



SRC-PE Software

C-Web Interface Configuration Guide

Release 2.0.x

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Table of Contents

About This Guide	xxi
Objectives	xxi
Audience	xxi
Documentation Conventions	xxii
Related Juniper Networks Documentation	xxiii
Obtaining Documentation	xxv
Documentation Feedback	xxv
Requesting Support	xxvi

Part 1

Configuring C-series Controllers

Chapter 1	Configuring Remote Access to a C-series Controller with the C-Web Interface	3
	Configuring External Interfaces on a C-series Controller	4
	Configuring Loopback Interfaces for IPv4 with the C-Web Interface	4
	Related Topics	5
	Configuring Loopback Interfaces for IPv6 with the C-Web Interface	5
	Related Topics	6
	Configuring Gigabit Ethernet Interfaces for IPv4 with the C-Web Interface	6
	Related Topics	7
	Configuring Gigabit Ethernet Interfaces for IPv6 with the C-Web Interface	7
	Related Topics	8
	Configuring Tunnel Interfaces with the C-Web Interface	8
	Related Topics	9
	Configuring a Static Route to Devices on Other Networks with the C-Web Interface	9
	Securing Connections Between a C-series Controller and Remote Hosts	9
	Configuring a C-series Controller to Accept SSH Connections with the C-Web Interface	10
	Configuring a C-series Controller to Accept Telnet Connections with the C-Web Interface	11
	Configuring a C-series Controller to Accept NETCONF Connections with the C-Web Interface	11

Chapter 2 Configuring NTP on C-series Controllers with the C-Web Interface 13

Specifying a Basic NTP Configuration on a C-series Controller	
with the C-Web Interface	14
Related Topics	14
Configuring NTP Client Mode for a C-series Controller	
with the C-Web Interface	14
Related Topics	15
Configuring an NTP Peer for a C-series Controller with the C-Web Interface ..	15
Related Topics	15
Configuring NTP Broadcast Mode on a C-series Controller	
with the C-Web Interface	15
Related Topics	16
Configuring NTP as a Multicast Client on a C-series Controller	
with the C-Web Interface	16
Related Topics	16
Specifying an Authentication Key for NTP on C-series Controllers	
with the C-Web Interface	16
Related Topics	17
Configuring NTP Authentication with the C-Web Interface	17
Related Topics	17

Chapter 3 Configuring System Logging for a C-series Controller with the C-Web Interface 19

Overview of the C-series Controller Log Server	19
Message Groups.....	20
Severity Levels.....	20
Before You Configure System Logging with the C-Web Interface.....	21
Saving System Log Messages to a File with the C-Web Interface	21
Sending System Log Messages to Other Servers with the C-Web Interface.....	21
Sending Notifications for System Log Messages to Users	
with the C-Web Interface	22

Part 2 Configuring User Access to the SRC Software**Chapter 4 Configuring User Access with the C-Web Interface 25**

Overview of User Accounts	25
Login Classes for User Accounts with the C-Web Interface	26
Access Privilege Level	26
Predefined Login Classes	29
Access to Individual Commands and Configuration Statements	
with the C-Web Interface	30
Regular Expressions for Allow and Deny Tasks	30
Guidelines for Using Regular Expressions.....	31
Timeout Value for Idle Login Sessions	32
Configuring Login Classes with the C-Web Interface	33
Configuring a Login Class	33

Configuring User Accounts with the C-Web Interface	33
Configuring a User Account	34
Configuring Authentication for User Accounts	34
Configuring a Plain Text Password	35
Configuring SSH Authentication	35
Changing the root Password	35
Configuring a System Login Announcement with the C-Web Interface.....	35

Chapter 5 Authenticating Users on a C-series Controller with the C-Web Interface

37

Configuring RADIUS and TACACS + Authentication on a C-series Controller with the C-Web Interface	37
Configuring RADIUS Authentication with the C-Web Interface	38
Configuring TACACS + Authentication with the C-Web Interface	38
Configuring More Than One Authentication Method with the C-Web Interface	39
Configuring Authentication Order	39
Removing an Authentication Method from the Authentication Order	40
Configuring Template Accounts for RADIUS and TACACS + Authentication with the C-Web Interface	40
Using Named Template Accounts	40
Using Remote Template Accounts	41
Configuring a Local User Template	41

Part 3

Managing Systems That Run the SRC Software

Chapter 6 Configuring Static Host Mapping with the C-Web Interface 45

Overview of Static Host Mapping	45
Configuring Static Host Mapping with the C-Web Interface	45

Chapter 7 Managing the Juniper Networks Database with the C-Web Interface 47

Enabling the Juniper Networks Database to Run in Standalone Mode with the C-Web Interface	48
Related Topics	48
Configuring the Juniper Networks Database to Run in Community Mode with the C-Web Interface	48
Related Topics	48
Securing the Juniper Networks Database with the C-Web Interface.....	49
Related Topics	49
Adding a Juniper Networks Database to an Established Community with the C-Web Interface	49
Related Topics	50
Promoting a Secondary Database to a Primary Role in a Configuration with One Primary Database with the C-Web Interface.....	51
Related Topics	52
Updating Data on a Juniper Networks Database with the C-Web Interface	52
Related Topics	52

Synchronizing Data on a Juniper Networks Database	
with the C-Web Interface	52
Related Topics	52
Loading Sample Data in to a Juniper Networks Database	
with the C-Web Interface	53
Related Topics	53
Securing Communications Between the Juniper Networks Database and	
SRC Components with the C-Web Interface	54
Related Topics	54
Recovering Data in a Community with One Primary Database and	
One Secondary Database with the C-Web Interface	55
Related Topics	55

Part 4

Configuring Network Components

Chapter 8	Setting Up an SAE with the C-Web Interface	59
	Initially Configuring the SAE with the C-Web Interface	59
	Creating Grouped Configurations for the SAE with the C-Web Interface	60
	Configuring an SAE Group with the C-Web Interface	60
	Configuring Local Properties for the SAE with the C-Web Interface	61
	Configuring the RADIUS Local IP Address and NAS ID	
	with the C-Web Interface	61
	Configuring the Directory Location for SAE Data with the C-Web Interface	61
	Starting and Stopping the SAE with the C-Web Interface	62
	Starting the SAE with the C-Web Interface	62
	Stopping the SAE with the C-Web Interface	62
Chapter 9	Configuring the SAE with the C-Web Interface	63
	Configuring LDAP Access to Directory Data with the C-Web Interface	63
	Configuring Access Through LDAPS to Service and Subscriber Data	64
	Configuring Access to Subscriber Data	65
	Configuring Access to Service Data	65
	Configuring Access to Policy Data	65
	Configuring Access to the Persistent Login Cache	65
	Configuring the Location of Network Device Data	65
	Enabling Automatic Discovery of Changes in SAE Configuration Data	66
	Setting the Timeout and Number of Events for SAE Directory Eventing	66
	Related Topics	66
	Storing Subscriber and Service Session Data with the C-Web Interface	66
	Session Store Files	66
	Active and Passive Session Stores	67
	Standby SAEs	67
	Session Store File Rotation	67
	Configuring the Session Store Feature on the C-Web Interface	67
	Configuring Session Store Parameters for a Device Driver	68
	Configuring Global Session Store Parameters with the C-Web Interface	68
	Reducing the Size of Objects for the Session Store Feature	69
	Related Topics	69
	Configuring the Number of Threads for Sessions on the C-Web Interface	69

Chapter 10	Classifying Interfaces and Subscribers with the C-Web Interface	71
	Overview of Classification Scripts	71
	How Classification Scripts Work	72
	Interface Classification Scripts	72
	Subscriber Classification Scripts	73
	DHCP Classification Scripts.....	73
	Classification Targets	74
	Target Expressions	74
	Classification Conditions.....	75
	Glob Matching.....	75
	Regular Expression Matching	76
	Classifying Interfaces with the C-Web Interface	76
	Interface Classification Conditions.....	77
	Classifying Subscribers with the C-Web Interface	79
	Subscriber Classification Conditions	79
	Sending DHCP Options to the JUNOS Router	82
	Subscriber Classification Targets.....	83
	Classifying DHCP Subscribers with the C-Web Interface	84
	DHCP Classification Conditions	85
	DHCP Classification Targets.....	86
	Selecting DHCP Parameters	87
	Setting DHCP Parameters with DHCP Options.....	87
	Creating DHCP Profiles with the C-Web Interface	90
Chapter 11	Configuring the SAE for a PCMM Environment with the C-Web Interface	91
	Configuring the SAE for a Cable Network Environment with the C-Web Interface	91
	Configuring the SAE to Manage PCMM Devices with the C-Web Interface	92
	Setting Up SAE Communities with the C-Web Interface	93
	Configuring the SAE Community Manager.....	93
	Configuring SAE Properties for the Event Notification API with the C-Web Interface	94
	Configuring PCMM Record-Keeping Server Plug-Ins with the C-Web Interface	94
	Configuring CMTS-Specific RKS Plug-Ins with the C-Web Interface	94
	Configuring Record-Keeping Server Peers for Plug-Ins with the C-Web Interface	95
Chapter 12	Configuring and Starting the SNMP Agent with the C-Web Interface	97
	Configuring the SDX SNMP Agent	98
	Related Topics	98
	Configuring General Properties for the SDX SNMP Agent	99
	Configuring Initial Properties for the SDX SNMP Agent	99
	Configuring Directory Connection Properties for the SDX SNMP Agent.....	99
	Configuring Directory Monitoring Properties for the SDX SNMP Agent	99
	Configuring Logging Destinations for the SDX SNMP Agent	100
	Configuring JRE Properties	100
	Configuring the SNMP Agent.....	100
	Configuring System Information for the SNMP Agent	101

