a much bigger business than the wireline branch

The PCRF controls the PCEF by pushing charging rules. Charging rules are reused as service (policy) rules to push policies. Charging rules may also have an associated rating group, or charging key. As a result, the PCEF configuration must define charging rules and mapping between credit control services (cc-services) and rating groups.

In many instances, both OCS and Offline Charging System (OFCS) 3GPP accounting services require Mobile Station International Subscriber Directory Number (MSISDN) be used for subscriber identification. The MSISDN is passed as the subscription ID. While each mobile user equipment device has an associated MSISDN, this information is not available for wireline subscribers. To enable the PCRF to dynamically pass subscription-ID parameters, and support a variety of authentication, authorization, and provisioning configuration, the Juniper attribute-value pairs (AVPs) in [Table 65 on page 719](#) have been allocated from the Juniper Vendor-ID space (2636) vendor-specific attribute (VSA).



NOTE: If no dynamic-subscription ID is received, then neither OCS or OFCS communications are initiated.

Table 65: Allocated Juniper AVPs

AVP Name	Vendor-ID	AVP Type	Diameter Type	Diameter Flag
Juniper-Dyn-Subscription-Indicator	2636	10001	Enum	V
Juniper-Dyn-Subscription-Id	2636	10002	Grouped	VM
Juniper-Dyn-Subscription-Id-Type	2636	10003	Integer32	VM
Juniper-Dyn-Subscription-Id-Data	2636	10004	UTF8String	VM

The client system (router) sends the Juniper-Dyn-Subscription-Id-Indicator AVP to indicate support of the dynamic assignment of the subscription ID. The Juniper-Dyn-Subscription-Id-Indicator attribute has two values:

- DYN_SUBSCRIPTION_NOT_SUPPORTED (0)
- DYN_SUBSCRIPTION_SUPPORTED (1)

The server then sends the Juniper-Dyn-Subscription-Id AVP to the client that indicated support. This is a grouped AVP that contains the values to be sent as Subscription-Id-Type and Subscription-Id-Data.

**NOTE:**

- The PCRF server may use standard Subscription-Id AVP to communicate the dynamic-subscription ID to the router.
- If both Juniper-Dyn-Subscription-Id and Subscription-Id are sent by the PCRF, the Subscription-Id value is used.

In many cases, wireline subscribers support only one IP family, which is required information for both AAA service and PCRF. To indicate this information, the Juniper-Network-Family-Indicator AVP has been allocated from the Juniper Vendor-ID space (2636) VSA in [Table 66 on page 720](#).

Table 66: Family Indicator AVP

AVP Name	Vendor-ID	AVP Type	Diameter Type	Diameter Flag
Juniper-Network-Family-Indicator	2636	10010	Enum	V

The client system (router) sends the Juniper-Network-Family-Indicator AVP to indicate which network families are associated with the service request and supported by the subscriber. When you configure the Juniper-Network-Family-Indicator AVP to indicate the associated network family, the system sends the information to the PCRF. The Juniper-Network-Family-Indicator attribute has four values:

- UNSPECIFIED (0)
- IPV4_FAMILY (1)
- IPV6_FAMILY (2)
- IPV4_IPV6_FAMILY (3)

Wireline customers often control user services solely through the PCRF and use the OCS as a convenient real-time usage monitoring mechanism rather than as an enforcement unit. To decrease the number of possible erroneous OCS configurations, include the [force-continue](#) statement at the **[edit access ocs partition *partition-name*]** hierarchy level to force the broadband PCEF (BPCEF) to limit the impact of negative responses from the OCS and quota expirations, and to prevent sending OCS notifications for affected rating-groups. Whenever the PCEF receives a negative response to any reported group, it stops reporting this group to the OCS.

Junos OS Environment

There are three categories of dynamic-profiles within the Junos OS environment:

- client-dynamic-profiles
- cos-service-dynamic-profiles
- firewall-service-dynamic-profiles

Client-dynamic-profiles and cos-service-dynamic-profiles define bandwidth and other characteristics of the services provided to a subscriber; the firewall-service-profiles perform filtering and usage counting. For all of the dynamic-profiles' categories, the service-dynamic-profile name is used as the value of a Charging-Rule-Name AVP.

When the service-dynamic-profile has no variables, or when defaults provided in service-dynamic-profile definition are requested, no additional elements are required. To provide custom values for a service-dynamic-profile, use the Charging-Rule-Definition AVP with additional VSAs.

The PCRF uses existing Juniper-Substitution VSAs (Vendor-ID 2636 and Type 2024) to supply attributes as a name-value pairs. The PCRF may also include parameters as positional notation for part of the rule name. The Redirect-Information AVP (Vendor-ID 10415 and Type 1085) supplies a value for the Redirect-URL parameter.

For every possible service-dynamic-profile parameter name requested by customers, a new Juniper-Parameter VSA is defined. [Table 67 on page 721](#) describes the initial set of fixed Juniper-Parameter VSAs.

Table 67: Initial Set of Fixed Juniper-Parameter VSAs

Parameter	VSA Name	Vendor-ID	Type	Diameter Type
Cos-Tcp	Juniper-Param-Cos-Tcp	2636	10005	UTF8String
V4-Firewall-Input-Filter	Juniper-Param-V4-Firewall-Input-Filter	2636	10006	UTF8String
V4-Firewall-Output-Filter	Juniper-Param-V4-Firewall-Output-Filter	2636	10007	UTF8String
V6-Firewall-Input-Filter	Juniper-Param-V6-Firewall-Input-Filter	2636	10008	UTF8String
V6-Firewall-Output-Filter	Juniper-Param-V6-Firewall-Output-Filter	2636	10009	UTF8String

If parameters or the Service-Identifier and Rating-Group are required to be indicated by the PCRF, the Charging-Rule-Definition AVP is used; otherwise, the Charging-Rule-Name AVP is used.

```
Charging-Rule-Definition ::= < AVP Header: 1003 >
{ Charging-Rule-Name }
[ Service-Identifier ]
[ Rating-Group ]
[ Online ]
[ Precedence ]
[ Juniper-Param-VSA ]
[ AVPs ] - standard AVPs used as parameters
```

For instances when there is a Service-Identifier and Rating-Group combination, or when only the Service-Identifier or only the Rating-Group is specified, the combination must be unique among the rules installed for a subscriber. You configure the service-context-id on the router.

- Related Documentation**
- [3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715](#)
 - [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
 - [Understanding Gy Interactions Between the Router and the OCS on page 730](#)
 - [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)

Understanding Gx Interactions Between the Router and the PCRF

The sequences of Diameter messages are exchanged by means of the 3rd Generation Partnership Project (3GPP) Gx protocol between the Policy Control and Rules Charging Function (PCRF) and the router acting as a Policy and Charging Enforcement Function (PCEF). They interact to perform the following subscriber access tasks:

- [Subscriber Login on page 722](#)
- [Subscriber Update on page 726](#)
- [Subscriber Logout on page 727](#)
- [Subscriber Disconnect on page 728](#)
- [Connectivity Fault Recovery on page 729](#)

Subscriber Login

The router sends a Diameter CCR request containing a fixed set of required information to a policy manager (PCRF) and receives a CCA response containing policies and other information. Gx provisioning is enabled for subscribers when you include the [provisioning-order](#) **pcrf** statement at the **[edit access profile *profile-name*]** hierarchy level. When an application requests AAA to activate the subscriber's session, the router sends a CCR-GX-I (where I represents INITIAL_REQUEST) message to the PCRF to request a fix set of provisioning information for the subscriber session, and receives a CCA-GX-I response message containing policies and other information, including the Result-Code AVP (AVP code 268).

When you configure the [provisioning-order](#) statement in the access profile, the broadband PCEF (BPCEF) module sends a provisioning request to the PCRF during the client activation. The following examples show a CCR-GX-I and CCA-GX-I packet exchange:

CCR-GX-I Packet Example

```
CCR-GX-I ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Auth-Application-Id: 16777238 }
{ Origin-Host: <configurable-string> }
{ Origin-Realm: <configurable-string> }
{ Destination-Realm: <configurable-string> }
{ CC-Request-Type: INITIAL_REQUEST(1) }
{ CC-Request-Number: 0 }
{ Subscription-Id:
  { Subscription-Id-Type: <configurable-integer> }
  { Subscription-Id-Data: <configurable-string> }
}
}
```

```
[ Destination-Host:  <configurable-string> ] -- if configured
[ Origin-State-Id:   <u32> ] -- if configured to send
[ Framed-IP-Address: <ipv4-address-in-radius-encoding> ] -- if available
[ Framed-IPv6-Prefix: <ipv6-prefix-in-radius-encoding> ] -- if available
{ IP-CAN-Type:       <configurable-integer> }
{ Online:           ENABLE_ONLINE (1) }
[ User-Name:        <string> ]
[ NAS-Port-Id:      <string> ] -- if included by config
[ Juniper-Virtual-Router: <virtual-router-name> ] -- if included by config
[ Event-Timestamp:  <timestamp> ] -- login timestamp, if included by config
{ Juniper-Dyn-Subscription-Indicator: DYN_SUBSCRIPTION_SUPPORTED(1) }
{ Juniper-Network-Family-Indicator: <subscriber-family> }
```



NOTE: The T (potentially retransmitted message) bit recalculates when the CCR-GX-I is resent. This flag is set after a link failover procedure to remove duplicate requests.

CCA-GX-I Packet Example

```
CCA-GX-I ::= <Diameter Header: 272, PXY, 16777238>
{ <Session-Id> }
{ Result-Code:   <integer> }
{ Auth-Application-Id: 16777238 }
{ Origin-Host:    <string> } -- should match destination-host if configured
{ Origin-Realm:   <string> } -- should match destination-realm
{ Result-Code:   <integer> }
{ CC-Request-Type: INITIAL_REQUEST(1) }
{ CC-Request-Number: 0 }
[ Juniper-Dyn-Subscription-Id:
  {Juniper-Dyn-Subscription-Id-Type: <value-to-be-used-for-ocs-interactions>
  }
  {Juniper-Dyn-Subscription-Id-Data: <value-to-be-used-for-ocs-interactions>
  }
]
*[ Supported-Features ] -- ignored
[ Origin-State-Id:   <u32> ] -- Indicates restart PCRF side
*[ Downstream data units ]
```



NOTE: If no rule-install AVP is defined in the CCA-GX-I, then the default rule is installed.

All event triggers, including those not yet defined, are acceptable. However, only a few event triggers actually generate events when implemented.

The PCRF returns a CCA-GX-I message that includes the Result-Code AVP (AVP code 268) that maps to the result categories listed in [Table 68 on page 723](#).

Table 68: Result-Code-AVP Categories

Result-Code-AVP Value	Result Category
SUCCESS(2001), LIMITED_SUCCSS(2002), and valid message	Grant

Table 68: Result-Code-AVP Categories (*continued*)

Result-Code-AVP Value	Result Category
AUTHENTICATION_REJECTED(4001), UNKNOWN_SESSION_ID(5002), AUTHORIZATION_REJECTED(5003), and USER_UNKNOWN(5030)	Deny
UNABLE_TO_DELIVER(3002), REALM_NOT_SERVED(3003), TOO_BUSY(3004), LOOP_DETECTED(3005), and REDIRECT_INDICATION(3006)	Failure
All other Diameter Permanent-failure Result-Code AVPs greater than and equal to 5000, and all Diameter protocol error Result-Code AVPs greater than and equal to 3000 and less than 4000	Permanent-failure
Other Result-Code AVPs for invalid message or no-response	Failure

As shown in [Table 69 on page 724](#), the CCA-GX-I response processing depends on three factors:

- Whether the local decision timeout has expired
- The setting of the local decision
- The result category

[Table 69 on page 724](#) also contains PCRF local decision timeout expiration actions.

Table 69: CCA-GX-I Response Processing

PCRF Local Decision Timeout	PCRF Local Decision	Result Category	Action
Not-expired	–	Grant	Clear the local decision timer, apply rules from the CCA-GX-I, notify the Online Charging System (OCS), and then acknowledge subscriber activation.
Not-expired	–	Deny	Clear the local decision timer and fail subscriber activation.
Not-expired	–	Failure	Retry the CCA-GX-I until the local decision time outs.
Not-expired	Grant	Permanent-failure	Clear the local decision timer, apply the default rule, acknowledge subscriber activation, and then keep retrying the CCA-GX-I.
Not-expired	Deny	Permanent-failure	Fail the subscriber activation and initiate the subscriber logout process.
On-expiration	Grant	–	Apply the default rule, keep retrying the CCA-GX-I indefinitely, and acknowledge subscriber activation.
On-expiration	Deny	–	Fail the subscriber activation and initiate the subscriber logout process.

Table 69: CCA-GX-I Response Processing (*continued*)

PCRF Local Decision Timeout	PCRF Local Decision	Result Category	Action
Expired	Grant	Grant	If the CCA-GX-I contains rules, remove the default rules and install the received rules, and then notify the OCS and acknowledge subscriber activation.
Expired	Grant	Deny	Log out the client.
Expired	Grant	Failure	Keep retrying the CCA-GX-I indefinitely.
Expired	Grant	Permanent-failure	Take a long pause and then restart retrying the CCA-GX-I.
Expired	Deny	Deny	If subscriber still logging out, ignore subscriber; otherwise, no action required.

A subscriber login initiates the following sequence of events:

1. A client application—such as DHCP, PPP, or static subscriber sessions—requests AAA to authenticate the subscriber.
2. Authentication begins if the subscriber access profile specifies RADIUS authentication. Login continues when the authentication is successful. Login fails when the **authentication-order** statement in the profile does not specify RADIUS authentication or no authentication. Login fails unless the **authentication-order** statement in the profile specifies RADIUS authentication or no authentication. Login also fails when authentication fails.
3. Default services are activated for the subscriber. Any services that the authentication server includes in the authentication grant are activated. Additionally, a default service may have been configured for the client application.
4. If the subscriber access profile specifies Gx provisioning, the router initiates the Gx message exchange by sending a CCR-GX-I message to the PCRF. The router waits for the PCRF to respond with a CCA-GX-I message within a non-configurable timeout period.

When the PCRF responds within the timeout period and includes the Charging-Rule-Install AVP in the CCA-GX-I message, subscriber login is delayed while the router deactivates any default services and attempts to activate the specified services.

- If all the specified services are activated, then the login completes.
- If any of the services cannot be activated, the router sends the PCRF a CCR-GX-U (where U represents UPDATE_REQUEST) message with the status of the services (a rule report). The PCRF responds to this message with a CCA-GX-U that can contain a new set of services for activation.
- The router ignores any default services, even if the CCA-GX-I message does not include any services. In this circumstance, no services are activated.

If the PCRF does not return a CCA-GX-I within the timeout period, subscriber login completes.

- The router searches first for services returned from the authentication server and activates any it finds. If no such services are found, then the router activates any locally configured default services. Subscriber login completes when default service activation is successful, but fails when any default service fails to activate. Because default services are not required to be present, login also completes when no default services are found.
- If login completes (with or without a default service), the router periodically resends the CCR-GX-I message to the PCRF. If the PCRF subsequently returns a CCA-GX-I, the router deactivates the default service, if any, and then activates any services included in the CCA-GX-I. If the message does not include any services, then no services are activated, not even a default service.
- If any of the services contained in the CCA-GX-I cannot be activated, the router sends the PCRF a CCR-GX-U message with the status of the services (a rule report). The PCRF responds to this message with a CCA-GX-U that can contain a new set of services for activation.

Subscriber Update

Whenever a trigger event occurs on the router, an update request is sent to the PCRF. The following examples show a CCR-GX-U (where U represents UPDATE_REQUEST) and CCA-GX-U packet exchange:

CCR-GX-U Packet Example

```
CCR-GX-U ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Auth-Application-Id: 16777238 }
{ Origin-Host: <configurable-string> }
{ Origin-Realm: <configurable-string> }
{ Destination-Realm: <configurable-string> }
{ CC-Request-Type: UPDATE_REQUEST(2) }
{ CC-Request-Number: <u32> }
[ Destination-Host: <configurable-string> ] -- if configured
[ Origin-State-Id: <u32> ] -- if configured to send
*[ Upstream data units ]
```



NOTE: The T bit recalculates when the CCR-GX-U is resent.

CCA-GX-U Packet Example

```
CCA-GX-U ::= <Diameter Header: 272, PXY, 16777238>
{ <Session-Id> }
{ Auth-Application-Id: 16777238 }
{ Origin-Host: <string> } -- should match destination-host if configured
{ Origin-Realm: <string> } -- should match destination-realm
{ Result-Code: <integer> }
{ CC-Request-Type: UPDATE_REQUEST(2) }
{ CC-Request-Number: <u32> }
[ Origin-State-Id: <u32> ] -- Indicates PCRF restart
*[ Downstream data units ]
```

The PCRF returns a CCA-GX-U message that includes the Result-Code AVP (AVP code 268) that maps to the result categories listed in [Table 70 on page 727](#).

Table 70: Result-Code-AVP Categories

Result-Code-AVP Value	Result Category
SUCCESS(2001), LIMITED_SUCCSS(2002), and valid message	Success
UNABLE_TO_DELIVER(3002), REALM_NOT_SERVED(3003), TOO_BUSY(3004), LOOP_DETECTED(3005), and REDIRECT_INDICATION(3006)	Failure
All other Diameter Permanent-failure Result-Code AVPs greater than and equal to 5000, and all Diameter protocol error Result-Code AVPs greater than and equal to 3000 and less than 4000	Success
Other Result-Code AVPs for invalid message or no-response	Failure

Subscriber Logout

When the client application sends a subscriber logout notice to AAA, Gx sends a CCR-GX-T (where T represents TERMINATION_REQUEST) message to notify the PCRF that the provisioned subscriber session is being terminated.

Whenever a trigger event occurs on the router, a terminate request is sent to the PCRF. The following examples show a CCR-GX-T and CCA-GX-T packet exchange:

CCR-GX-T Packet Example

```
CCR-GX-T ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Auth-Application-Id: 16777238 }
{ Origin-Host: <configurable-string> }
{ Origin-Realm: <configurable-string> }
{ Destination-Realm: <configurable-string> }
{ CC-Request-Type: TERMINATION_REQUEST(3) }
{ CC-Request-Number: <u32> }
[ Destination-Host: <configurable-string> ] -- if configured
{ Termination-Cause: DIAMETER_LOGOUT(1) }
[ Origin-State-Id: <u32> ] -- if configured to send
*[ Upstream data units ]
```



NOTE: The T bit recalculates when the CCR-GX-T is resent.

CCA-GX-T Packet Example

```
CCA-GX-T ::= <Diameter Header: 272, PXY, 16777238>
{ <Session-Id> }
{ Auth-Application-Id: 16777238 }
{ Origin-Host: <string> } -- should match destination-host if configured
{ Origin-Realm: <string> } -- should match destination-realm
{ Result-Code: <integer> }
{ CC-Request-Type: TERMINATION_REQUEST(3) }
{ CC-Request-Number: <u32> }
```

```
[ Origin-State-Id:    <u32> ]  -- Indicates PCRF restart
*[ Downstream data units ]
```

The PCRF returns a CCA-GX-T message that includes the Result-Code AVP (AVP code 268) that maps to the result categories listed in [Table 71 on page 728](#).

Table 71: Result-Code-AVP Categories

Result-Code-AVP Value	Result Category
SUCCESS(2001), LIMITED_SUCCSS(2002), and valid message	Success
UNABLE_TO_DELIVER(3002), REALM_NOT_SERVED(3003), TOO_BUSY(3004), LOOP_DETECTED(3005), and REDIRECT_INDICATION(3006)	Failure
All other Diameter Permanent-failure Result-Code AVPs greater than and equal to 5000, and all Diameter protocol error Result-Code AVPs greater than and equal to 3000 and less than 4000	Success
Other Result-Code AVPs for invalid message or no-response	Failure

If the Result-Code value is Success, Gx notifies AAA, and AAA notifies the application that the logout is complete. If Gx does not receive a CCA-GX-T message, or if the Result-Code AVP has any other value or is missing, then the termination request is retried until the CCA-GX-T message is returned with Success. The router notifies the PCRF about subscriber logouts by sending another CCR request to be acknowledged by a CCA response. The PCRF may also use RAR requests to force subscriber logout or to change applied services.

If the Result-Code value is Failure, then the request is retried.

Subscriber Disconnect

To perform subscriber disconnects, the PCRF sends a RAR-GX-D (where D represents DISCONNECT) and the BPCEF responds with a RAA-GX-D message.

The following examples show a RAR-GX-D and RAA-GX-D packet exchange:

RAR-GX-D Packet Example

```
RAR-GX-D ::= <Diameter Header: 258, PXY, 16777238>
{ <Session-Id> }
{ Auth-Application-Id:    16777238 }
{ Origin-Host:           <string> } -- should match destination-host if configured
{ Origin-Realm:          <string> } -- should match destination-realm
{ Destination-Realm:     <string> } -- should match origin-realm
{ Destination-Host:      <string> } -- should match origin-host
{ Re-Auth-Request-Type:   AUTHORIZE_ONLY(0) }
[ Origin-State-Id:    <u32> ]  -- Indicates PCRF restart
{ Session-Release-Cause:  <enum> }
*[ Downstream data units ]  -- ignored
```

RAA-GX-D Packet Example

```
RAA-GX-D ::= <Diameter Header: 272, REQ, PXY, 16777238>
{ <Session-Id> }
{ Auth-Application-Id:    16777238 }
```

```

{ Origin-Host:    <configurable-string> }
{ Origin-Realm:   <configurable-string> }
{ Result-Code:    <integer> }
[ Origin-State-Id: <u32> ]
*[ Upstream data units ]

```

The PCRF returns a RAA-GX-T message that includes the Result-Code AVP (AVP code 268) that maps to the result categories listed in [Table 72 on page 729](#).

Table 72: Result-Code-AVP Categories

Result-Code-AVP Value	Result Category
DIAMETER_SUCCESS(2001)	Subscriber disconnect is in progress or the subscriber is not found
DIAMETER_UNABLE_TO_COMPLY(5012)	Subscriber is not removable
DIAMETER_TOO_BUSY(3004)	Too many outstanding disconnect requests



NOTE: The BPCEF contains buffering space for at least 512 RAR-GX-D or RAA-GX-D messages.

Connectivity Fault Recovery

Gx does not rely on the connection state between devices to detect router or PCRF outages, because some events do not affect the connection state and others are not detected when there is a Diameter relay or proxy between the devices.

To mitigate connectivity faults with the PCRF, the router uses the following fault recovery procedures:

- If the PCRF is not available, and if you installed and configured a default service, the subscriber login proceeds accordingly.
- Unacknowledged provisioning requests replay indefinitely or until the subscriber logs out.
- Logout requests wait for the final OCS interrogation to complete, and then any unacknowledged logout requests replay for 24 hours.
- The router uses standard Diameter transport redundancy to communicate with redundant PCRFs.

An important aspect of Gx fault tolerance is that subscriber login and termination requests are retried (replayed) 24 hours until a satisfactory response is received from the PCRF. You can issue the **clear network-access pcrf subscribers** command to clear all PCRF subscribers.

Related Documentation

- [3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715](#)

- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
- [Understanding Upstream and Downstream Messages for the PCRF on page 740](#)
- [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)

Understanding Gy Interactions Between the Router and the OCS

Information or interrogations are exchanged by means of the 3rd Generation Partnership Project (3GPP) Gy protocol between the Online Charging System (OCS), and the router acting as a Policy and Charging Enforcement Function (PCEF). Broadband PCEF (BPCEF) interactions with the OCS use online session charging with centralized unit determination and centralized rating. PCEF optionally reports usage and receives additional authorizations from the OCS using the Gy protocol.

After subscriber provisioning has been completed between the Policy Control and Rules Charging Function (PCRF) and PCEF, the router begins sending the following interrogations between the OCS and PCEF:

- [First Interrogation to the OCS on page 730](#)
- [Intermediate Interrogation to the OCS on page 732](#)
- [Final Interrogation to the OCS on page 733](#)
- [Connectivity Fault Recovery on page 734](#)
- [Abort Session Requests on page 734](#)

First Interrogation to the OCS

During the first interrogation, the router sends a Diameter CCR request containing a fixed set of required information to the OCS charging server. The OCS charging server then replies with validity-time, rating groups, and usage-quotas.



NOTE: For this implementation phase, the router allows subscriber access without waiting for the OCS to respond, and the OCS always grants necessary quotas.

To configure a list of charging services to communicate information with the OCS over the Gy protocol, configure the **charging-service-list ocs** statement at the **[edit access profile *profile-name*]** hierarchy level. The following examples show a CCR-GY-I and CCA-GY-I packet exchange:



NOTE: The T (potentially retransmitted message) bit recalculates when the CCR-GY-I is resent. This flag is set after a link failover procedure to aid the removal of duplicate requests.

CCR-GY-I Packet Example

```

CCR-GY-I ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Origin-Host:    <configurable-string> }
{ Origin-Realm:   <configurable-string> }
{ Destination-Realm: <configurable-string> }
{ Auth-Application-Id: 4 }
{ Service-Context-Id: 98924@customer.com }
{ CC-Request-Type:  INITIAL_REQUEST(1) }
{ CC-Request-Number: 0 }
[ Destination-Host: <configurable-string> ] -- if configured
[ User-Name:        <string> ]
[ Origin-State-Id:  <u32> ] -- if configured to send
[ Event-Timestamp:  <timestamp> ] -- login timestamp, if included by config
{ Subscription-Id:
  { Subscription-Id-Type: <received-from-pcrf> }
  { Subscription-Id-Data: <received-from-pcrf> }
}
{ Multiple-Services-Indicator:  MULTIPLE_SERVICES_SUPPORTED(1) }
  { Multiple-Services-CC:
    { Service-Identifier: 7 }
    { Rating-group: 292 }
  }
  { Multiple-Services-CC:
    { Service-Identifier: 7 }
    { Rating-group: 293 }
  }
  { Multiple-Services-CC:
    { Service-Identifier: 7 }
    { Rating-group: 292 }
  }
  { Multiple-Services-CC:
    { Service-Identifier: 1 }
    { Rating-group: 17 }
  }
}

```

CCA-GY-I Packet Example

```

CCA-GY-I ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Result-Code:  DIAMETER_SUCCESS(2001) }
{ Origin-Host:   <string> } -- should match dest-host if configured
{ Origin-Realm:  <string> } -- should match dest-realm
{ Auth-Application-Id: 4 }
{ CC-Request-Type:  INITIAL_REQUEST(1) }
{ CC-Request-Number: 0 }
{ CC-Session-Failover:  FAILOVER_NOT_SUPPORTED(0) } -- ignored
}
{ Multiple-Services-CC:
  { Granted-Service-Unit:
    { CC-Time: 123456 }
    { CC-Total-Octets: 123455999000 }
  }
  { Service-Identifier: 7 }
  { Rating-group: 292 }
  { Validity-Time: 7200 }
  { Result-Code:  DIAMETER_SUCCESS(2001) }
}
{ Multiple-Services-CC:
  { Service-Identifier: 7 }
}

```

```

    { Rating-group: 293 }
    { Result-Code: DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE(4011) }
  }
  { Multiple-Services-CC:
    { Service-Identifier: 7 }
    { Rating-group: 292 }
    { Result-Code: DIAMETER_CREDIT_CONTROL_NOT_APPLICABLE(4011) }
  }
  { Multiple-Services-CC:
    { Granted-Service-Unit:
      { CC-Time: 123456 }
      { CC-Total-Octets: 123455999000 }
    }
    { Service-Identifier: 1 }
    { Rating-group: 17 }
    { Result-Code: DIAMETER_SUCCESS(2001) }
  }
  { CC-Failure-Handling: TERMINATE(0) }

```

Intermediate Interrogation to the OCS

After the router has sent a fixed set of required information to the OCS charging server, the OCS charging server replies with validity-time, rating groups, and usage-quotas. Validity-time and quota expirations trigger intermediate interrogation events.

Whenever a trigger event occurs on the router, an update request is sent to the OCS. The following examples show a CCR-GY-U (where U represents UPDATE_REQUEST) and CCA-GY-U packet exchange:

CCR-GY-U Packet Example

```

CCR-GY-U ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Origin-Host: <configurable-string> }
{ Origin-Realm: <configurable-string> }
{ Destination-Realm: <configurable-string> }
{ Auth-Application-Id: 4 }
{ Service-Context-Id: 98924@customer.com }
{ CC-Request-Type: UPDATE_REQUEST(2) }
{ CC-Request-Number: <integer> }
[ Destination-Host: <configurable-string> ] -- if configured
[ User-Name: <string> ]
[ Origin-State-Id: <u32> ] -- if configured to send
[ Event-Timestamp: <timestamp> ] -- change timestamp, if included by config
{ Multiple-Services-Indicator: MULTIPLE_SERVICES_SUPPORTED(1) }
{ Multiple-Services-CC:
  { Used-Service-Unit:
    { Reporting-Reason: VALIDITY_TIME(4) }
    { CC-Time: 7200 }
    { CC-Total-Octets: 12345 }
    { CC-Input-Octets: 10000 }
    { CC-Output-Octets: 2345 }
  }
  { Service-Identifier: 7 }
  { Rating-group: 292 }
}
{ Multiple-Services-CC:
  { Used-Service-Unit:
    { Reporting-Reason: FINAL(2) }
    { CC-Time: 334556 }
  }
}

```

```

    { CC-Total-Octets: 12345 }
    { CC-Input-Octets: 10000 }
    { CC-Output-Octets: 2345 }
  }
  { Service-Identifier: 1 }
  { Rating-group: 17 }
}
*[ More Multiple-Services-CC]

```

CCA-GY-U Packet Example

```

CCA-GY-U ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Result-Code: DIAMETER_SUCCESS(2001) }
{ Origin-Host: <string> } -- should match dest-host if configured
{ Origin-Realm: <string> } -- should match dest-realm
{ Auth-Application-Id: 4 }
{ CC-Request-Type: UPDATE_REQUEST(1) }
{ CC-Request-Number: <integer> }
{ Multiple-Services-CC:
  { Granted-Service-Unit:
    { CC-Time: 123456 }
    { CC-Total-Octets: 123455999000 }
  }
  { Service-Identifier: 7 }
  { Rating-group: 292 }
  { Validity-Time: 7200 }
  { Result-Code: DIAMETER_SUCCESS(2001) }
}
*[ More Multiple-Services-CC]

```

Final Interrogation to the OCS

When the client application sends a subscriber logout notice to AAA, Gy sends a CCR-GY-T (where T represents TERMINATION_REQUEST) message to notify the OCS that the provisioned subscriber is being terminated.

Whenever a trigger event occurs on the router, a terminate request is sent to the OCS. The following examples show a CCR-GY-T and CCA-GY-T packet exchange:

CCR-GY-T Packet Example

```

CCR-GY-T ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Origin-Host: <configurable-string> }
{ Origin-Realm: <configurable-string> }
{ Destination-Realm: <configurable-string> }
{ Auth-Application-Id: 4 }
{ Service-Context-Id: 98924@customer.com }
{ CC-Request-Type: TERMINATE_REQUEST(2) }
{ CC-Request-Number: <integer> }
[ Destination-Host: <configurable-string> ] -- if configured
[ User-Name: <string> ]
[ Origin-State-Id: <u32> ] -- if configured to send
[ Event-Timestamp: <timestamp> ] -- logout timestamp, if included by config
{ Termination-Cause: DIAMETER_LOGOUT(1) }
{ Multiple-Services-CC:
  { Used-Service-Unit:
    { Reporting-Reason: FINAL(2) }
    { CC-Total-Octets: 12345 }
  }
}

```

```

{ CC-Input-Octets: 10000 }
{ CC-Output-Octets: 2345 }
}
{ Service-Identifier: 7 }
{ Rating-group: 292 }
}
*[ More Multiple-Services-CC]

```

CCA-GY-T Packet Example

```

CCA-GY-T ::= <Diameter Header: 272, REQ, PXY 16777238>
{ <Session-Id> }
{ Result-Code: DIAMETER_SUCCESS(2001) }
{ Origin-Host: <string> } -- should match dest-host if configured
{ Origin-Realm: <string> } -- should match dest-realm
{ Auth-Application-Id: 4 }
{ CC-Request-Type: TERMINATE_REQUEST(1) }
{ CC-Request-Number: <integer> }

```

Connectivity Fault Recovery

Gy does not rely on the connection state between devices to detect router or OCS outages, because some events do not affect the connection state and others are not detected when there is a Diameter relay or proxy between the devices.

To mitigate connectivity faults with the OCS, the router uses the following fault recovery procedures:

- If the OCS is not available, you can configure to allow subscriber traffic by setting the **force-continue** statement at the **[edit access ocs partition *partition-name*]** hierarchy level.



NOTE: The **force-continue** statement is a required configuration statement.

- Unacknowledged first and intermediate interrogations replay indefinitely or until the subscriber logs out.
- Unacknowledged final interrogations replay for 24 hours.
- The router uses standard Diameter transport redundancy to communicate with redundant OCSs.
- You can configure transport redundancy events to trigger failures in application traffic.

An important aspect of Gy fault tolerance is that subscriber login and termination requests are retried (replayed) 24 hours until a satisfactory response is received from the OCS. You can issue the **clear network-access ocs statistics** command to clear all OCS statistics.

Abort Session Requests

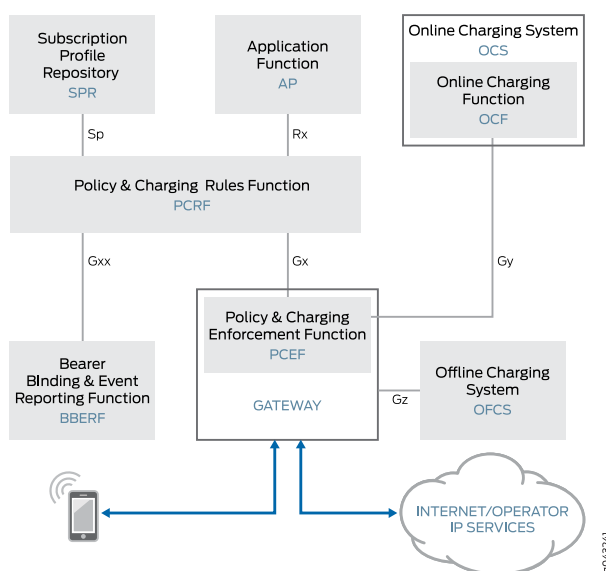
The OCS may issue an ASR (Abort-Session-Request) when the receiving MX Series router collects final data and posts the final interrogation. After the MX Series router receives the response, it stops updating the OCS for the session involved.

- Related Documentation**
- [3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715](#)
 - [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
 - [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)

Understanding Rule Interactions Between the PCRF, PCEF, and OCS

Figure 25 on page 735 shows the components of an overall 3rd Generation Partnership Project (3GPP) Policy and Charging Control (PCC) architecture.

Figure 25: 3GPP PCC Architecture Overview



The Policy and Charging Rules Function (PCRF) pushes the rules down to the Policy and Charging Enforcement Function (PCEF) using the 3GPP Gx protocol and online policy interface. The PCEF provides service data flow detection, and applies the rules received from the PCRF. Optionally, the PCEF interacts with the Online Charging System (OCS) using the 3GPP Gy protocol to retrieve policy and charging authorization for quotas and credit control. Broadband PCEF (BPCEF) interactions with the OCS use online session charging with centralized unit determination and centralized rating.

The behavior and rule interactions among the PCRF, PCEF, and OCS prohibit you from adding or modifying rules with a rating group, and require you to set the **force-continue** statement at the **[edit access ocs partition partition-name]** hierarchy level. Two loosely coupled finite state machines (FSMs), one for PCRF/Gx interactions and the other for OCS/Gy interactions, control the functionality.

The PCRF, PCEF, and OCS provide the following interactions:

- [Login Interactions on page 736](#)
- [Update Interactions on page 736](#)
- [Quota Expiration and Validity-Time Interactions on page 737](#)
- [Connection and Monitoring Interactions on page 737](#)
- [Logout Interactions on page 738](#)

Login Interactions

This login sequence of events is triggered by a CCA-GX-I message received between the PCRF and PCEF.

1. The PCRF installs the requested services.
2. The PCRF acknowledges subscriber activation and allows subscriber traffic to flow.
3. The PCRF sends a notification to the OCS.
4. The PCRF sends the first interrogation to the OCS using a CCR-GY-I message, and the OCS sends applicable reports to the PCRF using a CCR-GX-U message.
 - If the service-dynamic-profile instantiation fails, and the Resource-Allocation-Notification (ENABLE_NOTIFICATION) is set for the charging rule, then the OCS sends a report. The router acknowledges the subscriber activation, allows subscriber traffic to flow, and continues to repeat the process.
 - If the service-dynamic-profile instantiation succeeds, and the Resource-Allocation-Notification (ENABLE_NOTIFICATION) is set for the charging rule, and the SUCCESSFUL_RESOURCE_ALLOCATION event trigger is set in the request, then the OCS sends a report.
 - Otherwise, the system considers the response a no operation and takes no further action.

Update Interactions

This update sequence of events is triggered by an RAR-GX-U message received between the PCRF and PCEF.

1. If the update request contains any installation or modification of rules with rating groups, then the PCRF rejects the message request; otherwise, it acknowledges the message request.
2. The PCRF starts the service removal and installation process.
3. The PCRF waits for the service removal and installation process to complete, and if applicable, the OCS starts the final data collection process.
 - If the service being removed has a rating group, the service notifies the OCS that is part of the existing service removal process.
 - The OCS determines whether final data for this service is required to be reported, and then starts final data collection as necessary.

- If data collection was started successfully, then the service moves into wait state.
- 4. The OCS waits for the final data collection process to complete. After final data collection completes or times out, the service notifies the OCS again. The OCS saves data in the subscriber's private directory and allows service to proceed with its existing service removal process.
- 5. The OCS sends applicable reports to the PCRF using a CCR-GX-U message.
 - If the service-dynamic-profile instantiation fails, and the Resource-Allocation-Notification (ENABLE_NOTIFICATION) is set for the charging rule, then the OCS sends a report. The router acknowledges the subscriber activation, allows subscriber traffic to flow, and continues to repeat the process.
 - If the service-dynamic-profile instantiation succeeds, and the Resource-Allocation-Notification (ENABLE_NOTIFICATION) is set for the charging rule, and the SUCCESSFUL_RESOURCE_ALLOCATION event trigger is set in the request, then the OCS sends a report.
 - Otherwise, the system considers the response a no operation and takes no further action.
- 6. The PCRF sends the intermediate interrogation to the OCS using a CCR-GY-U message.

Quota Expiration and Validity-Time Interactions

For quota expirations and validity-time interactions, the router sends an intermediate interrogation to the OCS using a CCR-GY-U message and processes the OCS response.

Connection and Monitoring Interactions

When establishing a connection with the PCRF, OCS, or Diameter Relay/Proxy server, the Diameter daemon performs a standard Capability Exchange Request (CER)/Capability Exchange Answer (CEA) transaction. You use existing Junos OS Diameter infrastructure to configure an appropriate topology with the necessary redundancy features. Additionally, you can use the same Diameter connection for both PCRF and OCS communications, and other applications.

The following examples show two different communication connection scenarios:

CER Example with a Dedicated Connection Used to Communicate with the PCRF

```
CER ::= <Diameter Header: 257, REQ>
{ Origin-Realm:   CSim.PCRF.net }
{ Origin-Host:    MX-GWR3 }
{ Host-IP-Address: 10.8.52.91 }
{ Vendor-Id:      2636 }
{ Product-Name:   JUNOS }
[ Origin-State-Id: 7777 ] -- if configured
{ Supported-Vendor-Id: 10415 }
{ Supported-Vendor-Id: 2636 } -- have Juniper VSAs
{ Auth-Application-Id: 16777238 }
{ Vendor-Specific-Application-Id {
  { Vendor-Id:      10415 }
  { Auth-Application-Id: 16777238 }
  { Acct-Application-Id: 16777238 }
}
```



NOTE: If you set the `send-origin-state-id` statement for the router at either the `[edit access pcrf partition partition-name]` or `[edit access ocs partition partition-name]` hierarchy level, then the Origin-State-Id is included in Diameter level messages such as: CER, Device Watchdog Request (DWR)/Device Watchdog Answer (DWA), and Disconnect Peer Request (DPR)/Disconnect Peer Answer (DPA).

CER Example with a Dedicated Connection Used to Communicate with Both PCRF and OCS

```
CER ::= <Diameter Header: 257, REQ>
{ Origin-Realm:   CSim.PCRF.net }
{ Origin-Host:    MX-GWR3 }
{ Host-IP-Address: 10.8.52.91 }
{ Vendor-Id:      2636 }
{ Product-Name:   JUNOS }
[ Origin-State-Id: 7777 ] -- if configured
{ Supported-Vendor-Id: 10415 }
{ Supported-Vendor-Id: 2636 } -- have Juniper VSAs
{ Auth-Application-Id: 4 }      -- this is the difference with previous
{ Auth-Application-Id: 16777238 }
{ Vendor-Specific-Application-Id {
  { Vendor-Id:      10415 }
  { Auth-Application-Id: 16777238 }
  { Acct-Application-Id: 16777238 }
}
```



NOTE: The Auth-Application-Id: 4 field and value is the authentication application ID for the OCS. This is the difference between the first and second examples.

You monitor and manage connections using standard DWR/DWA and DPR/DPA messages.

Logout Interactions

This logout sequence of events is triggered by a CCR-GX-T message to the PCRF that includes data for all unacknowledged rule-reports, and also sends a final interrogation to the OCS using a CCR-GY-T message that includes data for all unacknowledged final quota reports.

1. The system infrastructure notifies the OCS that the subscriber logout has started.
2. If applicable, the OCS starts the final data collection process.
 - If the service being removed has a rating group, the service notifies the OCS that is part of the existing service removal process.
 - The OCS determines whether final data for this service is required to be reported, and then starts final data collection as necessary.
 - If data collection was started successfully, then the service moves into wait state.

3. The OCS waits for the final data collection process to complete. After final data collection completes or times out, the service notifies the OCS again. The OCS saves data in the subscriber's private directory and allows service to proceed with its existing service removal process.
4. The OCS allows the service deletion to proceed.
5. The OCS starts the final interrogation process.
6. Both the PCRF and the OCF wait for the final interrogation process to complete.
7. The OCF notifies the PCRF.
8. The PCRF starts a termination request, and then waits for the termination request to complete.
9. The PCRF allows the subscriber logout process to proceed.

**Related
Documentation**

- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
- [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
- [Understanding Gy Interactions Between the Router and the OCS on page 730](#)

Understanding Upstream and Downstream Messages for the PCRF

The MX Series router implements a number of measures to protect against data overload for both downstream and upstream transactions. Downstream transactions are protected by throttling input from the network under overload conditions. The upstream transactions are protected by limiting both the number of outstanding requests and using slow retries of the first unacknowledged message for a reliable recovery.

Built-in features of the Policy and Charging Enforcement Function (PCEF) environment provide protection from overload resulting from an excessive subscriber login rate. If there are too many rule changes and disconnect operations due to Reauthorization Request (RAR-GX) messages, the router sends a Reauthorization Answer (RAA-GX) response with the result-code: DIAMETER_TOO_BUSY (3004).

Within the router's AAA component, a session represents a subscriber (client) session entry in the Session Database (SDB).



NOTE: This is a representation of subscriber session only; it is not a connection-independent permanent identifier similar to a phone number. A subscriber can disconnect and reconnect, and it receives a different Session-Id.

There is a one-to-one correspondence between a session and the Session-Id. The Session-Id is globally and eternally unique because it is bound to the unique router identity and used to identify a user session without any reference to other information. The same subscriber could be mapped to several sessions, such as one from a disconnect and reconnect event. However, the session is always associated with a single subscriber.

The Session-Id (AVP Code 263) is of type UTF8String.

```
Session-Id AVP ::= <DiameterIdentity>;  
                <upper 32 bits of the AAA COMPONENT session-id>;  
                <lower 32 bits of the AAA COMPONENT session-id>;
```

The *DiameterIdentity* field is the value you configure for the Diameter origin-host. Internal Session-Ids are 64-bit integers assigned in ascending order. Both numeric parts of the Session-Id string are generated using %010u format, which guarantees that Session-Id AVP values are in the same order lexicographically as internal 64-bit sessions.

The Policy and Charging Rules Function (PCRF) pushes rules and messages down to the PCEF using the 3GPP Gx protocol and online policy interface. The PCRF and Gx protocol include the following messages:

- [Common Upstream Messages on page 741](#)
- [Common Downstream Messages on page 742](#)

Common Upstream Messages

The upstream messages for Credit Control Response for Initiation, Update, and Termination (CCR-GX-I, CCR-GX-U, and CCR-GX-T) and RAA-GX may include the following rules, parameters and data:

- [Event-Timestamp AVP on page 741](#)
- [Charging Rules Installation Notifications on page 741](#)
- [Event Trigger Commands on page 742](#)

Event-Timestamp AVP

The following shows an AVP for CCR-GX-I, CCR-GX-U, and CCR-GX-T, and RAA-GX messages between the PCRF and Gx:

```
{ Event-Timestamp: <timestamp> }
```

If you configure the Event-Timestamp AVP, it is included in the downstream message. The message definition in [Table 73 on page 741](#) varies depending on the transaction.

Table 73: Event-Timestamp AVP Message Definition

Message	Definition
CCR-GX-I	Subscriber login timestamp

Charging Rules Installation Notifications

The following notifications show a failed installation example and a successful installation example of charging rules installation for CCR-GX-U messages between the PCRF and Gx:



NOTE: If unacknowledged reports are still pending at the time of the client logout, these charging rules are included in CCR-GX-T messages.

Notification Reporting a Rule Installation Failure

```
{ Charging-Rule-Report
  { Charging-Rule-Name: <string> }
  { Charging-Rule-Name: <string> }
  { PCC-Rule-Status: INACTIVE(1) }
  { Rule-Failure-Code: UNKNOWN_RULE_NAME(1) }
}
```

Notification Reporting a Rule Installation Success

```
{ Charging-Rule-Report
  { Charging-Rule-Name: <string> }
  { Charging-Rule-Name: <string> }
  { PCC-Rule-Status: ACTIVE(0) }
}
```

Event Trigger Commands

The following shows a predefined event trigger command for CCR-GX and RAA-GX messages between the PCRF and Gx:

```
{ Event-Trigger: SUCCESSFUL_RESOURCE_ALLOCATION(22) }
```

Common Downstream Messages

The downstream messages for Credit Control Answer for Initiation and Update (CCA-GX-I and CCA-GX-U) and RAR-GX may include the following predefined rules with parameters and data:



NOTE: The CCA-GX-T (Termination) message is not included as a downstream message.

- [Charging Rule Installation Commands on page 742](#)
- [Charging Rule Removal Commands on page 742](#)
- [Event Trigger Commands on page 743](#)

Charging Rule Installation Commands

The following example shows predefined rule installation commands for CCA-GX and RAR-GX messages between the PCRF and Gx:

```
{ Charging-Rule-Install
  { Charging-Rule-Name:  "fixed-cos" }
  { Charging-Rule-Definition:
    { Charging-Rule-Name:  "firewall" }
    { Service-Identifier:  10 }
    { Rating-Group:       292 }
    { Juniper-Param-V4-Input-Filter: "my_input_filter" }
    { Juniper-Param-V4-Output-Filter: "my_output_filter" }
  }
  [ Resource-Allocation-Notification: ENABLE_NOTIFICATION(0) ]
}
```



NOTE: Some PCRFs may be unable to generate a Resource-Allocation-Notification AVP. As a result, the [report-resource-allocation](#) statement at the [edit access pcrf partition *partition-name*] hierarchy level provides generated reports by default.

Charging Rule Removal Commands

The following example shows predefined rule removal commands for CCA-GX and RAR-GX messages between the PCRF and Gx:

```
{ Charging-Rule-Remove
  { Charging-Rule-Name: "predefined-ftp" }
  { Charging-Rule-Name: "firewall" }
}
```

The router processes all rule removal operations before any rule installation operations enabling you to simultaneously request both removal of an existing rule and installation of a rule having the same base name in a single transaction.

Event Trigger Commands

The following shows a predefined event trigger command for CCA-GX and RAR-GX messages between the PCRF and Gx:

```
{ Event-Trigger: SUCCESSFUL_RESOURCE_ALLOCATION(22) }
```

If the SUCCESSFUL_RESOURCE_ALLOCATION (22) trigger value exists in the downstream data, the Broadband PCEF reports successful installations of rules marked with Resource-Allocation-Notification AVP in the Charging-Rule-Install AVP.



NOTE: Some PCRFs may be unable to generate this event trigger. As a result, the `report-successful-resource-allocation` statement at the `[edit access pcrf partition partition-name]` hierarchy level provides generated reports by default.

Related Documentation

- [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
- [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)
- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)

Configuring the OCS Partition

The Online Charging System (OCS) works within a specific logical system: routing instance context, called a partition.



NOTE: Currently, only a single partition is supported; you must configure it within the default logical system: routing instance context.

Before you configure the OCS partition, perform the following task:

- Configure the Diameter instance at the `[edit diameter]` hierarchy level. See [“Configuring Diameter” on page 699](#).

Configuration for the OCS partition consists of naming the partition and then defining or associating a numerous parameters to define the characteristics of the partition.

To configure the OCS partition:

1. Create the partition or specify the name of an existing partition.

```
[edit access ocs]
user@host# set partition partition-name
```

2. Specify the Diameter instance for the OCS partition.



NOTE: Currently, only the default Diameter instance, *master*, is supported.

```
[edit access ocs partition partition-name]
user@host# set diameter-instance instance-name
```

3. (Optional) Configure the Called-Station-ID AVP used in all CCR-Gy packets for the partition.

```
[edit access ocs partition partition-name]
user@host# set called-station-id station-name
```

4. (Optional) Configure the 3GPP-Charging-Id AVP used in all CCR-Gy packets for the partition.

```
[edit access ocs partition partition-name]
user@host# set charging-id number
```

5. (Optional) Configure the Destination-Host AVP value used in the CCR-GY-I message.

```
[edit access ocs partition partition-name]
user@host# set destination-host ocs-hostname
```

6. (Optional) Configure the Destination-Realm AVP value used in all CCR-GY messages

```
[edit access ocs partition partition-name]
user@host# set destination-realm ocs-realm-name
```

7. (Optional) Configure the OCS partition to the draining state to make substantial configuration changes quickly.

```
[edit access ocs partition partition-name]
user@host# set draining
```

8. (Optional) Configure the amount of time in seconds before the OCS partition responds and begins to drain after it has been placed in the draining state.

```
[edit access ocs partition partition-name]
user@host# set draining-response-timeout seconds
```

9. (Optional) Configure the amount of time in seconds before the OCS partition stops attempting to send the final interrogation during the subscriber logout process.

```
[edit access ocs partition partition-name]
user@host# set final-response-timeout seconds
```

10. Configure the OCS partition so that subscriber traffic is allowed before the first OCS interrogation and services are not removed by the PCEF when it receives negative responses from the OCS.

```
[edit access ocs partition partition-name]
user@host# set force-continue
```

11. (Optional) Configure the GGSN-Address AVP value used in all CCR-GY messages.

```
[edit access ocs partition partition-name]
user@host# set ggsn-address address
```

12. (Optional) Configure the 3GPP-GGSN-MCC-MNC AVP value used in all CCR-GY messages.

```
[edit access ocs partition partition-name]
user@host# set ggsn-mcc-mnc ggsn-mcc-mnc
```

13. (Optional) Configure the number of outstanding requests from the OCS to the OCS server that can be retried when the requests are improperly answered.

```
[edit access ocs partition partition-name]
user@host# set max-outstanding-requests number
```

14. (Optional) Specify that the Origin-State-ID AVP is included in Diameter base protocol level messages for the partition, and synchronized with the latest value sent to aid in monitoring changes in value.

```
[edit access ocs partition partition-name]
user@host# set send-origin-state-id
```

15. (Optional) Configure the information concatenated as a string in usernames that the OCS partition sends to the PCEF to identify the subscribers.

- a. (Optional) Include the underlying or physical interface name.

```
[edit access ocs partition partition-name]
user@host# set user-name-include base-interface-name
```

- b. (Optional) Use the specified character to separate the components of the username.

```
[edit access ocs partition partition-name]
user@host# set user-name-include delimiter delimiter-character
```

- c. (Optional) Include the specified domain name.

```
[edit access ocs partition partition-name]
user@host# set user-name-include domain-name domain-name
```

- d. (Optional) Include the interface name.

```
[edit access ocs partition partition-name]
user@host# set user-name-include interface-name
```

- e. (Optional) Include the client hardware MAC address from the incoming packet.

```
[edit access ocs partition partition-name]
user@host# set user-name-include mac-address
```

- f. (Optional) Include the NAS-Port-ID (RADIUS attribute 87) that identifies the physical interface that subscriber is using.

```
[edit access ocs partition partition-name]
user@host# set user-name-include nas-port-id
```

- g. (Optional) Include the name of the host that originates the Diameter message.

```
[edit access ocs partition partition-name]
user@host# set user-name-include origin-host
```

- h. (Optional) Include the name of the realm that originates the Diameter message.

```
[edit access ocs partition partition-name]
user@host# set user-name-include origin-realm
```

- i. Include the username.

```
[edit access ocs partition partition-name]
user@host# set user-name-include user-name
```

- j. (Optional) Include the specified prefix.

```
[edit access ocs partition partition-name]
user@host# set user-name-include user-prefix prefix
```

Related Documentation

- [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
- [Understanding Gy Interactions Between the Router and the OCS on page 730](#)

Configuring the PCRF Partition

The Policy Control and Rules Charging Function (PCRF) works within a specific logical system:routing instance context, called a partition.



NOTE: Currently, only a single partition is supported; you must configure it within the default logical system:routing instance context.

Before you configure the PCRF partition, perform the following task:

- Configure the Diameter instance at the **[edit diameter]** hierarchy level. See [“Configuring Diameter” on page 699](#).

Configuration for the PCRF partition consists of naming the partition and then defining or associating numerous parameters to define the characteristics of the partition.

To configure the PCRF partition:

1. Create the partition or specify the name of an existing partition.

```
[edit access pcrf]
user@host# set partition partition-name
```

2. Specify the Diameter instance for the PCRF partition.



NOTE: Currently, only the default Diameter instance, *master*, is supported.

```
[edit access pcrf partition partition-name]
user@host# set diameter-instance instance-name
```

3. (Optional) Configure the Destination-Host AVP value used in the CCR-GX-I message.

```
[edit access pcrf partition partition-name]
user@host# set destination-host pcrf-hostname
```

4. (Optional) Configure the Destination-Realm AVP value used in all CCR-GX messages

```
[edit access pcrf partition partition-name]
user@host# set destination-realm pcrf-realm-name
```

5. (Optional) Configure the PCRF to the draining state to make substantial configuration changes quickly.

```
[edit access pcrf partition partition-name]
user@host# set draining
```

6. (Optional) Configure the amount of time in seconds before the PCRF responds and begins to drain after it has been placed in the draining state.

```
[edit access pcrf partition partition-name]
user@host# set draining-response-timeout seconds
```

7. Configure the an IP connectivity access network (IP-CAN) that best fits your operating environment and access network.

```
[edit access pcrf partition partition-name]
user@host# set ip-can-type number seconds
```

8. Configure the PCRF partition so that the subscriber login proceeds even if the PCRF is unavailable or the PCRF does not respond within the corresponding logout response timeout period.

```
[edit access pcrf partition partition-name]
user@host# set local-decision
```

9. (Optional) Configure the amount of time in seconds before the PCRF stops attempting to send a subscriber logout message.

```
[edit access pcrf partition partition-name]
user@host# set logout-response-timeout seconds
```

10. (Optional) Configure the number of outstanding requests from the PCRF to the PCRF server that can be retried when the requests are improperly answered..

```
[edit access pcrf partition partition-name]
user@host# set max-outstanding-requests number
```

11. (Optional) Specify that the PCRF sends local report downstream messages by default.

```
[edit access pcrf partition partition-name]
user@host# set report-local-rule
```

12. (Optional) Specify that .the PCRF reports by default when installation fails for rules marked with the Resource-Allocation-Notification AVP in the Charging-Rule.

```
[edit access pcrf partition partition-name]
user@host# set report-resource-allocation
```

13. (Optional) Specify that the PCRF reports by default when installation either fails or succeeds for rules marked with the Resource-Allocation-Notification AVP in the Charging-Rule.

```
[edit access pcrf partition partition-name]
user@host# set report-successful-resource-allocation
```

14. (Optional) Specify that the Juniper-Dyn-Subscription-Id-Indicator AVP is included to indicate support for dynamic assignment of the subscription ID.

```
[edit access pcrf partition partition-name]
user@host# set send-dyn-subscription-indicator
```

15. (Optional) Specify that the Juniper-Network-Family-Indicator AVP is included to indicate the network families that are associated with the service request and supported by the subscriber.

```
[edit access pcrf partition partition-name]  
user@host# set send-network-family-indicator
```

16. (Optional) Specify that the

```
[edit access pcrf partition partition-name]  
user@host# set send-origin-state-id
```

17. (Optional) Specify that the Origin-State-ID AVP is included in Diameter base protocol level messages for the partition, and synchronized with the latest value sent to aid in monitoring changes in value.

```
[edit access pcrf partition partition-name]  
user@host# set send-origin-state-id
```

18. (Optional) Configure the subscriber data to use in the PCRF partition messages to identify subscribers.

- a. (Optional) Include the underlying or physical interface name.

```
[edit access pcrf partition partition-name]  
user@host# set subscription-id-data-include base-interface-name
```

- b. (Optional) Use the specified character to separate the components of the subscription identifier.

```
[edit access pcrf partition partition-name]  
user@host# set subscription-id-data-include delimiter delimiter-character
```

- c. (Optional) Include the specified domain name.

```
[edit access pcrf partition partition-name]  
user@host# set subscription-id-data-include domain-name domain-name
```

- d. (Optional) Include the interface name.

```
[edit access pcrf partition partition-name]  
user@host# set subscription-id-data-include interface-name
```

- e. (Optional) Include the client hardware MAC address from the incoming packet.

```
[edit access pcrf partition partition-name]  
user@host# set subscription-id-data-include mac-address
```

- f. (Optional) Include the NAS-Port-ID (RADIUS attribute 87) that identifies the physical interface that subscriber is using.

```
[edit access pcrf partition partition-name]  
user@host# set subscription-id-data-include nas-port-id
```

- g. (Optional) Include the name of the host that originates the Diameter message.

```
[edit access pcrf partition partition-name]  
user@host# set subscription-id-data-include origin-host
```

- h. (Optional) Include the name of the realm that originates the Diameter message.

```
[edit access pcrf partition partition-name]
user@host# set subscription-id-data-include origin-realm
```

- i. Include the username.

```
[edit access pcrf partition partition-name]
user@host# set subscription-id-data-include user-name
```

- j. (Optional) Include the specified prefix.

```
[edit access pcrf partition partition-name]
user@host# set subscription-id-data-include user-prefix prefix
```

- 19. (Optional) Identify the subscriber with a custom or predefined type value during the login session in CCR-GX-I and CCA-GX-I messages.

```
[edit access pcrf partition partition-name]
user@host# set subscription-id-type number
```

- 20. (Optional) Configure the amount of time in seconds before a PCRF partition stops attempting to send an updated rule report response using a CCR-GX-U message.

```
[edit access pcrf partition partition-name]
user@host# set update-response-timeout seconds
```

- Related Documentation**
- [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
 - [Understanding Gy Interactions Between the Router and the OCS on page 730](#)

Configuring OCS Global Parameters

You can configure global attributes of the 3rd Generation Partnership Project (3GPP) Diameter credit control service charging system for the Online Charging System (OCS), which interacts with the Policy and Charging Enforcement Function (PCEF).

Currently, the only configurable global attribute is the service context identifier allocated by the service provider or operator. This value corresponds to the Service-Context-Id AVP, which together with the Service-Identifier-AVP uniquely and globally identifies the Diameter credit control service.

To configure the OCS global parameters:

- Configure the service context identifier.

```
[edit access ocs global]
user@host# set service-context-id service-context
```

- Related Documentation**
- [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
 - [Understanding Gy Interactions Between the Router and the OCS on page 730](#)

Configuring NASREQ for Authentication and Authorization

- [Diameter Network Access Server Application \(NASREQ\) on page 751](#)
- [Configuring the Diameter Network Access Server Application \(NASREQ\) on page 753](#)

Diameter Network Access Server Application (NASREQ)

The Diameter Network Access Server Requirements (NASREQ) protocol is a Diameter-based authentication, authorization, and accounting protocol defined in RFC 7155, *Diameter Network Access Server Application*. It is an alternative to using RADIUS AAA in a Diameter environment. Junos OS supports the authentication and authorization functions, but not accounting. Authentication is used for the initial subscriber login to verify the subscriber identity. Similarly, authorization is used at login to set up the initial conditions or services or both that may be needed for the subscriber. The NASREQ protocol is not used for re-authentication or re-authorization of subscribers.

Junos OS supports the following NASREQ protocol exchanges:

- AA-Request/Answer—The authentication/authorization request at login.
- Session-Termination-Request/Answer—Notification that the subscriber's session has been terminated.
- Abort-Session-Request/Answer—Request to terminate the subscriber's session from a NASREQ server.



NOTE: The Auth-Application-Id AVP must be set to a value of 1 in AA-Request, Session-Termination-Request, and Abort-Session-Request messages.

The NASREQ client has two queues, the transmit queue and response queue. The transmit queue stores outbound packets until they are sent to Diameter, and includes requests and responses. The response queue stores packets until Diameter responds to the request, and includes only requests waiting for a response.

The following configuration variables control transmission flow and use of the queues:

- *outstanding-requests*—The maximum number of requests (includes AAR and STR) that are sent to Diameter for wireline transmissions—effectively this is the maximum count of requests on the response-queue (the maximum number of in-flight requests for which there has not been a response or timeout); it does not include sent responses.
- *request-retry*—The number of times to re-send a given request to Diameter after it times out for its initial request. This value applies only to requests in the response queue.
- *timeout*—The number of seconds that an outbound packet remains in the transmit queue before it is declared timed out. Packets that exceed the timeout value are not transmitted. Diameter manages packets that time out after transmission. The timeout value applies to all packets in the transmit queue, including both requests and responses to be sent.

The exchange flow takes place as follows:

1. A subscriber attempts to log in and authd, acting as the NASREQ client, sends the NASREQ server a Diameter AA-Request (AAR) message that includes information about the subscriber and authentication information.
 - If the number of outstanding requests is less than the configured maximum outstanding request value, then authd sends the request to the NASREQ server for transmission and places the request on the response queue.
 - If the number of outstanding requests is greater than or equal to the configured maximum outstanding request value, then authd stores the request on the transmit queue.
2. When a response is received from the NASREQ server in the form of a Diameter AA-Answer (AAA) message, authd checks the response queue for a matching request (AAR).
 - If a matching request is found, the request is pulled from the queue and used to process the response.
 - If no matching request is found, the response is ignored and dropped.

When Diameter notifies the NASREQ client that a request has timed out, one of the following actions occurs:

- If the request is not on the response queue, the timeout is ignored.
- If the retry counter for this request is less than the configured **request-retry** value, authd sends the request again and increments the retry counter for that request.
- If the retry counter for this request is greater than or equal to the configured value, authd processes the request timeout and sends the next request that is on the transmit queue to the NASREQ server.

When the configured timeout period expires, authd removes any expired outbound packets from the transmit queue and processes them as having timed out.

- Related Documentation**
- [Diameter Base Protocol Overview on page 679](#)
 - [Configuring the Diameter Network Access Server Application \(NASREQ\) on page 753](#)
 - [Diameter AVPs and Diameter Applications on page 687](#)

Configuring the Diameter Network Access Server Application (NASREQ)

You configure the NASREQ client as an alternative to RADIUS for subscriber authentication and authorization when the subscribers log in.

To configure NASREQ for authentication and authorization:

1. Specify NASREQ as a Diameter application (function) associated with a network element.

```
[edit diameter network-element network-element-name]
user@host# set function nasreq
```

2. Specify NASREQ as the Diameter network element forwarding function and partition.

```
[edit diameter network-element network-element-name forwarding route route]
user@host# set function nasreq
```

3. Specify NASREQ for subscriber authentication and authorization.

```
[edit access profile profile-name]
user@host# set authentication-order nasreq
```

4. Specify NASREQ for subscriber authorization only (no authentication).

```
[edit access profile profile-name]
user@host# set authorization-order nasreq
```



NOTE: When you configure both **authentication-order** and **authorization-order**, the behavior depends on the subscriber type. For DHCP subscribers, **authorization-order** has precedence over **authentication-order**. For all other subscriber types, **authentication-order** has precedence over **authorization-order**.

5. Specify the destination identity of the NASREQ partition.

```
[edit access nasreq partition partition-name]
user@host# set diameter-instance master destination-realm realm-name
destination-host hostname
```

6. Specify the maximum number of requests to send to the Diameter engine for transmission. This is also the maximum number of requests in the response queue.

```
[edit access nasreq]
user@host# set max-outstanding-requests number
```

7. Specify the number of times to retry sending a request to the Diameter engine if a timeout is received from Diameter for the request.

```
[edit access [edit access nasreq]
```

```
user@host# set request-retry retries
```

8. Specify the number of seconds an outbound packet remains in the transmit queue before it is declared timed out.

```
[edit access [edit access nasreq]  
user@host# set timeout seconds
```

**Related
Documentation**

- [Diameter Based Network Access Server Application \(NASREQ\) on page 751](#)
- [Diameter Base Protocol Overview on page 679](#)
- [Diameter AVPs and Diameter Applications on page 687](#)

CHAPTER 76

Configuring JSRC in Subscriber Access Networks

- [Juniper Networks Session and Resource Control \(SRC\) and JSRC Overview on page 755](#)
- [Understanding JSRC-SAE Interactions on page 757](#)
- [Configuring JSRC on page 759](#)
- [Configuring the JSRC Partition on page 760](#)
- [Assigning a Partition to JSRC on page 761](#)
- [Authorizing Subscribers with JSRC on page 761](#)
- [Provisioning Subscribers with JSRC on page 762](#)

Juniper Networks Session and Resource Control (SRC) and JSRC Overview

The Juniper Networks Session and Resource Control (SRC) environment provides a central administrative point for managing subscribers and their services. The SRC software runs on Juniper Networks C Series Controllers. The SRC software uses the Diameter protocol for communications between the local SRC peer on a Juniper Networks routing platform and the remote SRC peer on a C Series Controller. The local SRC peer is known as JSRC and is part of the AAA application. The remote SRC peer is the service activation engine (SAE); the SAE acts as the controlling agent in the SRC environment. JSRC and the SAE jointly provide the remote control enforcement functionality (RCEF).

JSRC has the following responsibilities:

- Request address authorization from the SAE.
- Request service activations from the SAE.
- Activate and deactivate services as specified by the SAE. JSRC can activate multiple policies with the same service (dynamic profile) name.
- Optionally report volume statistics for service accounting.
- Log out subscribers as specified by the SAE.
- Update the SAE with status of new service activations and deactivations.
- Synchronize subscriber state and service information with the SAE.
- Notify the SAE when subscribers log out.

The SRC software enables the SAE to activate and deactivate subscriber services (described by SRC policies) and log out subscribers. The SAE can control only those resources that have been provisioned through SAE. Therefore, the SAE receives information about only those subscribers for whom JSRC has requested provisioning from the SAE. For example, when a subscriber logs in, but the configuration did not require the session activation path to include SAE provisioning, the SAE does not receive information about this subscriber and cannot control the subscriber session.

Similarly, the SAE can control only the subscriber services that it has activated. When a service is not activated from the SAE—a RADIUS-activated service, for example—the SAE receives no information about the service and has no control over it.

The SAE can also direct JSRC to collect accounting statistics per service session.



NOTE: More than one Diameter-based application (function) can run on a router simultaneously.

Hardware Requirements for JSRC for Subscriber Access

JSRC is supported on Juniper Networks MX Series 3D Universal Edge Routers. JSRC currently supports subscriber sessions on static and dynamic interfaces.

Related Documentation

- [Understanding JSRC-SAE Interactions on page 757](#)
- [Messages Used by Diameter Applications on page 682](#)
- [Diameter AVPs and Diameter Applications on page 687](#)
- [Configuring JSRC on page 759](#)

Understanding JSRC-SAE Interactions

This topic describes the sequences of Diameter messages exchanged between JSRC (the local SRC peer) and the SAE (the remote SRC peer) as they interact to perform the following tasks for subscriber access:

- Subscriber login
- Service activation
- Service deactivation
- Resynchronization
- SAE-initiated subscriber logout
- Statistics collection and reporting
- Subscriber-initiated logout

Subscriber Login

JSRC authorization is enabled for DHCP subscribers when you include the **authorization-order jsrc** statement at the **[edit access profile *profile-name*]** hierarchy level. This setting causes AAA to ignore the authentication order setting in the access profile. As a result, AAA does not authenticate the DHCP subscribers. For non-DHCP subscribers, AAA ignores the **authorization-order** statement.

When a DHCP subscriber attempts to log in, DHCP sends an authentication request to AAA. In turn, JSRC sends a Diameter AA-Request message to the SAE. SAE returns a Diameter AA-Answer message that can include the Framed-IP-Address attribute and the Juniper-DHCP-Options AVP (AVP code 2010). JSRC ignores any other optional AVPs included in this AA-Answer message.

JSRC provisioning is enabled for DHCP (and SSC) subscribers when you include the **provisioning-order** statement at the **[edit access profile *profile-name*]** hierarchy level. When the application requests AAA to activate the subscriber's session, JSRC sends an AA-Request message that includes the Juniper-Request-Type AVP (AVP code 2050) with a value that indicates service provisioning is requested from the SAE.

The SAE returns a AA-Answer message that contains an ACK if the request is accepted or a NAK if the request is denied. If the request is accepted, the AA-Answer message includes the Juniper-Policy-Install AVP (AVP code 2020), which is used to specify the service to attach to the subscriber's interface. When this AVP is included, the SAE sets the Result-Code AVP to 1001 (DIAMETER_MULTI_ROUND_AUTH). This code means that the JSRC must send another AA-Request message to the SAE to report the success or failure of the policy instantiation (service activation) by AAA. JSRC ignores any other optional AVPs included in this AA-Answer message. The SAE returns an AA-Answer message to acknowledge this second AA-Request message.

Subscriber Service Activation and Deactivation

SAE policies provision subscriber services. After a subscriber is logged in, the SAE can send a PPR message to JSRC to activate or deactivate services. A given PPR can include the Juniper-Policy-Install AVP (AVP code 2020) to activate a service, the Juniper-Policy-Remove AVP (AVP code 2027) to deactivate a service, or both (for different services). A PPR can include no more than three of these AVPs (install, remove, or mixed).

JSRC sends a PPA message to the SAE when it has completed the tasks requested in the PPR. The PPA indicates the success or failure of the actions requested in the PPR.



NOTE: If you use RADIUS or the CLI to deactivate a service that the SAE, the SAE becomes unsynchronized with the state of subscribers on the routing engine.

Subscriber Resynchronization

During resynchronization, JSRC informs the SAE about the services that are active for the provisioned subscribers. Either JSRC or the SAE initiates the resynchronization.

- The SAE initiates resynchronization at startup or when a backup SAE takes over session control due to resource limits or conditions on the primary SAE. The SAE clears its database of all entries in preparation for the synchronization.
- JSRC initiates resynchronization at JSRC startup, such as when AAA starts or restarts.

JSRC can also initiate resynchronization in another circumstance. When an SAE in a multi-SAE environment becomes active, it must send an SRQ to JSRC as its first message. JSRC then locks the Origin-Host AVP of the active SAE. JSRC subsequently triggers resynchronization if it receives a message from any other SAE as indicated by the Origin-Host AVP. Such an incident can occur if communication between the active SAE and a standby SAE is interrupted.

Both entities initiate a resynchronization by sending an SRQ message. The recipient responds with an SRR message. After the SRR is sent, regardless of whether the SAE or JSRC initiates the synchronization, JSRC sends an AA-Request message to the SAE for each provisioned subscriber present in the session database. The AA-Request message includes a Juniper-Policy-Install AVP for the active services. The SAE returns an AA-Answer message with an ACK to acknowledge receipt.

Subscriber Session Terminated by the SAE

When the SAE terminates a subscriber session, it sends an ASR message to JSRC. JSRC causes AAA to send a logout request to the DHCP (or SSC) client application. When the DHCP client application accepts the logout request, JSRC includes an ACK in the ASR message it sends to the SAE to signify success. If the DHCP client application does not accept the request, then JSRC includes a NAK in the ASR to signify failure. The DHCP client application is responsible for initiating the actual logout sequence with AAA.

Statistics Collection and Reporting per Service Rule

Statistics information can be sent from the router to the SAE or from the SAE to the router. Both the Diameter Accounting-Request (ACR) and Accounting-Answer (ACA) messages include the Juniper-Acct-Record AVP (AVP code 2053), which identifies the policy (service) for which accounting information is requested.

Subscriber Logout

When the DHCP (or SSC) client application sends a subscriber logout notice to AAA, JSRC sends an STR message to notify the SAE that the provisioned subscriber session is being terminated. The SAE returns an STA message to JSRC, and JSRC notifies DHCP that the logout is complete.

Related Documentation

- [Juniper Networks Session and Resource Control \(SRC\) and JSRC Overview on page 755](#)
- [Messages Used by Diameter Applications on page 682](#)
- [Diameter AVPs and Diameter Applications on page 687](#)
- [Configuring JSRC on page 759](#)

Configuring JSRC

You can configure the JSRC client application to work with Session and Resource Control (SRC) to centrally manage subscribers and services. JSRC requests address and service authorizations from the remote SRC peer (the SAE), activates and deactivates services as specified by the SAE, logs out subscribers as specified by the SAE, and synchronizes subscriber state and service information with the SAE.

To configure JSRC:

1. Configure the JSRC partition.
See [“Configuring the JSRC Partition” on page 760](#).
2. Assign the JSRC partition.
See [“Assigning a Partition to JSRC” on page 761](#).
3. Configure JSRC authorization for subscribers.
See [“Authorizing Subscribers with JSRC” on page 761](#).
4. Configure JSRC provisioning for subscribers.
See [“Provisioning Subscribers with JSRC” on page 762](#).
5. (Optional) Configure JSRC to exclude an AVP from Messages Sent to SAE.
See [“Excluding AVPs from Diameter Messages for JSRC” on page 763](#).
6. Configure service accounting by JSRC.

See [“Configuring Service Accounting with JSRC” on page 766](#).

7. Configure JSRC event tracing as part of general authentication service tracing operations.

See [“Tracing General Authentication Service Processes” on page 859](#).

**Related
Documentation**

- [Juniper Networks Session and Resource Control \(SRC\) and JSRC Overview on page 755](#)

Configuring the JSRC Partition

JSRC works within a specific logical system: routing instance context, called a partition.



NOTE: Currently, only a single partition is supported; you must configure it within the default logical system: routing instance context.

Before you configure the JSRC partition, perform the following task:

- Configure the Diameter instance at the **[edit diameter]** hierarchy level. See [“Configuring Diameter” on page 699](#).

Configuration for the JSRC partition consists of naming the partition and then associating a Diameter instance, the SAE hostname, and the SAE realm with the partition.

To configure the JSRC partition:

1. Create the partition.

```
[edit jsrc]
user@host# set partition partition1
```

2. Specify the Diameter instance for the JSRC partition.



NOTE: Currently, only the default Diameter instance, *master*, is supported.

```
[edit jsrc partition partition1]
user@host# set diameter-instance master
```

3. Configure the destination host for the JSRC partition.

```
[edit jsrc partition partition1]
user@host# set destination-host sae1
```

4. Configure the destination realm for the JSRC partition.

```
[edit jsrc partition partition1]
user@host# set destination-realm generic.example.com
```

**Related
Documentation**

- [Configuring JSRC on page 759](#)

Assigning a Partition to JSRC

You must associate a configured JSRC partition with the JSRC instance that you are configuring.

Before you assign a partition to JSRC, perform the following task:

- Configure the JSRC partition. See [“Configuring the JSRC Partition” on page 760](#)

To assign the JSRC partition:

- Specify the partition name.

```
[edit jsrc]
user@host# set jsrc-partition partition1
```

Related Documentation

- [Configuring JSRC on page 759](#)

Authorizing Subscribers with JSRC

You can configure AAA to use JSRC in an SRC environment to request authorization from the SAE when AAA is verifying whether a DHCP subscriber can access the router. When JSRC authorization is configured, AAA ignores any configured authentication order settings.

Before you configure JSRC authorization, perform the following tasks:

- Create the subscriber access profile at the **[edit access profile]** hierarchy level.
- Define the subscriber username with the **username-include** statement in the authentication configuration for DHCP local server or DHCP relay.

To configure JSRC authorization:

- Specify **jsrc** as the authorization method in the profile.

```
[edit access profile dhcpsub1]
user@host# set authorization-order jsrc
```

Related Documentation

- [Configuring JSRC on page 759](#)
- [Creating Unique Usernames for DHCP Clients on page 272](#)
- [profile on page 1242](#)

Provisioning Subscribers with JSRC

You can configure AAA to use JSRC in an SRC environment to request provisioning from the SAE to instantiate services for an authenticated subscriber.

Before you configure JSRC provisioning for subscribers, perform the following task:

- Create the subscriber access profile at the **[edit access profile]** hierarchy level.

To configure JSRC provisioning:

- Specify **jsrc** as the provisioning method in the profile.

```
[edit access profile dhcpsub1]  
user@host# set provisioning-order jsrc
```

Related Documentation

- [Configuring JSRC on page 759](#)

Excluding Diameter AVPs from JSRC Messages

- [Excluding AVPs from Diameter Messages for JSRC on page 763](#)

Excluding AVPs from Diameter Messages for JSRC

Starting in Junos OS Release 14.2, you can configure the router to exclude AVPs from Diameter messages that are sent to the SAE from JSRC.



NOTE: Currently, only the user-name (1) AVP is supported.

To configure JSRC to exclude an AVP in Diameter messages:

1. Specify that you want to configure JSRC settings in the access profile.

```
[edit access profile profilewestern55]
user@host# edit jsrc
```

2. Specify that you want to configure Diameter attribute usage.

```
[edit access profile profilewestern55 jsrc]
user@host# edit attributes
```

3. Configure the router to exclude the specified AVP from the specified messages. The following example excludes the user-name AVP from authorization and provisioning AAR messages.

```
[edit access profile profilewestern55 jsrc attributes]
user@host# set exclude user-name authorization-request
user@host# set exclude user-name provisioning-request
```

Release History Table

Release	Description
14.2	Starting in Junos OS Release 14.2, you can configure the router to exclude AVPs from Diameter messages that are sent to the SAE from JSRC.

Related Documentation

- [Understanding JSRC-SAE Interactions on page 757](#)

Configuring Service Accounting with JSRC

- [Service Accounting with JSRC on page 765](#)
- [Configuring Service Accounting with JSRC on page 766](#)

Service Accounting with JSRC

A service session represents a service for a specific subscriber. Service sessions exist in the context of a subscriber session. JSRC activates and deactivates services as specified by the SAE (remote SRC peer). JSRC can collect and report service accounting data by volume. JSRC accounting requires that either classic firewall filters or fast update firewall filters be configured to count service packets—the service packet information provides the volume statistics.



NOTE: JSRC supports only volume statistics accounting for service sessions. Time statistics and subscriber accounting are not supported.

JSRC service accounting supports both accounting based on service activation/deactivation and interim accounting.

- **Service activation/deactivation accounting**—When accounting is enabled, JSRC sends an accounting start message to the SAE when it activates a service and an accounting stop message when it deactivates the service. The start message initiates the accounting session and provides initial information about the service session. The stop message terminates the accounting session and reports the final (cumulative) accounting data.
- **Interim accounting**—When interim accounting is enabled for a service session, JSRC sends interim accounting messages to the SAE at a specified interval to report the cumulative accounting information available at that time. Interim accounting is ignored when accounting is not enabled for the corresponding service session.

JSRC accounting for a service begins when the service is activated, and remains in effect while the service is active. The SAE specifies the service (policy) to be activated for the subscriber with the Juniper-Policy-Install AVP (AVP code 2020). When this AVP includes the Juniper-Acct-Collect AVP (AVP code 2054), JSRC initiates service activation/deactivation accounting for the service.

JSRC initiates interim accounting when the Juniper-Policy-Install AVP includes the Acct-Interim-Interval AVP (AVP code 85). In this case, JSRC updates the accounting values at the interval specified in the AVP— in the range 600 through 86,400 seconds. Aggregate counters are reported for the dual stack case.

JSRC and the SAE exchange Diameter Accounting-Request (ACR) and Accounting-Answer (ACA) messages to communicate accounting data. Both messages include the Juniper-Acct-Record AVP (AVP code 2053) to identify the service for which accounting information is requested.

JSRC sends ACR messages to report accounting data to the SAE. The ACR message includes the Accounting-Record-Type AVP (AVP code 480) to specify the kind of accounting record that it is sending. When a service is activated, this AVP has a value of START_RECORD. When a service is deactivated, it has a value of STOP_RECORD. For interim accounting, ACR messages are sent at the specified accounting interval and the AVP has a value of INTERIM_RECORD.

In addition to specifying the accounting record type, the ACR messages include standard RADIUS attributes to specify the desired statistics: Acct-Input-Octets [42], Acct-Output-Octets [43], Acct-Input-Packets [47], Acct-Output-Packets [48], and Acct-Session-Time [46].

The SAE returns ACA messages to the JSRC to acknowledge receipt of the ACR messages.

An access profile specifies subscriber access authentication and accounting parameters. When a service is activated through JSRC, the accounting reports can be sent either to the SAE or to RADIUS. The default configuration sends the reports to the SAE; you can also configure this by including the **service accounting-order activation-protocol** statement in the access profile. To send the reports instead to the RADIUS server, include the **service accounting-order radius** statement in the access profile.

When a service is activated through RADIUS rather than through JSRC, the accounting reports of the service session are sent to the RADIUS server.

- Related Documentation**
- [Configuring Service Packet Counting on page 107](#)
 - [Messages Used by Diameter Applications on page 682](#)
 - [Diameter AVPs and Diameter Applications on page 687](#)

Configuring Service Accounting with JSRC

You can configure JSRC to report accounting statistics for service sessions.

In addition to the configuration shown here, the network context for JSRC service accounting includes the configuration of firewall filters to count the statistics, Diameter, JSRC, the subscriber services, RADIUS, and the SRC.

To configure service accounting by JSRC:

1. Configure JSRC to provision subscriber services.

```
[edit access profile profile-name]  
user@host# set provisioning-order jsrc
```

2. Configure service accounting to be provided by the application that provisions the service—JSRC.

```
[edit access profile profile-name service]  
user@host# set accounting-order activation-protocol
```

**Related
Documentation**

- [Service Accounting with JSRC on page 765](#)

Configuring Subscribers on Static Interfaces

- [Subscribers on Static Interfaces Overview on page 769](#)
- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Example: Configuring Static Subscribers for Subscriber Access on page 773](#)

Subscribers on Static Interfaces Overview

You can associate subscribers with statically configured interfaces and provide dynamic service activation and activation for these subscribers. When the static interface comes up, the event is treated as a subscriber login. When the interface goes down, it is treated as a subscriber logout. After the subscribers are present in the session database (SDB), JSRC can report the subscribers to the SAE so that the SRC software can subsequently manage the subscribers.

Alternatively, you can configure the static subscribers to be authenticated and authorized by means of RADIUS. In this case, RADIUS can then activate and deactivate services with change of authorization (CoA) messages. However, this configuration does not prevent the interface from coming up and forwarding traffic. Further, authorization parameters are not imposed on the subscriber interface.

Currently, only Ethernet interfaces support static subscribers. Only one static subscriber can exist over a given interface. An interface cannot appear in more than one group. Static subscribers cannot be created over dynamic interfaces.

Static subscribers are intended to work with JSRC. Include the **provisioning-order jsrc** statement at the **[edit access profile *profile-name*]** hierarchy level to enable JSRC to handle the subscribers at the direction of the SRC software.

If the authentication request fails for a static subscriber, a 60-minute, nonconfigurable timer begins counting down. The request is reissued when the timer expires. This action repeats for as long as the interface is operationally up.

You can force a logout of the static subscriber by issuing the **request services static-subscribers logout interface *interface-name*** command. A static subscriber can also be logged out by AAA or an external policy manager. In both cases, no subsequent logins can take place on the underlying interface until you reset the state by issuing the **request**

services static-subscribers login interface *interface-name* command or the router or process reboots.

You can log out an interface group by issuing the **request services static-subscriber logout group *group-name*** command. You can subsequently log in a group of interfaces by issuing the **request services static-subscriber login group *group-name*** command.

No new CLI statements are required to configure the dynamic profile for static subscribers. The dynamic profile can be very simple; it is activated at login and deactivated at logout. If you do not configure a profile, then the *junos-default-profile* is automatically activated.

During a graceful Routing Engine switchover (GRES) event, active static subscribers are recovered, inactive subscribers are cleaned up, and logout continues for subscribers that were in the process of logging out.

Include the **static-subscribers** statement at the **[edit system services]** hierarchy level to configure static subscribers. Include the **traceoptions** statement at the **[edit system processes static-subscribers]** hierarchy level to configure tracing operations for static subscribers.

You can configure the access profile, dynamic profile, and authentication parameters for all static subscribers or for a particular group of static subscribers:

- To configure the access profile that triggers AAA services for the static subscriber for all static subscribers, include the **access-profile** statement at the **[edit system services static-subscribers]** hierarchy level. Alternatively, include this statement at the **[edit system services static-subscribers group *group-name*]** hierarchy level to apply the profile to a specific group and override a top-level configuration.
- To configure the dynamic profile that is instantiated when the static subscriber logs in for all static subscribers, include the **dynamic-profile** statement at the **[edit system services static-subscribers]** hierarchy level. Alternatively, include this statement at the **[edit system services static-subscribers group *group-name*]** hierarchy level to apply the profile to a specific group and override a top-level configuration. Do not specify a dynamic profile that creates a dynamic interface.
- To configure the authentication parameters that trigger an Access-Request message to AAA for all static subscribers, include the **authentication** statement at the **[edit system services static-subscribers]** hierarchy level. Alternatively, include the statement at the **[edit system services static-subscribers group *group-name*]** hierarchy level to configure authentication for a specific group and override a top-level configuration. If you do not configure authentication, then by default the interface name is modified and used as the default username for the subscriber session and the authentication request.

The configurable authentication parameters include the password and details of how the username is formed. Include the **password** statement at the **[edit system services static-subscribers authentication]** hierarchy level to configure the authentication password for all static subscribers. Alternatively, include the statement at the **[edit system services static-subscribers group *group-name* authentication]** hierarchy level to configure authentication for a specific group and override a top-level configuration.

The username that is sent to AAA for authentication must include at least one of the following attributes:

- Domain name
- User prefix
- Interface name
- Logical system name
- Routing instance name

To configure how the username is formed for all static subscribers, include the desired statements at the **[edit system services static-subscribers authentication]** hierarchy level: **domain-name**, **user-prefix**, **logical-system-name**, or **routing-instance-name**. Alternatively, include the desired statements at the **[edit system services static-subscribers group group-name authentication]** hierarchy level to configure the username for a specific group and override a top-level configuration.

If you change the authentication configuration for an existing group or for static subscribers globally, the change has no effect on existing static subscribers. The changes are applied only to any new logins that are attempted after you commit the changes.

A group configuration must specify all the interfaces that you expect to support static subscribers. Include the **interface** statement at the **[edit system services static-subscribers group group-name]** hierarchy level to specify the interfaces. This statement enables you to specify a single interface or a range of interfaces.

You must also statically configure these interfaces before any static subscribers can be supported on them. You must configure the static interfaces in the same logical system and routing instance as the group that includes the interfaces.

If you change the interfaces that are included in an existing interface group, existing static subscribers are automatically logged out and then back in when you commit the changes. However, changes made to the configuration of the interface itself have no effect on the login or logout state of the static subscriber associated with that interface.

By default, multiple subscribers are not supported on top of the same VLAN logical interface. If you want to support this behavior, then you can manage multiple subscribers on a single logical interface in one of two ways. You can either merge attributes such as firewall filters and CoS attributes for the multiple subscribers, or you can replace the current attributes with those of a new subscriber whenever a new subscriber logs into the underlying VLAN logical interface.

- To enable attribute merging for all static interfaces, include the **aggregate-clients merge** statement at the **[edit system services static-subscribers]** hierarchy level. Alternatively, include this statement at the **[edit system services static-subscribers group group-name]** hierarchy level to enable attribute merging for a specific group of static interfaces and override a top-level configuration.
- To enable attribute replacement for all static interfaces, include the **aggregate-clients replace** statement at the **[edit system services static-subscribers]** hierarchy level.

Alternatively, include this statement at the **[edit system services static-subscribers group group-name]** hierarchy level to enable attribute replacement for a specific group of static interfaces and override a top-level configuration.

- Related Documentation**
- [Configuring Subscribers over Static Interfaces on page 772](#)
 - [Juniper Networks Session and Resource Control \(SRC\) and JSRC Overview on page 755](#)
 - [Understanding JSRC-SAE Interactions on page 757](#)

Configuring Subscribers over Static Interfaces

This topic describes the procedure for configuring subscribers over static interfaces (static subscribers).

Before you configure subscribers over static interfaces, perform the following tasks:

- Configure the static interfaces on which you want to create and manage subscribers.
- Create an access profile to trigger AAA services for static subscribers.
- Create a dynamic profile that is instantiated when static subscribers log in.

To configure static subscribers:

1. Specify the global access profile that triggers AAA services for static subscribers.
See [“Specifying the Static Subscriber Global Access Profile” on page 775](#).
2. Specify the global dynamic profile that is instantiated when static subscribers log in.
See [“Specifying the Static Subscriber Global Dynamic Profile” on page 775](#).
3. Configure global method to handle multiple subscribers on a VLAN Logical Interface.
See [“Enabling Multiple Subscribers on a VLAN Logical Interface for All Static Subscribers” on page 776](#)
4. Configure the global authentication password for static subscribers.
See [“Configuring the Static Subscriber Global Authentication Password” on page 777](#).
5. Configure the global username for static subscribers.
See [“Configuring the Static Subscriber Global Username” on page 777](#).
6. Configure a group of subscribers to share values different from the global configuration.
See [“Creating a Static Subscriber Group” on page 779](#).
7. Specify the access profile for the static subscriber group.
See [“Specifying the Static Subscriber Group Access Profile” on page 780](#).
8. Specify the dynamic profile for the static subscriber group.
See [“Specifying the Static Subscriber Group Dynamic Profile” on page 780](#).

9. Configure method to handle multiple subscribers on a VLAN Logical Interface for a static subscriber group.

See [“Enabling Multiple Subscribers on a VLAN Logical Interface for a Static Subscriber Group”](#) on page 781.

10. Configure the authentication password for the static subscriber group.

See [“Configuring the Static Subscriber Group Authentication Password”](#) on page 781.

11. Configure the username for the static subscriber group.

See [“Configuring the Static Subscriber Group Username”](#) on page 782.

12. (Optional) Force a static subscriber to be logged out from an interface.

See [“Forcing a Static Subscriber to Be Logged Out”](#) on page 809.

13. (Optional) Enable an interface to accept static subscriber logins.

See [“Resetting the State of an Interface for Static Subscriber Login”](#) on page 809.

14. (Optional) Force static subscribers to be logged out from a group of interfaces.

See [“Forcing a Group of Static Subscribers to Be Logged Out”](#) on page 810.

15. (Optional) Enable a group of interfaces to accept static subscriber logins.

See [“Resetting the State of an Interface Group for Static Subscriber Login”](#) on page 810.

16. Configure trace options for troubleshooting the configuration.

See [“Tracing Static Subscriber Operations”](#) on page 871.

Related Documentation

- [Subscribers on Static Interfaces Overview](#) on page 769

Example: Configuring Static Subscribers for Subscriber Access

This example shows a static subscriber configuration.

1. Configure the access profile to be used for static subscribers.

```
access {
  profile access5 {
    provisioning-order jsr;
    accounting {
      order radius;
    }
    authentication {
      order radius;
    }
  }
}
```

2. Configure the dynamic profile to be used for static subscribers.

If you do not configure this profile, the default profile, junos-default-profile, is used.

3. Configure the static interfaces on which to layer the static subscribers.

4. Configure the parameters that apply globally to all static subscribers in the configuration context.

```
static-subscribers {
  access-profile access5;
  dynamic-profile dyn-profile-1;
  authentication {
    password $ABC123;
    username-include {
      user-prefix Building5;
      interface;
      logical-system-name;
      routing-instance-name;
      domain-name example.com;
    }
  }
}
```

5. If you want to override the global parameters for certain static subscribers, create a group of static interfaces for those subscribers and configure parameters to apply to that group. Repeat this step for as many groups as you need.

```
static-subscribers {
  group boston {
    interface ge-1/0/1.1 upto ge-1/0/1.102
    interface ge-1/0/1.6 exclude
    interface ge-1/0/1.70 upto ge-1/0/1.80 exclude
    access-profile boston-acs;
    dynamic-profile dyn-profile-2;
    authentication {
      password $ABC123;
      username-include {
        user-prefix 2ndFloor;
        interface;
        logical-system-name;
        routing-instance-name;
        domain-name example.net;
      }
    }
  }
}
```

6. Configure tracing options for static subscriber events.

```
static-subscribers {
  traceoptions {
    file filename <files number> <match regular-expression> <size maximum-file-size>
      <world-readable | no-world-readable>;
    flag flag;
    level (all | error | info | notice | verbose | warning);
    no-remote-trace;
  }
}
```

- Related Documentation**
- [Subscribers on Static Interfaces Overview on page 769](#)
 - [Configuring Subscribers over Static Interfaces on page 772](#)

CHAPTER 80

Configuring the Static Subscribers Global Profile

- [Specifying the Static Subscriber Global Access Profile on page 775](#)
- [Specifying the Static Subscriber Global Dynamic Profile on page 775](#)
- [Enabling Multiple Subscribers on a VLAN Logical Interface for All Static Subscribers on page 776](#)
- [Configuring the Static Subscriber Global Authentication Password on page 777](#)
- [Configuring the Static Subscriber Global Username on page 777](#)

Specifying the Static Subscriber Global Access Profile

You specify a previously created access profile that triggers AAA services for all static subscribers. This value can be overridden for a group of static subscribers when a different profile is configured for that group.

To specify the access profile used for all static subscribers:

- Specify the profile name.

```
[edit system services static-subscribers]  
user@host# set access-profile access5
```

Related Documentation

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Specifying the Static Subscriber Group Access Profile on page 780](#)
- [profile on page 1242](#)

Specifying the Static Subscriber Global Dynamic Profile

You specify a previously created dynamic profile that is instantiated when a static subscriber logs in. This profile is used for all static subscribers. This value can be overridden for a group of static subscribers when a different profile is configured for that group.

To specify the dynamic profile used for all static subscribers:

- Specify the profile name.

```
[edit system services static-subscribers]
user@host# set dynamic-profile dyn-profile-1
```

**Related
Documentation**

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Specifying the Static Subscriber Group Dynamic Profile on page 780](#)
- *dynamic-profiles*

Enabling Multiple Subscribers on a VLAN Logical Interface for All Static Subscribers

For a given interface, only a single static subscriber (or group) is logged in. Although we do not recommend this practice, you might have other kinds of subscribers configured on the same interface, such as a DHCP subscriber managed by the DHCP application. You can use the **aggregate-clients** statement to extend the dynamic profile for all static subscribers to enable multiple subscribers to share the same VLAN logical interface.

You can specify that attributes (such as CoS or firewall) for the multiple subscribers are merged for the logical interface. That is, the profiles for multiple subscribers of different types are instantiated on the interface, but the profile attributes of each are merged together. Alternatively, you can specify that the instantiated profile for the current subscriber is replaced by the profile of a new subscriber that logs in using the same logical interface. This configuration can be overridden for a group of static subscribers when a different configuration is applied for that group.

To enable multiple subscribers to share the same VLAN logical interface for all static subscribers, do one of the following:

- Specify that the multiple subscriber attributes are merged for the logical interface.

```
[edit system services static-subscribers dynamic-profile dyn-profile-1]
user@host# set aggregate-clients merge
```

- Specify that the entire logical interface is replaced when a new subscriber logs into the network using the same VLAN logical interface.

```
[edit system services static-subscribers dynamic-profile dyn-profile-3]
user@host# set aggregate-clients replace
```

**Related
Documentation**

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Specifying the Static Subscriber Group Dynamic Profile on page 780](#)
- [dynamic-profile on page 1045](#)

Configuring the Static Subscriber Global Authentication Password

You configure a password that is included in the Access-Request message sent to AAA to authenticate all static subscribers. This value can be overridden for a group of static subscribers when a different password is configured for that group.

To specify the authentication password used for all static subscribers:

- Specify the password.

```
[edit system services static-subscribers authentication]
user@host# set password $ABC123
```

Related Documentation

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Configuring the Static Subscriber Group Authentication Password on page 781](#)
- [authentication on page 944](#)

Configuring the Static Subscriber Global Username

You configure how the username is formed. The username serves as the username for all static subscribers that are created and is included in the Access-Request message sent to AAA to authenticate all static subscribers. This value can be overridden for a group of static subscribers when a different username is configured for that group.

The username must include at least one of the five possible elements. The value of each element is concatenated in a specific order; the resulting string is the username. If you specify their inclusion, the interface name, logical system name, and routing instance name are derived from the configuration context. The elements are ordered as follows:

user-prefix.interface.logical-system-name.routing-instance-name@domain-name

To configure the username for all static subscribers:

- (Optional) Specify a prefix for the username.

```
[edit system services static-subscribers authentication username-include]
user@host# set user-prefix Building5
```

- (Optional) Specify that the interface name is included in the username.

```
[edit system services static-subscribers authentication username-include]
user@host# set interface
```

- (Optional) Specify that the logical system name is included in the username.

```
[edit system services static-subscribers authentication username-include]
user@host# set logical-system-name
```

- Specify that the routing instance name is included in the username.

```
[edit system services static-subscribers authentication username-include]
user@host# set routing-instance-name
```

5. Specify the domain name included in the username.

```
[edit system services static-subscribers authentication username-include]  
user@host# set domain-name campus.example.com
```

Configured in the default logical system and master routing instance for interface ge-0/1/1.100, this sample configuration generates the following username:

Building5.ge-0-1-1-100.default.master.campus.example.com

**Related
Documentation**

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Configuring the Static Subscriber Group Username on page 782](#)
- [username-include on page 1422](#)

Configuring the Static Subscribers Group Profile

- [Creating a Static Subscriber Group on page 779](#)
- [Specifying the Static Subscriber Group Access Profile on page 780](#)
- [Specifying the Static Subscriber Group Dynamic Profile on page 780](#)
- [Enabling Multiple Subscribers on a VLAN Logical Interface for a Static Subscriber Group on page 781](#)
- [Configuring the Static Subscriber Group Authentication Password on page 781](#)
- [Configuring the Static Subscriber Group Username on page 782](#)

Creating a Static Subscriber Group

You can override the configuration that is applied globally to static subscribers by creating a static subscriber group that consists of a set of statically configured interfaces. You can then apply a common configuration for the group with values different from the global values for access and dynamic profiles, password, and username.

To configure an interface group for static subscribers:

1. Access the **[edit system services static-subscribers]** hierarchy level.
2. Create the group and assign the name.

```
[edit system services static-subscribers]  
user@host# edit group boston
```

3. Specify the names of one or more interfaces on which static subscribers can be created. You can repeat the **interface interface-name** statement to specify multiple interfaces within the group, but you cannot use the same interface in more than one group.

```
[edit system services static-subscribers group boston]  
user@host# set interface ge-1/0/1.1  
user@host# set interface ge-1/0/1.2
```

4. (Optional) You can use the **upto upto-interface-name** option to specify a range of interfaces for a group.

```
[edit system services static-subscribers group boston]  
user@host# set interface ge-1/0/1.3 upto ge-1/0/1.9
```

5. (Optional) You can use the **exclude** option to exclude a specific interface or a specified range of interfaces from the group. For example:

```
[edit system services static-subscribers group boston]
user@host# set interface ge-1/0/1.1 upto ge-1/0/1.102
user@host# set interface ge-1/0/1.6 exclude
user@host# set interface ge-1/0/1.70 upto ge-1/0/1.80 exclude
```

**Related
Documentation**

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Specifying the Static Subscriber Group Access Profile on page 780](#)
- [Specifying the Static Subscriber Group Dynamic Profile on page 780](#)
- [Configuring the Static Subscriber Group Authentication Password on page 781](#)
- [Configuring the Static Subscriber Group Username on page 782](#)

Specifying the Static Subscriber Group Access Profile

You can override the configured global access profile by specifying a different profile for a group of static subscribers. The access profile triggers AAA services for that group of static subscribers.

To specify the access profile used for a group of static subscribers:

- Specify the profile name.

```
[edit system services static-subscribers group boston]
user@host# set access-profile boston-acs
```

**Related
Documentation**

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [profile on page 1242](#)

Specifying the Static Subscriber Group Dynamic Profile

You can override the configured global dynamic profile by specifying a different profile for a group of static subscribers. The dynamic profile is instantiated when any static subscriber in the group logs in.

To specify the dynamic profile used for a group of static subscribers:

- Specify the profile name.

```
[edit system services static-subscribers group boston]
user@host# set dynamic-profile dyn-profile-2
```

**Related
Documentation**

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Specifying the Static Subscriber Global Dynamic Profile on page 775](#)
- [dynamic-profiles](#)

Enabling Multiple Subscribers on a VLAN Logical Interface for a Static Subscriber Group

For a given interface, only a single static subscriber group (or static subscriber) is logged in. Although we do not recommend this practice, you might have other kinds of subscribers configured on the same interface, such as a DHCP subscriber managed by the DHCP application. You can use the **aggregate-clients** statement to extend the dynamic profile for a static subscriber group to enable multiple subscribers to share the same VLAN logical interface.

You can specify that attributes (such as CoS or firewall) for the multiple subscribers are merged for the logical interface. That is, the profiles for multiple subscribers of different types are instantiated on the interface, but the profile attributes of each are merged together. Alternatively, you can specify that the instantiated profile for the current subscriber group is replaced by the profile of a new subscriber that logs in using the same logical interface. This configuration overrides the configuration applied to all static subscribers that are not members of the group.

To enable multiple subscribers to share the same VLAN logical interface for a static subscriber group, do one of the following:

- Specify that the multiple subscriber attributes are merged for the logical interface.

```
[edit system services static-subscribers group boston dynamic-profile dyn-profile-2]
user@host# set aggregate-clients merge
```

- Specify that the entire logical interface is replaced when a new subscriber logs into the network using the same VLAN logical interface.

```
[edit system services static-subscribers group boston dynamic-profile dyn-profile-4]
user@host# set aggregate-clients replace
```

Related Documentation

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Specifying the Static Subscriber Group Dynamic Profile on page 780](#)
- [dynamic-profile on page 1045](#)

Configuring the Static Subscriber Group Authentication Password

You can override the configured global authentication password by specifying a different password for a group of static subscribers. This password is included in the Access-Request message sent to AAA to authenticate all static subscribers in the group.

To specify the authentication password used for a group of static subscribers:

- Specify the password.

```
[edit system services static-subscribers group boston authentication]
user@host# set password $ABC123
```

Related Documentation

- [Configuring Subscribers over Static Interfaces on page 772](#)

- [Configuring the Static Subscriber Global Authentication Password on page 777](#)
- [authentication on page 944](#)

Configuring the Static Subscriber Group Username

You can override the configured global username by specifying a different username for a group of static subscribers. The username serves as the username for a group of static subscribers that is created and is included in the Access-Request message sent to AAA to authenticate that group.

The username must include at least one of the five possible elements. The value of each element is concatenated in a specific order; the resulting string is the username. If you specify their inclusion, the interface name, logical system name, and routing instance name are derived from the configuration context. The elements are ordered as follows:

user-prefix.interface.logical-system-name.routing-instance-name@domain-name

To configure the username for a group of static subscribers:

1. (Optional) Specify a prefix for the username.

```
[edit system services static-subscribers group boston authentication username-include]
user@host# set user-prefix 2ndFloor
```

2. (Optional) Specify that the interface name is included in the username.

```
[edit system services static-subscribers group boston authentication username-include]
user@host# set interface
```

3. (Optional) Specify that the logical system name is included in the username.

```
[edit system services static-subscribers group boston authentication username-include]
user@host# set logical-system-name
```

4. Specify that the routing instance name is included in the username.

```
[edit system services static-subscribers group boston authentication username-include]
user@host# set routing-instance-name
```

5. Specify the domain name included in the username.

```
[edit system services static-subscribers group boston authentication username-include]
user@host# set domain-name building5.example.com
```

Configured in the default logical system and master routing instance for interface ge-0/1/2.50, this sample configuration generates the following username:

2ndfloor.ge-0-1-2-50.default.master.building5.example.com

Related Documentation

- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Configuring the Static Subscriber Global Username on page 777](#)
- [username-include on page 1422](#)

CHAPTER 82

Configuring the PTSP Feature to Support Dynamic Subscribers

- [PTSP Overview on page 783](#)
- [Juniper Networks Session and Resource Control \(SRC\) and PTSP Overview on page 784](#)
- [Understanding PTSP-SAE Interactions on page 785](#)
- [Packet-Triggered Subscribers Services Overview on page 786](#)
- [Configuring the PTSP Application on page 790](#)
- [Configuring PTSP on page 790](#)

PTSP Overview

The packet-triggered subscribers and policy control (PTSP) feature allows the application of policies to individual source IP addresses flowing through a given interface. A subscriber context is created for each distinct source IP address seen in a given underlying interface. This feature can be used to support dynamic subscribers that are controlled by a subscriber termination device, such as a B-RAS or GGSN device, that is connected to an MX Series 3D Universal Edge Router.

PTSP has the following responsibilities:

- Create a subscriber context for each distinct IPv4 address on a given interface (subscriber context).
- Apply policies to or remove policies from the subscriber context.
- Collect statistics and report for each individual policy for each subscriber context.
- Derive information about subscribers.

You can associate specific subscriber contexts based on IPv4 addresses and provide service activation and deactivation for these subscribers. The Multiservices DPC (MS-DPC) maintains a table of addresses for each subscriber and any corresponding policies. If an address is not found in the subscriber table, then a new subscriber context is created. All policies are defined on a per-subscriber basis. Once the subscribers are present in the subscriber table, PTSP enforces the policies active for the subscriber context. PTSP can report the subscribers to the SAE using the Diameter protocol so that the SRC software can manage the subscribers and services with dynamic policies. You can also configure

static policies, but dynamic policies take precedence over static policies. When you download a new dynamic policy, it takes effect only for new flows. All new flows and TCP connections use the new dynamic policy. Existing flows are not affected by the new policy unless they timeout, after which they are considered a new flow.

Statistics collection that is aggregated on a service rule basis is also shared with the SAE using the Diameter application. These statistics are not written to a flat file. Statistics collection that is aggregated on an application or application group basis is written to a flat file. These statistics are not shared with the SAE using the Diameter protocol.

Hardware Requirements for PTSP for Subscriber Access

PTSP is supported on Juniper Networks MX Series 3D Universal Edge Routers. You must have a Multiservices DPC (MS-DPC) on the MX Series router.

Related Documentation

- [Configuring PTSP on page 790](#)

Juniper Networks Session and Resource Control (SRC) and PTSP Overview

The Juniper Networks Session and Resource Control (SRC) environment provides a central administrative point for managing subscribers and their services. The SRC software runs on Juniper Networks C Series Controllers. The SRC software uses the Diameter protocol for communications between the local peer on a Juniper Networks routing platform and the remote SRC peer on a C Series Controller. The local peer is known as PTSP and is part of the AAA application. The remote SRC peer is the service activation engine (SAE); the SAE acts as the controlling agent in the SRC environment.

The SRC software enables the SAE to activate and deactivate subscriber services (described by SRC policies). The SAE installs or removes policies using a service rule policy template called `__svc_rule__`. This policy template indicates which policy is applied to a new subscriber session. Additional policies are bound to new sessions; they do not affect existing sessions. Note that policy name must be unique between PPR requests. You can use the same rule name within a single request, but you cannot use the same name again in a separate request.

Statistics collection that is aggregated on a service rule basis is also shared with the SAE using the Diameter protocol.



NOTE: More than one Diameter-based application (function) can run on a router simultaneously.



NOTE: When the SRC software downloads PTSP policies, it matches all the application groups defined in the rule of the PTSP policy if the **application-group-any** keyword is used in the policy. The **application-group-any** keyword is not configured on the router although the application group name is defined in the application identification configuration database on the router to process application-aware access list (AACL) rules for accepting or discarding packets. The keyword is considered as an exception because the application group is defined in the application identification database.

Related Documentation

- [Messages Used by Diameter Applications on page 682](#)
- [Diameter AVPs and Diameter Applications on page 687](#)
- [Understanding PTSP-SAE Interactions on page 785](#)
- [Configuring the PTSP Application on page 790](#)
- [Configuring PTSP on page 790](#)

Understanding PTSP-SAE Interactions

This topic describes the sequences of Diameter messages exchanged between PTSP and the SAE as they interact to perform the following tasks for subscriber access:

- Subscriber login

When a packet-triggered subscriber logs in, PTSP sends a Diameter AA-Request message to request service provisioning from the SAE that includes the Session-Id attribute for the new subscriber. If the AA-Request fails, then the subscriber is not considered logged in and the subscriber session is not managed by the SAE. Only the static PTSP rules apply to the subscriber.

The SAE returns a Diameter AA-Answer message with the Result-Code. The AA-Answer message can include the Juniper-Policy-Install AVP (AVP code 2020), which is used to specify a service to attach to the subscriber's IP address.

PTSP can send an AA-Request message to the SAE to confirm activation. The SAE returns a AA-Answer message in acknowledgment. If the AA-Request message fails or the SAE does not respond with an AA-Answer message, the subscriber session is managed by the SAE.

- Service activation and deactivation

The SAE policies provision subscriber services. After a packet-triggered subscriber is logged in, the SAE can send a PPR message to PTSP to activate or deactivate services. A given PPR can include the Juniper-Policy-Install AVP (AVP code 2020) to activate a service or the Juniper-Policy-Remove AVP (AVP code 2027) to deactivate a service.

PTSP sends a PPA message to the SAE when it has completed the tasks requested in the PPR. The PPA indicates the success or failure of the actions requested in the PPR.

- Resynchronization

Either PTSP or the SAE initiates the resynchronization.

The SAE initiates resynchronization at startup or when a backup SAE takes over session control due to resource limits or conditions on the primary SAE. The SAE clears its database of all entries in preparation for the synchronization.

PTSP initiates resynchronization at startup, such as when AAA starts or restarts. PTSP uses the Juniper-Last-Origin-Host AVP (AVP code 2055) to keep track of the active SAE host in a multi-SAE environment. When an SAE in a multi-SAE environment becomes active, it must send an SRQ to PTSP as its first message. PTSP initiates a synchronization when it receives any other message type from an SAE that is different from the SAE indicated in the Juniper-Last-Origin-Host AVP.

Both entities initiate a resynchronization by sending an SRQ message. The recipient responds with an SRR message.

- Statistics collection and reporting per service rule

Statistics information can be sent from the router to the SAE or from the SAE to the router. Both the Diameter Accounting-Request and Accounting-Answer messages include the Juniper-Acct-Record AVP (AVP code 2053) which identifies the policy for which accounting information is requested.

- Subscriber logout

PTSP can determine when there is a logout request for a packet-triggered subscriber in two ways:

- The SAE terminates a subscriber session by sending an ASR message to PTSP.
- PTSP monitors a subscriber session and starts the logout process after 30 minutes of inactivity.

The subscriber logout triggers the final statistics aggregation for all policies and the removal of any policies installed by the SAE. PTSP sends an STR message that indicates the logout event to the SAE.

**Related
Documentation**

- [Juniper Networks Session and Resource Control \(SRC\) and PTSP Overview on page 784](#)
- [Messages Used by Diameter Applications on page 682](#)
- [Diameter AVPs and Diameter Applications on page 687](#)
- [Configuring the PTSP Application on page 790](#)
- [Configuring PTSP on page 790](#)

Packet-Triggered Subscribers Services Overview

The packet-triggered subscribers and policy control (PTSP) feature allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device. You can associate specific subscriber contexts based on IPv4 addresses and provide dynamic service activation and deactivation for these subscribers. Once the subscribers

are present in the subscriber database on the router, PSTP can report the subscribers to the SAE using the PTSP application so that the SRC software can manage the subscribers and services.

PTSP policies can be downloaded dynamically from the external policy manager (such as SRC) or configured statically on the router. The PTSP policies can be configured for each distinct IPv4 source address for a given interface on which the service is configured. Each distinct IPv4 address is considered a subscriber and all PTSP policies are applied on a per-subscriber basis. Dynamic policies, which are always specific to a subscriber, take precedence over static policies.

You can set up PTSP policies to:

- Manage traffic by configuring filtering, rate-limiting, and QoS enforcement in the rules.
- Steer traffic by specifying the forwarding instance in the forward rule.
- Collect accounting information by service rule or by application.

When you configure PTSP policies, you must specify the type of statistics collection (**count**) and the IP address used to identify the packet-triggered subscriber (**demux**) in the service rule. All service rules attached to a given service set must have the same settings for these options.

For the statistics collection type, terms and rules also cannot mix and match the following styles:

- rule—Statistics are aggregated in one bucket for the service rule and Diameter is used to report the statistics.
- application—Statistics are aggregated by application for a specific application, for a specific application group, or in one bucket. The statistics are reported in a flat file.

Subscriber instantiation is triggered for ingress packets by the IP address. When source address is specified, the source IP address of the ingress packets is used to establish the subscriber context. When destination address is specified, the destination IP address of the ingress packets is used to establish the subscriber context. If the IP address does not correspond to a known subscriber, then a new subscriber context is created to log in the packet-triggered subscriber.

The match conditions include local address, local port, remote address, and remote port. The following table describes how the **demux** value changes the IP address or port used for these terms.

Match Conditions	demux source-address		demux destination-address	
	Ingress Flows	Egress Flows	Ingress Flows	Egress Flows
local-address	Source address	Destination address	Destination address	Source address
remote-address	Destination address	Source address	Source address	Destination address
local-port	Source port	Destination port	Destination port	Source port

Match Conditions	demux source-address		demux destination-address	
	Ingress Flows	Egress Flows	Ingress Flows	Egress Flows
remote-port	Destination port	Source port	Source port	Destination port

Subscriber Identification Method for PTSP Partition

The PSTP functionality uses RADIUS attributes, such as *User-Name* to identify subscribers in a RADIUS partition. If a service provider uses a different RADIUS attribute other than *User-Name*, the authentication of subscribers and establishment of client sessions fail. To enable service providers to use a subscriber-identification method that suits their network needs, you can add flexible configurations in the packet-triggered subscriber process.

The PTSP configurable user-identification feature allows you to do the following:

- Configure the subscriber identification method for PTSP partitions, based on the network topology and the service provider requirements.
- Insert subscriber-specific tags for the subscriber's HTTP traffic for which the reference to subscriber-specific tagging is provided using subscriber identification.

The PTSP application generates the subscriber-identification parameter as a text-string by combining the RADIUS attribute value and the internal attribute value of the PTSP partition. The text-string is generated in the same order as the attributes that are configured in the PTSP partition.



NOTE: Only RADIUS partitions support user-identification to configure the subscriber-identification method for PTSP partitions.

PTSP Services on Aggregated and Redundant Services PICs

The packet-triggered subscribers and policy control (PTSP) feature supports both Aggregated Multiservices (AMS) and Redundant Multiservices (RMS) PICs. RMS services interfaces support 1:1 redundancy between two logical PICs and in an active or standby model. AMS services interfaces support load sharing and N:1 redundancy between N logical PICs.



NOTE: The PTSP services do not support load balancing on AMS.

In 1:1 redundancy, if services PIC fails:

- The subscriber is logged out, the traffic is switched to the redundant services PIC, and the subscriber receives a new session ID to log in with.
- The subscriber's last configured accounting data is retrieved as the latest interim accounting record.

In AMS, the PTSP subscriber's traffic is redistributed to other services PIC and the same subscriber may appear on different services PICs. The subscriber with no new data flow is logged out after idle timeout with the complete accounting data. The following example depicts the AMS scenario:

```
ams0 {
  load-balancing-options {
    member-interface mams-4/0/0;
    member-interface mams-4/1/0;
    member-interface mams-5/0/0;
    member-failure-options {
      redistribute-all-traffic;
    }
  }
  unit 1 {
    family inet;
  }
}
```

The traffic on ms-4/0/0 is redistributed to ms-4/1/0 only after ms-5/0/0 has failed. In this example, there are two subscribers: s1 on ms-4/0/0 and s2 on ms-4/1/0. The two subscribers have the same source IP address. If there is no new traffic, s1 is eventually logged out after idle timeout.



NOTE: PTSP does not support any type of hash key for traffic sharing among logical PICs configured with the same PTSP service set. For PTSP to work, all traffic for any given subscriber needs to reach the same logical PIC within an AMS container. For this to happen, the AMS hashing algorithm needs to align with the PTSP demux type, as follows:

- If PTSP is configured for source-demux, then the AMS hashing algorithm must be based on the source-ip-address only.
- If PTSP is configured for destination-demux, then the AMS hashing algorithm must be based on the destination-ip-address only.
- No other type of AMS hashing algorithm is compatible with PTSP.



NOTE: The packet level idle timeout for every packet is assigned from a given subscriber transiting the router. If the timeout limit sets in, the subscriber is logged out. The valid range for the subscriber packet idle timeout is 15 to 1440 minutes.

**Related
Documentation**

- [Configuring PTSP on page 790](#)
- [Configuring Static PTSP Rules on page 799](#)

Configuring the PTSP Application

You can configure the PTSP client application to work with the Session and Resource Control (SRC) peer to centrally manage packet-triggered subscribers and services. PTSP requests address and service authorizations from the remote SRC peer (the SAE), activates and deactivates services as specified by the SAE, logs out subscribers as specified by the SAE, and synchronizes subscriber state and service information with the SAE. The PTSP application also performs statistics collection and reporting.

To configure the PTSP application:

1. Configure the PTSP partition.
See [“Configuring the PTSP Partition” on page 795](#).
2. Assign the PTSP partition.
See [“Assigning the PTSP Partition” on page 796](#).
3. Configure statistics collection and reporting.
See [“Tracing Packet-Triggered Subscriber Operations” on page 875](#).

Related Documentation

- [Juniper Networks Session and Resource Control \(SRC\) and PTSP Overview on page 784](#)

Configuring PTSP

You can configure the packet-triggered subscribers and policy control (PTSP) feature on MX Series routers to allow the application of policies to dynamic subscribers that are controlled by a subscriber termination device, such as a B-RAS or GGSN device, connected to an MX Series router. The subscribers are associated by their IPv4 address and dynamic or static policies can be applied. Dynamic policies take precedence over static policies. When you download a new dynamic policy, it takes effect only for new flows. All new flows and TCP connections use the new dynamic policy. Existing flows are not affected by the new policy unless they timeout, after which they are considered a new flow.

To configure PTSP services on the MX Series router:

1. Configure the Multiservices DPC.
See [“Configuring the Multiservices DPC for PTSP” on page 797](#).
2. Configure the Diameter application to support the download of dynamic PTSP policies from the external policy manager (such as SRC). The PTSP application also provides statistics collection and reporting.
See [“Configuring the PTSP Application” on page 790](#).
3. Configure the static PTSP service rules.
See [“Configuring Static PTSP Rules” on page 799](#).
4. Configure statistics collection and reporting in a flat file.

See [“Configuring a Statistics Profile for PTSP” on page 877](#) and [“Tracing PTSP Operations” on page 879](#).

Related Documentation

- [PTSP Overview on page 783](#)

Configuring the PTSP Partition to Connect to the External Policy Manager

- [Understanding the Subscriber Profiles for Client Sessions per PTSP Partition on page 793](#)
- [Configuring the PTSP Partition on page 795](#)
- [Assigning the PTSP Partition on page 796](#)

Understanding the Subscriber Profiles for Client Sessions per PTSP Partition

Subscriber profiles for service activation enables you to specify which service plug-ins become activated on a per-subscriber basis. Previously, the only control mechanism for specifying service activation was to attach a service-set configuration to a selected interface or route. The new utility allows you to enable or disable services based on the subscriber associated with every data flow. As a result, you can apply differentiated services to different sets of subscribers. You can exercise the control mechanism in one of two ways: by using a CLI operational command or a RADIUS attribute.



NOTE: This feature applies only to MP-SDK services and does not depend on the specific services enabled or disabled, except that PTSP must be included in the chain.

The procedure consists of three steps:

1. Configure a service set that includes all the services to be applied to flows. You can include a default subscriber profile that controls which services are and are not active by default. The default profile applies to all subscribers until overridden for a specific subscriber. In the absence of a default subscriber profile, all services specified in the service set are applied by default. You can also include one or more alternative subscriber profiles that can be implemented to override the default profile. The following sample configuration illustrates these components:

```
services {
  service-set ss1 {
    application-identification-profile appidr1;
    idp-profile idpr1;
    aacl-rules aaclr1;
    hcm_rules hcmr1;
```

```
sfw_rules sfwr1;
subscriber-profile {
    sp1;
}
interface-service {
    service-interface ms-3/0/0.0;
}
}
}
subscriber-profile sp1 {
    disable HCM;
    enable IDP {
        concurrent-data-sessions 10;
    }
    disable AACL;
    max-data-sessions-per-subscriber {
        limit 10;
        exceed-action [ syslog drop ];
    }
}
subscriber-profile sp2 {
    enable HCM;
    disable IDP;
    enable AACL;
    max-data-sessions-per-subscriber {
        limit 100;
        exceed-action [ syslog ];
    }
}
```

Initially, all traffic reaching the service plane under service set ss1 receives all the services configured in service set ss1 that are enabled by the default subscriber profile sp1 applied to it. In the example, APPID, stateful firewall, and IDP are enabled, whereas HCM and AACL are disabled. However IDP is enabled for only at most 10 sessions concurrently. Beyond that threshold, IDP is also disabled. Also, because of the max-data-sessions-per-subscriber setting, any subscriber is allowed a maximum of ten concurrent data sessions. Beyond that threshold, data sessions are logged and dropped.

2. There are two ways to dynamically override the default subscriber profile associated with a particular PTSP subscriber:
 - CLI operational command
 - RADIUS attribute or VSA in an access-accept message.

From the previous example, assume that the subscriber profile for subscriber X is dynamically set to sp2. After that, any new data session associated with subscriber X has a different set of services applied to it. In the example, it would be APPID, stateful firewall, HCM, and AACL. Also, because the max-data-sessions-per-subscriber setting changes to 100, subscriber X now has no upper limit on the number of concurrent data sessions, although if that number crosses the 100 threshold, the threshold-crossing event is logged.

The following examples illustrate the dynamic override settings:

Operational command

```
user@router>request services subscriber clear subscriber-profile
client-id client-id
```

```
user@router>request services subscriber set subscriber-profile
subscriber-profile-name client-id client-id
```

RADIUS configuration

```
user@router# set system services packet-triggered-subscribers
partition-radius foo subscriber-service-profile attribute-26.4874.31
```

3. Processing of a new data session at the service plane takes place as follows, with respect to subscriber profiles:
 1. A new flow starts. MP-SDK sends a SESSION-INTEREST event to the service plug-ins. The first plug-in in the chain is the subscribers (PTSP) plug-in.
 2. The subscribers plug-in matches the flow to its subscriber by searching its database. It sets the subscriber ID in the session metadata.
 3. The subscriber plug-in checks for the corresponding subscriber profile and which services are enabled. It then sets the services mask of enabled and disabled services in the session metadata.
 4. MP-SDK or JSF invokes only the services that are enabled per the services mask. The other services are skipped, even if configured in the service set.



NOTE: : Subscriber-profile changes affect only the upcoming flows. Existing flows remain unaffected.

Configuring the PTSP Partition

PTSP works within a specific logical system: routing instance context, called a partition. The partition is configured to connect to the external policy manager.



NOTE: Currently, only a single partition is supported; you must configure it within the default logical system: routing instance context.

Before you configure the PTSP partition to connect to the external policy manager, perform the following task:

- Configure the Diameter instance for the remote SRC peer at the **[edit diameter]** hierarchy level. See [“Configuring Diameter” on page 699](#).

Configuration for the PTSP partition consists of naming the partition and then associating a Diameter instance, the SAE hostname, and the SAE realm with the partition.

To configure the PTSP partition:

1. Create the partition at the `[edit system services packet-triggered-subscribers]` hierarchy level.

```
[edit system services packet-triggered-subscribers]
user@host# edit partition ptsp-default
```

2. Specify the Diameter instance for the PTSP partition.

```
[edit system services packet-triggered-subscribers partition ptsp-default]
user@host# set diameter-instance master
```

3. Configure the destination host for the PTSP partition.

```
[edit system services packet-triggered-subscribers partition ptsp-default]
user@host# set destination-host sael
```

4. Configure the destination realm for the PTSP partition.

```
[edit system services packet-triggered-subscribers partition ptsp-default]
user@host# set destination-realm generic.example.com
```

5. Configure the subscriber ID for the PTSP partition.

```
[edit system services packet-triggered-subscribers partition-radius
radius-partition-name]
user@host# set subscriber-identification
```

Related Documentation

- [Configuring the PTSP Application on page 790](#)

Assigning the PTSP Partition

You must associate the PTSP partition with the logical system:routing instance.



NOTE: Currently, only the global logical system:routing instance, *master* logical system and default routing instance, is supported.

Before you assign the PTSP partition, perform the following task:

- Configure the PTSP partition. See [“Configuring the PTSP Partition” on page 795](#).

To assign the PTSP partition:

- Specify the partition name at the `[edit system]` hierarchy level.

```
[edit system]
user@host# set packet-triggered-subscribers-partition ptsp-default
```

Related Documentation

- [Configuring the PTSP Application on page 790](#)

Configuring PTSP Services and Rules

- [Configuring the Multiservices DPC for PTSP on page 797](#)
- [Configuring PTSP Service Rules on page 798](#)
- [Configuring Static PTSP Rules on page 799](#)
- [Configuring PTSP Rule Sets on page 801](#)
- [Configuring PTSP Service Sets on page 801](#)
- [Configuring the PTSP Forwarding Instance on page 802](#)

Configuring the Multiservices DPC for PTSP

To configure the Multiservices Dense Port Concentrator (MS-DPC) to support PTSP services, perform the following tasks:

- [Enabling the PTSP Service Package on the Multiservices DPC on page 797](#)
- [Configuring Services Interface for PTSP on page 798](#)

Enabling the PTSP Service Package on the Multiservices DPC

The PTSP feature runs on the Multiservices DPC, you must enable the PTSP service package on the Multiservices DPC before you can configure the PTSP software. The name of the PTSP service package is **jservices-ptsp**.

To enable the PTSP service package:

1. Determine the FPC slot number and the PIC number of the MS-DPC on which you want to enable the PTSP service package.

```
user@host> show chassis hardware
```

In this example, the FPC slot number is 3 and the PIC number is 0.

2. Enable the jservices-ptsp package on the Multiservices DPC.

```
[edit chassis]
```

```
user@host# set fpc 3 pic 0 adaptive-services service-package extension-provider  
package jservices-ptsp
```

Configuring Services Interface for PTSP



NOTE: ams- interfaces and rms- interfaces can be configured for PTSP.

To configure the services interface for PTSP:

1. Enter edit mode for the interface.

```
[edit]
user@host# edit interfaces ms-3/0/0
```

2. Configure a logical unit and specify the protocol family.

```
[edit interfaces ms-3/0/0]
user@host# set unit 0 family inet
```

- Related Documentation**
- [Configuring PTSP on page 790](#)
 - [PTSP Overview on page 783](#)

Configuring PTSP Service Rules

PTSP policies can be downloaded dynamically from the external policy manager (such as SRC) or configured statically on the router. The PTSP policies can be configured for each distinct IPv4 source address for a given interface on which the service is configured. Each distinct IPv4 address is considered a subscriber and all PTSP policies are applied on a per-subscriber basis.

Dynamic policies, which are always specific to a subscriber, take precedence over static policies. When you download a new dynamic policy, it takes effect only for new flows. All new flows and TCP connections use the new dynamic policy. Existing flows are not affected by the new policy unless they timeout, after which they are considered a new flow.

To configure the PTSP policies, perform these tasks:

- To download dynamic policies and to collect statistics with Diameter, configure the Diameter application for PTSP. See [“Configuring the PTSP Application” on page 790](#).
- To configure static policies, see [“Configuring Static PTSP Rules” on page 799](#). To collect statistics in a flat file, see [“Configuring a Statistics Profile for PTSP” on page 877](#).

- Related Documentation**
- [Configuring PTSP on page 790](#)
 - [PTSP Overview on page 783](#)

Configuring Static PTSP Rules

You can configure the static PTSP policies on the router. If the PTSP service is configured on the underlying interface, the PTSP service enforces the policies associated with the subscriber context.

To configure static PTSP rules:

1. Specify the rule that you want to configure.

```
[edit services ptsp]
user@host# edit rule ptspRule1
```

2. Specify the direction in which the rule match is applied.

```
[edit services ptsp rule ptspRule1]
user@host# set match-direction input
```

3. Specify the IP address used for the subscriber context. Subscriber instantiation is always triggered for ingress packets, so this value indicates which IP address in the ingress packets for the flow is used.

```
[edit services ptsp rule ptspRule1]
user@host# set demux source-address
```

4. Specify the statistics aggregation, collection, and reporting style. Terms and rules cannot mix and match different styles.

```
[edit services ptsp rule ptspRule1]
user@host# set count-type rule
```

If you specify the rule style, statistics collection is performed by the Diameter application. If you specify the application style, statistics collection is in a flat file controlled by the local policy decision function (L-PDF).

5. (Optional) Specify the forward rule used for forwarding packets. See [“Configuring the PTSP Forwarding Instance” on page 802](#).

```
[edit services ptsp rule ptspRule1]
user@host# set forward-rule forward-rule-name
```

6. Configure the term precedence for the rule.

```
[edit services ptsp rule ptspRule1]
user@host# edit term 1
```

7. Configure the match conditions for the term. See [Table 74 on page 800](#).

```
[edit services ptsp rule ptspRule1 term 1]
user@host# set from remote-address-range low 203.0.113.2 high 203.0.113.100
user@host# set from remote-address-range low 192.0.2.2 high 192.0.2.253
```

8. (Optional) Specify the action taken when the match conditions are met. See [Table 75 on page 800](#).

```
[edit services ptsp rule ptspRule1 term 1]
user@host# set then count rule
user@host# set then accept
```

[Table 74 on page 800](#) describes the match conditions for PTSP rules.

Table 74: PTSP Match Conditions

Match Condition	Description
application-group-any	Application group name defined in the application identification configuration.
application-groups [<i>application-group-name</i>]	Application group name defined in the application identification configuration.
applications	Application name defined in the application identification configuration.
local-port-range low <i>low-value</i> high <i>high-value</i>	Local port range.
local-ports <i>value-list</i>	Local ports.
protocol <i>protocol-number</i>	IP protocol number.
remote-address (<i>address</i> any-unicast)	Remote IP address. IPv4 only.
remote-address-range low <i>low-value</i> high <i>low-value</i>	Remote address range. IPv4 only.
remote-port-range low <i>low-value</i> high <i>high-value</i>	Remote port range.
remote-ports <i>value-list</i>	Remote ports.
remote-prefix-list <i>prefix-list-name</i>	Prefixes in the specified list.

[Table 75 on page 800](#) describes the actions for PTSP rules.

Table 75: PTSP Actions

Action or Action Modifier	Description
accept	Accept the packet.
count	Increment the specified counter.
discard	Drop the packet.
forwarding-class	Classify the packet into the specified forwarding class.
police	Rate-limit packets based on the specified policer.

Related Documentation

- [Configuring the PTSP Forwarding Instance on page 802](#)
- [Configuring a Statistics Profile for PTSP on page 877](#)

- [Configuring PTSP on page 790](#)
- [PTSP Overview on page 783](#)
- [Packet-Triggered Subscribers Services Overview on page 786](#)

Configuring PTSP Rule Sets

You can define a collection of PTSP rules to determine the actions performed on packets.

To configure static PTSP rule sets:

1. Specify the rule set that you want to configure.

```
[edit services ptsp]
user@host# edit rule-set ptspRules
```

2. Specify the rules in the order that you want them processed.

```
[edit services ptsp rule-set ptspRules]
user@host# set rule ptspRule1
user@host# set rule ptspRule2
```

Related Documentation

- [Configuring Static PTSP Rules on page 799](#)

Configuring PTSP Service Sets

To configure the service set for the PTSP application:

1. Configure the service set that you want to contain the PTSP service.

```
[edit services service-set ptspServiceSet]
user@host# set service-set ptspServiceSet
```

2. Specify the PTSP rules that constitute the service set that is applied to the services interface.

```
[edit services service-set ptspServiceSet]
user@host# set ptsp-rules ptsp-rule1
user@host# set ptsp-rules ptsp-rule2
```

3. Configure the services interface.



NOTE: ams- interfaces and rms- interfaces are supported for PTSP.

```
[edit services service-set ptspServiceSet]
user@host# set interface-service service-interface ms-3/0/0.0
```

4. Associate the service set with the underlying interface from which the subscribers originate. The service set must be applied to the interface facing the subscriber, that is, the interface with the IP address of the subscriber.

```
[edit interfaces ge-4/0/0 unit 0 family inet service]
user@host# set input service-set ptspServiceSet
```

```
user@host# set output service-set ptspServiceSet
```

- Related Documentation**
- [Configuring Static PTSP Rules on page 799](#)
 - [Configuring PTSP Rule Sets on page 801](#)

Configuring the PTSP Forwarding Instance

Before you can forward PTSP traffic, perform these tasks for each forwarding instance:

1. Configure each PTSP forwarding instance as a routing instance type of forwarding.
2. Configure a firewall filter with an action that specifies the routing instance configured in Step 1.
3. Configure the unit number for the Multiservices interface that specifies the filter configured in Step 2 as the input filter.



NOTE: To avoid service set dependency on specific unit numbers, use the same unit number across all Multiservices interfaces where PTSP services are applied.

4. Configure the PTSP forward rule to specify the forwarding instance.



NOTE: When the forwarding instance action is performed on the flow, any postservice filters are not applied to the underlying interface.

If you want to forward traffic for PTSP subscribers, you must specify the forwarding instance for specific subscribers based on IP address, network, or prefix list. The match direction for forward rules is always input.

To configure the PTSP forwarding instance:

1. Specify the PTSP forward rule that you want to use when configuring a PTSP forwarding instance.

```
[edit services ptsp]
user@host# edit forward-rule ptspForward
```

2. Set the term precedence for the forward rule. Term with lowest precedence is evaluated first.

```
[edit services ptsp forward-rule ptspForward]
user@host# edit term 5
```

3. Configure the match conditions for the IP address, address range, or prefix list. See [Table 76 on page 803](#).

```
[edit services ptsp forward-rule ptspForward term 5]
user@host# set from local-address 203.0.113.1
```

Table 76: PTSP Forward Rule Match Conditions

Match Condition	Description
<code>application-groups</code> [<i>application-group-name</i>]	Application group name defined in the application identification configuration.
<code>applications</code>	Application name defined in the application identification configuration.
<code>local-address</code> (<i>address</i> <i>any-unicast</i>)	Local IP address. IPv4 only.
<code>local-address-range</code> <i>low low-value high high-value</i>	Local address range. IPv4 only.
<code>local-prefix-list</code> <i>prefix-list-name</i>	Prefixes in the specified list.



NOTE: You can specify match conditions for applications or application groups that support application identification (APPID) services, but we do not recommend specifying the forwarding instance action when you are using these match conditions in PTSP policies. In this situation, some network topologies may route packets in a manner that causes the flow to be dropped. For example, the APPID services might forward some packets on the default routing instance while the PTSP services forward other packets in the same flow to another routing instance.

4. Configure the forwarding instance action with the routing instance name and the unit number.

```
[edit services ptsp forward-rule ptspForward term 5]
user@host# set then forwarding-instance less-effort-ri 144
```



NOTE: When the forwarding instance action is performed on the flow, any postservice filters are not applied to the underlying interface.

- Related Documentation**
- *APPID Overview*
 - *Routing Instances Overview*

Monitoring and Managing Diameter Information for Subscriber Access

- [Verifying Diameter Node, Instance, and Route Information on page 805](#)
- [Verifying and Managing Diameter Function Information on page 806](#)
- [Verifying and Managing Diameter Peer Information on page 807](#)
- [Verifying Diameter Network Element Information on page 808](#)

Verifying Diameter Node, Instance, and Route Information

Purpose View Diameter node information:

Action • To display summary information about all Diameter nodes:

`user@host> show diameter`

- To display summary information about all Diameter nodes and add information about Diameter functions, instances, network elements, and peers:

`user@host> show diameter brief`

- To display brief information about all Diameter nodes and add information about Diameter routes:

`user@host> show diameter detail`

- To display summary information about all Diameter instances:

`user@host> show diameter instance`

- To display detailed information about all Diameter instances:

`user@host> show diameter instance detail`

- To display information about a specific Diameter instance, add the instance name to the command:

`user@host> show diameter instance master`

`user@host> show diameter instance detail master`

- To display summary information about all Diameter routes:

`user@host> show diameter route`

- To display detailed information about all Diameter routes:

```
user@host> show diameter route detail
```

- To display information about a specific Diameter route, add the route name to the command:

```
user@host> show diameter route dne-route2
```

```
user@host> show diameter route detail dne-route2
```

**Related
Documentation**

- [Configuring Diameter on page 699](#)
- [Configuring Gx-Plus on page 710](#)
- [CLI Explorer](#)

Verifying and Managing Diameter Function Information

Purpose View or clear Diameter function information:

Action

- To display summary information about all functions associated with Diameter:

```
user@host> show diameter function
```

- To display detailed information about all functions associated with Diameter:

```
user@host> show diameter function detail
```

- To display information about a specific function associated with Diameter, add the function name to the command:

```
user@host> show diameter function jsrc
```

```
user@host> show diameter function detail ptsp
```

- To display summary statistics about all functions associated with Diameter:

```
user@host> show diameter function statistics
```

- To display detailed statistics about all functions associated with Diameter:

```
user@host> show diameter function statistics detail
```

- To display statistics about a specific function associated with Diameter, add the function name to the command:

```
user@host> show diameter function statistics gx-plus
```

```
user@host> show diameter function statistics detail jsrc
```

- To delete current statistics for all functions associated with Diameter:

```
user@host> clear diameter function statistics
```

- To delete current statistics for a specific function associated with Diameter:

```
user@host> clear diameter function gx-plus statistics
```

**Related
Documentation**

- [Configuring Diameter on page 699](#)
- [Configuring Gx-Plus on page 710](#)

- [CLI Explorer](#)

Verifying and Managing Diameter Peer Information

Purpose View or clear Diameter peer information:

- Action**
- To display summary information about all Diameter peers:
`user@host> show diameter peer`
 - To display detailed information about all Diameter peers:
`user@host> show diameter peer detail`
 - To display information about a specific Diameter peer, add the peer name to the command:
`user@host> show diameter peer peer235`
`user@host> show diameter peer detail peer235`
 - To display summary information about Diameter peer-to-network-element mapping for all peers:
`user@host> show diameter peer map`
 - To display detailed information about Diameter peer-to-network-element mapping for all peers:
`user@host> show diameter peer map detail`
 - To display information about Diameter peer-to-network-element mapping for a specified peer, add the peer name to the command:
`user@host> show diameter peer map peer235`
`user@host> show diameter peer map detail peer235`
 - To display summary statistics about all Diameter peers:
`user@host> show diameter peer statistics`
 - To display detailed statistics about all Diameter peers:
`user@host> show diameter peer statistics detail`
 - To display summary statistics about a specified Diameter peer:
`user@host> show diameter peer statistics peer235`
 - To display detailed statistics about a specified Diameter peer:
`user@host> show diameter peer statistics detail peer235`
 - To delete the specified Diameter peer and all of its statistics.
`user@host> clear diameter peer peer5 connection`
 - To delete the specified Diameter peer and its current statistics:
`user@host> clear diameter peer peer5 statistics`

- Related Documentation**
- [Configuring Diameter on page 699](#)
 - [CLI Explorer](#)

Verifying Diameter Network Element Information

Purpose View Diameter network element information:

- Action**
- To display summary information about Diameter network elements:
`user@host> show diameter network-element`
 - To display detailed information about Diameter network elements:
`user@host> show diameter network-element detail`
 - To display information about Diameter network elements for a specified network element, include the element name in the command:
`user@host> show diameter network-element dne-1`
`user@host> show diameter network-element detail dne-1`
 - To display summary information about Diameter network-element-to-peer mapping for all network elements:
`user@host> show diameter network-element map`
 - To display detailed information about Diameter network-element-to-peer mapping for all network elements:
`user@host> show diameter network-element map detail`

- Related Documentation**
- [Configuring Diameter on page 699](#)
 - [CLI Explorer](#)

CHAPTER 86

Monitoring and Managing Subscriber Information on Static Interfaces

- [Forcing a Static Subscriber to Be Logged Out on page 809](#)
- [Resetting the State of an Interface for Static Subscriber Login on page 809](#)
- [Forcing a Group of Static Subscribers to Be Logged Out on page 810](#)
- [Resetting the State of an Interface Group for Static Subscriber Login on page 810](#)
- [Verifying Information about Subscriber Sessions on Static Interfaces on page 810](#)

Forcing a Static Subscriber to Be Logged Out

You can force a static subscriber to be logged out on an interface. After you do so, no subscriber can subsequently log in on that interface until the interface state is reset either by a router reset or by entering the **request services static-subscribers login interface** command.

- To forcibly log out a static subscriber on a static interface:
`user@host> request services static-subscribers logout interface ge-2/0/1.5`

Related Documentation

- [Resetting the State of an Interface for Static Subscriber Login on page 809](#)

Resetting the State of an Interface for Static Subscriber Login

When a static subscriber has been forcibly logged out on an interface with the **request services static-subscribers logout interface** command, you can reset the state of the interface. This action enables a static subscriber to log in on the interface. If you do not reset the state manually, then no static subscribers can log in on the interface until the state is reset by a router reset.

- To reset the state of a static interface:
`user@host> request services static-subscribers login interface ge-2/0/1.5`

Related Documentation

- [Forcing a Static Subscriber to Be Logged Out on page 809](#)

Forcing a Group of Static Subscribers to Be Logged Out

You can force the static subscribers on all interfaces in a group to be logged out. After you do so, no subscriber can subsequently log in on an interface in that group until the interface state is reset either by a router reset or by entering the **request services static-subscribers login group** command.

- To forcibly log out all static subscribers on a static interface group:

```
user@host> request services static-subscribers logout group boston
```

Related Documentation

- [Resetting the State of an Interface Group for Static Subscriber Login on page 810](#)

Resetting the State of an Interface Group for Static Subscriber Login

When static subscribers have been forcibly logged out on an interface group with the **request services static-subscribers logout group** command, you can reset the state of the group. This action enables static subscribers to log in on the interfaces in the group. If you do not reset the state manually, then no static subscribers can log in on any interface in the group until the state is reset by a router reset.

- To reset the state of a static interface group:

```
user@host> request services static-subscribers login group boston
```

Related Documentation

- [Forcing a Group of Static Subscribers to Be Logged Out on page 810](#)

Verifying Information about Subscriber Sessions on Static Interfaces

Purpose View information about subscriber sessions on static interfaces:

- Action**
- To display information about all static subscriber sessions:

```
user@host> show static-subscribers sessions
```

- To display information about the subscriber sessions for the specified group of static interfaces:

```
user@host> show static-subscribers sessions group boston
```

- To display information about the subscriber session for the specified interface:

```
user@host> show static-subscribers sessions interface ge-0/0/1.1
```

Related Documentation

- For more information, see the [CLI Explorer](#)
- [Configuring Subscribers over Static Interfaces on page 772](#)
- [Subscribers on Static Interfaces Overview on page 769](#)

CHAPTER 87

Monitoring and Managing Packet-Triggered Subscribers

- [Verifying and Managing PTSP Configuration on page 811](#)

Verifying and Managing PTSP Configuration

Purpose Display and clear information about packet-triggered subscribers and PTSP services.

- Action**
- To display bandwidth information about subscribers:
user@host> [show services subscriber bandwidth](#)
 - To display information about the active dynamic policies applied to a subscriber:
user@host> [show services subscriber dynamic-policies client-id client-id](#)
 - To display information about the data flows associated with a subscriber:
user@host> [show services subscriber flows client-id client-id](#)
 - To display information about the active packet-triggered subscriber sessions on the router:
user@host> [show services subscriber sessions](#)
 - To display information about the data traffic statistics for the packet-triggered subscriber:
user@host> [show services subscriber statistics client-id client-id](#)
 - To clear the active packet-triggered subscriber session on the router and log out the subscriber:
user@host> [clear services subscriber sessions client-id client-id](#)

Related Documentation

- [CLI Explorer](#)

PART 10

Troubleshooting

- [Configuring AAA Testing and Troubleshooting on page 815](#)
- [Tracing Extended DHCP Operations on page 821](#)
- [Configuring Subscriber Management Database Log Files on page 829](#)
- [Configuring Subscriber Management Database Trace Flags and Operations on page 831](#)
- [Configuring Subscriber Management Session Database Log Files on page 833](#)
- [Configuring Subscriber Management Session Database Trace Flags and Operations on page 835](#)
- [Configuring Diameter Base Protocol Log Files on page 839](#)
- [Configuring Diameter Base Protocol Trace Flags and Operations on page 843](#)
- [Troubleshooting Diameter Networks on page 847](#)
- [Configuring ANCP Log Files on page 849](#)
- [Configuring ANCP Trace Flags and Operations on page 853](#)
- [Configuring General Authentication Service Log Files on page 857](#)
- [Configuring General Authentication Service Trace Flags and Operations on page 859](#)
- [Configuring Static Subscriber Interfaces Log Files on page 867](#)
- [Configuring Static Subscriber Interfaces Trace Flags and Operations on page 871](#)
- [Configuring PTSP Tracing Operations on page 875](#)
- [Overriding PCRF Session Control to Troubleshoot a Session or Services on page 881](#)
- [Contacting Juniper Technical Support on page 883](#)

CHAPTER 88

Configuring AAA Testing and Troubleshooting

- [AAA Configuration Testing and Troubleshooting on page 815](#)
- [Testing a Subscriber AAA Configuration on page 815](#)

AAA Configuration Testing and Troubleshooting

Subscriber management supports a test feature that enables you to check the AAA configuration of a subscriber. You might use the test feature to verify the subscriber's AAA settings and to help troubleshoot or isolate subscriber login problems. The AAA test process creates a pseudo session that authenticates the subscriber, allocates an address for the subscriber, and issues an accounting start packet. The process then issues an accounting stop request, releases the address, and terminates the pseudo session.

The AAA test results provide details about the attributes that subscriber management assigns to the subscriber during login. The attributes might be assigned by RADIUS, a dynamic profile, static interface configuration, or might be statically assigned. You can test the AAA configuration for DHCP, PPP, and authd-lite subscribers. For L2TP clients, the AAA test process displays all tunnel parameters but does not create an actual tunnel session.



NOTE: The `test` command does not support volume-time accounting. If volume-time accounting is configured for the test subscriber, the `test` command replaces the statistics with time-only accounting statistics.

Related Documentation

- [Testing a Subscriber AAA Configuration on page 815](#)

Testing a Subscriber AAA Configuration

Purpose Display the AAA attributes that subscriber management assigns to the subscriber during login.

The following example tests the AAA configuration for a PPP subscriber. You can use the `test aaa dhcp user` command to perform a similar test for DHCP subscribers and the `test aaa authd-lite user` command to test authd-lite subscribers.



.....

NOTE: The `test` command does not support volume-time accounting. If volume-time accounting is configured for the test subscriber, the `test` command replaces the statistics with time-only accounting statistics.

.....

Action user@host>test aaa ppp user user45@test.net password \$ABC123

Authentication Grant

*****User Attributes*****

User Name -	user45@test.net
Client IP Address -	192.168.1.1
Client IP Netmask -	255.255.0.0
Virtual Router Name -	default
Agent Remote Id -	NULL
Reply Message -	NULL
Primary DNS IP Address -	0.0.0.0
Secondary DNS IP Address -	0.0.0.0
Primary WINS IP Address -	0.0.0.0
Secondary WINS IP Address -	0.0.0.0
Primary DNS IPv6 Address -	::
Secondary DNS IPv6 Address -	::
Framed Pool -	not set
Class Attribute -	TEST
Service Type -	0
Client IPv6 Address -	::
Client IPv6 Mask -	null
Framed IPv6 Prefix -	::/0
Framed IPv6 Pool -	not-set
NDRA IPv6 Prefix -	not-set
Login IPv6 Host -	::
Framed Interface Id -	0:0:0:0
Delegated IPv6 Prefix -	::/0
Delegated IPv6 Pool -	not-set
User Password -	\$ABC123
CHAP Password -	NULL
Mac Address -	00:00:5E:00:53:ab
Idle Timeout -	600
Session Timeout -	6000
Service Name (1) -	cos-service(video_sch, nc_sch)
Service Statistics (1) -	1
Service Acct Interim (1) -	600
Service Activation Type (1) -	1
Service Name (2) -	filter-service(in_filter,
out_filter)	
Service Statistics (2) -	2
Service Acct Interim (2) -	900
Service Activation Type (2) -	1
Cos shaping rate -	100m
Filter Id -	not set
Framed MTU -	(null)
Framed Route -	not set
Ingress Policy Name -	not set
Egress Policy Name -	not set
IGMP -	disabled
Redirect VR Name -	default
Service Bundle -	Null
Framed Ip Route Tag -	not set
Ignore DF Bit -	disabled
IGMP Access Group Name -	not set
IGMP Access Source Group Name -	not set
MLD Access Group Name -	not set
MLD Access Source Group Name -	not set
IGMP Version -	not set
MLD Version -	not set
IGMP Immediate Leave -	disabled

```

MLD Immediate Leave - disabled
IPv6 Ingress Policy Name - not set
IPv6 Egress Policy Name - not set
Acct Session ID - 1
Acct Interim Interval - 750
Acct Type - 1
Ingress Statistics - disabled
Egress Statistics - disabled
Chargeable user identity - 0
NAS Port Id - -0/0/0.0
NAS Port - 4095
NAS Port Type - 15
Framed Protocol - 1
IPv4 ADF Rule - 010100
IPv4 ADF Rule - 010101
IPv6 ADF Rule - 030100
IPv6 ADF Rule - 030101
****Pausing 10 seconds before disconnecting the test user*****
Logging out subscriber
  Terminate Id - not set
Test complete. Exiting

```

You can use the **agent-remote-id ari** option with the **test aaa dhcp user** and **test aaa ppp user** commands to verify DHCP and PPP subscriber authentication in those networks that support the DSL Forum Agent-Remote-Id (VSA 26-2).

If you specify the DSL Forum Agent-Remote-Id, the output includes the specified value. If you do not specify the VSA, then the Agent-Remote-Id value is shown as **NULL**.

user@host>**test aaa ppp user** thomastank agent-remote-id "(202)555-1212"

```

Authentication Grant
*****User Attributes*****
  User Name - thomastank
  Client IP Address - 192.168.1.1
  Client IP Netmask - 255.255.0.0
  ...
  NAS Ip Address - 0.0.0.0
  Agent Remote Id - (202)555-1212
  ...

```

The following example shows output when the authentication grant fails due to an invalid password:

user@host>**test aaa ppp user** user45@test.net password 55N33%%56

```

Authentication Deny
Reason : Access Denied
Received Attributes :
  User Name - user45@test.net
  Client IP Address - 0.0.0.0
  Client IP Netmask - 0.0.0.0
  Virtual Router Name - default
  Agent Remote Id - NULL
  Reply Message - NULL
  Primary DNS IP Address - 0.0.0.0
  Secondary DNS IP Address - 0.0.0.0
  Primary WINS IP Address - 0.0.0.0
  Secondary WINS IP Address - 0.0.0.0
  Primary DNS IPv6 Address - ::
  Secondary DNS IPv6 Address - ::
  Framed Pool - not set

```

```

Class Attribute -                not set
Service Type -                   0
Client IPv6 Address -            ::
Client IPv6 Mask -               null
Framed IPv6 Prefix -             ::/0
Framed IPv6 Pool -               not-set
NDRA IPv6 Prefix -               not-set
Login IPv6 Host -                ::
Framed Interface Id -            0:0:0:0
Delegated IPv6 Prefix -          ::/0
Delegated IPv6 Pool -            not-set
User Password -                  55N33%%56
CHAP Password -                  NULL
Mac Address -                    00:00:5E:00:53:ab
Filter Id -                      not set
Framed MTU -                     (null)
Framed Route -                   not set
Ingress Policy Name -            not set
Egress Policy Name -             not set
IGMP -                           disabled
Redirect VR Name -               default
Service Bundle -                 Null
Framed Ip Route Tag -            not set
Ignore DF Bit -                  disabled
IGMP Access Group Name -         not set
IGMP Access Source Group Name -  not set
MLD Access Group Name -          not set
MLD Access Source Group Name -   not set
IGMP Version -                   not set
MLD Version -                    not set
IGMP Immediate Leave -           disabled
MLD Immediate Leave -            disabled
IPv6 Ingress Policy Name -        not set
IPv6 Egress Policy Name -         not set
Acct Session ID -                12
Acct Interim Interval -          0
Acct Type -                      0
Ingress Statistics -              disabled
Egress Statistics -               disabled
Chargeable user identity -        0
NAS Port Id -                    -0/0/0.0
NAS Port -                       4095
NAS Port Type -                  15
Framed Protocol -                0
Test complete. Exiting

```

For some networks, such as a Layer 2 network with VLAN-OOB subscribers, RADIUS is configured to provide the subscriber address in a client profile with the Client-Profile-Name VSA (26–174). In the default configuration, the test fails when it does not receive a subscriber address directly from RADIUS. To successfully test these subscribers, you must include the **no-address-request** option. The command output displays the client profile name in the Dynamic Profile field and the name of the routing instance conveyed by the Virtual-Router VSA (26-1) in the Routing Instance field.

```
user@host>test aaa ppp user thomastank no-address-request
```

```

Authentication Grant
*****User Attributes*****
User Name -                thomastank
Client IP Address -         0.0.0.0

```

Client IP Netmask -	0.0.0.0
...	
IPv6 Egress Policy Name -	not set
Dynamic Profile-	filter-service
Routing Instance -	VR27fin
...	

Related Documentation • [AAA Configuration Testing and Troubleshooting on page 815](#)

Tracing Extended DHCP Operations

- [Tracing Extended DHCP Operations on page 821](#)
- [Tracing Extended DHCP Operations for Specific Interfaces on page 827](#)

Tracing Extended DHCP Operations

Both the extended DHCP local server and the extended DHCP relay agent support tracing operations. DHCP tracing operations track extended DHCP operations and record them in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

You can configure DHCP trace operations at the global level and at the interface level. Global DHCP tracing logs all DHCP-related events, whereas interface-level tracing logs only interface-specific DHCP events. If you configure interface-level trace operations, you can specify tracing for a range of interfaces or an individual interface. However, only a single interface-level log file is supported. That is, you cannot specify different interface-level log files for different interfaces or groups of interfaces.

By default, nothing is traced. When you enable the tracing operation, the default tracing behavior is as follows:

- Important events for both global and per-interface tracing are logged in a file located in the `/var/log` directory. By default, the router uses the filename, `jdhcpd`. You can specify a different filename, but you cannot change the directory in which trace files are located.
- When the trace log file *filename* reaches 128 kilobytes (KB), it is compressed and renamed *filename.0.gz*. Subsequent events are logged in a new file called *filename*, until it reaches capacity again. At this point, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally specify the number of trace files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB). (For more information about how log files are created, see the [System Log Explorer](#).)

- By default, only the user who configures the tracing operation can access log files. You can optionally configure read-only access for all users.

To configure global DHCP tracing operations.

- Specify tracing operations for DHCP local server and DHCP relay:

```
[edit system processes dhcp-service]
user@host# edit traceoptions
```

The tracing configuration is applied globally to all DHCP applications in every LS:RI. Configuration of event tracing on a per-LS:RI basis is not supported. DHCP tracing is configurable only in the default LS:RI. However, DHCP applications (local server or relay) do not have to be configured in the default LS:RI.



NOTE: We recommend that you use configure tracing statements at the `[edit system processes dhcp-service]` hierarchy level.

Because you can configure DHCP tracing at three different hierarchy levels (one new and recommended, two old and deprecated), the following rules apply to manage the interaction:

- When you configure a filename or any other options for the trace log file, the configuration at the `[edit system processes dhcp-service]` hierarchy level has the highest precedence, followed by the configuration at the `[edit system services dhcp-local-server]` hierarchy level, and finally with the lowest precedence, the configuration at the `[edit forwarding-options dhcp-relay]` hierarchy level.
- The flag configurations for multiple hierarchy levels are merged and applied to all trace log events.
- The deprecated statements do not support filtering the generation of DHCP trace log events by severity level. If you use these statements, trace logging operates with an implicit severity of **all**, regardless of the severity level configured at the `[edit system processes dhcp-service]` hierarchy level.

For information about configuring per-interface tracing options, see [“Tracing Extended DHCP Operations for Specific Interfaces” on page 826](#).

The extended DHCP traceoptions operations are described in the following sections:

- [Configuring the Extended DHCP Log Filename on page 823](#)
- [Configuring the Number and Size of Extended DHCP Log Files on page 823](#)
- [Configuring Access to the Extended DHCP Log File on page 824](#)
- [Configuring a Regular Expression for Extended DHCP Messages to Be Logged on page 824](#)
- [Configuring the Extended DHCP Tracing Flags on page 824](#)
- [Configuring the Severity Level to Filter Which Extended DHCP Messages Are Logged on page 825](#)
- [Tracing Extended DHCP Operations for Specific Interfaces on page 826](#)

Configuring the Extended DHCP Log Filename

By default, the name of the file that records trace output is **jdhcpd**. You can specify a different name by including the **file** option. DHCP local server and DHCP relay agent both support the **file** option for the **traceoptions** statement and the **interface-traceoptions** statement.

To change the filename:

- Specify a filename for global tracing operations.

```
[edit system processes dhcp-service traceoptions]
user@host# set file filename
```

- Specify a filename for per-interface tracing operations.

```
[edit system processes dhcp-service interface-traceoptions]
user@host# set file filename
```

Configuring the Number and Size of Extended DHCP Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format **.number.gz**. The newest archived file is **.0.gz** and the oldest archived file is **.(maximum number)-1.gz**. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, **filename**, reaches 2 MB, **filename** is compressed and renamed **filename.0.gz**, and a new file called **filename** is created. When the new **filename** reaches 2 MB, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until there are 20 trace files. Then the oldest file, **filename.19.gz**, is simply overwritten when the next oldest file, **filename.18.gz** is compressed and renamed to **filename.19.gz**.

DHCP local server and DHCP relay agent both support the **files** and **size** options for the **traceoptions** statement and the **interface-traceoptions** statement. To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output for global tracing operations.

```
[edit system processes dhcp-service traceoptions]
user@host# set file filename files number size maximum-file-size
```

- Specify the name, number, and size of the file used for the trace output for per-interface tracing operations.

```
[edit system processes dhcp-service interface-traceoptions]
user@host# set file filename files number size maximum-file-size
```

Configuring Access to the Extended DHCP Log File

By default, only the user who configures the tracing operation can access the log files. You can enable all users to read the log file and you can explicitly set the default behavior of the log file.

DHCP local server and DHCP relay agent both support the **world-readable** option and the **no-world-readable** option for the **traceoptions** statement and the **interface-traceoptions** statement. To specify that all users can read the log file:

- Configure the log file to be world-readable for global tracing operations.

```
[edit system processes dhcp-service traceoptions]  
user@host# set file filename world-readable
```

- Configure the log file to be world-readable for per-interface tracing operations.

```
[edit system processes dhcp-service interface-traceoptions]  
user@host# set file filename world-readable
```

To explicitly set the default behavior, in which the log file can only be read by the user who configured tracing:

- Configure the log file to be no-world-readable for global tracing operations.

```
[edit system processes dhcp-service traceoptions]  
user@host# set file filename no-world-readable
```

- Configure the log file to be no-world-readable for per-interface tracing operations.

```
[edit system processes dhcp-service interface-traceoptions]  
user@host# set file filename no-world-readable
```

Configuring a Regular Expression for Extended DHCP Messages to Be Logged

By default, the trace operation output includes all messages relevant to the logged events. You can refine the output by including regular expressions to be matched.

DHCP local server and DHCP relay agent both support the **match** option for the **traceoptions** statement and the **interface-traceoptions** statement. To configure regular expressions to be matched:

- Specify the regular expression for global tracing operations.

```
[edit system processes dhcp-service traceoptions]  
user@host# set file filename match regular-expression
```

- Specify the regular expression for per-interface tracing operations.

```
[edit system processes dhcp-service interface-traceoptions]  
user@host# set file filename match regular-expression
```

Configuring the Extended DHCP Tracing Flags

By default, only important events are logged. You can specify which events and operations are logged by specifying one or more tracing flags.

DHCP local server and DHCP relay agent both support the **flag** option for the **traceoptions** statement and the **interface-traceoptions** statement. A smaller set of flags is supported for interface-level tracing than for global tracing. To configure the flags for the events to be logged:

- Specify the flags for global tracing operations.

```
[edit system processes dhcp-service traceoptions]
user@host# set flag flag
```

- Specify the flags for per-interface tracing operations.

```
[edit system processes dhcp-service interface-traceoptions]
user@host# set flag flag
```

Configuring the Severity Level to Filter Which Extended DHCP Messages Are Logged

The messages associated with a logged event are categorized according to severity level. You can use the severity level to determine which messages are logged for the event type. A low severity level is less restrictive—filters out fewer messages—than a higher level. When you configure a severity level, all messages at that level and all higher (more restrictive) levels are logged.

The following list presents severity levels in order from lowest (least restrictive) to highest (most restrictive). This order also represents the significance of the messages; for example, **error** messages are of greater concern than **info** messages.

- verbose**
- info**
- notice**
- warning**
- error**

The severity level that you configure depends on the issue that you are trying to resolve. In some cases you might be interested in seeing all messages relevant to the logged event, so you specify **all**. You can also specify **verbose** with the same result, because **verbose** is the lowest (least restrictive) severity level; it has nothing to do with the terseness or verbosity of the messages. Either choice generates a large amount of output. You can specify a more restrictive severity level, such as **notice** or **info** to filter the messages. By default, the trace operation output includes only messages with a severity level of **error**.

DHCP local server and DHCP relay agent both support the **level** option for the **traceoptions** statement and the **interface-traceoptions** statement. To configure the flags for the events to be logged:

- Specify the severity level for global tracing operations.

```
[edit system processes dhcp-service traceoptions]
user@host# set level severity
```

- Specify the severity level for per-interface tracing operations.

```
[edit system processes dhcp-service interface-traceoptions]  
user@host# set level severity
```

Tracing Extended DHCP Operations for Specific Interfaces

In addition to the global DHCP tracing operations, subscriber management enables you to trace extended DHCP operations for a specific interface or for a range of interfaces.

Configuring per-interface tracing is a two-step procedure. In the first step, you specify the tracing options that you want to use, such as file information and flags. In the second step, you enable the tracing operation on the specific interfaces.

To configure per-interface tracing operations:

1. Specify the tracing options you want to use.



NOTE: Per-interface tracing uses the same default tracing behavior as the global extended DHCP tracing operation. The default behavior is described in [“Tracing Extended DHCP Operations” on page 821](#).

- a. Specify that you want to configure per-interface tracing options.

- For DHCP local server, DHCPv6 local server, DHCP relay agent, and DHCPv6 relay agent:

```
[edit system processes dhcp-service]  
user@host# edit interface-traceoptions
```

- b. (Optional) Specify the tracing file options.

- Configure the name for the file used for the trace output.

See [“Configuring the Extended DHCP Log Filename” on page 823](#).

- Configure the number and size of the log files.

See [“Configuring the Number and Size of Extended DHCP Log Files” on page 823](#).

- Configure access to the log file.

See [“Configuring Access to the Extended DHCP Log File” on page 824](#).

- Configure a regular expression to filter logging events.

See [“Configuring a Regular Expression for Extended DHCP Messages to Be Logged” on page 824](#).

- c. (Optional) Specify tracing flag options.

See [“Configuring the Extended DHCP Tracing Flags” on page 824](#).

- d. (Optional) Configure a severity level for messages to specify which event messages are logged.