	Configuring Access Control for SNMPv3 Users	101
	Configuring Authentication	101
	Configuring Encryption	101
	Configuring Access Control for Communities	102
	Configuring Access Control for the VACM	102
	Associating Security Names with a Community	102
	Defining Named Views	103
	Defining Access Privileges for an SNMP Group	103
	Assigning Security Names to Groups	104
	Configuring Notification Targets	104
	Configuring Performance Traps	104
	Configuring Event Traps	105
	Operating the SNMP Agent	105
	Starting the SDX SNMP Agent	105
	Stopping the SDX SNMP Agent	106
	Monitoring the SDX SNMP Agent	106
Chapter 13	Configuring NIC with the C-Web Interface	107
	Before You Configure the NIC	108
	Related Topics	108
	Configuring the NIC with the C-Web Interface	109
	Related Topics	109
	Reviewing and Changing Operating Properties for NIC with the C-Web Interface	109
	Related Topics	110
	Configuring NIC Replication with the C-Web Interface	110
	Related Topics	111
	Starting the NIC with the C-Web Interface	111
	Related Topics	111
	Configuring a NIC Scenario with the C-Web Interface	111
	Related Topics	112
	Configuring the SAE to Communicate with SAE Plug-In Agents for NIC Replication with the C-Web Interface	113
	Related Topics	114
	Obtaining Interface Configuration Information for OnePopStaticRouteIp	114
	Related Topics	114
	Testing a NIC Resolution with the C-Web Interface	114
	Related Topics	114
	Stopping a NIC Host on a C-series Controller with the C-Web Interface	115
	Related Topics	115
	Restarting the NIC with the C-Web Interface	115
	Related Topics	115
	Changing NIC Configurations with the C-Web Interface	115
	Related Topics	116
Chapter 14	Using the C-Web Interface to Configure SRC Applications to Communicate with an SAE	117
	Before You Configure a NIC Proxy	117
	Configuring a NIC Proxy from the C-Web Interface	118
	Related Topics	119

Configuring NIC Test Data with the C-Web Interface	119
Examples: Key Values for NIC Bindings	120
Related Topics	121
Chapter 15	Configuring Admission Control with the C-Web Interface
	123
Configuring SRC-ACP	124
Creating Grouped Configurations for SRC-ACP with the C-Web Interface	124
Configuring an SRC-ACP Group	124
Related Topics	125
Configuring Local Properties for SRC-ACP	125
Configuring Basic Local Properties for SRC-ACP	125
Configuring Initial Properties for SRC-ACP	125
Configuring Directory Connection Properties for SRC-ACP	125
Configuring Initial Directory Eventing Properties for SRC-ACP	126
Related Topics	126
Configuring the SAE for SRC-ACP with the C-Web Interface	126
Configuring SRC-ACP as an External Plug-In	126
Configuring Event Publishers	127
Configuring the SAE to Monitor Interfaces for Congestion Points	127
Related Topics	127
Configuring SRC-ACP Properties	128
Configuring Logging Destinations for SRC-ACP	128
Configuring SRC-ACP Operation	129
Specifying Values That SRC-ACP Looks for in Remote	
Update Database	130
Specifying Interface Tracking Events That SRC-ACP Ignores	131
Configuring CORBA Interfaces	132
Configuring SRC-ACP Redundancy	132
Configuring Connections to the Subscribers' Directory	132
Configuring Connections to the Services' Directory	132
Configuring SRC-ACP Scripts and Classification	133
Configuring SRC-ACP to Manage the Edge Network	133
Configuring Network Interfaces in the Directory (Edge Network)	133
Configuring Bandwidths for Subscribers (Edge Network)	133
Assigning Network Interfaces to Subscribers	134
Configuring Bandwidths for Services	134
Related Topics	135
Configuring SRC-ACP to Manage the Backbone Network	135
Configuring Network Interfaces in the Directory (Backbone Network)	135
Extending SRC-ACP Congestion Points	136
Configuring Action Congestion Points	136
Configuring Bandwidths for Services (Backbone Network)	137
Configuring Congestion Points for Services	137
Configuring Congestion Points in the Directory	137
Assigning Interfaces to Congestion Points	138
Related Topics	138
Configuring Congestion Point Classification with the C-Web Interface	138
Congestion Point Classification Scripts	138
Congestion Point Profiles	139
Configuring Targets and Criteria for Classification Scripts	139
Configuring Classification Scripts Contents for Classification Scripts	139
Configuring Congestion Point Classification Targets	139
Selecting Congestion Point Classification Criteria	140

Defining a Congestion Point Profile.....	140
Congestion Point Expressions.....	140
Expressions in Templates for Congestion Point Profiles.....	141
Methods for Use with Scripting Expressions.....	141
Match Criteria for Congestion Point Classification.....	142

Part 5

Integrating Network Devices

Chapter 16	Configuring the JPS with the C-Web Interface	145
Configuring the JPS with the C-Web Interface	146	
Modifying the JPS Configuration with the C-Web Interface.....	146	
Configuring General Properties for the JPS with the C-Web Interface.....	146	
Specifying a Policy Server Identifier in Messages with the C-Web Interface	147	
Configuring Logging Destinations with the C-Web Interface	147	
Related Topics.....	147	
Specifying Connections to the Application Managers with the C-Web Interface	147	
Related Topics.....	147	
Specifying Connections to RKSs with the C-Web Interface	148	
Configuring RKS Pairs with the C-Web Interface	148	
Configuring RKS Pairs for Associated Application Managers with the C-Web Interface	149	
Specifying Connections to CMTS Devices with the C-Web Interface	149	
Modifying the Subscriber Configuration with the C-Web Interface	149	
Configuring Subscriber IP Pools as IP Address Ranges with the C-Web Interface	150	
Configuring Subscriber IP Pools as IP Subnets with the C-Web Interface	150	
Configuring the SAE to Interact with the JPS with the C-Web Interface	151	
Specifying Application Managers for the Policy Server with the C-Web Interface	151	
Related Topics.....	152	
Specifying Application Manager Identifiers for Policy Servers with the C-Web Interface	152	
Related Topics.....	152	
Adding Objects for Policy Servers to the Directory with the C-Web Interface	152	
Related Topics.....	152	
Configuring Initialization Scripts with the C-Web Interface	153	
Enabling State Synchronization with the C-Web Interface	153	
Using the NIC Resolver with the C-Web Interface.....	153	
Related Topics.....	154	
Managing the JPS with the C-Web Interface	154	
Related Topics.....	154	
Starting the JPS with the C-Web Interface.....	155	
Related Topics.....	155	
Restarting the JPS with the C-Web Interface	155	
Related Topics.....	155	

Stopping the JPS with the C-Web Interface	155
Related Topics.....	156
Displaying JPS Status with the C-Web Interface	156
Related Topics.....	156

Chapter 17 Using JUNOSe Routers in the SRC Network with the C-Web Interface

157

COPS Connection Between JUNOSe Routers and the SAE	158
Highly Available Connections to JUNOSe Routers	158
Adding JUNOSe Routers and Virtual Routers with the C-Web Interface	158
Adding Operative JUNOSe Routers and Virtual Routers	158
Adding JUNOSe Routers Individually	159
Adding Virtual Routers Individually	159
Related Topics	159
Configuring the SAE to Manage JUNOSe Routers with the C-Web Interface..	160
Related Topics	160
Using SNMP to Retrieve Information from JUNOSe Routers	160
Configuring the SNMP Server on the JUNOSe Router	160
Configuring Global SNMP Communities in the SRC Software	
with the C-Web Interface	161
Developing Router Initialization Scripts.....	161
Interface Object Fields.....	162
Required Methods	163
Example: Router Initialization Script.....	163
Specifying JUNOSe Router Initialization Scripts on the SAE	
with the C-Web Interface	164
Accessing the Router CLI	164
Starting the SRC Client on a JUNOSe Router	165
Stopping the SRC Client on a JUNOSe Router	165
Monitoring Interactions Between the SAE and the JUNOSe Router.....	166
Troubleshooting Problems with Managing JUNOSe Routers	166
Troubleshooting the SRC Client on JUNOSe Routers	166
Viewing the State of JUNOSe Device Drivers with the C-Web Interface..	167
Viewing Statistics for Specific JUNOSe Device Drivers	
with the C-Web Interface	167
Viewing Statistics for All JUNOSe Device Drivers	
with the C-Web Interface	168

Chapter 18 Using JUNOS Routing Platforms in the SRC Network with the C-Web Interface

169

BEEP Connection Between JUNOS Routing Platforms and the SAE	170
Adding JUNOS Routing Platforms and Virtual Routers with the C-Web Interface	
170	
Adding Operative JUNOS Routing Platforms	171
Adding JUNOS Routers Individually	171
Adding Virtual Routers Individually	171
Related Topics	171
Configuring the SAE to Manage JUNOS Routing Platforms	
with the C-Web Interface	172
Related Topics	172
Configuring Secure Connections Between the SAE and JUNOS	
Routing Platforms.....	172
Manually Obtaining Digital Certificates	173

Obtaining Digital Certificates through SCEP	174
Installing the Server Certificate on the Router.....	174
Creating a Client Certificate for the Router	175
Installing the Client Certificate on the Router.....	175
Configuring the SAE to Use TLS	175
Configuring TLS on the SAE	176
Checking Changes to the JUNOS Configuration with the C-Web Interface	176
Setting Up Periodic Configuration Checking	176
Using SNMP to Retrieve Information from JUNOS Routing Platforms.....	177
Configuring Global SNMP Communities in the SRC Software.....	177
Developing Router Initialization Scripts.....	177
Interface Object Fields.....	178
Required Methods	179
Example: Router Initialization Script.....	179
Specifying JUNOS Router Initialization Scripts on the SAE with the C-Web Interface	179
Accessing the Router CLI.....	180
Configuring JUNOS Routing Platforms to Interact with the SAE.....	180
Configuring the JUNOS Routing Platform to Apply Changes It Receives from the SAE	181
Disabling Interactions Between the SAE and JUNOS Routing Platforms	181
Monitoring Interactions Between the SAE and JUNOS Routing Platforms.....	182
Troubleshooting Problems with the SRC Software Process with the C-Web Interface	182
Deleting All SRC Data on JUNOS Routing Platforms.....	183
Viewing the State of JUNOS Device Drivers with the C-Web Interface ...	183
Viewing Statistics for Specific JUNOS Device Drivers with the C-Web Interface	183
Viewing Statistics for All JUNOS Device Drivers with the C-Web Interface	184
Chapter 19 Adding Objects for CMTS Devices with the C-Web Interface	185
Adding Objects for CMTS Devices with the C-Web Interface	185
Creating Virtual Routers for the CMTS Device with the C-Web Interface	186
Chapter 20 Integrating Third-Party Network Devices into the SRC Network with the C-Web Interface	187
Overview of Integrating Network Devices into the SRC Network.....	188
SAE Communities.....	188
Storing Session Data	189
Using Script Services to Provision Third-Party Devices	189
Logging In Subscribers and Creating Sessions.....	189
Assigned IP Subscribers.....	190
Login Interactions with Assigned IP Subscribers.....	190
Event Notification from an IP Address Manager	191
Login Interactions with Event Notification	192
Configuration Tasks for Integrating Third-Party Network Devices with the C-Web Interface	193
Setting Up Script Services with the C-Web Interface.....	194
Adding Objects for Network Devices with the C-Web Interface.....	194
Adding a Router Object	194
Adding Virtual Router Objects	194