See [“Configuring the Severity Level to Filter Which Extended DHCP Messages Are Logged” on page 825](#).

2. Enable tracing on an interface or interface range.

The following examples show a DHCP local server configuration. You can also use the **trace** statement at the **[edit forwarding-options dhcp-relay]** hierarchy level and at the **[edit system services dhcp-local-server dhcpv6]** hierarchy level.

- Enable tracing on a specific interface.

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

- Enable tracing on a range of interfaces.

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

Tracing Extended DHCP Operations for Specific Interfaces

In addition to the global DHCP tracing operations, subscriber management enables you to trace extended DHCP operations for a specific interface or for a range of interfaces.

Configuring per-interface tracing is a two-step procedure. In the first step, you specify the tracing options that you want to use, such as file information and flags. In the second step, you enable the tracing operation on the specific interfaces.

To configure per-interface tracing operations:

1. Specify the tracing options you want to use.



NOTE: Per-interface tracing uses the same default tracing behavior as the global extended DHCP tracing operation. The default behavior is described in [“Tracing Extended DHCP Operations” on page 821](#).

- a. Specify that you want to configure per-interface tracing options.

- For DHCP local server, DHCPv6 local server, DHCP relay agent, and DHCPv6 relay agent:

```
[edit system processes dhcp-service]
user@host# edit interface-traceoptions
```

- b. (Optional) Specify the tracing file options.

- Configure the name for the file used for the trace output.

See [“Configuring the Extended DHCP Log Filename” on page 823](#).

- Configure the number and size of the log files.

See [“Configuring the Number and Size of Extended DHCP Log Files” on page 823](#).

- Configure access to the log file.

See [“Configuring Access to the Extended DHCP Log File” on page 824](#).

- Configure a regular expression to filter logging events.

See [“Configuring a Regular Expression for Extended DHCP Messages to Be Logged”](#) on page 824.

- c. (Optional) Specify tracing flag options.

See [“Configuring the Extended DHCP Tracing Flags”](#) on page 824.

- d. (Optional) Configure a severity level for messages to specify which event messages are logged.

See [“Configuring the Severity Level to Filter Which Extended DHCP Messages Are Logged”](#) on page 825.

- 2. Enable tracing on an interface or interface range.

The following examples show a DHCP local server configuration. You can also use the **trace** statement at the **[edit forwarding-options dhcp-relay]** hierarchy level and at the **[edit system services dhcp-local-server dhcpv6]** hierarchy level.

- Enable tracing on a specific interface.

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

- Enable tracing on a range of interfaces.

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

**Related
Documentation**

- [Tracing Extended DHCP Operations on page 821](#)

CHAPTER 90

Configuring Subscriber Management Database Log Files

- [Configuring the Number and Size of Subscriber Management Database Log Files on page 829](#)
- [Configuring Access to the Subscriber Management Database Log File on page 830](#)
- [Configuring a Regular Expression for Subscriber Management Database Messages to Be Logged on page 830](#)

Configuring the Number and Size of Subscriber Management Database Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format *.number.gz*. The newest archived file is *.0.gz* and the oldest archived file is *.(maximum number)-1.gz*. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, *filename*, reaches 2 MB, *filename* is compressed and renamed *filename.0.gz*, and a new file called *filename* is created. When the new *filename* reaches 2 MB, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until there are 20 trace files. Then the oldest file, *filename.19.gz*, is simply overwritten when the next oldest file, *filename.18.gz* is compressed and renamed to *filename.19.gz*.

To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output.

```
[edit system services subscriber-management traceoptions]  
user@host# set file smi_1_logfile_1 files 20 size 2097152
```

Related Documentation

- [Tracing Subscriber Management Database Operations for Subscriber Access on page 831](#)

Configuring Access to the Subscriber Management Database Log File

By default, only the user who configures the tracing operation can access the log files. You can enable all users to read the log file and you can explicitly set the default behavior of the log file.

To specify that all users can read the log file:

- Configure the log file to be world-readable.

```
[edit system services subscriber-management traceoptions]  
user@host# set file smi_1_logfile_1 world-readable
```

To explicitly set the default behavior, only the user who configured tracing can read the log file:

- Configure the log file to be no-world-readable.

```
[edit system services subscriber-management traceoptions]  
user@host# set file smi_1_logfile_1 no-world-readable
```

Related Documentation

- [Tracing Subscriber Management Database Operations for Subscriber Access on page 831](#)

Configuring a Regular Expression for Subscriber Management Database Messages to Be Logged

By default, the trace operation output includes all messages relevant to the logged events.

You can refine the output by including regular expressions to be matched.

To configure regular expressions to be matched:

- Configure the regular expression.

```
[edit system services subscriber-management traceoptions]  
user@host# set file smi_1_logfile_1 match regex
```

Related Documentation

- [Tracing Subscriber Management Database Operations for Subscriber Access on page 831](#)

Configuring Subscriber Management Database Trace Flags and Operations

- [Tracing Subscriber Management Database Operations for Subscriber Access on page 831](#)
- [Configuring the Subscriber Management Database Trace Log Filename on page 832](#)
- [Configuring the Subscriber Management Database Tracing Flags on page 832](#)

Tracing Subscriber Management Database Operations for Subscriber Access

The Junos OS trace feature tracks subscriber management database operations and records events in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

By default, nothing is traced. When you enable the tracing operation, the default tracing behavior is as follows:

1. Important events are logged in a file located in the `/var/log` directory. By default, the router uses the filename **smid**. You can specify a different filename, but you cannot change the directory in which trace files are located.
2. When the trace log file **filename** reaches 128 kilobytes (KB), it is compressed and renamed **filename.0.gz**. Subsequent events are logged in a new file called **filename**, until it reaches capacity again. At this point, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally specify the number of trace files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB). (For more information about how log files are created, see the [System Log Explorer](#).)

By default, only the user who configures the tracing operation can access log files. You can optionally configure read-only access for all users.

To configure all aspects of subscriber management database tracing operations:

1. Configure a trace log filename.

See “Configuring the Subscriber Management Database Trace Log Filename” on page 832.

2. Configure the number and size of trace logs.

See “Configuring the Number and Size of Subscriber Management Database Log Files” on page 829.

3. Configure user access to trace logs.

See “Configuring Access to the Subscriber Management Database Log File” on page 830.

4. Configure a regular expression to filter the information to be included in the trace log.

See “Configuring a Regular Expression for Subscriber Management Database Messages to Be Logged” on page 830.

5. Configure flags to specify which events are logged.

See “Configuring the Subscriber Management Database Tracing Flags” on page 832.

Configuring the Subscriber Management Database Trace Log Filename

By default, the name of the file that records trace output for the subscriber management database is **smid**. You can specify a different name with the **file** option.

To configure the filename for subscriber management database tracing operations:

- Specify the name of the file used for the trace output.

```
[edit system services subscriber-management traceoptions]  
user@host# set file smi_logfile_1
```

Related Documentation

- [Tracing Subscriber Management Database Operations for Subscriber Access on page 831](#)

Configuring the Subscriber Management Database Tracing Flags

By default, only important events are logged. You can specify which events and operations are logged by specifying one or more tracing flags.

To configure the flags for the events to be logged:

- Configure the flags.

```
[edit system services subscriber-management traceoptions]  
user@host# set flag flag
```

Related Documentation

- [Tracing Subscriber Management Database Operations for Subscriber Access on page 831](#)

Configuring Subscriber Management Session Database Log Files

- [Configuring the Number and Size of Subscriber Management Session Database Replication Log Files on page 833](#)
- [Configuring Access to the Subscriber Management Session Database Replication Log File on page 834](#)
- [Configuring a Regular Expression for Subscriber Management Session Database Replication Messages to Be Logged on page 834](#)

Configuring the Number and Size of Subscriber Management Session Database Replication Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format *.number.gz*. The newest archived file is *.0.gz* and the oldest archived file is *.(maximum number)-1.gz*. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, *filename*, reaches 2 MB, *filename* is compressed and renamed *filename.0.gz*, and a new file called *filename* is created. When the new *filename* reaches 2 MB, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until there are 20 trace files. Then the oldest file, *filename.19.gz*, is simply overwritten when the next oldest file, *filename.18.gz* is compressed and renamed to *filename.19.gz*.

To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output.

```
[edit system services database-replication traceoptions]  
user@host# set file bdrep_1_logfile_1 files 20 size 2097152
```

- Related Documentation**
- [Tracing Subscriber Management Session Database Replication Operations for Subscriber Access on page 835](#)

Configuring Access to the Subscriber Management Session Database Replication Log File

By default, only the user who configures the tracing operation can access the log files. You can enable all users to read the log file and you can explicitly set the default behavior of the log file.

To specify that all users can read the log file:

- Configure the log file to be world-readable.

```
[edit system services database-replication traceoptions]  
user@host# set file bdrep_1_logfile_1 world-readable
```

To explicitly set the default behavior, only the user who configured tracing can read the log file:

- Configure the log file to be no-world-readable.

```
[edit system services database-replication traceoptions]  
user@host# set file bdrep_1_logfile_1 no-world-readable
```

- Related Documentation**
- [Tracing Subscriber Management Session Database Replication Operations for Subscriber Access on page 835](#)

Configuring a Regular Expression for Subscriber Management Session Database Replication Messages to Be Logged

By default, the trace operation output includes all messages relevant to the logged events.

You can refine the output by including regular expressions to be matched.

To configure regular expressions to be matched:

- Configure the regular expression.

```
[edit system services database-replication traceoptions]  
user@host# set file bdrep_1_logfile_1 match regex
```

- Related Documentation**
- [Tracing Subscriber Management Session Database Replication Operations for Subscriber Access on page 835](#)

Configuring Subscriber Management Session Database Trace Flags and Operations

- [Tracing Subscriber Management Session Database Replication Operations for Subscriber Access on page 835](#)
- [Configuring the Subscriber Management Session Database Replication Trace Log Filename on page 836](#)
- [Configuring the Subscriber Management Session Database Replication Tracing Flags on page 836](#)

Tracing Subscriber Management Session Database Replication Operations for Subscriber Access

The Junos OS trace feature tracks subscriber management database replication operations and records events in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

By default, nothing is traced. When you enable the tracing operation, the default tracing behavior is as follows:

1. Important events are logged in a file located in the **/var/log** directory. By default, the router uses the filename **bdbrepd**. You can specify a different filename, but you cannot change the directory in which trace files are located.
2. When the trace log file **filename** reaches 128 kilobytes (KB), it is compressed and renamed **filename.0.gz**. Subsequent events are logged in a new file called **filename**, until it reaches capacity again. At this point, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally configure the maximum file size to be from 10 KB through 1 gigabyte (GB). You can also specify the number of trace files to be from 2 through 1000. (For more information about how log files are created, see the [System Log Explorer](#).)

By default, only the user who configures the tracing operation can access log files. You can optionally configure read-only access for all users.

To configure all aspects of subscriber management database replication tracing operations:

1. Configure a trace log filename.

See [“Configuring the Subscriber Management Session Database Replication Trace Log Filename” on page 836](#).

2. Configure the number and size of trace logs.

See [“Configuring the Number and Size of Subscriber Management Session Database Replication Log Files” on page 833](#).

3. Configure user access to trace logs.

See [“Configuring Access to the Subscriber Management Session Database Replication Log File” on page 834](#).

4. Configure a regular expression to filter the information to be included in the trace log.

See [“Configuring a Regular Expression for Subscriber Management Session Database Replication Messages to Be Logged” on page 834](#).

5. Configure flags to specify which events are logged.

See [“Configuring the Subscriber Management Session Database Replication Tracing Flags” on page 836](#).

Configuring the Subscriber Management Session Database Replication Trace Log Filename

By default, the name of the file that records trace output for the subscriber management database is **bdbrepd**. You can specify a different name with the **file** option.

To configure the filename for subscriber management database tracing operations:

- Specify the name of the file used for the trace output.

```
[edit system services database-replication traceoptions]  
user@host# set file bdbrep_logfile_1
```

Related Documentation

- [Tracing Subscriber Management Session Database Replication Operations for Subscriber Access on page 835](#)

Configuring the Subscriber Management Session Database Replication Tracing Flags

By default, only important events are logged. You can specify which events and operations are logged by specifying one or more tracing flags.

To configure the flags for the events to be logged:

- Configure the flags.

```
[edit system services database-replication traceoptions]  
user@host# set flag flag
```

- Related Documentation**
- [Tracing Subscriber Management Session Database Replication Operations for Subscriber Access on page 835](#)

Configuring Diameter Base Protocol Log Files

- [Configuring the Number and Size of Diameter Base Protocol Log Files on page 839](#)
- [Configuring Access to the Diameter Base Protocol Log File on page 840](#)
- [Configuring a Regular Expression for Diameter Base Protocol Messages to Be Logged on page 840](#)
- [Configuring the Severity Level to Filter Which Diameter Base Protocol Messages Are Logged on page 840](#)

Configuring the Number and Size of Diameter Base Protocol Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format *.number.gz*. The newest archived file is *.0.gz* and the oldest archived file is *.(maximum number)-1.gz*. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, *filename*, reaches 2 MB, *filename* is compressed and renamed *filename.0.gz*, and a new file called *filename* is created. When the new *filename* reaches 2 MB, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until there are 20 trace files. Then the oldest file, *filename.19.gz*, is simply overwritten when the next oldest file, *filename.18.gz* is compressed and renamed to *filename.19.gz*.

To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output. (Diameter base protocol supports the **files** and **size** options for the **traceoptions** statement.)

```
[edit system processes diameter-service traceoptions]  
user@host# set file diam_1_logfile_1 files 20 size 2097152
```

- Related Documentation**
- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 843](#)

Configuring Access to the Diameter Base Protocol Log File

By default, only the user who configures the tracing operation can access the log files. You can enable all users to read the log file and you can explicitly set the default behavior of the log file.

To specify that all users can read the log file:

- Configure the log file to be world-readable.

```
[edit system processes diameter-service traceoptions]  
user@host# set file diam_1_logfile_1 world-readable
```

To explicitly set the default behavior, only the user who configured tracing can read the log file:

- Configure the log file to be no-world-readable.

```
[edit system processes diameter-service traceoptions]  
user@host# set file diam_1_logfile_1 no-world-readable
```

- Related Documentation**
- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 843](#)

Configuring a Regular Expression for Diameter Base Protocol Messages to Be Logged

By default, the trace operation output includes all messages relevant to the logged events.

You can refine the output by including regular expressions to be matched.

To configure regular expressions to be matched:

- Configure the regular expression.

```
[edit system processes diameter-service traceoptions]  
user@host# set file diam_1_logfile_1 match regex
```

- Related Documentation**
- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 843](#)

Configuring the Severity Level to Filter Which Diameter Base Protocol Messages Are Logged

The messages associated with a logged event are categorized according to severity level. You can use the severity level to determine which messages are logged for the event type. The severity level that you configure depends on the issue that you are trying to resolve. In some cases you might be interested in seeing all messages relevant to the logged event, so you specify **all** or **verbose**. Either choice generates a large amount of

output. You can specify a more restrictive severity level, such as **notice** or **info** to filter the messages. By default, the trace operation output includes only messages with a severity level of **error**.

To configure the type of messages to be logged:

- Configure the message severity level.

```
[edit system processes diameter-service traceoptions]  
user@host# set level severity
```

**Related
Documentation**

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 843](#)

Configuring Diameter Base Protocol Trace Flags and Operations

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 843](#)
- [Configuring the Diameter Base Protocol Trace Log Filename on page 844](#)
- [Configuring the Diameter Base Protocol Tracing Flags on page 844](#)

Tracing Diameter Base Protocol Processes for Subscriber Access

The Junos OS trace feature tracks Diameter base protocol operations and records events in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

By default, nothing is traced. When you enable the tracing operation, the default tracing behavior is as follows:

1. Important events are logged in a file located in the `/var/log` directory. By default, the router uses the filename `jdiameterd`. You can specify a different filename, but you cannot change the directory in which trace files are located.
2. When the trace log file *filename* reaches 128 kilobytes (KB), it is compressed and renamed *filename.0.gz*. Subsequent events are logged in a new file called *filename*, until it reaches capacity again. At this point, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally specify the number of trace files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB). For more information about how log files are created, see the [System Log Explorer](#).

By default, only the user who configures the tracing operation can access log files. You can optionally configure read-only access for all users.

To configure Diameter base protocol tracing operations:

1. (Optional) Configure a trace log filename.
See [“Configuring the Diameter Base Protocol Trace Log Filename” on page 844.](#)
2. (Optional) Configure the number and size of trace logs.
See [“Configuring the Number and Size of Diameter Base Protocol Log Files” on page 839.](#)
3. (Optional) Configure user access to trace logs.
See [“Configuring Access to the Diameter Base Protocol Log File” on page 840.](#)
4. (Optional) Configure a regular expression to filter the information to be included in the trace log.
See [“Configuring a Regular Expression for Diameter Base Protocol Messages to Be Logged” on page 840.](#)
5. (Optional) Configure flags to specify which events are logged.
See [“Configuring the Diameter Base Protocol Tracing Flags” on page 844.](#)
6. (Optional) Configure a severity level for messages to specify which event messages are logged.
See [“Configuring the Severity Level to Filter Which Diameter Base Protocol Messages Are Logged” on page 840.](#)

Configuring the Diameter Base Protocol Trace Log Filename

By default, the name of the file that records trace output for Diameter base protocol is **jdiameterd**. You can specify a different name with the **file** option.

To configure the filename for Diameter base protocol tracing operations:

- Specify the name of the file used for the trace output.

```
[edit system processes diameter-service traceoptions]  
user@host# set file diam_logfile_1
```

Related Documentation

- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 843](#)

Configuring the Diameter Base Protocol Tracing Flags

By default, only important events are logged. You can specify which events and operations are logged by specifying one or more tracing flags.

To configure the flags for the events to be logged:

- Configure the flags.

```
[edit system processes diameter-service traceoptions]  
user@host# set flag dne
```

- Related Documentation**
- [Tracing Diameter Base Protocol Processes for Subscriber Access on page 843](#)

Troubleshooting Diameter Networks

- [Troubleshooting Diameter Network Configuration on page 847](#)
- [Troubleshooting Diameter Network Connectivity on page 847](#)

Troubleshooting Diameter Network Configuration

Problem **Description:** A misconfiguration of the network can prevent Diameter from functioning properly. Configuration options for the Diameter base protocol are simplifying the discovery of a misconfiguration.

Symptoms: The output of the **show diameter peer** command indicates a peer is in the no-activation state. In this case issue the **show diameter peer map** and **show diameter network-element map** commands to determine which network elements use the peer. The output of these commands can indicate why the peer is not activated. For example, all the associated network elements might have higher-priority peers in the open state. The failed-to-forward counters are increasing in the output of the **show diameter function statistics detail** command. this can indicate that the routes to the peer are incorrectly configured. Check the network connectivity, then use the **show diameter routes** command to determine whether application traffic is being correctly forwarded.

Cause Typical misconfigurations appear in the routes, peers, and network element configurations.

Solution Use the appropriate statements to correct the misconfiguration.

Related Documentation

- [show diameter function statistics on page 1635](#)
- [show diameter network-element map on page 1643](#)
- [show diameter peer on page 1646](#)
- [show diameter peer map on page 1651](#)
- [show diameter route on page 1658](#)

Troubleshooting Diameter Network Connectivity

Problem **Description:** In some circumstances, problems can arise with network connectivity to Diameter peers. The problem may originate with the peer or the peer host.

Symptoms: The output of the **show diameter peer** command indicates a peer is in the suspended, rejected, or bad-peer state.

Cause The suspended state indicates that the peer is not responding or has some other malfunction, or the network path to the peer does not exist.

The rejected state indicates that the network connection has been rejected by the peer.

The bad-peer state indicates that the network connection has been rejected by the router on which the peer resides.

Solution Determine how persistent the problem is by issuing the **show diameter peer statistics *peer-name* brief** command to check the connectivity statistics.

Related Documentation

- [show diameter peer on page 1646](#)
- [show diameter peer statistics on page 1654](#)

Configuring ANCP Log Files

- [Configuring the Number and Size of ANCP Log Files on page 849](#)
- [Configuring Access to the ANCP Log File on page 850](#)
- [Configuring a Regular Expression for ANCP Messages to Be Logged on page 850](#)
- [Configuring the Severity Level to Filter Which ANCP Messages Are Logged on page 850](#)

Configuring the Number and Size of ANCP Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format *.number.gz*. The newest archived file is *.0.gz* and the oldest archived file is *.(maximum number)-1.gz*. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, *filename*, reaches 2 MB, *filename* is compressed and renamed *filename.0.gz*, and a new file called *filename* is created. When the new *filename* reaches 2 MB, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until there are 20 trace files. Then the oldest file, *filename.19.gz*, is simply overwritten when the next oldest file, *filename.18.gz* is compressed and renamed to *filename.19.gz*.

To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output.

```
[edit protocols ancp traceoptions]
user@host# set file ancp_1_logfile_1 files 20 size 2097152
```

Related Documentation

- [Tracing ANCP Agent Operations for Subscriber Access on page 853](#)

Configuring Access to the ANCP Log File

By default, only the user who configures the tracing operation can access the log files. You can enable all users to read the log file and you can explicitly set the default behavior of the log file.

To specify that all users can read the log file:

- Configure the log file to be world-readable.

```
[edit protocols ancp traceoptions]  
user@host# set file ancp_1_logfile_1 world-readable
```

To explicitly set the default behavior, only the user who configured tracing can read the log file:

- Configure the log file to be no-world-readable.

```
[edit protocols ancp traceoptions]  
user@host# set file ancp_1_logfile_1 no-world-readable
```

Related Documentation

- [Tracing ANCP Agent Operations for Subscriber Access on page 853](#)

Configuring a Regular Expression for ANCP Messages to Be Logged

By default, the trace operation output includes all messages relevant to the logged events.

You can refine the output by including regular expressions to be matched.

To configure regular expressions to be matched:

- Configure the regular expression.

```
[edit protocols ancp traceoptions]  
user@host# set file ancp_1_logfile_1 match regex
```

Related Documentation

- [Tracing ANCP Agent Operations for Subscriber Access on page 853](#)

Configuring the Severity Level to Filter Which ANCP Messages Are Logged

The messages associated with a logged event are categorized according to severity level. You can use the severity level to determine which messages are logged for the event type. The severity level that you configure depends on the issue that you are trying to resolve. In some cases you might be interested in seeing all messages relevant to the logged event, so you specify **all** or **verbose**. Either choice generates a large amount of output. You can specify a more restrictive severity level, such as **notice** or **info** to filter the messages. By default, the trace operation output includes only messages with a severity level of **error**.

To configure the type of messages to be logged:

- Configure the message severity level.

```
[edit protocols ancp traceoptions]  
user@host# set level severity
```

**Related
Documentation**

- [Tracing ANCP Agent Operations for Subscriber Access on page 853](#)
- [Configuring the ANCP Agent on page 624](#)
- [traceoptions on page 1374](#)

Configuring ANCP Trace Flags and Operations

- [Tracing ANCP Agent Operations for Subscriber Access on page 853](#)
- [Configuring the ANCP Trace Log Filename on page 854](#)
- [Configuring the ANCP Tracing Flags on page 854](#)

Tracing ANCP Agent Operations for Subscriber Access

The Junos OS trace feature tracks ANCP agent operations and records events in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

By default, nothing is traced. When you enable the tracing operation, the default tracing behavior is as follows:

1. Important events are logged in a file located in the `/var/log` directory. By default, the router uses the filename **ancpd**. You can specify a different filename, but you cannot change the directory in which trace files are located.
2. When the trace log file **filename** reaches 128 kilobytes (KB), it is compressed and renamed **filename.0.gz**. Subsequent events are logged in a new file called **filename**, until it reaches capacity again. At this point, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally specify the number of trace files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB). (For more information about how log files are created, see the [System Log Explorer](#).)

By default, only the user who configures the tracing operation can access log files. You can optionally configure read-only access for all users.

To configure ANCP agent tracing operations:

1. (Optional) Configure a trace log filename.
See [“Configuring the ANCP Trace Log Filename” on page 854](#).
2. (Optional) Configure the number and size of trace logs.
See [“Configuring the Number and Size of ANCP Log Files” on page 849](#).
3. (Optional) Configure user access to trace logs.
See [“Configuring Access to the ANCP Log File” on page 850](#).
4. (Optional) Configure a regular expression to filter the information to be included in the trace log.
See [“Configuring a Regular Expression for ANCP Messages to Be Logged” on page 850](#).
5. (Optional) Configure flags to specify which events are logged.
See [“Configuring the ANCP Tracing Flags” on page 854](#).
6. (Optional) Configure a severity level for messages to specify which event messages are logged.
See [“Configuring the Severity Level to Filter Which ANCP Messages Are Logged” on page 850](#).

Related Documentation • [Configuring the ANCP Agent on page 624](#)

Configuring the ANCP Trace Log Filename

By default, the name of the file that records trace output for ANCP is **ancpd**. You can specify a different name with the **file** option.

To configure the filename for ANCP tracing operations:

- Specify the name of the file used for the trace output.

```
[edit protocols ancp traceoptions]  
user@host# set file ancp_1
```

Related Documentation • [Tracing ANCP Agent Operations for Subscriber Access on page 853](#)

Configuring the ANCP Tracing Flags

By default, only important events are logged. You can specify which events and operations are logged by specifying one or more tracing flags.

To configure the flags for the events to be logged:

- Configure the flags.

```
[edit protocols ancp traceoptions]
```

```
user@host# set flag restart
```

Related Documentation

- [Tracing ANCP Agent Operations for Subscriber Access on page 853](#)

Configuring General Authentication Service Log Files

- [Configuring the Number and Size of General Authentication Service Processes Log Files on page 857](#)
- [Configuring Access to the Log File on page 858](#)
- [Configuring a Regular Expression for Lines to Be Logged on page 858](#)

Configuring the Number and Size of General Authentication Service Processes Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format *.number.gz*. The newest archived file is *.0.gz* and the oldest archived file is *.(maximum number)-1.gz*. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, *filename*, reaches 2 MB, *filename* is compressed and renamed *filename.0.gz*, and a new file called *filename* is created. When the new *filename* reaches 2 MB, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until there are 20 trace files. Then the oldest file, *filename.19.gz*, is simply overwritten when the next oldest file, *filename.18.gz* is compressed and renamed to *filename.19.gz*.

To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output, by including the **files** and **size** options with the **traceoptions** statement.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1 files 20 size 2097152
```

- Related Documentation**
- [Tracing General Authentication Service Processes on page 859](#)

Configuring Access to the Log File

By default, log files can be accessed only by the user who configures the tracing operation. You can allow all users to read the log file and you can explicitly set the default behavior of the log file.

To specify that all users can read the log file:

- Configure the log file to be world-readable.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1 world-readable
```

To explicitly set the default behavior, in which the log file can only be read by the user who configured tracing:

- Configure the log file to be no-world-readable.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1 no-world-readable
```

- Related Documentation**
- [Tracing General Authentication Service Processes on page 859](#)

Configuring a Regular Expression for Lines to Be Logged

By default, the trace operation output includes all lines relevant to the logged events. You can refine the output by including regular expressions (regex) that will be matched.

To configure regular expressions to match:

- Configure the regular expression.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1 match regular-expression
```

- Related Documentation**
- [Tracing General Authentication Service Processes on page 859](#)

Configuring General Authentication Service Trace Flags and Operations

- [Tracing General Authentication Service Processes on page 859](#)
- [Configuring the General Authentication Service Processes Trace Log Filename on page 863](#)
- [Configuring the Trace Operation on page 864](#)
- [Configuring Subscriber Filtering for General Authentication Service Trace Operations on page 864](#)

Tracing General Authentication Service Processes

The Junos OS trace operations feature tracks general authentication service operations and records events in a log file. By default, the tracing operation is inactive. To trace general authentication service processes, you specify flags in the **traceoptions** statement at the **[edit system processes general-authentication-service]** hierarchy level. The default tracing behavior is the following:

- Important events are logged in a file located in the **/var/log** directory. By default, the router uses the filename, **authd**. You can specify a different filename, but you cannot change the directory (**/var/log**) in which trace files are located.
- When the trace log file **filename** reaches 128 kilobytes (KB), it is compressed and renamed **filename.0.gz**. Subsequent events are logged in a new file called **filename**, until it reaches capacity again. At this point, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally specify the number of trace files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB). For more information about how log files are created, see the [System Log Explorer](#).

- By default, only the user who configures the tracing operation can access log files. You can optionally configure read-only access for all users.

The general authentication service tracing operations are described in the following sections:

- [Configuring the General Authentication Service Processes Trace Log Filename on page 860](#)
- [Configuring the Number and Size of General Authentication Service Processes Log Files on page 860](#)
- [Configuring Access to the Log File on page 861](#)
- [Configuring a Regular Expression for Lines to Be Logged on page 861](#)
- [Configuring Subscriber Filtering for General Authentication Service Trace Operations on page 861](#)
- [Configuring the Trace Operation on page 862](#)

Configuring the General Authentication Service Processes Trace Log Filename

By default, the name of the file that records trace output for general authentication service is **authd**. You can specify a different name by including the **file** statement at the **[edit system processes general-authentication-service]** hierarchy level:

To configure the filename for general authentication service tracing operations:

- Specify the name of the file used for the trace output.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1
```

Configuring the Number and Size of General Authentication Service Processes Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format **.number.gz**. The newest archived file is **.0.gz** and the oldest archived file is **.(maximum number)-1.gz**. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, **filename**, reaches 2 MB, **filename** is compressed and renamed **filename.0.gz**, and a new file called **filename** is created. When the new **filename** reaches 2 MB, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until there are 20 trace files. Then the oldest file, **filename.19.gz**, is simply overwritten when the next oldest file, **filename.18.gz** is compressed and renamed to **filename.19.gz**.

To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output, by including the **files** and **size** options with the **traceoptions** statement.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1 files 20 size 2097152
```

Configuring Access to the Log File

By default, log files can be accessed only by the user who configures the tracing operation. You can allow all users to read the log file and you can explicitly set the default behavior of the log file.

To specify that all users can read the log file:

- Configure the log file to be world-readable.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1 world-readable
```

To explicitly set the default behavior, in which the log file can only be read by the user who configured tracing:

- Configure the log file to be no-world-readable.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1 no-world-readable
```

Configuring a Regular Expression for Lines to Be Logged

By default, the trace operation output includes all lines relevant to the logged events. You can refine the output by including regular expressions (regex) that will be matched.

To configure regular expressions to match:

- Configure the regular expression.

```
[edit system processes general-authentication-service traceoptions]  
user@host# set file aap_logfile_1 match regular-expression
```

Configuring Subscriber Filtering for General Authentication Service Trace Operations

Starting in Junos OS Release 14.1, you can apply filters to the general authentication service to limit tracing to particular subscribers or domains. Subscriber filtering simplifies troubleshooting in a scaled environment by enabling you to focus on a reduced set of trace results.

For subscriber usernames that have the expected form of **user@domain**, you can filter on the user, the domain, or both. You can use an asterisk (*) as a wildcard to substitute for characters at the beginning or end of either term to match a greater number of subscribers.



NOTE: You cannot filter results using a wildcard in the middle of the user or domain terms. For example, the following uses of the wildcard are not supported: tom*25@example.com, tom125@ex*.com.

When you enable filtering by username, traces that have insufficient information to determine the username are automatically excluded.

To configure subscriber filtering:

- Specify the filter.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user user@domain
```

Consider the following examples of using the wildcard for filtering:

- Filter results for the specific subscriber with the username, tom@example.com.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user tom@example.com
```

- Filter results for all subscribers whose username begins with tom.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user tom*
```

- Filter results for all subscribers whose username ends with tom.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user *tom
```

- Filter results for subscribers with the username tom at all domains beginning with ex.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user tom@ex*
```

- Filter results for all subscribers at all domains that end with ample.com.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user *ample.com
```

- Filter results for all subscribers whose username begins with tom at domains that end with example.com.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user tom*.*example.com
```

Configuring the Trace Operation

By default, only important events are logged. You can specify which trace operations are logged by including specific tracing flags. The following table describes the flags that you can include.

Flag	Description
address-assignment	Trace all address-assignment pool events

Flag	Description
all	Trace all tracing operations
configuration	Trace configuration events
framework	Trace authentication framework events
gx-plus	Trace Gx-Plus events
jsrc	Trace JSRC events
ldap	Trace LDAP authentication events
local-authentication	Trace local authentication events
radius	Trace RADIUS authentication events
user-access	Trace user access events, such as login, logout, and authenticate

To configure the flags for the event to be logged:

- Configure the flags.

```
[edit system processes general-authentication-service traceoptions]
user@host# set flag address-assignment
```

Release History Table

Release	Description
14.1	Starting in Junos OS Release 14.1, you can apply filters to the general authentication service to limit tracing to particular subscribers or domains.

Configuring the General Authentication Service Processes Trace Log Filename

By default, the name of the file that records trace output for general authentication service is **authd**. You can specify a different name by including the **file** statement at the **[edit system processes general-authentication-service]** hierarchy level:

To configure the filename for general authentication service tracing operations:

- Specify the name of the file used for the trace output.

```
[edit system processes general-authentication-service traceoptions]
user@host# set file aap_logfile_1
```

Related Documentation

- [Tracing General Authentication Service Processes on page 859](#)
- [Configuring Address-Assignment Pools on page 567](#)

Configuring the Trace Operation

By default, only important events are logged. You can specify which trace operations are logged by including specific tracing flags. The following table describes the flags that you can include.

Flag	Description
address-assignment	Trace all address-assignment pool events
all	Trace all tracing operations
configuration	Trace configuration events
framework	Trace authentication framework events
gx-plus	Trace Gx-Plus events
jsrc	Trace JSRC events
ldap	Trace LDAP authentication events
local-authentication	Trace local authentication events
radius	Trace RADIUS authentication events
user-access	Trace user access events, such as login, logout, and authenticate

To configure the flags for the event to be logged:

- Configure the flags.

```
[edit system processes general-authentication-service traceoptions]
user@host# set flag address-assignment
```

Related Documentation

- [Tracing General Authentication Service Processes on page 859](#)

Configuring Subscriber Filtering for General Authentication Service Trace Operations

Starting in Junos OS Release 14.1, you can apply filters to the general authentication service to limit tracing to particular subscribers or domains. Subscriber filtering simplifies troubleshooting in a scaled environment by enabling you to focus on a reduced set of trace results.

For subscriber usernames that have the expected form of **user@domain**, you can filter on the user, the domain, or both. You can use an asterisk (*) as a wildcard to substitute for characters at the beginning or end of either term to match a greater number of subscribers.



NOTE: You cannot filter results using a wildcard in the middle of the user or domain terms. For example, the following uses of the wildcard are not supported: tom*25@example.com, tom125@ex*.com.

When you enable filtering by username, traces that have insufficient information to determine the username are automatically excluded.

To configure subscriber filtering:

- Specify the filter.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user user@domain
```

Consider the following examples of using the wildcard for filtering:

- Filter results for the specific subscriber with the username, tom@example.com.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user tom@example.com
```

- Filter results for all subscribers whose username begins with tom.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user tom*
```

- Filter results for all subscribers whose username ends with tom.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user *tom
```

- Filter results for subscribers with the username tom at all domains beginning with ex.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user tom@ex*
```

- Filter results for all subscribers at all domains that end with ample.com.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user *ample.com
```

- Filter results for all subscribers whose username begins with tom at domains that end with example.com.

```
[edit system processes general-authentication-service traceoptions]
user@host# set filter user tom*.*example.com
```

Release History Table

Release	Description
14.1	Starting in Junos OS Release 14.1, you can apply filters to the general authentication service to limit tracing to particular subscribers or domains.

Related Documentation

- [Tracing General Authentication Service Processes on page 859](#)

Configuring Static Subscriber Interfaces Log Files

- [Configuring the Number and Size of Static Subscribers Log Files on page 867](#)
- [Configuring Access to the Static Subscribers Log File on page 868](#)
- [Configuring a Regular Expression for Static Subscriber Messages to Be Logged on page 868](#)
- [Configuring the Severity Level to Filter Which Static Subscriber Messages Are Logged on page 868](#)

Configuring the Number and Size of Static Subscribers Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format *.number.gz*. The newest archived file is *.0.gz* and the oldest archived file is *.(maximum number)-1.gz*. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, *filename*, reaches 2 MB, *filename* is compressed and renamed *filename.0.gz*, and a new file called *filename* is created. When the new *filename* reaches 2 MB, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until there are 20 trace files. Then the oldest file, *filename.19.gz*, is simply overwritten when the next oldest file, *filename.18.gz* is compressed and renamed to *filename.19.gz*.

To configure the number and size of trace files:

- Specify the name, number, and size of the file used for the trace output.

```
[edit system processes static-subscribers traceoptions]  
user@host# set file stat-subs_1_logfile_1 files 20 size 2097152
```

- Related Documentation**
- [Tracing Static Subscriber Operations on page 871](#)

Configuring Access to the Static Subscribers Log File

By default, only the user who configures the tracing operation can access the log files. You can enable all users to read the log file and you can explicitly set the default behavior of the log file.

To specify that all users can read the log file:

- Configure the log file to be world-readable.

[edit system processes static-subscribers [traceoptions](#)]
user@host# set file stat-subs_1_logfile_1 world-readable

To explicitly set the default behavior, only the user who configured tracing can read the log file:

- Configure the log file to be no-world-readable.

[edit system processes static-subscribers [traceoptions](#)]
user@host# set file stat-subs_1_logfile_1 no-world-readable

- Related Documentation**
- [Tracing Static Subscriber Operations on page 871](#)

Configuring a Regular Expression for Static Subscriber Messages to Be Logged

By default, the trace operation output includes all messages relevant to the logged events.

You can refine the output by including regular expressions to be matched.

To configure regular expressions to be matched:

- Configure the regular expression.

[edit system processes static-subscribers [traceoptions](#)]
user@host# set file stat-subs_1_logfile match regex

- Related Documentation**
- [Tracing Static Subscriber Operations on page 871](#)

Configuring the Severity Level to Filter Which Static Subscriber Messages Are Logged

The messages associated with a logged event are categorized according to severity level. You can use the severity level to determine which messages are logged for the event type. The severity level that you configure depends on the issue that you are trying to resolve. In some cases you might be interested in seeing all messages relevant to the logged event, so you specify **all** or **verbose**. Either choice generates a large amount of output. You can specify a more restrictive severity level, such as **notice** or **info** to filter the

messages . By default, the trace operation output includes only messages with a severity level of **error**.

To configure the type of messages to be logged:

- Configure the message severity level.

```
[edit system processes static-subscribers traceoptions]  
user@host# set level severity
```

**Related
Documentation**

- [Tracing Static Subscriber Operations on page 871](#)

Configuring Static Subscriber Interfaces

Trace Flags and Operations

- [Tracing Static Subscriber Operations on page 871](#)
- [Configuring the Static Subscribers Trace Log Filename on page 872](#)
- [Configuring the Static Subscribers Tracing Flags on page 872](#)

Tracing Static Subscriber Operations

The Junos OS trace feature tracks static subscriber operations and records events in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

By default, nothing is traced. When you enable the tracing operation, the default tracing behavior is as follows:

1. Important events are logged in a file located in the `/var/log` directory. By default, the router uses the filename `jsscd`. You can specify a different filename, but you cannot change the directory in which trace files are located.
2. When the trace log file *filename* reaches 128 kilobytes (KB), it is compressed and renamed *filename.0.gz*. Subsequent events are logged in a new file called *filename*, until it reaches capacity again. At this point, *filename.0.gz* is renamed *filename.1.gz* and *filename* is compressed and renamed *filename.0.gz*. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally specify the number of trace files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB). (For more information about how log files are created, see the [System Log Explorer](#).)

By default, only the user who configures the tracing operation can access log files. You can optionally configure read-only access for all users.

To configure static subscriber tracing operations:

1. (Optional) Configure a trace log filename.
See [“Configuring the Static Subscribers Trace Log Filename” on page 872](#).
2. (Optional) Configure the number and size of trace logs.
See [“Configuring the Number and Size of Static Subscribers Log Files” on page 867](#).
3. (Optional) Configure user access to trace logs.
See [“Configuring Access to the Static Subscribers Log File” on page 868](#).
4. (Optional) Configure a regular expression to filter the information to be included in the trace log.
See [“Configuring a Regular Expression for Static Subscriber Messages to Be Logged” on page 868](#).
5. (Optional) Configure flags to specify which events are logged.
See [“Configuring the Static Subscribers Tracing Flags” on page 872](#).
6. (Optional) Configure a severity level for messages to specify which event messages are logged.
See [“Configuring the Severity Level to Filter Which Static Subscriber Messages Are Logged” on page 868](#).

Configuring the Static Subscribers Trace Log Filename

By default, the name of the file that records trace output for static subscribers is **jsscd**. You can specify a different name with the **file** option.

To configure the filename for static subscribers tracing operations:

- Specify the name of the file used for the trace output.

```
[edit system processes static-subscribers traceoptions]  
user@host# set file stat-subs_1
```

Related Documentation • [Tracing Static Subscriber Operations on page 871](#)

Configuring the Static Subscribers Tracing Flags

By default, only important events are logged. You can specify which events and operations are logged by specifying one or more tracing flags.

To configure the flags for the events to be logged:

- Configure the flags.

```
[edit system processes static-subscribers traceoptions]  
user@host# set flag authentication
```

Related Documentation • [Tracing Static Subscriber Operations on page 871](#)

Configuring PTSP Tracing Operations

- [Tracing Packet-Triggered Subscriber Operations on page 875](#)
- [Configuring a Statistics Profile for PTSP on page 877](#)
- [Tracing PTSP Operations on page 879](#)

Tracing Packet-Triggered Subscriber Operations

Packet-triggered subscriber tracing operations track packet-triggered subscriber operations and record them in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

All log files are located in the `/var/log` directory. You cannot change the directory (`/var/log`) in which trace files are located. When the trace file reaches its maximum size, a `.0` is appended to the filename, then a new file is created with a `.1`, and finally a `.2`. When the maximum number of trace files is reached, the oldest trace file is overwritten.

To configure packet-triggered subscriber tracing operations:

1. Specify that you want to configure tracing options.

```
[edit system services packet-triggered-subscribers]
user@host# edit traceoptions
```

2. (Optional) Configure the name for the file used for the trace output.
3. (Optional) Configure the number and size of the log files.
4. (Optional) Configure flags to filter the operations to be logged.

The packet-triggered subscriber traceoptions operations are described in the following sections:

- [Configuring the Packet-Triggered Subscribers Trace Log Filename on page 876](#)
- [Configuring the Size of Packet-Triggered Subscribers Log Files on page 876](#)
- [Configuring the Packet-Triggered Subscribers Tracing Flags on page 876](#)

Configuring the Packet-Triggered Subscribers Trace Log Filename

By default, the name of the file that records trace output for packet-triggered subscribers is **jptspd**. You can specify a different name with the **file** option.

To configure the filename for packet-triggered subscribers tracing operations:

- Specify the name of the file used for the trace output.

```
[edit system services packet-triggered-subscribers traceoptions]
user@host# set file ptsp-subsys_1
```

Configuring the Size of Packet-Triggered Subscribers Log Files

You can optionally specify the number of compressed, archived trace log files to be from 2 through 1000. You can also configure the maximum file size to be from 10 KB through 1 gigabyte (GB); the default size is 128 kilobytes (KB).

The archived files are differentiated by a suffix in the format **.number.gz**. The newest archived file is **.0.gz** and the oldest archived file is **.(maximum number)-1.gz**. When the current trace log file reaches the maximum size, it is compressed and renamed, and any existing archived files are renamed. This process repeats until the maximum number of archived files is reached, at which point the oldest file is overwritten.

For example, you can set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation, **filename**, reaches 2 MB, **filename** is compressed and renamed **filename.0.gz**, and a new file called **filename** is created. When the new **filename** reaches 2 MB, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until there are 20 trace files. Then the oldest file, **filename.19.gz**, is simply overwritten when the next oldest file, **filename.18.gz** is compressed and renamed to **filename.19.gz**.

To configure the size of trace files:

- Specify the name and size of the file used for the trace output.

```
[edit system services packet-triggered-subscribers traceoptions]
user@host# set file ptsp-subsys_1_logfile_1 size 2097152
```

Configuring the Packet-Triggered Subscribers Tracing Flags

To configure the flags for the events to be logged:

- Configure the flags.

```
[edit system services packet-triggered-subscribers traceoptions]
user@host# set flag peer
user@host# set flag session
```

**Related
Documentation**

- [Configuring the PTSP Application on page 790](#)

Configuring a Statistics Profile for PTSP

The local policy decision function (L-PDF) enables you to configure properties for statistics output by creating a statistics profile. The statistics profile configures the files to which statistics records are exported and the format that is exported. You configure the statistics profile so that the statistics records are exported to a flat file. Flat files contain statistics that are collected for each subscriber by application or application group. The statistics in a flat file are not transmitted to the external policy manager using Diameter.

To configure a statistics profile for PTSP:

1. Specify that you want to configure a statistics profile.

```
[edit system services local-policy-decision-function]
user@host# edit statistics
```

2. Configure the file properties used for the trace output.
3. Configure the profile properties.
4. Specify the record type.

Tasks to configure a statistics profile for PTSP are:

- [Configuring the File Properties for Statistics Data Output on page 877](#)
- [Configuring the Profile Properties for Statistics Data Output on page 878](#)
- [Configuring the Record Type for Statistics Data on page 878](#)

Configuring the File Properties for Statistics Data Output

You configure a file to which the statistics data output is exported in a specified format.

To configure the file properties:

1. Specify the unique filename for receiving statistics data output.

```
[edit system services local-policy-decision-function statistics]
user@host# edit file ptsp
```

2. (Optional) Specify the maximum number of files that are maintained at one time and the maximum size of each file. If you configure one of these options, you also must set the other option.

```
[edit system services local-policy-decision-function statistics file ptsp]
user@host# set files 10 size 1g
```

3. Specify the interval for transferring files to archive sites.

```
[edit system services local-policy-decision-function statistics file ptsp]
user@host# set transfer-interval 60
```

4. Specify one or more URLs for archiving the files. Archiving can be done by using FTP or SCP.

```
[edit system services local-policy-decision-function statistics file ptsp]
user@host# set archive-sites "ftp://anonymous@203.0.113.114"
```

Configuring the Profile Properties for Statistics Data Output

You can create an ACL statistics profile, which configures the statistics to collect and write to a file in the `/var/stats/acl` directory.

To configure the profile properties:

1. Specify the name of the profile.

```
[edit system services local-policy-decision-function statistics]
user@host# edit acl-statistics-profile ptsp
```

2. (Optional) Specify the file in the `/var/stats/acl` directory in which statistics are collected. Enclose the name within quotation marks.

```
[edit system services local-policy-decision-function statistics acl-statistics-profile
ptsp]
user@host# set file "pstp"
```

3. Set the interval for reporting statistics.

```
[edit system services local-policy-decision-function statistics acl-statistics-profile
ptsp]
user@host# set report-interval 5
```

4. Set the **interim-active-only** mode for reporting statistics. This mode reports only statistics that have changed in the past report interval.

```
[edit system services local-policy-decision-function statistics acl-statistics-profile
ptsp]
user@host# set record-mode interim-active-only
```

5. Specify the statistics to be collected in the log file.

```
[edit system services local-policy-decision-function statistics acl-statistics-profile
ptsp]
user@host# set acl-fields all-fields
```

Configuring the Record Type for Statistics Data

You must configure the interim record type for recording the ACL statistics.

To configure the record type:

- Specify interim as the record type.

```
[edit system services local-policy-decision-function statistics]
user@host# set record-type interim
```

Related Documentation

- [Tracing PTSP Operations on page 879](#)
- [Configuring PTSP on page 790](#)

Tracing PTSP Operations

Tracing operations track L-PDF operations and record them in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

By default, no events are traced. When you enable the tracing operation, the default tracing behavior is as follows:

1. Important events are logged in a file located in the `/var/log` directory. By default, the router uses the filename, **ptspd**. You can specify a different filename, but you cannot change the directory in which trace files are located.
2. When the trace log file **filename** reaches 128 kilobytes (KB), it is compressed and renamed **filename.0.gz**. Subsequent events are logged in a new file called **filename**, until it reaches capacity again. At this point, **filename.0.gz** is renamed **filename.1.gz** and **filename** is compressed and renamed **filename.0.gz**. This process repeats until the number of archived files reaches the maximum file number. Then the oldest trace file—the one with the highest number—is overwritten.

You can optionally configure the maximum file size to be from 10 KB through 1 gigabyte (GB). You can also specify the number of trace files to be from 2 through 1000. (For more information about how log files are created, see the [System Log Explorer](#).)

To customize trace file settings:

1. Specify that you want to configure tracing options.

```
[edit system services local-policy-decision-function]
user@host# edit traceoptions
```
2. Configure the filename used for the trace output.

```
[edit system services local-policy-decision-function traceoptions]
user@host# set file lpdfd
```
3. (Optional) Configure the maximum number and size of the log files. If you configure one of these options, you also must set the other option.

```
[edit system services local-policy-decision-function traceoptions]
user@host# set files 10 size 1g
```
4. (Optional) Specify flags to filter the operations to be logged. To specify more than one flag, include multiple **flag** statements.

```
[edit system services local-policy-decision-function traceoptions]
user@host# set flag ptsp-statistics
```

The following table describes the flags that you can include.

Flag	Description
configuration	Trace configuration events
database	Trace database events

Flag	Description
general	Trace general flow
ptsp-statistics	Trace PTSP events
rtsock	Trace routing socket events
statistics	Trace statistics events
subscriber	Trace subscriber events

- Related Documentation**
- [Configuring a Statistics Profile for PTSP on page 877](#)
 - [Configuring PTSP on page 790](#)

Overriding PCRF Session Control to Troubleshoot a Session or Services

- [Disabling PCRF Control of a Subscriber Session on page 881](#)

Disabling PCRF Control of a Subscriber Session

When a subscriber has been provisioned with Gx-Plus, services for that subscriber can be activated and deactivated only by the PCRF. Accordingly, AAA rejects any RADIUS CoA requests for subscribers provisioned by Gx-Plus. Similarly, CLI-based service activation and deactivation do not work while a subscriber is remotely provisioned.

Network administrators without PCRF access or authority may need to override PCRF control on a particular subscriber session to troubleshoot the session or correct the subscriber services. You can disable PCRF control by issuing the **request network-access aaa subscriber set session-id** command. In response, the router sends a termination notice to the PCRF, but does not actually log out the subscriber.

When you have confirmed that provisioning is disabled, you can then activate or deactivate subscriber services for that session with the **request network-access aaa subscriber add session-id** and **request network-access aaa subscriber delete session-id** commands, respectively. These commands fail if provisioning is still enabled.

Another consequence of disabling provisioning for a subscriber session is that RADIUS change of authorization (CoA) messages can modify the session.

Before you begin, determine or verify the ID for the session by displaying the session IDs of all current subscribers with the **show subscribers detail** or **show network-access aaa subscribers** command.

To disable control by the PCRF over a subscriber session:

1. Disable provisioning for the specified subscriber session ID.

```
user@host> request network-access aaa subscriber set session-id subscriber-session-id  
provisioning-state none
```

2. (Optional) Verify that provisioning is disabled for the session.

```
user@host> show network-access aaa subscribers session-id subscriber-session-id  
detail
```

For example, to disable provisioning for subscriber larry:

```
user@host> show network-access aaa subscribers
Username      Logical system/Routing instance  Client type  Session-ID
...
larry         default:default                  dhcp         55
...

user@host> request network-access aaa subscriber set session-id 55 provisioning-state none
user@host> show network-access aaa subscribers session-id 55 detail
Type: dhcp
Username: user23@example.net
Stripped username: user23
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:retail-onlinecompany-ca
Access-profile:retailer-onlinecompany-sjc
Session ID: 55
Accounting Session ID: 55
Multi Accounting Session ID: 0
IP Address: 192.168.44.104
Authentication State: AuthStateActive
Accounting State: Acc-Start-Send
Provisioning-type: none
Service name: basic-service
Service State: SvcActive
Session ID: 56
Session uptime: 00:01:45
```

Related Documentation • [Activating and Deactivating Subscriber Services Locally with the CLI on page 588](#)

Contacting Juniper Technical Support

- [Collecting Subscriber Access Logs Before Contacting Juniper Networks Technical Support on page 883](#)
- [Compressing Troubleshooting Logs from /var/logs to Send to Juniper Networks Technical Support on page 885](#)

Collecting Subscriber Access Logs Before Contacting Juniper Networks Technical Support

Problem **Description:** When you experience a subscriber access problem in your network, we recommend that you collect certain logs before you contact Juniper Networks Technical Support. This topic shows you the most useful logs for a variety of network implementations. In addition to the relevant log information, you must also collect standard troubleshooting information and send it to Juniper Networks Technical Support in your request for assistance.

Solution To collect standard troubleshooting information:

- Redirect the command output to a file.
`user@host> request support information | save rsi-1`

To configure logging to assist Juniper Networks Technical Support:

1. Review the following blocks of statements to determine which apply to your configuration.

[edit]

```
set system syslog archive size 100m files 25
set system auto-configuration traceoptions file filename
set system auto-configuration traceoptions file filename size 100m files 25
set protocols ppp-service traceoptions file filename size 100m files 25
set protocols ppp-service traceoptions level all
set protocols ppp-service traceoptions flag all
set protocols ppp traceoptions file filename size 100m files 25
set protocols ppp traceoptions level all
set protocols ppp traceoptions flag all
set protocols ppp monitor-session all
set interfaces pp0 traceoptions flag all
set demux traceoptions file filename size 100m files 25
set demux traceoptions level all
set demux traceoptions flag all
set system processes dhcp-service traceoptions file filename
set system processes dhcp-service traceoptions file size 100m
set system processes dhcp-service traceoptions file files 25
set system processes dhcp-service traceoptions flag all
set class-of-service traceoptions file filename
set class-of-service traceoptions file size 100m
set class-of-service traceoptions flag all
set class-of-service traceoptions file files 25
set routing-options traceoptions file filename
set routing-options traceoptions file size 100m
set routing-options traceoptions flag all
set routing-options traceoptions file files 25
set interfaces traceoptions file filename
set interfaces traceoptions file size 100m
set interfaces traceoptions flag all
set interfaces traceoptions file files 25
set system processes general-authentication-service traceoptions file filename
set system processes general-authentication-service traceoptions file size 100m
set system processes general-authentication-service traceoptions flag all
set system processes general-authentication-service traceoptions file files 25
```

2. Copy the relevant statements into a text file and modify the log filenames as you want.
3. Copy the statements from the text file and paste them into the CLI on your router to configure logging.
4. Commit the logging configuration to begin collecting information.



NOTE: The maximum file size for DHCP local server and DHCP relay log files is 1 GB. The maximum number of log files for DHCP local server and DHCP relay is 1000.



BEST PRACTICE: Enable these logs only to collect information when troubleshooting specific problems. Enabling these logs during normal operations can result in reduced system performance.

**Related
Documentation**

- [Compressing Troubleshooting Logs from /var/logs to Send to Juniper Networks Technical Support on page 885](#)

Compressing Troubleshooting Logs from /var/logs to Send to Juniper Networks Technical Support

Problem **Description:** You have collected logs on your device and need to send them to Juniper Networks Technical Support. This topic shows you how to compress the logs into a single file for each Routing Engine to more conveniently send the logs.

Solution You can compress all the log files in the **/var/log** directories of the master and backup (if present) Routing Engines into a single **tgz** file for each Routing Engine, which enables you to send the logs to JTAC in a convenient package. You can use either the CLI or the command shell to perform these tasks; because of its ease of use, only the CLI version is shown here.

1. Access the device through the management IP address or console, typically on the master Routing Engine, RE0.

```
user@host>
```

2. Archive and compress all the log files on RE0 and put them in **/var/tmp**.

```
user@host> file archive compress source /var/log/* destination /var/tmp/re0.tgz
/usr/bin/tar: Removing leading '/' from member names
```

3. Confirm that the compressed archive file has been created.

```
user@host> file list /var/tmp
baseline-config.conf
gres-tp
idp_license_info
install
jinstall-12.2-20120328.0-domestic-signed.tgz
krt_gencfg_filter.txt
preinstall_boot_loader.conf
re0.tgz
rtsdb
sec-download
vi.recover
```

On devices with a single Routing Engine, skip to Step 10.

4. Log in to the backup Routing Engine, RE1, and access the CLI.



NOTE: **1** is appended to the hostname in the prompt to signify that you are on RE1.

```
user@host> request routing-engine login backup
% cli
user@host11>
```

5. Archive and compress all the log files on RE1 and put them in **/var/tmp**.

```
user@host1> file archive compress source /var/log/* destination /var/tmp/re1.tgz
/usr/bin/tar: Removing leading '/' from member names
```

6. Confirm that the compressed archive file has been created.

```
user@host1> file list /var/tmp
baseline-config.conf
gres-tp
idp_license_info
install
jinstall-12.2-20120328.0-domestic-signed.tgz
krt_gencfg_filter.txt
preinstall_boot_loader.conf
re1.tgz
rtsdb
sec-download
vi.recover
%
```

7. Exit the remote login to the backup Routing Engine to return to the master Routing Engine. Note that the previously appended **1** is removed from the hostname in the prompt to signify that you are back on RE0.

```
user@host1> exit
rlogin: connection closed
```

```
user@host1>
```

8. Copy the compressed archive file from RE1 to RE0.

```
user@host> file copy re1:/var/tmp/re1.tgz /var/tmp
```

9. Confirm the presence of the copied file.

```
user@host> file list /var/tmp
baseline-config.conf
gres-tp
idp_license_info
install
jinstall-12.2-20120328.0-domestic-signed.tgz
krt_gencfg_filter.txt
preinstall_boot_loader.conf
re0.tgz
re1.tgz
rtsdb
sec-download
vi.recover
%
```

10. Copy the files directly from the master Routing Engine to any local host using FTP, SCP, JWEB, or (on some devices) a mounted USB.

Related Documentation

- [Collecting Subscriber Access Logs Before Contacting Juniper Networks Technical Support on page 883](#)

PART 11

Configuration Statements and Operational Commands

- [Configuration Statements on page 889](#)
- [Operational Commands on page 1433](#)

Configuration Statements

- `aaa-logical-system` (Domain Map) on page 904
- `aaa-routing-instance` (Domain Map) on page 905
- `abated-utilization` (Address-Assignment Pools) on page 906
- `abated-utilization-v6` (Address-Assignment Pools) on page 906
- `accept-max-tcp-connections` (System Process) on page 907
- `access-identifier` on page 907
- `access-loop-id-local` on page 908
- `access-profile` on page 909
- `access-profile` (Extensible Subscriber Services Manager) on page 910
- `access-profile` (Domain Map) on page 910
- `access-profile` (Static Subscribers) on page 911
- `access-profile-name` (Duplicate Accounting) on page 912
- `accounting` (Access Profile) on page 913
- `accounting` (Service Accounting) on page 914
- `accounting-backup-options` (Access Profile) on page 914
- `accounting-order` (Service Accounting) on page 915
- `accounting-port` on page 916
- `accounting-retry` (RADIUS) on page 917
- `accounting-server` on page 918
- `accounting-session-id-format` on page 918
- `accounting-stop-on-access-deny` on page 919
- `accounting-stop-on-failure` on page 919
- `accounting-timeout` (RADIUS) on page 920
- `active-server-group` on page 921
- `address` (Diameter Peer) on page 922
- `address` (Diameter Transport) on page 922
- `address-assignment` (Address-Assignment Pools) on page 923
- `address-change-immediate-update` on page 924

- [address-pool \(Domain Map\) on page 924](#)
- [address-protection on page 925](#)
- [adjacency-timer on page 926](#)
- [advisory-options \(Traffic Shaping\) on page 927](#)
- [aggregate-clients \(DHCP Relay Agent\) on page 928](#)
- [aggregate-clients \(Static Subscribers\) on page 930](#)
- [allow-bulk-leasequery \(DHCP Local Server\) on page 931](#)
- [allow-leasequery \(DHCP Local Server\) on page 932](#)
- [always-write-giaddr on page 933](#)
- [always-write-option-82 on page 934](#)
- [ancp on page 935](#)
- [ancp-speed-change-immediate-update \(ANCP\) on page 936](#)
- [application-group-any on page 937](#)
- [application-groups on page 937](#)
- [applications \(Services PTSP\) on page 938](#)
- [attempts \(DHCP Local Server\) on page 939](#)
- [attempts \(DHCP Relay Agent\) on page 940](#)
- [attributes on page 941](#)
- [attributes \(JSRC Attributes\) on page 941](#)
- [authentication \(DHCP Local Server\) on page 942](#)
- [authentication \(DHCP Relay Agent\) on page 943](#)
- [authentication \(Static Subscribers\) on page 944](#)
- [authentication-order on page 945](#)
- [authentication-server on page 946](#)
- [authorization-order on page 947](#)
- [autonomous \(Dynamic Router Advertisement\) on page 948](#)
- [boot-file on page 948](#)
- [boot-server on page 949](#)
- [bulk-leasequery \(DHCP Relay Agent\) on page 949](#)
- [called-station-id \(OCS Partition\) on page 950](#)
- [calling-station-id-delimiter \(Subscriber Management\) on page 950](#)
- [calling-station-id-format \(Subscriber Management\) on page 951](#)
- [chap-challenge-in-request-authenticator \(Subscriber Management\) on page 952](#)
- [charging-id \(OCS Partition\) on page 952](#)
- [charging-service-list on page 953](#)
- [circuit-id \(DHCP Relay Agent\) on page 954](#)
- [circuit-id \(Address-Assignment Pools\) on page 956](#)

- [circuit-type \(DHCP Local Server\)](#) on page 957
- [circuit-type \(DHCP Relay Agent\)](#) on page 958
- [clear-on-abort \(DHCP Local Server\)](#) on page 959
- [client-accounting-algorithm](#) on page 960
- [client-authentication-algorithm](#) on page 961
- [client-discover-match \(DHCP Local Server\)](#) on page 962
- [client-discover-match \(DHCP Relay Agent\)](#) on page 963
- [client-id \(DHCP Local Server\)](#) on page 964
- [client-id \(DHCP Relay Agent\)](#) on page 965
- [client-idle-timeout](#) on page 966
- [client-idle-timeout-ingress-only](#) on page 967
- [client-negotiation-match \(DHCPv6 Local Server\)](#) on page 968
- [client-negotiation-match \(DHCPv6 Relay Agent\)](#) on page 969
- [client-session-timeout](#) on page 970
- [commit-interval](#) on page 971
- [coa-dynamic-variable-validation](#) on page 972
- [coa-immediate-update](#) on page 972
- [coa-no-override service-class-attribute](#) on page 973
- [configuration-database \(Enhanced Subscriber Management\)](#) on page 973
- [concurrent-data-sessions](#) on page 974
- [connect-actively](#) on page 974
- [count-type](#) on page 975
- [current-hop-limit \(Dynamic Router Advertisement\)](#) on page 976
- [database-replication \(Subscriber Session Database\)](#) on page 976
- [default-action \(DHCP Relay Agent Option\)](#) on page 977
- [default-lifetime \(Dynamic Router Advertisement\)](#) on page 978
- [delay-advertise \(DHCPv6\)](#) on page 979
- [delay-authentication \(DHCP Relay Agent\)](#) on page 980
- [delay-offer \(DHCPv4\)](#) on page 981
- [delegated-pool \(DHCP Local Server\)](#) on page 982
- [delete-binding-on-renegotiation \(DHCP Local Server and Relay Agent\)](#) on page 983
- [delimiter \(DHCP Local Server\)](#) on page 984
- [delimiter \(Domain Map\)](#) on page 985
- [delimiter \(DHCP Relay Agent\)](#) on page 986
- [demux](#) on page 987
- [destination \(Diameter Network Element\)](#) on page 988
- [destination-host](#) on page 988

- [destination-host \(Gx-Plus\) on page 989](#)
- [destination-host \(OCS Partition\) on page 989](#)
- [destination-host \(PCRF Partition\) on page 990](#)
- [destination-host \(PTSP\) on page 990](#)
- [destination-realm \(JSRC\) on page 991](#)
- [destination-realm \(Gx-Plus\) on page 991](#)
- [destination-realm \(OCS Partition\) on page 992](#)
- [destination-realm \(PCRF Partition\) on page 993](#)
- [destination-realm \(PTSP\) on page 993](#)
- [dhcp-attributes \(Address-Assignment Pools\) on page 994](#)
- [dhcp-local-server on page 995](#)
- [dhcp-relay on page 1001](#)
- [dhcp-service on page 1008](#)
- [dhcpv6 \(DHCP Local Server\) on page 1009](#)
- [dhcpv6 \(DHCP Relay Agent\) on page 1012](#)
- [diameter on page 1016](#)
- [diameter-instance \(JSRC\) on page 1017](#)
- [diameter-instance \(Diameter Applications\) on page 1017](#)
- [diameter-instance \(PTSP\) on page 1018](#)
- [dictionary on page 1018](#)
- [disable on page 1019](#)
- [disable \(Extensible Subscriber Services Manager\) on page 1019](#)
- [disable-relay on page 1020](#)
- [dne-origin \(Diameter Network Element\) on page 1021](#)
- [dns-server on page 1021](#)
- [dns-server-address \(Dynamic Profiles\) on page 1022](#)
- [domain \(Domain Map\) on page 1023](#)
- [domain-name \(DHCP Local Server\) on page 1024](#)
- [domain-name \(DHCP Relay Agent\) on page 1026](#)
- [domain-name \(Address-Assignment Pools\) on page 1027](#)
- [domain-name \(Static Subscribers\) on page 1028](#)
- [domain-name-server \(Routing Instances and Access Profiles\) on page 1029](#)
- [domain-name-server-inet \(Routing Instances and Access Profiles\) on page 1030](#)
- [domain-name-server-inet6 \(Routing Instances and Access Profiles\) on page 1031](#)
- [downstream-rate \(Traffic Shaping\) on page 1032](#)
- [draining \(Diameter Applications\) on page 1033](#)
- [draining-response-timeout \(Diameter Applications\) on page 1034](#)

- [drop \(DHCP Relay Agent Option\)](#) on page 1035
- [dual-stack \(DHCP Relay Agent Overrides\)](#) on page 1036
- [dual-stack-group \(DHCP Relay Agent\)](#) on page 1037
- [duplication \(Access Profile\)](#) on page 1038
- [duplication-filter \(Access Profile\)](#) on page 1039
- [duplication-vrf \(Duplicate Accounting\)](#) on page 1040
- [duplication-filter \(Access Profile\)](#) on page 1041
- [dynamic-profile \(DHCP Local Server\)](#) on page 1042
- [dynamic-profile \(DHCP Relay Agent\)](#) on page 1043
- [dynamic-profile \(Domain Map\)](#) on page 1044
- [dynamic-profile \(Static Subscribers\)](#) on page 1045
- [enable](#) on page 1046
- [enable \(Enhanced Subscriber Management\)](#) on page 1046
- [equals \(DHCP Relay Agent\)](#) on page 1047
- [ethernet-port-type-virtual](#) on page 1048
- [exceed-action](#) on page 1048
- [exclude \(JSRC Attributes\)](#) on page 1049
- [exclude \(RADIUS\)](#) on page 1050
- [external-authority](#) on page 1055
- [failover \(System Process\)](#) on page 1056
- [family \(Address-Assignment Pools\)](#) on page 1057
- [fast-lookup-filter](#) on page 1058
- [final-response-timeout \(OCS Partition\)](#) on page 1059
- [force-continue \(OCS Partition\)](#) on page 1060
- [forward-only \(DHCP Relay Agent Option\)](#) on page 1061
- [forward-only \(DHCP Relay Agent\)](#) on page 1062
- [forward-only-replies \(DHCP Relay Agent\)](#) on page 1063
- [forward-rule \(Configuring\)](#) on page 1064
- [forward-rule \(Including in Rule\)](#) on page 1065
- [forwarding \(Diameter Network Element\)](#) on page 1065
- [from \(Forward Rule\)](#) on page 1066
- [from \(Rule\)](#) on page 1067
- [function \(Diameter Network Element\)](#) on page 1068
- [function \(Diameter Route\)](#) on page 1069
- [ggsn-address \(OCS Partition\)](#) on page 1070
- [ggsn-mcc-mnc \(OCS Partition\)](#) on page 1070
- [global \(Gx-Plus\)](#) on page 1071

- [global \(OCS\) on page 1072](#)
- [global \(PCRF\) on page 1073](#)
- [grace-period on page 1074](#)
- [group \(DHCP Local Server\) on page 1075](#)
- [group \(DHCP Relay Agent\) on page 1078](#)
- [group \(Static Subscribers\) on page 1081](#)
- [gsmp-syn-timeout \(ANCP\) on page 1082](#)
- [gsmp-syn-wait \(ANCP\) on page 1083](#)
- [gx-plus \(Gx-Plus\) on page 1084](#)
- [hardware-address on page 1084](#)
- [high-utilization \(Address-Assignment Pools\) on page 1085](#)
- [high-utilization-v6 \(Address-Assignment Pools\) on page 1085](#)
- [hold-down \(Address-Assignment Pools\) on page 1086](#)
- [host \(Address-Assignment Pools\) on page 1086](#)
- [host-name \(dhcp-relay\) on page 1087](#)
- [host-name \(dhcpcv6\) on page 1088](#)
- [ietf-mode on page 1088](#)
- [ignore on page 1089](#)
- [immediate-update on page 1090](#)
- [include-ipv6 \(Gx-Plus\) on page 1090](#)
- [include-irb-and-l2 on page 1091](#)
- [include-l2-interface-for-irb \(DHCP Relay Agent\) on page 1093](#)
- [include-option-82 \(DHCP Local Server\) on page 1094](#)
- [interface \(DHCP Local Server\) on page 1095](#)
- [interface \(DHCP Relay Agent\) on page 1097](#)
- [interface \(Dynamic Router Advertisement\) on page 1099](#)
- [interface \(Static Subscriber Group\) on page 1100](#)
- [interface \(Static Subscriber Username\) on page 1101](#)
- [interface-client-limit \(DHCP Local Server\) on page 1102](#)
- [interface-client-limit \(DHCP Relay Agent\) on page 1104](#)
- [interface-delete \(Subscriber Management or DHCP Client Management\) on page 1105](#)
- [interface-delete \(Subscriber Management or DHCP Client Management\) on page 1106](#)
- [interface-description-format on page 1106](#)
- [interface-name \(DHCP Local Server\) on page 1107](#)
- [interface-name \(DHCP Relay Agent\) on page 1108](#)
- [interface-mib \(Enhanced Subscriber Management\) on page 1109](#)
- [interface-set \(ANCP\) on page 1110](#)

- [interface-traceoptions \(DHCP\) on page 1111](#)
- [interfaces \(ANCP\) on page 1113](#)
- [ip-address on page 1113](#)
- [ip-address-change-notify on page 1114](#)
- [ip-address-first on page 1115](#)
- [ip-can-type \(PCRF Partition\) on page 1116](#)
- [ipcp-suggest-dns-option on page 1117](#)
- [jsrc \(JSRC\) on page 1118](#)
- [jsrc \(Access Profile\) on page 1119](#)
- [jsrc-partition on page 1119](#)
- [juniper-dsl-attributes on page 1120](#)
- [layer2-unicast-replies on page 1121](#)
- [keep-incoming-circuit-id \(DHCP Relay Agent\) on page 1122](#)
- [keep-incoming-interface-id \(DHCP Relay Agent\) on page 1123](#)
- [keep-incoming-remote-id \(DHCP Relay Agent\) on page 1124](#)
- [leasequery \(DHCP Relay Agent\) on page 1125](#)
- [lease-time-threshold \(DHCP Local Server and DHCP Relay Agent\) on page 1126](#)
- [lease-time-validation \(DHCP Local Server and DHCP Relay Agent\) on page 1127](#)
- [limit on page 1127](#)
- [link \(Address-Assignment Pools\) on page 1128](#)
- [local-address on page 1129](#)
- [local-address-range on page 1130](#)
- [local-decision \(PCRF Partition\) on page 1131](#)
- [local-port-range on page 1132](#)
- [local-ports on page 1132](#)
- [local-prefix-list on page 1133](#)
- [local-server-group \(DHCP Relay Agent Option\) on page 1133](#)
- [location \(dhcp-relay\) on page 1134](#)
- [location \(dhcpv6\) on page 1135](#)
- [logical-interface-unit-range on page 1135](#)
- [logical-system \(Diameter Peer\) on page 1136](#)
- [logical-system \(Diameter Transport\) on page 1137](#)
- [logical-system \(Subscriber Secure Policy\) on page 1138](#)
- [logical-system-name \(Static Subscribers\) on page 1139](#)
- [logical-system-name \(DHCP Local Server\) on page 1140](#)
- [logical-system-name \(DHCP Relay Agent\) on page 1141](#)
- [logout-response-timeout \(PCRF Partition\) on page 1142](#)

- [ltv-syslog-interval \(System Process\) on page 1143](#)
- [mac-address \(DHCP Local Server\) on page 1144](#)
- [mac-address \(DHCP Relay Agent\) on page 1145](#)
- [maintain-subscriber \(Subscriber Management\) on page 1146](#)
- [managed-configuration \(Dynamic Router Advertisement\) on page 1147](#)
- [map \(Domain Map\) on page 1148](#)
- [mask \(Domain Map\) on page 1149](#)
- [match-direction \(Services PTSP\) on page 1149](#)
- [max-advertisement-interval \(Dynamic Router Advertisement\) on page 1150](#)
- [max-connections \(DHCP Local Server\) on page 1151](#)
- [max-data-sessions-per-subscriber on page 1152](#)
- [max-db-size \(Enhanced Subscriber Management\) on page 1153](#)
- [max-empty-replies \(DHCP Local Server\) on page 1154](#)
- [max-outstanding-requests on page 1155](#)
- [max-outstanding-requests \(Diameter Applications\) on page 1156](#)
- [max-pending-accounting-stops \(Access Profile\) on page 1157](#)
- [max-withhold-time \(Access Profile\) on page 1157](#)
- [maximum-discovery-table-entries on page 1158](#)
- [maximum-helper-restart-time on page 1158](#)
- [maximum-lease-time on page 1159](#)
- [maximum-subscribers on page 1159](#)
- [metric \(Diameter Route\) on page 1160](#)
- [metric \(Domain Map\) on page 1160](#)
- [min-advertisement-interval \(Dynamic Router Advertisement\) on page 1161](#)
- [multi-address-embedded-option-response \(DHCP Local Server\) on page 1162](#)
- [name-server on page 1162](#)
- [nas-identifier on page 1163](#)
- [nas-port-extended-format on page 1164](#)
- [nas-port-extended-format \(Interfaces\) on page 1166](#)
- [nas-port-id-delimiter \(Subscriber Management\) on page 1167](#)
- [nas-port-id-format \(Subscriber Management\) on page 1168](#)
- [nas-port-options \(RADIUS Options\) on page 1170](#)
- [nas-port-type \(Subscriber Management\) on page 1171](#)
- [nas-port-type \(RADIUS Options\) on page 1173](#)
- [nasreq \(Diameter Application\) on page 1175](#)
- [neighbor \(Define ANCP\) on page 1176](#)
- [neighbor-discovery-router-advertisement \(Address-Assignment Pools\) on page 1177](#)

- [netbios-node-type](#) on page 1177
- [network](#) on page 1178
- [network-element](#) (Diameter Base Protocol) on page 1179
- [network-services](#) on page 1180
- [no-bind-on-request](#) (DHCP Relay Agent) on page 1181
- [no-unsolicited-ra](#) (Enhanced Subscriber Management) on page 1182
- [no-vlan-interface-name](#) on page 1183
- [ocs](#) (Diameter Applications) on page 1185
- [on-demand-ip-address](#) on page 1186
- [on-link](#) (Dynamic Router Advertisement) on page 1187
- [option](#) on page 1188
- [option-60](#) (DHCP Local Server) on page 1189
- [option-60](#) (DHCP Relay Agent) on page 1190
- [option-82](#) (DHCP Relay Agent) on page 1191
- [option-82](#) (DHCP Local Server Authentication) on page 1192
- [option-82](#) (DHCP Local Server Pool Matching) on page 1193
- [option-82](#) (Address-Assignment Pools) on page 1194
- [option-match](#) on page 1194
- [option-number](#) (DHCP Relay Agent Option) on page 1195
- [options](#) (Access Profile) on page 1196
- [order](#) on page 1198
- [origin](#) (Diameter Base Protocol) on page 1199
- [other-bytes](#) on page 1200
- [other-overhead-adjust](#) on page 1201
- [other-bytes](#) on page 1202
- [other-overhead-adjust](#) on page 1203
- [other-stateful-configuration](#) (Dynamic Router Advertisement) on page 1204
- [overhead-accounting](#) (ANCP) on page 1205
- [overrides](#) (DHCP Local Server) on page 1206
- [overrides](#) (DHCP Relay Agent) on page 1208
- [overrides](#) (Enhanced Subscriber Management) on page 1210
- [override-password](#) (Domain Map) on page 1210
- [packet-triggered-subscribers](#) on page 1211
- [packet-triggered-subscribers-partition](#) on page 1211
- [padn](#) (Domain Map) on page 1212
- [parse-direction](#) (Domain Map) on page 1212
- [parse-order](#) (Domain Map) on page 1213

- [parse-direction \(Domain Map\) on page 1214](#)
- [parse-order \(Domain Map\) on page 1215](#)
- [partition on page 1216](#)
- [partition \(Gx-Plus\) on page 1216](#)
- [partition \(NASREQ Diameter Application\) on page 1217](#)
- [partition \(OCS\) on page 1218](#)
- [partition \(PCRF\) on page 1220](#)
- [partition \(PTSP\) on page 1221](#)
- [password \(Static Subscribers\) on page 1222](#)
- [password \(DHCP Local Server\) on page 1223](#)
- [password \(DHCP Relay Agent\) on page 1224](#)
- [pcrf \(Diameter Applications\) on page 1225](#)
- [peer \(Diameter Base Protocol\) on page 1226](#)
- [peer \(Diameter Network Element\) on page 1227](#)
- [peer-ip-address-optional on page 1228](#)
- [peer-origin \(Diameter Peer\) on page 1229](#)
- [pool \(Address-Assignment Pools\) on page 1230](#)
- [pool \(DHCP Local Server Overrides\) on page 1231](#)
- [pool-match-order on page 1232](#)
- [port on page 1233](#)
- [port \(Diameter Peer\) on page 1233](#)
- [pre-ietf-mode on page 1234](#)
- [preauthentication-order \(Access Profile\) on page 1234](#)
- [preauthentication-port on page 1235](#)
- [preauthentication-secret on page 1235](#)
- [preauthentication-server \(Access Profile\) on page 1236](#)
- [preferred-lifetime \(Address-Assignment Pools\) on page 1237](#)
- [preferred-lifetime \(Dynamic Router Advertisement\) on page 1238](#)
- [prefix \(DHCP Relay Agent\) on page 1239](#)
- [prefix \(Address-Assignment Pools\) on page 1240](#)
- [prefix \(Dynamic Router Advertisement\) on page 1240](#)
- [priority \(Diameter Peer\) on page 1241](#)
- [profile \(Access\) on page 1242](#)
- [process-inform on page 1246](#)
- [protocol on page 1247](#)
- [protocols \(Dynamic Profiles\) on page 1248](#)
- [provisioning-order \(Diameter Applications\) on page 1250](#)

- [proxy-mode](#) on page 1251
- [qos-adjust](#) on page 1252
- [qos-adjust-adsl](#) on page 1253
- [qos-adjust-adsl2](#) on page 1253
- [qos-adjust-adsl2-plus](#) on page 1254
- [qos-adjust-other](#) on page 1255
- [qos-adjust-sdsl](#) on page 1256
- [qos-adjust-vdsl](#) on page 1256
- [qos-adjust-vdsl2](#) on page 1257
- [radius \(Access Profile\)](#) on page 1258
- [radius-disconnect \(DHCP Local Server\)](#) on page 1260
- [radius-flow-tap](#) on page 1261
- [radius-options \(Edit Access\)](#) on page 1262
- [radius-options \(Interfaces\)](#) on page 1263
- [radius-server](#) on page 1264
- [range \(Address-Assignment Pools\)](#) on page 1265
- [rapid-commit \(DHCPv6 Local Server\)](#) on page 1266
- [reachable-time \(Dynamic Router Advertisement\)](#) on page 1267
- [realm-delimiter \(Domain Map\)](#) on page 1267
- [realm-parse-direction \(Domain Map\)](#) on page 1268
- [reconfigure \(DHCP Local Server\)](#) on page 1269
- [relay-agent-interface-id \(DHCP Local Server\)](#) on page 1270
- [relay-agent-interface-id \(DHCPv6 Relay Agent\)](#) on page 1271
- [relay-agent-interface-id \(DHCPv6 Relay Agent Username\)](#) on page 1272
- [relay-agent-remote-id \(DHCP Local Server\)](#) on page 1273
- [relay-agent-remote-id \(DHCPv6 Relay Agent\)](#) on page 1274
- [relay-agent-remote-id \(DHCPv6 Relay Agent Username\)](#) on page 1275
- [relay-agent-subscriber-id \(DHCP Local Server\)](#) on page 1276
- [relay-agent-subscriber-id \(DHCPv6 Relay Agent\)](#) on page 1277
- [relay-option \(DHCP Relay Agent\)](#) on page 1278
- [relay-option-vendor-specific \(dhcpv6\)](#) on page 1279
- [relay-option-82](#) on page 1280
- [relay-server-group \(DHCP Relay Agent Option\)](#) on page 1281
- [relay-source](#) on page 1282
- [remote-address](#) on page 1283
- [remote-address-range](#) on page 1284
- [remote-id](#) on page 1284


- [remote-id \(DHCP Relay Agent\) on page 1285](#)
- [remote-id-mismatch \(DHCP Local Server and DHCP Relay Agent\) on page 1287](#)
- [remote-port-range on page 1288](#)
- [remote-ports on page 1288](#)
- [remote-prefix-list on page 1289](#)
- [replace-ip-source-with on page 1290](#)
- [report-interface-descriptions \(Edit Access\) on page 1291](#)
- [report-local-rule \(PCRF Partition\) on page 1292](#)
- [report-resource-allocation \(PCRF Partition\) on page 1293](#)
- [report-successful-resource-allocation \(PCRF Partition\) on page 1294](#)
- [request-max-tcp-connections \(System Process\) on page 1295](#)
- [request-max-tcp-connections \(System Process\) on page 1295](#)
- [request network-access aaa replay pending-accounting-stops](#)
- [request network-access aaa subscriber add session-id](#)
- [request network-access aaa subscriber delete session-id](#)
- [request network-access aaa subscriber modify session-id](#)
- [request-rate on page 1302](#)
- [requested-ip-network-match \(DHCP Local Server\) on page 1303](#)
- [restricted-requestor \(DHCP Local Server\) on page 1304](#)
- [retransmit-timer \(Dynamic Router Advertisement\) on page 1305](#)
- [retry on page 1306](#)
- [revert-interval on page 1307](#)
- [route \(Diameter Network Element\) on page 1308](#)
- [router \(Address-Assignment Pools\) on page 1308](#)
- [router-advertisement \(Dynamic Profiles\) on page 1309](#)
- [routing-instance on page 1309](#)
- [routing-instance \(Subscriber Secure Policy\) on page 1310](#)
- [routing-instance \(Diameter Peer\) on page 1310](#)
- [routing-instance \(Diameter Transport\) on page 1311](#)
- [routing-instance-name \(DHCP Local Server\) on page 1312](#)
- [routing-instance-name \(DHCP Relay Agent\) on page 1314](#)
- [routing-instance-name \(Static Subscribers\) on page 1315](#)
- [routing-services \(Enhanced Subscriber Management\) on page 1316](#)
- [rule \(Configuring\) on page 1317](#)
- [rule \(Including in Rule Set\) on page 1318](#)
- [rule-set \(Services PTSP\) on page 1318](#)
- [sdsl-bytes on page 1319](#)

- [sdsl-overhead-adjust](#) on page 1319
- [secret](#) on page 1320
- [send-acct-status-on-config-change](#) (Access Profile) on page 1320
- [send-dyn-subscription-indicator](#) (PCRF Partition) on page 1321
- [send-network-family-indicator](#) (PCRF Partition) on page 1323
- [send-origin-state-id](#) (Diameter Applications) on page 1324
- [send-release-on-delete](#) (DHCP Relay Agent) on page 1325
- [server-duid-type](#) (DHCP Local Server) on page 1326
- [server-group](#) on page 1327
- [server-identifier](#) (Address-Assignment Pools) on page 1328
- [server-id-override](#) on page 1329
- [server-response-time](#) (DHCP Relay Agent) on page 1330
- [service](#) (Service Accounting) on page 1331
- [service-activation](#) (Access Profile) on page 1332
- [service-context-id](#) (OCS) on page 1334
- [service-profile](#) (DHCP Local Server) on page 1335
- [service-profile](#) (DHCP Relay Agent) on page 1336
- [services](#) (PTSP) on page 1337
- [session-options](#) on page 1338
- [shmlog](#) (Shared Memory Log) on page 1339
- [sip-server-address](#) on page 1341
- [sip-server-domain-name](#) on page 1341
- [smg-service](#) (Enhanced Subscriber Management) on page 1342
- [source-address](#) on page 1343
- [stacked-vlan-ranges](#) (RADIUS Options) on page 1344
- [starts-with](#) (DHCP Relay Agent Option) on page 1345
- [static-subscribers](#) on page 1346
- [statistics](#) (Access Profile) on page 1347
- [statistics](#) (Service Accounting) on page 1347
- [strict](#) (DHCP Local Server) on page 1348
- [strip-domain](#) (Domain Map) on page 1349
- [strip-username](#) (Domain Map) on page 1349
- [subscriber-identification](#) (PTSP) on page 1350
- [subscriber-packet-idle-timeout](#) on page 1351
- [subscriber-management](#) (Subscriber Management) on page 1352
- [subscriber-profile](#) on page 1353
- [subscription-id-data-include](#) (PCRF Partition) on page 1354

- [subscription-id-type \(PCRF Partition\) on page 1356](#)
- [t1-percentage \(Address-Assignment Pools\) on page 1357](#)
- [t2-percentage \(Address-Assignment Pools\) on page 1358](#)
- [target-logical-system \(Domain Map\) on page 1359](#)
- [target-routing-instance \(Domain Map\) on page 1360](#)
- [term \(Forward Rule\) on page 1361](#)
- [term \(Rule\) on page 1362](#)
- [terminate-code on page 1363](#)
- [tftp-server on page 1364](#)
- [then \(Forward Rule\) on page 1365](#)
- [then \(Rule\) on page 1366](#)
- [timeout \(RADIUS\) on page 1367](#)
- [timeout \(DHCP Local Server\) on page 1368](#)
- [timeout \(DHCP Local Server Leasequery\) on page 1369](#)
- [timeout \(DHCP Relay Agent Leasequery\) on page 1370](#)
- [token \(DHCP Local Server\) on page 1371](#)
- [trace \(DHCP Local Server\) on page 1372](#)
- [trace \(DHCP Relay Agent\) on page 1373](#)
- [traceoptions \(ANCP\) on page 1374](#)
- [traceoptions \(DHCP\) on page 1376](#)
- [traceoptions \(Diameter Base Protocol\) on page 1379](#)
- [traceoptions \(Extensible Subscriber Services Manager\) on page 1381](#)
- [traceoptions \(Enhanced Subscriber Management\) on page 1382](#)
- [traceoptions \(General Authentication Service\) on page 1384](#)
- [traceoptions \(PTSP\) on page 1386](#)
- [traceoptions \(Static Subscribers\) on page 1388](#)
- [traceoptions \(Subscriber Management\) on page 1390](#)
- [traceoptions \(Subscriber Session Database Replication\) on page 1392](#)
- [transport \(Diameter Base Protocol\) on page 1393](#)
- [transport \(Diameter Peer\) on page 1394](#)
- [traps on page 1395](#)
- [trigger \(DHCP Local Server\) on page 1396](#)
- [trigger \(DHCP Relay Agent Leasequery\) on page 1397](#)
- [trio-flow-offload on page 1398](#)
- [trust-option-82 on page 1399](#)
- [tunnel-profile \(Domain Map\) on page 1400](#)
- [underlying-interface \(ANCP\) on page 1400](#)

- [unique-nas-port](#) on page 1401
- [update-interval](#) on page 1402
- [update-interval \(Service Accounting\)](#) on page 1403
- [update-response-timeout \(PCRF Partition\)](#) on page 1404
- [upstream-rate \(Traffic Shaping\)](#) on page 1405
- [use-interface-description](#) on page 1406
- [user-name-include \(OCS Partition\)](#) on page 1408
- [use-option-82](#) on page 1410
- [use-primary \(DHCP Relay Agent\)](#) on page 1411
- [use-vlan-id](#) on page 1413
- [user-prefix \(DHCP Local Server\)](#) on page 1415
- [user-prefix \(DHCP Relay Agent\)](#) on page 1417
- [user-prefix \(Static Subscribers\)](#) on page 1418
- [username-include \(DHCP Local Server\)](#) on page 1419
- [username-include \(DHCP Relay Agent\)](#) on page 1421
- [username-include \(Static Subscribers\)](#) on page 1422
- [valid-lifetime \(Dynamic Router Advertisement\)](#) on page 1423
- [valid-lifetime \(Address-Assignment Pools\)](#) on page 1424
- [vdsl-bytes](#) on page 1425
- [vdsl-overhead-adjust](#) on page 1425
- [vdsl2-bytes](#) on page 1426
- [vdsl2-overhead-adjust](#) on page 1426
- [vendor-specific \(dhcp-relay\)](#) on page 1427
- [violation-action \(DHCP Local Server and DHCP Relay Agent\)](#) on page 1428
- [vlan-nas-port-stacked-format](#) on page 1429
- [vlan-ranges \(RADIUS Options\)](#) on page 1430
- [vrf-name \(Duplicate Accounting\)](#) on page 1431
- [wait-for-acct-on-ack \(Access Profile\)](#) on page 1431
- [wins-server \(Access\)](#) on page 1432

aaa-logical-system (Domain Map)

Syntax	<code>aaa-logical-system <i>logical-system-name</i> { aaa-routing-instance <i>routing-instance-name</i>; }</code>
Hierarchy Level	[edit access domain <code>map</code> <i>domain-map-name</i>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Configure a non-default logical system in which the authd daemon sends AAA requests for the domain map.
<div> NOTE: Subscriber management is supported in the default logical system only. The <code>aaa-logical-system</code> statement is for future extensions of subscriber management and is not supported in current Junos OS releases.</div>	
Default	Default logical system for the subscriber.
Options	<i>logical-system-name</i> —Name of the logical system. The remaining statement is explained separately.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying an AAA Logical System/Routing Instance in a Domain Map on page 167

aaa-routing-instance (Domain Map)

Syntax	<code>aaa-routing-instance (routing-instance-name default);</code>
Hierarchy Level	[edit access domain <code>map</code> domain-map-name], [edit access domain <code>map</code> domain-map-name <code>aaa-logical-system</code> logical-system-name]
Release Information	Statement introduced in Junos OS Release 10.4. default option added in Junos OS Release 13.3.
Description	Configure the routing instance in which the authd daemon sends AAA requests for the domain map.



NOTE: Subscriber management is supported in the default logical system only. The `aaa-logical-system` statement, which appears in the CLI, is not supported in current Junos OS releases.

Default	Routing instance used for the subscriber context.
Options	routing-instance-name —Name of the routing instance. default —The default (master) routing instance.
Required Privilege Level	admin —To view this statement in the configuration. admin-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Understanding Domain Maps and Logical System/Routing Instance Contexts on page 161 • Specifying an AAA Logical System/Routing Instance in a Domain Map on page 167

abated-utilization (Address-Assignment Pools)

Syntax	<code>abated-utilization <i>percentage</i>;</code>
Hierarchy Level	[edit access address-assignment], [edit routing-instances <i>routing-instance-name</i> address-assignment]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Generate SNMP traps for DHCP address pools or linked set of address pools. No SNMP traps are generated unless a value is configured.
Default	Abated utilization is not set. Delete the abated-utilization value to unset.
Options	<i>percentage</i> —Threshold below which an SNMP trap clear is generated. Range: 1 through 98
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Address-Assignment Pools Overview on page 565• Configuring Address-Assignment Pool Usage Threshold Traps on page 570

abated-utilization-v6 (Address-Assignment Pools)

Syntax	<code>abated-utilization-v6 <i>percentage</i>;</code>
Hierarchy Level	[edit access address-assignment], [edit routing-instances <i>routing-instance-name</i> address-assignment]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Generate SNMP traps for DHCPv6 address pools or linked set of address pools. No SNMP traps are generated unless a value is configured.
Default	Abated utilization is not set. Delete the abated-utilization value to unset.
Options	<i>percentage</i> —Threshold below which an SNMP trap clear is generated. Range: 1 through 98
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Address-Assignment Pools Overview on page 565• Configuring Address-Assignment Pool Usage Threshold Traps on page 570

accept-max-tcp-connections (System Process)

Syntax	<code>accept-max-tcp-connections <i>max-tcp-connections</i>;</code>
Hierarchy Level	[edit system processes dhcp-service]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Specify the number of simultaneous TCP connections that the DHCP server can use for bulk leasequery operations.
Options	<p><i>max-tcp-connections</i>—Number of connections.</p> <p>Range: 1 through 10</p> <p>Default: 5</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Individual Leasequery on page 257 • Configuring and Using DHCP Bulk Leasequery on page 260

access-identifier

Syntax	<code>access-identifier <i>identifier-string</i>;</code>
Hierarchy Level	[edit protocols ancp interfaces <i>interface-name</i>], [edit protocols ancp interfaces interface-set]
Release Information	Statement introduced in Junos OS Release 9.4.
Description	Associate an access-loop circuit identifier (ACI) with the VLAN or set of VLANs that carry traffic to the subscriber using that access loop; identify a particular subscriber. This statement requires that the name of the interface or interface set is statically configured or deterministic. This means that it can be used with dynamic or static interface sets, VLAN-tagged interface sets, or static VLAN/VLAN demux interfaces.
Options	<i>identifier-string</i> —Unique identifier string for the access loop circuit; also configured on the access node.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent on page 624 • Associating an Access Node with Subscribers for ANCP Agent Operations on page 626

access-loop-id-local

Syntax	access-loop-id-local;
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	Specify that the Agent-Remote-Id and Agent-Circuit-Id are generated locally when these values are not present in the client database.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring RADIUS Server Parameters for Subscriber Access on page 118

access-profile

Syntax	<code>access-profile <i>profile-name</i>;</code>
Hierarchy Level	<p>[edit],</p> <p>[edit forwarding-options dhcp-relay]</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i>],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i>]</p> <p>[edit forwarding-options dhcp-relay dhcpv6]</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i>]</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i>]</p> <p>[edit interfaces <i>interface-name</i> auto-configure vlan-ranges],</p> <p>[edit interfaces <i>interface-name</i> auto-configure stacked-vlan-ranges],</p> <p>[edit routing-instances <i>routing-instances-name</i>]</p> <p>[edit system services dhcp-local-server]</p> <p>[edit system services dhcp-local-server group <i>group-name</i>]</p> <p>[edit system services dhcp-local-server dhcpv6]</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3 for ACX Series routers.</p>
Description	<p>After you have created the access profile that specifies authentication and accounting parameters, you must specify where the profile is used. Authentication and accounting will not run unless you specify the profile. You can attach access profiles globally at the [edit] hierarchy level, or you can apply them to DHCP clients or subscribers, VLANs, or to a routing instance.</p>
Options	<p><i>profile-name</i>—Name of the access profile that you configured at the [edit access profile name] hierarchy level.</p>
Required Privilege Level	<p>access—To view this statement in the configuration.</p> <p>access-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Attaching Access Profiles on page 124 • Attaching Access Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces on page 320 • Configuring Access Components for the DHCP Layer 3 Wholesale Network Solution • Configuring Access Components for the PPPoE Wholesale Network Solution

access-profile (Extensible Subscriber Services Manager)

Syntax	<code>access-profile <i>access-profile-name</i>;</code>
Hierarchy Level	<code>[edit system services extensible-subscriber-services]</code>
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Define the access profile name for time accounting. In most cases, the information about the access profile on the RADIUS server is the same as the information about the access profile of a control session. This configuration is mandatory.
Options	<i>access-profile-name</i> —Name of the access profile.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.

access-profile (Domain Map)

Syntax	<code>access-profile <i>profile-name</i>;</code>
Hierarchy Level	<code>[edit access domain map <i>domain-map-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Access profile that defines the AAA services and options for subscribers associated with the domain map.
Options	<i>profile-name</i> —Name of access profile.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying an Access Profile in a Domain Map on page 164

access-profile (Static Subscribers)

Syntax	<code>access-profile <i>profile-name</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit system services static-subscribers],</p> <p>[edit system services static-subscribers group <i>group-name</i>]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the access profile that triggers AAA services for all static subscribers on interfaces configured at the [edit system services static-subscribers interface] hierarchy level or for the static subscribers in a specific group. The group version of this statement overrides the global configuration.
Options	<i>profile-name</i> —Name of the static subscriber access profile.
Required Privilege Level	<p>access—To view this statement in the configuration.</p> <p>access-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Specifying the Static Subscriber Global Access Profile on page 775 • Specifying the Static Subscriber Group Access Profile on page 780

access-profile-name (Duplicate Accounting)

Syntax	access-profile-name [<i>profile-name</i>];
Hierarchy Level	[edit access profile <i>profile-name</i> accounting duplication-vrf]
Release Information	Statement introduced in Junos OS Release 12.3R3 and supported in later 12.3Rx releases. Statement supported in Junos OS Release 13.2 and later releases.
Description	Specify up to five access profiles, all in the same nondefault VRF (LS:RI combination), each of which lists one or more RADIUS accounting servers to which duplication accounting information is sent.
Options	<i>profile-name</i> —Name of an access profile that lists RADIUS accounting servers for duplicate reporting.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Understanding RADIUS Accounting Duplicate Reporting on page 97• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

accounting (Access Profile)

Syntax

```

accounting {
    accounting-stop-on-access-deny;
    accounting-stop-on-failure;
    address-change-immediate-update;
    ancp-speed-change-immediate-update;
    coa-immediate-update;
    coa-no-override service-class-attribute;
    duplication;
    duplication-filter;
    duplication-vrf {
        access-profile-name profile-name;
        vrf-name vrf-name;
    }
    immediate-update;
    order [accounting-method];
    send-acct-status-on-config-change
    statistics (time | volume-time);
    update-interval minutes;
    wait-for-acct-on-ack;
}

```

Hierarchy Level [edit access [profile](#) *profile-name*]

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

Description Configure RADIUS accounting parameters and enable RADIUS accounting for an access profile.

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 Authentication and Accounting Parameters for Subscriber Access on page 90](#)
- [Configuring Per-Subscriber Session Accounting on page 104](#)
- [Understanding RADIUS Accounting Duplicate Reporting on page 97](#)

accounting (Service Accounting)

Syntax	<code>accounting { update-interval <i>minutes</i>; statistics (time volume-time); }</code>
Hierarchy Level	[edit access <code>profile profile-name service</code>]
Release Information	Statement introduced in Junos OS Release 14.2R1 for MX Series routers.
Description	Define the service accounting configuration. 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	<ul style="list-style-type: none">• Configuring Service Interim Accounting on page 113• Processing Cisco VSAs in RADIUS Messages for Service Provisioning on page 110


accounting-backup-options (Access Profile)

Syntax	<code>accounting-backup-options { max-pending-accounting-stops <i>number</i>; max-withhold-time <i>hold-time</i>; }</code>
Hierarchy Level	[edit access]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	Configure options for backing up RADIUS accounting stop requests when all RADIUS accounting servers in the profile are offline. The remaining statements are explained separately.
Required Privilege Level	access—To view this statement in the configuration. access-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Back-up Options for RADIUS Accounting on page 109

accounting-order (Service Accounting)

Syntax	accounting-order (activation-protocol radius);
Hierarchy Level	[edit access profile <i>profile-name</i> service]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Specify which method is used for reporting subscriber service accounting.
Default	activation-protocol
Options	activation-protocol —Send service accounting reports by means of the application that activates services, such as JSRC. radius —Send service accounting reports by means of the RADIUS protocol.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Service Accounting with JSRC on page 766• Service Accounting with JSRC on page 765

accounting-port

Syntax	<code>accounting-port <i>port-number</i>;</code>
Hierarchy Level	[edit access radius-server <i>server-address</i>], [edit access profile <i>profile-name</i> radius-server <i>server-address</i>]
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches with support for Enhanced Layer 2 software (ELS).</p> <p>Statement introduced on Junos OS without ELS in the following releases:</p> <ul style="list-style-type: none">• Junos OS Release 12.3 for EX Series switches: Release 12.3R10.• Junos OS Release 14.1X53 for EX Series switches: Release 14.1X53-D25.• Junos OS Release 15.1 for EX Series switches: Release 15.1R4.
Description	Configure the port number on which to contact the RADIUS accounting server.
	<div> NOTE: Specifying the accounting port is optional, and port 1813 is the default. However, we recommend that you configure it in order to avoid confusion, as some RADIUS servers might refer to an older default.</div>
Options	<p><i>port-number</i>—Port number on which to contact the RADIUS accounting server. Most RADIUS servers use port 1813, as specified in RFC 2866.</p> <p>Default: 1813</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS System Accounting• Configuring Router or Switch Interaction with RADIUS Servers on page 115• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90• Configuring RADIUS Authentication for L2TP

accounting-retry (RADIUS)

Syntax	<code>accounting-retry <i>number</i>;</code>
Hierarchy Level	[edit access radius-server <i>server-address</i>], [edit access profile <i>profile-name</i> radius-server <i>server-address</i>]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Configure the number of times the router retransmits RADIUS accounting messages when no response is received from the server. When you do not configure this statement, the number of retry attempts is determined by the retry statement.



NOTE: To successfully set a retry limit for the accounting servers different from the authentication servers, you must configure both the `accounting-retry` and `accounting-timeout` statements. If you configure only one of these statements, then the value you configure is ignored in favor of the values configured with the `retry` and `timeout` statements.



NOTE: The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.

Options	<i>number</i> —Number of retry attempts. Range: 0 through 100 Default: 0 (disabled)
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Router or Switch Interaction with RADIUS Servers on page 115 • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90 • Configuring RADIUS Authentication for L2TP

accounting-server

Syntax	accounting-server [<i>ip-address</i>];
Hierarchy Level	[edit access profile <i>profile-name</i> radius radius]
Release Information	Statement introduced in Junos OS Release 9.1.
Description	Specify a list of the RADIUS accounting servers used for accounting for DHCP, L2TP, and PPP clients.
Options	<i>ip-address</i> —IP version 4 (IPv4) address.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

accounting-session-id-format

Syntax	accounting-session-id-format (decimal description);
Hierarchy Level	[edit access profile <i>profile-name</i> radius radius options]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Configure the format the router or switch uses to identify the accounting session.
Default	decimal
Options	decimal —Use the decimal format. description —Use the generic format, in the form: jnpr interface-specifier:subscriber-session-id .
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90



accounting-stop-on-access-deny

Syntax	accounting-stop-on-access-deny;
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Configure RADIUS accounting to send an Acct-Stop message when the AAA server refuses a client request for access.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

accounting-stop-on-failure

Syntax	accounting-stop-on-failure;
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	<p>Configure RADIUS accounting to send an Acct-Stop message when a subscriber session has been successfully authenticated and authorized, but then fails before an Acct-Start message is sent. By default, an Acct-Stop message is sent only if an Acct-Start message has been exchanged with the accounting server.</p> <p>Consider a situation where RADIUS address pools are used to assign IP/IPv6 addresses. After a subscriber session is successfully authenticated, the RADIUS server authorizes the session by assigning an IP address from the RADIUS address pool and conveying that address in the Framed-IP-Address attribute. If a negotiation failure occurs at this point, the session is terminated before activating. The Acct-Start message is never sent because it is initiated by session activation. By default, an Acct-Stop message cannot be sent because the Acct-Start is never sent. However, if the acct-stop-on-failure statement is configured, the negotiation failure causes the Acct-Stop message to be sent, which explicitly notifies the RADIUS server that the session is disconnected and that it can free the allocated IP address back to the pool.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

accounting-timeout (RADIUS)

Syntax	<code>accounting-timeout seconds;</code>
Hierarchy Level	[edit access radius-server <i>server-address</i>], [edit access profile <i>profile-name</i> radius-server <i>server-address</i>]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Configure how long the local router waits to receive a response from a RADIUS accounting server before retransmitting the message. When you do not configure this statement, the length of the timeout is determined by the timeout statement.
<div> NOTE: To successfully set a timeout value for the accounting servers different from the authentication servers, you must configure both the <code>accounting-retry</code> and <code>accounting-timeout</code> statements. If you configure only one of these statements, then the value you configure is ignored in favor of the values configured with the <code>retry</code> and <code>timeout</code> statements.</div>	
<div> NOTE: The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.</div>	
Options	<i>seconds</i> —Duration of timeout period. Default: 0 (disabled) Range: 0 through 1000 seconds
Required Privilege Level	<code>admin</code> —To view this statement in the configuration. <code>admin-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Router or Switch Interaction with RADIUS Servers on page 115• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90• Configuring RADIUS Authentication for L2TP

active-server-group

Syntax	<code>active-server-group <i>server-group-name</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit forwarding-options dhcp-relay group <i>group-name</i>], [edit forwarding-options dhcp-relay group <i>group-name</i> dhcpv6], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6], [edit logical-systems <i>logical-system-name</i> forwarding-options group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options group <i>group-name</i> dhcpv6], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> dhcpv6], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay] [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.3.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
Description	<p>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.</p> <p>A group-specific configuration overrides a global option.</p>
Options	<i>server-group-name</i> —Name of the group of DHCP or DHCPv6 server addresses to which the DHCP or DHCPv6 relay agent configuration applies.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Relay Agent Overview on page 236 • Configuring Active Server Groups to Apply a Common DHCP Relay Agent Configuration to Named Server Groups on page 323 • Configuring Group-Specific DHCP Relay Options on page 280 • dhcp-relay on page 1001

address (Diameter Peer)

Syntax	<code>address <i>ip-address</i>;</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Configure the IP address for a Diameter remote peer.
Options	<i>ip-address</i> —IP address of remote Diameter peer.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Peers on page 700

address (Diameter Transport)

Syntax	<code>address <i>ip-address</i>;</code>
Hierarchy Level	[edit diameter transport <i>transport-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Configure the source (local) IP address for the Diameter local transport connection.
Options	<i>ip-address</i> —IP address of remote Diameter peer.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699

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;
            }
        }
        hold-down;
        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.

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 on page 565](#)
- [Configuring Address-Assignment Pools on page 567](#)

- *Configuring an Address-Assignment Pool for L2TP LNS with Inline Services*

address-change-immediate-update

Syntax	address-change-immediate-update;
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	<p>Configure the router to send an Interim-Accounting message to the RADIUS server immediately after on-demand IPv4 allocation and de-allocation.</p> <p>Changes to this setting take effect for new subscriber logins. Existing subscribers are not impacted by this change except when the AAA daemon restarts.</p>
Default	This functionality is disabled by default.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Enabling Immediate Interim Accounting Messages for On-Demand IPv4 Address Changes on page 456• Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447

address-pool (Domain Map)

Syntax	address-pool <i>pool-name</i> ;
Hierarchy Level	[edit access domain map <i>domain-map-name</i>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Specify the address pool used to assign addresses to subscribers associated with the domain map.
Options	<i>pool-name</i> —Name of address pool.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying an Address Pool in a Domain Map on page 165

address-protection

Syntax	address-protection;
Hierarchy Level	[edit access], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> access]
Release Information	Statement introduced in Junos OS Release 11.2. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	<p>Prevent IPv4 addresses and IPv6 prefixes from being assigned to more than one subscriber session when you use AAA to supply IPv4 addresses.</p> <p>For IPv4:</p> <p>If enabled, the router checks the following attributes received from external servers:</p> <ul style="list-style-type: none"> • <i>Framed-IP-Address</i> • <i>Framed-Pool</i> <p>The router then takes one of the following actions:</p> <ul style="list-style-type: none"> • If an address matches an address in an address pool, the address is taken from the pool, provided it is available. • If the address is already in use, it is rejected as unavailable. <p>For IPv6:</p> <p>If enabled, the router checks the following attributes received from external servers:</p> <ul style="list-style-type: none"> • <i>Framed-IPv6-Prefix</i> • <i>Framed-IPv6-Pool</i> <p>The router then takes one of the following actions:</p> <ul style="list-style-type: none"> • If a prefix matches a prefix in an address pool, the prefix is taken from the pool, provided it is available. • If the prefix is already in use, it is rejected as unavailable. • If the prefix length requested from the external server does not exactly match the pool's prefix length, the authentication request is denied. If configured, the Acct-Stop message includes the cause for termination.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Duplicate IPv6 Prefix Protection for Router Advertisement on page 471 • Configuring Duplicate IPv4 Address Protection for AAA on page 573

adjacency-timer

Syntax	<code>adjacency-timer <i>seconds</i>;</code>
Hierarchy Level	[edit protocols ancp], [edit protocols ancp neighbor ip-address]
Release Information	Statement introduced in Junos OS Release 9.4.
Description	Specify a value for the interval that the ANCP agent proposes during negotiation to establish an adjacency, for all neighbors or a specific neighbor. The larger of the values proposed by the agent and the neighbor is selected for the interval between subsequent adjacency messages exchanged by the agent and the neighbor.
Options	<i>seconds</i> —Number of seconds between adjacency messages. Range: 1 through 25 seconds Default: 10 seconds
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Specifying the Interval Between ANCP Adjacency Messages on page 627• Configuring ANCP Neighbors on page 625

advisory-options (Traffic Shaping)

Syntax	<pre>advisory-options { downstream-rate <i>rate</i>; upstream-rate <i>rate</i>; }</pre>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces \$junos-interface-ifd-name unit \$junos-interface-unit],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces interface-set \$junos-interface-set-name interface \$junos-interface-ifd-name],</p> <p>[edit interfaces demux0 unit <i>logical-unit-number</i>],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Support at the [edit interfaces demux0 ...] hierarchy level introduced in Junos OS Release 12.2.</p> <p>Support at the [edit dynamic-profiles ...] hierarchy level introduced in Junos OS Release 13.1.</p>
Description	<p>Specify a recommended shaping rate to be applied to downstream or upstream traffic on an interface.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Setting a Recommended Shaping Rate for Traffic on ANCP Interfaces on page 659 • Configuring the ANCP Agent on page 624 • Configuring the Method to Set the LAC Connection Speeds to the LNS

aggregate-clients (DHCP Relay Agent)

Syntax	<code>aggregate-clients (merge replace);</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 dynamic-profile <i>profile-name</i>],</p> <p>[edit forwarding-options dhcp-relay dynamic-profile <i>profile-name</i>],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> dynamic-profile <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.3.</p> <p>Options merge and replace introduced in Junos OS Release 9.5.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	<p>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.</p> <p>M120 and M320 routers do not support DHCPv6.</p> <p>Not supported for IP demux subscriber interfaces.</p>
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

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

Related Documentation

- [dhcp-relay on page 1001](#)
- *Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces*
- [Configuring Group-Specific DHCP Relay Options on page 280](#)

aggregate-clients (Static Subscribers)

Syntax	aggregate-clients (merge replace);
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit system services static-subscribers dynamic-profile <i>profile-name</i>],</p> <p>[edit system services static-subscribers group <i>group-name</i> dynamic-profile <i>profile-name</i>]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Specify for all static subscribers or for a group of static subscribers that the router merge (chain) subscriber (client) attributes such as firewall filters and CoS attributes or replace them when multiple subscriber sessions exist on the same underlying VLAN. The group version of this statement overrides the global version.</p> <p>This statement is not supported for IP demux subscriber interfaces.</p>
Default	By default, multiple subscribers cannot be on the same logical interface.
Options	<p>merge—Aggregate the attributes of multiple subscribers for the logical interface.</p> <p>replace—Replace the entire logical interface whenever a new client logs in to the network using the same VLAN logical interface.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Enabling Multiple Subscribers on a VLAN Logical Interface for All Static Subscribers on page 776

allow-bulk-leasequery (DHCP Local Server)

Syntax	<pre>allow-bulk-leasequery { max-connections <i>number-of-connections</i>; max-empty-replies <i>number-of-replies</i>; restricted-requestor; timeout <i>seconds</i>; }</pre>
Hierarchy Level	<pre>[edit system services dhcp-local-server], [edit system services dhcp-local-server dhcpv6], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services ...], [edit logical-systems <i>logical-system-name</i> system services ...], [edit routing-instances <i>routing-instance-name</i> system services ...]</pre>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Enable DHCP local server to listen for, and respond to bulk leasequery requests received on TCP connections.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Bulk Leasequery on page 260

allow-leasequery (DHCP Local Server)

Syntax	<code>allow-leasequery { restricted-requestor; }</code>
Hierarchy Level	<code>[edit system services dhcp-local-server],</code> <code>[edit system services dhcp-local-server dhcpv6],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system</code> <code> services ...],</code> <code>[edit logical-systems <i>logical-system-name</i> system services ...],</code> <code>[edit routing-instances <i>routing-instance-name</i> system services ...]</code>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Enable DHCP local server to listen on the UDP socket and to respond to leasequery requests received on UDP connections. 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	<ul style="list-style-type: none">• Configuring and Using DHCP Individual Leasequery on page 257• Configuring and Using DHCP Bulk Leasequery on page 260

always-write-giaddr

Syntax	<code>always-write-giaddr;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay overrides],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.3.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
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	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Relay Agent Overview on page 236 • dhcp-relay on page 1001

always-write-option-82

Syntax	<code>always-write-option-82;</code>
Hierarchy Level	<code>[edit forwarding-options dhcp-relay overrides],</code> <code>[edit forwarding-options dhcp-relay group <i>group-name</i> overrides],</code> <code>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides],</code> <code>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i></code> <code>forwarding-options dhcp-relay overrides],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i></code> <code>forwarding-options dhcp-relay group <i>group-name</i> overrides],</code> <code>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</code> <code>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group</code> <code><i>group-name</i> overrides],</code> <code>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group</code> <code><i>group-name</i> interface <i>interface-name</i> overrides]</code>
Release Information	Statement introduced in Junos OS Release 8.3. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>Override the DHCP relay agent information option (option 82) in DHCP packets destined for a DHCP server. The use of this option causes the DHCP relay agent to perform one of the following actions, depending on how it is configured:</p> <ul style="list-style-type: none">• If the DHCP relay agent is configured to add option 82 information to DHCP packets, it clears the existing option 82 values from the DHCP packets and inserts the new values before forwarding the packets to the DHCP server.• If the DHCP relay agent is not configured to add option 82 information to DHCP packets, it clears the existing option 82 values from the packets, but does not add any new values before forwarding the packets 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	<ul style="list-style-type: none">• Extended DHCP Relay Agent Overview on page 236

ancp

```

Syntax  ancp {
    adjacency-loss-hold-time seconds;
    adjacency-timer seconds;
    gsmp-syn-timeout seconds;
    gsmp-syn-wait;
    interfaces {
        interface-set interface-set-name {
            access-identifier identifier-string;
            underlying-interface underlying-interface-name;
        }
        interface-name {
            access-identifier identifier-string;
        }
    }
    maximum-discovery-table-entries entry-number;
    maximum-helper-restart-time;
    neighbor ip-address {
        adjacency-loss-hold-time seconds;
        adjacency-timer;
        auto-configure-trigger interface interface-name;
        ietf-mode;
        maximum-discovery-table-entries entry-number;
        pre-ietf-mode;
    }
    pre-ietf-mode;
    qos-adjust {
        other-bytes bytes;
        other-overhead-adjust percentage;
        sds1-bytes bytes;
        sds1-overhead-adjust percentage;
        vds1-bytes bytes;
        vds1-overhead-adjust percentage;
        vds12-bytes bytes;
        vds12-overhead-adjust percentage;
    }
    qos-adjust-ads1 adjustment-factor;
    qos-adjust-ads12 adjustment-factor;
    qos-adjust-ads12-plus adjustment-factor;
    qos-adjust-other adjustment-factor;
    qos-adjust-sds1 adjustment-factor;
    qos-adjust-vds1 adjustment-factor;
    qos-adjust-vds2 adjustment-factor;
    traceoptions {
        file filename <files number> <match regular-expression > <size maximum-file-size>
        <world-readable | no-world-readable>;
        flag flag;
        level (all | error | info | notice | verbose | warning);
        no-remote-trace;
    }
}

```

Hierarchy Level [edit protocols]

Release Information Statement introduced in Junos OS Release 9.4.

Description Configure Junos OS ANCP agent features.

The remaining statements are explained separately.



NOTE: When you deactivate the ANCP protocol, the router does not perform a commit check to determine whether any ANCP or L2-BSA subscribers are present (active or inactive). Any subscribers that are active at the time of deactivation remain active.

Required Privilege routing—To view this statement in the configuration.

Level routing-control—To add this statement to the configuration.

Related Documentation

- [Configuring the ANCP Agent on page 624](#)

ancp-speed-change-immediate-update (ANCP)

Syntax `ancp-speed-change-immediate-update;`

Hierarchy Level [edit access profile *profile-name* **accounting**]

Release Information Statement introduced in Junos OS Release 13.3.

Description Configure AAA to generate immediate interim accounting updates to the RADIUS server in response to ANCP agent notifications of rate changes on subscriber access lines.

Required Privilege admin—To view this statement in the configuration.

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

Related Documentation

- [Configuring Immediate Interim Accounting Updates to RADIUS in Response to ANCP Notifications on page 668](#)
- [Configuring Per-Subscriber Session Accounting on page 104](#)
- [Configuring the ANCP Agent on page 624](#)

application-group-any

Syntax	<code>application-group-any;</code>
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify that any application group defined in the database is considered a match.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

application-groups

Syntax	<code>application-group [<i>application-group-name</i>];</code>
Hierarchy Level	[edit services ptsp forward-rule <i>forward-rule-name</i> term <i>precedence</i> from] [edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Identify one or more application groups defined in the application identification configuration for inclusion as a match condition.
Options	<i>application-group-name</i> —Identifier of the application group.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

applications (Services PTSP)

Syntax	<code>applications [<i>application-name</i>];</code>
Hierarchy Level	[edit services ptsp forward-rule <i>forward-rule-name</i> term <i>precedence</i> from] [edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Identify one or more applications defined in the application identification configuration for inclusion as a match condition.
Options	<i>application-name</i> —Identifier of the application.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

attempts (DHCP Local Server)

Syntax	<code>attempts attempt-count;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6 ...] hierarchy levels introduced in Junos OS Release 10.4.</p>
Description	Configure how many attempts are made to reconfigure all DHCP clients or only the DHCP clients serviced by the specified group of interfaces before reconfiguration is considered to have failed. A group configuration takes precedence over a DHCP local server configuration.
Options	<p><i>attempt-count</i>—Maximum number of attempts.</p> <p>Range: 1 through 10</p> <p>Default: 8</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298 • Configuring Dynamic Reconfiguration Attempts for DHCP Clients on page 300

attempts (DHCP Relay Agent)

Syntax	<code>attempts <i>number-of-attempts</i>;</code>
Hierarchy Level	[edit forwarding-options <code>dhcp-relay</code> (<code>leasequery</code> <code>bulk-leasequery</code>)], [edit forwarding-options <code>dhcp-relay</code> <code>dhcpv6</code> (<code>leasequery</code> <code>bulk-leasequery</code>)], [edit logical-systems <i>logical-system-name</i> ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> ...], [edit routing-instances <i>routing-instance-name</i> ...]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Specify the number of times the DHCP relay agent attempts to send DHCP leasequery or bulk leasequery messages to the configured DHCP servers in the logical system/routing instance. DHCP relay agent resends the query message if the configured timeout value is reached, and either a confirmed reply or a reply from all configured DHCP servers has not been received. DHCP relay agent sends the subsequent messages only to the DHCP servers that have not replied to previous queries.
Options	<i>number-of-attempts</i> —Number of times DHCP relay agent attempts to send the leasequery or bulk leasequery message. Range: 1 through 10 Default: 6
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring and Using DHCP Individual Leasequery on page 257• Configuring and Using DHCP Bulk Leasequery on page 260

attributes

Syntax	<pre> attributes { exclude { ... } ignore { framed-ip-netmask; input-filter; logical-system-routing-instance; output-filter; } } </pre>
Hierarchy Level	[edit access profile <i>profile-name</i> radius]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Specify how the router or switch processes RADIUS attributes. 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	<ul style="list-style-type: none"> • Configuring How RADIUS Attributes Are Used for Subscriber Access on page 43

attributes (JSRC Attributes)

Syntax	<pre> attributes { exclude { user-name [authorization-request provisioning-request]; } } </pre>
Hierarchy Level	[edit access profile <i>profile-name</i> jsrc]
Release Information	Statement introduced in Junos OS Releases 14.2.
Description	Specify how the router processes Diameter attributes. 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	<ul style="list-style-type: none"> • Excluding AVPs from Diameter Messages for JSRC on page 763 • Understanding JSRC-SAE Interactions on page 757

authentication (DHCP Local Server)

Syntax	<pre> authentication { password <i>password-string</i>; username-include { circuit-type; client-id; delimiter <i>delimiter-character</i>; domain-name <i>domain-name-string</i>; 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 <i>user-prefix-string</i>; } }</pre>
Hierarchy Level	<pre> [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 <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</pre>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>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.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using External AAA Authentication Services with DHCP on page 271


authentication (DHCP Relay Agent)

Syntax	<pre> authentication { password <i>password-string</i>; username-include { circuit-type; client-id; delimiter <i>delimiter-character</i>; domain-name <i>domain-name-string</i>; 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 <i>user-prefix-string</i>; } }</pre>
Hierarchy Level	<pre> [edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i>], [edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i>], [edit forwarding-options dhcp-relay group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</pre>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	<p>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.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • dhcp-relay on page 1001 • Using External AAA Authentication Services with DHCP on page 271

authentication (Static Subscribers)

Syntax	<pre> authentication { password <i>password-string</i>; username-include { domain-name <i>domain-name</i>; interface; logical-system-name; routing-instance-name; user-prefix <i>user-prefix-string</i>; } }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit system services static-subscribers],</p> <p>[edit system services static-subscribers group <i>group-name</i>]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Specify the authentication parameters that trigger the Access-Request message to AAA for all static subscribers on interfaces configured at the [edit system services static-subscribers interface] hierarchy level, or for the static subscribers in a specific group. The group version of this statement overrides the global configuration.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Configuring the Static Subscriber Global Authentication Password on page 777 • Configuring the Static Subscriber Group Authentication Password on page 781

authentication-order

Syntax	<code>authentication-order [<i>authentication-methods</i>];</code>
Hierarchy Level	<code>[edit access <i>profile profile-name</i>]</code>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>none option added in Junos OS Release 11.2.</p> <p>nasreq option added in Junos OS Release 16.1.</p>
Description	<p>Set the order in which AAA tries different authentication methods when verifying that a client can access the router or switch. For each login attempt, AAA tries the authentication methods in order, from first to last.</p> <p>A given subscriber does not undergo both authentication and authorization as separate steps. When both authentication-order and authorization-order are specified, DHCP subscribers honor the configured authorization order, all other subscribers use the configured authentication-order.</p>
Options	<p><i>authentication-methods</i>—Ordered list of methods to use for authentication attempts. The list includes one or more of the following methods in any combination:</p> <ul style="list-style-type: none"> • nasreq—Verify the client using NASREQ authentication services. • none—No authentication is performed. Grants authentication without examining the client credentials. Can be used, for example, when the Diameter function Gx-Plus is employed for notification during subscriber provisioning. • password—Verify the client using the information configured at the <code>[edit access profile <i>profile-name</i> client <i>client-name</i>]</code> hierarchy level. • radius—Verify the client using RADIUS authentication services.
	<p> NOTE: Subscriber access management does not support the password option, and authentication fails when no method (none) is specified.</p>
	Default: <code>password</code>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Example: Configuring CHAP Authentication with RADIUS</i> • Specifying the Authentication and Accounting Methods for Subscriber Access on page 90 • <i>Configuring Access Profiles for L2TP or PPP Parameters</i>

authentication-server

Syntax	authentication-server [<i>ip-address</i>];
Hierarchy Level	[edit access profile <i>profile-name</i> radius]
Release Information	Statement introduced in Junos OS Release 9.1.
Description	Specify a list of the RADIUS authentication servers used to authenticate DHCP, L2TP, and PPP clients. The servers in the list are also used as RADIUS dynamic-request servers, from which the router accepts and processes RADIUS disconnect requests, CoA requests, and dynamic service activations and deactivations.
Options	<i>ip-address</i> —IPv4 address.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Parameters for Subscriber Access on page 118

authorization-order

Syntax	<code>authorization-order [<i>authorization-methods</i>];</code>
Hierarchy Level	<code>[edit access profile <i>profile-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 9.6. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches. nasreq option added in Junos OS Release 16.1.
Description	<p>Set the order in which AAA tries different methods to verify that a client is authorized access to the router or switch. For each login attempt, AAA tries the authorization methods in order, from first to last.</p> <p>A given subscriber does not undergo both authentication and authorization as separate steps. When both authentication-order and authorization-order are specified, DHCP subscribers honor the configured authorization order, all other subscribers use the configured authentication-order.</p>
Options	<p><i>authorization-methods</i>—Ordered list of methods to use for authorization attempts. The list includes one or more of the following methods in any combination:</p> <ul style="list-style-type: none"> • jsrc—Use the JSRC application in an SRC environment to request authorization from the SAE when verifying that a DHCP subscriber can access the router or switch. When you include this option, AAA ignores any configured authentication order settings. This option is ignored for non-DHCP subscribers. • nasreq—Use the NASREQ application to communicate with a NASREQ server for authorization of any subscriber type as an alternative to RADIUS authorization. • none—No authorization is performed. Can be used, for example, when the Diameter function Gx-Plus is employed for notification during subscriber provisioning.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring JSRC on page 759 • Authorizing Subscribers with JSRC on page 761

autonomous (Dynamic Router Advertisement)

Syntax	(autonomous no-autonomous);
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> protocols router-advertisement interface <i>interface-name</i> <i>prefix</i> <i>prefix</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	<p>Specify whether prefixes in the router advertisement messages are used for stateless address autoconfiguration:</p> <ul style="list-style-type: none">• autonomous—Use prefixes for address autoconfiguration.• no-autonomous—Do not use prefixes for address autoconfiguration.
Default	autonomous
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

boot-file

Syntax	boot-file <i>filename</i> ;
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	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 is equivalent to DHCP Option 67.
Options	<i>filename</i> —Location of the boot file on the boot server. The filename can include a pathname.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• boot-server on page 949• Configuring Address-Assignment Pools on page 567

boot-server

Syntax	<code>boot-server (address hostname);</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	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. This configuration is equivalent to DHCP Option 66.
Options	<p>address—IPv4 address of a boot server.</p> <p>hostname—Fully qualified hostname of a boot server.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • boot-file on page 948 • Configuring Address-Assignment Pools on page 567

bulk-leasequery (DHCP Relay Agent)

Syntax	<pre>bulk-leasequery { attempts number-of-attempts; timeout seconds; trigger automatic; }</pre>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay],</p> <p>[edit forwarding-options dhcp-relay dhcpv6],</p> <p>[edit logical-systems <i>logical-system-name</i> ...],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> ...],</p> <p>[edit routing-instances <i>routing-instance-name</i> ...]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Configure parameters that the DHCP relay agent uses when sending DHCP bulk leasequery messages to obtain lease information from the DHCP servers in the logical system/routing instance.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Bulk Leasequery on page 260

called-station-id (OCS Partition)

Syntax	<code>called-station-id <i>station-name</i>;</code>
Hierarchy Level	[edit access ocs partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Include the Called-Station-Id AVP value in all CCR-GY packets.
Options	<i>station-name</i> —Called station name defined for the Called-Station-Id AVP to include in all CCR-GY packets.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the OCS Partition on page 743• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

calling-station-id-delimiter (Subscriber Management)

Syntax	<code>calling-station-id-delimiter <i>delimiter-character</i>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	Specify the character that the router uses as a separator between the concatenated values in the Calling-Station-ID (RADIUS IETF attribute 31) string. The router uses the delimiter when you configure more than one value in the calling-station-id-format statement.
Default	The hash (#) character.
Options	<i>delimiter-character</i> —Character to use for the delimiter. You must enclose the delimiter character in quotation marks (" ").
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a Calling-Station-ID with Additional Attributes on page 66

calling-station-id-format (Subscriber Management)

Syntax	<pre>calling-station-id-format { agent-circuit-id; agent-remote-id; interface-description; interface-text-description; mac-address; nas-identifier; stacked-vlan; vlan; }</pre>
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 13.1. mac-address , interface-text-description , stacked-vlan , and vlan options added in Junos OS Release 15.1.
Description	Specify the information that the router includes in the Calling-Station-ID (RADIUS IETF attribute 31) that is passed to the RADIUS server during authentication and accounting. You can include one or more optional values in any combination.
Default	The router displays the Calling-Station-ID set by the client.
Options	<p>agent-circuit-id—Include the agent circuit identifier (ACI) string, which uniquely identifies the subscriber's access node and the digital subscriber line (DSL) on the access node. The ACI string is stored in either the DHCP option 82 field of DHCP messages (for DHCP traffic), or in the DSL Forum Agent-Circuit-ID VSA [26-1] of PPPoE PADI and PADR control packets (for PPPoE traffic).</p> <p>agent-remote-id—Include the agent remote identifier (ARI) string, which identifies the subscriber on the digital subscriber line access multiplexer (DSLAM) interface that initiated the service request. The ARI string is stored in either the DHCP option 82 field of DHCP messages (for DHCP traffic), or in the DSL Forum Agent-Remote-ID VSA [26-2] of PPPoE PADI and PADR control packets (for PPPoE traffic).</p> <p>interface-description—Include the interface description value.</p> <p>interface-text-description—Include the interface text description.</p> <p>mac-address—Include the MAC address of the source device for the subscriber.</p> <p>nas-identifier—Include the NAS-identifier (RADIUS IETF attribute 32), which specifies the name of the NAS that originated the authentication or accounting request.</p> <p>stacked-vlan—Include the stacked VLAN tag value.</p> <p>vlan—Include the VLAN tag value.</p>

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

Related Documentation

- [Configuring a Calling-Station-ID with Additional Attributes on page 66](#)

chap-challenge-in-request-authenticator (Subscriber Management)

Syntax chap-challenge-in-request-authenticator;

Hierarchy Level [edit access profile *profile-name* radius **options**]

Release Information Statement introduced in Junos OS Release 15.1.

Description Configure the **authd** process to insert the random challenge generated by the NAS into the Request Authenticator field of Access-Request packets, if the challenge value is 16 bytes long.

If you enable the **chap-challenge-in-request-authenticator** statement and the random challenge is not 16 bytes long, **authd** ignores the statement and uses the default behavior, which inserts the random challenge as the CHAP-Challenge attribute (RADIUS attribute 60) in Access-Request packets.

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

Related Documentation

- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)

charging-id (OCS Partition)

Syntax charging-id *number*;

Hierarchy Level [edit access **ocs partition** *partition-name*]

Release Information Statement introduced in Junos OS Release 16.2.

Description Include the 3GPP-Charging-Id AVP value in all CCR-GY messages.


Options *number*—3GPP-Charging-Id AVP value to include in all CCR-GY messages.

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

Related Documentation

- [Configuring the OCS Partition on page 743](#)
- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
- [Understanding Gy Interactions Between the Router and the OCS on page 730](#)
- [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)

charging-service-list

Syntax	charging-service-list ocs;
Hierarchy Level	[edit access profile <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the list of charging services with which to communicate for the broadband Policy and Charging Enforcement Function (BPCEF).
<div>  <p>NOTE: Currently, if you configure this statement, you must also configure the provisioning-order statement to pcrf.</p> </div>	
Options	ocs —Use Online Charging Services (OCS) as the list of charging services with which to communicate.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Gy Interactions Between the Router and the OCS on page 730 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

circuit-id (DHCP Relay Agent)

Syntax	<pre> circuit-id { include-irb-and-l2; include-l2-interface-for-irb; keep-incoming-circuit-id; no-vlan-interface-name; prefix <i>prefix</i>; use-interface-description (logical device); use-vlan-id; } </pre>
Hierarchy Level	<pre> [edit forwarding-options dhcp-relay relay-option-82], [edit forwarding-options dhcp-relay group <i>group-name</i> relay-option-82], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay relay-option-82], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> relay-option-82], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay relay-option-82], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> relay-option-82], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay relay-option-82], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> relay-option-82] </pre>
Release Information	<p>Statement introduced in Junos OS Release 8.3.</p> <p>Statement introduced in Junos OS Release 12.3 for EX Series switches.</p> <p>include-irb-and-l2 , no-vlan-interface-name, and use-vlan-id options added in Junos OS Release 14.1.</p>
Description	<p>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.</p>



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



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	<ul style="list-style-type: none"> • Using DHCP Relay Agent Option 82 Information on page 337 • Configuring Option 82 Information on page 338

circuit-id (Address-Assignment Pools)

Syntax	<code>circuit-id <i>value</i> range <i>named-range</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes option-match option-82]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure the address-assignment pool <i>named-range</i> to use for a particular option 82 Agent Circuit ID value.
Options	<p><i>value</i>—String for the Agent Circuit ID suboption (suboption 1) of the DHCP relay agent information option (option 82) in DHCP packets.</p> <p><i>range named-range</i>—Name of the address-assignment pool range to use.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

circuit-type (DHCP Local Server)

Syntax	circuit-type;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server group group-name authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the circuit type is concatenated with the username during the subscriber authentication or client authentication process.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using External AAA Authentication Services with DHCP on page 271

circuit-type (DHCP Relay Agent)

Syntax	circuit-type;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include], [edit forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> authentication username-include], [edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	<p>Specify that the circuit type is concatenated with the username during the subscriber authentication or client authentication process. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Using External AAA Authentication Services with DHCP on page 271• Creating Unique Usernames for DHCP Clients on page 272


clear-on-abort (DHCP Local Server)

Syntax	clear-on-abort;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6 ...] hierarchy levels introduced in Junos OS Release 10.4.</p>
Description	Delete all DHCP clients or only the DHCP clients serviced by the specified group of interfaces when reconfiguration fails; that is, when the maximum number of retry attempts have been made without success. A group configuration takes precedence over a DHCP local server configuration.
Default	Restores the original client configuration when reconfiguration fails.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298 • Configuring Deletion of the Client When Dynamic Reconfiguration Fails on page 301


client-accounting-algorithm

Syntax	client-accounting-algorithm (direct round-robin);
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 10.0. Statement introduced in Junos OS for EX Series switches Release 13.2X50-D10.
Description	Configure the access method the router uses to access RADIUS accounting servers.
Default	direct
Options	direct —Use the direct method. round-robin —Use the round-robin method.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Parameters for Subscriber Access on page 118• Configuring RADIUS Server Options for Subscriber Access on page 119


client-authentication-algorithm

Syntax	client-authentication-algorithm (direct round-robin);
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 10.0. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	<p>Configure the method that the authenticator uses to access RADIUS authentication servers when there are multiple servers configured. Initially, a RADIUS client sends a request to a RADIUS authentication or accounting server. The router or switch, acting as the authenticator, waits for a response from the server before sending another request.</p> <p>When there are multiple RADIUS server connections configured for a client, the authenticator attempts to reach the different servers in the order that they are configured. If there is no response from the first RADIUS server, the authenticator attempts to reach the next RADIUS server. This process repeats until the client is either granted access or there are no more configured servers.</p> <p>If the direct method is configured, the authenticator always treats the first server in the list as the primary server. The authenticator moves on to the second server only if the attempt to reach the first server fails. If the round-robin method is configured, the server chosen first will be rotated based on which server was used last. The first server in the list is treated as a primary for the first authentication request, but for the second request, the second server configured is treated as primary, and so on. With this method, all of the configured servers receive roughly the same number of requests on average so that no single server has to handle all of the requests.</p>
	<p> NOTE: The round-robin access method is not recommended for use with EX Series switches.</p>
Default	The direct option is the default.
Options	<p>direct—Use the direct access method. The authenticator contacts the first RADIUS server on the list for each request, the second server if the first one fails, and so on.</p> <p>round-robin—Use the round-robin method. The authenticator contacts the first RADIUS server for the first request, the second server for the second request, and so on.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring RADIUS Server Parameters for Subscriber Access on page 118 • Configuring RADIUS Server Options for Subscriber Access on page 119

client-discover-match (DHCP Local Server)

Syntax	client-discover-match <option60-and-option82 incoming-interface>;
Hierarchy Level	<p>[edit system services dhcp-local-server overrides],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i> overrides]</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ... overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>incoming-interface option added in Junos OS Release 13.3.</p>
Description	Configure the match criteria DHCP local server uses to uniquely identify DHCP subscribers or clients when primary identification fails. The options are mutually exclusive.
Default	By default, DHCP uses the option60-and-option82 option.
Options	<p>incoming-interface—(Optional) Allow only one client device to connect on the interface. If the client device changes, the router deletes the existing client binding and creates a binding for the newly connected device.</p>
<div>  <p>NOTE: The overrides client-discover-match incoming-interface configuration deletes and replaces the existing binding when a new device connects. This action differs from the overrides interface-client-limit 1 statement, which retains the existing binding and rejects the newly connected client.</p> </div>	
<p>option60-and-option82—(Optional) Use option 60 and option 82 information to identify subscribers.</p>	
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Local Server Overview on page 230 • Overriding Default DHCP Local Server Configuration Settings on page 311 • DHCP Auto Logout Overview on page 303 • Allowing Only One DHCP Client Per Interface on page 288

client-discover-match (DHCP Relay Agent)

Syntax	client-discover-match <option60-and-option82 incoming-interface>;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay overrides],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ... overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ... overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group ... overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>incoming-interface option added in Junos OS Release 13.3.</p>
Description	Configure the match criteria DHCP relay uses to uniquely identify DHCP subscribers or clients when primary identification fails. The options are mutually exclusive.
Default	By default, DHCP uses the option60-and-option82 option.
Options	<p>incoming-interface—(Optional) Allow only one client device to connect on the interface. If the client device changes, the router deletes the existing client binding and creates a binding for the newly connected device.</p>
<div>  <p>NOTE: The overrides client-discover-match incoming-interface configuration deletes and replaces the existing binding when a new device connects. This action differs from the overrides interface-client-limit 1 statement, which retains the existing binding rejects the newly connected client.</p> </div>	
<p>option60-and-option82—(Optional) Use option 60 and option 82 information to identify subscribers.</p>	
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Relay Agent Overview on page 236 • Overriding the Default DHCP Relay Configuration Settings on page 313 • DHCP Auto Logout Overview on page 303 • Allowing Only One DHCP Client Per Interface on page 288

client-id (DHCP Local Server)

Syntax	client-id;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.6.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the DHCPv6 Client-ID option (option 1) in the client PDU name is concatenated with the username during the subscriber authentication or client authentication process.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Creating Unique Usernames for DHCP Clients on page 272

client-id (DHCP Relay Agent)

Syntax	client-id;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.4. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the client ID is concatenated with the username during the subscriber authentication or client authentication process.
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using External AAA Authentication Services with DHCP on page 271 • Creating Unique Usernames for DHCP Clients on page 272

client-idle-timeout

Syntax	<code>client-idle-timeout <i>minutes</i>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> session-options]
Release Information	Statement introduced in Junos OS Release 8.5.
Description	<p>Specify the grace period that begins after an authenticated user terminates all sessions and connections. Authentication is not required if a new connection is initiated during the grace period by the same user.</p> <p>During this period, the router determines whether the subscriber is inactive by monitoring data traffic, both upstream from the user (ingress) and downstream to the user (egress). Control traffic is ignored. The subscriber is not considered idle as long as data traffic is detected in either direction. When no traffic is detected for the duration of the idle time out, non-DHCP subscribers (such as L2TP or PPP) are gracefully logged out, similarly to a RADIUS-initiated disconnect or a CLI-initiated logout; DHCP subscribers are disconnected.</p> <p>When you additionally configure the related client-idle-timeout-ingress-only statement (MX Series only), the router monitors only ingress traffic to determine whether the subscriber is inactive; it does not monitor any egress traffic. The related client-session-timeout statement terminates the subscriber session when the session timeout expires regardless of user activity.</p> <p>Client idle timeouts are most often used for residential services rather than business services. The most practical use case for this timeout is in a PPP access model. It is not practical for DHCP or DHCPv6 subscribers.</p> <p>Although you can use the client-idle-timeout statement for dynamically configured subscriber VLANs, this configuration is useful only in limited circumstances (such as IP over Ethernet without DHCP and with fixed addresses) and is not typically used. If you do use the idle timeout for VLANs, the timeout period starts when the VLAN is instantiated. It resets when a client session is created or an existing session is reactivated. When no traffic is detected on an authenticated VLAN for the duration of the timeout, the VLAN is considered inactive and is deleted. If no client sessions are ever created on the VLAN, then the VLAN is removed when the timeout expires.</p>
Default	The timeout is not configured.
Options	<p><i>minutes</i>—Number of minutes of idle time that elapse before the session is terminated. The value that you specify must be determined locally with consideration of the services and policies that you offer.</p> <p>Range: 10 through 1440 minutes</p>
Required Privilege Level	<p>access—To view this statement in the configuration.</p> <p>access-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Understanding Session Options for Subscriber Access on page 131](#)
 - [Configuring Subscriber Session Options on page 136](#)
 - [Removing Inactive Dynamic Subscriber VLANs on page 137](#)

client-idle-timeout-ingress-only

Syntax	client-idle-timeout-ingress-only;
Hierarchy Level	[edit access profile <i>profile-name</i> session-options]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Specify that only ingress traffic is monitored for subscriber idle timeout processing for the duration of the idle timeout period that you specify with the client-idle-timeout statement. If no ingress traffic is received for the duration of the timeout, then the subscriber is gracefully logged out (non-DHCP subscribers) or disconnected (DHCP subscribers).</p> <p>If you configure client-idle-timeout alone, then both ingress and egress traffic are monitored during the idle timeout. Monitoring only ingress traffic is useful in cases where the LNS sends traffic to the remote peer even when the peer is not up, such as when the LNS does not have PPP keepalives enabled and therefore does not detect that the peer is not up. Because the LAC monitors both ingress and egress traffic by default, in this situation it receives the egress traffic from the LNS and either does not log out the subscriber or delays detection of inactivity until the egress traffic ceases. When you specify that only ingress traffic is monitored in this case, the LAC can detect that the peer is inactive and then initiate logout.</p>
Required Privilege Level	<p>access—To view this statement in the configuration.</p> <p>access-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Understanding Session Options for Subscriber Access on page 131 • Configuring Subscriber Session Options on page 136 • Removing Inactive Dynamic Subscriber VLANs on page 137


client-negotiation-match (DHCPv6 Local Server)

Syntax	client-negotiation-match incoming-interface;
Hierarchy Level	[edit system services dhcp-local-server dhcpv6 overrides], [edit system services dhcp-local-server dhcpv6 group <i>group-name</i> overrides], [edit system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i> overrides]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Configure the match criteria the DHCPv6 local server uses to uniquely identify IPv6 subscribers or clients.
Options	incoming-interface —Allow only one client device to connect on the interface. If the client device changes, the router deletes the existing client binding and creates a binding for the newly connected device.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Automatically Logging Out DHCPv6 Clients on page 308• Extended DHCP Local Server Overview on page 230• Allowing Only One DHCP Client Per Interface on page 288

client-negotiation-match (DHCPv6 Relay Agent)

Syntax	client-negotiation-match incoming-interface;
Hierarchy Level	[edit forwarding-options dhcp-relay dhcpv6 overrides], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> interface <i>interface-name</i> overrides]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Configure the match criteria the DHCPv6 relay agent uses to uniquely identify IPv6 subscribers or clients.
Options	incoming-interface —Allow only one client device to connect on the interface. If the client device changes, the router deletes the existing client binding and creates a binding for the newly connected device.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Automatically Logging Out DHCPv6 Clients on page 308 • Extended DHCP Relay Agent Overview on page 236 • Allowing Only One DHCP Client Per Interface on page 288

client-session-timeout

Syntax	<code>client-session-timeout <i>minutes</i>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> session-options]
Release Information	Statement introduced in Junos OS Release 8.5.
Description	<p>Specify the amount of time after which user sessions are terminated, regardless of user activity (also known as a forced or hard authentication timeout).</p> <p>Alternatively, when you want subscribers to be identified as inactive before they are terminated, use the related statements, client-idle-timeout and client-idle-timeout-ingress-only. Use client-idle-timeout alone to specify a period of time during which both ingress and egress subscriber data traffic is monitored; if no traffic is detected for the duration of the period, the subscriber is considered inactive and is terminated. Add the client-idle-timeout-ingress-only statement to monitor only ingress traffic for the duration of the timeout set with the client-idle-timeout statement.</p>
	<div>  <p>BEST PRACTICE: We recommend that you do not configure a session timeout for subscribers receiving voice services. Because the session timeout is a simple time-based timeout, it is likely to interrupt subscribers actively using a voice service and terminate their calls unexpectedly (from the subscriber viewpoint). This result is a particular concern for emergency services calls.</p> </div>
	<p>Client session timeouts are most often used for residential services rather than business services. The most practical use case for this timeout is in a PPP access model when no voice services are offered. For DHCP or DHCPv6 subscribers, the session timeout is used as the DHCP lease timer if no other lease time configuration is present.</p> <p>Although you can use the client-session-timeout statement for dynamically configured subscriber VLANs, this configuration is useful only in limited circumstances (such as IP over Ethernet without DHCP and with fixed addresses) and is not typically used. If you do use the session timeout for VLANs, the timeout period starts when the VLAN is instantiated.</p>
Default	The timeout is not configured.
Options	<p><i>minutes</i>—Number of minutes after which user sessions are terminated. The value that you specify must be determined locally with consideration of the services and policies that you offer.</p> <p>Range: 1 through 527040 minutes</p>
Required Privilege Level	<p>access—To view this statement in the configuration.</p> <p>access-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Understanding Session Options for Subscriber Access on page 131](#)
 - [Configuring Subscriber Session Options on page 136](#)

commit-interval

Syntax	<code>commit-interval <i>interval</i>;</code>
Hierarchy Level	<code>[edit system services extensible-subscriber-services]</code>
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Specify the interval at which Extensible Subscriber Services Manager issues requests for committing op script configurations. Requests that are received and processed within the interval are committed in a batch at the end of the interval. Requests that are processed after the interval are committed at the end of the next commit interval. When no operation script is to be committed, no request for committing operation script configurations is issued.
Options	<i>interval</i> —Length of the interval. Range: 10 through 3600 seconds Default: 20 seconds
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Op Script Overview

coa-dynamic-variable-validation

Syntax	coa-dynamic-variable-validation;
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 12.1. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Specify that when a CoA operation includes a change to a client profile dynamic variable that cannot be applied (such as an update to a non-existent filter), the router does not apply any changes to client profile dynamic variables in the request, and responds with a NACK message.
Default	If you do not configure this statement, the router does not apply any incorrect variable updates, but does make any other changes to the client profile dynamic variables, and responds with an ACK message.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• RADIUS Server Options for Subscriber Access on page 4• Configuring RADIUS Server Parameters for Subscriber Access on page 118

coa-immediate-update

Syntax	coa-immediate-update;
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 10.0.
Description	Configure the router to send an Acct-Update message to the RADIUS accounting server immediately following a CoA operation.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Parameters for Subscriber Access on page 118• Configuring Per-Subscriber Session Accounting on page 104

coa-no-override service-class-attribute

Syntax	coa-no-override service-class-attribute;
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Specify that, after a CoA action that changes the RADIUS Class attribute, accounting reports for the subscriber's service sessions continue to use the original Class attribute that was assigned when the service sessions were created. The new Class attribute value is used in accounting reports for the subscriber session only.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring RADIUS Server Parameters for Subscriber Access on page 118 • Configuring Per-Subscriber Session Accounting on page 104

configuration-database (Enhanced Subscriber Management)

Syntax	configuration-database { max-db-size size; }
Hierarchy Level	[edit system]
Release Information	Statement introduced in Junos OS Release 15.1R3 on MX Series routers with MPCs
Description	Enhanced subscriber management leverages system shared memory to improve performance and scaling. Since this memory is used by both the Junos configuration and enhanced subscriber management, you need to set an upper limit on the memory available to the Junos configuration, which in turn determines the allocation available for enhanced subscriber management.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Junos OS Enhanced Subscriber Management on page 554

concurrent-data-sessions

Syntax	<code>concurrent-data-sessions <i>max-session-number</i>;</code>
Hierarchy Level	<code>[edit services service-set <i>services-set-name</i> subscriber-profile <i>profile-name</i> enable <i>service-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Specify the maximum number of sessions that are concurrently enabled for the named service. The system randomly selects the number of sessions and enables the named service, whereas other sessions are not allotted the named service. This facilitates to increase the limit on the number of resources a service can use.
Options	<i>max-session-number</i> —Maximum number of sessions concurrently enabled for the named service.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.

connect-actively

Syntax	<code>connect-actively { <code>port</code> <i>port-number</i>; <code>transport</code> <i>transport-name</i>; }</code>
Hierarchy Level	<code>[edit diameter <code>peer</code> <i>peer-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Define the destination port and transport connection used to establish active connections to Diameter peer. The remaining statements are explained separately.
Default	Port 3868 and an automatically assigned local address are used to establish active connections to a peer.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Peers on page 700

count-type

Syntax	count-type (application rule);
Hierarchy Level	[edit services ptsp rule rule-name]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the statistics aggregation, collection, and reporting style for this rule. Terms and rules cannot mix and match different styles. All service rules attached to a given service set must have the same style.
Options	<p>application—Report statistics in a flat file and aggregate them by application for one of the following:</p> <ul style="list-style-type: none"> • An application, where the count action application is specified in the term. • An application group, where the count action application-group is specified in the term. • All application groups, where the count action application-group-any is specified in the term. <p>rule—Aggregate statistics for the service rule. The statistics are reported by Diameter. All count actions in all terms for the rule must specify rule.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

current-hop-limit (Dynamic Router Advertisement)

Syntax	<code>current-hop-limit <i>number</i>;</code>
Hierarchy Level	[edit dynamic-profiles protocols router-advertisement interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Default value placed in the hop count field of the IP header for outgoing packets.
Options	<i>number</i> —Hop limit. A value of 0 means the limit is unspecified by this router. Range: 0 through 255 Default: 64
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

database-replication (Subscriber Session Database)

Syntax	<pre>database-replication { traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; } }</pre>
Hierarchy Level	[edit system services]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Define operations for subscriber management session database replication processes. 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	<ul style="list-style-type: none">• Tracing Subscriber Management Session Database Replication Operations for Subscriber Access on page 835

default-action (DHCP Relay Agent Option)

Syntax	<pre>default-action { drop; forward-only; local-server-group local-server-group; relay-server-group relay-server-group; }</pre>
Hierarchy Level	<pre>[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 ...]</pre>
Release Information	Statement introduced in Junos OS Release 12.3.
Description	<p>Specify the action DHCP relay agent takes when the option string in client traffic does not satisfy any match criteria or when no match criteria are configured.</p> <p>The default-action statement is optional. If the match criteria are not satisfied or not configured and no default-action is specified, DHCP relay processes the traffic in the normal manner.</p> <p>The local-server-group option is not supported for DHCPv6 relay agent.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

default-lifetime (Dynamic Router Advertisement)

Syntax	<code>default-lifetime <i>seconds</i>;</code>
Hierarchy Level	[edit protocols router-advertisement interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Lifetime associated with a default router.
Options	<i>seconds</i> —Default lifetime. A value of 0 means this router is not the default router. Range: Maximum advertisement interval value through 9000 seconds Default: Three times the maximum advertisement interval value
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>max-advertisement-interval (Protocols IPv6 Neighbor Discovery)</i>• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

delay-advertise (DHCPv6)

```
Syntax  delay-advertise {
        based-on {
            option 15 {
                equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                not-equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                starts-with {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
            }
            option 16 {
                equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                not-equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                starts-with {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
            }
            option 18 {
                equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                not-equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                starts-with {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
            }
            option 37 {
                equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                not-equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
            }
        }
    }
```

```

    }
    starts-with {
      ascii <ascii-name>;
      hexadecimal <hex-name>;
    }
  }
}

```

Hierarchy Level	[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]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Delay the DHCP-OFFER sent to the customers. Delay can be set between 1 to 30 seconds.
Default	If no delay time is set, default delay time of 3 seconds will be used.
Options	delay-time <time in seconds> —Time delay between solicit and advertise. Time delay can be set between 1 to 30 seconds.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.

delay-authentication (DHCP Relay Agent)

Syntax	delay-authentication;
Hierarchy Level	[edit forwarding-options dhcp-relay ... overrides], [edit forwarding-options dhcp-relay dhcpv6 ... overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ... overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ... overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ... overrides]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	Delay authentication of subscribers until the DHCP client sends a Request packet. This conserves managed resources by delaying the authorization process and the creation of an entry in the subscriber database until the DHCP request processing phase.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Relay Agent Overview on page 236 • Overriding the Default DHCP Relay Configuration Settings on page 313

delay-offer (DHCPv4)

```
Syntax  delay-offer {
        based-on {
            option 60 {
                equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                not-equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                starts-with {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
            }
            option 77 {
                equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                not-equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                starts-with {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
            }
            option 82 {
                equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                not-equals {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
                starts-with {
                    ascii <ascii-name>;
                    hexadecimal <hex-name>;
                }
            }
        }
    }
```


Hierarchy Level [edit system services dhcp-local-server 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 16.1.
Description	Delay the DHCP-OFFER sent to the customers. Delay can be set between 1 to 30 seconds.
Default	If no delay time is set, default delay time of 3 seconds will be used.
Options	delay-time <i><time in seconds></i> —Time delay between discover and offer. Time delay can be set between 1 to 30 seconds.
Required Privilege	system—To view this statement in the configuration.
Level	system-control—To add this statement to the configuration.

delegated-pool (DHCP Local Server)

Syntax	<code>delegated-pool pool-name;</code>
Hierarchy Level	[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 <i>interface-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 ...], [edit logical-systems <i>logical-system-name</i> system services system services dhcp-local-server dhcpv6 ...], [edit routing-instances <i>routing-instance-name</i> system services system services dhcp-local-server dhcpv6 ...]
Release Information	Statement introduced in Junos OS Release 11.4. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Specify the address pool that assigns the IA_PD address. A pool specified by RADIUS VSA 26-161 takes precedence over the pool specified by this delegated-pool statement.
Options	pool-name —Name of the address-assignment pool.
Required Privilege	system—To view this statement in the configuration.
Level	system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying the Delegated Address-Assignment Pool to Be Used for DHCPv6 Prefix Delegation on page 474• Overriding Default DHCP Local Server Configuration Settings on page 311

delete-binding-on-renegotiation (DHCP Local Server and Relay Agent)

Syntax	delete-binding-on-renegotiation;
Hierarchy Level	[edit forwarding-options dhcp-relay overrides], [edit forwarding-options dhcp-relay dhcpv6 overrides], [edit forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> ...], [edit routing-instances <i>routing-instance-name</i> ...], [edit system services dhcp-local-server overrides], [edit system services dhcp-local-server dhcpv6 overrides], [edit system services dhcp-local-server group <i>group-name</i> overrides], [edit system services dhcp-local-server dhcpv6 group <i>group-name</i> overrides]
Release Information	Statement introduced in Junos OS Release 15.1.
Description	<p>Configure the router to override the default behavior when the router receives a DHCPv4 Discover or DHCPv6 Solicit message while in a bound state. By default, DHCP maintains the existing client entry when DHCP receives a new Discover or Solicit message that has a client ID that matches the existing client. DHCP then processes the new message using the existing client entry.</p> <p>You use the delete-binding-on-renegotiation statement to override the default action, and to specify that DHCP tear down the existing matching client entry and to process the message as a new client entry.</p>
	<div>  <p>NOTE: In Junos OS releases prior to 15.1, the DHCPv6 local server and relay agent use the opposite default behavior, and tear down the existing client entry when receiving a Solicit message while in a bound state. Starting in Junos OS release 15.1, the DHCPv6 local server and DHCPv6 relay agent default behavior is the same as DHCPv4 local server and relay agent—in all models, the default behavior is to maintain the existing client entry.</p> </div>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • DHCP Behavior When Renegotiating While in Bound State on page 317

delimiter (DHCP Local Server)

Syntax	<code>delimiter <i>delimiter-character</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server group group-name authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify the character used as the delimiter between the concatenated components of the username.
Options	<i>delimiter-character</i> —Character that separates components that make up the concatenated username. You cannot use the semicolon (;) as a delimiter.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)

delimiter (Domain Map)

Syntax	<code>delimiter [<i>delimiter-character</i>];</code>
Hierarchy Level	[edit access domain]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Specify the characters that the router uses to separate usernames from domain names.
Default	The @ character.
Options	<i>delimiter-character</i> —One or more characters used as delimiters. You can specify a maximum of eight delimiters. You cannot use the semicolon (;) as a delimiter. Do not include spaces between characters.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying Domain and Realm Name Delimiters on page 169• Configuring Domain and Realm Name Usage for Domain Maps on page 168

delimiter (DHCP Relay Agent)

Syntax	<code>delimiter <i>delimiter-character</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Support at the [edit ... dual-stack-group dual-stack-group-name] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	Specify the character used as the delimiter between the concatenated components of the username. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.
Options	<i>delimiter-character</i> —Character that separates components that make up the concatenated username. You cannot use the semicolon (;) as a delimiter.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)
 - [Creating Unique Usernames for DHCP Clients on page 272](#)

demux

Syntax	demux (destination-address source-address);
Hierarchy Level	[edit services ptsp rule rule-name]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the IP address used to establish the subscriber context. Subscriber instantiation is always triggered for ingress packets, so this value indicates which IP address in the ingress packets for the flow is used. If the IP address does not correspond to a known subscriber, then a new subscriber context is created. All service rules attached to a given service set must have the same setting.
Options	<p>destination-address—Use the destination IP address field of the ingress packet header for the flow.</p> <p>source-address—Use the source IP address field of the ingress packet header for the flow.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

destination (Diameter Network Element)

Syntax	destination realm <i>realm-name</i> <host <i>hostname</i> >;
Hierarchy Level	[edit diameter network-element <i>element-name</i> forwarding route <i>dne-route-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Associate the route with all hosts of the specified realm or with a specific host of the specified realm. Together with the function and metric, defines a route reachable through a Diameter network element.
Options	host <i>hostname</i> —(Optional) Name of the destination host associated with the route. realm <i>realm-name</i> —Name of the destination realm associated with the route.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Network Elements on page 701

destination-host

Syntax	destination-host <i>hostname</i>
Hierarchy Level	[edit jsrc partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Configure the host on which the SAE application resides.
Options	<i>hostname</i> —Host on which the SAE is installed.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring JSRC on page 759• Configuring the JSRC Partition on page 760

destination-host (Gx-Plus)

Syntax	<code>destination-host <i>hostname</i>;</code>
Hierarchy Level	[edit access gx-plus partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure the host on which the PCRF application resides.
Options	<i>hostname</i> —Host on which the PCRF is installed.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Gx-Plus on page 710 • Configuring the Gx-Plus Partition on page 711

destination-host (OCS Partition)

Syntax	<code>destination-host <i>ocs-hostname</i>;</code>
Hierarchy Level	[edit access ocs partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the Destination-Host AVP value used in the CCR-GY-I message.
Options	<i>ocs-hostname</i> —Value of the Destination-Host AVP to be used in the CCR-GY-I message.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the OCS Partition on page 743 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gy Interactions Between the Router and the OCS on page 730 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

destination-host (PCRF Partition)

Syntax	<code>destination-host <i>pcrf-hostname</i>;</code>
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the Destination-Host AVP value used in the CCR-GX-I message.
Options	<i>pcrf-hostname</i> —(Optional) Value of the Destination-Host AVP to be used in the CCR-GX-I message.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740

destination-host (PTSP)

Syntax	<code>destination-host <i>hostname</i>;</code>
Hierarchy Level	[edit system services packet-triggered-subscribers partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Configure the host on which the SAE application resides.
Options	<i>hostname</i> —Host on which the SAE is installed.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the PTSP Partition on page 795

destination-realm (JSRC)

Syntax	<code>destination-realm <i>realm</i></code>
Hierarchy Level	[edit jsrc partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Configure the realm in which the SAE host resides.
Options	<i>realm</i> —Realm in which the SAE host resides.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring JSRC on page 759 • Configuring the JSRC Partition on page 760

destination-realm (Gx-Plus)

Syntax	<code>destination-realm <i>realm</i>;</code>
Hierarchy Level	[edit access gx-plus partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure the realm in which the PCRF host resides.
Options	<i>realm</i> —Realm in which the PCRF host resides.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Gx-Plus on page 710 • Configuring the Gx-Plus Partition on page 711

destination-realm (OCS Partition)

Syntax	<code>destination-realm <i>ocs-realm-name</i>;</code>
Hierarchy Level	[edit access ocs partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the Destination-Realm AVP value in all CCR-GY messages.
Options	<i>ocs-realm-name</i> —Name of the Destination-Real AVP value to be used in all CCR-GY messages.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the OCS Partition on page 743• 3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

destination-realm (PCRF Partition)

Syntax	<code>destination-realm <i>pcrf-realm-name</i>;</code>
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the Destination-Realm AVP value in all CCR-GX messages.
Options	<i>pcrf-realmname</i> —Value of the Destination-Real AVP to be used in all CCR-GX messages.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the PCRF Partition on page 746 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735 • Understanding Upstream and Downstream Messages for the PCRF on page 740

destination-realm (PTSP)

Syntax	<code>destination-realm <i>realm</i></code>
Hierarchy Level	[edit system services packet-triggered-subscribers partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Configure the realm in which the SAE host resides.
Options	<i>realm</i> —Realm in which the SAE host resides.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the PTSP Partition on page 795

dhcp-attributes (Address-Assignment Pools)

Syntax	<pre> 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]; } </pre>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family <i>family</i>]
Release Information	<p>Statement introduced in Junos OS Release 9.0.</p> <p>Statement introduced in Junos OS Release 12.3 for EX Series switches.</p>
Description	<p>Configure address pools that can be used by different client applications.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Address-Assignment Pools Overview on page 565 • DHCP Attributes for Address-Assignment Pools on page 243 • Configuring Address-Assignment Pools on page 567 • Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address on page 247

dhcp-local-server

```
Syntax  dhcp-local-server {
    access-profile profile-name;
    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 {
        access-profile profile-name;
        authentication {
            ...
        }
        duplicate-clients incoming-interface;
        group group-name {
            access-profile profile-name;
            authentication {
                ...
            }
            interface interface-name {
                access-profile profile-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;
server-duid-type type;
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 {
        forcerenew;
        nak;
    }
    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;
    }
}
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>;
    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;
  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 extended DHCP local server is incompatible with the DHCP server on J Series routers and so is not supported on J Series routers. Also, 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 **dhcpcv6** 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 on page 230](#)
 - [DHCPv6 Local Server Overview on page 434](#)

dhcp-relay

```
Syntax  dhcp-relay {
        access-profile profile-name;
        active-server-group server-group-name;
        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 {
        access-profile profile-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;
                interface-name;
                logical-system-name;
                relay-agent-interface-id;
                relay-agent-remote-id;
                relay-agent-subscriber-id;
                routing-instance-name;
                user-prefix user-prefix-string;
            }
        }
    }
    dual-stack-group dual-stack-group-name {
        access-profile profile-name;
        authentication {
            ... authentication-configuration
        }
        dynamic-profile profile-name {
            ... dynamic-profile-configuration
        }
        relay-agent-interface-id {
            ... relay-agent-interface-id-configuration
        }
        relay-agent-remote-id {
            ... relay-agent-remote-id-configuration
        }
        service-profile dynamic-profile-name;
    }
}
```

```
dual-stack-group dual-stack-group-name {
  access-profile profile-name;
  authentication {
    ... authentication-configuration
  }
  dynamic-profile profile-name {
    ... dynamic-profile-configuration
  }
  relay-agent-interface-id {
    ... relay-agent-interface-id-configuration
  }
  relay-agent-remote-id {
    ... relay-agent-remote-id-configuration
  }
  service-profile dynamic-profile-name;
}
dynamic-profile profile-name {
  aggregate-clients (merge | replace);
  use-primary primary-profile-name;
}
forward-only {
  logical-system <current | default | logical-system-name>;
  routing-instance <current | default | routing-instance-name>;
}
forward-only-replies;
group group-name {
  access-profile profile-name;
  active-server-group server-group-name;
  authentication {
    ...
  }
  dynamic-profile profile-name {
    ...
  }
  forward-only {
    ...
  }
  forward-only {
    ...
  }
}
interface interface-name {
  access-profile profile-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 {
    ...
}
relay-option {
    ...
}
service-profile dynamic-profile-name;
trace;
upto upto-interface-name;
}
route-suppression:
service-profile dynamic-profile-name;
overrides {
    ...
}
relay-agent-interface-id {
    ...
}
relay-agent-remote-id {
    ...
}
relay-option {
    ...
}
route-suppression;
server-response-time seconds;
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 {
    allow-snooped-clients;
    delay-authentication;
    dual-stack dual-stack-group-name;
    delete-binding-on-renegotiation;
    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);
    use-option-82 <strict>;
}
server-group {
    server-group-name {
        server-ip-address;
    }
}
duplicate-clients-in-subnet (incoming-interface | option-82):
dynamic-profile profile-name {
    aggregate-clients (merge | replace);
    use-primary primary-profile-name;
}
forward-only {
    logical-system <current | default | logical-system-name>;
    routing-instance <current | default | routing-instance-name>;
}
forward-only-replies;
forward-snooped-clients (all-interfaces | configured-interfaces |
    non-configured-interfaces);
group group-name {
    access-profile profile-name;
    active-server-group server-group-name;
    authentication {
        ...
    }
}
dynamic-profile profile-name {
    ...
}
forward-only {
    logical-system <current | default | logical-system-name>;
    routing-instance <current | default | routing-instance-name>;
}
forward-only {
    logical-system <current | default | logical-system-name>;
    routing-instance <current | default | routing-instance-name>;
}
interface interface-name {

```

```

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

```

```

    }
  }
  server-group {
    server-group-name {
      server-ip-address;
    }
  }
  route-suppression:
  server-response-time seconds;
  service-profile dynamic-profile-name;
}

```

Hierarchy Level	<p>[edit forwarding-options], [edit logical-systems <i>logical-system-name</i> forwarding-options], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options], [edit routing-instances <i>routing-instance-name</i> forwarding-options]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.3. 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.</p>
Description	<p>Configure extended Dynamic Host Configuration Protocol (DHCP) relay and DHCPv6 relay options on the router or switch and enable the router (or 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.</p> <p>DHCP relay supports the attachment of dynamic profiles and also interacts with the local AAA Service Framework to use back-end authentication servers, such as RADIUS, to provide subscriber authentication or client authentication. You can attach dynamic profiles and configure authentication support on a global basis or for a specific group of interfaces.</p> <p>The extended DHCP and DHCPv6 relay agent options configured with the dhcp-relay and dhcpv6 statements are incompatible with the DHCP/BOOTP relay agent options configured with the bootp statement. As a result, the extended DHCP or DHCPv6 relay agent and the DHCP/BOOTP relay agent cannot both be enabled on the router (or switch) at the same time.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Relay Agent Overview on page 236 • DHCPv6 Relay Agent Overview on page 441 • DHCP Relay Proxy Overview on page 239 • Using External AAA Authentication Services with DHCP on page 271

dhcp-service

```
Syntax  dhcp-service {
        accept-max-tcp-connections max-tcp-connections;
        dhcp-snooping-file(local_pathname | remote_URL) {
            write-interval interval;
        }
        interface-traceoptions {
            file filename <files number> <match regular-expression > <size maximum-file-size>
            <world-readable | no-world-readable>;
            flag flag;
            level (all | error | info | notice | verbose | warning);
            no-remote-trace;
        }
        ltv-syslog-interval seconds;
        request-max-tcp-connections max-tcp-connections;
        traceoptions {
            file filename <files number> <match regular-expression > <size maximum-file-size>
            <world-readable | no-world-readable>;
            flag flag;
            level (all | error | info | notice | verbose | warning);
            no-remote-trace;
        }
    }
```

Hierarchy Level [edit system processes]

Release Information Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Statement introduced in Junos OS Release 13.2 for the QFX Series.
Statement introduced in Junos OS Release 14.1 for MX Series routers.