Setting Up SAE Communities with the C-Web Interface	195
Configuring the SAE Community Manager.....	195
Specifying the Community Manager in the SAE Device Driver	195
Configuring SAE Properties for the Event Notification API with the C-Web Interface	196
Developing Initialization Scripts for Network Devices with the C-Web Interface	196
Interface Object Fields.....	196
Required Methods	197
Example: Initialization Script	197
Copying Initialization Scripts to the C-series Controller.....	198
Specifying Initialization Scripts on the SAE.....	198
Using SNMP to Retrieve Information from Network Devices with the C-Web Interface	198
Configuring Global SNMP Communities in the SRC Software.....	199
Using the NIC Resolver with the C-Web Interface.....	199

Part 6

Configuring Policies and Services

Chapter 21	Configuring and Managing Policies with the C-Web Interface	203
Before You Configure Policies	203	
Creating a Worksheet	203	
Naming Objects.....	204	
Using the apply-groups Statement	204	
Using Expressions	204	
Policy Values	204	
SAE to JUNOS Routing Platforms.....	204	
SAE to JUNOSe Routers.....	205	
Enabling the Policy Configuration on the C-Web Interface	205	
Configuring Policy Folders with the C-Web Interface	205	
Configuring Policy Groups with the C-Web Interface	206	
Configuring Policy Lists with the C-Web Interface	206	
Configuring Policy Rules with the C-Web Interface	206	
Before You Configure JUNOS Policy Rules	207	
JUNOS Scheduler and JUNOS Shaping Policy Rules	207	
JUNOS ASP Policy Rules.....	207	
Setting the Policy Rule Precedence	207	
Adding a Policy Rule.....	208	
Configuring Classify-Traffic Conditions with the C-Web Interface.....	208	
Before You Configure Classify-Traffic Conditions	210	
Enabling Expansion of JUNOSe Classify-Traffic Conditions	210	
Specifying the PCMM Classifier Type	210	
Specifying Port Access for Traffic Classification	211	
Creating a Classify-Traffic Condition	211	
Configuring Source Networks	212	
Configuring Source Grouped Networks	212	
Configuring Destination Networks	212	
Configuring Destination Grouped Networks.....	212	
Configuring Protocol Conditions	213	
Configuring Protocol Conditions with Ports	213	
Configuring Protocol Conditions with Parameters	214	

Configuring TCP Conditions.....	214
Configuring ICMP Conditions.....	215
Configuring IGMP Conditions	215
Configuring IPsec Conditions	215
Configuring ToS Byte Conditions	215
Configuring JUNOS Filter Conditions	216
Configuring Application Protocol Conditions	216
Creating and Configuring an Application Protocol Condition.....	216
Using Map Expressions in Application Protocol Conditions	217
Configuring QoS Conditions with the C-Web Interface	217
Configuring Actions with the C-Web Interface.....	218
Configuring DOCSIS Actions	219
Configuring Filter Actions	219
Configuring FlowSpec Actions	220
Configuring Forward Actions	220
Configuring Forwarding Class Actions	220
Configuring Gate Spec Actions	221
Configuring Loss Priority Actions	221
Configuring Mark Actions	221
Configuring NAT Actions	222
Configuring Next-Hop Actions	222
Using the Next-Hop Action with the Captive Portal	222
Configuring Next-Hop Action	223
Configuring Next-Interface Actions	223
Configuring Next-Rule Actions	223
Configuring Policer Actions	224
Configuring QoS Profile Attachment Actions	224
Configuring Rate-Limit Actions	225
Configuring Actions for Rate-Limit Actions.....	225
Configuring Reject Actions.....	226
Configuring Routing Instance Actions	226
Configuring Scheduler Actions	227
Configuring Drop Profiles.....	227
Configuring Service Class Name Actions	227
Configuring Stateful Firewall Actions	228
Configuring Traffic-Class Actions	228
Configuring Traffic-Mirror Actions	228
Configuring Traffic-Shape Actions	229
Chapter 22	Configuring Local and Global Parameters with the C-Web Interface 231
Viewing Predefined Global Parameters with the C-Web Interface	231
Configuring Global Parameters with the C-Web Interface.....	232
Related Topics	232
Configuring Local Parameters with the C-Web Interface	232
Related Topics	232
Viewing Runtime Parameters with the C-Web Interface.....	233
Chapter 23	Configuring Services with the C-Web Interface 235
Enabling the Service Configuration on the C-Web Interface	236
Before You Configure Services	236
Related Topics.....	236
Adding a Normal Service with the C-Web Interface.....	236
Setting Parameter Values for Services with the C-Web Interface	237

Configuring Service Fragments for an Aggregate Service with the C-Web Interface	237
Related Topics	237
Configuring Timers for Aggregate Services with the C-Web Interface	238
Related Topics	238
Adding an Infrastructure Service with the C-Web Interface	238
Related Topics	238
Configuring Script Services with the C-Web Interface	239
Related Topics	239
Adding a Mutex Group with the C-Web Interface	239
Related Topics	239
Configuring Service Scopes with the C-Web Interface	240
Adding Service Scopes with the C-Web Interface	240
Assigning Services and Mutex Groups to Service Scopes with the C-Web Interface	240
Assigning Service Scopes to VRs or Subscribers with the C-Web Interface	241
Related Topics	241
Example: Configuring a Limited Set of Services for Organizations with the C-Web Interface	241
Example: Customizing Generic Services to Particular Regions with the C-Web Interface	243
Chapter 24 Scheduling Services with the C-Web Interface	247
Setting the Action Threshold and Preparation Time with the C-Web Interface	248
Authorizing Scheduled Services with the C-Web Interface	248
Defining an Authorization Plug-In for a Scheduled Service in the Global Configuration with the C-Web Interface	248
Defining an Authorization Plug-In for a Scheduled Service in the Service Scope with the C-Web Interface	249
Related Topics	249
Adding a Service Schedule with the C-Web Interface	249
Adding a Service Schedule for Scopes with the C-Web Interface	249
Adding a Service Schedule for Services with the C-Web Interface	250
Adding a Service Schedule for Retailers with the C-Web Interface	251
Adding a Service Schedule for Enterprises with the C-Web Interface	251
Adding a Service Schedule for Subscribers in an Enterprise with the C-Web Interface	252
Setting the Time Schedule with the C-Web Interface	253
Guidelines for Entering Time Values	254
Setting the Action with the C-Web Interface	255
Related Topics	255
Defining Attributes for Service Activation with the C-Web Interface	256
Example: Configuring Different Service Tiers for Different Days with the C-Web Interface	256
Example: Configuring a Service to Be Active During Nonwork Hours with the C-Web Interface	259
Example: Configuring a Service to Be Available for a Specified Interval with the C-Web Interface	264

Chapter 25	Managing Tiered and Premium Services with QoS on JUNOS Routers with the C-Web Interface	267
<hr/>		
Overview of QoS on JUNOS Routers		267
Dynamically Managing QoS Profiles		268
How QoS Profile Tracking Works		268
Identifying QoS Services		269
Determining the QoS Profile		269
Setting Up Policy Groups		270
Setting Up Services		271
Reestablishing Default QoS Profile		271
Example: How QTP Activates a QoS Service		271
Configuring QoS Profile-Tracking Plug-Ins with the C-Web Interface		273
Configuring Search Filters for QoS Profile-Tracking Plug-Ins		273
Updating QoS Profile Data in the Directory		274
Using SDX Admin to Update QoS Profile Data		275
Using qosProfilePublish to Update QoS Profile Data		275
Searching for QoS Policy Data in the Directory		277
Using Policy Editor to Search for QoS Policy Information		278
Running Queries from Policy Editor		278
Examples		280
Using Policy Web Admin to Search for QoS Policy Information		281
Launching Policy Web Admin		282
Connecting to a Directory		283
Quering the Directory for QoS Information		284

Part 7

Configuring Subscribers and Subscriptions

Chapter 26	Configuring Subscriber-Related Properties on the SAE with the C-Web Interface	287
	Configuring the Length of Time That MAC Addresses Remain in SAE Cache with the C-Web Interface	288
	Identifying a Profile for Unauthenticated Subscribers with the C-Web Interface	288
	Configuring Interim Accounting for Services and Subscribers with the C-Web Interface	289
	Avoiding Overcharges for Sessions That Time Out with the C-Web Interface	290
	Allowing Multiple Logins from the Same IP Address with the C-Web Interface	290
	Authenticating Registered Username/Password Pairs with the C-Web Interface	291
	Configuring Timers for Session Reactivation with the C-Web Interface	291
Chapter 27	Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface	293
	Creating Plug-In Instances with the C-Web Interface	293
	Creating a Plug-In Instance for All SAE Configurations	294
	Creating a Plug-In Instance for an SAE Group	294
	Related Topics	294