Description Enable DHCP services on the device. DHCP services automate network-parameter assignment to network devices. The DHCP service process is enabled by default. However, by default, IP-MAC bindings in the DHCP snooping database do not persist through device reboots. You can improve performance after rebooting by configuring the IP-MAC bindings to persist, by configuring a storage location for the DHCP database file. When specifying the location for the DHCP database, you must also specify how frequently the switch writes the database entries into the DHCP snooping database file.

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 Persistent Bindings in the DHCP or DHCPv6 Snooping Database to Improve Network Performance (CLI Procedure)*

dhcpv6 (DHCP Local Server)

```
Syntax  dhcpv6 {
    access-profile profile-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;
        }
    }
    duplicate-clients incoming-interface;
    group group-name {
        access-profile profile-name;
        authentication {
            ...
        }
        interface interface-name {
            access-profile profile-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-negotiation-match incoming-interface;
        delete-binding-on-renegotiation;
        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 {
    client-negotiation-match incoming-interface;
    delegated-pool;
    delete-binding-on-renegotiation;
    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 {
    client-negotiation-match incoming-interface;
    delegated-pool;
    delete-binding-on-renegotiation;
    delete-binding-on-renegotiation;
    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;
        }
    }
}
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;
server-duid-type type;
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 on page 434](#)

dhcpcv6 (DHCP Relay Agent)

```
Syntax  dhcpcv6 {
    access-profile profile-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;
        relay-agent-interface-id;
        relay-agent-remote-id;
        relay-agent-subscriber-id;
        routing-instance-name;
        user-prefix user-prefix-string;
    }
}
duplicate-clients incoming-interface;
dynamic-profile profile-name {
    aggregate-clients (merge | replace);
    use-primary primary-profile-name;
}
forward-only {
    logical-system <current | default | logical-system-name>;
    routing-instance <current | default | routing-instance-name>;
}
forward-only-replies;
}
group group-name {
    active-server-group server-group-name;
    authentication {
        ...
    }
    dynamic-profile profile-name {
        ...
    }
    forward-only {
        logical-system <current | default | logical-system-name>;
        routing-instance <current | default | routing-instance-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;
upto upto-interface-name;
}
}
overrides {
    ...
}
relay-agent-interface-id {
    ...
}
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;
        }
        route-suppression;
        service-profile dynamic-profile-name;
    }
}
liveness-detection {
    ...
}
overrides {
    allow-snooped-clients;
}

```

```

    client-negotiation-match incoming-interface;
    delay-authentication;
    delete-binding-on-renegotiation;
    dual-stack dual-stack-group-name;
    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);
    use-option-82 <strict>;
}
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) {
        drop;
        forward-only;
        relay-server-group relay-server-group;
    }
}
relay-option-vendor-specific {
    host-name;
    location;
    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	<p>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.</p> <p>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.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• dhcp-relay on page 1001• DHCPv6 Relay Agent Overview on page 441• Using External AAA Authentication Services with DHCP on page 271

diameter

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

Hierarchy Level [edit]

Release Information Statement introduced in Junos OS Release 9.6.

Description Configure the Diameter base protocol for subscriber management.

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 Diameter on page 699](#)

diameter-instance (JSRC)

Syntax	<code>diameter-instance <i>instance-name</i></code>
Hierarchy Level	<code>[edit jsrc partition <i>partition-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the Diameter instance associated with the JSRC partition.
Options	<i>instance-name</i> —Name of the Diameter instance. Currently, only master is supported.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring JSRC on page 759 • Configuring the JSRC Partition on page 760

diameter-instance (Diameter Applications)

Syntax	<code>diameter-instance <i>instance-name</i>;</code>
Hierarchy Level	<code>[edit access gx-plus partition <i>partition-name</i>]</code> <code>[edit access ocs partition <i>partition-name</i>],</code> <code>[edit access pcrf partition <i>partition-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 11.2. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches. Support at the <code>[edit access ocs partition <i>partition-name</i>]</code> and <code>[edit access pcrf partition <i>partition-name</i>]</code> hierarchy levels introduced in Junos OS Release 16.2.
Description	Specify the Diameter instance associated with the Gx-Plus, OCS, or PCRF partition.
Options	<i>instance-name</i> —Name of the Diameter instance. Currently, only master is supported.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Gx-Plus on page 710 • Configuring the Gx-Plus Partition on page 711 • Configuring the OCS Partition on page 743 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Gy Interactions Between the Router and the OCS on page 730

diameter-instance (PTSP)

Syntax	<code>diameter-instance <i>instance-name</i></code>
Hierarchy Level	[edit system services packet-triggered-subscribers partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the Diameter instance associated with the PTSP partition.
Options	<i>instance-name</i> —Name of the Diameter instance. Currently, only master is supported.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the PTSP Partition on page 795

dictionary

Syntax	<code>dictionary <i>dictionary-path</i>;</code>
Hierarchy Level	[edit system services extensible-subscriber-services]
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Configure an XML-based dictionary file. The dictionary path is the complete path to the dictionary file and includes the dictionary filename. Extensible Subscriber Services Manager acts on the extensible-subscriber-service request on the basis of the services configured in the dictionary file. This configuration is mandatory.
Options	<i>dictionary-path</i> —Path to the dictionary file. The complete path including the filename must not be more than 127 characters.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• show extensible-subscriber-services dictionary on page 1666• show extensible-subscriber-services dictionary attributes on page 1670• request services extensible-subscriber-services reload-dictionary on page 1493• show extensible-subscriber-services dictionary services on page 1673• Understanding the Dictionary File on page 222

disable

Syntax	<code>disable service-name;</code>
Hierarchy Level	<code>[edit services service-set services-set-name subscriber-profile profile-name]</code>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Disable the service name of the subscriber profile.
Options	service-name —Name of the disabled service.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.


disable (Extensible Subscriber Services Manager)

Syntax	<code>disable</code>
Hierarchy Level	<code>[edit system processes extensible-subscriber-services]</code>
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Disable the Extensible Subscriber Services Manager process when there is an extensible-subscriber-services configuration and the user wants to stop the process. The process is disabled by default when there is no configuration under the [edit system services extensible-subscriber-services] hierarchy level.
Default	The process is disabled by default.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • restart extensible-subscriber-services on page 1503

disable-relay

Syntax	disable-relay;
Hierarchy Level	[edit forwarding-options dhcp-relay overrides], [edit forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]
Release Information	Statement introduced in Junos OS Release 8.3. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Disable DHCP relay on specific interfaces in a group.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Extended DHCP Relay Agent Overview on page 236

dne-origin (Diameter Network Element)

Syntax	<code>dne-origin realm <i>realm-name</i> <host <i>hostname</i>>;</code>
Hierarchy Level	[edit diameter network-element <i>element-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Specify values of Origin-Realm-AVP and Origin-Host-AVP used in messages sent for the specified network element by the Diameter instance.
<div>  NOTE: Only the realm is mandatory for the DNE origin. </div>	
Options	<p>host <i>hostname</i>—(Optional) Name of the message origin host that is supplied as the value of the Origin-Host AVP for Diameter messages associated with the network element.</p> <p>realm <i>realm-name</i>—Name of the message origin realm, that is supplied as the value of the Origin-Realm AVP for Diameter messages associated with the network element.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter Network Elements on page 701 • Configuring Diameter on page 699

dns-server

Syntax	<code>dns-server <i>ipv6-address</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet6 dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 10.0.
Description	Specify a DNS server to which clients can send DNS queries. This is equivalent to DHCPv6 option 23. To specify multiple DNS servers, add multiple dns-server statements in order of preference.
Options	<i>ipv6-address</i> —IPv6 address of a DNS server.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Address-Assignment Pools Overview on page 565 • Configuring Address-Assignment Pools on page 567

dns-server-address (Dynamic Profiles)

Syntax	<code>dns-server-address [<i>dns-server-address</i> \$junos-ipv6-dns-server-address] { lifetime <i>seconds</i>; }</code>
Hierarchy Level	[edit dynamic-profiles <i>dynamic-profile-name</i> protocols router-advertisement interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	<p>Specify the address of the DNS server that is used to resolve IPv6 DNS names. You can use RADIUS to provide the address dynamically in the \$junos-ipv6-dns-server variable within Access-Accept messages, or you can statically configure up to three IPv6 addresses.</p> <p>You can also specify the maximum time in seconds for which the DNS server address remains valid. The device can use the recursive DNS server address for DNS name resolution until the time specified expires.</p>
Options	<p>\$junos-ipv6-dns-server-address—Dynamically receive the address of the DNS server from RADIUS in Access-Accept messages.</p> <p><i>dns-server-address</i>—IPv6 address of the DNS server. You can configure up to three DNS server addresses.</p> <p>lifetime <i>seconds</i>—Maximum time for which the recursive DNS server address remains valid.</p> <p>Range: 0 through 4,294,967,295 seconds</p> <p>Default: 1800 seconds</p> <p>Values: 0 indicates that the advertised recursive DNS server address is no longer valid and that this recursive DNS server address entry can be deleted. A value of 4,294,967,295 seconds indicates an infinite lifetime and a persistent entry in the device for this recursive DNS server address.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• DNS Resolver for IPv6 DNS Overview on page 582• Configuring a DNS Server Address for IPv6 Hosts on page 582

domain (Domain Map)

Syntax

```

domain {
  delimiter [delimiter-character];
  map domain-map-name {
    aaa-logical-system logical-system-name {
      aaa-routing-instance routing-instance-name;
    }
    aaa-routing-instance routing-instance-name;
    access-profile profile-name;
    address-pool pool-name;
    dynamic-profile profile-name;
    padn destination-address {
      mask destination-mask;
      metric route-metric;
    }
    strip-domain;
    target-logical-system logical-system-name {
      target-routing-instance routing-instance-name;
    }
    target-routing-instance routing-instance-name;
    tunnel-profile profile-name;
  }
  parse-direction (left-to-right | right-to-left);
  parse-order (domain-first | realm-first);
  realm-delimiter [delimiter-character];
  realm-parse-direction (left-to-right | right-to-left);
}

```

Hierarchy Level [edit access]

Release Information Statement introduced in Junos OS Release 10.4.

Description Configure a domain map, which is used to map access options and session parameters for subscriber sessions.

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 a Domain Map on page 162](#)

domain-name (DHCP Local Server)

Syntax	<code>domain-name <i>domain-name-string</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit system services dhcp],</p> <p>[edit system services dhcp-local-server authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server group group-name authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify the domain name that is concatenated with the username during the subscriber authentication or DHCP client authentication process.
Options	<i>domain-name-string</i> —Domain name formatted string.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)

domain-name (DHCP Relay Agent)

Syntax	<code>domain-name <i>domain-name-string</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include]</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	Specify the domain name that is concatenated with the username during the subscriber authentication or client authentication process. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.
Options	<i>domain-name-string</i> —Domain name formatted string.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)
 - [Creating Unique Usernames for DHCP Clients on page 272](#)

domain-name (Address-Assignment Pools)

Syntax	<code>domain-name <i>domain-name</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	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. This is equivalent to DHCP option 15.
Options	<i>domain-name</i> —Name of the domain.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	• Configuring Address-Assignment Pools on page 567

domain-name (Static Subscribers)

Syntax	<code>domain-name <i>domain-name</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit system services static-subscribers authentication username-include],</p> <p>[edit system services static-subscribers group <i>group-name</i> authentication username-include]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the domain name that is included at the end of the username created for all static subscribers or for the static subscribers in a specified group. The group version of the statement takes precedence over the global version.
Options	<p><i>domain-name</i>—Domain name that ends the username created for all static subscribers. The username is also sent to RADIUS in the Access-Request message. The string can include the following characters: a through z, A through Z, 0 through 9, “-”, or “.”.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Subscribers over Static Interfaces on page 772• Configuring the Static Subscriber Global Username on page 777• Configuring the Static Subscriber Group Username on page 782

domain-name-server (Routing Instances and Access Profiles)

Syntax	<code>domain-name-server <i>dns-address</i>;</code>
Hierarchy Level	<code>[edit access];</code> <code>[edit access <i>profile</i>]</code>
Release Information	Statement introduced in Junos OS Release 12.3. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure an IPv4 address for a DNS name server. You can configure an address globally for a routing instance at the <code>[edit access]</code> hierarchy level or for an access profile at the <code>[edit access profile <i>profile-name</i>]</code> hierarchy level. You can configure more than one address by including the statement multiple times.



NOTE: A DNS name server address configured with this statement is less preferred than one configured with the `domain-name-server inet` statement. That is, the server with the address configured with the `domain-name-server inet` takes precedence over a server configured with this statement.

Options	<code><i>dns-address</i></code> —IPv4 address of the DNS name server.
Required Privilege Level	<code>admin</code> —To view this statement in the configuration <code>admin-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring DNS Name Server Addresses for Subscriber Management on page 578 • DNS Name Server Address Overview on page 577

domain-name-server-inet (Routing Instances and Access Profiles)

Syntax	<code>domain-name-server-inet <i>dns-address</i>;</code>
Hierarchy Level	[edit access], [edit access profile]
Release Information	Statement introduced in Junos OS Release 12.3. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure an IPv4 address for a DNS name server. You can configure an address globally for a routing instance at the [edit access] hierarchy level or for an access profile at the [edit access profile <i>profile-name</i>] hierarchy level. You can configure more than one address by including the statement multiple times.



NOTE: A DNS name server address configured with this statement is higher in preference than one configured with the [domain-name-server](#) statement. That is, the server with the address configured with the [domain-name-server-inet](#) takes precedence over a server configured with the [domain-name-server](#) statement.

Options	<i>dns-address</i> —IPv4 address of the DNS name server.
Required Privilege Level	admin—To view this statement in the configuration admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring DNS Name Server Addresses for Subscriber Management on page 578• DNS Name Server Address Overview on page 577

domain-name-server-inet6 (Routing Instances and Access Profiles)

Syntax	<code>domain-name-server-inet6 <i>dns-address</i>;</code>
Hierarchy Level	[edit access], [edit access profile]
Release Information	Statement introduced in Junos OS Release 12.3. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure an IPv6 address for a DNS name server. You can configure an address globally for a routing instance at the [edit access] hierarchy level or for an access profile at the [edit access profile <i>profile-name</i>] hierarchy level. You can configure more than one address by including the statement multiple times.
Options	<i>dns-address</i> —IPv6 address of the DNS name server.
Required Privilege Level	admin—To view this statement in the configuration admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring DNS Name Server Addresses for Subscriber Management on page 578• DNS Name Server Address Overview on page 577

downstream-rate (Traffic Shaping)

Syntax	<code>downstream-rate rate;</code>
Hierarchy Level	<code>[edit dynamic-profiles <i>profile-name</i> interfaces \$junos-interface-ifd-name unit \$junos-interface-unit advisory-options],</code> <code>[edit dynamic-profiles <i>profile-name</i> interfaces interface-set \$junos-interface-set-name interface \$junos-interface-ifd-name advisory-options],</code> <code>[edit interfaces demux0 unit <i>logical-unit-number</i> advisory-options],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> advisory-options]</code>
Release Information	Statement introduced in Junos OS Release 11.4. Support at the <code>[edit interfaces demux0 ...]</code> hierarchy level introduced in Junos OS Release 12.2. Support at the <code>[edit dynamic-profiles ...]</code> hierarchy level introduced in Junos OS Release 13.1.
Description	<p>Specify a recommended shaping rate to be applied to downstream traffic on an interface.</p> <p>For ANCP interfaces, this configured rate is used as the default value for the Juniper VSA Downstream-Calculated-Qos-Rate (26–141) when the router has not received and processed the attributes from the access node.</p> <p>For L2TP, the rate is configured on an underlying PPPoE logical interface for a subscriber on an MX Series router acting as a LAC. When the subscriber is tunneled, this rate, referred to as speed for L2TP, is sent to the LNS in the ICCN message as AVP 24.</p>
Options	rate —Traffic rate in bits per second. Range: 1000 through 4,294,967,295 bits per second
Required Privilege Level	interface —To view this statement in the configuration. interface-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Setting a Recommended Shaping Rate for Traffic on ANCP Interfaces on page 659• Configuring the ANCP Agent on page 624• <i>Configuring the Method to Set the LAC Connection Speeds to the LNS</i>

draining (Diameter Applications)

Syntax	draining;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>], [edit access ocs partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure the Policy and Charging Rule Function (PCRF) or Online Charging System (OCS) partition to the draining state to make substantial configuration changes quickly. To log out all subscribers quickly and immediately, issue the clear network-access pcrf subscribers command.</p> <p>After you set draining for either of the PCRF or OCS partitions, any new subscriber logins are denied, and the time limit you set in the draining-response-timeout statement is used instead of the logout-response-timeout time limit.</p> <p>After the partition has drained, you must issue the clear network-access pcrf or clear network-access ocs statistics command to clear out the respective partition's subscribers and wait for all of the subscribers to log out before you can make configuration changes and resume normal operations.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the OCS Partition on page 743 • Configuring the PCRF Partition on page 746 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Gy Interactions Between the Router and the OCS on page 730 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

draining-response-timeout (Diameter Applications)

Syntax	<code>draining-response-timeout <i>seconds</i>;</code>
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>], [edit access ocs partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure the amount of time in seconds before a PCRF or an Online Charging System OCS partition responds and begins to drain. Configuring this statement is optional if you set draining statement for either of the Policy and Charging Rule Function (PCRF) or Online Charging System (OCS) partitions.</p> <p>After you set draining for either of the PCRF or OCS partitions, any new subscriber logins are denied, and the time limit you set in this statement is used instead of the logout-response-timeout time limit.</p>
Options	<p><i>seconds</i>—Number of seconds to wait before the partition begins to drain.</p> <p>Default: 400</p> <p>Range: 0 through 86,400 seconds (24 hours)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the OCS Partition on page 743• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

drop (DHCP Relay Agent Option)

Syntax	drop;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay relay-option (default-action equals starts-with)],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 relay-option (default-action equals starts-with)],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> relay-option (default-action equals starts-with)],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> relay-option (default-action equals starts-with)],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</p>
Release Information	Statement introduced in Junos OS Release 12.3.
Description	Drop (discard) specified DHCP client packets when you use DHCP relay agent selective processing. You can configure the drop operation globally or for a group of interfaces, and for either DHCP or DHCPv6 relay agent.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

dual-stack (DHCP Relay Agent Overrides)

Syntax	<code>dual-stack <i>dual-stack-group-name</i>;</code>
Hierarchy Level	<code>[edit forwarding-options dhcp-relay overrides],</code> <code>[edit forwarding-options dhcp-relay dhcpv6 overrides],</code> <code>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides],</code> <code>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> interface <i>interface-name</i></code> <code>overrides],</code> <code>[edit forwarding-options dhcp-relay group <i>group-name</i> overrides],</code> <code>[edit forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides],</code> <code>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i></code> <code>forwarding-options dhcp-relay ...],</code> <code>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</code>
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Assigns the specified dual-stack group to both legs (DHCP and DHCPv6) of the DHCP dual stack. The dual-stack group defines the common configuration settings for DHCP and DHCPv6 subscribers on both legs. These settings take precedence over all other configurations, such as those specified in global, group, or interface settings.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement in the configuration.
Related Documentation	<ul style="list-style-type: none">• Single-Session DHCP Dual-Stack Overview on page 408• Configuring Single-Session DHCP Dual-Stack Support on page 409


dual-stack-group (DHCP Relay Agent)

Syntax	<pre> dual-stack-group <i>dual-stack-group-name</i> { access-profile <i>profile-name</i>; authentication { ... <i>authentication-configuration</i> } dynamic-profile <i>profile-name</i> { ... <i>dynamic-profile-configuration</i> } relay-agent-interface-id { ... <i>relay-agent-interface-id-configuration</i> } relay-agent-remote-id { ... <i>relay-agent-remote-id-configuration</i> } service-profile <i>dynamic-profile-name</i>; } </pre>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay]</p>
Release Information	Statement introduced in Junos OS Release 15.1.
Description	<p>Specifies common configuration settings that are used for both legs (DHCP and DHCPv6) of the DHCP dual stack, and names the dual stack group.</p> <p>The group is assigned to each leg of the DHCP dual-stack with the dual-stack statement in the overrides stanza. When applied, the dual-stack configuration takes precedence over all other configurations, such as those specified in global, group, or interface settings.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement in the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Single-Session DHCP Dual-Stack Overview on page 408 • Configuring Single-Session DHCP Dual-Stack Support on page 409

duplication (Access Profile)

Syntax	duplication;
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the router to send accounting reports to both the RADIUS accounting server configured in the access profile for the wholesaler and the RADIUS accounting server configured in the access profile for the retailer.
Default	The router sends accounting reports to the accounting servers that are in the context in which the subscriber is authenticated.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90• Understanding RADIUS Accounting Duplicate Reporting on page 97


duplication-filter (Access Profile)

Syntax	<code>duplication-filter (interim-duplicated interim-original) <exclude-attributes>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Configure which accounting servers receive accounting messages when RADIUS duplication accounting is configured in the access profile.
Options	<p>exclude-attributes—(Optional) Filter RADIUS attributes from duplicated accounting interim messages based on the exclude statement configuration in the corresponding duplication access profile. You can configure exclude-attributes alone, or with interim-duplicated or interim-original.</p> <p>interim-duplicated—Do not send accounting interim messages to RADIUS accounting servers that are in a duplication context other than the subscriber's access profile.</p> <p>interim-original—Do not send accounting interim messages to RADIUS accounting servers that are in the subscriber's access profile.</p>
<div>  <p>NOTE: The interim-duplicated and interim-original filters are mutually exclusive.</p> </div>	
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90 • Understanding RADIUS Accounting Duplicate Reporting on page 97 • Configuring Duplication Filters for RADIUS Accounting Duplicate Reporting on page 99 • Configuring Per-Subscriber Session Accounting on page 104

duplication-vrf (Duplicate Accounting)

Syntax	<pre>duplication-vrf { access-profile-name <i>profile-name</i>; vrf-name <i>vrf-name</i>; }</pre>
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 12.3R3 and supported in later 12.3Rx releases. Statement supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)
Description	<p>Configure the router to send duplicate accounting information to the RADIUS accounting servers defined in up to five access profiles all in the same nondefault VRF (LS:RI combination).</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Understanding RADIUS Accounting Duplicate Reporting on page 97• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

duplication-filter (Access Profile)

Syntax	<code>duplication-filter (interim-duplicated interim-original) <exclude-attributes>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Configure which accounting servers receive accounting messages when RADIUS duplication accounting is configured in the access profile.
Options	<p>exclude-attributes—(Optional) Filter RADIUS attributes from duplicated accounting interim messages based on the exclude statement configuration in the corresponding duplication access profile. You can configure exclude-attributes alone, or with interim-duplicated or interim-original.</p> <p>interim-duplicated—Do not send accounting interim messages to RADIUS accounting servers that are in a duplication context other than the subscriber's access profile.</p> <p>interim-original—Do not send accounting interim messages to RADIUS accounting servers that are in the subscriber's access profile.</p>
<div>  <p>NOTE: The interim-duplicated and interim-original filters are mutually exclusive.</p> </div>	
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90 • Understanding RADIUS Accounting Duplicate Reporting on page 97 • Configuring Duplication Filters for RADIUS Accounting Duplicate Reporting on page 99 • Configuring Per-Subscriber Session Accounting on page 104

dynamic-profile (DHCP Local Server)

Syntax	<pre>dynamic-profile <i>profile-name</i> { aggregate-clients (merge replace); use-primary <i>primary-profile-name</i>; }</pre>
Hierarchy Level	<pre>[edit system services dhcp-local-server], [edit system services dhcp-local-server dhcpv6], [edit system services dhcp-local-server dhcpv6 group <i>group-name</i>], [edit system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i>], [edit system services dhcp-local-server group <i>group-name</i>], [edit system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i>], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</pre>
Release Information	<p>Statement introduced in Junos OS Release 9.2.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Options aggregate-clients and use-primary introduced in Junos OS Release 9.3.</p> <p>Support at the [edit ... interface] hierarchy levels introduced in Junos OS Release 11.2.</p>
Description	Specify the dynamic profile that is attached to all interfaces, a named group of interfaces, or a specific interface.
Options	<p><i>profile-name</i>—Name of the dynamic profile.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces</i>• Configuring a Default Subscriber Service on page 242


dynamic-profile (DHCP Relay Agent)

Syntax	<pre>dynamic-profile <i>profile-name</i> { aggregate-clients (merge replace); use-primary <i>primary-profile-name</i>; }</pre>
Hierarchy Level	<pre>[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 <i>group-name</i> interface interface-name], [edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name], [edit forwarding-options dhcp-relay group group-name], [edit forwarding-options dhcp-relay group <i>group-name</i> interface interface-name], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</pre>
Release Information	<p>Statement introduced in Junos OS Release 9.2.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p> <p>Support at the [edit ... dual-stack-group dual-stack-group-name] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	<p>Specify the dynamic profile that is attached to all interfaces, to a named group of interfaces, or to a specific interface.</p> <p>M120 and M320 routers do not support DHCPv6.</p>
Options	<p><i>profile-name</i>—Name of the dynamic profile.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • dhcp-relay on page 1001 • Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces • Grouping Interfaces with Common DHCP Configurations on page 277 • Configuring a Default Subscriber Service on page 242

dynamic-profile (Domain Map)

Syntax	<code>dynamic-profile <i>profile-name</i>;</code>
Hierarchy Level	[edit access domain map <i>domain-map-name</i>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Dynamic profile that is used for subscriber sessions associated with the domain map.
Options	<i>profile-name</i> —Name of dynamic profile.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying a Dynamic Profile in a Domain Map on page 166

dynamic-profile (Static Subscribers)

Syntax	<code>dynamic-profile <i>profile-name</i> { aggregate-clients (merge replace); }</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit system services static-subscribers],</p> <p>[edit system services static-subscribers group <i>group-name</i>]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Specify the dynamic client profile that is instantiated at login and de-instantiated at logout for all static subscribers on interfaces configured at the [edit system services static-subscribers interface] hierarchy level or for the static subscribers in a specific group. The group version of the statement takes precedence over the global version.</p>
<div>  NOTE: Do not specify a dynamic profile that creates a dynamic interface. </div>	
Default	By default, the <i>junos-default-profile</i> is used when you do not specify a global dynamic profile with this statement.
Options	<p><i>profile-name</i>—Name of the dynamic client profile profile.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>access—To view this statement in the configuration.</p> <p>access-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Specifying the Static Subscriber Global Dynamic Profile on page 775 • Specifying the Static Subscriber Group Dynamic Profile on page 780

enable

Syntax	<code>enable service-name { concurrent-data-sessions <i>max-session-number</i>; }</code>
Hierarchy Level	<code>[edit services service-set <i>services-set-name</i> subscriber-profile <i>profile-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Enable the service name for the subscriber profile.
Options	<i>service-name</i> —Name of the enabled service. 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.


enable (Enhanced Subscriber Management)

Syntax	<code>enable;</code>
Hierarchy Level	<code>[edit system services subscriber-management]</code>
Release Information	Statement introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Enable the Junos OS enhanced subscriber management software architecture to support configuration of dynamic interfaces and services for subscriber management. To use dynamic profiles and authentication to create and manage dynamic subscriber interfaces and services, you must enable enhanced subscriber management and reboot the router.
Required Privilege Level	system —To view this statement in the configuration. system-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS Enhanced Subscriber Management on page 554• Junos OS Enhanced Subscriber Management Overview on page 556

equals (DHCP Relay Agent)

Syntax	<pre> equals (ascii <i>ascii-string</i> hexadecimal <i>hexadecimal-string</i>) { drop; forward-only; local-server-group <i>local-server-group</i>; relay-server-group <i>relay-server-group</i>; } </pre>
Hierarchy Level	<pre> [edit forwarding-options dhcp-relay relay-option], [edit forwarding-options dhcp-relay dhcpv6 relay-option], [edit forwarding-options dhcp-relay group <i>group-name</i> relay-option], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> relay-option], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...] </pre>
Release Information	Statement introduced in Junos OS Release 12.3.
Description	<p>Configure the exact match criteria used with the DHCP relay agent selective processing feature. DHCP relay agent compares the configured match string with the option-specific string received in DHCP client packets. If there is an exact left-to-right match, DHCP performs the action you define for the match criteria.</p> <p>You can configure an unlimited number of match strings. Match strings do not support wildcard attributes.</p> <p>The local-server-group option is not supported for DHCPv6 relay agent.</p>
Options	<p><i>ascii-string</i>—ASCII string of 1 through 255 alphanumeric characters.</p> <p><i>hexadecimal-string</i>—Hexadecimal string of 1 through 255 hexadecimal characters (0 through 9, a through f, A through F).</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

ethernet-port-type-virtual

Syntax	ethernet-port-type-virtual;
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Specify the physical port type the router or switch uses to authenticate clients. The router or switch passes a port type of ethernet in RADIUS attribute 61 (NAS-Port-Type) by default. This statement specifies a port type of virtual .
<div> NOTE: This statement takes precedence over the nas-port-type statement if you include both statements in the same access profile.</div>	
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring RADIUS Server Parameters for Subscriber Access on page 118

exceed-action

Syntax	exceed-action { drop; syslog; }
Hierarchy Level	[edit services service-set <i>services-set-name</i> subscriber-profile <i>profile-name</i> max-data-sessions-per-subscriber]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Specify the action if the maximum data sessions per subscriber exceed the maximum limit. You must also specify the drop rate of the packets for drop and system log details for syslog .
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.

exclude (JSRC Attributes)

Syntax	<pre>exclude { user-name [authorization-request provisioning-request]; }</pre>
Hierarchy Level	[edit access profile <i>profile-name</i> jsrc attributes]
Release Information	Statement introduced in Junos OS Release 14.2.
Description	Configure the router to exclude the specified attribute-value pair (AVP) from the specified Diameter message for JSRC.
Options	<ul style="list-style-type: none">• user-name—User-Name AVP (1). Diameter AVP name and number.• authorization-request—address-authorization request in AAR message sent from JSRC to the SAE.• provisioning-request—provisioning-request in AAR message sent from JSRC to the SAE.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Excluding AVPs from Diameter Messages for JSRC on page 763• Understanding JSRC-SAE Interactions on page 757

exclude (RADIUS)

Syntax `exclude {`

```
    acc-aggr-cir-id-asc [ access-request | accounting-start | accounting-stop ];
    acc-aggr-cir-id-bin [ access-request | accounting-start | accounting-stop ];
    acc-loop-cir-id [ access-request | accounting-start | accounting-stop ];
    acc-loop-encap [ access-request | accounting-on | accounting-off | accounting-start |
        accounting-stop ];
    acc-loop-remote-id [ access-request | accounting-on | accounting-off | accounting-start
        | accounting-stop ];
    accounting-authentic [ accounting-on | accounting-off ];
    accounting-delay-time [ accounting-on | accounting-off ];
    accounting-session-id [ access-request | accounting-on | accounting-off | accounting-stop
        ];
    accounting-terminate-cause [ accounting-off ];
    acct-tunnel-connection [ accounting-start | accounting-stop ];
    act-data-rate-dn [ access-request | accounting-start | accounting-stop ];
    act-data-rate-up [ access-request | accounting-start | accounting-stop ];
    act-interlv-delay-dn [ access-request | accounting-start | accounting-stop ];
    act-interlv-delay-up [ access-request | accounting-start | accounting-stop ];
    att-data-rate-dn [ access-request | accounting-start | accounting-stop ];
    att-data-rate-up [ access-request | accounting-start | accounting-stop ];
    called-station-id [ access-request | accounting-start | accounting-stop ];
    calling-station-id [ access-request | accounting-start | accounting-stop ];
    chap-challenge [ access-request ];
    chargeable-user-identity [ access-request ];
    class [ accounting-start | accounting-stop ];
    cos-shaping-rate [ accounting-start | accounting-stop ];
    dhcp-gi-address [ access-request | accounting-start | accounting-stop ];
    dhcp-mac-address [ access-request | accounting-start | accounting-stop ];
    dhcp-options [ access-request | accounting-start | accounting-stop ];
    downstream-calculated-qos-rate [ access-request | accounting-start | accounting-stop
        ];
    dsl-forum-attributes [ access-request | accounting-start | accounting-stop ];
    dsl-line-state [ access-request | accounting-start | accounting-stop ];
    dsl-type [ access-request | accounting-start | accounting-stop ];
    event-timestamp [ accounting-on | accounting-off | accounting-start | accounting-stop
        ];
    filter-id [ accounting-start | accounting-stop ];
    first-relay-ipv4-address [ access-request | accounting-start | accounting-stop ];
    first-relay-ipv6-address [ access-request | accounting-start | accounting-stop ];
    framed-ip-address [ accounting-start | accounting-stop ];
    framed-ip-netmask [ accounting-start | accounting-stop ];
    input-filter [ accounting-start | accounting-stop ];
    input-gigapackets [ accounting-stop ];
    input-gigawords [ accounting-stop ];
    interface-description [ access-request | accounting-start | accounting-stop ];
    l2tp-rx-connect-speed [ access-request | accounting-start | accounting-stop ];
    l2tp-tx-connect-speed [ access-request | accounting-start | accounting-stop ];
    max-data-rate-dn [ access-request | accounting-start | accounting-stop ];
    max-data-rate-up [ access-request | accounting-start | accounting-stop ];
    max-interlv-delay-dn [ access-request | accounting-start | accounting-stop ];
    max-interlv-delay-up [ access-request | accounting-start | accounting-stop ];
    min-data-rate-dn [ access-request | accounting-start | accounting-stop ];
```

```

min-data-rate-up [ access-request | accounting-start | accounting-stop ];
min-lp-data-rate-dn [ access-request | accounting-start | accounting-stop ];
min-lp-data-rate-up [ access-request | accounting-start | accounting-stop ];
nas-identifier [ access-request | accounting-on | accounting-off | accounting-start |
    accounting-stop ];
nas-port [ access-request | accounting-start | accounting-stop ];
nas-port-id [ access-request | accounting-start | accounting-stop ];
nas-port-type [ access-request | accounting-start | accounting-stop ];
output-filter [ accounting-start | accounting-stop ];
output-gigapackets [ accounting-stop ];
output-gigawords [ accounting-stop ];
pppoe-description [ access-request | accounting-start | accounting-stop ];
tunnel-assignment-id [ accounting-start | accounting-stop ];
tunnel-client-auth-id [ accounting-start | accounting-stop ];
tunnel-client-endpoint [ accounting-start | accounting-stop ];
tunnel-medium-type [ accounting-start | accounting-stop ];
tunnel-server-auth-id [ accounting-start | accounting-stop ];
tunnel-server-endpoint [ accounting-start | accounting-stop ];
tunnel-type [ accounting-start | accounting-stop ];
upstream-calculated-qos-rate [ access-request | accounting-start | accounting-stop ];
virtual-router [ access-request | accounting-start | accounting-stop ]
}

```

Hierarchy Level [edit access profile *profile-name* radius [attributes](#)]

Release Information Statement introduced in Junos OS Release 9.1.
Statement introduced in Junos OS Release 9.1 for EX Series switches.
Options **downstream-calculated-qos-rate**, **dsl-forum-attributes**, and **upstream-calculated-qos-rate** added in Junos OS Release 11.4.
Options **cos-shaping-rate** and **filter-id** added in Junos OS Release 13.2.
Option **pppoe-description** added in Junos OS Release 14.2.
Option **virtual-router** added in Junos OS Release 15.1.
Options **first-relay-ipv4-address** and **first-relay-ipv6-address** added in Junos OS Release 16.1.

Description Configure the router or switch to exclude the specified attributes from the specified type of RADIUS message.

Not all attributes are available in all types of RADIUS messages. By default, the router or switch includes the specified attributes in RADIUS Access-Request, Acct-On, Acct-Off, Acct-Start, and Acct-Stop messages.



NOTE: If you exclude an attribute from Acct-Off messages, the attributes are then excluded from Interim-Acct messages.

Options RADIUS attribute type—RADIUS attribute, Juniper Networks (vendor ID 4874) VSA number and name, or DSL Forum (vendor ID 3561) VSA number and name:

- **acc-aggr-cir-id-asc**—Juniper Networks VSA 26-112, Acc-Aggr-Cir-Id-Asc.
- **acc-aggr-cir-id-bin**—Juniper Networks VSA 26-111, Acc-Aggr-Cir-Id-Bin.
- **acc-loop-cir-id**—Juniper Networks VSA 26-110, Acc-Loop-Cir-Id.
- **acc-loop-encap**—Juniper Networks VSA 26-183, Acc-Loop-Encap.
- **acc-loop-remote-id**—Juniper Networks VSA 26-182, Acc-Loop-Remote-Id.
- **accounting-authentic**—RADIUS attribute 45, Acct-Authentic.
- **accounting-delay-time**—RADIUS attribute 41, Acct-Delay-Time.
- **accounting-session-id**—RADIUS attribute 44, Acct-Session-Id.
- **accounting-terminate-cause**—RADIUS attribute 49, Acct-Terminate-Cause.
- **acct-tunnel-connection**—RADIUS attribute 68, Acct-Tunnel-Connection.
- **act-data-rate-dn**—Juniper Networks VSA 26-114, Act-Data-Rate-Dn
- **act-data-rate-up**—Juniper Networks VSA 26-113, Act-Data-Rate-Up
- **act-interlv-delay-dn**—Juniper Networks VSA 26-126, Act-Interlv-Delay-Dn
- **act-interlv-delay-up**—Juniper Networks VSA 26-124, Act-Interlv-Delay-Up
- **att-data-rate-dn**—Juniper Networks VSA 26-118, Att-Data-Rate-Dn
- **att-data-rate-up**—Juniper Networks VSA 26-117, Att-Data-Rate-Up
- **called-station-id**—RADIUS attribute 30, Called-Station-Id.
- **calling-station-id**—RADIUS attribute 31, Calling-Station-Id.
- **chargeable-user-identity**—RADIUS attribute 89, Chargeable-User-Identity.
- **class**—RADIUS attribute 25, Class.
- **cos-shaping-rate**—Juniper Networks VSA 26-177, Cos-Shaping-Rate.
- **dhcp-gi-address**—Juniper Networks VSA 26-57, DHCP-GI-Address.
- **dhcp-mac-address**—Juniper Networks VSA 26-56, DHCP-MAC-Address.
- **dhcp-options**—Juniper Networks VSA 26-55, DHCP-Options.
- **downstream-calculated-qos-rate**—Juniper Networks VSA 26-141
- **dsl-forum-attributes**—DSL Forum VSA (vendor ID 3561) as described in RFC 4679, *DSL Forum Vendor-Specific RADIUS Attributes*
- **dsl-line-state**—Juniper Networks VSA 26-127, DSL-Line-State
- **dsl-type**—Juniper Networks VSA 26-128, DSL-Type
- **event-timestamp**—RADIUS attribute 55, Event-Timestamp.
- **filter-id**—RADIUS attribute 11, Filter-Id.

- **first-relay-ipv4-address**—Juniper Networks VSA 26-187, DHCP-First-Relay-IPv4-Address.
- **first-relay-ipv6-address**—Juniper Networks VSA 26-188, DHCP-First-Relay-IPv6-Address.
- **framed-ip-address**—RADIUS attribute 8, Framed-IP-Address.
- **framed-ip-netmask**—RADIUS attribute 9, Framed-IP-Netmask.
- **input-filter**—Juniper Networks VSA 26-10, Ingress-Policy-Name.
- **input-gigapackets**—Juniper Networks VSA 26-42, Acct-Input-Gigapackets.
- **input-gigawords**—RADIUS attribute 52, Acct-Input-Gigawords.
- **interface-description**—Juniper Networks VSA 26-53, Interface-Desc.
- **l2tp-rx-connect-speed**—Juniper Networks VSA 26-163, Rx-Connect-Speed
- **l2tp-tx-connect-speed**—Juniper Networks VSA 26-162, Tx-Connect-Speed
- **max-data-rate-dn**—Juniper Networks VSA 26-120, Max-Data-Rate-Dn
- **max-data-rate-up**—Juniper Networks VSA 26-119, Max-Data-Rate-Up
- **max-interlv-delay-dn**—Juniper Networks VSA 26-125, Max-Interlv-Delay-Dn
- **max-interlv-delay-up**—Juniper Networks VSA 26-123, Max-Interlv-Delay-Up
- **min-data-rate-dn**—Juniper Networks VSA 26-116, Min-Data-Rate-Dn
- **min-data-rate-up**—Juniper Networks VSA 26-115, Min-Data-Rate-Up
- **min-lp-data-rate-dn**—Juniper Networks VSA 26-122, Min-Lp-Data-Rate-Dn
- **min-lp-data-rate-up**—Juniper Networks VSA 26-121, Min-Lp-Data-Rate-Up
- **nas-identifier**—RADIUS attribute 32, NAS-Identifier.
- **nas-port**—RADIUS attribute 5, NAS-Port.
- **nas-port-id**—RADIUS attribute 87, NAS-Port-Id.
- **nas-port-type**—RADIUS attribute 61, NAS-Port-Type.
- **output-filter**—Juniper Networks VSA 26-11, Egress-Policy-Name.
- **output-gigapackets**—Juniper Networks VSA 26-43, Acct-Output-Gigapackets.
- **output-gigawords**—RADIUS attribute 53, Acct-Output-Gigawords.
- **pppoe-description**—Juniper Networks VSA 26-24, PPPoE-Description.
- **tunnel-assignment-id**—RADIUS attribute 82, Tunnel-Assignment-ID.
- **tunnel-client-auth-id**—RADIUS attribute 90, Tunnel-Client-Auth-ID.
- **tunnel-client-endpoint**—RADIUS attribute 66, Tunnel-Client-Endpoint.
- **tunnel-medium-type**—RADIUS attribute 65, Tunnel-Medium-Type.
- **tunnel-server-auth-id**—RADIUS attribute 91, Tunnel-Server-Auth-ID.
- **tunnel-server-endpoint**—RADIUS attribute 67, Tunnel-Server-Endpoint.

- **tunnel-type**—RADIUS attribute 64, Tunnel-Type.
- **upstream-calculated-qos-rate**—Juniper Networks VSA 26-142
- **virtual-router**—Juniper Networks VSA 26-1

RADIUS message type:

- **access-request**—RADIUS Access-Request messages.
- **accounting-off**—RADIUS Accounting-Off messages.
- **accounting-on**—RADIUS Accounting-On messages.
- **accounting-start**—RADIUS Accounting-Start messages.
- **accounting-stop**—RADIUS Accounting-Stop messages.

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

Related Documentation	<ul style="list-style-type: none">• Configuring How RADIUS Attributes Are Used for Subscriber Access on page 43• Configuring RADIUS Server Parameters for Subscriber Access on page 118
------------------------------	--

external-authority

Syntax	external-authority;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit system services dhcp-local-server pool-match-order]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>Specify that an external authority (for example, RADIUS or Diameter) provides the address assignment.</p> <p>When RADIUS is the external authority, the router uses the Framed-IPv6-Pool attribute (RADIUS attribute 100) to select the pool. When Diameter is the external authority, the router uses the Diameter counterpart of RADIUS Framed-IPv6-Pool attribute.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use on page 245 • Extended DHCP Local Server Overview on page 230 • Address-Assignment Pools Overview on page 565

failover (System Process)

Syntax	<code>failover (alternate-media other-routing-engine);</code>
Hierarchy Level	[edit system processes <i>process-name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the router to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
Options	<p><i>process-name</i>—Junos OS process name. Some of the processes that support the failover statement are bootp, chassis-control, craft-control, ethernet-connectivity-fault-management, init, interface-control, neighbor-liveness, pfe, redundancy-interface-process, routing, smg-service, and vrp.</p> <p>alternate-media—Use the Junos OS image on alternate media during the reboot.</p> <p>other-routing-engine—On routers with dual Routing Engines, use the Junos OS image on the other Routing Engine during the reboot. That Routing Engine assumes mastership; in the usual configuration, the other Routing Engine is the designated backup Routing Engine.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>When a Software Process Fails</i>• <i>processes</i>

family (Address-Assignment Pools)

Syntax

```
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;
    }
}
```

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

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

Description Configure the protocol family for the address-assignment pool.



NOTE: Subordinate statement support depends on the platform. See individual statement topics for more detailed support information.

Options *family*—Protocol family:

- **inet**—Internet Protocol version 4 suite
- **inet6**—Internet Protocol version 6 suite


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 on page 565](#)
- [Configuring Address-Assignment Pools on page 567](#)


fast-lookup-filter

Syntax	fast-lookup-filter;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> firewall family <i>family</i>], [edit firewall family <i>family-name</i> filter <i>filter-name</i>], [edit logical-systems <i>logical-system-name</i> firewall family <i>family-name</i> filter <i>filter-name</i>]
Release Information	Statement introduced in Junos OS Release 13.3R3 for MX 240, MX 480, MX 960, MX 2010, and MX 2020 routers with MPC5E, MPC5EQ, and MPC6E MPCs. Support for the next-header firewall match condition is available in Junos OS Release 13.3R6 and later.
Description	<p>The fast-lookup-filter is available for the inet and inet6 protocol families for both static and dynamic profiles. Junos installs firewall filters created under this hierarchy to the accelerated filter block available in the MPC5E, MPC5EQ, and MPC6E MPCs, which provides enhanced performance.</p> <p>Juniper recommends that you use the payload-protocol term rather than the next-header term when configuring a firewall filter with match conditions for IPv6 traffic. Although either can be used, payload-protocol provides the more reliable match condition because it uses the actual payload protocol to find a match, whereas next-header simply takes whatever appears in the first header following the IPv6 header, which may or may not be the actual protocol. In addition, if next-header is used with IPv6, the accelerated filter block lookup process is bypassed and the standard filter used instead.</p> <p>See <i>Firewall Filter Match Conditions for IPv6 Traffic</i> for more information about firewall filters and terms.</p> <p>The filter block hardware supports up to 4095 firewall filters, each of which can support up to 255 terms, to a system maximum of 8000 terms. Firewall instances from the same firewall block can also be attached to multiple interfaces.</p>
	<p> NOTE: If both fast-filter-optimization and fast-lookup-filter are configured at the same time, fast-lookup-filter will take precedence (that is, any terms under fast-filter-optimization will be ignored).</p>
Required Privilege Level	firewall—To view this statement in the configuration. firewall-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide</i>


final-response-timeout (OCS Partition)

Syntax	<code>final-response-timeout <i>seconds</i>;</code>
Hierarchy Level	[edit access ocs partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the amount of time in seconds before an Online Charging System (OCS) partition stops attempting to send the final interrogation during the subscriber logout process. When a subscriber starts to logs out, the OCS sends a final interrogation. If there is no response within 24 hours, then the system continues and starts sending a logout message to the Policy and Charging Rule Function (PCRF). If there is no response within the next 24 hours, then the subscriber logout proceeds.
<div>  NOTE: Any configuration changes made to this statement apply to all subscribers currently waiting to log out within a 60 second period. </div>	
Options	<p><i>seconds</i>—Number of seconds to wait before an OCS partition stops sending the final interrogation using a CCR-GY-T message.</p> <p>Default: 7200</p> <p>Range: 0 through 86,400 seconds (24 hours)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the OCS Partition on page 743 • 3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gy Interactions Between the Router and the OCS on page 730 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

force-continue (OCS Partition)

Syntax	force-continue;
Hierarchy Level	[edit access ocs partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Enable subscriber traffic to flow before the first interrogation with the Online Charging System (OCS) occurs.</p> <p>Wireline customers often control user services solely through the Policy Control and Charging Rules Function (PCRF) and use the OCS as a convenient real-time usage monitoring mechanism rather than as an enforcement unit. To decrease the number of possible erroneous OCS configurations, include the force-continue statement to force the broadband Policy and Charging Enforcement Function (BPCEF) to limit the impact of negative responses from the OCS and quota expirations, and to prevent sending OCS notifications for affected rating groups. Whenever the PCEF receives a negative response to any reported group, it stops reporting this group to the OCS.</p>
	<div> NOTE: The force-continue state is required; you must configure it in the OCS partition.</div>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the OCS Partition on page 743• 3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

forward-only (DHCP Relay Agent Option)

Syntax	forward-only;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay relay-option (default-action equals starts-with)],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 relay-option (default-action equals starts-with)],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> relay-option (default-action equals starts-with)],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> relay-option (default-action equals starts-with)],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</p>
Release Information	Statement introduced in Junos OS Release 12.3.
Description	Forward specified DHCP client packets, without creating a new subscriber session, when you use DHCP relay selective processing feature. You can configure the forwarding operation globally or for a group of interfaces, and for either DHCP or DHCPv6 relay agent.
<div style="display: flex; align-items: center;">  <p>NOTE: When you use the forward-only action, the only configured overrides operation supported is the trust-option-82 option. DHCP relay agent ignores all other configured overrides options.</p> </div>	
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

forward-only (DHCP Relay Agent)

Syntax	<pre>forward-only { logical-system <current default <i>logical-system-name</i>>; routing-instance <current default <i>routing-instance-name</i>>; }</pre>
Hierarchy Level	<pre>[edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit forwarding-options dhcp-relay group <i>group-name</i>], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</pre>
Release Information	Statement introduced in Junos OS Releases 13.3R3, 14.1R2, and 14.2R1.
Description	Specify the VRF location of the DHCP server when configuring secure DHCP traffic between the DHCP server and DHCP client when the two reside in different VRFs.
Default	Logical system and routing instance from where the configuration is applied.
Options	<p>logical-system—(Optional) Logical system in which the DHCP server resides.</p> <ul style="list-style-type: none">• current—Logical system from which the configuration is applied.• default—Root logical system.• logical-system-name—A specific logical system. <p>routing-instance—(Optional) Routing instance in which the DHCP server resides.</p> <ul style="list-style-type: none">• current—Routing instance from which the configuration is applied.• default—Root routing instance.• logical-system-name—A specific routing instance.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• DHCP Message Exchange Between DHCP Clients and DHCP Server in Different VRFs on page 327• Configuring DHCP Message Exchange Between DHCP Server and Clients in Different VRFs on page 328

forward-only-replies (DHCP Relay Agent)

Syntax	forward-only-replies;
Hierarchy Level	[edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]
Release Information	Statement introduced in Junos OS Releases 13.3R3, 14.1R2, and 14.2R1.
Description	Specify that reply packets are for the forward-only support that is configured in option 82 interface ID of the reply packet. You must configure this statement for forward-only support when the client and server are in different logical system/routing instances.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • DHCP Message Exchange Between DHCP Clients and DHCP Server in Different VRFs on page 327 • Configuring DHCP Message Exchange Between DHCP Server and Clients in Different VRFs on page 328

forward-rule (Configuring)

Syntax	<pre>forward-rule <i>forward-rule-name</i> { term <i>precedence</i> { from { application-groups [<i>application-group-name</i>]; applications [<i>application-name</i>]; local-address <i>address</i> <except>; local-address-range low <i>low-value</i> high <i>high-value</i> <except>; local-prefix-list <i>prefix-list-name</i> <except>; } then { forwarding-instance <i>forwarding-instance</i>; unit-number <i>unit-number</i>; } } }</pre>
Hierarchy Level	[edit services ptsp]
Release Information	Statement introduced in Junos OS Release 10.2. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the forwarding instance for a specific subscriber or set of subscribers based on the IP address, network, or prefix list. The rule match is applied on the input side.
Options	<i>forward-rule-name</i> —Identifier for the collection of terms that constitute this rule. 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	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

forward-rule (Including in Rule)

Syntax	<code>forward-rule <i>forward-rule-name</i>;</code>
Hierarchy Level	<code>[edit services ptsp rule <i>rule-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Identify the forwarding instance for inclusion in a rule.
Options	<p><i>forward-rule-name</i>—Identifier for the forward rule that specifies the forwarding instance.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

forwarding (Diameter Network Element)

Syntax	<pre>forwarding { route <i>dne-route-name</i> { destination realm <i>realm-name</i> <host <i>hostname</i>>; function <i>function-name</i> <partition <i>partition-name</i>>; metric <i>route-metric</i>; } }</pre>
Hierarchy Level	<code>[edit diameter network-element <i>element-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Define the criteria that specify which destinations are reachable through the Diameter network element.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 699 • Configuring Diameter Network Elements on page 701

from (Forward Rule)

Syntax	<pre>from { application-groups [<i>application-group-name</i>]; applications [<i>application-name</i>]; local-address <i>address</i> <except >; local-address-range low <i>low-value</i> high <i>high-value</i> <except >; local-prefix-list <i>prefix-list-name</i> <except >; }</pre>
Hierarchy Level	[edit services ptsp forward-rule <i>forward-rule-name</i> term <i>precedence</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify match conditions for the PTSP term.
Options	<p>For information on match conditions, see the description of firewall filter match conditions in the <i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide</i>.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

from (Rule)

Syntax	<pre> from { application-group-any; application-groups [application-group-name]; applications [application-name]; local-port-range low low-value high high-value; local-ports [value-list]; protocol protocol-number; remote-address address <except >; remote-address-range low low-value high high-value <except >; remote-port-range low low-value high high-value; remote-ports [value-list]; remote-prefix-list prefix-list-name <except >; } </pre>
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify match conditions for the PTSP term.
Options	<p>For information on match conditions, see the description of firewall filter match conditions in the <i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide</i>.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

function (Diameter Network Element)

Syntax	<code>function [<i>function-name</i>];</code>
Hierarchy Level	[edit diameter network-element <i>element-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2. Support for NASREQ added in Junos OS Release 16.1.
Description	Specify one or more applications (function) associated with a Diameter network element.
Default	By default, all functions are associated with (supported by) the network element.
Options	<p><i>function-name</i>—Application (function) associated with the route. You can list multiple functions with the element.</p> <ul style="list-style-type: none">• gx-plus—Associate the Gx-Plus application with the network element.• jsrc—Associate the JSRC application with the network element.• nasreq—Associate the NASREQ application with the network element.• packet-triggered-subscribers—Associate the packet-triggered subscribers application with the network element.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Network Elements on page 701

function (Diameter Route)

Syntax	<code>function <i>function-name</i> <partition <i>partition-name</i>>;</code>
Hierarchy Level	[edit diameter network-element <i>element-name</i> forwarding route <i>dne-route-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2. Support for NASREQ added in Junos OS Release 16.1.
Description	Specify the application (function) associated with a destination and metric. Together, these three elements define a route reachable through a Diameter network element.
Default	All functions are associated with the route.
Options	<i>function-name</i> —Application (function) associated with the route. Gx-Plus, JSRC, NASREQ, and packet-triggered-subscribers are the applications currently supported. <i>partition partition-name</i> —(Optional) Partition associated with the application (function).
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 699 • Configuring Diameter Network Elements on page 701

ggsn-address (OCS Partition)

Syntax	<code>ggsn-address address;</code>
Hierarchy Level	[edit access ocs partition partition-name]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Include the GGSN-Address AVP value in all CCR-GY messages.
Options	address —Address of the GGSN-Address AVP value to include in all CCR-GY messages.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the OCS Partition on page 743• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

ggsn-mcc-mnc (OCS Partition)

Syntax	<code>ggsn-mcc-mnc ggsn-mcc-mnc;</code>
Hierarchy Level	[edit access ocs partition partition-name]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the value of the 3GPP-GGSN-MCC-MNC AVP value to include in all CCR-GY messages. The value is the mobile country code (MCC) and mobile network code (MNC) of the network that the GGSN belongs to. The combined MCC and MNC uniquely identify the mobile network operator.
Options	ggsn-mcc-mnc —Value of the mobile network country and network codes to include in all CCR-GY messages.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the OCS Partition on page 743• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

global (Gx-Plus)

Syntax	<pre>global { include-ipv6; max-outstanding-requests <i>number</i>; }</pre>
Hierarchy Level	[edit access gx-plus]
Release Information	Statement introduced in Junos OS Release 11.2. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure global attributes for the Gx-Plus application. 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	<ul style="list-style-type: none">• Configuring Gx-Plus on page 710

global (OCS)

Syntax	<pre>global { service-context-id <i>service-context</i> ; }</pre>
Hierarchy Level	[edit access ocs]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure global attributes and data elements of the 3rd Generation Partnership Project (3GPP) Diameter credit control service charging system for the Online Charging System (OCS), which interacts with the Policy and Charging Enforcement Function (PCEF). The PCEF optionally reports usage and receives additional authorizations from the OCS using the 3GPP Gy protocol. Broadband PCEF (BPCEF) interactions with the OCS use online session charging with centralized unit determination and centralized rating.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring OCS Global Parameters on page 749• 3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

global (PCRF)

Syntax	global { rule-param <i>avp-code</i> ; }
Hierarchy Level	[edit access pcrf]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure global attributes and data elements of the 3rd Generation Partnership Project (3GPP) Diameter credit control service charging system for the Online Charging System (OCS), which interacts with the Policy and Charging Enforcement Function (PCEF). The PCEF optionally reports usage and receives additional authorizations from the OCS using the 3GPP Gy protocol. Broadband PCEF (BPCEF) interactions with the OCS use online session charging with centralized unit determination and centralized rating.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • 3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gy Interactions Between the Router and the OCS on page 730 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

grace-period

Syntax	<code>grace-period <i>seconds</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family (inet inet6) dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure the amount of time that the client retains the address lease after the lease expires. The address cannot be reassigned to another client during the grace period.
Options	<p><i>seconds</i>—Number of seconds the lease is retained.</p> <p>Range: 0 through 4,294,967,295 seconds</p> <p>Default: 0 (no grace period)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

group (DHCP Local Server)

```
Syntax  group group-name {
        access-profile profile-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 {
            access-profile profile-name;
            exclude;
            overrides {
                client-discover-match <option60-and-option82>;
                client-negotiation-match 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);
    holddown-interval milliseconds;
}
}
}
overrides {
    client-discover-match <option60-and-option82>;
    client-negotiation-match incoming-interface;
    delegated-pool;
    delete-binding-on-renegotiation;
    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	<p>[edit system services dhcp-local-server],</p> <p>[edit system services dhcp-local-server dhcpv6],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.0.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
Description	Configure a group of interfaces that have a common configuration, such as authentication parameters. A group must contain at least one interface.
Options	<p><i>group-name</i>—Name of the group.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

**Related
Documentation**

- [Extended DHCP Local Server Overview on page 230](#)
- [Grouping Interfaces with Common DHCP Configurations on page 277](#)
- [Using External AAA Authentication Services with DHCP on page 271](#)
- *Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces*

group (DHCP Relay Agent)

```
Syntax  group group-name {
        access-profile profile-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;
        }
        forward-only {
            logical-system <current | default | logical-system-name>;
            routing-instance <current | default | routing-instance-name>;
        }
        interface interface-name {
            access-profile profile-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;
    upto upto-interface-name;
}
overrides {
    allow-snooped-clients;
    always-write-giaddr;
    always-write-option-82;
    client-discover-match <option60-and-option82>;
    client-negotiation-match incoming-interface;
    disable-relay;
    dual-stack dual-stack-group-name;
    interface-client-limit number;
    layer2-unicast-replies;
    no-allow-snooped-clients;
    no-bind-on-request;
    proxy-mode;
    relay-source
    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);
    use-option-82 <strict>;
}
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);
  }
  server-id-override
}
route-suppression;
service-profile dynamic-profile-name;
}

```

Hierarchy Level	<p>[edit forwarding-options dhcp-relay],</p> <p>[edit forwarding-options dhcp-relay dhcpv6],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.3.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
Description	<p>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.</p>
Options	<p><i>group-name</i>—Name of a group of interfaces that have a common DHCP or DHCPv6 relay agent configuration.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • dhcp-relay on page 1001 • Extended DHCP Relay Agent Overview on page 236 • Understanding the Extended DHCP Relay Agent for EX Series Switches • Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) • Configuring Group-Specific DHCP Relay Options on page 280 • Grouping Interfaces with Common DHCP Configurations on page 277 • Using External AAA Authentication Services with DHCP on page 271 • Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces

group (Static Subscribers)

Syntax

```
group group-name {
  access-profile profile-name;
  dynamic-profile profile-name {
    aggregate-clients (merge | replace);
  }
  authentication {
    password password-string;
    username-include {
      domain-name domain-name;
      interface;
      logical-system-name;
      routing-instance-name;
      user-prefix user-prefix-string;
    }
  }
  interface interface-name <exclude> <upto upto-interface-name>;
}
```

Hierarchy Level [edit logical-systems *logical-system-name* system services **static-subscribers**],
[edit logical-systems *logical-system-name* routing-instances *routing-instances-name* system
services **static-subscribers**],
[edit routing-instances *routing-instances-name* system services **static-subscribers**],
[edit system services **static-subscribers**]

Release Information Statement introduced in Junos OS Release 9.6.

Description Configure a static subscriber group with values that override the values configured at the [edit system services **static-subscribers**] hierarchy level for subscribers outside the group. Includes the subscriber access and dynamic profiles, the authentication parameters that trigger the Access-Request message to AAA for static subscribers in the group, and the statically configured interfaces that form the group.



NOTE: The logical system and routing instance in which the group is configured must match the logical system and routing instance where the static interfaces are configured.

Options *group-name*—Name of a group that defines authentication parameters for static subscribers to override the global authentication 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 Subscribers over Static Interfaces on page 772](#)
- [Creating a Static Subscriber Group on page 779](#)

gsmp-syn-timeout (ANCP)

Syntax	<code>gsmp-syn-timeout <i>seconds</i>;</code>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	Configure the maximum period that the ANCP agent waits before sending a SYN message to an ANCP neighbor to negotiate the adjacency. If the neighbor sends a SYN message during this period, the ANCP agent uses the partition information in the neighbor's message when generating its own initial SYN message to the neighbor. The agent does not wait for the period to expire if it receives a SYN message from the neighbor.
Options	<i>seconds</i> —Number of seconds the ANCP agent waits. Range: 1 through 60 seconds Default: 60 seconds
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Configuring the ANCP Agent to Learn ANCP Partition IDs on page 629

gsmp-syn-wait (ANCP)

Syntax	gsmp-syn-wait;
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 13.3
Description	Enable the ANCP agent to learn partition ID information from neighbors, in support of nonzero ANCP partition IDs. This statement forces the ANCP agent to delay sending a SYN message during adjacency negotiation for a configurable period. When the neighbor sends a SYN message to the ANCP agent during that period, the agent learns the partition ID information from the neighbor and uses that information when it sends its own SYN message. If the agent does not receive the message during the period, then it sends a SYN message to the neighbor when the period times out.
Default	This statement is disabled. The ANCP agent does not wait before sending the initial SYN message and does not support nonzero partition IDs.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Configuring the ANCP Agent to Learn ANCP Partition IDs on page 629

gx-plus (Gx-Plus)

Syntax	<pre>gx-plus { global { include-ipv6; max-outstanding-requests <i>number</i>; } partition <i>partition-name</i> { diameter-instance <i>instance-name</i>; destination-host <i>hostname</i>; destination-realm <i>realm</i>; } }</pre>
Hierarchy Level	[edit access]
Release Information	Statement introduced in Junos OS Release 11.2. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure the Gx-Plus application to interact with a PCRF to authorize and provision subscribers. 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	<ul style="list-style-type: none">• Configuring Gx-Plus on page 710

hardware-address

Syntax	<pre>hardware-address <i>mac-address</i>;</pre>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family (inet inet6) <i>host</i> <i>hostname</i>]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Specify the MAC address of the client. This is the hardware address that identifies the client on the network.
Options	<i>mac-address</i> —MAC address of the client.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

high-utilization (Address-Assignment Pools)

Syntax	<code>high-utilization <i>percentage</i>;</code>
Hierarchy Level	<code>[edit access address-assignment],</code> <code>[edit routing-instances <i>routing-instance-name</i> address-assignment]</code>
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Generate an SNMP trap when the DHCP address pool or linked set of address pools use surpasses the specified percentage.
Default	High utilization is not set. Delete the high-utilization value to unset.
Options	<i>percentage</i> —Percentage used to generate a trap. Range: 2 through 99
Required Privilege Level	<code>admin</code> —To view this statement in the configuration. <code>admin-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Address-Assignment Pools Overview on page 565 • Configuring Address-Assignment Pool Usage Threshold Traps on page 570

high-utilization-v6 (Address-Assignment Pools)

Syntax	<code>high-utilization-v6 <i>percentage</i>;</code>
Hierarchy Level	<code>[edit access address-assignment],</code> <code>[edit routing-instances <i>routing-instance-name</i> address-assignment]</code>
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Generate an SNMP trap when the DHCPv6 address pool or linked set of address pools use surpasses the specified percentage.
Default	High utilization is not set. Delete the high-utilization value to unset.
Options	<i>percentage</i> —Percentage used to generate a trap. Range: 2 through 99
Required Privilege Level	<code>admin</code> —To view this statement in the configuration. <code>admin-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Address-Assignment Pools Overview on page 565 • Configuring Address-Assignment Pool Usage Threshold Traps on page 570

hold-down (Address-Assignment Pools)

Syntax	hold-down;
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i>]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Configure an active address-assignment pool to be unavailable. When a pool is in the hold-down state, the pool is no longer used to allocate IP addresses for subscribers. Current subscribers who previously obtained an address from the pool are not affected.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Address-Assignment Pools Overview on page 565• Configuring Address-Assignment Pools on page 567• Configuring Address-Assignment Pool Hold-Down on page 572

host (Address-Assignment Pools)

Syntax	host <i>hostname</i> { hardware-address <i>mac-address</i> ; ip-address <i>ip-address</i> ; }
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family (inet inet6)]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure a static binding for the specified client.
Options	<i>hostname</i> —Name of the client. 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	<ul style="list-style-type: none">• Address-Assignment Pools Overview on page 565• Configuring Address-Assignment Pools on page 567

host-name (dhcp-relay)

Syntax	host-name <i>name</i> ;
Hierarchy Level	[edit forwarding-options dhcp-relay relay-option-82], [edit forwarding-options dhcp-relay group group-name relay-option-82]
Release Information	Command introduced in Junos OS Release 16.2.
Description	<p>Supports the addition of vendor-specific hostname in the option-82, suboption 9 field of DHCPv4 control messages on server-facing interfaces. The hostname can be a string of characters such as Juniper-AB-1.</p> <p>Junos OS automatically adds the remaining vendor-specific information as per RFC 4243. The enterprise ID is 2636. The hostname is option-data 1 (the location is option-data 2). The DHCPv4 relay strips the suboption data from replies from the server before it relays the packets out the client facing interface.</p> <p>This feature can be useful, in conjunction with operator-developed tools, for troubleshooting DHCP servers and providing service assurances. For example, a central DHCP server can log the information, and operators can query the hostname to track and troubleshoot subscriber IP information and network attachment points.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

host-name (dhcpv6)

Syntax	host-name <i>name</i> ;
Hierarchy Level	[edit forwarding-options dhcp-relay dhcpv6 relay-option-vendor-specific], [edit forwarding-options dhcp-relaygroup group-name dhcpv6 relay-option-vendor-specific]
Release Information	Command introduced in Junos OS Release 16.2.
Description	<p>Supports the addition of vendor-specific hostname in the vendor-specific option (17) of DHCPv6 control messages on server-facing interfaces. The hostname can be a string of characters such as Juniper-AB-1.</p> <p>Junos automatically adds the remaining vendor-specific information as per RFC 4243. The Enterprise ID is 2636. The hostname is option-data 1 (the location is option-data 2). The DHCPv6 relay strips the sub-option data from replies from the server before it relays the packets out the client facing interface.</p> <p>This feature can be useful, in conjunction with operator-developed tools, for troubleshooting DHCP servers and providing service assurances. For example, a central DHCP server can log the information, and operators can query the hostname to track and troubleshoot subscriber IP information and network attachment points.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

ietf-mode

Syntax	ietf-mode
Hierarchy Level	[edit protocols ancp neighbor ip-address]
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Configure the ANCP agent to run in a mode that is not backward compatible with Internet draft-wadhwa-gsmp-l2control-configuration-00.txt, <i>GSMP extensions for layer2 control (L2C)</i> . Include this statement when pre-ietf mode has been configured globally for the ANCP agent, but you want one or more neighbors to run in the default mode.
Default	ANCP does not run in a backward-compatible mode.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Configuring ANCP Neighbors on page 625

ignore

Syntax	<pre>ignore { dynamic-iflset-name; framed-ip-netmask; input-filter; logical-system-routing-instance; output-filter; }</pre>
Hierarchy Level	[edit access profile <i>profile-name</i> radius attributes]
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 9.1 for EX Series switches.</p>
Description	Configure the router or switch to ignore the specified attributes in RADIUS Access-Accept messages. By default, the router or switch processes the attributes it receives from the external server.
Options	<p>dynamic-iflset-name—Ignore Interface-Set/Dynamic-Ifset-Name (VSA 26-130).</p> <p>framed-ip-netmask—Ignore Framed-IP-Netmask (RADIUS attribute 9).</p> <p>input-filter—Ignore Ingress-Policy-Name (VSA 26-10).</p> <p>logical-system-routing-instance—Ignore Virtual-Router (VSA 26-1).</p> <p>output-filter—Ignore Egress-Policy-Name (VSA 26-11).</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring How RADIUS Attributes Are Used for Subscriber Access on page 43 • Configuring RADIUS Server Parameters for Subscriber Access on page 118

immediate-update

Syntax	immediate-update;
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Configure the router or switch to send an Acct-Update message to the RADIUS accounting server on receipt of a response (for example, an ACK or timeout) to the Acct-Start message.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Parameters for Subscriber Access on page 118• Configuring Per-Subscriber Session Accounting on page 104

include-ipv6 (Gx-Plus)

Syntax	include-ipv6;
Hierarchy Level	[edit access gx-plus global]
Release Information	Statement introduced in Junos OS Release 12.3. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Include IPv6 subscribers in Gx-Plus provisioning requests.
Default	By default, IPv6 subscribers are not included.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Gx-Plus Global Attributes on page 712• Configuring Gx-Plus on page 710

include-irb-and-l2

Syntax	include-irb-and-l2;
Hierarchy Level	<pre>[edit forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> (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 <i>group-name</i> relay-option-82 (circuit-id remote-id)], [edit logical-systems <i>logical-system-name</i> ... forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)], [edit logical-systems <i>logical-system-name</i> ... forwarding-options dhcp-relay ... relay-option-82 (circuit-id remote-id)], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ... relay-option-82 (circuit-id remote-id)], [edit vlans <i>vlan-name</i> forwarding-options dhcp-security dhcpv6-options option-18], [edit vlans <i>vlan-name</i> forwarding-options dhcp-security dhcpv6-options option-37]</pre>
Release Information	Statement introduced in Junos OS Release 14.1.



NOTE: The EX Series switches that support the include-irb-and-l2 statement are the EX4300, EX4600, and EX9200 switches.

Description Include both the integrated routing and bridging (IRB) interface name and Layer 2 interface name in the **circuit-id** or **remote-id** value in the DHCP option 82 information. VLAN tags are global.

When you configure the **include-irb-and-l2** statement without including the **no-vlan-interface** statement, the format is as follows:

- Bridge domain:

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

- VLAN:

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



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

When you configure both the **include-irb-and-l2** statement and the **use-vlan-id** statement, the format is as follows:

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



NOTE: The *svlan-id-vlan-id* represents the VLANs associated with the bridge domain.

When you configure both the **include-irb-and-l2** and **no-vlan-interface-name** statements, the format is as follows:

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

When you configure both the **include-irb-and-l2** and **use-interface-description** statements, the format displays the description for the Layer 2 interface:

l2_descr:vlan-name+irb.subunit

If you configure both the **include-irb-and-l2** and **use-interface-description** statements, and no description for the Layer 2 interface is found, the format displays the Layer 2 logical interface name:

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

When you configure the **include-irb-and-l2** statement with both the **no-vlan-interface-name** and **use-interface-description** statements, the format displays as follows:

l2_descr+irb.subunit

If you configure the **include-irb-and-l2** statement with both the **no-vlan-interface-name** and **use-interface-description** statements, and no description is found for the Layer 2 interface, the format displays as follows:

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

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

Related Documentation	<ul style="list-style-type: none">• Including a Textual Description in DHCP Options on page 342• Using DHCP Relay Agent Option 82 Information on page 337• Configuring DHCPv6 Relay Agent Options on page 442
------------------------------	---

include-l2-interface-for-irb (DHCP Relay Agent)

Syntax	<code>include-l2-interface-for-irb;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> relay-agent-interface-id], [edit forwarding-options dhcp-relay relay-option-82 circuit-id], [edit forwarding-options dhcp-relay group <i>group-name</i> relay-option-82 circuit-id], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id], [edit logical-systems <i>logical-system-name</i> ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> ...], [edit routing-instances <i>routing-instance-name</i> ...]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	For leasequery and bulk leasequery operations that involve integrated routing and bridging (IRB) interfaces, you must configure DHCP relay agent to include the layer 2 interface name along with IRB name in the circuit ID of option 82. DHCP relay agent uses the layer 2 interface name when using leasequery or bulk leasequery to restore the lease database.
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Individual Leasequery on page 257 • Configuring and Using DHCP Bulk Leasequery on page 260 • Using DHCP Relay Agent Option 82 Information on page 337 • Including a Prefix in DHCP Options on page 340 • Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets on page 444

include-option-82 (DHCP Local Server)

Syntax	<pre>include-option-82 { forcerenew; nak; }</pre>
Hierarchy Level	<p>[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 logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server (dhcpv6) ...overrides], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server (dhcpv6) ...overrides], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server (dhcpv6) ...overrides]</p>
Release Information	Statement introduced in Junos OS Releases 13.3R3, 14.1R2, and 14.2R1.
Description	Specify that the DHCP server include option 82 information in NAK and forcerenew messages when you configure secure communications between the DHCP server and DHCP clients that are in different VRFs. You can configure support globally, for a group of interfaces, or for a specific interface.
Options	<p>forcerenew—Include option 82 in DHCP forcerenew messages.</p> <p>nak—Include option 82 in DHCP NAK messages.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• DHCP Message Exchange Between DHCP Clients and DHCP Server in Different VRFs on page 327• Configuring DHCP Message Exchange Between DHCP Server and Clients in Different VRFs on page 328

interface (DHCP Local Server)

Syntax `interface interface-name {
 access-profile profile-name;
 exclude;
 overrides {
 client-discover-match <option60-and-option82 | incoming-interface>;
 client-negotiation-match incoming-interface;
 interface-client-limit number;
 rapid-commit;
 }
 service-profile dynamic-profile-name;
 trace;
 upto upto-interface-name;
 }`

Hierarchy Level [edit system services dhcp-local-server **group** group-name],
 [edit system services dhcp-local-server **dhcpv6** 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 9.0.
 Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
 Options **upto** and **exclude** introduced in Junos OS Release 9.1.

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



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.

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.

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	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Extended DHCP Local Server Overview on page 230• Grouping Interfaces with Common DHCP Configurations on page 277• Using External AAA Authentication Services with DHCP on page 271

interface (DHCP Relay Agent)

Syntax

```
interface dhcp interface-name {
  access-profile profile-name;
  exclude;
  overrides {
    allow-no-end-option;
    allow-snooped-clients;
    always-write-giaddr;
    always-write-option-82;
    client-discover-match <option60-and-option82 | incoming-interface>;
    client-negotiation-match incoming-interface;
    disable-relay;
    dual-stack dual-stack-group-name;
    interface-client-limit number;
    layer2-unicast-replies;
    no-allow-snooped-clients;
    proxy-mode;
    relay-source
    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. .

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 on page 236](#)
- [dhcp-relay on page 1001](#)
- [Grouping Interfaces with Common DHCP Configurations on page 277](#)
- [Using External AAA Authentication Services with DHCP on page 271](#)

interface (Dynamic Router Advertisement)

Syntax `interface interface-name {
 current-hop-limit number;
 default-lifetime seconds;
 dns-server-address
 (managed-configuration | no-managed-configuration);
 max-advertisement-interval seconds;
 min-advertisement-interval seconds;
 (other-stateful-configuration | no-other-stateful-configuration);
 prefix prefix {
 (autonomous | no-autonomous);
 (on-link | no-on-link);
 preferred-lifetime seconds;
 valid-lifetime seconds;
 }
 reachable-time milliseconds;
 retransmit-timer milliseconds;
 }`

Hierarchy Level [edit dynamic-profiles protocols router-advertisement]

Release Information Statement introduced in Junos OS Release 10.1.

Description Dynamically configure router advertisement properties on an interface. To dynamically configure interface properties, include the *\$junos-interface-name* dynamic variable for the interface name.

Options *interface-name*—Name of an interface. Specify the *\$junos-interface-name* dynamic variable or the full, static interface name, including the physical and logical address components.




NOTE: Even though you can specify the static interface name when defining the interface, we recommend using dynamic variable when configuring this statement.

The remaining statements are explained separately.

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

Related Documentation • *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

interface (Static Subscriber Group)

Syntax	<code>interface <i>interface-name</i> <exclude> <upto <i>upto-interface-name</i>>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i>],</p> <p>[edit system services static-subscribers group <i>group-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.6.</p> <p>Support for IPv6 and IPv4 demux static interfaces introduced in Junos OS Release 11.2.</p>
Description	Specify one or more interfaces, or a range of interfaces, that are within a specified group on which static subscribers are created. You can repeat the interface <i>interface-name</i> statement to specify multiple interfaces within a group. You must configure each interface in only one group.
<div>  <p>NOTE: The logical system and routing instance in which the static interfaces are configured must match the logical system and routing instance where the group is configured.</p> </div>	
Options	<p>exclude—(Optional) Exclude an interface or a range of interfaces from the group.</p> <p><i>interface-name</i>—Name of the interface on which static subscribers are created. If you do not specify a unit number for the interface, then .0 is assumed. For example, ge-0/1/0 is interpreted as ge-0/1/0.0.</p> <p><i>upto-interface-name</i>—(Optional) The upper end of the range of interfaces; the lower end of the range is the <i>interface-name</i> entry. The interface device name of <i>upto-interface-name</i> must be the same as the device name of <i>interface-name</i>.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Creating a Static Subscriber Group on page 779

interface (Static Subscriber Username)

Syntax	interface;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit system services static-subscribers authentication username-include],</p> <p>[edit system services static-subscribers group <i>group-name</i> authentication username-include]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify that a modified version of the interface name is included as part of the username created for all static subscribers or for the static subscribers in a specified group. The group version of the statement takes precedence over the global version. The username is also sent to RADIUS in the Access-Request message. The interface name is modified by replacing the "/" character with the "-" character. For example, ge-0/1/2.50 is converted to ge-0-1-2.50.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Configuring the Static Subscriber Global Username on page 777 • Configuring the Static Subscriber Group Username on page 782

interface-client-limit (DHCP Local Server)

Syntax	<code>interface-client-limit <i>number</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group group-name overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit system services dhcp-local-server overrides],</p> <p>[edit system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit system services dhcp-local-server dhcpv6 group group-name overrides],</p> <p>[edit system services dhcp-local-server dhcpv6 group interface <i>interface-name</i> <i>group-name</i> overrides],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.2.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Set the maximum number of DHCP subscribers or DHCP clients per interface allowed for a specific group or for all groups. A group specification takes precedence over a global specification for the members of that group.
Default	No limit
Options	<i>number</i> —Maximum number of clients allowed.

Range: 1 through 500,000

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

Related Documentation

- [Specifying the Maximum Number of DHCP Clients Per Interface on page 287](#)
- [Overriding Default DHCP Local Server Configuration Settings on page 311](#)

interface-client-limit (DHCP Relay Agent)

Syntax	<code>interface-client-limit <i>number</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 overrides], [edit forwarding-options dhcp-relay overrides], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>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.</p>
Description	<p>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.</p> <p>M120 and M320 routers do not support DHCPv6.</p>
Default	No limit
Options	<p><i>number</i>—Maximum number of clients allowed. Range: 1 through 500,000</p>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [dhcp-relay on page 1001](#)
 - [Extended DHCP Relay Agent Overview on page 236](#)
 - [Configuring Group-Specific DHCP Relay Options on page 280](#)
 - [Overriding the Default DHCP Relay Configuration Settings on page 313](#)

interface-delete (Subscriber Management or DHCP Client Management)

Syntax	interface-delete;
Hierarchy Level	[edit system services subscriber-management maintain-subscriber]
Release Information	Statement introduced in Junos OS Release 11.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>On router—Configure the router to maintain, rather than log out, subscribers when the subscriber interface is deleted. By default, the router logs out subscribers when the subscriber interface is deleted.</p> <p>On switch—Configure the switch to maintain rather than log out DHCP clients when the client interface is deleted. By default, the switch logs out DHCP clients when the client interface is deleted.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events on page 292

interface-delete (Subscriber Management or DHCP Client Management)

Syntax	interface-delete;
Hierarchy Level	[edit system services subscriber-management maintain-subscriber]
Release Information	Statement introduced in Junos OS Release 11.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>On router—Configure the router to maintain, rather than log out, subscribers when the subscriber interface is deleted. By default, the router logs out subscribers when the subscriber interface is deleted.</p> <p>On switch—Configure the switch to maintain rather than log out DHCP clients when the client interface is deleted. By default, the switch logs out DHCP clients when the client interface is deleted.</p>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events on page 292

interface-description-format

Syntax	interface-description-format { exclude-adapter; exclude-sub-interface; }
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches. Options exclude-adapter and exclude-sub-interface introduced in Junos OS Release 10.4.
Description	Specify the information that is excluded from the interface description that the device passes to RADIUS for inclusion in the RADIUS attribute 87 (NAS-Port-Id). By default, the device includes both the subinterface and the adapter in the interface description.
Options	<p>exclude-adapter—Exclude the adapter from the interface description.</p> <p>exclude-sub-interface—Exclude the subinterface from the interface description.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• RADIUS Server Options for Subscriber Access on page 4

interface-name (DHCP Local Server)

Syntax	interface-name;
Hierarchy Level	<p>[edit system services dhcp-local-server authentication username-include], [edit system services dhcp-local-server dhcpv6 authentication username-include], [edit system services dhcp-local-server dhcpv6 group group-name authentication username-include], [edit system services dhcp-local-server group group-name authentication username-include] [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the interface name is concatenated with the username during the subscriber authentication or DHCP client authentication process. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Creating Unique Usernames for DHCP Clients on page 272

interface-name (DHCP Relay Agent)

Syntax	interface-name;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include], [edit forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> authentication username-include], [edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.4</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	<p>Specify that the interface name is concatenated with the username during the subscriber authentication or client authentication process. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Creating Unique Usernames for DHCP Clients on page 272

interface-mib (Enhanced Subscriber Management)

Syntax	interface-mib;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Enable representation of the Interfaces MIB for the specified dynamic interface.



BEST PRACTICE: To achieve maximum performance with enhanced subscriber management, we recommend that you *not* enable representation of the Interfaces MIB on all dynamic subscriber interfaces.

Default	If you do not include the interface-mib statement, representation of the Interfaces MIB on dynamic subscriber interfaces is disabled by default.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Junos OS Enhanced Subscriber Management on page 554 • Junos OS Enhanced Subscriber Management Overview on page 556

interface-set (ANCP)

Syntax	<code>interface-set <i>interface-set-name</i> { <code>access-identifier</code> <i>identifier-string</i>; <code>underlying-interface</code> <i>underlying-interface-name</i>; }</code>
Hierarchy Level	[edit protocols ancp interfaces]
Release Information	Statement introduced in Junos OS Release 9.4.
Description	Identify a group of VLANs on which traffic is sent to a subscriber identified by the access-loop circuit identifier.
Options	<p><i>interface-set-name</i>—Name of a group of VLANs that carry traffic to the subscriber identified by the access loop circuit identifier.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Associating an Access Node with Subscribers for ANCP Agent Operations on page 626

interface-traceoptions (DHCP)

Syntax	<pre> interface-traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; level (all error info notice verbose warning); no-remote-trace; } </pre>
Hierarchy Level	[edit system processes dhcp-service]
Release Information	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>Configure extended DHCP tracing operations that can be enabled on a specific interface or group of interfaces.</p> <p>Replaces deprecated interface-traceoptions statements at the [edit forwarding-options dhcp-relay] and [edit system services dhcp-local-server] hierarchy levels.</p> <p>To enable the tracing operation on the specific interfaces, you use the interface <i>interface-name</i> trace statement.</p>
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements</p> <ul style="list-style-type: none"> • all—Trace all events • packet—Trace packet and option decoding operations • state—Trace changes in state <p>level—Level of tracing to perform; also known as severity level. The option you configure enables tracing of events at that level and all higher (more restrictive) levels. You can specify any of the following levels:</p> <ul style="list-style-type: none"> • all—Match messages of all levels. • error—Match error messages. • info—Match informational messages. • notice—Match notice messages about conditions requiring special handling.

- **verbose**—Match verbose messages. This is the lowest (least restrictive) severity level; when you configure **verbose**, messages at all higher levels are traced. Therefore, the result is the same as when you configure **all**.
- **warning**—Match warning messages.

Default: error

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

world-readable—(Optional) Enable unrestricted file access.

Required Privilege Level	trace—To view this statement in the configuration.
	trace-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Tracing Extended DHCP Operations for Specific Interfaces on page 826

interfaces (ANCP)

Syntax	<pre> interfaces { interface-set interface-set-name { access-identifier identifier-string; underlying-interface underlying-interface-name; } interface-name { access-identifier identifier-string } } </pre>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 9.4.
Description	Identify the subscribers whose traffic is reported and shaped by the ANCP agent.
Options	<p>interface-name—Name of a logical interface supporting a single VLAN that carries traffic to the subscriber identified by the access-loop circuit identifier.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent on page 624 • Associating an Access Node with Subscribers for ANCP Agent Operations on page 626

ip-address

Syntax	<code>ip-address <i>ip-address</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet host <i>hostname</i>]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Specify the reserved IP address assigned to the client.
Options	ip-address —IP version 4 (IPv4) address.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Address-Assignment Pools on page 567 • Configuring Static Address Assignment on page 572

ip-address-change-notify

Syntax	<pre>ip-address-change-notify { message <i>message</i>; }</pre>
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	<p>For on-demand address allocation for dual-stack PPP subscribers, specify that the BNG includes the Unisphere-Ipv4-release-control VSA in the Access-Request that is sent during on-demand IP address allocation and in the Interim-Accounting messages that are sent to report an address change.</p> <p>The configuration of this statement has no effect when on-demand IP address allocation or deallocation is not configured.</p> <p>Optionally, configure a message that is included in the VSA when it is sent to the RADIUS server.</p>
Default	This functionality is disabled by default.
Options	<p>message—VSA message.</p> <p>Range: Up to 32 characters.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447• Enabling Immediate Interim Accounting Messages for On-Demand IPv4 Address Changes on page 456

ip-address-first

Syntax	ip-address-first;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit system services dhcp-local-server pool-match-order]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.0.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
Description	<p>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.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use on page 245 • Extended DHCP Local Server Overview on page 230 • Address-Assignment Pools Overview on page 565

ip-can-type (PCRF Partition)

Syntax	<code>ip-can-type <i>number</i>;</code>
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure an IP connectivity access network (IP-CAN) value according to what best fits your operating environment and access network. The Policy and Charging Rules Function (PCRF) partition requires that you configure this statement. The Policy Control and Charging (PCC) enables a centralized control to ensure that the service sessions (IP-CAN sessions) are provided with appropriate bandwidth and QoS.</p> <p>An IP-CAN bearer is the IP transmission path of defined capacity, delay, and bit error rate. An IP-CAN session incorporates one or more IP-CAN bearers. Support for multiple IP-CAN bearers per IP-CAN session is IP-CAN specific. An IP-CAN session exists as long as the related IPv4 address or IPv6 prefix is assigned and announced to the IP network.</p> <p>If an IP-CAN session is modified, the Policy and Charging Enforcement Function (PCEF) first uses the event trigger to determine whether to request the PCC rules for the modified IP-CAN session from the PCRF. Then upon reception of updated PCC rules from the PCRF, the PCEF activates, modifies, or removes the PCC rules as indicated by the PCRF.</p>
Options	<p><i>number</i>—Identifier of the IP-CAN value used for your operating environment and access network.</p> <p>Default: 77</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740

ipcp-suggest-dns-option

Syntax	ipcp-suggest-dns-option;
Hierarchy Level	<p>[edit access group-profile <i>group-profile-name</i> ppp ppp-options],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" ppp-options],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit" ppp-options],</p> <p>[edit interfaces pp0 unit <i>logical-unit-number</i> ppp-options],</p> <p>[edit interfaces si-<i>fpc/pic/port</i> unit <i>logical-unit-number</i> ppp-options]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Configure the router to prompt Customer Premises Equipment (CPE) to negotiate both primary and secondary DNS addresses during IPCP negotiation for terminated PPPoE and LNS subscribers. You can configure this for dynamic or static PPPoE subscribers, dynamic or static LNS subscribers, and in an LNS group profile.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Ensuring IPCP Negotiation for Primary and Secondary DNS Addresses on page 580 • <i>Configuring the Group Profile for Defining L2TP Attributes</i> • <i>Applying PPP Attributes to L2TP LNS Subscribers with a User Group Profile</i> • <i>Configuring Dynamic Authentication for PPP Subscribers</i> • <i>Applying PPP Attributes to L2TP LNS Subscribers per Inline Service Interface</i>

jsrc (JSRC)

Syntax	<pre>jsrc { partition <i>partition-name</i> { diameter-instance <i>instance-name</i>; destination-host <i>hostname</i>; destination-realm <i>realm-name</i>; } }</pre>
Hierarchy Level	[edit]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Configure JSRC to interact with an SAE in an SRC environment to authorize and provision subscribers.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring JSRC on page 759

jsrc (Access Profile)

Syntax	<pre>jsrc { attributes { exclude { user-name [authorization-request provisioning-request]; } } }</pre>
Hierarchy Level	[edit access profile <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Release 14.2.
Description	<p>Specify JSRC settings in an access profile.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring JSRC on page 759 • Authorizing Subscribers with JSRC on page 761 • Understanding JSRC-SAE Interactions on page 757 • Excluding AVPs from Diameter Messages for JSRC on page 763

jsrc-partition

Syntax	jsrc-partition <i>partition-name</i> ;
Hierarchy Level	[edit]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the JSRC partition to use.
Options	<i>partition-name</i> —Name of the JSRC partition that you want JSRC to use. The name is defined with the partition statement at the [edit jsrc] hierarchy level.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring JSRC on page 759 • Configuring the JSRC Partition on page 760

juniper-dsl-attributes

Syntax	juniper-dsl-attributes;
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	<p>Configure AAA to add Juniper Networks DSL VSAs to the RADIUS authentication and accounting request messages for subscribers. If the router has not received and processed the corresponding ANCP attributes from the access node, then AAA provides only the following in these RADIUS messages:</p> <ul style="list-style-type: none">• Downstream-Calculated-QoS-Rate (IANA 4874, 26-141)—Default configured advisory transmit speed.• Upstream-Calculated-QoS-Rate (IANA 4874, 26-142)—Default configured advisory receive speed.
Default	The Juniper Networks DSL VSAs are not added to the RADIUS authentication and accounting request messages. However, the DSL Forum VSA—if available—is added to RADIUS messages by default.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring AAA to Include Juniper Networks DSL VSAs in RADIUS Messages on page 667• Configuring the ANCP Agent on page 624

layer2-unicast-replies

Syntax	layer2-unicast-replies;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay overrides],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.3.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
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	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Relay Agent Overview on page 236 • dhcp-relay on page 1001

keep-incoming-circuit-id (DHCP Relay Agent)

Syntax	keep-incoming-circuit-id ;
Hierarchy Level	[edit forwarding-options dhcp-relay relay-option-82 circuit-id], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay relay-option-82 circuit-id], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay relay-option-82 circuit-id], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay relay-option-82 circuit-id]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Specify that the jdhcpd process keeps the incoming circuit ID and prepends the ID with the locally generated ID (in the format, generated-id + incoming-id) before sending the leasequery packet to the DHCP server.</p> <p>This configuration is required for leasequery and bulk leasequery operations when subscriber authentication is based on the circuit ID, and enables leasequery and bulk leasequery to restore the agent circuit identifier/agent remote identifier (ACI/ARI) pair and to use the circuit ID to authenticate subscribers.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Using DHCP Relay Agent Option 82 Information on page 337

keep-incoming-interface-id (DHCP Relay Agent)

Syntax	keep-incoming-interface-id ;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 relay-agent-interface-id],</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Specify that the jdhcpd process keeps the incoming interface ID and prepends the ID with the locally generated ID (in the format, generated-id + incoming-id) before sending the leasequery packet to the DHCPv6 server.</p> <p>This configuration is required for leasequery and bulk leasequery operations when subscriber authentication is based on the interface ID, and enables leasequery and bulk leasequery to restore the agent circuit identifier/agent remote identifier (ACI/ARI) pair and to use the interface ID to authenticate subscribers.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets on page 444

keep-incoming-remote-id (DHCP Relay Agent)

Syntax	keep-incoming-remote-id ;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id], [edit forwarding-options dhcp-relay relay-option-82 circuit-id], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay relay-option-82 XXXcircuit-id], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay relay-option-82 circuit-id], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 relay-agent-remote-id], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay relay-option-82 circuit-id],</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Specify that the jdhcpd process keeps the incoming remote ID and prepends the ID with the locally generated ID (in the format, generated-id + incoming-id) before sending the leasequery packet to the DHCPv6 server.</p> <p>This configuration is required for leasequery and bulk leasequery operations when subscriber authentication is based on the remote ID, and enables leasequery and bulk leasequery to restore the agent circuit identifier/agent remote identifier (ACI/ARI) pair and to use the remote ID to authenticate subscribers.</p> <p>Use the statement at the [edit ... dhcpv6] hierarchy level to configure DHCPv6 support.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Using DHCP Relay Agent Option 82 Information on page 337• Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets on page 444

leasequery (DHCP Relay Agent)

Syntax	<pre>leasequery { attempts <i>number-of-attempts</i>; timeout <i>seconds</i>; }</pre>
Hierarchy Level	[edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit logical-systems <i>logical-system-name</i> ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> ...], [edit routing-instances <i>routing-instance-name</i> ...]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Configure parameters that DHCP relay agent uses when sending DHCP leasequery messages to obtain lease information from the DHCP servers in the logical system/routing instance.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Individual Leasequery on page 257

lease-time-threshold (DHCP Local Server and DHCP Relay Agent)

Syntax	<code>lease-time-threshold seconds;</code>
Hierarchy Level	<code>[edit forwarding-options dhcp-relay lease-time-validation],</code> <code>[edit forwarding-options dhcp-relay dhcpv6 lease-time-validation],</code> <code>[edit forwarding-options dhcp-relay group <i>group-name</i> lease-time-validation],</code> <code>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> lease-time-validation],</code> <code>[edit logical-systems <i>logical-system-name</i> ...],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i>...],</code> <code>[edit routing-instances <i>routing-instance-name</i> ...],</code> <code>[edit system services dhcp-local-server lease-time-validation],</code> <code>[edit system services dhcp-local-server dhcpv6 lease-time-validation],</code> <code>[edit system services dhcp-local-server group <i>group-name</i> lease-time-validation],</code> <code>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> lease-time-validation]</code>
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Configure the minimum DHCP lease time allowed in your subscriber access network. If a third-party DHCP server or address pool provides a client lease that is less than the configured threshold, the router performs the action specified by the violation-action statement.
Options	seconds —Minimum client lease time allowed. Range: 60 through 2,147,483,647 seconds
Required Privilege Level	system —To view this statement in the configuration. system-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a DHCP Lease-Time Threshold on page 251

lease-time-validation (DHCP Local Server and DHCP Relay Agent)

Syntax	<pre>lease-time-validation { lease-time-threshold seconds; violation-action action; }</pre>
Hierarchy Level	<pre>[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]</pre>
Release Information	Statement introduced in Junos OS Release 14.1.
Description	<p>Enable the lease-time validation feature on the router. You can then configure the lease-time threshold and an optional action to take when a lease-time violation occurs.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring a DHCP Lease-Time Threshold on page 251

limit

Syntax	<pre>limit max-sub-sessions;</pre>
Hierarchy Level	<pre>[edit services service-set services-set-name subscriber-profile profile-name max-data-sessions-per-subscriber]</pre>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Specify the limit for the maximum number of subscriber sessions.
Options	<i>max-sub-sessions</i> —Maximum number of subscriber sessions.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>

link (Address-Assignment Pools)

Syntax	link <i>pool-name</i> ;
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Configure the name of the secondary address-assignment pool that is linked to a primary address-assignment pool. The secondary pool provides backup pool for local address assignment.
Options	<i>pool-name</i> —Name assigned to the address-assignment pool.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Address-Assignment Pools Overview on page 565• Configuring Address-Assignment Pools on page 567• Configuring Address-Assignment Pool Linking on page 571

local-address

Syntax	<code>local-address (address any-unicast) <except>;</code>
Hierarchy Level	[edit services ptsp forward-rule <i>forward-rule-name</i> term <i>precedence from</i>]
Release Information	Statement introduced in Junos OS Release 10.2. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the address for rule matching. Local address values are matched against a source or destination IP address for the flow depending on the configured value for the demux statement. If you do not specify an address, then any local address matches this term. If you do not specify a prefix value, then a host mask is the default.
Options	<p>address—IPv4 or IPv6 address or prefix value.</p> <p>any-unicast—Match all unicast addresses.</p> <p>except—(Optional) Exclude the specified address, prefix, or unicast packets from rule matching.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i> • demux on page 987

local-address-range

Syntax	<code>local-address-range low <i>low-value</i> high <i>high-value</i> <except>;</code>
Hierarchy Level	[edit services ptsp forward-rule <i>forward-rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the address range for rule matching. Local address values are matched against a source or destination IP address for the flow depending on the configured value for the demux statement. If you do not specify an address, then any local address matches this term.
Options	<i>low-value</i> —Lower boundary for the IPv4 or IPv6 address range. <i>high-value</i> —Upper boundary for the IPv4 or IPv6 address range. except —(Optional) Exclude the specified address range from rule matching.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>• demux on page 987

local-decision (PCRF Partition)

Syntax	local-decision (deny grant) timeout <i>seconds</i> ;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure a non-standard extension that allows the subscriber login to proceed even if the Policy and Charging Rule Function (PCRF) is not available or if the PCRF does not respond within the corresponding logout response timeout. This statement determines how long to wait before using the local decision to log in.
Options	<p>deny—Prevent subscriber logins from occurring.</p> <p>grant—Allow subscriber logins to occur when the PCRF is not available or not responding.</p> <p>Default: deny</p> <p>seconds—Number of seconds to wait before using the local decision to log in.</p> <p>Default: 90</p> <p>Range: 0 through 86,400 seconds (24 hours)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the PCRF Partition on page 746 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735 • Understanding Upstream and Downstream Messages for the PCRF on page 740

local-port-range

Syntax	local-port-range low <i>low-value</i> high <i>high-value</i> ;
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the port range for rule matching.
Options	<i>low-value</i> —Lower boundary for the port range. <i>high-value</i> —Upper boundary for the port range.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

local-ports

Syntax	local-ports [<i>port-numbers</i>];
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Identify one or more ports for inclusion as a match condition.
Options	<i>port-numbers</i> —Port number.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

local-prefix-list

Syntax	<code>local-prefix-list <i>prefix-list-name</i> <except>;</code>
Hierarchy Level	[edit services ptsp forward-rule <i>forward-rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the prefix list for rule matching. You configure the prefix list by including the prefix-list statement at the [edit policy-options] hierarchy level.
Options	<i>prefix-list-name</i> —Prefix list. except —(Optional) Exclude the specified prefix list from rule matching.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

local-server-group (DHCP Relay Agent Option)

Syntax	<code>local-server-group <i>local-server-group</i>;</code>
Hierarchy Level	[edit forwarding-options dhcp-relay relay-option (default-action equals starts-with)], [edit forwarding-options dhcp-relay group <i>group-name</i> relay-option (default-action equals starts-with)], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]
Release Information	Statement introduced in Junos OS Release 12.3. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Forward DHCP client packets to the specified group of DHCP local servers when you use the DHCP relay selective processing feature. You can configure the forwarding operation globally or for a group of interfaces. The local-server-group option is not supported for DHCPv6 relay agent.
Options	<i>local-server-group</i> —Name of DHCP local server group.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

location (dhcp-relay)

Syntax	location <i>name</i> ;
Hierarchy Level	[edit forwarding-options dhcp-relay relay-option-82 vendor-specific], [edit forwarding-options dhcp-relay group <i>group-name</i> relay-option-82 vendor-specific]
Release Information	Command introduced in Junos OS Release 16.2.
Description	<p>Supports the addition of a vendor-specific location in the option-82, suboption 9 field of DHCPv4 control messages on server-facing interfaces. The location should be specified as interface, vlan ID, and if applicable, svlan ID. For example, <ifd-name>:<vlan> (ae0:100) or <ifd-name>:<svlan> -<vlan> (ae0:100-10).</p> <p>Junos OS automatically adds the remaining vendor-specific information as per RFC 4243. The enterprise ID is 2636. The the location is option-data 2 (the hostname is option-data 1). The DHCPv4 relay strips the suboption data from replies from the server before it relays the packets out the client facing interface.</p> <p>This feature can be useful, in conjunction with operator-developed tools, for troubleshooting DHCP servers and providing service assurances. For example, a central DHCP server can log the information, and operators can query the hostname to track and troubleshoot subscriber IP information and network attachment points.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

location (dhcpv6)

Syntax	location <i>name</i> ;
Hierarchy Level	[edit forwarding-options dhcp-relaydhcpv6 relay-option-vendor-specific], [edit forwarding-options dhcp-relaygroup group-name dhcpv6 relay-option-vendor-specific]
Release Information	Command introduced in Junos OS Release 16.2.
Description	<p>Supports the addition of a vendor-specific location in the vendor-specific option (17) of DHCPv6 control messages on server-facing interfaces. The location should be specified as interface, vlan ID, and if applicable, svlan ID. For example, <ifd-name>:<vlan> (ae0:100) or <ifd-name>:<svlan> -<vlan> (ae0:100-10).</p> <p>Junos automatically adds the remaining vendor-specific information as per RFC 4243. The Enterprise ID is 2636. The the location is option-data 2 (the hostname is option-data 1). The DHCPv6 relay strips the sub-option data from replies from the server before it relays the packets out the client facing interface.</p> <p>This feature can be useful, in conjunction with operator-developed tools, for troubleshooting DHCP servers and providing service assurances. For example, a central DHCP server can log the information, and operators can query the hostname to track and troubleshoot subscriber IP information and network attachment points.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

logical-interface-unit-range

Syntax	logical-interface-unit-range (high low)
Hierarchy Level	[edit system services extensible-subscriber-services]
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Configure the unit number for the logical interface service that is created by Extensible Subscriber Services Manager by using an op script. Extensible Subscriber Services Manager assigns the first available unit number in the specified range.
Options	<p>high—Use upper limit of the logical interface unit range. Range: 1 through 16,385 Default: 1</p> <p>low—Use lower limit of the logical interface unit range. Range: 1 through 16,385 Default: 16,385</p>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.

logical-system (Diameter Peer)

Syntax	<code>logical-system <i>logical-system-name</i> [<routing-instance <i>routing-instance-name</i> > ;</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify a logical system and optionally a routing instance for a Diameter peer. Alternatively, you can include the routing-instance statement at the [edit diameter peer <i>peer-name</i>] hierarchy level to configure only a routing instance.
Options	<p><i>logical-system-name</i>— Name of the logical system. Default: Default logical system</p> <p><i>routing-instance routing-instance-name</i>—(Optional) Name of the routing instance. Default: Master routing instance</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Peers on page 700

logical-system (Diameter Transport)

Syntax	<code>logical-system <i>logical-system-name</i> <routing-instance <i>routing-instance-name</i> >;</code>
Hierarchy Level	[edit diameter transport <i>transport-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Specify a logical system and optionally a routing instance for the transport layer connection.



NOTE: The logical system and routing instance must match that for the peer or a configuration error is reported.

Options	<p><i>logical-system-name</i>—Name of the logical system.</p> <p>Default: Default logical system</p> <p><i>routing-instance <i>routing-instance-name</i></i>—(Optional) Name of the routing instance.</p> <p>Default: Master routing instance</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 699 • Configuring the Diameter Transport on page 701

logical-system (Subscriber Secure Policy)

Syntax	<code>logical-system <i>logical-system-name</i>;</code>
Hierarchy Level	[edit services radius-flow-tap]
Release Information	Statement introduced in Junos OS Release 15.1R3 for enhanced subscriber management on MX Series routers.
Description	Specify the logical system that is used to send mirrored packets to a mediation device for subscriber secure policy traffic mirroring. When you specify a logical system, you must also specify a routing instance.
Options	<i>logical-system-name</i> —Name of the logical system. Default: Logical system default
Required Privilege Level	flow-tap—To view this statement in the configuration. flow-tap-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Subscriber Secure Policy Overview</i>• Configuring RADIUS-Initiated Subscriber Secure Policy Mirroring Overview on page 560• <i>Configuring Support for Subscriber Secure Policy Mirroring</i>

logical-system-name (Static Subscribers)

Syntax	logical-system-name;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit system services static-subscribers authentication username-include],</p> <p>[edit system services static-subscribers group <i>group-name</i> authentication username-include]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify that the name of the logical system is included as part of the username created for all static subscribers or for the static subscribers in a specified group. The group version of the statement takes precedence over the global version. The username is also sent to RADIUS in the Access-Request message.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Configuring the Static Subscriber Global Username on page 777 • Configuring the Static Subscriber Group Username on page 782

logical-system-name (DHCP Local Server)


Syntax	logical-system-name;
Hierarchy Level	<p>[edit system services dhcp-local-server authentication username-include], [edit system services dhcp-local-server dhcpv6 authentication username-include], [edit system services dhcp-local-server dhcpv6 group group-name authentication username-include], [edit system services dhcp-local-server group group-name authentication username-include] [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...] [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the logical system name be concatenated with the username during the subscriber authentication or DHCP client process. No logical system name is concatenated if the configuration is in the default logical system.
Required Privilege Level	<p>system—To view this statement in the configuration. system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Using External AAA Authentication Services with DHCP on page 271

logical-system-name (DHCP Relay Agent)

Syntax	logical-system-name;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	Specify that the logical system name is concatenated with the username during the subscriber authentication or client authentication process. No logical system name is concatenated if the configuration is in the default logical system. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)
 - [Creating Unique Usernames for DHCP Clients on page 272](#)

logout-response-timeout (PCRF Partition)

Syntax	logout-response-timeout <i>seconds</i> ;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure the amount of time in seconds before a Policy and Charging Rule Function (PCRF) partition stops attempting to send a subscriber logout.</p> <p>If you set draining and the draining-response-timeout statements for the PCRF partition, any new subscriber logins are denied, and the time limit you set in the draining-response-timeout statement is used instead of the logout-response-timeout time limit.</p>
	<div> NOTE: Any configuration changes made to this statement apply to all subscribers currently waiting to log out within a 60 second period.</div>
Options	<p><i>seconds</i>—Number of seconds to wait before a PCRF partition stops attempting to send a subscriber logout.</p> <p>Default: 7200</p> <p>Range: 0 through 86,400 seconds (24 hours)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740

ltv-syslog-interval (System Process)

Syntax	ltv-syslog-interval <i>seconds</i> ;
Hierarchy Level	[edit system processes dhcp-service]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Configure how often the router logs consolidated syslog messages for DHCP lease-time violations.
Options	<i>seconds</i> —Time interval that specifies how often the router logs syslog messages. Range: 600 through 86,400 seconds
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a DHCP Lease-Time Threshold on page 251• processes


mac-address (DHCP Local Server)

Syntax	mac-address;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server authentication username-include],</p> <p>[edit system services dhcp-local-server group group-name authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the MAC address from the client PDU be concatenated with the username during the subscriber authentication or DHCP client authentication process.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Using External AAA Authentication Services with DHCP on page 271

mac-address (DHCP Relay Agent)

Syntax	mac-address;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the MAC address from the client PDU be concatenated with the username during the subscriber authentication or client authentication process.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using External AAA Authentication Services with DHCP on page 271

maintain-subscriber (Subscriber Management)

Syntax	<code>maintain-subscriber { interface-delete; }</code>
Hierarchy Level	[edit system services subscriber-management]
Release Information	Statement introduced in Junos OS Release 11.1.
Description	<p>Configure the router to maintain, rather than log out, DHCP relay and DHCP local server based subscribers when the specified type of event occurs.</p> <p>For example, by default, the router logs out DHCP subscribers when an interface delete event occurs, such as a line card reboot or failure. You would specify the interface-delete option to ensure that the router maintains subscribers during line card reboots or failures. However, this option does not maintain subscribers during router reboots or failures.</p> <p>This statement provides a global configuration for the router, which applies to all DHCP local server and DHCP relay clients in all routing instances.</p> <div> NOTE: The maintain-subscriber statement and remove-when-no-subscribers statement are mutually exclusive. You cannot specify that dynamically configured VLAN interfaces are removed when no subscribers exist when the router is also configured to maintain subscribers.</div> <p>The remaining statement is explained separately.</p>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Subscriber Binding Retention During Interface Delete Events on page 291• Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events on page 292

managed-configuration (Dynamic Router Advertisement)

Syntax	(managed-configuration no-managed-configuration);
Hierarchy Level	[edit dynamic-profiles protocols router-advertisement interface (Protocols IPv6 Neighbor Discovery) <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	<p>Specify whether to enable the dynamic host to use a stateful autoconfiguration protocol for address autoconfiguration, along with any stateless autoconfiguration already configured:</p> <ul style="list-style-type: none">• managed-configuration—Enable host to use stateful autoconfiguration.• no-managed-configuration—Disable host from using stateful autoconfiguration.
Default	The configured object is disabled unless explicitly enabled.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

map (Domain Map)

Syntax	<pre> map domain-map-name { aaa-logical-system logical-system-name { aaa-routing-instance routing-instance-name; } aaa-routing-instance routing-instance-name; access-profile profile-name; address-pool pool-name; dynamic-profile profile-name; padn destination-address { mask destination-mask; metric route-metric; } strip-domain; strip-username (left-to-right right-to-left); override-password password; target-logical-system logical-system-name { target-routing-instance routing-instance-name; } target-routing-instance routing-instance-name; tunnel-profile profile-name; tunnel-switch-profile profile-name; } </pre>
Hierarchy Level	[edit access domain]
Release Information	<p>Statement introduced in Junos OS Release 10.4.</p> <p>override-password and strip-username options introduced in Junos OS Release 15.1.</p> <p>wildcard character introduced in Junos OS Release 16.1.</p>
Description	Specify the domain map to use to map options and parameters to subscriber sessions based on the subscriber domain.
Options	<p>domain-map-name—Name of the domain map. The name is the same as the subscriber domain to which it will apply. For example, for the username user1@example.com, the domain map name is example.com.</p> <ul style="list-style-type: none"> *—Use the asterisk wildcard character in the domain-map-name to specify a wildcard domain map, which enables mapping based on a partial match (for example, xyz*northern.example.com). The router performs the wildcard lookup when there is no exact match for the subscriber domain name. The wildcard can appear anywhere within the domain name string, and can match zero or more characters. The asterisk is the only wildcard character, and only one wildcard is supported in a domain map name. If you include multiple asterisks, the first asterisk is treated as the wildcard character and the others are treated as non-wildcard characters. default—Use a domain map name of default to specify the domain map that the router uses when there is no exact or wildcard match for the domain or realm name in the subscriber username.

- **none**—Use a domain map name of **none** to specify the domain map the router uses when a subscriber username does not have a domain or realm 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 a Domain Map on page 162](#)

mask (Domain Map)

Syntax `mask destination-mask;`

Hierarchy Level [edit access domain **map** *domain-map-name* **padn** *destination-address*]

Release Information Statement introduced in Junos OS Release 10.4.

Description Configure the IP mask of the destination used in the PADN parameters for a domain map.

Options **destination-mask**—Subnet mask of the destination.

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

Related Documentation • [Configuring PADN Parameters for a Domain Map on page 173](#)

match-direction (Services PTSP)

Syntax `match-direction (input | input-output | output);`

Hierarchy Level [edit services ptsp **rule** *rule-name*]

Release Information Statement introduced in Junos OS Release 10.2.

Description Specify the direction in which the rule match is applied.

Options **input**—Apply the rule match on the input side of the interface.

input-output—Apply the rule match bidirectionally.

output—Apply the rule match on the output side of the interface.

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

Related Documentation • [Configuring Static PTSP Rules on page 799](#) in *Junos OS Broadband Subscriber Management and Services Library*

max-advertisement-interval (Dynamic Router Advertisement)

Syntax	max-advertisement-interval <i>seconds</i> ;
Hierarchy Level	[edit dynamic-profiles protocols router-advertisement interface (Protocols IPv6 Neighbor Discovery) <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Maximum interval between each router advertisement message.
Options	<i>seconds</i> —Maximum interval. Range: 4 through 1800 seconds Default: 600 seconds
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>min-advertisement-interval (Protocols IPv6 Neighbor Discovery)</i>• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

max-connections (DHCP Local Server)

Syntax	<code>max-connections <i>number-of-connections</i>;</code>
Hierarchy Level	<p>[edit system services dhcp-local-server allow-bulk-leasequery],</p> <p>[edit system services dhcp-local-server dhcpv6 allow-bulk-leasequery],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Specify the maximum number of concurrent TCP connections allowed in the logical system/routing instance. This setting helps you manage the resources that the jdhcp daemon uses for bulk leasequery operations in the logical system/routing instance. The number of connections you specify for a logical system/routing instances must be less than the number of connections you specify for the global accept-max-tcp-connections statement.</p>
Options	<p><i>number-of-connections</i>—Maximum number of concurrent TCP connections.</p> <p>Range: 1 through 10</p> <p>Default: 3</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Bulk Leasequery on page 260

max-data-sessions-per-subscriber

Syntax	<pre>max-data-sessions-per-subscriber { limit <i>max-sub-sessions</i>; exceed-action { drop; syslog; } }</pre>
Hierarchy Level	[edit services service-set <i>services-set-name</i> subscriber-profile <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Specify the maximum number of sessions that are concurrently enabled for the named service. The system randomly selects a number of sessions and enables the named service for them. To limit the service's use of resources, other sessions cannot access these named services.
Options	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.

max-db-size (Enhanced Subscriber Management)

Syntax	<code>max-db-size size;</code>
Hierarchy Level	[edit system configuration-database (Enhanced Subscriber Management)]
Release Information	Statement introduced in Junos OS Release 15.1R3 for MX Series routers with MPCs.
Description	<p>Enhanced subscriber management leverages system shared memory to improve performance and scaling. Since this memory is used by both the Junos configuration and enhanced subscriber management, you must set a max-db-size for the Junos configuration to allow for an allocation of the memory for enhanced subscriber management.</p> <p>Juniper recommends that you set max-db-size to 300 MB or less for MX240, MX480, and MX960 routers, and 100 MB or less for MX5, MX10, MX40, MX80 and MX104 routers. Because you must reboot the device before the new setting takes effect, doing it as a part of the initial configuration can prevent multiple reboots.</p>
Options	<p>size— Specifies the portion of system shared memory, in megabytes (MB), that is allocated for the Junos configuration database.</p> <p>Syntax: <i>size M</i> to specify MB</p> <p>Default: 300 MB for MX240, MX480, and MX960 routers, and 100 MB for MX5, MX10, MX40, MX80 and MX104 routers</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Junos OS Enhanced Subscriber Management on page 554 • Junos OS Enhanced Subscriber Management Overview on page 556

max-empty-replies (DHCP Local Server)

Syntax	<code>max-empty-replies <i>number-of-replies</i>;</code>
Hierarchy Level	<code>[edit system services dhcp-local-server allow-bulk-leasequery],</code> <code>[edit system services dhcp-local-server dhcpv6 allow-bulk-leasequery],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system</code> <code>services dhcp-local-server ...],</code> <code>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...],</code> <code>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</code>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Specify the maximum number of empty replies that the DHCP local server sends to a specific requestor. When the maximum number is reached, the DHCP server closes the connection.</p> <p>An empty reply is a response sent from the DHCP local server that contains no bindings or has an option status code error. Empty replies are often the response to an unauthorized requestor that has sent an invalid or incorrect query that produces no binding information. By limiting the number of empty replies that the DHCP local server can send, you prevent the connection from being consumed by an unauthorized or malicious requester, and free up the DHCP local server to support legitimate requestors.</p>
Options	<p><i>number-of-replies</i>—Number of empty replies the DHCP local server sends before the connection is terminated.</p> <p>Range: 1 through 100</p> <p>Default: 5</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring and Using DHCP Bulk Leasequery on page 260

max-outstanding-requests

Syntax	<code>max-outstanding-requests requests;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> radius-server <i>server-address</i>], [edit access radius-server <i>server-address</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the maximum number of outstanding requests for this RADIUS server. An increase in this value is immediate while a decrease is more gradual if the current number of outstanding requests exceeds the new value.
Options	<p>requests—Maximum number of outstanding requests for this RADIUS server.</p> <p>Range: 0 through 2000 outstanding requests per server</p> <p>Default: 1000 outstanding requests per server</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Router or Switch Interaction with RADIUS Servers on page 115 • Configuring RADIUS Server Options for Subscriber Access on page 119 • show network-access aaa statistics on page 1690 • clear network-access aaa statistics on page 1467

max-outstanding-requests (Diameter Applications)

Syntax	<code>max-outstanding-requests</code> <i>number</i> ;
Hierarchy Level	[edit access <code>gx-plus</code> global], [edit access <code>ocs</code> partition <i>partition-name</i>], [edit access <code>pcrf</code> partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches. Support for OCS and PCRF partitions introduced in Junos OS Release 16.2 for MX Series routers.
Description	<p>Limit the number of outstanding requests that the Diameter-based application (function) can retry to a remote server when the requests are improperly answered. Too many requests risks overloading the server and increases the chance of losing messages.</p> <p>The gx-plus statement limits retries from the Gx-Plus function to the Gx-Plus server using the Gx and JSRC protocols. The ocs statement limits retries from the OCS function to the OCS server using the Gy protocol. The pcrf statement limits retries from the PCRF function to the PCRF server using the Gx protocol.</p>
Options	<p>number—Number of outstanding requests from the function to the server that can exist at any time.</p> <p>Default: 40</p> <p>Range: 2 through 40</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Gx-Plus Global Attributes on page 712• Configuring Gx-Plus on page 710• Configuring the OCS Partition on page 743• Configuring the PCRF Partition on page 746• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Gy Interactions Between the Router and the OCS on page 730

max-pending-accounting-stops (Access Profile)

Syntax	max-pending-accounting-stops <i>number</i> ;
Hierarchy Level	[edit access accounting-backup-options]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	Set the maximum number of pending accounting stop requests that the router backs up while all the RADIUS accounting servers in the profile are offline.
Options	<i>number</i> —Number of stops to hold. Range: 1 through 168,000 Default: 168,000
Required Privilege Level	access—To view this statement in the configuration. access-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Back-up Options for RADIUS Accounting on page 109

max-withhold-time (Access Profile)

Syntax	max-withhold-time <i>hold-time</i> ;
Hierarchy Level	[edit access accounting-backup-options]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	Set the timer that determines how long the router holds pending accounting stop requests. Any remaining accounting stop messages are flushed when the timer expires, even if the accounting server is again online.
Options	<i>hold-time</i> —Number of minutes. Range: 1 through 1440 Default: 60
Required Privilege Level	access—To view this statement in the configuration. access-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Back-up Options for RADIUS Accounting on page 109

maximum-discovery-table-entries

Syntax	<code>maximum-discovery-table-entries <i>entry-number</i>;</code>
Hierarchy Level	[edit protocols ancp], [edit protocols ancp neighbor ip-address]
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Specify the maximum number of discovery table entries accepted from all ANCP neighbors or from a particular ANCP neighbor. The number of entries configured for an individual neighbor supersedes the global value. The neighbor can continue to update previously created entries when the maximum has been exceeded, but no new entries are accepted.
Default	No limit on the number of table entries
Options	<i>entry-number</i> —Maximum number of discovery table entries. Range: 1 through 100,000 Default: 100,000
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Configuring ANCP Neighbors on page 625

maximum-helper-restart-time

Syntax	<code>maximum-helper-restart-time <i>seconds</i>;</code>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 9.4.
Description	Specify how long other router processes wait for the ANCP agent to restart before considering it to be down.
Options	<i>seconds</i> —Number of seconds other processes wait for ANCP to restart. Range: 45 through 600 seconds Default: 45 seconds
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Specifying How Long Processes Wait for the ANCP Agent Restart to Complete on page 629

maximum-lease-time

Syntax	<code>maximum-lease-time <i>seconds</i>;</code>
Hierarchy Level	<code>[edit access address-assignment pool <i>pool-name</i> family (inet inet6) dhcp-attributes]</code>
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Specify the maximum length of time, in seconds, that the lease is held for a client if the client does not renew the lease. This is equivalent to DHCP option 51. The maximum-lease-time is mutually exclusive with both the preferred-lifetime and the valid-lifetime , and cannot be configured with either timer.
Options	<p>seconds—Maximum number of seconds the lease can be held.</p> <p>Range: 30 through 4,294,967,295 seconds</p> <p>Default: 86,400 (24 hours)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Address-Assignment Pools on page 567 • DHCP Attributes for Address-Assignment Pools on page 243 • preferred-lifetime (Address-Assignment Pools) on page 1237 • valid-lifetime (Address-Assignment Pools) on page 1424

maximum-subscribers

Syntax	<code>maximum-subscribers <i>limit</i>;</code>
Hierarchy Level	<code>[edit system services extensible-subscriber-services]</code>
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Configure the maximum number of subscriber sessions supported at a time.
Options	<p>limit—Maximum number of subscribers.</p> <p>Range: 1 through 2000</p> <p>Default: 1000</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • show subscribers on page 1775 • show subscribers summary on page 1796

metric (Diameter Route)

Syntax	<code>metric route-metric;</code>
Hierarchy Level	[edit diameter network-statement <i>element-name</i> forwarding <code>route dne-route-name</code>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the metric associated with a destination and function. Together, these three elements define a route reachable through a Diameter network element. A lower metric makes a route more preferred.
Options	<code>route-metric</code> —Metric assigned to the route. Range: 0 through 255
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Network Elements on page 701

metric (Domain Map)

Syntax	<code>metric route-metric;</code>
Hierarchy Level	[edit access domain <code>map domain-map-name padn destination-address</code>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Configure the route metric PADN parameter for a domain map.
Options	<code>route-metric</code> —Value assigned to the route. Range: 0 through 255
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring PADN Parameters for a Domain Map on page 173

min-advertisement-interval (Dynamic Router Advertisement)

Syntax	min-advertisement-interval <i>seconds</i> ;
Hierarchy Level	[edit dynamic-profiles protocols router-advertisement interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Minimum interval between each router advertisement message.
Options	<p>seconds—Minimum interval.</p> <p>Range: 3 seconds through three-quarter times the maximum advertisement interval value</p> <p>Default: One-third the maximum advertisement interval value</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>max-advertisement-interval (Protocols IPv6 Neighbor Discovery)</i>• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

multi-address-embedded-option-response (DHCP Local Server)

Syntax	multi-address-embedded-option-response;
Hierarchy Level	[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 logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 ...], [edit logical-systems <i>logical-system-name</i> system services system services dhcp-local-server dhcpv6 ...], [edit routing-instances <i>routing-instance-name</i> system services system services dhcp-local-server dhcpv6 ...]
Release Information	Statement introduced in Junos OS Release 12.3R3 and supported in later 12.3Rx releases. Statement supported in Junos OS Release 13.3 and later releases. (Not supported in Junos OS 13.1 and 13.2.)
Description	Configure DHCPv6 local server to return the DNS server address (DHCPv6 attribute 23) as a suboption in the respective IA_NA or IA_PD headers.
Default	DHCPv6 local server returns the DNS server address as a global DHCPv6 option.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Overriding How the DNS Server Address Is Returned in a DHCPv6 Multiple Address Environment on page 581• Overriding Default DHCP Local Server Configuration Settings on page 311

name-server

Syntax	name-server [<i>server-names</i>];
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure one or more Domain Name System (DNS) name servers available to the client to resolve hostname-to-client mappings. This is equivalent to DHCP option 6.
Options	<i>server-names</i> —IP addresses of the domain name servers, listed in order of preference.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

nas-identifier

Syntax	<code>nas-identifier <i>identifier-value</i>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Configure the value for the client RADIUS attribute 32 (NAS-Identifier). This attribute is used for authentication and accounting requests.
Options	<i>identifier-value</i> —String to use for authentication and accounting requests. Range: 1 through 64 characters
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring RADIUS Server Parameters for Subscriber Access on page 118

nas-port-extended-format

Syntax

```
nas-port-extended-format {
    adapter-width width;
    ae-width width;
    port-width width;
    pw-width width;
    slot-width width;
    stacked-vlan-width width;
    vlan-width width;
    atm {
        adapter-width width;
        port-width width;
        slot-width width;
        vci-width width;
        vpi-width width;
    }
}
```

Hierarchy Level [edit access profile *profile-name* radius [options](#)]

Release Information Statement introduced in Junos OS Release 9.1.
Statement introduced in Junos OS Release 9.1 for EX Series switches.
ae-width option added in Junos OS Release 12.1.
atm option added in Junos OS Release 12.3R3 and supported in later 12.3Rx releases.
atm option supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)
pw-width option added in Junos OS Release 15.1.

Description Configure the RADIUS client to use the extended format for RADIUS attribute 5 (NAS-Port) and specify the width of the fields in the NAS-Port attribute.

Options

- adapter-width *width***—Number of bits in the adapter field.
- ae-width *width***—Number of bits in the aggregated Ethernet identifier field.
- port-width *width***—Number of bits in the port field.
- pw-width *width***—Number of bits in the pseudowire field. Appears in the Cisco NAS-Port-Info AVP (100).
- slot-width *width***—Number of bits in the slot field.
- stacked-vlan-width *width***—Number of bits in the SVLAN ID field.
- vlan-width *width***—Number of bits in the VLAN ID field.



NOTE: The total of the widths must not exceed 32 bits, or the configuration will fail.

Required Privilege	admin—To view this statement in the configuration.
Level	admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring RADIUS Server Parameters for Subscriber Access on page 118

nas-port-extended-format (Interfaces)

Syntax

```
nas-port-extended-format {
    adapter-width width;
    ae-width width;
    port-width width;
    slot-width width;
    stacked;
    stacked-vlan-width width;
    vci-width width;
    vlan-width width;
    vpi-width width;
}
```

Hierarchy Level [edit interfaces *interface-name* radius-options **nas-port-options** *nas-port-options-name*]

Release Information Statement introduced in Junos OS Release 12.3.
Options **vci-width** and **vpi-width** introduced in Junos OS Release 12.3R3 and supported in later 12.3Rx releases.
Options **vci-width** and **vpi-width** supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)

Description Configure the RADIUS client to use the extended format for RADIUS attribute 5 (NAS-Port) and specify the width of the fields in the NAS-Port attribute.

Options

- adapter-width *width***—Number of bits in the adapter field.
- ae-width *width***—Number of bits in the aggregated Ethernet identifier field.
- port-width *width***—Number of bits in the port field.
- slot-width *width***—Number of bits in the slot field.
- stacked**—Include stacked VLAN IDs, in addition to VLAN IDs, in the NAS-Port extended format.
- stacked-vlan-width *width***—Number of bits in the SVLAN ID field.
- vci-width *width***—Number of bits in the ATM virtual circuit identifier (VCI) field.
- vlan-width *width***—Number of bits in the VLAN ID field.
- vpi-width *width***—Number of bits in the ATM virtual path identifier (VPI) field.



NOTE: Each field can be 0 through 32 bits wide; however, the total of the widths of all fields must not exceed 32 bits, or the configuration fails.

The router may truncate the values of individual fields depending on the bit width you specify.

Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73 • Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72

nas-port-id-delimiter (Subscriber Management)

Syntax	nas-port-id-delimiter <i>delimiter-character</i> ;
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 11.4. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Specify the character that the router uses as a separator between the concatenated values in the NAS-Port-ID string. The router uses the delimiter when you configure more than one value in the nas-port-id-format statement.
Default	The hash (#) character.
Options	<i>delimiter-character</i> —Character used for the delimiter.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring RADIUS Server Options for Subscriber Access on page 119 • Configuring RADIUS Server Parameters for Subscriber Access on page 118 • Configuring a NAS-Port-ID with Additional Options on page 63

nas-port-id-format (Subscriber Management)

Syntax

```
nas-port-id-format {
  agent-circuit-id;
  agent-remote-id;
  interface-description;
  interface-text-description;
  nas-identifier;
  order {
    agent-circuit-id;
    agent-remote-id;
    interface-description;
    interface-text-description;
    nas-identifier;
    postpend-vlan-tags;
  }
  postpend-vlan-tags;
}
```

Hierarchy Level [edit access profile *profile-name* radius [options](#)]

Release Information Statement introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Options **interface-text-description**, **order**, and **postpend-vlan-tags** introduced in Junos OS Release 15.1.

Description Specify the optional information that the router includes in the NAS-Port-ID (RADIUS attribute 87) that is passed to the RADIUS server during authentication and accounting. You can include any combination of the optional values.

When you specify the values for the NAS-Port-ID, you can configure the values to appear in either the default order or a custom order of your choice.



NOTE: The default and custom order methods are mutually exclusive. The configuration fails if you attempt to configure a NAS-Port-ID that includes values in both types of orders.

To specify that the optional values appear in the default order in the NAS-Port-ID, configure the values directly under the **nas-port-id-format** statement. The default order is as follows, in which the **#** character is the delimiter:

```
nas-identifier # interface-description # interface-text-description # agent-circuit-id #
agent-remote-id # postpend-vlan-tags
```

To specify a custom order for the NAS-Port-ID string, you use the **order** option. Include the **order** option before each optional value you want to include in the string, in the order in which you want the options to appear. For example, the configuration, **order interface-text-description order nas-identifier order agent-remote-id** produces the following NAS-Port-ID, in which the **#** character is the delimiter:

interface-text-description # nas-identifier # agent-remote-id

Default The router includes the interface description in the NAS-Port-ID when no optional values are specified.

Options **agent-circuit-id**—Include the agent circuit ID from either DHCP option 82 or the DSL forum VSAs.

agent-remote-id—Include the agent remote ID from either DHCP option 82 or the DSL forum VSAs.

interface-description—Include the interface description (interface identifier).

interface-text-description—Include the textual interface description (the text description that is statically configured in the CLI).

nas-identifier—Include the NAS identifier value (RADIUS attribute 32).

order—Specify the optional values you want to include in the NAS-Port-ID and the customized order in which you want the values to appear. You must include the **order** option before each optional value (for example, **order agent-circuit-id order interface-description**).

postpend-vlan-tags—Include the VLAN tags. The router includes the tags in the format **:<outer-tag>-<inner-tag>** for a double-tagged VLAN, or **:<outer-tag>** for a single-tagged VLAN.

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

Related Documentation

- [Configuring RADIUS Server Options for Subscriber Access on page 119](#)
- [Configuring RADIUS Server Parameters for Subscriber Access on page 118](#)
- [Configuring a NAS-Port-ID with Additional Options on page 63](#)

nas-port-options (RADIUS Options)

Syntax `nas-port-options nas-port-options-name {
 nas-port-extended-format {
 adapter-width width;
 ae-width width;
 port-width width;
 slot-width width;
 stacked;
 stacked-vlan-width width;
 vci-width width;
 vlan-width width;
 vpi-width width;
 }
 nas-port-type port-type;
 stacked-vlan-ranges (any | low-outer-tag–high-outer-tag),any;
 vlan-ranges (any | low-tag–high-tag);
}`

Hierarchy Level [edit interfaces *interface-name* **radius-options**]

Release Information Statement introduced in Junos OS Release 12.3.

Description Create a NAS-Port options definition to configure the NAS-Port-Type (61) RADIUS IETF attribute, and an extended format for the NAS-Port (5) RADIUS IETF attribute, on a per-physical interface, per-VLAN, or per-stacked VLAN (S-VLAN) basis. Each NAS-Port options definition includes the NAS-Port extended format, the NAS-Port-Type, and either the VLAN range of subscribers or the S-VLAN range of subscribers to which the definition applies.



NOTE: You can configure a maximum of 16 NAS-Port options definitions per physical interface. Each definition can include a maximum of 32 VLAN ranges or 32 S-VLAN ranges, but cannot include a combination of VLAN ranges and S-VLAN ranges.

Options *nas-port-options-name*—Name of the NAS-Port options definition.

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 RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)

nas-port-type (Subscriber Management)

Syntax `nas-port-type {
 ethernet {
 port-type;
 }
 }`

Hierarchy Level [edit access profile *profile-name* radius [options](#)]

Release Information Statement introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.

Description Specify the port type used to authenticate subscribers. The router includes the port type in RADIUS attribute 61 (NAS-Port-Type attribute).



NOTE: This statement is ignored if the [ethernet-port-type-virtual](#) statement is included in the same access profile.

Default The router uses a port type of **ethernet**.

Options *port-type*—One of the following port types:

- *value*—A value from 0-65535
- **adsl-cap**—Asymmetric DSL, carrierless amplitude phase (CAP) modulation
- **adsl-dmt**—Asymmetric DSL, discrete multitone (DMT)
- **async**—Asynchronous
- **cable**—Cable
- **ethernet**—Ethernet
- **fddi**—Fiber Distributed Data Interface
- **g3-fax**—G.3 Fax
- **hdlc-clear-channel**—HDLC Clear Channel
- **iapp**—Inter-Access Point Protocol (IAPP)
- **isdsl**—ISDN DSL
- **isdn-sync**—ISDN Synchronous
- **isdn-v110**—ISDN Async V.110
- **isdn-v120**—ISDN Async V.120
- **piafs**—Personal Handyphone System (PHS) Internet Access Forum Standard
- **sdsl**—Symmetric DSL

- **sync**—Synchronous
- **token-ring**—Token Ring
- **virtual**—Virtual
- **wireless**—Other wireless
- **wireless-1x-ev**—Wireless 1xEV
- **wireless-cdma2000**—Wireless code division multiple access (CDMA) 2000
- **wireless-ieee80211**—Wireless 802.11
- **wireless-umts**—Wireless universal mobile telecommunications system (UMTS)
- **x25**—X.25
- **x75**—X.75
- **xdsl**—DSL of unknown type

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

Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring RADIUS Server Parameters for Subscriber Access on page 118
------------------------------	--

nas-port-type (RADIUS Options)

Syntax	<code>nas-port-type <i>port-type</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> radius-options nas-port-options <i>nas-port-options-name</i>]
Release Information	Statement introduced in Junos OS Release 12.3.
Description	Specify the port type used to authenticate subscribers. The router includes the port type in the NAS-Port-Type (61) RADIUS IETF attribute.
Default	If you do not include the nas-port-type statement at the [edit interfaces <i>interface-name</i> radius-options nas-port-options <i>nas-port-options-name</i>] hierarchy level, the global value configured for nas-port-type at the [edit access profile <i>profile-name</i> radius options] hierarchy level takes effect.
Options	<p><i>port-type</i>—One of the following port types:</p> <ul style="list-style-type: none"> <i>value</i>—A value from 0 through 65535 adsl-cap—Asymmetric DSL, carrierless amplitude phase (CAP) modulation adsl-dmt—Asymmetric DSL, discrete mutilating (DOT) async—Asynchronous cable—Cable ethernet—Ethernet fdi—Fiber Distributed Data Interface g3-fax—G.3 Fax hdlc-clear-channel—HDLC Clear Channel iapp—Inter-Access Point Protocol (IAPP) idsl—ISDN DSL isdn-sync—ISDN Synchronous isdn-v110—ISDN Async V.110 isdn-v120—ISDN Async V.120 piafs—Personal Handyphone System (PHS) Internet Access Forum Standard sdsl—Symmetric DSL sync—Synchronous token-ring—Token Ring virtual—Virtual wireless—Other wireless wireless-1x-ev—Wireless 1xEV

- **wireless-cdma2000**—Wireless code division multiple access (CDMA) 2000
- **wireless-ieee80211**—Wireless 802.11
- **wireless-umts**—Wireless universal mobile telecommunications system (UMTS)
- **x25**—X.25
- **x75**—X.75
- **xdsl**—DSL of unknown type

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

Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73• Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72
------------------------------	--

nasreq (Diameter Application)

Syntax `nasreq`

```

max-outstanding-requests number;
partition partition-name {
    destination-host hostname;
    destination-realm realm-name;
    diameter-instance master;
}
request-retry retries;
timeout seconds;

```

Hierarchy Level [edit access]

Release Information Statement introduced in Junos OS Release 16.1.

Description Specify the destination and transmission parameters for the Diameter Network Access Server Requirements (NASREQ) protocol.

NASREQ is a Diameter-based authentication and authorization protocol. The NASREQ client has two queues, the transmit queue and response queue. The transmit queue stores outbound packets until sent to Diameter, and includes requests and responses. The response queue stores request packets until Diameter responds to the request, and includes only requests waiting for a response.

The following configuration options control transmission flow and use of the queues:

- **max-outstanding-requests** option specifies the maximum number of requests (includes AAR and STR) that the NASREQ client sends to Diameter for wireline transmissions. Effectively, this is the maximum count of requests on the response-queue (the maximum number of in-flight requests for which there has not been a response or timeout); it does not include sent responses.
- The **request-retry** option specifies how many times the NASREQ client retries transmitting a packet to the Diameter server when a timeout is received from the Diameter server for the request.
- The **timeout** option specifies the number of seconds that an outbound packet remains in the transmit queue before it is declared to have timed out. The NASREQ client does not transmit packets that have timed out. The timeout value applies to all packets in the transmit queue, including both requests and responses to be sent. Diameter manages packets that time out after transmission.

Options *number*—Maximum number of requests that the NASREQ client sends to Diameter.

Range: 20 through 100

retries—Number of times to re-send a timeout request to Diameter after the initial request. This value applies only to requests in the response queue. A value of 0 indicates to try transmission once and then do not retry.

Range: 0 through 3

seconds—Number of seconds that an outbound packet remains in the transmit queue before it is declared to have timed out.

Range: 5 through 30

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

- [Diameter Based Network Access Server Application \(NASREQ\) on page 751](#)
- [Configuring the Diameter Network Access Server Application \(NASREQ\) on page 753](#)

neighbor (Define ANCP)

Syntax `neighbor ip-address {
adjacency-loss-hold-time seconds;
adjacency-timer;
auto-configure-trigger interface interface-name;
ietf-mode;
maximum-discovery-table-entries entry-number;
pre-ietf-mode;
}`

Hierarchy Level [edit protocols [ancp](#)]

Release Information Statement introduced in Junos OS Release 9.4.

Description Configure an ANCP neighbor with which the ANCP agent on the router forms an adjacency for reporting and shaping traffic.

Options *ip-address*—IP address of the ANCP neighbor.

The remaining statements are explained separately.

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

Related Documentation

- [Configuring the ANCP Agent on page 624](#)
- [Configuring ANCP Neighbors on page 625](#)

neighbor-discovery-router-advertisement (Address-Assignment Pools)

Syntax	<code>neighbor-discovery-router-advertisement <i>ndra-pool-name</i>;</code>
Hierarchy Level	[edit access address-assignment]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Configure the name of the address-assignment pool used to assign the router advertisement prefix.
Options	<i>ndra-pool-name</i> —Name of the address-assignment pool.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Address-Assignment Pools Overview on page 565 • Configuring an Address-Assignment Pool Used for Router Advertisements on page 470

netbios-node-type

Syntax	<code>netbios-node-type <i>node-type</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Specify the NetBIOS node type. This is equivalent to DHCP option 46.
Options	<i>node-type</i> —One of the following node types: <ul style="list-style-type: none"> • b-node—Broadcast node • h-node—Hybrid node • m-node—Mixed node • p-node—Peer-to-peer node
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Address-Assignment Pools on page 567

network

Syntax	<code>network <i>ip-prefix</i></<i>prefix-length</i>>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure subnet information for an IPv4 address-assignment pool.
Options	<i>ip-prefix</i> —IP version 4 address or prefix value. <i>prefix-length</i> —(Optional) Subnet mask.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

network-element (Diameter Base Protocol)

```
Syntax  network-element element-name {
        dne-origin realm realm-name <host hostname>
        forwarding {
            route dne-route-name {
                destination realm realm-name <host hostname> ;
                function [function-name] <partition partition-name>;
                metric route-metric;
            }
        }
        function function-name;
        peer peer-name {
            priority priority-number;
        }
    }
```

Hierarchy Level [edit [diameter](#)]

Release Information Statement introduced in Junos OS Release 9.6.

Description Specify the transport layer Diameter configuration. The Diameter network element includes a list of routes reachable through the Diameter instance, associated functions, and prioritized Diameter peers.

Options ***element-name***—Name of the network element.
The remaining statements are explained separately.

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


Related Documentation

- [Configuring Diameter on page 699](#)
- [Configuring Diameter Network Elements on page 701](#)

network-services

Syntax	network-services (ethernet enhanced-ethernet ip enhanced-ip lan);
Hierarchy Level	[edit chassis]
Release Information	Statement introduced before Junos OS Release 8.5. enhanced-ethernet and enhanced-ip options introduced in Junos OS Release 11.4. limited-ifl-scaling option introduced in Junos OS Release 15.1R3 for MX Series routers.
Description	Set the router's network services to a specific mode of operation. On MX240, MX480, and MX960 routers, MPC5E and MPC7E power on only if the network services mode configured is enhanced-ip or enhanced-ethernet . All the other MPCs work with any of the network services modes. MX2010 and MX2020 support only enhanced-ip and enhanced-ethernet network services modes.
Default	<ul style="list-style-type: none"> MX80, MX104, MX2010, MX2020—enhanced-ip MX240, MX480, MX960—ip
Options	<p>ethernet—Set the router's network services to Ethernet and use standard, compiled firewall filter format.</p> <p>enhanced-ethernet—Set the router's network services to enhanced Ethernet and use enhanced mode capabilities. Only Trio MPCs and MS-DPCs are powered on in the chassis.</p> <p>ip—Set the router's network services to Internet Protocol and use standard, compiled firewall filter format.</p> <p>enhanced-ip—Set the router's network services to enhanced Internet Protocol and use enhanced mode capabilities. Only Trio MPCs and MS-DPCs are powered on in the chassis. Non-service DPCs do not work with enhanced network services mode options. This feature is enabled by default on MX80, MX104, MX 2010, and 2020 3D Universal Edge Routers.</p> <p>lan—Set the router's network services to LAN and use standard, compiled firewall filter format. Reboot the system after setting the router's network services to LAN.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>Network Services Mode Overview</i> <i>Firewall Filters and Enhanced Network Services Mode Overview</i> in the <i>Junos OS Broadband Subscriber Management and Services Library</i> <i>Configuring Junos OS to Run a Specific Network Services Mode in MX Series Routers</i> <i>Configuring Enhanced IP Network Services for a Virtual Chassis</i>

no-bind-on-request (DHCP Relay Agent)

Syntax	no-bind-on-request;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 overrides], [edit forwarding-options dhcp-relay overrides], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>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 12.3 for EX Series switches.</p>
Description	<p>Explicitly disable automatic binding of received DHCP request messages that have no entry in the database (<i>stray</i> requests). Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.</p> <p>M120 and M320 routers do not support DHCPv6.</p>
	<div>  <p>NOTE: Beginning with Junos OS Release 10.4, automatic binding of stray requests is enabled by default. In Junos OS Release 10.3 and earlier releases, automatic binding of stray requests is disabled by default.</p> </div>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Extended DHCP Relay Agent Overview on page 236](#)
 - [Overriding the Default DHCP Relay Configuration Settings on page 313](#)
 - [Disabling Automatic Binding of Stray DHCP Requests on page 336](#)

no-unsolicited-ra (Enhanced Subscriber Management)

Syntax	no-unsolicited-ra;
Hierarchy Level	[edit system services subscriber-management overrides (Enhanced Subscriber Management)]
Release Information	Statement introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Disable the default transmission and periodic refresh of unsolicited Router Advertisement messages by the router when the subscriber interface is created, and at configured periodic intervals thereafter. When you include the no-unsolicited-ra statement, the router sends Router Advertisement messages and associated periodic refresh messages only when it receives a Router Solicitation message from the subscriber.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS Enhanced Subscriber Management on page 554

no-vlan-interface-name

Syntax no-vlan-interface-name;

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 14.1.



NOTE: The EX Series switches that support the **no-vlan-interface-name** statement are the EX4300, EX4600, and EX9200 switches.

Description When you do not want bridge domain or VLAN tag information, do not include the VLAN ID nor the VLAN interface name (the default) in the circuit or remote ID value in the DHCP option 82 information.



NOTE: The **no-vlan-interface-name** statement is mutually exclusive with the **use-interface-description** and **use-vlan-id** statements.

When you configure the **no-vlan-interface-name** statement only, the format displays only the Layer 3 interface:

```
irb.subunit
```



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

When you configure the **no-vlan-interface-name** and **use-interface-description** statements, the format displays the IRB interface description:

irb_descr

If you configure the **no-vlan-interface-name** and **use-interface-description** statements, and no description for the IRB interface is found, the format displays the IRB interface name:

irb.subunit

When you configure the **no-vlan-interface-name** and **include-irb-and-l2** statements, the format displays the Layer 2 logical interface name and the IRB interface name:

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

When you configure the **no-vlan-interface-name**, **include-irb-and-l2** and **use-interface-name** statements, the format displays the Layer 2 interface description and the IRB interface name:

l2_descr+irb.subunit

If you configure the **no-vlan-interface-name**, **include-irb-and-l2** and **use-interface-name** statements, and no description for the Layer 2 interface is found, the format displays the Layer 2 logical interface name and the IRB interface name:

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

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

Related Documentation	<ul style="list-style-type: none">• Including a Textual Description in DHCP Options on page 342• Using DHCP Relay Agent Option 82 Information on page 337• Configuring DHCPv6 Relay Agent Options on page 442
------------------------------	---

ocs (Diameter Applications)

```
Syntax  ocs {
        global {
            service-context-id service-context;
        }
        partition partition-name {
            called-station-id station-name;
            charging-id number;
            destination-host ocs-hostname;
            destination-realm ocs-realm-name;
            diameter-instance;
            draining;
            draining-response-timeout seconds;
            final-response-timeout seconds;
            force-continue;
            ggsn-address address;
            ggsn-mcc-mnc ggsn-mcc-mnc;
            max-outstanding-requests number;
            send-origin-state-id number;
            user-name-include {
                base-interface-name;
                delimiter delimiter-character;
                domain-name my-domain;
                interface-name;
                mac-address;
                nas-port-id;
                origin-host;
                origin-realm;
                user-name;
                user-prefix pref;
            }
        }
    }
```

Hierarchy Level [edit access]

Release Information Statement introduced in Junos OS Release 16.2.

Description Configure the Online Charging System (OCS) global attributes and partition. The OCS interacts with the Policy and Charging Enforcement Function (PCEF). The PCEF optionally reports usage and receives additional authorizations from the OCS using the 3rd Generation Partnership Project (3GPP) Gy protocol. Broadband PCEF (BPCEF) interactions with the OCS use online session charging with centralized unit determination and centralized rating.

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 the OCS Partition on page 743](#)

- [3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715](#)
- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
- [Understanding Gy Interactions Between the Router and the OCS on page 730](#)
- [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)

on-demand-ip-address

Syntax	on-demand-ip-address;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit “\$junos-interface-unit” ppp-options], [edit interfaces pp0 unit <i>unit-number</i> ppp-options], [edit protocols ppp-service]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	<p>For IPv4 and IPv6 dual-stack PPP subscribers, enables on-demand allocation and de-allocation of an IPv4 address after initial PPP authentication for a subscriber who does not have an existing IPv4 address.</p> <p>Configuration changes take effect as follows:</p> <ul style="list-style-type: none">• When you change this setting for a dynamic PPP interface (at the [edit dynamic-profiles] hierarchy level), the change takes effect only for new subscriber logins.• When you change this setting for a static PPP interface (at the [edit interfaces pp0] hierarchy level, the subscribers on the interface are logged out.• When you change this setting globally (at the [edit protocols ppp-service] hierarchy level), the change takes effect only for new subscriber logins. <p>If you enable on-demand allocation at both the interface and global levels, the global configuration takes precedence and changes take effect for new subscriber logins.</p>
Default	This functionality is disabled by default.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Conserving IPv4 Addresses for Dual-Stack PPP Subscribers Using On-Demand IPv4 Address Allocation on page 447• Configuring Static On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 454• Configuring Dynamic On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 455• Configuring Global On-Demand IPv4 Address Allocation for Dual-Stack PPP Subscribers on page 455

on-link (Dynamic Router Advertisement)

Syntax	(on-link no-on-link);
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> protocols router-advertisement interface <i>interface-name</i> prefix <i>prefix</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	<p>Specify whether to enable prefixes to be used for onlink determination:</p> <ul style="list-style-type: none">• no-on-link—Disable prefixes from being used for onlink determination.• on-link—Enable prefixes to be used for onlink determination.
Default	The configured object is enabled unless explicitly disabled.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

option

Syntax	<pre>option { [(id-number option-type option-value) (id-number array option-type option-value)]; }</pre>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family (inet inet6) dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0. hex-string option type introduced in Junos OS Release 13.3.
Description	Specify user-defined options that are added to client packets.
Options	<p>array—An option can include an array of option types.</p> <p>id-number—Any whole number. The ID number is used to index the option and must be unique across a DHCP server.</p> <p>option-type—Any of the following types: byte, byte-stream, flag, hex-string, integer, ip-address, short, string, unsigned-integer, or unsigned-short.</p> <p>option-value—Value associated with an option. The option value must be compatible with the option type (for example, an On or Off value for a flag type).</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567


option-60 (DHCP Local Server)

Syntax	option-60;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> authentication username-include],</p> <p>[edit system services dhcp-local-server authentication username-include],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the payload of Option 60 (Vendor Class Identifier) from the client PDU be concatenated with the username during the subscriber authentication or DHCP client authentication process.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using External AAA Authentication Services with DHCP on page 271

option-60 (DHCP Relay Agent)

Syntax	option-60;
Hierarchy Level	[edit forwarding-options dhcp-relay authentication username-include], [edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Specify that the payload of the Option 60 (Vendor Class Identifier) from the client PDU is concatenated with the username during the subscriber authentication or client authentication process.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Using External AAA Authentication Services with DHCP on page 271

option-82 (DHCP Relay Agent)

Syntax	<code>option-82 <circuit-id> <remote-id>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify the option 82 that is concatenated with the username during the subscriber authentication or client authentication process. You can specify either, both, or neither the Agent Circuit ID and the Agent Remote ID suboptions. If you specify both, the Agent Circuit ID is supplied first, followed by a delimiter, and then the Agent Remote ID. If neither suboption is supplied, the raw payload of option 82 is concatenated to the username.
<div>  <p>NOTE: The option 82 value used in creating the username is based on the option 82 value that is encoded in the outgoing (relayed) PDU.</p> </div>	
Options	<p>circuit-id—(Optional) The string for the Agent Circuit ID suboption (suboption 1).</p> <p>remote-id—(Optional) The string for the Agent Remote ID suboption (suboption 2).</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using External AAA Authentication Services with DHCP on page 271

option-82 (DHCP Local Server Authentication)

Syntax	<code>option-82 <circuit-id> <remote-id>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> authentication username-include],</p> <p>[edit system services dhcp-local-server authentication username-include],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>Specify the type of Option 82 information from the client PDU that is concatenated with the username during the subscriber authentication or DHCP client authentication process. You can specify either, both, or neither of the Agent Circuit ID and Agent Remote ID suboptions. If you specify both, the Agent Circuit ID is supplied first, followed by a delimiter, and then the Agent Remote ID. If you specify that neither suboption is supplied, the raw payload of Option 82 from the PDU is concatenated to the username.</p>
Options	<p>circuit-id—(Optional) Agent Circuit ID suboption (suboption 1).</p> <p>remote-id—(Optional) Agent Remote ID suboption (suboption 2).</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using External AAA Authentication Services with DHCP on page 271

option-82 (DHCP Local Server Pool Matching)

Syntax	option-82;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server pool-match-order],</p> <p>[edit system services dhcp-local-server pool-match-order]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.0.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>Configure the extended DHCP local server to use the option 82 value in the DHCP client DHCP PDU together with the ip-address-first method to determine which address-assignment pool to use. You must configure the ip-address-first statement before configuring the option-82 statement. The DHCP local server first determines which address-assignment pool to use based on the ip-address-first method. Then, the local server matches the option 82 value in the client PDU with the option 82 configuration in the address-assignment pool. This statement is supported for IPv4 address-assignment pools only.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use on page 245 • Extended DHCP Local Server Overview on page 230 • Address-Assignment Pools Overview on page 565


option-82 (Address-Assignment Pools)

Syntax	<pre>option-82 { circuit-id value range named-range; remote-id value range named-range; }</pre>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes option-match]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	<p>Specify the list of option 82 suboption match criteria used to select the named address range used for the client. The server matches the option 82 value in the user PDU to the specified option 82 match criteria and uses the named address range associated with the string.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

option-match

Syntax	<pre>option-match { option-82 { circuit-id value range named-range; remote-id value range named-range; } }</pre>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	<p>Specify a list of match criteria used to determine which named address range in the address-assignment pool to use. The extended DHCP local server matches this information to the match criteria specified in the client PDUs. For example, for option 82 match criteria, the server matches the option 82 value in the user PDU to the specified option 82 string and uses the named range associated with the string.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

option-number (DHCP Relay Agent Option)

Syntax	<code>option-number <i>option-number</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay <i>relay-option</i>], [edit forwarding-options dhcp-relay dhcpv6 <i>relay-option</i>], [edit forwarding-options dhcp-relay group <i>group-name</i> <i>relay-option</i>], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> <i>relay-option</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 12.3.</p> <p>Statement introduced in Junos OS Release 12.3 for EX Series switches.</p>
Description	<p>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.</p> <p>Use the [edit forwarding-options dhcp-relay dhcpv6] hierarchy level to configure the DHCPv6 relay agent support.</p>
Options	<i>option-number</i> —The DHCP or DHCPv6 option in the incoming traffic.
<div>  NOTE: EX Series switches do not support the User Class Options. </div>	
<ul style="list-style-type: none"> 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	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

options (Access Profile)

```
Syntax  options {
    accounting-session-id-format (decimal | description);
    calling-station-id-delimiter delimiter-character;
    calling-station-id-format {
        agent-circuit-id;
        agent-remote-id;
        interface-description;
        nas-identifier;
    }
    chap-challenge-in-request-authenticator;
    client-accounting-algorithm (direct | round-robin);
    client-authentication-algorithm (direct | round-robin);
    coa-dynamic-variable-validation;
    ethernet-port-type-virtual;
    access-loop-id-local;
    interface-description-format {
        exclude-adapter;
        exclude-sub-interface;
    }
    ip-address-change-notify message;
    juniper-dsl-attributes;
    nas-identifier identifier-value;
    nas-port-extended-format {
        adapter-width width;
        ae-width width;
        port-width width;
        slot-width width;
        stacked-vlan-width width;
        vlan-width width;
        atm {
            adapter-width width;
            port-width width;
            pw-width width;
            slot-width width;
            vci-width width;
            vpi-width width;
        }
    }
    nas-port-id-delimiter delimiter-character;
    nas-port-id-format {
        agent-circuit-id;
        agent-remote-id;
        interface-description;
        interface-text-description;
        nas-identifier;
        order {
            agent-circuit-id;
            agent-remote-id;
            interface-description;
            interface-text-description;
            nas-identifier;
            postpend-vlan-tags;
        }
    }
}
```

```

    }
    postpend-vlan-tags;
  }
  nas-port-type {
    ethernet {
      port-type;
    }
  }
  revert-interval interval;
  service-activation {
    dynamic-profile (optional-at-login | required-at-login);
    extensible-service (optional-at-login | required-at-login);
  }
  vlan-nas-port-stacked-format;
}


```

Hierarchy Level	[edit access profile <i>profile-name</i> radius]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Configure the options used by RADIUS authentication and accounting servers. 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	<ul style="list-style-type: none"> • Configuring RADIUS Server Options for Subscriber Access on page 119 • RADIUS Server Options for Subscriber Access on page 4

order

Syntax	<code>order [<i>accounting-method</i>];</code>
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Set the order in which the Junos OS tries different accounting methods for client activity. When a client logs in, the software tries the accounting methods in the specified order.
Options	<i>accounting-method</i> —One or more accounting methods. When a client logs in, the software tries the accounting methods in the following order, from first to last. The only valid value is radius for RADIUS accounting.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

origin (Diameter Base Protocol)

Syntax	origin realm <i>realm-name</i> host <i>hostname</i>
Hierarchy Level	[edit diameter]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the hostname and realm of the endpoint node that originates Diameter messages for the Diameter instance. The Diameter instance supplies these values to be conveyed by the Origin-Realm-AVP and Origin-Host-AVP for all messages sent by the Diameter instance.
<div>  NOTE: Both the host and realm are mandatory. </div>	
Options	<p>host <i>hostname</i>—Name of the message origin host that is supplied as the value of the Origin-Host AVP for all Diameter messages in the Diameter master instance.</p> <p>realm <i>realm-name</i>—Name of the message origin realm, that is supplied as the value of the Origin-Realm AVP for all Diameter messages in the Diameter master instance.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 699 • Configuring the Origin Attributes of the Diameter Instance on page 699

other-bytes

Syntax	<code>other-bytes bytes;</code>
Hierarchy Level	[edit protocols anc qos-adjust]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Adjust the number of overhead bytes in the actual downstream rate for an access line of DSL type OTHER reported in the ANCP Port Up message by the specified number of bytes. The ANCP agent reports the adjusted value to CoS.</p> <p>The router reports some access technology types—such as Gigabit passive optical network lines (GPON)—as DSL type OTHER.</p>
Options	<p>bytes—Number of bytes added to or subtracted from the actual downstream frame overhead.</p> <p>Range: -100 through 100 bytes</p> <p>Default: 0 bytes</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657• Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653• Configuring the ANCP Agent on page 624

other-overhead-adjust

Syntax	<code>other-overhead-adjust <i>percentage</i>;</code>
Hierarchy Level	[edit protocols ancp qos-adjust]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Adjust the actual downstream rate for an access line of DSL type OTHER received in the ANCP Port Up message by multiplying the rate by the specified percentage. The ANCP agent reports the adjusted rate to CoS.</p> <p>The router reports some access technology types—such as Gigabit passive optical network lines (GPON)—as DSL type OTHER.</p>
Options	<p><i>percentage</i>—Percentage by which to multiply the rate.</p> <p>Range: 80 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657 • Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653 • Configuring the ANCP Agent on page 624

other-bytes

Syntax	<code>other-bytes bytes;</code>
Hierarchy Level	[edit protocols ancp qos-adjust]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Adjust the number of overhead bytes in the actual downstream rate for an access line of DSL type OTHER reported in the ANCP Port Up message by the specified number of bytes. The ANCP agent reports the adjusted value to CoS.</p> <p>The router reports some access technology types—such as Gigabit passive optical network lines (GPON)—as DSL type OTHER.</p>
Options	<p>bytes—Number of bytes added to or subtracted from the actual downstream frame overhead.</p> <p>Range: -100 through 100 bytes</p> <p>Default: 0 bytes</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657• Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653• Configuring the ANCP Agent on page 624


other-overhead-adjust

Syntax	<code>other-overhead-adjust <i>percentage</i>;</code>
Hierarchy Level	[edit protocols ancp qos-adjust]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Adjust the actual downstream rate for an access line of DSL type OTHER received in the ANCP Port Up message by multiplying the rate by the specified percentage. The ANCP agent reports the adjusted rate to CoS.</p> <p>The router reports some access technology types—such as Gigabit passive optical network lines (GPON)—as DSL type OTHER.</p>
Options	<p><i>percentage</i>—Percentage by which to multiply the rate.</p> <p>Range: 80 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657 • Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653 • Configuring the ANCP Agent on page 624

other-stateful-configuration (Dynamic Router Advertisement)

Syntax	(other-stateful-configuration no-other-stateful-configuration);
Hierarchy Level	[edit dynamic-profiles protocols router-advertisement interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	<p>Specify whether to enable autoconfiguration of other nonaddress-related information:</p> <ul style="list-style-type: none">• no-other-stateful-configuration—Disable autoconfiguration of other nonaddress-related information.• other-stateful-configuration—Enable autoconfiguration of other nonaddress-related information.
Default	The configured object is disabled unless explicitly enabled.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Using NDRA to Provide IPv6 WAN Link Addressing Overview on page 385

overhead-accounting (ANCP)

Syntax	overhead-accounting;
Hierarchy Level	[edit protocols ancp interfaces <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	<p>Prevent ANCP from performing an adjustment on the actual downstream data rate that ANCP receives from the DSLAM for the difference between the customer premise equipment (CPE) protocol overhead and the B-RAS protocol overhead. You include this statement when you want CoS to perform the adjustment on the data rate from the DSLAM according to the overhead accounting configuration in a CoS traffic control profile.</p> <p>When this statement is not configured (the default condition), ANCP makes the traffic rate adjustment according to the configuration of the qos-adjust-line-type statements and reports that rate to CoS. CoS then applies (if configured) the adjustment set by the overhead-accounting statement in the CoS traffic profile.</p>
	<div>  <p>NOTE: ANCP reports a traffic rate to CoS only if the qos-adjust statement at the [edit protocols ancp] hierarchy level has been configured.</p> </div>
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent on page 624

overrides (DHCP Local Server)

Syntax	<pre> overrides { allow-no-end-option; client-discover-match <option60-and-option82 incoming-interface>; client-negotiation-match incoming-interface; delegated-pool; delete-binding-on-renegotiation; include-option-82 { forcerenew; nak; } interface-client-limit <i>number</i>; multi-address-embedded-option-response; process-inform { pool <i>pool-name</i>; } rapid-commit; } </pre>
Hierarchy Level	<pre> [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 <i>group-name</i> interface interface-name], [edit system services dhcp-local-server group group-name], [edit system services dhcp-local-server group <i>group-name</i> interface interface-name], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...] </pre>
Release Information	Statement introduced in Junos OS Release 12.3X48-D10 for SRX Series devices.
Description	<p>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.</p> <ul style="list-style-type: none"> 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 <i>group-name</i>] 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 <i>group-name</i> interface <i>interface-name</i>] hierarchy level. Use the [edit system services dhcp-local-server dhcpv6] hierarchy level to override DHCPv6 configuration options.



NOTE: By default, `jdhcp` does not process DHCPINFORM message. Only after you enable the `overrides` command using the `set system services dhcp-local-server overrides process-inform` statement, `jdhcp` starts processing the DHCPINFORM message.

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.

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	<ul style="list-style-type: none"> • Extended DHCP Local Server Overview on page 230 • Overriding Default DHCP Local Server Configuration Settings on page 311 • Deleting DHCP Local Server and DHCP Relay Override Settings on page 315
------------------------------	---

overrides (DHCP Relay Agent)

Syntax	<pre> overrides { allow-no-end-option; allow-snooped-clients; always-write-giaddr; always-write-option-82; client-discover-match <option60-and-option82 incoming-interface>; client-negotiation-match incoming-interface; delete-binding-on-renegotiation; delay-authentication; disable-relay; dual-stack <i>dual-stack-group-name</i>; interface-client-limit <i>number</i>; layer2-unicast-replies; no-allow-snooped-clients; no-bind-on-request; proxy-mode; relay-source replace-ip-source-with; send-release-on-delete; trust-option-82; } </pre>
Hierarchy Level	<pre> [edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i>], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> interface <i>interface-name</i>], [edit forwarding-options dhcp-relay group <i>group-name</i>], [edit forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...] </pre>
Release Information	<p>Statement introduced in Junos OS Release 8.3.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p> <p>Support for the delete-binding-on-renegotiation statement introduced in Junos OS Release 13.2 for EX Series switches.</p> <p>Support for the allow-no-end-options statement introduced in Junos OS Release 14.1X53 for EX Series switches.</p> <p>Support for the relay-source statement introduced in Junos OS Release 15.1.</p> <p>Support for the asymmetric-lease-time and asymmetric-prefix-lease-time statements introduced in Junos OS Release 16.1X60.</p>
Description	<p>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.</p> <p>M120 and M320 routers do not support DHCPv6.</p>

The following statements are supported at both the **[edit ... dhcp-relay]** and **[edit ... dhcpv6]** hierarchy levels.

- **allow-snooped-clients**
- **asymmetric-lease-time**
- **delete-binding-on-renegotiation**
- **dual-stack**
- **interface-client-limit**
- **no-allow-snooped-clients**
- **no-bind-on-request**
- **relay-source**
- **send-release-on-delete**

The following statements are supported at the **[edit ... dhcpv6]** hierarchy levels only.

- **asymmetric-prefex-lease-time**

All other statements are supported at the **[edit ... dhcp-relay]** hierarchy levels 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.
---------------------------------	---

Related Documentation	<ul style="list-style-type: none">• Extended DHCP Relay Agent Overview on page 236• Overriding the Default DHCP Relay Configuration Settings on page 313• Deleting DHCP Local Server and DHCP Relay Override Settings on page 315• dhcp-relay on page 1001
------------------------------	---

overrides (Enhanced Subscriber Management)

Syntax	<pre>overrides { no-unsolicited-ra; shmlog { } }</pre>
Hierarchy Level	[edit system services subscriber-management]
Release Information	Statement introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	<p>Override the default configuration settings for the Junos OS enhanced subscriber management software for subscriber management.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS Enhanced Subscriber Management on page 554

override-password (Domain Map)

Syntax	<pre>override-password <i>password</i></pre>
Hierarchy Level	[edit access domain <i>domain-name</i> map]
Release Information	Statement introduced in Junos OS 14.1.
Description	Specify a password to be used as the authenticating password for all outgoing authentication requests for subscribers who match the domain map.
Options	<i>password</i> —Name of the password.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• strip-username on page 1349

packet-triggered-subscribers

Syntax	<pre>packet-triggered-subscribers { partition <i>partition-name</i> { destination-host <i>hostname</i>; destination-realm <i>realm</i>; diameter-instance <i>instance-name</i>; } traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i> <disable>; no-remote-trace; } }</pre>
Hierarchy Level	[edit system services]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	<p>Configure PTSP to interact with an SAE in an SRC environment to provision packet-triggered subscribers.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the PTSP Partition on page 795

packet-triggered-subscribers-partition

Syntax	packet-triggered-subscribers-partition <i>partition-name</i> ;
Hierarchy Level	[edit system]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the PTSP partition to associate with the logical system and routing instance.
Options	<p><i>partition-name</i>—Name of the PTSP partition that you want PTSP to use. The name is defined with the partition statement at the [edit system services packet-triggered-subscribers] hierarchy level.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Assigning the PTSP Partition on page 796

padn (Domain Map)

Syntax	<code>padn destination-address { mask destination-mask; metric route-metric; }</code>
Hierarchy Level	[edit access domain <code>map domain-map-name</code>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Configure PADN parameters for a domain map.
Options	destination-address —IP address of the destination. 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	<ul style="list-style-type: none">• Configuring PADN Parameters for a Domain Map on page 173

parse-direction (Domain Map)

Syntax	<code>parse-direction (left-to-right right-to-left);</code>
Hierarchy Level	[edit access <code>domain</code>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Specify the direction in which the router searches for the domain name in a username.
Default	<code>left-to-right</code>
Options	left-to-right —The router searches starting at the left-most character. When the router reaches a domain delimiter, it uses anything to the right of the delimiter as the domain name. right-to-left —The router searches starting at the right-most character. When the router reaches a domain delimiter, it uses anything to the right of the delimiter as the domain name.
Required Privilege Level	admin —To view this statement in the configuration. admin-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying the Parsing Direction for Domain and Realm Names on page 171• Configuring Domain and Realm Name Usage for Domain Maps on page 168

parse-order (Domain Map)

Syntax	parse-order (domain-first realm-first);
Hierarchy Level	[edit access domain]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Specify the order in which the router searches for a domain name, either the domain first, or the realm first.
Default	domain-first
Options	<p>domain-first—The router searches for a domain name first. When the router reaches a domain delimiter, it uses anything to the right of the delimiter as the domain name.. If no domain is found, then the router searches for a realm. If the router does not find either a domain or realm, then there is no domain.</p> <p>realm-first—The router searches for a realm name first. When the router reaches a realm delimiter, it uses anything to the left of the delimiter as the domain name. If no realm is found, then the router searches for a domain. If the router does not find either a domain or realm, then there is no domain.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Specifying the Parsing Direction for Domain and Realm Names on page 171 • Configuring Domain and Realm Name Usage for Domain Maps on page 168

parse-direction (Domain Map)

Syntax	parse-direction (left-to-right right-to-left);
Hierarchy Level	[edit access domain]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Specify the direction in which the router searches for the domain name in a username.
Default	left-to-right
Options	<p>left-to-right—The router searches starting at the left-most character. When the router reaches a domain delimiter, it uses anything to the right of the delimiter as the domain name.</p> <p>right-to-left—The router searches starting at the right-most character. When the router reaches a domain delimiter, it uses anything to the right of the delimiter as the domain name.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying the Parsing Direction for Domain and Realm Names on page 171• Configuring Domain and Realm Name Usage for Domain Maps on page 168

parse-order (Domain Map)

Syntax	parse-order (domain-first realm-first);
Hierarchy Level	[edit access domain]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Specify the order in which the router searches for a domain name, either the domain first, or the realm first.
Default	domain-first
Options	<p>domain-first—The router searches for a domain name first. When the router reaches a domain delimiter, it uses anything to the right of the delimiter as the domain name.. If no domain is found, then the router searches for a realm. If the router does not find either a domain or realm, then there is no domain.</p> <p>realm-first—The router searches for a realm name first. When the router reaches a realm delimiter, it uses anything to the left of the delimiter as the domain name. If no realm is found, then the router searches for a domain. If the router does not find either a domain or realm, then there is no domain.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Specifying the Parsing Direction for Domain and Realm Names on page 171 • Configuring Domain and Realm Name Usage for Domain Maps on page 168

partition

Syntax	<pre>partition <i>partition-name</i> { <i>diameter-instance</i> <i>instance-name</i>; <i>destination-host</i> <i>hostname</i>; <i>destination-realm</i> <i>realm</i>; }</pre>
Hierarchy Level	[edit jsrc]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Configure a JSRC partition.
Options	<i>partition-name</i> —Name of the JSRC partition. 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	<ul style="list-style-type: none">• Configuring JSRC on page 759• Configuring the JSRC Partition on page 760

partition (Gx-Plus)

Syntax	<pre>partition <i>partition-name</i> { <i>diameter-instance</i> <i>instance-name</i>; <i>destination-host</i> <i>hostname</i>; <i>destination-realm</i> <i>realm</i>; }</pre>
Hierarchy Level	[edit access gx-plus]
Release Information	Statement introduced in Junos OS Release 11.2. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure a Gx-Plus partition.
Options	<i>partition-name</i> —Name of the Gx-Plus partition. 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	<ul style="list-style-type: none">• Configuring Gx-Plus on page 710• Configuring the Gx-Plus Partition on page 711

partition (NASREQ Diameter Application)

Syntax	<pre>partition <i>partition-name</i> { destination-host <i>hostname</i>; destination-realm <i>realm-name</i>; diameter-instance master; }</pre>
Hierarchy Level	[edit access nasreq]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Define the NASREQ partition by specifying the destination host and realm where the application resides. Only the master routing instance is supported for the application partition.
Options	<p>diameter-instance master—Specifies that the master Diameter instance is used. master is the only supported value.</p> <p>hostname—Name of the host where the NASREQ server application resides; generally, this value is not set unless needed.</p> <p>partition-name—Name of the NASREQ partition.</p> <p>realm-name—Name of the realm where the NASREQ server application resides.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Diameter Based Network Access Server Application (NASREQ) on page 751 • Configuring the Diameter Network Access Server Application (NASREQ) on page 753

partition (OCS)

Syntax `partition partition-name {
 called-station-id station-name;
 charging-id number;
 destination-host ocs-hostname;
 destination-realm ocs-realm-name;
 diameter-instance;
 draining;
 draining-response-timeout seconds;
 final-response-timeout seconds;
 force-continue;
 ggsn-address address;
 ggsn-mcc-mnc ggsn-mcc-mnc;
 max-outstanding-requests number;
 send-origin-state-id number;
 user-name-include {
 base-interface-name;
 delimiter delimiter-character;
 domain-name domain-name;
 interface-name;
 mac-address;
 nas-port-id;
 origin-host;
 origin-realm;
 user-name;
 user-prefix prefix;
 }
 }`

Hierarchy Level [edit access [ocs](#)]

Release Information Statement introduced in Junos OS Release 16.2.

Description Configure an Online Charging System (OCS) partition (a specific logical system: routing instance context) and its parameters to define user ID information, destination host and realm names, and number of outstanding requests to the OCS, and control subscriber traffic flow before the first interrogation with the OCS. The OCS that interacts with the Policy and Charging Enforcement Function (PCEF). Broadband PCEF (BPCEF) interactions with the OCS use online session charging with centralized unit determination and centralized rating.

Options *partition-name*—Name of the OCS partition. You can define only one partition for the OCS.

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 the OCS Partition on page 743](#)

- [3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715](#)
- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
- [Understanding Gy Interactions Between the Router and the OCS on page 730](#)
- [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)

partition (PCRF)

Syntax `partition partition-name {`
 `destination-host pcrf-hostname;`
 `destination-realm pcrf-realm-name;`
 `diameter-instance;`
 `draining;`
 `draining-response-timeout seconds;`
 `ip-can-type number;`
 `local-decision (deny | grant) timeout seconds;`
 `logout-response-timeout seconds;`
 `max-outstanding-requests number;`
 `report-local-rule;`
 `report-resource-allocation;`
 `report-successful-resource-allocation;`
 `send-dyn-subscription-indicator;`
 `send-network-family-indicator;`
 `send-origin-state-id;`
 `subscription-id-data-include {`
 `base-interface-name;`
 `delimiter delimiter-character;`
 `domain-name name;`
 `interface-name;`
 `mac-address;`
 `nas-port-id;`
 `origin-host;`
 `origin-realm;`
 `user-name;`
 `user-prefix prefix;`
 `}`
 `subscription-id-type number;`
 `update-response-timeout seconds;`
 `}`

Hierarchy Level [edit access [pcrf](#)]

Release Information Statement introduced in Junos OS Release 16.2.

Description Configure a Policy and Charging Rules Function (PCRF) partition (a specific logical system:routing instance context) and its parameters to define subscription ID information, destination host and realm names, and reporting for rules and resources. The PCRF is a centralized policy decision point that deploys business policy rules to allocate broadband network resources and manages flow-based charges for subscribers and services.

Options *partition-name*—Name of the PCRF partition. You can define only one partition for the PCRF.

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 the PCRF Partition on page 746](#)
 - [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
 - [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
 - [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)
 - [Understanding Upstream and Downstream Messages for the PCRF on page 740](#)

partition (PTSP)

Syntax	<pre>partition <i>partition-name</i> { destination-host <i>hostname</i>; destination-realm <i>realm</i>; diameter-instance <i>instance-name</i>; }</pre>
Hierarchy Level	[edit system services packet-triggered-subscribers]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Configure a PTSP partition.
Options	<p><i>partition-name</i>—Name of the PTSP partition.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the PTSP Partition on page 795

password (Static Subscribers)

Syntax	<pre>password password-string; username-include { domain-name domain-name; username-include; logical-system-name; routing-instance-name; user-prefix user-prefix-string; }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i> authentication],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers authentication],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include], authentication],</p> <p>[edit system services static-subscribers authentication],</p> <p>[edit system services static-subscribers group <i>group-name</i> authentication]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the password that is sent to AAA for user login for all static subscribers on interfaces configured at the [edit system services static-subscribers interface] hierarchy level, or for the subscribers in a specified group. The group version of the statement takes precedence over the global version.
Options	<p>password-string—String that defines the password.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system-level—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Subscribers over Static Interfaces on page 772• Configuring the Static Subscriber Global Authentication Password on page 777• Configuring the Static Subscriber Group Authentication Password on page 781

password (DHCP Local Server)

Syntax	<code>password password-string;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group group-name authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group group-name authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication],</p> <p>[edit system services dhcp-local-server authentication],</p> <p>[edit system services dhcp-local-server dhcpv6],</p> <p>[edit system services dhcp-local-server dhcpv6 group group-name authentication],</p> <p>[edit system services dhcp-local-server group group-name authentication]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Configure the password that is sent to the external AAA authentication server for subscriber authentication or DHCP client authentication.
Options	<i>password-string</i> —Authentication password.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using External AAA Authentication Services with DHCP on page 271

password (DHCP Relay Agent)

Syntax	<code>password password-string;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication], [edit forwarding-options dhcp-relay dhcpv6 authentication], [edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name authentication], [edit forwarding-options dhcp-relay group <i>group-name</i> authentication], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication]</p>
Release Information	<p>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. Support at the [edit ... dual-stack-group dual-stack-group-name authentication] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	Configure the password that is sent to the external AAA authentication server for subscriber authentication or client authentication. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.
Options	<code>password-string</code> —Authentication password.
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Using External AAA Authentication Services with DHCP on page 271 Configuring Passwords for Usernames on page 275

pcrf (Diameter Applications)

```
Syntax  pcrf {
        global {
            rule-param avp-code;
        }
        partition partition-name {
            destination-host pcrf-hostname;
            destination-realm pcrf-realm-name;
            diameter-instance;
            draining;
            draining-response-timeout seconds;
            ip-can-type number;
            local-decision (deny | grant) timeout seconds;
            logout-response-timeout seconds;
            max-outstanding-requests number;
            report-local-rule;
            report-resource-allocation;
            report-successful-resource-allocation;
            send-dyn-subscription-indicator;
            send-network-family-indicator;
            send-origin-state-id;
            subscription-id-data-include {
                base-interface-name;
                delimiter delimiter-character;
                domain-name name;
                interface-name;
                mac-address;
                nas-port-id;
                origin-host;
                origin-realm;
                user-name;
                user-prefix prefix;
            }
            subscription-id-type number;
            update-response-timeout seconds;
        }
    }
```

Hierarchy Level [edit access]

Release Information Statement introduced in Junos OS Release 16.2.

Description Configure the Policy and Charging Rules Function (PCRF) global attributes, rules, parameters, and partition to authorize and provision subscribers. PCRF is a centralized policy decision point that deploys business policy and charging rules to allocate broadband network resources and manages flow-based charges for subscribers and services. PCRF pushes the rules down to the Policy and Charging Enforcement Function (PCEF) using the 3GPP Gx protocol and online policy interface.

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	<ul style="list-style-type: none">• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740


peer (Diameter Base Protocol)

Syntax	<pre>peer <i>peer-name</i> { address <i>ip-address</i>; connect-actively { port <i>port-number</i>; transport <i>transport-name</i>; } logical-system <i>logical-system-name</i> <routing-instance <i>routing-instance-name</i>>; peer-origin realm <i>realm-name</i> host <i>hostname</i>; routing-instance <i>routing-instance-name</i>; send-origin-state-id; }</pre>
Hierarchy Level	[edit diameter]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Configure peer-specific Origin-Realm and Origin-Name AVP values to include in the CER, DWR, DWA, DPR, and DPA messages of this peer.
Options	<p><i>peer-name</i>—Name of the peer.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Peers on page 700


peer (Diameter Network Element)

Syntax	<code>peer <i>peer-name</i> { <i>priority</i> <i>priority-value</i>; }</code>
Hierarchy Level	[edit diameter network-element <i>element-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Assigns a peer to a Diameter network element and sets a priority value for that peer within the DNE.
Options	<p><i>peer-name</i>—Name of the peer.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Network Elements on page 701

peer-ip-address-optional

Syntax	peer-ip-address-optional;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" ppp-options], [edit interfaces <i>interface-name</i> pp0 unit <i>unit-number</i> ppp-options], [edit access group-profile <i>profile-name</i> ppp ppp-options]
Release Information	Statement introduced in Junos OS Release 15.1.
Description	<p>Enable the Internet Protocol Control Protocol (IPCP) negotiation to succeed even though the peer does not include the IP address option in an IPCP configuration request for static and dynamic, and terminated and tunneled, Point-to-Point Protocol over Ethernet (PPPoE) subscribers. By default, this statement is disabled.</p> <p>If the client's provisioned IP address on the customer premises equipment (CPE):</p> <ul style="list-style-type: none">• Matches the Framed-Route RADIUS attribute, then you must configure the access route at the [edit dynamic-profiles routing-options] hierarchy level.• Matches the Framed-IP-Address RADIUS attribute, then no access route configuration is required. <div> NOTE: You must assign an IP address by configuring the Framed-IP-Address RADIUS attribute or the Framed-Pool RADIUS attribute, or by allocating an IP address from the local address pool without a RADIUS-specified pool name, with an <i>optional</i> Framed-Route RADIUS attribute returned from the RADIUS Server.</div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• IPCP Negotiation with Optional Peer IP Address on page 453• Dynamic Profiles Overview

peer-origin (Diameter Peer)

Syntax	<code>peer-origin realm <i>realm-name</i> host <i>hostname</i>;</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Specify values of Origin-Realm-AVP and Origin-Host-AVP used in messages sent for the specified peer by the Diameter instance.
<div>  NOTE: Both the host and realm are mandatory for the peer origin. </div>	
Options	<p>host <i>hostname</i>—Name of the message origin host that is supplied as the value of the Origin-Host AVP for Diameter messages to the peer.</p> <p>realm <i>realm-name</i>—Name of the message origin realm, that is supplied as the value of the Origin-Realm AVP for Diameter messages to the peer.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter Peers on page 700 • Configuring Diameter on page 699

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;
 }
 }
 hold-down;
 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 on page 565](#)
 • [Configuring Address-Assignment Pools on page 567](#)

pool (DHCP Local Server Overrides)

Syntax `pool pool-name;`

Hierarchy Level [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name* overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name* overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server group *group-name* overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server group *group-name* interface *interface-name* overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* system services dhcp-local-server overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* system services dhcp-local-server dhcpv6 overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* system services dhcp-local-server dhcpv6 group *group-name* overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name* overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* system services dhcp-local-server group *group-name* overrides [process-inform](#)],
 [edit logical-systems *logical-system-name* system services dhcp-local-server group *group-name* interface *interface-name* overrides [process-inform](#)],
 [edit routing-instances *routing-instance-name* system services dhcp-local-server overrides [process-inform](#)],
 [edit routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 overrides [process-inform](#)],
 [edit routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name* overrides [process-inform](#)],
 [edit routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name* overrides [process-inform](#)],
 [edit routing-instances *routing-instance-name* system services dhcp-local-server group *group-name* overrides [process-inform](#)],
 [edit routing-instances *routing-instance-name* system services dhcp-local-server group *group-name* interface *interface-name* overrides [process-inform](#)],
 [edit system services dhcp-local-server overrides [process-inform](#)],
 [edit system services dhcp-local-server dhcpv6 overrides [process-inform](#)],
 [edit system services dhcp-local-server dhcpv6 group *group-name* overrides [process-inform](#)],
 [edit system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name* overrides [process-inform](#)],
 [edit system services dhcp-local-server group *group-name* overrides [process-inform](#)],
 [edit system services dhcp-local-server group *group-name* interface *interface-name* overrides [process-inform](#)]

Release Information Statement introduced in Junos OS Release 11.4.
 Statement introduced in Junos OS Release 12.3R2 for EX Series switches.

Description	Configure DHCP or DHCPv6 local server to reply to DHCP information request messages (DHCPINFORM for DHCPv4 and INFORMATION-REQUEST for DHCPv6) with information taken from the specified pool without interacting with AAA.
Options	pool-name —Name of the address pool, which must be configured within family inet for DHCP local server and within family inet6 for DHCPv6 local server.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Enabling Processing of Client Information Requests on page 268• Overriding Default DHCP Local Server Configuration Settings on page 311

pool-match-order

Syntax	<pre>pool-match-order { external-authority; ip-address-first; option-82; }</pre>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server], [edit routing-instances <i>routing-instance-name</i> 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	<ul style="list-style-type: none">• Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use on page 245• Extended DHCP Local Server Overview on page 230

port

Syntax	<code>port <i>port-number</i>;</code>
Hierarchy Level	[edit access radius-server <i>server-address</i>], [edit access profile <i>profile-name</i> radius-server <i>server-address</i>]
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 RADIUS server.
Options	<i>port-number</i> —Port number on which to contact the RADIUS server. Default: 1812 (as specified in RFC 2865)
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Router or Switch Interaction with RADIUS Servers on page 115 • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90


port (Diameter Peer)

Syntax	<code>port <i>port-number</i>;</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i> connect-actively]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify the destination TCP port used by the active connection to peer.
Options	<i>port-number</i> —Number of the TCP port. Default: 3868
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Diameter on page 699 • Configuring Diameter Peers on page 700

pre-ietf-mode

Syntax	pre-ietf-mode
Hierarchy Level	[edit protocols ancp], [edit protocols ancp neighbor <i>ip-address</i>]
Release Information	Statement introduced in Junos OS Release 9.4.
Description	Configure the ANCP agent to run in a mode that is backward compatible with Internet draft draft-wadhwa-gsmp-l2control-configuration-00.txt, <i>GSMP extensions for layer2 control (L2C)</i> for all neighbors or for a specific neighbor.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Configuring the ANCP Agent for Backward Compatibility on page 628• Configuring ANCP Neighbors on page 625

preauthentication-order (Access Profile)

Syntax	preauthentication-order [<i>preauthentication-method</i>];
Hierarchy Level	[edit access profile <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	Set the order in which the Junos OS uses preauthentication methods for the LLID service when multiple methods are configured. Junos OS supports only the radius method. <div> NOTE: You cannot configure this statement if the Calling-Station-ID attribute is excluded from RADIUS Access-Request messages by the exclude statement.</div>
Options	<i>preauthentication-method</i> <ul style="list-style-type: none">• radius—Verify the client using RADIUS.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• RADIUS Logical Line Identifier (LLID) Overview on page 147• Configuring Logical Line Identification (LLID) Preauthentication on page 150

preauthentication-port

Syntax	<code>preauthentication-port <i>port-number</i>;</code>
Hierarchy Level	[edit access radius-server <i>server-address</i>], [edit access profile <i>profile-name</i> radius-server <i>server-address</i>]
Release Information	Statement introduced in Junos OS Release 15.1 for MX Series routers.
Description	Configure the port number on which to contact the RADIUS server for logical line identification (LLID) preauthentication requests. If you do not configure a separate UDP port for preauthentication purposes, the same UDP port that you configure for authentication messages by including the port <i>port-number</i> statement is used.
Options	<i>port-number</i> —Port number used for preauthentication requests to contact the RADIUS server.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • RADIUS Logical Line Identifier (LLID) Overview on page 147 • RADIUS Attributes for LLID Preauthentication Requests on page 148

preauthentication-secret

Syntax	<code>preauthentication-secret <i>password</i>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> radius-server <i>server-address</i>], [edit access radius-server <i>server-address</i>]
Release Information	Statement introduced in Junos OS Release 15.1 for MX Series routers.
Description	Configure the password to use with the RADIUS server for logical line identification (LLID) preauthentication requests. If you do not configure a separate UDP password for preauthentication purposes, the same password that you configure for authentication messages by including the secret <i>password</i> statement is used. The secret password used by the local router must match that used by the server.
Options	<i>password</i> —Password to use. To include spaces enclose the character string in quotation marks.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • RADIUS Logical Line Identifier (LLID) Overview on page 147 • RADIUS Attributes for LLID Preauthentication Requests on page 148

preauthentication-server (Access Profile)

Syntax	<code>preauthentication-server <i>ip-address</i>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> radius]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	Specify the RADIUS preauthentication server, which is used for the LLID service.



NOTE: You cannot configure this statement if the Calling-Station-ID attribute is excluded from RADIUS Access-Request messages by the [exclude](#) statement.

Options	<i>ip-address</i> —IPv4 address.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• RADIUS Logical Line Identifier (LLID) Overview on page 147• Configuring Logical Line Identification (LLID) Preauthentication on page 150

preferred-lifetime (Address-Assignment Pools)

Syntax	<code>preferred-lifetime <i>seconds</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet6 dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	<p>Specify the length of time, in seconds, that the DHCPv6 server keeps the IPv6 prefix active. When the lifetime expires, the address is deprecated.</p> <p>If the valid-lifetime is also configured, the preferred-lifetime must be less than the valid-lifetime. The preferred-lifetime and the maximum-lease-time are mutually exclusive and cannot both be configured.</p>
Options	<p>seconds—Number of seconds that the IPv6 prefix is active.</p> <p>Range: 30 through 4,294,967,295 seconds</p> <p>Default: 86,400 (24 hours)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Address-Assignment Pools on page 567 • DHCP Attributes for Address-Assignment Pools on page 243 • maximum-lease-time on page 1159 • valid-lifetime (Address-Assignment Pools) on page 1424

preferred-lifetime (Dynamic Router Advertisement)

Syntax	<code>preferred-lifetime <i>seconds</i>;</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> protocols router-advertisement interface <i>interface-name</i> <code>prefix prefix</code>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Specify how long the prefix generated by stateless autoconfiguration remains preferred.
Options	<i>seconds</i> —Preferred lifetime, in seconds. If you set the preferred lifetime to 0xffffffff , the lifetime is infinite. The preferred lifetime is never greater than the valid lifetime. Default: 604,800 seconds
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>valid-lifetime</i>• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

prefix (DHCP Relay Agent)

Syntax	<code>prefix <i>prefix</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> (relay-agent-interface-id relay-agent-remote-id)],</p> <p>[edit forwarding-options dhcp-relay relay-option-82 (circuit-id remote-id)],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> relay-option-82 (circuit-id remote-id)],</p> <p>[edit logical-systems <i>logical-system-name</i> ... forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)],</p> <p>[edit logical-systems <i>logical-system-name</i> ... forwarding-options dhcp-relay ... relay-option-82 (circuit-id remote-id)],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ... relay-option-82 (circuit-id remote-id)]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.3.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.3 for EX Series switches.</p> <p>Support at the [edit ... relay-agent-remote-id] and [edit ... remote-id] hierarchy levels introduced in Junos OS Release 14.1.</p>
Description	<p>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.</p>
Options	<p><i>prefix</i>—Any of the following:</p> <ul style="list-style-type: none"> • 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	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Including a Prefix in DHCP Options on page 340 • Using DHCP Relay Agent Option 82 Information on page 337 • Configuring DHCPv6 Relay Agent Options on page 442

prefix (Address-Assignment Pools)

Syntax	<code>prefix <i>ipv6-prefix</i>;</code>
Hierarchy Level	[edit access address-assignment <code>pool <i>pool-name</i> family inet6</code>]
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	<i>ipv6-prefix</i> —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	<ul style="list-style-type: none">• Address-Assignment Pools Overview on page 565• Configuring Address-Assignment Pools on page 567

prefix (Dynamic Router Advertisement)

Syntax	<pre>prefix <i>prefix</i> { (<code>autonomous</code> <code>no-autonomous</code>); (<code>on-link</code> <code>no-on-link</code>); <code>preferred-lifetime</code> <i>seconds</i>; <code>valid-lifetime</code> <i>seconds</i>; }</pre>
Hierarchy Level	[edit dynamic-profiles protocols router-advertisement <code>interface <i>interface-name</i></code>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Configure the prefix name in router advertisement messages.
Options	<i>prefix</i> —Prefix name. For dynamic configuration, specify the <code>\$junos-ipv6-ndra-prefix</code> dynamic variable. The remaining statements are explained separately.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery

priority (Diameter Peer)

Syntax	<code>priority <i>priority-value</i>;</code>
Hierarchy Level	[edit diameter network-element <i>element-name</i> peer <i>peer-name</i>]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Set the priority for a peer within a Diameter network element. A peer with a higher number has a higher priority.
Options	<i>priority-value</i> —Priority for the peer within the network element. Range: 1 through 65535
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Network Elements on page 701

profile (Access)

```
Syntax  profile profile-name {
        accounting {
            address-change-immediate-update
            accounting-stop-on-access-deny;
            accounting-stop-on-failure;
            ancp-speed-change-immediate-update;
            coa-immediate-update;
            coa-no-override service-class-attribute;
            duplication;
            duplication-filter;
            duplication-vrf {
                access-profile-name profile-name;
                vrf-name vrf-name;
            }
            immediate-update;
            order [ accounting-method ];
            send-acct-status-on-config-change;
            statistics (time | volume-time);
            update-interval minutes;
            wait-for-acct-on-ack;
        }
        authentication-order [ authentication-methods ];
        client client-name {
            chap-secret chap-secret;
            group-profile profile-name;
            ike {
                allowed-proxy-pair {
                    remote remote-proxy-address local local-proxy-address;
                }
                pre-shared-key (ascii-text character-string | hexadecimal hexadecimal-digits);
                ike-policy policy-name;
                interface-id string-value;
            }
            l2tp {
                aaa-access-profile profile-name;
                interface-id interface-id;
                lcp-renegotiation;
                local-chap;
                maximum-sessions number;
                maximum-sessions-per-tunnel number;
                multilink {
                    drop-timeout milliseconds;
                    fragment-threshold bytes;
                }
                override-result-code session-out-of-resource;
                ppp-authentication (chap | pap);
                ppp-profile profile-name;
                sessions-limit-group limit-group-name;
                shared-secret shared-secret;
            }
            pap-password pap-password;
            ppp {
```

```

    cell-overhead;
    encapsulation-overhead bytes;
    framed-ip-address ip-address;
    framed-pool framed-pool;
    idle-timeout seconds;
    interface-id interface-id;
    keepalive seconds;
    primary-dns primary-dns;
    primary-wins primary-wins;
    secondary-dns secondary-dns;
    secondary-wins secondary-wins;
  }
  user-group-profile profile-name;
}
domain-name-server;
domain-name-server-inet;
domain-name-server-inet6;
preauthentication-order preauthentication-method;
provisioning-order (gx-plus | jsr | pcrf);
radius {
  accounting-server [ ip-address ];
  attributes {
    exclude {
      ...
    }
    ignore {
      framed-ip-netmask;
      input-filter;
      logical-system:routing-instance;
      output-filter;
    }
  }
}
authentication-server [ ip-address ];
options {
  accounting-session-id-format (decimal | description);
  calling-station-id-delimiter delimiter-character;
  calling-station-id-format {
    agent-circuit-id;
    agent-remote-id;
    interface-description;
    interface-text-description;
    mac-address;
    nas-identifier;
    stacked-vlan;
    vlan;
  }
  chap-challenge-in-request-authenticator;
  client-accounting-algorithm (direct | round-robin);
  client-authentication-algorithm (direct | round-robin);
  coa-dynamic-variable-validation;
  ethernet-port-type-virtual;
  interface-description-format {
    exclude-adapter;
    exclude-sub-interface;
  }
  juniper-dsl-attributes;
}

```

```
nas-identifier identifier-value;  
nas-port-extended-format {  
    adapter-width width;  
    ae-width width;  
    port-width width;  
    pw-width width;  
    slot-width width;  
    stacked-vlan-width width;  
    vlan-width width;  
    atm {  
        adapter-width width;  
        port-width width;  
        slot-width width;  
        vci-width width;  
        vpi-width width;  
    }  
}  
nas-port-id-delimiter delimiter-character;  
nas-port-id-format {  
    agent-circuit-id;  
    agent-remote-id;  
    interface-description;  
    interface-text-description;  
    nas-identifier;  
    order {  
        agent-circuit-id;  
        agent-remote-id;  
        interface-description;  
        interface-text-description;  
        nas-identifier;  
        postpend-vlan-tags;  
    }  
    postpend-vlan-tags;  
}  
nas-port-type {  
    ethernet {  
        port-type;  
    }  
}  
revert-interval interval;  
service-activation {  
    dynamic-profile (optional-at-login | required-at-login);  
    extensible-service (optional-at-login | required-at-login);  
}  
vlan-nas-port-stacked-format;  
}  
preauthentication-server ip-address;  
}  
radius-server server-address {  
    accounting-port port-number;  
    accounting-retry number;  
    accounting-timeout seconds;  
    dynamic-request-port  
    port port-number;  
    preauthentication-port port-number;  
    preauthentication-secret password;
```

```

    retry attempts;
    routing-instance routing-instance-name;
    secret password;
    max-outstanding-requests value;
    source-address source-address;
    timeout seconds;
}
service {
    accounting-order (activation-protocol | radius);
}
session-options {
    client-idle-timeout minutes;
    client-idle-timeout-ingress-only;
    client-session-timeout minutes;
    strip-user-name {
        delimiter [ delimiter ];
        parse-direction (left-to-right | right-to-left);
    }
}
}

```

Hierarchy Level	[edit access]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure PPP CHAP, or a profile and its subscriber access, L2TP, or PPP properties.
Options	<p>profile-name—Name of the profile.</p> <p>For CHAP, the name serves as the mapping between peer identifiers and CHAP secret keys. This entity is queried for the secret key whenever a CHAP challenge or response is received.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the PPP Authentication Protocol • Configuring Access Profiles for L2TP or PPP Parameters • Configuring L2TP Properties for a Client-Specific Profile • Configuring an L2TP LNS with Inline Service Interfaces • Configuring PPP Properties for a Client-Specific Profile • Configuring Service Accounting with JSRC on page 766 • AAA Service Framework Overview on page 3 • show network-access aaa statistics on page 1690 • clear network-access aaa statistics on page 1467

process-inform

Syntax	<pre>process-inform { pool pool-name; }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit system services dhcp-local-server overrides],</p> <p>[edit system services dhcp-local-server dhcpv6 overrides],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> overrides],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> overrides],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
Description	<p>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.</p>

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	<ul style="list-style-type: none">• Enabling Processing of Client Information Requests on page 268• Overriding Default DHCP Local Server Configuration Settings on page 311

protocol

Syntax	<code>protocol protocol-number;</code>
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Identify the protocol for inclusion as a match condition.
Options	<i>protocol-number</i> —Protocol number.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

protocols (Dynamic Profiles)

```

Syntax protocols {
    igmp {
        interface interface-name {
            accounting;
            disable;
            group-policy;
            immediate-leave
            no-accounting;
            promiscuous-mode;
            ssm-map ssm-map-name;
            static {
                group group {
                    source source;
                }
            }
            version version;
        }
    }
    mld {
        interface interface-name {
            disable;
            (accounting | no-accounting);
            group-policy;
            immediate-leave;
            oif-map;
            passive;
            ssm-map ssm-map-name;
            static {
                group multicast-group-address {
                    exclude;
                    group-count number;
                    group-increment increment;
                    source ip-address {
                        source-count number;
                        source-increment increment;
                    }
                }
            }
            version version;
        }
    }
    router-advertisement {
        interface interface-name {
            current-hop-limit number;
            default-lifetime seconds;
            (managed-configuration | no-managed-configuration);
            max-advertisement-interval seconds;
            min-advertisement-interval seconds;
            (other-stateful-configuration | no-other-stateful-configuration);
            prefix prefix;
            reachable-time milliseconds;
            retransmit-timer milliseconds;
        }
    }
}

```

```

    }
  }
}

```

Hierarchy Level [edit dynamic-profiles *profile-name*]

Release Information Statement introduced in Junos OS Release 9.2.
Support at the [edit dynamic-profiles *profile-name* protocols mld] and [edit dynamic-profiles *profile-name* protocols router-advertisement] hierarchy levels introduced in Junos OS Release 10.1.

Description Enable IGMP on the router. IGMP must be enabled for the router to receive multicast packets.

Default IGMP is disabled on the router. IGMP is automatically enabled on all broadcast interfaces when you configure Protocol Independent Multicast (PIM) or Distance Vector Multicast Routing Protocol (DVMRP).

The statements are explained separately.

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

Related Documentation

- *Configuring IGMP*
- *Examples: Configuring MLD*

provisioning-order Diameter Applications)

Syntax	<code>provisioning-order (gx-plus jsrc pcrf);</code>
Hierarchy Level	[edit access profile <i>profile-name</i>]
Release Information	<p>Statement introduced in Junos OS Release 9.6.</p> <p>Support for Gx-Plus introduced in Junos OS Release 11.2.</p> <p>Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.</p> <p>pcrf option added in Junos OS Release 16.2.</p>
Description	Configure AAA to use the specified application for subscriber service provisioning.
Options	<p>gx-plus—Specify Gx-Plus as the application used to communicate with a PCRF server for subscriber service provisioning.</p> <p>jsrc—Specify JSRC as the application used to communicate with the SAE for subscriber service provisioning. JSRC is used in an SRC environment to request services from the SAE for an authenticated subscriber. JSRC attempts to activate these services. If successful, JSRC returns an ACK message. If unsuccessful, the subscriber is denied access.</p> <p>pcrf—Specify Policy Control and Charging Rules Function (PCRF) as the application used to request provisioning from the PCRF server over the Gx protocol. If you change this configuration, any existing subscriber sessions are unaffected.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring JSRC on page 759• Provisioning Subscribers with JSRC on page 762• Configuring Gx-Plus on page 710• Provisioning Subscribers with Gx-Plus on page 713• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

proxy-mode

Syntax	proxy-mode;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay overrides],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>Enable DHCP relay proxy mode on the extended DHCP relay. Proxy mode supports all extended DHCP relay functionality.</p> <p>You cannot configure both the DHCP relay proxy and the extended DHCP local server on the same interface.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • DHCP Relay Proxy Overview on page 239 • Extended DHCP Relay Agent Overview on page 236 • Enabling DHCP Relay Proxy Mode on page 355

qos-adjust

Syntax	<pre>qos-adjust { other-bytes; other-overhead-adjust; sds1-bytes <i>bytes</i>; sds1-overhead-adjust <i>percentage</i>; vds1-bytes <i>bytes</i>; vds1-overhead-adjust <i>percentage</i>; vds12-bytes <i>bytes</i>; vds12-overhead-adjust <i>percentage</i>; }</pre>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 9.4.
Description	<p>Specify that the ANCP agent reports data rates for downstream traffic to CoS. Configure the values by which the actual downstream data rates are adjusted. When this statement is not configured, the ANCP agent does not report traffic rates to CoS.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657• Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653• Configuring the ANCP Agent on page 624

qos-adjust-adsl

Syntax	<code>qos-adjust-adsl <i>adjustment-factor</i>;</code>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an adjustment factor that is applied globally to the downstream and upstream data rates reported by the ANCP agent for all subscribers on an ADSL line. The ANCP agent reports the adjusted rate only to AAA.
Options	<p><i>adjustment-factor</i>—Adjustment factor applied to upstream and downstream data rates for the DSL type.</p> <p>Range: 0 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates on page 660 • Configuring the ANCP Agent on page 624

qos-adjust-adsl2

Syntax	<code>qos-adjust-adsl2 <i>adjustment-factor</i>;</code>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an adjustment factor that is applied globally to the downstream and upstream data rates reported by the ANCP agent for all subscribers on an ADSL2 line. The ANCP agent reports the adjusted rate only to AAA.
Options	<p><i>adjustment-factor</i>—Adjustment factor applied to upstream and downstream data rates for the DSL type.</p> <p>Range: 0 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates on page 660 • Configuring the ANCP Agent on page 624

qos-adjust-adsl2-plus

Syntax	<code>qos-adjust-adsl2-plus <i>adjustment-factor</i>;</code>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an adjustment factor that is applied globally to the downstream and upstream data rates reported by the ANCP agent for all subscribers on an ADSL2+ line. The ANCP agent reports the adjusted rate only to AAA.
Options	<p><i>adjustment-factor</i>—Adjustment factor applied to upstream and downstream data rates for the DSL type.</p> <p>Range: 0 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates on page 660• Configuring the ANCP Agent on page 624

qos-adjust-other

Syntax	<code>qos-adjust-other <i>adjustment-factor</i>;</code>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Configure an adjustment factor that is applied globally to the downstream and upstream data rates reported by the ANCP agent for all subscribers on an access line of DSL type OTHER. The ANCP agent reports the adjusted rate only to AAA.</p> <p>The router reports some access technology types—such as Gigabit passive optical network lines (GPON)—as DSL type OTHER.</p>
Options	<p><i>adjustment-factor</i>—Adjustment factor applied to upstream and downstream data rates for the DSL type.</p> <p>Range: 0 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates on page 660 • Configuring the ANCP Agent on page 624

qos-adjust-sdsl

Syntax	<code>qos-adjust-sdsl <i>adjustment-factor</i>;</code>
Hierarchy Level	[edit protocols ancpl]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an adjustment factor that is applied globally to the downstream and upstream data rates reported by the ANCP agent for all subscribers on an SDSL line. The ANCP agent reports the adjusted rate only to AAA.
Options	<i>adjustment-factor</i> —Adjustment factor applied to upstream and downstream data rates for the DSL type. Range: 0 through 100 percent Default: 100 percent
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates on page 660• Configuring the ANCP Agent on page 624

qos-adjust-vdsl

Syntax	<code>qos-adjust-vdsl <i>adjustment-factor</i>;</code>
Hierarchy Level	[edit protocols ancpl]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an adjustment factor that is applied globally to the downstream and upstream data rates reported by the ANCP agent for all subscribers on an VDSL line. The ANCP agent reports the adjusted rate only to AAA.
Options	<i>adjustment-factor</i> —Adjustment factor applied to upstream and downstream data rates for the DSL type. Range: 0 through 100 percent Default: 100 percent
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates on page 660• Configuring the ANCP Agent on page 624

qos-adjust-vdsl2

Syntax	<code>qos-adjust-vdsl2 <i>adjustment-factor</i>;</code>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure an adjustment factor that is applied globally to the downstream and upstream data rates reported by the ANCP agent for all subscribers on an VDSL2 line. The ANCP agent reports the adjusted rate only to AAA.
Options	<p><i>adjustment-factor</i>—Adjustment factor applied to upstream and downstream data rates for the DSL type.</p> <p>Range: 0 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Setting a Global Adjustment Factor per DSL Subscriber Line for ANCP Agent-Reported Traffic Rates on page 660• Configuring the ANCP Agent on page 624

radius (Access Profile)

```
Syntax  radius {
        accounting-server [ ip-address ];
        attributes {
            exclude
            ...
        }
        ignore {
            framed-ip-netmask;
            input-filter;
            logical-system-routing-instance;
            output-filter;
        }
    }
    authentication-server [ ip-address ];
    options {
        accounting-session-id-format (decimal | description);
        calling-station-id-delimiter delimiter-character;
        calling-station-id-format {
            agent-circuit-id;
            agent-remote-id;
            interface-description;
            nas-identifier;
        }
        chap-challenge-in-request-authenticator;
        client-accounting-algorithm (direct | round-robin);
        client-authentication-algorithm (direct | round-robin);
        coa-dynamic-variable-validation;
        ethernet-port-type-virtual;
        interface-description-format {
            exclude-adapter;
            exclude-sub-interface;
        }
        ip-address-change-notify message;
        juniper-dsl-attributes;
        nas-identifier identifier-value;
        nas-port-extended-format {
            adapter-width width;
            ae-width width;
            port-width width;
            slot-width width;
            stacked-vlan-width width;
            vlan-width width;
            atm {
                adapter-width width;
                port-width width;
                slot-width width;
                vci-width width;
                vpi-width width;
            }
        }
        nas-port-id-delimiter delimiter-character;
        nas-port-id-format {
```

```

agent-circuit-id;
agent-remote-id;
interface-description;
interface-text-description;
nas-identifier;
order {
    agent-circuit-id;
    agent-remote-id;
    interface-description;
    interface-text-description;
    nas-identifier;
    postpend-vlan-tags;
}
postpend-vlan-tags;
}
nas-port-type {
    ethernet {
        port-type;
    }
}
revert-interval interval;
service-activation {
    dynamic-profile (optional-at-login | required-at-login);
    extensible-service (optional-at-login | required-at-login);
}
vlan-nas-port-stacked-format;
}
preauthentication-server ip-address;
}

```

Hierarchy Level	[edit access profile <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Configure the RADIUS parameters that the router uses for AAA authentication and accounting for subscribers. 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	<ul style="list-style-type: none"> • Configuring RADIUS Server Parameters for Subscriber Access on page 118 • RADIUS Server Options for Subscriber Access on page 4

radius-disconnect (DHCP Local Server)

Syntax	radius-disconnect;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure trigger],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure trigger],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure trigger],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure trigger],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server reconfigure trigger],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 reconfigure trigger],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure trigger],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure trigger],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure trigger],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure trigger],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure trigger],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure trigger],</p> <p>[edit system services dhcp-local-server reconfigure trigger],</p> <p>[edit system services dhcp-local-server dhcpv6 reconfigure trigger],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> reconfigure trigger],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure trigger]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6 ...] hierarchy levels introduced in Junos OS Release 10.4.</p>
Description	Configure all DHCP clients or only the DHCP clients serviced by the specified group of interfaces to be reconfigured when a RADIUS-initiated disconnect is received by the DHCP client or group of clients. A group configuration takes precedence over a DHCP local server configuration.
Default	The client is deleted when a RADIUS-initiated disconnect is received.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298 • Configuring Reconfiguration of the Client on Receipt of RADIUS-Initiated Disconnect on page 301

radius-flow-tap

```

Syntax  radius-flow-tap {
            forwarding-class class-name;
            multicast-interception;
            policy policy-name {
                inet {
                    drop-policy rule-name {
                        from {
                            apply-groups group-name;
                            apply-groups-except group-name;
                            destination-address address;
                            destination-port port-number;
                            dscp dscp-value;
                            protocol protocol;
                            source-address address;
                            source-port port-number;
                        }
                    }
                }
            }
            inet6 {
                drop-policy rule-name {
                    from {
                        apply-groups group-name;
                        apply-groups-except group-name;
                        destination-address address;
                        destination-port port-number;
                        dscp dscp-value;
                        protocol protocol;
                        source-address address;
                        source-port port-number;
                    }
                }
            }
            routing-instance routing-instance-name;
            source-ipv4-address ipv4-address;
        }
    )

```

Hierarchy Level [edit services]

Release Information Statement introduced in Junos OS Release 9.4.

Description Assign parameters that are used with subscriber secure policy mirroring.

The remaining statements are explained separately.

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

Related Documentation

- *Subscriber Secure Policy Overview*
- *Configuring Support for Subscriber Secure Policy Mirroring*

radius-options (Edit Access)

Syntax	<pre>radius-options { request-rate <i>rate</i>; revert-interval <i>seconds</i>; unique-nas-port chassis-id <i>chassis-id</i>; chassis-id-width <i>chassis-id-width</i>; }</pre>
Hierarchy Level	[edit access]
Release Information	Statement introduced in Junos OS Release 8.3.
Description	<p>Configure RADIUS options.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>access—To view this statement in the configuration.</p> <p>access-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

radius-options (Interfaces)

```
Syntax  radius-options {
        nas-port-options nas-port-options-name {
            nas-port-extended-format {
                adapter-width width;
                ae-width width;
                port-width width;
                slot-width width;
                stacked;
                stacked-vlan-width width;
                vci-width width;
                vlan-width width;
                vpi-width width;
            }
            nas-port-type port-type;
            stacked-vlan-ranges (any | low-outer-tag-high-outer-tag),any;
            vlan-ranges (any | low-tag-high-tag);
        }
    }
```

Hierarchy Level [edit interfaces *interface-name*]

Release Information Statement introduced in Junos OS Release 12.3.

Description Configure RADIUS options to set the NAS-Port-Type (61) RADIUS IETF attribute, and an extended format for the NAS-Port (5) RADIUS IETF attribute, on a per-physical interface, per-VLAN, or per-stacked VLAN (S-VLAN) basis.

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 RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)

radius-server

Syntax	<pre>radius-server server-address { accounting-port port-number; accounting-retry number; accounting-timeout seconds; dynamic-request-port max-outstanding-requests value; port port-number; preauthentication-port port-number; preauthentication-secret password; retry attempts; routing-instance routing-instance-name; secret password; source-address source-address; timeout seconds; }</pre>
Hierarchy Level	[edit access], [edit access profile <i>profile-name</i>]
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>dynamic-request-port option added in Junos OS Release 14.2 for MX Series routers.</p> <p>preauthentication-port and preauthentication-secret options added in Junos OS Release 15.1 for MX Series routers.</p> <p>Support for IPv6 server-address introduced in Junos OS Release 16.1.</p>
Description	<p>Configure RADIUS for subscriber access management, L2TP, or PPP.</p> <p>To configure multiple RADIUS servers, include multiple radius-server statements. The servers are tried in order and in a round-robin fashion until a valid response is received from one of the servers or until all the configured retry limits are reached.</p>
Options	<p>server-address—IPv4 or IPv6 address of the RADIUS server.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring RADIUS Authentication for L2TP</i> • <i>Configuring the PPP Authentication Protocol</i> • <i>Configuring Router or Switch Interaction with RADIUS Servers on page 115</i> • <i>Configuring Authentication and Accounting Parameters for Subscriber Access on page 90</i> • show network-access aaa statistics on page 1690 • clear network-access aaa statistics on page 1467

range (Address-Assignment Pools)

Syntax	<pre>range <i>range-name</i> { high <i>upper-limit</i>; low <i>lower-limit</i>; prefix-length <i>prefix-length</i>; }</pre>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family (inet inet6)]
Release Information	<p>Statement introduced in Junos OS Release 9.0.</p> <p>IPv6 support introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.3 for EX Series switches.</p>
Description	Configure a named range of IPv4 addresses or IPv6 prefixes, used within an address-assignment pool.
Options	<p>high <i>upper-limit</i>—Upper limit of an address range or IPv6 prefix range.</p> <p>low <i>lower-limit</i>—Lower limit of an address range or IPv6 prefix range.</p> <p>prefix-length <i>prefix-length</i>—Assigned length of the IPv6 prefix.</p> <p>range-name—Name assigned to the range of IPv4 addresses or IPv6 prefixes.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Address-Assignment Pools Overview on page 565 • Configuring Address-Assignment Pools on page 567

rapid-commit (DHCPv6 Local Server)

Syntax	rapid-commit;
Hierarchy Level	[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 logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 ...], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 ...]
Release Information	Statement introduced in Junos OS Release 12.1. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Configure DHCPv6 local server to recognize the Rapid Commit option (DHCPv6 option 14) in DHCPv6 solicit messages sent from the DHCPv6 client. When rapid commit is enabled for both DHCPv6 local server and the DHCPv6 client, a two-message handshake is used instead of the standard four-message handshake. You can enable rapid commit support on DHCPv6 local server globally, for a named group, or for a specific interface.
Default	Rapid commit support is not enabled.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Enabling DHCPv6 Rapid Commit Support on page 435• Overriding Default DHCP Local Server Configuration Settings on page 311

reachable-time (Dynamic Router Advertisement)

Syntax	<code>reachable-time <i>milliseconds</i>;</code>
Hierarchy Level	[edit protocols router-advertisement interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Set the length of time that a node considers a neighbor reachable until another reachability confirmation is received from that neighbor.
Options	<p><i>milliseconds</i>—Reachability time limit.</p> <p>Range: 0 through 3,600,000 milliseconds</p> <p>Default: 0 milliseconds</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery

realm-delimiter (Domain Map)

Syntax	<code>realm-delimiter [<i>delimiter-character</i>];</code>
Hierarchy Level	[edit access domain]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Specify the characters that the router uses to separate usernames from realm names.
Default	none
Options	<p><i>delimiter-character</i>—One or more characters used as delimiters. You can specify a maximum of eight delimiters. You cannot use the semicolon (;) as a delimiter. Do not include spaces between characters.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Specifying Domain and Realm Name Delimiters on page 169 • Configuring Domain and Realm Name Usage for Domain Maps on page 168

realm-parse-direction (Domain Map)

Syntax	realm-parse-direction (left-to-right right-to-left);
Hierarchy Level	[edit access domain]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Specify the direction in which the router searches for the realm name in a username.
Default	left-to-right
Options	<p>left-to-right—The router searches starting at the left-most character. When the router reaches a realm delimiter, it uses anything to the left of the delimiter as the realm name.</p> <p>right-to-left—The router searches starting at the right-most character. When the router reaches a realm delimiter, it uses anything to the left of the realm as the domain name.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying the Parsing Direction for Domain and Realm Names on page 171• Configuring Domain and Realm Name Usage for Domain Maps on page 168

reconfigure (DHCP Local Server)

Syntax	<pre> reconfigure { attempts <i>attempt-count</i>; clear-on-abort; strict; timeout <i>timeout-value</i>; token <i>token-value</i>; trigger { radius-disconnect; } } </pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i>],</p> <p>[edit system services dhcp-local-server],</p> <p>[edit system services dhcp-local-server dhcpv6],</p> <p>[edit system services dhcp-local-server group <i>group-name</i>],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Support at the [edit ... dhcpv6 ...] hierarchy levels introduced in Junos OS Release 10.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
Description	<p>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.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)

relay-agent-interface-id (DHCP Local Server)

Syntax	relay-agent-interface-id;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.6.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the DHCPv6 Relay Agent Interface-ID option (option 18) in the client PDU name is concatenated with the username during the subscriber authentication or DHCP client authentication process.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Creating Unique Usernames for DHCP Clients on page 272

relay-agent-interface-id (DHCPv6 Relay Agent)

Syntax	<pre> relay-agent-interface-id { include-l2-interface-for-irb; keep-incoming-interface-id; prefix <i>prefix</i>; use-interface-description (logical device); use-option-82; } </pre>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6], [edit forwarding-options dhcp-relay dhcpv6 group group-name], [edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.4. Statement introduced in Junos OS Release 12.3 for EX Series switches. Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	<p>Insert the DHCPv6 Relay Agent Interface-ID option (option 18) in DHCPv6 packets destined for the DHCPv6 server.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • dhcp-relay on page 1001 • Extended DHCP Relay Agent Overview on page 236 • DHCPv6 Relay Agent Overview on page 441 • Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets on page 444

relay-agent-interface-id (DHCPv6 Relay Agent Username)

Syntax	relay-agent-interface-id;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include]</p>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Specify that the DHCPv6 Relay Agent Interface-ID option (option 18) in the client PDU name is concatenated with the username during the subscriber authentication process.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• DHCPv6 Relay Agent Overview on page 441• Creating Unique Usernames for DHCP Clients on page 272

relay-agent-remote-id (DHCP Local Server)

Syntax	relay-agent-remote-id;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.6.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>For MX Series routers only, enterprise-id and remote-id options introduced in Junos OS Release 12.3R3.</p> <p>For MX Series routers only, the enterprise-id and remote-id options are obsoleted starting in Junos OS Releases 12.3R7, 13.2R4, 13.3R2, and 14.1R1.</p>
Description	Specify that the DHCPv6 Relay Agent Remote-ID option (option 37) in the client PDU name is concatenated with the username during the subscriber authentication or DHCP client authentication process. In order to generate an ASCII version of the username, the router concatenates only the remote-id portion of option 37 to the username, and ignores the enterprise number.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Creating Unique Usernames for DHCP Clients on page 272

relay-agent-remote-id (DHCPv6 Relay Agent)

Syntax	<pre>relay-agent-remote-id { keep-incoming-remote-id; prefix <i>prefix</i>; use-interface-description (logical device); use-option-82 <strict>; }</pre>
Hierarchy Level	<pre>[edit forwarding-options dhcp-relay dhcpv6], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 ...]</pre>
Release Information	Statement introduced in Junos OS Release 14.1.
Description	<p>Specify that the DHCPv6 relay agent include Relay Agent Remote-ID (option 37) in DHCPv6 packets destined for a DHCPv6 server. Optionally specify that the option includes a prefix, the interface textual description, or both. In dual-stack environments, you can also specify that the DHCPv6 relay agent use the DHCPv4 option 82 value for DHCPv6 option 37.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Extended DHCP Relay Agent Overview on page 236• DHCPv6 Relay Agent Overview on page 441• DHCPv6 Relay Agent Options on page 442• Configuring DHCPv6 Relay Agent Options on page 442

relay-agent-remote-id (DHCPv6 Relay Agent Username)

Syntax	relay-agent-remote-id;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>For MX Series routers only, enterprise-id and remote-id options introduced in Junos OS Release 12.3R3.</p> <p>For MX Series routers only, the enterprise-id and remote-id options are obsoleted starting in Junos OS Releases 12.3R7, 13.2R4, 13.3R2, and 14.1R1.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	Specify that the DHCPv6 Relay Agent Remote-ID option (option 37) in the client PDU name is concatenated with the username during the subscriber authentication or client authentication process. In order to generate an ASCII version of the username, the router concatenates only the remote-id portion of option 37 to the username, and ignores the enterprise number.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • DHCPv6 Relay Agent Overview on page 441 • Creating Unique Usernames for DHCP Clients on page 272

relay-agent-subscriber-id (DHCP Local Server)

Syntax	relay-agent-subscriber-id;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> authentication username-include]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify that the DHCPv6 Relay Agent Subscriber-ID option (option 38) in the client PDU name is concatenated with the username during the subscriber authentication process.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Creating Unique Usernames for DHCP Clients on page 272

relay-agent-subscriber-id (DHCPv6 Relay Agent)

Syntax	relay-agent-subscriber-id;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include]</p>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Specify that the DHCPv6 Relay Agent Subscriber-ID option (option 38) in the client PDU name is concatenated with the username during the subscriber authentication process.
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • DHCPv6 Relay Agent Overview on page 441 • Creating Unique Usernames for DHCP Clients on page 272

relay-option (DHCP Relay Agent)

Syntax	<pre> 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 <i>ascii-string</i> hexadecimal <i>hexadecimal-string</i>) { drop; forward-only; local-server-group local-server-group; relay-server-group relay-server-group; } starts-with (ascii <i>ascii-string</i> hexadecimal <i>hexadecimal-string</i>) { drop; forward-only; local-server-group local-server-group; relay-server-group relay-server-group; } } </pre>
Hierarchy Level	<pre> [edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit forwarding-options dhcp-relay group <i>group-name</i>], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...] </pre>
Release Information	<p>Statement introduced in Junos OS Release 12.3.</p> <p>Statement introduced in Junos OS Release 12.3 for EX Series switches.</p>
Description	<p>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.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

relay-option-vendor-specific (dhcpv6)

Syntax	<pre> relay-option-vendor-specific { host-name; location; } </pre>
Hierarchy Level	[edit forwarding-options dhcp-relaydhcpv6],
Release Information	Command introduced in Junos OS Release 16.2.
Description	<p>Add vendor-specific information to the vendor-specific option (17) field of DHCPv6 control messages on server-facing interfaces. The vendor-specific information can be a hostname, a location (such as a unique connection identifier), or both. The hostname can be a string of characters such as Juniper-AB-1. The location should be specified as interface, VLAN ID, and if applicable, stacked VLAN ID. For example, <ifd-name>:<vlan> (ae0:100) or <ifd-name>:<svlan> -<vlan> (ae0:100-10).</p> <p>Junos OS automatically adds the remaining vendor-specific information as per RFC 4243. The enterprise ID is 2636. The hostname is option-data 1, and the location is option-data 2. The DHCPv6 relay strips the suboption data from replies from the server before it relays the packets out the client facing interface.</p> <p>This feature can be useful, in conjunction with operator-developed tools, for troubleshooting DHCP servers and providing service assurances. For example, a central DHCP server can log the information, and operators can query a single entity to track and troubleshoot subscriber IP information and network attachment points.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

relay-option-82

```
Syntax  relay-option-82 {
        circuit-id {
            include-irb-and-l2;
            keep-incoming-circuit-id;
            no-vlan-interface-name;
            prefix prefix;
            use-interface-description (logical | device);
            use-vlan-id;
        }
        remote-id {
            include-irb-and-l2;
            keep-incoming-remote-id;
            no-vlan-interface-name;
            prefix prefix;
            use-interface-description (logical | device);
            use-vlan-id;
        }
        server-id-override
        vendor-specific{
            host-name;
            location;
        }
    }
```

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.

To enable insertion of option 82 information in DHCP packets, you must specify at least one of the **circuit-id** or **remote-id** statements.

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.
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Relay Agent Option 82 Information on page 337 • dhcp-relay on page 1001

relay-server-group (DHCP Relay Agent Option)

Syntax	<code>relay-server-group <i>relay-server-group</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay relay-option (default-action equals starts-with), [edit forwarding-options dhcp-relay dhcpv6 relay-option (default-action equals starts-with), [edit forwarding-options dhcp-relay group <i>group-name</i> relay-option (default-action equals starts-with), [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> relay-option (default-action equals starts-with), [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 12.3.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Relay DHCP client packets to the specified group of DHCP servers when you use the DHCP relay selective processing feature. You can configure the relay operation globally or for a group of interfaces, and for either DHCP or DHCPv6 relay agent.
Options	<i>relay-server-group</i> —Name of DHCP server group.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

relay-source

Syntax	<code>relay-source <i>interface-name</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay overrides],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Configure DHCP relay server to use the configured loopback address as the source address in both the IP header and in DHCP messages relayed to the server.</p> <p>In network configurations where a firewall on the broadband network gateway (BNG) is between the DHCP relay agent and the DHCP server, only the BNG loopback address passes through the BNG firewall. In that case, DHCP unicast packets do not pass through the firewall and are discarded. This configuration statement places the loopback address in IP headers and DHCP messages, which enables DHCP unicast packets to pass through the firewall to the DHCP server.</p>
Options	<i>interface-name</i> —Specify the loopback interface. The <i>interface-name</i> must be <code>lo0</code> .
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring DHCP Relay Agent Source Address on page 345

remote-address

Syntax	<code>remote-address (<i>address</i> any-unicast) <except>;</code>
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the address for rule matching. Remote address values are matched against a destination or source IP address for the flow depending on the configured value for the demux statement. If you do not specify an address, then any remote address matches this term. If you do not specify a prefix value, then a host mask is the default.
Options	<p>address—IPv4 or IPv6 address or prefix value.</p> <p>any-unicast—Match all unicast addresses.</p> <p>except—(Optional) Exclude the specified address, prefix, or unicast packets from rule matching.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i> • demux on page 987

remote-address-range

Syntax	<code>remote-address-range low <i>low-value</i> high <i>high-value</i> <except>;</code>
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the address range for rule matching. Remote address values are matched against a destination or source IP address for the flow depending on the configured value for the demux statement. If you do not specify an address, then any remote address matches this term.
Options	<i>low-value</i> —Lower boundary for the IPv4 or IPv6 address range. <i>high-value</i> —Upper boundary for the IPv4 or IPv6 address range. <i>except</i> —(Optional) Exclude the specified address range from rule matching.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>• demux on page 987

remote-id

Syntax	<code>remote-id <i>value</i> range <i>named-range</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes option-match option-82]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Specify the address-assignment pool named range to use based on the particular option 82 Agent Remote ID value.
Options	<i>range named-range</i> —Name of the address-assignment pool range to use. <i>value</i> —String for Agent Remote ID suboption (suboption 2) of the DHCP relay agent information option (option 82) in DHCP packets.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

remote-id (DHCP Relay Agent)

Syntax	<pre>remote-id { include-irb-and-l2; keep-incoming-remote-id; no-vlan-interface-name; prefix <i>prefix</i>; use-interface-description (logical device); use-vlan-id; }</pre>
Hierarchy Level	<pre>[edit forwarding-options dhcp-relay relay-option-82], [edit forwarding-options dhcp-relay group <i>group-name</i> relay-option-82], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ... relay-option-82], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ... relay-option-82], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ... relay-option-82]</pre>
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Specify the Agent Remote ID suboption (suboption 2) 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 Remote 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 Remote 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
```



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

The format of the Agent Remote 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 Remote 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 on page 337
	• Configuring Option 82 Information on page 338

remote-id-mismatch (DHCP Local Server and DHCP Relay Agent)

Syntax	<code>remote-id-mismatch <i>action</i>;</code>
Hierarchy Level	<p>[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 <i>logical-system-name</i> ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i>...], [edit routing-instances <i>routing-instance-name</i> ...], [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]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Specify that the router match the remote ID string for DHCPv4 and DHCPv6 clients. The router then inspects incoming Renew and Rebind messages and compares the Remote ID in the message against the initial value that DHCP stored when creating the client entry. If there is a mismatch between the initial value and the Renew or Rebind message value, DHCP local server performs the specified action.
Options	<p><i>action</i>—Action the DHCP local server takes when it detects a remote ID mismatch.</p> <ul style="list-style-type: none"> disconnect—DHCP local server disconnects the client, which forces the client to reconnect.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Example: Configuring DHCP-Initiated Service Change Based on Remote ID on page 352

remote-port-range

Syntax	remote-port-range low <i>low-value</i> high <i>high-value</i> ;
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the port range for rule matching.
Options	<i>low-value</i> —Lower boundary for the port range. <i>high-value</i> —Upper boundary for the port range.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

remote-ports

Syntax	remote-ports [<i>port-numbers</i>];
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Identify one or more ports for inclusion as a match condition.
Options	<i>port-numbers</i> —Port number.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

remote-prefix-list

Syntax	<code>remote-prefix-list <i>prefix-list-name</i> <except>;</code>
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i> from]
Release Information	Statement introduced in Junos OS Release 10.2. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the prefix list for rule matching. You configure the prefix list by including the prefix-list statement at the [edit policy-options] hierarchy level.
Options	<i>prefix-list-name</i> —Prefix list. except —(Optional) Exclude the specified prefix list from rule matching.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

replace-ip-source-with

Syntax	replace-ip-source-with giaddr;
Hierarchy Level	[edit forwarding-options dhcp-relay overrides], [edit forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]
Release Information	Statement introduced in Junos OS Release 9.6. Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	Replace the IP source address in DHCP relay request and release packets with the gateway IP address (giaddr).
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Extended DHCP Relay Agent Overview on page 236• Replacing the DHCP Relay Request and Release Packet Source Address on page 325

report-interface-descriptions (Edit Access)

Syntax	report-interface-descriptions;
Hierarchy Level	[edit access]
Release Information	Statement introduced in Junos OS Release 13.1.
Description	Enable storing and reporting of interface descriptions through RADIUS. To disable storing and reporting of interface descriptions, configure the [edit access profile <i>profile-name</i> radius attributes exclude] statement to exclude the interface description attribute. The description can contain letters, numbers, and hyphens (-), and can be up to 64 characters long.
Required Privilege Level	access—To view this statement in the configuration. access-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • exclude on page 1050 • Configuring RADIUS Server Options for Subscriber Access on page 119 • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90 • Subscriber Access Interface Description Storage and Reporting Through RADIUS Overview on page 8

report-local-rule (PCRF Partition)

Syntax	report-local-rule;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure the Policy and Charging Rule Function (PCRF) partition to send local report downstream messages by default. If you configure this statement, this generates the same result as if you enabled the Resource-Allocation-Notification message trigger with the local rule definition.</p> <p>The following example shows predefined rule installation commands, including the Resource-Allocation-Notification command, for Credit Control Answer (CCA-GX) and Reauthorization Request (RAR-GX) messages between the PCRF and Gx:</p> <pre>{ Charging-Rule-Install { Charging-Rule-Name: "fixed-cos" } { Charging-Rule-Definition: { Charging-Rule-Name: "firewall" } { Service-Identifier: 10 } { Rating-Group: 292 } { Juniper-Param-V4-Input-Filter: "my_input_filter" } { Juniper-Param-V4-Output-Filter: "my_output_filter" } } [Resource-Allocation-Notification: ENABLE_NOTIFICATION(0)] }</pre>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740

report-resource-allocation (PCRF Partition)

Syntax	report-resource-allocation;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the Policy and Charging Rule Function (PCRF) partition to generate reports for resource allocation failures by default. If you configure this statement, this generates the same result as if you enabled the Resource-Allocation-Notification message trigger with every rule received from the PCRF.

The following example shows predefined rule installation commands, including the Resource-Allocation-Notification command, for Credit Control Answer (CCA-GX) and Reauthorization Request (RAR-GX) messages between the PCRF and Gx:

```
{ Charging-Rule-Install
  { Charging-Rule-Name:  "fixed-cos" }
  { Charging-Rule-Definition:
    { Charging-Rule-Name:  "firewall" }
    { Service-Identifier:  10 }
    { Rating-Group:       292 }
    { Juniper-Param-V4-Input-Filter: "my_input_filter" }
    { Juniper-Param-V4-Output-Filter: "my_output_filter" }
  }
  [ Resource-Allocation-Notification: ENABLE_NOTIFICATION(0) ]
}
```



NOTE: Some PCRFs may be unable to generate a Resource-Allocation-Notification AVP. As a result, the `report-resource-allocation` statement provides generated reports by default.

For login and update interactions between the PCRF and the Online Charging System (OCS), the OCS sends applicable reports to the PCRF using a CCR-GX-U message. If the service-dynamic-profile instantiation fails, and the Resource-Allocation-Notification (ENABLE_NOTIFICATION) is set for the charging rule, then the OCS sends a report. The router acknowledges the subscriber activation, allows subscriber traffic to flow, and continues to repeat the process.

Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the PCRF Partition on page 746 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

- [Understanding Upstream and Downstream Messages for the PCRF on page 740](#)

report-successful-resource-allocation (PCRF Partition)

Syntax	<code>report-successful-resource-allocation;</code>
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure the Policy and Charging Rule Function (PCRF) partition to generate reports for both resource allocation successes and failures by default. If you configure this statement, this generates the same result as if you enabled the Successful-Resource-Allocation-Notification message trigger with every CCA-GX-I, CCA-GX-U, and RAR-GX-A message.</p> <p>The following example shows a predefined event trigger command for CCA-GX and RAR-GX messages between the PCRF and Gx:</p> <pre>{ Event-Trigger: SUCCESSFUL_RESOURCE_ALLOCATION(22) }</pre> <p>If the SUCCESSFUL_RESOURCE_ALLOCATION (22) trigger value exists in the downstream data, the Broadband Policy and Charging Enforcement Function (PCEF) reports successful installations of rules marked with Resource-Allocation-Notification AVP in the Charging-Rule-Install AVP.</p>
	<p> NOTE: Some PCRFs may be unable to generate this event trigger. As a result, the <code>report-successful-resource-allocation</code> statement provides generated reports by default.</p>
	<p>For login and update interactions between the PCRF and the Online Charging System (OCS), the OCS sends applicable reports to the PCRF using a CCR-GX-U message. If the service-dynamic-profile instantiation succeeds, and the Resource-Allocation-Notification (ENABLE_NOTIFICATION) is set for the charging rule, and the SUCCESSFUL_RESOURCE_ALLOCATION event trigger is set in the request, then the OCS sends a report.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the PCRF Partition on page 746 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735 • Understanding Upstream and Downstream Messages for the PCRF on page 740

request-max-tcp-connections (System Process)

Syntax	<code>request-max-tcp-connections <i>max-tcp-connections</i>;</code>
Hierarchy Level	[edit system processes dhcp-service]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Specify the number of simultaneous TCP connections that the DHCP relay can request when sending bulk leasequery messages to DHCP servers.
Options	<p><i>max-tcp-connections</i>—Number of simultaneous connections.</p> <p>Range: 1 through 10</p> <p>Default: 3</p>
Required Privilege Level	<p>system—to view this statement in the configuration.</p> <p>system-control—to add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Individual Leasequery on page 257 • Configuring and Using DHCP Bulk Leasequery on page 260

request-max-tcp-connections (System Process)

Syntax	<code>request-max-tcp-connections <i>max-tcp-connections</i>;</code>
Hierarchy Level	[edit system processes dhcp-service]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Specify the number of simultaneous TCP connections that the DHCP relay can request when sending bulk leasequery messages to DHCP servers.
Options	<p><i>max-tcp-connections</i>—Number of simultaneous connections.</p> <p>Range: 1 through 10</p> <p>Default: 3</p>
Required Privilege Level	<p>system—to view this statement in the configuration.</p> <p>system-control—to add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Individual Leasequery on page 257 • Configuring and Using DHCP Bulk Leasequery on page 260

[request network-access aaa replay pending-accounting-stops](#)

Syntax	request network-access aaa replay pending-accounting-stops
Release Information	Command introduced in Junos OS Release 13.1.
Description	Force the router to attempt contact with the accounting sever immediately, rather than allowing it to wait until the periodic interval has expired.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Forcing the Router to Contact the Accounting Server Immediately on page 117• show accounting pending-accounting-stops on page 1505
List of Sample Output	request network-access aaa replay pending-accounting-stops on page 1296
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

[request network-access aaa replay pending-accounting-stops](#)

```
user@host> request network-access aaa replay pending-accounting-stops
replay started
```

request network-access aaa subscriber add session-id

Syntax	<code>request network-access aaa subscriber add session-id <i>subscriber-session-id</i> service-profile <i>profile-name</i></code>
Release Information	Command introduced in Junos OS Release 11.2.
Description	Locally activate a dynamic subscriber service for a subscriber who is currently logged in to the network.
Options	<p><i>profile-name</i>—Name of service-profile to activate.</p> <p><i>subscriber-session-id</i>—ID of the subscriber session for which the service will be added.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • CLI-Activated Subscriber Services on page 587 • Activating and Deactivating Subscriber Services Locally with the CLI on page 588 • request network-access aaa subscriber delete session-id on page 1299
List of Sample Output	request network-access aaa subscriber add session-id service-profile on page 1298
Output Fields	When you enter this command, you are provided feedback on the status of your request. Table 77 on page 1297 lists possible error messages that might be returned if the service activation fails.

Table 77: Service Activation/Deactivation Error Messages

Message	Description	Corrective Action
Command failed: <i>reason</i>	—	—
Error: AUTHD ISSU in progress	A unified ISSU operation is active.	Wait until the unified ISSU operation completes and then retry the service activation/deactivation.
Provisioning is already active	Remote provisioning by a JSRC server or Gx-plus server is active.	—
Service activation/deactivation already in progress	Another service activation/deactivation operation is currently in progress.	Wait until the active operation completes and then retry the activation/deactivation operation.
Session identifier is not for a subscriber session	The session ID is incorrect.	Verify the correct session ID for the subscriber and then retry the activation/deactivation operation.

Sample Output

`request network-access aaa subscriber add session-id service-profile`

```
user@host> request network-access aaa subscriber add session-id 49 service-profile
service-bronze
Successful completion
```

request network-access aaa subscriber delete session-id

Syntax	<code>request network-access aaa subscriber delete session-id <i>subscriber-session-id</i> service-profile <i>profile-name</i></code>
Release Information	Command introduced in Junos OS Release 11.2.
Description	Deactivate a dynamic subscriber service for a subscriber who is currently logged in to the network.
Options	<p><i>profile-name</i>—Name of the service-profile to deactivate. To deactivate a single instance of a subscriber service that has multiple instances, you can specify the service-profile name and its service parameters.</p> <p><i>subscriber-session-id</i>—ID of the subscriber session for which the service will be deleted.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • CLI-Activated Subscriber Services on page 587 • Activating and Deactivating Subscriber Services Locally with the CLI on page 588 • Deactivating a Single Instance of a Subscriber Service with Multiple Instances on page 597 • Deactivating All Instances of a Subscriber Service with Multiple Instances on page 599 • request network-access aaa subscriber add session-id on page 1297
List of Sample Output	<p>request network-access aaa subscriber delete session-id service-profile on page 1300</p> <p>request network-access aaa subscriber delete session-id service-profile (Deactivating a Single Server Instance) on page 1300</p> <p>request network-access aaa subscriber delete session-id service-profile (Deactivating All Server Instances) on page 1300</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request. Table 78 on page 1299 lists possible error messages that might be returned if the service deactivation fails.

Table 78: Service Activation/Deactivation Error Messages

Message	Description	Corrective Action
Command failed: <i>reason</i>	Error condition that caused the command to fail.	Correct the error condition.
Error: AUTHD ISSU in progress	A unified ISSU operation is active.	Wait until the unified ISSU operation completes and then retry the service activation/deactivation.

Table 78: Service Activation/Deactivation Error Messages (*continued*)

Message	Description	Corrective Action
Provisioning is already active	Remote provisioning by a JSRC server or Gx-plus server is active.	Disable provisioning.
Service activation/deactivation already in progress	Another service activation/deactivation operation is currently in progress.	Wait until the active operation completes and then retry the activation/deactivation operation.
Session identifier is not for a subscriber session	The session ID is incorrect.	Verify the correct session ID for the subscriber and then retry the activation/deactivation operation.

Sample Output

request network-access aaa subscriber delete session-id service-profile

```
user@host> request network-access aaa subscriber delete session-id 49 service-profile
service-silver
Successful completion
```

request network-access aaa subscriber delete session-id service-profile (Deactivating a Single Server Instance)

```
user@host> request network-access aaa subscriber delete session-id 6 service-profile
economy-service(up-filter,down-filter)
Successful completion
```

request network-access aaa subscriber delete session-id service-profile (Deactivating All Server Instances)

```
user@host> request network-access aaa subscriber delete session-id 6 service-profile
economy-service
Successful completion
```

request network-access aaa subscriber modify session-id

Syntax	<code>request network-access aaa subscriber modify session-id <i>subscriber-session-id</i> <i>predefined-variable</i> <i>variable-option</i></code>
Release Information	Command introduced in Junos OS Release 11.2.
Description	Modify a predefined variable that is applied to a subscriber who is currently logged in to the network.
Options	<p><i>predefined-variable</i>—Name of the predefined variable that you want to modify.</p> <p><i>subscriber-session-id</i>—ID of the subscriber session.</p> <p><i>variable-option</i>—Name of the variable option that you want to apply to the predefined variable.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Using the CLI to Modify Traffic-Control Profiles That Are Currently Applied to Subscribers on page 591 • CLI-Activated Subscriber Services on page 587
List of Sample Output	request network-access aaa subscriber modify session-id on page 1301
Output Fields	When you enter this command, you are provided feedback on the status of your request. Table 79 on page 1301 lists possible messages that might be returned.

Table 79: Service Activation/Deactivation Error Messages

Message	Description	Corrective Action
Successful completion	Variable was successfully modified	—
Error: AUTHD ISSU in progress	A unified ISSU operation is active.	Wait until the unified ISSU operation completes and then retry the service activation/deactivation.

Sample Output

request network-access aaa subscriber modify session-id

```
user@host> request network-access aaa subscriber modify session-id 49
junos-cos-traffic-control-profile TCP-gold
Successful completion
```


request-rate

Syntax	<code>request-rate rate;</code>
Hierarchy Level	[edit access radius-options]
Release Information	Statement introduced in Junos OS Release 11.4.
Description	Configure the number of requests the router can send per second to all configured RADIUS servers collectively. By limiting the flow of requests from the router to the RADIUS servers, you can prevent the RADIUS servers from being flooded with requests.
Options	<p><i>rate</i>—Number of requests per second.</p> <p>Range: 100 through 4000 requests per second</p> <p>Default: 500 requests per second</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Global RADIUS Options for Subscriber Access on page 8• Global RADIUS Options for Subscriber Access on page 8• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring Router or Switch Interaction with RADIUS Servers on page 115

requested-ip-network-match (DHCP Local Server)

Syntax	<code>requested-ip-network-match <i>subnet-mask</i>;</code>
Hierarchy Level	<p>[edit system services dhcp-local-server] [edit system services dhcp-local-server dhcpv6], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</p>
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the subnet to which the DHCP local server matches the requested IP address (IPv6 address for DHCPv6 local server). The server accepts and uses the active client's requested address for address assignment only when the requested address and the IP address of the DHCP server interface (or IPv6 address of the DHCPv6 local server) are in the same subnet. The server accepts and uses the passive client's requested address for address assignment only when the requested address and the address of the relay interface are in the same subnet.
Options	<p><i>subnet-mask</i>—Length of the subnet mask.</p> <p>Range:</p> <ul style="list-style-type: none"> DHCP: 0 through 15 DHCPv6: 0 through 127 <p>Default:</p> <ul style="list-style-type: none"> DHCP: 8 DHCPv6: 16
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Specifying the Subnet for DHCP Client Address Assignment on page 248

restricted-requestor (DHCP Local Server)

Syntax	restricted-requestor;
Hierarchy Level	<p>[edit system services dhcp-local-server allow-bulk-leasequery], [edit system services dhcp-local-server allow-leasequery], [edit system services dhcp-local-server dhcpv6 allow-bulk-leasequery], [edit system services dhcp-local-server dhcpv6 allow-leasequery], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Specify that the DHCP local server responds to a leasequery or bulk leasequery request by sending the binding information to restricted requestors only. This ensures that the requestor is the originator of the binding.</p> <p>Restricted requestors are determined as follows:</p> <ul style="list-style-type: none"> • For DHCPv4 leasequery and bulk leasequery requests, the giaddr of the requestor must match the giaddr of the client. • For DHCPv6 leasequery and bulk leasequery requests, the requestor's client ID in the bulk leasequery message must match the relay ID sent during binding creation.
	<div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <div style="display: flex; align-items: center;">  <div> <p>NOTE: The <code>restricted-requestor</code> statement is not supported for the <code>DHCPv6 allow-leasequery</code> statement.</p> </div> </div> </div>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Individual Leasequery on page 257 • Configuring and Using DHCP Bulk Leasequery on page 260

retransmit-timer (Dynamic Router Advertisement)

Syntax	<code>retransmit-timer <i>milliseconds</i>;</code>
Hierarchy Level	[edit protocols router-advertisement interface <i>interface-name</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Set the retransmission frequency of neighbor solicitation messages.
Options	<i>milliseconds</i> —Retransmission frequency. Default: 0 milliseconds
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

retry

Syntax	<code>retry attempts;</code>
Hierarchy Level	[edit access radius-server <i>server-address</i>]; [edit access profile <i>profile-name</i> radius-server <i>server-address</i>]
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 number of times that the router or switch is allowed to attempt to contact a RADIUS authentication or accounting server. You can override the retry limit for accounting servers with the accounting-retry statement.



NOTE: To successfully set a retry limit for the accounting servers different from the authentication servers, you must configure both the [accounting-retry](#) and [accounting-timeout](#) statements. If you configure only one of these statements, then the value you configure is ignored in favor of the values configured with the [retry](#) and [timeout](#) statements.



NOTE: The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.

Options	attempts —Number of times that the router is allowed to attempt to contact a RADIUS server. Range: 1 through 100 Default: 3
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90 • Configuring Router or Switch Interaction with RADIUS Servers on page 115 • Example: Configuring CHAP Authentication with RADIUS • Configuring RADIUS Authentication for L2TP • timeout on page 1367

revert-interval

Syntax	<code>revert-interval <i>interval</i>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]; [edit access radius-options]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Configure the amount of time the router or switch waits after a server has become unreachable. The router or switch rechecks the connection to the server when the specified interval expires. If the server is then reachable, it is used in accordance with the order of the server list.
Options	<i>interval</i> —Amount of time to wait. Range: 0 through 604,800 seconds Default: 60 seconds
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring RADIUS Server Options for Subscriber Access on page 119 • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

route (Diameter Network Element)

Syntax	<pre>route <i>dne-route-name</i> { destination realm <i>realm-name</i> <host <i>hostname</i>>; function <i>function-name</i> <partition <i>partition-name</i>>; metric <i>route-metric</i>; }</pre>
Hierarchy Level	[edit diameter network-element <i>element-name</i> forwarding]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Define a route reachable through the Diameter network element by associating a metric with a combination of destination and function partition.
Options	<i>dne-route-name</i> —Route name defined for the Diameter network element. 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	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Network Elements on page 701

router (Address-Assignment Pools)

Syntax	<pre>router [<i>router-address</i>];</pre>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Specify one or more routers located on the client's subnet. This statement is the equivalent of DHCP option 3.
Options	<i>router-address</i> —IP address of one or more routers.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

router-advertisement (Dynamic Profiles)

Syntax	router-advertisement {...}
Hierarchy Level	[edit dynamic-profiles protocols]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Enable router advertisement. The remaining statements are explained separately.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery</i>

routing-instance

Syntax	routing-instance <i>routing-instance-name</i> ;
Hierarchy Level	[edit access radius-server <i>server-address</i>], [edit access profile <i>profile-name</i> radius-server <i>server-address</i>]
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 routing instance used to send RADIUS packets to the RADIUS server.
Options	<i>routing-instance-name</i> —Routing instance name.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring the PPP Authentication Protocol</i> • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

routing-instance (Subscriber Secure Policy)

Syntax	<code>routing-instance <i>routing-instance-name</i>;</code>
Hierarchy Level	[edit services radius-flow-tap]
Release Information	Statement introduced in Junos OS Release 15.1R3 for enhanced subscriber management on MX Series routers.
Description	Specify the routing instance that is used to send mirrored packets to a mediation device for subscriber secure policy traffic mirroring.
Options	<i>routing-instance-name</i> —Name of the routing instance. Default: Routing instance default
Required Privilege Level	flow-tap—To view this statement in the configuration. flow-tap-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Subscriber Secure Policy Overview• Configuring RADIUS-Initiated Subscriber Secure Policy Mirroring Overview on page 560• Configuring Support for Subscriber Secure Policy Mirroring

routing-instance (Diameter Peer)

Syntax	<code>routing-instance <i>routing-instance-name</i> ;</code>
Hierarchy Level	[edit diameter peer peer-name]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify a routing instance for a Diameter peer. Alternatively, you can include the logical-system statement at the [edit diameter peer <i>peer-name</i>] hierarchy level to configure a logical and routing instance.
Options	<i>routing-instance-name</i> —Name of the routing instance. Default: Master routing instance
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Peers on page 700

routing-instance (Diameter Transport)

Syntax	<code>routing-instance <i>routing-instance-name</i> ;</code>
Hierarchy Level	[edit diameter transport <i>transport-name</i>]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Specify a routing instance for the Diameter transport layer connection.
Options	<i>routing-instance-name</i> —Name of the routing instance. Default: Master routing instance
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Diameter Transport on page 701

routing-instance-name (DHCP Local Server)

Syntax	routing-instance-name;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server group group-name authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify that the routing instance name be concatenated with the username during the subscriber authentication or DHCP client authentication process. No routing instance name is concatenated if the configuration is in the default routing instance.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)

routing-instance-name (DHCP Relay Agent)

Syntax	routing-instance-name;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	Specify that the routing instance name is concatenated with the username during the subscriber authentication or client authentication process. No routing instance name is concatenated if the configuration is in the default routing instance. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)
 - [Creating Unique Usernames for DHCP Clients on page 272](#)

routing-instance-name (Static Subscribers)

Syntax	routing-instance-name;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit system services static-subscribers authentication username-include],</p> <p>[edit system services static-subscribers group <i>group-name</i> authentication username-include]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify that the name of the routing instance is included as part of the username created for all static subscribers or for the static subscribers in the specified group. The group version of the statement takes precedence over the global version. The username is also sent to RADIUS in the Access-Request message.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Configuring the Static Subscriber Global Username on page 777 • Configuring the Static Subscriber Group Username on page 782

routing-services (Enhanced Subscriber Management)

Syntax	routing-services;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-name</i>]
Release Information	Statement introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	<p>Enable configuration of all routing protocols except Internet Group Management Protocol (IGMP) and the Multicast Listener Discovery (MLD) protocol on dynamically created enhanced subscriber management interfaces. IGMP and MLD are natively supported on enhanced subscriber management interfaces, and therefore do not require you to specify the routing-services statement in the dynamic profile.</p> <p>When a dynamic profile containing the routing-services statement is instantiated, the router creates an enhanced subscriber management logical interface, also referred to as a pseudo logical interface, in the form demux0.<i>nnnnnnnnnn</i> (for example, demux0.3221225472). Any associated subscriber routes or routes learned from a routing protocol running on the enhanced subscriber management interface use this pseudo interface as the next-hop interface.</p>
Default	If you do not include the routing-services statement in the dynamic profile, configuration of all routing protocols except IGMP and MLD on enhanced subscriber management interfaces is disabled by default.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS Enhanced Subscriber Management on page 554• Junos OS Enhanced Subscriber Management Overview on page 556

rule (Configuring)

Syntax

```
rule rule-name {
  count-type (application | rule);
  demux (destination-address | source-address);
  forward-rule forward-rule-name;
  match-direction (input | input-output | output);
  term precedence {
    from {
      application-group-any;
      application-groups [ application-group-name ];
      applications [ application-name ];
      local-port-range low low-value high high-value;
      local-ports [ value-list ];
      protocol protocol-number;
      remote-address address <except>;
      remote-address-range low low-value high high-value <except>;
      remote-ports [ value-list ];
      remote-port-range low low-value high high-value;
      remote-prefix-list prefix-list-name <except>;
    }
    then {
      (accept | discard);
      count (application | application-group | application-group-any | rule | none);
      forwarding-class forwarding-class;
      police policer-name;
    }
  }
}
```

Hierarchy Level [edit services ptsp]

Release Information Statement introduced in Junos OS Release 10.2.

Description Specify the rule the router uses when applying this service.

Options *rule-name*—Identifier for the collection of terms that constitute this rule.

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 Static PTSP Rules on page 799](#) in *Junos OS Broadband Subscriber Management and Services Library*

rule (Including in Rule Set)

Syntax	<code>rule rule-name;</code>
Hierarchy Level	[edit services ptsp rule-set rule-set-name]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the rule the router uses when applying this service.
Options	rule-name —Identifier for the collection of terms that constitute this rule.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

rule-set (Services PTSP)

Syntax	<pre>rule-set rule-set-name { [rule rule-names]; }</pre>
Hierarchy Level	[edit services ptsp]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the rule set the router uses when applying this service.
Options	rule-set-name —Identifier for the collection of rules that constitute this rule set.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

sdsl-bytes

Syntax	<code>sdsl-bytes <i>bytes</i>;</code>
Hierarchy Level	<code>[edit protocols ancp qos-adjust]</code>
Release Information	Statement introduced in Junos OS Release 14.2.
Description	Adjust the number of overhead bytes in the actual downstream rate for an SDSL access line reported in the ANCP Port Up message by the specified number of bytes. The ANCP agent reports the adjusted value to CoS.
Options	<p>bytes—Number of bytes added to or subtracted from the actual downstream frame overhead.</p> <p>Range: -100 through 100 bytes</p> <p>Default: 0 bytes</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657 • Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653 • Configuring the ANCP Agent on page 624

sdsl-overhead-adjust

Syntax	<code>sdsl-overhead-adjust <i>percentage</i>;</code>
Hierarchy Level	<code>[edit protocols ancp qos-adjust]</code>
Release Information	Statement introduced in Junos OS Release 14.2.
Description	Adjust the actual downstream rate for an SDSL access line reported in the ANCP Port Up message by multiplying the rate by the specified percentage. The ANCP agent reports the adjusted rate to CoS.
Options	<p>percentage—Percentage by which to multiply the rate.</p> <p>Range: 80 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657 • Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653 • Configuring the ANCP Agent on page 624

secret

Syntax	<code>secret password;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> radius-server <i>server-address</i>], [edit access radius-disconnect <i>client-address</i>], [edit access radius-server <i>server-address</i>]
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 password to use with the RADIUS server. The secret password used by the local router or switch must match that used by the server.
Options	password —Password to use; it can include spaces if the character string is enclosed in quotation marks.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90• Configuring Router or Switch Interaction with RADIUS Servers on page 115• Example: Configuring CHAP Authentication with RADIUS• Configuring RADIUS Authentication for L2TP• Configuring the RADIUS Disconnect Server for L2TP

send-acct-status-on-config-change (Access Profile)

Syntax	<code>send-acct-status-on-config-change;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 13.1. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure the router's authd process to send an Acct-On message when the first RADIUS server is added to an access profile, and to send an Acct-Off message when the last RADIUS server is removed from an access profile.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Parameters for Subscriber Access on page 118• Configuring Per-Subscriber Session Accounting on page 104

send-dyn-subscription-indicator (PCRF Partition)

Syntax	send-dyn-subscription-indicator;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>],
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Include the Juniper-Network-Family-Indicator AVP into its message requests. To enable the Policy Control and Charging Rules Function (PCRF) to dynamically pass subscription-ID parameters, and support a variety of authentication, authorization, and provisioning configuration, the Juniper attribute-value pairs (AVPs) in Table 80 on page 1321 have been allocated from the Juniper Vendor-ID space (2636) vendor-specific attribute (VSA).



NOTE: If no dynamic-subscription ID is received, then neither Online Charging System (OCS) or Offline Charging System (OFCS) communications is initiated.

Table 80: Allocated Juniper AVPs

AVP Name	Vendor-ID	AVP Type	Diameter Type	Diameter Flag
Juniper-Dyn-Subscription-Indicator	2636	10001	Enum	V
Juniper-Dyn-Subscription-Id	2636	10002	Grouped	VM
Juniper-Dyn-Subscription-Id-Type	2636	10003	Integer32	VM
Juniper-Dyn-Subscription-Id-Data	2636	10004	UTF8String	VM

The client system (router) sends the Juniper-Dyn-Subscription-Id-Indicator AVP to indicate support of the dynamic assignment of the subscription ID. The Juniper-Dyn-Subscription-Id-Indicator attribute has two values:

- DYN_SUBSCRIPTION_NOT_SUPPORTED (0)
- DYN_SUBSCRIPTION_SUPPORTED (1)

The server then sends the Juniper-Dyn-Subscription-Id AVP to the client that indicated support. This is a grouped AVP that contains the values to be sent as Subscription-Id-Type and Subscription-Id-Data.

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

Related Documentation	<ul style="list-style-type: none"> • Configuring the PCRF Partition on page 746
------------------------------	--

- [Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718](#)
- [Understanding Gx Interactions Between the Router and the PCRF on page 722](#)
- [Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735](#)
- [Understanding Upstream and Downstream Messages for the PCRF on page 740](#)

send-network-family-indicator (PCRF Partition)

Syntax	send-network-family-indicator;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Include the Juniper-Network-Family-Indicator AVP into its message requests. In many cases, wireline subscribers support only one IP family, which is required information for both AAA service and Policy Control and Charging Rules Function (PCRF). To indicate this information, the Juniper-Network-Family-Indicator AVP has been allocated from the Juniper Vendor-ID space (2636) VSA in Table 81 on page 1323 .

Table 81: Network Family Indicator AVP

AVP Name	Vendor-ID	AVP Type	Diameter Type	Diameter Flag
Juniper-Network-Family-Indicator	2636	10010	Enum	V

The client system (router) sends the Juniper-Network-Family-Indicator AVP to indicate which network families are associated with the service request and supported by the subscriber. When you configure the Juniper-Network-Family-Indicator AVP to indicate the associated network family, the system sends the information to the PCRF. The Juniper-Network-Family-Indicator attribute has four values:

- UNSPECIFIED (0)
- IPV4_FAMILY (1)
- IPV6_FAMILY (2)
- IPV4_IPV6_FAMILY (3)

Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740


send-origin-state-id (Diameter Applications)

Syntax	send-origin-state-id;
Hierarchy Level	[edit access pcrf partition partition-name], [edit access ocs partition partition-name], [edit diameter peer peer-name]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Include the Origin-State AVP for the Diameter peer, OCS partition, or PCRF partition. The AVP is conveyed in Diameter-level or partition-level messages, respectively. The value of the AVP increases every time it changes, such as when the system reboots. Sending the Origin-State AVP in messages enables Diameter entities that receive the message to infer from a changed AVP value that sessions associated with a lower value are no longer active.</p> <p>If you include the send-origin-state-id statement for the OCS or PCRF partition, a new value is sent for the partition only when a cold boot occurs. The system daemon detects the cold boot and changes the Origin-State-Id when required.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the OCS Partition on page 743• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

send-release-on-delete (DHCP Relay Agent)

Syntax	send-release-on-delete;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 overrides], [edit forwarding-options dhcp-relay overrides], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.2.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.3 for EX Series switches.</p>
Description	<p>Send a release message to the DHCP (or DHCPv6) server whenever DHCP relay or relay proxy deletes a client. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.</p> <p>M120 and M320 routers do not support DHCPv6.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Relay Agent Overview on page 236 • Overriding the Default DHCP Relay Configuration Settings on page 313 • Sending Release Messages When Clients Are Deleted on page 335

server-duid-type (DHCP Local Server)

Syntax	<code>server-duid-type type;</code>
Hierarchy Level	[edit system services dhcp-local-server dhcpv6]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Configure the DHCP Unique Identifier (DUID) type that the DHCPv6 server supports. The server uses the DUID to identify clients for configuration and to group clients into identity associations.</p> <p>Use this statement to explicitly configure the DUID-LL type. DUID-LL uses a link-layer network interface address on the device as part of the unique identifier. Remove this configuration to return to the default type, DUID-EN. DUID-EN has a vendor-assigned value based on the vendor's enterprise number and an IANA-recognized hardware type code. DUID-EN is not explicitly configurable.</p>
	<div> NOTE: The DUID-LLT type is not supported.</div>
Options	type —DUID type to support. The only available option is duid-ll .
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• DHCPv6 Local Server Overview on page 434

server-group

Syntax	<pre>server-group { server-group-name { server-ip-address; } }</pre>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6]</p>
Release Information	<p>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.</p>
Description	<p>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.</p>
Options	<p><i>server-group-name</i>—Name of the group of DHCP or DHCPv6 server addresses.</p> <p><i>server-ip-address</i>—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.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • dhcp-relay on page 1001 • Extended DHCP Relay Agent Overview on page 236 • Configuring Named Server Groups on page 323

server-identifier (Address-Assignment Pools)

Syntax	<code>server-identifier <i>ipv4-address</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Specify the IP address that is used as the source address the DHCP server includes in IP packets when communicating with clients. The address is included in the DHCP packet in option 54.
Options	<i>ipv4-address</i> —IP address.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

server-id-override

Syntax	server-id-override;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay relay-option-82],</p> <p>[edit forwarding-options dhcp-relay group group-name relay-option-82],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay relay-option-82],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group group-name relay-option-82],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay relay-option-82],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group group-name relay-option-82],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay relay-option-82],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group group-name relay-option-82]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	<p>Add the suboptions link-selection and server-id override to option-82 information for DHCP packets relayed to the server.</p> <p>In network configurations where a firewall on the broadband network gateway (BNG) is between the DHCPv4 relay agent and the DHCP server, only the BNG loopback address passes through the BNG firewall. In that case, DHCP unicast packets do not pass through the firewall and are discarded. To enable DHCP unicast packets to pass through the BNG firewall, use the relay-source configuration statement to configure the DHCP relay agent to use the loopback address as the source address in IP headers and DHCP messages. In this case, this configuration statement adds the link-selection suboption to provide the DHCP server information to locate the correct address pool for the DHCP client and adds the server-id override suboption to set the server ID option.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring DHCP Relay Agent Source Address on page 345


server-response-time (DHCP Relay Agent)

Syntax	<code>server-response-time seconds;</code>
Hierarchy Level	[edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	Configure the timeframe during which the router monitors DHCP server responsiveness within the routing instance. The router generates a system log message when the DHCP server does not respond to relayed packets during the specified timeframe.
Options	seconds —Number of seconds the DHCP server is monitored. Range: 30 through 4,294,967,295 seconds Default: 0 (no limit)
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Monitoring DHCP Relay Server Responsiveness on page 370

service (Service Accounting)


Syntax	<pre> service { accounting-order (activation-protocol radius); accounting{ update-interval <i>minutes</i>; statistics (time volume-time); } } </pre>
Hierarchy Level	[edit access profile <i>profile-name</i>]
Release Information	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.</p> <p>accounting, update-interval, and statistics options added in Junos OS Release 14.2R1 for MX Series routers.</p>
Description	<p>Define the subscriber service accounting configuration.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Service Accounting with JSRC on page 766 • Service Accounting with JSRC on page 765

service-activation (Access Profile)

Syntax	<pre>service-activation { dynamic-profile (optional-at-login required-at-login); extensible-service (optional-at-login required-at-login); }</pre>
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Specify whether subscribers are allowed to log in even when service activation failures related to configuration errors occur during family activation request processing by authd for a newly authenticated subscriber. Configuration errors include missing or incorrect syntax, missing or incomplete references to dynamic profiles, and missing or incomplete variables.
<div>  <p>NOTE: This configuration does not apply to services activated by means of RADIUS CoA requests, JSRC Push-Profile-Request (PPR) messages, or subscriber secure policies.</p> </div>	
<p>You can enable separate configurations for subscriber login services for two service-activation types: dynamic-profile and extensible-service. You configure the dynamic-profile type services in the dynamic profile at the [edit dynamic-profiles] hierarchy level; the profile is used to provide dynamic subscriber access and services for broadband applications. The extensible-service type is for business services configured in an operation script and provisioned by the Extensible Subscriber Services Manager daemon (essmd).</p>	
Options	<p>optional-at-login—Service activation is optional. Failure due to configuration errors does not prevent activation of the address family; it allows subscriber access. Failure for any other reason causes network family activation to fail. If no other network family is already active for the subscriber, then the client application logs out the subscriber.</p> <p>required-at-login—Service activation is required. Failure for any reason causes the Network-Family-Activate-Request for that network family to fail. If no other network family is already active for the subscriber, then the client application logs out the subscriber.</p> <p>Default: Default behavior depends on the service type:</p> <ul style="list-style-type: none"> • For dynamic-profile services: required-at-login. • For extensible-service services: optional-at-login.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Subscriber Session Logins and Service Activation Failures Overview on page 125](#)

service-context-id (OCS)

Syntax	<code>service-context-id service-context ;</code>
Hierarchy Level	[edit access ocs global]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Configure the service-context-id to globally and uniquely identify the Service-Context-Id AVP (cc-service-context) and the Service-Identifier AVP (cc-service-identifier), which is part of the Diameter Credit Control Service charging system. The service provider or operator allocates this identifier.
Options	<p>service-context—3rd Generation Partnership Project (3GPP)-specific values.</p> <ul style="list-style-type: none"> <code>service-context—32251</code> <code>customer-domain—3gpp.org</code>
<div>  <p>NOTE: For every service used to support the packet-switching charging infrastructure, you must prepare the necessary documentation and define associated cc-service-context-id values.</p> </div>	
<p>For mobile subscribers, the user equipment requests services; whereas for broadband wireline subscribers, the Policy Control and Charging Rules Function (PCRF) requests services. In the wireline environment, PCRF functions as the service requester, and the Policy and Charging Enforcement Function (PCEF) functions as the service receiver and enforcer.</p> <p>The PCRF controls the PCEF by pushing charging rules. Charging rules are reused as service (policy) rules to push policies. Charging rules may also have an associated rating group, or charging key. As a result, you must configure the PCEF to define a charging rules mapping between credit control services (cc-services) and rating groups.</p>	
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring OCS Global Parameters on page 749 3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715 Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 Understanding Gy Interactions Between the Router and the OCS on page 730 Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735

service-profile (DHCP Local Server)

Syntax	<code>service-profile <i>dynamic-profile-name</i>;</code>
Hierarchy Level	<p>[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 <i>logical-system-name</i> system services dhcp-local-server ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.2.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>Specify the default subscriber service or 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.</p> <ul style="list-style-type: none"> • To specify the default service for all DHCP local server clients, include the service-profile statement at the [edit system services dhcp-local-server] hierarchy level. • To specify the default service for a named group of interfaces, include the service-profile statement at the [edit system services dhcp-local-server group <i>group-name</i>] 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 system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i>] hierarchy level. • For DHCPv6 clients, use the service-profile statement at the [edit system services dhcp-local-server dhcpv6] hierarchy level.
Options	<i>dynamic-profile-name</i> —Name of the dynamic profile that defines the service.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Extended DHCP Local Server Overview on page 230 • Default Subscriber Service Overview on page 241 • Configuring a Default Subscriber Service on page 242

service-profile (DHCP Relay Agent)

Syntax	<code>service-profile <i>dynamic-profile-name</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay], [edit forwarding-options dhcp-relay dhcpv6], [edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i>], [edit forwarding-options dhcp-relay group <i>group-name</i>], [edit forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i>], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i>], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> interface <i>interface-name</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</p>
Release Information	<p>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. Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	<p>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.</p> <ul style="list-style-type: none"> 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 <i>group-name</i>] 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 <i>group-name</i> interface <i>interface-name</i>] hierarchy level.
Options	<i>dynamic-profile-name</i> —Name of the dynamic profile.
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> dhcp-relay on page 1001 Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces Grouping Interfaces with Common DHCP Configurations on page 277 Default Subscriber Service Overview on page 241 Configuring a Default Subscriber Service on page 242

services (PTSP)

Syntax	<code>services ptsp { ... }</code>
Hierarchy Level	[edit]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Define the services to be applied to traffic.
Options	ptsp —Identify the values configured for PTSP matching rules. The 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	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

session-options

Syntax	<pre>session-options { client-group [<i>group-names</i>]; client-idle-timeout <i>minutes</i>; client-idle-timeout-ingress-only; client-session-timeout <i>minutes</i>; strip-user-name { delimiter [<i>delimiter</i>]; parse-direction (left-to-right right-to-left); } }</pre>
Hierarchy Level	[edit access profile <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Release 8.5.
Description	<p>(MX Series and SRX Series devices) Define options to place limits on subscriber access based on how long the session has been up, how long the user has been inactive, or both.</p> <p>(MX Series) Define options to modify a subscriber username at login based on the subscriber's access profile.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>access—To view this statement in the configuration.</p> <p>access-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Understanding Session Options for Subscriber Access on page 131• Configuring Subscriber Session Options on page 136• Configuring Username Modification for Subscriber Sessions• Removing Inactive Dynamic Subscriber VLANs on page 137

shmlog (Shared Memory Log)

Syntax	<pre> shmlog { disable; file filename <files maximum-no-files> <size maximum-file-size>; filtering enable; log-name { all; logname { <brief detail extensive none terse>; <file-logging no-file-logging>; } } log-type (debug info notice); } </pre>
Hierarchy Level	[edit system services subscriber-management overrides (Enhanced Subscriber Management)]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Junos OS uses a shared memory space to store log entries for subscriber service daemons including jpppd, jdhcpd, jl2tpd, autoconfd, bbe-smgd, authd, cosd, and dfwd. Shared memory logging is enabled by default and occurs at the client level. You can view the shmlogs on a per subscriber basis, or use filters to retrieve logs according to a variety of different parameters such as interface name, IP address, session ID, subnet, and VLAN in addition to the Client Identifier or Client DUID. Filtering is disabled by default. To see a complete list of supported filters, use this command:</p> <pre>user@rdevice> show shmlog entries logname all ?</pre> <p>When viewing logs you can limit results on the basis of event flags that include interface events, routing process interaction events, l2tp tunneling events, and ldap authentication events. To see a complete list of supported flags, use this command:</p> <pre>user@rdevice> show shmlog entries logname all flag-name ?</pre>
Options	<p>disable—Name of the command to override the default behavior. Use this option to disable shared memory logging; it is always enabled otherwise.</p> <p>file— Name of the file containing the shmlogs. Use this option to redirect shmlogs to a file for file-based logging. Specify the file name, define the number of files (from 2 to 1000), and set the maximum file size (from 10240 to 1073741824 bytes). Data will be written to the <code>/var/log/shmlog/</code> directory. Files follow this naming convention: <code><cfg-file-name>-<daemon>-<severity>.log</code>. The shmlog files are not human-readable, so to access the logs you must first run the following command to generate a file in the <code>/var/log/<file-name>/</code> directory with logs from all daemons:</p> <pre>user@rdevice> show shmlog entries filename /var/log/shmlog/<file-name>*logname all</pre>

If you then want to view logs from a specific daemon, you need to run the following command to generate a file under the `/var/log/<file-name>/` directory with complete logs:

```
user@rdevice> show shmlog entries filename /var/log/shmlog/<filename> logname  
authd*
```

filtering— Command to enable filtering. Filtering is subscriber centric and is useful for debugging and troubleshooting. It is disabled by default so you must use this option to enable it.

For example, if you want to quickly view the transmit packet logs for subscribers with interface-name `pp0.100`, you could use the following command to display only the relevant results:

```
user@rdevice> show shmlog entries logname jpppd* interface-name pp0.100 flag  
transmit-packets
```

To debug sessions according to the interface name, use this command:

```
user@rdevice> show shmlog entries logname all interface-name pp0.100
```

To debug sessions that are logging in via VLAN 7 on physical-interface `ge-0/0/0`, use this command:

```
user@rdevice> show shmlog entries logname all vlan 7 physical-interface ge-0/0/0
```

log-name—Name of the file containing the log output. Use this option to override all logs or a specified log, and to set the verbosity level (brief, detail, extensive, none, or terse). For example, to configure **bbe-autoconf-info** for detailed file logging, you would use the following command:

```
user@rdevice> [edit system services subscriber-management overrides shmlog]  
user@rdevice> set log-name bbe-autoconf-info detail file-logging
```

log-type— Severity level of the collected logs. Use this option to configure the severity level for captured logs (notice, info, or debug).

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

Related •
Documentation

sip-server-address

Syntax	<code>sip-server-address <i>ipv6-address</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family <i>family</i> dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 10.0.
Description	Specify a SIP outbound proxy server that DHCPv6 local server clients can use. This is equivalent to DHCPv6 option 22. To specify multiple serv <i>ipv6-addressers</i> , add multiple sip-server-address statements in order of preference.
Options	<i>ipv6-address</i> —IPv6 address of a SIP outbound proxy server.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Address-Assignment Pools Overview on page 565 • Configuring Address-Assignment Pools on page 567

sip-server-domain-name

Syntax	<code>sip-server-domain-name <i>domain-name</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family <i>family</i> dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 10.0.
Description	Configure the domain name of the SIP outbound proxy server that DHCPv6 local server clients can use. This is equivalent to DHCPv6 option 21.
Options	<i>domain-name</i> —Name of the domain.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Address-Assignment Pools Overview on page 565 • Configuring Address-Assignment Pools on page 567

smg-service (Enhanced Subscriber Management)

Syntax	<pre>smg-service { failover other-routing-engine; traceoptions { file filename <files number> <match regular-expression > <size maximum-file-size> <world-readable no-world-readable>; flag flag <disable>; level level; no-remote-trace } }</pre>
Hierarchy Level	[edit system processes]
Release Information	Statement introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	<p>Configure system services, including tracing operations and Routing Engine failover, for the main enhanced subscriber management session management process, smg-service.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>trace—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Junos OS Enhanced Subscriber Management on page 554• Configuring the Subscriber Management Database Trace Log Filename on page 832

source-address

Syntax	<code>source-address <i>source-address</i>;</code>
Hierarchy Level	<code>[edit access radius-server <i>server-address</i>];</code> <code>[edit access profile <i>profile-name</i> radius-server <i>server-address</i>]</code>
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 9.0 for EX Series switches. Support for IPv6 source-address introduced in Junos OS Release 16.1.
Description	Configure a source address for each configured RADIUS server. Each RADIUS request sent to a RADIUS server uses the specified source address.
Options	source-address —Valid IPv4 or IPv6 address configured on one of the router or switch interfaces. On M Series routers only, the source address can be an IPv6 address and the UDP source port is 514.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Router or Switch Interaction with RADIUS Servers on page 115 • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90 • <i>Example: Configuring CHAP Authentication with RADIUS</i> • <i>Configuring RADIUS Authentication for L2TP</i>

stacked-vlan-ranges (RADIUS Options)

Syntax	stacked-vlan-ranges (any <i>low-outer-tag–high-outer-tag</i>),any;
Hierarchy Level	[edit interfaces <i>interface-name</i> radius-options nas-port-options <i>nas-port-options-name</i>]
Release Information	Statement introduced in Junos OS Release 12.3.
Description	Configure the stacked VLAN (S-VLAN) range of subscribers to which the named NAS-Port options definition applies.



NOTE: You can configure a maximum of 16 NAS-Port options definitions per physical interface. Each definition can include a maximum of 32 VLAN ranges or 32 S-VLAN ranges, but cannot include a combination of VLAN ranges and S-VLAN ranges.

Options **any**—Entire S-VLAN range representing all S-VLAN IDs. The inner tag (S-VLAN ID) of the S-VLAN range must be configured as **any** to represent all inner VLAN ID tags.

low-outer-tag—Outer VLAN ID tag representing the lower limit of the S-VLAN range.

Range: 1 through 4094

high-outer-tag—Outer VLAN ID tag representing the upper limit of the S-VLAN range.

Range: 1 through 4094



NOTE: To specify a single outer VLAN ID tag, set **low-outer-tag** and **high-outer-tag** to the same value.

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

Related Documentation

- [Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73](#)
- [Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72](#)

starts-with (DHCP Relay Agent Option)

Syntax	<pre>starts-with (ascii <i>ascii-string</i> hexadecimal <i>hexadecimal-string</i>) { drop; forward-only; local-server-group <i>local-server-group</i>; relay-server-group <i>relay-server-group</i>; }</pre>
Hierarchy Level	<pre>[edit forwarding-options dhcp-relay <i>relay-option</i>], [edit forwarding-options dhcp-relay dhcpv6 <i>relay-option</i>], [edit forwarding-options dhcp-relay group <i>group-name</i> <i>relay-option</i>], [edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> <i>relay-option</i>], [edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...], [edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ...]</pre>
Release Information	Statement introduced in Junos OS Release 12.3.
Description	<p>Configure a partial match criteria used with the DHCP relay agent selective processing feature. DHCP relay agent compares the configured partial match string with the option-specific string received in DHCP client packets. If there is an partial left-to-right match, DHCP performs the action you define for the match criteria.</p> <p>The option-specific string in the DHCP client packets can contain a superset of the specified ASCII or hexadecimal match string, provided that the leftmost characters of the option-specific string entirely match the characters in the configured match string.</p> <p>You can configure an unlimited number of match strings. If you have multiple partial match configurations, the longest match rule applies. For example, DHCP relay agent matches the string “test123” before it matches the string “test”. Match strings do not support wildcard attributes.</p> <p>The local-server-group option is not supported for DHCPv6 relay agent.</p>
Options	<p><i>ascii-string</i>—ASCII string of 1 through 255 alphanumeric characters.</p> <p><i>hexadecimal-string</i>—Hexadecimal string of 1 through 255 hexadecimal characters (0 through 9, a through f, A through F).</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Using DHCP Option Information to Selectively Process DHCP Client Traffic on page 344

static-subscribers

Syntax	<pre> static-subscribers { access-profile <i>profile-name</i>; authentication { password <i>password-string</i>; username-include { domain-name <i>domain-name</i>; interface; logical-system-name; routing-instance-name; user-prefix <i>user-prefix-string</i>; } } dynamic-profile <i>profile-name</i> { aggregate-clients (merge replace); } group <i>group-name</i> { access-profile <i>profile-name</i>; authentication { password <i>password-string</i>; username-include { domain-name <i>domain-name</i>; interface; logical-system-name; routing-instance-name; user-prefix <i>user-prefix-string</i>; } } dynamic-profile <i>profile-name</i> { aggregate-clients (merge replace); } interface <i>interface-name</i> <exclude> <upto <i>upto-interface-name</i>>; } } </pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> system services], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services], [edit routing-instances <i>routing-instances-name</i> system services], [edit system services]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Configure and associate subscribers with statically configured interfaces for dynamic service provisioning.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration. system-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Configuring Subscribers over Static Interfaces on page 772](#)

statistics (Access Profile)

Syntax	statistics (time volume-time);
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches. volume-time option added in Junos OS Release 9.4.
Description	Configure the router or switch to collect time statistics, or both volume and time statistics, for the sessions being managed by AAA.
Options	time —Collect uptime statistics only. volume-time —Collect both volume and uptime statistics.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

statistics (Service Accounting)

Syntax	statistics (time volume-time);
Hierarchy Level	[edit access profile <i>profile-name</i> service accounting]
Release Information	Statement introduced in Junos OS Release 14.2R1 for MX Series routers.
Description	Configure the router to collect time statistics, or both volume and time statistics, for the service accounting sessions being managed by AAA.
Options	time —Collect uptime statistics only. volume-time —Collect both volume and uptime statistics. This option is not available for Mobile IP.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	• Configuring Service Interim Accounting on page 113 • Processing Cisco VSAs in RADIUS Messages for Service Provisioning on page 110

strict (DHCP Local Server)

Syntax	strict;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify whether the server denies a client to bind when the client does not indicate that it accepts reconfigure messages. This feature is available only for DHCPv6.
Default	Accept solicit messages from clients that do not support reconfiguration and permit them to bind.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298• Preventing Binding of Clients That Do Not Support Reconfigure Messages on page 436


strip-domain (Domain Map)

Syntax	strip-domain;
Hierarchy Level	[edit access domain map <i>domain-map-name</i>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Remove the domain name from the username before continuing with any AAA services specified in a domain map.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Enabling Domain Name Stripping on page 171 • Configuring Domain and Realm Name Usage for Domain Maps on page 168

strip-username (Domain Map)

Syntax	strip-username (<i>left-to-right</i> <i>right-to-left</i>)
Hierarchy Level	[edit access domain <i>domain</i> map]
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Strip the user portion of the username for authentication to simplify off-chassis provisioning. Parsing direction can be left-to-right (default) or right-to-left.
Options	<p>left-to-right—Strip the user portion of the username from left to right.</p> <p>right-to-left—Strip the user portion of the username from right to left.</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • override-password on page 1210

subscriber-identification (PTSP)

Syntax	<code>subscriber-identification <i>subscriber-identification</i></code>
Hierarchy Level	[edit system services packet-triggered-subscribers partition radius <i>radius-partition-name</i>]
Release Information	Statement introduced in Junos OS Release 11.3.
Description	Configure the subscriber identification to be used in a PTSP partition. You can configure the subscriber identification only in a RADIUS partition.
Options	<p><i>subscriber-identification</i>—String of user-defined characters or a RADIUS attribute type that is supported by the PTSP application. To enable subscriber identification for the specified RADIUS attribute, you may configure the following RADIUS attributes:</p> <ul style="list-style-type: none">• <code>\$attribute-1\$</code>—User-Name• <code>\$attribute-4\$</code>—NAS-IP-Address• <code>\$attribute-5\$</code>—NAS-Port• <code>\$attribute-8\$</code>—Framed-IP-Address• <code>\$attribute-32\$</code>—NAS-Identifier• <code>\$attribute-87\$</code>—NAS-Port-ID <p>When configuring subscriber identification, you must precede the "\$" with a slash (\) to enable the CLI interface to process and store the variable correctly.</p>
<hr/>	
<div> NOTE: The IP address is formatted in dotted decimal notation—for example, 192.168.1.1. All the other numeric values are converted to a string of characters.</div> <hr/>	
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the PTSP Partition on page 795

subscriber-packet-idle-timeout

Syntax	subscriber-packet-idle-timeout <i>subscriber-packet-idle-timeout</i> ;
Hierarchy Level	[edit system services packet-triggered-subscribers]
Description	The subscriber packet idle timeout for packet triggered subscribers.
Options	<i>subscriber-packet-idle-timeout</i> —Maximum idle time. Range: 15 through 1440 minutes.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Packet-Triggered Subscribers Services Overview on page 786

subscriber-management (Subscriber Management)

Syntax	<pre>subscriber-management { enable; enforce-strict-scale-limit-license; gres-route-flush-delay; } overrides { no-unsolicited-ra; shmlog { } traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i>> <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; } }</pre>
Hierarchy Level	[edit system services]
Release Information	Statement introduced in Junos OS Release 11.1.
Description	<p>Configure global services for subscriber management, such as maintaining subscribers, tracing operations, and enabling enhanced subscriber management.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Configuring the Router to Strictly Enforce the Subscriber Scaling License</i>• <i>Delaying Removal of Access Routes and Access-Internal Routes After Graceful Routing Engine Switchover</i>• Configuring the Router to Maintain DHCP Subscribers During Interface Delete Events on page 292• Tracing Subscriber Management Database Operations for Subscriber Access on page 831• Configuring Junos OS Enhanced Subscriber Management on page 554

subscriber-profile

Syntax

```
subscriber-profile profile-name {
  enable service-name {
    concurrent-data-sessions max-session-number;
  }
  disable service-name;
  max-data-sessions-per-subscriber {
    limit max-sub-sessions;
    exceed-action {
      drop;
      syslog;
    }
  }
}
```

Hierarchy Level [edit services service-set *services-set-name*]

Release Information Statement introduced in Junos OS Release 11.4.

Description Specify the subscriber profile name. A subscriber profile specifies which services should be enabled and which services should be disabled for traffic belonging to a subscriber bound to a particular subscriber profile. A subscriber is bound to a minimum of one subscriber profile at any given time.

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

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

subscription-id-data-include (PCRF Partition)

Syntax subscription-id-data-include {
 base-interface-name;
 delimiter *delimiter-character*;
 domain-name *name*;
 interface-name;
 mac-address;
 nas-port-id;
 origin-host;
 origin-realm;
 user-name;
 user-prefix *prefix*;
 }

Hierarchy Level [edit access [pcrf partition](#) *partition-name*]

Release Information Statement introduced in Junos OS Release 16.2.

Description Configure the subscriber data to use in a Policy and Charging Rules Function (PCRF).

Options **base-interface-name**—Use the specified physical or underlying interface name. If both the underlying interface and the client application perform authentication, authorization, and provisioning, the identification attributes in the server requests enable the AAA or PCRF server to make an association between the two entities.

delimiter *delimiter-character*—Use the specified character used as the delimiter between the concatenated components of the subscription-id-data-include. You cannot use the semicolon (;) as a delimiter.

Default: @

domain-name *name*—Use the specified domain name that is concatenated with the subscription-id-data-include during the subscriber identification process.

interface-name—Use the specified interface name that is concatenated with the subscription-id-data-include during the subscriber identification process; for example, demux0.

mac-address—Use the specified client hardware address (chaddr) from the incoming packet that is concatenated with the subscription-id-data-include during the subscriber identification process.

nas-port-id—Use the specified NAS-Port-ID (RADIUS attribute 87), which identifies the physical interface that subscriber management uses to identify subscribers that is concatenated with the subscription-id-data-include during the subscriber identification process. By default, the NAS-Port-ID includes the interface-description value that describes the physical interface.

origin-host—Use the specified name of the host that originates the Diameter message that is concatenated with the subscription-id-data-include during the subscriber

identification process. Supplied as the value of Origin-Host AVP for all messages sent by the Diameter master instance.

origin-realm—Use the specified realm of the host that originates the Diameter message that is concatenated with the subscription-id-data-include during the subscriber identification process. Supplied as the value of Origin-Realm AVP for all messages sent by the Diameter master instance.

user-name—Use the specified subscriber username that is concatenated with the subscription-id-data-include during the subscriber identification process.

user-prefix *prefix*—Use the specified user prefix that is concatenated with the subscription-id-data-include during the subscriber identification process.

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

Related Documentation	<ul style="list-style-type: none">• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740
------------------------------	---

subscription-id-type (PCRF Partition)

Syntax	subscription-id-type <i>number</i> ;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	Identify the subscriber. You can identify the subscriber using several IANA predefined values, or define your own. The Policy and Charging Rule Function (PCRF) uses the subscription-id-type during a subscriber login session using for CCR-GX-I and CCA-GX-I messages.



BEST PRACTICE: For wireline service, we recommend that you define your own customer-specific value.

If you do not define or include any data in the [subscription-id-data-include](#) statement, then the value defaults to reserved. For some applications, the PCRF may be configured to identify subscribers using another method, and instead use the subscription-id-type for protocol compliance. If the dynamic-subscription-id is provided by the AAA server, then the PCRF uses the dynamic-subscription-id as the identifier regardless of what you defined for the local configuration.

Options	<i>number</i> —Identifier for the type of subscriber for a PCRF partition. Default: 4 (END_USER_PRIVATE) Range: 1 through 2147483647 Values: 1 (END_USER_IMSI) 2 (END_USER_SIP_URI) 3 (END_USER_NAI) 4 (END_USER_PRIVATE)
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring the PCRF Partition on page 746 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735 • Understanding Upstream and Downstream Messages for the PCRF on page 740


t1-percentage (Address-Assignment Pools)

Syntax	<code>t1-percentage <i>percentage</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet6 dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	<p>Specify a percentage of the preferred-lifetime value. After this percentage of the preferred-lifetime value elapses, the router requests an extension on its lease from the originating DHCPv6 server. The t1-percentage is also referred to as the renewal time.</p> <p>The t1-percentage value must be less than the t2-percentage value.</p>
Options	<p>percentage—Percentage of the preferred-lifetime value.</p> <p>Range: 0 through 100</p> <p>Default: If the t1-percentage value is not configured, the default is based on the preferred-lifetime value, as follows.</p> <ul style="list-style-type: none"> • If the preferred-lifetime value is finite, the default is 50 percent of the preferred-lifetime value. • If the preferred-lifetime value is infinite, the default is also infinite.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Address-Assignment Pools on page 567 • DHCP Attributes for Address-Assignment Pools on page 243 • dhcp-attributes (Address-Assignment Pools) on page 994 • preferred-lifetime (Address-Assignment Pools) on page 1237 • t2-percentage (Address-Assignment Pools) on page 1358


t2-percentage (Address-Assignment Pools)

Syntax	t2-percentage <i>percentage</i> ;
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet6 dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	<p>Specify a percentage of the preferred-lifetime value. After this percentage of the preferred-lifetime value elapses, the router requests an extension on its lease from any available DHCPv6 server. The t1-percentage is also referred to as the rebinding time.</p> <p>The t2-percentage value must be greater than the t1-percentage value.</p>
Options	<p>percentage—Percentage of the preferred-lifetime value.</p> <p>Range: 0 through 100</p> <p>Default: If the t2-percentage value is not configured, the default is based on the preferred-lifetime value.</p> <ul style="list-style-type: none">• If the preferred-lifetime value is finite, the default is 80 percent. of the preferred-lifetime value.• When the preferred-lifetime value is infinite, the default is also infinite.
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567• DHCP Attributes for Address-Assignment Pools on page 243• dhcp-attributes (Address-Assignment Pools) on page 994• preferred-lifetime (Address-Assignment Pools) on page 1237• t1-percentage (Address-Assignment Pools) on page 1357

target-logical-system (Domain Map)

Syntax	target-logical-system <i>logical-system-name</i> { target-routing-instance <i>routing-instance-name</i> ; }
Hierarchy Level	[edit access domain map <i>domain-map-name</i>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	<p>Configure a non-default logical system and optionally a non-default routing instance for the subscriber's interface in a domain map.</p> <p>You use the target-routing-instance statement at the [edit access domain map <i>domain-map-name</i>] hierarchy level to configure a non-default routing instance for the default logical system.</p>
	<div>  <p>NOTE: Subscriber management is supported in the default logical system only.</p> </div>
Default	Default logical system for the subscriber..
Options	<p><i>logical-system-name</i>—Name of the logical system.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Specifying a Target Logical System/Routing Instance in a Domain Map on page 168

target-routing-instance (Domain Map)

Syntax	target-routing-instance (<i>routing-instance-name</i> default);
Hierarchy Level	[edit access domain map <i>domain-map-name</i>], [edit access domain map <i>domain-map-name</i> target-logical-system <i>logical-system-name</i>]
Release Information	Statement introduced in Junos OS Release 10.4. default option added in Junos OS Release 13.3.
Description	Configure the routing instance of the subscriber context.
<div> NOTE: Subscriber management is supported in the default logical system only. The target-logical-system statement, which appears in the CLI, is not supported in current Junos OS releases.</div>	
Default	For dynamic LNS sessions, the routing instance of the peer (LAC facing) interface. For all other sessions, the default logical system/routing instance context.
Options	routing-instance-name —Name of the routing instance. default —The default (master) routing instance.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Understanding Domain Maps and Logical System/Routing Instance Contexts on page 161• Specifying a Target Logical System/Routing Instance in a Domain Map on page 168

term (Forward Rule)

Syntax	<pre> term <i>precedence</i> { from { application-groups [<i>application-group-name</i>]; applications [<i>application-name</i>]; local-address <i>address</i> <except>; local-address-range low <i>low-value</i> high <i>high-value</i> <except>; local-prefix-list <i>prefix-list-name</i> <except>; } then { forwarding-instance <i>forwarding-instance</i>; unit-number <i>unit-number</i>; } } </pre>
Hierarchy Level	[edit services ptsp forward-rule <i>forward-rule-name</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Define the term properties for the forward rule.
Options	<p><i>precedence</i>—Precedence value for this term in relation to other terms. Term with lowest precedence is evaluated first.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

term (Rule)

Syntax	<pre>term precedence { from { application-group-any; application-groups [application-group-name]; applications [application-name]; local-port-range low low-value high high-value; local-ports [value-list]; protocol protocol-number; remote-address address <except>; remote-address-range low low-value high high-value <except>; remote-port-range low low-value high high-value; remote-ports [value-list]; remote-prefix-list prefix-list-name <except>; } then { (accept discard); count (application application-group application-group-any rule); forwarding-class forwarding-class; police policer-name; } }</pre>
Hierarchy Level	[edit services ptsp rule rule-name]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Define the term properties for the PTSP rule.
Options	<p>precedence—Precedence value for this term in relation to other terms. Term with lowest precedence is evaluated first.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

terminate-code

Syntax	<code>terminate-code (aaa (deny service-shutdown shutdown) dhcp l2tp ppp vlan) <i>term-reason</i> radius <i>value</i>;</code>
Hierarchy Level	[edit access]
Release Information	Statement introduced in Junos OS Release 11.4. vlan option added in Junos OS Release 16.1.
Description	<p>Customize the mapping between a termination cause (the internal termination identifier) and a numerical code value for the cause that is reported in the RADIUS Acct-Terminate-Cause attribute (49).</p> <p>When a RADIUS Acct-Stop message is issued as a result of the termination of a subscriber or service session, the RADIUS Acct-Terminate-Cause attribute (49) reports the cause or reason for the termination. This attribute is included only in RADIUS Acct-Stop messages. The termination cause is conveyed as a code value in the attribute. <i>RFC 2866, RADIUS Accounting</i>, defines the standard mapping between 18 code values and termination causes.</p> <p>Junos OS defines a set of internal termination cause codes for AAA, DHCP, L2TP, PPP, and VLAN subscriber and service session failures. By default, these internal cause codes are mapped to the RFC-defined code values. When a subscriber or service session is terminated, the router logs a message for the internal termination cause and logs another message for the RADIUS Acct-Terminate-Cause attribute. You can use the logged information to help monitor and troubleshoot the events.</p> <p>Because there are many different Junos OS internal identifiers for termination causes and only 18 supported, RFC-defined standard code values, by default a given code value can map to multiple identifiers. Instead of using the default code values, you can use the terminate-code statement to map any of the internally defined termination causes to any 32-bit number (1 through 4,294,967,295). The flexibility of customized mapping greatly increases the possibilities for fine-grained analytics and failure tracking.</p>
Options	<p>aaa—Map internal identifiers for AAA-specific termination causes to a numerical value.</p> <p>deny—Limit selection of termination causes to those associated with denial of subscriber access.</p> <p>dhcp—Map internal identifiers for DHCP-specific termination causes to a numerical value.</p> <p>l2tp—Map internal identifiers for L2TP-specific termination causes to a numerical value.</p> <p>ppp—Map internal identifiers for PPP-specific termination causes to a numerical value.</p> <p>radius <i>value</i>—Number that represents the termination cause in the RADIUS Acct-Terminate-Cause attribute (49). Range: 1 through 4,294,967,295</p>

service-shutdown—Limit selection of termination causes to those associated with established service sessions independent of the parent subscriber session.

shutdown—Limit selection of termination causes to those associated with established subscriber sessions.

vlan—Map internal identifiers for VLAN-specific termination causes to a numerical value.

term-reason—Internal identifier for the termination causes defined for the specified protocol type.

For protocol-specific termination causes, see the following topics:

- [AAA Terminate Reasons on page 186](#)
- [DHCP Terminate Reasons on page 188](#)
- [L2TP Terminate Reasons on page 189](#)
- [PPP Terminate Reasons on page 209](#)
- [VLAN Termination Causes and Code Values on page 217](#)

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

Related Documentation

- [Mapping Application Terminate Reasons and RADIUS Terminate Codes on page 183](#)
- [Configuring Custom Terminate Reason Mappings on page 185](#)

tftp-server

Syntax `tftp-server ip-address;`

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

Release Information Statement introduced in Junos OS Release 9.0.

Description Specify the Trivial File Transfer Protocol (TFTP) server that the client uses to obtain the client configuration file. This is equivalent to DHCP option 150.

Options *ip-address*—IP address of the TFTP server.

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

Related Documentation

- [Configuring Address-Assignment Pools on page 567](#)

then (Forward Rule)

Syntax	<pre> then { forwarding-instance <i>forwarding-instance</i>; unit-number <i>unit-number</i>; } </pre>
Hierarchy Level	[edit services ptsp forward-rule <i>forward-rule-name</i> term <i>precedence</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Define the term actions for the forward rule.
Options	<p><i>forwarding-instance</i>—Identifier for the forwarding instance for packet flows accepted under this policy.</p> <p><i>unit-number</i>—Unit number associated with the forwarding instance.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Static PTSP Rules on page 799 in <i>Junos OS Broadband Subscriber Management and Services Library</i>

then (Rule)

Syntax	<pre>then { (accept discard); count (application application-group application-group-any rule); forwarding-class <i>forwarding-class</i>; police <i>policer-name</i>; }</pre>
Hierarchy Level	[edit services ptsp rule <i>rule-name</i> term <i>precedence</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Define the term actions. You can configure the router to accept or discard the targeted traffic. The action modifiers (count and forwarding-class) are optional.
Options	<p>You can configure one of the following actions:</p> <ul style="list-style-type: none">• accept—Accept the packets and all subsequent packets in flows that match the rules.• discard—Discard the packet and all subsequent packets in flows that match the rules. <p>When you select accept as the action, you can optionally configure one or both of the following action modifiers. No action modifiers are allowed with the discard action.</p> <ul style="list-style-type: none">• count (application application-group application-group-any rule none)—For all accepted packets that match the rules, record a packet count using PTSP statistics practices. You can specify one of the following options; there is no default setting:<ul style="list-style-type: none">• application—Count the application that matched in the from clause.• application-group—Count the application group that matched in the from clause.• application-group-any—Count all application groups that match from application-group-any under the any group name.• rule—Count the rule that matched in the from clause.• none—Same as not specifying count as an action.• forwarding-class <i>forwarding-class</i>—Specify the forwarding class name for outgoing packets. <p>When you include a policer, the only allowed action is discard. For more information on policers, see the <i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide</i>.</p> <ul style="list-style-type: none">• police <i>policer-name</i>—Apply rate-limiting properties to the traffic as configured at the [edit firewall policer <i>policer-name</i>] hierarchy level. This configuration allows bit-rate and burst-size attributes to be applied to the traffic that are not supported by PTSP rules.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

- Related Documentation**
- [Configuring Static PTSP Rules on page 799](#) in *Junos OS Broadband Subscriber Management and Services Library*

timeout (RADIUS)

Syntax	<code>timeout seconds;</code>
Hierarchy Level	[edit access radius-server <i>server-address</i>], [edit access profile <i>profile-name</i> radius-server <i>server-address</i>]
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 amount of time that the local router or switch waits to receive a response from RADIUS authentication and accounting servers. You can override the timeout value for accounting servers with the accounting-timeout statement.



NOTE: To successfully set a timeout value for the accounting servers different from the authentication servers, you must configure both the [accounting-retry](#) and [accounting-timeout](#) statements. If you configure only one of these statements, then the value you configure is ignored in favor of the values configured with the [retry](#) and [timeout](#) statements.



NOTE: The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.

Options	seconds —Amount of time to wait. Range: 1 through 1000 seconds Default: 3 seconds
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Router or Switch Interaction with RADIUS Servers on page 115 • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90 • <i>Example: Configuring CHAP Authentication with RADIUS</i> • <i>Configuring RADIUS Authentication for L2TP</i>

timeout (DHCP Local Server)

Syntax	<code>timeout <i>timeout-value</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6 ...] hierarchy levels introduced in Junos OS Release 10.4.</p>
Description	Configure the initial value in seconds between attempts to reconfigure all DHCP clients or only the DHCP clients serviced by the specified group of interfaces.
Options	<p><i>timeout-value</i>—Initial retry timeout value.</p> <p>Range: 1 through 10 seconds</p> <p>Default: 2 seconds</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298 Configuring Dynamic Reconfiguration Attempts for DHCP Clients on page 300

timeout (DHCP Local Server Leasequery)

Syntax	<code>timeout seconds;</code>
Hierarchy Level	<p>[edit system services dhcp-local-server allow-bulk-leasequery], [edit system services dhcp-local-server dhcpv6 allow-bulk-leasequery], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...], [edit logical-systems <i>logical-system-name</i> system services dhcp-local-server ...], [edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server ...]</p>
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Specify the number of seconds that a connection on the TCP socket is idle before the DHCP local server closes the connection. Closing inactive connections enables the DHCP local server to more efficiently apply resources in support of active TCP connections.
Options	<p>seconds—Number of seconds the connection can be idle. Range: 1 through 1000 Default: 120</p>
Required Privilege Level	<p>system—To view this statement in the configuration. system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Bulk Leasequery on page 260

timeout (DHCP Relay Agent Leasequery)

Syntax	<code>timeout seconds;</code>
Hierarchy Level	[edit forwarding-options <code>dhcp-relay</code> (<code>leasequery</code> <code>bulk-leasequery</code>)], [edit forwarding-options <code>dhcp-relay dhcpv6</code> (<code>leasequery</code> <code>bulk-leasequery</code>)], [edit logical-systems <i>logical-system-name</i> ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> ...], [edit routing-instances <i>routing-instance-name</i> ...]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Specify the number of seconds that DHCP relay agent waits before resending a leasequery or bulk leasequery message to the DHCP servers when all servers have not responded to a previous message.
Options	seconds —Number of seconds. Range: 1 through 10 Default: 10
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring and Using DHCP Individual Leasequery on page 257• Configuring and Using DHCP Bulk Leasequery on page 260

token (DHCP Local Server)

Syntax	<code>token <i>token-value</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6 ...] hierarchy levels introduced in Junos OS Release 10.4.</p>
Description	<p>Configure a plain-text token for all DHCP clients or only the DHCP clients serviced by the specified group of interfaces. The token enables rudimentary entity authentication to protect against inadvertently instantiated DHCP servers. A null token (empty string) indicates that the configuration token functionality is not enabled. A group configuration takes precedence over a DHCP local server configuration. For more information about tokens, see RFC 3118, <i>Authentication for DHCP Messages</i>, section 4.</p>
Options	<p><i>token-value</i>—Plain-text alphanumeric string.</p> <p>Default: null (empty string)</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298 • Configuring a Token for DHCP Local Server Authentication on page 357

trace (DHCP Local Server)

Syntax	trace;
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> interface <i>interface-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.4.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Enable trace operations for a group of interfaces or for a specific interface within a group.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Tracing Extended DHCP Operations on page 821 • Tracing Extended DHCP Operations for Specific Interfaces on page 826

trace (DHCP Relay Agent)

Syntax	trace;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> interface <i>interface-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.4.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p>
Description	<p>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.</p> <p>EX Series switches do not support DHCPv6.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) • Tracing Extended DHCP Operations on page 821 • Tracing Extended DHCP Operations for Specific Interfaces on page 826

traceoptions (ANCP)

Syntax	<pre>traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i> <disable>; level (all error info notice verbose warning); no-remote-trace; }</pre>
Hierarchy Level	[edit protocols ancp]
Release Information	Statement introduced in Junos OS Release 9.4.
Description	Define tracing operations for ANCP agent processes.
Options	<p>file <i>filename</i>— Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. Include the disable option after a flag to disable tracing for that flag. You can include the following flags:</p> <ul style="list-style-type: none">• all—Trace all operations.• config—Trace configuration events.• cos—Trace class-of-service events.• general—Trace general flow.• packet—Trace ANCP packet transmit and receive operations.• process—Trace process internals.• protocol—Trace protocol events.• restart—Trace process restart flow• routing-socket—Trace routing socket events.• session—Trace connection events and flow.• startup—Trace ANCP startup events and flow.• subscriber—Trace subscriber events.• timer—Trace timer processing. <p>level—Level of tracing to perform. You can specify any of the following levels:</p>

- **all**—Match all levels.
- **error**—Match error conditions.
- **info**—Match informational messages.
- **notice**—Match notice messages about conditions requiring special handling.
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

Default: error

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *size***k** to specify KB, *size***m** to specify MB, or *size***g** to specify GB

Range: 10240 through 1073741824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

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

Related Documentation	<ul style="list-style-type: none"> • Tracing ANCP Agent Operations for Subscriber Access on page 853
------------------------------	---

traceoptions (DHCP)

Syntax	<pre>traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; level (all error info notice verbose warning); no-remote-trace; }</pre>
Hierarchy Level	[edit system processes dhcp-service]
Release Information	Statement introduced in Junos OS Release 11.4. Statement introduced in Junos OS Release 12.1 for EX Series switches.
Description	<p>Define global tracing operations for extended DHCP local server and extended DHCP relay agent processes.</p> <p>This statement replaces the deprecated traceoptions statements at the [edit forwarding-options dhcp-relay] and [edit system services dhcp-local-server] hierarchy levels.</p>
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements:</p> <ul style="list-style-type: none">• all—Trace all events.• auth—Trace authentication events.• database—Trace database events.• fwd—Trace firewall process events.• general—Trace miscellaneous events.• ha—Trace high availability-related events.• interface—Trace interface operations.• io—Trace I/O operations.• liveness-detection—Trace liveness detection operations.• packet—Trace packet and option decoding operations.• performance—Trace performance measurement operations.

- **profile**—Trace profile operations.
- **rpd**—Trace routing protocol process events.
- **rtsock**—Trace routing socket operations.
- **security-persistence**—Trace security persistence events.
- **session-db**—Trace session database events.
- **state**—Trace changes in state.
- **statistics**—Trace baseline statistics.
- **ui**—Trace user interface operations.

level—Level of tracing to perform; also known as severity level. The option you configure enables tracing of events at that level and all higher (more restrictive) levels. You can specify any of the following levels:

- **all**—Match messages of all levels.
- **error**—Match error messages.
- **info**—Match informational messages.
- **notice**—Match notice messages about conditions requiring special handling.
- **verbose**—Match verbose messages. This is the lowest (least restrictive) severity level; when you configure **verbose**, messages at all higher levels are traced. Therefore, the result is the same as when you configure **all**.
- **warning**—Match warning messages.

Default: error

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access, allowing only the user **root** and users who have the Junos OS **maintenance** permission to access the trace files.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (***maximum-file-size**k*), megabytes (***maximum-file-size**m*), or gigabytes (***maximum-file-size**g*). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Range: 10,240 through 1,073,741,824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

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

- Related Documentation**
- [Tracing Extended DHCP Operations on page 821](#)

traceoptions (Diameter Base Protocol)

Syntax	<pre> traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; level (all error info notice verbose warning); no-remote-trace; } </pre>
Hierarchy Level	[edit system processes diameter-service]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Define tracing options for Diameter processes.
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the filename within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none"> • all—Trace all operations • application—Trace Diameter application interface events • configuration—Trace configuration events • daemon—Trace Diameter daemon level events • diameter-instance—Trace Diameter instance events • dne—Trace Diameter network element events • framework—Trace Diameter framework events • memory-management—Trace memory management events • messages—Trace Diameter messages • node—Trace Diameter node events • peer—Trace Diameter peer events <p>level—Level of tracing to perform. You can specify any of the following levels:</p> <ul style="list-style-type: none"> • all—Match all levels. • error—Match error conditions.

- **info**—Match informational messages.
- **notice**—Match notice messages about conditions requiring special handling.
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

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

Related Documentation	<ul style="list-style-type: none">• Tracing Diameter Base Protocol Processes for Subscriber Access on page 843
------------------------------	--

traceoptions (Extensible Subscriber Services Manager)

Syntax	traceoptions file <i>file-name</i> flag authentication flag configuration flag dictionary flag fsm flag statistics flag kernel flag dynamic flag database flag op-script flag general flag all
Hierarchy Level	[edit system processes extensible-subscriber-services]
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Configure the trace options for Extensible Subscriber Services Manager. essmd supports Junos OS daemon trace options.
Options	<p>traceoptions—Configure the trace options for Extensible Subscriber Services Manager.</p> <p><i>file-name</i>—Name of the trace file.</p> <p>flag all—Configure trace settings for all operations.</p> <p>flag authentication—Configure trace settings for authentication operations.</p> <p>flag configuration—Configure trace settings for configuration operations.</p> <p>flag database—Configure trace settings for database operations.</p> <p>flag dictionary—Configure trace settings for dictionary operations.</p> <p>flag dynamic—Configure trace settings for dynamic profile operations.</p> <p>flag fsm—Configure trace settings for finite state machine operations.</p> <p>flag general—Configure trace settings for general operations.</p> <p>flag kernel—Configure trace settings for kernel state-change operations.</p> <p>flag op-script—Configure trace settings for op script operations.</p> <p>flag statistics—Configure trace settings for statistics-collection operations.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

tracoptions (Enhanced Subscriber Management)

Syntax	<pre>tracoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i> <disable>; level <i>level</i>;; no-remote-trace; }</pre>
Hierarchy Level	[edit system processes smg-service]
Release Information	Statement introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Define tracing operations for the main enhanced subscriber management session management process.
Options	<p>file <i>filename</i>— Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All trace logs are stored in the directory <code>/var/log/bbesmgd</code>.</p> <p>files <i>number</i>— (Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 5 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. Include the disable option after a flag to disable tracing for that flag. You can include the following flags:</p> <ul style="list-style-type: none">• all—Trace all operations.• auth—Trace general authentication events.• autoconf—Trace autoconfiguration events.• config—Trace configuration events.• demux—Trace demultiplexing (demux) events.• dhcp—Trace DHCP Server events.• dprof—Trace dynamic profile events.• interface—Trace interface events.• io—Trace packet socket events.• l2tp—Trace L2TP events.• main—Trace main operations.• net—Trace network processing events.

- **ppp**—Trace PPP events.
- **pppoe**—Trace PPPoE events.
- **rpd**—Trace routing protocol process events.
- **rtsock**—Trace routing socket events.
- **service**—Trace service events.
- **session**—Trace connection events and flow.
- **stats**—Trace statistics events.
- **ucac**—Trace universal call admission control events.
- **ui**—Trace user interface events.
- **vbf**—Trace variable-based forwarding events.

level *level*—Level of tracing to perform. You can specify any of the following levels:

- **all**—Match all levels.
- **error**—Match error conditions.
- **info**—Match informational messages.
- **notice**—Match notice messages about conditions requiring special handling.
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10,240 through 1,073,741,824 bytes

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

Required Privilege Level

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

Related Documentation

- [Configuring Junos OS Enhanced Subscriber Management on page 554](#)
- [Configuring the Subscriber Management Database Trace Log Filename on page 832](#)

traceoptions (General Authentication Service)

Syntax	<pre>traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; filter { user <i>user@domain</i>; } flag <i>flag</i>; no-remote-trace; }</pre>
Hierarchy Level	[edit system processes general-authentication-service]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Configure tracing options for the general authentication service.
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. All files are placed in the directory <code>/var/log</code>.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>filter—Additional filter to refine the output to display particular subscribers. Filtering based on the following subscriber identifier simplifies troubleshooting in a scaled environment.</p> <ul style="list-style-type: none">• user <i>user@domain</i>—Username of a subscriber. Optionally use an asterisk (*) as a wildcard to substitute for characters at the beginning or end of either term or both terms. <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none">• address-assignment—Trace address-assignment pool events• all—Trace all tracing operations• configuration—Trace configuration events• framework—Trace authentication framework events• gx-plus—Trace Gx-Plus events• jsrc—Trace JSRC events• ldap—Trace LDAP authentication events• local-authentication—Trace local authentication events

- **radius**—Trace RADIUS authentication events
- **user-access**—Trace user access events, such as login, logout, and authenticate.

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

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

Related Documentation	<ul style="list-style-type: none"> • Tracing General Authentication Service Processes on page 859
------------------------------	--

traceoptions (PTSP)

Syntax	<pre>traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i> <disable>; no-remote-trace; }</pre>
Hierarchy Level	[edit system services packet-triggered-subscribers]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	Define tracing operations for PTSP.
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none">• all—Trace all operations.• configuration—Trace configuration events.• general—Trace general flow.• peer—Trace SRC peer events.• pic—Trace PIC events.• rtsock—Trace routing socket events.• session—Trace session events. <p>disable—Disable this trace flag.</p> <p>match <i>regular-expression</i>—(Optional) Refine the output to include lines that contain the regular expression.</p> <p>no-remote-trace—Disable remote tracing.</p> <p>no-world-readable—(Optional) Disable unrestricted file access.</p> <p>size <i>maximum-file-size</i>—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the files option.</p>

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

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

Related Documentation	<ul style="list-style-type: none">• Tracing Packet-Triggered Subscriber Operations on page 875
------------------------------	--

tracoptions (Static Subscribers)

Syntax	<pre>tracoptions { file <i>filename</i><files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; level (all error info notice verbose warning); no-remote-trace; }</pre>
Hierarchy Level	[edit logical-systems <i>logical-system-name</i> system processes static-subscribers], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system processes static-subscribers], [edit routing-instances <i>routing-instances-name</i> system processes static-subscribers], [edit system processes static-subscribers]
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Define tracing operations for static subscriber processes.
Options	<p>file <i>filename</i>— Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory <code>/var/log</code>.</p> <p>files <i>number</i>— (Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none">• all—Trace all operations.• authentication—Trace authentication events.• configuration—Trace configuration events.• database—Trace database events.• general—Trace general events.• gres—Trace GRES events.• profile—Trace dynamic profile events.• rtsock—Trace routing socket events.• statistics—Trace statistics events.• subscriber—Trace subscriber events. <p>level—Level of tracing to perform. You can specify any of the following levels:</p> <ul style="list-style-type: none">• all—Match all levels.

- **error**—Match error conditions.
- **info**—Match informational messages.
- **notice**—Match notice messages about conditions requiring special handling.
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

Default: error

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

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

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

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

Related Documentation	<ul style="list-style-type: none"> • Tracing Static Subscriber Operations on page 871
------------------------------	--

traceoptions (Subscriber Management)

Syntax	<pre>traceoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; }</pre>
Hierarchy Level	[edit system services subscriber-management]
Release Information	Statement introduced in Junos OS Release 11.1.
Description	Define tracing operations for subscriber management interface processes.
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the filename within quotation marks. All files are placed in the directory <code>/var/log</code>.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none">• all—Trace all operations.• database—Trace database events.• general—Trace general events.• issu—Trace unified ISSU events.• server—Trace server events.• session-db—Trace session database interactions.• ui—Trace user interface events. <p>match <i>regular-expression</i>—(Optional) Refine the output to include lines that contain the regular expression.</p> <p>no-world-readable—(Optional) Disable unrestricted file access.</p> <p>size <i>maximum-file-size</i>—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the files option.</p> <p>Syntax: sizek to specify KB, sizem to specify MB, or sizeg to specify GB</p> <p>Range: 10240 through 1073741824</p> <p>Default: 128 KB</p>

world-readable—(Optional) Enable unrestricted file access.

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

Related Documentation • [Tracing Subscriber Management Database Operations for Subscriber Access on page 831](#)

tracoptions (Subscriber Session Database Replication)

Syntax	<pre>tracoptions { file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; flag <i>flag</i>; no-remote-trace; }</pre>
Hierarchy Level	[edit system services database-replication]
Release Information	Statement introduced in Junos OS Release 9.3.
Description	Define tracing operations for subscriber management session database replication processes.
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:</p> <ul style="list-style-type: none">• all—Trace all operations.• database—Trace database events.• general—Trace general flow.• mirror—Trace mirroring events.• replication—Trace database replication events.• server—Trace server events.• session-db—Trace session database interactions.• ui—Trace user interface events. <p>match <i>regular-expression</i>—(Optional) Refine the output to include lines that contain the regular expression.</p> <p>no-remote-trace—Disable remote tracing.</p> <p>no-world-readable—(Optional) Disable unrestricted file access.</p> <p>size <i>maximum-file-size</i>—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to</p>

indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

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

Related Documentation • [Tracing Subscriber Management Session Database Replication Operations for Subscriber Access on page 835](#)

transport (Diameter Base Protocol)

Syntax `transport transport-name {
 address;
 logical-system logical-system-name <routing-instance routing-instance-name >;
 routing-instance routing-instance-name
}`

Hierarchy Level [edit [diameter](#)]

Release Information Statement introduced in Junos OS Release 11.2.

Description Configure the Diameter instance and the local IP address for the Diameter local transport connection.

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

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 Diameter on page 699](#)
• [Configuring the Diameter Transport on page 701](#)

transport (Diameter Peer)

Syntax	<code>transport <i>transport-name</i>;</code>
Hierarchy Level	[edit diameter peer <i>peer-name</i> connect-actively]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Specify the transport layer connection to be used for establishing active connections to the peer.
Default	The transport is defined in the default logical system and master routing instance.
Options	<i>transport-name</i> —Name of the transport.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Diameter on page 699• Configuring Diameter Peers on page 700

traps

Syntax	(traps no-traps);
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i>], [edit interfaces <i>interface-name</i>], [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces interface-range <i>name</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.</p> <p>Support at the [edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i>] hierarchy level introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.</p>
Description	<p>Enable or disable the sending of Simple Network Management Protocol (SNMP) notifications when the state of the connection changes.</p> <p>(Enhanced subscriber management for MX Series routers) To enable SNMP notifications, you must first configure the interface-mib statement at the [edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i>] hierarchy level. If interface-mib is not configured, the traps statement has no effect.</p>
<div>  <p>BEST PRACTICE: To achieve maximum performance when enhanced subscriber management is enabled, we recommend that you <i>not</i> enable SNMP notifications on all dynamic subscriber interfaces.</p> </div>	
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Enabling or Disabling SNMP Notifications on Physical Interfaces</i> • <i>Enabling or Disabling SNMP Notifications on Logical Interfaces</i>


trigger (DHCP Local Server)

Syntax	<pre>trigger { radius-disconnect; }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 reconfigure],</p> <p>[edit system services dhcp-local-server group <i>group-name</i> reconfigure],</p> <p>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> reconfigure]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6 ...] hierarchy levels introduced in Junos OS Release 10.4.</p>
Description	<p>Configure behavior in response to a trigger for all DHCP clients or only the DHCP clients serviced by the specified group of interfaces.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298 Configuring Reconfiguration of the Client on Receipt of RADIUS-Initiated Disconnect on page 301 radius-disconnect on page 1260

trigger (DHCP Relay Agent Leasequery)

Syntax	trigger automatic;
Hierarchy Level	[edit forwarding-options dhcp-relay dhcpv6 bulk-leasequery], [edit logical-systems <i>logical-system-name</i> ...], [edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> ...], [edit routing-instances <i>routing-instance-name</i> ...]
Release Information	Statement introduced in Junos OS Release 16.1.
Description	Specify the event that triggers DHCPv6 relay agent to send bulk leasequery messages to the DHCPv6 servers in the logical system/routing instance. The trigger initiates the bulk leasequery configuration parameters you specify in the DHCPv6 relay agent configuration. The optional event support is in addition to the default CLI command support.
Options	automatic —Specify that the DHCPv6 relay agent always sends a bulk leasequery message whenever the jdhcp daemon is started or restarted and there are no bound subscribers in the session database. The automatic trigger updates the DHCP relay agent's binding information for clients associated with the requesting DHCPv6 relay agent.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring and Using DHCP Bulk Leasequery on page 260

trio-flow-offload

Syntax	trio-flow-offload minimum-bytes <i>minimum-bytes</i> ;
Hierarchy Level	[edit interfaces <i>interface-name</i> services-options]
Release Information	Statement introduced in Junos OS Release 12.1.
Description	Enable any plug-in or daemon on a PIC to generate a request to off-load flows to the Packet Forwarding Engine. This command is available on MX Series routers with Modular Port Concentrators (MPCs) and Modular Interface Cards (MICs).
<hr/>	
<div> NOTE: This feature is not supported for Broadband Edge subscribers (given that service PIC off load is not available with aggregate Ethernet (AE)).</div> <hr/>	
Options	<i>minimum-bytes</i> —Minimum number of bytes that trigger offloading. When this option is omitted, offloading is triggered when both the forward and reverse flows of the session have begun, meaning that at least one packet has flowed in each direction.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Flow Offloading</i>

trust-option-82

Syntax	trust-option-82;
Hierarchy Level	<p>[edit forwarding-options dhcp-relay overrides],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> overrides],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> interface <i>interface-name</i> overrides]</p>
Release Information	<p>Statement introduced in Junos OS Release 8.3.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	<p>Enable processing of DHCP client packets that have a gateway IP address (giaddr) of 0 (zero) and contain option 82 information. By default, the DHCP relay agent treats such packets as if they originated at an untrusted source, and drops them without further processing.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Trusting Option 82 Information on page 334 • Overriding the Default DHCP Relay Configuration Settings on page 313

tunnel-profile (Domain Map)

Syntax	tunnel-profile <i>profile-name</i> ;
Hierarchy Level	[edit access domain map <i>domain-map-name</i>]
Release Information	Statement introduced in Junos OS Release 10.4.
Description	Tunnel profile that provides definitions for tunnels associated with the domain map.
Options	<i>profile-name</i> —Name of tunnel profile.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Specifying a Tunnel Profile in a Domain Map on page 172• Configuring a Tunnel Profile for Subscriber Access


underlying-interface (ANCP)

Syntax	underlying-interface <i>underlying-interface-name</i> ;
Hierarchy Level	[edit protocols ancp interfaces interface-set <i>interface-set-name</i>]
Release Information	Statement introduced in Junos OS Release 12.2.
Description	Configure the underlying interface on which the VLAN demux interface is running. The VLAN demux interface is the underlying interface for the PPPoE sessions controlled by ANCP.
Options	<i>underlying-interface-name</i> —Name of the underlying interface.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent on page 624• Associating an Access Node with Subscribers for ANCP Agent Operations on page 626

unique-nas-port

Syntax	unique-nas-port { chassis-id <i>chassis-id</i> ; chassis-id-width <i>chassis-id-width</i> ; }
Hierarchy Level	[edit access radius-options]
Release Information	Statement introduced in Junos OS Release 15.1.
Description	Configure the router to provide a unique value for the NAS-Port attribute (RADIUS attribute 5) of each subscriber. You can configure a NAS-Port value that is unique within the router only, or unique across the different MX routers in the network.
Options	<p>chassis-id—Value for the chassis-id part of NAS-Port attribute. To ensure that NAS-Port values are unique across all MX series routers in the network, you must specify a unique chassis-id for each MX router.</p> <p>Range: 0-127 bits</p> <p>chassis-id-width—Number of bits used to uniquely identify the chassis across the MX series routers in the network. All routers must use the same chassis-id-width. If you do not configure a chassis-id-width, the resulting NAS-Port attribute is unique within the router only.</p> <p>Range: 1-7 bits</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Enabling Unique NAS-Port Attributes (RADIUS Attribute 5) for Subscribers on page 69

update-interval

Syntax	update-interval <i>minutes</i> ;
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	<p>Enable interim accounting updates and configure the amount of time that the router or switch waits before sending a new accounting update.</p> <p>Interim accounting updates are included in the exchange of messages between the client and the accounting server. In RADIUS accounting, the client is the network access server (NAS), which can be the router or switch. The NAS sends Accounting-Request messages to the server, which acknowledges receipt of the requests with Accounting-Response messages. Interim accounting updates are sent in Accounting-Request packets with the Acct-Status-Type attribute set to Interim-Update.</p> <p>When a user is authenticated, the authentication server issues an Access-Accept message in response to a successful Access-Request message. The interval between interim updates can be configured directly on the server using the Acct-Interim-Interval attribute of the Access-Accept message. However, if the update interval is configured on the NAS using update-interval, then the locally configured value overrides the value found in an Access-Accept message from the server.</p>
	<div> NOTE: All information in an interim update message is cumulative from the beginning of the session, not from the last interim update message.</div>
Default	No interim updates are sent from the client to the accounting server.
Options	<p>minutes—Amount of time between updates, in minutes. All values are rounded to the next higher multiple of 10. For example, the values 811 through 819 are all accepted by the CLI, but are all rounded up to 820.</p> <p>Range: 10 through 1440 minutes</p>
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90• Configuring Immediate Interim Accounting Updates to RADIUS in Response to ANCP Notifications on page 668

update-interval (Service Accounting)

Syntax	update-interval <i>minutes</i> ;
Hierarchy Level	[edit access profile <i>profile-name</i> service accounting]
Release Information	Statement introduced in Junos OS Release 14.2R1 for MX Series routers.
Description	Enable service interim accounting updates and configure the amount of time that the router waits before sending a new service accounting update.
Default	No updates
Options	minutes —Amount of time between updates, in minutes. All values are rounded up to the next higher multiple of 10. For example, the values 811 through 819 are all accepted by the CLI, but are all rounded up to 820. Range: 10 through 1440 minutes
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Service Interim Accounting on page 113• Processing Cisco VSAs in RADIUS Messages for Service Provisioning on page 110

update-response-timeout (PCRF Partition)

Syntax	update-response-timeout <i>seconds</i> ;
Hierarchy Level	[edit access pcrf partition <i>partition-name</i>]
Release Information	Statement introduced in Junos OS Release 16.2.
Description	<p>Configure the amount of time in seconds before a Policy and Charging Rule Function (PCRF) partition stops attempting to send an updated rule report response using a CCR-GX-U message. Use this statement if you added or deleted rules in either the subscriber login using a CCA-GX-I message, or the reauthorization request using a RAR-GX-U message, and configured rule reporting.</p> <p>The last rule report may be preempted by the subscriber logging out too soon. Use this statement to control the amount of time to allow the system to send the last rule report.</p>
Options	<p><i>seconds</i>—Number of seconds to wait before a PCRF partition stops attempting to send an updated rule report response using a CCR-GX-U message.</p> <p>Default: 300</p> <p>Range: 0 through 86,400 seconds (24 hours)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring the PCRF Partition on page 746• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740

upstream-rate (Traffic Shaping)

Syntax	<code>upstream-rate rate;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces \$junos-interface-ifd-name unit \$junos-interface-unit advisory-options],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces interface-set \$junos-interface-set-name interface \$junos-interface-ifd-name advisory-options],</p> <p>[edit interfaces demux0 unit <i>logical-unit-number</i> advisory-options],</p> <p>[edit interfaces <i>interface-name</i> <i>logical-unit-number</i> advisory-options]</p>
Release Information	<p>Statement introduced in Junos OS Release 11.4.</p> <p>Support at the [edit interfaces demux0 ...] hierarchy level introduced in Junos OS Release 12.2.</p> <p>Support at the [edit dynamic-profiles ...] hierarchy level introduced in Junos OS Release 13.1.</p>
Description	<p>Specify a recommended shaping rate to be applied to upstream traffic on an interface.</p> <p>For ANCP interfaces, this configured rate is used as the default value for the Juniper VSA Upstream-Calculated-Qos-Rate (26-142) when the router has not received and processed the attributes from the access node.</p> <p>For L2TP, the rate is configured on an underlying PPPoE logical interface for a subscriber on an MX Series router acting as a LAC. When the subscriber is tunneled, this rate, referred to as speed for L2TP, is sent to the LNS in the ICCN message as AVP 38.</p>
Options	<p>rate—Traffic rate in bits per second.</p> <p>Range: 1000 through 4,294,967,295 bits per second</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Setting a Recommended Shaping Rate for Traffic on ANCP Interfaces on page 659 • Configuring the ANCP Agent on page 624 • Configuring the Method to Set the LAC Connection Speeds to the LNS

use-interface-description

Syntax	<code>use-interface-description (logical device);</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> (relay-agent-interface-id relay-agent-remote-id)],</p> <p>[edit forwarding-options dhcp-relay relay-option-82 (circuit-id remote-id)],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> relay-option-82 (circuit-id remote-id)],</p> <p>[edit logical-systems <i>logical-system-name</i> ... forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)],</p> <p>[edit logical-systems <i>logical-system-name</i> ... forwarding-options dhcp-relay ... relay-option-82 (circuit-id remote-id)],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay ... relay-option-82 (circuit-id remote-id)],</p> <p>[edit vlans <i>vlan-name</i> forwarding-options dhcp-security dhcpv6-options option-18],</p> <p>[edit vlans <i>vlan-name</i> forwarding-options dhcp-security dhcpv6-options option-37]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.6.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.3 for EX Series switches.</p> <p>Support at the [edit ... relay-agent-remote-id] and [edit ... remote-id] hierarchy levels introduced in Junos OS Release 14.1.</p> <p>Support at the [edit vlans <i>vlan-name</i> dhcp-security dhcpv6-options option-18] and [edit vlans <i>vlan-name</i> dhcp-security dhcpv6-options option-37] hierarchy levels introduced in Junos OS Release 14.1X53-D10 for EX Series switches.</p>
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,

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 on page 342](#)
- [Using DHCP Relay Agent Option 82 Information on page 337](#)
- [Configuring DHCPv6 Relay Agent Options on page 442](#)

user-name-include (OCS Partition)

Syntax `user-name-include{
 base-interface-name;
 delimiter delimiter-character;
 domain-name my-domain;
 interface-name;
 mac-address;
 nas-port-id;
 origin-host;
 origin-realm;
 user-name;
 user-prefix pref;
 }`

Hierarchy Level [edit access [ocs partition](#) *partition-name*]

Release Information Statement introduced in Junos OS Release 16.2.

Description Configure the username identification to be used in an Online Charging Function (OCS) partition. You can configure a data string to include the following options.

Options **base-interface-name**—Use the physical or underlying interface name. If both the underlying interface and the client application perform authentication, authorization, and provisioning, the identification attributes in the server requests enable the AAA or PCRF server to make an association between the two entities.

delimiter *delimiter-character*—Use the specified character as the delimiter between the concatenated components of the **user-name-include** statement. You cannot use the semicolon (;) as a delimiter.

Default: @

domain-name *my-domain*—Use the specified domain name that is concatenated with the **user-name-include** statement during the subscriber identification process.

interface-name—Use the interface name that is concatenated with the **user-name-include** statement during the subscriber identification process; for example, demux0.

mac-address—Use the client hardware address (chaddr) from the incoming packet that is concatenated with the **user-name-include** statement during the subscriber identification process.

nas-port-id—Use the NAS-Port-ID (RADIUS attribute 87), which identifies the physical interface that subscriber management uses to identify users that is concatenated with the **user-name-include** statement during the subscriber identification process. By default, the NAS-Port-ID includes the interface-description value that describes the physical interface.

origin-host—Use the name of the host that originates the Diameter message that is concatenated with the **user-name-include** statement during the subscriber

identification process. Supplied as the value of Origin-Host AVP for all messages sent by the Diameter master instance.

origin-realm—Use the realm of the host that originates the Diameter message that is concatenated with the **user-name-include** statement during the subscriber identification process. Supplied as the value of Origin-Realm AVP for all messages sent by the Diameter master instance.

user-name—(Included in the **user-name-include** statement by default) Use the username that is concatenated with the **user-name-include** statement during the subscriber identification process.

user-prefix *prefix*—Use the specified user prefix that is concatenated with the **user-name-include** statement during the subscriber identification process.

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

Related Documentation	<ul style="list-style-type: none">• Configuring the OCS Partition on page 743• 3GPP Policy and Charging Control Overview for Wireline Provisioning and Accounting on page 715• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735
------------------------------	--

use-option-82




Syntax	<code>use-option-82 <strict>;</code>
Hierarchy Level	<code>[edit forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id relay-agent-remote-id)],</code> <code>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> (relay-agent-interface-id relay-agent-remote-id)],</code> <code>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 ... (relay-agent-interface-id relay-agent-remote-id)],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 ... (relay-agent-interface-id relay-agent-remote-id)],</code> <code>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 ... (relay-agent-interface-id relay-agent-remote-id)]</code>
Release Information	Statement introduced in Junos OS Release 13.2. Support at the [... relay-agent-remote-id] hierarchy level introduced in Junos OS Release 15.1.
Description	<p>For the relay-agent-interface-id statement, specify that in dual-stack environments, the DHCPv6 relay agent uses an Interface-ID option (option 18) that is based on the DHCPv4 relay agent information option (option 82). When you include this statement, the DHCPv6 relay agent checks for the option 82 Agent Circuit-ID suboption (suboption 1) and inserts it into the outgoing RELAY-FORW message.</p> <p>For the relay-agent-remote-id statement, specify that in dual-stack environments, the DHCPv6 relay agent uses a Remote-ID option (option 37) that is based on the DHCPv4 relay agent information option (option 82). When you include this statement, the DHCPv6 relay agent checks for the option 82 Remote-ID suboption (suboption 2) and inserts it into the outgoing RELAY-FORW message.</p>
Options	strict —(Optional) (relay-agent-remote-id only) The router drops Solicit messages that do not include a DHCPv4 Remote-ID (option 82 suboption 2). If you do not specify the strict keyword, the router sends the RELAY-FORW message without adding option 37.
Required Privilege Level	interface —To view this statement in the configuration. interface-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Using DHCP Relay Agent Option 82 Information on page 337• Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets on page 444

use-primary (DHCP Relay Agent)

Syntax	<code>use-primary <i>primary-profile-name</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay dhcpv6 dynamic-profile <i>profile-name</i>],</p> <p>[edit forwarding-options dhcp-relay dynamic-profile <i>profile-name</i>],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> dynamic-profile <i>profile-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> dynamic-profile <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.3.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Statement introduced in Junos OS Release 12.1 for EX Series switches.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	<p>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.</p> <p>Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.</p> <p>EX Series switches do not support DHCPv6.</p>

Options	<i>primary-profile-name</i> —Name of the dynamic profile to configure as the primary dynamic profile
Required Privilege	system—To view this statement in the configuration.
Level	system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces</i>

use-vlan-id

Syntax	<code>use-vlan-id;</code>
For Platforms with Enhanced Layer 2 Software (ELS)	<p>[edit forwarding-options helpers bootp dhcp-option82-circuit-id]</p> <p>[edit forwarding-options helpers bootp interface <i>interface-name</i> dhcp-option82-circuit-id]</p>
For MX Series Platforms	[edit bridge-domains <i>bridge-domain-name</i> forwarding-options dhcp-security option-82 circuit-id]
Release Information	<p>Statement introduced in Junos OS Release 9.3 for EX Series switches.</p> <p>Statement introduced in Junos OS Release 11.3 for the QFX Series.</p> <p>Hierarchy level [edit vlans <i>vlan-name</i> forwarding-options dhcp-security] introduced in Junos OS Release 13.2X50-D10. (See <i>Getting Started with Enhanced Layer 2 Software</i> for information about ELS.)</p> <p>Hierarchy level [edit bridge-domains <i>bridge-domain-name</i> forwarding-options dhcp-security] introduced in Junos OS Release 14.1 for the MX Series.</p>
<div>  <p>NOTE: The EX Series switches that support the <code>use-vlan-id</code> statement are the EX4300, EX4600, and EX9200 switches.</p> </div>	
Description	Use the VLAN ID rather than the VLAN name (the default) in the circuit ID or remote ID value in the DHCP option 82 information.
<div>  <p>NOTE: The <code>use-vlan-id</code> statement is mutually exclusive with the <code>use-interface-description</code> and <code>no-vlan-interface-name</code> statements.</p> </div> <p>The <code>use-vlan-id</code> statement only applies to interfaces in a bridge domain. The format of the Agent Circuit ID or Agent Remote ID information for Fast Ethernet or Gigabit Ethernet interfaces is as follows:</p> <pre>(fe ge)-fpc/pic/port.subunit:svlan_id-vlan_id</pre>	
<div>  <p>NOTE: The <i>subunit</i> is required and used to differentiate the interface for remote systems, and <i>svlan_id-vlan_id</i> represents the VLANs associated with the bridge domain.</p> </div>	
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

**Related
Documentation**

- *Example: Setting Up DHCP Option 82 with a Switch with No Relay Agent Between Clients and a DHCP Server*
- *Example: Setting Up DHCP Option 82 with a Switch as a Relay Agent Between Clients and a DHCP Server*
- *Setting Up DHCP Option 82 on the Switch with No Relay Agent Between Clients and DHCP Server (CLI Procedure)*
- *Setting Up DHCP Option 82 with the Switch as a Relay Agent Between Clients and DHCP Server (CLI Procedure)*
- RFC 3046, *DHCP Relay Agent Information Option*, at <http://tools.ietf.org/html/rfc3046>.

user-prefix (DHCP Local Server)

Syntax	<code>user-prefix <i>user-prefix-string</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> system services dhcp-local-server group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 authentication username-include],</p> <p>[edit system services dhcp-local-server dhcpv6 group group-name authentication username-include],</p> <p>[edit system services dhcp-local-server group group-name authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p>
Description	Specify the user prefix that is concatenated with the username during the subscriber authentication or DHCP client authentication process.
Options	<i>user-prefix-string</i> —User prefix string.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)

user-prefix (DHCP Relay Agent)

Syntax	<code>user-prefix <i>user-prefix-string</i>;</code>
Hierarchy Level	<p>[edit forwarding-options dhcp-relay authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay dual-stack-group <i>dual-stack-group-name</i> authentication username-include],</p> <p>[edit forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instance-name</i> forwarding-options dhcp-relay group <i>group-name</i> authentication username-include]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.1.</p> <p>Statement introduced in Junos OS Release 12.3R2 for EX Series switches.</p> <p>Support at the [edit ... dhcpv6] hierarchy levels introduced in Junos OS Release 11.4.</p> <p>Support at the [edit ... dual-stack-group <i>dual-stack-group-name</i>] hierarchy level introduced in Junos OS Release 15.1.</p>
Description	Specify the user prefix that is concatenated with the username during the subscriber authentication or client authentication process. Use the statement at the [edit ... dhcpv6] hierarchy levels to configure DHCPv6 support.
Options	<i>user-prefix-string</i> —User prefix string.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Using External AAA Authentication Services with DHCP on page 271](#)

user-prefix (Static Subscribers)

Syntax	<code>user-prefix <i>user-prefix-string</i>;</code>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers authentication username-include],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers authentication username-include],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication username-include],</p> <p>[edit system services static-subscribers authentication username-include],</p> <p>[edit system services static-subscribers group <i>group-name</i> authentication username-include]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	Specify that a string is included as the beginning of the username created for all static subscribers or for the static subscribers in a specified group. The group version of the statement takes precedence over the global version. The username is also sent to RADIUS in the Access-Request message.
Options	<i>user-prefix-string</i> —String that begins the username. The string can include the following characters: a through z, A through Z, 0 through 9, “-”, or “.”.
Required Privilege Level	<p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Subscribers over Static Interfaces on page 772 • Configuring the Static Subscriber Global Username on page 777 • Configuring the Static Subscriber Group Username on page 782

username-include (DHCP Local Server)

Syntax

```
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 authentication],
[edit system services dhcp-local-server dhcpv6 authentication],
[edit system services dhcp-local-server dhcpv6 group group-name authentication],
[edit system services dhcp-local-server group group-name authentication],
[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 username that the router or switch passes to the external AAA server. You must include at least one of the optional statements for the username to be valid. If you do not configure a username, the router (or switch) accesses the local authentication service only and does not use external authentication services, such as RADIUS.