Configuring Internal Plug-Ins with the C-Web Interface	294
Related Topics	295
Configuring the SAE for External Plug-Ins with the C-Web Interface	295
Related Topics	296
Configuring the State Synchronization Plug-In Interface with the C-Web Interface	296
Related Topics	297
Chapter 28 Configuring Accounting and Authentication Plug-Ins with the C-Web Interface	299
Creating RADIUS Peers	300
Related Topics	300
Tracking Plug-Ins with the C-Web Interface	301
Configuring Flat File Accounting Plug-Ins	301
Configuring Headers for Flat File Accounting Plug-Ins	302
Related Topics	303
Configuring Basic RADIUS Accounting Plug-Ins	304
Related Topics	304
Configuring Flexible RADIUS Accounting Plug-Ins	304
Related Topics	305
Configuring Custom RADIUS Accounting-Plug-Ins	305
Related Topics	306
Configuring Authentication Plug-Ins with the C-Web Interface	306
Limiting Subscribers on Router Interfaces	307
Configuring Basic RADIUS Authentication Plug-Ins	307
Related Topics	308
Configuring Flexible RADIUS Authentication Plug-Ins	308
Related Topics	309
Configuring Custom RADIUS Authentication Plug-Ins	309
Related Topics	310
Configuring LDAP Authentication Plug-Ins	310
Related Topics	310
Configuring UDP Ports for RADIUS Plug-Ins with the C-Web Interface	310
Configuring Global UDP Ports	311
Defining RADIUS Packets for Flexible RADIUS Plug-Ins with the C-Web Interface	311
Using Default RADIUS Templates	312
Naming RADIUS Attribute Instances	312
Defining RADIUS Attributes	312
Standard RADIUS Attributes	313
Juniper Networks VSAs	313
Defining the Values of RADIUS Attributes	314
Configuring a RADIUS Packet Template	316
More About Using Flexible RADIUS Packet Definitions	317
Setting Values in Authentication Response Packets	318
Selecting IP Address Pools Using DHCP Response Packets	319
Configuring Event Publishers with the C-Web Interface	319
Configuring Global and Default Retailer Event Publishers	319
Configuring Service-Specific Event Publishers	320
Configuring Retailer-Specific Event Publishers	320
Configuring Virtual Router-Specific Event Publishers	320
Related Topics	320

Chapter 29	Configuring Subscribers and Subscriptions with the C-Web Interface	321
	Overview of Configuring Subscribers and Subscriptions.....	322
	Specifying the Activation Order for Subscriptions	322
	Inheritance of Properties and Subscriptions	322
	Enabling the Subscriber and Subscription Configuration	
	on the C-Web Interface.....	322
	Adding Subscribers with the C-Web Interface	323
	Related Topics	323
	Adding Retailers with the C-Web Interface.....	323
	Configuring Administrative Information for Retailers	
	with the C-Web Interface	324
	Adding Subscriber Folders with the C-Web Interface	324
	Adding Residential Subscribers with the C-Web Interface	325
	Configuring Administrative Information for Residential Subscribers	
	with the C-Web Interface	325
	Adding Enterprises with the C-Web Interface.....	325
	Configuring Administrative Information for Enterprise Subscribers	
	with the C-Web Interface	326
	Adding Sites with the C-Web Interface.....	326
	Adding Devices as Subscribers with the C-Web Interface.....	327
	Adding Managers with the C-Web Interface	327
	Configuring Subscriptions with the C-Web Interface	328
	Allowing Multiple Subscriptions to the Same Service per Subscriber.....	328
	Configuring Accesses with the C-Web Interface	329
Chapter 30	Configuring Traffic Redirection with the C-Web Interface	331
	Before You Configure the Redirect Server on a C-series Controller.....	332
	Configuring the Redirect Server with the C-Web Interface	332
	Configuring General Properties for the Redirect Server	
	with the C-Web Interface.....	333
	Configuring a Connection Between the Redirect Server and	
	the Directory with the C-Web Interface	334
	Defining Traffic to Transmit to the Redirect Server	
	with the C-Web Interface.....	334
	Changing the Number of Requests That the Redirect Server Accepts	
	with the C-Web Interface.....	335
	Specifying Extensions for Files That the Redirect Server Accepts	
	with the C-Web Interface.....	335
	Configuring the DNS Server for the Redirect Server	
	with the C-Web Interface.....	336
	Configuring the Redirect Server to Support HTTP Proxies	
	with the C-Web Interface.....	336
	Configuring a Redundant Redirect Server with the C-Web Interface.....	337
	Configuring Logging for the Redirect Server.....	337
	Changing the Configuration for the Redirect Server	337
	Assessing Load for Redirect Server with the C-Web Interface.....	338
	Index	339

About This Guide

This preface provides the following guidelines for using the *SRC-PE Software Getting Started Guide*.

- Objectives on page xxi
- Audience on page xxi
- Documentation Conventions on page xxii
- Related Juniper Networks Documentation on page xxiii
- Obtaining Documentation on page xxv
- Documentation Feedback on page xxv
- Requesting Support on page xxvi

Objectives

This guide provides the information that you need to the Session and Resource Control (SRC) software with the C-Web interface.



NOTE: If the information in the latest *SRC Release Notes* differs from the information in this guide, follow the *SRC Release Notes*.

Audience

This guide is intended for experienced system and network specialists working with JUNOSe routers and JUNOS routing platforms in an Internet access environment. We assume that readers know how to use the routing platforms, directories, and RADIUS servers that they will deploy in their SRC networks. For users who deploy the SRC software on a Solaris platform, we also assume that readers are familiar with the Lightweight Directory Access Protocol (LDAP) and the UNIX operating system. A working knowledge of the SRC CLI is also desirable.

If you are using the SRC software in a cable network environment, we assume that you are familiar with the *PacketCable Multimedia Specification* (PCMM) as defined by Cable Television Laboratories, Inc. (CableLabs) and with the Data-over-Cable Service Interface Specifications (DOCSIS) 1.1 protocol. We also assume that you are familiar with operating a multiple service operator (MSO) multimedia-managed IP network.

Documentation Conventions

The sample screens used throughout this guide are representations of the screens that are displayed when you install and configure the SRC software. The actual screens may differ.

For convenience and clarity, the installation and configuration examples show default file paths. If you do not accept the installation defaults, your paths will vary from the examples.

Table 1 defines notice icons used in this guide. Table 2 defines text conventions used throughout the documentation.

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.

Table 2: Text Conventions

Convention	Description	Examples
Bold typeface	<ul style="list-style-type: none"> Represents keywords, scripts, and tools in text. Represents a GUI element that the user selects, clicks, checks, or clears. 	<ul style="list-style-type: none"> Specify the keyword exp-msg. Run the install.sh script. Use the pkgadd tool. To cancel the configuration, click Cancel.
Bold sans serif typeface	Represents text that the user must type.	<code>user@host# set cache-entry-age cache-entry-age</code>
Monospace sans serif typeface	Represents information as displayed on your terminal's screen, such as CLI commands in output displays.	<pre>nic-locators { login { resolution { resolver-name /realms/login/A1; key-type LoginName; value-type SaeId; } } }</pre>
Regular sans serif typeface	<ul style="list-style-type: none"> Represents configuration statements. Indicates SRC CLI commands and options in text. Represents examples in procedures. Represents URLs. 	<ul style="list-style-type: none"> <code>system ldap server {</code> <code>stand-alone;</code> Use the <code>request sae modify device failover</code> command with the <code>force</code> option. <code>user@host# . . .</code> <code>http://www.juniper.net/techpubs/software/management/sdx/api-index.html</code>
<i>Italic sans serif typeface</i>	Represents variables in SRC CLI commands.	<code>user@host# set local-address local-address</code>
Angle brackets	In text descriptions, indicate optional keywords or variables.	Another runtime variable is <code><gfwif></code> .

Table 2: Text Conventions (continued)

Convention	Description	Examples
Key name	Indicates the name of a key on the keyboard.	Press Enter.
Key names linked with a plus sign (+) .	Indicates that you must press two or more keys simultaneously.	Press Ctrl + b.
<i>Italic typeface</i>	<ul style="list-style-type: none"> ■ Emphasizes words. ■ Identifies chapter, appendix, and book names. ■ Identifies distinguished names. ■ Identifies files, directories, and paths in text but not in command examples. 	<ul style="list-style-type: none"> ■ There are two levels of access: <i>user</i> and <i>privileged</i>. ■ <i>Chapter 2, Services</i>. ■ <i>o = Users, o = UMC</i> ■ The <i>/etc/default.properties</i> file.
Backslash	At the end of a line, indicates that the text wraps to the next line.	Plugin.radiusAcct-1.class = \net.juniper.smgmt.sae.plugin\RadiusTrackingPluginEvent
Words separated by the symbol	Represent a choice to select one keyword or variable to the left or right of this symbol. (The keyword or variable may be either optional or required.)	diagnostic line

Related Juniper Networks Documentation

With each SRC software release, we provide the *SRC Documentation CD*, which contains the documentation described in Table 3.

With each SRC Application Library release, we provide the *SRC Application Library CD*. This CD contains both the software applications and the *SRC Application Library Guide*.

A complete list of abbreviations used in this document set, along with their spelled-out terms, is provided in this *SRC-PE Getting Started Guide*.

Table 3: Juniper Networks C-series and SRC Technical Publications

Document	Description
Core Documentation Set	
<i>C2000 and C4000 Hardware Guide</i>	Describes the hardware platforms and how to install, maintain, replace, and troubleshoot them. The guide also includes specifications.
<i>C2000 and C4000 Quick Start Guide</i>	Describes how to get the C-series Controller up and running quickly. Intended for experienced installers who want to expedite the installation process.
<i>SRC-PE Getting Started Guide</i>	Describes the SRC software, how to set up an initial software configuration, and how to upgrade the SRC software. It also explains how to manage a C-series Controller. The guide describes how to set up and start the SRC CLI and the C-Web interface, as well as other SRC configuration tools. It includes reference material for the SRC documentation.
<i>SRC-PE CLI User Guide</i>	Describes how to use the SRC CLI, configure and monitor the platform with the CLI, and control the CLI environment. The guide also describes how to manage SRC components with the CLI.
<i>SRC-PE Network Guide: SAE, Juniper Networks Routers, NIC, and SRC-ACP</i>	Describes how to use and configure the SAE, the NIC, and the SRC-ACP (Admission Control Plug-In) application. This guide also provides detailed information for using JUNOS routers and JUNOS routing platforms in the SRC network.
<i>SRC-PE Integration Guide: Network Devices, Directories, and RADIUS Servers</i>	Describes how to integrate external components—network devices, directories, and RADIUS servers—into the SRC network. The guide provides detailed information about integrating specific models of the external components.
<i>SRC-PE Services and Policies Guide</i>	Describes how to work with services and policies. The guide provides an overview, configuration procedures, and management information. The guide also provides information about the SRC tools for configuring policies.
<i>SRC-PE Subscribers and Subscriptions Guide</i>	Describes how to work with residential and enterprise subscribers and subscriptions. The guide provides an overview, configuration procedures, and management information. This guide also provides information about the enterprise service portals, including the Enterprise Manager Portal.
<i>SRC-PE Monitoring and Troubleshooting Guide</i>	Describes how to use logging, the SNMP agent, the SRC CLI, and the C-Web interface to monitor and troubleshoot SRC components. This guide also describes the SNMP traps.
<i>SRC-PE Solutions Guide</i>	Provides high-level instructions for SRC implementations. The guide documents the following scenarios: managing QoS services on JUNOS routers; managing subscribers in a wireless roaming environment; providing voice over IP (VoIP) services; integrating the SRC software in a PCMM environment, including the use of the Juniper Policy Server (JPS); and mirroring subscriber traffic on JUNOS routers.
<i>SRC-PE CLI Command Reference, Volume 1</i> <i>SRC-PE CLI Command Reference, Volume 2</i>	Together constitute information about command and statement syntax; descriptions of commands, configuration statements, and options; editing level of statement options; and a history of when a command was added to the documentation.
<i>SRC-PE NETCONF API Guide</i>	Describes how to use the NETCONF application programming interface (API) to configure or request information from the NETCONF server on a C-series Controller that runs the SRC software.
<i>SRC-PE XML API Configuration Reference</i>	Describes the tag elements in the SRC Extensible Markup Language (XML) application programming interface (API) that are equivalent to configuration statements in the SRC command-line interface (SRC CLI).
<i>SRC-PE XML API Operational Reference</i>	Describes the tag elements in the SRC Extensible Markup Language (XML) application programming interface (API) that are equivalent to operational commands in the SRC command-line interface (SRC CLI).

Table 3: Juniper Networks C-series and SRC Technical Publications (continued)

Document	Description
<i>SRC-PE Comprehensive Index</i>	Provides a complete index of the SRC guides, excluding the <i>C-series Hardware Guide</i> , the <i>SRC CLI Command Reference</i> , the <i>SRC-PE NETCONF API Guide</i> , the <i>SRC-PE XML API Configuration Reference</i> , and the <i>SRC-PE XML API Operational Reference</i> .
Application Library	
<i>SRC Application Library Guide</i>	Describes how to install and work with applications that you can use to extend the capabilities of the SRC software. The guide documents the following applications: SRC-SG (SOAP Gateway) Web applications, an application to provide threat mitigation, an application to provide tracking and QoS control at the application level by integrating the SRC software with the Ellacoya deep packet inspection (DPI) platform, and an application to control volume usage.
Release Notes	
<i>SRC-PE Release Notes</i> <i>SRC Application Library Release Notes</i>	In the <i>Release Notes</i> , you will find the latest information about features, changes, known problems, resolved problems, supported platforms and network devices (such as Juniper Networks routers and CMTS devices), and third-party software. If the information in the <i>Release Notes</i> differs from the information found in the documentation set, follow the <i>Release Notes</i> . Release notes are included in the corresponding software distribution and are available on the Web.

Obtaining Documentation

To obtain the most current version of all Juniper Networks technical documentation, see the products documentation page on the Juniper Networks Web site at

<http://www.juniper.net/>

To order printed copies of this manual and other Juniper Networks technical documents or to order a documentation CD, which contains this manual, contact your sales representative.

Documentation Feedback

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Part 1

Configuring C-series Controllers

Chapter 1

Configuring Remote Access to a C-series Controller with the C-Web Interface

This chapter describes how to use the C-Web interface to configure access to a C-series Controller.

You can also use the SRC CLI to configure access to a C-series Controller. See *SRC-PE Getting Started Guide, Chapter 7, Configuring Remote Access to a C-series Controller with the SRC CLI*.

Topics in this chapter include:

- Configuring External Interfaces on a C-series Controller on page 4
- Configuring Loopback Interfaces for IPv4 with the C-Web Interface on page 4
- Configuring Loopback Interfaces for IPv6 with the C-Web Interface on page 5
- Configuring Gigabit Ethernet Interfaces for IPv4 with the C-Web Interface on page 6
- Configuring Gigabit Ethernet Interfaces for IPv6 with the C-Web Interface on page 7
- Configuring Tunnel Interfaces with the C-Web Interface on page 8
- Configuring a Static Route to Devices on Other Networks with the C-Web Interface on page 9
- Securing Connections Between a C-series Controller and Remote Hosts on page 9
- Configuring a C-series Controller to Accept SSH Connections with the C-Web Interface on page 10
- Configuring a C-series Controller to Accept Telnet Connections with the C-Web Interface on page 11
- Configuring a C-series Controller to Accept NETCONF Connections with the C-Web Interface on page 11

Configuring External Interfaces on a C-series Controller

The C-series Controller provides the following interfaces:

- Serial port—9600 baud

The serial port is enabled by default. You can use the serial port to connect to a console terminal and perform initial configuration as well as configuration updates.

- Two external Gigabit Ethernet interfaces—eth0 and eth1

The eth0 interface is designed to provide access from a network that is behind a firewall. This interface accepts connections from protocols supported by the SRC software. When you configure an SRC component, the specified port is opened on this interface.

The eth1 interface is designed to provide access for applications on an external network, such as the Internet. You can configure a limited number of ports on this interface. By default, no inbound ports are open.

- Optional two additional Gigabit Ethernet interfaces—eth2 and eth3

These interfaces require an additional input/output module. You can obtain a module to support either RJ-45 or optical connections.

- Two USB interfaces

Configuring Loopback Interfaces for IPv4 with the C-Web Interface

Loopback interfaces are for private use only by software running on the C-series Controller, to communicate with other software also running on the same C-series Controller.

To configure a loopback interface for IPv4:

1. Click **Configure**, expand **Interfaces**, and then click **Interface: lo**.

The Interface:lo pane appears.

2. To specify the unit:
 - a. From the Create new list, select **Unit**.
 - b. In the dialog box, type a number for the new unit, and click **OK**.

The Unit: *<number>* appears in the side pane.

3. To specify an IPv4 address for the interface, expand **Unit: <number>**, and then expand **Family** in the side pane.
 - a. Click **Inet**.
The Inet pane appears.
 - b. Click the **Create** button.
 - c. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- *Configuring External Interfaces on a C-series Controller* on page 4
- *Configuring Loopback Interfaces for IPv6 with the C-Web Interface* on page 5
- *Configuring Gigabit Ethernet Interfaces for IPv4 with the C-Web Interface* on page 6
- *Configuring Gigabit Ethernet Interfaces for IPv6 with the C-Web Interface* on page 7
- *Configuring Tunnel Interfaces with the C-Web Interface* on page 8

Configuring Loopback Interfaces for IPv6 with the C-Web Interface

Loopback interfaces are for private use only by software running on the C-series Controller, to communicate with other software also running on the same C-series Controller.

To configure a loopback interface for IPv6:

1. Click **Configure**, and expand **Interfaces > Interface: lo > Unit > Family**.
2. Click **Inet6**.
The Inet6 pane appears.
3. From the Create new list, select **Address**.
4. In the dialog box, type a name for the new address, and click **OK**.

Related Topics

- *Configuring External Interfaces on a C-series Controller* on page 4
- *Configuring Loopback Interfaces for IPv4 with the C-Web Interface* on page 4
- *Configuring Gigabit Ethernet Interfaces for IPv4 with the C-Web Interface* on page 6
- *Configuring Gigabit Ethernet Interfaces for IPv6 with the C-Web Interface* on page 7
- *Configuring Tunnel Interfaces with the C-Web Interface* on page 8

Configuring Gigabit Ethernet Interfaces for IPv4 with the C-Web Interface

To allow remote access to the C-series Controller, you configure the Gigabit Ethernet interfaces. You can specify an IP address with mask or a broadcast address with mask for an interface.

To configure a Gigabit Ethernet interface for IPv4:

1. Click **Configure > Interfaces**.

The Interfaces pane appears.

2. From the Create new list, create an interface.
 - To create a new interface, select **Interface**, type a name for the new interface in the dialog box, and click **OK**.
 - To create an eth1, eth2, or eth3 interface, select **eth1**, **eth2**, or **eth3**, and click **OK**.
3. To specify the unit:
 - a. From the Create new list, select **Unit**.
 - b. In the dialog box, type a number for the new unit, and click **OK**.
4. To specify an IPv4 address for the new unit, expand **Unit: < number >**, and expand **Family** in the side pane.
 - a. In the side pane, click **Inet**.

The Interfaces pane appears.

- b. Click the **Create** button.
- c. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- *Configuring External Interfaces on a C-series Controller* on page 4
- *Configuring Loopback Interfaces for IPv4 with the C-Web Interface* on page 4
- *Configuring Loopback Interfaces for IPv6 with the C-Web Interface* on page 5
- *Configuring Gigabit Ethernet Interfaces for IPv6 with the C-Web Interface* on page 7
- *Configuring Tunnel Interfaces with the C-Web Interface* on page 8

Configuring Gigabit Ethernet Interfaces for IPv6 with the C-Web Interface

To allow remote access to the C-series Controller, you configure the Gigabit Ethernet interfaces. You can specify an IP address with mask for an interface.

To configure a Gigabit Ethernet interface for IPv6:

1. Click **Configure > Interfaces**.

The Interfaces pane appears.

2. Create an interface from the Create new list.
 - To create a new interface, select **Interface**. In the dialog box, type a name for the new interface, and click **OK**.
 - To create an eth1, eth2, or eth3 interface, select **eth1**, **eth2**, or **eth3**, and click **OK**.
3. To specify the unit:
 - a. From the Create new list, select **Unit**.
 - b. In the dialog box, type a number for the new unit, and click **OK**.
4. To specify an IPv6 address for the new unit, expand **Unit: <number>**, and expand **Family** in the side pane.
 - a. In the side pane, click **Inet6**.

The Interfaces pane appears.

- b. From the Create new list, select **Address**.
- c. In the dialog box, type a name for the new address, and click **OK**.