The following statements are not supported in the DHCPv6 hierarchy levels:

- **mac-address**
- **option-60**
- **option-82**

The following statements are supported in the DHCPv6 hierarchy levels only:

- **relay-agent-interface-id**
- **relay-agent-remote-id**
- **relay-agent-subscriber-id**

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	<ul style="list-style-type: none">• Using External AAA Authentication Services with DHCP on page 271• Creating Unique Usernames for DHCP Clients on page 272

username-include (DHCP Relay Agent)

Syntax

```
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 authentication],
[edit forwarding-options dhcp-relay dhcpv6 authentication],
[edit forwarding-options dhcp-relay dhcpv6 group group-name authentication],
[edit forwarding-options dhcp-relay dual-stack-group dual-stack-group-name
authentication],
[edit forwarding-options dhcp-relay group group-name authentication],
[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.
Support at the **[edit ... dual-stack-group *dual-stack-group-name*]** hierarchy level introduced in Junos OS Release 15.1.

Description

Configure the username that the router (or switch) passes to the external AAA server. You must include at least one of the optional statements for the username to be valid. If you do not configure a username, the router (or switch) accesses the local authentication service only and does not use external authentication services, such as RADIUS. Use the statement at the **[edit...dhcpv6]** hierarchy levels to configure DHCPv6 support.

The following statements are not supported in the DHCPv6 hierarchy levels:

- **mac-address**
- **option-60**
- **option-82**

The following statements are supported in the DHCPv6 hierarchy levels only:

- **relay-agent-interface-id**

- `relay-agent-remote-id`
- `relay-agent-subscriber-id`

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	<ul style="list-style-type: none">• Creating Unique Usernames for DHCP Clients on page 272• Using External AAA Authentication Services with DHCP on page 271

username-include (Static Subscribers)

Syntax	<pre>username-include { domain-name domain-name; interface; logical-system-name; routing-instance-name; user-prefix user-prefix-string; }</pre>
Hierarchy Level	<p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers authentication],</p> <p>[edit logical-systems <i>logical-system-name</i> system services static-subscribers group <i>group-name</i> authentication],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers authentication],</p> <p>[edit routing-instances <i>routing-instances-name</i> system services static-subscribers group <i>group-name</i> authentication],</p> <p>[edit system services static-subscribers authentication],</p> <p>[edit system services static-subscribers group <i>group-name</i> authentication]</p>
Release Information	Statement introduced in Junos OS Release 9.6.
Description	<p>Specify the information included in the username created for all static subscribers or for static subscribers in a specified group. The group version of the statement takes precedence over the global version. The username is also sent to RADIUS in the Access-Request message.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Subscribers over Static Interfaces on page 772• Configuring the Static Subscriber Global Username on page 777• Configuring the Static Subscriber Group Username on page 782

valid-lifetime (Dynamic Router Advertisement)

Syntax	<code>valid-lifetime <i>seconds</i>;</code>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> protocols router-advertisement interface <i>interface-name</i> prefix <i>prefix</i>]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	Specify how long the prefix remains valid for onlink determination.
Options	<p><i>seconds</i>—Valid lifetime, in seconds. If you set the valid lifetime to 0xffffffff, the lifetime is infinite.</p> <p>Default: 2,592,000 seconds</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>preferred-lifetime</i> • Using NDRA to Provide IPv6 WAN Link Addressing Overview on page 385

valid-lifetime (Address-Assignment Pools)

Syntax	<code>valid-lifetime <i>seconds</i>;</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet6 dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 13.3.
Description	<p>Specify the length of time, in seconds, that the DHCPv6 server keeps the IPv6 prefix valid. When the lifetime expires, the address becomes invalid.</p> <p>If the preferred-lifetime is also configured, the valid-lifetime must be greater than the preferred-lifetime. The valid-lifetime and the maximum-lease-time are mutually exclusive and cannot both be configured.</p>
Options	<p>seconds—Number of seconds that the IPv6 prefix is valid.</p> <p>Range: 30 through 4,294,967,295 seconds</p> <p>Default: 86,400 (24 hours)</p>
Required Privilege Level	<p>admin—To view this statement in the configuration.</p> <p>admin-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567• DHCP Attributes for Address-Assignment Pools on page 243• maximum-lease-time on page 1159• preferred-lifetime (Address-Assignment Pools) on page 1237

vdsl-bytes

Syntax	<code>vdsl-bytes <i>bytes</i>;</code>
Hierarchy Level	<code>[edit protocols ancp qos-adjust]</code>
Release Information	Statement introduced in Junos OS Release 14.2.
Description	Adjust the number of overhead bytes in the actual downstream rate for a VDSL access line reported in the ANCP Port Up message by the specified number of bytes. The ANCP agent reports the adjusted value to CoS.
Options	<p>bytes—Number of bytes added to or subtracted from the actual downstream frame overhead.</p> <p>Range: -100 through 100 bytes</p> <p>Default: 0 bytes</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657 • Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653 • Configuring the ANCP Agent on page 624

vdsl-overhead-adjust

Syntax	<code>vdsl-overhead-adjust <i>percentage</i>;</code>
Hierarchy Level	<code>[edit protocols ancp qos-adjust]</code>
Release Information	Statement introduced in Junos OS Release 14.2.
Description	Adjust the actual downstream rate for a VDSL access line reported in the ANCP Port Up message by multiplying the rate by the specified percentage. The ANCP agent reports the adjusted rate to CoS.
Options	<p>percentage—Percentage by which to multiply the rate.</p> <p>Range: 80 through 100 percent</p> <p>Default: 100 percent</p>
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657 • Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653 • Configuring the ANCP Agent on page 624

vdsl2-bytes

Syntax	<code>vdsl2-bytes bytes;</code>
Hierarchy Level	[edit protocols ancp qos-adjust]
Release Information	Statement introduced in Junos OS Release 14.2.
Description	Adjust the number of overhead bytes in the actual downstream rate for a VDSL2 access line reported in the ANCP Port Up message by the specified number of bytes. The ANCP agent reports the adjusted value to CoS.
Options	bytes —Number of bytes added to or subtracted from the actual downstream frame overhead. Range: -100 through 100 bytes Default: 0 bytes
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657• Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653• Configuring the ANCP Agent on page 624

vdsl2-overhead-adjust

Syntax	<code>vdsl2-overhead-adjust percentage;</code>
Hierarchy Level	[edit protocols ancp qos-adjust]
Release Information	Statement introduced in Junos OS Release 14.2.
Description	Adjust the actual downstream rate for a VDSL2 access line received in the ANCP Port Up message by multiplying the rate by the specified percentage. The ANCP agent reports the adjusted rate to CoS.
Options	percentage —Percentage by which to multiply the rate. Range: 80 through 100 percent Default: 100 percent
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the ANCP Agent to Report Traffic Rates to CoS on page 657• Traffic Rate Reporting and Adjustment by the ANCP Agent on page 653• Configuring the ANCP Agent on page 624

vendor-specific (dhcp-relay)

Syntax	<pre> vendor-specific { host-name; location; } </pre>
Hierarchy Level	[edit forwarding-options dhcp-relay relay-option-82], [edit forwarding-options dhcp-relay group group-name relay-option-82]
Release Information	Command introduced in Junos OS Release 16.2.
Description	<p>Add vendor-specific information to the option-82, suboption 9 field of DHCPv4 control messages on server-facing interfaces. The vendor-specific information can be a hostname, a location (such as a unique connection identifier), or both. The hostname can be a string of characters such as Juniper-AB-1. The location should be specified as interface, VLAN ID, and if applicable, stacked VLAN ID. For example, <ifd-name>:<vlan> (ae0:100) or <ifd-name>:<svlan> -<vlan> (ae0:100-10).</p> <p>Junos OS automatically adds the remaining vendor-specific information as per RFC 4243. The enterprise ID is 2636. The hostname is option-data 1, and the location is option-data 2. The DHCPv4 relay strips the suboption data from replies from the server before it relays the packets out the client facing interface.</p> <p>This feature can be useful, in conjunction with operator-developed tools, for troubleshooting DHCP servers and providing service assurances. For example, a central DHCP server can log the information, and operators can query a single entity to track and troubleshoot subscriber IP information and network attachment points.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

violation-action (DHCP Local Server and DHCP Relay Agent)

Syntax	<code>violation-action <i>action</i>;</code>
Hierarchy Level	<code>[edit forwarding-options dhcp-relay lease-time-validation],</code> <code>[edit forwarding-options dhcp-relay dhcpv6 lease-time-validation],</code> <code>[edit forwarding-options dhcp-relay group <i>group-name</i> lease-time-validation],</code> <code>[edit forwarding-options dhcp-relay dhcpv6 group <i>group-name</i> lease-time-validation],</code> <code>[edit logical-systems <i>logical-system-name</i> ...],</code> <code>[edit logical-systems <i>logical-system-name</i> routing-instances <i>routing-instance-name</i>...],</code> <code>[edit routing-instances <i>routing-instance-name</i> ...],</code> <code>[edit system services dhcp-local-server lease-time-validation],</code> <code>[edit system services dhcp-local-server dhcpv6 lease-time-validation],</code> <code>[edit system services dhcp-local-server group <i>group-name</i> lease-time-validation],</code> <code>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> lease-time-validation]</code>
Release Information	Statement introduced in Junos OS Release 14.1.
Description	Configure the action that the router performs when a DHCP lease-time violation occurs. The violation occurs when a third-party DHCP server or address-assignment pool offers a DHCP lease time that is less than the threshold specified by the lease-time-threshold statement.
Options	<i>action</i> —Action taken by the router when a lease-time violation occurs. <ul style="list-style-type: none">• drop—(Optional) For DHCPv4 and DHCPv6 relay agent, the third-party lease is dropped and the client binding fails.• override-lease—(Optional) For DHCPv4 and DHCPv6 local server, the third-party lease is overridden with the value specified by the lease-time-threshold statement and binds the client using the new value.• strict—(Optional) For DHCPv4 and DHCPv6 local server, DHCP ignores the third-party lease and the client binding fails.
Required Privilege Level	system —To view this statement in the configuration. system-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a DHCP Lease-Time Threshold on page 251

vlan-nas-port-stacked-format

Syntax	vlan-nas-port-stacked-format;
Hierarchy Level	[edit access profile <i>profile-name</i> radius options]
Release Information	Statement introduced in Junos OS Release 9.1. Statement introduced in Junos OS Release 9.1 for EX Series switches.
Description	Configure RADIUS attribute 5 (NAS-Port) to include the S-VLAN ID, in addition to the VLAN ID, for subscribers on Ethernet interfaces.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring RADIUS Server Options for Subscriber Access on page 119• Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

vlan-ranges (RADIUS Options)

Syntax	<code>vlan-ranges (any <i>low-tag-high-tag</i>);</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> radius-options nas-port-options <i>nas-port-options-name</i>]
Release Information	Statement introduced in Junos OS Release 12.3.
Description	Configure the VLAN range of subscribers to which the named NAS-Port options definition applies.



NOTE: You can configure a maximum of 16 NAS-Port options definitions per physical interface. Each definition can include a maximum of 32 VLAN ranges or 32 S-VLAN ranges, but cannot include a combination of VLAN ranges and S-VLAN ranges.

Options	<p>any—Entire VLAN range representing all VLAN IDs.</p> <p>low-tag—VLAN ID tag representing the lower limit of the VLAN range. Range: 1 through 4094</p> <p>high-tag—VLAN ID tag representing the upper limit of the VLAN range. Range: 1 through 4094</p>
----------------	---



NOTE: To specify a single VLAN ID, set *low-tag* and *high-tag* to the same value.

Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 73 Guidelines for Configuring RADIUS NAS-Port Options for Subscriber Access per Physical Interface, VLAN, or Stacked VLAN on page 72

vrf-name (Duplicate Accounting)

Syntax	<code>vrf-name <i>vrf-name</i>;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> accounting duplication-vrf]
Release Information	Statement introduced in Junos OS Release 12.3R3 and supported in later 12.3Rx releases. Statement supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)
Description	Specify a nondefault VRF (LS:RI combination) to which duplicate accounting information is sent. Up to five access profiles can be defined in this VRF; the profiles point to the RADIUS accounting servers that receive the accounting information.
Options	<i>vrf-name</i> —Name of a nondefault VRF to receive duplicate accounting reports.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Understanding RADIUS Accounting Duplicate Reporting on page 97 • Configuring Authentication and Accounting Parameters for Subscriber Access on page 90

wait-for-acct-on-ack (Access Profile)

Syntax	<code>wait-for-acct-on-ack;</code>
Hierarchy Level	[edit access profile <i>profile-name</i> accounting]
Release Information	Statement introduced in Junos OS Release 12.3. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure the router's authd process to wait for an Acct-On-Ack response message from RADIUS before sending new authentication and accounting updates to the RADIUS server. This configuration ensures that when a new subscriber session starts, the authentication and accounting information for the new session does not get deleted when RADIUS clears previously existing session state information.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring RADIUS Server Parameters for Subscriber Access on page 118 • Configuring Per-Subscriber Session Accounting on page 104

wins-server (Access)

Syntax	<code>wins-server { <code>ipv4-address</code>; }</code>
Hierarchy Level	[edit access address-assignment pool <i>pool-name</i> family inet dhcp-attributes]
Release Information	Statement introduced in Junos OS Release 9.0.
Description	Specify one or more NetBIOS name servers (NBNS) that the client uses to resolve NetBIOS names. This is equivalent to DHCP option 44.
Options	<i>ipv4-address</i> —IP address of each NetBIOS name server; add them to the configuration in order of preference.
Required Privilege Level	admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Address-Assignment Pools on page 567

CHAPTER 107

Operational Commands

- clear ancp neighbor
- clear ancp statistics
- clear ancp subscriber
- clear dhcp relay binding
- clear dhcp relay statistics
- clear dhcp server binding
- clear dhcp server statistics
- clear dhcpv6 relay binding
- clear dhcpv6 relay statistics
- clear dhcpv6 server binding
- clear dhcpv6 server statistics
- clear diameter function statistics
- clear diameter peer
- clear extensible-subscriber-services counters
- clear extensible-subscriber-services sessions
- clear ipv6 router-advertisement
- clear network-access aaa statistics
- clear network-access aaa subscriber
- clear network-access gx-plus replay
- clear network-access gx-plus statistics
- clear network-access ocs statistics
- clear network-access pcrf
- request services subscribers clear
- clear services subscriber sessions
- clear system subscriber-management statistics
- request ancp oam interface
- request ancp oam neighbor
- request dhcp relay bulk-leasequery

- request dhcp relay leasequery
- request dhcp relay bulk-leasequery
- request dhcp relay leasequery
- request dhcp server reconfigure
- request dhcpv6 server reconfigure
- request dhcpv6 relay bulk-leasequery
- request dhcpv6 relay leasequery
- request network-access aaa subscriber set session-id
- request services extensible-subscriber-services reload-dictionary
- request services static-subscribers login group
- request services static-subscribers logout group
- request services static-subscribers login interface
- request services static-subscribers logout interface
- request system reboot
- restart extensible-subscriber-services
- set request services subscribers
- show accounting pending-accounting-stops
- show ancp cos
- show ancp neighbor
- show ancp statistics
- show ancp subscriber
- show ancp summary
- show ancp summary neighbor
- show ancp summary subscriber
- show class-of-service interface
- show class-of-service interface-set
- show class-of-service scheduler-map
- show class-of-service scheduler-map
- show class-of-service traffic-control-profile
- show database-replication statistics
- show database-replication summary
- show network-access aaa accounting
- show dhcp relay binding
- show dhcp relay statistics
- show dhcp server binding
- show dhcp server statistics
- show dhcpv6 relay binding

- `show dhcpv6 relay statistics`
- `show dhcpv6 server binding`
- `show dhcpv6 server statistics`
- `show diameter`
- `show diameter function`
- `show diameter function statistics`
- `show diameter instance`
- `show diameter network-element`
- `show diameter network-element map`
- `show diameter peer`
- `show diameter peer map`
- `show diameter peer statistics`
- `show diameter route`
- `show extensible-subscriber-services accounting`
- `show extensible-subscriber-services counters`
- `show extensible-subscriber-services debug-information`
- `show extensible-subscriber-services dictionary`
- `show extensible-subscriber-services dictionary attributes`
- `show extensible-subscriber-services dictionary services`
- `show extensible-subscriber-services sessions`
- `show extensible-subscriber-services service`
- `show ipv6 router-advertisement`
- `show network-access aaa accounting`
- `show network-access aaa radius-servers`
- `show network-access aaa statistics`
- `show network-access aaa statistics authentication`
- `show network-access aaa statistics pending-accounting-stops`
- `show network-access aaa statistics preauthentication`
- `show network-access aaa subscribers`
- `show network-access aaa subscribers session-id`
- `show network-access aaa terminate-code`
- `show network-access address-assignment pool`
- `show network-access domain-map`
- `show network-access gx-plus`
- `show network-access nasreq statistics`
- `show network-access ocs`
- `show network-access pcrf`

- `show ppp address-pool`
- `show route`
- `show route extensive`
- `show services subscriber bandwidth`
- `show services subscriber dynamic-policies`
- `show services subscriber flows`
- `show services subscriber sessions`
- `show services subscriber statistics`
- `show static-subscribers sessions`
- `show subscribers`
- `show subscribers summary`
- `show system subscriber-management route`
- `show system subscriber-management statistics`
- `show system subscriber-management summary`
- `test aaa authd-lite user`
- `test aaa dhcp user`
- `test aaa ppp user`

clear ancp neighbor

Syntax	clear ancp neighbor <ip-address <i>ip-address</i>> <system-name <i>mac-address</i>>
Release Information	Command introduced in Junos OS Release 9.4.
Description	<p>Clear the ANCP agent connection with all ANCP neighbors or with the specified ANCP neighbor. This command deletes information for subscribers associated with the neighbor, causing the adjusted traffic rates to revert to the configured rate for the subscriber interfaces. The neighbor remains configured (its administrative state is <i>enabled</i>) and can reestablish adjacencies.</p> <p>This command initiates logout of ANCP-triggered dynamic VLAN sessions on the physical interface associated with the specified neighbor; conventionally autosensed dynamic VLAN sessions and their associated logical interfaces are not affected.</p>
Options	<p>none—Clear all ANCP neighbors.</p> <p>ip-address <i>ip-address</i>—(Optional) Clear the ANCP neighbor specified by the IP address.</p> <p>system-name <i>mac-address</i>—(Optional) Clear the ANCP neighbor specified by the MAC address.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show ancp neighbor on page 1514
List of Sample Output	clear ancp neighbor on page 1437 show ancp neighbor on page 1437
Output Fields	When you enter this command, you are provided no feedback on the status of your request. You can enter the show ancp neighbor command before and after clearing the ANCP neighbors to verify the clear operation.

Sample Output

clear ancp neighbor

```
user@host> clear ancp neighbor
```

show ancp neighbor

The following sample output displays the connections with ANCP neighbors before and after the **clear ancp neighbor** command was issued.

```
user@host> show ancp neighbor
```

IP Address	MAC Address	State	Subscriber	Capabilities
------------	-------------	-------	------------	--------------

			Count	
203.0.113.102	00:00:5e:00:53:10	Established	5	Topo
203.0.113.122	00:00:5e:00:53:12	Established	5	Topo
203.0.113.132	00:00:5e:00:53:13	Established	5	Topo
203.0.113.142	00:00:5e:00:53:14	Established	5	Topo

```
user@host> clear ancp neighbor ip-address 203.0.113.102
```

```
user@host> show ancp neighbor
```

IP Address	MAC Address	State	Subscriber Count	Capabilities
203.0.113.122	00:00:5e:00:53:12	Established	5	Topo
203.0.113.132	00:00:5e:00:53:13	Established	5	Topo
203.0.113.142	00:00:5e:00:53:14	Established	5	Topo

clear ancp statistics

Syntax	<code>clear ancp statistics</code> <code><ip-address <i>ip-address</i>></code> <code><system-name <i>mac-address</i>></code>
Release Information	Command introduced in Junos OS Release 13.3.
Description	Clear current statistics accumulated by the ANCP agent for all ANCP neighbors or the specified neighbor.
Options	<p>none—Clear all ANCP statistics.</p> <p>ip-address <i>ip-address</i>—(Optional) Clear statistics for the ANCP neighbor specified by the IP address.</p> <p>system-name <i>mac-address</i>—(Optional) Clear statistics for the ANCP neighbor specified by the MAC address.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show ancp neighbor on page 1514
List of Sample Output	clear ancp statistics on page 1439 show ancp neighbor on page 1439
Output Fields	When you enter this command, you are provided no feedback on the status of your request. You can enter the show ancp neighbor command before and after clearing the ANCP neighbor statistics to verify the clear operation.

Sample Output

clear ancp statistics

```
user@host> clear ancp statistics
```

show ancp neighbor

The following sample output displays statistics for an ANCP neighbor before and after the **clear ancp statistics** command was issued.

```
user@host> show ancp neighbor ip-address 192.168.10.1 detail
Neighbor Information
  IP Address       : 192.168.10.1
  System Name      : 00:00:5E:00:53:02
  Up Time          : 38
  TCP Port         : 64959
  State            : Established
  Subscriber Count : 7
  Capabilities     : Topology Discovery
  System Instance  : 11
```

```
Peer Instance                : 1
Adjacency Timer (in 100ms)   : 50
Peer Adjacency Timer (in 100ms) : 100
Partition Type               : 0
Partition Flag               : 1
Partition Identifier         : 0
Dead Timer                   : 22
Received Syn Count           : 47
Received Synack Count        : 48
Received Rstack Count        : 2
Received Ack Count           : 12
Received Port Up Count       : 8
Received Port Down Count     : 2
Received Other Count         : 0
Sent Syn Count               : 48
Sent Synack Count            : 47
Sent Rstack Count            : 1
Sent Ack Count               : 12
Max Discovery Limit Exceed Count : 0
```

```
user@host> clear ancp statistics ip-address 192.168.10.1
```

```
user@host> show ancp neighbor ip-address 192.168.10.1 detail
```

Neighbor Information

```
IP Address                   : 192.168.10.1
System Name                   : 00:00:5E:00:53:02
Up Time                      : 38
TCP Port                     : 64959
State                        : Established
Subscriber Count              : 7
Capabilities                  : Topology Discovery
System Instance               : 11
Peer Instance                 : 1
Adjacency Timer (in 100ms)   : 50
Peer Adjacency Timer (in 100ms) : 100
Partition Type               : 0
Partition Flag               : 1
Partition Identifier         : 0
Dead Timer                   : 22
Received Syn Count           : 0
Received Synack Count        : 0
Received Rstack Count        : 0
Received Ack Count           : 0
Received Port Up Count       : 0
Received Port Down Count     : 0
Received Other Count         : 0
Sent Syn Count               : 0
Sent Synack Count            : 0
Sent Rstack Count            : 0
Sent Ack Count               : 0
Max Discovery Limit Exceed Count : 0
```

clear ancp subscriber

Syntax	clear ancp subscriber <identifier <i>identifier</i> > <ip-address <i>ip-address</i> > <system-name <i>mac-address</i> >
Release Information	Command introduced in Junos OS Release 11.4.
Description	Clear the ANCP agent connection with all ANCP subscribers or with the specified ANCP subscriber. This command deletes information for the subscribers, causing the adjusted traffic rate to revert to the configured rate for the subscriber interface, but otherwise has no affect on ANCP neighbors.
Options	<p>none—Clear all ANCP subscribers.</p> <p>identifier <i>identifier-string</i>—(Optional) Clear the ANCP subscriber identified by the access loop ID.</p> <p>ip-address <i>ip-address</i>—(Optional) Clear all ANCP subscribers on the neighbor specified by the IP address.</p> <p>system-name <i>mac-address</i>—(Optional) Clear all ANCP subscribers on the neighbor specified by the MAC address.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show ancp subscriber on page 1527
List of Sample Output	show ancp subscriber brief on page 1441 clear ancp subscriber on page 1442
Output Fields	When you enter this command, you are provided no feedback on the status of your request. You can enter the show ancp subscriber command before and after clearing the ANCP neighbors to verify the clear operation.

Sample Output

show ancp subscriber brief

```

user@host> show ancp subscriber brief

```

Loop Identifier	Type	Interface	Rate Kbps	Neighbor
port-1-10	VDSL2	set-ge-10410	64	203.0.113.102
port-1-11	VDSL2	set-ge-10411	64	203.0.113.112
port-2-10	VDSL2	ge-1/0/4.12	64	203.0.113.122
port-2-10	VDSL2	ge-1/0/4.12	64	203.0.113.123
port-2-11	VDSL2	ge-1/0/4.13	64	203.0.113.132

```
user@host> clear ancp subscriber identifier port-2-10
```

```
user@host> show ancp subscriber brief
```

Loop Identifier	Type	Interface	Rate Kbps	Neighbor
port-1-10	VDSL2	set-ge-10410	64	203.0.113.102
port-1-11	VDSL2	set-ge-10411	64	203.0.113.112
port-2-11	VDSL2	ge-1/0/4.13	64	203.0.113.132

clear ancp subscriber

```
user@host> clear ancp subscriber
```

clear dhcp relay binding

Syntax	<pre>clear dhcp relay binding <address> <all> <dual-stack> <interface interface-name> <interfaces-vlan> <interfaces-wildcard> <logical-system logical-system-name> <routing-instance routing-instance-name></pre>
Release Information	<p>Command introduced in Junos OS Release 8.3.</p> <p>Options all and interface added in Junos OS Release 8.4.</p> <p>Options interfaces-vlan and interfaces-wildcard added in Junos OS Release 12.1.</p> <p>Command introduced in Junos OS Release 12.1X48R3 for PTX Series Packet Transport Routers.</p> <p>Option dual-stack added in Junos OS Release 15.1.</p>
Description	Clear the binding state of a Dynamic Host Configuration Protocol (DHCP) client from the client table.
Options	<p>address—(Optional) Clear the binding state for the DHCP client, using one of the following entries:</p> <ul style="list-style-type: none"> <i>ip-address</i>—The specified IP address. <i>mac-address</i>—The specified MAC address. <i>session-id</i>—The specified session ID. <p>all—(Optional) Clear the binding state for all DHCP clients.</p> <p>dual-stack—(Optional) Clear the binding state for DHCPv4 clients and the associated DHCPv6 bindings in the single-session DHCP dual stack. DHCPv6 clients created in a DHCPv6-only stack are not affected.</p> <p>interface interface-name—(Optional) Clear the binding state for DHCP clients on the specified interface.</p> <p>interfaces-vlan—(Optional) Clear the binding state on the interface VLAN ID and S-VLAN ID.</p> <p>interfaces-wildcard—(Optional) The set of interfaces on which to clear bindings. This option supports the use of the wildcard character (*).</p> <p>logical-system logical-system-name—(Optional) Clear the binding state for DHCP clients on the specified logical system.</p> <p>routing-instance routing-instance-name—(Optional) Clear the binding state for DHCP clients on the specified routing instance.</p>

Required Privilege Level view

Related Documentation

- [Clearing DHCP Bindings for Subscriber Access on page 368](#)
- [show dhcp relay binding on page 1585](#)

List of Sample Output

- [clear dhcp relay binding on page 1444](#)
- [clear dhcp relay binding all on page 1444](#)
- [clear dhcp relay binding dual-stack all on page 1444](#)
- [clear dhcp relay binding interface on page 1444](#)
- [clear dhcp relay binding <interfaces-vlan> on page 1445](#)
- [clear dhcp relay binding <interfaces-wildcard> on page 1445](#)

Output Fields See [show dhcp relay binding](#) for an explanation of output fields.

Sample Output

clear dhcp relay binding

The following sample output displays the address bindings in the DHCP client table before and after the **clear dhcp relay binding** command is issued.

```
user@host> show dhcp relay binding
IP address      Hardware address  Type    Lease expires at
198.51.100.32   00:00:5e:00:53:01 active    2007-02-08 16:41:17 EST
192.168.14.8    00:00:5e:00:53:02 active    2007-02-10 10:01:06 EST
```

```
user@host> clear dhcp relay binding 198.51.100.32
```

```
user@host> show dhcp relay binding
IP address      Hardware address  Type    Lease expires at
192.168.14.8    00:00:5e:00:53:02 active    2007-02-10 10:01:06 EST
```

clear dhcp relay binding all

The following command clears all DHCP relay agent bindings:

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

clear dhcp relay binding dual-stack all

The following command clears all DHCP relay agent bindings for all DHCPv4 clients and the associated DHCPv6 bindings in the single-session DHCP dual stack. DHCPv6 clients created in a DHCPv6-only stack are not affected.

```
user@host> clear dhcp relay binding dual-stack all
```

clear dhcp relay binding interface

The following command clears DHCP relay agent bindings on a specific interface:

```
user@host> clear dhcp relay binding interface fe-0/0/3
```

clear dhcp relay binding <interfaces-vlan>

The following command uses the *interfaces-vlan* option to clear all DHCP relay agent bindings on top of the underlying interface **ae0**, which clears DHCP bindings on all demux VLANs on top of **ae0**:

```
user@host> clear dhcp relay binding interface ae0
```

clear dhcp relay binding <interfaces-wildcard>

The following command uses the *interfaces-wildcard* option to clear all DHCP relay agent bindings over a specific interface:

```
user@host> clear dhcp relay binding ge-1/0/0.*
```

clear dhcp relay statistics

Syntax	<code>clear dhcp relay statistics</code> <code><bulk-leasequery-connections></code> <code><logical-system <i>logical-system-name</i>></code> <code><routing-instance <i>routing-instance-name</i>></code>
Syntax	Syntax for EX Series switches: <code>show dhcp relay statistics</code> <code><routing-instance <i>routing-instance-name</i>></code>
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. bulk-leasequery-connections option introduced in Junos OS Release 16.1.
Description	Clear all Dynamic Host Configuration Protocol (DHCP) relay statistics.
Options	bulk-leasequery-connections —(Optional) Clear bulk leasequery statistics. logical-system <i>logical-system-name</i> —(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 <i>routing-instance-name</i> —(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	<ul style="list-style-type: none">• show dhcp relay statistics on page 1591
List of Sample Output	clear dhcp relay statistics on page 1447
Output Fields	Table 82 on page 1447 lists the output fields for the clear dhcp relay statistics command.

Table 82: clear dhcp relay statistics Output Fields

Field Name	Field Description
Packets dropped	<p>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.</p> <ul style="list-style-type: none"> • 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	<p>Number of DHCP messages received.</p> <ul style="list-style-type: none"> • 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	<p>Number of DHCP messages sent.</p> <ul style="list-style-type: none"> • BOOTREPLY—Number of BOOTP PDUs transmitted • DHCPOFFER—Number of DHCP OFFER PDUs transmitted • DHCPACK—Number of DHCP ACK PDUs transmitted • DHC PNACK—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
```

```
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
```

clear dhcp server binding

Syntax `clear dhcp server binding`
 `<address>`
 `<all>`
 `<interface interface-name>`
 `<interfaces-vlan>`
 `<interfaces-wildcard>`
 `<logical-system logical-system-name>`
 `<routing-instance routing-instance-name>`

Release Information Command introduced in Junos OS Release 9.0.
 Options *interfaces-vlan* and *interfaces-wildcard* added in Junos OS Release 12.1.

Description Clear the binding state of a Dynamic Host Configuration Protocol (DHCP) client from the client table on the extended DHCP local server.



NOTE: If you delete the DHCP server configuration, DHCP server bindings might still remain. To ensure that DHCP bindings are removed, issue the `clear dhcp server binding` command before you delete the DHCP server configuration.

Options ***address***—(Optional) Clear the binding state for the DHCP client, using one of the following entries:

- *ip-address*—The specified IP address.
- *mac-address*—The specified MAC address.
- *session-id*—The specified session ID.

all—(Optional) Clear the binding state for all DHCP clients.

interface interface-name—(Optional) Clear the binding state for DHCP clients on the specified interface.



NOTE: This option clears all bindings whose initial login requests were received over the specified interface. Dynamic demux login requests are not received over the dynamic demux interface, but rather the underlying interface of the dynamic demux interface. To clear a specific dynamic demux interface, use the *ip-address* or *mac-address* options.

interfaces-vlan—(Optional) Clear the binding state on the interface VLAN ID and S-VLAN ID.

interfaces-wildcard—(Optional) Clear bindings on a set of interfaces. This option supports the use of the wildcard character (*).

logical-system *logical-system-name*—(Optional) Clear the binding state for DHCP clients on the specified logical system.

routing-instance *routing-instance-name*—(Optional) Clear the binding state for DHCP clients on the specified routing instance.

Required Privilege Level view

Related Documentation

- [Clearing DHCP Bindings for Subscriber Access on page 368](#)
- [show dhcp server binding on page 1595](#)

List of Sample Output

- [clear dhcp server binding <ip-address> on page 1450](#)
- [clear dhcp server binding all on page 1450](#)
- [clear dhcp server binding interface on page 1451](#)
- [clear dhcp server binding <interfaces-vlan> on page 1451](#)
- [clear dhcp server binding <interfaces-wildcard> on page 1451](#)

Output Fields See [show dhcp server binding](#) for an explanation of output fields.

Sample Output

clear dhcp server binding <ip-address>

The following sample output displays the address bindings in the DHCP client table on the extended DHCP local server before and after the **clear dhcp server binding** command is issued.

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

```
2 clients, (0 bound, 0 selecting, 0 renewing, 0 rebinding)
```

IP address	Hardware address	Type	Lease expires at
198.51.100.1	00:00:5e:00:53:01	active	2007-01-17 11:38:47 PST
198.51.100.3	00:00:5e:00:53:02	active	2007-01-17 11:38:41 PST

```
user@host> clear dhcp server binding 198.51.100.1
```

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

```
1 clients, (0 bound, 0 selecting, 0 renewing, 0 rebinding)
```

IP address	Hardware address	Type	Lease expires at
198.51.100.3	00:00:5e:00:53:02	active	2007-01-17 11:38:41 PST

clear dhcp server binding all

The following command clears all DHCP local server bindings:

```
user@host> clear dhcp server binding all
```

clear dhcp server binding interface

The following command clears DHCP local server bindings on a specific interface:

```
user@host> clear dhcp server binding interface fe-0/0/2
```

clear dhcp server binding <interfaces-vlan>

The following command uses the *interfaces-vlan* option to clear all DHCP local server bindings on top of the underlying interface **ae0**, which clears DHCP bindings on all demux VLANs on top of **ae0**:

```
user@host> clear dhcp server binding ae0
```

clear dhcp server binding <interfaces-wildcard>

The following command uses the *interfaces-wildcard* option to clear all DHCP local server bindings over a specific interface:

```
user@host> clear dhcp server binding ge-1/0/0.*
```

clear dhcp server statistics

Syntax	<code>clear dhcp server statistics</code> <code><bulk-leasequery-connections></code> <code><logical-system <i>logical-system-name</i>></code> <code><routing-instance <i>routing-instance-name</i>></code>
Release Information	Command introduced in Junos OS Release 9.0. <code>bulk-leasequery-connections</code> option introduced in Junos OS Release 16.1.
Description	Clear all extended Dynamic Host Configuration Protocol (DHCP) local server statistics.
Options	<code>bulk-leasequery-connections</code> —(Optional) Clear bulk leasequery statistics. <code>logical-system <i>logical-system-name</i></code> —(Optional) Clear the statistics for DHCP clients on the specified logical system. If you do not specify a logical system, statistics are cleared for the default logical system. <code>routing-instance <i>routing-instance-name</i></code> —(Optional) Clear the statistics for DHCP clients on the specified routing instance. If you do not specify a routing instance, statistics are cleared for the default routing instance.
Required Privilege Level	view
List of Sample Output	clear dhcp server statistics on page 1452
Output Fields	See show dhcp server statistics for an explanation of output fields.

Sample Output

clear dhcp server statistics

The following sample output displays the extended DHCP local server statistics before and after the `clear dhcp server statistics` command is issued.

```
user@host> show dhcp server statistics
Packets dropped:
  Total                1
  Lease Time Violation 1

Messages received:
  BOOTREQUEST          89163
  DHCPDECLINE          0
  DHCPDISCOVER         8110
  DHCPINFORM           0
  DHCPRELEASE          0
  DHCPREQUEST          81053

Messages sent:
  BOOTREPLY            32420
  DHCPOFFER            8110
  DHCPACK              8110
  DHCPNAK              8100
```

```
user@host> clear dhcp server statistics
```

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

```
Packets dropped:
```

Total	0
-------	---

```
Messages received:
```

BOOTREQUEST	0
DHCPDECLINE	0
DHCPDISCOVER	0
DHCPINFORM	0
DHCPRELEASE	0
DHCPREQUEST	0

```
Messages sent:
```

BOOTREPLY	0
DHCPOFFER	0
DHCPACK	0
DHCPNAK	0

clear dhcpv6 relay binding

Syntax	clear dhcpv6 relay binding <address> <all> <dual-stack> <interface <i>interface-name</i>> <interfaces-vlan> <interfaces-wildcard> <logical-system <i>logical-system-name</i>> <routing-instance <i>routing-instance-name</i>>
Release Information	Command introduced in Junos OS Release 11.4. Command introduced in Junos OS Release 12.3R2 for EX Series switches. Options <i>interfaces-vlan</i> and <i>interfaces-wildcard</i> added in Junos OS Release 12.1. Command introduced in Junos OS Release 12.1X48R3 for PTX Series Packet Transport Routers. Option dual-stack added in Junos OS Release 15.1.
Description	Clear the binding state of Dynamic Host Configuration Protocol for IPv6 (DHCPv6) clients from the client table.
Options	<p>address—(Optional) Clear the binding state for the DHCPv6 client, using one of the following entries:</p> <ul style="list-style-type: none">• <i>CID</i>—The specified Client ID (CID).• <i>ipv6-prefix</i>—The specified IPv6 prefix.• <i>session-id</i>—The specified session ID. <p>all—(Optional) Clear the binding state for all DHCPv6 clients.</p> <p>dual-stack—(Optional) Clear the binding state for DHCPv6 clients and the associated DHCPv4 bindings in the single-session DHCP dual stack. DHCPv4 clients created in a DHCPv4-only stack are not affected.</p> <p>interfaces-vlan—(Optional) Clear the binding state on the interface VLAN ID and S-VLAN ID.</p> <p>interfaces-wildcard—(Optional) The set of interfaces on which to clear bindings. This option supports the use of the wildcard character (*).</p> <p>interface <i>interface-name</i>—(Optional) Clear the binding state for DHCPv6 clients on the specified interface.</p> <p>logical-system <i>logical-system-name</i>—(Optional) Clear the binding state for DHCPv6 clients on the specified logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Clear the binding state for DHCPv6 clients on the specified routing instance.</p>

Required Privilege Level view

Related Documentation

- [Clearing DHCP Bindings for Subscriber Access on page 368](#)
- [show dhcpv6 relay binding on page 1604](#)

List of Sample Output

- [clear dhcpv6 relay binding on page 1455](#)
- [clear dhcpv6 relay binding <prefix> on page 1455](#)
- [clear dhcpv6 relay binding all on page 1456](#)
- [clear dhcpv6 relay binding dual-stack all on page 1456](#)
- [clear dhcpv6p relay binding interface on page 1456](#)
- [clear dhcpv6 relay binding <interfaces-vlan> on page 1456](#)
- [clear dhcpv6 relay binding <interfaces-wildcard> on page 1456](#)

Output Fields See [show dhcpv6 relay binding](#) for an explanation of output fields.

Sample Output

clear dhcpv6 relay binding

The following sample output displays the DHCPv6 bindings before and after the **clear dhcpv6 relay binding** command is issued.

```
user@host> show dhcpv6 relay binding
```

Prefix	Session Id	Expires	State	Interface	Client DUID
2001:db8:3c4d:15::/64	1	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:01					
2001:db8:3c4d:16::/64	2	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:02					
2001:db8:3c4d:17::/64	3	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:03					
2001:db8:3c4d:18::/64	4	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:04					
2001:db8:3c4d:19::/64	5	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:05					
2001:db8:3c4d:20::/64	6	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:06					

clear dhcpv6 relay binding <prefix>

```
user@host> clear dhcpv6 relay binding 2001:db8:3c4d:15::/64
```

```
user@host> show dhcpv6 relay binding
```

Prefix	Session Id	Expires	State	Interface	Client DUID
2001:db8:3c4d:16::/64	2	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:02					
2001:db8:3c4d:17::/64	3	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:03					
2001:db8:3c4d:18::/64	4	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:04					
2001:db8:3c4d:19::/64	5	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:05					
2001:db8:3c4d:20::/64	6	83720	BOUND	ge-1/0/0.0	
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:06					

clear dhcpv6 relay binding all

The following command clears all DHCP relay agent bindings:

```
user@host> clear dhcpv6 relay binding all
```

clear dhcpv6 relay binding dual-stack all

The following command clears all DHCPv6 relay agent bindings for all DHCPv6 clients and the associated DHCPv4 bindings in the single-session DHCP dual stack. DHCPv4 clients created in a DHCPv4-only stack are not affected.

```
user@host> clear dhcpv6 relay binding dual-stack all
```

clear dhcpv6 relay binding interface

The following command clears DHCPv6 relay agent bindings on a specific interface:

```
user@host> clear dhcpv6 relay binding interface fe-0/0/2
```

clear dhcpv6 relay binding <interfaces-vlan>

The following command uses the *interfaces-vlan* option to clear all DHCPv6 relay agent bindings on top of the underlying interface **ae0**, which clears DHCPv6 bindings on all demux VLANs on top of **ae0**:

```
user@host> clear dhcpv6 relay binding interface ae0
```

clear dhcpv6 relay binding <interfaces-wildcard>

The following command uses the *interfaces-wildcard* option to clear all DHCPv6 relay agent bindings over a specific interface:

```
user@host> clear dhcpv6 relay binding ge-1/0/0.*
```

clear dhcpv6 relay statistics

Syntax	<pre>clear dhcpv6 relay statistics <bulk-leasequery-connections> <logical-system <i>logical-system-name</i>> <routing-instance <i>routing-instance-name</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 11.4.</p> <p>Command introduced in Junos OS Release 12.1X48R3 for PTX Series Packet Transport Routers.</p> <p>bulk-leasequery-connections option introduced in Junos OS Release 16.1.</p>
Description	Clear all Dynamic Host Configuration Protocol for IPv6 (DHCPv6) relay statistics.
Options	<p>bulk-leasequery-connections—(Optional) Clear bulk leasequery statistics.</p> <p>logical-system <i>logical-system-name</i>—(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.</p> <p>routing-instance <i>routing-instance-name</i>—(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.</p>
Required Privilege Level	view
List of Sample Output	clear dhcpv6 relay statistics on page 1457
Output Fields	See show dhcpv6 relay statistics for an explanation of output fields.

Sample Output

clear dhcpv6 relay statistics

The following sample output displays the DHCPv6 relay statistics before and after the **clear dhcpv6 relay statistics** command is issued.

```
user@host> show dhcpv6 relay statistics
DHCPv6 Packets dropped:
  Total                0
  Lease Time Violated  1

Messages received:
  DHCPV6_DECLINE        0
  DHCPV6_SOLICIT       10
  DHCPV6_INFORMATION_REQUEST  0
  DHCPV6_RELEASE        0
  DHCPV6_REQUEST       10
  DHCPV6_CONFIRM        0
  DHCPV6_RENEW          0
  DHCPV6_REBIND         0
  DHCPV6_RELAY_REPL     0
```

```
Messages sent:
  DHCPV6_ADVERTISE      0
  DHCPV6_REPLY          0
  DHCPV6_RECONFIGURE    0
  DHCPV6_RELAY_FORW     0

user@host> clear dhcpv6 relay statistics
user@host> show dhcpv6 relay statistics
DHCPv6 Packets dropped:
  Total                  0

Messages received:
  DHCPV6_DECLINE        0
  DHCPV6_SOLICIT        0
  DHCPV6_INFORMATION_REQUEST 0
  DHCPV6_RELEASE        0
  DHCPV6_REQUEST        0
  DHCPV6_CONFIRM        0
  DHCPV6_RENEW          0
  DHCPV6_REBIND         0
  DHCPV6_RELAY_REPL     0

Messages sent:
  DHCPV6_ADVERTISE      0
  DHCPV6_REPLY          0
  DHCPV6_RECONFIGURE    0
  DHCPV6_RELAY_FORW     0
```

clear dhcpv6 server binding

Syntax	<pre>clear dhcpv6 server binding <address> <all> <interface interface-name> <interfaces-vlan> <interfaces-wildcard> <logical-system logical-system-name> <routing-instance routing-instance-name></pre>
Release Information	<p>Command introduced in Junos OS Release 9.6.</p> <p>Options <i>interfaces-vlan</i> and <i>interfaces-wildcard</i> added in Junos OS Release 12.1.</p>
Description	Clear the binding state of a Dynamic Host Configuration Protocol for IPv6 (DHCPv6) client from the client table on the extended DHCPv6 local server.
Options	<p>address—(Optional) Clear the binding state for the DHCPv6 client, using one of the following entries:</p> <ul style="list-style-type: none"> • <i>CID</i>—The specified Client ID (CID). • <i>ipv6-prefix</i>—The specified IPv6 prefix. • <i>session-id</i>—The specified session ID. <p>all—(Optional) Clear the binding state for all DHCPv6 clients.</p> <p>interface interface-name—(Optional) Clear the binding state for DHCPv6 clients on the specified interface.</p> <p>interfaces-vlan—(Optional) Clear the binding state on the interface VLAN ID and S-VLAN ID.</p> <p>interfaces-wildcard—(Optional) Clear bindings on a set of interfaces. This option supports the use of the wildcard character (*).</p> <p>logical-system logical-system-name—(Optional) Clear the binding state for DHCPv6 clients on the specified logical system.</p> <p>routing-instance routing-instance-name—(Optional) Clear the binding state for DHCPv6 clients on the specified routing instance.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • Clearing DHCP Bindings for Subscriber Access on page 368 • show dhcpv6 server binding on page 1616
List of Sample Output	<p>clear dhcpv6 server binding all on page 1460</p> <p>clear dhcpv6 server binding <ipv6-prefix> on page 1460</p>

[clear dhcpv6 server binding interface on page 1460](#)

[clear dhcpv6 server binding <interfaces-vlan> on page 1460](#)

[clear dhcpv6 server binding <interfaces-wildcard> on page 1460](#)

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

`clear dhcpv6 server binding all`

The following command clears all DHCPv6 local server bindings:

```
user@host> clear dhcpv6 server binding all
```

`clear dhcpv6 server binding <ipv6-prefix>`

The following command clears DHCPv6 local server bindings for a specific IPv6 prefix:

```
user@host> clear dhcpv6 server binding 14/0x00010001/0x02b3be8f/0x00109400/0x0005
```

`clear dhcpv6 server binding interface`

The following command clears DHCPv6 local server bindings on a specific interface:

```
user@host> clear dhcpv6 server binding interface fe-0/0/2
```

`clear dhcpv6 server binding <interfaces-vlan>`

The following command uses the *interfaces-vlan* option to clear all DHCPv6 local server bindings on top of the underlying interface **ae0**, which clears DHCPv6 bindings on all demux VLANs on top of **ae0**:

```
user@host> clear dhcpv6 server binding interface ae0
```

`clear dhcpv6 server binding <interfaces-wildcard>`

The following command uses the *interfaces-wildcard* option to clear all DHCPv6 local server bindings over a specific interface:

```
user@host> clear dhcpv6 server binding ge-1/0/0.*
```

clear dhcpv6 server statistics

Syntax	<pre>clear dhcpv6 server statistics <bulk-leasequery-connections> <interface <i>interface-name</i>> <logical-system <i>logical-system-name</i>> <routing-instance <i>routing-instance-name</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 9.6.</p> <p>bulk-leasequery-connections option introduced in Junos OS Release 16.1.</p>
Description	Clear all extended Dynamic Host Configuration Protocol for IPv6 (DHCPv6) local server statistics.
Options	<p>bulk-leasequery-connections—(Optional) Clear bulk leasequery statistics.</p> <p>logical-system <i>logical-system-name</i>—(Optional) Clear the statistics for DHCPv6 clients on the specified logical system. If you do not specify a logical system, statistics are cleared for the default logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Clear the statistics for DHCPv6 clients on the specified routing instance. If you do not specify a routing instance, statistics are cleared for the default routing instance.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show dhcpv6 server statistics on page 1622
List of Sample Output	clear dhcpv6 server statistics on page 1461
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear dhcpv6 server statistics

```
user@host> clear dhcpv6 server statistics
```

clear diameter function statistics

Syntax	clear diameter function < <i>function-name</i> > statistics
Release Information	Command introduced in Junos OS Release 9.6. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2.
Description	Clear current statistics accumulated for a specified function (application) or for all functions associated with the Diameter instance.
Options	<i>function-name</i> —(Optional) Clear statistics for the specified function. Currently, Gx-Plus, JSRC, and packet-triggered-subscribers are supported functions.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• Gx-Plus for Provisioning Subscribers Overview on page 703• Juniper Networks Session and Resource Control (SRC) and JSRC Overview on page 755• PTSP Overview on page 783• show diameter on page 1625• show diameter function on page 1631• show diameter function statistics on page 1635
List of Sample Output	clear diameter function statistics on page 1462
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear diameter function statistics

```
user@host> clear diameter function jsrc statistics
```

clear diameter peer

Syntax	<code>clear diameter peer <i>peer-name</i></code> <code><connection statistics></code>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Delete the specified Diameter peer and clear all statistics or only current statistics for the specified peer.
Options	<p><i>peer-name</i>—Delete the Diameter peer.</p> <p><i>connection</i>—(Optional) Clear all peer statistics and restart the peer state machine for the specified Diameter peer. This is the default action.</p> <p><i>statistics</i>—(Optional) Clear current statistics for the specified Diameter peer.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 1625 • show diameter peer on page 1646 • show diameter peer map on page 1651 • show diameter peer statistics on page 1654
List of Sample Output	clear diameter peer on page 1463
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear diameter peer

```
user@host> clear diameter peer peer5 connection
```

clear extensible-subscriber-services counters

Syntax	clear extensible-subscriber-services counters
Release Information	Command introduced in Junos OS Release 15.1.
Description	Clear values of all event counters to zero. Active sessions and services counters are not reset.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show extensible-subscriber-services counters on page 1663

Sample Output

```
#clear extensible-subscriber-services counters
```

clear extensible-subscriber-services sessions

Syntax	clear extensible-subscriber-services sessions < <i>accounting-session-id</i> >
Release Information	Command introduced in Junos OS Release 15.1.
Description	Clear extensible subscriber service sessions in any state by executing the operational script or the application to remove all services created. Specify an accounting session ID to clear a specific session. If you do not specify an accounting session ID in the command, the command clears all sessions.
Options	<i>accounting-session-id</i> —(Optional) Identifier of the ESSM session you want cleared.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show extensible-subscriber-services sessions on page 1676

Sample Output

```
#clear extensible-subscriber-services sessions "jnpr demux0.1073762028:46422"
```

clear ipv6 router-advertisement

Syntax	<code>clear ipv6 router-advertisement</code> <code><interface <i>interface</i>></code> <code><logical-system (all <i>logical-system-name</i>)></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Clear IPv6 router advertisement counters.
Options	none —Clear IPv6 router advertisement counters for all interfaces. interface <i>interface</i> —(Optional) Clear IPv6 router advertisement counters for the specified interface. logical-system (all <i>logical-system-name</i>) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• show ipv6 router-advertisement on page 1679
List of Sample Output	clear ipv6 router-advertisement on page 1466
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear ipv6 router-advertisement

```
user@host> clear ipv6 router-advertisement
```

clear network-access aaa statistics

Syntax	<pre>clear network-access aaa statistics <accounting> <address-assignment (client pool <i>pool-name</i>)> <authentication> <dynamic-requests> <radius> <re-authentication> <terminate-code></pre>
Release Information	<p>Command introduced in Junos OS Release 10.0.</p> <p>Option radius introduced in Junos OS Release 11.4.</p> <p>Option terminate-code introduced in Junos OS Release 11.4.</p>
Description	Clear AAA statistics.
Options	<p>accounting—(Optional) Clear AAA accounting statistics.</p> <p>address-assignment client—(Optional) Clear AAA address-assignment statistics for the client.</p> <p>address-assignment pool <i>pool-name</i>—(Optional) Clear AAA address-assignment pool statistics.</p> <p>authentication—(Optional) Clear AAA authentication statistics.</p> <p>dynamic-requests—(Optional) Clear AAA dynamic-request statistics.</p> <p>radius—(Optional) Clears the values in the Peak and Exceeded columns only.</p> <p>re-authentication—(Optional) Clear AAA reauthentication statistics.</p> <p>terminate-code—(Optional) Clear AAA termination code statistics.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Subscriber AAA Information on page 223
List of Sample Output	<p>clear network-access aaa statistics accounting on page 1467</p> <p>clear network-access aaa statistics address-assignment pool on page 1468</p> <p>clear network-access aaa statistics radius on page 1468</p>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear network-access aaa statistics accounting

```
user@host> clear network-access aaa statistics accounting
```

clear network-access aaa statistics address-assignment pool

```
user@host> clear network-access aaa statistics address-assignment pool isp_1
```

clear network-access aaa statistics radius

```
user@host> clear network-access aaa statistics radius
```

clear network-access aaa subscriber

Syntax	<pre>clear network-access aaa subscriber <session-id <i>identifier</i> <reconnect>> <statistics username <i>username</i>> <username <i>username</i> <reconnect>></pre>
Release Information	<p>Command introduced in Junos OS Release 9.1.</p> <p>reconnect and session-id options added in Junos OS Release 16.1.</p>
Description	Clear AAA subscriber statistics and log out subscribers. You can log out subscribers based on the username or on the subscriber session identifier. Use the session identifier when more than one session has the same username string.
Options	<p>reconnect—(Optional) Reconnect as a Layer 2 wholesale session when the subscriber session has been fully logged out. This option is equivalent to issuing a RADIUS-initiated disconnect with reconnect semantics; that is, when the message includes Acct-Terminate-Cause (RADIUS attribute 49) with a value of callback (16).</p> <p>session-id <i>identifier</i>—(Optional) Log out the subscriber based on the subscriber session identifier.</p> <p>statistics username <i>username</i>—(Optional) Clear AAA subscriber statistics and log out the subscriber.</p> <p>username <i>username</i>—(Optional) Log out the AAA subscriber.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Subscriber AAA Information on page 223
List of Sample Output	clear network-access aaa subscriber statistics username on page 1469 clear network-access aaa subscriber username on page 1469 clear network-access aaa subscriber username on page 1469
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear network-access aaa subscriber statistics username

```
user@host> clear network-access aaa subscriber statistics username user22@example.com
```

clear network-access aaa subscriber username

```
user@host> clear network-access aaa subscriber username user22@example.com
```

clear network-access aaa subscriber session-id

```
user@host> clear network-access aaa subscriber session-id 18367425
```

clear network-access gx-plus replay

Syntax	clear network-access gx-plus replay
Release Information	Command introduced in Junos OS Release 11.2.
Description	Clear pending Gx-Plus login and logout requests (replays). Sends JSER message to PCRF that includes the Juniper-Event-Type AVP (AVP code 2103) with a value of 3 indicating a discovery request. The PCRF returns a JDER message to initiate discovery of all subscribers. When this discovery completes, all pending subscriber requests are cleared.
Options	This command has no options.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• clear network-access gx-plus statistics on page 1471• show network-access gx-plus on page 1722
List of Sample Output	clear network-access gx-plus replay on page 1470
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear network-access gx-plus replay

```
user@host> clear network-access gx-plus replay
```

clear network-access gx-plus statistics

Syntax	clear network-access gx-plus statistics
Release Information	Command introduced in Junos OS Release 11.2.
Description	Clear Gx-Plus statistics.
Options	This command has no options.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show network-access gx-plus on page 1722
List of Sample Output	clear network-access gx-plus statistics on page 1471
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear network-access gx-plus statistics

```
user@host> clear network-access gx-plus statistics
```

clear network-access ocs statistics

Syntax	clear network-access ocs statistics
Release Information	Command introduced in Junos OS Release 16.2.
Description	Clear Online Charging System (OCS) provisioning statistics information.
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• ocs on page 1185• show network-access ocs on page 1728• Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718• Understanding Gy Interactions Between the Router and the OCS on page 730• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735
List of Sample Output	clear network-access ocs statistics on page 1472
Output Fields	When you enter this command, you are provided no feedback on the status of your request.

Sample Output

clear network-access ocs statistics

```
user@host> clear network-access ocs statistics
```

clear network-access pcrf

Syntax	clear network-access pcrf (statistics subscribers)
Release Information	Command introduced in Junos OS Release 16.2.
Description	Clear Policy and Charging Rules Function (PCRF) provisioning statistics and subscribers information.
Options	<p>statistics—(Optional) Clear PCRF provisioning statistics.</p> <p>subscribers—(Optional) Force logout of all PCRF subscribers. Used with draining mode to flush all subscribers before making substantial configuration changes.</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • pcrf on page 1225 • show network-access pcrf on page 1730 • Understanding Gx Interactions Between the Router and the PCRF on page 722 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735 • Understanding Upstream and Downstream Messages for the PCRF on page 740
List of Sample Output	clear network-access pcrf statistics on page 1473 clear network-access pcrf subscribers on page 1473
Output Fields	When you enter this command, you are provided no feedback on the status of your request.

Sample Output

clear network-access pcrf statistics

```
user@host> clear network-access pcrf statistics
```

Sample Output

clear network-access pcrf subscribers

```
user@host> clear network-access pcrf subscribers
```

request services subscribers clear

Syntax	<code>request services subscribers clear subscriber-profile <i>profile</i> client-id <i>client-id</i></code>
Release Information	Command introduced in Junos OS Release 11.4.
Description	Clear the subscriber profile associated with the given subscriber.
Options	<i>profile</i> —Name of the subscriber profile to clear the active subscriber profile for the given subscriber. <i>client-id</i> —Client session ID assigned to the subscriber.
Required Privilege Level	clear
List of Sample Output	request services subscriber clear subscriber-profile tc_act_prof client-id on page 1474

Sample Output

[request services subscriber clear subscriber-profile tc_act_prof client-id](#)

```
user@host>request services subscriber clear subscriber-profile tc_act_prof client-id
2533274790395909 | display xml
rpc-reply xmlns:junos="http://xml.juniper.net/junos/11.1I0/junos"
  packet-triggered-subscribers-information
    xmlns="http://xml.juniper.net/junos/11.1I0/junos-packet-triggered-subscribers"
      service-subscribers-request-result junos:style="success"
    /service-subscribers-request-result
  /packet-triggered-subscribers-information
cli
  banner/banner
/ccli
/rpc-reply
```

clear services subscriber sessions

Syntax	<code>clear services subscriber sessions client-id <i>client-id</i></code>
Release Information	Command introduced in Junos OS Release 10.2.
Description	Clear the packet-triggered subscriber sessions on the router to log out the subscribers.
Options	<code>client-id <i>client-id</i></code> —Logs out the packet-triggered subscriber with this client ID. The client ID is a generated identifier assigned to each packet-triggered subscriber known to the router.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show services subscriber sessions on page 1768
List of Sample Output	clear services subscriber sessions on page 1475
Output Fields	When you issue this command, you are provided feedback on the status of your request.

Sample Output

clear services
subscriber sessions

```
user@host> clear services subscriber sessions client-id 1
Initiated logout request for 1 subscriber session(s)
```

clear system subscriber-management statistics

Syntax	clear system subscriber-management statistics
Release Information	Command introduced in Junos OS Release 15.1.
Description	Clear subscriber-management statistics.
Options	This command has no options.
Required Privilege Level	view and system
Related Documentation	<ul style="list-style-type: none">• show system subscriber-management statistics on page 1806
List of Sample Output	clear subscriber-management statistics on page 1476
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear subscriber-management statistics

```
user@host> clear subscriber-management statistics
```

request ancp oam interface

Syntax	request ancp oam interface (<i>interface-name</i> interface-set <i>set-name</i>) <count <i>count</i> > <timeout <i>duration</i> >
Release Information	Command introduced in Junos OS Release 11.4.
Description	Trigger the access node to run a loopback test on the local loop between the access node and the customer premises equipment. You must specify either an ANCP interface or an ANCP interface set. The access node responds to the NAS with the results of the test.
Options	<p><i>interface-name</i>—Name of the ANCP interface on whose local loop the loopback test is run.</p> <p>interface-set <i>set-name</i>—Name of the ANCP interface set on whose local loop the loopback test is run.</p> <p>count <i>count</i>—(Optional) Number of times a loopback message is sent on the local loop. Range: 1 through 32. Default: 1.</p> <p>timeout <i>duration</i>—(Optional) Period of time in seconds that the NAS waits for a response to the OAM request. Range: 0 through 255. Default: 5.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Triggering ANCP OAM to Test the Local Loop on page 671
List of Sample Output	request ancp oam interface on page 1477
Output Fields	When you enter this command, you are provided feedback on the status of your request, including the result of the test, the response code, and the response string returned with the OAM response in the event of failure, an error code is displayed.

Sample Output

request ancp oam interface

```
user@host> request ancp oam interface ge-1/0/4.12 count 5 timeout 40
request succeeded
0x503 : DSL line status showtime
DEFAULT RESPONSE
```

request ancp oam neighbor


Syntax	request ancp oam neighbor (ip-address <i>ip-address</i> system-name <i>neighbor-name</i>) subscriber <i>identifier-string</i> < count <i>count</i> > < timeout <i>duration</i> >
Release Information	Command introduced in Junos OS Release 11.4.
Description	Trigger the access node to run a loopback test on the local loop between the access node and the customer premises equipment. You must specify both the access node and the subscriber. The access node responds to the NAS with the results of the test.
Options	<p>ip-address <i>ip-address</i>—IP address that specifies the access node on whose local loop the loopback test is run.</p> <p>system-name <i>neighbor-name</i>—System name that specifies the access node on whose local loop the loopback test is run.</p> <p>subscriber <i>identifier-string</i>—Access identifier that specifies the subscriber on whose local loop the loopback test is run.</p> <p>count <i>count</i>—(Optional) Number of times a loopback message is sent on the local loop. Range: 1 through 32. Default: 1.</p> <p>timeout <i>duration</i>—(Optional) Period of time in seconds that the NAS waits for a response to the OAM request. Range: 0 through 255. Default: 5.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Triggering ANCP OAM to Test the Local Loop on page 671
List of Sample Output	request ancp oam subscriber on page 1478
Output Fields	When you enter this command, you are provided feedback on the status of your request, including the result of the test, the response code, and the response string returned with the OAM response in the event of failure, an error code is displayed.

Sample Output

request ancp oam subscriber

```
user@host> request ancp oam neighbor 203.0.113.21 subscriber "dslam port-1-11"
request succeeded
0x503 : DSL line status showtime
DEFAULT RESPONSE
```

request dhcp relay bulk-leasequery

Syntax	request dhcp relay bulk-leasequery (<i>client-id</i> <i>ipv4-address</i> <i>mac-address</i>) <server-address <i>address</i> server-group <i>group-name</i> > <logical-system <i>logical-system</i> > <routing-instance <i>routing-instance</i> >
Release Information	Command introduced in Junos OS Release 16.1.
Description	Initiate the bulk leasequery operation that updates binding information for subscribers by requesting that DHCP relay agent send the bulk leasequery message to the configured DHCP servers. The DHCP bulk leasequery feature must be configured in the DHCP relay agent.
Options	<p> NOTE: You must configure at least one of <i>client-id</i>, <i>ipv4-address</i>, or <i>mac-address</i>.</p> <p><i>address</i>—Specify the IP address of the DHCP local server to query.</p> <p><i>client-id</i>—Use the DHCP client identifier option (option 61) to identify the client whose binding information is requested.</p> <p><i>group-name</i>—Specify the name of a group of DHCP local servers to query.</p> <p><i>mac-address</i>—Use the MAC address to identify the client whose binding information is requested.</p> <p><i>logical-system</i>—Specify an optional logical system for the DHCP server being queried. The default logical system is used by default.</p> <p><i>routing-instance</i>—Specify an optional routing instance for the DHCP server being queried. The default routing instance is used by default.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263
List of Sample Output	request dhcp relay bulk-leasequery on page 1479
Output Fields	When you enter this command, DHCP relay agent initiates the bulk leasequery operation.

Sample Output

request dhcp relay bulk-leasequery

```
user@host> request dhcp relay bulk-leasequery 4/1224 server-address 192.168.10.10
```

request dhcp relay leasequery

Syntax request dhcp relay leasequery (*client-id* | *ipv4-address* | *mac-address*)
<server-address *address* | server-group *group-name*>
<logical-system *logical-system*>
<routing-instance *routing-instance*>

Release Information Command introduced in Junos OS Release 16.1.

Description Initiate the leasequery operation that updates binding information for a specific subscriber by requesting that DHCP relay agent send the leasequery message to the configured DHCP servers. The DHCP leasequery feature must be configured in the DHCP relay agent.

Options



NOTE: You must configure at least one of *client-id*, *ipv4-address*, or *mac-address*.

address—Specify the IP address of the DHCP local server to query.

client-id—Use the DHCP client identifier option (option 61) to identify the client whose binding information is requested.

group-name—Specify the name of a group of DHCP local servers to query.

ipv4-address—Use the IPv4 address to identify the client whose binding information is requested.

logical-system—Specify an optional logical system for the DHCP servers being queried. The default logical system is used by default.

mac-address—Use the MAC address to identify the client whose binding information is requested.

routing-instance—Specify an optional routing instance for the DHCP servers being queried. The default routing instance is used by default.

Required Privilege Level view

Related Documentation

- [Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263](#)

List of Sample Output [request dhcp relay leasequery on page 1481](#)


Output Fields When you enter this command, DHCP relay agent initiates the leasequery operation.

Sample Output

request dhcp relay leasequery

```
user@host> request dhcp relay leasequery 192.168.25.25 server-group DHCPgroup-10
```

request dhcp relay bulk-leasequery

Syntax	request dhcp relay bulk-leasequery (<i>client-id</i> <i>ipv4-address</i> <i>mac-address</i>) <server-address <i>address</i> server-group <i>group-name</i> > <logical-system <i>logical-system</i> > <routing-instance <i>routing-instance</i> >
Release Information	Command introduced in Junos OS Release 16.1.
Description	Initiate the bulk leasequery operation that updates binding information for subscribers by requesting that DHCP relay agent send the bulk leasequery message to the configured DHCP servers. The DHCP bulk leasequery feature must be configured in the DHCP relay agent.
Options	<p> NOTE: You must configure at least one of <i>client-id</i>, <i>ipv4-address</i>, or <i>mac-address</i>.</p> <p><i>address</i>—Specify the IP address of the DHCP local server to query.</p> <p><i>client-id</i>—Use the DHCP client identifier option (option 61) to identify the client whose binding information is requested.</p> <p><i>group-name</i>—Specify the name of a group of DHCP local servers to query.</p> <p><i>mac-address</i>—Use the MAC address to identify the client whose binding information is requested.</p> <p><i>logical-system</i>—Specify an optional logical system for the DHCP server being queried. The default logical system is used by default.</p> <p><i>routing-instance</i>—Specify an optional routing instance for the DHCP server being queried. The default routing instance is used by default.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263
List of Sample Output	request dhcp relay bulk-leasequery on page 1482
Output Fields	When you enter this command, DHCP relay agent initiates the bulk leasequery operation.

Sample Output

request dhcp relay bulk-leasequery

```
user@host> request dhcp relay bulk-leasequery 4/1224 server-address 192.168.10.10
```

request dhcp relay leasequery

Syntax	request dhcp relay leasequery (<i>client-id</i> <i>ipv4-address</i> <i>mac-address</i>) <server-address <i>address</i> server-group <i>group-name</i> > <logical-system <i>logical-system</i> > <routing-instance <i>routing-instance</i> >
Release Information	Command introduced in Junos OS Release 16.1.
Description	Initiate the leasequery operation that updates binding information for a specific subscriber by requesting that DHCP relay agent send the leasequery message to the configured DHCP servers. The DHCP leasequery feature must be configured in the DHCP relay agent.
Options	<div>  <p>NOTE: You must configure at least one of <i>client-id</i>, <i>ipv4-address</i>, or <i>mac-address</i>.</p> </div> <p>address—Specify the IP address of the DHCP local server to query.</p> <p>client-id—Use the DHCP client identifier option (option 61) to identify the client whose binding information is requested.</p> <p>group-name—Specify the name of a group of DHCP local servers to query.</p> <p>ipv4-address—Use the IPv4 address to identify the client whose binding information is requested.</p> <p>logical-system—Specify an optional logical system for the DHCP servers being queried. The default logical system is used by default.</p> <p>mac-address—Use the MAC address to identify the client whose binding information is requested.</p> <p>routing-instance—Specify an optional routing instance for the DHCP servers being queried. The default routing instance is used by default.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263
List of Sample Output	request dhcp relay leasequery on page 1484
Output Fields	When you enter this command, DHCP relay agent initiates the leasequery operation.

Sample Output

`request dhcp relay leasequery`

```
user@host> request dhcp relay leasequery 192.168.25.25 server-group DHCPgroup-10
```

request dhcp server reconfigure

Syntax `request dhcp server reconfigure (all | address | interface interface-name | logical-system logical-system-name | routing-instance routing-instance-name)`

Release Information Command introduced in Junos OS Release 10.0.
Command introduced in Junos OS Release 12.3R2 for EX Series switches.

Description Initiate reconfiguration processing for the specified DHCP clients if they are in the bound state. If the clients are in the reconfiguring state, this command has no effect. If the clients are in any state other than bound or reconfiguring, this command has the same effect as the **clear dhcp server binding** command.

When the local server state machine starts the reconfiguration process on a bound client, the client transitions to the reconfiguring state and the local server sends a **forcerenew** message to the client. Because the client was in the bound state before entering the reconfiguring state, all subscriber (or DHCP client) services, such as forwarding and statistics, continue to work. An exponential back-off timer determines the interval at which the **forcerenew** message is sent. If the final attempt is unsuccessful, the client is returned to its original state by default. You can optionally include the **clear-on-abort** statement to configure the client to be cleared when reconfiguration fails.

Options **all**—Initiate reconfiguration for all DHCP clients.

address—Initiate reconfiguration for DHCP client with the specified IP address or MAC address.

interface *interface-name*—Initiate reconfiguration for all DHCP clients on this logical interface (clients whose initial login requests were received over the specified interface).



NOTE: You cannot use the **interface *interface-name*** option with the **request dhcp server reconfigure** command for DHCP passive clients (clients that are added as a result of DHCP snooped packets). For passive clients, the interface is not guaranteed to be the next-hop interface to the client, as is the case for active clients.

logical-system *logical-system-name*—Initiate reconfiguration for all DHCP clients on the specified logical system.

routing-instance *routing-instance-name*—Initiate reconfiguration reconfigured for all DHCP clients in the specified routing instance.

Required Privilege Level view

Related Documentation • [Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298](#)

List of Sample Output [request dhcp server reconfigure on page 1486](#)

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

[request dhcp server reconfigure](#)

```
user@host> request dhcp server reconfigure interface fe-0/0/0.100
```

request dhcpv6 server reconfigure

Syntax	<code>request dhcpv6 server reconfigure (all <i>address</i> <i>client-id</i> interface <i>interface-name</i> logical-system <i>logical-system-name</i> routing-instance <i>routing-instance-name</i> session-id)</code>
Release Information	Command introduced in Junos OS Release 10.4. Command introduced in Junos OS Release 12.3R2 for EX Series switches.
Description	<p>Initiate reconfiguration processing for the specified DHCPv6 clients if they are in the bound state. If the clients are in the reconfiguring state, this command has no effect. If the clients are in any state other than bound or reconfiguring, this command has the same effect as the clear dhcpv6 server binding command.</p> <p>When the local server state machine starts the reconfiguration process on a bound client, the client transitions to the reconfigure state and the local server sends a reconfigure message to the client. Because the client was in the bound state before entering the reconfiguring state, all subscriber (or DHCP client) services, such as forwarding and statistics, continue to work. An exponential back-off timer determines the interval at which the reconfigure message is sent. If the final attempt is unsuccessful, the client is returned to its original state by default. You can optionally include the clear-on-abort statement to configure the client to be cleared when reconfiguration fails.</p>
Options	<p>all—Initiate reconfiguration for all DHCPv6 clients.</p> <p><i>address</i>—Initiate reconfiguration for DHCPv6 client with the specified IPv6 address.</p> <p><i>client-id</i>—Initiate reconfiguration for DHCPv6 client with the specified client ID.</p> <p>interface <i>interface-name</i>—Initiate reconfiguration for all DHCPv6 clients on this logical interface (clients whose initial login requests were received over the specified interface).</p> <p>logical-system <i>logical-system-name</i>—Initiate reconfiguration for all DHCPv6 clients on the specified logical system.</p> <p>routing-instance <i>routing-instance-name</i>—Initiate reconfiguration reconfigured for all DHCPv6 clients in the specified routing instance.</p> <p><i>session-id</i>—Initiate reconfiguration for DHCPv6 client with the specified session ID.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Configuring Dynamic Client Reconfiguration of Extended Local Server Clients on page 298
List of Sample Output	request dhcpv6 server reconfigure on page 1488
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request dhcpv6 server reconfigure

```
user@host> request dhcpv6 server reconfigure 2001db8::2/16
```

request dhcpv6 relay bulk-leasequery


Syntax	request dhcpv6 relay bulk-leasequery ([<i>client-id</i> <i>ipv6-prefix</i>] relay-id <i>relay-id</i> link-address <i>ipv6-link-address</i> remote-id <i>remote-id</i>) <server-address <i>address</i> server-group <i>group-name</i> > <logical-system <i>logical-system</i> > <routing-instance <i>routing-instance</i> >
Release Information	Command introduced in Junos OS Release 16.1.
Description	<p>Initiate the bulk leasequery operation that updates the DHCPv6 relay agent's binding information for a group of subscribers. The DHCPv6 bulk leasequery feature must be configured in the DHCPv6 relay agent.</p> <p>By default, this bulk leasequery command is initiated with relay ID of the DHCPv6 relay agent if you do not explicitly specify one of the <i>client-id</i>, <i>ipv6-prefix</i>, <i>relay-id</i>, <i>ipv6-link-address</i>, or <i>remote-id</i> options.</p>
Options	<p><i>address</i>—Specify the IPv6 address of the DHCP local server to query.</p> <p><i>client-id</i>—Update binding information for clients identified by the specified DHCPv6 Client ID option (option 1).</p> <p><i>group-name</i>—Specify the name of a group of DHCP local servers to query.</p> <p><i>ipv6-link-address</i>—Update binding information for clients associated with the specified IPv6 network segment.</p> <p><i>ipv6-prefix</i>—Update binding information for clients identified by the specified IPv6 prefix.</p> <p><i>logical-system</i>—Specify an optional logical system for the clients. The default logical system is used by default.</p> <p><i>relay-id</i>—Update binding information for clients associated with the DHCPv6 relay identified by the DHCP Unique Identifier (DUID) in the specified Relay-ID option.</p> <p><i>remote-id</i>—Update binding information for clients associated with the specified Relay Agent Remote-ID option (option 37).</p> <p><i>routing-instance</i>—Specify an optional routing instance for the clients. The default routing instance is used by default.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263
List of Sample Output	request dhcpv6 relay bulk-leasequery on page 1490
Output Fields	When you enter this command, DHCPv6 relay agent initiates the bulk leasequery operation.

Sample Output

`request dhcpv6 relay bulk-leasequery`

```
user@host> request dhcpv6 relay bulk-leasequery LL0x1-00:00:65:03:01:02 server-address  
2001:db8:3000:0:8001::5/128
```

request dhcpv6 relay leasequery

Syntax	request dhcpv6 relay leasequery (<i>client-id</i> <i>ipv6-prefix</i>) <server-address <i>address</i> server-group <i>group-name</i> > <logical-system <i>logical-system</i> > <routing-instance <i>routing-instance</i> >
Release Information	Command introduced in Junos OS Release 16.1.
Description	Initiate the leasequery operation that updates binding information for a specific subscriber by requesting that DHCPv6 relay agent send the leasequery message to the configured DHCP servers. The DHCP leasequery feature must be configured in the DHCPv6 relay agent.
Options	<div>  NOTE: You must configure at least one of <i>client-id</i> or <i>ipv6-prefix</i>. </div> <p>address—Specify the IPv6 address of the DHCP local server to query.</p> <p>client-id—Use the DHCPv6 Client ID option (option 1) to identify the client whose binding information is requested.</p> <p>group-name—Specify the name of a group of DHCP local servers to query.</p> <p>ipv6-prefix—Use the IPv6 prefix to identify the client whose binding information is requested.</p> <p>logical-system—Specify an optional logical system for the DHCPv6 servers being queried. The default logical system is used by default.</p> <p>routing-instance—Specify an optional routing instance for the DHCPv6 servers being queried. The default routing instance is used by default.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> Initiating DHCP Leasequery to Update the DHCP Relay Agent Lease Database on page 263
List of Sample Output	request dhcpv6 relay leasequery on page 1491
Output Fields	When you enter this command, DHCPv6 relay agent initiates the leasequery operation.

Sample Output

request dhcpv6 relay leasequery

```
user@host> request dhcpv6 relay leasequery 2001:db8:3000:0:8001::5/128
```

request network-access aaa subscriber set session-id

Syntax	<code>request network-access aaa subscriber set session-id <i>subscriber-session-id</i> provisioning-state none</code>
Release Information	Command introduced in Junos OS Release 12.3.
Description	Release control of the PCRF over the specified subscriber session. In response, AAA clears the subscriber's provisioning state and sends a terminated request to the PCRF indicating the subscriber is no longer available.
Options	<i>subscriber-session-id</i> —ID of the subscriber session.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> Disabling PCRF Control of a Subscriber Session on page 881 Activating and Deactivating Subscriber Services Locally with the CLI on page 588
List of Sample Output	request network-access aaa subscriber set session-id on page 1492
Output Fields	When you enter this command, you are provided feedback on the status of your request. Table 83 on page 1492 lists possible error messages that might be returned if the service activation fails.

Table 83: Service Activation/Deactivation Error Messages

Message	Description	Corrective Action
Error: AUTHD ISSU in progress	A unified ISSU operation is active.	Wait until the unified ISSU operation completes and then retry the service activation/deactivation.
Service activation/deactivation already in progress	Another service activation/deactivation operation is currently in progress.	Wait until the active operation completes and then retry the activation/deactivation operation.
Session identifier is not for a subscriber session	The session ID is incorrect.	Verify the correct session ID for the subscriber and then retry the activation/deactivation operation.

Sample Output

request network-access aaa subscriber set session-id

```
user@host> request network-access aaa subscriber set session-id session-id 49 provisioning-state none
Successful completion
```

request services extensible-subscriber-services reload-dictionary

Syntax	<code>request services extensible-subscriber-services reload-dictionary</code>
Release Information	Command introduced in Junos OS Release 15.1.
Description	Reload the configured dictionary to essmd.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• dictionary on page 1018• show extensible-subscriber-services dictionary on page 1666• show extensible-subscriber-services dictionary attributes on page 1670• show extensible-subscriber-services dictionary services on page 1673• Understanding the Dictionary File on page 222

Sample Output

```
# request services extensible-subscriber-services reload-dictionary
Dictionary reloaded successfully
```

request services static-subscribers login group

Syntax	request services static-subscribers login group <i>group-name</i>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Resets the state of an interface group on which static subscribers were forcibly logged out by the request services static-subscribers logout group command. This action enables static subscriber to login on the interfaces in the group.
Options	group <i>group-name</i> —Group of static subscriber interfaces on which static subscribers have been created.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Resetting the State of an Interface Group for Static Subscriber Login on page 810• request services static-subscribers logout group on page 1495
List of Sample Output	request services static-subscribers login group on page 1494
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request services static-subscribers login group

```
user@host> request services static-subscribers login group boston
```

request services static-subscribers logout group

Syntax	<code>request services static-subscribers logout group <i>igroup-name</i></code>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Force static subscribers on the interfaces in the group to be logged out. No subscriber can subsequently log in on the interface group until the interface state is reset by a router reset or the <code>request services static-subscribers login group</code> command.
Options	<code>group <i>group-name</i></code> —Group of static subscriber interfaces on which static subscribers have been created.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Forcing a Group of Static Subscribers to Be Logged Out on page 810 • request services static-subscribers login group on page 1494
List of Sample Output	request services static-subscribers logout group on page 1495
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request services static-subscribers logout group

```
user@host> request services static-subscribers logout group boston
```

request services static-subscribers login interface

Syntax	<code>request services static-subscribers login interface <i>interface-name</i></code>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Resets the state of an interface on which a static subscriber was forcibly logged out by the <code>request services static-subscribers logout interface</code> command. This action enables a static subscriber to login on the interface.
Options	<code>interface <i>interface-name</i></code> —Static interface on which a static subscriber has been created.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Resetting the State of an Interface for Static Subscriber Login on page 809• request services static-subscribers logout interface on page 1497
List of Sample Output	request services static-subscribers login interface on page 1496
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request services static-subscribers login interface

```
user@host> request services static-subscribers login interface ge-2/0/1.5
```

request services static-subscribers logout interface

Syntax	<code>request services static-subscribers logout interface <i>interface-name</i></code>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Force static subscriber on the interface to be logged out. No subscriber can subsequently log in on the interface until the interface state is reset by a router reset or the request services static-subscribers login interface command.
Options	<code>interface <i>interface-name</i></code> —Static interface on which a static subscriber has been created.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Forcing a Static Subscriber to Be Logged Out on page 809 • request services static-subscribers login interface on page 1496
List of Sample Output	request services static-subscribers logout interface on page 1497
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request services static-subscribers logout interface

```
user@host> request services static-subscribers logout interface ge-2/0/1.5
```

request system reboot

List of Syntax	Syntax on page 1498 Syntax (EX Series Switches) on page 1498 Syntax (TX Matrix Router) on page 1498 Syntax (TX Matrix Plus Router) on page 1498 Syntax (MX Series Router) on page 1498
Syntax	<code>request system reboot</code> <code><at <i>time</i>></code> <code><both-routing-engines></code> <code><in <i>minutes</i>></code> <code><media (compact-flash disk removable-compact-flash usb)></code> <code><message "<i>text</i>"></code> <code><other-routing-engine></code>
Syntax (EX Series Switches)	<code>request system reboot</code> <code><all-members></code> <code><at <i>time</i>></code> <code><both-routing-engines></code> <code><in <i>minutes</i>></code> <code><local></code> <code><media (external internal)></code> <code><member <i>member-id</i>></code> <code><message "<i>text</i>"></code> <code><other-routing-engine></code> <code><slice <i>slice</i>></code>
Syntax (TX Matrix Router)	<code>request system reboot</code> <code><all-chassis all-lcc lcc <i>number</i> scc></code> <code><at <i>time</i>></code> <code><both-routing-engines></code> <code><in <i>minutes</i>></code> <code><media (compact-flash disk)></code> <code><message "<i>text</i>"></code> <code><other-routing-engine></code>
Syntax (TX Matrix Plus Router)	<code>request system reboot</code> <code><all-chassis all-lcc lcc <i>number</i> sfc <i>number</i>></code> <code><at <i>time</i>></code> <code><both-routing-engines></code> <code><in <i>minutes</i>></code> <code><media (compact-flash disk)></code> <code><message "<i>text</i>"></code> <code><other-routing-engine></code> <code><partition (1 2 alternate)></code>
Syntax (MX Series Router)	<code>request system reboot</code> <code><all-members></code> <code><at <i>time</i>></code> <code><both-routing-engines></code> <code><in <i>minutes</i>></code> <code><local></code>

```

<media (external | internal)>
<member member-id>
<message "text">
<other-routing-engine>

```

Release Information Command introduced before Junos OS Release 7.4.
Option **other-routing-engine** introduced in Junos OS Release 8.0.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Option **sfc** introduced for the TX Matrix Plus router in Junos OS Release 9.6.
Option **both-routing-engines** introduced in Junos OS Release 12.1.

Description Reboot the software.



NOTE: Starting with Junos OS Release 15.1F3, the statement **request system reboot** reboots only the guest operating system on the PTX5000 with RE-DUO-C2600-16G and , MX240, MX480, and MX960 with RE-S-1800X4-32G-S.

Starting with Junos OS Release 15.1F5, the statement **request system reboot** reboots only the guest operating system on the MX2010, and MX2020 with REMX2K-1800-32G-S.

Options **none**—Reboot the software immediately.

all-chassis—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router or TX Matrix Plus router, reboot all routers connected to the TX Matrix or TX Matrix Plus router, respectively.

all-lcc—(TX Matrix routers and TX Matrix Plus routers only) (Optional) On a TX Matrix router or TX Matrix Plus router, reboot all line card chassis connected to the TX Matrix or TX Matrix Plus router, respectively.

all-members—(EX4200 switches and MX Series routers only) (Optional) Reboot the software on all members of the Virtual Chassis configuration.

at *time*—(Optional) Time at which to reboot the software, specified in one of the following ways:

- **now**—Stop or reboot the software immediately. This is the default.
- **+*minutes***—Number of minutes from now to reboot the software.
- ***yyymmddhhmm***—Absolute time at which to reboot the software, specified as year, month, day, hour, and minute.
- ***hh:mm***—Absolute time on the current day at which to stop the software, specified in 24-hour time.

both-routing-engines—(Optional) Reboot both Routing Engines at the same time.

in *minutes*—(Optional) Number of minutes from now to reboot the software. This option is an alias for the **at +*minutes*** option.

lcc *number*—(TX Matrix routers and TX Matrix Plus routers only) (Optional) Line-card chassis number.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

local—(EX4200 switches and MX Series routers only) (Optional) Reboot the software on the local Virtual Chassis member.

media (compact-flash | disk)—(Optional) Boot medium for next boot.

media (external | internal)—(EX Series switches and MX Series routers only) (Optional) Reboot the boot media:

- **external**—Reboot the external mass storage device.
- **internal**—Reboot the internal flash device.

member *member-id*—(EX4200 switches and MX Series routers only) (Optional) Reboot the software on the specified member of the Virtual Chassis configuration. For EX4200 switches, replace *member-id* with a value from 0 through 9. For an MX Series Virtual Chassis, replace *member-id* with a value of 0 or 1.

message "*text*"—(Optional) Message to display to all system users before stopping or rebooting the software.

other-routing-engine—(Optional) Reboot the other Routing Engine from which the command is issued. For example, if you issue the command from the master Routing Engine, the backup Routing Engine is rebooted. Similarly, if you issue the command from the backup Routing Engine, the master Routing Engine is rebooted.

partition—(TX Matrix Plus routers only) (Optional) Reboot using the specified partition on the boot media. This option has the following suboptions:

- **1**—Reboot from partition 1.
- **2**—Reboot from partition 2.
- **alternate**—Reboot from the alternate partition.

scc—(TX Matrix routers only) (Optional) Reboot the Routing Engine on the TX Matrix switch-card chassis. If you issue the command from `re0`, `re0` is rebooted. If you issue the command from `re1`, `re1` is rebooted.

sfc *number*—(TX Matrix Plus routers only) (Optional) Reboot the Routing Engine on the TX Matrix Plus switch-fabric chassis. If you issue the command from `re0`, `re0` is rebooted. If you issue the command from `re1`, `re1` is rebooted. Replace *number* with 0.

slice *slice*—(EX Series switches only) (Optional) Reboot a partition on the boot media. This option has the following suboptions:

- **1**—Power off partition 1.
- **2**—Power off partition 2.
- **alternate**—Reboot from the alternate partition.

Additional Information Reboot requests are recorded in the system log files, which you can view with the **show log** command (see *show log*). Also, the names of any running processes that are scheduled to be shut down are changed. You can view the process names with the **show system processes** command (see *show system processes*).

On a TX Matrix or TX Matrix Plus router, if you issue the **request system reboot** command on the master Routing Engine, all the master Routing Engines connected to the routing matrix are rebooted. If you issue this command on the backup Routing Engine, all the backup Routing Engines connected to the routing matrix are rebooted.



NOTE: Before issuing the **request system reboot** command on a TX Matrix Plus router with no options or the **all-chassis**, **all-lcc**, **lcc *number***, or **sfc** options, verify that master Routing Engine for all routers in the routing matrix are in the same slot number. If the master Routing Engine for a line-card chassis is in a different slot number than the master Routing Engine for a TX Matrix Plus router, the line-card chassis might become logically disconnected from the routing matrix after the **request system reboot** command.



NOTE: To reboot a router that has two Routing Engines, reboot the backup Routing Engine (if you have upgraded it) first, and then reboot the master Routing Engine.

Required Privilege Level maintenance

Related Documentation

- *clear system reboot*
- *request system halt*

- [Routing Matrix with a TX Matrix Plus Router Solutions Page](#)
- [request vmhost reboot](#)

List of Sample Output [request system reboot on page 1502](#)
[request system reboot \(at 2300\) on page 1502](#)
[request system reboot \(in 2 Hours\) on page 1502](#)
[request system reboot \(Immediately\) on page 1502](#)
[request system reboot \(at 1:20 AM\) on page 1502](#)

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

[request system reboot](#)

```
user@host> request system reboot
Reboot the system ? [yes,no] (no)
```

[request system reboot \(at 2300\)](#)

```
user@host> request system reboot at 2300 message ?Maintenance time!?
Reboot the system ? [yes,no] (no) yes
```

```
shutdown: [pid 186]
*** System shutdown message from root@test.example.net ***
System going down at 23:00
```

[request system reboot \(in 2 Hours\)](#)

The following example, which assumes that the time is 5 PM (17:00), illustrates three different ways to request the system to reboot in two hours:

```
user@host> request system reboot at +120
user@host> request system reboot in 120
user@host> request system reboot at 19:00
```

[request system reboot \(Immediately\)](#)

```
user@host> request system reboot at now
```

[request system reboot \(at 1:20 AM\)](#)

To reboot the system at 1:20 AM, enter the following command. Because 1:20 AM is the next day, you must specify the absolute time.

```
user@host> request system reboot at 06060120
request system reboot at 120
Reboot the system at 120? [yes,no] (no) yes
```

restart extensible-subscriber-services

Syntax	restart extensible-subscriber-services
Release Information	Command introduced in Junos OS Release 15.1.
Description	Restart essmd.
Required Privilege Level	system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• disable on page 1019

Sample Output

```
# restart extensible-subscriber-services
```

set request services subscribers

Syntax	<code>request services subscribers set subscriber-profile <i>profile</i> client-id <i>client-id</i></code>
Release Information	Command introduced in Junos OS Release 11.4.
Description	Set the subscriber profile associated with the given subscriber.
Options	<p><i>profile</i>—Name of the subscriber profile to create or override the currently active subscriber profile for the given subscriber.</p> <p><i>client-id</i>—Client session ID assigned to the subscriber.</p>
Required Privilege Level	view
List of Sample Output	request services subscriber set subscriber-profile tc_act_prof client-id on page 1504

Sample Output

[request services subscriber set subscriber-profile tc_act_prof client-id](#)

```
user@host> request services subscriber set subscriber-profile tc_act_prof client-id
2533274790395909 | display xml
rpc-reply xmlns:junos="http://xml.juniper.net/junos/11.1I0/junos"
  packet-triggered-subscribers-information
    xmlns="http://xml.juniper.net/junos/11.1I0/junos-packet-triggered-subscribers"
      service-subscribers-request-result junos:style="success"
    /service-subscribers-request-result
  /packet-triggered-subscribers-information
cli
  banner/banner
/ccli
/rpc-reply
```

show accounting pending-accounting-stops

Syntax	show accounting pending-accounting-stops <detail terse> <profile-name>
Release Information	Command introduced in Junos OS Release 13.1.
Description	Display all statistics for all pending accounting stop requests, including both service and session requests.
Options	<p>none—Display information for all access profiles.</p> <p>detail terse—(Optional) Display the specified level of output.</p> <p>profile-name—(Optional) Particular access profile for which you want to display accounting stop statistics.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • request network-access aaa replay pending-accounting-stops on page 1296 • show network-access aaa statistics pending-accounting-stops on page 1702
List of Sample Output	show accounting pending-accounting-stops detail on page 1507 show accounting pending-accounting-stops (Specific Profile) on page 1507 show accounting pending-accounting-stops terse on page 1507
Output Fields	Table 84 on page 1505 lists the output fields for the show accounting pending-accounting-stops command. Output fields are listed in the approximate order in which they appear.

Table 84: show accounting pending-accounting-stops Output Fields

Field Name	Field Description	Level of Output
Type	Type of client.	All levels
Username	Name of the user logged in to the session.	All levels
Logical system/Routing instance	Logical system and routing instance used for the session.	detail none
Access-profile	Access profile used for AAA services for the session.	detail none
Session ID	ID of the subscriber session; generated when the subscriber logs in. In the Service name block, this is the ID of the service session.	All levels

Table 84: show accounting pending-accounting-stops Output Fields (*continued*)

Field Name	Field Description	Level of Output
Accounting Session ID	ID of the accounting session (RADIUS attribute 44). The ID appears in decimal or description format, as specified by the accounting-session-id-format statement.	detail none
IP Address	IP address of the subscriber.	detail none
IPv6 Prefix	IPv6 address of the subscriber.	detail none
Authentication State	State of the subscriber authentication session: AuthInit , AuthStart , AuthChallenge , AuthRedirect , AuthClntRespWait , AuthAcctVolStatsAckWait , AuthAcctStopAckWait , AuthServCreateRespWait , AuthLogoutStart , AuthStateActive , AuthClntLogoutRespWait , AuthProfileUpdateWait , AuthProvisionRespWait , AuthProvisionServiceCreationWait	detail none
Accounting State	State of the subscriber accounting session: Acc-Init , Acc-Start-Sent , Imm-Update-Stats-Pending , Acc-Interim-Sent , Acc-Stop-Stats-Pending , Acc-Stop-Sent , Acc-Stop-On-Fail-Deny-Sent , Acc-Stop-Ackd	detail none
Service name	Name of the attached service or policy.	detail none
Service State	State of the service provided in the subscriber session.	detail none
Session uptime	How long the session has been up, in <i>HH:MM:SS</i> .	detail none
Accounting status	Status of the accounting configuration for the service, on or off , and the type of accounting, time or volume+time . Configured in RADIUS Service-Statistics VSA [26-69].	detail none
Service accounting session ID	ID of the service accounting session; RADIUS Acct-Session-Id attribute (44). The ID appears in decimal or description format, as specified by the accounting-session-id-format statement.	detail none
Service accounting state	State of the service accounting session: Acc-Init , Acc-Start-Sent , Imm-Update-Stats-Pending , Acc-Interim-Sent , Acc-Stop-Stats-Pending , Acc-Stop-Sent , Acc-Stop-On-Fail-Deny-Sent , Acc-Stop-Ackd	detail none
Accounting interim interval	Amount of time between interim accounting updates for this service, in seconds; RADIUS Service-Interim-Acct-Interval VSA [26-140] or Diameter Acct-Interim-Interval AVP (85).	detail none
Subscriber ID	ID of the subscriber; generated when the subscriber logs in.	detail none
Service ID	ID of the subscriber service.	All levels

Table 84: show accounting pending-accounting-stops Output Fields (*continued*)

Field Name	Field Description	Level of Output
Service	Name of the attached service or policy.	terse

Sample Output

show accounting pending-accounting-stops detail

```

user@host> show accounting pending-accounting-stops detail
Type: pppoe
Username: vjshah29@example.com
AAA Logical system/Routing instance: default:default
Access-profile: ce-ppp-profile
Session ID: 84
Accounting Session ID: 84
IP Address: 192.168.0.25
IPv6 Prefix: 2010:db8:9999:18::/48
Authentication State: AuthAcctStopAckWait
Accounting State: Acc-Stop-Stats-Pending
Service name: cos-service
  Service State: SvcInactive
  Session ID: 94
  Session uptime: 00:08:02
  Accounting status: on/time
  Service accounting session ID: 84:94-1352294677
  Service accounting state: Acc-Stop-Stats-Pending
  Accounting interim interval: 600
Service name: filter-service
  Service State: SvcInactive
  Session ID: 93
  Session uptime: 00:08:02
  Accounting status: on/volume+time
  Service accounting session ID: 84:93-1352294677
  Service accounting state: Acc-Stop-Stats-Pending
  Accounting interim interval: 600
Service name: filter-service6
  Service State: SvcInactive
  Session ID: 95
  Session uptime: 00:08:02
  Accounting status: on/volume+time
  Service accounting session ID: 84:95-1352294677
  Service accounting state: Acc-Stop-Stats-Pending
  Accounting interim interval: 600

```

show accounting pending-accounting-stops (Specific Profile)

```
user@host> show accounting pending-accounting-stops ce-ppp-profile
```

Type:	Username:	Session ID:	Service ID:	Service
pppoe	vjshah29@example.com	84		
pppoe	vjshah29@example.com	84	94	cos-service
pppoe	vjshah29@example.com	84	93	filter-service
pppoe	vjshah29@example.com	84	95	filter-service6

show accounting pending-accounting-stops terse

```
user@host> show accounting pending-accounting-stops terse
```

Type:	Username:	Session ID:	Service ID:	Service
pppoe	vjshah29@example.com	84		
pppoe	vjshah29@example.com	84	94	cos-service
pppoe	vjshah29@example.com	84	93	filter-service
pppoe	vjshah29@example.com	84	95	filter-service6
pppoe	larry@example.com	85		
pppoe	larry@example.com	85	94	cos-service
pppoe	larry@example.com	85	93	filter-service
pppoe	larry@example.com	85	95	filter-service6

show ancp cos

Syntax	show ancp cos <identifier <i>identifier</i>> <last-update> <pending-update>
Release Information	Command introduced in Junos OS Release 9.4.
Description	Display information about the CoS state for subscriber traffic.
Options	identifier <i>identifier</i> —(Optional) Display information about the local loops for the specified access identifier. last-update —(Optional) Display the most recently updated CoS information. pending-update —(Optional) Display the pending update of CoS information.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show ancp neighbor on page 1514 • show ancp statistics on page 1522 • show ancp subscriber on page 1527
List of Sample Output	show ancp cos on page 1511 show ancp cos last-update on page 1512 show ancp cos pending-update on page 1512
Output Fields	Table 85 on page 1509 lists the output fields for the show ancp cos command. Output fields are listed in the approximate order in which they appear.

Table 85: show ancp cos Output Fields

Field Name	Field Description
Per-DSL CoS adjustment	Adjustment values applied by the ANCP agent to the actual downstream rates and frame overhead for frame-mode DSL types. The agent then reports the adjusted rates to CoS to establish a shaping rate for the CoS node that corresponds to the subscriber access line.
QoS Adjust Flag	State of QoS adjust: <ul style="list-style-type: none"> • TRUE—The ANCP agent is enabled to adjust the actual downstream data rates and frame overhead and report the adjusted values to CoS. • FALSE—The ANCP agent is not enabled to adjust and report values to CoS.
SDSL overhead adjusted	Percentage by which the actual SDSL downstream rate is adjusted before reporting it to CoS.

Table 85: show ancp cos Output Fields (*continued*)

Field Name	Field Description
SDSL bytes	Number of bytes by which the actual SDSL downstream frame overhead is adjusted before reporting it to CoS.
OTHER overhead adjusted	Percentage by which the actual OTHER downstream rate is adjusted before reporting it to CoS.
OTHER bytes	Number of bytes by which the actual OTHER downstream frame overhead is adjusted before reporting it to CoS.
VDSL overhead adjusted	Percentage by which the actual VDSL downstream rate is adjusted before reporting it to CoS.
VDSL bytes	Number of bytes by which the actual VDSL downstream frame overhead is adjusted before reporting it to CoS.
VDSL2 overhead adjusted	Percentage by which the actual VDSL2 downstream rate is adjusted before reporting it to CoS.
VDSL2 bytes	Number of bytes by which the actual VDSL2 downstream frame overhead is adjusted before reporting it to CoS.
Per-DSL adjustment for reporting	Adjustment values applied by the ANCP agent to the actual downstream rates for individual DSL types to account for traffic overhead. The agent then reports the adjusted rates to AAA.
ADSL adjustment factor	Percentage by which the actual ADSL downstream rate is adjusted before reporting it to AAA.
ADSL2 adjustment factor	Percentage by which the actual ADSL2 downstream rate is adjusted before reporting it to AAA.
ADSL2+ adjustment factor	Percentage by which the actual ADSL2+ downstream rate is adjusted before reporting it to AAA.
VDSL adjustment factor	Percentage by which the actual VDSL downstream rate is adjusted before reporting it to AAA.
VDSL2 adjustment factor	Percentage by which the actual VDSL2 downstream rate is adjusted before reporting it to AAA.
SDSL adjustment factor	Percentage by which the actual SDSL downstream rate is adjusted before reporting it to AAA.
OTHER adjustment factor	Percentage by which the actual OTHER downstream rate is adjusted before reporting it to AAA.
Keepalive Timer	Interval between the keepalive messages that the ANCP agent sends to CoS.

Table 85: show ancp cos Output Fields (*continued*)

Field Name	Field Description
Cos State	State of the interaction between the ANCP agent and CoS: <ul style="list-style-type: none"> • ANCPD_COS_CONNECT_NEEDED • ANCPD_COS_CONNECT_PENDING • ANCPD_COS_CONNECT_DONE • ANCPD_COS_SESSION_SENT • ANCPD_COS_WRITE_READY
Connect Time	Time at which the ANCP agent connected to CoS; useful for debugging.
Session Time	Time at which the ANCP agent sent a session connect message to CoS; useful for debugging.
Routing Instance Time	Time at which the ANCP agent sent the routing instance to CoS; useful for debugging.
Keepalive Time	Time at which the last keepalive message was sent.
Update Time	Time at which the shaping rate was last updated.
Type	Subscriber access type: ifl indicates that a single VLAN carries subscriber traffic and iflset indicates that a set of VLANs carries subscriber traffic.
Name	System-wide name of the particular subscriber access.
Index	Access identifier.
Pending Update	Actual downstream data rate to be applied next to this local loop, in Kbps.
Last Update	Adjusted downstream data rate last reported to CoS by the ANCP agent for this local loop, in Kbps.

Sample Output

show ancp cos

```
user@host> show ancp cos
```

```
Per-DSL CoS adjustment:
  Qos Adjust Flag:      TRUE
  VDSL overhead adjusted: 90
  VDSL bytes:           20
  VDSL2 overhead adjusted: 95
  VDSL2 bytes:          -20
  SDSL overhead adjusted: 85
  SDSL bytes:           30
  OTHER overhead adjusted: 85
  OTHER bytes:          30
```

```
Per-DSL adjustment for reporting:
```

```

ADSL adjustment factor: 100
ADSL2 adjustment factor: 100
ADSL2+ adjustment factor:100
VDSL adjustment factor: 100
VDSL2 adjustment factor: 100
SDSL adjustment factor: 100
OTHER adjustment factor: 100

```

```

Keepalive Timer:      45 secs
State:                WRITE_READY
Connect Time:         Fri May 2 12:08:49 2016
Session Time:         Fri May 2 12:18:52 2016
Routing Instance Time: Fri May 2 12:18:53 2016
Keepalive Time:       Fri May 2 13:44:14 2016
Update Time:         Fri May 2 13:02:55 2016

```

Type	Name	Index	Pending Update	Last Update
iflset	aci-1004-ge-2/0/0.1073741834	4	None	36000 Kbps

show ancp cos last-update

```

Per-DSL CoS adjustment:
  Qos Adjust Flag:      TRUE
  VDSL overhead adjusted: 90
  VDSL bytes:           20
  VDSL2 overhead adjusted: 95
  VDSL2 bytes:          -20
  SDSL overhead adjusted: 85
  SDSL bytes:           30
  OTHER overhead adjusted: 85
  OTHER bytes:          30

```

```

Per-DSL adjustment for reporting:
  ADSL adjustment factor: 100
  ADSL2 adjustment factor: 100
  ADSL2+ adjustment factor:100
  VDSL adjustment factor: 100
  VDSL2 adjustment factor: 100
  SDSL adjustment factor: 100
  OTHER adjustment factor: 100

```

```

Keepalive Timer:      45 secs
State:                WRITE_READY
Connect Time:         Fri May 2 12:08:49 2016
Session Time:         Fri May 2 12:18:52 2016
Routing Instance Time: Fri May 2 12:18:53 2016
Keepalive Time:       Fri May 2 13:44:34 2016
Update Time:         Fri May 2 13:02:55 2016

```

Type	Name	Index	Pending Update	Last Update
iflset	aci-1004-ge-2/0/0.1073741834	4	None	36000 Kbps

show ancp cos pending-update

```

user@host> show ancp cos pending-update
Per-DSL CoS adjustment:
  Qos Adjust Flag:      TRUE
  VDSL overhead adjusted: 90

```

VDSL bytes: 20
VDSL2 overhead adjusted: 95
VDSL2 bytes: -20
SDSL overhead adjusted: 85
SDSL bytes: 30
OTHER overhead adjusted: 85
OTHER bytes: 30

Per-DSL adjustment for reporting:

ADSL adjustment factor: 100
ADSL2 adjustment factor: 100
ADSL2+ adjustment factor: 100
VDSL adjustment factor: 100
VDSL2 adjustment factor: 100
SDSL adjustment factor: 100
OTHER adjustment factor: 100

Keepalive Timer: 45 secs
State: WRITE_READY
Connect Time: Fri May 2 12:08:49 2016
Session Time: Fri May 2 12:18:52 2016
Routing Instance Time: Fri May 2 12:18:53 2016
Keepalive Time: Fri May 2 13:44:34 2016
Update Time: Fri May 2 13:02:55 2016

show ancp neighbor

Syntax	<pre>show ancp neighbor <brief detail> <ip-address ip-address <system-name mac-address></pre>
Release Information	Command introduced in Junos OS Release 9.4.
Description	Display information about all ANCP neighbors or the specified ANCP neighbor, regardless of operational state.
Options	<p>brief detail—(Optional) Display the specified level of detail.</p> <p>ip-address ip-address—(Optional) Display information about the neighbor (access node) specified by the IP address.</p> <p>system-name mac-address—(Optional) Display information about the neighbor (access node) specified by the MAC address.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show ancp cos on page 1509 • show ancp subscriber on page 1527
List of Sample Output	show ancp neighbor on page 1517 show ancp neighbor detail on page 1517 show ancp neighbor ip-address on page 1519 show ancp neighbor system-name on page 1520
Output Fields	Table 86 on page 1514 lists the output fields for the show ancp neighbor command. Output fields are listed in the approximate order in which they appear.

Table 86: show ancp neighbor Output Fields

Field Name	Field Description	Level of Output
Version	Version of the ANCP implementation: <ul style="list-style-type: none"> • 0x31—General Switch Management Protocol (GSMP) version 3, sub-version 1; ANCP version before <i>RFC 6320, Protocol for Access Node Control Mechanism in Broadband Networks</i>. • 0x32—ANCP version 1, defined in <i>RFC 6320, Protocol for Access Node Control Mechanism in Broadband Networks</i>. 	brief detail none
IP Address	IP address of the ANCP neighbor.	brief detail none
Partid	Number that associates the ANCP message with a specific partition.	brief none

Table 86: show ancp neighbor Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	Operational state of the ANCP adjacency: <ul style="list-style-type: none"> Configured—The neighbor has been configured, but has never been in the Established state. An asterisk (*) is prefixed to the neighbor entry for this state. Establishing—Adjacency negotiations are in progress for the neighbor. An asterisk (*) is prefixed to the neighbor entry for this state. This state is rarely seen because the adjacency is established so quickly. Established—Adjacency negotiations have succeeded for the neighbor and an ANCP session has been established. Not Estblshed—Not Established; adjacency negotiations are ready to begin. Indicates that this neighbor previously had been in the Established state; that is, it has lost a previously established adjacency. An asterisk (*) is prefixed to the neighbor entry for this state. 	All levels
Time	How long the adjacency has been up in one of the following formats: <ul style="list-style-type: none"> <i>nwndnh</i>—number of weeks, days, and hours <i>nd hh:mm:ss</i>—number of days, hours, minutes, and seconds 	brief detail none
Subscriber Count	Number of subscribers associated with the ANCP neighbor (access local loop).	brief none
Capabilities	Negotiated ANCP capability: <ul style="list-style-type: none"> Topo—Topology discovery. OAM—Performance of local Operations Administration Maintenance (OAM) procedures on an access loop controlled by the router. 	All levels
System Name	MAC address of the ANCP neighbor.	detail
TCP Port	TCP port on which ANCP messages are exchanged.	detail
System Instance	Number identifying the ANCP link instance from the edge device's perspective.	detail
Peer Instance	Number identifying the ANCP instance from the access node's perspective. This number is unique and changes when the node or link comes back up after going down.	detail
Timer	Adjacency timer value advertised by the ANCP peer in 100 ms increments; the interval between ANCP ACK messages. This value remains constant for the duration of an ANCP session.	detail
Partition Type	Number that identifies whether partitions are used and how the ID is negotiated: <ul style="list-style-type: none"> 0—No partition. 1—Fixed partition requested. 2—Fixed partition assigned. 	detail
Partition Flag	Number that specifies the type of partition requested: 1 (new adjacency) or 2 (recovered adjacency).	detail

Table 86: show ancp neighbor Output Fields (*continued*)

Field Name	Field Description	Level of Output
Partition Identifier	Number that associates the ANCP message with a specific partition.	detail
Partition Adjacencies	Number of adjacencies that share the partition.	detail
Dead Timer	Remaining period that the edge device waits for adjacency packets from a neighbor before declaring the neighbor to be down. The maximum dead time value is three times the configured adjacency timer value. This field displays the current value based on the time that the last adjacency packet was received.	detail
Received Syn Count	Number of synchronization messages received from neighbors to maintain adjacencies.	detail
Received Synack Count	Number of synchronization acknowledgment messages received from neighbors in response to the node's synchronization messages.	detail
Received Rstack Count	Number of messages received from neighbors indicating that the link to the neighbor needs to be reset.	detail
Received Ack Count	Number of acknowledgment messages periodically received from neighbors after an adjacency has been established.	detail
Received Port Up Count	Number of status messages received from neighbors indicating that a port has transitioned to the up state.	detail
Received Port Down Count	Number of status messages received from neighbors indicating that a port has transitioned to the down state.	detail
Received Generic Resp Count	Number of generic response messages received from neighbors.	detail
Received Adjacency Update Count	Number of adjacency update messages received from neighbors.	detail
Received OAM Count	Number of OAM responses received from neighbors in reply to request commands.	detail
Received Other Count	Number of all other ANCP message packets received from neighbors that do not fit into one of the other categories.	detail
Sent Syn Count	Number of synchronization messages sent to neighbors to maintain adjacencies.	detail
Sent Synack Count	Number of synchronization acknowledgment messages sent to neighbors in response to the their synchronization messages.	detail
Sent Rstack Count	Number of messages sent to neighbors indicating that the link to the neighbor needs to be reset.	detail
Sent Ack Count	Number of acknowledgment messages periodically sent to neighbors after an adjacency has been established.	detail

Table 86: show ancp neighbor Output Fields (*continued*)

Field Name	Field Description	Level of Output
Sent Generic Resp Count	Number of generic response messages sent to neighbors.	detail
Sent OAM Count	Number of OAM request commands sent to neighbors.	detail
Max Discovery Limit Exceed Count	Number of times that the maximum number of discovery table entries accepted from the neighbor has been exceeded.	detail
Result Codes	<p>Number of generic response messages sent to neighbors that include each of the following result codes:</p> <ul style="list-style-type: none"> • Invalid Request Message Count—A properly formed request message violated the protocol because of timing (such as a race condition) or direction of transmission. • Specified Port(s) Down Count—One or more of the specified ports are down because of a state mismatch between the router and an ANCP control application. • Out of Resources Count—ANCP is out of resources, probably not related to the access lines. This result code is sent only by an access node. • Request Msg Not Implemented Count— • Malformed Msg Count—Message is malformed because it was corrupted in transit or there was an implementation error at either end of the connection. • TLV Missing Count—One or more mandatory TLVs was missing from a request. • Invalid TLV Contents Count—The contents of one or more TLVs in the request do not match its required specification. • Non-Existent Port(s) Count—One or more of the ports specified in a request do not exist, possibly because of a configuration mismatch between the access node and the router or AAA. 	detail

Sample Output

show ancp neighbor

```

user@host> show ancp neighbor
  Version IP Address      PartID  State      Time      Subscriber
Capabilities
  0x31    203.0.113.13          0      Established  11:24      Count
Topo      0x31    203.0.113.15          0      Not Estblshd  2:45      2
Topo
* 0x0    198.51.100.102         0      Establishing  0          0
* 0x0    192.0.2.0              0      Configured   0          0
* 0x0    192.0.2.1              0      Configured   0          0

```

show ancp neighbor detail

```

user@host> show ancp neighbor detail
  Neighbor Information
    Version      : 0x31
    IP Address    : 192.0.2.85
    System Name   : 00:00:5e:00:53:01

```

```

Up Time : 26
TCP Port : 32666
State : Established
Subscriber Count : 4
Capabilities : Topo
System Instance : 2
Peer Instance : 20
Adjacency Timer (in 100ms) : 100
Peer Adjacency Timer (in 100ms) : 100
Partition Type : 0
Partition Flag : 1
Partition Identifier : 0
Partition Adjacencies : 0
Dead Timer : 23
Received Syn Count : 1
Received Synack Count : 1
Received Rstack Count : 0
Received Ack Count : 4
Received Port Up Count : 10
Received Port Down Count : 0
Received Generic Resp Count : 0
Received Adjacency Update Count : 0
Received OAM Count : 0
Received Other Count : 0
Sent Syn Count : 1
Sent Synack Count : 2
Sent Rstack Count : 0
Sent Ack Count : 3
Sent Generic Resp Count : 0
Sent OAM Count : 0
Max Discovery Limit Exceed Count : 0
Result Codes:
Invalid Request Message Count : 0
Specified Port(s) Down Count : 0
Out of Resources Count : 0
Request Msg Not Implemented Count: 0
Malformed Msg Count : 0
TLV Missing Count : 0
Invalid TLV Contents Count : 0
Non-Existent Port(s) Count : 0

Version : 0x32
IP Address : 192.168.9.1
System Name : 00:00:5e:00:53:02
Up Time : 36
TCP Port : 61408
State : Not Established
Subscriber Count : 1
Capabilities : Topology Discovery
System Instance : 12
Peer Instance : 1
Adjacency Timer (in 100ms) : 50
Peer Adjacency Timer (in 100ms) : 100
Partition Type : 0
Partition Flag : 1
Partition Identifier : 0
Partition Adjacencies : 0
Dead Timer : 23
Received Syn Count : 24
Received Synack Count : 20

```

```

Received Rstack Count      : 2
Received Ack Count         : 9
Received Port Up Count     : 5
Received Port Down Count   : 0
Received Generic Resp Count : 0
Received Adjacency Update Count : 0
Received OAM Responses Count : 2
Received Other Count       : 0
Sent Syn Count             : 20
Sent Synack Count          : 24
Sent Rstack Count          : 1
Sent Generic Resp Count    : 0
Sent Ack Count             : 9
Sent OAM Requests Count    : 4
Max Discovery Limit Exceed Count : 0
Result Codes:
Invalid Request Message Count : 0
Specified Port(s) Down Count : 0
Out of Resources Count        : 0
Request Msg Not Implemented Count: 0
Malformed Msg Count          : 0
TLV Missing Count            : 0
Invalid TLV Contents Count    : 0
Non-Existent Port(s) Count   : 0
Received                     Sent

```

show ancp neighbor ip-address

```
user@host> show ancp neighbor ip-address 192.0.2.85
```

```

Neighbor Information
Version           : 0x32
IP Address        : 192.0.2.85
System Name       : 00:00:5e:00:53:ba
Up Time           : 26
TCP Port          : 32666
State             : Established
Subscriber Count  : 4
Capabilities      : Topo
System Instance   : 2
Peer Instance     : 20
Adjacency Timer (in 100ms) : 100
Peer Adjacency Timer (in 100ms) : 100
Partition Type    : 0
Partition Flag    : 1
Partition Identifier : 0
Partition Adjacencies : 0
Dead Timer        : 23
Received Syn Count : 1
Received Synack Count : 1
Received Rstack Count : 0
Received Ack Count   : 4
Received Port Up Count : 10
Received Port Down Count : 0
Received Generic Resp Count : 0
Received Adjacency Update Count : 0
Received OAM Count    : 0
Received Other Count  : 0
Sent Syn Count        : 1
Sent Synack Count     : 2
Sent Rstack Count     : 0
Sent Ack Count        : 3

```

Sent Generic Resp Count	: 0	
Sent OAM Count	: 0	
Max Discovery Limit Exceed Count	: 0	
Result Codes:	Received	Sent
Invalid Request Message Count	: 0	0
Specified Port(s) Down Count	: 0	0
Out of Resources Count	: 0	0
Request Msg Not Implemented Count	: 0	0
Malformed Msg Count	: 0	0
TLV Missing Count	: 0	0
Invalid TLV Contents Count	: 0	0
Non-Existent Port(s) Count	: 0	0

show ancp neighbor system-name

user@host> show ancp neighbor 00:00:5e:00:53:ba detail

Neighbor Information

Version	: 0x31	
IP Address	: 203.0.113.101	
System Name	: 00:00:5e:00:53:ba	
Up Time	: 19	
TCP Port	: 1028	
State	: Established	
Subscriber Count	: 2	
Capabilities	: Topology Discovery, OAM	
System Instance	: 1	
Peer Instance	: 10	
Adjacency Timer (in 100ms)	: 100	
Peer Adjacency Timer (in 100ms)	: 250	
Partition Type	: 0	
Partition Flag	: 1	
Partition Identifier	: 0	
Partition Adjacencies	: 0	
Dead Timer	: 55	
Received Syn Count	: 1	
Received Synack Count	: 1	
Received Rstack Count	: 0	
Received Ack Count	: 1	
Received Port Up Count	: 34	
Received Port Down Count	: 0	
Received Generic Resp Count	: 0	
Received Adjacency Update Count	: 0	
Received OAM Responses Count	: 2	
Received Other Count	: 0	
Sent Syn Count	: 1	
Sent Synack Count	: 1	
Sent Rstack Count	: 0	
Sent Ack Count	: 3	
Sent Generic Resp Count	: 0	
Sent OAM Requests Count	: 4	
Max Discovery Limit Exceed Count	: 3	
Result Codes:	Received	Sent
Invalid Request Message Count	: 0	0
Specified Port(s) Down Count	: 0	0
Out of Resources Count	: 0	0
Request Msg Not Implemented Count	: 0	0
Malformed Msg Count	: 0	0
TLV Missing Count	: 0	0

Invalid TLV Contents Count	: 0	0
Non-Existent Port(s) Count	: 0	0

show ancp statistics

Syntax	show ancp statistics <ip-address <i>ip-address</i>> <system-name <i>mac-address</i>>
Release Information	Command introduced in Junos OS Release 13.3.
Description	Display statistics for all ANCP neighbors (access nodes) or the specified ANCP neighbor.
Options	<p>none—Display statistics for all ANCP neighbors, including global statistics not show for individual neighbors.</p> <p>ip-address <i>ip-address</i>—(Optional) Display statistics for only the neighbor with the specified IP address.</p> <p>system-name <i>mac-address</i>—(Optional) Display statistics for only the neighbor with the specified MAC address.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show ancp cos on page 1509 • show ancp neighbor on page 1514 • show ancp subscriber on page 1527
List of Sample Output	show ancp statistics on page 1524 show ancp statistics ip-address on page 1525 show ancp statistics system-name on page 1525
Output Fields	Table 87 on page 1522 lists the output fields for the show ancp statistics command. Output fields are listed in the approximate order in which they appear.

Table 87: show ancp statistics Output Fields

Field Name	Field Description
Number of neighbors	Total count of ANCP neighbors.
Number of subscribers	Total count of ANCP subscribers.
Accept Count	Number of neighbor TCP/IP sessions accepted on listener socket.
Accept Fail Count	Number of neighbor TCP/IP sessions that failed due to one of the following causes: session already exists, maximum number of ANCP connections exceeded, creation of session or neighbor failed, or protocol start failed.

Table 87: show ancp statistics Output Fields (*continued*)

Field Name	Field Description
No Config Accept Deny Count	Number of neighbor TCP/IP sessions that failed because the neighbor was not configured.
Received Syn Count	Number of synchronization messages received from neighbors to maintain adjacencies.
Received Synack Count	Number of synchronization acknowledgment messages received from neighbors in response to the node's synchronization messages.
Received Rstack Count	Number of messages received from neighbors indicating that the link to the neighbor needs to be reset.
Received Ack Count	Number of acknowledgment messages periodically received from neighbors after an adjacency has been established.
Received Port Up Count	Number of status messages received from neighbors indicating that a port has transitioned to the up state.
Received Port Down Count	Number of status messages received from neighbors indicating that a port has transitioned to the down state.
Received Generic Resp Count	Number of generic response messages received from neighbors.
Received Adjacency Update Count	Number of adjacency update messages received from neighbors.
Received OAM Count	Number of OAM responses received from neighbors in reply to request commands.
Received Other Count	Number of all other ANCP message packets received from neighbors that do not fit into one of the other categories.
Sent Syn Count	Number of synchronization messages sent to neighbors to maintain adjacencies.
Sent Synack Count	Number of synchronization acknowledgment messages sent to neighbors in response to the their synchronization messages.
Sent Rstack Count	Number of messages sent to neighbors indicating that the link to the neighbor needs to be reset.
Sent Ack Count	Number of acknowledgment messages periodically sent to neighbors after an adjacency has been established.
Sent Generic Resp Count	Number of generic response messages sent to neighbors.
Sent OAM Count	Number of OAM request commands sent to neighbors.

Table 87: show ancp statistics Output Fields (*continued*)

Field Name	Field Description
Result Codes	<p>Number of generic response messages sent to neighbors that include each of the following result codes:</p> <ul style="list-style-type: none"> • Invalid Request Message Count—A properly formed request messages violated the protocol because of timing (such as a race condition) or direction of transmission. • Specified Port(s) Down Count—One or more of the specified ports are down because of a state mismatch between the router and an ANCP control application. • Out of Resources Count—the ANCP agent is out of resources, probably not related to the access lines. This result code is sent only by an access node. • Request Msg Not Implemented Count— • Malformed Msg Count—Message is malformed because it was corrupted in transit or there was an implementation error at either end of the connection. • TLV Missing Count—One or more mandatory TLVs was missing from a request. • Invalid TLV Contents Count—The contents of one or more TLVs in the request do not match its required specification. • Non-Existent Port(s) Count—One or more of the ports specified in a request do not exist, possibly because of a configuration mismatch between the access node and the router or AAA.

Sample Output

show ancp statistics

```

user@host> show ancp statistics
Statistics
  Number of neighbors           : 4
  Number of subscribers         : 6
  Accept Count                  : 0
  Accept Fail Count             : 0
  No Config Accept Deny Count  : 0
  Received Syn Count            : 2
  Received Synack Count         : 1
  Received Rstack Count         : 0
  Received Ack Count            : 8
  Received Port Up Count        : 7
  Received Port Down Count      : 0
  Received Generic Resp Count   : 0
  Received Adjacency Update Count : 0
  Received OAM Count            : 0
  Received Other Count          : 0
  Sent Syn Count                : 1
  Sent Synack Count             : 1
  Sent Rstack Count             : 0
  Sent Ack Count                : 17
  Sent Generic Resp Count       : 0
  Sent OAM Count                : 4
Result Codes:
  Invalid Request Message Count : 0
  Specified Port(s) Down Count  : 0
  Out of Resources Count        : 0
  Request Msg Not Implemented Count: 0
Received Sent

```

Malformed Msg Count	: 0	0
TLV Missing Count	: 0	0
Invalid TLV Contents Count	: 0	0
Non-Existent Port(s) Count	: 0	0

show ancp statistics ip-address

```
user@host> show ancp statistics ip-address 203.0.113.1
Statistics
  Received Syn Count           : 2
  Received Synack Count       : 1
  Received Rstack Count       : 0
  Received Ack Count          : 8
  Received Port Up Count      : 7
  Received Port Down Count    : 0
  Received Generic Resp Count : 0
  Received Adjacency Update Count : 0
  Received OAM Count          : 0
  Received Other Count        : 0
  Sent Syn Count              : 1
  Sent Synack Count           : 1
  Sent Rstack Count           : 0
  Sent Ack Count              : 17
  Sent Generic Resp Count     : 0
  Sent OAM Count              : 4
Result Codes:
  Received      Sent
Invalid Request Message Count : 0      0
Specified Port(s) Down Count  : 0      0
Out of Resources Count        : 0      0
Request Msg Not Implemented Count: 0      0
Malformed Msg Count           : 0      0
TLV Missing Count             : 0      0
Invalid TLV Contents Count    : 0      0
Non-Existent Port(s) Count    : 0      0
```

show ancp statistics system-name

```
user@host> show ancp statistics system-name 00:00:5E:00:53:02
Statistics
  Received Syn Count           : 2
  Received Synack Count       : 1
  Received Rstack Count       : 0
  Received Ack Count          : 8
  Received Port Up Count      : 7
  Received Port Down Count    : 0
  Received Generic Resp Count : 0
  Received Adjacency Update Count : 0
  Received OAM Count          : 0
  Received Other Count        : 0
  Sent Syn Count              : 1
  Sent Synack Count           : 1
  Sent Rstack Count           : 0
  Sent Ack Count              : 17
  Sent Generic Resp Count     : 0
  Sent OAM Count              : 4
Result Codes:
  Received      Sent
Invalid Request Message Count : 0      0
Specified Port(s) Down Count  : 0      0
Out of Resources Count        : 0      0
```

Request Msg Not Implemented Count:	0	0
Malformed Msg Count	: 0	0
TLV Missing Count	: 0	0
Invalid TLV Contents Count	: 0	0
Non-Existent Port(s) Count	: 0	0

show ancp subscriber

Syntax	<pre>show ancp subscriber <brief detail> <identifier <i>identifier</i>> <ip-address <i>ip-address</i>> <system-name <i>mac-address</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 9.4.</p> <p>neighbor option replaced with ip-address in Junos OS Release 16.1.</p> <p>system-name option introduced in Junos OS Release 16.1.</p>
Description	<p>Display information about active subscribers regardless of the subscriber's operational state, for all subscribers (local access loops), the subscriber associated with the access line specified by an ACI, or the subscriber associated with the specified ANCP neighbor (access node).</p> <p>After an ancpd restart, this command displays orphaned entries (marked with an o) for subscriber sessions that were established before the restart but which have not yet been reestablished. As sessions are reestablished, the number of orphaned entries displayed by the command decreases. The number reaches zero when all sessions are reestablished or when the orphaned-interface timer expires.</p>
Options	<p>none—Display information about all subscribers.</p> <p>brief detail—(Optional) Display the specified level of detail.</p> <p>identifier <i>identifier</i>—(Optional) Display information about the subscriber associated with the access line (ACI) specified by the access identifier.</p> <p>ip-address <i>ip-address</i>—(Optional) Display information about the subscribers connected to the access node specified by the IP address.</p> <p>system-name <i>mac-address</i>—(Optional) Display information about the subscribers connected to the access node specified by the MAC address.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear ancp subscriber on page 1441 • show ancp cos on page 1509 • show ancp neighbor on page 1514 • show ancp statistics on page 1522
List of Sample Output	<p>show ancp subscriber on page 1530</p> <p>show ancp subscriber (After ancpd Restart) on page 1530</p> <p>show ancp subscriber brief on page 1530</p> <p>show ancp subscriber detail on page 1531</p>

[show ancp subscriber identifier identifier-string detail on page 1532](#)

Output Fields [Table 88 on page 1528](#) lists the output fields for the **show ancp subscriber** command. Output fields are listed in the approximate order in which they appear.

Table 88: show ancp subscriber Output Fields

Field Name	Field Description	Level of Output
Loop Identifier	<p>Access loop identifier as sent by the access node and configured to map the subscriber to an interface.</p> <p>An asterisk (*) indicates that the information might be stale due to receiving a Port Down message with a DSL Line State of Idle.</p> <p>Two asterisks (**) indicate that the neighbor associated with the subscriber has lost its adjacency. In this case, the DSL Line State might be Established.</p> <p>An o indicates that the entry is for an orphaned interface and represents a previously established subscriber session that has not been reestablished after an ancpd restart.</p> <p>The number of orphaned entries decreases as the ANCP neighbors reestablish adjacencies and the protocol subscriber sessions are reestablished. The command output indicates this by removing the o marker.</p> <p>Eventually the number of orphaned entries reaches zero, because either all the adjacencies and subscriber sessions have been reestablished or any remaining orphaned entries are removed when the orphaned-interface timer expires.</p>	brief none
DSL Line State	State of the DSL line: Idle , Showtime , or Silent .	brief detail
Type	Type of digital subscriber line employed by the access node: ADSL1 , ADSL2 , ADSL2+ , VDSL1 , VDSL2 , SDSL , or UNKNOWN .	brief none
Interface	Name of the interface set or logical interface.	brief detail none
Rate Kbps	Actual downstream data rate for this local loop.	brief none
Neighbor	IP address of ANCP neighbor (access node).	brief none
Access Loop Circuit Identifier	<p>Access loop circuit identifier as sent by the access node and configured to map the subscriber to an interface.</p> <p>An asterisk (*) indicates that the information might be stale due to receiving a Port Down message with a DSL Line State of Idle.</p> <p>Two asterisks (**) indicate that the neighbor associated with the subscriber has lost its adjacency. In this case, the DSL Line State might be Established.</p>	detail
Neighbor IP Address	IP address of the ANCP neighbor (access node).	detail

Table 88: show ancp subscriber Output Fields (*continued*)

Field Name	Field Description	Level of Output
Aggregate Circuit Identifier Binary	Binary identifier for the VLAN circuit ID.	detail
DSL Type	Type of digital subscriber line employed by the access node: ADSL1, ADSL2, ADSL2+, VDSL1, VDSL2, SDSL, or UNKNOWN.	detail
DSL Line Data Link	Data link protocol employed on the access loop: AAL5 or Ethernet.	detail
DSL Line Encapsulation	Encapsulation type on the access loop, for Ethernet only: <ul style="list-style-type: none"> 0—NA, type not conveyed 1—Untagged Ethernet 2—Single-tagged Ethernet 	detail
DSL Line Encapsulation Payload	Payload carried across the access loop: <ul style="list-style-type: none"> 0—NA, type not conveyed 1—PPPoA LLC 2—PPPoA null 3—IPoA LLC 4—IPoA null 5—Ethernet over AAL5 LLC with FCS 6—Ethernet over AAL5 LLC without FCS 7—Ethernet over AAL5 null with FCS 8—Ethernet over AAL5 null without FCS 	detail
Interface Type	Type of interface employed for subscriber traffic: ifl for a single VLAN or interface-set for a configured group of VLANs.	detail
Actual Net Data Upstream	Actual upstream data rate for this local loop, in Kbps.	detail
Actual Net Data Downstream	Actual downstream data rate for this local loop, in Kbps.	detail
Minimum Net Data Upstream	Minimum upstream data rate desired by the operator for this local loop, in Kbps.	detail
Minimum Net Data Downstream	Minimum downstream data rate desired by the operator for this local loop, in Kbps.	detail
Maximum Net Data Upstream	Maximum upstream data rate desired by the operator for this local loop, in Kbps.	detail
Maximum Net Data Downstream	Maximum downstream data rate desired by the operator for this local loop, in Kbps.	detail

Table 88: show ancp subscriber Output Fields (*continued*)

Field Name	Field Description	Level of Output
Attainable Net Data Upstream	Maximum attainable upstream data rate for this local loop, in Kbps.	detail
Attainable Net Data Downstream	Maximum attainable downstream data rate for this local loop, in Kbps.	detail
Minimum Low Power Data Downstream	Minimum downstream data rate desired by the operator for this local loop in low power state, in Kbps.	detail
Minimum Low Power Data Upstream	Minimum upstream data rate desired by the operator for this local loop in low power state, in Kbps.	detail
Maximum Interleave Delay Downstream	Maximum interleaving delay for downstream data, in milliseconds.	detail
Maximum Interleave Delay Upstream	Maximum interleaving delay for upstream data, in milliseconds.	detail
Actual Interleave Delay Downstream	Actual interleaving delay for downstream data, in milliseconds.	detail
Actual Interleave Delay Upstream	Actual interleaving delay for upstream data, in milliseconds.	detail

Sample Output

show ancp subscriber

```

user@host> show ancp subscriber
  Loop Identifier      DSL Line State   Type      Interface      Rate      Neighbor
                        Kbps
**circuit 101         Idle     ADSL1    ----         32         203.0.113.13
**circuit 102         Idle     ADSL1    ----         32         203.0.113.13

  circuit 301         Showtime ADSL1    ----         32         203.0.113.15
  circuit 302         Showtime ADSL1    ----         32         203.0.113.15

```

show ancp subscriber (After ancpd Restart)

```

user@host> show ancp subscriber
  Loop Identifier      DSL Line State   Type      Interface      Rate      Neighbor
                        Kbps
o circuit 201         Showtime ADSL1    ----        22222
o circuit 202         Showtime ADSL1    ----        22222

```

show ancp subscriber brief

```

user@host> show ancp subscriber brief

  Loop Identifier      Type      Interface      Rate      Neighbor

```

port-1-10	VDSL2	set-ge-10410	Kbps 64	203.0.113.102
port-1-11	VDSL2	set-ge-10411	64	203.0.113.111
port-2-10	VDSL2	ge-1/0/4.12	64	203.0.113.112
port-2-11	VDSL2	ge-1/0/4.13	64	203.0.113.113

show ancp subscriber detail

```

user@host> show ancp subscriber detail
Subscriber Information
* Access Loop Circuit Identifier : circuit 101
  Neighbor IP Address           : 203.0.113.13
  Aggregate Circuit Identifier Binary : 0/0
  DSL Type                     : ADSL1
  DSL Line State               : Idle
  DSL Line Data Link           : Data link 2
  DSL Line Encapsulation       : N/A
  DSL Line Encapsulation Payload : N/A
  Interface Type               : N/A
  Interface                    : ----
  Actual Net Data Upstream     : 32
  Actual Net Data Downstream   : 32
  Minimum Net Data Upstream    : 0
  Minimum Net Data Downstream  : 0
  Maximum Net Data Upstream    : 0
  Maximum Net Data Downstream  : 0
  Attainable Net Data Upstream : 1024
  Attainable Net Data Downstream : 8192
  Minimum Low Power Data Downstream : 32
  Minimum Low Power Data Upstream : 32
  Maximum Interleave Delay Downstream : 20
  Maximum Interleave Delay Upstream : 20
  Actual Interleave Delay Downstream : 20
  Actual Interleave Delay Upstream : 20
* Access Loop Circuit Identifier: circuit 102
  Neighbor IP Address           : 213.0.113.13
  Aggregate Circuit Identifier Binary : 0/0
  DSL Type                     : ADSL1
  DSL Line State               : Idle
  DSL Line Data Link           : Data link 2
  DSL Line Encapsulation       : N/A
  DSL Line Encapsulation Payload : N/A
  Interface Type               : N/A
  Interface                    : ----
  Actual Net Data Upstream     : 32
  Actual Net Data Downstream   : 32
  Minimum Net Data Upstream    : 0
  Minimum Net Data Downstream  : 0
  Maximum Net Data Upstream    : 0
  Maximum Net Data Downstream  : 0
  Attainable Net Data Upstream : 1024
  Attainable Net Data Downstream : 8192
  Minimum Low Power Data Downstream : 32
  Minimum Low Power Data Upstream : 32
  Maximum Interleave Delay Downstream : 20
  Maximum Interleave Delay Upstream : 20
  Actual Interleave Delay Downstream : 20

```

```
Actual Interleave Delay Upstream      : 20
...
```

show ancp subscriber identifier identifier-string detail

```
user@host> show ancp subscriber identifier port-1-11 detail
```

```
Access Loop Identifier : port-1-11
Neighbor IP Address    : 203.0.113.112
Aggregate Circuit Identifier Binary : 0/0
DSL Type               : DSL 0
Interface Type         : interface-set
Interface              : set-ge-10411
DSL Line State         : Show Time
Actual Net Data Upstream : 64
Actual Net Data Downstream : 64
DSL Line Data Link     : AAL5
DSL Line Encapsulation : N/A
DSL Line Encapsulation Payload : N/A
Minimum Net Data Upstream : 64
Minimum Net Data Downstream : 64
Maximum Net Data Upstream : 64
Maximum Net Data Downstream : 64
Attainable Net Data Upstream : 64
Attainable Net Data Downstream : 64
Minimum Low Power Data Downstream : 64
Minimum Low Power Data Upstream : 64
Maximum Interleave Delay Downstream : 50
Maximum Interleave Delay Upstream : 50
Actual Interleave Delay Downstream : 50
Actual Interleave Delay Upstream : 50
```

show ancp summary

Syntax	show ancp summary
Release Information	Command introduced in Junos OS Release 13.1.
Description	Display a summary of the counts and states for all ANCP neighbors and subscribers.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show ancp neighbor on page 1514 • show ancp summary neighbor on page 1535 • show ancp subscriber on page 1527 • show ancp summary subscriber on page 1537

List of Sample Output [show ancp summary on page 1534](#)

Output Fields [Table 89 on page 1533](#) lists the output fields for the **show ancp summary** command. Output fields are listed in the approximate order in which they appear.

Table 89: show ancp summary Output Fields

Field Name	Field Description
Configured	Number of ANCP neighbors in the Configured state; that is, that have been configured but never established.
Establishing	Number of ANCP neighbors in the Establishing state; that is, where negotiations are in progress.
Established	Number of ANCP neighbors in the Established state; that is, where negotiations have succeeded and the ANCP session has been established.
Not Estblshd	Number of ANCP neighbors in the Not Estblshd state; that is, that have lost a previously established adjacency and are ready to begin negotiations.
Total	Total number of ANCP neighbors; sum of neighbors in the Configured , Establishing , Established , and Not Estblshd states.
Showtime	Number of DSL lines in Showtime state.
Idle	Number of DSL lines in Idle state.
Silent	Number of DSL lines in Silent state.
Unknown	Number of DSL lines where the state is not Showtime , Idle , or Silent .

Table 89: show ancp summary Output Fields (*continued*)

Field Name	Field Description
Total	Total number of DSL lines (ANCP subscribers); sum of DSL lines in the Showtime , Idle , Silent , and Unknown states.

Sample Output

show ancp summary

```
user@host> show ancp summary
```

Neighbors Summary:

Configured	Establishing	Established	Not Established	Total
22	0	2	0	24

Subscribers Summary:

Showtime	Idle	Silent	Unknown	Total
4	0	0	0	4

show ancp summary neighbor

Syntax	show ancp summary neighbor <ip-address <i>ip-address</i> system-name <i>mac-address</i> >
Release Information	Command introduced in Junos OS Release 13.1.
Description	Display a summary of the counts and states for all ANCP neighbors and of the neighbor's subscribers when you specify a particular neighbor.
Options	ip-address <i>ip-address</i> —(Optional) IP address of the ANCP neighbor (access node). system-name <i>mac-address</i> —(Optional) MAC address of the ANCP neighbor (access node).
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show ancp summary on page 1533 • show ancp subscriber on page 1527 • show ancp summary subscriber on page 1537
List of Sample Output	show ancp summary neighbor on page 1536 show ancp summary neighbor (IP Address) on page 1536 show ancp summary neighbor (MAC Address) on page 1536
Output Fields	Table 90 on page 1535 lists the output fields for the show ancp summary command. Output fields are listed in the approximate order in which they appear.

Table 90: show ancp summary neighbor Output Fields

Field Name	Field Description
Configured	Number of ANCP neighbors in the Configured state; that is, that have been configured but never established.
Establishing	Number of ANCP neighbors in the Establishing state; that is, where negotiations are in progress.
Established	Number of ANCP neighbors in the Established state; that is, where negotiations have succeeded and the ANCP session has been established.
Not Estblshd	Number of ANCP neighbors in the Not Estblshd state; that is, that have lost a previously established adjacency and are ready to begin negotiations.
Total	Total number of ANCP neighbors; sum of neighbors in the Configured , Establishing , Established , and Not Estblshd states.
Showtime	Number of DSL lines for the neighbor in Showtime state.

Table 90: show ancp summary neighbor Output Fields (*continued*)

Field Name	Field Description
Idle	Number of DSL lines for the neighbor in Idle state.
Silent	Number of DSL lines for the neighbor in Silent state.
Unknown	Number of DSL lines for the neighbor where the state is not Showtime , Idle , or Silent .
Total	Total number of DSL lines (ANCP subscribers); sum of DSL lines in the Showtime , Idle , Silent , and Unknown states.

Sample Output

show ancp summary neighbor

```
user@host> show ancp summary neighbor
```

```
Neighbors Summary:
```

Configured	Establishing	Established	Not Established	Total
22	0	2	0	24

show ancp summary neighbor (IP Address)

```
user@host> show ancp summary neighbor ip-address 192.168.10.1
```

```
Neighbor Summary:192.168.10.1 status Established
```

```
Subscribers Summary:
```

Show Time	Idle	Silent	Unknown	Total
6	0	0	0	6

show ancp summary neighbor (MAC Address)

```
user@host> show ancp summary neighbor system-name 00:00:5E:00:53:02
```

```
Neighbor Summary:00:00:5E:00:53:02 status Established
```

```
Subscribers Summary:
```

Show Time	Idle	Silent	Unknown	Total
5	1	2	0	8

show ancp summary subscriber

Syntax	show ancp summary subscriber
Release Information	Command introduced in Junos OS Release 13.1.
Description	Display a summary of the counts and states for all ANCP subscribers.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show ancp summary on page 1533 • show ancp neighbor on page 1514 • show ancp summary neighbor on page 1535
List of Sample Output	show ancp summary subscriber on page 1537
Output Fields	Table 91 on page 1537 lists the output fields for the show ancp summary subscriber command. Output fields are listed in the approximate order in which they appear.

Table 91: show ancp summary subscriber Output Fields

Field Name	Field Description
Showtime	Number of DSL lines in Showtime state.
Idle	Number of DSL lines in Idle state.
Silent	Number of DSL lines in Silent state.
Unknown	Number of DSL lines where the state is not Showtime , Idle , or Silent .
Total	Total number of DSL lines (ANCP subscribers); sum of DSL lines in the Showtime , Idle , Silent , and Unknown states.

Sample Output

show ancp summary subscriber

```
user@host> show ancp summary subscriber
```

```
Subscribers Summary:
Show Time      Idle      Silent      Unknown      Total
-----
              8          1          0          1          10
```

show class-of-service interface

Syntax `show class-of-service interface`
 `<comprehensive | detail> <interface-name>`

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Forwarding class map information added in Junos OS Release 9.4.
 Command introduced in Junos OS Release 11.1 for the QFX Series.
 Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.
 Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access routers.
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
 Options **detail** and **comprehensive** introduced in Junos OS Release 11.4.
 Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.

Description Display the logical and physical interface associations for the classifier, rewrite rules, and scheduler map objects.



NOTE: On routing platforms with dual Routing Engines, running this command on the backup Routing Engine, with or without any of the available options, is not supported and produces the following error message:

error: the class-of-service subsystem is not running

Options **none**—Display CoS associations for all physical and logical interfaces.

comprehensive—(M Series, MX Series, and T Series routers) (Optional) Display comprehensive quality-of-service (QoS) information about all physical and logical interfaces.

detail—(M Series, MX Series, and T Series routers) (Optional) Display QoS and CoS information based on the interface.

If the **interface** *interface-name* is a physical interface, the output includes:

- Brief QoS information about the physical interface
- Brief QoS information about the logical interface
- CoS information about the physical interface
- Brief information about filters or policers of the logical interface
- Brief CoS information about the logical interface

If the **interface** *interface-name* is a logical interface, the output includes:

- Brief QoS information about the logical interface

- Information about filters or policers for the logical interface
- CoS information about the logical interface

interface-name—(Optional) Display class-of-service (CoS) associations for the specified interface.

none—Display CoS associations for all physical and logical interfaces.

Required Privilege Level view

Related Documentation [• Verifying and Managing Junos OS Enhanced Subscriber Management on page 558](#)

List of Sample Output [show class-of-service interface \(Physical\) on page 1550](#)
[show class-of-service interface \(Logical\) on page 1551](#)
[show class-of-service interface \(Gigabit Ethernet\) on page 1551](#)
[show class-of-service interface \(ANCP\) on page 1551](#)
[show class-of-service interface \(PPPoE Interface\) on page 1551](#)
[show class-of-service interface \(DHCP Interface\) on page 1551](#)
[show class-of-service interface \(T4000 Routers with Type 5 FPCs\) on page 1552](#)
[show class-of-service interface detail on page 1552](#)
[show class-of-service interface comprehensive on page 1553](#)
[show class-of-service interface \(ACX Series Routers\) on page 1564](#)
[show class-of-service interface \(PPPoE Subscriber Interface for Enhanced Subscriber Management\) on page 1566](#)

Output Fields [Table 92 on page 1539](#) describes the output fields for the **show class-of-service interface** command. Output fields are listed in the approximate order in which they appear.

Table 92: show class-of-service interface Output Fields

Field Name	Field Description
Physical interface	Name of a physical interface.
Index	Index of this interface or the internal index of this object. (Enhanced subscriber management for MX Series routers) Index values for dynamic CoS traffic control profiles and dynamic scheduler maps are larger for enhanced subscriber management than they are for legacy subscriber management.
Dedicated Queues	Status of dedicated queues configured on an interface. Supported only on Trio MPC/MIC interfaces on MX Series routers. (Enhanced subscriber management for MX-Series routers) This field is not displayed for enhanced subscriber management.
Maximum usable queues	Number of queues you can configure on the interface.
Maximum usable queues	Maximum number of queues you can use.

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Total non-default queues created	Number of queues created in addition to the default queues. Supported only on Trio MPC/MIC interfaces on MX Series routers. (Enhanced subscriber management for MX Series routers) This field is not displayed for enhanced subscriber management.
Rewrite Input IEEE Code-point	(QFX3500 switches only) IEEE 802.1p code point (priority) rewrite value. Incoming traffic from the Fibre Channel (FC) SAN is classified into the forwarding class specified in the native FC interface (NP_Port) fixed classifier and uses the priority specified as the IEEE 802.1p rewrite value.
Shaping rate	Maximum transmission rate on the physical interface. You can configure the shaping rate on the physical interface, or on the logical interface, but not on both. Therefore, the Shaping rate field is displayed for either the physical interface or the logical interface.
Scheduler map	Name of the output scheduler map associated with this interface. (Enhanced subscriber management for MX Series routers) The name of the dynamic scheduler map object is associated with a generated UID (for example, SMAP-1_UID1002) instead of with a subscriber interface.
Scheduler map forwarding class sets	(QFX Series only) Name of the output fabric scheduler map associated with a QFabric system Interconnect device interface.
Input shaping rate	For Gigabit Ethernet IQ2 PICs, maximum transmission rate on the input interface.
Input scheduler map	For Gigabit Ethernet IQ2 PICs, name of the input scheduler map associated with this interface.
Chassis scheduler map	Name of the scheduler map associated with the packet forwarding component queues.
Rewrite	Name and type of the rewrite rules associated with this interface.
Traffic-control-profile	Name of the associated traffic control profile. (Enhanced subscriber management for MX Series routers) The name of the dynamic traffic control profile object is associated with a generated UID (for example, TC_PROF_100_199_SERIES_UID1006) instead of with a subscriber interface.
Classifier	Name and type of classifiers associated with this interface.
Forwarding-class-map	Name of the forwarding map associated with this interface.
Congestion-notification	(QFX Series and EX4600 switches only) Congestion notification state, enabled or disabled .
Logical interface	Name of a logical interface.
Object	Category of an object: Classifier , Fragmentation-map (for LSQ interfaces only), Scheduler-map , Rewrite , Translation Table (for IQE PICs only), or traffic-class-map (for T4000 routers with Type 5 FPCs).
Name	Name of an object.

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Type	Type of an object: dscp , dscp-ipv6 , exp , ieee-802.1 , ip , inet-precedence , or ieee-802.1ad (for traffic class map on T4000 routers with Type 5 FPCs)..
Link-level type	Encapsulation on the physical interface.
MTU	MTU size on the physical interface.
Speed	Speed at which the interface is running.
Loopback	Whether loopback is enabled and the type of loopback.
Source filtering	Whether source filtering is enabled or disabled.
Flow control	Whether flow control is enabled or disabled.
Auto-negotiation	(Gigabit Ethernet interfaces) Whether autonegotiation is enabled or disabled.
Remote-fault	(Gigabit Ethernet interfaces) Remote fault status. <ul style="list-style-type: none"> • Online—Autonegotiation is manually configured as online. • Offline—Autonegotiation is manually configured as offline.
Device flags	<p>The Device flags field provides information about the physical device and displays one or more of the following values:</p> <ul style="list-style-type: none"> • Down—Device has been administratively disabled. • Hear-Own-Xmit—Device receives its own transmissions. • Link-Layer-Down—The link-layer protocol has failed to connect with the remote endpoint. • Loopback—Device is in physical loopback. • Loop-Detected—The link layer has received frames that it sent, thereby detecting a physical loopback. • No-Carrier—On media that support carrier recognition, no carrier is currently detected. • No-Multicast—Device does not support multicast traffic. • Present—Device is physically present and recognized. • Promiscuous—Device is in promiscuous mode and recognizes frames addressed to all physical addresses on the media. • Quench—Transmission on the device is quenched because the output buffer is overflowing. • Recv-All-Multicasts—Device is in multicast promiscuous mode and therefore provides no multicast filtering. • Running—Device is active and enabled.

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Interface flags	<p>The Interface flags field provides information about the physical interface and displays one or more of the following values:</p> <ul style="list-style-type: none"> • Admin-Test—Interface is in test mode and some sanity checking, such as loop detection, is disabled. • Disabled—Interface is administratively disabled. • Down—A hardware failure has occurred. • Hardware-Down—Interface is nonfunctional or incorrectly connected. • Link-Layer-Down—Interface keepalives have indicated that the link is incomplete. • No-Multicast—Interface does not support multicast traffic. • No-receive No-transmit—Passive monitor mode is configured on the interface. • Point-To-Point—Interface is point-to-point. • Pop all MPLS labels from packets of depth—MPLS labels are removed as packets arrive on an interface that has the pop-all-labels statement configured. The depth value can be one of the following: <ul style="list-style-type: none"> • 1—Takes effect for incoming packets with one label only. • 2—Takes effect for incoming packets with two labels only. • [1 2]—Takes effect for incoming packets with either one or two labels. • Promiscuous—Interface is in promiscuous mode and recognizes frames addressed to all physical addresses. • Recv-All-Multicasts—Interface is in multicast promiscuous mode and provides no multicast filtering. • SNMP-Traps—SNMP trap notifications are enabled. • Up—Interface is enabled and operational.
Flags	<p>The Logical interface flags field provides information about the logical interface and displays one or more of the following values:</p> <ul style="list-style-type: none"> • ACFC Encapsulation—Address control field Compression (ACFC) encapsulation is enabled (negotiated successfully with a peer). • Device-down—Device has been administratively disabled. • Disabled—Interface is administratively disabled. • Down—A hardware failure has occurred. • Clear-DF-Bit—GRE tunnel or IPsec tunnel is configured to clear the Don't Fragment (DF) bit. • Hardware-Down—Interface protocol initialization failed to complete successfully. • PFC—Protocol field compression is enabled for the PPP session. • Point-To-Point—Interface is point-to-point. • SNMP-Traps—SNMP trap notifications are enabled. • Up—Interface is enabled and operational.
Encapsulation	Encapsulation on the logical interface.
Admin	Administrative state of the interface (Up or Down).
Link	Status of physical link (Up or Down).
Proto	Protocol configured on the interface.