Related Topics

- *Configuring External Interfaces on a C-series Controller* on page 4
- *Configuring Loopback Interfaces for IPv4 with the C-Web Interface* on page 4
- *Configuring Loopback Interfaces for IPv6 with the C-Web Interface* on page 5
- *Configuring Gigabit Ethernet Interfaces for IPv4 with the C-Web Interface* on page 6
- *Configuring Tunnel Interfaces with the C-Web Interface* on page 8

Configuring Tunnel Interfaces with the C-Web Interface

A tunnel allows direct connection between a remote location and an application running on the C-series Controller. A tunnel lets you use the redirect server in deployments where the JUNOSe router does not have a direct connection to the C-series Controller.

The C-series Controller supports three types of tunnel interfaces:

- GRE—Encapsulates traffic that can use various network protocols within IP. For C-series Controllers, the tunnel interface encapsulates IP packets.
- IP- over- IP—Encapsulates IP packets within IP packets.
- IPv6 in IPv4—Encapsulates IPv6 packet in IPv4 packets.

The other endpoint for the tunnel on a JUNOS or JUNOSe router must be configured for the tunnel to be operational.

To configure tunnel interfaces:

1. Click **Configure**, expand **Interfaces**, and expand the specified interface.
2. Click **Tunnel**.

The Tunnel pane appears.

3. Click the **Create** button.
4. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- *Configuring External Interfaces on a C-series Controller* on page 4
- *Configuring Loopback Interfaces for IPv4 with the C-Web Interface* on page 4
- *Configuring Loopback Interfaces for IPv6 with the C-Web Interface* on page 5
- *Configuring Gigabit Ethernet Interfaces for IPv4 with the C-Web Interface* on page 6
- *Configuring Gigabit Ethernet Interfaces for IPv6 with the C-Web Interface* on page 7

Configuring a Static Route to Devices on Other Networks with the C-Web Interface

In some instances, the SRC software might need to connect to devices that reside on networks other than the one that the SRC software accesses directly. you can configure a static route for the software to be able to connect devices on other networks.

When you specify the IP address for a static route, include a mask.

To configure a static route to another network:

1. Click **Configure**, expand **Routing Options**, and click **Static**.

The Static pane appears.

2. From the Create new list, select **Route**.
3. In the dialog box, type a destination network/mask (using the form address/prefix length) for the new Route, and click **OK**.

The Route: *< name >* pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Securing Connections Between a C-series Controller and Remote Hosts

For security reasons, take care to limit the number of open ports you configure for applications and SRC components on the external interfaces. To review the default port settings for SRC components, see *SRC-PE Getting Started Guide, Chapter 34, Defining an Initial Configuration on a Solaris Platform* which provides information about an initial configuration on a Solaris platform.

By default, SSH for non-root users is enabled on C-series Controllers. Otherwise, you configure the C-series Controller to explicitly allow users on remote systems to access it. Table 1 lists the applications through which remote users can access a C-series Controller.

Table 1: Applications to Remotely Access the C-series Controller

Application	Information About Access Configuration
SSH	<i>Configuring a C-series Controller to Accept SSH Connections with the C-Web Interface on page 10</i>
Telnet	<i>Configuring a C-series Controller to Accept Telnet Connections with the C-Web Interface on page 11</i>
NETCONF	<i>Configuring a C-series Controller to Accept NETCONF Connections with the C-Web Interface on page 11</i>
C-Web interface	<i>SRC-PE Getting Started Guide, Chapter 6, Accessing and Using the C-Web Interface</i>
Policies, Services, and Subscribers C-Web interface	<i>SRC-PE Getting Started Guide, Chapter 6, Accessing and Using the C-Web Interface</i>

You can also configure security certificates for use by HTTPS connections.

See *SRC-PE Getting Started Guide, Chapter 7, Configuring Remote Access to a C-series Controller with the SRC CLI*.

You can connect from a C-series Controller to remote hosts through:

- SSH
- Telnet
- FTP by means of a file URL

Configuring a C-series Controller to Accept SSH Connections with the C-Web Interface

You can enable SSH to let users who have the appropriate privileges connect to a C-series Controller. For security reasons, we recommend that you do not allow remote users to access the C-Web interface as **root**.

1. Click **Configure**, expand **System > Services**, and then click **SSH**.

The SSH pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring a C-series Controller to Accept Telnet Connections with the C-Web Interface

You can enable Telnet to let users who have the appropriate privileges connect to a C-series Controller. The system does not allow `root` access over a Telnet connection.

To configure the C-series Controller to accept Telnet connections:

1. Click **Configure**, expand **System**, and then click **Services**.

The Services pane appears.

2. Select the Telnet checkbox to accept Telnet connections. (Leave the checkbox empty to disable Telnet connections.) Refer to the information in the Help text in the main pane.
3. Click **Apply**.

Configuring a C-series Controller to Accept NETCONF Connections with the C-Web Interface

To configure the C-series Controller to accept NETCONF connections:

1. Click **Configure**, expand **System > Services**, and then click **NETCONF**.

The NETCONF pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Chapter 2

Configuring NTP on C-series Controllers with the C-Web Interface

This chapter discusses how to configure the Network Time Protocol (NTP) for a C-series Controller by using the C-Web interface. Topics include:

- Specifying a Basic NTP Configuration on a C-series Controller with the C-Web Interface on page 14
- Configuring NTP Client Mode for a C-series Controller with the C-Web Interface on page 14
- Configuring an NTP Peer for a C-series Controller with the C-Web Interface on page 15
- Configuring NTP Broadcast Mode on a C-series Controller with the C-Web Interface on page 15
- Configuring NTP as a Multicast Client on a C-series Controller with the C-Web Interface on page 16
- Specifying an Authentication Key for NTP on C-series Controllers with the C-Web Interface on page 16
- Configuring NTP Authentication with the C-Web Interface on page 17

Specifying a Basic NTP Configuration on a C-series Controller with the C-Web Interface

We recommend that you configure NTP on C-series Controllers.

To configure NTP to operate on a C-series controller:

1. Click **Configure**, expand **System**, and then click **NTP**.

The NTP pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.



NOTE: If you do not configure a boot server, NTP cannot synchronize with a time server if the server's time is very far off the local system's time.

Related Topics

- *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers, NTP Support on C-series Controllers*
- *Configuring NTP on a C-series Controller on page 114 in SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*

Configuring NTP Client Mode for a C-series Controller with the C-Web Interface

To configure an NTP server that the C-Series Controller uses for time synchronization:

1. Click **Configure**, expand **System**, and then click **NTP**.

The NTP pane appears.

2. In the Create new list, select **Server**. Type an IPV4 or IPV6 address for the server, and click **OK**.

The Server pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.



NOTE: If the remote system has authentication enabled, specify an authentication key and value. The system transmits the specified authentication key when transmitting packets.

Related Topics

- *NTP Support on C-series Controllers* on page 113 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*
- *Configuring NTP on a C-series Controller* on page 114 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*

Configuring an NTP Peer for a C-series Controller with the C-Web Interface

To configure NTP to operate as a peer:

1. Click **Configure**, expand **System**, and then click **NTP**.

The NTP pane appears.

2. In the Create new list, select **Peer**. Type an IPV4 or IPV6 address for the server and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.



NOTE: If the remote system has authentication enabled, specify an authentication key and value. The system transmits the specified authentication key when transmitting packets.

Related Topics

- *NTP Support on C-series Controllers* on page 113 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*
- *Configuring NTP on a C-series Controller* on page 114 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*

Configuring NTP Broadcast Mode on a C-series Controller with the C-Web Interface

To configure NTP to operate in broadcast mode:

1. Click **Configure**, expand **System**, and click **NTP**.

The NTP pane appears.

2. In the Create new list, select **Broadcast**. Type an IP address or a hostname on one of the local networks or a multicast address assigned to NTP. Click **OK**.

3. Enter information as described in the Help text in the main pane, and click **Apply**.



NOTE: If the remote system has authentication enabled, specify an authentication key and value. The system transmits the specified authentication key when transmitting packets.

Related Topics

- *NTP Support on C-series Controllers* on page 113 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*
- *Configuring NTP on a C-series Controller* on page 114 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*

Configuring NTP as a Multicast Client on a C-series Controller with the C-Web Interface

To configure NTP to operate in multicast mode on a C-series controller:

1. Click **Configure**, expand **System > NTP**, and then click **Multicast Client**.

The Multicast Client pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- *NTP Support on C-series Controllers* on page 113 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*
- *Configuring NTP on a C-series Controller* on page 114 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*

Specifying an Authentication Key for NTP on C-series Controllers with the C-Web Interface

Only time servers transmitting network time packets that contain one of the specified key numbers and whose key matches the value configured for that key number are eligible for synchronization. Other systems can synchronize with the local system without being authenticated.

To configure an NTP authentication key that is shared among systems that run NTP:

1. Click **Configure**, expand **System**, and then click **NTP**.

The NTP pane appears.

2. In the Create new list, select **Authentication Key**. Type the key number for the key. The key number must match on all systems using that particular key for authentication. Click **OK**.

Related Topics

- *NTP Support on C-series Controllers* on page 113 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*
- *Configuring NTP on a C-series Controller* on page 114 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*
- *Configuring NTP Authentication with the C-Web Interface* on page 17

Configuring NTP Authentication with the C-Web Interface

You can specify authentication keys for the various modes you configure for NTP.

To configure the authentication key for a mode:

- In the main pane, specify a key value for a mode.
 - Client mode—See *Specifying a Basic NTP Configuration on a C-series Controller with the C-Web Interface* on page 14
 - Server mode—See *Configuring NTP Client Mode for a C-series Controller with the C-Web Interface* on page 14
 - Broadcast mode—See *Configuring NTP Broadcast Mode on a C-series Controller with the C-Web Interface* on page 15
 - Symmetric active (peer) mode—See *Configuring an NTP Peer for a C-series Controller with the C-Web Interface* on page 15

Related Topics

- *NTP Support on C-series Controllers* on page 113 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*
- *Configuring NTP on a C-series Controller* on page 114 in *SRC-PE Getting Started Guide, Chapter 15, Configuring NTP for C-Series Controllers*
- *Specifying an Authentication Key for NTP on C-series Controllers with the C-Web Interface* on page 16

Chapter 3

Configuring System Logging for a C-series Controller with the C-Web Interface

This chapter describes how to configure the system log server (also called a syslog server) on a C-series Controller with the C-Web interface.

You can also configure system logging with the SRC CLI. See *SRC-PE Getting Started Guide, Chapter 17, Configuring System Logging for a C-series Controller with the SRC CLI*.