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Input Filter	Names of any firewall filters to be evaluated when packets are received on the interface, including any filters attached through activation of dynamic service.
Output Filter	Names of any firewall filters to be evaluated when packets are transmitted on the interface, including any filters attached through activation of dynamic service.
Link flags	Provides information about the physical link and displays one or more of the following values: <ul style="list-style-type: none"> • ACFC—Address control field compression is configured. The Point-to-Point Protocol (PPP) session negotiates the ACFC option. • Give-Up—Link protocol does not continue connection attempts after repeated failures. • Loose-LCP—PPP does not use the Link Control Protocol (LCP) to indicate whether the link protocol is operational. • Loose-LMI—Frame Relay does not use the Local Management Interface (LMI) to indicate whether the link protocol is operational. • Loose-NCP—PPP does not use the Network Control Protocol (NCP) to indicate whether the device is operational. • Keepalives—Link protocol keepalives are enabled. • No-Keepalives—Link protocol keepalives are disabled. • PFC—Protocol field compression is configured. The PPP session negotiates the PFC option.
Hold-times	Current interface hold-time up and hold-time down, in milliseconds.
CoS queues	Number of CoS queues configured.
Last flapped	Date, time, and how long ago the interface went from down to up. The format is Last flapped: year-month-day hour:minute:second:timezone (hour:minute:second ago) . For example, Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago) .
Statistics last cleared	Number and rate of bytes and packets received and transmitted on the physical interface. <ul style="list-style-type: none"> • Input bytes—Number of bytes received on the interface. • Output bytes—Number of bytes transmitted on the interface. • Input packets—Number of packets received on the interface. • Output packets—Number of packets transmitted on the interface.
IPv6 transit statistics	Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled.

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Input errors	<p>Input errors on the interface. The labels are explained in the following list:</p> <ul style="list-style-type: none"> • Errors—Sum of the incoming frame aborts and FCS errors. • Drops—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. • Framing errors—Number of packets received with an invalid frame checksum (FCS). • Runts—Number of frames received that are smaller than the runt threshold. • Giants—Number of frames received that are larger than the giant threshold. • Bucket Drops—Drops resulting from the traffic load exceeding the interface transmit or receive leaky bucket configuration. • Policed discards—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that Junos OS does not handle. • L3 incompletes—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. Layer 3 incomplete errors can be ignored by configuring the ignore-l3-incompletes statement. • L2 channel errors—Number of times the software did not find a valid logical interface for an incoming frame. • L2 mismatch timeouts—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. • HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. • HS link FIFO overflows—Number of FIFO overflows on the high-speed links between the ASICs responsible for handling the router interfaces.
Output errors	<p>Output errors on the interface. The labels are explained in the following list:</p> <ul style="list-style-type: none"> • Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC is malfunctioning. • Errors—Sum of the outgoing frame aborts and FCS errors. • Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. <p>NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), the Drops field does not always use the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.</p> <ul style="list-style-type: none"> • Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. • HS link FIFO underflows—Number of FIFO underflows on the high-speed links between the ASICs responsible for handling the router interfaces. • MTU errors—Number of packets whose size exceeds the MTU of the interface.
Egress queues	Total number of egress Maximum usable queues on the specified interface.

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Queue counters	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> • Queued packets—Number of queued packets. • Transmitted packets—Number of transmitted packets. • Dropped packets—Number of packets dropped by the ASIC's RED mechanism. <p>NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), the Dropped packets field does not always display the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.</p>
SONET alarms SONET defects	<p>(SONET) SONET media-specific alarms and defects that prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: SONET PHY, SONET section, SONET line, and SONET path.</p>
SONET PHY	<p>Counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> • Seconds—Number of seconds the defect has been active. • Count—Number of times that the defect has gone from inactive to active. • State—State of the error. A state other than OK indicates a problem. <p>The SONET PHY field has the following subfields:</p> <ul style="list-style-type: none"> • PLL Lock—Phase-locked loop • PHY Light—Loss of optical signal
SONET section	<p>Counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> • Seconds—Number of seconds the defect has been active. • Count—Number of times that the defect has gone from inactive to active. • State—State of the error. A state other than OK indicates a problem. <p>The SONET section field has the following subfields:</p> <ul style="list-style-type: none"> • BIP-BI—Bit interleaved parity for SONET section overhead • SEF—Severely errored framing • LOS—Loss of signal • LOF—Loss of frame • ES-S—Errored seconds (section) • SES-S—Severely errored seconds (section) • SEFS-S—Severely errored framing seconds (section)

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
SONET line	<p>Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> • Seconds—Number of seconds the defect has been active. • Count—Number of times that the defect has gone from inactive to active. • State—State of the error. A state other than OK indicates a problem. <p>The SONET line field has the following subfields:</p> <ul style="list-style-type: none"> • BIP-B2—Bit interleaved parity for SONET line overhead • REI-L—Remote error indication (near-end line) • RDI-L—Remote defect indication (near-end line) • AIS-L—Alarm indication signal (near-end line) • BERR-SF—Bit error rate fault (signal failure) • BERR-SD—Bit error rate defect (signal degradation) • ES-L—Errored seconds (near-end line) • SES-L—Severely errored seconds (near-end line) • UAS-L—Unavailable seconds (near-end line) • ES-LFE—Errored seconds (far-end line) • SES-LFE—Severely errored seconds (far-end line) • UAS-LFE—Unavailable seconds (far-end line)
SONET path	<p>Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> • Seconds—Number of seconds the defect has been active. • Count—Number of times that the defect has gone from inactive to active. • State—State of the error. A state other than OK indicates a problem. <p>The SONET path field has the following subfields:</p> <ul style="list-style-type: none"> • BIP-B3—Bit interleaved parity for SONET section overhead • REI-P—Remote error indication • LOP-P—Loss of pointer (path) • AIS-P—Path alarm indication signal • RDI-P—Path remote defect indication • UNEQ-P—Path unequipped • PLM-P—Path payload (signal) label mismatch • ES-P—Errored seconds (near-end STS path) • SES-P—Severely errored seconds (near-end STS path) • UAS-P—Unavailable seconds (near-end STS path) • ES-PFE—Errored seconds (far-end STS path) • SES-PFE—Severely errored seconds (far-end STS path) • UAS-PFE—Unavailable seconds (far-end STS path)

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Received SONET overhead	Values of the received and transmitted SONET overhead: <ul style="list-style-type: none"> • C2—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P. • F1—Section user channel byte. This byte is set aside for the purposes of users. • K1 and K2—These bytes are allocated for APS signaling for the protection of the multiplex section. • J0—Section trace. This byte is defined for STS-1 number 1 of an STS-N signal. Used to transmit a 1-byte fixed-length string or a 16-byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter. • S1—Synchronization status. The S1 byte is located in the first STS-1 number of an STS-N signal. • Z3 and Z4—Allocated for future use.
Transmitted SONET overhead	
Received path trace	SONET/SDH interfaces allow path trace bytes to be sent inband across the SONET/SDH link. Juniper Networks and other router manufacturers use these bytes to help diagnose misconfigurations and network errors by setting the transmitted path trace message so that it contains the system hostname and name of the physical interface. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits.
Transmitted path trace	
HDLC configuration	Information about the HDLC configuration. <ul style="list-style-type: none"> • Policing bucket—Configured state of the receiving policer. • Shaping bucket—Configured state of the transmitting shaper. • Giant threshold—Giant threshold programmed into the hardware. • Runt threshold—Runt threshold programmed into the hardware.
Packet Forwarding Engine configuration	Information about the configuration of the Packet Forwarding Engine: <ul style="list-style-type: none"> • Destination slot—FPC slot number. • PLP byte—Packet Level Protocol byte.
CoS information	Information about the CoS queue for the physical interface. <ul style="list-style-type: none"> • CoS transmit queue—Queue number and its associated user-configured forwarding class name. • Bandwidth %—Percentage of bandwidth allocated to the queue. • Bandwidth bps—Bandwidth allocated to the queue (in bps). • Buffer %—Percentage of buffer space allocated to the queue. • Buffer usec—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. • Priority—Queue priority: low or high. • Limit—Displayed if rate limiting is configured for the queue. Possible values are none and exact. If exact is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If none is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.
Forwarding classes	Total number of forwarding classes supported on the specified interface.
Egress queues	Total number of egress Maximum usable queues on the specified interface.

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Queue	Queue number.
Forwarding classes	Forwarding class name.
Queued Packets	Number of packets queued to this queue.
Queued Bytes	Number of bytes queued to this queue. The byte counts vary by PIC type.
Transmitted Packets	Number of packets transmitted by this queue. When fragmentation occurs on the egress interface, the first set of packet counters shows the postfragmentation values. The second set of packet counters (displayed under the Packet Forwarding Engine Chassis Queues field) shows the prefragmentation values.
Transmitted Bytes	Number of bytes transmitted by this queue. The byte counts vary by PIC type.
Tail-dropped packets	Number of packets dropped because of tail drop.
RED-dropped packets	<p>Number of packets dropped because of random early detection (RED).</p> <ul style="list-style-type: none"> • (M Series and T Series routers only) On M320 and M120 routers and the T Series routers, the total number of dropped packets is displayed. On all other M Series routers, the output classifies dropped packets into the following categories: <ul style="list-style-type: none"> • Low, non-TCP—Number of low-loss priority non-TCP packets dropped because of RED. • Low, TCP—Number of low-loss priority TCP packets dropped because of RED. • High, non-TCP—Number of high-loss priority non-TCP packets dropped because of RED. • High, TCP—Number of high-loss priority TCP packets dropped because of RED. • (MX Series routers with enhanced DPCs, and T Series routers with enhanced FPCs only) The output classifies dropped packets into the following categories: <ul style="list-style-type: none"> • Low—Number of low-loss priority packets dropped because of RED. • Medium-low—Number of medium-low loss priority packets dropped because of RED. • Medium-high—Number of medium-high loss priority packets dropped because of RED. • High—Number of high-loss priority packets dropped because of RED. <p>NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), this field does not always display the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.</p>

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
RED-dropped bytes	<p>Number of bytes dropped because of RED. The byte counts vary by PIC type.</p> <ul style="list-style-type: none"> (M Series and T Series routers only) On M320 and M120 routers and the T Series routers, only the total number of dropped bytes is displayed. On all other M Series routers, the output classifies dropped bytes into the following categories: <ul style="list-style-type: none"> Low, non-TCP—Number of low-loss priority non-TCP bytes dropped because of RED. Low, TCP—Number of low-loss priority TCP bytes dropped because of RED. High, non-TCP—Number of high-loss priority non-TCP bytes dropped because of RED. High, TCP—Number of high-loss priority TCP bytes dropped because of RED. <p>NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), this field does not always display the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.</p>
Transmit rate	Configured transmit rate of the scheduler. The rate is a percentage of the total interface bandwidth.
Rate Limit	<p>Rate limiting configuration of the queue. Possible values are :</p> <ul style="list-style-type: none"> None—No rate limit. exact—Queue transmits at the configured rate.
Buffer size	Delay buffer size in the queue.
Priority	Scheduling priority configured as low or high .
Excess Priority	Priority of the excess bandwidth traffic on a scheduler: low , medium-low , medium-high , high , or none .
Drop profiles	<p>Display the assignment of drop profiles.</p> <ul style="list-style-type: none"> Loss priority—Packet loss priority for drop profile assignment. Protocol—Transport protocol for drop profile assignment. Index—Index of the indicated object. Objects that have indexes in this output include schedulers and drop profiles. Name—Name of the drop profile. Type—Type of the drop profile: discrete or interpolated. Fill Level—Percentage fullness of a queue. Drop probability—Drop probability at this fill level.
Excess Priority	Priority of the excess bandwidth traffic on a scheduler.

Table 92: show class-of-service interface Output Fields (*continued*)

Field Name	Field Description
Drop profiles	<p>Display the assignment of drop profiles.</p> <ul style="list-style-type: none"> • Loss priority—Packet loss priority for drop profile assignment. • Protocol—Transport protocol for drop profile assignment. • Index—Index of the indicated object. Objects that have indexes in this output include schedulers and drop profiles. • Name—Name of the drop profile. • Type—Type of the drop profile: discrete or interpolated. • Fill Level—Percentage fullness of a queue. • Drop probability—Drop probability at this fill level.
Adjustment information	<p>Display the assignment of shaping-rate adjustments on a scheduler node or queue.</p> <ul style="list-style-type: none"> • Adjusting application—Application that is performing the shaping-rate adjustment. <ul style="list-style-type: none"> • The adjusting application can appear as ancp LS-0, which is the Junos OS Access Node Control Profile process (ancpd) that performs shaping-rate adjustments on schedule nodes. • The adjusting application can appear as DHCP, which adjusts the shaping-rate and overhead-accounting class-of-service attributes based on DHCP option 82, suboption 9 (Vendor Specific Information). The shaping rate is based on the actual-data-rate-downstream attribute. The overhead accounting value is based on the access-loop-encapsulation attribute and specifies whether the access loop uses Ethernet (frame mode) or ATM (cell mode). • The adjusting application can also appear as pppoe, which adjusts the shaping-rate and overhead-accounting class-of-service attributes on dynamic subscriber interfaces in a broadband access network based on access line parameters in Point-to-Point Protocol over Ethernet (PPPoE) Tags [TR-101]. This feature is supported on MPC/MIC interfaces on MX Series routers. The shaping rate is based on the actual-data-rate-downstream attribute. The overhead accounting value is based on the access-loop-encapsulation attribute and specifies whether the access loop uses Ethernet (frame mode) or ATM (cell mode). • Adjustment type—Type of adjustment: absolute or delta. • Configured shaping rate—Shaping rate configured for the scheduler node or queue. • Adjustment value—Value of adjusted shaping rate. • Adjustment target—Level of shaping-rate adjustment performed: node or queue. • Adjustment overhead-accounting mode—Configured shaping mode: frame or cell. • Adjustment overhead bytes—Number of bytes that the ANCP agent adds to or subtracts from the actual downstream frame overhead before reporting the adjusted values to CoS. • Adjustment target—Level of shaping-rate adjustment performed: node or queue. • Adjustment multicast index—

Sample Output

show class-of-service interface (Physical)

```

user@host> show class-of-service interface so-0/2/3
Physical interface: so-0/2/3, Index: 135
Maximum usable queues: 8, Queues in use: 4
Total non-default queues created: 4
Scheduler map: <default>, Index: 2032638653

Logical interface: fe-0/0/1.0, Index: 68, Dedicated Queues: no
Shaping rate: 32000

```

Object	Name	Type	Index
Scheduler-map	<default>		27
Rewrite	exp-default	exp	21
Classifier	exp-default	exp	5
Classifier	ipprec-compatibility	ip	8
Forwarding-class-map	exp-default	exp	5

show class-of-service interface (Logical)

```

user@host> show class-of-service interface so-0/2/3.0
Logical interface: so-0/2/3.0, Index: 68, Dedicated Queues: no
Shaping rate: 32000
Object      Name      Type      Index
Scheduler-map <default>
Rewrite     exp-default exp        21
Classifier   exp-default exp        5
Classifier   ipprec-compatibility ip        8
Forwarding-class-map exp-default exp        5

```

show class-of-service interface (Gigabit Ethernet)

```

user@host> show class-of-service interface ge-6/2/0
Physical interface: ge-6/2/0, Index: 175
Maximum usable queues: 4, Queues in use: 4
Scheduler map: <default>, Index: 2
Input scheduler map: <default>, Index: 3
Chassis scheduler map: <default-chassis>, Index: 4

```

show class-of-service interface (ANCP)

```

user@host> show class-of-service interface pp0.1073741842
Logical interface: pp0.1073741842, Index: 341
Object      Name      Type      Index
Traffic-control-profile TCP-CVLAN  Output    12408
Classifier   dscp-ipv6-compatibility dscp-ipv6 9
Classifier   ipprec-compatibility ip        13

Adjusting application: ancp LS-0
Adjustment type: absolute
Configured shaping rate: 4000000
Adjustment value: 11228000
Adjustment overhead-accounting mode: Frame Mode
Adjustment overhead bytes: 50
Adjustment target: node

```

show class-of-service interface (PPPoE Interface)

```

user@host> show class-of-service interface pp0.1
Logical interface: pp0.1, Index: 85
Object      Name      Type      Index
Traffic-control-profile tcp-pppoe.o.pp0.1 Output    2726446535
Classifier   ipprec-compatibility ip        13

Adjusting application: PPPoE
Adjustment type: absolute
Adjustment value: 5000000
Adjustment overhead-accounting mode: cell
Adjustment target: node

```

show class-of-service interface (DHCP Interface)

```

user@host> show class-of-service interface demux0.1

```

```

Logical interface: pp0.1, Index: 85
  Object      Name      Type      Index
  Traffic-control-profile tcp-dhcp.o.demux0.1  Output    2726446535
  Classifier      ipprec-compatibility ip         13

Adjusting application: DHCP
Adjustment type: absolute
Adjustment value: 5000000
Adjustment overhead-accounting mode: cell
Adjustment target: node

```

show class-of-service interface (T4000 Routers with Type 5 FPCs)

```

user@host> show class-of-service interface xe-4/0/0
Physical interface: xe-4/0/0, Index: 153
  Maximum usable queues: 8, Queues in use: 4
  Shaping rate: 5000000000 bps
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled

  Logical interface: xe-4/0/0.0, Index: 77
    Object      Name      Type
  Index
    Classifier      ipprec-compatibility ip
    13

```

show class-of-service interface detail

```

user@host> show class-of-service interface ge-0/3/0 detail

Physical interface: ge-0/3/0, Enabled, Physical link is Up
  Link-level type: Ethernet, MTU: 1518, Speed: 1000mbps, Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
  Remote fault: Online
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000

Physical interface: ge-0/3/0, Index: 138
  Maximum usable queues: 4, Queues in use: 5
  Shaping rate: 50000 bps
  Scheduler map: interface-scheduler-map, Index: 58414
  Input shaping rate: 10000 bps
  Input scheduler map: scheduler-map, Index: 15103
  Chassis scheduler map: <default-chassis>, Index: 4
  Congestion-notification: Disabled

Logical interface ge-0/3/0.0
  Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.1 ] Encapsulation: ENET2
  inet
  mpls
Interface      Admin Link Proto Input Filter      Output Filter
ge-0/3/0.0     up    up    inet
               mpls
Interface      Admin Link Proto Input Policer      Output Policer
ge-0/3/0.0     up    up    inet
               mpls

Logical interface: ge-0/3/0.0, Index: 68
  Object      Name      Type      Index
  Rewrite      exp-default exp (mpls-any) 33
  Classifier      exp-default exp         10

```

Classifier ipprec-compatibility ip 13

Logical interface ge-0/3/0.1

Flags: SNMP-Traps 0x4000 VLAN-Tag [0x8100.2] Encapsulation: ENET2

inet

Interface	Admin	Link	Proto	Input Filter	Output Filter
ge-0/3/0.1	up	up	inet		
Interface	Admin	Link	Proto	Input Policer	Output Policer
ge-0/3/0.1	up	up	inet		

Logical interface: ge-0/3/0.1, Index: 69

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

show class-of-service interface comprehensive

user@host> show class-of-service interface ge-0/3/0 comprehensive

Physical interface: ge-0/3/0, Enabled, Physical link is Up

Interface index: 138, SNMP ifIndex: 601, Generation: 141

Link-level type: Ethernet, MTU: 1518, Speed: 1000mbps, BPDU Error: None, MAC-REWRITE Error: None, Loopback: Disabled, Source filtering: Disabled, Flow control: Enabled,

Auto-negotiation: Enabled, Remote fault: Online

Device flags : Present Running

Interface flags: SNMP-Traps Internal: 0x4000

CoS queues : 4 supported, 4 maximum usable queues

Schedulers : 256

Hold-times : Up 0 ms, Down 0 ms

Current address: 00:14:f6:f4:b4:5d, Hardware address: 00:14:f6:f4:b4:5d

Last flapped : 2010-09-07 06:35:22 PDT (15:14:42 ago)

Statistics last cleared: Never

Traffic statistics:

Input bytes :	0	0 bps
Output bytes :	0	0 bps
Input packets:	0	0 pps
Output packets:	0	0 pps

IPv6 total statistics:

Input bytes :	0
Output bytes :	0
Input packets:	0
Output packets:	0

Ingress traffic statistics at Packet Forwarding Engine:

Input bytes :	0	0 bps
Input packets:	0	0 pps
Drop bytes :	0	0 bps
Drop packets:	0	0 pps

Label-switched interface (LSI) traffic statistics:

Input bytes :	0	0 bps
Input packets:	0	0 pps

Input errors:

Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0, L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0, FIFO errors: 0, Resource errors: 0

Output errors:

Carrier transitions: 5, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0, FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0

Ingress queues: 4 supported, 5 in use

Queue counters:	Queued packets	Transmitted packets	Dropped packets
0 af3	0	0	0

1 af2	0	0	0
2 ef2	0	0	0
3 ef1	0	0	0

Egress queues: 4 supported, 5 in use

Queue counters:	Queued packets	Transmitted packets	Dropped packets
0 af3	0	0	0
1 af2	0	0	0
2 ef2	0	0	0
3 ef1	0	0	0

Active alarms : None
Active defects : None

MAC statistics:

	Receive	Transmit
Total octets	0	0
Total packets	0	0
Unicast packets	0	0
Broadcast packets	0	0
Multicast packets	0	0
CRC/Align errors	0	0
FIFO errors	0	0
MAC control frames	0	0
MAC pause frames	0	0
Oversized frames	0	
Jabber frames	0	
Fragment frames	0	
VLAN tagged frames	0	
Code violations	0	

Filter statistics:

Input packet count	0	
Input packet rejects	0	
Input DA rejects	0	
Input SA rejects	0	
Output packet count		0
Output packet pad count		0
Output packet error count		0

CAM destination filters: 0, CAM source filters: 0

Autonegotiation information:

Negotiation status: Complete

Link partner:

Link mode: Full-duplex, Flow control: Symmetric/Asymmetric, Remote fault:

OK

Local resolution:

Flow control: Symmetric, Remote fault: Link OK

Packet Forwarding Engine configuration:

Destination slot: 0

CoS information:

Direction : Output

CoS transmit queue	Bandwidth	Buffer	Priority
Limit	%	bps	%
			usec
2 ef2	39	19500	0
			120
			high

none

Direction : Input

CoS transmit queue Limit	Bandwidth			Buffer Priority	
	%	bps	%	usec	
0 af3	30	3000	45	0	low
none					

Physical interface: ge-0/3/0, Enabled, Physical link is Up

Interface index: 138, SNMP ifIndex: 601

Forwarding classes: 16 supported, 5 in use

Ingress queues: 4 supported, 5 in use

Queue: 0, Forwarding classes: af3

Queued:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Transmitted:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Tail-dropped packets : Not Available

RED-dropped packets	:	0	0 pps
---------------------	---	---	-------

RED-dropped bytes	:	0	0 bps
-------------------	---	---	-------

Queue: 1, Forwarding classes: af2

Queued:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Transmitted:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Tail-dropped packets : Not Available

RED-dropped packets	:	0	0 pps
---------------------	---	---	-------

RED-dropped bytes	:	0	0 bps
-------------------	---	---	-------

Queue: 2, Forwarding classes: ef2

Queued:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Transmitted:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Tail-dropped packets : Not Available

RED-dropped packets	:	0	0 pps
---------------------	---	---	-------

RED-dropped bytes	:	0	0 bps
-------------------	---	---	-------

Queue: 3, Forwarding classes: ef1

Queued:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Transmitted:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Tail-dropped packets : Not Available

RED-dropped packets	:	0	0 pps
---------------------	---	---	-------

RED-dropped bytes	:	0	0 bps
-------------------	---	---	-------

Forwarding classes: 16 supported, 5 in use

Egress queues: 4 supported, 5 in use

Queue: 0, Forwarding classes: af3

Queued:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Transmitted:

Packets	:	0	0 pps
Bytes	:	0	0 bps

Tail-dropped packets : Not Available

RL-dropped packets	:	0	0 pps
--------------------	---	---	-------

```

        RL-dropped bytes      :          0          0 bps
        RED-dropped packets   :          0          0 pps
        RED-dropped bytes     :          0          0 bps
Queue: 1, Forwarding classes: af2
  Queued:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
  Transmitted:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
    Tail-dropped packets : Not Available
    RL-dropped packets :          0          0 pps
    RL-dropped bytes  :          0          0 bps
    RED-dropped packets :          0          0 pps
    RED-dropped bytes  :          0          0 bps
Queue: 2, Forwarding classes: ef2
  Queued:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
  Transmitted:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
    Tail-dropped packets : Not Available
    RL-dropped packets :          0          0 pps
    RL-dropped bytes  :          0          0 bps
    RED-dropped packets :          0          0 pps
    RED-dropped bytes  :          0          0 bps
Queue: 3, Forwarding classes: ef1
  Queued:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
  Transmitted:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
    Tail-dropped packets : Not Available
    RL-dropped packets :          0          0 pps
    RL-dropped bytes  :          0          0 bps
    RED-dropped packets :          0          0 pps
    RED-dropped bytes  :          0          0 bps

Packet Forwarding Engine Chassis Queues:
Queues: 4 supported, 5 in use
Queue: 0, Forwarding classes: af3
  Queued:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
  Transmitted:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
    Tail-dropped packets :          0          0 pps
    RED-dropped packets : Not Available
    RED-dropped bytes   : Not Available
Queue: 1, Forwarding classes: af2
  Queued:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
  Transmitted:
    Packets      :          0          0 pps
    Bytes        :          0          0 bps
    Tail-dropped packets :          0          0 pps
    RED-dropped packets : Not Available

```

```

    RED-dropped bytes      : Not Available
Queue: 2, Forwarding classes: ef2
Queued:
  Packets      :                0                0 pps
  Bytes       :                0                0 bps
Transmitted:
  Packets      :                0                0 pps
  Bytes       :                0                0 bps
  Tail-dropped packets :                0                0 pps
  RED-dropped packets : Not Available
  RED-dropped bytes  : Not Available
Queue: 3, Forwarding classes: ef1
Queued:
  Packets      :            108546                0 pps
  Bytes       :        12754752            376 bps
Transmitted:
  Packets      :            108546                0 pps
  Bytes       :        12754752            376 bps
  Tail-dropped packets :                0                0 pps
  RED-dropped packets : Not Available
  RED-dropped bytes  : Not Available

```

```

Physical interface: ge-0/3/0, Index: 138
Maximum usable queues: 4, Queues in use: 5
Shaping rate: 50000 bps

```

Scheduler map: interface-scheduler-map, Index: 58414

```

Scheduler: ef2, Forwarding class: ef2, Index: 39155
  Transmit rate: 39 percent, Rate Limit: none, Buffer size: 120 us, Buffer
Limit: none, Priority: high
  Excess Priority: unspecified
  Drop profiles:
    Loss priority  Protocol    Index    Name
    Low           any         1        < default-drop-profile>
    Medium low    any         1        < default-drop-profile>
    Medium high   any         1        < default-drop-profile>
    High          any         1        < default-drop-profile>
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
    100          100
Input shaping rate: 10000 bps
Input scheduler map: scheduler-map

```

Scheduler map: scheduler-map, Index: 15103

```

Scheduler: af3, Forwarding class: af3, Index: 35058
  Transmit rate: 30 percent, Rate Limit: none, Buffer size: 45 percent, Buffer
Limit: none, Priority: low
  Excess Priority: unspecified
  Drop profiles:
    Loss priority  Protocol    Index    Name

```

```

        Low          any          40582    green
        Medium low   any          1        < default-drop-profile>
        Medium high  any          1        < default-drop-profile>
        High         any          18928    yellow
Drop profile: green, Type: discrete, Index: 40582
  Fill level  Drop probability
    50         0
    100        100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level  Drop probability
    100        100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level  Drop probability
    100        100
Drop profile: yellow, Type: discrete, Index: 18928
  Fill level  Drop probability
    50         0
    100        100
Chassis scheduler map: < default-drop-profile>
Scheduler map: < default-drop-profile>, Index: 4

Scheduler: < default-drop-profile>, Forwarding class: af3, Index: 25
  Transmit rate: 25 percent, Rate Limit: none, Buffer size: 25 percent, Buffer
  Limit: none, Priority: low
  Excess Priority: low
  Drop profiles:
    Loss priority  Protocol  Index  Name
    Low           any       1       < default-drop-profile>
    Medium low     any       1       < default-drop-profile>
    Medium high    any       1       < default-drop-profile>
    High           any       1       < default-drop-profile>
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level  Drop probability
    100        100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level  Drop probability
    100        100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level  Drop probability
    100        100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level  Drop probability
    100        100

Scheduler: < default-drop-profile>, Forwarding class: af2, Index: 25
  Transmit rate: 25 percent, Rate Limit: none, Buffer size: 25 percent, Buffer
  Limit: none, Priority: low
  Excess Priority: low
  Drop profiles:
    Loss priority  Protocol  Index  Name
    Low           any       1       < default-drop-profile>
    Medium low     any       1       < default-drop-profile>
    Medium high    any       1       < default-drop-profile>
    High           any       1       < default-drop-profile>
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level  Drop probability
    100        100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level  Drop probability
    100        100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1

```

```

Fill level      Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
Fill level      Drop probability
    100          100

Scheduler: < default-drop-profile>, Forwarding class: ef2, Index: 25
Transmit rate: 25 percent, Rate Limit: none, Buffer size: 25 percent, Buffer
Limit: none, Priority: low
Excess Priority: low
Drop profiles:
  Loss priority  Protocol    Index    Name
  Low            any          1        < default-drop-profile>
  Medium low     any          1        < default-drop-profile>
  Medium high    any          1        < default-drop-profile>
  High           any          1        < default-drop-profile>
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
Fill level      Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
Fill level      Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
Fill level      Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
Fill level      Drop probability
    100          100

Scheduler: < default-drop-profile>, Forwarding class: ef1, Index: 25
Transmit rate: 25 percent, Rate Limit: none, Buffer size: 25 percent, Buffer
Limit: none, Priority: low
Excess Priority: low
Drop profiles:
  Loss priority  Protocol    Index    Name
  Low            any          1        < default-drop-profile>
  Medium low     any          1        < default-drop-profile>
  Medium high    any          1        < default-drop-profile>
  High           any          1        < default-drop-profile>
Drop profile: , Type: discrete, Index: 1
Fill level      Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
Fill level      Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
Fill level      Drop probability
    100          100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
Fill level      Drop probability
    100          100
Congestion-notification: Disabled
Forwarding class
priority Policing priority
af3      normal
af2      normal
ef2      normal
ef1      normal
ID        Queue  Restricted queue  Fabric
0         0      0                low
1         1      1                low
2         2      2                high
3         3      3                high

```

```

          normal
af1              4      4      0      low
          normal

```

Logical interface ge-0/3/0.0 (Index 68) (SNMP ifIndex 152) (Generation 159)

Flags: SNMP-Traps 0x4000 VLAN-Tag [0x8100.1] Encapsulation: ENET2

Traffic statistics:

```

Input bytes :      0
Output bytes :      0
Input packets:      0
Output packets:     0

```

Local statistics:

```

Input bytes :      0
Output bytes :      0
Input packets:      0
Output packets:     0

```

Transit statistics:

```

Input bytes :      0      0 bps
Output bytes :      0      0 bps
Input packets:      0      0 pps
Output packets:     0      0 pps

```

Protocol inet, MTU: 1500, Generation: 172, Route table: 0

Flags: Sendbcst-pkt-to-re

Input Filters: filter-in-ge-0/3/0.0-i,

Policer: Input: p1-ge-0/3/0.0-inet-i

Protocol mpls, MTU: 1488, Maximum labels: 3, Generation: 173, Route table: 0

Flags: Is-Primary

Output Filters: exp-filter,,,,,

Logical interface ge-1/2/0.0 (Index 347) (SNMP ifIndex 638) (Generation 156)

Forwarding class ID	Queue	Restricted queue	Fabric priority	Policing priority
SPU priority				

best-effort	0	0	0	low	normal
low					

Aggregate Forwarding-class statistics per forwarding-class

Aggregate Forwarding-class statistics:

Forwarding-class statistics:

Forwarding-class best-effort statistics:

```

Input unicast bytes: 0
Output unicast bytes: 0
Input unicast packets: 0
Output unicast packets: 0

```

```

Input multicast bytes: 0
Output multicast bytes: 0
Input multicast packets: 0
Output multicast packets: 0

```

Forwarding-class expedited-forwarding statistics:

```

Input unicast bytes: 0
Output unicast bytes: 0
Input unicast packets: 0
Output unicast packets: 0

```

```

Input multicast bytes: 0
Output multicast bytes: 0
Input multicast packets: 0

```

Output multicast packets: 0

IPv4 protocol forwarding-class statistics:

Forwarding-class statistics:

Forwarding-class best-effort statistics:

Input unicast bytes: 0
Output unicast bytes: 0
Input unicast packets: 0
Output unicast packets: 0

Input multicast bytes: 0
Output multicast bytes: 0
Input multicast packets: 0
Output multicast packets: 0

Forwarding-class expedited-forwarding statistics:

Input unicast bytes: 0
Output unicast bytes: 0
Input unicast packets: 0
Output unicast packets: 0

Input multicast bytes: 0
Output multicast bytes: 0
Input multicast packets: 0
Output multicast packets: 0

IPv6 protocol forwarding-class statistics:

Forwarding-class statistics:

Forwarding-class best-effort statistics:

Input unicast bytes: 0
Output unicast bytes: 0
Input unicast packets: 0
Output unicast packets: 0

Input multicast bytes: 0
Output multicast bytes: 0
Input multicast packets: 0
Output multicast packets: 0

Forwarding-class expedited-forwarding statistics:

Input unicast bytes: 0
Output unicast bytes: 0
Input unicast packets: 0
Output unicast packets: 0

Input multicast bytes: 0
Output multicast bytes: 0
Input multicast packets: 0
Output multicast packets: 0

Logical interface ge-0/3/0.0 (Index 68) (SNMP ifIndex 152)

Flags: SNMP-Traps 0x4000 VLAN-Tag [0x8100.1] Encapsulation: ENET2

Input packets : 0

Output packets: 0

Interface	Admin	Link	Proto	Input Filter	Output Filter
ge-0/3/0.0	up	up	inet	filter-in-ge-0/3/0.0-i	
			mpls		exp-filter
Interface	Admin	Link	Proto	Input Policer	Output Policer

```

ge-0/3/0.0      up      up
                  inet    p1-ge-0/3/0.0-inet-i
                  mpls

Filter: filter-in-ge-0/3/0.0-i
Counters:
Name                                     Bytes      Packets
count-filter-in-ge-0/3/0.0-i             0           0

Filter: exp-filter
Counters:
Name                                     Bytes      Packets
count-exp-seven-match                     0           0
count-exp-zero-match                      0           0
Policers:
Name                                     Packets
p1-ge-0/3/0.0-inet-i                     0

Logical interface: ge-0/3/0.0, Index: 68
Object      Name      Type      Index

Rewrite      exp-default      exp (mpls-any)      33

Rewrite rule: exp-default, Code point type: exp, Index: 33
Forwarding class      Loss priority      Code point
af3                    low                    000
af3                    high                   001
af2                    low                    010
af2                    high                   011
ef2                    low                    100
ef2                    high                   101
ef1                    low                    110
ef1                    high                   111
Object      Name      Type      Index

Classifier      exp-default      exp      10

Classifier: exp-default, Code point type: exp, Index: 10
Code point      Forwarding class      Loss priority
000              af3                    low
001              af3                    high
010              af2                    low
011              af2                    high
100              ef2                    low
101              ef2                    high
110              ef1                    low
111              ef1                    high
Object      Name      Type      Index

Classifier      ipprec-compatibility      ip      13

Classifier: ipprec-compatibility, Code point type: inet-precedence, Index: 13
Code point      Forwarding class      Loss priority
000              af3                    low
001              af3                    high
010              af3                    low
011              af3                    high
100              af3                    low
101              af3                    high
110              ef1                    low

```

111	ef1			high	
Forwarding class		ID	Queue	Restricted queue	Fabric
priority	Policing priority				
af3		0	0	0	low
	normal				
af2		1	1	1	low
	normal				
ef2		2	2	2	high
	normal				
ef1		3	3	3	high
	normal				
af1		4	4	0	low
	normal				

Logical interface ge-0/3/0.1 (Index 69) (SNMP ifIndex 154) (Generation 160)

Flags: SNMP-Traps 0x4000 VLAN-Tag [0x8100.2] Encapsulation: ENET2

Traffic statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

Local statistics:

Input bytes : 0

Output bytes : 0

Input packets: 0

Output packets: 0

Transit statistics:

Input bytes : 0 0 bps

Output bytes : 0 0 bps

Input packets: 0 0 pps

Output packets: 0 0 pps

Protocol inet, MTU: 1500, Generation: 174, Route table: 0

Flags: Sendbroadcast-pkt-to-re

Logical interface ge-0/3/0.1 (Index 69) (SNMP ifIndex 154)

Flags: SNMP-Traps 0x4000 VLAN-Tag [0x8100.2] Encapsulation: ENET2

Input packets : 0

Output packets: 0

Interface	Admin	Link	Proto	Input Filter	Output Filter
ge-0/3/0.1	up	up	mpls		
Interface	Admin	Link	Proto	Input Policer	Output Policer
ge-0/3/0.1	up	up	mpls		

Logical interface: ge-0/3/0.1, Index: 69

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

Classifier: ipprec-compatibility, Code point type: inet-precedence, Index: 13

Code point	Forwarding class	Loss priority
000	af3	low
001	af3	high
010	af3	low
011	af3	high
100	af3	low
101	af3	high
110	ef1	low
111	ef1	high

Forwarding class priority	Policing priority	ID	Queue	Restricted queue	Fabric
af3	normal	0	0	0	low
af2	normal	1	1	1	low
ef2	normal	2	2	2	high
ef1	normal	3	3	3	high
af1	normal	4	4	0	low

show class-of-service interface (ACX Series Routers)

```
user@host-g11# show class-of-service interface
```

```
Physical interface: at-0/0/0, Index: 130
```

```
Maximum usable queues: 4, Queues in use: 4
```

```
Scheduler map: <default>, Index: 2
```

```
Congestion-notification: Disabled
```

```
Logical interface: at-0/0/0.0, Index: 69
```

```
Logical interface: at-0/0/0.32767, Index: 70
```

```
Physical interface: at-0/0/1, Index: 133
```

```
Maximum usable queues: 4, Queues in use: 4
```

```
Scheduler map: <default>, Index: 2
```

```
Congestion-notification: Disabled
```

```
Logical interface: at-0/0/1.0, Index: 71
```

```
Logical interface: at-0/0/1.32767, Index: 72
```

```
Physical interface: ge-0/1/0, Index: 146
```

```
Maximum usable queues: 8, Queues in use: 5
```

```
Scheduler map: <default>, Index: 2
```

```
Congestion-notification: Disabled
```

Object	Name	Type	Index
Rewrite	dscp-default	dscp	31
Classifier	d1	dscp	11331
Classifier	ci	ieee8021p	583

```
Logical interface: ge-0/1/0.0, Index: 73
```

Object	Name	Type	Index
Rewrite	custom-exp	exp (mpls-any)	46413

```
Logical interface: ge-0/1/0.1, Index: 74
```

```
Logical interface: ge-0/1/0.32767, Index: 75
```

```
Physical interface: ge-0/1/1, Index: 147
```

```
Maximum usable queues: 8, Queues in use: 5
```

```
Scheduler map: <default>, Index: 2
```

```
Congestion-notification: Disabled
```

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

```
Logical interface: ge-0/1/1.0, Index: 76
```

Physical interface: ge-0/1/2, Index: 148
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled

Object	Name	Type	Index
Rewrite	ri	ieee8021p (outer)	35392
Classifier	ci	ieee8021p	583

Physical interface: ge-0/1/3, Index: 149
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

Logical interface: ge-0/1/3.0, Index: 77

Object	Name	Type	Index
Rewrite	custom-exp2	exp (mpls-any)	53581

Physical interface: ge-0/1/4, Index: 150
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

Physical interface: ge-0/1/5, Index: 151
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

Physical interface: ge-0/1/6, Index: 152
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

Physical interface: ge-0/1/7, Index: 153
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled

Object	Name	Type	Index
Classifier	d1	dscp	11331

Physical interface: ge-0/2/0, Index: 154
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

Physical interface: ge-0/2/1, Index: 155
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled

Object	Name	Type	Index
Classifier	ipprec-compatibility	ip	13

```

Logical interface: ge-0/2/1.0, Index: 78

Logical interface: ge-0/2/1.32767, Index: 79

Physical interface: xe-0/3/0, Index: 156
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled
Object      Name      Type      Index
Classifier  ipprec-compatibility  ip      13

Logical interface: xe-0/3/0.0, Index: 80

Physical interface: xe-0/3/1, Index: 157
Maximum usable queues: 8, Queues in use: 5
Scheduler map: <default>, Index: 2
Congestion-notification: Disabled
Object      Name      Type      Index
Classifier  ipprec-compatibility  ip      13

Logical interface: xe-0/3/1.0, Index: 81

[edit]
user@host-g11#

```

show class-of-service interface (PPPoE Subscriber Interface for Enhanced Subscriber Management)

```

user@host> show class-of-service interface pp0.3221225474
Logical interface: pp0.3221225475, Index: 3221225475
Object      Name      Type      Index
Traffic-control-profile TC_PROF_100_199_SERIES_UID1006 Output  4294967312
Scheduler-map SMAP-1_UID1002 Output  4294967327
Rewrite-Output ieee-rewrite ieee8021p 60432
Rewrite-Output rule1 ip 50463

Adjusting application: PPPoE IA tags
Adjustment type: absolute
Configured shaping rate: 11000000
Adjustment value: 5000000
Adjustment target: node

Adjusting application: ucac
Adjustment type: delta
Configured shaping rate: 5000000
Adjustment value: 100000
Adjustment target: node

```

show class-of-service interface-set

Syntax	<code>show class-of-service interface-set</code> <code><interface-set-name></code>
Release Information	Command introduced in Junos OS Release 9.4. Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Display the configured shaping rate and the adjusted shaping rate for each logical interface set configured for hierarchical class of service (CoS).
Options	none —Display CoS associations for all logical interface sets. interface-set <i>interface-set-name</i> —(Optional) Display CoS associations for the specified interface set.
Required Privilege Level	view
List of Sample Output	show class-of-service interface-set on page 1568 show class-of-service interface-set (Enhanced Subscriber Management) on page 1568
Output Fields	Table 93 on page 1567 describes the output fields for the show class-of-service interface-set command. Output fields are listed in the approximate order in which they appear.

Table 93: show class-of-service interface-set Output Fields

Field Name	Field Description
Interface-set	Name of a logical interface set composed of one or more logical interfaces for which hierarchical scheduling is enabled.
Index	Index number of this interface set or the internal index number of this object.
Physical interface	Name of a physical interface.
Queues supported	Number of queues you can configure on the interface.
Queues in use	Number of queues currently configured.
Output traffic control profile	Name of the output traffic control profile attached to the logical interface set.
Output traffic control profile remaining	(Enhanced subscriber management for MX Series routers) For dynamic subscriber management, name of the output traffic control profile for remaining traffic attached to the logical interface set.

Table 93: show class-of-service interface-set Output Fields (*continued*)

Field Name	Field Description
Adjusting application	<p>Name of the application that communicates shaping-rate adjustment information to the Junos OS class-of-service process (cosd) on the broadband services router (BSR). The BSR uses the information from this application to perform shaping-rate adjustments on the scheduler node that manages the interface set. The adjusting application appears as ancp LS-0 which is the Junos OS Access Node Control Profile process (ancpd) that performs shaping-rate adjustments on schedule nodes. The nodes are logical interface sets configured to represent subscriber local loops. When the synchronization speed of the DSL line changes, ancpd communicates the local loop speed to cosd over the default logical system, LS-0, and then the BSR throttles the shaping rate on the scheduler node to the loop speed.</p> <p>The adjusting application can also appear as PPPoE, which adjusts the shaping-rate and overhead-accounting class-of-service attributes on dynamic subscriber interfaces in a broadband access network based on access line parameters in Point-to-Point Protocol over Ethernet (PPPoE) Tags [TR-101]. This feature is supported on MPC/MIC interfaces on MX Series routers. The shaping rate is based on the actual data rate downstream attribute. The overhead accounting value is based on the access loop encapsulation attribute and specifies whether the access loop uses Ethernet (frame mode) or ATM (cell mode).</p>
Adjustment type	Type of shaping-rate adjustment performed by the BSR on the scheduler node. The type of adjustment appears as Adjustment type , meaning that the configured shaping rate is adjusted by an absolute value as opposed to by a percentage of the configured rate.
Configured shaping rate	The maximum transmission rate on the physical interface as configured by the output traffic-control profile attached to the scheduler node.
Adjustment value	Value of the shaping-rate adjustment information sent by the adjusting application to cosd .
Adjustment overhead-accounting mode	Configured shaping mode: frame or cell .

Sample Output

show class-of-service interface-set

```

user@host> show class-of-service interface-set example-ifset-ge-4/0/0-7
Interface-set: example-ifset-ge-4/0/0-7, Index: 8
Physical interface: ge-4/0/0, Index: 270
Queues supported: 8, Queues in use: 8
  Output traffic control profile: example-tcp-basic-rate, Index: 11395
Adjusting application: ancp LS-0
  Adjustment type: absolute
  Configured shaping rate: 50000000
  Adjustment value: 888000
  Adjustment overhead-accounting mode: cell

```

show class-of-service interface-set (Enhanced Subscriber Management)

```

user@host> show class of service interface-set
Interface-set: ge-1/0/0-201-201, Index: 1
Physical interface: ge-1/0/0, Index: 142
Queues supported: 8, Queues in use: 4
  Output traffic control profile: LEVEL_2_UID1001, Index: 4294967307
  Output traffic control profile remaining: TCP_REMAIN_UID1003, Index: 4294967308

```


show class-of-service scheduler-map

Syntax	<code>show class-of-service scheduler-map</code> <code><name></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Display the mapping of schedulers to forwarding classes and a summary of scheduler parameters for each entry.
Options	none —Display all scheduler maps. name —(Optional) Display a summary of scheduler parameters for each forwarding class to which the named scheduler is assigned.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Junos OS Enhanced Subscriber Management on page 558
List of Sample Output	show class-of-service scheduler-map on page 1571 show class-of-service scheduler-map (QFX Series) on page 1572
Output Fields	Table 94 on page 1570 describes the output fields for the show class-of-service scheduler-map command. Output fields are listed in the approximate order in which they appear.

Table 94: show class-of-service scheduler-map Output Fields

Field Name	Field Description
Scheduler map	<p>Name of the scheduler map.</p> <p>(Enhanced subscriber management for MX Series routers) The name of the dynamic scheduler map object is associated with a generated UID (for example, SMAP-1_UID1002) instead of with a subscriber interface.</p>
Index	<p>Index of the indicated object. Objects having indexes in this output include scheduler maps, schedulers, and drop profiles.</p> <p>(Enhanced subscriber management for MX Series routers) Index values for dynamic CoS traffic control profiles are larger for enhanced subscriber management than they are for legacy subscriber management.</p>
Scheduler	Name of the scheduler.
Forwarding class	Classification of a packet affecting the forwarding, scheduling, and marking policies applied as the packet transits the router.

Table 94: show class-of-service scheduler-map Output Fields (*continued*)

Field Name	Field Description
Transmit rate	Configured transmit rate of the scheduler (in bps). The rate is a percentage of the total interface bandwidth, or the keyword remainder , which indicates that the scheduler receives the remaining bandwidth of the interface.
Rate Limit	Rate limiting configuration of the queue. Possible values are none , meaning no rate limiting, and exact , meaning the queue only transmits at the configured rate.
Maximum buffer delay	Amount of transmit delay (in milliseconds) or the buffer size of the queue. The buffer size is shown as a percentage of the total interface buffer allocation, or by the keyword remainder to indicate that the buffer is sized according to what remains after other scheduler buffer allocations.
Priority	Scheduling priority: low or high .
Excess priority	Priority of excess bandwidth: low , medium-low , medium-high , high , or none .
Explicit Congestion Notification	(QFX Series, OCX Series, and EX4600 switches only) Explicit congestion notification (ECN) state: <ul style="list-style-type: none"> • Disable—ECN is disabled on the specified scheduler • Enable—ECN is enabled on the specified scheduler ECN is disabled by default.
Adjust minimum	Minimum shaping rate for an adjusted queue, in bps.
Adjust percent	Bandwidth adjustment applied to a queue, in percent.
Drop profiles	Table displaying the assignment of drop profiles by name and index to a given loss priority and protocol pair.
Loss priority	Packet loss priority for drop profile assignment.
Protocol	Transport protocol for drop profile assignment.
Name	Name of the drop profile.

Sample Output

show class-of-service scheduler-map

```
user@host> show class-of-service scheduler-map
Scheduler map: dd-scheduler-map, Index: 84
```

```
Scheduler: aa-scheduler, Index: 8721, Forwarding class: aa-forwarding-class
Transmit rate: 30 percent, Rate Limit: none, Maximum buffer delay: 39 ms,
Priority: high
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           non-TCP   8724   aa-drop-profile
  Low           TCP       9874   bb-drop-profile
  High          non-TCP   8833   cc-drop-profile
  High          TCP       8484   dd-drop-profile
```

```
Scheduler: bb-scheduler, Forwarding class: aa-forwarding-class
Transmit rate: 40 percent, Rate limit: none, Maximum buffer delay: 68 ms,
Priority: high
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           non-TCP   8724   aa-drop-profile
  Low           TCP      9874   bb-drop-profile
  High          non-TCP   8833   cc-drop-profile
  High          TCP      8484   dd-drop-profile
```

show class-of-service scheduler-map (QFX Series)

```
user@switch# show class-of-service scheduler-map
Scheduler map: be-map, Index: 12240
```

```
Scheduler:be-sched, Forwarding class: best-effort, Index: 115
Transmit rate: 30 percent, Rate Limit: none, Buffer size: remainder,
Buffer Limit: none, Priority: low
Excess Priority: unspecified, Explicit Congestion Notification: disable
```

```
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           any      3312   lan-dp
  Medium-high    any      2714   be-dp1
  High          any      3178   be-dp2
```

show class-of-service scheduler-map

Syntax	<code>show class-of-service scheduler-map</code> <code><name></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Display the mapping of schedulers to forwarding classes and a summary of scheduler parameters for each entry.
Options	none —Display all scheduler maps. name —(Optional) Display a summary of scheduler parameters for each forwarding class to which the named scheduler is assigned.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Junos OS Enhanced Subscriber Management on page 558
List of Sample Output	show class-of-service scheduler-map on page 1574 show class-of-service scheduler-map (QFX Series) on page 1575
Output Fields	Table 94 on page 1570 describes the output fields for the show class-of-service scheduler-map command. Output fields are listed in the approximate order in which they appear.

Table 95: show class-of-service scheduler-map Output Fields

Field Name	Field Description
Scheduler map	Name of the scheduler map. (Enhanced subscriber management for MX Series routers) The name of the dynamic scheduler map object is associated with a generated UID (for example, SMAP-1_UID1002) instead of with a subscriber interface.
Index	Index of the indicated object. Objects having indexes in this output include scheduler maps, schedulers, and drop profiles. (Enhanced subscriber management for MX Series routers) Index values for dynamic CoS traffic control profiles are larger for enhanced subscriber management than they are for legacy subscriber management.
Scheduler	Name of the scheduler.
Forwarding class	Classification of a packet affecting the forwarding, scheduling, and marking policies applied as the packet transits the router.

Table 95: show class-of-service scheduler-map Output Fields (*continued*)

Field Name	Field Description
Transmit rate	Configured transmit rate of the scheduler (in bps). The rate is a percentage of the total interface bandwidth, or the keyword remainder , which indicates that the scheduler receives the remaining bandwidth of the interface.
Rate Limit	Rate limiting configuration of the queue. Possible values are none , meaning no rate limiting, and exact , meaning the queue only transmits at the configured rate.
Maximum buffer delay	Amount of transmit delay (in milliseconds) or the buffer size of the queue. The buffer size is shown as a percentage of the total interface buffer allocation, or by the keyword remainder to indicate that the buffer is sized according to what remains after other scheduler buffer allocations.
Priority	Scheduling priority: low or high .
Excess priority	Priority of excess bandwidth: low , medium-low , medium-high , high , or none .
Explicit Congestion Notification	(QFX Series, OCX Series, and EX4600 switches only) Explicit congestion notification (ECN) state: <ul style="list-style-type: none"> • Disable—ECN is disabled on the specified scheduler • Enable—ECN is enabled on the specified scheduler ECN is disabled by default.
Adjust minimum	Minimum shaping rate for an adjusted queue, in bps.
Adjust percent	Bandwidth adjustment applied to a queue, in percent.
Drop profiles	Table displaying the assignment of drop profiles by name and index to a given loss priority and protocol pair.
Loss priority	Packet loss priority for drop profile assignment.
Protocol	Transport protocol for drop profile assignment.
Name	Name of the drop profile.

Sample Output

show class-of-service scheduler-map

```
user@host> show class-of-service scheduler-map
Scheduler map: dd-scheduler-map, Index: 84
```

```
Scheduler: aa-scheduler, Index: 8721, Forwarding class: aa-forwarding-class
Transmit rate: 30 percent, Rate Limit: none, Maximum buffer delay: 39 ms,
Priority: high
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           non-TCP   8724   aa-drop-profile
  Low           TCP       9874   bb-drop-profile
  High          non-TCP   8833   cc-drop-profile
  High          TCP       8484   dd-drop-profile
```

```
Scheduler: bb-scheduler, Forwarding class: aa-forwarding-class
Transmit rate: 40 percent, Rate limit: none, Maximum buffer delay: 68 ms,
Priority: high
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           non-TCP   8724   aa-drop-profile
  Low           TCP      9874   bb-drop-profile
  High          non-TCP   8833   cc-drop-profile
  High          TCP      8484   dd-drop-profile
```

show class-of-service scheduler-map (QFX Series)

```
user@switch# show class-of-service scheduler-map
Scheduler map: be-map, Index: 12240
```

```
Scheduler:be-sched, Forwarding class: best-effort, Index: 115
Transmit rate: 30 percent, Rate Limit: none, Buffer size: remainder,
Buffer Limit: none, Priority: low
Excess Priority: unspecified, Explicit Congestion Notification: disable
```

```
Drop profiles:
  Loss priority  Protocol  Index  Name
  Low           any       3312   lan-dp
  Medium-high    any       2714   be-dp1
  High          any       3178   be-dp2
```

show class-of-service traffic-control-profile

Syntax	<code>show class-of-service traffic-control-profile</code> <code><profile-name></code>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 11.1 for the QFX Series. Command introduced in Junos OS Release 12.2 for ACX Series Routers. Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	For Gigabit Ethernet IQ PICs, Channelized IQ PICs, EQ DPCs, and MPC/MIC interfaces only, display traffic shaping and scheduling profiles. (ACX Series routers) For ATM IMA pseudowire interfaces, display traffic shaping and scheduling profiles.
Options	none —Display all profiles. profile-name —(Optional) Display information about a single profile.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Junos OS Enhanced Subscriber Management on page 558
List of Sample Output	show class-of-service traffic-control-profile on page 1578 show class-of-service traffic-control-profile (MX Series routers with Clear Channel Multi-Rate CE MIC) on page 1579 show class-of-service traffic-control-profile (ACX Series routers with ATM IMA pseudowire interfaces) on page 1579 show class-of-service traffic-control-profile (Enhanced Subscriber Management) on page 1579
Output Fields	Table 96 on page 1576 describes the output fields for the show class-of-service traffic-control-profile command. Output fields are listed in the approximate order in which they appear.

Table 96: show class-of-service traffic-control-profile Output Fields

Field Name	Field Description
Traffic control profile	<p>Name of the traffic control profile.</p> <p>(Enhanced subscriber management for MX Series routers) The name of the dynamic traffic control profile object is associated with a generated UID (for example, TC_PROF_100_199_SERIES_UID1000) instead of with a subscriber interface.</p>

Table 96: show class-of-service traffic-control-profile Output Fields (*continued*)

Field Name	Field Description
Index	Index number of the traffic control profile. (Enhanced subscriber management for MX Series routers) Index values for dynamic CoS traffic control profiles are larger for enhanced subscriber management than they are for legacy subscriber management.
ATM Service	(MX Series routers with ATM Multi-Rate CE MIC) Configured category of ATM service. Possible values: <ul style="list-style-type: none"> • cbr—Constant bit rate. • rtvbr—Real time variable bit rate. • nrtvbr—Non real time variable bit rate. • ubr—Unspecified bit rate.
Maximum Burst Size	Configured maximum burst size, in cells.
Peak rate	Configured peak rate, in cps.
Sustained rate	Configured sustained rate, in cps.
Shaping rate	Configured shaping rate, in bps. NOTE: (MX Series routers with ATM Multi-Rate CE MIC) Configured peak rate, in cps.
Shaping rate burst	Configured burst size for the shaping rate, in bytes. NOTE: (MX Series routers with ATM Multi-Rate CE MIC) Configured maximum burst rate, in cells.
Shaping rate priority high	Configured shaping rate for high-priority traffic, in bps.
Shaping rate priority medium	Configured shaping rate for medium-priority traffic, in bps.
Shaping rate priority low	Configured shaping rate for low-priority traffic, in bps.
Shaping rate excess high	Configured shaping rate for high-priority excess traffic, in bps.
Shaping rate excess low	Configured shaping rate for low-priority excess traffic, in bps.
Scheduler map	Name of the associated scheduler map. (Enhanced subscriber management for MX Series routers) The name of the dynamic scheduler map object is associated with a generated UID (for example, SMAP-1_UID1002) instead of with a subscriber interface.
Delay Buffer rate	Configured delay buffer rate, in bps.

Table 96: show class-of-service traffic-control-profile Output Fields (*continued*)

Field Name	Field Description
Excess rate	Configured excess rate, in percent or proportion.
Excess rate high	Configured excess rate for high priority traffic, in percent or proportion.
Excess rate low	Configured excess rate for low priority traffic, in percent or proportion.
Guaranteed rate	<p>Configured guaranteed rate, in bps or cps.</p> <p>NOTE: (MX Series routers with ATM Multi-Rate CE MIC) This value depends on the ATM service category chosen. Possible values:</p> <ul style="list-style-type: none"> • cbr—Guaranteed rate is equal to the configured peak rate in cps. • rtvbr—Guaranteed rate is equal to the configured sustained rate in cps. • nrtvbr—Guaranteed rate is equal to the configured sustained rate in cps.
Guaranteed rate burst	Configured burst size for the guaranteed rate, in bytes.
adjust-minimum	Configured minimum shaping rate for an adjusted queue, in bps.
overhead accounting mode	Configured shaping mode: Frame Mode or Cell Mode .
Overhead bytes	Configured byte adjustment value.
Adjust parent	<p>Configured shaping-rate adjustment for parent scheduler nodes. If enabled, this field appears.</p> <p>flow-aware indicates that the parent scheduler node is adjusted only once per multicast channel.</p>

Sample Output

show class-of-service traffic-control-profile

```

user@host> show class-of-service traffic-control-profile
Traffic control profile: Profile1, Index: 57625
  Scheduler map: m1
  Delay Buffer rate: 500000
  Guaranteed rate: 1000000

Traffic control profile: Profile2, Index: 57624
  Scheduler map: m2
  Delay Buffer rate: 600000
  Guaranteed rate: 2000000

Traffic control profile: Profile3, Index: 57627
  Scheduler map: m3

```

```

Delay Buffer rate: 800000
Guaranteed rate: 3000000
.Excess rate high: proportion 4

Traffic control profile: Profile4, Index: 57626
Scheduler map: m4
Delay Buffer rate: 750000
Guaranteed rate: 4000000
..adjust-minimum 20000000

Traffic control profile: foo, Index: 57626
Shaping rate: 100000000
Scheduler map: <default>
Overhead accounting mode: Frame Mode
Frame mode overhead accounting bytes: -12
Adjust parent: flow-aware

```

show class-of-service traffic-control-profile (MX Series routers with Clear Channel Multi-Rate CE MIC)

```

user@host> show class-of-service traffic-control-profile
Traffic control profile: at-vbr1, Index: 11395
ATM Service: RTVBR
Scheduler map: m3
overhead accounting mode: Frame Mode
Shaping rate: 1000 cps
Shaping rate burst: 500 cells
Delay Buffer rate: 2000 cps
Guaranteed rate: 1000 cps

Traffic control profile: foo, Index: 38286
ATM Service: UBR
Scheduler map: m3
overhead accounting mode: Frame Mode

```

show class-of-service traffic-control-profile (ACX Series routers with ATM IMA pseudowire interfaces)

```

user@host> show class-of-service traffic-control-profile
Traffic control profile: foo, Index: 38286
ATM Service: RTVBR
Shaping rate: 2000 cps
Shaping rate burst: 200 cells
Scheduler map: <default>
Delay Buffer rate: 1000 cps
Guaranteed rate: 1700 cps

```

show class-of-service traffic-control-profile (Enhanced Subscriber Management)

```

user@host> show class-of-service traffic-control-profile
Traffic control profile: TC_PROF_100_199_SERIES_UID1000, Index: 4294967313
Shaping rate: 11000000
Shaping rate burst: 1 bytes
Scheduler map: SMAP-1_UID1002
Delay Buffer rate: 5000000
Overhead accounting mode: Cell Mode
Frame mode overhead accounting bytes: -4
Cell mode overhead accounting bytes: 20

```

show database-replication statistics

Syntax	show database-replication statistics
Release Information	Command introduced in Junos OS Release 9.3.
Description	Display statistics regarding the replication of the subscriber management session database.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show database-replication summary on page 1582
List of Sample Output	show database-replication statistics on page 1580
Output Fields	Table 97 on page 1580 lists the output fields for the show database-replication statistics command. Output fields are listed in the approximate order in which they appear.

Table 97: show database-replication statistics Output Fields

Field Name	Field Description
General	Number of dropped connections and the maximum buffer count.
Message Received	Total size of messages received and the number of received messages that have been processed.
Message Sent	Total size of messages sent and the number of sent messages that have been processed.
Message Queue	Number of messages in the queue and the maximum size of the queue.

Sample Output

show database-replication statistics

```
user@host> show database-replication statistics
```

```
General:
  Dropped connections      0
  Max buffer count        0
Message received:
  Size (bytes)             0
  Processed                0
Message sent:
  Size (bytes)             0
  Processed                0
Message queue:
```

Queue full	0
Max queue size	0

show database-replication summary

Syntax	show database-replication summary
Release Information	Command introduced in Junos OS Release 9.3.
Description	Display summary information regarding database replication for the subscriber management session database.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show database-replication statistics on page 1580
List of Sample Output	show database-replication summary on page 1583
Output Fields	Table 98 on page 1582 lists the output fields for the show database-replication summary command. Output fields are listed in the approximate order in which they appear.

Table 98: show database-replication summary Output Fields

Field Name	Field Description
Graceful Restart	State of graceful Routing Engine switchover (GRES): <ul style="list-style-type: none"> • Enabled • Disabled
Mastership	State of the Routing Engine: <ul style="list-style-type: none"> • Master • Standby
Connection	State of the connection: <ul style="list-style-type: none"> • Up • Down
Database	State of the subscriber management database: <ul style="list-style-type: none"> • Available • Unavailable • Synchronized
Message Queue	State of the message queue: <ul style="list-style-type: none"> • Full • Init • Not Ready • Ready

Sample Output

show database-replication summary

```
user@host> show database-replication summary
General:
  Graceful Restart    Enabled
  Mastership          Standby
  Connection           Up
  Database             Available
  Message Queue       Ready
```

show network-access aaa accounting

Syntax	show network-access aaa accounting
Release Information	Command introduced in Junos OS Release 12.3.
Description	Display the state of the RADIUS Acct-On response sent from the RADIUS server.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> RADIUS Acct-On and Acct-Off Messages on page 103
List of Sample Output	show network-access aaa accounting on page 1584
Output Fields	Table 99 on page 1584 lists the output fields for the show network-access aaa accounting command. Output fields are listed in the approximate order in which they appear.

Table 99: show network-access aaa accounting Output Fields

Field Name	Field Description
Profile	Name of the profile associated with the RADIUS server. A RADIUS server can be associated with more than one profile.
Logical System	Logical system associated with the access profile.
Routing Instance	Routing instance associated with the access profile.
Acct-On-Response	Status of the RADIUS Acct-On response. <ul style="list-style-type: none"> ACK—ACK response for the Acct-On message is received from the RADIUS server. ERROR—An error condition has occurred. NONE— No Acct-On message is sent. PENDING—Acct-On message is sent to RADIUS server, but no response has been received yet.

Sample Output

show network-access aaa accounting

```

user@host> show network-access aaa accounting
Profile      Logical System  Routing Instance  Acct-On-Response
ppp-profile  default        default          ACK
l2tp-profile default        l2tp_RI          PENDING

```

show dhcp relay binding

Syntax	<pre> show dhcp relay binding <address> <brief> <detail> <interface interface-name> <interfaces-vlan> <interfaces-wildcard> <ip-address mac-address> <logical-system logical-system-name> <routing-instance routing-instance-name> <summary> </pre>
Release Information	<p>Command introduced in Junos OS Release 8.3.</p> <p>Options interface and mac-address added in Junos OS Release 8.4.</p> <p>Options interfaces-vlan and interfaces-wildcard added in Junos OS Release 12.1.</p> <p>Command introduced in Junos OS Release 12.1X48R3 for PTX Series Packet Transport Routers.</p>
Description	Display the address bindings in the Dynamic Host Configuration Protocol (DHCP) client table.
Options	<p>address—(Optional) Display DHCP binding information for a specific client identified by one of the following entries:</p> <ul style="list-style-type: none"> • ip-address—The specified IP address. • mac-address—The specified MAC address. • session-id—The specified session ID. <p>brief—(Optional) Display brief information about the active client bindings. This is the default, and produces the same output as show dhcp relay binding.</p> <p>detail—(Optional) Display detailed client binding information.</p> <p>interface interface-name—(Optional) Perform this operation on the specified interface. You can optionally filter on VLAN ID and SVLAN ID.</p> <p>interfaces-vlan—(Optional) Show the binding state information on the interface VLAN ID and S-VLAN ID.</p> <p>interfaces-wildcard—(Optional) The set of interfaces on which to show binding state information. This option supports the use of the wildcard character (*).</p> <p>logical-system logical-system-name—(Optional) Perform this operation on the specified logical system.</p> <p>routing-instance routing-instance-name—(Optional) Perform this operation on the specified routing instance.</p> <p>summary—(Optional) Display a summary of DHCP client information.</p>

Required Privilege Level view

Related Documentation

- [Clearing DHCP Bindings for Subscriber Access on page 368](#)
- [clear dhcp relay binding on page 1443](#)

List of Sample Output

- [show dhcp relay binding on page 1588](#)
- [show dhcp relay binding detail on page 1588](#)
- [show dhcp relay binding interface on page 1588](#)
- [show dhcp relay binding interface vlan-id on page 1589](#)
- [show dhcp relay binding interface svlan-id on page 1589](#)
- [show dhcp relay binding ip-address on page 1589](#)
- [show dhcp relay binding mac-address on page 1589](#)
- [show dhcp relay binding session-id on page 1589](#)
- [show dhcp relay binding <interfaces-vlan> on page 1589](#)
- [show dhcp relay binding <interfaces-wildcard> on page 1589](#)
- [show dhcp relay binding summary on page 1589](#)

Output Fields Table 100 on page 1586 lists the output fields for the **show dhcp relay binding** command. Output fields are listed in the approximate order in which they appear.

Table 100: show dhcp relay binding Output Fields

Field Name	Field Description	Level of Output
<i>number</i> clients, (<i>number</i> init, <i>number</i> bound, <i>number</i> selecting, <i>number</i> requesting, <i>number</i> renewing, <i>number</i> rebinding, <i>number</i> releasing)	Summary counts of the total number of DHCP clients and the number of DHCP clients in each state.	summary
IP address	IP address of the DHCP client.	brief detail
Session Id	Session ID of the subscriber session.	brief detail
Generated Remote ID	Remote ID generated by the Option 82 Agent Remote ID (suboption 1)	detail
Hardware address	Hardware address of the DHCP client.	brief detail
Expires	Number of seconds in which the lease expires.	brief detail

Table 100: show dhcp relay binding Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the DHCP relay address binding table on the DHCP client: <ul style="list-style-type: none"> • BOUND—Client has an active IP address lease. • INIT—Initial state. • REBINDING—Client is broadcasting a request to renew the IP address lease. • 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. 	brief detail
Interface	Incoming client interface.	brief
Lease Expires	Date and time at which the client's IP address lease expires.	detail
Lease Expires in	Number of seconds in which the lease expires.	detail
Lease Start	Date and time at which the client's IP address lease started.	detail
Lease time violated	Lease time violation has occurred.	detail
Incoming Client Interface	Client's incoming interface.	detail
Server IP Address	IP address of the DHCP server.	detail
Server Interface	Interface of the DHCP server.	detail
Bootp Relay Address	IP address of BOOTP relay.	detail
Type	Type of DHCP packet processing performed on the router: <ul style="list-style-type: none"> • active—Router actively processes and relays DHCP packets. • passive—Router passively snoops DHCP packets passing through the router. 	All levels
Lease expires at	Date and time at which the client's IP address lease expires.	All levels
Dual Stack Group	Name of dual stack that is configured with the DHCP binding.	detail
Dual Stack Peer Prefix	Prefix of dual stack DHCPv6 peer.	detail
Dual Stack Peer Address	Address of the dual stack DHCPv6 peer.	detail

Sample Output

show dhcp relay binding

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

IP address	Session Id	Hardware address	Expires	State	Interface
198.51.100.11	41	00:00:5e:00:53:01	86371	BOUND	ge-1/0/0.0
198.51.100.12	42	00:00:5e:00:53:02	86371	BOUND	ge-1/0/0.0
198.51.100.13	43	00:00:5e:00:53:03	86371	BOUND	ge-1/0/0.0
198.51.100.14	44	00:00:5e:00:53:04	86371	BOUND	ge-1/0/0.0
198.51.100.15	45	00:00:5e:00:53:05	86371	BOUND	ge-1/0/0.0

show dhcp relay binding detail

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

```
Client IP Address: 198.51.100.11
  Hardware Address: 00:00:5e:00:53:01
  State: BOUND(DHCP_RELAY_STATE_BOUND_ON_INTF_DELETE)
  Lease Expires: 2009-07-21 11:00:06 PDT
  Lease Expires in: 86361 seconds
  Lease Start: 2009-07-20 11:00:06 PDT
  Lease time violated: yes
  Last Packet Received: 2009-07-20 11:00:06 PDT
  Incoming Client Interface: ge-1/0/0.0
  Server Ip Address: 198.51.100.22
  Server Interface: none
  Bootp Relay Address: 198.51.100.32
  Session Id: 41
  Dual Stack Group: dual-stack-retail6
  Dual Stack Peer Prefix: 2001:db8:0:4::/64
  Dual Stack Peer Address: 2001:db8:1:0:8003::1/128
```

```
Client IP Address: 198.51.100.12
  Hardware Address: 00:00:5e:00:53:02
  State: BOUND(DHCP_RELAY_STATE_BOUND_ON_INTF_DELETE)
  Lease Expires: 2009-07-21 11:00:06 PDT
  Lease Expires in: 86361 seconds
  Lease Start: 2009-07-20 11:00:06 PDT
  Last Packet Received: 2009-07-20 11:00:06 PDT
  Incoming Client Interface: ge-1/0/0.0
  Server Ip Address: 198.51.100.22
  Server Interface: none
  Bootp Relay Address: 198.51.100.32
  Session Id: 42
  Generated Remote ID: host:ge-1/0/0:100
```

show dhcp relay binding interface

```
user@host> show dhcp relay binding interface fe-0/0/2
```

IP address	Hardware address	Type	Lease expires at
198.51.100.1	00:00:5e:00:53:01	active	2007-03-27 15:06:20 EDT

show dhcp relay binding interface vlan-id

```
user@host> show dhcp relay binding interface ge-1/1/0:100
```

IP address	Session Id	Hardware address	Expires	State	Interface
198.51.100.15	6	00:00:5e:00:53:94	86124	BOUND	ge-1/1/0:100

show dhcp relay binding interface svlan-id

```
user@host> show dhcp relay binding interface ge-1/1/0:10-100
```

IP address	Session Id	Hardware address	Expires	State	Interface
198.51.100.16	7	00:00:5e:00:53:92	86124	BOUND	ge-1/1/0:10-100

show dhcp relay binding ip-address

```
user@host> show dhcp relay binding 198.51.100.13
```

IP address	Session Id	Hardware address	Expires	State	Interface
198.51.100.13	43	00:00:5e:00:53:03	86293	BOUND	ge-1/0/0.0

show dhcp relay binding mac-address

```
user@host> show dhcp relay binding 00:00:5e:00:53:05
```

IP address	Session Id	Hardware address	Expires	State	Interface
198.51.100.15	45	00:00:5e:00:53:05	86279	BOUND	ge-1/0/0.0

show dhcp relay binding session-id

```
user@host> show dhcp relay binding 41
```

IP address	Session Id	Hardware address	Expires	State	Interface
198.51.100.11	41	00:00:5e:00:53:53	86305	BOUND	ge-1/0/0.0

show dhcp relay binding <interfaces-vlan>

```
user@host> show dhcp relay binding ge-1/0/0:100-200
```

IP address	Session Id	Hardware address	Expires	State	Interface
192.168.0.17	42	00:00:5e:00:53:02	86346	BOUND	ge-1/0/0.1073741827
192.168.0.16	41	00:00:5e:00:53:01	86346	BOUND	ge-1/0/0.1073741827

show dhcp relay binding <interfaces-wildcard>

```
user@host> show dhcp relay binding ge-1/3/*
```

IP address	Session Id	Hardware address	Expires	State	Interface
192.168.0.9	24	00:00:5e:00:53:04	86361	BOUND	ge-1/3/0.110
192.168.0.8	23	00:00:5e:00:53:03	86361	BOUND	ge-1/3/0.110
192.168.0.7	22	00:00:5e:00:53:02	86361	BOUND	ge-1/3/0.110

show dhcp relay binding summary

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

```
3 clients, (2 init, 1 bound, 0 selecting, 0 requesting, 0 renewing, 0 rebinding,
0 releasing)
```


show dhcp relay statistics

Syntax	<pre>show dhcp relay statistics <bulk-leasequery-connections> <logical-system <i>logical-system-name</i>> <routing-instance <i>routing-instance-name</i>></pre>
Syntax	<p>Syntax for EX Series switches:</p> <pre>show dhcp relay statistics <routing-instance <i>routing-instance-name</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 8.3.</p> <p>Command introduced in Junos OS Release 12.1 for EX Series switches.</p> <p>Command introduced in Junos OS Release 12.1X48R3 for PTX Series Packet Transport Routers.</p> <p>bulk-leasequery-connections option introduced in Junos OS Release 16.1.</p>
Description	Display Dynamic Host Configuration Protocol (DHCP) relay statistics.
Options	<p>bulk-leasequery-connections—(Optional) Display information about bulk leasequery operations.</p> <p>logical-system <i>logical-system-name</i>—(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.</p> <p>routing-instance <i>routing-instance-name</i>—(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.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear dhcp relay statistics on page 1446
List of Sample Output	<p>show dhcp relay statistics on page 1593</p> <p>show dhcp relay statistics bulk-leasequery-connections on page 1594</p>
Output Fields	<p>Table 101 on page 1592 lists the output fields for the show dhcp relay statistics command. Output fields are listed in the approximate order in which they appear.</p>

Table 101: show dhcp relay statistics Output Fields

Field Name	Field Description
Packets dropped	<p>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.</p> <ul style="list-style-type: none"> • 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	<p>Number of DHCP messages received.</p> <ul style="list-style-type: none"> • 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 • DHCPLEASEACTIVE—Number of active DHCP leases • DHCPLEASEUNASSIGNED—Number of DHCP leases that are managed by the server but have not yet been assigned • DHCPLEASEUNKNOWN—Number of unknown DHCP leases • DHCPLEASEQUERYDONE—The leasequery is complete
Messages sent	<p>Number of DHCP messages sent.</p> <ul style="list-style-type: none"> • 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 • DHCPLEASEQUERY—Number of DHCP leasequery messages transmitted • DHCPLEASEBULKLEASEQUERY—Number of DHCP bulk leasequery messages transmitted

Table 101: show dhcp relay statistics Output Fields (*continued*)

Field Name	Field Description
External Server Response	State of the external DHCP server responsiveness.
Packets forwarded	Number of packets forwarded. <ul style="list-style-type: none"> BOOTREQUEST—Number of BOOTREQUEST protocol data units (PDUs) forwarded BOOTREPLY—Number of BOOTREPLY protocol data units (PDUs) forwarded
External Server Response	State of the external DHCP server responsiveness.
Total Requested Servers	Total number of servers with which the DHCP relay agent has requested a bulk leasequery connection.
Total Attempted Servers	Total number of servers with which the DHCP relay agent has attempted to create a bulk leasequery connection.
Total Connected	Total number of servers that have formed a bulk leasequery connection with the DHCP relay agent.
Total Terminated by Server	Total number of servers that have terminated a bulk leasequery connection with the DHCP relay agent.
Total Max Attempted	Total number of servers where the DHCP relay agent reached the maximum retry limit when it attempted to create a bulk leasequery connection.
Total Closed due to Errors	Total number of bulk leasequery connections that closed due to an internal error on the DHCP relay agent.
In-Flight Connected	Number of current bulk leasequery connections on the DHCP relay agent.
Bulk Leasequery Reply Packet Retries	Number of bulk leasequery reply packets that the DHCP relay agent has retried.

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
DHCPCDECLINE       0
DHCPDISCOVER       11
DHCPINFORM         0
DHCPRELEASE        0
DHCPREQUEST        105
DHCPLEASEACTIVE    0
DHCPLEASEUNASSIGNED 0
DHCPLEASEUNKNOWN   0
DHCPLEASEQUERYDONE 0

Messages sent:
BOOTREPLY          0
DHCPOFFER          2
DHCPACK            1
DHCPNAK            0
DHCPFORCERENEW     0
DHCPLEASEQUERY     0
DHCPBULKLEASEQUERY 0

Packets forwarded:
Total              4
BOOTREQUEST        2
BOOTREPLY          2

External Server Response:
State              Responding
```

show dhcp relay statistics bulk-leasequery-connections

```
user@host> show dhcp relay statistics bulk-leasequery-connections

Total Requested Servers: 0
Total Attempted Servers: 0
Total Connected: 0
Total Terminated by Server: 0
Total Max Attempted: 0
Total Closed due to Errors: 0
In-Flight Connected: 0
Bulk Leasequery Reply Packet Retries: 0
```

show dhcp server binding

Syntax `show dhcp server binding`
 `<address>`
 `<interfaces-vlan><brief | detail | summary>`
 `<interface interface-name>`
 `<interfaces-vlan>`
 `<interfaces-wildcard>`
 `<logical-system logical-system-name>`
 `<routing-instance routing-instance-name>`

Release Information Command introduced in Junos OS Release 9.0.
 Options *interfaces-vlan* and *interfaces-wildcard* added in Junos OS Release 12.1.

Description Display the address bindings in the client table on the extended Dynamic Host Configuration Protocol (DHCP) local server.



NOTE: If you delete the DHCP server configuration, DHCP server bindings might still remain. To ensure that DHCP bindings are removed, issue the `clear dhcp server binding` command before you delete the DHCP server configuration.

Options **address**—(Optional) Display DHCP binding information for a specific client identified by one of the following entries:

- *ip-address*—The specified IP address.
- *mac-address*—The specified MAC address.
- *session-id*—The specified session ID.

brief | detail | summary—(Optional) Display the specified level of output about active client bindings. The default is **brief**, which produces the same output as **show dhcp server binding**.

interface interface-name—(Optional) Display information about active client bindings on the specified interface. You can optionally filter on VLAN ID and SVLAN ID.

interfaces-vlan—(Optional) Show the binding state information on the interface VLAN ID and S-VLAN ID.

interfaces-wildcard—(Optional) The set of interfaces on which to show the binding state information. This option supports the use of the wildcard character (*).

logical-system logical-system-name—(Optional) Display information about active client bindings for DHCP clients on the specified logical system.

routing-instance routing-instance-name—(Optional) Display information about active client bindings for DHCP clients on the specified routing instance.

Required Privilege Level view

Related Documentation

- [Clearing DHCP Bindings for Subscriber Access on page 368](#)
- [Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration](#)
- [clear dhcp server binding on page 1449](#)

List of Sample Output

[show dhcp server binding on page 1598](#)
[show dhcp server binding detail on page 1599](#)
[show dhcp server binding detail \(ACI Interface Set Configured\) on page 1599](#)
[show dhcp server binding interface <vlan-id> on page 1600](#)
[show dhcp server binding interface <svlan-id> on page 1600](#)
[show dhcp server binding <ip-address> on page 1600](#)
[show dhcp server binding <session-id> on page 1600](#)
[show dhcp server binding summary on page 1600](#)
[show dhcp server binding <interfaces-vlan> on page 1600](#)
[show dhcp server binding <interfaces-wildcard> on page 1600](#)

Output Fields [Table 102 on page 1596](#) lists the output fields for the **show dhcp server binding** command. Output fields are listed in the approximate order in which they appear.

Table 102: show dhcp server binding Output Fields

Field Name	Field Description	Level of Output
<i>number</i> clients, (<i>number</i> init, <i>number</i> bound, <i>number</i> selecting, <i>number</i> requesting, <i>number</i> renewing, <i>number</i> releasing)	Summary counts of the total number of DHCP clients and the number of DHCP clients in each state.	summary
IP address	IP address of the DHCP client.	brief detail
Session Id	Session ID of the subscriber session.	brief detail
Hardware address	Hardware address of the DHCP client.	brief detail
Expires	Number of seconds in which lease expires.	brief detail

Table 102: show dhcp server binding Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the address binding table on the extended DHCP local server: <ul style="list-style-type: none"> • BOUND—Client has active IP address lease. • FORCERENEW—Client has received forcerenew message from server. • INIT—Initial state. • RELEASE—Client is releasing IP address lease. • RENEWING—Client sending request to renew IP address lease. • REQUESTING—Client requesting a DHCP server. • SELECTING—Client receiving offers from DHCP servers. 	brief detail
Interface	Interface on which the request was received.	brief
Lease Expires	Date and time at which the client's IP address lease expires.	detail
Lease Expires in	Number of seconds in which lease expires.	detail
Lease Start	Date and time at which the client's IP address lease started.	detail
Lease time violated	Lease time violation has occurred.	detail
Last Packet Received	Date and time at which the router received the last packet.	detail
Incoming Client Interface	Client's incoming interface.	detail
Client Interface Svlan Id	S-VLAN ID of the client's incoming interface.	detail
Client Interface Vlan Id	VLAN ID of the client's incoming interface.	detail
Demux Interface	Name of the IP demultiplexing (demux) interface.	detail
Server IP Address or Server Identifier	IP address of DHCP server.	detail
Server Interface	Interface of DHCP server.	detail
Client Pool Name	Name of address pool used to assign client IP address lease.	detail

Table 102: show dhcp server binding Output Fields (*continued*)

Field Name	Field Description	Level of Output
Liveness Detection State	<p>State of the liveness detection status for a subscriber's Bidirectional Forwarding Detection (BFD) protocol session:</p> <p>NOTE: This output field displays status only when liveness detection has been explicitly configured for a subscriber and the liveness detection protocol is actively functioning for that subscriber.</p> <ul style="list-style-type: none"> DOWN—Liveness detection has been enabled for a subscriber but the broadband network gateway (BNG) detects that the liveness detection session for the BFD protocol is in the DOWN state. A liveness detection session that was previously in an UP state has transitioned to a DOWN state, beginning with a liveness detection failure, and ending with the deletion of the client binding. The DOWN state is reported only during this transition period of time. UNKNOWN—Liveness detection has been enabled for a subscriber but the actual liveness detection state has not yet been determined. The UNKNOWN state is reported after a DHCP subscriber initially logs in while the underlying liveness detection protocol handshake, such as BFD, is still processing and the BFD session has not yet reached the UP state. UP—Liveness detection has been enabled for a subscriber, and the BNG and the subscriber or client have <i>both</i> determined that the liveness detection session for the BFD protocol is in the UP state. WENT_DOWN—State is functionally equivalent to the DOWN state. A liveness detection session that was previously in an UP state has transitioned to a DOWN state implying a liveness detection failure. The WENT_DOWN state applies to the internal distribution of the liveness detection mechanism between the Junos DHCP Daemon for Subscriber Services (JDHCPd), the BFD plug-in within the Broadband Edge Subscriber Management Daemon (BBE-SMGD), and the Packet Forwarding Engine. 	detail
ACI Interface Set Name	Internally generated name of the dynamic agent circuit identifier (ACI) interface set.	detail
ACI Interface Set Index	Index number of the dynamic ACI interface set.	detail
ACI Interface Set Session ID	Identifier of the dynamic ACI interface set entry in the session database.	detail

Sample Output

show dhcp server binding

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

IP address	Session Id	Hardware address	Expires	State	Interface
198.51.100.15	6	00:00:5e:00:53:01	86180	BOUND	ge-1/0/0.0
198.51.100.16	7	00:00:5e:00:53:02	86180	BOUND	ge-1/0/0.0
198.51.100.17	8	00:00:5e:00:53:03	86180	BOUND	ge-1/0/0.0
198.51.100.18	9	00:00:5e:00:53:04	86180	BOUND	ge-1/0/0.0
198.51.100.19	10	00:00:5e:00:53:05	86180	BOUND	ge-1/0/0.0

show dhcp server binding detail

```

user@host> show dhcp server binding detail
Client IP Address: 198.51.100.15
    Hardware Address:      00:00:5e:00:53:01
    State:                 BOUND(LOCAL_SERVER_STATE_BOUND_ON_INTF_DELETE)

    Lease Expires:        2009-07-21 10:10:25 PDT
    Lease Expires in:     86151 seconds
    Lease Start:          2009-07-20 10:10:25 PDT
    Incoming Client Interface: ge-1/0/0.0
    Server Ip Address:     198.51.100.9
    Server Interface:      none
    Session Id:            6
    Client Pool Name:      6
    Liveness Detection State: UP
Client IP Address: 198.51.100.16
    Hardware Address:      00:00:5e:00:53:02
    State:                 BOUND(LOCAL_SERVER_STATE_BOUND_ON_INTF_DELETE)

    Lease Expires:        2009-07-21 10:10:25 PDT
    Lease Expires in:     86151 seconds
    Lease Start:          2009-07-20 10:10:25 PDT
    Lease time violated:   yes
    Incoming Client Interface: ge-1/0/0.0
    Server Ip Address:     198.51.100.9
    Server Interface:      none
    Session Id:            7
    Client Pool Name:      7
    Liveness Detection State: UP

```

show dhcp server binding detail (ACI Interface Set Configured)

```

user@host> show dhcp server binding detail
Client IP Address: 198.51.100.14
    Hardware Address:      00:00:5e:00:53:02
    State:                 BOUND(LOCAL_SERVER_STATE_BOUND)
    Lease Expires:        2012-03-13 09:53:32 PDT
    Lease Expires in:     82660 seconds
    Lease Start:          2012-03-12 10:23:32 PDT
    Last Packet Received: 2012-03-12 10:23:32 PDT
    Incoming Client Interface: demux0.1073741827
    Client Interface Svlan Id: 1802
    Client Interface Vlan Id: 302
    Demux Interface:       demux0.1073741832
    Server Identifier:     198.51.100.202
    Session Id:            11
    Client Pool Name:      poolA
    Client Profile Name:   DEMUXprofile
    Liveness Detection State: UP

```

```

ACI Interface Set Name:      aci-1002-demux0.1073741827
ACI Interface Set Index:    2
ACI Interface Set Session ID: 6

```

show dhcp server binding interface <vlan-id>

```

user@host> show dhcp server binding interface ge-1/1/0:100
IP address      Session Id  Hardware address  Expires  State  Interface
198.51.100.15   6          00:00:5e:00:53:01 86124    BOUND  ge-1/1/0:100

```

show dhcp server binding interface <svlan-id>

```

user@host> show dhcp server binding interface ge-1/1/0:10-100
IP address      Session Id  Hardware address  Expires  State  Interface
198.51.100.16   7          00:00:5e:00:53:02 86124    BOUND  ge-1/1/0:10-100

```

show dhcp server binding <ip-address>

```

user@host> show dhcp server binding 198100.19
IP address      Session Id  Hardware address  Expires  State  Interface
198.51.100.19   10         00:00:5e:00:53:05 86081    BOUND  ge-1/0/0.0

```

show dhcp server binding <session-id>

```

user@host> show dhcp server binding 6
IP address      Session Id  Hardware address  Expires  State  Interface
198.51.100.15   6          00:00:5e:00:53:01 86124    BOUND  ge-1/0/0.0

```

show dhcp server binding summary

```

user@host> show dhcp server binding summary
3 clients, (2 init, 1 bound, 0 selecting, 0 requesting, 0 renewing, 0 releasing)

```

show dhcp server binding <interfaces-vlan>

```

user@host> show dhcp server binding ge-1/0/0:100-200
IP address      Session Id  Hardware address  Expires  State  Interface
192.168.0.17    42         00:00:5e:00:53:02 86346    BOUND  ge-1/0/0.1073741827
192.168.0.16    41         00:00:5e:00:53:01 86346    BOUND  ge-1/0/0.1073741827

```

show dhcp server binding <interfaces-wildcard>

```

user@host> show dhcp server binding ge-1/3/*
IP address      Session Id  Hardware address  Expires  State  Interface
192.168.0.9     24         00:00:5e:00:53:04 86361    BOUND  ge-1/3/0.110
192.168.0.8     23         00:00:5e:00:53:03 86361    BOUND  ge-1/3/0.110
192.168.0.7     22         00:00:5e:00:53:02 86361    BOUND  ge-1/3/0.110

```

show dhcp server statistics

Syntax	<pre>show dhcp server statistics <bulk-leasequery-connections> <logical-system <i>logical-system-name</i>> <routing-instance <i>routing-instance-name</i>></pre>
Release Information	<p>Command introduced in Junos OS Release 9.0.</p> <p>bulk-leasequery-connections option introduced in Junos OS Release 16.1.</p>
Description	Display extended Dynamic Host Configuration Protocol (DHCP) local server statistics.
Options	<p>bulk-leasequery-connections—(Optional) Display bulk leasequery statistics.</p> <p>bulk-leasequery-connections—(Optional) Display information about bulk leasequery statistics.</p> <p>logical-system <i>logical-system-name</i>—(Optional) Display information about extended DHCP local server statistics on the specified logical system. If you do not specify a logical system, statistics are displayed for the default logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Display information about extended DHCP local server statistics on the specified routing instance. If you do not specify a routing instance, statistics are displayed for the default routing instance.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear dhcp server statistics on page 1452
List of Sample Output	show dhcp server statistics on page 1603
Output Fields	<p>Table 103 on page 1602 lists the output fields for the show dhcp server statistics command. Output fields are listed in the approximate order in which they appear.</p>

Table 103: show dhcp server statistics Output Fields

Field Name	Field Description
Packets dropped	<p>Number of packets discarded by the extended DHCP local server because of errors. Only nonzero statistics appear in the Packets dropped output. When all of the Packets dropped statistics are 0 (zero), only the Total field appears.</p> <ul style="list-style-type: none"> • Total—Total number of packets discarded by the extended DHCP local server • Authentication—Number of packets discarded because they could not be authenticated • 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 • Dynamic profile—Number of packets discarded due to dynamic profile information • 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 local server could not send
Messages received	<p>Number of DHCP messages received.</p> <ul style="list-style-type: none"> • 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 • DHCPLEASEQUERY—Number of DHCP leasequery messages received. • DHCPBULKLEASEQUERY—Number of DHCP bulk leasequery messages received.
Messages sent	<p>Number of DHCP messages sent.</p> <ul style="list-style-type: none"> • 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 • DHCPLEASEUNASSIGNED—Number of DHCP leases that are managed by the server but have not yet been assigned • DHCPLEASEUNKNOWN—Number of unknown DHCP leases • DHCPLEASEACTIVE—Number of active DHCP leases • DHCPLEASEQUERYDONE—The leasequery is complete

Table 103: show dhcp server statistics Output Fields (*continued*)

Field Name	Field Description
Total Accepted Connections	Total number of bulk leasequery connections accepted by the server.
Total Not-Accepted Connections	Total number of bulk leasequery connections not accepted by the server.
Connections Closed due to Errors	Number of bulk leasequery connections that the server closed due to an internal error.
Connections Closed due to max-empty-replies	Number of bulk leasequery connections that the server closed because the maximum number of empty replies was reached.
In-flight Connections	Number of bulk leasequery connections on the server.

Sample Output

show dhcp server statistics

```

user@host> show dhcp server statistics
Packets dropped:
    Total                  1
    Lease Time Violation   1

Messages received:
    BOOTREQUEST            25
    DHCPDECLINE             0
    DHCPDISCOVER           10
    DHCPINFORM              0
    DHCPRELEASE             4
    DHCPREQUEST            10

Messages sent:
    BOOTREPLY               20
    DHCPOFFER               10
    DHCPACK                 10
    DHCPNAK                  0
    DHCPFORCERENEW          0

```

show dhcpv6 relay binding

Syntax	show dhcpv6 relay binding <address> <brief> <detail> <interface <i>interface-name</i>> <interfaces-vlan> <interfaces-wildcard> <logical-system <i>logical-system-name</i>> <routing-instance <i>routing-instance-name</i>> <summary>
Release Information	Command introduced in Junos OS Release 11.4. <i>interfaces-vlan</i> and <i>interfaces-wildcard</i> options introduced in Junos OS Release 12.1.
Description	Display the DHCPv6 address bindings in the Dynamic Host Configuration Protocol (DHCP) client table.
Options	<p>address—(Optional) One of the following identifiers for the DHCPv6 client whose binding state you want to show:</p> <ul style="list-style-type: none">• <i>CID</i>—The specified Client ID (CID).• <i>ipv6-prefix</i>—The specified IPv6 prefix.• <i>session-id</i>—The specified session ID. <p>brief—(Optional) Display brief information about the active client bindings. This is the default, and produces the same output as show dhcpv6 relay binding.</p> <p>detail—(Optional) Display detailed client binding information.</p> <p>interface <i>interface-name</i>—(Optional) Perform this operation on the specified interface. You can optionally filter on VLAN ID and S-VLAN ID.</p> <p>interfaces-vlan—(Optional) Interface VLAN ID or S-VLAN ID interface on which to show binding state information.</p> <p>interfaces-wildcard—(Optional) Set of interfaces on which to show binding state information. This option supports the use of the wildcard character (*).</p> <p>logical-system <i>logical-system-name</i>—(Optional) Perform this operation on the specified logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Perform this operation on the specified routing instance.</p> <p>summary—(Optional) Display a summary of DHCPv6 client information.</p>
Required Privilege Level	view

- Related Documentation**
- [Clearing DHCP Bindings for Subscriber Access on page 368](#)
 - [clear dhcpv6 relay binding on page 1454](#)

- List of Sample Output**
- [show dhcpv6 relay binding on page 1607](#)
 - [show dhcpv6 relay binding \(Address\) on page 1607](#)
 - [show dhcpv6 relay binding detail \(Client ID\) on page 1608](#)
 - [show dhcpv6 relay binding detail on page 1608](#)
 - [show dhcpv6 relay binding detail \(Dual-Stack\) on page 1608](#)
 - [show dhcpv6 relay binding detail \(Multi-Relay Topology\) on page 1609](#)
 - [show dhcpv6 relay binding \(Session ID\) on page 1609](#)
 - [show dhcpv6 relay binding \(Subscriber with Multiple Addresses\) on page 1609](#)
 - [show dhcpv6 relay binding detail \(Subscriber with Multiple Addresses\) on page 1609](#)
 - [show dhcpv6 relay binding \(Interfaces VLAN\) on page 1610](#)
 - [show dhcpv6 relay binding \(Interfaces Wildcard\) on page 1610](#)
 - [show dhcpv6 relay binding \(Interfaces Wildcard\) on page 1611](#)
 - [show dhcpv6 relay binding summary on page 1611](#)

- Output Fields** Table 104 on page 1605 lists the output fields for the **show dhcpv6 relay binding** command. Output fields are listed in the approximate order in which they appear.

Table 104: show dhcpv6 relay binding Output Fields

Field Name	Field Description	Level of Output
<i>number</i> clients, (<i>number</i> init, <i>number</i> bound, <i>number</i> selecting, <i>number</i> requesting, <i>number</i> renewing, <i>number</i> rebinding, <i>number</i> releasing)	Summary counts of the total number of DHCPv6 clients and the number of DHCPv6 clients in each state.	summary
Client IPv6 Prefix	Prefix of the DHCPv6 client.	brief detail
Client DUID	DHCP for IPv6 Unique Identifier (DUID) of the client.	brief detail
Client IPv6 Address	IPv6 address assigned to the subscriber.	detail
Session Id	Session ID of the subscriber session.	brief detail
Expires	Number of seconds in which the lease expires.	brief detail

Table 104: show dhcpv6 relay binding Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	<p>State of the DHCPv6 relay address binding table on the DHCPv6 client:</p> <ul style="list-style-type: none"> • BOUND—Client has an active IP address lease. • INIT—Initial state. • REBINDING—Client is broadcasting a request to renew the IP address lease. • RECONFIGURE—Client is broadcasting a request to reconfigure the IP address lease. • 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 DHCPv6 server. • SELECTING—Client is receiving offers from DHCPv6 servers. 	brief detail
Interface	Incoming client interface.	brief
Lease Expires	Date and time at which the client's IP address lease expires.	detail
Lease Expires in	Number of seconds in which the lease expires.	detail
Preferred Lease Expires	Date and UTC time at which the client's IPv6 prefix expires.	detail
Preferred Lease Expires in	Number of seconds at which the client's IPv6 prefix expires.	detail
Lease Start	Date and time at which the client's IP address lease started.	detail
Lease time violated	Lease time violation has occurred.	detail
Incoming Client Interface	Client's incoming interface.	detail
Server Address	<p>IP address of the DHCPv6 server.</p> <p>Displays unknown for a DHCPv6 relay agent in a multi-relay topology that is not directly adjacent to the DHCPv6 server and does not detect the IP address of the server. In that case, the output instead displays the Next Hop Server Facing Relay field.</p>	detail
Next Hop Server Facing Relay	Next-hop address in the direction of the DHCPv6 server.	detail
Server Interface	Interface of the DHCPv6 server.	detail
Relay Address	IP address of the relay.	detail
Client Pool Name	Address pool that granted the client lease.	detail
Client ID Length	Length of client ID.	All levels

Table 104: show dhcpv6 relay binding Output Fields (*continued*)

Field Name	Field Description	Level of Output
Client Id	Client ID.	All levels
Generated Circuit ID	Circuit ID generated by the DHCPv6 Interface-ID option (option 18)	detail
Generated Remote ID Enterprise Number	The Juniper Networks IANA private enterprise number	detail
Generated Remote ID	Remote ID generated by the DHCPv6 Remote-ID option (option 37)	detail
Dual Stack Group	Name of the dual-stack group for the DHCPv6 binding.	detail
Dual Stack Peer Address	Address of the dual-stack DHCPv4 peer.	detail

Sample Output

show dhcpv6 relay binding

```

user@host> show dhcpv6 relay binding
Prefix                Session Id Expires State Interface Client DUID
2001:db8:3c4d:15::/64 1 83720 BOUND ge-1/0/0.0 LL_TIME0x1-0x4bfa26af-00:10:94:00:00:01
2001:db8:3c4d:16::/64 2 83720 BOUND ge-1/0/0.0 LL_TIME0x1-0x4bfa26af-00:10:94:00:00:02
2001:db8:3c4d:17::/64 3 83720 BOUND ge-1/0/0.0 LL_TIME0x1-0x4bfa26af-00:10:94:00:00:03
2001:db8:3c4d:18::/64 4 83720 BOUND ge-1/0/0.0 LL_TIME0x1-0x4bfa26af-00:10:94:00:00:04
2001:db8:3c4d:19::/64 5 83720 BOUND ge-1/0/0.0 LL_TIME0x1-0x4bfa26af-00:10:94:00:00:05
2001:db8:3c4d:20::/64 6 83720 BOUND ge-1/0/0.0 LL_TIME0x1-0x4bfa26af-00:10:94:00:00:06

```

show dhcpv6 relay binding (Address)

```

user@host> show dhcp6 relay binding 2001:db8:1111:2222::/64 detail
Session Id: 1
  Client IPv6 Prefix: 2001:db8:3c4d:15::/64
  Client DUID: LL_TIME0x1-0x4bfa26af-00:10:94:00:00:01

  State: BOUND(RELAY_STATE_BOUND)
  Lease Expires: 2011-05-25 07:12:09 PDT
  Lease Expires in: 77115 seconds
  Preferred Lease Expires: 2012-07-24 00:18:14 UTC
  Preferred Lease Expires in: 600 seconds
  Lease Start: 2011-05-24 07:12:09 PDT
  Incoming Client Interface: ge-1/0/0.0
  Server Address: 2001:db8:aaaa:bbbb::1
  Server Interface: none
  Relay Address: 2001:db8:1111:2222::
  Client Pool Name: pool-25
  Client Id Length: 14

```

```
Client Id:
/0x00010001/0x4bfa26af/0x00109400/0x0001
```

show dhcpv6 relay binding detail (Client ID)

```
user@host> show dhcpv6 relay binding 14/0x00010001/0x4bfa26af/0x00109400/0x0001
detail
Session Id: 1
  Client IPv6 Prefix:      2001:db8:3c4d:15::/64
  Client DUID:             LL_TIME0x1-0x4bfa26af-00:10:94:00:00:01

  State:                   BOUND(RELAY_STATE_BOUND)
  Lease Expires:           2011-05-25 07:12:09 PDT
  Lease Expires in:        77115 seconds
  Preferred Lease Expires: 2012-07-24 00:18:14 UTC
  Preferred Lease Expires in: 600 seconds
  Lease Start:             2011-05-24 07:12:09 PDT
  Lease time violated:     yes
  Incoming Client Interface: ge-1/0/0.0
  Server Address:          2001:db8:aaaa:bbbb::1
  Server Interface:        none
  Relay Address:           2001:db8:1111:2222::
  Client Pool Name:        pool-25
  Client Id Length:        14
  Client Id:
/0x00010001/0x4bfa26af/0x00109400/0x0001
```

show dhcpv6 relay binding detail

```
user@host> show dhcpv6 relay binding detail
Session Id: 1
  Client IPv6 Prefix:      2001:db8:3c4d:15::/64
  Client DUID:             LL_TIME0x1-0x4bfa26af-00:10:94:00:00:01

  State:                   BOUND(RELAY_STATE_BOUND)
  Lease Expires:           2011-05-25 07:12:09 PDT
  Lease Expires in:        77115 seconds
  Preferred Lease Expires: 2012-07-24 00:18:14 UTC
  Preferred Lease Expires in: 600 seconds
  Lease Start:             2011-05-24 07:12:09 PDT
  Lease time violated:     yes
  Incoming Client Interface: ge-1/0/0.0
  Server Address:          2001:db8:aaaa:bbbb::1
  Server Interface:        none
  Relay Address:           2001:db8:1111:2222::
  Client Pool Name:        pool-25
  Client Id Length:        14
  Client Id:
/0x00010001/0x4bfa26af/0x00109400/0x0001
  Generated Remote ID Enterprise Number: 1411
  Generated Remote ID:      host:ge-1/0/0:100
```

show dhcpv6 relay binding detail (Dual-Stack)

```
user@host> show dhcpv6 relay binding detail
Session Id: 2
  Client IPv6 Prefix:      2001:db8:ffff:0:4::/64
  Client IPv6 Address:     2001:db8:3000:8003::1/128
  Client DUID:             LL0x1-00:00:64:01:01:02
  State:                   BOUND(DHCPV6_RELAY_STATE_BOUND)
  Lease Expires:           2016-10-17 07:39:25 PDT
```

```

Lease Expires in:          3450 seconds
Lease Start:              2016-10-17 06:39:25 PDT
Last Packet Received:     2016-10-17 06:39:25 PDT
Incoming Client Interface: ae0.3221225472
Client Interface Svlan Id: 2000
Client Interface Vlan Id: 1
Server Ip Address:        2001:db8:3000::2
Server Interface:         none
Client Profile Name:      my-dual-stack
Client Id Length:         10
Client Id:                /0x00030001/0x00006401/0x0102
Dual Stack Group:         group1
Dual Stack Peer Address:  192.0.2.4

```

show dhcpv6 relay binding detail (Multi-Relay Topology)

```

user@host > show dhcpv6 relay binding detail
Session Id: 13
  Client IPv6 Prefix:      2001:db8:3000:0:8001::5/128
  Client DUID:             LL0x1-00:00:65:03:01:02
  State:                   BOUND(DHCPV6_RELAY_STATE_BOUND)
  Lease Expires:           2011-11-21 06:14:50 PST
  Lease Expires in:        293 seconds
  Preferred Lease Expires: 2012-07-24 00:18:14 UTC
  Preferred Lease Expires in: 600 seconds
  Lease Start:             2011-11-21 06:09:50 PST
  Incoming Client Interface: ge-1/0/0.0
  Server Address:          unknown
  Next Hop Server Facing Relay: 2001:db8:4000::2
  Server Interface:        none
  Client Id Length:        10
  Client Id:               /0x00030001/0x00006503/0x0102

```

show dhcpv6 relay binding (Session ID)

```

user@host> show dhcpv6 relay binding 41
Prefix          Session Id Expires   State   Interface   Client DUID
2001:db8:3c4d:15::/64  41      78837   BOUND   ge-1/0/0.0
LL_TIME0x1-0x4bfa26af-00:10:94:00:00:01

```

show dhcpv6 relay binding (Subscriber with Multiple Addresses)

```

user@host> show dhcpv6 relay binding
Prefix          Session Id Expires   State   Interface   Client DUID
2001:db8:1001::1:24/128      23      593     BOUND   ge-9/0/9.0
LL_TIME0x1-0x55306754-00:10:94:00:00:02
2001:db8:1001::1:1c/128      23      393     BOUND   ge-9/0/9.0
LL_TIME0x1-0x55306754-00:10:94:00:00:02
2001:db8:1001::1:14/128      23      193     BOUND   ge-9/0/9.0
LL_TIME0x1-0x55306754-00:10:94:00:00:02
2001:db8:3001::300/120        23      293     BOUND   ge-9/0/9.0
LL_TIME0x1-0x55306754-00:10:94:00:00:02
2001:db8:3001::200/120        23      193     BOUND   ge-9/0/9.0
LL_TIME0x1-0x55306754-00:10:94:00:00:02
2001:db8:3001::100/120        23      93      BOUND   ge-9/0/9.0
LL_TIME0x1-0x55306754-00:10:94:00:00:02

```

show dhcpv6 relay binding detail (Subscriber with Multiple Addresses)

```

user@host> show dhcpv6 relay binding detail
Session Id: 3
  Client IPv6 Address:      2001:db8:1001::1:2/128

```

```

Lease Expires:                2015-05-15 02:34:51 PDT
Lease Expires in:             24 seconds
Preferred Lease Expires:      2015-05-15 02:34:51 PDT
Preferred Lease Expires in:   24 seconds
Client IPv6 Address:          2001:db8:1001::1:12/128
Lease Expires:                2015-05-15 02:41:31 PDT
Lease Expires in:             424 seconds
Preferred Lease Expires:      2015-05-15 02:41:31 PDT
Preferred Lease Expires in:   424 seconds
Client IPv6 Address:          2001:db8:1001::1:a/128
Lease Expires:                2015-05-15 02:38:11 PDT
Lease Expires in:             224 seconds
Preferred Lease Expires:      2015-05-15 02:38:11 PDT
Preferred Lease Expires in:   224 seconds
Client IPv6 Prefix:           2001:db8:3001::/120
Lease Expires:                2015-05-15 02:34:51 PDT
Lease Expires in:             24 seconds
Preferred Lease Expires:      2015-05-15 02:34:51 PDT
Preferred Lease Expires in:   24 seconds
Client IPv6 Prefix:           2001:db8:3001::200/120
Lease Expires:                2015-05-15 02:38:11 PDT
Lease Expires in:             224 seconds
Preferred Lease Expires:      2015-05-15 02:38:11 PDT
Preferred Lease Expires in:   224 seconds
Client IPv6 Prefix:           2001:db8:3001::100/120
Lease Expires:                2015-05-15 02:36:31 PDT
Lease Expires in:             124 seconds
Preferred Lease Expires:      2015-05-15 02:36:31 PDT
Preferred Lease Expires in:   124 seconds
Client DUID:                   LL_TIME0x1-0x55554c6e-00:10:94:00:00:02

State:                         BOUND(DHCPV6_RELAY_STATE_BOUND)
Lease Start:                   2015-05-15 02:34:21 PDT
Last Packet Received:          2015-05-15 02:34:22 PDT
Incoming Client Interface:     ge-9/0/9.0
Client Interface Vlan Id:      111
Demux Interface:               demux0.3221225475
Server Ip Address:              2001:db8:5001::1
Server Interface:               none
Client Profile Name:            DHCP-IPDEMUX-PROF
Client Id Length:               14
Client Id:                      /0x00010001/0x55554c6e/0x00109400/0x0002
Generated Circuit ID:           ge-9/0/9:111
Generated Remote ID Enterprise Number: 1411
Generated Remote ID:            ge-9/0/9:111

```

show dhcpv6 relay binding (Interfaces VLAN)

```

user@host> show dhcpv6 relay binding ge-1/0/0:100-200
Prefix          Session Id Expires State Interface Client DUID
2001:DB8::/32   11      87583 BOUND ge-1/0/0.1073741827
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:DB8:19::/32 12      87583 BOUND ge-1/0/0.1073741827
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01

```

show dhcpv6 relay binding (Interfaces Wildcard)

```

user@host> show dhcpv6 relay binding demux0
Prefix          Session Id Expires State Interface Client DUID
2001:DB8::/32   30      79681 BOUND demux0.1073741824

```

```

LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:DB8:19::/32      31      79681    BOUND    demux0.1073741825
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:DB8:C9::/32     32      79681    BOUND    demux0.1073741826
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01

```

show dhcpv6 relay binding (Interfaces Wildcard)

```

user@host> show dhcpv6 relay binding ge-1/3/*
Prefix          Session Id Expires State Interface Client DUID
2001:DB8::/32   22      79681    BOUND    ge-1/3/0.110
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:DB8:19::/32 33      79681    BOUND    ge-1/3/0.110
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:DB8:C9::/32 24      79681    BOUND    ge-1/3/0.110
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01

```

show dhcpv6 relay binding summary

```

user@host> show dhcpv6 relay binding summary
5 clients, (0 init, 5 bound, 0 selecting, 0 requesting, 0 renewing, 0 releasing)

```

show dhcpv6 relay statistics

Syntax	show dhcpv6 relay statistics <bulk-leasquery-connections> <logical-system <i>logical-system-name</i>> <routing-instance <i>routing-instance-name</i>>
Release Information	Command introduced in Junos OS Release 11.4. Command introduced in Junos OS Release 12.1X48R3 for PTX Series Packet Transport Switches. Command introduced in Junos OS Release 12.3R2 for EX Series switches. bulk-leasquery-connections option introduced in Junos OS Release 16.1.
Description	Display Dynamic Host Configuration Protocol for IPv6 (DHCPv6) relay statistics.
Options	bulk-leasquery-connections —(Optional) Display bulk leasquery statistics. logical-system <i>logical-system-name</i> —(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 <i>routing-instance-name</i> —(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	<ul style="list-style-type: none">• clear dhcpv6 relay statistics on page 1457
List of Sample Output	show dhcpv6 relay statistics on page 1614 show dhcpv6 relay statistics bulk-leasquery-connections on page 1615
Output Fields	Table 105 on page 1613 lists the output fields for the show dhcpv6 relay statistics command. Output fields are listed in the approximate order in which they appear.

Table 105: show dhcpv6 relay statistics Output Fields

Field Name	Field Description
DHCPv6 Packets dropped	<p>Number of packets discarded by the extended DHCPv6 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.</p> <ul style="list-style-type: none"> Total—Total number of packets discarded by the DHCPV6 relay agent application. Bad options—Number of packets discarded because invalid options were specified. Bad send—Number of packets that the extended DHCP relay application could not send. Bad src address—Number of packets discarded because the family type was not AF_INET6. No client id—Number of packets discarded because they could not be matched to a client. Lease Time Violation—Number of packets discarded because of a lease time violation No safd—Number of packets discarded because they arrived on an unconfigured interface. Short packet—Number of packets discarded because they were too short. Relay hop count—Number of packets discarded because the hop count in the packet exceeded 32.
Messages received	<p>Number of DHCPv6 messages received.</p> <ul style="list-style-type: none"> DHCPv6_DECLINE—Number of DHCPv6 PDUs of type DECLINE received DHCPV6_SOLICIT—Number of DHCPv6 PDUs of type SOLICIT received DHCPV6_INFORMATION_REQUEST—Number of DHCPv6 PDUs of type INFORMATION-REQUEST received DHCPV6_RELEASE—Number of DHCPv6 PDUs of type RELEASE received DHCPV6_REQUEST—Number of DHCPv6 PDUs of type REQUEST received DHCPV6_CONFIRM—Number of DHCPv6 PDUs of type CONFIRM received DHCPV6_RENEW—Number of DHCPv6 PDUs of type RENEW received DHCPV6_REBIND—Number of DHCPv6 PDUs of type REBIND received DHCPV6_RELAY_REPL—Number of DHCPv6 PDUs of type RELAY-REPL received DHCPV6_LEASEQUERY_REPLY—Number of DHCPv6 replies received from the DHCPv6 sever DHCPV6_LEASEQUERY_DATA—xxxx DHCPV6_LEASEQUERY_DONE—The leasequery is complete
Messages sent	<p>Number of DHCPv6 messages sent.</p> <ul style="list-style-type: none"> DHCPV6_ADVERTISE—Number of DHCPv6 ADVERTISE PDUs transmitted DHCP_REPLY—Number of DHCPv6 REPLY PDUs transmitted DHCP_RECONFIGURE—Number of DHCPv6 RECONFIGURE PDUs transmitted DHCP_RELAY_FORW—Number of DHCPv6 RELAY-FORW PDUs transmitted DHCP6_LEASEQUERY—Number of DHCP leasequery messages transmitted
Packets forwarded	<p>Number of packets forwarded by the extended DHCPv6 relay agent application.</p> <ul style="list-style-type: none"> FWD REQUEST—Number of DHCPv6 REQUEST packets forwarded FWD REPLY—Number of DHCPv6 REPLY packets forwarded
External Server Response	State of the external DHCP server responsiveness.
Total Requested Servers	Total number of servers with which the DHCP relay agent has requested a bulk leasequery connection.

Table 105: show dhcpv6 relay statistics Output Fields (*continued*)

Field Name	Field Description
Total Attempted Servers	Total number of servers with which the DHCP relay agent has attempted to create a bulk leasequery connection.
Total Connected	Total number of servers that have formed a bulk leasequery connection with the DHCP relay agent.
Total Terminated by Server	Total number of servers that have terminated a bulk leasequery connection with the DHCP relay agent.
Total Max Attempted	Total number of servers where the DHCP relay agent reached the maximum retry limit when it attempted to create a bulk leasequery connection.
Total Closed due to Errors	Total number of bulk leasequery connections that closed due to an internal error on the DHCP relay agent.
In-Flight Connected	Number of current bulk leasequery connections on the DHCP relay agent.
Bulk Leasequery Reply Packet Retries	Number of bulk leasequery reply packets that the DHCP relay agent has retried.

Sample Output

show dhcpv6 relay statistics

```

user@host> show dhcpv6 relay statistics
DHCPv6 Packets dropped:
    Total 1
    Lease Time Violation 1

Messages received:
    DHCPV6_DECLINE 0
    DHCPV6_SOLICIT 10
    DHCPV6_INFORMATION_REQUEST 0
    DHCPV6_RELEASE 0
    DHCPV6_REQUEST 10
    DHCPV6_CONFIRM 0
    DHCPV6_RENEW 0
    DHCPV6_REBIND 0
    DHCPV6_RELAY_REPL 0
    DHCPV6_LEASEQUERY_REPLY 0
    DHCPV6_LEASEQUERY_DATA 0
    DHCPV6_LEASEQUERY_DONE 0

Messages sent:
    DHCPV6_ADVERTISE 0
    DHCPV6_REPLY 0
    DHCPV6_RECONFIGURE 0
    DHCPV6_RELAY_FORW 0
    DHCPV6_LEASEQUERY 0

Packets forwarded:
    Total 4
    FWD REQUEST 2
    FWD REPLY 2

```

External Server Response:
State Responding

show dhcpv6 relay statistics bulk-leasequery-connections

user@host> show dhcp relay statistics bulk-leasequery-connections

Total Requested Servers: 0
Total Attempted Servers: 0
Total Connected: 0
Total Terminated by Server: 0
Total Max Attempted: 0
Total Closed due to Errors: 0
In-Flight Connected: 0
Bulk Leasequery Reply Packet Retries: 0

show dhcpv6 server binding

Syntax	<pre>show dhcpv6 server binding <address> <brief detail summary> <interface interface-name> <interfaces-vlan> <interfaces-wildcard> <logical-system logical-system-name> <routing-instance routing-instance-name></pre>
Release Information	Command introduced in Junos OS Release 9.6. Options <i>interfaces-vlan</i> and <i>interfaces-wildcard</i> added in Junos OS Release 12.1.
Description	Display the address bindings in the client table on the extended Dynamic Host Configuration Protocol for IPv6 (DHCPv6) local server.
Options	<p>address—(Optional) One of the following identifiers for the DHCPv6 client whose binding state you want to show:</p> <ul style="list-style-type: none">• <i>CID</i>—The specified Client ID (CID).• <i>ipv6-prefix</i>—The specified IPv6 prefix.• <i>session-id</i>—The specified session ID. <p>brief detail summary—(Optional) Display the specified level of output about active client bindings. The default is brief, which produces the same output as show dhcpv6 server binding.</p> <p>interface interface-name—(Optional) Display information about active client bindings on the specified interface. You can optionally filter on VLAN ID and SVLAN ID.</p> <p>interfaces-vlan—(Optional) Interface VLAN ID or S-VLAN ID interface on which to show binding state information.</p> <p>interfaces-wildcard—(Optional) Set of interfaces on which to show binding state information. This option supports the use of the wildcard character (*).</p> <p>logical-system logical-system-name—(Optional) Display information about active client bindings for DHCPv6 clients on the specified logical system.</p> <p>routing-instance routing-instance-name—(Optional) Display information about active client bindings for DHCPv6 clients on the specified routing instance.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Clearing DHCP Bindings for Subscriber Access on page 368• clear dhcpv6 server binding on page 1459

List of Sample Output

- [show dhcpv6 server binding on page 1618](#)
- [show dhcpv6 server binding detail on page 1619](#)
- [show dhcpv6 server binding interface on page 1619](#)
- [show dhcpv6 server binding interface detail on page 1619](#)
- [show dhcpv6 server binding \(IPv6 Prefix\) on page 1620](#)
- [show dhcpv6 server binding \(Session ID\) on page 1620](#)
- [show dhcpv6 server binding \(Interfaces VLAN\) on page 1620](#)
- [show dhcpv6 server binding \(Interfaces Wildcard\) on page 1620](#)
- [show dhcpv6 server binding \(Interfaces Wildcard\) on page 1620](#)
- [show dhcpv6 server binding summary on page 1621](#)

Output Fields [Table 106 on page 1617](#) lists the output fields for the **show dhcpv6 server binding** command. Output fields are listed in the approximate order in which they appear.

Table 106: show dhcpv6 server binding Output Fields

Field Name	Field Description	Level of Output
<i>number clients</i> , (<i>number init</i> , <i>number bound</i> , <i>number selecting</i> , <i>number requesting</i> , <i>number renewing</i> , <i>number releasing</i>)	Summary counts of the total number of DHCPv6 clients and the number of DHCPv6 clients in each state.	summary
Prefix	Client's DHCPv6 prefix, or prefix used to support multiple address assignment.	brief detail
Session Id	Session ID of the subscriber session.	brief detail
Expires	Number of seconds in which lease expires.	brief detail
State	State of the address binding table on the extended DHCPv6 local server: <ul style="list-style-type: none"> • BOUND—Client has active IP address lease. • INIT—Initial state. • RECONFIGURE—Server has sent reconfigure message to client. • RELEASE—Client is releasing IP address lease. • RENEWING—Client sending request to renew IP address lease. • REQUESTING—Client requesting a DHCPv6 server. • SELECTING—Client receiving offers from DHCPv6 servers. 	brief detail
Interface	Interface on which the DHCPv6 request was received.	brief
Client IPv6 Address	Client's IPv6 address.	detail
Client IPv6 Prefix	Client's IPv6 prefix.	detail
Client DUID	Client's DHCP Unique Identifier (DUID).	brief detail
Lease expires	Date and time at which the client's IP address lease expires.	detail

Table 106: show dhcpv6 server binding Output Fields (*continued*)

Field Name	Field Description	Level of Output
Lease expires in	Number of seconds in which lease expires.	detail
Preferred Lease Expires	Date and UTC time at which the client's IPv6 prefix expires.	detail
Preferred Lease Expires in	Number of seconds at which client's IPv6 prefix expires.	detail
Lease Start	Date and time at which the client's address lease was obtained.	detail
Lease time violated	Lease time violation has occurred.	detail
Incoming Client Interface	Client's incoming interface.	detail
Server IP Address	IP address of DHCPv6 server.	detail
Server Interface	Interface of DHCPv6 server.	detail
Client Pool Name	Address pool used to assign IPv6 address.	detail
Client Prefix Pool Name	Address pool used to assign IPv6 prefix.	detail
Client Id length	Length of the DHCPv6 client ID, in bytes.	detail
Client Id	ID of the DHCPv6 client.	detail
Server Id	DHCP unique identifier (DUID) for the DHCPv6 server.	detail

Sample Output

show dhcpv6 server binding

```

user@host> show dhcpv6 server binding
Prefix          Session Id Expires State Interface Client DUID
2001:db8:1111:2222::/64 6      86321 BOUND ge-1/0/0.0
LL_TIME0x1-0x2e159c0-00:10:94:00:00:01
2001:db8:1111:2222::/64 7      86321 BOUND ge-1/0/0.0
LL_TIME0x1-0x2e159c0-00:10:94:00:00:02
2001:db8:1111:2222::/64 8      86321 BOUND ge-1/0/0.0
LL_TIME0x1-0x2e159c0-00:10:94:00:00:03
2001:db8:1111:2222::/64 9      86321 BOUND ge-1/0/0.0
LL_TIME0x1-0x2e159c1-00:10:94:00:00:04
2001:db8:1111:2222::/64 10     86321 BOUND ge-1/0/0.0
LL_TIME0x1-0x2e159c1-00:10:94:00:00:05
2001:db8:2002::1/74 11     86321 BOUND ge-1/0/0.0
LL_TIME0x1-0x2e159c1-00:10:94:00:00:06

```

show dhcpv6 server binding detail

```

user@host> show dhcpv6 server binding detail
Session Id: 6
  Client IPv6 Prefix:      2001:db8:1111:2222::/64
  Client DUID:             LL_TIME0x1-0x2e159c0-00:10:94:00:00:01

  State:
BOUND(LOCAL_SERVER_STATE_BOUND_ON_INTF_DELETE)
  Lease Expires:           2009-07-21 10:41:15 PDT
  Lease Expires in:        86308 seconds
  Preferred Lease Expires: 2012-07-24 00:18:14 UTC
  Preferred Lease Expires in: 600 seconds
  Lease Start:             2009-07-20 10:41:15 PDT
  Lease time violated:     yes
  Incoming Client Interface: ge-1/0/0.0
  Server Ip Address:       0.0.0.0
  Server Interface:        none
  Client Id Length:        14
  Client Id:
/0x00010001/0x02e159c0/0x00109400/0x0001

Session Id: 7
  Client IPv6 Address:      2001:db8:2002::1/128
  Client IPv6 Prefix:      2001:db8:1111:2222::/64
  Client DUID:             LL_TIME0x1-0x2e159c0-00:10:94:00:00:02

  State:
BOUND(LOCAL_SERVER_STATE_BOUND_ON_INTF_DELETE)
  Lease Expires:           2009-07-21 10:41:15 PDT
  Lease Expires in:        86308 seconds
  Preferred Lease Expires: 2012-07-24 00:18:14 UTC
  Preferred Lease Expires in: 600 seconds
  Lease Start:             2009-07-20 10:41:15 PDT
  Incoming Client Interface: ge-1/0/0.0
  Server Ip Address:       0.0.0.0
  Client Pool Name:        bos-v6-pool
  Client Prefix Pool Name: bos-v6-prefix-pool
  Client Id Length:        14
  Client Id:
/0x00010001/0x02e159c0/0x00109400/0x0002

```

show dhcpv6 server binding interface

```

user@host> show dhcpv6 server binding interface ge-1/0/0:10-101
Prefix      Session Id Expires State Interface Client DUID
2001:db8:1111:2222::/64 1      86055   BOUND   ge-1/0/0.100
LL_TIME0x1-0x4b0a53b9-00:10:94:00:00:01

```

show dhcpv6 server binding interface detail

```

user@host> show dhcpv6 server binding interface ge-1/0/0:10-101 detail
Session Id: 7
  Client IPv6 Prefix:      2001:db8:1111:2222::/64
  Client DUID:             LL_TIME0x1-0x2e159c0-00:10:94:00:00:02

  State:                   BOUND(bound)
  Lease Expires:           2009-07-21 10:41:15 PDT
  Lease Expires in:        86136 seconds
  Preferred Lease Expires: 2012-07-24 00:18:14 UTC
  Preferred Lease Expires in: 600 seconds

```

```

Lease Start:                2009-07-20 10:41:15 PDT
Incoming Client Interface:  ge-1/0/0.0
Server Ip Address:          0.0.0.0
Server Interface:           none
Client Id Length:           14
Client Id:
/0x00010001/0x02e159c0/0x00109400/0x0002

```

show dhcpv6 server binding (IPv6 Prefix)

```

user@host> show dhcpv6 server binding 14/0x00010001/0x02b3be8f/0x00109400/0x0005
detail
Session Id: 7
  Client IPv6 Prefix:        2001:db8:1111:2222::/64
  Client DUID:               LL_TIME0x1-0x2e159c0-00:10:94:00:00:02

  State:                     BOUND(bound)
  Lease Expires:              2009-07-21 10:41:15 PDT
  Lease Expires in:           86136 seconds
  Preferred Lease Expires:    2012-07-24 00:18:14 UTC
  Preferred Lease Expires in: 600 seconds
  Lease Start:                2009-07-20 10:41:15 PDT
  Incoming Client Interface:  ge-1/0/0.0
  Server Ip Address:          0.0.0.0
  Server Interface:           none
  Client Id Length:           14
  Client Id:
/0x00010001/0x02e159c0/0x00109400/0x0002

```

show dhcpv6 server binding (Session ID)

```

user@host> show dhcpv6 server binding 8
Prefix      Session Id Expires State Interface Client DUID
2001:db8::/32 8      86235  BOUND ge-1/0/0.0
LL_TIME0x1-0x2e159c0-00:10:94:00:00:03

```

show dhcpv6 server binding (Interfaces VLAN)

```

user@host> show dhcpv6 server binding ge-1/0/0:100-200
Prefix      Session Id Expires State Interface Client DUID
2001:db8::/32 11      87583  BOUND ge-1/0/0.1073741827
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:db8:19::/32 12      87583  BOUND ge-1/0/0.1073741827
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01

```

show dhcpv6 server binding (Interfaces Wildcard)

```

user@host> show dhcpv6 server binding demux0
Prefix      Session Id Expires State Interface Client DUID
2001:db8::/32 30      79681  BOUND demux0.1073741824
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:db8:19::/32 31      79681  BOUND demux0.1073741825
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:db8:C9::/32 32      79681  BOUND demux0.1073741826
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01

```

show dhcpv6 server binding (Interfaces Wildcard)

```

user@host> show dhcpv6 server binding ge-1/3/*
Prefix      Session Id Expires State Interface Client DUID
2001:db8::/32 22      79681  BOUND ge-1/3/0.110
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01

```

```
2001:db8:19::/32      33      79681    BOUND    ge-1/3/0.110
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
2001:db8:C9::/32      24      79681    BOUND    ge-1/3/0.110
LL_TIME0x1-0x4d5d009f-00:10:94:00:00:01
```

show dhcpv6 server binding summary

```
user@host> show dhcpv6 server binding summary
5 clients, (0 init, 5 bound, 0 selecting, 0 requesting, 0 renewing, 0 releasing)
```

show dhcpv6 server statistics

Syntax	show dhcpv6 server statistics <bulk-leasequery-connections> <logical-system <i>logical-system-name</i>> <routing-instance <i>routing-instance-name</i>>
Release Information	Command introduced in Junos OS Release 9.6. bulk-leasequery-connections option introduced in Junos OS Release 16.1.
Description	Display extended Dynamic Host Configuration Protocol for IPv6 (DHCPv6) local server statistics.
Options	bulk-leasequery-connections —(Optional) Display bulk leasequery statistics. logical-system <i>logical-system-name</i> —(Optional) Display information about extended DHCPv6 local server statistics on the specified logical system. If you do not specify a logical system, statistics are displayed for the default logical system. routing-instance <i>routing-instance-name</i> —(Optional) Display information about extended DHCPv6 local server statistics on the specified routing instance. If you do not specify a routing instance, statistics are displayed for the default routing instance.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• clear dhcpv6 server statistics on page 1461
List of Sample Output	show dhcpv6 server statistics on page 1624 show dhcpv6 server statistics bulk-leasequery-connections on page 1624
Output Fields	Table 107 on page 1623 lists the output fields for the show dhcpv6 server statistics command. Output fields are listed in the approximate order in which they appear.

Table 107: show dhcpv6 server statistics Output Fields

Field Name	Field Description
Packets dropped	<p>Number of packets discarded by the extended DHCPv6 local server because of errors. Only nonzero statistics appear in the Packets dropped output. When all of the Packets dropped statistics are 0 (zero), only the Total field appears.</p> <ul style="list-style-type: none"> • Total—Total number of packets discarded by the extended DHCPv6 local server • Strict Reconfigure—Number of solicit messages discarded because the client does not support reconfiguration • 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 DHCPv6 local server could not send
Messages received	<p>Number of DHCPv6 messages received.</p> <ul style="list-style-type: none"> • DHCPV6_CONFIRM—Number of DHCPv6 CONFIRM PDUs received. • DHCPV6_DECLINE—Number of DHCPv6 DECLINE PDUs received. • DHCPV6_INFORMATION_REQUEST—Number of DHCPv6 INFORMATION-REQUEST PDUs received. • DHCPV6_REBIND—Number of DHCPv6 REBIND PDUs received. • DHCPV6_RELAY_FORW—Number of DHCPv6 RELAY-FORW PDUs received. • DHCPV6_RELAY_REPL—Number of DHCPv6 RELAY-REPL PDUs received. • DHCPV6_RELEASE—Number of DHCPv6 RELEASE PDUs received. • DHCPV6_RENEW—Number of DHCPv6 RENEW PDUs received. • DHCPV6_REQUEST—Number of DHCPv6 REQUEST PDUs received. • DHCPV6_SOLICIT—Number of DHCPv6 SOLICIT PDUs received. • DHCPV6_LEASEQUERY—Number of DHCPv6 leasequery messages received.
Messages sent	<p>Number of DHCPv6 messages sent.</p> <ul style="list-style-type: none"> • DHCPV6_ADVERTISE—Number of DHCPv6 ADVERTISE PDUs transmitted. • DHCPV6_REPLY—Number of DHCPv6 ADVERTISE PDUs transmitted. • DHC6_RECONFIGURE—Number of DHCPv6 RECONFIGURE PDUs transmitted. • DHCPV6_LEASEQUERY_REPLY—Number of DHCPv6 leasequery replies transmitted to the DHCPv6 relay agent • DHCPV6_LEASEQUERY_DATA—xxxx • DHCPV6_LEASEQUERY_DONE—The leasequery is complete

Sample Output

show dhcpv6 server statistics

```
user@host> show dhcpv6 server statistics
```

```
Dhcpv6 Packets dropped:
```

Total	1
Lease Time Violation	1

```
Messages received:
```

DHCPV6_DECLINE	0
DHCPV6_SOLICIT	9
DHCPV6_INFORMATION_REQUEST	0
DHCPV6_RELEASE	0
DHCPV6_REQUEST	5
DHCPV6_CONFIRM	0
DHCPV6_RENEW	0
DHCPV6_REBIND	0
DHCPV6_RELAY_FORW	0
DHCPV6_RELAY_REPL	0
DHCPV6_LEASEQUERY	0

```
Messages sent:
```

DHCPV6_ADVERTISE	9
DHCPV6_REPLY	5
DHCPV6_RECONFIGURE	0
DHCPV6_LEASEQUERY_REPLY	0
DHCPV6_LEASEQUERY_DATA	0
DHCPV6_LEASEQUERY_DONE	0

show dhcpv6 server statistics bulk-leasequery-connections

```
user@host> show dhcpv6 server statistics bulk-leasequery-connections
```

Total Accepted Connections:	0
Total Not-Accepted Connections:	0
Connections Closed due to Errors:	0
Connections Closed due to max-empty-replies:	0
In-flight Connections:	0

show diameter

Syntax	show diameter <brief detail summary>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about the Diameter node.
Options	brief detail summary —(Optional) Display the specified level of output. The summary output is displayed by default and includes Diameter node status. The brief output adds summary information about functions, instances, network elements, and peers. The detail output adds summary information about routes.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter function statistics on page 1462 • clear diameter peer on page 1463 • show diameter function on page 1631 • show diameter instance on page 1638 • show diameter network-element on page 1640 • show diameter peer on page 1646 • show diameter route on page 1658
List of Sample Output	show diameter brief on page 1628 show diameter detail on page 1629 show diameter summary on page 1629
Output Fields	Table 108 on page 1625 lists the output fields for the show diameter command. Output fields are listed in the approximate order in which they appear.

Table 108: show diameter Output Fields

Field Name	Field Description	Level of Output
Diameter process id	ID number of the Diameter process.	All levels
Functions	Number of functions associated with Diameter.	All levels
Connected functions	Number of functions with active Diameter connections.	All levels
Instances	Number of configured Diameter instances.	All levels

Table 108: show diameter Output Fields (*continued*)

Field Name	Field Description	Level of Output
Network elements (NEs)	Number of configured Diameter network elements.	All levels
Connected NEs	Number of Diameter network elements with active connections.	All levels
Peers	Number of Diameter peer nodes.	All levels
Activated peers	Number of Diameter peers with active connections.	All levels
Open peers	Number of peers in the open state, without active network element connections but available for a connection.	All levels
Transports	Number of transports configured.	All levels
Requests queued for network transmit	Number of requests waiting to be sent to the Diameter peers.	All levels
Answers queued for network transmit	Number of replies waiting to be sent to the Diameter peers.	All levels
Expected answers from network	Number of replies expected to be received from the Diameter peers.	All levels
Requests queued for function transmit	Number of requests waiting to be sent to the functions associated with Diameter.	All levels
Answers queued for function transmit	Number of replies waiting to be sent to the functions associated with Diameter.	All levels
Expected answers from functions	Number of replies expected to be received from the functions associated with Diameter.	All levels
Memory used by network transmit queues	Amount of memory consumed by network transmit queues.	All levels
Memory used by function transmit queues	Amount of memory consumed by function transmit queues.	All levels
Origin-state-id	Value of the Origin-State-ID AVP.	All levels
Function	Name of the function for which information is displayed.	brief detail
State	State of the Diameter connection with the function: Connected or Disconnec (disconnected).	brief detail

Table 108: show diameter Output Fields (*continued*)

Field Name	Field Description	Level of Output
Upstream Transaction Utilization	Percent of upstream traffic used for this function.	brief detail
Downstream Transaction Utilization	Percent of downstream traffic used for this function.	brief detail
Net Queue Buffer Utilization	Percent of network transmission buffer used for this function.	brief detail
Func Queue Buffer Utilization	Percent of function transmission buffer used for this function.	brief detail
Routed Dests	Number of destinations that have this function associated with their routes.	brief detail
Name	Name of the Diameter instance.	brief detail
Origin-Realm	Value of Origin-Realm attribute-value pair (AVP).	brief detail
Origin Host	Value of Origin-Host AVP.	brief detail
NE-Total	Number of configured network elements.	brief detail
NE-Connected	Number of network elements with active Diameter connections.	brief detail
Name	Name of the Diameter network element.	brief detail
Instance	Name of the Diameter instance in which the network element is configured.	brief detail
State	State of the network element: <ul style="list-style-type: none"> • Connecting—None of the network element peers are in the open state and available for connection. • Selecting—One network element peer is connected and the network element is waiting for another peer to reach the open state so that it can be connected. • Partially-Connected—One network element peer is in the open state and connected. • Post-selection-delay—Three or more peers are in the open state and the network element is waiting to deactivate the peers in excess of two. • Fully-connected—Two network element peers are in the open state and connected. 	brief detail
Primary Peer	Primary peer for the network element, based on the configured peer priority.	brief detail
Secondary Peer	Secondary peer for the network element, based on the configured peer priority.	brief detail
Peer	Name of the peer.	brief detail

Table 108: show diameter Output Fields (*continued*)

Field Name	Field Description	Level of Output
Instance	Name of the Diameter instance in which the peer is configured.	brief detail
State	State of the peer: <ul style="list-style-type: none"> • Bad-Config—Misconfiguration. • Bad-Remote—Remote side does not conform to one of the decisions or is sending malformed messages. • Closed—Normal disconnect due to a request from the remote site or due to excessive watchdog timeouts. • Destructing—Peer to be deleted on the next timer tick. Until then, it performs no actions. • Disabled—Peer is administratively disabled. • Internal-error—Internal error has been detected and the peer is in the process of restarting. • No-Activation—Peer is not used by any Diameter network element. • Rejected—Connection was rejected by remote side of the connection. • Suspended—All other reasons to be suspended. 	brief detail
NE-Count	Number of network elements associated with the peer.	brief detail
Activated Count	Activation status of the peer: <ul style="list-style-type: none"> • 1—Peer is activated. • 0—Peer is not activated. 	brief detail
Primary Count	Status of the peer: primary (1) or secondary (0).	brief detail
Secondary Count	Status of the peer: secondary (0) or primary (1).	brief detail
Route	Name of the Diameter route.	detail
NE	Name of the Diameter network element in which the route is configured	detail
Instance	Name of the Diameter instance in which the route is configured.	detail
Valid	Determination of whether the route is valid: yes or no .	detail
Up	State of the route: yes for an active route, no for an inactive route.	detail

Sample Output

show diameter brief

```
user@host> show diameter brief
```

```
Diameter node:
  Diameter process id      :    1446
  Functions                 :      4
  Connected functions      :      2
```

```

Instances                               : 1
Network elements(NEs)                  : 1
Connected NEs                          : 0
Peers                                   : 2
Activated peers                         : 1
Open peers                             : 0
Transports                             : 1
Requests queued for network transmit   : 0
Answers queued for network transmit    : 0
Expected answers from network          : 0
Requests queued for function transmit  : 0
Answers queued for function transmit   : 0
Expected answers from functions        : 0
Memory used by network transmit queues : 0
Memory used by function transmit queues : 0
Origin-state-id                        : 0

```

Diameter function list:

Function	State	Upstream Transaction Utilization %	Downstream Transaction Utilization %	Net Queue Buffer Utilization %	Func Queue Buffer Utilization %	Routed Dests
charging-	Disconnec	0	0	0	0	0
gx-plus	Connected	0	0	0	0	1
jsrc	Connected	0	0	0	0	0
packet-tr	Disconnec	0	0	0	0	0

Diameter instances:

Name	Origin-Realm	Origin-Host	NE-Total	NE-Connected
master	orrr	ohhh	1	0

Diameter network-elements:

Name	Instance	State	Primary Peer	Secondary Peer
n0	master	Connecting	<NONE>	<NONE>

Diameter peer list:

Peer	Instance	State	NE-Count	Activated Count	Primary Count	Secondary Count
p0	master	Suspended	1	1	0	0
p100	master	No-Activation	0	0	0	0

show diameter detail

```
user@host> show diameter detail
```

```
...
```

Diameter routes:

Route	NE	Instance	Valid	Up
dne-route1	dne1	master	yes	no

show diameter summary

```
user@host> show diameter summary
```

Diameter node:

```

Diameter process id      : 1446
Functions                 : 4
Connected functions      : 2
Instances                : 1
Network elements(NEs)    : 1
Connected NEs            : 0
Peers                    : 2

```

Activated peers	:	1
Open peers	:	0
Transports	:	1
Requests queued for network transmit	:	0
Answers queued for network transmit	:	0
Expected answers from network	:	0
Requests queued for function transmit	:	0
Answers queued for function transmit	:	0
Expected answers from functions	:	0
Memory used by network transmit queues	:	0
Memory used by function transmit queues	:	0
Origin-state-id	:	0

show diameter function

Syntax	show diameter function <brief detail summary> <function-name>
Release Information	Command introduced in Junos OS Release 9.6. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2.
Description	Display information about all functions associated with Diameter instances or only the specified function.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic function information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>function-name—(Optional) Display information for only the specified function. Currently, Gx-Plus, JSRC, and packet-triggered-subscribers are supported functions.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter function statistics on page 1462 • show diameter on page 1625 • show diameter function statistics on page 1635
List of Sample Output	show diameter function on page 1633 show diameter function brief on page 1633 show diameter function detail (JSRC) on page 1633 show diameter function detail (Gx-Plus) on page 1634
Output Fields	Table 109 on page 1631 lists the output fields for the show diameter function command. Output fields are listed in the approximate order in which they appear.

Table 109: show diameter function Output Fields

Field Name	Field Description	Level of Output
Function name	Name of the function for which information is displayed.	All levels
State	State of the Diameter connection with the function.	All levels
Upstream transaction utilization	Percent of upstream traffic used for this function.	All levels

Table 109: show diameter function Output Fields (*continued*)

Field Name	Field Description	Level of Output
Downstream transaction utilization	Percent of downstream traffic used for this function.	All levels
Network transmit buffer utilization	Percent of network transmission buffer used for this function.	All levels
Function transmit buffer utilization	Percent of function transmission buffer used for this function.	All levels
Routed destinations	Number of destinations that have this function associated with their routes.	All levels
Requests queued for network tx	Number of requests waiting to be sent to the Diameter peers for this function.	detail
Pending answers from network	Number of replies expected from the Diameter peers for this function.	detail
Answers queued for function tx	Number of replies waiting to be sent to this function.	detail
Total upstream transactions pending	Total number of messages queued for this function.	detail
Upstream transactions limit	Total number of messages queued for this function.	detail
Requests queued for function tx	Number of requests waiting to be sent to this function.	detail
Pending answers from function	Number of replies expected to be received from this function.	detail
Answers queued for network tx	Number of replies waiting to be sent to this function.	detail
Total downstream transactions pending	Total number of messages queued for the Diameter peers.	detail
Downstream transactions limit	Maximum number of messages that can be queued for the Diameter peers.	detail
Buffers used by network tx queue	Number of buffers used by messages queued for the Diameter peers.	detail
Limit on network tx queue buffers	Maximum buffer capacity available for messages queued for the Diameter peers.	detail

Table 109: show diameter function Output Fields (*continued*)

Field Name	Field Description	Level of Output
Buffers used by function tx queue	Number of buffers used by messages queued for this function.	detail
Limit on function tx queue buffers	Maximum buffer capacity available for messages queued for this function.	detail
Origin-state-id	Value of the Origin-State-ID AVP.	detail

Sample Output

show diameter function

```
user@host> show diameter function
```

```
Diameter function list:
```

Function	State	Upstream Transaction Utilization %	Downstream Transaction Utilization %	Net Queue Buffer Utilization %	Func Queue Buffer Utilization %	Routed Dests
jsrc	Disconnect	0	0	0	0	0

show diameter function brief

```
user@host> show diameter function brief
```

```
Diameter function:
```

```
Function name           : gx-plus
State                   : Connected
Upstream transaction utilization : 0 %
Downstream transaction utilization : 0 %
Network transmit buffer utilization : 0 %
Function transmit buffer utilization : 0 %
Routed destinations     : 1

Function name           : jsrc
State                   : Disconnected
Upstream transaction utilization : 0 %
Downstream transaction utilization : 0 %
Network transmit buffer utilization : 0 %
Function transmit buffer utilization : 0 %
Routed destinations     : 0
```

show diameter function detail (JSRC)

```
user@host> show diameter function detail
```

```
Diameter function:
```

```
Function name           : jsrc
State                   : Disconnected
Upstream transaction utilization : 0 %
Downstream transaction utilization : 0 %
Network transmit buffer utilization : 0 %
```

```
Function transmit buffer utilization : 0 %
Routed destinations                 : 0
Requests queued for network tx      : 0
Pending answers from network        : 0
Answers queued for function tx       : 0
Total upstream transactions pending  : 0
Upstream transactions limit          : 1024
Requests queued for function tx      : 0
Pending answers from function        : 0
Answers queued for network tx        : 0
Total downstream transactions pending : 0
Downstream transactions limit        : 1024
Buffers used by network tx queue     : 0
Limit on network tx queue buffers    : 10485760
Buffers used by function tx queue    : 0
Limit on function tx queue buffers   : 10485760
```

show diameter function detail (Gx-Plus)

```
user@host> show diameter function gx-plus detail
```

```
Diameter function:
Function name           : gx-plus
State                   : Connected
Upstream transaction utilization : 0 %
Downstream transaction utilization : 0 %
Network transmit buffer utilization : 0 %
Function transmit buffer utilization : 0 %
Routed destinations     : 1
Requests queued for network tx : 0
Pending answers from network : 0
Answers queued for function tx : 0
Total upstream transactions pending : 0
Upstream transactions limit : 1024
Requests queued for function tx : 0
Pending answers from function : 0
Answers queued for network tx : 0
Total downstream transactions pending : 0
Downstream transactions limit : 1024
Buffers used by network tx queue : 0
Limit on network tx queue buffers : 10485760
Buffers used by function tx queue : 0
Limit on function tx queue buffers : 10485760
Origin-state-id         : 0
```

show diameter function statistics

Syntax	show diameter function statistics <brief detail summary> <function-name>
Release Information	Command introduced in Junos OS Release 9.6. Support for PTSP introduced in Junos OS Release 10.2. Support for Gx-Plus introduced in Junos OS Release 11.2.
Description	Display statistics about all functions associated with Diameter instances or only the specified function.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic function statistics. The brief output displays the summary information in a different format and adds numbers accumulated since the Diameter node was started. The detail output adds information to the brief output.</p> <p>function-name—(Optional) Display information for only the specified function. Currently, Gx-Plus, JSRC, and packet-triggered-subscribers are supported functions. When you specify a function, the brief output is displayed by default, even when you explicitly specify summary.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter function statistics on page 1462 • show diameter on page 1625 • show diameter function on page 1631
List of Sample Output	show diameter function statistics on page 1637 show diameter function statistics brief on page 1637 show diameter function statistics detail on page 1637
Output Fields	Table 110 on page 1635 lists the output fields for the show diameter function statistics command. Output fields are listed in the approximate order in which they appear.

Table 110: show diameter function statistics Output Fields

Field Name	Field Description	Level of Output
Function	Name of the function for which information is displayed.	All levels
Delivered Requests	Number of requests delivered by Diameter to the application.	All levels
Delivered Answers	Number of answers delivered by Diameter to the application.	All levels
Delivered Messages	Total number of messages delivered by Diameter to the application.	All levels

Table 110: show diameter function statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Forwarded Requests	Number of requests sent by Diameter to the network.	All levels
Forwarded Answers	Number of answers sent by Diameter to the network.	All levels
Forwarded Messages	Number of messages sent by Diameter to the network.	All levels
Function name	Name of the function for which information is displayed.	All levels
Over-limit network requests	Number of requests sent to Diameter peers that exceeded the limit on the network transmit queue.	detail
Over-limit network answers	Number of answers sent to Diameter peers that exceeded the limit on the network transmit queue.	detail
Over-limit network messages	Total number of messages sent to Diameter peers that exceeded the limit on the network transmit queue.	detail
Failed to deliver requests	Number of requests sent by Diameter to its application that were not successfully delivered.	detail
Failed to deliver answers	Number of answers sent by Diameter to its application that were not successfully delivered.	detail
Failed to deliver messages	Total number of messages sent by Diameter to its application that were not successfully delivered.	detail
Over-limit function requests	Number of requests sent to Diameter peers that exceeded the limit on the function transmit queue.	detail
Over-limit function answers	Number of answers sent to Diameter peers that exceeded the limit on the function transmit queue.	detail
Over-limit function messages	Total number of messages sent to Diameter peers that exceeded the limit on the function transmit queue.	detail
Failed to forward requests	Number of requests that were not successfully sent by Diameter to the network.	detail
Failed to forward answers	Number of answers that were not successfully sent by Diameter to the network.	detail
Failed to forward messages	Total number of messages that were not successfully sent by Diameter to the network.	detail

Sample Output

show diameter function statistics

```
user@host> show diameter function statistics
Diameter function statistics:
      Delivered Delivered Delivered Forwarded Forwarded Forwarded
Function Requests  Answers  Messages Requests  Answers  Messages
jsrc           0          0          0          0          0          0
```

show diameter function statistics brief

```
user@host> show diameter function statistics brief
Diameter function statistics:
Function name           : jsrsc

Delivered requests      :          0          0
Delivered answers       :          0          0
Delivered messages      :          0          0
Forwarded requests      :          0          0
Forwarded answers       :          0          0
Forwarded messages      :          0          0
```

show diameter function statistics detail

```
user@host> show diameter function statistics detail
Diameter function statistics:
Function name           : jsrsc

Delivered requests      :          0          0
Delivered answers       :          0          0
Delivered messages      :          0          0
Forwarded requests      :          0          0
Forwarded answers       :          0          0
Forwarded messages      :          0          0
Over-limit network requests :          0          0
Over-limit network answers :          0          0
Over-limit network messages :          0          0
Failed to deliver requests :          0          0
Failed to deliver answers  :          0          0
Failed to deliver messages :          0          0
Over-limit function requests :          0          0
Over-limit function answers :          0          0
Over-limit function messages :          0          0
Failed to forward requests :          0          0
Failed to forward answers  :          0          0
Failed to forward messages :          0          0
```

show diameter instance

Syntax	show diameter instance <brief detail summary> <instance-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about all Diameter instances or only the specified instance.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic instance information. The brief output displays the summary information in a different format. The detail output is the same as the brief output.</p> <p>instance-name—(Optional) Display information for only the specified Diameter instance.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 1625
List of Sample Output	show diameter instance on page 1639 show diameter instance detail on page 1639
Output Fields	Table 111 on page 1638 lists the output fields for the show diameter instance command. Output fields are listed in the approximate order in which they appear.

Table 111: show diameter instance Output Fields

Field Name	Field Description	Level of Output
name	Name of the Diameter instance.	summary
Origin-realm	Value of Origin-Realm AVP.	summary
Origin-host	Value of Origin-Host AVP.	summary
NE-total	Total number of network elements configured for this instance.	summary
NE-connected	Number of network elements with active Diameter connections.	summary
Instance name	Name of the Diameter instance.	brief detail
Origin realm	Value of Origin-Realm AVP.	brief detail
Origin host	Value of Origin-Host AVP.	brief detail
NEs	Total number of network elements configured for this instance.	brief detail

Table 111: show diameter instance Output Fields (*continued*)

Field Name	Field Description	Level of Output
Connected NEs	Number of network elements with active Diameter connections.	brief detail

Sample Output

show diameter instance

```
user@host> show diameter instance
```

```
Diameter instances:
```

Name	Origin-Realm	Origin-Host	NE-Total	NE-Connected
master	rrrr	hhhh	1	1

show diameter instance detail

```
user@host> show diameter instance detail
```

```
Diameter instance:
```

```
Instance name : master
```

```
Origin realm  : rrrr
```

```
Origin host   : hhhh
```

```
NEs           : 1
```

```
Connected NEs : 1
```

show diameter network-element

Syntax	show diameter network-element <brief detail summary> <element-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about all Diameter network elements or only the specified network element.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic network element information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>element-name—(Optional) Display information for only the specified network element.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 1625 • show diameter function on page 1631 • show diameter network-element map on page 1643 • show diameter peer on page 1646 • show diameter route on page 1658
List of Sample Output	<p>show diameter network-element on page 1641</p> <p>show diameter network-element detail on page 1642</p>
Output Fields	Table 112 on page 1640 lists the output fields for the show diameter network-element command. Output fields are listed in the approximate order in which they appear.

Table 112: show diameter network-element Output Fields

Field Name	Field Description	Level of Output
Name	Name of the Diameter network element.	summary
Instance	Name of the Diameter instance in which the network element is configured.	summary

Table 112: show diameter network-element Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the network element: <ul style="list-style-type: none"> Connecting—None of the network element peers are in the open state and available for connection. Selecting—One network element peer is connected and the network element is waiting for another peer to reach the open state so that it can be connected. Partially-Connected—One network element peer is in the open state and connected. Post-selection-delay—Three or more peers are in the open state and the network element is waiting to deactivate the peers in excess of two. Fully-connected—Two network element peers are in the open state and connected. 	All levels
Primary peer	Primary peer for the network element, based on the configured peer priority.	All levels
Secondary peer	Secondary peer for the network element, based on the configured peer priority.	All levels
NE name	Name of the Diameter network element.	brief detail
Instance name	Name of the Diameter instance in which the network element is configured.	brief detail
Peers	Number of configured peers.	brief detail
Activated peers	Number of peers that have been activated.	brief detail
Open peers	Number of peers in the open state, without active network element connections but available for a connection.	brief detail
Routes	Number of routes configured for the network element.	brief detail
Invalid routes	Number of routes that are invalid because they lack one or more of the following: application and partition, Diameter instance, or destination realm.	brief detail
Activation delay	Period in milliseconds between peer activations by the network element.	brief detail
First selection delay	Period in milliseconds that the network element waited after connecting to the first peer to allow other peers to reach the open state.	brief detail
Postselection delay	Period in milliseconds that the network element waited after having two peers in the open state before deactivating all lower-priority peers.	brief detail

Sample Output

show diameter network-element

```
user@host> show diameter network-element
```

```
Diameter network-elements:
```

```
Primary      Secondary
```

Name	Instance	State	Peer	Peer
ne0	master	Fully-connected	p0	p1

show diameter network-element detail

```
user@host> show diameter network-element detail
```

Diameter network-element:

NE name : ne0

Instance name : master

State : Fully-connected

Primary peer : p0

Secondary peer : p1

Peers : 5

Activated peers : 4

Open peers : 2

Routes : 1

Invalid routes : 0

Activation delay : 10000 ms

First selection delay : 0 ms

Post selection delay : 30000 ms

show diameter network-element map

Syntax	show diameter network-element map <brief detail summary> <element-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display network-element-to-peer mapping information for all Diameter network elements or only the specified network element.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default. The brief output and detail output display the summary information in a different format.</p> <p>element-name—(Optional) Display information for only the specified network element.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 1625 • show diameter network-element on page 1640
List of Sample Output	<p>show diameter network-element map on page 1644</p> <p>show diameter network-element map detail on page 1644</p>
Output Fields	Table 113 on page 1643 lists the output fields for the show diameter network-element map command. Output fields are listed in the approximate order in which they appear.

Table 113: show diameter network-element map Output Fields

Field Name	Field Description	Level of Output
Name	Name of the Diameter network element.	summary
Instance	Name of the Diameter instance in which the network element is configured.	summary
Peer	Name of the peer.	All levels
Priority	Priority configured for the peer. A lower number indicates a higher priority.	All levels
State	State of the peer: <ul style="list-style-type: none"> • Activated—Peer has been activated (selected) by the network element. • Not-Activated—Peer has not been selected by the network element. • Primary—Peer that is connected to the network element and has the higher priority of the two connected peers. • Secondary—Peer that is connected to the network element and has the lower priority of the two connected peers. 	summary
NE name	Name of the Diameter network element.	brief detail

Table 113: show diameter network-element map Output Fields (*continued*)

Field Name	Field Description	Level of Output
Instance name	Name of the Diameter instance in which the network element is configured.	brief detail
Usage	State of the peer: <ul style="list-style-type: none"> Activated—Peer has been activated (selected) by the network element. Not-Activated—Peer has not been selected by the network element. Primary—Peer that is connected to the network element and has the higher priority of the two connected peers. Secondary—Peer that is connected to the network element and has the lower priority of the two connected peers. 	brief detail

Sample Output

show diameter network-element map

```
user@host> show diameter network-element map
```

```
Diameter network-element peers:
Name      Instance Peer      Priority State
ne0       master  p288      30      Activated
ne0       master  p0        20      Primary
ne0       master  pA        15      Activated
ne0       master  p1        10      Secondary
ne0       master  pB        5      Not-Activated
```

show diameter network-element map detail

```
user@host> show diameter network-element map detail
```

```
Diameter network-element peers:
NE name      : ne0

Instance name : master

Peer         : p288

Priority      :      30
Usage        : Activated

NE name      : ne0

Instance name : master

Peer         : p0

Priority      :      20
Usage        : Primary

NE name      : ne0

Instance name : master

Peer         : pA
```

```
Priority      :      15
Usage        : Activated

NE name      : ne0

Instance name : master

Peer         : p1

Priority      :      10
Usage        : Secondary

NE name      : ne0

Instance name : master

Peer         : pB

Priority      :       5
Usage        : Not-Activated
```

show diameter peer

Syntax	show diameter peer <brief detail summary> <peer-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about all peers associated with Diameter instances or only the specified peer.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic peer information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>peer-name—(Optional) Display information for only the specified peer.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter peer on page 1463 • show diameter on page 1625 • show diameter peer map on page 1651 • show diameter peer statistics on page 1654
List of Sample Output	<p>show diameter peer on page 1648</p> <p>show diameter peer detail on page 1649</p>
Output Fields	Table 114 on page 1646 lists the output fields for the show diameter peer command. Output fields are listed in the approximate order in which they appear.

Table 114: show diameter peer Output Fields

Field Name	Field Description	Level of Output
Peer	Name of the peer.	brief summary
Instance	Name of the Diameter instance in which the peer is configured.	brief summary

Table 114: show diameter peer Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the peer: <ul style="list-style-type: none"> • Bad-Config—Misconfiguration. • Bad-Remote—Remote side does not conform to one of the decisions or is sending malformed messages. • Closed—Normal disconnect due to a request from the remote site or due to excessive watchdog timeouts. • Destructing—Peer to be deleted on the next timer tick; until then, it performs no actions. • Disabled—Peer is administratively disabled. • Internal-error—Internal error has been detected and the peer is in the process of restarting. • No-Activation—Peer is not used by any Diameter network element. • Rejected—Connection was rejected by remote side of the connection. • Reopen—Connection has been unexpectedly closed and Diameter is attempting to reopen the connection. • Suspended—All other reasons to be suspended. 	All levels
NE-Count	Number of network elements associated with the peer.	brief summary
Activated Count	Activation status of the peer: <ul style="list-style-type: none"> • 1—Peer is activated. • 0—Peer is not activated. 	All levels
Primary Count	Status of the peer, primary (1) or secondary (0).	All levels
Secondary Count	Secondary (0) versus Primary (1) status of the peer.	All levels
Peer name	Name of the peer.	detail
NEs	Number of network elements associated with the peer.	detail
Vrf	Logical system:routing instance of the configuration.	detail
Remote address	Remote IP address of the peer.	detail
Remote port	Remote port on the peer on which the connection is made.	detail
Remote end origin realm	Name of the realm of the Diameter node that originates messages to the peer.	detail
Remote end origin host	Name of the host of the Diameter node that originates messages to the peer.	detail
Local address	Local IP address on the Diameter origin node.	detail
Local port	Local port on the Diameter origin node.	detail

Table 114: show diameter peer Output Fields (*continued*)

Field Name	Field Description	Level of Output
Local transport	Number of transports configured.	detail
Time since last enable	Period since peer was enabled in <i>hh:mm:ss</i> format.	detail
In state time	Period that peer has been in present state in <i>hh:mm:ss</i> format.	detail
Remaining in state time	Period that peer will remain in present state in <i>hh:mm:ss</i> format.	detail
Missing wd events	Number of missed watchdog events.	detail
Tx queue length	Number of messages in the transmit queue.	detail
Answer waiting count	Number of answers on which the peer is waiting.	detail
Time since last rx	Number of milliseconds since the last message was received by the peer.	detail
Time until wd timeout	Time remaining until next watchdog event.	detail
Operation timeout	Watchdog timeout period.	detail
Suspended timeout base	Base timeout period in suspended states (suspended, rejected, bad-remonte, bad-config). This timeout doubles after each consecutive suspension, until the maximum value of 600 seconds is reached.	detail
Closed timeout	Timeout period in normal closed state, such as when an external peer requested a disconnect.	detail
Connection timeout	Timeout period for establishing a connection.	detail
Waiting origin state id	Whether the peer is waiting for the Origin-State-Id AVP, yes or no .	detail

Sample Output

show diameter peer

```
user@host> show diameter peer
```

```
Diameter peer list:
```

Peer	Instance	State	NE-Count	Activated Count	Primary Count	Secondary Count
p0	master	I-Open	1	1	1	0
p1	master	I-Open	1	1	0	1
p288	master	Suspended	1	1	0	0
pA	master	Suspended	1	1	0	0
pB	master	No-Activation	1	0	0	0

pc	master	No-Activation	0	0	0	0
pd	master	No-Activation	0	0	0	0

show diameter peer detail

```
user@host> show diameter peer detail
```

```
Diameter peer:
Peer name       : p0
State           : I-Open
NEs             : 1
Activated count  : 1
Primary count    : 1
Secondary count  : 0
Vrf             : default:master
Remote address   : 203.0.113.158
Remote port      : 62917
Remote end origin realm : rrrrA
Remote end origin host : hhhhA
Local address    : 203.0.113.155
Local port       : 57095
Local transport   : <NO-TRANSPORT>
Time since last enable : 08:56.200
In state time    : 08:56.200
Remaining in state time : no limit
Missed wd events : 0
Tx queue length  : 0
Answer waiting count : 0
Time since last rx : 2200 ms
Time until wd timeout : 3800 ms
Operation timeout : 6000 ms
Suspended timeout base : 30000 ms
Closed timeout   : 30000 ms
Connection timeout : 6000 ms
Waiting origin state id : no

Peer name       : p1
State           : I-Open
NEs             : 1
Activated count  : 1
Primary count    : 0
Secondary count  : 1
Vrf             : default:master
Remote address   : 203.0.113.158
Remote port      : 58490
Remote end origin realm : rrrrA
Remote end origin host : hhhhB
Local address    : 203.0.113.155
Local port       : 49293
Local transport   : <NO-TRANSPORT>
Time since last enable : 08:56.200
In state time    : 08:36.000
Remaining in state time : no limit
Missed wd events : 0
Tx queue length  : 0
Answer waiting count : 0
Time since last rx : 0 ms
Time until wd timeout : 6000 ms
Operation timeout : 6000 ms
Suspended timeout base : 30000 ms
```

```
Closed timeout      :    30000 ms
Connection timeout  :     6000 ms
Waiting origin state id : no
```

show diameter peer map

Syntax	show diameter peer map <brief detail summary> <peer-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display peer-to-network-element mapping information for all peers associated with Diameter instances or with the specified peer.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic peer information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>peer-name—(Optional) Display mapping information for only the specified peer.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter peer on page 1463 • show diameter on page 1625 • show diameter peer on page 1646 • show diameter peer statistics on page 1654
List of Sample Output	<p>show diameter peer map on page 1652</p> <p>show diameter peer map detail on page 1652</p>
Output Fields	Table 115 on page 1651 lists the output fields for the show diameter peer map command. Output fields are listed in the approximate order in which they appear.

Table 115: show diameter peer map Output Fields

Field Name	Field Description	Level of Output
Peer	Name of the peer.	All levels
Instance	Name of the Diameter instance in which the network element is configured.	All levels
NE	Name of the Diameter network element.	All levels
Priority	Priority configured for the peer. A lower number indicates a higher priority.	All levels

Table 115: show diameter peer map Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the peer: <ul style="list-style-type: none"> Activated—Peer has been activated (selected) by the network element. Not-Activated—Peer has not been selected by the network element. Primary—Peer that is connected to the network element and has the higher priority of the two connected peers. Secondary—Peer that is connected to the network element and has the lower priority of the two connected peers. 	All levels
Instance name	Name of the Diameter instance in which the network element is configured.	brief detail
NE name	Name of the Diameter network element.	brief detail
Usage	Role of the peer for the network element, Primary or Secondary .	brief detail

Sample Output

show diameter peer map

```
user@host> show diameter peer map
```

```
Diameter peer usage by network elements:
```

Peer	Instance	NE	Priority	State
p0	master	ne0	20	Primary
p1	master	ne0	10	Secondary
p288	master	ne0	30	Activated
pA	master	ne0	15	Activated
pB	master	ne0	5	Not-Activated

show diameter peer map detail

```
user@host> show diameter peer map detail
```

```
Diameter network-element peers:
```

```

Peer                : p0

Instance name       : master

NE name             : ne0

Priority             :      20
Usage               : Primary

Peer                : p1

Instance name       : master

NE name             : ne0

Priority             :      10
Usage               : Secondary

Peer                : p288
```

```
Instance name      : master
NE name            : ne0
Priority            :      30
Usage              : Activated
Peer               : pA
Instance name      : master
NE name            : ne0
Priority            :      15
Usage              : Activated
Peer               : pB
Instance name      : master
NE name            : ne0
Priority            :       5
Usage              : Not-Activated
```

show diameter peer statistics

Syntax	show diameter peer statistics <brief detail summary> <peer-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display statistics about all peers associated with Diameter instances or only the specified peer.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic function statistics. The brief output displays the summary information in a different format and adds numbers accumulated since the peer was connected. The detail output adds information to the brief output.</p> <p>peer-name—(Optional) Display information for only the specified peer. When you specify a peer, the brief output is displayed by default, even when you explicitly specify summary.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear diameter peer on page 1463 • show diameter on page 1625 • show diameter peer on page 1646 • show diameter peer map on page 1651
List of Sample Output	show diameter peer statistics on page 1655 show diameter peer statistics detail on page 1655
Output Fields	Table 116 on page 1654 lists the output fields for the show diameter peer statistics command. Output fields are listed in the approximate order in which they appear.

Table 116: show diameter peer statistics Output Fields

Field Name	Field Description	Level of Output
Peer	Name of the peer.	summary brief
Instance	Name of the Diameter instance in which the network element is configured.	summary brief
Rx	Total number of messages received.	summary brief
Rx-Peer	Number of messages received by the peer.	summary brief
Rx-node	Number of messages received by the Diameter node.	summary brief

Table 116: show diameter peer statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Forw	Total number of forwarded messages.	summary brief
Tx-Peer	Number of messages transmitted by the peer.	summary brief
Tx	Total number of transmitted messages.	summary brief
Peer name	Name of the peer.	detail
Instance name	Name of the Diameter instance in which the network element is configured.	detail

Sample Output

show diameter peer statistics

```
user@host> show diameter peer statistics
```

```
Diameter peer statistics:
```

Peer	Instance	Rx	Rx-Peer	Rx-Node	Forw	Tx-Peer	Tx
p0	master	113	113	0	0	113	
113							
p1	master	110	110	0	0	110	
110							
p288	master	0	0	0	0	0	
0							
pA	master	0	0	0	0	0	
0							
pB	master	0	0	0	0	0	
0							
pc	master	0	0	0	0	0	
0							
pd	master	0	0	0	0	0	
0							

show diameter peer statistics detail

```
user@host> show diameter peer statistics detail
```

```
Diameter peer statistics:
```

Peer name	:	p0	
Instance name	:	master	
		Current	Since last enable
Rx errors	:	0	0
Rx messages	:	114	114
Rx handled by peer	:	114	114
Rx dropped msgs	:	0	0
Rx unmatched answers	:	0	0
Rx answers	:	0	0
Rx requests	:	0	0
Rx total	:	0	0
Forw to connection	:	0	0
Forw to peer	:	0	0

Forw to routed dest	:	0	0		
Total forwarding	:	0	0		
Forwarding failures	:	0	0		
Forwarding success	:	0	0		
Moved-in messages	:	0	0		
Moved-out messages	:	0	0		
Rerouted messages	:	0	0		
Dropped tx messages	:	0	0		
Tx by peer	:	114	114		
Tx errors	:	0	0		
Tx total	:	114	114		
Connection attempts	:	0	1		
Connection fails	:	0	0		
Connections	:	0	1		
Passive terminations	:	0	0		
Active terminations	:	0	0		
Passive disconnects	:	0	0		
Active disconnects	:	0	0		
Rx block requests	:	0	0		
Rx block timeoutss	:	0	0		
Connection management messages					
		Rx current	Rx since last enable	Tx current	Tx since last enable
CER	:	0	0	1	1
CEA	:	1	1	0	0
DWR	:	0	0	113	113
DWA	:	113	113	0	0
DPR	:	0	0	0	0
DPA	:	0	0	0	0
Peer name : p1					
Instance name : master					
		Current	Since last enable		
Rx errors	:	0	0		
Rx messages	:	110	110		
Rx handled by peer	:	110	110		
Rx dropped msgs	:	0	0		
Rx unmatched answers	:	0	0		
Rx answers	:	0	0		
Rx requests	:	0	0		
Rx total	:	0	0		
Forw to connection	:	0	0		
Forw to peer	:	0	0		
Forw to routed dest	:	0	0		
Total forwarding	:	0	0		
Forwarding failures	:	0	0		
Forwarding success	:	0	0		
Moved-in messages	:	0	0		
Moved-out messages	:	0	0		
Rerouted messages	:	0	0		
Dropped tx messages	:	0	0		
Tx by peer	:	110	110		
Tx errors	:	0	0		
Tx total	:	110	110		
Connection attempts	:	0	1		
Connection fails	:	0	0		
Connections	:	0	1		
Passive terminations	:	0	0		
Active terminations	:	0	0		
Passive disconnects	:	0	0		

Active disconnects	:	0	0		
Rx block requests	:	0	0		
Rx block timeoutss	:	0	0		
Connection management messages					
		Rx current	Rx since last enable	Tx current	Tx since last enable
CER	:	0	0	1	1
CEA	:	1	1	0	0
DWR	:	0	0	109	109
DWA	:	109	109	0	0
DPR	:	0	0	0	0
DPA	:	0	0	0	0

show diameter route

Syntax	show diameter route <brief detail summary> <route-name>
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about all routes associated with Diameter instances or only the specified route.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes basic function information. The brief output displays the summary information in a different format. The detail output adds information to the brief output.</p> <p>route-name—(Optional) Display information for only the specified route.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show diameter on page 1625 • show diameter network-element on page 1640
List of Sample Output	<p>show diameter route on page 1659</p> <p>show diameter route detail on page 1659</p>
Output Fields	Table 117 on page 1658 lists the output fields for the show diameter route command. Output fields are listed in the approximate order in which they appear.

Table 117: show diameter route Output Fields

Field Name	Field Description	Level of Output
Route	Name of the route.	summary brief
NE	Name of the network element associated with the route.	summary brief
Instance	Name of the Diameter instance in which the route is configured.	summary brief
NE name	Name of the network element associated with the route.	brief detail
Instance name	Name of the Diameter instance in which the route is configured.	brief detail
Valid	Determination whether the route is valid, yes or no .	All levels
Up	State of the route, yes (up) or no (down).	All levels
Function	Name of the function associated with the route.	brief detail

Table 117: show diameter route Output Fields (*continued*)

Field Name	Field Description	Level of Output
Partition	Partition associated with the function.	brief detail
Dest-realm	Destination realm configured for the route.	brief detail
Dest-host	Destination hostname configured for the route.	brief detail
Metric	Metric associated with the destination and function to create the route.	brief detail
Score	<p>Value that represents how a route is configured. The basic score is 0. Points are added according to the following scheme:</p> <ul style="list-style-type: none"> • Function is specified—Add 3. • Function partition is specified—Add 1. • Destination realm is specified—Add 1. • Destination host is specified—Add 1. 	brief detail

Sample Output

show diameter route

```
user@host> show diameter route
```

```
Diameter routes:
```

```
Route      NE      Instance  Valid Up
rA         ne0     master    yes  yes
```

show diameter route detail

```
user@host> show diameter route detail
```

```
Diameter route:
```

```
Route name      : rA
NE name         : ne0
Instance name    : master
Valid           : yes
Up              : yes
Function        : jsrsc
Partition       : jsrsc-a
Dest-realm      : outer-realm
Dest-host       : outer-host
Metric          :      50
Score           :      6
```

show extensible-subscriber-services accounting

Syntax `show extensible-subscriber-services accounting vsa <vsa>`

Release Information Command introduced in Junos OS Release 15.1.

Description Display the accounting statistics collected in the current log file. If the **vsa** option is not provided, the entire content of the current statistics file is displayed. If the **vsa** option and value are specified, contents of each line that matches the vendor-specific attribute are displayed.

Options **vsa**—(Optional) Vendor-specific attribute.
Range: 1 through 255

Required Privilege Level view

Output Fields [Table 118 on page 1660](#) lists the output fields for the **show extensible-subscriber-services accounting** command. Output fields are listed in the approximate order in which they appear.

Table 118: show extensible-subscriber-services accounting Output Fields

Field Name	Field Description
Timestamp	System time when the statistics file is generated in UTC.
Accounting-Status-Type	Type of status, whether it is service start, stop, or update message
NAS-Port-ID	NAS port ID
Line-ID	Line ID
Vlan-ID	VLAN ID
Logical-Interface	Physical and logical interface information
Total-Input-Bytes	Number of bytes received on the interface
Total-Input-Packets	Number of packets received on the interface
IPv6-Input-Bytes	Number of IPv6 bytes received on the interface
IPv6-Input-Packets	Number of IPv6 packets received on the interface
Total-Output-Bytes	Number of bytes transmitted from the interface
Total-Output-Packets	Number of packets transmitted from the interface
IPv6-Output-Bytes	Number of IPv6 bytes transmitted from the interface

Table 118: show extensible-subscriber-services accounting Output Fields (*continued*)

Field Name	Field Description
IPv6-Output-Packets	Number of IPv6 packets transmitted from the interface
Egress-Queued-Packets	Number of packets sent for this class
Egress-Queued-Bytes	Number of bytes, sent for this class
Egress-TX-Packets	Number of packets transmitted by this queue
Egress-TX-Bytes	Number of bytes actually transmitted by this queue
Egress-Tail-Drop-Packets	Number of packets dropped because of tail drop
Egress-Red-Drop-Packets	Number of packets dropped because of random early detection
Egress-Red-Drop-Bytes	Number of bytes dropped because of random early detection

Sample Output

```
#show extensible-subscriber-services accounting vsa
<Ipdr>
  <General-Interface-Parameters>
    <Timestamp>2013-02-19T01:23:51</Timestamp>
    <Accounting-Status-Type>start</Accounting-Status-Type>

  <Description>#ge-1/0/0.demux0.1073770301:635-7#ngcoco#remote634#circuit634</Description>

  <NAS-Port-ID>mynah#ge-1/0/0.demux0.1073770301:635-7#circuit634#remote634</NAS-Port-ID>

    <Line-ID>remote634</Line-ID>
    <Vlan-ID>635</Vlan-ID>
    <Logical-Interface>ge-1/0/0.2395</Logical-Interface>
  </General-Interface-Parameters>
  <Overall-Packets>
    <Total-Input-Bytes>0</Total-Input-Bytes>
    <Total-Input-Packets>0</Total-Input-Packets>
    <IPv6-Input-Bytes>0</IPv6-Input-Bytes>
    <IPv6-Input-Packets>0</IPv6-Input-Packets>
    <Total-Output-Bytes>0</Total-Output-Bytes>
    <Total-Output-Packets>0</Total-Output-Packets>
    <IPv6-Output-Bytes>0</IPv6-Output-Bytes>
    <IPv6-Output-Packets>0</IPv6-Output-Packets>
  </Overall-Packets>
  <Egress-Packets>
    <Egress-Queue-Index>0</Egress-Queue-Index>
    <Egress-Queued-Packets>0</Egress-Queued-Packets>
    <Egress-Queued-Bytes>0</Egress-Queued-Bytes>
    <Egress-TX-Packets>0</Egress-TX-Packets>
    <Egress-TX-Bytes>0</Egress-TX-Bytes>
    <Egress-Tail-Drop-Packets>0</Egress-Tail-Drop-Packets>
    <Egress-Red-Drop-Packets>0</Egress-Red-Drop-Packets>
    <Egress-Red-Drop-Bytes>0</Egress-Red-Drop-Bytes>
```

```
</Egress-Packets>
<Egress-Packets>
  <Egress-Queue-Index>1</Egress-Queue-Index>
  <Egress-Queued-Packets>0</Egress-Queued-Packets>
  <Egress-Queued-Bytes>0</Egress-Queued-Bytes>
  <Egress-TX-Packets>0</Egress-TX-Packets>
  <Egress-TX-Bytes>0</Egress-TX-Bytes>
  <Egress-Tail-Drop-Packets>0</Egress-Tail-Drop-Packets>
  <Egress-Red-Drop-Packets>0</Egress-Red-Drop-Packets>
  <Egress-Red-Drop-Bytes>0</Egress-Red-Drop-Bytes>
</Egress-Packets>
<Egress-Packets>
  <Egress-Queue-Index>2</Egress-Queue-Index>
  <Egress-Queued-Packets>0</Egress-Queued-Packets>
  <Egress-Queued-Bytes>0</Egress-Queued-Bytes>
  <Egress-TX-Packets>0</Egress-TX-Packets>
  <Egress-TX-Bytes>0</Egress-TX-Bytes>
  <Egress-Tail-Drop-Packets>0</Egress-Tail-Drop-Packets>
  <Egress-Red-Drop-Packets>0</Egress-Red-Drop-Packets>
  <Egress-Red-Drop-Bytes>0</Egress-Red-Drop-Bytes>
</Egress-Packets>
```

show extensible-subscriber-services counters

Syntax	show extensible-subscriber-services counters
Release Information	Command introduced in Junos OS Release 15.1.
Description	Display number of times various events were processed by Extensible Subscriber Services Manager.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear extensible-subscriber-services counters on page 1464
Output Fields	Table 119 on page 1663 describes the output fields for the show extensible-subscriber-services counters command. Output fields are listed in the approximate order in which they appear.

Table 119: show extensible-subscriber-services counters Output Fields

Field Name	Field Description
Total Sessions	Number of extensible-subscriber-service control sessions that are currently in the system
Total Services	Number of extensible-subscriber-services that are currently in the system
Active Services	Number of extensible-subscriber-services that are currently in active state
Op-script execution	Total number of operational scripts executed: <ul style="list-style-type: none"> • Successful—Operational scripts that are executed without error • Unsuccessful—Operational scripts that encountered errors
Commit execution	Total number of commit scripts executed: <ul style="list-style-type: none"> • Successful—Commit scripts that are executed without error • Unsuccessful—Commit scripts that encountered errors
Application execution	Number of applications executed: <ul style="list-style-type: none"> • Successful—Applications that are executed without error • Unsuccessful—Applications that encountered errors
Service requests	Number of service requests received by the daemon. It has counters for total number of requests received, acknowledged (Acked), and negatively acknowledged (Nacked).

Sample Output

```
# show extensible-subscriber-services counters

Total Sessions:      7
Total Services:      14
```

Active Services:	14
Op-script execution:	
Successful	30
Unsuccessful	0
Commit execution:	
Successful	4
Unsuccessful	0
Application execution:	
Successful	0
Unsuccessful	0
Service requests:	
Received	30
Aked	30
Nacked	0

show extensible-subscriber-services debug-information

Syntax	show extensible-subscriber-services debug-information
Release Information	Command introduced in Junos OS Release 15.1.
Description	Write service session information to a file.
Required Privilege Level	view
Output Fields	Table 120 on page 1665 lists the output fields for the show extensible-subscriber-services debug-information command.

Table 120: show extensible-subscriber-services debug-information Output Fields

Field Name	Field Description
File Name	Name of the file that contains the service session information

Sample Output

```
#show extensible-subscriber-services debug-information
File Name: /var/tmp/dump_session_record
```

show extensible-subscriber-services dictionary

Syntax	show extensible-subscriber-services dictionary
Release Information	Command introduced in Junos OS Release 15.1.
Description	Display contents of the dictionary including attributes and services.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • dictionary on page 1018 • request services extensible-subscriber-services reload-dictionary on page 1493 • show extensible-subscriber-services dictionary attributes on page 1670 • show extensible-subscriber-services dictionary services on page 1673 • Understanding the Dictionary File on page 222
Output Fields	Table 121 on page 1666 lists the output fields for the show extensible-subscriber-services dictionary command. Output fields are listed in the approximate order in which they appear.

Table 121: show extensible-subscriber-services dictionary Output Fields

Field Name	Field Description
Acct-Session-Id	<p>Unique accounting identifier that makes it easy to match start and stop records in a log file. The identifier can be in one of the following formats:</p> <ul style="list-style-type: none"> • decimal—For example, 435264 • description—In the generic format, jnpr interface-specifier:subscriber-session-id; For example, jnpr fastEthernet 3/2.6:1010101010101
ERX-Service-Activate	Service to be activated for the subscriber.
Service-Type	Type of service the user has requested or the type of service to be provided.
ADSL-Agent-Remote-Id	Identifier for the subscriber on the digital subscriber line access multiplexer (DSLAM) interface that initiated the service request.
ERX-Med-Port-Number	UDP port in the mediation device to which mirrored traffic is forwarded
NAS-Port-Id	Text string that identifies the physical interface of the NAS that is authenticating the user.
ERX-Med-Dev-Handle	Identifier that associates mirrored traffic with a specific subscriber
ERX-Service-Deactivate	Service to be deactivated for the subscriber.
NAS-IP-Address	IP address of the network access server (NAS) that is requesting authentication of the user.

Table 121: show extensible-subscriber-services dictionary Output Fields (*continued*)

Field Name	Field Description
NAS-Identifier	Name of the NAS that originated the authentication or accounting request.
ERX-Service-Acct-Interval	Amount of time between accounting updates for the service type
ADSL-Agent-Circuit-Id	Identifier for subscriber's access node and the digital subscriber line (DSL) on the access node.
ERX-LI-Action	<p>Traffic mirroring action.</p> <p>For dynamic CoA, VSA 26-58 changes the action on the mirrored traffic identified by VSA 26-59.</p> <p>CoA-Request messages that include any of the RADIUS-based mirroring attributes (VSAs 26-58, 26-59, 26-60, or 26-61) must always include all four VSAs.</p> <p>If the CoA action is to stop mirroring (VSA 26-58 value is 0), then the values of the other three attributes in the CoA message must match the existing attribute values, or the action fails.</p>
ERX-Med-Ip-Address	IP address of content destination device to which mirrored traffic is forwarded.

Sample Output

```
root@ce-bras-mx240-g> show extensible-subscriber-services dictionary
```

RADIUS DICTIONARY

Attribute Name Class	Vendor ID 0	Attribute Code 25	Attribute Type string	Has Tag FALSE	Config Type INVALID
Acct-Session-Id	0	44	string	FALSE	INVALID
ERX-Service-Activate	4874	65	string	TRUE	SERVICE_ACTIVATE
Service-Type	4874	173	integer	TRUE	INVALID
ADSL-Agent-Remote-Id	3561	2	string	FALSE	INVALID
ERX-Med-Port-Number	4874	61	OctetString	FALSE	INVALID
NAS-Port-Id	0	87	text	FALSE	INVALID
ERX-Med-Dev-Handle	4874	59	OctetString	FALSE	INVALID
ERX-Service-Deactivate	4874	66	string	TRUE	SERVICE_DEACTIVATE
NAS-IP-Address	0	4	address	FALSE	INVALID
NAS-Identifier	0	32	string	FALSE	INVALID
ERX-Service-Acct-Interval	4874	140	integer	TRUE	INVALID
ADSL-Agent-Circuit-Id	3561	1	string	FALSE	INVALID

ERX-LI-Action	4874	58	OctetString	FALSE	SERVICE_ACTIVATE
ERX-Med-Ip-Address	4874	60	OctetString	FALSE	INVALID

Services List

Service Name: ngcoco
Service Attribute Name : ERX-Service-Activate

PROVISION ACTION

Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_ngcoco_add

PARAMETERS

Acct-Session-Id
NAS-Port-Id
ERX-Service-Activate

DE-PROVISION ACTION

Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_de1

PARAMETERS

Acct-Session-Id
NAS-Port-Id
ERX-Service-Activate

Service Name: dhcprelay
Service Attribute Name : ERX-Service-Activate

PROVISION ACTION

Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_dhcprelay_add

PARAMETERS

Acct-Session-Id
NAS-Port-Id
ERX-Service-Activate

DE-PROVISION ACTION

Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_de1

PARAMETERS

Acct-Session-Id
NAS-Port-Id
ERX-Service-Activate

Service Name: default
Service Attribute Name : ERX-LI-Action

PROVISION ACTION

Action Type : APPLICATION
Action Version : 1
Action Name : LI

PARAMETERS

ERX-Med-Dev-Handle
ERX-Med-Ip-Address
ERX-Med-Port-Number

Service Name: dhcprelay

Service Attribute Name : ERX-Service-Deactivate

DE-PROVISION ACTION

Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_del

PARAMETERS

Acct-Session-Id
NAS-Port-Id
ERX-Service-Deactivate

Service Name: ngcoco

Service Attribute Name : ERX-Service-Deactivate

DE-PROVISION ACTION

Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_del

PARAMETERS

Acct-Session-Id
NAS-Port-Id
ERX-Service-Deactivate

show extensible-subscriber-services dictionary attributes

Syntax	show extensible-subscriber-services dictionary attributes
Release Information	Command introduced in Junos OS Release 15.1.
Description	Display contents of the dictionary file. It shows only the parameter attributes in the dictionary.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • dictionary on page 1018 • request services extensible-subscriber-services reload-dictionary on page 1493 • show extensible-subscriber-services dictionary on page 1666 • show extensible-subscriber-services dictionary services on page 1673 • Understanding the Dictionary File on page 222
Output Fields	Table 122 on page 1670 lists the output fields for the show extensible-subscriber-services dictionary attributes command. Output fields are listed in the approximate order in which they appear.

Table 122: show extensible-subscriber-services dictionary attributes Output Fields

Field Name	Field Description
Acct-Session-Id	<p>Unique accounting identifier that makes it easy to match start and stop records in a log file. The identifier can be in one of the following formats:</p> <ul style="list-style-type: none"> • decimal—For example, 435264 • description—In the generic format, jnpr interface-specifier:subscriber-session-id; For example, jnpr fastEthernet 3/2.6:1010101010101
ERX-Service-Activate	Service to be activated for the subscriber.
Service-Type	Type of service the user has requested or the type of service to be provided.
ADSL-Agent-Remote-Id	Identifier for the subscriber on the digital subscriber line access multiplexer (DSLAM) interface that initiated the service request.
ERX-Med-Port-Number	UDP port in the mediation device to which mirrored traffic is forwarded
NAS-Port-Id	Text string that identifies the physical interface of the NAS that is authenticating the user.
ERX-Med-Dev-Handle	Identifier that associates mirrored traffic with a specific subscriber
ERX-Service-Deactivate	Service to be deactivated for the subscriber.

Table 122: show extensible-subscriber-services dictionary attributes Output Fields (*continued*)

Field Name	Field Description
NAS-IP-Address	IP address of the network access server (NAS) that is requesting authentication of the user.
NAS-Identifier	Name of the NAS that originated the authentication or accounting request.
ERX-Service-Acct-Interval	Amount of time between accounting updates for the service type
ADSL-Agent-Circuit-Id	Identifier for subscriber's access node and the digital subscriber line (DSL) on the access node.
ERX-LI-Action	<p>Traffic mirroring action.</p> <p>For dynamic CoA, VSA 26-58 changes the action on the mirrored traffic identified by VSA 26-59.</p> <p>CoA-Request messages that include any of the RADIUS-based mirroring attributes (VSAs 26-58, 26-59, 26-60, or 26-61) must always include all four VSAs.</p> <p>If the CoA action is to stop mirroring (VSA 26-58 value is 0), then the values of the other three attributes in the CoA message must match the existing attribute values, or the action fails.</p>
ERX-Med-Ip-Address	IP address of content destination device to which mirrored traffic is forwarded.

Sample Output

```
root@ce-bras-mx240-g> show extensible-subscriber-services dictionary attributes
```

RADIUS DICTIONARY

Attribute Name Class	Vendor ID 0	Attribute Code 25	Attribute Type string	Has Tag FALSE	Config Type INVALID
Acct-Session-Id	0	44	string	FALSE	INVALID
ERX-Service-Activate	4874	65	string	TRUE	SERVICE_ACTIVATE
Service-Type	4874	173	integer	TRUE	INVALID
ADSL-Agent-Remote-Id	3561	2	string	FALSE	INVALID
ERX-Med-Port-Number	4874	61	OctetString	FALSE	INVALID
NAS-Port-Id	0	87	text	FALSE	INVALID
ERX-Med-Dev-Handle	4874	59	OctetString	FALSE	INVALID
ERX-Service-Deactivate	4874	66	string	TRUE	SERVICE_DEACTIVATE
NAS-IP-Address	0	4	address	FALSE	INVALID
NAS-Identifier	0	32	string	FALSE	INVALID

ERX-Service-Acct-Interval	4874	140	integer	TRUE	INVALID
ADSL-Agent-Circuit-Id	3561	1	string	FALSE	INVALID
ERX-LI-Action	4874	58	OctetString	FALSE	SERVICE_ACTIVATE
ERX-Med-Ip-Address	4874	60	OctetString	FALSE	INVALID

show extensible-subscriber-services dictionary services

Syntax	show extensible-subscriber-services dictionary services
Release Information	Command introduced in Junos OS Release 15.1.
Description	Display services configured in the dictionary file and their attributes.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • dictionary on page 1018 • request services extensible-subscriber-services reload-dictionary on page 1493 • show extensible-subscriber-services dictionary on page 1666 • show extensible-subscriber-services dictionary attributes on page 1670 • Understanding the Dictionary File on page 222
Output Fields	Table 123 on page 1673 lists the output fields for the show extensible-subscriber-services dictionary services command. Output fields are listed in the approximate order in which they appear.

Table 123: show extensible-subscriber-services dictionary services Output Fields

Field Name	Field Description
Service Name	Name of the service specified in the dictionary.
Service Attribute Name	Name of the service attribute.
PROVISION ACTION	Name, type, and version of the provisioning action
DE-PROVISION ACTION	Name, type, and version of the deprovisioning action
PARAMETERS	Parameters to be processed for the provisioning or deprovisioning action.

Sample Output

```
root@ce-bras-mx240-g> show extensible-subscriber-services dictionary services
```

```
RADIUS DICTIONARY
```

```
Services List
```

```
Service Name: ngcoco
Service Attribute Name : ERX-Service-Activate
```

```
PROVISION ACTION
Action Type      : OP-SCRIPT
Action Version   : 1
```

Action Name : iceaaa_ngcoco_add

PARAMETERS
Acct-Session-Id
NAS-Port-Id
ERX-Service-Activate

DE-PROVISION ACTION
Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_de1

PARAMETERS
Acct-Session-Id
NAS-Port-Id
ERX-Service-Activate

Service Name: dhcprelay
Service Attribute Name : ERX-Service-Activate

PROVISION ACTION
Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_dhcprelay_add

PARAMETERS
Acct-Session-Id
NAS-Port-Id
ERX-Service-Activate

DE-PROVISION ACTION
Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_de1

PARAMETERS
Acct-Session-Id
NAS-Port-Id
ERX-Service-Activate

Service Name: default
Service Attribute Name : ERX-LI-Action

PROVISION ACTION
Action Type : APPLICATION
Action Version : 1
Action Name : LI

PARAMETERS
ERX-Med-Dev-Handle
ERX-Med-Ip-Address
ERX-Med-Port-Number

Service Name: dhcprelay
Service Attribute Name : ERX-Service-Deactivate

DE-PROVISION ACTION
Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_de1

PARAMETERS

Acct-Session-Id
NAS-Port-Id
ERX-Service-Deactivate

Service Name: ngcoco
Service Attribute Name : ERX-Service-Deactivate

DE-PROVISION ACTION
Action Type : OP-SCRIPT
Action Version : 1
Action Name : iceaaa_del

PARAMETERS
Acct-Session-Id
NAS-Port-Id
ERX-Service-Deactivate

show extensible-subscriber-services sessions

Syntax	<code>show extensible-subscriber-services sessions <i>accounting-session-id</i></code>
Release Information	Command introduced in Junos OS Release 15.1.
Description	Display session information. It displays a list of the services applied and their current state. Specify the accounting session ID to view information about a specific session. If an accounting session ID is not specified in the command, the command displays details of all the sessions.
Options	<i>accounting-session-id</i> —Identifier of the session you want information about.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> clear extensible-subscriber-services sessions on page 1465
Output Fields	Table 124 on page 1676 describes the output fields for the show extensible-subscriber-services sessions command. Output fields are listed in the approximate order in which they appear.

Table 124: show extensible-subscriber-services sessions Output Fields

Field Name	Field Description
Session ID	Session ID. Accounting session ID must be enclosed in quotation marks.
Timestamp	Time when the session was started
Service Name	Name of the service
Commit State	Commit state: Init , Queued , or Success .
Service ID	Service ID

Sample Output

```
#show extensible-subscriber-services sessions
Session ID: jnpr demux0.1073762028:46422
  Timestamp: Fri Mar  8 04:58:27 2013
  Service Name: ngcoco
  Service Name: dhcprelay

Total Sessions: 1

# show extensible-subscriber-services sessions "jnpr demux0.1073762028:46422"

Service ID: jnpr demux0.1073762028:46422:46425
  Timestamp: Fri Mar  8 04:58:27 2013
  Service Name: ngcoco
```

Commit State: Success

Service ID: jnpr demux0.1073762028:46422:46426

Timestamp: Fri Mar 8 04:58:27 2013

Service Name: dhcprelay

Commit State: Success

Total Services: 2

show extensible-subscriber-services service

Syntax	show extensible-subscriber-services service
Release Information	Command introduced in Junos OS Release 15.1.
Description	Display service information. It displays the service name specified in the dictionary, scripts used for provisioning and deprovisioning, and the number of services. A service can have more than one version. Each version is grouped using an action set. The number of action sets is equal to the number of versions for the service. Number of services in all the versions is displayed in Total Services .
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Understanding the Dictionary File on page 222
Output Fields	Table 125 on page 1678 lists the output fields for the show extensible-subscriber-services service command. Output fields are listed in the approximate order in which they appear.

Table 125: show extensible-subscriber-services service Output Fields

Field Name	Field Description
Service Name	Name of the service
Action	Name and number of services provisioned or deprovisioned.
Total Services	Total number of services provisioned or deprovisioned.

Sample Output

```
#show extensible-subscriber-services services
Service Name: ngcoco
  Action:
    Provision:      iceaaa_ngcoco_add_1
    Deprovision:    iceaaa_del_1
    Services:       1301

    Total Services:      1301

Service Name: dhcprelay
  Action:
    Provision:      iceaaa_dhcprelay_add_1
    Deprovision:    iceaaa_del_1
    Services:       1301

    Total Services:      1301
```

show ipv6 router-advertisement

Syntax	<pre>show ipv6 router-advertisement <conflicts> <interface <i>interface</i>> <logical-system (all <i>logical-system-name</i>)> <prefix <i>prefix/prefix length</i>></pre>
Release Information	<p>Command introduced before Junos OS Release 7.4.</p> <p>Command introduced in Junos OS Release 12.2 for the QFX Series.</p> <p>Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.</p>
Description	Display information about IPv6 router advertisements, including statistics about messages sent and received on interfaces, and information received from advertisements from other routers.
Options	<p>none—Display all IPv6 router advertisement information for all interfaces.</p> <p>conflicts—(Optional) Display only the IPv6 router advertisement information that is conflicting.</p> <p>interface <i>interface</i>—(Optional) Display IPv6 router advertisement information for the specified interface.</p> <p>logical-system (all <i>logical-system-name</i>)—(Optional) Perform this operation on all logical systems or on a particular logical system.</p> <p>prefix <i>prefix/prefix length</i>—(Optional) Display IPv6 router advertisement information for the specified prefix.</p>
Additional Information	The display identifies conflicting information by enclosing the value the router is advertising in brackets.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear ipv6 router-advertisement on page 1466
List of Sample Output	<p>show ipv6 router-advertisement on page 1680</p> <p>show ipv6 router-advertisement conflicts on page 1681</p> <p>show ipv6 router-advertisement prefix on page 1681</p>
Output Fields	<p>Table 126 on page 1679 describes the output fields for the show ipv6 router-advertisement command. Output fields are listed in the approximate order in which they appear.</p>

Table 126: show ipv6 router-advertisement Output Fields

Field Name	Field Description
Interface	Name of the interface.

Table 126: show ipv6 router-advertisement Output Fields (*continued*)

Field Name	Field Description
Advertisements sent	Number of router advertisements sent and the elapsed time since they were sent.
Solicits received	Number of solicitation messages received.
Advertisements received	Number of router advertisements received.
Advertisements from	Names of interfaces from which router advertisements have been received and the elapsed time since the last one was received.
Managed	Managed address configuration flag: 0 (stateless) or 1 (stateful).
Other configuration	Other stateful configuration flag: 0 (stateless) or 1 (stateful).
Reachable time	Time that a node identifies a neighbor as reachable after receiving a reachability confirmation, in milliseconds.
Default lifetime	Default lifetime, in seconds: from 0 seconds to 18.2 hours. A setting of 0 indicates that the router is not a default router.
Retransmit timer	Time between retransmitted Neighbor Solicitation messages, in milliseconds.
Current hop limit	Configured current hop limit.
Prefix	Name and length of the prefix.
Valid lifetime	How long the prefix remains valid for onlink determination.
Preferred lifetime	How long the prefix generated by stateless autoconfiguration remains preferred.
On link	Onlink flag: 0 (not onlink) or 1 (onlink).
Autonomous	Autonomous address configuration flag: 0 (not autonomous) or 1 (autonomous).

Sample Output

show ipv6 router-advertisement

```

user@host> show ipv6 router-advertisement
Interface: fe-0/1/1.0
  Advertisements sent: 0
  Solicits received: 0
  Advertisements received: 0
Interface: fxp0.0
  Advertisements sent: 0
  Solicits received: 0
  Advertisements received: 1
  Advertisement from fe80::2d0:b7ff:fe1e:7b0e, heard 00:00:13 ago
  Managed: 0

```

```
Other configuration: 0 [1]
Reachable time: 0 ms
Default lifetime: 1800 sec
Retransmit timer: 0 ms
Current hop limit: 64
```

show ipv6 router-advertisement conflicts

```
user@host> show ipv6 router-advertisement conflicts
Interface: fxp0.0
Advertisement from fe80::2d0:b7ff:fe1e:7b0e, heard 00:01:08 ago
Other configuration: 0 [1]
```

show ipv6 router-advertisement prefix

```
user@host> show ipv6 router-advertisement prefix 2001:db8:8040::/16
Interface: fe-0/1/3.0
Advertisements sent: 3, last sent 00:04:11 ago
Solicits received: 0
Advertisements received: 3
Advertisement from fe80::290:69ff:fe9a:5403, heard 00:00:05 ago
Managed: 0
Other configuration: 0
Reachable time: 0 ms
Default lifetime: 180 sec [1800 sec]
Retransmit timer: 0 ms
Current hop limit: 64
Prefix: 2001:db8:8040:1::/64
Valid lifetime: 2592000 sec
Preferred lifetime: 604800 sec
On link: 1
Autonomous: 1
```

show network-access aaa accounting

Syntax	show network-access aaa accounting
Release Information	Command introduced in Junos OS Release 12.3.
Description	Display the state of the RADIUS Acct-On response sent from the RADIUS server.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • RADIUS Acct-On and Acct-Off Messages on page 103
List of Sample Output	show network-access aaa accounting on page 1682
Output Fields	Table 99 on page 1584 lists the output fields for the show network-access aaa accounting command. Output fields are listed in the approximate order in which they appear.

Table 127: show network-access aaa accounting Output Fields

Field Name	Field Description
Profile	Name of the profile associated with the RADIUS server. A RADIUS server can be associated with more than one profile.
Logical System	Logical system associated with the access profile.
Routing Instance	Routing instance associated with the access profile.
Acct-On-Response	Status of the RADIUS Acct-On response. <ul style="list-style-type: none"> • ACK—ACK response for the Acct-On message is received from the RADIUS server. • ERROR—An error condition has occurred. • NONE— No Acct-On message is sent. • PENDING—Acct-On message is sent to RADIUS server, but no response has been received yet.

Sample Output

show network-access aaa accounting

```

user@host> show network-access aaa accounting
Profile      Logical System  Routing Instance  Acct-On-Response
ppp-profile  default        default          ACK
l2tp-profile default        l2tp_RI          PENDING

```

show network-access aaa radius-servers

Syntax	show network-access aaa radius-servers <detail>
Release Information	Command introduced in Junos OS Release 12.1.
Description	Display RADIUS server status and information.
Options	detail —(Optional) Display detailed level of information.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Subscriber AAA Information on page 223
List of Sample Output	show network-access aaa radius-servers on page 1687 show network-access aaa radius-servers on page 1688 show network-access aaa radius-servers detail on page 1688
Output Fields	Table 128 on page 1683 lists the output fields for the show network-access aaa radius-servers command. Output fields are listed in the approximate order in which they appear.

Table 128: show network-access aaa radius-servers Output Fields

Field Name	Field Description	Level of Output
Profile	Name of the profile associated with the RADIUS server. A RADIUS server can be associated with more than one profile.	All levels
Server address	IPv4 or IPv6 address of the RADIUS server.	All levels
Authentication port	RADIUS server authentication port number.	All levels
Preauthentication port	RADIUS server preauthentication port number.	All levels
Accounting port	RADIUS server accounting port number.	All levels
Accounting retry	Number of times the router retransmits RADIUS accounting messages when no response is received from the server.	Detail
Accounting timeout	Period the local router waits to receive a response from a RADIUS accounting server before retransmitting the message.	Detail

Table 128: show network-access aaa radius-servers Output Fields (*continued*)

Field Name	Field Description	Level of Output
Status	<p>RADIUS server status, UP (Alive), UNREACHABLE, or DOWN (DEAD).</p> <p>If status is DOWN, the Status field includes the number of seconds configured by the revert-interval statement. The router does not send requests to servers in the DOWN state, but does send requests to servers with a status of either UP or UNREACHABLE.</p> <p>NOTE:</p> <p>After requests to a server or set of servers time out after 10 seconds, the status of the servers changes. The following guidelines apply to server status:</p> <ul style="list-style-type: none"> For the purpose of marking a server as Down (DEAD), the request includes the original request and any retries that are configured. The 10-second timeout period starts after the initial request and all retries have expired without receiving a response from the server. <p>The amount of the timeout period that elapses before the server is marked Down is not always exactly 10 seconds, and can vary depending on how frequently subscribers are logging in. When subscribers are continually and rapidly logging in, the server is marked as Down at 10 seconds. However, if subscribers are logging in less frequently and at a slower pace, then the server is not marked Down until a subsequent subscriber attempts to log in. For example, if the subsequent subscriber logs in a minute after the request and all retries lapse, and the 10-second timeout starts, the actual time until the server is marked Down is 50 seconds after the timeout starts (the one minute between subscriber login minus the 10-second timeout).</p> <ul style="list-style-type: none"> All servers cannot be marked as DOWN; instead, the unresponsive servers are marked as UNREACHABLE. <p>For example, if only one RADIUS server is configured and that server is unresponsive, the server status is marked as UNREACHABLE rather than DOWN.</p> <ul style="list-style-type: none"> If at least one server has a status of UP, the status of all unresponsive servers is set to DOWN for the remainder of the configured revert-interval setting. If no server has a status of UP, then the status of the unresponsive servers is set to UNREACHABLE for the remainder of the revert-interval setting or for 30 seconds, whichever is less. The status of unresponsive servers is returned to UP from DOWN or UNREACHABLE at the end of the revert-interval setting (or the 30-second interval). If no requests are sent to a server, the server's status is always UP. 	All levels

Table 128: show network-access aaa radius-servers Output Fields (continued)

Field Name	Field Description	Level of Output
RADIUS servers	Details for specific RADIUS server, identified by IP address.	Detail
Authentication requests	Number of authentication requests received by the authentication server.	Detail
Authentication rollover requests	Number of requests coming into the server as a result of the previous server timing out.	Detail
Authentication retransmissions	Number of retransmissions.	Detail
Accepts	Number of authentication requests accepted by the authentication server.	Detail
Rejects	Number of authentication requests rejected by the authentication server.	Detail
Challenges	Number of authentication requests challenged by the authentication server.	Detail
Authentication malformed responses	Number of responses with attributes having an invalid length or unexpected attributes (such as two attributes when the response is required to have at most one).	Detail
Authentication bad authenticators	Number of responses in which the authenticator is incorrect for the authentication request. This can occur if the RADIUS secrets for the client and server do not match.	Detail
Authentication requests pending	Number of authentication requests waiting for a response.	Detail
Authentication request timeouts	Number of times an authentication request to the server timed out.	Detail
Authentication unknown responses	Number of unknown responses. The RADIUS response type in the header is invalid or unsupported.	Detail
Authentication packets dropped	Number of packets dropped because they are too short or because the router receives a response for which there is no corresponding request.	Detail
Preauthentication requests	Number of preauthentication requests received by the preauthentication server.	Detail
Preauthentication rollover requests	Number of preauthentication requests coming into the server as a result of the previous server timing out.	Detail

Table 128: show network-access aaa radius-servers Output Fields (*continued*)

Field Name	Field Description	Level of Output
Preauthentication retransmissions	Number of retransmissions of preauthentication requests.	Detail
Preauthentication Accepts	Number of preauthentication requests accepted by the preauthentication server.	Detail
Preauthentication Rejects	Number of preauthentication requests rejected by the preauthentication server.	Detail
Preauthentication Challenges	Number of preauthentication requests challenged by the preauthentication server.	Detail
Preauthentication malformed responses	Number of responses to preauthentication requests with attributes having an invalid length or unexpected attributes (such as two attributes when the response is required to have at most one).	Detail
Preauthentication bad authenticators	Number of responses in which the authenticator is incorrect for the preauthentication request. This can occur if the RADIUS secrets for the client and server do not match.	Detail
Preauthentication requests pending	Number of preauthentication requests waiting for a response.	Detail
Preauthentication request timeouts	Number of times a preauthentication request to the server timed out.	Detail
Preauthentication unknown responses	Number of unknown responses during the preauthentication phase. The RADIUS response type in the header is invalid or unsupported.	Detail
Preauthentication packets dropped	Number of preauthentication packets dropped because they are too short or because the router receives a response for which there is no corresponding request.	Detail
Accounting start requests	Number of accounting start requests received.	Detail
Accounting interim requests	Number of accounting interim requests received.	Detail
Accounting stop requests	Number of accounting stop requests received.	Detail
Accounting rollover requests	Number of requests coming into the server as a result of the previous server timing out.	Detail

Table 128: show network-access aaa radius-servers Output Fields (*continued*)

Field Name	Field Description	Level of Output
Accounting retransmissions	Number of retransmissions.	Detail
Accounting start responses	Number of accounting start responses sent by the server.	Detail
Accounting interim responses	Number of accounting interim responses sent by the server.	Detail
Accounting stop responses	Number of accounting stop responses sent by the server.	Detail
Accounting malformed responses	Number of responses with attributes having an invalid length or unexpected attributes (such as two attributes when the response is required to have at most one).	Detail
Accounting bad authenticators	Number of responses in which the authenticator is incorrect for the accounting request. This can occur if the RADIUS secrets for the client and server do not match.	Detail
Accounting requests pending	Number of accounting requests waiting for a response.	Detail
Accounting request timeouts	Number of accounting requests to the accounting server that timed out.	Detail
Accounting unknown responses	Number of unknown responses. The RADIUS response type in the header is invalid or unsupported.	Detail
Accounting packets dropped	Number of packets dropped because they are too short or because the router receives a response for which there is no corresponding request.	Detail

Sample Output

show network-access aaa radius-servers

```

user@host> show network-access aaa radius-servers
Profile: xyz-profile1
  Server address: 192.168.30.188
  Authentication port: 1645
  Preauthentication port: 1810
  Accounting port: 1646
  Status: UP
Profile: xyz-profile2
  Server address: 192.168.30.190
  Authentication port: 1812
  Preauthentication port: 1810

```

```
Accounting port: 1813
Status: DOWN ( 60 seconds )
Profile: xyz-profile11
Server address: 2001:DB8:0:f101::2
Authentication port: 1645
Preauthentication port: 1810
Accounting port: 1646
Status: UP
```

show network-access aaa radius-servers

```
user@host> show network-access aaa radius-servers
Profile: xyz-profile3
Server address: 192.168.30.188
Authentication port: 1645
Preauthentication port: 1810
Accounting port: 1646
Status: UNREACHABLE
Profile: xyz-profile3
Server address: 192.168.30.190
Authentication port: 1812
Accounting port: 1813
Preauthentication port: 1810
Status: UNREACHABLE
```

show network-access aaa radius-servers detail

```
user@host> show network-access aaa radius-servers detail
Profile: xyz_profile5
Server address: 192.168.30.188
Authentication port: 1812
Preauthentication port: 1810
Accounting port: 1813
Status: UP
Server address: 192.168.30.190
Authentication port: 1812
Preauthentication port: 1810
Accounting port: 1813
Accounting retry: 5
Accounting port: 60
Status: UP
Server address: 192.168.30.192
Authentication port: 1812
Preauthentication port: 1810
Accounting port: 1813
Status: UP

RADIUS Servers
192.168.30.188
Authentication requests: 7658
Authentication rollover requests: 0
Authentication retransmissions: 3600
Accepts: 6458
Rejects: 0
Challenges: 0
Authentication malformed responses: 0
Authentication bad authenticators: 0
Authentication requests pending: 0
Authentication request timeouts: 4800
Authentication unknown responses: 0
Authentication packets dropped: 0
```

Preauthentication requests: 7658
Preauthentication rollover requests: 0
Preauthentication retransmissions: 3600
Preauthentication Accepts: 6458
Preauthentication Rejects: 0
Preauthentication Challenges: 0
Preauthentication malformed responses: 0
Preauthentication bad authenticators: 0
Preauthentication requests pending: 0
Preauthentication request timeouts: 4800
Preauthentication unknown responses: 0
Preauthentication packets dropped: 0
Accounting start requests: 1
Accounting interim requests: 1
Accounting stop requests: 0
Accounting rollover requests: 0
Accounting retransmissions: 0
Accounting start responses: 1
Accounting interim responses: 1
Accounting stop responses: 0
Accounting malformed responses: 0
Accounting bad authenticators: 0
Accounting requests pending: 0
Accounting request timeouts: 0
Accounting unknown responses: 0
Accounting packets dropped: 0

show network-access aaa statistics

Syntax	<code>show network-access aaa statistics</code> <code><accounting (detail)></code> <code><address-assignment (client pool <i>pool-name</i>)></code> <code><dynamic-requests></code> <code><radius></code>
Release Information	Command introduced in Junos OS Release 9.1. Option address-assignment introduced in Junos OS Release 10.0. Option radius introduced in Junos OS Release 11.4. Option detail introduced in Junos OS Release 13.3.
Description	Display AAA accounting, address-assignment, dynamic request statistics, and RADIUS settings and statistics.
Options	accounting (detail) —(Optional) Display AAA accounting statistics. The detail keyword displays additional accounting information address-assignment (client pool <i>pool-name</i>) —(Optional) Display AAA address-assignment client and pool statistics. dynamic-requests —(Optional) Display AAA dynamic requests. radius —(Optional) Display RADIUS settings and statistics.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Verifying and Managing Subscriber AAA Information on page 223
List of Sample Output	show network-access aaa statistics accounting on page 1696 show network-access aaa statistics accounting detail on page 1697 show network-access aaa statistics address-assignment client on page 1697 show network-access aaa statistics address-assignment pool on page 1697 show network-access aaa statistics dynamic-requests on page 1698 show network-access aaa statistics radius on page 1698
Output Fields	Table 129 on page 1691 lists the output fields for the show network-access aaa statistics command. Output fields are listed in the approximate order in which they appear.

Table 129: show network-access aaa statistics Output Fields

Field Name	Field Description	Level of Output
Requests received	<ul style="list-style-type: none"> Number of accounting requests generated by the AAA framework. Number of dynamic requests received from the external server. <p>Does not include requests sent from backup accounting.</p>	All levels
Accounting request failures	<p>Number of accounting requests that failed to be sent or queued from a client to a RADIUS accounting server.</p> <p>Does not include requests sent from backup accounting.</p>	detail
Accounting request success	<p>Number of accounting requests successfully sent or queued from a client to a RADIUS accounting server.</p> <p>Does not include requests sent from backup accounting.</p>	detail
Account on requests	<p>Number of accounting on requests sent from a client to a RADIUS accounting server.</p>	detail
Accounting start requests	<p>Number of accounting start requests sent from a client to a RADIUS accounting server.</p>	detail
Accounting interim requests	<p>Number of accounting interim requests sent from a client to a RADIUS accounting server.</p>	detail
Accounting stop requests	<p>Number of accounting stop requests sent from a client to a RADIUS accounting server.</p> <p>Does not include requests sent from backup accounting.</p>	detail
Accounting request timeouts	<p>Number of accounting requests to the accounting server that timed out. This field was named Timed out requests in releases before Junos OS Release 16.1.</p> <p>Does not include requests sent from backup accounting.</p>	All levels
Accounting Response failures	<p>Number of accounting requests not acknowledged (NAK) by the accounting server.</p> <p>Does not include requests sent from backup accounting.</p>	All levels

Table 129: show network-access aaa statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Accounting response success	Number of accounting requests acknowledged by the accounting server. Does not include requests sent from backup accounting.	All levels
Account on responses	Number of accounting on requests acknowledged by the RADIUS accounting server.	detail
Accounting start responses	Number of accounting start requests acknowledged by the RADIUS accounting server.	detail
Accounting interim responses	Number of accounting interim requests acknowledged by the RADIUS accounting server.	detail
Accounting stop responses	Number of accounting stop requests acknowledged by the RADIUS accounting server. Does not include requests sent from backup accounting.	detail
Accounting rollover requests	Number of accounting requests coming to a RADIUS accounting server after a previous server timing out.	detail
Accounting unknown requests	Number of unknown accounting requests sent from a client to a RADIUS accounting server (for example, when the header has invalid or unsupported information).	detail
Accounting radius pending requests	Number of accounting requests sent from a client to a RADIUS accounting server that are waiting for a response from the server.	detail
Accounting malformed responses	Number of accounting responses from a RADIUS accounting server that have invalid or unexpected attributes.	detail
Accounting retransmissions	Number of accounting requests made by a client to the RADIUS sever that were retransmitted. Does not include requests sent from backup accounting.	detail
Accounting bad authenticators	Number of accounting responses from a RADIUS accounting server that have an incorrect authenticator (for example, the client and server RADIUS secret do not match).	detail

Table 129: show network-access aaa statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Accounting packets dropped	Number of accounting responses from a RADIUS accounting server that are dropped by a client.	detail
Accounting backup record creation requests	Number of accounting stop requests from a client to a RADIUS accounting server that were forwarded to be backed up.	detail
Accounting backup replay request success	Number of backup accounting stop requests successfully created by clients after each timeout for replay to a RADIUS accounting server.	detail
Accounting backup request failures	Number of backup accounting requests that failed to be sent or queued from a client to a RADIUS accounting server.	detail
Accounting backup request success	Number of backup accounting requests successfully sent or queued from a client to a RADIUS accounting server.	detail
Accounting backup timeouts	Number of backup accounting requests that timed out after being sent to a RADIUS accounting server.	detail
Accounting backup in-flight requests	<p>Number of backup accounting requests that were successfully sent or queued to a RADIUS accounting server for which no response or error has been received yet.</p> <p>Backup requests are replayed only in the following circumstances:</p> <ul style="list-style-type: none"> When the request being replayed receives a positive response, the next request can be replayed. When the request being replayed receives a timeout response, it can be replayed again. <p>Consequently this intermediate timer displays 1 or 0. The value eventually drops to 0 as requests are responded to positively or fail due to error.</p>	detail
Accounting backup responses success	Number of backup records that were successfully acknowledged with a positive response from a RADIUS accounting server.	detail

Table 129: show network-access aaa statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Accounting backup radius requests	<p>Number of backup requests sent to UDP level.</p> <p>This is a RADIUS-level counter and increments rapidly based on the configured retries and timeouts and the RADIUS-level retransmissions. An observation that the value is increasing is more significant than the exact value of the counter.</p>	detail
Accounting backup radius responses	<p>Number of responses received at the UDP level for backup requests.</p> <p>This is a RADIUS-level counter and increments rapidly based on the configured retries and timeouts and the RADIUS-level retransmissions. Observation that the value is increasing is more significant than the exact value of the counter.</p>	detail
Accounting backup radius timeouts	<p>Number of backup requests that timed out after being sent to UDP.</p> <p>This is a RADIUS-level counter and increments rapidly based on the configured retries and timeouts and the RADIUS-level retransmissions. Observation that the value is increasing is more significant than the exact value of the counter.</p>	detail
Accounting backup radius pending requests	<p>Number of backup requests sent to a RADIUS accounting server that are waiting for a response from the server.</p> <p>This is an intermediate state counter that eventually drops to zero as requests are responded to or failed due to error.</p>	detail
Accounting backup radius retransmissions	<p>Sum of backup request retransmissions for each RADIUS accounting server.</p> <p>This is a RADIUS-level counter and increments rapidly based on the configured retries and timeouts and the RADIUS-level retransmissions. Observation that the value is increasing is more significant than the exact value of the counter.</p>	detail
Accounting backup malformed responses	<p>Sum of malformed responses received for backup requests sent to each RADIUS accounting server at the UDP level.</p>	detail
Accounting backup bad authenticators	<p>Sum of responses received for backup accounting requests for each RADIUS accounting server where authenticators were mismatched.</p>	detail

Table 129: show network-access aaa statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Accounting backup responses dropped	Sum of responses for backup accounting requests for each RADIUS accounting server that were dropped due to various sanity checks.	detail
Accounting backup rollover requests	Sum of backup accounting requests rolled over for each RADIUS accounting server.	detail
Accounting backup unknown responses	Sum of unknown responses for backup accounting requests for each RADIUS accounting server.	detail
Client	Client type; for example, DHCP, Mobile IP, PPP.	none specified
Out of Memory	Number of times an address was not given to the client due to memory issues.	none specified
No Matches	Number of times there were no network matches for the pool.	none specified
Pool Name	Name of the address-assignment pool for this client.	none specified
Out of Addresses	Number of times there were no available addresses in the pool.	none specified
Address total	Number of addresses in the pool.	none specified
Addresses in use	Number of addresses in use.	none specified
Address Usage (percent)	Percentage of total addresses in use.	none specified
Pool Usage	Percentage of allocated addresses in the specified address pool.	none specified
processed successfully	Number of dynamic requests processed successfully by the AAA framework.	All levels
errors during processing	Number of dynamic requests that resulted in processing errors by the AAA framework.	All levels
Link Name	Name of the secondary address-assignment pool to which the primary pool is linked.	

Table 129: show network-access aaa statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
silently dropped	Number of dynamic requests dropped by the AAA framework due to multiple back-to-back or duplicate requests.	All levels
RADIUS Server	IPv4 or IPv6 address of the RADIUS server to which the router is sending requests.	All levels
Profile	Name of the RADIUS profile associated with the RADIUS server. A RADIUS server can be associated with more than one RADIUS profile.	All levels
Configured	Configured maximum number of outstanding requests from the router to the RADIUS server for a specific profile. An outstanding request is a request to which the RADIUS server has not yet responded. The range of values is 0 through 2000 outstanding requests. The default value is 1000.	All levels
Current	Current number of outstanding requests from the router to the RADIUS server for a specific profile. An outstanding request is a request to which the RADIUS server has not yet responded.	All levels
Peak	Highest number of outstanding requests from the router to the RADIUS server for a specific profile at any point in time since the router was started or since the counter was last cleared. NOTE: If the value of this field is equal to the value of the Configured field, you may want to increase the value of the Configured field.	All levels
Exceeded	Number of times that the router attempted to send requests to the RADIUS server in excess of the configured maximum value for a specific profile. NOTE: If the value of this field is nonzero, you may want to increase the value of the Configured field.	All levels

Sample Output

show network-access aaa statistics accounting

```

user@host> show network-access aaa statistics accounting
Accounting module statistics
Accounting module statistics
  Requests received: 5000
  Accounting request timeouts: 2000
  Accounting response failures: 0
  Accounting response success: 3000

```

show network-access aaa statistics accounting detail

```

user@host> show network-access aaa statistics accounting detail
Accounting module statistics
Accounting module statistics
  Requests received: 5000
  Accounting request failures: 0
  Accounting request success: 5000
    Account on requests: 0
    Accounting start requests: 3000
    Accounting interim requests: 0
    Accounting stop requests: 2000
  Accounting request timeouts: 2000
  Accounting response failures: 0
  Accounting response success: 3000
    Account on responses: 0
    Accounting start responses: 3000
    Accounting interim responses: 0
    Accounting stop responses: 0
  Accounting rollover requests: 0
  Accounting unknown responses: 0
  Accounting radius pending requests: 0
  Accounting malformed responses: 0
  Accounting retransmissions: 6000
  Accounting bad authenticators: 0
  Accounting packets dropped: 0

  Accounting backup record creation requests: 3000
  Accounting backup request replay success: 9808
  Accounting backup request failures: 0
  Accounting backup request success: 3006
  Accounting backup timeouts: 6
  Accounting backup in-flight requests: 0
  Accounting backup responses success: 3000
  Accounting backup radius requests: 3006
  Accounting backup radius responses: 3000
  Accounting backup radius timeouts: 99
  Accounting backup radius pending requests: 0
  Accounting backup radius retransmissions: 99
  Accounting backup malformed responses: 0
  Accounting backup bad authenticators: 0
  Accounting backup responses dropped: 0
  Accounting backup rollover requests: 0
  Accounting backup unknown responses: 0

```

show network-access aaa statistics address-assignment client

```

user@host> show network-access aaa statistics address-assignment client
Address-assignment statistics
Client: jdhcpd
Out of Memory: 0
No Matches: 2

```

show network-access aaa statistics address-assignment pool

```

user@host> show network-access aaa statistics address-assignment pool isp_1
Address-assignment statistics
Pool Name: isp_1
Pool Name: (all pools in chain)
Out of Memory: 0
Out of Addresses: 9

```

```
Address total: 47
Addresses in use: 47
Address Usage (percent): 100
```

show network-access aaa statistics dynamic-requests

```
user@host> show network-access aaa statistics dynamic-requests
requests received: 0
processed successfully: 0
errors during processing: 0
silently dropped: 0
```

show network-access aaa statistics radius

```
user@host> show network-access aaa statistics radius
Outstanding Requests
RADIUS Server      Profile      Configured   Current   Peak   Exceeded
198.51.100.239     prof1        1000         0         1000   14
                   prof2        500          17        432    0
198.51.100.211     myprof       200          0         200    27
203.0.113.254      pppoe-auth   111          0         1       0
2001:db8:0:f101::2 xyz-profile11 1000         10        135    0
```

show network-access aaa statistics authentication

Syntax	show network-access aaa statistics authentication <detail>
Release Information	Command introduced in Junos OS Release 9.1. Option detail introduced in Junos OS Release 12.1.
Description	Display AAA authentication statistics.
Options	detail —(Optional) Displays detailed information about authentication.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Subscriber AAA Information on page 223
List of Sample Output	show network-access aaa statistics authentication on page 1701 show network-access aaa statistics authentication detail on page 1701
Output Fields	Table 130 on page 1699 lists the output fields for the show network-access aaa statistics authentication command. Output fields are listed in the approximate order in which they appear.

Table 130: show network-access aaa statistics authentication Output Fields

Field Name	Field Description	Level of Output
Requests received	Number of authentication requests received from clients.	All levels
Accepts	Number of authentication requests accepted by the authentication server.	All levels
Rejects	Number of authentication requests rejected by the authentication server.	All levels
Challenges	Number of authentication requests challenged by the authentication server.	All levels
Timed out requests	Number of authentication requests that timed out.	All levels
RADIUS authentication failures	Number of RADIUS authentication requests that have failed.	Detail
Queue request deleted	Number of queue requests that have been deleted.	Detail
Malformed reply	Number of malformed replies received from the RADIUS authentication server.	Detail

Table 130: show network-access aaa statistics authentication Output Fields (*continued*)

Field Name	Field Description	Level of Output
No server configured	Number of authentication requests that failed because no authentication server is configured.	Detail
Access Profile configuration not found	Number of authentication requests that failed because no access profile is configured.	Detail
Unable to create client record	Number of times that the router is unable to create the client record for the authentication request.	Detail
Unable to create client request	Number of times that the router is unable to create the client request for the authentication request.	Detail
Unable to build authentication request	Number of times that the router is unable to build the authentication request.	Detail
No server found	Number of requests to the authentication server that have timed out; the server is then considered to be down.	Detail
Unable to create handle	Number of authentication requests that have failed because of an internal allocation failure.	Detail
Unable to queue request	Number of times the router was unable to queue the request to the authentication server.	Detail
Invalid credentials	Number of times the router did not have proper authorization to access the authentication server.	Detail
Malformed request	Number of times the router request to the authentication server is malformed.	Detail
License unavailable	Number of times the router did not have a license to access the authentication server.	Detail
Redirect requested	Number of authentication requests that have been redirected based on routing instance.	Detail
Internal failure	Number of internal failures.	Detail
Local authentication failures	Number of times local authentication failed.	Detail
LDAP lookup failures	Number of times the LDAP lookup operation failed.	Detail

Sample Output

show network-access aaa statistics authentication

```
user@host> show network-access aaa statistics authentication
Authentication module statistics
  Requests received: 2118
  Accepts: 261
  Rejects: 975
  Challenges: 0
  Timed out requests: 882
```

show network-access aaa statistics authentication detail

```
user@host> show network-access aaa statistics authentication detail
Authentication module statistics
  Requests received: 2118
  Accepts: 261
  Rejects: 975
    RADIUS authentication failures: 975
      Queue request deleted: 0
      Malformed reply: 0
      No server configured: 0
      Access Profile configuration not found: 0
      Unable to create client record: 0
      Unable to create client request: 0
      Unable to build authentication request: 0
      No server found: 975
      Unable to create handle: 0
      Unable to queue request: 0
      Invalid credentials: 0
      Malformed request: 0
      License unavailable: 0
      Redirect requested: 0
      Internal failure: 0
    Local authentication failures: 0
    LDAP lookup failures: 0
  Challenges: 0
  Timed out requests: 882
```

show network-access aaa statistics pending-accounting-stops

Syntax	show network-access aaa statistics pending-accounting-stops
Release Information	Command introduced in Junos OS Release 13.1.
Description	Display the number of pending accounting stop requests.
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• request network-access aaa replay pending-accounting-stops on page 1296• show accounting pending-accounting-stops on page 1505
List of Sample Output	show network-access aaa statistics pending-accounting-stops on page 1702
Output Fields	Table 131 on page 1702 lists the output field for the show network-access aaa statistics pending-accounting-stops command.

Table 131: show network-access aaa statistics pending-accounting-stops Output Fields

Field Name	Field Description
Pending accounting stops	Total number of accounting stop messages queued.

Sample Output

show network-access aaa statistics pending-accounting-stops

```
user@host> show network-access aaa statistics pending-accounting-stops
Pending accounting stops: 10,000
```

show network-access aaa statistics preauthentication

Syntax	show network-access aaa statistics preauthentication
Release Information	Command introduced in Junos OS Release 13.3.
Description	Display AAA preauthentication statistics.
Options	detail —(Optional) Displays detailed information about authentication.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • RADIUS Logical Line Identifier (LLID) Overview on page 147 • Configuring Logical Line Identification (LLID) Preauthentication on page 150
List of Sample Output	show network-access aaa statistics preauthentication on page 1703
Output Fields	Table 132 on page 1703 lists the output fields for the show network-access aaa statistics preauthentication command. Output fields are listed in the approximate order in which they appear.

Table 132: show network-access aaa statistics preauthentication Output Fields

Field Name	Field Description	Level of Output
Requests received	Number of preauthentication requests received from clients.	All levels
Multistack requests	Number of preauthentication requests for dual-stack subscribers.	All levels
Accepts	Number of preauthentication requests accepted by the preauthentication server.	All levels
Rejects	Number of preauthentication requests rejected by the preauthentication server.	All levels
Challenges	Number of preauthentication requests challenged by the preauthentication server.	All levels
Timed out requests	Number of preauthentication requests that timed out.	All levels

Sample Output

show network-access aaa statistics preauthentication

```

user@host> show network-access aaa statistics preauthentication
Preauthentication module statistics
Requests received: 2118

```

Multistack requests: 0
Accepts: 261
Rejects: 975
Challenges: 0
Timed out requests: 882

show network-access aaa subscribers

Syntax	<code>show network-access aaa subscribers</code> <code><logical-system <i>logical-system-name</i>></code> <code><routing-instance <i>routing-instance-name</i>></code> <code><statistics></code> <code><username></code>
Release Information	Command introduced in Junos OS Release 9.1.
Description	Display subscriber-specific AAA statistics.
Options	<p><code>logical-system <i>logical-system-name</i></code>—(Optional) List subscribers in the specific logical system.</p> <p><code>routing-instance <i>routing-instance-name</i></code>—(Optional) List subscribers for the specific routing instance. If you do not specify a routing instance name, the default routing instance is assumed.</p> <p><code>statistics</code>—(Optional) Display statistics for the subscriber events.</p> <p><code>username</code>—(Optional) Display information for the specified subscriber.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Subscriber AAA Information on page 223
List of Sample Output	show network-access aaa subscribers logical-system on page 1706 show network-access aaa subscribers logical-system routing-instance on page 1706 show network-access aaa subscribers statistics username on page 1707 show network-access aaa subscribers username on page 1707
Output Fields	Table 133 on page 1705 lists the output fields for the show network-access aaa subscribers command. Output fields are listed in the approximate order in which they appear.

Table 133: show network-access aaa subscribers Output Fields

Field Name	Field Description
Challenge requests	Number of authentication requests challenged by the authentication server for this subscriber.
Challenge responses	Number of challenge responses sent by the subscriber to the authentication server.
START sent successfully	Number of accounting start requests generated by the AAA framework for this subscriber.
START send failures	Number of accounting start requests that failed to make it to the accounting server for this subscriber.
START ack received	Number of accounting start requests acknowledged by the accounting server for this subscriber.

Table 133: show network-access aaa subscribers Output Fields (*continued*)

Field Name	Field Description
INTERIM sent successfully	Number of accounting interim requests generated by the AAA framework for this subscriber.
INTERIM send failures	Number of accounting interim requests that failed to make it to the accounting server for this subscriber.
INTERIM ack received	Number of accounting interim requests acknowledged by the accounting server for this subscriber.
Requests received	Number of reauthentication requests received by the authentication server.
Successful responses	Number of successful reauthentication requests granted by the authentication server.
Aborts handled	Number of reauthentication requests aborted by the authentication server.
Service name	Name of the subscriber service.
Creation requests	Number of requests to create the service.
Deletion requests	Number of requests to delete the service.
Request timeouts	Number of times the service request was timed out.
Client type	Type of client; for example, DHCP, Mobile IP, PPP.
Session-ID	ID of the subscriber session.
Session uptime	How long the session has been up, in <i>HH:MM:SS</i> .
Accounting	Status of accounting, and type of accounting if accounting is on.

Sample Output

show network-access aaa subscribers logical-system

```

user@host> show network-access aaa subscribers logical-system
Username           Client type      Logical system/Routing instance
user61@example.net  ppp             default
00010e020304.1231  dhcp            isp-bos-metro-12:isp-cmborg-12
user54@example.com  dhcp            default:isp-gtown-r3-00
0020df980102.2334  dhcp            isp-bos-metro-16:isp-cmborg-12

```

show network-access aaa subscribers logical-system routing-instance

```

user@host> show network-access aaa subscribers logical-system isp-bos-metro-16
routing-instance isp-cmborg-12-32
Username           Client type      Logical system/Routing instance
00010e020304.1231  dhcp            isp-bos-metro-12:isp-cmborg-12
user54@example.com  dhcp            default:isp-gtown-r3-00
0020df980102.2334  dhcp            isp-bos-metro-16:isp-cmborg-12

```

show network-access aaa subscribers statistics username

```

user@host> show network-access aaa subscribers statistics username 00010e020304.1231
Authentication statistics
  Challenge requests: 0
  Challenge responses: 0
Accounting statistics
  START sent successfully: 1
  START send failures: 0
  START ack received: 1
  INTERIM sent successfully: 0
  INTERIM send failures: 0
  INTERIM ack received: 0
Re-authentication statistics
  Requests received: 0
  Successful responses: 0
  Aborts handled: 0
Service statistics
  Service name: filter-serv
  Creation requests: 1
  Deletion requests: 0
  Request timeouts: 0
  Service name: filter-serv2
  Creation requests: 144
  Deletion requests: 0
  Request timeouts: 144

```

show network-access aaa subscribers username

```

user@host> show network-access aaa subscribers username user80@example.net
Logical system/Routing instance  Client type  Session-ID  Session uptime
Accounting
isp-bos-metro-16:isp-cmbrg-12    dhcp      7           01:12:56
on/volume
Service name      Service type  Quota      Accounting
I-Cast           volume       1200 Mbps  on/volume+time
Voip              time         6000 secs  on/volume
GamingBurst      time         6000 secs  on/volume

```

show network-access aaa subscribers session-id

Syntax	show network-access aaa subscribers session-id <i>session-id</i> <brief detail>
Release Information	Command introduced in Junos OS Release 10.0.
Description	Display information about the specified subscriber session.
Options	<i>session-id</i> —ID of the subscriber session. brief detail —(Optional) Display the specified level of information.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Subscriber AAA Information on page 223 • Activating and Deactivating Subscriber Services Locally with the CLI on page 588 • Deactivating a Single Instance of a Subscriber Service with Multiple Instances on page 597 • Deactivating All Instances of a Subscriber Service with Multiple Instances on page 599 • Verifying and Managing Subscriber Services with Multiple Instances on page 603 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gy Interactions Between the Router and the OCS on page 730 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735
List of Sample Output	show network-access aaa subscribers session-id brief on page 1712 show network-access aaa subscribers session-id detail on page 1712 show network-access aaa subscribers session-id detail (Service with Multiple Instances) on page 1713 show network-access aaa subscribers session-id detail (Single Session Dual Stack with active V4 and V6 subscribers) on page 1713
Output Fields	Table 134 on page 1708 lists the output fields for the show network-access aaa subscribers session-id command. Output fields are listed in the approximate order in which they appear.

Table 134: show network-access aaa subscribers session-id Output Fields

Field Name	Field Description	Level of Output
Type and Client type	Type of client.	All levels
Accounting	Status of accounting, and type of accounting if accounting is on.	brief

Table 134: show network-access aaa subscribers session-id Output Fields (*continued*)

Field Name	Field Description	Level of Output
Service type	Type of accounting: volume , time , volume+time , or na .	brief
Quota	Quota for service: volume (in Mbps) or time (seconds).	brief
Username	Name of the user logged in to the session.	detail
Stripped username	Username after the domain has been removed.	detail
Logical system/Routing instance and AAA Logical system/Routing instance	Name of the routing instance, logical system name, or both used for the session.	All levels
Target Logical system/Routing instance	Logical system/routing instance to which the session is mapped.	detail
Access-profile	Access profile used for AAA services for the session.	detail
Session ID	ID of the subscriber session. The session ID value displayed under Service name is the service session ID.	detail
Accounting Session ID	ID of the accounting session (RADIUS attribute 44). The ID appears in decimal or description format, as specified by the accounting-session-id-format statement.	detail
Multi Accounting Session ID	Bundle ID for MLPPP sessions. Acct-Multi-Session-Id (RADIUS attribute 50) uses the value of the session database bundle session ID to enable RADIUS to link together multiple related sessions. The value of this field is zero when no MLPPP sessions exist.	detail
IP Address	IP address of the subscriber. For a single-session dual stack, addresses of both IPv4 and IPv6 clients are displayed.	detail
IPv6 Address	IPv6 address of the subscriber. For a single-session dual stack, addresses of both IPv4 and IPv6 clients are displayed.	detail
IPv6 Prefix	IPv6 prefix of the subscriber. For a single-session dual stack, addresses of both IPv4 and IPv6 clients are displayed.	detail

Table 134: show network-access aaa subscribers session-id Output Fields (*continued*)

Field Name	Field Description	Level of Output
Authentication State	State of the subscriber authentication session: AuthInit , AuthStart , AuthChallenge , AuthRedirect , AuthClntRespWait , AuthAcctVolStatsAckWait , AuthAcctStopAckWait , AuthServCreateRespWait , AuthLogoutStart , AuthStateActive , AuthClntLogoutRespWait , AuthProfileUpdateWait , AuthProvisionRespWait , AuthProvisionServiceCreationWait	detail
Gx-Plus Provisioning State	State of Gx-Plus provisioning: <ul style="list-style-type: none"> ignored—Subscriber has no IPv4 address or NAS-Port-ID. in-progress—Provisioning is in progress. logout—Subscriber logout is in progress. logout-done—Logout response has been received. response-received—Provisioning response has been received. 	detail
Pcrf Provisioning State	State of PCRF provisioning: <ul style="list-style-type: none"> active—PCRF provisioning is active. ignored—Subscriber has no IPv4 address or NAS-Port-ID. in-progress—Provisioning is in progress. logout—Subscriber logout is in progress. logout-done—Logout response has been received. response-received—Provisioning response has been received. 	detail
Pcrf Subscription-Id-Type	Type of subscriber for a PCRF partition. You can define your own or use a predefined value: 0 (END_USER_E164) , 1 (END_USER_IMSI) , 2 (END_USER_SIP_URI) , 3 (END_USER_NAI) , 4 (END_USER_PRIVATE) .	detail
Pcrf Subscription-Id-Data	Subscriber data string concatenated from a list of user-selected data options used to identify the subscriber type for a PCRF partition; for example, demux0	detail
Ocs Subscription-Id-Type	Type of subscriber for an OCS partition. You can define your own or use a predefined value: 0 (END_USER_E164) , 1 (END_USER_IMSI) , 2 (END_USER_SIP_URI) , 3 (END_USER_NAI) , 4 (END_USER_PRIVATE) .	detail
Ocs Subscription-Id-Data	Subscriber data string concatenated from a list of user-selected data options used to identify the subscriber type for an OCS partition; for example: test-sid	detail

Table 134: show network-access aaa subscribers session-id Output Fields (*continued*)

Field Name	Field Description	Level of Output
Ocs Interrogation State	State of the OCS interrogation: first , intermediate , final .	detail
Ocs Data State	State of the OCS data: none	detail
Accounting State	State of the subscriber accounting session: Acc-Init , Acc-Start-Sent , Imm-Update-Stats-Pending , Acc-Interim-Sent , Acc-Stop-Stats-Pending , Acc-Stop-Sent , Acc-Stop-On-Fail-Deny-Sent , Acc-Stop-Ackd	detail
Provisioning-type	Provisioning type for this session: <ul style="list-style-type: none"> gx-plus—Subscriber service uses Gx-Plus provisioning. jsrc—Subscriber service uses JSRC provisioning. none—Provisioning is not enabled. 	detail
Service name	Name of the attached service or policy. <ul style="list-style-type: none"> For RADIUS-activated and CLI-activated services, displays the full activation string for the service. If the activation string includes service parameters, then both the service name and service parameters are displayed. For JSRC-activated policies—displays the policy name. 	All levels
Service State	State of the service provided in the subscriber session.	detail
Service Family	Network family of the service provided in the subscriber session.	detail
Service Activation Source	Source used to activate the service.	detail
Session uptime	How long the session has been up, in <i>HH:MM:SS</i> .	All levels
Service CC-Service-Identifier	Data identification element of the 3GPP Diameter credit control service charging system that uniquely defines the CC-Service-Context .	detail
Service Rating-Group	Value associated with a charging rule and part of the accounting data stream for the PCRF.	detail
Ocs Control	Whether OCS controls the service: yes or no .	detail
Accounting status	Status of the accounting configuration for the service, on or off , and the type of accounting, time or volume+time . Configured in RADIUS Service-Statistics VSA [26-69].	detail

Table 134: show network-access aaa subscribers session-id Output Fields (*continued*)

Field Name	Field Description	Level of Output
Service accounting session ID	ID of the service accounting session; RADIUS Acct-Session-Id attribute (44). The ID appears in decimal or description format, as specified by the accounting-session-id-format statement.	detail
Service accounting state	State of the service accounting session: Acc-Init , Acc-Start-Sent , Imm-Update-Stats-Pending , Acc-Interim-Sent , Acc-Stop-Stats-Pending , Acc-Stop-Sent , Acc-Stop-On-Fail-Deny-Sent , Acc-Stop-Ackd	detail
Accounting interim interval	Amount of time between interim accounting updates for this service, in seconds; RADIUS Service-Interim-Acct-Interval VSA [26-140] or Diameter Acct-Interim-Interval AVP (85).	detail

Sample Output

show network-access aaa subscribers session-id brief

```

user@host> show network-access aaa subscribers session-id 6 brief
Logical system/Routing instance  Client type  Session uptime  Accounting
default:default                 dhcp      00:01:29       on/time
Service name                    Service type  Quota           Accounting
filter-service                  -na-         -na-            off
filter-service-2                volume+time  77.00MB/120secs off
1337994190863204450            -na-         -na-            off

```

show network-access aaa subscribers session-id detail

```

user@host> show network-access aaa subscribers session-id 5 detail
Type: dhcp
Username: user23@example.net
Stripped username: user23
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:retail-onlinecompany-ca
Access-profile:retailer-onlinecompany-sjc
Session ID: 5
Accounting Session ID: jnpr ge-1/0/0.101:1
Multi Accounting Session ID: 0
IP Address: 192.168.44.104
Authentication State: AuthStateActive
Pcrf Provisioning State: active
Pcrf Subscription-Id-Type: 4
Pcrf Subscription-Id-Data: demux0
Ocs Subscription-Id-Type: 15
Ocs Subscription-Id-Data: test-sid
Ocs Interrogation State: intermediate
Ocs Data State: none
Gx-Plus Provisioning State: response-received
Accounting State: Acc-Interim-Sent
Provisioning-type: jsrsc
Service name: filter-service-1

```

```

Service State: SvcActive
Service Family: inet
Service Activation Source: PCRF-LOGIN
Session ID: 7
Session uptime: 00:01:33
Service CC-Service-Identifier: 777
Service Rating Group: 10
Ocs Control: yes
Service name: filter-service-2
Service State: SvcActive
Service Family: inet
Service Activation Source: PCRF-LOGIN Session ID: 8
Session uptime: 00:01:33
Service CC-Service-Identifier: 778
Service Rating Group: 11
Ocs Control: no
Accounting status: on/volume+time
Service accounting session ID: 1:2-1322506006
Service accounting state: Acc-Interim-Sent
Accounting interim interval: 600

```

show network-access aaa subscribers session-id detail (Service with Multiple Instances)

```

user@host> show network-access aaa subscribers session-id 6 detail
Type: dhcp
Stripped username: fms2
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:default
Access-profile: attr_test_profile1
Session ID: 6
Accounting Session ID: 6
Multi Accounting Session ID: 0
IP Address: 198.51.100.10
Authentication State: AuthStateActive
Accounting State: Acc-Interim-Sent
Provisioning Type: None
Service name: economy-service(up-filter,down-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 7
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:7-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600
Service name: economy-service(upstrm-filter,dwnstrm-filter)
  Service State: SvcActive
  Service Family: inet
  Service Activation Source: Radius
  Session ID: 8
  Session uptime: 00:04:36
  Accounting status: on/volume+time
  Service accounting session ID: 6:8-1354811427
  Service accounting state: Acc-Start-Sent
  Accounting interim interval: 600

```

show network-access aaa subscribers session-id detail (Single Session Dual Stack with active V4 and V6 subscribers)

```

user@host> show network-access aaa subscribers session-id 26 detail

```

Type: dhcp
Stripped username: reta1-25
AAA Logical system/Routing instance: default:default
Target Logical system/Routing instance: default:default
Access-profile: AccessProfile
Session ID: 26
Accounting Session ID: 26
Multi Accounting Session ID: 0
IP Address: 10.10.0.6
IPv6 Address: 3000:0:0:8003::2
IPv6 Prefix: 3ffe:ffff:0:4::/64
Authentication State: AuthStateActive
Accounting State: Acc-Interim-Sent
Provisioning Type: None

show network-access aaa terminate-code

Syntax	<pre>show network-access aaa terminate-code <brief detail summary> <reverse> <(aaa dhcp l2tp ppp)></pre>
Release Information	<p>Command introduced in Junos OS Release 11.4.</p> <p>vlan option introduced in Junos OS Release 16.1.</p>
Description	Display the count for termination cause types and the current mapping between session termination cause types and code values.
Options	<p>none—Display all mappings.</p> <p>brief detail summary—(Optional) Display the specified level of output. The summary output is displayed by default and includes base count information about mappings. The brief output displays mappings with non-zero usage count and custom mappings. The detail output displays all mappings.</p> <p>aaa—(Optional) Limit display to AAA mappings only.</p> <p>dhcp—(Optional) Limit display to DHCP mappings only.</p> <p>l2tp—(Optional) Limit display to L2TP mappings only.</p> <p>ppp—(Optional) Limit display to PPP mappings only.</p> <p>reverse—(Optional) Display mapping of the code value conveyed in the RADIUS Acct-Terminate-Cause attribute (49) to the termination cause type.</p> <p>vlan—(Optional) Limit display to VLAN mappings only.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Mapping Application Terminate Reasons and RADIUS Terminate Codes on page 183 • Configuring Custom Terminate Reason Mappings on page 185 • AAA Terminate Reasons on page 186 • DHCP Terminate Reasons on page 188 • L2TP Terminate Reasons on page 189 • PPP Terminate Reasons on page 209 • VLAN Termination Causes and Code Values on page 217
List of Sample Output	<p>show network-access aaa terminate-code on page 1716</p> <p>show network-access aaa terminate-code reverse on page 1717</p> <p>show network-access aaa terminate-code dhcp on page 1717</p>

[show network-access aaa terminate-code detail on page 1717](#)
[show network-access aaa terminate-code brief on page 1718](#)
[show network-access aaa terminate-code summary on page 1718](#)
[show network-access aaa terminate-code vlan on page 1718](#)
[show network-access aaa terminate-code vlan detail on page 1718](#)

Output Fields Table 130 on page 1699 lists the output fields for the **show network-access aaa terminate-code** command. Output fields are listed in the approximate order in which they appear.

Table 135: show network-access aaa terminate-code Output Fields

Field Name	Field Description	Level of Output
RADIUS	RFC-defined code value conveyed in the RADIUS Acct-Terminate-Cause attribute (49) or a nonstandard, customized value that you configure with the terminate-code aaa statement at the [edit access] hierarchy level.	brief detail None (with reverse option)
Custom	Whether or not the termination cause is a customized mapping or the default mapping.	All levels
Mapping-Count	Number of mappings that occurred for a specific terminate cause type or category (standard or summary output) or per termination cause (reverse output).	summary None
Usage-Count	Number of times the terminate code mapping was used.	All levels
Type	Termination cause type—null, aaa, dhcp, l2tp, ppp, or vlan. NOTE: The null termination cause type indicates that no termination reason was provided by the subscriber and the RADIUS Acct-Terminate-Cause attribute (49) was not included in the Acct-Stop request	All levels
Code	Specific termination cause.	brief detail

Sample Output

show network-access aaa terminate-code

```

user@host> show network-access aaa terminate-code
Terminate-code:
Custom Mapping-Count Usage-Count Type
no      1              0      null
no      12             0      aaa
no      5              0      dhcp
no     364             0      l2tp
no     210             0      ppp
no      13             10     vlan

```

show network-access aaa terminate-code reverse

```
user@host> show network-access aaa terminate-code reverse
```

```
Terminate-code:
```

RADIUS	Custom	Mapping-Count	Usage-Count	Type
0	no	1	0	null
1	no	1	0	aaa
1	no	1	0	dhcp
1	no	5	0	l2tp
1	no	8	0	ppp
1	no	2	10	vlan
2	no	1	0	dhcp
2	no	3	0	ppp
2	no	2	0	vlan
4	no	1	0	aaa
4	no	1	0	dhcp
4	no	1	0	l2tp
4	no	1	0	ppp
5	no	2	0	aaa
5	no	1	0	l2tp
5	no	1	0	ppp
6	no	2	0	aaa
6	no	13	0	l2tp
6	no	3	0	ppp
6	no	3	0	vlan
8	no	3	0	l2tp
8	no	5	0	ppp
9	no	13	0	l2tp
9	no	12	0	ppp
9	no	4	0	vlan
10	no	4	0	aaa
10	no	1	0	dhcp
10	no	128	0	l2tp
10	no	171	0	ppp
15	no	1	0	dhcp
15	no	190	0	l2tp
15	no	1	0	vlan
16	no	1	0	vlan
17	no	2	0	aaa
17	no	10	0	l2tp
17	no	6	0	ppp

show network-access aaa terminate-code dhcp

```
user@host> show network-access aaa terminate-code dhcp
```

```
Terminate-code:
```

Custom	Mapping-Count	Usage-Count	Type
no	5	0	dhcp

show network-access aaa terminate-code detail

```
user@host> show network-access aaa terminate-code aaa detail
```

```
Terminate-code:
```

RADIUS	Custom	Usage-Count	Type	Code
17	no	1	aaa	deny-authentication-denied
10	no	1	aaa	deny-no-resources
17	no	0	aaa	deny-server-request-timeout
6	no	0	aaa	service-shutdown-network-logout
10	no	0	aaa	service-shutdown-remote-reset
1200	yes	5	aaa	service-shutdown-subscriber-logout

5	no	0	aaa	service-shutdown-time-limit
10	no	0	aaa	service-shutdown-volume-limit
6	no	13	aaa	shutdown-administrative-reset
4	no	0	aaa	shutdown-idle-timeout
10	no	0	aaa	shutdown-remote-reset
5	no	0	aaa	shutdown-session-timeout

show network-access aaa terminate-code brief

```
user@host> show network-access aaa terminate-code brief
```

Terminate-code:

RADIUS	Custom	Usage-Count	Type	Code
17	no	1	aaa	deny-authentication-denied
10	no	1	aaa	deny-no-resources
1200	yes	5	aaa	service-shutdown-subscriber-logout
6	no	13	aaa	shutdown-administrative-reset
15	no	7	dhcp	nak
10	no	1	l2tp	session-receive-cdn-avp-missing-secret
10	no	1	ppp	bundle-fail-create
1	no	1	ppp	lcp-peer-terminate-term-req
10	no	1	ppp	lcp-tunnel-disconnected
1	no	10	vlan	out-of-band-ancp-port-down

show network-access aaa terminate-code summary

```
user@host> show network-access aaa terminate-code summary
```

Terminate-code:

Custom	Mapping-Count	Usage-Count	Type
no	1	0	null
no	12	0	aaa
no	5	0	dhcp
no	364	0	l2tp
no	210	0	ppp
no	13	10	vlan

show network-access aaa terminate-code vlan

```
user@host> show network-access aaa terminate-code vlan
```

Terminate-code:

Custom	Mapping-Count	Usage-Count	Type
no	13	0	vlan

show network-access aaa terminate-code vlan detail

```
user@host> show network-access aaa terminate-code vlan detail
```

Terminate-code:

RADIUS	Custom	Usage-Count	Type	Code
6	no	0	vlan	admin-logout
16	no	0	vlan	admin-reconnect
9	no	0	vlan	other
2	no	0	vlan	out-of-band-access-interface-down
6	no	0	vlan	out-of-band-admin-access-interface-down
6	no	0	vlan	out-of-band-admin-core-interface-down
1	no	0	vlan	out-of-band-ancp-port-down
1	no	0	vlan	out-of-band-ancp-port-vlan-id-change
2	no	0	vlan	out-of-band-core-interface-down
15	no	0	vlan	out-of-band-l2-wholesale-no-free-vlans
9	no	0	vlan	profile-request-error
9	no	0	vlan	sdb-error
9	no	0	vlan	subscriber-activate-error

show network-access address-assignment pool

Syntax	<code>show network-access address-assignment pool <i>pool-name</i></code> <code><logical-system <i>logical-system-name</i>></code> <code><routing-instance <i>routing-instance-name</i>></code>
Release Information	Command introduced in Junos OS Release 9.0.
Description	Display state information for each address-assignment pool.
Options	<p>none—Display information about clients that have obtained addresses from the address-assignment pool.</p> <p>pool <i>pool-name</i>—Display information about the specified address-assignment pool.</p> <p>logical-system <i>logical-system-name</i>—(Optional) Perform this operation on the specified logical system.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Perform this operation on the specified routing instance.</p>
Required Privilege Level	view and system
List of Sample Output	show network-access address-assignment pool on page 1720
Output Fields	Table 136 on page 1720 lists the output fields for the show network-access address-assignment pool command. Output fields are listed in the approximate order in which they appear.

Table 136: show network-access address-assignment pool Output Fields

Field Name	Field Description
IP address	IP address of the client.
Hardware address	MAC address of the client.
Type	Type of client.

Sample Output

show network-access address-assignment pool

```

user@host> show network-access address-assignment pool sunnywest logical-system ls1
routing-instance routinst2
IP address      Hardware address      Type
192.168.2.1     00:00:5e:00:53:01     DHCP
192.168.2.2     00:00:5e:00:53:02     DHCP
192.168.2.3     00:00:5e:00:53:03     DHCP
192.168.2.4     00:00:5e:00:53:04     DHCP

```

show network-access domain-map

Syntax	show network-access domain-map <statistics>
Release Information	Command introduced in Junos OS Release 10.4.
Description	Display domain map information.
Options	statistics —(Optional) Display domain map statistics.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Domain Map Configuration on page 225
List of Sample Output	show network-access domain-map statistics on page 1721
Output Fields	Table 137 on page 1721 lists the output fields for the show network-access domain-map statistics command. Output fields are listed in the approximate order in which they appear.

Table 137: show network-access domain-map Output Fields

Field Name	Field Description
Matched domains	Number of usernames with domain names that are matched.
Unmatched domains	Number of usernames with domain names that are not matched.
Missing domain names	Number of usernames without a domain name.
Stripped username	Number of usernames from which the domain name has been stripped.
Default used	Number of times the default domain map is used.

Sample Output

show network-access domain-map statistics

```

user@host> show network-access domain-map statistics
General domain mapping statistics
  Matched domains: 7
  Unmatched domains: 1
  Missing domain names: 0
  Stripped username: 7
Domain statistics for domain-name: default
  Default used: 1

```

show network-access gx-plus

Syntax	show network-access gx-plus <state statistics sync-state>
Release Information	Command introduced in Junos OS Release 11.2.
Description	Display Gx-Plus provisioning state, synchronization state, and statistics information.
Options	state —(Optional) Display Gx-Plus provisioning state. statistics —(Optional) Display Gx-Plus statistics. sync-state —(Optional) Display Gx-Plus synchronization state.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear network-access gx-plus replay on page 1470 • clear network-access gx-plus statistics on page 1471
List of Sample Output	show network-access gx-plus state on page 1723 show network-access gx-plus statistics on page 1723 show network-access gx-plus sync-state on page 1723
Output Fields	Table 138 on page 1722 lists the output fields for the show network-access gx-plus command. Output fields are listed in the approximate order in which they appear.

Table 138: show network-access gx-plus Output Fields

Field Name	Field Description
Gx-plus state	State of the Gx-Plus application, including the following: <ul style="list-style-type: none"> • Engine created • Partition configured • Configuration active • Diameter interface configured • Total number of entries—Number of provisioned, pending, and terminating subscribers. • Number of pending entries—Number of pending subscribers. • Number of pending logouts—Number of subscribers logging out.
Sync-Event	Type of synchronization event.
Timeout	Number of times notification sent without response.
Gx-plus general counters	Number and state of general events.
Gx-plus sync-event counters	Number and state of synchronization events.

Sample Output

show network-access gx-plus state

```
user@host> show network-access gx-plus state
Gx-plus state:
  Engine created           : yes
  Partition configured    : yes
  Configuration active     : yes
  Diameter interface configured : yes
  Total number of entries  : 0
  Number of pending entries : 0
  Number of pending logouts : 0
```

show network-access gx-plus statistics

```
user@host> show network-access gx-plus statistics
Gx-plus general counters:
  Counter                                     Value
  engine created                             1
  initial config: active                     1
  recovery: process restart                  1
  diameter-app initial config: success       1

Gx-plus sync-event counters:
  Category      Counter      Value
  warm-boot     activated    1

  warm-boot     posted       1

  warm-boot     response     1

  awd           posted       12

  awd           response     12
```

show network-access gx-plus sync-state

```
user@host> show network-access gx-plus sync-state
Gx-plus sync-events:
  Sync-Event      Timeout
  cold-boot       6100
```

show network-access nasreq statistics

Syntax	show network-access nasreq statistics
Release Information	Command introduced in Junos OS Release 16.1.
Description	Display information about the NASREQ protocol exchanges that are used to authenticate and authorize subscribers when they log in.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Diameter Based Network Access Server Application (NASREQ) on page 751 • Configuring the Diameter Network Access Server Application (NASREQ) on page 753 • Messages Used by Diameter Applications on page 682
Output Fields	Table 139 on page 1724 lists the output fields for the show network-access nasreq statistics command. Output fields are listed in the approximate order in which they appear.

Table 139: show network-access nasreq statistics Output Fields

Field Name	Field Description
Authentication request attempts	Number of authentication requests forwarded to the NASREQ engine. Note that authentication includes authorization in one message exchange.
Authentication request failures	Number of authentication request failures at the NASREQ engine. This includes timeout failures of the request waiting in the transmit queue.
Authentication request messages sent	Number of authentication requests forwarded to the Diameter engine.
Authentication request message failures	Number of authentication requests failures at the Diameter engine.
Authentication request messages timeouts	Number of authentication requests that timed out waiting for a response from the NASREQ server.
Authentication denies failures	Number of authentication responses with an unsuccessful result-code.
Authentication grants received	Number of authentication responses with a successful result-code.
Authorization request attempts	Number of authorization requests to the NASREQ engine.
Authorization request failures	Number of authorization request failures at the NASREQ engine. This includes timeout failures of the request waiting in the transmit queue.
Authorization request messages sent	Number of authorization requests forwarded to the Diameter engine.
Authorization request message failures	Number of authorization requests failures at the Diameter engine.

Table 139: show network-access nasreq statistics Output Fields (*continued*)

Field Name	Field Description
Authorization request messages timeouts	Number of authorization requests that timed out waiting for a response from the NASREQ server.
Authorization denies failures	Number of authorization responses with an unsuccessful result-code.
Authorization grants received	Number of authorization responses with a successful result-code.
Session-terminate request attempts	Number of session-terminate requests forwarded to the NASREQ engine.
Session-terminate request failures	Number of session-terminate requests failures at the NASREQ engine. This includes timeout failures of the request waiting in the transmit queue.
Session-terminate request messages sent	Number of session-terminate requests forwarded to the Diameter engine.
Session-terminate request messages failures	Number of session-terminate requests failures at the Diameter engine.
Session-terminate request messages timeouts	Number of session-terminate requests that timed out waiting for a response from the NASREQ server.
Session-terminate response message failures	Number of session-terminate responses with an unsuccessful result-code.
Session-terminate response messages received	Number of session-terminate responses with a successful result-code.
Abort-session requests received	Number of abort-session requests received by the NASREQ engine.
Abort-session response-ack messages sent	Number of abort-session requests receiving an ACK response.
Abort-session response-nack messages sent	Number of abort-session requests receiving a NACK response.
Abort-session response message failures	Number of abort-session responses that failed transmission, either due to timeout in the transmit queue, or failed by the Diameter engine.
Number of NASREQ subscribers	Number of active subscribers that received NASREQ authorization.
Number of result-code-1xxx	Number of response messages with an informational result-code.
Number of result-code-2xxx	Number of response messages with a success result-code.
Number of result-code-3xxx	Number of response messages with a protocol-error result-code.
Number of result-code-4xxx	Number of response messages with an transient-error result-code.
Number of result-code-5xxx	Number of response messages with a permanent-error result-code.

Table 139: show network-access nasreq statistics Output Fields (*continued*)

Field Name	Field Description
Number of result-code-other	Number of response messages with an unregistered result-code.
Transmit queue time-outs	Number of request/responses that timed out waiting for Diameter engine resources.
Transmit message drops	Number of request/responses dropped.
Transmit message failures	Number of request/response failures at the Diameter engine.
Number of requests on the Tx queue	Number of requests/responses currently on the transmit queue.
Number of requests waiting for a response	Number of requests currently in the response queue waiting for a response.
Number of outstanding requests	Number of outstanding requests, including AAR and STR.
Total number of allocated messages	Number of currently allocated request/response messages.

Sample Output

```

user@host> show network-access nasreq statistics
Authentication request attempts:4000
Authentication request failures:0
Authentication request messages sent:4000
Authentication request message failures:0
Authentication request messages timeouts:0
Authentication denies failures:0
Authentication grants received:4000
Authorization request attempts:4000
Authorization request failures:0
Authorization request messages sent:4000
Authorization request message failures:0
Authorization request messages timeouts:0
Authorization denies failures:0
Authorization grants received:4000
Session-terminate request attempts:1000
Session-terminate request failures:0
Session-terminate request messages sent:1000
Session-terminate request message failures:0
Session-terminate request messages timeouts:0
Session-terminate response messages failures:0
Session-terminate response messages received:1000
Abort-session requests received:1000
Abort-session response-ack messages sent:1000
Abort-session response-nack messages sent:0
Abort-session response message failures:0
Number of NASREQ subscribers:3000
Number of result-code-1xxx:0
Number of result-code-2xxx:5000
Number of result-code-3xxx:0
Number of result-code-4xxx:0
Number of result-code-5xxx:0
Number of result-code-other:0
Transmit queue time-outs:0

```

```
Transmit message drops:0
Transmit message failures:0
Number of requests on the Tx queue:0
Number of requests waiting for a response:0
Number of outstanding requests:0
Total number of allocated messages:0
```

show network-access ocs

Syntax	show network-access ocs <state> <statistics [brief detail extensive]>
Release Information	Command introduced in Junos OS Release 16.2.
Description	Display Online Charging System (OCS) provisioning state and statistics information.
Options	brief detail extensive —(Optional) Display the specified level of output. state —(Optional) Display OCS provisioning state. statistics —(Optional) Display OCS statistics.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • ocs on page 1185 • clear network-access ocs statistics on page 1472 • Policy and Charging Enforcement Function Overview for Broadband Wireline Subscribers on page 718 • Understanding Gy Interactions Between the Router and the OCS on page 730 • Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735
List of Sample Output	show network-access ocs state on page 1729 show network-access ocs statistics on page 1729
Output Fields	Table 140 on page 1728 lists the output fields for the show network-access ocs command. Output fields are listed in the approximate order in which they appear.

Table 140: show network-access ocs Output Fields

Field Name	Field Description	Level of Output
Ocs state	State of the OCS components, including the following: <ul style="list-style-type: none"> • created—Just created. • dead—Ready to be deleted. • final—Final interrogation in progress. • idle—Idle. • initial—Initial interrogation in progress. • intermediate—Intermediate interrogation in progress. 	All levels
Ocs general counters	Type and number of Diameter response and answer messages for OCS communication using the Gy protocol.	All levels

Sample Output

show network-access ocs state

```
user@host> show network-access ocs state
Ocs state:
  Component      Value
  state          active
  active-configuration yes
  queue-state    normal
  subscribers    2000
  sub-in-idle    2000
```

show network-access ocs statistics

```
user@host> show network-access ocs statistics
Ocs general counters:
  Counter      Value
  ccr-gy-i     4001
  cca-gy-i     4001
  ccr-gy-u     38001
  cca-gy-u     38001
  ccr-gy-t     2001
  cca-gy-t     2001
  asr          1
  asa-ack      1
```

show network-access pcrf

Syntax	show network-access pcrf <state> <statistics [brief detail extensive]>
Release Information	Command introduced in Junos OS Release 16.2.
Description	Display Policy and Charging Rules Function (PCRF) provisioning state and statistics information.
Options	brief detail extensive —(Optional) Display the specified level of output. state —(Optional) Display PCRF provisioning state. statistics —(Optional) Display PCRF statistics.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• pcrf on page 1225• clear network-access pcrf on page 1473• Understanding Gx Interactions Between the Router and the PCRF on page 722• Understanding Rule Interactions Between the PCRF, PCEF, and OCS on page 735• Understanding Upstream and Downstream Messages for the PCRF on page 740
List of Sample Output	show network-access pcrf state on page 1731 show network-access pcrf statistics on page 1731
Output Fields	Table 138 on page 1722 lists the output fields for the show network-access pcrf command. Output fields are listed in the approximate order in which they appear.

Table 141: show network-access pcrf Output Fields

Field Name	Field Description	Level of Output
Pcrf state	State of the PCRF components: <ul style="list-style-type: none"> • active—Installed services from local grant. • created—Just created. • started—Log in. • local-active—Services installed after local grant. • local-deny—Denied by local decision waiting for subscriber logout. • local-grant—Received local grant and installing services. • grant—Received remote grant and installing services. • upd-from-local—Received remote grant, in local-active state, and installing services. • update—Processing RAR-update. • report—Sending report. • deny—Received deny from remote and waiting for subscriber logout. • failed—GRES before active state or provisioning failed, waiting for subscriber logout. • ocs-final-wait—Waiting for OCS to complete final interrogation. • logout—Waiting for logout response. • dead—Received logout response or timed out waiting for logout response. 	All levels
Pcrf general counters	Type and number of Diameter response and answer messages for PCRF communication using the Gx protocol.	All levels
Pcrf diameter event counters	State and number of Diameter events.	All levels
Pcrf rule install counters	Result and number of rule installations.	All levels

Sample Output

show network-access pcrf state

```

user@host> show network-access pcrf state
Pcrf state:
Component      Value
state          active
active-configuration yes
queue-state    normal
subscribers    2000
sub-in-idle    2000

```

show network-access pcrf statistics

```

user@host> show network-access pcrf statistics
Pcrf general counters:
Counter      Value
ccr-gx-i     4001

```

ccr-gx-i-retry	4
cca-gx-i	4001
ccr-gx-u	4001
cca-gx-u	4001
ccr-gx-t	2001
cca-gx-t	2001
Pcrf diameter event counters:	
Diameter event	Value
no peer for tx	4
Pcrf rule install counters:	
Result	Value
success	16004

show ppp address-pool

Syntax	<code>show ppp address-pool <i>pool-name</i> <detail></code>
Release Information	Command introduced in Junos OS Release 7.5.
Description	Display PPP address pool information.
Options	<p><i>pool-name</i>—Address pool name.</p> <p>detail—(Optional) Display detailed address pool information.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • <i>Verifying and Managing PPP Configuration for Subscriber Management</i>
List of Sample Output	<p>show ppp address-pool on page 1734</p> <p>show ppp address-pool detail on page 1734</p>
Output Fields	<p>Table 142 on page 1733 lists the output fields for the show ppp address-pool command. Output fields are listed in the approximate order in which they appear.</p>

Table 142: show ppp address-pool Output Fields

Field Name	Field Description	Level of Output
Address pool	Trace address pool code.	All levels
Address range	Range of sequentially ordered IP addresses contained in the address pool.	detail
Number of assigned addresses	Fixed IP address that is to be given to remote users when they dial in. This is a host-only IP address (subnet mask is 255.255.255.255) and is only for single connection receiver profiles.	All levels
Number of addresses configured	Number of IP addresses that are available for allocation and used by PPP sessions.	All levels
Assigned addresses	Addresses assigned to PPP sessions from the address pool.	detail

Sample Output

show ppp address-pool

```
user@host> show ppp address-pool
Address pool ppp1
  Address range: 203.0.113.221 - 203.0.113.230
  Number of assigned addresses: 0
  Number of addresses configured: 10
```

show ppp address-pool detail

```
user@host> show ppp address-pool ppp1 detail
Address pool ppp1
  Address range: 203.0.113.221 - 203.0.113.230
  Number of assigned addresses: 2
  Number of addresses configured: 10
  Assigned addresses:
    203.0.113.221
    203.0.113.222
```

show route

List of Syntax [Syntax on page 1735](#)
[Syntax \(EX Series Switches\) on page 1735](#)

Syntax `show route`
 `<all>`
 `<destination-prefix>`
 `<logical-system (all | logical-system-name)>`
 `<private>`

Syntax (EX Series Switches) `show route`
 `<all>`
 `<destination-prefix>`
 `<private>`

Release Information Command introduced before Junos OS Release 7.4.
 Command introduced in Junos OS Release 9.0 for EX Series switches.
 Option **private** introduced in Junos OS Release 9.5.
 Option **private** introduced in Junos OS Release 9.5 for EX Series switches.
 Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
 Option **display-client-data** introduced in Junos OS Release 16.2R1 on MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series routers.

Description Display the active entries in the routing tables.

Options **none**—Display brief information about all active entries in the routing tables.

all—(Optional) Display information about all routing tables, including private, or internal, routing tables.

destination-prefix—(Optional) Display active entries for the specified address or range of addresses.

logical-system (all | logical-system-name)—(Optional) Perform this operation on all logical systems or on a particular logical system.

private—(Optional) Display information only about all private, or internal, routing tables.

display-client-data—(Optional) Display client id and cookie information for routes installed by rpd client applications.

Required Privilege Level view

Related Documentation

- *Example: Configuring RIP*
- *Example: Configuring IS-IS*
- *Examples: Configuring Internal BGP Peering*
- *Examples: Configuring External BGP Peering*

- [Examples: Configuring OSPF Routing Policy](#)
- [Verifying and Managing Junos OS Enhanced Subscriber Management on page 558](#)

List of Sample Output

- [show route on page 1739](#)
- [show route \(VPN\) on page 1740](#)
- [show route \(with Destination Prefix\) on page 1740](#)
- [show route destination-prefix detail on page 1740](#)
- [show route extensive on page 1740](#)
- [show route extensive \(ECMP\) on page 1741](#)
- [show route \(Enhanced Subscriber Management\) on page 1741](#)
- [show route \(IPv6 Flow Specification\) on page 1741](#)
- [show route display-client-data detail on page 1742](#)

Output Fields [Table 143 on page 1736](#) describes the output fields for the **show route** command. Output fields are listed in the approximate order in which they appear.

Table 143: show route Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active). • holddown (routes that are in the pending state before being declared inactive). A holddown route was once the active route and is no longer the active route. The route is in the holddown state because a protocol still has interest in the route, meaning that the interest bit is set. A protocol might have its interest bit set on the previously active route because the protocol is still advertising the route. The route will be deleted after all protocols withdraw their advertisement of the route and remove their interest bit. A persistent holddown state often means that the interested protocol is not releasing its interest bit properly. <p>However, if you have configured advertisement of multiple routes (with the add-path or advertise-inactive statement), the holddown bit is most likely set because BGP is advertising the route as an active route. In this case, you can ignore the holddown state because nothing is wrong.</p> <ul style="list-style-type: none"> • hidden (routes that are not used because of a routing policy).

Table 143: show route Output Fields (*continued*)

Field Name	Field Description
<i>destination-prefix</i>	<p>Route destination (for example:10.0.0.1/24). Sometimes the route information is presented in another format, such as:</p> <ul style="list-style-type: none"> • <i>MPLS-label</i> (for example, 80001). • <i>interface-name</i> (for example, ge-1/0/2). • <i>neighbor-address:control-word-status:encapsulation type:vc-id:source</i> (Layer 2 circuit only. For example, 10.1.1.195:NoCtrlWord:1:1:Local/96): <ul style="list-style-type: none"> • <i>neighbor-address</i>—Address of the neighbor. • <i>control-word-status</i>—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • <i>encapsulation type</i>—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • <i>vc-id</i>—Virtual circuit identifier. • <i>source</i>—Source of the advertisement: Local or Remote.
[<i>protocol, preference</i>]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • - —A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.</p>
<i>weeks:days hours:minutes:seconds</i>	How long the route been known (for example, 2w4d 13:11:14 , or 2 weeks, 4 days, 13 hours, 11 minutes, and 14 seconds).
metric	Cost value of the indicated route. For routes within an AS, the cost is determined by the IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.
localpref	Local preference value included in the route.
from	Interface from which the route was received.

Table 143: show route Output Fields (*continued*)

Field Name	Field Description
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the local AS number associated with the AS path if more than one AS number is configured on the routing device, or if AS path prepending is configured. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>
Route Labels	Stack of labels carried in the BGP route update.
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGP peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that the origin of the prefix is not verified against the database. This is because the database got populated and the validation is not called for in the BGP import policy, although origin validation is enabled, or the origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
to	<p>Next hop to the destination. An angle bracket (>) indicates that the route is the selected route.</p> <p>If the destination is Discard, traffic is dropped.</p>

Table 143: show route Output Fields (*continued*)

Field Name	Field Description
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing. • lsp-path-name—Name of the LSP used to reach the next hop. • label-action—MPLS label and operation occurring at the next hop. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label). For VPNs, expect to see multiple push operations, corresponding to the inner and outer labels required for VPN routes (in the case of a direct PE-to-PE connection, the VPN route would have the inner label push only).
Private unicast	(Enhanced subscriber management for MX Series routers) Indicates that an access-internal route is managed by enhanced subscriber management. By contrast, access-internal routes <i>not</i> managed by enhanced subscriber management are displayed with associated next-hop and media access control (MAC) address information.
balance	Distribution of the load based on the underlying operational interface bandwidth for equal-cost multipaths (ECMP) across the nexthop gateways in percentages.

Sample Output

show route

```

user@host> show route
inet.0: 11 destinations, 12 routes (11 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

1:65500:1:10.0.0.20/240
    * [MVPN/70] 19:53:41, metric2 1
    Indirect
1:65500:1:10.0.0.40/240
    * [BGP/170] 19:53:29, localpref 100, from 10.0.0.30
    AS path: I
    > to 10.0.24.4 via lt-0/3/0.24, label-switched-path toD
    [BGP/170] 19:53:26, localpref 100, from 10.0.0.33
    AS path: I
    > to 10.0.24.4 via lt-0/3/0.24, label-switched-path toD
1:65500:1:10.0.0.60/240
    * [BGP/170] 19:53:29, localpref 100, from 10.0.0.30
    AS path: I
    > to 10.0.28.8 via lt-0/3/0.28, label-switched-path toF
    [BGP/170] 19:53:25, localpref 100, from 10.0.0.33
    AS path: I
    > to 10.0.28.8 via lt-0/3/0.28, label-switched-path toF

```

show route (VPN)

The following sample output shows a VPN route with composite next hops enabled. The first **Push** operation corresponds to the outer label. The second **Push** operation corresponds to the inner label.

```
user@host> show route 192.0.2.0

13979:665001.inet.0: 871 destinations, 3556 routes (871 active, 0 holddown, 0
hidden)
+ = Active Route, - = Last Active, * = Both

192.0.2.0/24      @[BGP/170] 00:28:32, localpref 100, from 10.9.9.160
                  AS path: 13980 ?, validation-state: unverified
                  > to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
                  [BGP/170] 00:28:28, localpref 100, from 10.9.9.169
                  AS path: 13980 ?, validation-state: unverified
                  > to 10.100.0.42 via ae2.0, Push 126016, Push 300368(top)
                  #[Multipath/255] 00:28:28, metric2 102
                  > to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
                  to 10.100.0.42 via ae2.0, Push 16, Push 300368(top)
```

show route (with Destination Prefix)

```
user@host> show route 172.16.0.0/12

inet.0: 10 destinations, 10 routes (9 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

172.16.0.0/12    *[Static/5] 2w4d 12:54:27
                  > to 192.168.167.254 via fxp0.0
```

show route destination-prefix detail

```
user@host> show route 198.51.100.0 detail

inet.0: 15 destinations, 20 routes (15 active, 0 holddown, 0 hidden)
198.51.100.0/24 (2 entries, 2 announced)
  *BGP      Preference: 170/-101
  ...
  BGP-Static Preference: 4294967292
    Next hop type: Discard
    Address: 0x9041ae4
    Next-hop reference count: 2
    State: <NoReadvrt Int Ext AlwaysFlash>
  Inactive reason: Route Preference
  Local AS: 200
  Age: 4d 1:40:40
  Validation State: unverified
  Task: RT
  Announcement bits (1): 2-BGP_RT_Background
  AS path: 4 5 6 I
```

show route extensive

```
user@host> show route extensive

v1.mvpn.0: 5 destinations, 8 routes (5 active, 1 holddown, 0 hidden)
1:65500:1:10.0.0.40/240 (1 entry, 1 announced)
  *BGP      Preference: 170/-101
    PMSI: Flags 0x0: Label[0:0:0]: PIM-SM: Sender 10.0.0.40 Group
```

```

203.0.113.1
  Next hop type: Indirect
  Address: 0x92455b8
  Next-hop reference count: 2
  Source: 10.0.0.30
  Protocol next hop: 10.0.0.40
  Indirect next hop: 2 no-forward
  State: <Active Int Ext>
    Local AS: 64510 Peer AS: 64511
  Age: 3 Metric2: 1
  Validation State: unverified
  Task: BGP_64510.10.0.0.30+179
  Announcement bits (2): 0-PIM.v1 1-mvpn global task
  AS path: I (Originator) Cluster list: 10.0.0.30
  AS path: Originator ID: 10.0.0.40
  Communities: target:64502:100
  Import Accepted
  Localpref: 100
  Router ID: 10.0.0.30
  Primary Routing Table bgp.mvpn.0
  Indirect next hops: 1
    Protocol next hop: 10.0.0.40 Metric: 1
    Indirect next hop: 2 no-forward
    Indirect path forwarding next hops: 1
      Next hop type: Router
      Next hop: 10.0.24.4 via lt-0/3/0.24 weight 0x1
    10.0.0.40/32 Originating RIB: inet.3
      Metric: 1 Node path count: 1
      Forwarding nexthops: 1
        Nexthop: 10.0.24.4 via lt-0/3/0.24

```

show route extensive (ECMP)

```

user@host> show route extensive
*IS-IS Preference: 15
  Level: 1
  Next hop type: Router, Next hop index: 1048577
  Address: 0xFFFFFFFF
  Next-hop reference count: YY
  Next hop: 172.16.50.2 via ae1.0 balance 43%, selected
  Session Id: 0x141
  Next hop: 192.0.2.2 via ae0.0 balance 57%

```

show route (Enhanced Subscriber Management)

```

user@host> show route
inet.0: 41 destinations, 41 routes (40 active, 0 holddown, 1 hidden)
+ = Active Route, - = Last Active, * = Both

198.51.100.11/24    *[Access-internal/12] 00:00:08
> to #0 10.0.0.1.93.65 via demux0.1073741824
198.51.100.12/24    *[Access-internal/12] 00:00:08
Private unicast

```

show route (IPv6 Flow Specification)

```

user@host> show route
inet6.0: 6 destinations, 6 routes (6 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::10:255:185:19/128
*[Direct/0] 05:11:27

```

```

> via lo0.0
2001:db8::11:11:11:0/120
  * [BGP/170] 00:28:58, localpref 100
    AS path: 2000 I, validation-state: unverified
  > to 2001:db8::13:14:2:2 via ge-1/1/4.0
2001:db8::13:14:2:0/120* [Direct/0] 00:45:07
  > via ge-1/1/4.0
2001:db8::13:14:2:1/128* [Local/0] 00:45:18
  Local via ge-1/1/4.0
fe80::2a0:a50f:fc71:71d5/128
  * [Direct/0] 05:11:27
  > via lo0.0
fe80::5e5e:abff:feb0:933e/128
  * [Local/0] 00:45:18
  Local via ge-1/1/4.0

inet6flow.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both

2001:db8::11:11:11:10/128, *, proto=6, dstport=80, srcport=65535/term:1
  * [BGP/170] 00:28:58, localpref 100, from 2001:db8::13:14:2:2
    AS path: 2000 I, validation-state: unverified
    Fictitious
2001:db8::11:11:11:30/128, *, icmp6-type=128, len=100, dscp=10/term:2
  * [BGP/170] 00:20:54, localpref 100, from 2001:db8::13:14:2:2
    AS path: 2000 I, validation-state: unverified
    Fictitious

```

show route display-client-data detail

```

user@host> show route 198.51.100.0/24 display-client-data detail
inet.0: 59 destinations, 70 routes (59 active, 0 holddown, 0 hidden)
198.51.100.0/24 (1 entry, 1 announced)
  State: <FlashAll>
    *BGP-Static Preference: 5/-101
      Next hop type: Indirect, Next hop index: 0
      Address: 0xa5c2af8
      Next-hop reference count: 2
      Next hop type: Router, Next hop index: 1641
      Next hop: 192.0.2.1 via ge-2/1/1.0, selected
      Session Id: 0x160
      Protocol next hop: 192.0.2.1
      Indirect next hop: 0xa732cb0 1048621 INH Session ID: 0x17e
      State: <Active Int Ext AlwaysFlash NSR-incapable Programmed>
      Age: 3:13      Metric2: 0
      Validation State: unverified
      Announcement bits (3): 0-KRT 5-LDP 6-Resolve tree 3
      AS path: I
      Client id: 1, Cookie: 1

```

show route extensive

List of Syntax	Syntax on page 1743 Syntax (EX Series Switches) on page 1743
Syntax	show route extensive <destination-prefix> <logical-system (all logical-system-name)>
Syntax (EX Series Switches)	show route extensive <destination-prefix>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 9.0 for EX Series switches.
Description	Display extensive information about the active entries in the routing tables.
Options	none —Display all active entries in the routing table. destination-prefix —(Optional) Display active entries for the specified address or range of addresses. logical-system (all logical-system-name) —(Optional) Perform this operation on all logical systems or on a particular logical system.
Required Privilege Level	view
List of Sample Output	show route extensive on page 1750 show route extensive (Access Route) on page 1757 show route extensive (BGP PIC Edge) on page 1757 show route extensive (FRR and LFA) on page 1758 show route extensive (IS-IS) on page 1759 show route extensive (Route Reflector) on page 1759 show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs) on page 1759 show route label detail (Multipoint LDP with Multicast-Only Fast Reroute) on page 1760
Output Fields	Table 144 on page 1743 describes the output fields for the show route extensive command. Output fields are listed in the approximate order in which they appear.

Table 144: show route extensive Output Fields

Field Name	Field Description
<i>routing-table-name</i>	Name of the routing table (for example, inet.0).
<i>number destinations</i>	Number of destinations for which there are routes in the routing table.

Table 144: show route extensive Output Fields (*continued*)

Field Name	Field Description
<i>number routes</i>	<p>Number of routes in the routing table and total number of routes in the following states:</p> <ul style="list-style-type: none"> • active (routes that are active). • holddown (routes that are in the pending state before being declared inactive). • hidden (routes that are not used because of a routing policy).
<i>route-destination</i> (entry, announced)	<p>Route destination (for example: 10.0.0.1/24). The entry value is the number of route for this destination, and the announced value is the number of routes being announced for this destination. Sometimes the route destination is presented in another format, such as:</p> <ul style="list-style-type: none"> • MPLS-label (for example, 80001). • interface-name (for example, ge-1/0/2). • neighbor-address:control-word-status:encapsulation type:vc-id:source (Layer 2 circuit only; for example, 10.1.1.195:NoCtrlWord:1:1:Local/96). <ul style="list-style-type: none"> • neighbor-address—Address of the neighbor. • control-word-status—Whether the use of the control word has been negotiated for this virtual circuit: NoCtrlWord or CtrlWord. • encapsulation type—Type of encapsulation, represented by a number: (1) Frame Relay DLCI, (2) ATM AAL5 VCC transport, (3) ATM transparent cell transport, (4) Ethernet, (5) VLAN Ethernet, (6) HDLC, (7) PPP, (8) ATM VCC cell transport, (10) ATM VPC cell transport. • vc-id—Virtual circuit identifier. • source—Source of the advertisement: Local or Remote.
TSI	Protocol header information.
label stacking	<p>(Next-to-the-last-hop routing device for MPLS only) Depth of the MPLS label stack, where the label-popping operation is needed to remove one or more labels from the top of the stack. A pair of routes is displayed, because the pop operation is performed only when the stack depth is two or more labels.</p> <ul style="list-style-type: none"> • S=0 route indicates that a packet with an incoming label stack depth of two or more exits this router with one fewer label (the label-popping operation is performed). • If there is no S= information, the route is a normal MPLS route, which has a stack depth of 1 (the label-popping operation is not performed).
[protocol, preference]	<p>Protocol from which the route was learned and the preference value for the route.</p> <ul style="list-style-type: none"> • +—A plus sign indicates the active route, which is the route installed from the routing table into the forwarding table. • - —A hyphen indicates the last active route. • *—An asterisk indicates that the route is both the active and the last active route. An asterisk before a to line indicates the best subpath to the route. <p>In every routing metric except for the BGP LocalPref attribute, a lesser value is preferred. In order to use common comparison routines, Junos OS stores the 1's complement of the LocalPref value in the Preference2 field. For example, if the LocalPref value for Route 1 is 100, the Preference2 value is -101. If the LocalPref value for Route 2 is 155, the Preference2 value is -156. Route 2 is preferred because it has a higher LocalPref value and a lower Preference2 value.</p>

Table 144: show route extensive Output Fields (*continued*)

Field Name	Field Description
Level	(IS-IS only). In IS-IS, a single autonomous system (AS) can be divided into smaller groups called areas. Routing between areas is organized hierarchically, allowing a domain to be administratively divided into smaller areas. This organization is accomplished by configuring Level 1 and Level 2 intermediate systems. Level 1 systems route within an area. When the destination is outside an area, they route toward a Level 2 system. Level 2 intermediate systems route between areas and toward other ASs.
Route Distinguisher	IP subnet augmented with a 64-bit prefix.
PMSI	Provider multicast service interface (MVPN routing table).
Next-hop type	Type of next hop. For a description of possible values for this field, see the Output Field table in the <i>show route detail</i> command.
Next-hop reference count	Number of references made to the next hop.
Flood nexthop branches exceed maximum message	Indicates that the number of flood next-hop branches exceeded the system limit of 32 branches, and only a subset of the flood next-hop branches were installed in the kernel.
Source	IP address of the route source.
Next hop	Network layer address of the directly reachable neighboring system.
via	<p>Interface used to reach the next hop. If there is more than one interface available to the next hop, the name of the interface that is actually used is followed by the word Selected. This field can also contain the following information:</p> <ul style="list-style-type: none"> • Weight—Value used to distinguish primary, secondary, and fast reroute backup routes. Weight information is available when MPLS label-switched path (LSP) link protection, node-link protection, or fast reroute is enabled, or when the standby state is enabled for secondary paths. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible. • Balance—Balance coefficient indicating how traffic of unequal cost is distributed among next hops when a routing device is performing unequal-cost load balancing. This information is available when you enable BGP multipath load balancing.
Label-switched-path lsp-path-name	Name of the LSP used to reach the next hop.
Label operation	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Offset	Whether the metric has been increased or decreased by an offset value.
Interface	(Local only) Local interface name.
Protocol next hop	Network layer address of the remote routing device that advertised the prefix. This address is used to recursively derive a forwarding next hop.

Table 144: show route extensive Output Fields (*continued*)

Field Name	Field Description
<i>label-operation</i>	MPLS label and operation occurring at this routing device. The operation can be pop (where a label is removed from the top of the stack), push (where another label is added to the label stack), or swap (where a label is replaced by another label).
Indirect next hops	<p>When present, a list of nodes that are used to resolve the path to the next-hop destination, in the order that they are resolved.</p> <p>When BGP PIC Edge is enabled, the output lines that contain Indirect next hop: weight follow next hops that the software can use to repair paths where a link failure occurs. The next-hop weight has one of the following values:</p> <ul style="list-style-type: none"> • 0x1 indicates active next hops. • 0x4000 indicates passive next hops.
State	State of the route (a route can be in more than one state). See the Output Field table in the <i>show route detail</i> command.
Session ID	The BFD session ID number that represents the protection using MPLS fast reroute (FRR) and loop-free alternate (LFA).
Weight	<p>Weight for the backup path. If the weight of an indirect next hop is larger than zero, the weight value is shown.</p> <p>For sample output, see show route table.</p>

Table 144: show route extensive Output Fields (*continued*)

Field Name	Field Description
Inactive reason	<p>If the route is inactive, the reason for its current state is indicated. Typical reasons include:</p> <ul style="list-style-type: none"> • Active preferred—Currently active route was selected over this route. • Always compare MED—Path with a lower multiple exit discriminator (MED) is available. • AS path—Shorter AS path is available. • Cisco Non-deterministic MED selection—Cisco nondeterministic MED is enabled and a path with a lower MED is available. • Cluster list length—Path with a shorter cluster list length is available. • Forwarding use only—Path is only available for forwarding purposes. • IGP metric—Path through the next hop with a lower IGP metric is available. • IGP metric type—Path with a lower OSPF link-state advertisement type is available. • Interior > Exterior > Exterior via Interior—Direct, static, IGP, or EBGP path is available. • Local preference—Path with a higher local preference value is available. • Next hop address—Path with a lower metric next hop is available. • No difference—Path from a neighbor with a lower IP address is available. • Not Best in its group—Occurs when multiple peers of the same external AS advertise the same prefix and are grouped together in the selection process. When this reason is displayed, an additional reason is provided (typically one of the other reasons listed). • Number of gateways—Path with a higher number of next hops is available. • Origin—Path with a lower origin code is available. • OSPF version—Path does not support the indicated OSPF version. • RIB preference—Route from a higher-numbered routing table is available. • Route distinguisher—64-bit prefix added to IP subnets to make them unique. • Route metric or MED comparison—Route with a lower metric or MED is available. • Route preference—Route with a lower preference value is available. • Router ID—Path through a neighbor with a lower ID is available. • Unusable path—Path is not usable because of one of the following conditions: the route is damped, the route is rejected by an import policy, or the route is unresolved. • Update source—Last tiebreaker is the lowest IP address value.
Local AS	Autonomous system (AS) number of the local routing device.
Age	How long the route has been known.
AIGP	Accumulated interior gateway protocol (AIGP) BGP attribute.
Metric	Cost value of the indicated route. For routes within an AS, the cost is determined by IGP and the individual protocol metrics. For external routes, destinations, or routing domains, the cost is determined by a preference value.
MED-plus-IGP	Metric value for BGP path selection to which the IGP cost to the next-hop destination has been added.
TTL-Action	<p>For MPLS LSPs, state of the TTL propagation attribute. Can be enabled or disabled for all RSVP-signaled and LDP-signaled LSPs or for specific VRF routing instances.</p> <p>For sample output, see show route table.</p>

Table 144: show route extensive Output Fields (*continued*)

Field Name	Field Description
Task	Name of the protocol that has added the route.
Announcement bits	List of protocols that announce this route. n-Resolve inet indicates that the route is used for route resolution for next hops found in the routing table. n is an index used by Juniper Networks customer support only.
AS path	<p>AS path through which the route was learned. The letters at the end of the AS path indicate the path origin, providing an indication of the state of the route at the point at which the AS path originated:</p> <ul style="list-style-type: none"> • I—IGP. • E—EGP. • Recorded—The AS path is recorded by the sample process (sampled). • ?—Incomplete; typically, the AS path was aggregated. <p>When AS path numbers are included in the route, the format is as follows:</p> <ul style="list-style-type: none"> • []—Brackets enclose the local AS number associated with the AS path if more than one AS number is configured on the routing device, or if AS path prepending is configured. • { }—Braces enclose AS sets, which are groups of AS numbers in which the order does not matter. A set commonly results from route aggregation. The numbers in each AS set are displayed in ascending order. • ()—Parentheses enclose a confederation. • ([])—Parentheses and brackets enclose a confederation set. <p>NOTE: In Junos OS Release 10.3 and later, the AS path field displays an unrecognized attribute and associated hexadecimal value if BGP receives attribute 128 (attribute set) and you have not configured an independent domain in any routing instance.</p>
validation-state	<p>(BGP-learned routes) Validation status of the route:</p> <ul style="list-style-type: none"> • Invalid—Indicates that the prefix is found, but either the corresponding AS received from the EBGp peer is not the AS that appears in the database, or the prefix length in the BGP update message is longer than the maximum length permitted in the database. • Unknown—Indicates that the prefix is not among the prefixes or prefix ranges in the database. • Unverified—Indicates that origin validation is not enabled for the BGP peers. • Valid—Indicates that the prefix and autonomous system pair are found in the database.
FECs bound to route	Point-to-multipoint root address, multicast source address, and multicast group address when multipoint LDP (M-LDP) inband signaling is configured.
AS path: I <Originator>	(For route reflected output only) Originator ID attribute set by the route reflector.

Table 144: show route extensive Output Fields (*continued*)

Field Name	Field Description
route status	<p>Indicates the status of a BGP route:</p> <ul style="list-style-type: none"> • Accepted—The specified BGP route is imported by the default BGP policy. • Import—The route is imported into a Layer 3 VPN routing instance. • Import-Protect—A remote instance egress that is protected. • Multipath—A BGP multipath active route. • MultipathContrib—The route is not active but contributes to the BGP multipath. • Protect—An egress route that is protected. • Stale—A route that is marked stale due to graceful restart.
Primary Upstream	When multipoint LDP with multicast-only fast reroute (MoFRR) is configured, the primary upstream path. MoFRR transmits a multicast join message from a receiver toward a source on a primary path, while also transmitting a secondary multicast join message from the receiver toward the source on a backup path.
RPF Nexthops	When multipoint LDP with MoFRR is configured, the reverse-path forwarding (RPF) next-hop information. Data packets are received from both the primary path and the secondary paths. The redundant packets are discarded at topology merge points due to the RPF checks.
Label	Multiple MPLS labels are used to control MoFRR stream selection. Each label represents a separate route, but each references the same interface list check. Only the primary label is forwarded while all others are dropped. Multiple interfaces can receive packets using the same label.
weight	Value used to distinguish MoFRR primary and backup routes. A lower weight value is preferred. Among routes with the same weight value, load balancing is possible.
VC Label	MPLS label assigned to the Layer 2 circuit virtual connection.
MTU	Maximum transmission unit (MTU) of the Layer 2 circuit.
VLAN ID	VLAN identifier of the Layer 2 circuit.
Cluster list	(For route reflected output only) Cluster ID sent by the route reflector.
Originator ID	(For route reflected output only) Address of router that originally sent the route to the route reflector.
Prefixes bound to route	Forwarding Equivalent Class (FEC) bound to this route. Applicable only to routes installed by LDP.
Communities	Community path attribute for the route. See the Output Field table in the <i>show route detail</i> command for all possible values for this field.
Layer2-info: encaps	Layer 2 encapsulation (for example, VPLS).
control flags	Control flags: none or Site Down.
mtu	Maximum transmission unit (MTU) information.
Label-Base, range	First label in a block of labels and label block size. A remote PE routing device uses this first label when sending traffic toward the advertising PE routing device.

Table 144: show route extensive Output Fields (*continued*)

Field Name	Field Description
status vector	Layer 2 VPN and VPLS network layer reachability information (NLRI).
Localpref	Local preference value included in the route.
Router ID	BGP router ID as advertised by the neighbor in the open message.
Primary Routing Table	In a routing table group, the name of the primary routing table in which the route resides.
Secondary Tables	In a routing table group, the name of one or more secondary tables in which the route resides.
Originating RIB	Name of the routing table whose active route was used to determine the forwarding next-hop entry in the resolution database. For example, in the case of inet.0 resolving through inet.0 and inet.3, this field indicates which routing table, inet.0 or inet.3, provided the best path for a particular prefix.
Node path count	Number of nodes in the path.
Forwarding nexthops	Number of forwarding next hops. The forwarding next hop is the network layer address of the directly reachable neighboring system (if applicable) and the interface used to reach it.

Sample Output

show route extensive

```

user@host> show route extensive
inet.0: 22 destinations, 23 routes (21 active, 0 holddown, 1 hidden)
203.0.113.10/16 (1 entry, 1 announced)
TSI:
KRT in-kernel 203.0.113.10/16 -> {192.168.71.254}
  *Static Preference: 5
    Next-hop reference count: 29
    Next hop: 192.168.71.254 via fxp0.0, selected
    State: <Active NoReadvrt Int Ext>
    Local AS: 64496
    Age: 1:34:06
    Task: RT
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

203.0.113.30/30 (2 entries, 1 announced)
  *Direct Preference: 0
    Next hop type: Interface
    Next-hop reference count: 2
    Next hop: via so-0/3/0.0, selected
    State: <Active Int>
    Local AS: 64496
    Age: 1:32:40
    Task: IF
    Announcement bits (1): 3-Resolve tree 2
    AS path: I
  OSPF Preference: 10
    Next-hop reference count: 1
    Next hop: via so-0/3/0.0, selected

```

```

State: <Int>
Inactive reason: Route Preference
Local AS: 64496
Age: 1:32:40 Metric: 1
Area: 0.0.0.0
Task: OSPF
AS path: I

203.0.113.103/32 (1 entry, 1 announced)
  *Local Preference: 0
    Next hop type: Local
    Next-hop reference count: 7
    Interface: so-0/3/0.0
    State: <Active NoReadvrt Int>
    Local AS: 644969
    Age: 1:32:43
    Task: IF
    Announcement bits (1): 3-Resolve tree 2
    AS path: I

...

203.0.113.203/30 (1 entry, 1 announced)
TSI:
KRT in-kernel 203.0.113.203/30 -> {203.0.113.216}
  *OSPF Preference: 10
    Next-hop reference count: 9
    Next hop: via so-0/3/0.0
    Next hop: 203.0.113.216 via ge-3/1/0.0, selected
    State: <Active Int>
    Local AS: 64496
    Age: 1:32:19 Metric: 2
    Area: 0.0.0.0
    Task: OSPF
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

...

198.51.100.2/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 198.51.100.2/32 -> {}
  *PIM Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 64496
    Age: 1:34:08
    Task: PIM Recv
    Announcement bits (2): 0-KRT 3-Resolve tree 2
    AS path: I

...

198.51.100.22/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 198.51.100.22/32 -> {}
  *IGMP Preference: 0
    Next-hop reference count: 18
    State: <Active NoReadvrt Int>
    Local AS: 64496
    Age: 1:34:06

```

```

Task: IGMP
Announcement bits (2): 0-KRT 3-Resolve tree 2
AS path: I

inet.3: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)

203.0.113.103/32 (1 entry, 1 announced)
State: <FlashAll>
*RSVP Preference: 7
Next-hop reference count: 6
Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1, selected
Label-switched-path green-r1-r3
Label operation: Push 100096
State: <Active Int>
Local AS: 64496
Age: 1:28:12 Metric: 2
Task: RSVP
Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
AS path: I

203.0.113.238/32 (1 entry, 1 announced)
State: <FlashAll>
*RSVP Preference: 7
Next-hop reference count: 6
Next hop: via so-0/3/0.0 weight 0x1, selected
Label-switched-path green-r1-r2
State: <Active Int>
Local AS: 64496
Age: 1:28:12 Metric: 1
Task: RSVP
Announcement bits (2): 1-Resolve tree 1 2-Resolve tree 2
AS path: I

private1__inet.0: 2 destinations, 3 routes (2 active, 0 holddown, 0 hidden)

...

iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

47.0005.80ff.f800.0000.0108.0001.0102.5507.1052/152 (1 entry, 0 announced)
*Direct Preference: 0
Next hop type: Interface
Next-hop reference count: 1
Next hop: via lo0.0, selected
State: <Active Int>
Local AS: 64496
Age: 1:34:07
Task: IF
AS path: I

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

0 (1 entry, 1 announced)
TSI:
KRT in-kernel 0 /36 -> {}
*MPLS Preference: 0
Next hop type: Receive
Next-hop reference count: 6
State: <Active Int>
Local AS: 64496
Age: 1:34:08 Metric: 1

```

```

Task: MPLS
Announcement bits (1): 0-KRT
AS path: I

...

mpls.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)
299840 (1 entry, 1 announced)
TSI:
KRT in-kernel 299840 /52 -> {indirect(1048575)}
  *RSVP Preference: 7/2
    Next hop type: Flood
    Address: 0x9174a30
    Next-hop reference count: 4
    Next hop type: Router, Next hop index: 798
    Address: 0x9174c28
    Next-hop reference count: 2
    Next hop: 198.51.100.2 via lt-1/2/0.9 weight 0x1
    Label-switched-path R2-to-R4-2p2mp
    Label operation: Pop
    Next hop type: Router, Next hop index: 1048574
    Address: 0x92544f0
    Next-hop reference count: 2
    Next hop: 198.51.100.2 via lt-1/2/0.7 weight 0x1
    Label-switched-path R2-to-R200-p2mp
    Label operation: Pop
    Next hop: 198.51.100.2 via lt-1/2/0.5 weight 0x8001
    Label operation: Pop
    State: <Active Int>
    Age: 1:29 Metric: 1
    Task: RSVP
    Announcement bits (1): 0-KRT
    AS path: I...

800010 (1 entry, 1 announced)
TSI:
KRT in-kernel 800010 /36 -> {vt-3/2/0.32769}
  *VPLS Preference: 7
    Next-hop reference count: 2
    Next hop: via vt-3/2/0.32769, selected
    Label operation: Pop
    State: <Active Int>
    Age: 1:31:53
    Task: Common L2 VC
    Announcement bits (1): 0-KRT
    AS path: I

vt-3/2/0.32769 (1 entry, 1 announced)
TSI:
KRT in-kernel vt-3/2/0.32769.0 /16 -> {indirect(1048574)}
  *VPLS Preference: 7
    Next-hop reference count: 2
    Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1, selected
    Label-switched-path green-r1-r3
    Label operation: Push 800012, Push 100096(top)
    Protocol next hop: 203.0.113.103
    Push 800012
    Indirect next hop: 87272e4 1048574
    State: <Active Int>
    Age: 1:31:53 Metric2: 2

```

```

Task: Common L2 VC
Announcement bits (2): 0-KRT 1-Common L2 VC
AS path: I
Communities: target:11111:1 Layer2-info: encaps:VPLS,
control flags:, mtu: 0
Indirect next hops: 1
    Protocol next hop: 203.0.113.103 Metric: 2
    Push 800012
    Indirect next hop: 87272e4 1048574
    Indirect path forwarding next hops: 1
        Next hop: 203.0.113.216 via ge-3/1/0.0 weight 0x1

203.0.113.103/32 Originating RIB: inet.3
    Metric: 2                               Node path count: 1
    Forwarding nexthops: 1
        Nexthop: 203.0.113.216 via ge-3/1/0.0

inet6.0: 5 destinations, 5 routes (5 active, 0 holddown, 0 hidden)

2001:db8::10:255:71:52/128 (1 entry, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active Int>
        Local AS: 64496
        Age: 1:34:07
        Task: IF
        AS path: I

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
    *Direct Preference: 0
        Next hop type: Interface
        Next-hop reference count: 1
        Next hop: via lo0.0, selected
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:07
        Task: IF
        AS path: I

ff02::2/128 (1 entry, 1 announced)
TSI:
KRT in-kernel ff02::2/128 -> {}
    *PIM Preference: 0
        Next-hop reference count: 18
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:08
        Task: PIM Recv6
        Announcement bits (1): 0-KRT
        AS path: I

ff02::d/128 (1 entry, 1 announced)
TSI:
KRT in-kernel ff02::d/128 -> {}
    *PIM Preference: 0
        Next-hop reference count: 18
        State: <Active NoReadvrt Int>
        Local AS: 64496
        Age: 1:34:08

```

```

Task: PIM Recv6
Announcement bits (1): 0-KRT
AS path: I

ff02::16/128 (1 entry, 1 announced)
TSI:
KRT in-kerne1 ff02::16/128 -> {}
  *MLD    Preference: 0
          Next-hop reference count: 18
          State: <Active NoReadvrt Int>
          Local AS: 64496
          Age: 1:34:06
          Task: MLD
          Announcement bits (1): 0-KRT
          AS path: I

private.inet6.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)

fe80::280:42ff:fe10:f179/128 (1 entry, 0 announced)
  *Direct Preference: 0
          Next hop type: Interface
          Next-hop reference count: 1
          Next hop: via 1o0.16385, selected
          State: <Active NoReadvrt Int>
          Age: 1:34:07
          Task: IF
          AS path: I

green.l2vpn.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)

203.0.113.103:1:3:1/96 (1 entry, 1 announced)
  *BGP    Preference: 170/-101
          Route Distinguisher: 203.0.113.103:1
          Next-hop reference count: 7
          Source: 203.0.113.103
          Protocol next hop: 203.0.113.103
          Indirect next hop: 2 no-forward
          State: <Secondary Active Int Ext>
          Local AS: 64496 Peer AS: 64496
          Age: 1:28:12 Metric2: 1
          Task: BGP_69.203.0.113.103+179
          Announcement bits (1): 0-green-l2vpn
          AS path: I
          Communities: target:11111:1 Layer2-info: encaps:VPLS,
          control flags:, mtu: 0
          Label-base: 800008, range: 8
          Localpref: 100
          Router ID: 203.0.113.103
          Primary Routing Table bgp.l2vpn.0

203.0.113.152:1:1:1/96 (1 entry, 1 announced)
TSI:
Page 0 idx 0 Type 1 val 8699540
  *L2VPN  Preference: 170/-1
          Next-hop reference count: 5
          Protocol next hop: 203.0.113.152
          Indirect next hop: 0 -
          State: <Active Int Ext>
          Age: 1:34:03 Metric2: 1
          Task: green-l2vpn
          Announcement bits (1): 1-BGP.0.0.0.0+179

```

```

AS path: I
Communities: Layer2-info: encaps:VPLS, control flags:Site-Down,
mtu: 0
Label-base: 800016, range: 8, status-vector: 0x9F

203.0.113.152:1:5:1/96 (1 entry, 1 announced)
TSI:
Page 0 idx 0 Type 1 val 8699528
  *L2VPN Preference: 170/-101
    Next-hop reference count: 5
    Protocol next hop: 203.0.113.152
    Indirect next hop: 0 -
    State: <Active Int Ext>
    Age: 1:34:03 Metric2: 1
    Task: green-l2vpn
    Announcement bits (1): 1-BGP.0.0.0.0+179
    AS path: I
    Communities: Layer2-info: encaps:VPLS, control flags:, mtu: 0
    Label-base: 800008, range: 8, status-vector: 0x9F

...

l2circuit.0: 2 destinations, 2 routes (2 active, 0 holddown, 0 hidden)
TSI:

203.0.113.163:CtrlWord:4:3:Local/96 (1 entry, 1 announced)
  *L2CKT Preference: 7
    Next hop: via so-1/1/2.0 weight 1, selected
    Label-switched-path my-lsp
    Label operation: Push 100000[0]
    Protocol next hop: 203.0.113.163 Indirect next hop: 86af000 296
    State: <Active Int>
    Local AS: 64499
    Age: 10:21
    Task: l2 circuit
    Announcement bits (1): 0-LDP
    AS path: I
    VC Label 100000, MTU 1500, VLAN ID 512

203.0.113.55/24 (1 entry, 1 announced)
TSI:
KRT queued (pending) add
  198.51.100.0/24 -> {Push 300112}
    *BGP Preference: 170/-101
      Next hop type: Router
      Address: 0x925c208
      Next-hop reference count: 2
      Source: 203.0.113.9
      Next hop: 203.0.113.9 via ge-1/2/0.15, selected
      Label operation: Push 300112
      Label TTL action: prop-ttl
      State: <Active Ext>
      Local AS: 64509 Peer AS: 65539
      Age: 1w0d 23:06:56
      AIGP: 25
      Task: BGP_65539.203.0.113.9+56732
      Announcement bits (1): 0-KRT
      AS path: 65539 64508 I
      Accepted

```

```

Route Label: 300112
Localpref: 100
Router ID: 213.0.113.99

```

show route extensive (Access Route)

```

user@host> show route 203.0.113.102 extensive
inet.0: 39256 destinations, 39258 routes (39255 active, 0 holddown, 1 hidden)
203.0.113.102/32 (1 entry, 1 announced)
TSI:
KRT in-kernel 203.0.113.102/32 -> {192.0.2.2}
OSPF area : 0.0.0.0, LSA ID : 203.0.113.102, LSA type : Extern
  *Access Preference: 13
    Next-hop reference count: 78472
    Next hop: 192.0.2.2 via fe-0/0/0.0, selected
    State: <Active Int>
  Age: 12
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 1-OSPFv2
    AS path: I

```

```

user@host> show route 2001:db8:4641:1::/48 extensive

inet6.0: 75 destinations, 81 routes (75 active, 0 holddown, 0 hidden)
2001:db8:4641:1::/48 (1 entry, 1 announced)
TSI:
KRT in-kernel 2001:db8:4641:1::/48 -> {#0 0.13.1.0.0.1}
  *Access Preference: 13
    Next hop type: Router, Next hop index: 74548
    Address: 0x1638c1d8
    Next-hop reference count: 6
    Next hop: #0 0.13.1.0.0.1 via demux0.1073753267, selected
    Session Id: 0x0
    State: <Active Int>
    Age: 4:17
    Validation State: unverified
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 4-Resolve tree 2
    AS path: I
2001:db8:4641:1::/128 (1 entry, 1 announced)
TSI:
KRT in-kernel 2001:db8:4641:1::/128 -> {#0 0.13.1.0.0.1}
  *Access-internal Preference: 12
    Next hop type: Router, Next hop index: 74548
    Address: 0x1638c1d8
    Next-hop reference count: 6
    Next hop: #0 0.13.1.0.0.1 via demux0.1073753267, selected
    Session Id: 0x0
    State: <Active Int>
    Age: 4:17
    Validation State: unverified
    Task: RPD Unix Domain Server./var/run/rpd_serv.local
    Announcement bits (2): 0-KRT 4-Resolve tree 2
    AS path: I

```

show route extensive (BGP PIC Edge)

```

user@host> show route 198.51.100.6 extensive
ed.inet.0: 6 destinations, 9 routes (6 active, 0 holddown, 0 hidden)
198.51.100.6/32 (3 entries, 2 announced)
  State: <CalcForwarding>

```

```

TSI:
KRT in-kernel 198.51.100.6/32 -> {indirect(1048574), indirect(1048577)}
Page 0 idx 0 Type 1 val 9219e30
  Nexthop: Self
  AS path: [2] 3 I
  Communities: target:2:1
Path 198.51.100.6 from 198.51.100.4 Vector len 4. Val: 0
..
  #Multipath Preference: 255
    Next hop type: Indirect
    Address: 0x93f4010
    Next-hop reference count: 2
..
  Protocol next hop: 198.51.1001.4
  Push 299824
  Indirect next hop: 944c000 1048574 INH Session ID: 0x3
  Indirect next hop: weight 0x1
  Protocol next hop: 198.51.100.5
  Push 299824
  Indirect next hop: 944c1d8 1048577 INH Session ID: 0x4
  Indirect next hop: weight 0x4000
  State: <ForwardingOnly Int Ext>
  Inactive reason: Forwarding use only
  Age: 25      Metric2: 15
  Validation State: unverified
  Task: RT
  Announcement bits (1): 0-KRT
  AS path: 3 I
  Communities: target:2:1

```

show route extensive (FRR and LFA)

```

user@host> show route 203.0.113.20 extensive
inet.0: 46 destinations, 49 routes (45 active, 0 holddown, 1 hidden)
203.0.113.20/24 (2 entries, 1 announced)
  State: FlashAll
TSI:
KRT in-kernel 203.0.113.20/24 -> {Push 299776, Push 299792}
  *RSVP Preference: 7/1
    Next hop type: Router, Next hop index: 1048574
    Address: 0xbbbc010
    Next-hop reference count: 5
    Next hop: 203.0.113.112 via ge-2/1/8.0 weight 0x1, selected
    Label-switched-path europa-d-to-europa-e
    Label operation: Push 299776
    Label TTL action: prop-ttl
    Session Id: 0x201
    Next hop: 203.0.113.122 via ge-2/1/4.0 weight 0x4001
    Label-switched-path europa-d-to-europa-e
    Label operation: Push 299792
    Label TTL action: prop-ttl
    Session Id: 0x202
    State: Active Int
    Local AS: 64500
    Age: 5:31 Metric: 2
    Task: RSVP
    Announcement bits (1): 0-KRT
    AS path: I
  OSPF Preference: 10
    Next hop type: Router, Next hop index: 615
    Address: 0xb9d78c4

```

```

Next-hop reference count: 7
Next hop: 203.0.113.112 via ge-2/1/8.0, selected
Session Id: 0x201
State: Int
Inactive reason: Route Preference
Local AS: 64500
Age: 5:35 Metric: 3
Area: 0.0.0.0
Task: OSPF
AS path: I

```

show route extensive (IS-IS)

```

user@host> show route extensive
IS-IS Preference: 15
Level: 1
Next hop type: Router, Next hop index: 1048577
Address: 0XXXXXXXXXX
Next-hop reference count: YY
Next hop: 203.0.113.22 via ae1.0 balance 43%, selected
Session Id: 0x141
Next hop: 203.0.113.22 via ae0.0 balance 57%

```

show route extensive (Route Reflector)

```

user@host> show route extensive
203.0.113.0/8 (1 entry, 1 announced)

TSI:
KRT in-kernel 203.0.113.0/8 -> {indirect(40)}
  *BGP Preference: 170/-101
    Source: 192.168.4.214
    Protocol next hop: 198.51.100.192 Indirect next hop: 84ac908 40
    State: <Active Int Ext>
    Local AS: 65548 Peer AS: 65548
    Age: 3:09 Metric: 0 Metric2: 0
    Task: BGP_65548.192.168.4.214+1033
    Announcement bits (2): 0-KRT 4-Resolve inet.0
    AS path: 65544 64507 I <Originator>
    Cluster list: 198.51.100.1
    Originator ID: 203.0.113.88
    Communities: 7777:7777
    Localpref: 100
    Router ID: 203.0.113.4
    Indirect next hops: 1
      Protocol next hop: 203.0.113.192 Metric: 0
      Indirect next hop: 84ac908 40
      Indirect path forwarding next hops: 0
      Next hop type: Discard

```

show route label detail (Multipoint LDP Inband Signaling for Point-to-Multipoint LSPs)

```

user@host> show route label 299872 detail
mpls.0: 13 destinations, 13 routes (13 active, 0 holddown, 0 hidden)
299872 (1 entry, 1 announced)
  *LDP Preference: 9
    Next hop type: Flood
    Next-hop reference count: 3
    Address: 0x9097d90
    Next hop: via vt-0/1/0.1
    Next-hop index: 661
    Label operation: Pop

```

```

Address: 0x9172130
Next hop: via so-0/0/3.0
Next-hop index: 654
Label operation: Swap 299872
State: **Active Int>
Local AS: 64511
Age: 8:20      Metric: 1
Task: LDP
Announcement bits (1): 0-KRT
AS path: I
FECs bound to route: P2MP root-addr 203.0.113.166, grp 203.0.1.1,
src 192.168.142.2

```

show route label detail (Multipoint LDP with Multicast-Only Fast Reroute)

```
user@host> show route label 301568 detail
```

```

mpls.0: 18 destinations, 18 routes (18 active, 0 holddown, 0 hidden)
301568 (1 entry, 1 announced)
  *LDP   Preference: 9
    Next hop type: Flood
    Address: 0x2735208
    Next-hop reference count: 3
    Next hop type: Router, Next hop index: 1397
    Address: 0x2735d2c
    Next-hop reference count: 3
    Next hop: 203.0.113.82 via ge-1/2/22.0
    Label operation: Pop
    Load balance label: None;
    Next hop type: Router, Next hop index: 1395
    Address: 0x2736290
    Next-hop reference count: 3
    Next hop: 203.0.113.2 via ge-1/2/18.0
    Label operation: Pop
    Load balance label: None;
    State: <Active Int AckRequest MulticastRPF>
    Local AS: 64500
    Age: 54:05      Metric: 1
    Validation State: unverified
    Task: LDP
    Announcement bits (1): 0-KRT
    AS path: I
    FECs bound to route: P2MP root-addr 198.51.100.1, grp: 232.1.1.1,
src: 192.168.219.11
    Primary Upstream : 198.51.100.3:0--198.51.100.2:0
      RPF Nexthops :
        ge-1/2/15.0, 1.2.94.1, Label: 301568, weight: 0x1
        ge-1/2/14.0, 1.2.3.1, Label: 301568, weight: 0x1
    Backup Upstream : 198.51.100.3:0--198.51.100.6:0
      RPF Nexthops :
        ge-1/2/20.0, 198.51.100.96, Label: 301584, weight: 0xffffe
        ge-1/2/19.0, 198.51.100.36, Label: 301584, weight: 0xffffe

```

show services subscriber bandwidth

Syntax	<pre>show services subscriber bandwidth <client-id <i>client-id</i>> <interface <i>interface-name</i>> <top-talkers <i>top-talkers</i>> <ip-address <i>ip-address</i>> <service-interface <i>interface-name</i>> <top-talkers <i>top-talkers</i>></pre>
Release Information	Command introduced in Junos OS Release 10.2.
Description	Display bandwidth information about subscribers with the specified criteria. The bandwidth is computed at fixed intervals on the MS-DPC and only the last interval is used for comparison.
Options	<p>client-id <i>client-id</i>—(Optional) Displays bandwidth information for the subscriber with this client ID. The client ID is a generated identifier assigned to each packet-triggered subscriber known to the router.</p> <p>interface <i>interface-name</i>—(Optional) Displays bandwidth information for the subscriber with this underlying interface name.</p> <p>ip-address <i>ip-address</i>—(Optional) Displays bandwidth information for the subscriber with this IPv4 address.</p> <p>service-interface <i>interface-name</i>—(Optional) Displays bandwidth information for the subscriber with this service interface name.</p> <p>top-talkers <i>number-top-talkers</i>—(Optional) Displays bandwidth information for the specified number of subscribers using the most bandwidth based on the input-bps or output-bps values for the interface or service interface.</p>
Required Privilege Level	view
List of Sample Output	show services subscriber bandwidth client-id on page 1762
Output Fields	Table 145 on page 1761 lists the output fields for the show services subscriber bandwidth command. Output fields are listed in the approximate order in which they appear.

Table 145: show services subscriber bandwidth Output Fields

Field Name	Field Description
client-id	Client identifier.
input-bps	Ingress bandwidth in bytes per second.
output-bps	Egress bandwidth in bytes per second.
input-pps	Ingress bandwidth in packets per second.
output-pps	Egress bandwidth in packets per second.

Sample Output

show services

subscriber bandwidth client-id

```
user@host> show services subscriber bandwidth client-id 1
client-id  input-bps  output-bps  input-pps  output-pps
1           20          20          1000       1000
```

show services subscriber dynamic-policies

Syntax	show services subscriber dynamic-policies client-id <i>client-id</i>
Release Information	Command introduced in Junos OS Release 10.2.
Description	Display information about the active dynamic policies applied to the specified subscriber.
Options	client-id <i>client-id</i> —Displays information about the active dynamic policies applied to the subscriber with this client ID. The client ID is a generated identifier assigned to each packet-triggered subscriber known to the router.
Required Privilege Level	view
List of Sample Output	show services subscriber dynamic-policies client-id on page 1764
Output Fields	Table 146 on page 1763 lists the output fields for the show services subscriber dynamic-policies command. Output fields are listed in the approximate order in which they appear.

Table 146: show services subscriber dynamic-policies Output Fields

Field Name	Field Description
Subscriber session	Client identifier.
Policy name	Dynamic policy identifier.
rpr	Rule precedence for the dynamic policy.
d	Direction of the dynamic policy.
Template	Service rule associated with the dynamic policy.
tpr	Term precedence.
ra	Remote address.
rm	Remote address mask.
lpl	Lower boundary for the local port range.
lph	Upper boundary for the local port range.
rpl	Lower boundary for the remote port range.
rph	Upper boundary for the remote port range.
p	Protocol.

Table 146: show services subscriber dynamic-policies Output Fields (*continued*)

Field Name	Field Description
a-f	Action.
a-s	Type of statistics collection and aggregation.
a-fc	Forwarding class.
a-p-l	Policer instance.
a-p-bw	Policer bandwidth.
a-p-mbs	Policer maximum burst size.
a-fu	Unit number for forwarding instance.
anl	Application names.
agl	Application group name.

Sample Output

show services
subscriber dynamic-policies client-id

```

user@host> show services subscriber dynamic-policies client-id 1
Subscriber session 1 policy
  Policy name: 1311465998724890695
  rpr: 200
  d: input-output
    Template: __svc_rule__
    tpr: 100
    ra: 0.0.0.0
    rm: 0
    lpl: 0
    lph: 65535
    rpl: 0
    rph: 65535
    p: 0
    a-f: accept forwarding-class
    a-s:
    a-fc: assured-forwarding
    a-p-i: 0
    a-p-bw: 0
    a-p-mbs: 0
    a-fu: 0
    anl: junos:http
    agl: junos:web
    Template: __svc_rule__
    tpr: 100
    ra: 203.0.113.10
    rm: 0
    lpl: 0

```

```
lph: 65535
rpl: 0
rph: 65535
p: 0
a-f: accept
a-s:
a-fc:
a-p-i: 0
a-p-bw: 0
a-p-mbs: 0
a-fu: 0
anl:
agl:
```

show services subscriber flows

Syntax	show services subscriber flows client-id <i>client-id</i>
Release Information	Command introduced in Junos OS Release 10.2. Offload status for flows using Juniper Forwarding Mechanism (JFM) added in Junos OS Release 12.1.
Description	Display information about the data flows associated with the specified subscriber. Offloading using JFM is supported only on MX Series routers with Modular Port Concentrators (MPCs) for the packet-triggered subscribers and policy control (PTSP) plug-in.
Options	client-id <i>client-id</i> —Displays information about the data flows associated with the subscriber identified by this client ID. The client ID is a generated identifier assigned to each packet-triggered subscriber known to the router.
Required Privilege Level	view
List of Sample Output	show services subscriber flows client-id on page 1767 show services subscriber flows client-id for offloading using JFM on page 1767
Output Fields	Table 147 on page 1766 lists the output fields for the show services subscriber flows command. Output fields are listed in the approximate order in which they appear.

Table 147: show services subscriber flows Output Fields

Field Name	Field Description
Subscriber session	Client identifier.
Number of data flows	Number of data sessions associated with this subscriber.
Data flow high-water-mark	High water mark number of concurrent data sessions for this subscriber. This value is never reset during the login session.
5-tuple	5 tuple information for each flow.
Application-ID	Application ID for each flow.
Policy-name	Service rule name for each flow.
Dir	Direction of each flow.
Packets	Information about counter statistics for each flow.
Bytes	Information about counter statistics for each flow.

Table 147: show services subscriber flows Output Fields (*continued*)

Field Name	Field Description
Off	The status of offload to Packet Forwarding Engine using JFM. The various options are: <ul style="list-style-type: none"> • Not Offloaded (-) • Offload requested but not completed (R) • Offload requested and completed (O)
Action	Action of the service rule for each flow.

Sample Output

show services
subscriber flows client-id

```
user@host> show services subscriber flows client-id 1
Subscriber session 1
Number of data flows: 1
Data flows high-water-mark: 8180
5-tuple                               Application-ID  Policy-name  Dir
192.0.2.2:45287->198.51.100.52:80,6   junos:http     ptsp-appl/23 I
Packets      Bytes      Action
6            511       C-T
```

show services subscriber flows client-id for offloading using JFM

```
user@host> show services subscriber flows client-id 1
5-tuple                               Application-ID  Policy-name  Dir  Packets
Bytes Off Action
192.0.2.2:45288->198.51.100.52:80,6   junos:http     ptsp-appl/23 I    12
1511  -   C-T
192.0.2.2:45287->198.51.100.52:80,6   junos:http     ptsp-appl/23 I     6
511   R   C-T
192.0.2.2:45287->198.51.100.200:80,6  junos:http     ptsp-appl/23 I   645
5329  O   C-T
```

show services subscriber sessions

Syntax	show services subscriber sessions <brief detail summary> <client-id <i>client-id</i>> <interface <i>interface-name</i>> <ip-address <i>ip-address</i>> <routing-instance <i>routing-instance-name</i>> <service-interface <i>interface-name</i>> <user-id <i>user-id</i>>
Release Information	Command introduced in Junos OS Release 10.2.
Description	Display information about the active packet-triggered subscriber sessions on the router.
Options	<p>brief detail summary—(Optional) Display the specified level of output. The default level is brief.</p> <p>client-id <i>client-id</i>—(Optional) Displays information about the active packet-triggered subscriber sessions for this client ID. The client ID is a generated identifier assigned to each packet-triggered subscriber known to the router.</p> <p>interface <i>interface-name</i>—(Optional) Displays information about the active packet-triggered subscriber sessions for the subscriber with this underlying interface name.</p> <p>ip-address <i>ip-address</i>—(Optional) Displays information about the active packet-triggered subscriber sessions for the subscriber with this IP address.</p> <p>routing-instance <i>routing-instance-name</i>—(Optional) Displays information about the active packet-triggered subscriber sessions for the subscriber on this routing instance.</p> <p>service-interface <i>interface-name</i>—(Optional) Displays information about the active packet-triggered subscriber sessions for the subscriber with this service interface name.</p> <p>user-id <i>user-id</i>—(Optional) Displays information about the active packet-triggered subscriber sessions with this user ID.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• clear services subscriber sessions on page 1475
List of Sample Output	show services subscriber sessions client-id summary on page 1769 show services subscriber sessions client-id on page 1769 show services subscriber sessions client-id detail on page 1769 show services subscriber sessions detail on page 1769
Output Fields	Table 148 on page 1769 lists the output fields for the show services subscriber sessions command. Output fields are listed in the approximate order in which they appear.

Table 148: show services subscriber sessions Output Fields

Field Name	Field Description
Client-ID	Client identifier.
IP-address	IPv4 address.
Underlying-interface	Interface where services are applied.
User-name	Subscriber identifier.
Service interface name	Location of the MS-DPC on which the subscriber is instantiated.
Routing instance	Routing instance on which the subscriber is instantiated.
State	State of the subscriber.

Sample Output

show services
subscriber sessions client-id summary

```
user@host> show services subscriber sessions client-id 1 summary
1
```

show services
subscriber sessions client-id

```
user@host> show services subscriber sessions client-id 1
Client-ID      IP-address      Underlying-interface  User-name
1              192.0.2.80      ge-1/3/2.1           ip80.1.1.2@default
```

show services
subscriber sessions
client-id detail

```
user@host> show services subscriber sessions client-id 1 detail
Subscriber session 1
  User name: ip80.1.1.2@default
  Interface name: ge-1/3/2.1
  User IP address: 192.0.2.80
  Service interface name: ms-2/0/0
  Routing instance: default
  State: logged in
  Login time: Tue Dec 29 19:56:07 2009
  1 service session(s) instantiated:
  Service session 1323423760868442114 => State: activated
```

show services subscriber sessions detail

```
user@host> show services subscriber sessions detail
Subscriber session 4503599627370515
  User name:
  user.1234.9876@test.example.net<203.0.113.111>:glacier:ge-1/0/6.0[:0-0]
  Interface name: ge-1/0/3.8
```

User IP address: 203.0.113.111
Service interface name: ms-4/0/0
Partition name: radius-p1
State: logged in
Subscriber profile: enable_HCM_only
Login time: Mon Oct 4 14:32:51 2010
1 service session(s) instantiated:
Service session radius => State: activated

show services subscriber statistics

Syntax	show services subscriber statistics client-id <i>client-id</i>
Release Information	Command introduced in Junos OS Release 10.2.
Description	Display information about the data traffic statistics for the specified packet-triggered subscriber and for each service rule attached to that subscriber.
Options	client-id <i>client-id</i> —Displays information about the data traffic statistics associated with the subscriber identified by this client ID. The client ID is a generated identifier assigned to each packet-triggered subscriber known to the router.
Required Privilege Level	view
List of Sample Output	show services subscriber statistics client-id by rule on page 1771 show services subscriber statistics client-id by application on page 1771
Output Fields	Table 149 on page 1771 lists the output fields for the show services subscriber statistics command. Output fields are listed in the approximate order in which they appear.

Table 149: show services subscriber statistics Output Fields

Field Name	Field Description
Aggregation-level	Type of statistics collected — subscriber and service rule or application.
Name/Id	Identifier for Aggregation-level field.
Packets-in	Number of ingress packets.
Packets-out	Number of egress packets.
Bytes-in	Number of ingress bytes.
Bytes-out	Number of egress bytes.

Sample Output

show services
subscriber statistics client-id by rule

```

user@host> show services subscriber statistics client-id 1
Aggregation-level Name/Id   Packets-in Packets-out Bytes-in Bytes-out
subscriber        1           5          5         1000    1000
dynamic rule      ptsp-rule   5          5         1000    1000

```

Sample Output

show services

subscriber statistics client-id by application