Topics in this chapter include:

- Overview of the C-series Controller Log Server on page 19
- Before You Configure System Logging with the C-Web Interface on page 21
- Saving System Log Messages to a File with the C-Web Interface on page 21
- Sending System Log Messages to Other Servers with the C-Web Interface on page 21
- Sending Notifications for System Log Messages to Users with the C-Web Interface on page 22

Overview of the C-series Controller Log Server

The C-series Controller includes a system log server that you can configure to manage messages generated on the system. These messages record events that occur to system processes and components.

You can configure the system log server on a C-series Controller to send messages about events to:

- A local file
- Other hosts that are running a system log server
- Users who need to be notified about particular error conditions

You configure which groups of messages are to be forwarded by message type and severity level.

Message Groups

Message groups (also called facilities) define sets of messages generated by the same software process or concerned with a similar condition or activity (such as authentication attempts).

You can configure the following message groups for the system log server:

- any—Messages from all facilities.
- authorization—Authentication and authorization attempts.
- daemon—Actions performed or errors encountered by various system processes.
- ftp—Actions performed or errors encountered by an FTP process.
- kernel—Actions performed or errors encountered by the kernel.
- user—Actions performed or errors encountered by various user processes.
- local7—Actions performed or errors encountered by different SRC processes.

Severity Levels

You can specify the following severity levels for groups of messages to be forwarded:

- any—Messages for all severity levels.
- emergency—System panic or other condition that causes the system to stop functioning.
- alert—Conditions that require immediate correction.
- critical—Critical conditions, such as hard drive errors.
- error—Error conditions that generally have less serious consequences than errors in the emergency, alert, and critical levels.
- warning— Conditions that warrant monitoring.
- notice—Conditions that are not errors but might warrant special handling.
- info—Events or nonerror conditions of interest.
- none—Messages are not generated for any condition.

Before You Configure System Logging with the C-Web Interface

Before you configure the syslog server on a C-series Controller, you should be familiar with:

- The syslog protocol
- Logging for SRC components

See *SRC-PE Monitoring and Troubleshooting Guide, Chapter 2, Configuring Logging for SRC Components*.

Saving System Log Messages to a File with the C-Web Interface

To save system log messages to a file:

1. Click **Configure**, expand **System**, and click **Syslog**.

The Syslog pane appears.

2. From the Create new list, select **File**.
3. Type a name for the file in the dialog box, and click **OK**.

The File pane appears.

4. To configure a message group, select the message group that you want to configure from the Create new list.

You can configure multiple message groups in the log file.

5. To configure a severity level:
 - a. In the side pane, click the log file.
 - b. From the Severity box, select the severity level that you want to track with the log file, and click **Apply**.

Sending System Log Messages to Other Servers with the C-Web Interface

Before you configure the system log server to send messages to other system log servers, ensure that the remote system log server is configured to receive messages on the standard UDP port, 514.

To configure the system log server to send messages to another system log server:

1. Click **Configure**, expand **System**, and click **Syslog**.

The Syslog pane appears.

2. From the Create new list, select **Host**.

3. Type a name for the file in the dialog box, and click **OK**.

The Host pane appears.

4. To configure a message group, select the message group that you want to configure from the Create new list.

You can configure multiple message groups in the log file.

5. To configure a severity level:
 - a. In the side pane, click the log file.
 - b. From the Severity box, select the severity level that you want to track with the log file, and click **Apply**.

Sending Notifications for System Log Messages to Users with the C-Web Interface

To configure the system log server to send notifications to users:

1. Click **Configure**, expand **System**, and click **Syslog**.

The Syslog pane appears.

2. From the Create new list, select **User**.

3. Type a name for the file in the dialog box, and click **OK**.

The User pane appears.

4. To configure a message group, select the message group that you want to configure from the Create new list.

You can configure multiple message groups in the log file.

5. To configure a severity level:
 - a. In the side pane, click the log file.
 - b. From the Severity box, select the severity level that you want to track with the log file, and click **Apply**.

Part 2

Configuring User Access to the SRC Software

Chapter 4

Configuring User Access with the C-Web Interface

This chapter contains information about how to configure user access to the SRC software and how to configure an announcement for users to see at login.

You can configure user access to the SRC software using the SRC CLI. See *SRC-PE Getting Started Guide, Chapter 24, Configuring User Access with the SRC CLI*.

Topics in this chapter include:

- Overview of User Accounts on page 25
- Login Classes for User Accounts with the C-Web Interface on page 26
- Configuring Login Classes with the C-Web Interface on page 33
- Configuring User Accounts with the C-Web Interface on page 33
- Configuring a System Login Announcement with the C-Web Interface on page 35

Overview of User Accounts

All users who can log in to the SRC software must be a member of a login class. With login classes, you define the following:

- Access privileges that users have when they are logged in to the SRC software
- Commands and statements that users can and cannot specify
- How long a login session can be idle before it times out and the user is logged out

You can define any number of login classes. You then apply one login class to an individual user account.

Login Classes for User Accounts with the C-Web Interface

The SRC software provides four predefined login classes to use for configuring user accounts. You can also configure login classes to precisely define access privileges for the user accounts in your SRC environment.

Access Privilege Level

In the SRC CLI, each top-level command-line interface (CLI) command and each configuration statement have an access privilege level associated with them. Similarly, each task and subtask in the C-Web interface have an access privilege level associated with them. Users can configure and view only those tasks for which they have access privileges. The access privileges for each login class are defined by one or more *permission options*.

Permission options specify which actions are allowed for users assigned to use a login class. More than one permission option can be configured for a login class. Table 2 lists the permission options available when you configure permissions with the SRC CLI and the C-Web interface.

You can use the SRC CLI or the C-Web interface to configure permission options for all commands, statements, tasks, and subtasks. For example, if you configure a user to have the **system** permission class using the C-Web interface, that user will have the same permission when accessing the SRC CLI.

The SRC software also provides a default set of system login classes that have permissions preset. Table 3 on page 29 lists the default system login classes.

Table 2: Login Class Permission Options

Permission	Description
admin	SRC CLI—Can view user account information in configuration mode and with the show configuration command. C-Web interface—Can view user account information by accessing Monitor > CLI > Authorization .
admin-control	SRC CLI—Can view user accounts and configure them at the [edit system login] hierarchy level. C-Web interface—Can view user accounts and configure them by accessing Configure > System > Login .
all	SRC CLI and C-Web interface—Has all permissions.
clear	SRC CLI—Can clear (delete) information learned from the network that is stored in various network databases using the clear commands. C-Web interface—Can clear (delete) information learned from the network that is stored in various network databases by accessing Manage > Clear .
configure	SRC CLI—Can enter configuration mode using the configure command. C-Web interface—Can access the Configure task and subtasks.
control	SRC CLI and C-Web interface—Can perform all control-level operations (all operations configured with the -control permission).

Table 2: Login Class Permission Options (continued)

Permission	Description
field	SRC CLI and C-Web interface—Reserved for field (debugging) support.
firewall	<p>SRC CLI—Can view the firewall filter configuration in configuration mode.</p> <p>C-Web interface—Can view the firewall filter configuration by accessing Monitor > SAE > Services.</p>
firewall-control	<p>SRC CLI—Can view and configure firewall filter information at the [edit firewall] hierarchy level.</p> <p>C-Web interface—Can view and configure firewall filter information by accessing Configure > Services.</p>
interface	<p>SRC CLI—Can view the interface configuration in configuration mode and with the show configuration operational mode command.</p> <p>C-Web interface—Can view the interface configuration by accessing Monitor > Interfaces.</p>
interface-control	<p>SRC CLI—Can view chassis, class of service, groups, forwarding options, and interfaces configuration information. Can configure chassis, class of service, groups, forwarding options, and interfaces at the [edit] hierarchy level.</p> <p>C-Web interface—Can view chassis, class of service, groups, forwarding options, and interfaces configuration information. Can configure chassis, class of service, groups, forwarding options, and interfaces by accessing the Configure task and subtasks.</p>
maintenance	<p>SRC CLI—Can perform system maintenance, including starting a local shell on the system and becoming the superuser in the shell (by issuing the su root command), and can halt and reboot the system (using the request system commands).</p> <p>C-Web interface—Can perform system maintenance, including halting and reboot the system, by accessing Manage > Request > System.</p>
network	SRC CLI and C-Web interface—Can access the network by entering the SSH and telnet commands.
reset	<p>SRC CLI—Can restart software processes using the restart command, enable components using the enable command, and disable components using the disable command.</p> <p>C-Web interface—Can restart software processes by accessing Manage > Restart, enable components by accessing Manage > Enable, and disable components by accessing Manage > Disable.</p>
routing	<p>SRC CLI—Can view general routing information in configuration and operational modes.</p> <p>C-Web interface—Can view general routing information by accessing Monitor > SAE > Route.</p>
routing-control	<p>SRC CLI—Can view and configure general routing at the [edit routing-options] hierarchy level.</p> <p>C-Web interface—Can view general routing and configure general routing by accessing Configure > Routing Options.</p>
secret	SRC CLI and C-Web interface—Can view passwords and other authentication keys in the configuration.