```
user@host> show services subscriber statistics client-id 1
Aggregation-level Name/Id      Packets-in  Packets-out  Bytes-in  Bytes-out
subscriber        1              4358118    3630087     371167451 3301658453
application group any          4358118    3631768     371167451 3304179953
```

show static-subscribers sessions

Syntax	show static-subscribers sessions <group <i>group-name</i> > <interface <i>interface-name</i> >
Release Information	Command introduced in Junos OS Release 9.6.
Description	Display information about the subscriber sessions for all static subscribers, all static subscribers on an interface group, or a single subscriber on an interface.
Options	<p><i>group-name</i>—(Optional) Display session information for static subscribers on all interfaces in the specified group.</p> <p><i>interface-name</i>—(Optional) Display session information for the static subscriber on the specified in the specified group.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Subscribers on Static Interfaces Overview on page 769
List of Sample Output	show static-subscribers sessions on page 1774 show static-subscribers sessions group on page 1774 show static-subscribers sessions interface on page 1774
Output Fields	Table 150 on page 1773 lists the output fields for the show static-subscribers sessions command. Output fields are listed in the approximate order in which they appear.

Table 150: show static-subscribers sessions Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the interface.	None specified
State	State of the static subscriber session: <ul style="list-style-type: none"> • authenticating—Subscriber is being authenticated. • activating client—Client is being activated. • activating services—Subscriber services are being activated. • deactivating client—Client is being deactivated. • deactivating services—Subscriber services are being deactivated. • initializing—Process is initializing. • logged in—Subscriber is logged in to the interface. • logged out—Subscriber is logged out of the interface. • processing statistics—Session statistics are being processed. • terminating session—Subscriber session is being terminated. 	None specified
Group	Name of the interface group to which the interface belongs.	None specified

Table 150: show static-subscribers sessions Output Fields (*continued*)

Field Name	Field Description	Level of Output
User Name	Username used for the static subscriber. Can be the interface name.	None specified

Sample Output

show static-subscribers sessions

```
user@host> show static-subscribers sessions
```

Static subscriber information:

Interface	State	Group	User Name
ge-9/1/0.1	logged out	SS1	ge-9-1-0.1
ge-9/1/0.10	logged out	SS1	ge-9-1-0.10
ge-9/1/0.100	logged out	SS1	ge-9-1-0.100
ge-9/1/0.11	logged out	SS1	ge-9-1-0.11
ge-9/1/0.12	logged out	SS1	ge-9-1-0.12
ge-9/1/0.13	logged out	SS1	ge-9-1-0.13
ge-9/1/0.14	logged out	SS1	ge-9-1-0.14
ge-9/1/0.15	logged out	SS1	ge-9-1-0.15
ge-9/1/0.16	logged out	SS1	ge-9-1-0.16
ge-9/1/0.17	logged out	SS1	ge-9-1-0.17
ge-9/1/0.18	logged out	SS1	ge-9-1-0.18
ge-9/1/0.19	logged out	SS1	ge-9-1-0.19
ge-9/1/0.2	logged out	SS1	ge-9-1-0.2
ge-9/1/0.20	logged out	SS1	ge-9-1-0.20
ge-9/1/0.21	logged out	SS1	ge-9-1-0.21

show static-subscribers sessions group

```
user@host> show static-subscribers sessions group boston
```

Interface	State	Group	User Name
ge-0/0/1.1	logged in	boston	ge-0/0/1.1
ge-0/0/1.2	logged in	boston	ge-0/0/1.2

show static-subscribers sessions interface

```
user@host> show static-subscribers sessions interface ge-0/0/1.1
```

Interface	State	Group	User Name
ge-0/0/1.1	logged in	foo	ge-0/0/1.1

show subscribers

Syntax show subscribers
 <detail | extensive | terse>
 <aci-interface-set-name *aci-interface-set-name*>
 <address *address*>
 <agent-circuit-identifier *agent-circuit-identifier-substring*>
 <client-type *client-type*>
 <count>
 <id>
 <interface *interface*>
 <logical-system *logical-system*>
 <mac-address *mac-address*>
 <physical-interface *physical-interface-name*>
 <profile-name *profile-name*>
 <routing-instance *routing-instance*>
 <stacked-vlan-id *stacked-vlan-id*>
 <subscriber-state *subscriber-state*>
 <user-name *user-name*>
 <vci *vci-identifier*>
 <vpi *vpi-identifier*>
 <vlan-id *vlan-id*>

Release Information Command introduced in Junos OS Release 9.3.
 Command introduced in Junos OS Release 9.3 for EX Series switches.
client-type, **mac-address**, **subscriber-state**, and **extensive** options introduced in Junos OS Release 10.2.
count option usage with other options introduced in Junos OS Release 10.2.
 Command introduced in Junos OS Release 11.1 for the QFX Series.
 Options **aci-interface-set-name** and **agent-circuit-identifier** introduced in Junos OS Release 12.2.
 The **physical-interface** and **user-name** options introduced in Junos OS Release 12.3.
 Options **vci** and **vpi** introduced in Junos OS Release 12.3R3 and supported in later 12.3Rx releases.
 Options **vci** and **vpi** supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)
 Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
 Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.

Description Display information for active subscribers.

Options **detail | extensive | terse**—(Optional) Display the specified level of output.

aci-interface-set-name—(Optional) Display all dynamic subscriber sessions that use the specified agent circuit identifier (ACI) interface set. Use the ACI interface set name generated by the router, such as aci-1003-ge-1/0/0.4001, and not the actual ACI value found in the DHCP or PPPoE control packets.

address—(Optional) Display subscribers whose IP address matches the specified address. You must specify the IPv4 or IPv6 address prefix without a netmask (for example,

192.0.2.0). If you specify the IP address as a prefix with a netmask (for example, 192.0.2.0/32), the router displays a message that the IP address is invalid, and rejects the command.

agent-circuit-identifier-substring—(Optional) Display all dynamic subscriber sessions whose ACI value matches the specified substring.

client-type—(Optional) Display subscribers whose client type matches one of the following client types:

- **dhcp**—DHCP clients only.
- **dot1x**—Dot1x clients only.
- **essm**—ESSM clients only.
- **fwauth**—FwAuth (authenticated across a firewall) clients only.
- **l2tp**—L2TP clients only.
- **mlppp**—MLPPP clients only.
- **ppp**—PPP clients only.
- **pppoe**—PPPoE clients only.
- **static**—Static clients only.
- **vlan**—VLAN clients only.
- **vlan-oob**—VLAN out-of-band (ANCP-triggered) clients only.
- **vpls-pw**—VPLS pseudowire clients only.
- **xauth**—Xauth clients only.

count—(Optional) Display the count of total subscribers and active subscribers for any specified option. You can use the **count** option alone or with the **address**, **client-type**, **interface**, **logical-system**, **mac-address**, **profile-name**, **routing-instance**, **stacked-vlan-id**, **subscriber-state**, or **vlan-id** options.

id—(Optional) Display a specific subscriber session whose session id matches the specified subscriber ID. You can display subscriber IDs by using the **show subscribers extensive** or the **show subscribers interface extensive** commands.

interface—(Optional) Display subscribers whose interface matches the specified interface.

logical-system—(Optional) Display subscribers whose logical system matches the specified logical system.

mac-address—(Optional) Display subscribers whose MAC address matches the specified MAC address.

physical-interface-name—(M120, M320, and MX Series routers only) (Optional) Display subscribers whose physical interface matches the specified physical interface.

profile-name—(Optional) Display subscribers whose dynamic profile matches the specified profile name.

routing-instance—(Optional) Display subscribers whose routing instance matches the specified routing instance.

stacked-vlan-id—(Optional) Display subscribers whose stacked VLAN ID matches the specified stacked VLAN ID.

subscriber-state—(Optional) Display subscribers whose subscriber state matches the specified subscriber state (ACTIVE, CONFIGURED, INIT, TERMINATED, or TERMINATING).

user-name—(M120, M320, and MX Series routers only) (Optional) Display subscribers whose username matches the specified subscriber name.

vci-identifier—(MX Series routers with MPCs and ATM MICs with SFP only) (Optional) Display active ATM subscribers whose ATM virtual circuit identifier (VCI) matches the specified VCI identifier. The range of values is 0 through 255.

vpi-identifier—(MX Series routers with MPCs and ATM MICs with SFP only) (Optional) Display active ATM subscribers whose ATM virtual path identifier (VPI) matches the specified VPI identifier. The range of values is 0 through 65535.

vlan-id—(Optional) Display subscribers whose VLAN ID matches the specified VLAN ID, regardless of whether the subscriber uses a single-tagged or double-tagged VLAN. For subscribers using a double-tagged VLAN, this option displays subscribers where the inner VLAN tag matches the specified VLAN ID. To display only subscribers where the specified value matches only double-tagged VLANs, use the **stacked-vlan-id** option to match the outer VLAN tag.



NOTE: Due to display limitations, logical system and routing instance output values are truncated when necessary.

Required Privilege Level

view

Related Documentation

- [show subscribers summary on page 1796](#)
- [Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration](#)
- [Verifying and Managing Junos OS Enhanced Subscriber Management on page 558](#)

List of Sample Output

[show subscribers \(IPv4\) on page 1782](#)
[show subscribers \(IPv6\) on page 1782](#)
[show subscribers \(IPv4 and IPv6 Dual Stack\) on page 1782](#)
[show subscribers \(Single Session DHCP Dual Stack\) on page 1783](#)
[show subscribers \(Single Session DHCP Dual Stack detail\) on page 1783](#)
[show subscribers \(LNS on MX Series Routers\) on page 1783](#)
[show subscribers \(L2TP Switched Tunnels\) on page 1783](#)
[show subscribers client-type dhcp detail on page 1784](#)
[show subscribers client-type vlan-oob detail on page 1784](#)

[show subscribers count on page 1784](#)
[show subscribers address detail \(IPv6\) on page 1784](#)
[show subscribers detail \(IPv4\) on page 1785](#)
[show subscribers detail \(IPv6\) on page 1785](#)
[show subscribers detail \(IPv6 Static Demux Interface\) on page 1786](#)
[show subscribers detail \(L2TP LNS Subscribers on MX Series Routers\) on page 1786](#)
[show subscribers detail \(L2TP Switched Tunnels\) on page 1786](#)
[show subscribers detail \(Tunneled Subscriber\) on page 1787](#)
[show subscribers detail \(IPv4 and IPv6 Dual Stack\) on page 1787](#)
[show subscribers detail \(ACI Interface Set Session\) on page 1788](#)
[show subscribers detail \(PPPoE Subscriber Session with ACI Interface Set\) on page 1788](#)
[show subscribers extensive on page 1788](#)
[show subscribers extensive \(RPF Check Fail Filter\) on page 1789](#)
[show subscribers extensive \(L2TP LNS Subscribers on MX Series Routers\) on page 1789](#)
[show subscribers extensive \(IPv4 and IPv6 Dual Stack\) on page 1789](#)
[show subscribers extensive \(ADF Rules \) on page 1790](#)
[show subscribers extensive \(Effective Shaping-Rate\) on page 1791](#)
[show subscribers aci-interface-set-name detail \(Subscriber Sessions Using Specified ACI Interface Set\) on page 1791](#)
[show subscribers agent-circuit-identifier detail \(Subscriber Sessions Using Specified ACI Substring\) on page 1791](#)
[show subscribers interface extensive on page 1792](#)
[show subscribers logical-system terse on page 1793](#)
[show subscribers physical-interface count on page 1793](#)
[show subscribers routing-instance inst1 count on page 1793](#)
[show subscribers stacked-vlan-id detail on page 1793](#)
[show subscribers stacked-vlan-id vlan-id detail \(Combined Output\) on page 1793](#)
[show subscribers stacked-vlan-id vlan-id interface detail \(Combined Output for a Specific Interface\) on page 1793](#)
[show subscribers user-name detail on page 1794](#)
[show subscribers vlan-id on page 1794](#)
[show subscribers vlan-id detail on page 1794](#)
[show subscribers vpi vci extensive \(PPPoE-over-ATM Subscriber Session\) on page 1794](#)
[show subscribers address detail \(Enhanced Subscriber Management\) on page 1795](#)

Output Fields [Table 151 on page 1778](#) lists the output fields for the **show subscribers** command. Output fields are listed in the approximate order in which they appear.

Table 151: show subscribers Output Fields

Field Name	Field Description
Interface	<p>Interface associated with the subscriber. The router or switch displays subscribers whose interface matches or begins with the specified interface.</p> <p>The * character indicates a continuation of addresses for the same session.</p>
IP Address/VLAN ID	<p>Subscriber IP address or VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i></p> <p>No IP address or VLAN ID is assigned to an L2TP tunnel-switched session. For these subscriber sessions the value is Tunnel-switched.</p>

Table 151: show subscribers Output Fields (*continued*)

Field Name	Field Description
User Name	Name of subscriber.
LS:RI	Logical system and routing instance associated with the subscriber.
Type	Subscriber client type (DHCP, L2TP, PPP, PPPoE, STATIC-INTERFACE, VLAN).
IP Address	Subscriber IPv4 address.
IP Netmask	Subscriber IP netmask. (MX Series) This field displays 255.255.255.255 by default. For tunneled or terminated PPP subscribers only, this field displays the actual value of Framed-IP-Netmask when the SDB_FRAMED_PROTOCOL attribute in the session database is equal to AUTHD_FRAMED_PROTOCOL_PPP. This occurs in the use case where the LNS generates access-internal routes when it receives Framed-IP-Netmask from RADIUS during authorization. When it receives Framed-Pool from RADIUS, the pool mask is ignored and the default /32 mask is used.
Primary DNS Address	IP address of primary DNS server.
Secondary DNS Address	IP address of secondary DNS server.
Primary WINS Address	IP address of primary WINS server.
Secondary WINS Address	IP address of secondary WINS server.
IPv6 Address	Subscriber IPv6 address, or multiple addresses.
IPv6 Prefix	Subscriber IPv6 prefix. If you are using DHCPv6 prefix delegation, this is the delegated prefix.
IPv6 User Prefix	IPv6 prefix obtained through ND/RA.
IPv6 Address Pool	Subscriber IPv6 address pool. The IPv6 address pool is used to allocate IPv6 prefixes to the DHCPv6 clients.
IPv6 Network Prefix Length	Length of the network portion of the IPv6 address.
IPv6 Prefix Length	Length of the subscriber IPv6 prefix.
Logical System	Logical system associated with the subscriber.
Routing Instance	Routing instance associated with the subscriber.
Interface	(Enhanced subscriber management for MX Series routers) Name of the enhanced subscriber management logical interface, in the form demux0.nnnn (for example, demux0.3221225472), to which access-internal and framed subscriber routes are mapped.
Interface Type	Whether the subscriber interface is Static or Dynamic .

Table 151: show subscribers Output Fields (*continued*)

Field Name	Field Description
Interface Set	Internally generated name of the dynamic ACI interface set used by the subscriber session.
Interface Set Type	Interface type of the ACI interface set: Dynamic . This is the only ACI interface set type currently supported.
Interface Set Session ID	Identifier of the dynamic ACI interface set entry in the session database.
Underlying Interface	Name of the underlying interface for the subscriber session.
Dynamic Profile Name	Dynamic profile used for the subscriber.
Dynamic Profile Version	Version number of the dynamic profile used for the subscriber.
MAC Address	MAC address associated with the subscriber.
State	Current state of the subscriber session (Init , Configured , Active , Terminating , Tunneled).
L2TP State	Current state of the L2TP session, Tunneled or Tunnel-switched . When the value is Tunnel-switched , two entries are displayed for the subscriber; the first entry is at the LNS interface on the LTS and the second entry is at the LAC interface on the LTS.
Tunnel switch Profile Name	Name of the L2TP tunnel switch profile that initiates tunnel switching.
Local IP Address	IP address of the local gateway (LAC).
Remote IP Address	IP address of the remote peer (LNS).
VLAN Id	VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i> .
Stacked VLAN Id	Stacked VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i> .
RADIUS Accounting ID	RADIUS accounting ID associated with the subscriber.
Agent Circuit ID	<p>For the dhcp client type, option 82 agent circuit ID associated with the subscriber. The ID is displayed as an ASCII string unless the value has nonprintable characters, in which case it is displayed in hexadecimal format.</p> <p>For the vlan-oob client type, the agent circuit ID or access-loop circuit identifier that identifies the subscriber line based on the subscriber-facing DSLAM interface on which the subscriber request originates.</p>
Agent Remote ID	<p>For the dhcp client type, option 82 agent remote ID associated with the subscriber. The ID is displayed as an ASCII string unless the value has nonprintable characters, in which case it is displayed in hexadecimal format.</p> <p>For the vlan-oob client type, the agent remote ID or access-loop remote identifier that identifies the subscriber line based on the NAS-facing DSLAM interface on which the subscriber request originates.</p>

Table 151: show subscribers Output Fields (*continued*)

Field Name	Field Description
DHCP Relay IP Address	IP address used by the DHCP relay agent.
ATM VPI	(MX Series routers with MPCs and ATM MICs with SFP only) ATM virtual path identifier (VPI) on the subscriber's physical interface.
ATM VCI	(MX Series routers with MPCs and ATM MICs with SFP only) ATM virtual circuit identifier (VCI) for each VPI configured on the subscriber interface.
Login Time	Date and time at which the subscriber logged in.
Effective shaping-rate	Actual downstream traffic shaping rate for the subscriber, in kilobits per second.
IPv4 rpf-check Fail Filter Name	Name of the filter applied by the dynamic profile to IPv4 packets that fail the RPF check.
IPv6 rpf-check Fail Filter Name	Name of the filter applied by the dynamic profile to IPv6 packets that fail the RPF check.
DHCP Options	len = number of hex values in the message. The hex values specify the type, length, value (TLV) for DHCP options, as defined in RFC 2132.
Session ID	ID number for a subscriber service session.
Underlying Session ID	For DHCPv6 subscribers on a PPPoE network, displays the session ID of the underlying PPPoE interface.
Service Sessions	Number of service sessions (that is, a service activated using RADIUS CoA) associated with the subscribers.
Service Session Name	Service session profile name.
Session Timeout (seconds)	Number of seconds of access provided to the subscriber before the session is automatically terminated.
Idle Timeout (seconds)	Number of seconds subscriber can be idle before the session is automatically terminated.
IPv6 Delegated Address Pool	Name of the pool used for DHCPv6 prefix delegation.
IPv6 Delegated Network Prefix Length	Length of the prefix configured for the IPv6 delegated address pool.
IPv6 Interface Address	Address assigned by the Framed-Ipv6-Prefix AAA attribute.
IPv6 Framed Interface Id	Interface ID assigned by the Framed-Interface-Id AAA attribute.
ADF IPv4 Input Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv4 input filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.

Table 151: show subscribers Output Fields (*continued*)

Field Name	Field Description
ADF IPv4 Output Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv4 output filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
ADF IPv6 Input Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv6 input filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
ADF IPv6 Output Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv6 output filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
IPv4 Input Filter Name	Name assigned to the IPv4 input filter (client or service session).
IPv4 Output Filter Name	Name assigned to the IPv4 output filter (client or service session).
IPv6 Input Filter Name	Name assigned to the IPv6 input filter (client or service session).
IPv6 Output Filter Name	Name assigned to the IPv6 output filter (client or service session).
IFL Input Filter Name	Name assigned to the logical interface input filter (client or service session).
IFL Output Filter Name	Name assigned to the logical interface output filter (client or service session).

Sample Output

show subscribers (IPv4)

```

user@host> show subscribers
Interface          IP Address/VLAN ID  User Name          LS:RI
ge-1/3/0.1073741824 10                   WHOLESALE-CLIENT  default:default
demux0.1073741824   203.0.113.10        RETAILER1-CLIENT  default:default
demux0.1073741825   203.0.113.3         RETAILER1-CLIENT  test1:retailer1
demux0.1073741826   203.0.113.3         RETAILER2-CLIENT  test1:retailer2

```

show subscribers (IPv6)

```

user@host> show subscribers
Interface          IP Address/VLAN ID  User Name          LS:RI
ge-1/0/0.0         2001:db8:c0:0:0:0/74 WHOLESALE-CLIENT  default:default
*                  2001:db8:1/128     subscriber-25      default:default

```

show subscribers (IPv4 and IPv6 Dual Stack)

```

user@host> show subscribers
Interface          IP Address/VLAN ID  User Name
LS:RI
demux0.1073741834  0x8100.1002 0x8100.1
default:default
demux0.1073741835  0x8100.1001 0x8100.1
default:default
pp0.1073741836     203.0.113.13      dualstackuser1@example1.com

```

```

default:ASP-1
*                2001:db8:1::/48
*                2001:db8:1:1::/64
pp0.1073741837   203.0.113.33          dualstackuser2@example1.com
default:ASP-1
*                2001:db8:1:2:5::/64

```

show subscribers (Single Session DHCP Dual Stack)

user@host> show subscribers

Interface	IP Address/VLAN ID	User Name	LS:RI
demux0.1073741364	192.168.10.10	dual-stack-retail35	default:default
	2001:db8::100:0:0:0/74		default:default
	2001:db8:3ffe:0:4::/64		

show subscribers (Single Session DHCP Dual Stack detail)

```

user@host> show subscribers id 27 detail
Type: DHCP
User Name: dual-stack-retail33
IP Address: 10.10.0.53
IPv6 Address: 2001:db8:3000:0:0:8003::2
IPv6 Prefix: 2001:db8:3ffe:0:4::/64
Logical System: default
Routing Instance: default
Interface: ae0.3221225472
Interface type: Static
Underlying Interface: ae0.3221225472
Dynamic Profile Name: dhcp-retail-18
MAC Address: 00:00:5E:00:53:02
State: Active
DHCP Relay IP Address: 10.10.0.1
Radius Accounting ID: 27
Session ID: 27
PFE Flow ID: 2
Stacked VLAN Id: 2000
VLAN Id: 1
Login Time: 2014-05-15 10:12:10 PDT
DHCP Options: len 60
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 00 64 01 01 02
00 06 00 04 00 03 00 19 00 03 00 0c 00 00 00 00 00 00 00 00
00 00 00 00 00 19 00 0c 00 00 00 00 00 00 00 00 00 00 00 00

```

show subscribers (LNS on MX Series Routers)

```

user@host> show subscribers
Interface      IP Address/VLAN ID  User Name      LS:RI
si-4/0/0.1     192.0.2.0           user@example.com default:default

```

show subscribers (L2TP Switched Tunnels)

```

user@host> show subscribers
Interface      IP Address/VLAN ID  User Name      LS:RI
si-2/1/0.1073741842 Tunnel-switched    user@example.com default:default
si-2/1/0.1073741843 Tunnel-switched    user@example.com default:default

```

show subscribers client-type dhcp detail

```
user@host> show subscribers client-type dhcp detail
Type: DHCP
IP Address: 203.0.113.29
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux
MAC Address: 00:00:5e:00:53:98
State: Active
Radius Accounting ID: user :2304
Login Time: 2009-08-25 14:43:52 PDT

Type: DHCP
IP Address: 203.0.113.27
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744383
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:00:5e:00:53:f3
State: Active
Radius Accounting ID: 1234 :2560
Login Time: 2009-08-25 14:43:56 PDT
```

show subscribers client-type vlan-oob detail

```
user@host> show subscribers client-type vlan-oob detail
Type: VLAN-00B
User Name: L2WS.line-aci-1.line-ari-1
Logical System: default
Routing Instance: ISP1
Interface: demux0.1073744127
Interface type: Dynamic
Underlying Interface: ge-1/0/0
Dynamic Profile Name: Prof_L2WS
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 1234
Session ID: 77
VLAN Id: 126
Core-Facing Interface: ge-2/1/1
VLAN Map Id: 6
Inner VLAN Map Id: 2001
Agent Circuit ID: line-aci-1
Agent Remote ID: line-ari-1
Login Time: 2013-10-29 14:43:52 EDT
```

show subscribers count

```
user@host> show subscribers count
Total Subscribers: 188, Active Subscribers: 188
```

show subscribers address detail (IPv6)

```
user@host> show subscribers address 203.0.113.137 detail
```

```

Type: PPPoE
User Name: pppoeTerV6User1Svc
IP Address: 203.0.113.137
IP Netmask: 255.0.0.0
IPv6 User Prefix: 2001:db8:0:c88::/32
Logical System: default
Routing Instance: default
Interface: pp0.1073745151
Interface type: Dynamic
Underlying Interface: demux0.8201
Dynamic Profile Name: pppoe-client-profile
MAC Address: 00:00:5e:00:53:53
Session Timeout (seconds): 31622400
Idle Timeout (seconds): 86400
State: Active
Radius Accounting ID: example demux0.8201:6544
Session ID: 6544
Agent Circuit ID: if13720
Agent Remote ID: if13720
Login Time: 2012-05-21 13:37:27 PDT
Service Sessions: 1

```

show subscribers detail (IPv4)

```

user@host> show subscribers detail
Type: DHCP
IP Address: 203.0.113.29
IP Netmask: 255.255.0.0
Primary DNS Address: 192.0.2.0
Secondary DNS Address: 192.0.2.1
Primary WINS Address: 192.0.2.3
Secondary WINS Address: 192.0.2.4
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:00:5e:00:53:98
State: Active
Radius Accounting ID: example :2304
Idle Timeout (seconds): 600
Login Time: 2009-08-25 14:43:52 PDT
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 08 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 36 2f
33 2d 37 2d 30 37 05 01 06 0f 21 2c
Service Sessions: 2

```

show subscribers detail (IPv6)

```

user@host> show subscribers detail
Type: DHCP
User Name: pd-user1
IPv6 Prefix: 2001:db8:ffff:1::/32
Logical System: default
Routing Instance: default
Interface: ge-3/1/3.2
Interface type: Static
MAC Address: 00:00:5e:00:53:03
State: Active
Radius Accounting ID: 1

```

```
Session ID: 1
Login Time: 2011-08-25 12:12:26 PDT
DHCP Options: len 42
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 51 ff ff 00 03
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00
00 00
```

show subscribers detail (IPv6 Static Demux Interface)

```
user@host> show subscribers detail
Type: STATIC-INTERFACE
User Name: user@example.net
IPv6 Prefix: 2001:db8:3:4:5:6:7:aa/32
Logical System: default
Routing Instance: default
Interface: demux0.1
Interface type: Static
Dynamic Profile Name: junos-default-profile
State: Active
Radius Accounting ID: 185
Login Time: 2010-05-18 14:33:56 EDT
```

show subscribers detail (L2TP LNS Subscribers on MX Series Routers)

```
user@host> show subscribers detail
Type: L2TP
User Name: user@example.net
IP Address: 203.0.113.58
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: si-5/2/0.1073749824
Interface type: Dynamic
Dynamic Profile Name: dyn-lns-profile2
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 8001
Session ID: 8001
Login Time: 2011-04-25 20:27:50 IST
```

show subscribers detail (L2TP Switched Tunnels)

```
user@host> show subscribers detail
Type: L2TP
User Name: user@example.com
Logical System: default
Routing Instance: default
Interface: si-2/1/0.1073741842
Interface type: Dynamic
Dynamic Profile Name: dyn-lts-profile
State: Active
L2TP State: Tunnel-switched
Tunnel switch Profile Name: ce-lts-profile
Local IP Address: 203.0.113.51
Remote IP Address: 192.0.2.0
Radius Accounting ID: 21
Session ID: 21
Login Time: 2013-01-18 03:01:11 PST

Type: L2TP
User Name: user@example.com
Logical System: default
```

```

Routing Instance: default
Interface: si-2/1/0.1073741843
Interface type: Dynamic
Dynamic Profile Name: dyn-lts-profile
State: Active
L2TP State: Tunnel-switched
Tunnel switch Profile Name: ce-lts-profile
Local IP Address: 203.0.113.31
Remote IP Address: 192.0.2.1
Session ID: 22
Login Time: 2013-01-18 03:01:14 PST

```

show subscribers detail (Tunneled Subscriber)

```

user@host> show subscribers detail
Type: PPPoE
User Name: user1@example.com
Logical System: default
Routing Instance: default
Interface: pp0.1
State: Active, Tunneled
Radius Accounting ID: 512

```

show subscribers detail (IPv4 and IPv6 Dual Stack)

```

user@host> show subscribers detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlanProfile
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.1001
VLAN Id: 0x8100.1
Login Time: 2011-11-30 00:18:04 PST

Type: PPPoE
User Name: dualstackuser1@example1.com
IP Address: 203.0.113.13
IPv6 Prefix: 2001:db8:1::/32
IPv6 User Prefix: 2001:db8:1:1::/32
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: dualStack-Profile1
MAC Address: 00:00:5e:00:53:02
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-11-30 00:18:05 PST

Type: DHCP
IPv6 Prefix: 2001:db8:1::/32
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:5e:00:53:02

```

```
State: Active
Radius Accounting ID: test :3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-11-30 00:18:35 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 00 64 03 01 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

show subscribers detail (ACI Interface Set Session)

```
user@host> show subscribers detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0
Interface Set: aci-1001-ge-1/0/0.2800
Interface Set Session ID: 0
Underlying Interface: ge-1/0/0.2800
Dynamic Profile Name: aci-vlan-set-profile-2
Dynamic Profile Version: 1
State: Active
Session ID: 1
Agent Circuit ID: aci-ppp-dhcp-20
Login Time: 2012-05-26 01:54:08 PDT
```

show subscribers detail (PPPoE Subscriber Session with ACI Interface Set)

```
user@host> show subscribers detail
Type: PPPoE
User Name: ppphint2
IP Address: 203.0.113.15
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Dynamic
Interface Set: aci-1001-demux0.1073741824
Interface Set Type: Dynamic
Interface Set Session ID: 2
Underlying Interface: demux0.1073741824
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:5e:00:53:02
State: Active
Radius Accounting ID: 3
Session ID: 3
Agent Circuit ID: aci-ppp-dhcp-dvlan-50
Login Time: 2012-03-07 13:46:53 PST
```

show subscribers extensive

```
user@host> show subscribers extensive
Type: DHCP
User Name: pd-user1
IPv6 Prefix: 2001:db8:ffff:1::/32
Logical System: default
Routing Instance: default
Interface: ge-3/1/3.2
Interface type: Static
MAC Address: 00:00:5e:00:53:03
```

```

State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-08-25 12:12:26 PDT
DHCP Options: len 42
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 51 ff ff 00 03
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00
00 00
IPv6 Address Pool: pd_pool
IPv6 Network Prefix Length: 48

```

show subscribers extensive (RPF Check Fail Filter)

```

user@host> show subscribers extensive
...
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ae0.1073741824
Interface type: Dynamic
Dynamic Profile Name: vlan-prof
State: Active
Session ID: 9
VLAN Id: 100
Login Time: 2011-08-26 08:17:00 PDT
IPv4 rpf-check Fail Filter Name: rpf-allow-dhcp
IPv6 rpf-check Fail Filter Name: rpf-allow-dhcpv6
...

```

show subscribers extensive (L2TP LNS Subscribers on MX Series Routers)

```

user@host> show subscribers extensive
Type: L2TP
User Name: user@example.net
IP Address: 203.0.113.58
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: si-5/2/0.1073749824
Interface type: Dynamic
Dynamic Profile Name: dyn-lns-profile2
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 8001
Session ID: 8001
Login Time: 2011-04-25 20:27:50 IST
IPv4 Input Filter Name: classify-si-5/2/0.1073749824-in
IPv4 Output Filter Name: classify-si-5/2/0.1073749824-out

```

show subscribers extensive (IPv4 and IPv6 Dual Stack)

```

user@host> show subscribers extensive
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlanProfile
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.1001
VLAN Id: 0x8100.1

```

```

Login Time: 2011-11-30 00:18:04 PST

Type: PPPoE
User Name: dualstackuser1@example1.com
IP Address: 203.0.113.13
IPv6 Prefix: 2001:db8:1::/32
IPv6 User Prefix: 2001:db8:1:1::/32
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: dualStack-Profile1
MAC Address: 00:00:5e:00:53:02
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-11-30 00:18:05 PST
IPv6 Delegated Network Prefix Length: 48
IPv6 Interface Address: 2001:db8:2016:1:1::1/64
IPv6 Framed Interface Id: 1:1:2:2
IPv4 Input Filter Name: FILTER-IN-pp0.1073741825-in
IPv4 Output Filter Name: FILTER-OUT-pp0.1073741825-out
IPv6 Input Filter Name: FILTER-IN6-pp0.1073741825-in
IPv6 Output Filter Name: FILTER-OUT6-pp0.1073741825-out

Type: DHCP
IPv6 Prefix: 2001:db8:1::/32
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:5e:00:53:02
State: Active
Radius Accounting ID: test :3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-11-30 00:18:35 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 00 64 03 01 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00
00 00
IPv6 Delegated Network Prefix Length: 48

```

show subscribers extensive (ADF Rules)

```

user@host> show subscribers extensive
...
Service Session ID: 12
Service Session Name: SERVICE-PROFILE
State: Active
Family: inet
  ADF IPv4 Input Filter Name: __junos_adf_12-demux0.3221225474-inet-in
    Rule 0: 010101000b0101020b020200201811
      from {
        source-address 203.0.113.232;
        destination-address 198.51.100.0/24;
        protocol 17;
      }
      then {

```

```

    }
    accept;

```

show subscribers extensive (Effective Shaping-Rate)

```

user@host> show subscribers extensive
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741837
Interface type: Dynamic
Interface Set: ifset-1
Underlying Interface: ae1
Dynamic Profile Name: svlan-dhcp-test
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.201
VLAN Id: 0x8100.201
Login Time: 2011-11-30 00:18:04 PST
Effective shaping-rate: 31000000k
...

```

show subscribers aci-interface-set-name detail (Subscriber Sessions Using Specified ACI Interface Set)

```

user@host> show subscribers aci-interface-set-name aci-1003-ge-1/0/0.4001 detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-set-profile
Dynamic Profile Version: 1
State: Active
Session ID: 13
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:56 PDT

Type: PPPoE
User Name: ppphint2
IP Address: 203.0.113.17
Logical System: default
Routing Instance: default
Interface: pp0.1073741834
Interface type: Dynamic
Interface Set: aci-1003-ge-1/0/0.4001
Interface Set Type: Dynamic
Interface Set Session ID: 13
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address:
State: Active
Radius Accounting ID: 14
Session ID: 14
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:57 PDT

```

show subscribers agent-circuit-identifier detail (Subscriber Sessions Using Specified ACI Substring)

```

user@host> show subscribers agent-circuit-identifier aci-ppp-vlan detail
Type: VLAN
Logical System: default

```

Routing Instance: default
Interface: ge-1/0/0.
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-set-profile
Dynamic Profile Version: 1
State: Active
Session ID: 13
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:56 PDT

Type: PPPoE
User Name: ppphint2
IP Address: 203.0.113.17
Logical System: default
Routing Instance: default
Interface: pp0.1073741834
Interface type: Dynamic
Interface Set: aci-1003-ge-1/0/0.4001
Interface Set Type: Dynamic
Interface Set Session ID: 13
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:5e:00:53:52
State: Active
Radius Accounting ID: 14
Session ID: 14
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:57 PDT

show subscribers interface extensive

```
user@host> show subscribers interface demux0.1073741826 extensive
```

Type: VLAN
User Name: user@test.example.com
Logical System: default
Routing Instance: testnet
Interface: demux0.1073741826
Interface type: Dynamic
Dynamic Profile Name: profile-vdemux-relay-23qos
MAC Address: 00:00:5e:00:53:04
State: Active
Radius Accounting ID: 12
Session ID: 12
Stacked VLAN Id: 0x8100.1500
VLAN Id: 0x8100.2902
Login Time: 2011-10-20 16:21:59 EST

Type: DHCP
User Name: user@test.example.com
IP Address: 192.0.2.0
IP Netmask: 255.255.255.0
Logical System: default
Routing Instance: testnet
Interface: demux0.1073741826
Interface type: Static
MAC Address: 00:00:5e:00:53:04
State: Active
Radius Accounting ID: 21
Session ID: 21
Login Time: 2011-10-20 16:24:33 EST

Service Sessions: 2

Service Session ID: 25
Service Session Name: SUB-QOS
State: Active

Service Session ID: 26
Service Session Name: service-cb-content
State: Active
IPv4 Input Filter Name: content-cb-in-demux0.1073741826-in
IPv4 Output Filter Name: content-cb-out-demux0.1073741826-out

show subscribers logical-system terse

```
user@host> show subscribers logical-system test1 terse
Interface          IP Address/VLAN ID  User Name          LS:RI
demux0.1073741825  203.0.113.3         RETAILER1-CLIENT   test1:retailer1
demux0.1073741826  203.0.113.4         RETAILER2-CLIENT   test1:retailer2
```

show subscribers physical-interface count

```
user@host> show subscribers physical-interface ge-1/0/0 count
Total subscribers: 3998, Active Subscribers: 3998
```

show subscribers routing-instance inst1 count

```
user@host> show subscribers routing-instance inst1 count
Total Subscribers: 188, Active Subscribers: 183
```

show subscribers stacked-vlan-id detail

```
user@host> show subscribers stacked-vlan-id 101 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers stacked-vlan-id vlan-id detail (Combined Output)

```
user@host> show subscribers stacked-vlan-id 101 vlan-id 100 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers stacked-vlan-id vlan-id interface detail (Combined Output for a Specific Interface)

```
user@host> show subscribers stacked-vlan-id 101 vlan-id 100 interface ge-1/2/0.* detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
```

```
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers user-name detail

```
user@host> show subscribers user-name larry1 detail
Type: DHCP
User Name: larry1
IP Address: 203.0.113.37
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.1
Interface type: Static
Dynamic Profile Name: foo
MAC Address: 00:00:5e:00:53:01
State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-11-07 08:25:59 PST
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 01 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 32 2f
37 2d 30 2d 30 37 05 01 06 0f 21 2c
```

show subscribers vlan-id

```
user@host> show subscribers vlan-id 100
Interface          IP Address          User Name
ge-1/0/0.1073741824
ge-1/2/0.1073741825
```

show subscribers vlan-id detail

```
user@host> show subscribers vlan-id 100 detail
Type: VLAN
Interface: ge-1/0/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: vlan-prof-tpid
State: Active
VLAN Id: 100
Login Time: 2009-03-11 06:48:54 PDT

Type: VLAN
Interface: ge-1/2/0.1073741825
Interface type: Dynamic
Dynamic Profile Name: vlan-prof-tpid
State: Active
VLAN Id: 100
Login Time: 2009-03-11 06:48:54 PDT
```

show subscribers vpi vci extensive (PPPoE-over-ATM Subscriber Session)


```
user@host> show subscribers vpi 40 vci 50 extensive
Type: PPPoE
User Name: testuser
IP Address: 203.0.113.2
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: pp0.0
Interface type: Static
```

```
MAC Address: 00:00:5e:00:53:02
State: Active
Radius Accounting ID: 2
Session ID: 2
ATM VPI: 40
ATM VCI: 50
Login Time: 2012-12-03 07:49:26 PST
IP Address Pool: pool_1
IPv6 Framed Interface Id: 200:65ff:fe23:102
```

show subscribers address detail (Enhanced Subscriber Management)

```
user@host> show subscribers address 203.0.113.111 detail
Type: DHCP
User Name: simple_filters_service
IP Address: 203.0.113.111
IP Netmask: 255.0.0.0
Logical System: default
Routing Instance: default
Interface: demux0.3221225482
Interface type: Dynamic
Underlying Interface: demux0.3221225472
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:00:5e:00:53:0f
State: Active
Radius Accounting ID: 11
Session ID: 11
PFE Flow ID: 15
Stacked VLAN Id: 210
VLAN Id: 209
Login Time: 2014-03-24 12:53:48 PDT
Service Sessions: 1
DHCP Options: len 3
35 01 01
```

show subscribers summary

Syntax	<pre>show subscribers summary <all> <detail extensive terse> <count> <physical-interface <i>physical-interface-name</i>> <logical-system <i>logical-system</i> pic port routing-instance <i>routing-instance</i> slot></pre>
Release Information	Command introduced in Junos OS Release 10.2.
Description	Display summary information for subscribers.
Options	<p>none—Display summary information by state and client type for all subscribers.</p> <p>all—(Optional) Display summary information by state, client type, and LS:RI.</p> <p>detail extensive terse—(Not supported on MX Series routers) (Optional) Display the specified level of output.</p> <p>count—(Not supported on MX Series routers) (Optional) Display the count of total subscribers and active subscribers for any specified option.</p> <p>logical-system <i>logical-system</i>—(Optional) Display subscribers whose logical system matches the specified logical system.</p> <p>physical-interface <i>physical-interface-name</i>—(M120, M320, and MX Series routers only) (Optional) Display a count of subscribers whose physical interface matches the specified physical interface, by subscriber state, client type, and LS:RI.</p> <p>pic—(M120, M320, and MX Series routers only) (Optional) Display a count of subscribers by PIC number and the total number of subscribers.</p> <p>port—(M120, M320, and MX Series routers only) (Optional) Display a count of subscribers by port number and the total number of subscribers.</p> <p>routing-instance <i>routing-instance</i>—(Optional) Display subscribers whose routing instance matches the specified routing instance.</p> <p>slot—(M120, M320, and MX Series routers only) (Optional) Display a count of subscribers by FPC slot number and the total number of subscribers.</p>
	<div>  <p>NOTE: Due to display limitations, logical system and routing instance output values are truncated when necessary.</p> </div>
Required Privilege Level	view

Related Documentation • [show subscribers on page 1775](#)

List of Sample Output [show subscribers summary on page 1798](#)
[show subscribers summary all on page 1798](#)
[show subscribers summary physical-interface on page 1799](#)
[show subscribers summary physical-interface pic on page 1799](#)
[show subscribers summary physical-interface port on page 1799](#)
[show subscribers summary physical-interface slot on page 1800](#)
[show subscribers summary pic on page 1800](#)
[show subscribers summary pic \(Aggregated Ethernet Interfaces\) on page 1800](#)
[show subscribers summary port on page 1800](#)
[show subscribers summary port extensive on page 1800](#)
[show subscribers summary slot on page 1801](#)
[show subscribers summary terse on page 1801](#)

Output Fields [Table 152 on page 1797](#) lists the output fields for the **show subscribers summary** command. Output fields are listed in the approximate order in which they appear.

Table 152: show subscribers summary Output Fields

Field Name	Field Description	Level of Output
Subscribers by State	Number of subscribers summarized by state. The summary information includes the following: <ul style="list-style-type: none"> Init—Number of subscriber currently in the initialization state. Configured—Number of configured subscribers. Active—Number of active subscribers. Terminating—Number of subscribers currently terminating. Terminated—Number of terminated subscribers. Total—Total number of subscribers for all states. 	detail none
Subscribers by Client Type	Number of subscribers summarized by client type. Client types can include DHCP, L2TP, PPP, PPPOE, STATIC-INTERFACE, VLAN, and VLAN-OOB. Also displays the total number of subscribers for all client types (Total).	detail extensive none
Subscribers by LS:RI	Number of subscribers summarized by logical system:routing instance (LS:RI) combination. Also displays the total number of subscribers for all LS:RI combinations (Total).	detail none
Subscribers by Connection Type	Number of subscribers summarized by connection type, Cross-connected or Terminated .	extensive
Interface	Interface associated with the subscriber. The router or switch displays subscribers whose interface matches or begins with the specified interface. The * character indicates a continuation of addresses for the same session. For aggregated Ethernet interfaces, the output of the summary (pic port slot) options prefixes the interface name with ae0:.	All levels

Table 152: show subscribers summary Output Fields (*continued*)

Field Name	Field Description	Level of Output
Count	Count of subscribers displayed for each PIC, port, or slot when those options are specified with the summary option. For an aggregated Ethernet configuration, the total subscriber count does not equal the sum of the individual PIC, port, or slot counts, because each subscriber can be in more than one aggregated Ethernet link.	detail extensive none
Total Subscribers	Total number of subscribers for all physical interfaces, all PICS, all ports, or all LS:RI slots.	detail extensive none
IP Address/VLAN ID	Subscriber IP address or VLAN ID associated with the subscriber in the form <i>tpid.vlan-id</i>	terse
User Name	Name of subscriber.	terse
LS:RI	Logical system and routing instance associated with the subscriber.	terse

Sample Output

show subscribers summary

```
user@host> show subscribers summary
```

Subscribers by State

```
Init      3
Configured  2
Active    183
Terminating  2
Terminated  1
```

```
TOTAL      191
```

Subscribers by Client Type

```
DHCP      107
PPP        76
VLAN        8
VLAN-OOB    2
TOTAL      193
```

show subscribers summary all

```
user@host> show subscribers summary all
```

Subscribers by State

```
Init      3
Configured  2
Active    183
Terminating  2
Terminated  1
```

```
TOTAL      191
```

Subscribers by Client Type

```
DHCP      107
PPP        76
VLAN        8
```

```

TOTAL          191

Subscribers by LS:RI
default:default  1
default:ri1      28
default:ri2      16
ls1:default      22
ls1:riA          38
ls1:riB          44
logsysX:routinstY 42

TOTAL          191

```

show subscribers summary physical-interface

```

user@host> show subscribers summary physical-interface ge-1/0/0
Subscribers by State
  Active: 3998
  Total: 3998

Subscribers by Client Type
  DHCP: 3998
  Total: 3998

Subscribers by LS:RI
  default:default: 3998
  Total: 3998

```

show subscribers summary physical-interface pic

```

user@host> show subscribers summary physical-interface ge-0/2/0 pic
Subscribers by State
  Active: 4825
  Total: 4825

Subscribers by Client Type
  DHCP: 4825
  Total: 4825

Subscribers by LS:RI
  default:default: 4825
  Total: 4825

```

show subscribers summary physical-interface port

```

user@host> show subscribers summary physical-interface ge-0/3/0 port
Subscribers by State
  Active: 4825
  Total: 4825

Subscribers by Client Type
  DHCP: 4825
  Total: 4825

Subscribers by LS:RI
  default:default: 4825
  Total: 4825

```

show subscribers summary physical-interface slot

```
user@host> show subscribers summary physical-interface ge-2/0/0 slot
Subscribers by State
  Active: 4825
  Total: 4825

Subscribers by Client Type
  DHCP: 4825
  Total: 4825

Subscribers by LS:RI
  default:default: 4825
  Total: 4825
```

show subscribers summary pic

```
user@host> show subscribers summary pic
Interface      Count
ge-1/0         1000
ge-1/3         1000

Total Subscribers: 2000
```

show subscribers summary pic (Aggregated Ethernet Interfaces)

```
user@host> show subscribers summary pic
Interface      Count
ae0: ge-1/0    801
ae0: ge-1/3    801

Total Subscribers: 801
```

show subscribers summary port

```
user@host> show subscribers summary port
Interface      Count
ge-5/0/1       201
ge-5/0/2       301

Total Subscribers: 502
```

show subscribers summary port extensive

```
user@host> show subscribers summary port extensive
Interface: ge-5/0/1
Count: 201
Detail:
Subscribers by Client Type
  DHCP: 100
  PPPoE: 100
  VLAN-OOB: 1
Subscribers by Connection Type
  Terminated: 200
  Cross-connected: 1

Interface: ge-5/0/2
Count: 301
Detail:
Subscribers by Client Type
  DHCP: 200
```

```
PPPoE: 100
VLAN-00B: 1
Subscribers by Connection Type
Terminated: 300
Cross-connected: 1

Total Subscribers: 502
```

show subscribers summary slot

```
user@host> show subscribers summary slot
Interface          Count
ge-1                2000

Total Subscribers: 2000
```

show subscribers summary terse

```
user@host> show subscribers summary terse
Interface          IP Address/VLAN ID  User Name          LS:RI
ge-1/3/0.1073741824 100                  WHOLESALE-CLIENT default:default
demux0.1073741824   203.0.113.10        RETAILER1-CLIENT test1:retailer1
demux0.1073741825   203.0.113.13        RETAILER2-CLIENT test1:retailer2
demux0.1073741826   203.0.113.213
```

show system subscriber-management route

Syntax	<code>show system subscriber-management route</code> <code><family <i>family</i>></code> <code><incomplete></code> <code><level (brief detail)></code> <code><next-hop></code> <code><route-type <i>type</i>></code> <code><rtt-index <i>index</i>></code> <code><summary></code>
Release Information	Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Display information about how routes are mapped to specific enhanced subscriber management interfaces. You can customize the output by including one or more optional filters in the command. With the exception of the summary option, all filter options can be combined in a single command.
Options	<p>family <i>family</i>—(Optional) Display route mapping information for the specified protocol family: inet (IPv4) or inet6 (IPv6).</p> <p>incomplete—(Optional) Display route mapping information for incomplete routes that are missing elements required to add the routes to the routing table.</p> <p>level (brief detail)—(Optional) Display the specified level of output: brief or detail.</p> <p>next-hop—(Optional) Display the next hop associated with the route entry.</p> <p>route-type <i>type</i>—(Optional) Display route mapping information for the specified route type: access, access-internal, kernel, or local.</p> <p>rtt-index <i>index</i>—(Optional) Display mapping information for the specified routing table index, in the range 0 through 65535. An rtt-index value of 0 (zero) denotes routes in the default routing table managed by enhanced subscriber management.</p> <p>summary—(Optional) Display summary information about the routes managed by enhanced subscriber management.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• Verifying and Managing Junos OS Enhanced Subscriber Management on page 558
List of Sample Output	show system subscriber-management route family route-type rtt-index level brief on page 1803 show system subscriber-management route family route-type rtt-index level detail on page 1804 show system subscriber-management route family route-type rtt-index level brief on page 1805

Output Fields Table 153 on page 1803 lists the output fields for the **show system subscriber-management route** command. Output fields are listed in the approximate order in which they appear.

Table 153: show system subscriber-management route Output Fields

Field Name	Field Description	Level of Output
<i>address</i>	IPv4 or IPv6 address associated with the route entry.	All levels
Route Type	One of the following route types: <ul style="list-style-type: none"> • Access • Access-internal • Kernel • Local 	All levels
Interface	Name of the enhanced subscriber management interface associated with the route entry.	All levels
Next-hop	Next-hop associated with the route entry.	All levels
Rtt-index	Value of the routing table index. A value of 0 (zero) denotes a route in the default routing table managed by enhanced subscriber management.	detail
Bbe index	Value of the interface index for the control plane.	detail
Flow id	Value of the route object index.	detail
Reference Count	Used for internal accounting.	detail
Dirty Flags	Used for internal accounting.	detail
Flags	Used for internal accounting.	detail
Family	One of the following protocol families: <ul style="list-style-type: none"> • AF_INET—IPv4 • AF_INET6—IPv6 	detail

Sample Output

show system subscriber-management route family route-type rtt-index level brief

The following example displays abbreviated information about IPv6 access routes in the default routing table (**rtt-index 0**) managed by enhanced subscriber management.

```

user@host> show system subscriber-management route family inet6 route-type access rtt-index 0
level brief
2001:db8::/64
    Route Type: Access
    Interface: pp0.3221225479, Next-hop:721
2001:db8:0:0:1::/64
    Route Type: Access

```

```

        Interface: pp0.3221225477, Next-hop:721
2001:db8:0:0:2::/64
    Route Type: Access
        Interface: pp0.3221225478, Next-hop:721
2001:db8:0:0:3::/64
    Route Type: Access
        Interface: pp0.3221225480, Next-hop:721
2001:db8:0:0:4::/64
    Route Type: Access
        Interface: pp0.3221225481, Next-hop:721
2001:db8:2002::/84
    Route Type: Access
        Interface: demux0.3221225492, Next-hop:721
2001:db8:0:0:5::/64
    Route Type: Access
        Interface: pp0.3221225487, Next-hop:721
2001:db8:0:0:6::/64
    Route Type: Access

```

show system subscriber-management route family route-type rtt-index level detail

The following example displays detailed information about IPv6 access routes in the default routing table (**rtt-index 0**) managed by enhanced subscriber management.

```

user@host> show system subscriber-management route family inet6 route-type access rtt-index 0
level detail

```

```

2001:db8::/64
    Route Type:      Access
    Interface:       pp0.3221225479
    Next-hop:        721
    Rtt-index:       0
    Bbe index:       9
    Flow id:         1
    Reference Count: 1
    Dirty Flags:     0
    Flags:           0x10082
    Family:          AF_INET6
2001:db8:0:0:1::/64
    Route Type:      Access
    Interface:       pp0.3221225477
    Next-hop:        721
    Rtt-index:       0
    Bbe index:       9
    Flow id:         1
    Reference Count: 1
    Dirty Flags:     0
    Flags:           0x10082
    Family:          AF_INET6
2001:db8:0:0:2::/64
    Route Type:      Access
    Interface:       pp0.3221225478
    Next-hop:        721
    Rtt-index:       0
    Bbe index:       9
    Flow id:         1
    Reference Count: 1
    Dirty Flags:     0
    Flags:           0x10082
    Family:          AF_INET6
2001:db8:0:0:3::/64
    Route Type:      Access

```

```

Interface:      pp0.3221225480
Next-hop:      721
Rtt-index:     0
Bbe index:     9
Flow id:       1
Reference Count: 1
Dirty Flags:   0
Flags:         0x10082
Family:        AF_INET6

```

show system subscriber-management route family route-type rtt-index level brief

The following example displays abbreviated information about IPv6 access routes in the default routing table (**rtt-index 0**) managed by enhanced subscriber management.

```

user@host> show system subscriber-management route family inet6 route-type access rtt-index 0
level brief

```

```

2000::/64
    Route Type: Access
    Interface: pp0.3221225479, Next-hop:721
2001:db8:0:0:1::/64
    Route Type: Access
    Interface: pp0.3221225477, Next-hop:721
2001:db8:0:0:2::/64
    Route Type: Access
    Interface: pp0.3221225478, Next-hop:721
2001:db8:0:0:3::/64
    Route Type: Access
    Interface: pp0.3221225480, Next-hop:721
2001:db8:0:0:4::/64
    Route Type: Access
    Interface: pp0.3221225481, Next-hop:721
2001:db8:2002::/84
    Route Type: Access
    Interface: demux0.3221225492, Next-hop:721
2001:db8:0:0:5::/64
    Route Type: Access
    Interface: pp0.3221225487, Next-hop:721
2001:db8:0:0:6::/64
    Route Type: Access

```

show system subscriber-management statistics

Syntax	show system subscriber-management statistics <all> <dhcp> <pppoe>
Release Information	Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management. Enhanced I/O Statistics introduced as part of Extensive output in Junos OS Release 15.1R4 on MX Series routers for enhanced subscriber management.
Description	Display statistics for the specified option. You can customize the output by including one or more optional filters in the command. With the exception of the extensive option, all filter options can be combined in a single command.
Options	all —(Optional) Display packet statistics for all protocol.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> <i>Understanding Dropped Packets and Untransmitted Traffic Using show Commands</i>
List of Sample Output	show system subscriber-management statistics all on page 1807 show system subscriber-management statistics pppoe on page 1808 show system subscriber-management statistics dhcp on page 1808 show system subscriber-management statistics dhcp extensive on page 1809 show system subscriber-management statistics extensive on page 1810
Output Fields	Table 153 on page 1803 lists the output fields for the show system subscriber-management statistics command. Output fields are listed in the approximate order in which they appear.

Table 154: show system subscriber-management statistics Output Fields

Field Name	Field Description
Rx Statistics	Statistics for packets received.
Tx Statistics	Statistics for packets sent.
Enhanced I/O Statistics	Statistics for visibility into packet drops from the queue.
Error Statistics	Includes connection packets, flow control, and messages and packets sent to and received from the daemon.
ERA discards	Event Rate Analyzer discards. For DHCP and PPPoE in advanced subscriber management, ERA packet discard counts are included for Discover, Solicit, and PADI packets .

Table 154: show system subscriber-management statistics Output Fields (*continued*)

Field Name	Field Description
padis	PPPoE Active Discovery Initiation (PADI) packets. PADI is the first step in the PPPoE establishment protocol.
padrs	PPPoE Active Discovery Request packets.
ppp	Point-to-Point Protocol packets.
router solicitations	Number of router solicitations sent or received. Router solicitations are sent to prompt all on-link routers to send it router advertisements.
router advertisements	Number of router advertisements sent or received.
route solicit response packet	Number of router solicitation responses sent or received.

Sample Output

The following examples displays packet statistics accumulated for DHCP and PPPoE since the last time the session manager was cleared.

show system subscriber-management statistics all

```

user@host> show system subscriber-management statistics all
user@host> show system subscriber-management statistics all
Session Manager started @ Tue Nov  3 10:00:57 2015
Session Manager cleared @ Tue Nov  3 11:10:01 2015
-----
                        Packet Statistics
-----
I/O Statistics:
-----
    Rx Statistics
      packets                : 784711
    Tx Statistics
      packets                : 7013122
  Layer 3 Statistics
    Rx Statistics
      packets                : 356218
    Tx Statistics
      packets                : 6604660

DHCP Statistics:
-----
    Rx Statistics
      packets                : 320008
      ERA discards           : 6274
    Tx Statistics
      transmit request packets : 320482
      sent packets            : 320482
  Error Statistics
  Connection Statistics
    no connection packets    : 0

```

PPPoE Statistics:

```
-----  
Rx Statistics  
  packets           : 486165  
  padis             : 36768  
  padrs             : 35421  
  ppp packets       : 341787  
  ERA discards      : 8249  
Tx Statistics  
  packets           : 70842  
  send failures     : 6240
```

show system subscriber-management statistics pppoe

```
user@host> show system subscriber-management statistics pppoe  
Session Manager started @ Tue Nov  3 10:00:57 2015  
Session Manager cleared @ Tue Nov  3 11:10:01 2015  
-----
```

Packet Statistics

I/O Statistics:

```
-----  
Rx Statistics  
  packets           : 784711  
Tx Statistics  
  packets           : 7013122  
Layer 3 Statistics  
  Rx Statistics  
    packets         : 356218  
  Tx Statistics  
    packets         : 6604660
```

PPPoE Statistics:

```
-----  
Rx Statistics  
  packets           : 486165  
  padis             : 36768  
  padrs             : 35421  
  ppp packets       : 341787  
  ERA discards      : 8249  
Tx Statistics  
  packets           : 70842  
  send failures     : 6240
```

show system subscriber-management statistics dhcp

```
user@host> show system subscriber-management statistics dhcp  
Session Manager started @ Tue Nov  3 10:00:57 2015  
Session Manager cleared @ Tue Nov  3 11:10:01 2015  
-----
```

Packet Statistics

I/O Statistics:

```
-----  
Rx Statistics  
  packets           : 784711  
Tx Statistics  
  packets           : 7013122  
Layer 3 Statistics  
  Rx Statistics
```

```

        packets                : 356218
Tx Statistics
        packets                : 6604660

```

DHCP Statistics:

```

-----
Rx Statistics
    packets                : 320008
    ERA discards           : 6274
Tx Statistics
    transmit request packets : 320482
    sent packets           : 320482
Error Statistics
Connection Statistics
    no connection packets   : 0

```

show system subscriber-management statistics dhcp extensive

```

user@host> show system subscriber-management statistics dhcp extensive
Session Manager started @ Tue Nov  3 10:00:57 2015
Session Manager cleared @ Tue Nov  3 11:10:01 2015

```

Packet Statistics

I/O Statistics:

```

-----
Rx Statistics
    packets                : 784711
Tx Statistics
    packets                : 7013122
Buffer Statistics
    allocations            : 7032618
    frees                  : 7032624
    allocation failures     : 0
Layer 3 Statistics
    Rx Statistics
        packets            : 356218
    Tx Statistics
        packets            : 6604660
PFE Event Statistics
    packets                : 0

```

DHCP Statistics:

```

-----
Rx Statistics
    packets                : 320008
    ERA discards           : 6274
Tx Statistics
    transmit request packets : 320482
    sent packets           : 320482
DHCPv4 Rx Statistics
    total packets          : 0
DHCPv4 Tx Statistics
    total packets          : 0
DHCPv6 Rx Statistics
    total packets          : 320008
    solicit                 : 36250
    request                 : 36382
    renew                   : 247376
    ERA discards            : 6274

```

```

DHCPv6 Tx Statistics
  total packets           : 320482
  advertise                : 36382
  reply                   : 284100
Error Statistics
Connection Statistics
  no connection packets   : 0
  connection down events  : 0
  connection up events    : 0
  flow control invoked    : 0
  flow control released   : 0
  packets sent to daemon  : 320008
  packets received from daemon : 320482
  messages sent to daemon : 0
  messages received from daemon : 0
  notifies while not connected : 0

```

NET Statistics:

```

-----
ICMP6 Statistics
Rx Statistics
  packets:                : 36271
  router solicitations    : 36271
Tx Statistics
  packets:                : 6284178
  router advertisements   : 6284178
  route solicit response packet : 36271

```

Management Statistics:

```

-----
dvlan                     : 33912
dvlan adds                : 33912
pppoe                     : 143651
pppoe add                 : 35750
pppoe changes             : 107901
ip flow                   : 143633
ip flow add               : 107883

```

Management Config Status:

```

-----
gres state enabled state  : 1
shmlog disabled state    : 0
Rx Statistics
  packets                 : 167361
  ERA discards            : 15116
Tx Statistics
  transmit request packets : 150903
  sent packets             : 150903
DHCPv4 Rx Statistics
  total packets           : 167361
  discover                : 91910
  request                 : 75451
  ERA discards            : 15116

```

show system subscriber-management statistics extensive

```

user@host> show system subscriber-management statistics extensive
Session Manager started @ Tue Nov  3 10:00:57 2015
Session Manager cleared @ Tue Nov  3 11:10:01 2015

```

Packet Statistics

I/O Statistics:

Rx Statistics	
packets	: 784711
Tx Statistics	
packets	: 7013122
Buffer Statistics	
allocations	: 7032618
frees	: 7032624
allocation failures	: 0
Layer 3 Statistics	
Rx Statistics	
packets	: 356218
Tx Statistics	
packets	: 6604660
PFE Event Statistics	
packets	: 0

Enhanced I/O Statistics:

bbe_io_rcv l2	: 0
bbe_io_rcv l3	: 0
bbe_io_rcv l3 v4	: 0
io low queue drops	:12
io mlow queue drops	:0
io medium queue drops	:0
io high queue drops	:0

show system subscriber-management summary

Syntax	show system subscriber-management summary
Release Information	Command introduced in Junos OS Release 11.1. Command introduced in Junos OS Release 15.1R3 on MX Series routers for enhanced subscriber management.
Description	Display complete subscriber management database summary information.
Options	none—This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show database-replication statistics on page 1580 • show database-replication summary on page 1582
List of Sample Output	show system subscriber-management summary on page 1813 show system subscriber-management summary (Enhanced Subscriber Management) on page 1814
Output Fields	Table 155 on page 1812 lists the output fields for the show system subscriber-management summary command. Output fields are listed in the approximate order in which they appear.

Table 155: show system subscriber-management summary Output Fields

Field Name	Field Description
Graceful Restart	State of graceful Routing Engine switchover (GRES): <ul style="list-style-type: none"> • Enabled • Disabled (Enhanced subscriber management for MX Series routers) The name of this field is Graceful Switchover .
Mastership	State of the Routing Engine: <ul style="list-style-type: none"> • Master • Standby
Database	State of the subscriber management database: <ul style="list-style-type: none"> • Available • Init • Not-available

Table 155: show system subscriber-management summary Output Fields (continued)

Field Name	Field Description
Standby	<p>(Enhanced subscriber management for MX Series routers) State of the standby Routing Engine:</p> <ul style="list-style-type: none"> • Connected—Connected but not synchronized • Disconnected—Not connected • Resync (nn%)—Connected and <i>nn</i> percent synchronized with the master Routing Engine • Synchronized—Synchronized with the master Routing Engine
Chassisd ISSU State	<p>State of unified ISSU chassis daemon:</p> <ul style="list-style-type: none"> • ABORT • DAEMON_ISSU_PREPARE • DAEMON_ISSU_PREPARE_DONE • DAEMON_SWITCHOVER_PREPARE • DAEMON_SWITCHOVER_PREPARE_DONE • FRU_ISSU • FRU_ISSU_DONE • IDLE • UNKNOWN
ISSU State	<p>State of unified ISSU aggregate daemon:</p> <ul style="list-style-type: none"> • ABORT • IDLE • PREPARE • READY • SWITCHOVER_PREPARE • SWITCHOVER_READY • UNKNOWN
ISSU Wait	<p>Amount of time, in seconds, requested by a daemon to perform cleanup. If multiple daemons request time, the displayed value is the highest wait time requested by a daemon.</p>

Sample Output

show system subscriber-management summary

```

user@host> show system subscriber-management summary
General:
Graceful Restart      Enabled
Mastership            Master
Database              Available
Chassisd ISSU State   DAEMON_ISSU_PREPARE
ISSU State            PREPARE
ISSU Wait             198

```

show system subscriber-management summary (Enhanced Subscriber Management)

```
user@host> show system subscriber-management summary
General:
  Graceful Switchover      Enabled
  Mastership               Master
  Database                 Available
  Standby                  Resync (75%)
  Chassisd ISSU State      IDLE
  ISSU State               IDLE
  ISSU Wait                0
```

test aaa authd-lite user

Syntax	<code>test aaa authd-lite user <i>username</i> password <i>password</i> profile <i>access-profile-name</i> <port <i>nas-port</i>> <zero-stats></code>
Release Information	Command introduced in Junos OS Release 11.2.
Description	Verify authd-lite subscriber access authentication, accounting, and address allocation configuration.
Options	<p><i>username</i>—Specify the subscriber username to test.</p> <p><i>password password</i>—Specify the password associated with the username.</p> <p><i>profile access-profile-name</i>—Specify the access profile associated with the subscriber.</p> <p><i>port nas-port</i>—(Optional) Specify the NAS port used for the test.</p> <p><i>zero-stats</i>—(Optional) Specify that no accounting statistics are set for this test.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Testing a Subscriber AAA Configuration on page 815
List of Sample Output	test aaa authd-lite user on page 1816
Output Fields	<p>When you enter this command, you are provided feedback on the status of your request. For information about output fields related to authentication, accounting, and subscriber-specific information, see the show network-access aaa statistics, show network-access aaa statistics authentication, show network-access aaa subscribers, and show subscribers commands.</p> <p>The test command does not support volume-time accounting. If volume-time accounting is configured for the test subscriber, the test command replaces the statistics with time-only accounting statistics.</p> <p>Attributes not supported by Junos OS no longer appear in the output.</p> <p>Supported attributes now always appear in the display, even when their values are not set.</p> <p>The value for any attribute that is not received (except for 26-1) is displayed as <not set>.</p> <p>The Chargeable user identity value has changed from an integer to a string.</p> <p>The Virtual Router Name and Routing Instance fields have been combined into the new Virtual Router Name (LS:RI) field. The value of this field matches the Juniper Networks Virtual-Router VSA (26-1), if present; otherwise the field displays default:default.</p> <p>The IGMP field has been renamed to IGMP Enable.</p>

The IGMP Immediate Leave and the MLD Immediate Leave default values have changed from disabled to **<not set>**.

The Max Clients Per Interface field has been fixed so that it reads from the correct value source in authd-lite.

Sample Output

test aaa authd-lite user

The following example tests the configuration for authd-lite subscriber user1bt with a password of \$ABC123 and an access profile of employee12, and displays the resulting output:

```
user@host> test aaa authd-lite user user1bt password $ABC123 profile employee12
```

```
Authentication Grant
*****User Attributes*****
User Name - user1bt
Framed IPv6 Prefix - ::/0
Framed IPv6 Pool - NULL
Nas IPv6 Address - ::
NDRA IPv6 Prefix - NULL
Login IPv6 Host - ::
Framed Interface Id - 0:0:0:0
Delegated IPv6 Prefix - ::/0
NDRA IPv6 Pool - NULL
User Password - $ABC123
Nas Ip Address - 0.0.0.0
NAS Port - 0
Service Type- 0
Framed IP Address - 0.0.0.0
Framed IP Netmask - 0.0.0.0
Filter Id - NULL
Framed MTU - 0
Reply Message - NULL
Framed Route- <not set>
Framed MTU - 0
Class - SBR2CL
Virtual Router Name (LS:RI) default:default
Primary DNS IP Address - 0.0.0.0
Secondary DNS IP Address - 0.0.0.0
Primary WINS IP Address - 0.0.0.0
Secondary WINS IP Address - 0.0.0.0
Ingress Statistics - disabled
Egress Statistics - disabled
Ingress Policy Name - <not set>
Engress Policy Name - <not set>
IGMP Enable - disabled
Redirect VR Name (LS:RI) default:default
Service Bundle <not set>
Framed Ip Route Tag <not set>
LI Action 0
LI Interception Identifier 0
LI Mediation Device IP Address 0.0.0.0
LI_Mediation_Device_Port_Number 0
Activate Service NULL
Deactivate Service NULL
Service Statistics 0
Ignore_DF_Bit - disabled
```

IGMP Access Group Name	<not set>
IGMP Access Source Group_Name -	<not set>
MLD Access Group Name	<not set>
MLD Access Source Group Name	<not set>
MLD Version -	MLD Version not set
IGMP Version	IGMP Version not set
IGMP Immediate Leave -	<not set>
MLD Immediate Leave -	<not set>
IPv6_Ingress_Policy_Name -	<not set>
IPv6_Egress_Policy_Name -	<not set>
Cos_Parameter_Type -	<not set>
Service Interim Acct Interval	0
Max Clients Per Interface	0
Cos_Scheduler_Pmt_Type	<not set>
Session Timeout	599999940
NAS Port Type	0
Framed Pool	NULL
Idle Timeout	0
Acct-start sent	
Acct-start succeeded	
Pausing 10 seconds	
Interim-Acct sent	
Acct-interim succeeded	
Pausing 10 seconds	
Acct-stop sent	
Acct-stop succeeded	
Logging out subscriber	
Test complete. Exiting	

test aaa dhcp user

Syntax `test aaa dhcp user username`
 `<agent-remote-id ari>`
 `<logical-system logical-system-name>`
 `<mac-address mac-address>`
 `<no-address-request>`
 `<option-82 option-82>`
 `<password password>`
 `<profile access-profile-name>`
 `<routing-instance routing-instance-name>`
 `<service-type service-type>`
 `<source-address source-address>`
 `<terminate-code code-value>`

Release Information Command introduced in Junos OS Release 11.2.
 Option **terminate-code** added in Junos OS Release 11.4.
 Option **agent-remote-id** added in Junos OS Release 14.1.
 Options **no-address-request** and **service-type** added in Junos OS Release 16.1.

Description Verify Dynamic Host Configuration Protocol (DHCP) subscriber access authentication, accounting, and address allocation configuration by creating a test pseudo session.

Options ***username***—Subscriber username to test.

agent-remote-id ari—(Optional) Value of the DSL Forum Agent-Remote-Id (VSA 26–2).

logical-system logical-system-name—(Optional) Logical system in which the subscriber is authenticated. This is the logical system in the AAA LS:RI context for the subscriber. This context differs from the subscriber context, which is the LS:RI in which the subscriber is placed, by either the Virtual-Router VSA (26-1) or the Redirect-VRouter-Name VSA (26–25).

mac-address mac-address—(Optional) MAC address of the DHCP client.

no-address-request—(Optional) Prevents the test from failing when no user IP address is allocated. For example, for Layer 2 VLAN-OOB subscribers, the subscriber address is provided by means the RADIUS Client-Profile-Name VSA (26-174) rather than a direct allocation.

option-82 option-82—(Optional) DHCP relay agent information option (option-82) value.

password password—(Optional) Password associated with the username.

profile access-profile-name—(Optional) Access profile associated with the subscriber.

routing-instance routing-instance-name—(Optional) Routing instance in which the subscriber is authenticated. This is the routing instance in the AAA LS:RI context for the subscriber. This context differs from the subscriber context, which is the LS:RI in which the subscriber is placed, by either the Virtual-Router VSA (26-1) or the Redirect-VRouter-Name VSA (26–25). In the case of VSA 26–25, the subscriber is re-authenticated in the subscriber context.

service-type *service-type*—(Optional) Value of the Service Type RADIUS attribute [6] that is associated with the test user; either a number in the range 1 through 255 or one of the following strings that corresponds to an RFC-defined service type; the numbers are the values that are carried in the RADIUS attribute to specify the service:

administrative (6)	callback-nas-prompt (9)
authenticate-only (8)	framed (2)
call-check (10)	login (1)
callback-admin (11)	nas-prompt (7)
callback-framed (4)	outbound (5)
callback-login (3)	—

source-address *source-address*—(Optional) IP address of the outgoing interface.

terminate-code *code-value*—(Optional) Code associated with the subscriber termination.

Required Privilege Level

view

Related Documentation

- [Testing a Subscriber AAA Configuration on page 815](#)

List of Sample Output

[test aaa dhcp user on page 1820](#)

Output Fields

When you enter this command, you are provided feedback on the status of your request. For information about output fields related to authentication, accounting, and subscriber-specific information, see the [show network-access aaa statistics](#), [show network-access aaa statistics authentication](#), [show network-access aaa subscribers](#), and [show subscribers](#) commands.

The **test** command does not support volume-time accounting. If volume-time accounting is configured for the test subscriber, the **test** command replaces the statistics with time-only accounting statistics.

Attributes not supported by Junos OS no longer appear in the output.

Supported attributes now always appear in the display, even when their values are not set.

The value for any attribute that is not received (except for 26-1) is displayed as **<not set>**.

The Chargeable user identity value has changed from an integer to a string.

The Virtual Router Name and Routing Instance fields have been combined into the new Virtual Router Name (LS:RI) field. The value of this field matches the Juniper Networks Virtual-Router VSA (26-1), if present; otherwise the field displays default:default.

The IGMP field has been renamed to IGMP Enable.

The IGMP Immediate Leave and the MLD Immediate Leave default values have changed from disabled to **<not set>**.

The Virtual Router Name field has been added to the display for the DHCP client.

Sample Output

test aaa dhcp user

The following example tests the configuration for DHCP subscriber user1DB and password \$ABC123, and displays the resulting output:

```
user@host> test aaa dhcp user user1DB@test.net password $ABC123
Authentication Grant
*****User Attributes*****
      User Name -                               user1DB@test.net
      Client IP Address -                       192.168.1.1
      Client IP Netmask -                       255.255.0.0
      Virtual Router Name (LS:RI)-              default:default

      Agent Remote Id -                         NULL
      Reply Message -                           NULL
      Primary DNS IP Address -                   0.0.0.0
      Secondary DNS IP Address -                 0.0.0.0
      Primary WINS IP Address -                 0.0.0.0
      Secondary WINS IP Address -               0.0.0.0
      Primary DNS IPv6 Address -                ::
      Secondary DNS IPv6 Address -              ::
      Framed Pool -                             <not set>
      Service Type -                            0
      DHCP Guided Relay Server -                0
      Class Attribute -                         TEST
      Client IPv6 Address -                     ::
      Client IPv6 Mask -                       null
      Framed IPv6 Prefix -                      ::/0
      Framed IPv6 Pool -                       <not-set>
      NDRA IPv6 Prefix -                       <not-set>
      Login IPv6 Host -                        ::
      Framed Interface Id -                     0:0:0:0
      Delegated IPv6 Prefix -                   ::/0
      Delegated IPv6 Pool -                    <not-set>
      User Password -                          $ABC123
      CHAP Password -                          NULL
      Mac Address -                            00:00:5E:00:53:ab
      Idle Timeout -                           600
      Session Timeout -                        6000
      Service Name (1) -                       cos-service(video_sch, nc_sch)

      Service Statistics (1) -                  1
      Service Acct Interim (1) -                600
      Service Activation Type (1) -             1
      Service Name (2) -                       filter-service(in_filter,
out_filter)
      Service Statistics (2) -                  2
      Service Acct Interim (2) -                900
      Service Activation Type (2) -             1
      Cos shaping rate -                       100m
      Filter Id -                              <not set>
```

```

Framed MTU - (null)
Framed Route - <not set>
Ingress Policy Name - <not set>
Egress Policy Name - <not set>
IGMP Enable - disabled
Redirect VR Name (LS:RI)- default:default
Service Bundle - Null
Framed Ip Route Tag - <not set>
Ignore DF Bit - disabled
IGMP Access Group Name - <not set>
IGMP Access Source Group Name - <not set>
MLD Access Group Name - <not set>
MLD Access Source Group Name - <not set>
IGMP Version - <not set>
MLD Version - <not set>
IGMP Immediate Leave - <not set>
MLD Immediate Leave - <not set>
IPv6 Ingress Policy Name - <not set>
IPv6 Egress Policy Name - <not set>
Dynamic Profile - <not set>
Acct Session ID - 1
Acct Interim Interval - 750
Acct Type - 1
Ingress Statistics - disabled
Egress Statistics - disabled
Chargeable user identity - 0
NAS Port Id - -0/0/0.0
NAS Port - 4095
NAS Port Type - 15
Framed Protocol - 1
IPv4 ADF Rule - 010100
IPv4 ADF Rule - 010101
IPv6 ADF Rule - 030100
IPv6 ADF Rule - 030101
****Pausing 10 seconds before disconnecting the test user*****
Logging out subscriber
  Terminate Id - <not set>
Test complete. Exiting

```

test aaa ppp user

Syntax `test aaa ppp user username`
 `<agent-remote-id ari>`
 `<logical-system logical-system-name>`
 `<no-address-request>`
 `<password password>`
 `<profile access-profile-name>`
 `<routing-instance routing-instance-name>`
 `<service-type service-type>`
 `<terminate-code code-value>`

Release Information Command introduced in Junos OS Release 11.2.
 Option **terminate-code** added in Junos OS Release 11.4.
 Option **agent-remote-id** added in Junos OS Release 14.1.
 Options **no-address-request** and **service-type** added in Junos OS Release 16.1.

Description Verify Point-to-Point Protocol (PPP) subscriber access authentication, accounting, and address allocation configuration by creating a test pseudo session.

Options ***username***—Subscriber username to test.

agent-remote-id ari—(Optional) Value of the DSL Forum Agent-Remote-Id (VSA 26–2).

logical-system logical-system-name—(Optional) Logical system in which the subscriber is authenticated. This is the logical system in the AAA LS:RI context for the subscriber. This context differs from the subscriber context, which is the LS:RI in which the subscriber is placed, by either the Virtual-Router VSA (26-1) or the Redirect-VRouter-Name VSA (26–25).

no-address-request—(Optional) Prevents the test from failing when no user IP address is allocated. For example, for Layer 2 VLAN-OOB subscribers, the subscriber address is provided by means the RADIUS Client-Profile-Name VSA (26-174) rather than a direct allocation.

password password—(Optional) Password associated with the username.

profile access-profile-name—(Optional) Access profile associated with the subscriber.

routing-instance routing-instance-name—(Optional) Routing instance in which the subscriber is authenticated. This is the routing instance in the AAA LS:RI context for the subscriber. This context differs from the subscriber context, which is the LS:RI in which the subscriber is placed, by either the Virtual-Router VSA (26-1) or the Redirect-VRouter-Name VSA (26–25). In the case of VSA 26-25, the subscriber is re-authenticated in the subscriber context.

service-type service-type—(Optional) Value of the Service Type RADIUS attribute [6] that is associated with the test user; either a number in the range 1 through 255 or

one of the following strings that corresponds to an RFC-defined service type; the numbers are the values that are carried in the RADIUS attribute to specify the service:

administrative (6)	callback-nas-prompt (9)
authenticate-only (8)	framed (2)
call-check (10)	login (1)
callback-admin (11)	nas-prompt (7)
callback-framed (4)	outbound (5)
callback-login (3)	–

terminate-code *code-value*—(Optional) Code associated with the subscriber termination.

Required Privilege Level

view

Related Documentation

- [Testing a Subscriber AAA Configuration on page 815](#)

List of Sample Output

[test aaa ppp user on page 1824](#)
[test aaa ppp user \(tunneled user\) on page 1825](#)
[test aaa ppp user \(authentication failure\) on page 1825](#)

Output Fields

When you enter this command, you are provided feedback on the status of your request. For information about output fields related to authentication, accounting, and subscriber-specific information, see the [show network-access aaa statistics](#), [show network-access aaa statistics authentication](#), [show network-access aaa subscribers](#), and [show subscribers](#) commands.

The **test** command does not support volume-time accounting. If volume-time accounting is configured for the test subscriber, the **test** command replaces the statistics with time-only accounting statistics.

Attributes not supported by Junos OS no longer appear in the output.

Supported attributes now always appear in the display, even when their values are not set.

The value for any attribute that is not received (except for 26-1) is displayed as **<not set>**.

The Chargeable user identity value has changed from an integer to a string.

The Virtual Router Name and Routing Instance fields have been combined into the new Virtual Router Name (LS:RI) field. The value of this field matches the Juniper Networks Virtual-Router VSA (26-1), if present; otherwise the field displays default:default.

The IGMP field has been renamed to IGMP Enable.

The IGMP Immediate Leave and the MLD Immediate Leave default values have changed from disabled to **<not set>**.

Sample Output

test aaa ppp user

The following example tests the configuration for PPP subscriber user98BEDC and password \$ABC123, and displays the resulting output:

```
user@host> test aaa ppp user user98BEDC@test.net password $ABC123
Authentication Grant
*****User Attributes*****
    User Name - user98BEDC@test.net
    Client IP Address - 192.168.1.1
    Client IP Netmask - 255.255.0.0
    Virtual Router Name (LS:RI) - default:default
    Agent Remote Id - NULL
    Reply Message - NULL
    Primary DNS IP Address - 0.0.0.0
    Secondary DNS IP Address - 0.0.0.0
    Primary WINS IP Address - 0.0.0.0
    Secondary WINS IP Address - 0.0.0.0
    Primary DNS IPv6 Address - ::
    Secondary DNS IPv6 Address - ::
    Framed Pool - <not set>
    Class Attribute - TEST
    Service Type - 0
    Client IPv6 Address - ::
    Client IPv6 Mask - null
    Framed IPv6 Prefix - ::/0
    Framed IPv6 Pool - <not-set>
    NDRA IPv6 Prefix - <not-set>
    Login IPv6 Host - ::
    Framed Interface Id - 0:0:0:0
    Delegated IPv6 Prefix - ::/0
    Delegated IPv6 Pool - <not-set>
    User Password - $ABC123
    CHAP Password - NULL
    Mac Address - 00:00:5E:00:53:ab
    Idle Timeout - 600
    Session Timeout - 6000
    Service Name (1) - cos-service(video_sch, nc_sch)

    Service Statistics (1) - 1
    Service Acct Interim (1) - 600
    Service Activation Type (1) - 1
    Service Name (2) - filter-service(in_filter,
out_filter)
    Service Statistics (2) - 2
    Service Acct Interim (2) - 900
    Service Activation Type (2) - 1
    Cos shaping rate - 100m
    Filter Id - <not set>
    Framed MTU - (null)
    Framed Route - <not set>
    Ingress Policy Name - <not set>
    Egress Policy Name - <not set>
    IGMP Enable - disabled
    Redirect VR Name (LS:RI) - default
```

```

Service Bundle - Null
Framed Ip Route Tag - <not set>
Ignore DF Bit - disabled
IGMP Access Group Name - <not set>
IGMP Access Source Group Name - <not set>
MLD Access Group Name - <not set>
MLD Access Source Group Name - <not set>
IGMP Version - <not set>
MLD Version - <not set>
IGMP Immediate Leave - <not set>
MLD Immediate Leave - <not set>
IPv6 Ingress Policy Name - <not set>
IPv6 Egress Policy Name - <not set>
Dynamic Profile - <not set>
Acct Session ID - 1
Acct Interim Interval - 750
Acct Type - 1
Chargeable user identity - 0
NAS Port Id - -0/0/0.0
NAS Port - 4095
NAS Port Type - 15
Framed Protocol - 1
IPv4 ADF Rule - 010100
IPv4 ADF Rule - 010101
IPv6 ADF Rule - 030100
IPv6 ADF Rule - 030101
****Pausing 10 seconds before disconnecting the test user*****
Logging out subscriber
Terminate Id - <not set>
Test complete. Exiting

```

test aaa ppp user (tunneled user)

The following example tests the configuration for PPP tunneled subscriber accounting14, with password \$ABC123 and access profile finance-b, and displays the resulting output:

```

user@host> test aaa ppp user accounting14 password $ABC123 14 profile finance-b
Authentication Grant with Tunnel Attributes
*****Tunnel Attributes*****
****Tunnel Definiton - 1
Tunnel Medium - 1
Tunnel Type - 3
Tunnel Max Sessions - 100
Tunnel Server Endpoint - 192.0.2.4
Tunnel Client Endpoint - 198.51.100.5
Tunnel Server AuthId - rt1
Tunnel Client AuthId - ts1
Tunnel Password - radius
Tunnel Assignment Id - til
Tunnel Logical System -
Tunnel Routing Instance -
****Pausing 10 seconds before disconnecting the test user*****
Logging out subscriber
Terminate Id - 12tp
session-receive-cdn-avp-bad-hidden
Test complete. Exiting

```

test aaa ppp user (authentication failure)

The following example shows sample output when the authentication grant fails due to an invalid password:

```
user@host>test aaa ppp user user45@test.net password 55N33%%56
```

```
Authentication Deny
```

```
Reason : Access Denied
```

```
Received Attributes :
```

```

  User Name - user45@test.net
  Client IP Address - 0.0.0.0
  Client IP Netmask - 0.0.0.0
  Virtual Router Name (LS:RI)- default
  Agent Remote Id - NULL
  Reply Message - NULL
  Primary DNS IP Address - 0.0.0.0
  Secondary DNS IP Address - 0.0.0.0
  Primary WINS IP Address - 0.0.0.0
  Secondary WINS IP Address - 0.0.0.0
  Primary DNS IPv6 Address - ::
  Secondary DNS IPv6 Address - ::
  Framed Pool - not set
  Class Attribute - not set
  Service Type - 0
  Client IPv6 Address - ::
  Client IPv6 Mask - null
  Framed IPv6 Prefix - ::/0
  Framed IPv6 Pool - not-set
  NDRA IPv6 Prefix - not-set
  Login IPv6 Host - ::
  Framed Interface Id - 0:0:0:0
  Delegated IPv6 Prefix - ::/0
  Delegated IPv6 Pool - not-set
  User Password - 55N33%%56
  CHAP Password - NULL
  Mac Address - 00:00:5E:00:53:ab
  Filter Id - not set
  Framed MTU - (null)
  Framed Route - not set
  Ingress Policy Name - not set
  Egress Policy Name - not set
  IGMP Enable- disabled
  Redirect VR Name (LS:RI)- default
  Service Bundle - Null
  Framed Ip Route Tag - not set
  Ignore DF Bit - disabled
  IGMP Access Group Name - not set
  IGMP Access Source Group Name - not set
  MLD Access Group Name - not set
  MLD Access Source Group Name - not set
  IGMP Version - not set
  MLD Version - not set
  IGMP Immediate Leave - not set
  MLD Immediate Leave - not set
  IPv6 Ingress Policy Name - not set
  IPv6 Egress Policy Name - not set
  Acct Session ID - 12
  Acct Interim Interval - 0
  Acct Type - 0
Chargeable user identity - 0
  NAS Port Id - -0/0/0.0
  NAS Port - 4095
  NAS Port Type - 15
  Framed Protocol - 0
Test complete. Exiting
```


PART 12

Index

- [Index on page 1831](#)

Index

Symbols

#, comments in configuration statements.....	I
\$junos-subscriber-ipv6-multi-address predefined variable.....	395
(), in syntax descriptions.....	I
3GPP	
Policy and Charging Control.....	715
3GPP Gx	
Gx-Plus and.....	703
< >, in syntax descriptions.....	I
[], in configuration statements.....	I
{ }, in configuration statements.....	I
(pipe), in syntax descriptions.....	I

A

AAA	
ANCP interactions.....	663
configuration testing.....	815
RADIUS accounting	
Acct-On reponse state.....	1584, 1682
radius servers	
displaying.....	1683
subscriber sessions	
displaying.....	1708
subscriber statistics	
clearing.....	1467, 1469
displaying.....	1690, 1699, 1703
subscribers	
displaying.....	1705
logging out.....	1469
with Diameter base protocol.....	679
AAA access messages	
supported attributes.....	33
AAA accounting messages	
supported attributes.....	39
AAA directed logout	
DHCP authentication services.....	271
AAA logical system/routing instance	
domain map.....	167

AAA Service Framework.....	3
dynamic service activation	
during login.....	176
aaa-logical-system statement	
domain map.....	904
aaa-routing-instance statement	
domain map.....	905
abated-utilization statement	
address-assignment pools.....	906
abated-utilization-v6 statement	
address-assignment pools.....	906
accept-max-tcp-connections statement.....	907
access loop circuit identifier	
ANCP.....	609
configuring ANCP	626
access profile	
configuring global static subscriber.....	775
configuring static subscriber group.....	780
domain map.....	164
session options.....	131
access profile statements	
access-profile-name.....	912
accounting-backup-options.....	914
ancp-speed-change-immediate-update.....	936
duplication-vrf.....	1040
max-pending-accounting-stops.....	1157
max-withhold-time.....	1157
session-options.....	1338
update-interval.....	1402
vrf-name.....	1431
access profiles	
attaching.....	124
configuring.....	123
DHCP attachment.....	320
overview.....	319
interface support	
overview.....	319
access-identifier statement	
ANCP.....	907
access-loop-id-local statement.....	908
access-profile.....	910
access-profile statement	
domain map.....	910
routing instances.....	909
static subscribers.....	911
access-profile statements	
accounting.....	913
access-profile-name statement	
duplicate accounting.....	912

accounting		DHCP attributes.....	243
configuring RADIUS.....	90	mapping option 82.....	243
duplicate report filters.....	98, 99	setting the grace period.....	243
duplicate reports.....	97	setting the maximum lease time.....	243
opaque DHCP options.....	143	setting the name server address.....	243
accounting methods.....	90	specifying NetBIOS node type.....	243
accounting statement		specifying router addresses.....	243
access profile.....	913	specifying the boot file	243
service accounting.....	914	specifying the boot server	243
accounting statistics.....	95	specifying the DNS server IPv6	
per-service accounting.....	95	address.....	243
subscriber service session.....	106, 107	specifying the domain name to	
subscriber session.....	104	search.....	243
accounting-backup-options statement		specifying the SIP server domain	
RADIUS accounting.....	914	name.....	243
accounting-order statement		specifying the SIP server IPv6	
service accounting.....	915	address.....	243
accounting-port statement.....	916	specifying the source address.....	243
accounting-retry statement.....	917	specifying the TFTP server.....	243
accounting-server statement.....	918	specifying the WINS server.....	243
accounting-session-id-format statement.....	918	specifying user-defined options.....	243
accounting-stop-on-access-deny statement.....	919	DHCP local server.....	234
accounting-stop-on-failure statement.....	919	DHCPv6 attributes.....	243
accounting-timeout statement.....	920	specifying the	
Acct-Off messages.....	103	preferred-lifetime.....	243, 994
Acct-On messages.....	103	specifying the t1-percentage.....	243, 994
ACI		specifying the t2-percentage.....	243, 994
ANCP.....	609	specifying the valid-lifetime.....	243, 994
activating subscriber services.....	1297	high-utilization.....	1085
CLI-based.....	588	high-utilization-v6.....	1085
active server groups		hold down.....	572
DHCP relay.....	323	license requirements.....	566
active-server-group statement		linking.....	571
DHCP relay agent.....	921	name.....	569
address assignment pools		named range.....	569
displaying.....	1720	network address.....	569
address assignment precedence.....	249	router advertisement.....	1177
address pool		static address.....	572
domain map.....	165	threshold traps.....	570
address statement		tracing operations.....	859
Diameter base protocol		address-assignment statement	
peer.....	922	address-assignment pools.....	923
transport.....	922	address-change-immediate-update statement	
address-assignment pools		accounting.....	924
abated-utilization.....	906	address-pool statement	
abated-utilization-v6.....	906	domain map.....	924
client attributes.....	247	address-protection statement	
configuring.....	567	access.....	925

- adjacency timer
 - ANCP global configuration.....627
 - ANCP neighbor configuration.....625, 627
- adjacency-timer statement
 - ANCP.....926
- advisory-options statement
 - ANCP.....927
 - L2TP.....927
- Agent Circuit ID suboption
 - DHCP relay.....338
- Agent Remote ID suboption
 - DHCP relay.....338
- aggregate-clients statement
 - DHCP relay agent.....928
 - static subscribers.....930
- allow-bulk-leasequery statement
 - DHCP local server.....931
- allow-leasequery statement
 - DHCP local server.....932
- always-write-giaddr statement
 - DHCP relay agent.....933
- always-write-option-82 statement
 - DHCP relay agent.....934
- ANCP
 - AAA interactions.....663
 - access loop circuit identifier.....609
 - access loop circuit identifier
 - configuration.....626
 - ACI.....609
 - adjacency timer global configuration.....627
 - adjacency timer neighbor configuration.....627
 - adjusting subscriber line traffic
 - rates.....659, 660, 667
 - adjusting subscriber traffic with.....653
 - associating subscriber VLANs with access
 - nodes.....626
 - backwards compatibility global
 - configuration.....628
 - backwards compatibility neighbor
 - configuration.....625, 628
 - clearing statistics.....1439
 - configuration overview.....624
 - CoS information
 - verifying.....674
 - CoS shaping across restarts.....656
 - CoS shaping rate adjustment for subscriber
 - local loops.....653
 - CoS state
 - displaying ANCP.....1509
 - discovery table global configuration.....628
 - discovery table neighbor
 - configuration.....625, 628
 - event logging.....853
 - flags for tracing operations.....854
 - immediate interim-accounting
 - messages.....668
 - local access loop
 - displaying.....1527
 - log file access for tracing operations.....850
 - log file size and number.....849
 - log filenames for tracing operations.....854
 - message severity levels for tracing
 - operations.....850
 - monitoring subscriber traffic with.....607
 - neighbor
 - clearing.....1437
 - neighbor configuration
 - adjacency timer.....625
 - discovery table entries.....625
 - ietf mode.....625
 - IP address.....625
 - pre-ietf mode.....625
 - neighbor information
 - clearing.....672
 - verifying.....672
 - neighbor summary
 - displaying.....1535
 - neighbors
 - displaying.....1514
 - operations in different access models.....614
 - overview.....607
 - partition ID learning.....629
 - pre-ietf mode global configuration.....628
 - pre-ietf mode neighbor
 - configuration.....625, 628
 - regular expressions for tracing
 - operations.....850
 - reporting traffic to CoS.....657
 - request OAM per interface.....1477
 - request OAM per neighbor.....1478
 - restart time global configuration.....629
 - statistics
 - displaying.....1522
 - statistics information
 - clearing.....674
 - subscriber
 - clearing.....1441

subscriber information		
clearing.....	673	
verifying.....	673	
subscriber summary		
displaying.....	1537	
subscribers		
displaying.....	1527	
summary		
displaying.....	1533	
tracing operations.....	853	
triggering OAM		
local loop testing.....	671	
ANCP agent See ANCP		
ancp statement		
ANCP.....	935	
ANCP statements		
access-identifier.....	907	
adjacency-timer.....	926	
advisory-options.....	927	
ancp.....	935	
ancp-speed-change-immediate-update.....	936	
downstream-rate.....	1032	
gsmpp-syn-timeout.....	1082	
gsmpp-syn-wait.....	1083	
ietf-mode.....	1088	
interface-set.....	1110	
interfaces.....	1113	
juniper-dsl-attributes.....	1120	
maximum-discovery-table-entries.....	1158	
maximum-helper-restart-time.....	1158	
neighbor		
for all neighbors.....	1176	
other-bytes.....	1200, 1202	
other-overhead-adjust.....	1201, 1203	
overhead-accounting.....	1205	
pre-ietf-mode.....	1234	
qos-adjust.....	1252	
qos-adjust-adsl.....	1253	
qos-adjust-adsl2.....	1253	
qos-adjust-adsl2-plus.....	1254	
qos-adjust-other.....	1255	
qos-adjust-sdsl.....	1256	
qos-adjust-vdsl.....	1256	
qos-adjust-vdsl2.....	1257	
sdsl-bytes.....	1319	
sdsl-overhead-adjust.....	1319	
traceoptions.....	1374	
underlying-interface.....	1400	
upstream-rate.....	1405	
vdsl-bytes.....	1425	
vdsl-overhead-adjust.....	1425	
vdsl2-bytes.....	1426	
vdsl2-overhead-adjust.....	1426	
ancp-speed-change-immediate-update statement		
ANCP.....	936	
application-group-any statement		
PTSP.....	937	
application-groups statement		
PTSP.....	937	
applications statement		
PTSP.....	938	
attempts statement		
DHCP leasequery.....	940	
DHCP local server.....	939	
attributes statement.....	941	
authentication		
configuring RADIUS.....	90	
authentication and accounting information		
retaining.....	89	
authentication methods.....	90	
authentication password		
configuring global static subscriber.....	777	
configuring group static subscriber.....	781	
authentication services		
with DHCP.....	271	
authentication statement		
DHCP local server.....	942	
DHCP relay agent.....	943	
static subscribers.....	944	
authentication-order statement		
access.....	945	
authentication-server statement.....	946	
authorization, subscriber		
JSRC.....	761	
authorization-order statement		
JSRC.....	947	
auto logout		
DHCP.....	303	
DHCP relay agent option 82.....	306	
autonomous statement		
dynamic router advertisement.....	948	
AVPs		
Diameter.....	687	
Juniper Networks		
Diameter and Diameter applications.....	687	

B

backup-options, RADIUS accounting	
configuring.....	109, 117
overview.....	100, 224
backwards compatibility	
ANCP global configuration.....	628
ANCP neighbor configuration.....	625, 628
binding state of DHCP client	
clearing.....	1443, 1449
displaying.....	1585, 1595
binding state of DHCPv6 client	
clearing.....	1454, 1459
displaying.....	1604, 1616
bindingst	
clearing DHCP.....	368
boot-file statement.....	948
boot-server statement.....	949
braces, in configuration statements.....	1
brackets	
angle, in syntax descriptions.....	1
square, in configuration statements.....	1
bulk leasequery	
guidelines.....	256
bulk-leasequery statement.....	949

C

called-station-id statement	
OCS.....	950
Calling-Station-ID	
configuring.....	66
calling-station-id-delimiter statement.....	950
calling-station-id-format statement.....	951
change of authorization See CoA	
chap-challenge-in -request-authenticator.....	952
charging-id statement	
OCS.....	952
charging-service-list statement	
subscriber services.....	953
circuit-id statement	
address-assignment pools.....	956
DHCP relay agent.....	954
circuit-type statement	
DHCP local server.....	957
DHCP relay agent.....	958
clear ancp neighbor command.....	1437
clear ancp statistics command.....	1439
clear ancp subscriber command.....	1441
clear dhcp relay binding command.....	1443
clear dhcp relay statistics command.....	1446

clear dhcp server binding command.....	1449
clear dhcp server statistics command.....	1452
clear dhcpv6 relay binding command.....	1454
clear dhcpv6 relay statistics command.....	1457
clear dhcpv6 server binding command.....	1459
clear dhcpv6 server statistics command.....	1461
clear diameter function statistics command.....	1462
clear diameter peer command.....	1463
clear extensible-subscriber-services	
counters.....	1464
clear extensible-subscriber-services	
sessions.....	1465
clear ipv6 router-advertisement command.....	1466
clear network-access aaa statistics	
command.....	1467
clear network-access aaa subscriber	
command.....	1469
clear network-access gx-plus replay	
command.....	1470
clear network-access gx-plus statistics	
command.....	1471
clear network-access ocs command.....	1472
clear network-access pcrf command.....	1473
clear services subscriber sessions command.....	1475
clear system subscriber-management statistics	
command.....	1476
clear-on-abort statement	
DHCP local server.....	959
client attributes	
address-assignment pools.....	247
client configuration information	
DHCP.....	232
client usernames	
DHCP	
unique.....	272
client-accounting-algorithm statement	
RADIUS.....	960
client-authentication-algorithm statement	
RADIUS.....	961
client-discover-match statement	
DHCP local server.....	962
DHCP relay agent.....	963
client-id statement.....	964
DHCP relay agent.....	965
client-idle-timeout statement	
access profile session options.....	966
client-idle-timeout-ingress-only statement	
access profile session options.....	967

client-negotiation-match statement	
DHCP v6 relay agent.....	969
DHCPv6 local server.....	968
client-session-timeout statement	
access profile session options.....	970
CoA	
messages.....	177
RADIUS.....	177
coa-dynamic-variable-validation.....	972
coa-immediate-update statement	
accounting.....	972
comments, in configuration statements.....	l
commit-interval	
Extensible Subscriber Services Manager.....	971
concurrent-data-sessions statement.....	974
configuration-database statement	
enhanced subscriber management.....	973
configuring enhanced subscriber management.....	554
connect-actively statement	
Diameter base protocol.....	974
conventions	
text and syntax.....	xlix
CoS	
interface sets, displaying.....	1567
interfaces, displaying.....	1538
mapping, displaying	
schedulers to forwarding	
classes.....	1570, 1573
scheduler map information,	
displaying.....	1570, 1573
shaping preserved across ANCP restarts.....	656
subscriber access	
modifying.....	591
traffic-control profiles.....	591
traffic-control profile information,	
displaying.....	1576
CoS traffic shaping	
with ANCP.....	659, 667
count-type statement	
PTSP.....	975
curly braces, in configuration statements.....	l
current-hop-limit statement	
dynamic router advertisement.....	976
customer support.....	li
contacting JTAC.....	li

D

database-replication statement	
subscriber session database replication.....	976
deactivating subscriber services.....	1299
CLI-based.....	588
CLI-based for services with multiple	
instances.....	597, 599
default subscriber service.....	241
configuring.....	242
default-action statement	
DHCP relay agent.....	977
default-lifetime statement	
dynamic router advertisement.....	978
delay-advertise.....	979
delay-authentication statement	
DHCP relay agent.....	980
delay-offer.....	981
delegated-pool statement	
DHCP local server.....	982
delete-binding-on-renegotiation	
DHCP local server.....	983
DHCP relay agent.....	983
delimiter statement	
DHCP local server.....	984
DHCP relay agent.....	986
domain map.....	985
delimiters	
domain and realm names.....	169
demux statement	
PTSP.....	987
destination statement	
Diameter base protocol.....	988
destination-host statement	
Gx-Plus.....	989
JSRC.....	988
OCS.....	989
PCRF.....	990
PTSP.....	990
destination-realm statement	
Gx-Plus.....	991
JSRC.....	991
OCS.....	992
PCRF.....	993
PTSP.....	993
DHCP	
allowing one client per interface.....	288
authentication services.....	271
AAA directed logout.....	271
auto logout.....	303

-
- centrally-configured DHCP options.....140, 144
 - clearing bindings.....368
 - client configuration information.....232
 - different VRFs.....327, 328
 - extended server binding
 - clearing.....1449
 - displaying.....1595
 - extended server statistics
 - clearing.....1452
 - displaying.....1601
 - firewall filters on routers using the `jdhcpd`
 - process.....365
 - example.....361
 - grouping interfaces.....277
 - configuration guidelines.....278
 - information request processing
 - overriding.....268
 - maximum clients per interface
 - overriding.....287
 - message severity levels for tracing
 - operations.....825
 - override settings
 - deleting.....315
 - rapid commit.....435
 - regular expressions for tracing
 - operations.....824
 - relay binding
 - clearing.....1443
 - relay binding state
 - displaying.....1585
 - relay statistics
 - clearing.....1446
 - displaying.....1591
 - unique client usernames.....272
 - user passwords.....275
 - DHCP bulk leasequery.....255
 - configuring.....260
 - statistics.....264
 - DHCP client
 - binding state
 - clearing.....1443, 1449
 - displaying.....1585, 1595
 - statistics
 - clearing.....1446, 1452
 - displaying.....1601
 - DHCP dual-stack
 - single-session.....408, 409
 - verifying configuration.....411
 - DHCP lease thresholds
 - configuring.....251
 - DHCP lease time thresholds
 - DHCP.....252
 - DHCP lease-time validation.....252
 - DHCP leasequery255
 - configuring.....257
 - global configuration.....907, 1295
 - initiating.....263
 - statistics.....264
 - DHCP local server
 - access profile attachment
 - for a group of subscribers.....320
 - for a subscriber.....320
 - for an interface or group of
 - interfaces.....320
 - overview.....319
 - address-assignment pool selection.....245
 - address-assignment pools.....234
 - allowing one client per interface.....288
 - client auto logout.....305
 - DHCPv6.....434
 - DHCPv6 rapid commit.....435
 - dynamic client reconfiguration
 - authentication token configuration.....357
 - behavior on failure configuration.....301
 - configuration overview.....298
 - number of attempts configuration.....300
 - preventing binding of nonsupporting
 - clients.....436
 - RADIUS-initiated disconnect
 - configuration.....301
 - requesting.....367
 - grouping interfaces
 - options.....279
 - information request message processing.....267
 - information request processing
 - overriding.....268
 - interaction
 - address-assignment pools.....232
 - DHCP clients.....232
 - lease time thresholds.....252
 - lease timers.....1159
 - maximum clients per interface
 - overriding.....287
 - minimal configuration
 - default settings.....234
 - option 50.....246

override settings	
deleting.....	315
overriding default configuration.....	311
overriding third-party leases.....	251
overview.....	230
per-interface tracing operations.....	826, 827
processing client information requests.....	267
reconfigure client bindings.....	1485
renegotiation.....	317
specific address.....	246
subnet for client addresses.....	248
tracing operations.....	821
using Remote ID to change service.....	333, 352
verifying configuration.....	371
DHCP local server statements	
allow-bulk-leasequery.....	931
allow-leasequery.....	932
attempts.....	939
boot-file.....	948
boot-server.....	949
circuit-type.....	957
clear-on-abort.....	959
client-discover-match.....	962
client-id.....	964
delegated-pool	982
delete-binding-on-renegotiation.....	983
delimiter.....	984
dhcp-local-server.....	995
dhcpv6.....	1009
dns-server.....	1021
domain-name.....	1024
dynamic-profile.....	1042
group.....	1075
include-option-82.....	1094
interface.....	1095
interface-client-limit.....	1102
interface-name.....	1107
interface-traceoptions.....	1111
ip-address-first.....	1115
lease-time-threshold.....	1126
lease-time-validation.....	1127
logical-system-name.....	1140
mac-address.....	1144
max-connections.....	1151
max-empty-replies.....	1154
option-60.....	1189
option-82.....	1192, 1193
overrides.....	1206
password.....	1223
pool.....	1231
pool-match-order.....	1232
process-inform.....	1246
rapid-commit.....	1266
relay-agent-interface-id.....	1270
relay-agent-remote-id.....	1273
relay-agent-subscriber-id.....	1276
remote-id-mismatch.....	1287
requested-ip-network-match.....	1303
restricted-requestor.....	1304
routing-instance-name.....	1312
service-profile.....	1335
strict.....	1348
timeout.....	1368, 1369
trace.....	1372
traceoptions.....	1376
trigger.....	1396
username-include.....	1419
violation-action.....	1428
DHCP option information	
DHCP relay.....	344
DHCP option strings	
DHCP relay agent.....	281, 346
DHCPv6 relay agent.....	281, 346
DHCP options	
accounting.....	143
configuring on RADIUS.....	140
opaque.....	140
RADIUS-sourced.....	140
renewing.....	143
verifying.....	144
DHCP relay	
access profile attachment	
for a group of subscribers.....	320
for a subscriber.....	320
for an interface or group of	
interfaces.....	320
overview.....	319
active server groups.....	323
Agent Circuit ID suboption.....	338
Agent Remote ID suboption.....	338
allowing one client per interface.....	288
automatic binding of stray requests.....	336
client auto logout.....	305
configuration examples	
minimum configuration.....	346
multiple clients and servers	
configuration.....	351
DHCP option information.....	344

-
- DHCP relay proxy.....239, 355
 - DHCPv6.....441
 - DHCPv6 Interface-ID option.....444
 - DHCPv6 Remote-ID option.....445
 - disabling.....353
 - discarded packets
 - counting.....370
 - grouping interfaces
 - options.....280
 - how components interact.....237
 - Layer 2 unicast transmission.....334
 - lease time thresholds.....252
 - liveness detection.....238
 - maximum clients per interface
 - overriding.....287
 - monitoring DHCP server responsiveness.....370
 - option 82
 - auto logout.....306
 - option 82 information.....337
 - option 82 prefix.....340
 - option 82 textual description.....342
 - override settings
 - deleting.....315
 - overriding broadcast bit.....334
 - overriding default configuration.....313
 - overriding third-party leases.....251
 - overview.....236
 - overwrite giaddr.....325
 - per-interface tracing operations.....826, 827
 - renegotiation.....317
 - replacing IP source address.....325
 - selective traffic
 - processing.....281, 327, 328, 344, 346
 - sending release messages.....335
 - server groups.....323
 - tracing operations.....821
 - trusting option 82.....334
 - using Remote ID to change service.....333
 - verifying configuration.....371
 - DHCP relay agent
 - DHCP option strings.....281, 346
 - initiating leasequery.....263
 - request dhcp relay bulk-leasequery
 -1479, 1482
 - request dhcp relay leasequery1480, 1483
 - request dhcpv6 relay leasequery1489, 1491
 - DHCP relay agent statements
 - active-server-group.....921
 - always-write-giaddr.....933
 - always-write-option-82.....934
 - attempts
 - bulk-leasequery.....940
 - leasequery.....940
 - bulk-leasequery.....949
 - circuit-id.....954
 - circuit-type.....958
 - client-discover-match.....963
 - client-id.....965
 - default-action.....977
 - delay-authentication.....980
 - delete-binding-on-renegotiation.....983
 - delimiter.....986
 - dhcp-relay.....1001
 - dhcpv6.....1012
 - relay-option-vendor-specific.....1279
 - disable-relay.....1020
 - domain-name.....1026
 - drop.....1035
 - dual-stack.....1036, 1037
 - dynamic-profile.....1043
 - equals.....1047
 - forward-only.....1061, 1062
 - forward-only-replies1063
 - group.....1078
 - include-irb-and-l2.....1091
 - include-l2-interface-for-irb1093
 - interface.....1097
 - interface-client-limit.....1104
 - interface-name.....1108
 - interface-traceoptions.....1111
 - keep-incoming-circuit-id1122
 - keep-incoming-interface-id1123
 - keep-incoming-remote-id1124
 - layer2-unicast-replies.....1121
 - lease-time-threshold.....1126
 - lease-time-validation.....1127
 - leasequery.....1125
 - local-server-group.....1133
 - logical-system-name.....1141
 - mac-address.....1145
 - no-bind-on-request.....1181
 - no-vlan-interface-name.....1183
 - option-60.....1190
 - option-number.....1195
 - overrides.....1208
 - password.....1224
 - prefix.....1239
 - proxy-mode.....1251

relay-agent-interface-id.....	1271	DHCPv6	
username.....	1272	DNS address	
relay-agent-remote-id.....	1274, 1275	multiple addresses.....	396, 581
relay-agent-subscriber-id.....	1277	extended server binding	
relay-option.....	1278	clearing.....	1459
relay-option-82.....	1280	displaying.....	1616
vendor-specific.....	1427	extended server statistics	
relay-server-group.....	1281	clearing.....	1461
remote-id.....	1285	displaying.....	1622
remote-id-mismatch.....	1287	relay binding	
replace-ip-source-with.....	1290	clearing.....	1454
routing-instance-name.....	1314	relay binding state	
send-release-on-delete.....	1325	displaying.....	1604
server-group.....	1327	relay statistics	
server-response-time.....	1330	clearing.....	1457
service-profile.....	1336	displaying.....	1612
starts-with.....	1345	subscriber match criteria.....	307
timeout		DHCPv6 client	
bulk-leasequery.....	1370	binding state	
leasequery.....	1370	clearing.....	1459
trace.....	1373	displaying.....	1604, 1616
traceoptions.....	1376	statistics	
trigger		clearing.....	1457, 1461
bulk-leasequery.....	1397	displaying.....	1622
leasequery.....	1397	DHCPv6 Interface-ID option	
trust-option-82.....	1399	DHCP relay.....	444
use-interface-description.....	1406	DHCPv6 local server	
use-option-82.....	1410	client auto logout.....	308
use-primary.....	1411	IA_NA.....	246
user-prefix.....	1415, 1417	lease timers.....	1159, 1237, 1357, 1424
username-include.....	943, 1421	overview.....	434
violation-action.....	1428	reconfigure client bindings.....	1487
DHCP relay proxy.....	1251	specific address.....	246
enabling.....	355	verifying configuration.....	550
how components interact.....	239	DHCPv6 local server statements	
overview.....	239	client-negotiation-match.....	968
DHCP server responsiveness		multi-address-embedded-option-response....	1162
monitoring.....	370	preferred-lifetime.....	1237
DHCP service		t1-percentage.....	1357
statement.....	1008	t2-percentage.....	1358
DHCP stray requests		valid-lifetime.....	1424
disabling automatic binding.....	336	DHCPv6 Option-18	
enabling automatic binding.....	336	DHCP relay.....	444
DHCP subscriber		DHCPv6 Option-37	
auto logout.....	305	DHCP relay.....	445
dhcp-attributes statement		DHCPv6 relay	
address-assignment pools.....	994	client auto logout.....	308
dhcp-local-server statement.....	995	monitoring DHCP server responsiveness.....	370
dhcp-relay statement.....	1001	options.....	442

options prefix.....	340, 342	network element information	
overview.....	441	displaying.....	1640
Relay Agent Interface ID option 18.....	442	verifying.....	808
Relay Agent Remote ID option 37.....	442	network element map information	
verifying configuration.....	550	displaying.....	1643
DHCPv6 relay agent		node information	
DHCP option strings.....	281, 346	verifying.....	805
DHCPv6 relay agent statements		node status	
client-negotiation-match.....	969	displaying.....	1625
DHCPv6 Remote-ID option		origin attribute configuration.....	699
DHCP relay.....	445	peer configuration.....	700
dhcpv6 statement.....	1009, 1012	peer information	
relay-option-vendor-specific.....	1279	verifying.....	807
DHCPv6 subscriber		peer map	
auto logout.....	308	displaying.....	1651
DHCPv6client		peer statistics	
binding state		displaying.....	1654
clearing.....	1454	peer status	
Diameter		displaying.....	1646
AVPs.....	687	route information	
message sequences for Gx.....	722	displaying.....	1658
message sequences for Gx-Plus.....	705	verifying.....	805
message sequences for Gy.....	730	tracing operations.....	843
message sequences for JSRC.....	757	transport configuration.....	701
message sequences for PTSP.....	785	troubleshooting configuration.....	847
messages used by Diameter		troubleshooting connectivity.....	847
applications.....	682	Diameter Base Protocol	
Diameter base protocol.....	679	message severity levels for tracing	
clearing function statistics.....	1462	operations.....	840
clearing peers.....	1463	Diameter base protocol statements	
configuration overview.....	699	address	
event log access.....	840	peer.....	922
event logging.....	843	transport.....	922
filtering trace operation output.....	840	connect-actively.....	974
flags for tracing operations.....	844	destination.....	988
function information		diameter.....	1016
verifying.....	806	forwarding.....	1065
function statistics		function	
displaying.....	1635	network element.....	1068
function status		route.....	1069
displaying.....	1631	logical-system.....	1136
instance information		transport.....	1137
displaying.....	1638	metric.....	1160
verifying.....	805	network-element.....	1179
log file size.....	839	origin.....	1199
log filenames.....	844	peer	
network element configuration.....	701	network element.....	1227
		remote.....	1226
		port.....	1233

priority.....	1241
route.....	1308
routing-instance	
peer.....	1310
transport.....	1311
traceoptions.....	1379
transport	
local.....	1393
peer.....	1394
diameter statement	
Diameter base protocol.....	1016
diameter-instance statement	
Gx-Plus.....	1017
JSRC.....	1017
PTSP.....	1018
dictionary.....	1018
directed logout	
AAA.....	271
disable statement.....	1019
disable-relay statement.....	1020
discovery table	
ANCP global configuration.....	628
ANCP neighbor configuration.....	625, 628
DNS (Domain Name System)	
name server address	
configuring.....	578
overview.....	577
preference order.....	577
DNS address assignment	
DHCPv6 multiple addresses.....	396, 581
DNS addresses	
IPCP negotiation for primary and	
secondary.....	580
DNS statements	
domain-name-server.....	1029
domain-name-server-inet.....	1030
domain-name-server-inet6.....	1031
dns-server statement.....	1021
documentation	
comments on.....	li
domain map.....	158
AAA logical system/routing instance.....	167
access profile.....	164
address pool.....	165
configuring.....	162, 163
default.....	160
domain name.....	168
dynamic profile.....	166, 173
L2TP tunnel profile.....	172
L2TP tunnel switch profile.....	172
logical system/routing instance contexts.....	161
none.....	160
target logical system/routing instance.....	168
usernames with no domain name.....	160
verifying configuration.....	225
wildcard.....	160, 163
domain map statements	
aaa-logical-system.....	904
aaa-routing-instance.....	905
access-profile.....	910
address-pool.....	924
delimiter.....	985
domain.....	1023
dynamic-profile.....	1044
map.....	1148
mask.....	1149
metric.....	1160
override-password.....	1210
padn.....	1212
parse-direction.....	1212, 1214
parse-order.....	1213, 1215
realm-delimiter.....	1267
realm-parse-direction	1268
strip-domain.....	1349
strip-username.....	1349
target-logical-system.....	1359
target-routing-instance.....	1360
tunnel-profile.....	1400
domain mapping See domain map	
domain maps	
displaying.....	1721
domain names	
delimiters.....	169
domain map.....	168
parse order.....	170
parsing direction.....	171
stripping from username.....	171
domain statement	
domain map.....	1023
domain-name statement	
address-assignment pools.....	1027
DHCP local server.....	1024
DHCP relay agent.....	1026
static subscribers.....	1028
domain-name-server statement	
DNS.....	1029
domain-name-server-inet statement	
DNS.....	1030

- domain-name-server-inet6 statement
 - DNS.....1031
 - downstream-rate statement
 - ANCP.....1032
 - L2TP.....1032
 - draining statement
 - OCS.....1033
 - PCRF.....1033
 - draining-response-timeout statement
 - OCS.....1034
 - PCRF.....1034
 - drop statement
 - DHCP relay agent.....1035
 - DSL Forum VSAs.....55
 - ANCP.....665
 - supported RADIUS messages.....57
 - dual-stack
 - DHCP.....408, 409
 - dual-stack statement
 - DHCP relay agent.....1036, 1037
 - duplicate accounting reports.....97
 - filters.....98
 - duplicate accounting statements
 - access-profile-name.....912
 - duplication-vrf.....1040
 - vrf-name.....1431
 - duplication statement.....1038, 1039, 1041
 - duplication-vrf statement
 - duplicate accounting.....1040
 - dynamic client reconfiguration
 - DHCP local server
 - attempts configuration.....300
 - authentication token configuration.....357
 - behavior on failure configuration.....301
 - configuration overview.....298
 - preventing binding of non-supporting
 - clients.....436
 - RADIUS-initiated disconnect
 - configuration.....301
 - requesting.....367
 - Dynamic Host Control Protocol See DHCP
 - dynamic PPP statements
 - on-demand-ip-address.....1186
 - peer-ip-address-optional.....1228
 - dynamic profiles
 - configuring global static
 - subscriber.....775, 776, 781
 - configuring static subscriber group.....780
 - domain map.....166, 173
 - dynamic profiles statements
 - protocols.....1248
 - router-advertisement.....1309
 - dynamic requests
 - RADIUS.....175, 176
 - dynamic Router Advertisement protocol
 - overview.....477
 - dynamic router advertisement statements
 - autonomous.....948
 - current-hop-limit.....976
 - default-lifetime.....978
 - dns-server-address.....1022
 - interface.....1099
 - managed-configuration.....1147
 - max-advertisement-interval.....1150
 - min-advertisement-interval.....1161
 - no-managed-configuration.....1147
 - no-other-stateful-configuration.....1204
 - on-link.....1187
 - other-stateful-configuration.....1204
 - preferred-lifetime.....1238
 - prefix.....1240
 - reachable-time.....1267
 - retransmit-timer.....1305
 - router-advertisement.....1309
 - valid-lifetime.....1423
 - dynamic service activation
 - during login.....176
 - dynamic-profile statement
 - DHCP local server.....1042
 - DHCP relay agent.....1043
 - domain map.....1044
 - static subscribers.....1045
- ## E
- enable statement.....1046
 - enhanced subscriber management.....1046
 - enabling enhanced subscriber management.....554
 - enhanced subscriber management
 - configuring.....554
 - enabling.....554
 - managing.....558
 - overview.....556
 - route mapping
 - displaying.....1802
 - verifying.....558
 - enhanced subscriber management commands
 - show system subscriber-management
 - route.....1802

enhanced subscriber management statements	
configuration-database.....	973
enable.....	1046
failover.....	1056
interface-mib.....	1109
max-db-size.....	1153
overrides.....	1182, 1210
routing-services.....	1316
smg-service.....	1342
traceoptions.....	1382
traps.....	1395
equals statement	
DHCP relay agent.....	1047
ethernet-port-type-virtual statement.....	1048
exceed-action statement.....	1048
exclude statement.....	1050
JSRC statements.....	1049
excluding AVPs	
JSRC.....	763
extended DHCP local server	
overview.....	230
Extensible Subscriber Services Manager	
clearing an ESSM session.....	1465
clearing event counters.....	1464
commit-interval.....	971
configuring a dictionary file.....	1018
configuring a logical interface service	
unit.....	1135
configuring an access profile name.....	910
configuring the maximum number of	
subscribers.....	1159
configuring trace options.....	1381
disabling ESSM.....	1019
displaying accounting statistics.....	1660
displaying event counters.....	1663
displaying service information	1678
displaying session information.....	1665, 1676
displaying the dictionary attributes.....	1670
displaying the dictionary file.....	1666
displaying the services configured in a	
dictionary file.....	1673
enabling ESSM.....	1019
reloading the dictionary.....	1493
restarting essmd.....	1503
validating a dictionary file.....	1018
extensible-subscriber-services.....	1019
external-authority statement	
DHCP local server pool matching.....	1055
F	
failover statement	
enhanced subscriber management.....	1056
software process failure.....	1056
family statement	
address-assignment pools.....	1057
fast-lookup-filter statement.....	1058
filters	
duplicate accounting reports.....	98, 99
final-response-timeout statement	
OCS.....	1059
firewall filter	
DHCP on routers using the jdhcpd	
process.....	365
example	
DHCP on routers using the jdhcpd	
process.....	361
font conventions.....	xlix
force-continue statement	
OCS.....	1060
forward-only statement.....	1062
DHCP relay agent.....	1061
forward-only-replies statement.....	1063
forward-rule statement	
PTSP.....	1065
forwarding instance.....	1064
forwarding options	
DHCP relay agent.....	1443, 1446, 1585, 1591
DHCPv6 relay agent.....	1454, 1457, 1604, 1612
forwarding statement	
Diameter base protocol.....	1065
from statement	
PTSP.....	1067
PTSP forward rule.....	1066
function statement	
Diameter base protocol	
network element.....	1068
route.....	1069
function statistics	
clearing Diameter base protocol.....	1462
G	
general authentication service	
subscriber filtering for tracing	
operations.....	861, 864
tracing operations.....	859
ggsn-address statement	
OCS.....	1070

global attributes	
Gx-Plus, configuring.....	712
global statement	
Gx-Plus.....	1071
OCS.....	1072
PCRF.....	1073
grace-period statement.....	1074
group	
configuring static subscriber.....	779
group statement	
DHCP local server.....	1075
DHCP relay agent.....	1078
static subscribers.....	1081
gsmp-syn-timeout statement	
ANCP.....	1082
gsmp-syn-wait statement	
ANCP.....	1083
Gx	
Diameter message sequences.....	722
interactions with the PCRF.....	722
PCRF.....	1225
Gx-Plus	
configuration overview.....	710
Diameter AVPs.....	687
Diameter message sequences.....	705
Diameter messages.....	682
disabling PCRF policy control.....	881
displaying.....	1722
global attributes	
configuring.....	712
inclusion of IPv6 subscribers	
configuring.....	712
interactions with the PCRF.....	705
number of outstanding requests	
configuring.....	712
overview.....	703
partition	
configuring.....	711
pending requests	
clearing.....	1470
provisioning subscribers.....	713
statistics	
clearing.....	1471
tracing operations.....	859
verifying.....	805, 806
Gx-plus commands	
request network-access aaa subscriber set	
session-id.....	1492
gx-plus statement	
Gx-Plus.....	1084
Gx-Plus statements	
destination-host.....	989
destination-realm.....	991
diameter-instance.....	1017
global.....	1071
gx-plus.....	1084
include-ipv6.....	1090
max-outstanding-requests.....	1156
partition.....	1216
provisioning-order.....	1250
Gy	
Diameter message sequences.....	730
interactions with the OCS.....	730
Gy protocol	
OCS.....	1185
H	
hardware-address statement.....	1084
high-utilization statement	
address-assignment pools.....	1085
high-utilization-v6 statement	
address-assignment pools.....	1085
hold-down statement	
address-assignment pools.....	1086
host statement	
address-assignment pools.....	1086
host-name statement	
vendor-specific	
relay-option-82.....	1087, 1088
I	
IA_NA	
DHCPv6 local server.....	246
idle timeout	
subscriber access.....	131
ietf-mode statement	
ANCP.....	1088
IGMP	
enabling.....	1249
ignore statement.....	1089
immediate-update statement	
accounting.....	1090
inactive VLANs	
removing.....	137
include-ipv6 statement	
Gx-Plus.....	1090
include-irb-and-l2 statement.....	1091

include-l2-interface-for-irb statement		ip-address statement.....	1113
DHCP relay agent.....	1093	ip-address-change-notify statement.....	1114
include-option-82 statement		ip-address-first statement.....	1115
DHCP local server.....	1094	ip-can-type statement	
interface delete events		PCRF.....	1116
maintaining subscribers.....	291, 292	IPCP negotiation	
interface groups		DNS addresses.....	580
DHCP local server		ipcp-suggest-dns-option statement	
configuration guidelines.....	278	L2TP.....	1117
options.....	279	IPv6	
DHCP relay		router advertisements	
configuration guidelines.....	278	clearing.....	1466
options.....	280	displaying.....	1679
enabling static subscribers to log in.....	810		
forcing static subscribers to log out.....	810	J	
interface ranges		JSRC	
DHCP configuration guidelines.....	278	authorizing subscribers.....	761
interface statement		configuration overview.....	759, 772
DHCP local server.....	1095	Diameter AVPs.....	687
DHCP relay agent.....	1097	Diameter message sequences.....	757
dynamic router advertisement.....	1099	Diameter messages.....	682
static subscribers		excluding AVPs.....	763
group.....	1100	interactions with the SAE.....	757
username.....	1101	managing subscribers.....	755
interface-client-limit statement		partition	
DHCP local server.....	1102	assigning.....	761
DHCP relay agent.....	1104	configuring.....	760
interface-delete statement		provisioning services.....	755
subscriber management.....	1105, 1106	provisioning static subscribers.....	769
interface-description-format statement.....	1106	provisioning subscribers.....	762
interface-mib statement		service accounting.....	765
enhanced subscriber management.....	1109	tracing operations.....	859
interface-name statement		verifying.....	805, 806
DHCP local server.....	1107	jsrc statement.....	1119
DHCP relay agent.....	1108	JSRC.....	1118
interface-set statement		JSRC statements	
ANCP.....	1110	accounting-order.....	915
interface-traceoptions statement		attributes statement.....	941
DHCP local server.....	1111	authorization-order.....	947
DHCP relay agent.....	1111	destination-host.....	988
interfaces		destination-realm.....	991
enabling static subscribers to log in.....	809	diameter-instance.....	1017
forcing static subscribers to log out.....	809	exclude statement.....	1049
interfaces statement		jsrc.....	1118
ANCP.....	1113	jsrc statement.....	1119
interim accountingr		jsrc-partition.....	1119
ANCP immediate updates.....	668	partition.....	1216
interim service accounting		provisioning-order.....	1250
interval between update messages.....	110, 153	service.....	1331

-
- jsrc-partition statement
 - JSRC.....1119
 - Juniper Networks VSAs.....13
 - corresponding predefined variables.....49
 - supported.....21
 - juniper-dsl-attributes statement
 - RADIUS.....1120
 - Junos OS
 - rebooting.....1498
 - K**
 - keep-incoming-circuit-id statement.....1122
 - keep-incoming-interface-id statement.....1123
 - keep-incoming-remote-id statement.....1124
 - L**
 - L2TP (Layer 2 Tunneling Protocol)
 - tunnel profile
 - domain map configuration.....172
 - tunnel switch profile
 - domain map configuration.....172
 - L2TP statements
 - ipcp-suggest-dns-option.....1117
 - LAC
 - advisory-options.....927
 - downstream-rate.....1032
 - upstream-rate.....1405
 - layer2-unicast-replies statement.....1121
 - lease-time-threshold
 - DHCP local server.....1126
 - DHCP relay agent.....1126
 - lease-time-validation
 - DHCP local server.....1127
 - DHCP relay agent.....1127
 - leasequery
 - guidelines.....256
 - leasequery statement.....1125
 - license requirements
 - address-assignment pools.....566
 - link statement
 - address-assignment pools.....1128
 - liveness detection
 - DHCP relay.....238
 - LLID
 - preauthentication.....147, 148
 - preauthentication server.....150
 - specifying a secret.....151
 - specifying a UDP port.....151
 - verifying configuration.....226
 - local decision statement
 - PCRF.....1131
 - local-address statement
 - PTSP.....1129
 - local-address-range statement
 - PTSP.....1130
 - local-port-range statement
 - PTSP.....1132
 - local-ports statement
 - PTSP.....1132
 - local-prefix-list statement
 - PTSP.....1133
 - local-server-group statement
 - DHCP relay agent.....1133
 - location statement
 - vendor-specific
 - relay-option-82.....1134, 1135
 - log files
 - access to Diameter base protocol.....840
 - collecting for Juniper Networks Technical Support.....883
 - configuring ANCP trace.....853
 - configuring Diameter base protocol
 - trace.....843
 - configuring static subscribers trace.....871
 - filenames for Diameter base protocol.....844
 - filenames for subscriber management
 - database.....832
 - filenames for subscriber management session
 - database replication.....836
 - number of ANCP.....849
 - number of Diameter base protocol.....839
 - number of static subscribers.....867
 - number of subscriber management
 - database.....829
 - number of subscriber management session
 - database replication.....833
 - profile properties.....878
 - size of ANCP.....849
 - size of Diameter base protocol.....839
 - size of packet-triggered subscribers.....876
 - size of PTSP.....877
 - size of static subscribers.....867
 - size of subscriber management
 - database.....829
 - size of subscriber management session
 - database replication.....833
 - Logical Line ID See LLID

logical system/routing instance contexts	
domain map.....	161
logical-interface-unit-range.....	1135
logical-system statement	
Diameter base protocol.....	1136
transport.....	1137
subscriber secure policy.....	1138
logical-system-name statement	
DHCP local server.....	1140
DHCP relay agent.....	1141
static subscribers.....	1139
logout-response-timeout statement	
PCRF.....	1142
lrouting-instance statement	
subscriber secure policy.....	1310
ltv-syslog-interval statement	
DHCP server process interval.....	1143
M	
mac-address statement	
DHCP local server.....	1144
DHCP relay agent.....	1145
maintain-subscriber statement	
subscriber management.....	1146
maintaining subscribers	
interface delete events.....	291, 292
verifying configuration.....	292
managed-configuration statement	
dynamic router advertisement.....	1147
managing enhanced subscriber management.....	558
manuals	
comments on.....	li
map statement	
domain maps.....	1148
mask statement	
domain map.....	1149
match-direction statement	
PTSP.....	1149
max-advertisement-interval statement	
dynamic router advertisement.....	1150
max-connections statement	
DHCP local server.....	1151
max-data-sessions-per-subscriber	
statement.....	1127, 1152
max-db-size statement	
enhanced subscriber management.....	1153
max-empty-replies statement	
DHCP local server.....	1154

max-outstanding-requests statement	
access.....	1155
Gx-Plus.....	1156
max-pending-accounting-stops statement	
RADIUS accounting.....	1157
max-withhold-time statement	
RADIUS accounting.....	1157
maximum-discovery-table-entries statement	
ANCP.....	1158
maximum-helper-restart-time statement	
ANCP.....	1158
maximum-lease-time statement.....	1159
maximum-subscribers.....	1159
metric statement	
Diameter base protocol.....	1160
domain map.....	1160
min-advertisement-interval statement	
dynamic router advertisement.....	1161
Mobile IP statements	
statistics.....	1347
modifying subscriber services.....	1301
multi-address-embedded-option-responsestatement	
DHCPv6 local server.....	1162
multiple DHCPv6 addresses	
predefined variable.....	395
Multiservices DPC	
configuring PTSP.....	797
N	
name-server statement.....	1162
nas-identifier statement.....	1163
NAS-Port attribute extended format	
configuring for ATM interfaces.....	86
configuring per physical interface.....	81
configuring per stacked VLAN.....	84
configuring per VLAN.....	82
nas-port-extended-format statement.....	1164
interfaces.....	1166
NAS-Port-ID	
configuring.....	63
NAS-Port-ID attribute	
manual configuration.....	61
nas-port-id-delimiter statement.....	1167
nas-port-id-format statement.....	1168
nas-port-options statement	
RADIUS options.....	1170
NAS-Port-Type attribute	
configuring per physical interface.....	76
configuring per stacked VLAN.....	79

configuring per VLAN.....	78	draining.....	1033
manual configuration.....	74	draining-response-timeout.....	1034
nas-port-type statement.....	1171	final-response-timeout.....	1059
RADIUS options.....	1173	force-continue.....	1060
neighbor		ggsn-address.....	1070
ANCP.....	1437	global.....	1072
parameters for ANCP.....	625	partition.....	1218
neighbor statement		service-context-id.....	1334
ANCP		user-name-include.....	1408
for all neighbors.....	1176	on-demand-ip-address-statement	
neighbor-discovery-router-advertisement		dynamic PPP.....	1186
statement		on-link statement	
address-assignment pools.....	1177	dynamic router advertisement.....	1187
netbios-node-type statement.....	1177	opaque DHCP options.....	140
network element		option 37 information	
configuring Diameter.....	701	DHCPv6 relay.....	442
network statement.....	1178	option 38 information	
network-element statement		DHCPv6 relay.....	442
Diameter base protocol.....	1179	option 50	
network-services statement.....	1180	DHCP local server.....	246
no-bind-on-request statement		option 82	
DHCP relay agent.....	1181	DHCP relay	
no-managed-configuration statement		auto logout.....	306
dynamic router advertisement.....	1147	option 82 information	
no-other-stateful-configuration statement		DHCP relay.....	337
dynamic router advertisement.....	1204	option 82 prefix	
no-traps statement.....	1395	DHCP relay.....	340
no-unsolicited- statement		option 82 textual description	
enhanced subscriber management.....	1182	DHCP relay.....	342
no-vlan-interface-name statement.....	1183	option statement.....	1188
		option-60 statement	
O		DHCP local server.....	1189
OAM		DHCP relay agent.....	1190
triggering ANCP		option-82 statement	
local loop testing.....	671	address-assignment pools.....	1194
OCS		DHCP local server authentication.....	1192
displaying.....	1728	DHCP local server pool matching.....	1193
interactions with Gy.....	730	DHCP relay agent.....	1191
rule interactions.....	735	option-match statement.....	1194
statistics		option-number statement	
clearing.....	1472	DHCP relay agent.....	1195
ocs statement		options	
Gy protocol.....	1185	RADIUS.....	8, 122
OCS statements		RADIUS server.....	4, 61, 63, 66, 74, 119
called-station-id.....	950	options per interface, VLAN, or S-VLAN	
charging-id.....	952	NAS-Port-Type.....	76
charging-service-list.....	953	options per interface, VLAN, or stacked VLAN	
destination-host statement.....	989	configuration guidelines.....	72
destination-realm.....	992	NAS-Port extended format.....	81, 82, 84

NAS-Port-Type.....	78, 79
RADIUS server.....	70, 73
options prefix	
DHCPv6 relay.....	340, 342
options statement	
RADIUS.....	1196
order statement	
accounting.....	1198
origin attributes	
configuring Diameter endpoint.....	699
origin statement	
Diameter base protocol.....	1199
other-bytes statement.....	1200, 1202
other-overhead-adjust statement.....	1201, 1203
other-stateful-configuration statement	
dynamic router advertisement.....	1204
outstanding requests	
Gx-Plus, configuring.....	712
overhead-accounting statement	
ANCP.....	1205
override-password statement	
domain map.....	1210
overrides statement	
DHCP local server.....	1206
DHCP relay agent.....	1208
enhanced subscriber management.....	1210
P	
packet-triggered subscribers.....	786
flags for tracing operations.....	876, 879
log file size.....	876
log filenames for tracing operations.....	876
monitoring.....	811
profile properties.....	878
record type.....	878
tracing operations.....	875, 877
packet-triggered subscribers and policy control See	
PTSP	
packet-triggered-subscribers statement.....	1211
packet-triggered-subscribers-partition	
statement.....	1211
padn statement	
domain map.....	1212
parentheses, in syntax descriptions.....	1
parse order	
domain and realm names.....	170
parse-direction statement	
domain map.....	1212, 1214
parse-order statement	
domain map.....	1213, 1215
partition	
Gx-Plus, configuring.....	711
JSRC, assigning.....	761
JSRC, configuring.....	760
partition ID	
learning ANCP.....	629
partition statement	
Gx-Plus.....	1216
JSRC.....	1216
OCS.....	1218
PCRF.....	1220
PTSP.....	1221
password	
configuring global static subscriber	
authentication.....	777
configuring static subscriber group	
authentication.....	781
password statement	
DHCP local server.....	1223
DHCP relay agent.....	1224
static subscribers.....	1222
passwords	
DHCP users.....	275
PCC	
Policy and Charging Control.....	715
PCEF	
Policy and Charging Enforcement	
Function.....	718
rule interactions.....	735
PCRF	
displaying.....	1730
downstream messages.....	740
interactions with Gx.....	722
interactions with Gx-Plus.....	705
rule interactions.....	735
statistics	
clearing.....	1473
subscribers	
clearing.....	1473
upstream messages.....	740
pcrf statement	
Gx.....	1225
PCRF statements	
destination-host statement.....	990
destination-realm.....	993
draining.....	1033
draining-response-timeout.....	1034

- global.....1073
- ip-can-type.....1116
- local decision.....1131
- logout-response-timeout.....1142
- partition.....1220
- provisioning-order.....1250
- report-local-rules statement.....1292
- report-resource-allocation statement.....1293
- report-successful-resource-allocation statement.....1294
- send-dyn-subscription-indicator.....1321
- send-network-family-indicator.....1323
- send-origin-state-id.....1324
- subscription-id-data-include.....1354
- subscription-id-type.....1356
- update-response-timeout.....1404
- peer
 - configuring Diameter.....700
- peer statement
 - Diameter base protocol
 - network element.....1227
 - remote peer.....1226
- peer-ip-address-optional statement
 - dynamic PPP.....1228
- peers
 - clearing Diameter base protocol.....1463
- per-interface tracing operations
 - DHCP local server.....826, 827
 - DHCP relay.....826, 827
- Policy and Charging Control
 - overview.....715
 - PCC.....715
- Policy and Charging Enforcement Function
 - PCEF.....718
- pool statement
 - address-assignment pools.....1230
 - DHCP local server.....1231
- pool-match-order statement.....1232
- port statement
 - Diameter base protocol.....1233
 - RADIUS servers.....1233
- PPP
 - address pools, displaying.....1733
- PPP subscriber services
 - unauthorized NCP negotiation, rejecting.....430
- pre-ietf mode
 - ANCP global configuration.....628
 - ANCP neighbor configuration.....625, 628
- pre-ietf-mode statement
 - ANCP.....1234
- preauthentication
 - LLID.....147, 148
 - verifying configuration.....226
- preauthentication server
 - LLID.....150
- preauthentication-order statement
 - access profiles.....1234
- preauthentication-port statement
 - RADIUS servers.....1235
- preauthentication-secret statement
 - RADIUS servers.....1235
- preauthentication-server statement
 - access profiles.....1236
- precedence
 - address assignment249
- predefined variables
 - corresponding RADIUS attributes and VSAs.....49
- preferred-lifetime statement.....1237
- dynamic router advertisement.....1238
- prefix statement
 - address-assignment pools.....1240
 - DHCP relay agent.....1239
 - DHCPv6 relay agent.....1239
 - dynamic router advertisement.....1240
- priority statement
 - Diameter base protocol.....1241
- process-inform statement
 - DHCP local server.....1246
- profile statement
 - subscriber access.....1242
- protocol statement
 - PTSP.....1247
- protocols statement
 - dynamic profiles.....1248
- provisioning-order statement
 - subscriber services.....1250
- proxy-mode statement.....1251
- PTSP
 - configuration overview.....790
 - configuring forward rules.....802
 - configuring forwarding instance.....802
 - configuring rules.....798
 - configuring service sets.....801
 - configuring services interface.....798
 - configuring static policies.....799
 - configuring static rule sets.....801

configuring static rules.....	799	remote-port-range.....	1288
Diameter AVPs.....	687	remote-ports.....	1288
Diameter message sequences.....	785	remote-prefix-list.....	1289
Diameter messages.....	682	rule-set.....	1318
flags for tracing operations.....	879	services.....	1337
interactions with the SAE.....	785	term	
log file size.....	877	forward rule.....	1361
log filenames for tracing operations.....	877	rule.....	1362
managing subscribers.....	784	then	
monitoring.....	811	forward rule.....	1365
overview.....	783	rule.....	1366
profile properties.....	878		
provisioning packet-triggered		Q	
subscribers.....	786	qos-adjust statement	
provisioning services.....	784	ANCP.....	1252
record type.....	878	qos-adjust-adsl statement	
subscriber bandwidth, displaying.....	1761	ANCP.....	1253
subscriber dynamic policies, displaying.....	1763	qos-adjust-adsl2 statement	
subscriber flows, displaying.....	1766	ANCP.....	1253
subscriber sessions		qos-adjust-adsl2-plus statement	
clearing.....	1475	ANCP.....	1254
displaying.....	1768	qos-adjust-other statement	
subscriber statistics, displaying.....	1771	ANCP.....	1255
tracing operations.....	875, 877	qos-adjust-sdsl statement	
verifying.....	805, 806	ANCP.....	1256
PTSP statements		qos-adjust-vdsl statement	
application-group-any.....	937	ANCP.....	1256
application-groups.....	937	qos-adjust-vdsl2 statement	
applications.....	938	ANCP.....	1257
count-type.....	975		
demux.....	987	R	
destination-host.....	990	RADIUS	
destination-realm.....	993	Acct-Off messages.....	103
diameter-instance.....	1018	Acct-On messages.....	103
forward-rule		CoA.....	177
.....	1065	dynamic requests.....	175, 176
forwarding instance.....	1064	mapping termination causes to code	
local-address.....	1129	values.....	185
local-address-range.....	1130	options.....	8, 122
local-port-range.....	1132	service activation failures.....	130
local-ports.....	1132	session termination causes and code values	
local-prefix-list.....	1133	AAA defaults.....	186
match-direction.....	1149	DHCP defaults.....	188
packet-triggered-subscribers.....	1211	L2TP defaults.....	189
packet-triggered-subscribers-partition.....	1211	mapping.....	185
partition.....	1221	overview.....	183
protocol.....	1247	PPP defaults.....	209
remote-address.....	1283	VLAN defaults.....	217
remote-address-range.....	1284		

-
- RADIUS accounting
 - back-up options, configuring.....109
 - backing up accounting stop requests.....1505, 1702
 - backing up during an outage.....100
 - duplicate report filters.....98, 99
 - duplicating in a nondefault LS:RI.....97
 - forcing contact with offline server.....117
 - monitoring backup.....224
 - releasing pending accounting stop requests.....1296
 - RADIUS accounting statements
 - access-profile-name.....912
 - accounting-backup-options.....914
 - accounting-retry.....917
 - accounting-timeout.....920
 - duplication-filter.....1039, 1041
 - duplication-vrf.....1040
 - max-pending-accounting-stops.....1157
 - max-withhold-time.....1157
 - vrf-name.....1431
 - RADIUS attribute 31
 - configuring.....66
 - RADIUS attribute 5
 - configuring extended format per physical interface.....81
 - configuring extended format per stacked VLAN.....84
 - configuring extended format per VLAN.....82
 - configuring for ATM interfaces.....86
 - RADIUS attribute 61
 - configuring per physical interface.....76
 - configuring per VLAN.....78, 79
 - manual configuration.....74
 - RADIUS attribute 87
 - configuring.....63
 - manual configuration.....61
 - RADIUS attributes.....13
 - configuring for ATM interfaces.....86
 - configuring per physical interface.....76, 81
 - configuring per stacked VLAN.....79, 84
 - configuring per VLAN.....78, 82
 - corresponding predefined variables.....49
 - ignoring and excluding.....43
 - preauthentication.....148
 - supported.....14
 - RADIUS dynamic request information
 - verifying.....225
 - RADIUS messages
 - support for interworking of Cisco VSAs.....110, 153
 - supported DSL Forum VSAs.....57
 - RADIUS preauthentication server
 - port number, specifying.....151
 - secret, specifying.....151
 - specifying.....150
 - RADIUS server
 - Calling-Station-ID attribute.....66
 - configuring interaction with.....115
 - configuring parameters.....118
 - NAS-Port-ID attribute.....61, 63
 - NAS-Port-Type attribute.....74
 - options.....4, 61, 63, 66, 74, 119
 - options per interface, VLAN, or stacked VLAN.....70, 73
 - configuration guidelines.....72
 - RADIUS servers
 - configuration example.....92
 - specifying.....91, 150
 - radius statement
 - subscriber access.....1258
 - RADIUS statements
 - accounting-order.....915
 - juniper-dsl-attributes.....1120
 - terminate-code.....1363
 - radius-disconnect statement
 - DHCP local server.....1260
 - radius-flow-tap statement.....1261
 - RADIUS-initiated disconnect.....181
 - messages.....181
 - radius-options statement1262, 1263
 - radius-server statement.....1264
 - RADIUS-sourced DHCP options.....140
 - range statement
 - address-assignment pools.....1265
 - rapid commit
 - DHCP.....435
 - rapid-commit statement
 - DHCP local server.....1266
 - reachable-time statement
 - dynamic router advertisement.....1267
 - realm names
 - delimiters.....169
 - parse order.....170
 - realm-delimiter statement
 - domain map.....1267

realm-parse-direction statement	
domain map.....	1268
rebooting router software	
requesting a system reboot.....	1498
reconfigure statement	
DHCP local server.....	1269
Relay Agent Interface ID option 18	
DHCPv6 relay.....	442
Relay Agent Remote ID option 37	
DHCPv6 relay.....	442
relay-agent-interface-id statement	
DHCP local server.....	1270
DHCP relay agent.....	1271
username.....	1272
relay-agent-remote-id statement	
DHCP local server statements.....	1273
DHCP relay agent.....	1274, 1275
relay-agent-subscriber-id statement	
DHCP local server.....	1276
DHCP relay agent.....	1277
relay-option statement.....	1278
relay-option-82 statement	
deleting.....	337, 1280
vendor-specific.....	1427
relay-option-vendor-specific statement	
dhcpv6	1279
relay-server-group statement	
DHCP relay agent.....	1281
remote-address statement	
PTSP.....	1283
remote-address-range statement	
PTSP.....	1284
remote-id statement.....	1284
DHCP relay agent.....	1285
remote-id-mismatch	
DHCP local server.....	1287
DHCP relay agent.....	1287
remote-port-range statement	
PTSP.....	1288
remote-ports statement	
PTSP.....	1288
remote-prefix-list statement	
PTSP.....	1289
replace-ip-source-with statement.....	1290
report-interface-descriptions statement	1291
report-local-rules statement	
PCRF.....	1292
report-resource-allocation statement	
PCRF.....	1293
report-successful-resource-allocation statement	
PCRF.....	1294
request ancp oam interface command.....	1477
request ancp oam neighbor command.....	1478
request dhcp relay bulk-leasequery	
command.....	1479, 1482
request dhcp relay leasequery	
command.....	1480, 1483
request dhcp server reconfigure command.....	1485
request dhcpv6 relay bulk-leasequery	
command.....	1489
request dhcpv6 relay leasequery command.....	1491
request dhcpv6 server reconfigure	
command.....	1487
request network-access aaa replay	
pending-accounting-stops command.....	1296
request network-access aaa subscriber add	
session-id command.....	1297
request network-access aaa subscriber delete	
session-id command.....	1299
request network-access aaa subscriber modify	
session-id command.....	1301
request network-access aaa subscriber set	
session-id command.....	1492
request services extensible-subscriber-services	
reload-dictionary.....	1493
request services static-subscribers login group	
command.....	1494
request services static-subscribers login interface	
command.....	1496
request services static-subscribers logout group	
command.....	1495
request services static-subscribers logout interface	
command.....	1497
request system reboot command.....	1498
request-max-tcp-connections statement	
DHCP leasequery.....	1295
request-rate statement	
access.....	1302
requested-ip-network-match statement	
DHCP local server.....	1303
restart extensible-subscriber-services.....	1503
restart time	
ANCP global configuration.....	629
restricted-requestor statement	
DHCP local server.....	1304
retransmit-timer statement	
dynamic router advertisement.....	1305
retry statement.....	1306

revert-interval statement.....	1307
route statement	
Diameter base protocol.....	1308
router advertisements	
IPv6	
clearing.....	1466
displaying.....	1679
router statement	
address-assignment pools.....	1308
router-advertisement statement	
dynamic profiles.....	1309
routes, displaying	
active.....	1735
extensive information.....	1743
routing-instance statement	
Diameter base protocol	
transport.....	1311
Diameter base protocol peer	
peer.....	1310
RADIUS.....	1309
routing-instance-name statement	
DHCP local server.....	1312
DHCP relay agent.....	1314
static subscribers.....	1315
routing-services statement	
enhanced subscriber management.....	1316
rule statement	
PTSP.....	1317, 1318
rule-set statement	
PTSP.....	1318
S	
SAE	
interactions with JSRC.....	757
interactions with PTSP.....	785
service accounting with JSRC.....	765
sdsl-bytes statement.....	1319
sdsl-overhead-adjust statement.....	1319
secret statement	
access.....	1320
selective traffic processing	
DHCP relay.....	281, 327, 328, 344, 346
send-acct-status-on-config-change statement	
accounting.....	1320
send-dyn-subscription-indicatorstatement	
PCRF.....	1321
send-network-family-indicator statement	
PCRF.....	1323
send-origin-state-id statement	
PCRF.....	1324
send-release-on-delete statement	
DHCP relay agent.....	1325
server groups	
DHCP relay.....	323
server-group statement	
DHCP relay agent.....	1327
server-identifier statement	
address-assignment pools.....	1328
server-response-time statement	
DHCP relay agent.....	1330
service accounting	
accounting.....	914
enabling.....	113, 156
interim accounting, enabling.....	110, 153
JSRC.....	765
service accounting statements	
statistics.....	1347
update-interval.....	1403
service activation and subscriber login.....	130
service interim accounting	
specifying, interval.....	113, 156
service provisioning	
interoperation of Cisco VSAs with Juniper VSAs	
in RADIUS messages.....	110, 153
packet-triggered subscribers with PTSP.....	786
static subscribers with JSRC.....	769
with JSRC.....	755
with PTSP.....	784
service statement	
service accounting.....	1331
service thresholds.....	180
service-activation statement.....	1332
service-context-id statement	
OCS.....	1334
service-profile statement	
DHCP local server.....	1335
DHCP relay agent.....	1336
services statement	
PTSP.....	1337
services with multiple instances	
deactivating all instances with CLI.....	599
deactivating single instance with CLI.....	597
overview.....	595
session options	
subscriber access.....	131

session options statements	
client-idle-timeout.....	966
client-idle-timeout-ingress-only.....	967
client-session-timeout.....	970
session startup	
authentication and accounting	
information.....	89
session termination causes and code values	
AAA defaults.....	186
custom mapping.....	185
DHCP defaults.....	188
displaying.....	1715
L2TP defaults.....	189
PPP defaults.....	209
understanding.....	183
VLAN defaults.....	217
session timeout	
subscriber access.....	131
session-options statement	
access profile.....	1338
set request services subscribers	
command.....	1474, 1504
shaping-rate adjustments	
for subscriber local loops.....	653
shmlog statement	
enhanced subscriber management.....	1339
show accounting pending-accounting-stops	
command.....	1505
show ancp cos command.....	1509
show ancp neighbor command.....	1514
show ancp statistics command.....	1522
show ancp subscriber command.....	1527
show ancp summary command.....	1533
show ancp summary neighbor command.....	1535
show ancp summary subscriber command.....	1537
show class-of-service interface command.....	1538
show class-of-service interface-set	
command.....	1567
show class-of-service scheduler-map	
command.....	1570, 1573
show class-of-service traffic-control-profile	
command.....	1576
show database-replication statistics	
command.....	1580
show database-replication summary	
command.....	1582
show dhcp relay binding command.....	1585
show dhcp relay statistics command.....	1591
show dhcp server binding command.....	1595
show dhcp server statistics command.....	1601
show dhcpv6 relay binding command.....	1604
show dhcpv6 relay statistics command.....	1612
show dhcpv6 server binding command.....	1616
show dhcpv6 server statistics command.....	1622
show diameter command.....	1625
show diameter function command.....	1631
show diameter function statistics command.....	1635
show diameter instance command.....	1638
show diameter network-element command.....	1640
show diameter network-element map	
command.....	1643
show diameter peer command.....	1646
show diameter peer map command.....	1651
show diameter peer statistics command.....	1654
show diameter route command.....	1658
show extensible-subscriber-services	
accounting.....	1660
show extensible-subscriber-services	
counters.....	1663
show extensible-subscriber-services	
debug-information.....	1665
show extensible-subscriber-services	
dictionary.....	1666
show extensible-subscriber-services dictionary	
attributes.....	1670
show extensible-subscriber-services dictionary	
services.....	1673
show extensible-subscriber-services service.....	1678
show extensible-subscriber-services	
sessions.....	1676
show ipv6 router-advertisement command.....	1679
show network-access aaa accounting	
command.....	1584, 1682
show network-access aaa radius-servers	
command.....	1683
show network-access aaa statistics authentication	
command.....	1699
show network-access aaa statistics	
command.....	1690
show network-access aaa statistics	
pending-accounting-stops command.....	1702
show network-access aaa statistics	
preauthentication command.....	1703
show network-access aaa subscriber session-id	
command.....	1708
show network-access aaa subscribers	
command.....	1705

show network-access aaa terminate-code command.....	1715	stacked-vlan-ranges statement.....	1344
show network-access address-assignment pool command.....	1720	starts-with statement	
show network-access domain-map command.....	1721	DHCP relay agent.....	1345
show network-access gx-plus command.....	1722	static subscriber statements	
show network-access ocs command.....	1728	access-profile.....	911
show network-access pcrf command.....	1730	aggregate-clients.....	930
show ppp address-pool command.....	1733	authentication.....	944
show route command.....	1735	domain-name.....	1028
show route extensive command.....	1743	dynamic-profile.....	1045
show services subscriber bandwidth command.....	1761	group.....	1081
show services subscriber dynamic-policies command.....	1763	interface	
show services subscriber flows command.....	1766	group.....	1100
show services subscriber sessions command.....	1768	username.....	1101
show services subscriber statistics command.....	1771	logical-system-name.....	1139
show static-subscribers sessions command.....	1773	password.....	1222
show subscribers command.....	1775	routing-instance.....	1315
show subscribers summary command.....	1796	static-subscribers.....	1346
show system subscriber-management route command.....	1802	traceoptions.....	1388
show system subscriber-management statistics command.....	1806	user-prefix.....	1418
show system subscriber-management summary command.....	1812	username-include.....	1422
sip-server-address statement.....	1341	static subscribers.....	769
sip-server-domain-name statement.....	1341	configuring interface groups.....	779
smg-service statement		event logging.....	871
enhanced subscriber management.....	1342	flags for tracing operations.....	872
source-address statement		forced group logout.....	1495
RADIUS.....	1343	forced logout.....	1497
SRC		forcing logout.....	809
packet-triggered subscriber management with		forcing logout for interface groups.....	810
PTSP.....	786	global access profile.....	775
SAE interactions with JSRC.....	757	global authentication password.....	777
SAE interactions with PTSP.....	785	global dynamic profile.....	775, 776, 781
static subscriber management with		global username.....	777
JSRC.....	769	group.....	779
subscriber management with JSRC.....	755	group access profile.....	780
subscriber management with PTSP.....	784	group authentication password.....	781
stacked VLANs		group dynamic profile.....	780
configuration guidelines for RADIUS		group username.....	782
options.....	72	interface group state reset.....	1494
configuring RADIUS options for.....	73, 79	interface state reset.....	1496
overview of configuring RADIUS options		log file access for tracing operations.....	868
for.....	70	log file size and number.....	867
		log filenames for tracing operations.....	872
		message severity levels for tracing	
		operations.....	868
		regular expressions for tracing	
		operations.....	868
		resetting login state for an interface.....	809
		resetting login state for interface groups.....	810

session status		regular expressions for tracing	
displaying.....	1773	operations.....	834
verifying.....	810	tracing operations.....	835
tracing operations.....	871	subscriber management statements	
static-subscribers statement.....	1346	interface-delete.....	1105, 1106
statistics statement		maintain-subscriber.....	1146
access.....	1347	subscriber-management.....	1352
service accounting.....	1347	traceoptions.....	1390
strict statement		subscriber match criteria	
DHCP local server.....	1348	DHCPv6.....	307
strip-domain statement		subscriber provisioning	
domain map.....	1349	Gx-Plus.....	713
strip-username statement		JSRC.....	762
domain map.....	1349	subscriber secure policy	
subscriber		configuring DTCP-initiated.....	559
ANCP.....	1441	configuring RADIUS-initiated.....	560
subscriber AAA information		system resources.....	559
verifying.....	223	subscriber service	
subscriber access		activating with CLI.....	587
subscriber information, displaying.....	1775	deactivating with CLI.....	587
subscriber summary information,		default.....	241, 242
displaying.....	1796	subscriber service session	
subscriber interface statements		accounting statistics.....	106, 107
peer-ip-address-optional.....	1228	subscriber services	
subscriber local loops		activating.....	1297
CoS shaping-rate adjustments with		activating with CLI.....	588
ANCP.....	653	deactivating.....	1299
subscriber management		deactivating with CLI.....	588
packet-triggered.....	786	local activation and deactivation.....	588
static.....	769	modifying.....	1301
with JSRC.....	755	removing PCRF control.....	881, 1492
with PTSP.....	784	subscriber services with multiple instances	
subscriber management database		deactivating all instances with CLI.....	599
flags for tracing operations.....	832	deactivating single instance with CLI.....	597
log file access for tracing operations.....	830	local deactivation with CLI.....	597, 599
log file size and number.....	829	overview.....	595
log filenames.....	832	subscriber session	
regular expressions for tracing		accounting statistics.....	104
operations.....	830	subscriber session database statements	
statistics information, displaying.....	1580	database-replication.....	976
summary information, displaying.....	1582, 1812	traceoptions.....	1392
tracing operations.....	831	subscriber session options	
subscriber management session database		configuration overview	
replication		timeout limits.....	136
flags for tracing operations.....	836	removing inactive VLANs.....	137
log file access for tracing operations.....	834	subscriber-identification statement	
log file size and number.....	833	PTSP.....	1350
log filenames.....	836		

- subscriber-management
 - statistics
 - clearing.....1476
- subscriber-management statement
 - subscriber management.....1352
- subscriber-packet-idle-timeout statement.....1351
- subscriber-profile statement.....1353
- subscribers
 - displaying.....1775
 - displaying summary.....1796
 - identifying ANCP.....626
- subscription-id-data-include statement
 - PCRF.....1354
- subscription-id-type statement
 - PCRF.....1356
- support, technical See technical support
- syntax conventions.....xliv
- T**
 - t1-percentage statement.....1357, 1358
 - t2-percentage statement.....1358
 - target logical system/routing instance
 - domain map.....168
 - target-logical-system statement
 - domain map.....1359
 - target-routing-instance statement
 - domain map.....1360
 - tcp-tickles statement.....1398
 - technical support
 - collecting logs for.....883
 - contacting JTAC.....li
 - term statement
 - PTSP
 - forward rule.....1361
 - rule.....1362
 - terminate-code statement.....1363
 - termination cause codes
 - AAA defaults.....186
 - DHCP defaults.....188
 - L2TP defaults.....189
 - mapping.....185
 - overview.....183
 - PPP defaults.....209
 - VLAN defaults.....217
 - test aaa authd-lite user command.....1815
 - test aaa dhcp user command.....1818
 - test aaa ppp user command.....1822
 - tftp-server statement.....1364
 - then statement
 - PTSP
 - forward rule.....1365
 - rule.....1366
 - third-party DHCP leases
 - overriding.....251
 - thresholds
 - subscriber service.....180
 - timeout statement
 - access.....1367
 - DHCP leasequery.....1370
 - DHCP local server.....1368, 1369
 - timeouts
 - idle and session.....131
 - token statement
 - DHCP local server.....1371
 - trace operations
 - collecting logs for Juniper Networks Technical Support.....883
 - filtering output for Diameter base protocol.....840
 - trace statement
 - DHCP local server.....1372
 - DHCP relay agent.....1373
 - traceoptions.....1381
 - traceoptions statement
 - address-assignment pools.....1384
 - ANCP.....1374
 - DHCP local server.....1376
 - DHCP relay agent.....1376
 - Diameter base protocol.....1379
 - enhanced subscriber management.....1382
 - general authentication service.....1384
 - PTSP.....1386
 - static subscribers.....1388
 - subscriber management.....1390
 - subscriber session database replication.....1392
 - tracing operations
 - address-assignment pools.....859
 - ANCP.....853
 - DHCP local server.....821
 - DHCP local server interface-specific.....1111
 - DHCP relay.....821
 - DHCP relay interface-specific.....1111
 - Diameter base protocol.....843
 - general authentication service.....859
 - Gx-Plus.....859
 - JSRC.....859
 - packet-triggered subscribers.....875, 877

PTSP.....	875, 877	upstream-rate statement	
static subscribers.....	871	ANCP.....	1405
subscriber management database.....	831	L2TP.....	1405
subscriber management session database replication.....	835	use-interface-description statement.....	1406
traffic shaping		use-option-82 statement.....	1410
adjustment of ANCP.....	659, 660, 667	use-primary statement	
ANCP-agent reported rates for CoS.....	657	DHCP relay agent.....	1411
traffic-control profiles		use-vlan-id statement.....	1413
global modification.....	592	user-name-include statement	
modifying.....	591	OCS.....	1408
per-subscriber modification.....	592	user-prefix statement	
transport		DHCP local server.....	1415
configuring Diameter.....	701	DHCP relay agent.....	1417
transport statement		static subscribers.....	1418
Diameter base protocol		username	
local.....	1393	configuring global static subscriber.....	777
peer.....	1394	configuring static subscriber group.....	782
traps statement.....	1395	username-include statement	
traps statements		DHCP local server.....	1419
enhanced subscriber management.....	1395	DHCP relay agent.....	1421
trigger statement		static subscribers.....	1422
DHCP leasequery.....	1397		
DHCP local server.....	1396	V	
troubleshooting statements		valid-lifetime statement.....	1424
enhanced subscriber management		dynamic router advertisement.....	1423
shmlog.....	1339	variables, Junos OS predefined	
troubleshooting subscriber access		corresponding RADIUS attributes and VSAs.....	49
collecting logs for Juniper Networks Technical Support.....	883	vendor-specific attributes	
trust-option-82 statement.....	1399	supported.....	21
tunnel profile, L2TP		vendor-specific statement	
domain map.....	172	relay-option-82	1427
tunnel switching, L2TP		verifying enhanced subscriber management.....	558
domain map configuration.....	172	violation-action	
tunnel-profile statement		DHCP local server.....	1428
domain map.....	1400	DHCP relay agent.....	1428
		Virtual Chassis statements	
U		network-services.....	1180
underlying-interface statement		vlan-nas-port-stacked-format statement.....	1429
ANCP interface set.....	1400	vlan-ranges statement.....	1430
unique-nas-port statement.....	1401	VLANs	
update-interval statement		configuration guidelines for RADIUS	
access profile.....	1402	options.....	72
service accounting.....	1403	configuring RADIUS options for.....	73, 78
update-response-timeout statement		overview of configuring RADIUS options.....	70
PCRF.....	1404	removing inactive.....	137
		vrf-name statement	
		duplicate accounting.....	1431

VSA 26-55	
opaque DHCP options.....	140
RADIUS-sourced DHCP options.....	140
VSA	
ANCP-related DSL Forum.....	665
corresponding predefined variables.....	49
DSL Forum.....	55
Microsoft Corporation.....	58
supported.....	21
vsdsl-bytes statement.....	1425
vsdsl-overhead-adjust statement.....	1425
vsdsl2-bytes statement.....	1426
vsdsl2-overhead-adjust statement.....	1426
W	
wait-for-acct-on-ack statement	
accounting.....	1431
wins-server statement.....	1432