Table 2: Login Class Permission Options (continued)

Permission	Description
secret-control	<p>SRC CLI—Can view passwords and other authentication keys in the configuration and can modify them in configuration mode.</p> <p>C-Web interface—Can view passwords and other authentication keys in the configuration and can modify them by accessing Configure > System > Login.</p>
security	<p>SRC CLI—Can view security configuration in configuration mode and with the show configuration operational mode command.</p> <p>C-Web interface—Can view security configuration by accessing Monitor > Security > Certificate.</p>
security-control	<p>SRC CLI—Can view and configure security information at the [edit security] hierarchy level.</p> <p>C-Web interface—Can view security information and configure security information by accessing Manage > Request > Security.</p>
service	<p>SRC CLI and C-Web interface—Can view service and policy definitions.</p> <p>C-Web interface—Can view service definitions by accessing Monitor > SAE > Services and policy definitions by accessing Monitor > SAE > Policies.</p>
service-control	<p>SRC CLI—Can view and modify service and policy definitions.</p> <p>C-Web interface—Can view and modify service and policy definitions by accessing Configure > Services and Configure > Policies.</p>
shell	<p>SRC CLI and C-Web interface—Can start a local shell by entering the start shell command.</p>
snmp	<p>SRC CLI—Can view Simple Network Management Protocol (SNMP) configuration information in configuration and operational modes.</p> <p>C-Web interface—Can view Simple Network Management Protocol (SNMP) configuration information by accessing Monitor > SAE > Statistics.</p>
snmp-control	<p>SRC CLI—Can view SNMP configuration information and configure SNMP (at the [edit snmp] hierarchy level).</p> <p>C-Web interface—Can view SNMP configuration information and configure SNMP by accessing Configure > SNMP.</p>
subscriber	<p>SRC CLI—Can view information about subscriber definitions.</p> <p>C-Web interface—Can view information about subscriber definitions by accessing Monitor > SAE > Subscribers.</p>
subscriber-control	<p>SRC CLI —Can view and control information about subscriber definitions.</p> <p>C-Web interface—Can view information about subscriber definitions and control information about subscriber definitions by accessing Configure > Subscribers.</p>

Table 2: Login Class Permission Options (continued)

Permission	Description
system	<p>SRC CLI—Can view system-level information in configuration and operational modes.</p> <p>C-Web interface—Can view system-level configuration information by accessing Monitor > System.</p>
system-control	<p>SRC CLI—Can view system-level configuration information and configure it at the [edit system] hierarchy level.</p> <p>C-Web interface—Can view system-level configuration and configure it by accessing Configure > System.</p>
view	<p>SRC CLI—Can use various commands to display current systemwide, routing table, and protocol-specific values and statistics.</p> <p>C-Web interface—Can access various Monitor subtasks to display current systemwide, routing table, and protocol-specific values and statistics.</p>
view-configuration	SRC CLI and C-Web interface—Can view all system configurations, excluding any secret configuration.

When you configure more than one permission with the SRC CLI or the C-Web interface, the resulting set of permissions is a combination of all of the permissions set. This does not apply when you include **all** and **control** with the SRC CLI.

When you configure permissions with the SRC CLI, include **view** to display information and **configure** to enter configuration mode. Two forms for the permissions control the individual parts of the configuration:

- “Plain” form—Provides read-only capability for that permission type. An example is **interface**.
- Form that ends in **-control**—Provides read and write capability for that permission type. An example is **interface-control**.

When you configure permissions with the C-Web interface, click **Monitor** to display information and **Configure** to configure.

Predefined Login Classes

Table 3 lists the system login classes predefined in the SRC software.

Table 3: Default System Login Classes

Login Class	Permission Options Set
operator	clear, network, reset, view
read-only	view
super-user	all
unauthorized	None



NOTE: You cannot modify a predefined login class name. If you issue the **set** command on a predefined class name with the SRC CLI, the software will append **-local** to the login class name. The following message also appears:

warning: '<class-name>' is a predefined class name; changing to '<class-name>-local'

NOTE: You cannot issue the **rename** or **copy** command on a predefined login class with the SRC CLI. Doing so results in the following error message:

error: target '<classname>' is a predefined class

Access to Individual Commands and Configuration Statements with the C-Web Interface

By default, all top-level CLI commands have associated access privilege levels. Users can execute only those commands and view only those statements for which they have access privileges. For each login class, you can deny or allow the use of specified operational and configuration mode commands that would otherwise be permitted or not allowed by a specified privilege level.

Regular Expressions for Allow and Deny Tasks

You can use extended regular expressions to specify which commands to allow or deny. By using extended regular expressions, you can list a number of commands in each statement.

In the C-Web interface, you specify these regular expressions for the following options in the Class pane (by clicking the user class in **Configure > System > Login**).

- Allow Commands
- Deny Commands
- Allow Configuration
- Deny Configuration

Command regular expressions implement the extended (modern) regular expressions as defined in POSIX 1003.2. Table 4 lists common regular expression operators.

Table 4: Common Regular Expression Operators to Allow or Deny Operational Mode and Configuration Mode Commands

Operator	Match
Operation Mode and Configuration Mode	
	One of the two terms on either side of the pipe.
^	Character at the beginning of an expression. Used to denote where the command begins, where there might be some ambiguity.
\$	Character at the end of a command. Used to denote a command that must be matched exactly up to that point. For example, <code>allow-commands "show interfaces\$"</code> means that the user can issue the <code>show interfaces</code> command but cannot issue <code>show interfaces detail</code> or <code>show interfaces extensive</code> .
[]	Range of letters or digits. To separate the start and end of a range, use a hyphen (-).
()	A group of commands, indicating an expression to be evaluated; the result is then evaluated as part of the overall expression.
Configuration Mode Only	
*	0 or more terms.
+	One or more terms.
.	Any character except for a space.

Guidelines for Using Regular Expressions

Keep in mind the following considerations when using regular expressions to specify which statements or commands to allow or deny:

- Regular expressions are not case-sensitive.
- If a regular expression contains a syntax error, authentication fails and the user cannot log in.
- If a regular expression does not contain any operators, all varieties of the command are allowed.

Follow these guidelines when using regular expressions:

- Enclose the following in quotation marks:
 - A command name or regular expression that contains:
 - Spaces
 - Operators
 - Wildcard characters
 - In the C-Web interface, an extended regular expression that connects two or more terms with the pipe (|) symbol. For example, you could enter the following in the Deny Configuration box:

"(system login class) | (system services)"
- Do not use spaces between regular expressions separated with parentheses and connected with the pipe (|) symbol.
- Specify the full paths in the extended regular expressions with the Allow Configuration and Deny Configuration options.



NOTE: You cannot define access to keywords such as **set** or **edit**.

Timeout Value for Idle Login Sessions

An idle login session is one in which the CLI operational mode prompt is displayed but there is no input from the keyboard. By default, a login session remains established until a user logs out of the system, even if that session is idle. To close idle sessions automatically, you configure a time limit for each login class. If a session established by a user in that class remains idle for the configured time limit, the session automatically closes.

For SRC CLI users who belong to a login class for which an idle timeout is configured, the CLI displays messages similar to the following when an idle user session times out.

```
user@host# Session will be closed in 5 minutes if there is no activity.
Warning: session will be closed in 1 minute if there is no activity
Warning: session will be closed in 10 seconds if there is no activity
Idle timeout exceeded: closing session
```

If you configure a timeout value, the session closes after the specified time has elapsed, except if the user is running commands such as **ssh**, **start shell**, or **telnet**.

The C-Web interface session closes after the specified time has elapsed with no message, and returns to the login window.

Configuring Login Classes with the C-Web Interface

Before you configure a login class:

- Review the predefined login classes to determine whether you can use one of these classes rather than creating a new one.

See *Predefined Login Classes* on page 29.

- Make sure you are familiar with how to use regular expressions to specify which commands and configuration statements to allow or deny.

Consider that you can issue one **allow** statement and one **deny** statement for operation mode commands, and one **allow** statement and one **deny** statement for configuration mode commands. Use regular expressions in a statement to specify more than one command in a statement.

See *Regular Expressions for Allow and Deny Tasks* on page 30.

Configuring a Login Class

To configure a login class:

1. Click **Configure**, expand **System**, and then click **Login**.

The Login pane appears.

2. From the Create New list, select **Class**.
3. Type a name for the login class in the dialog box, and click **OK**.

The Class pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring User Accounts with the C-Web Interface

User accounts provide one way for users to access the system. For each account, you define the login name for the user, properties for the user account, and authentication information. After you create an account, the software creates a home directory for the user when the user logs in to the system for the first time.

Each user has a home directory on the C-series Controller, which is created the first time that the user logs in. Home directories that have the same name as the user ID are created in the */var/home* directory; for example, the home directory for a user with the user ID *Chris_Bee* is */var/home/Chris_Bee*.

Configuring a User Account

To configure a user account:

1. Click **Configure**, expand **System**, and then click **Login**.

The Login pane appears.

2. From the Create New list, select **User**.
3. Type a name for the user in the dialog box, and click **OK**.

The User pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Authentication for User Accounts

You can configure the following types of authentication for user accounts:

- Plain text password—Prompt for a plain text (unencrypted) password. The requirements for plain text passwords are:
 - Can contain between 6 and 128 characters
 - Can include most character classes in a password (uppercase letters, lowercase letters, numbers, punctuation marks, and other special characters).



NOTE: We do not recommend that the password include control characters. We do recommend that the password include at least one change of case or character class.

If you configure a plain text password, you are prompted to enter and confirm the password.

- Encrypted password—Password encoded with crypt. The format of encrypted passwords is "{crypt} <13-characters in a-zA-Z0-9./>".



NOTE: We recommend that you *do not* enter the password in encrypted format.

- SSH—SSH authentication. For SSH authentication, you can copy the contents of an SSH keys file into a CLI session.

Configuring a Plain Text Password

To configure a plain text password for a user account:

1. Click **Configure**, expand **System**, and then click **Login**.

The Login pane appears.

2. From the side pane, expand a user account, and click **Authentication**.
3. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring SSH Authentication

Before you configure SSH authentication, obtain the contents of SSH key files. You can copy the contents of an SSH keys file into a CLI session:

1. Click **Configure**, expand **System**, and then click **Login**.

The Login pane appears.

2. From the side pane, expand a user account, and click **Authentication**.
3. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Changing the root Password

You can change the root password only with the SRC CLI. For more information, see *SRC-PE Getting Started Guide, Chapter 24, Configuring User Access with the SRC CLI*.

Configuring a System Login Announcement with the C-Web Interface

A system login announcement appears after the user logs in. By default, no login announcement is displayed.

To configure a system login announcement:

1. Click **Configure**, expand **System**, and then click **Login**.

The Login pane appears.

2. In the Announcement box, type the system announcement.
3. Click **Apply**.

Chapter 5

Authenticating Users on a C-series Controller with the C-Web Interface

This chapter describes how to configure RADIUS and TACACS + authentication for users who access a C-series Controller with the C-Web interface.

You can also use the SRC CLI to configure RADIUS and TACACS + authentication. See *SRC-PE Getting Started Guide, Chapter 25, Authenticating Users on a C-series Controller with the SRC CLI*.

Topics in this chapter include:

- Configuring RADIUS and TACACS + Authentication on a C-series Controller with the C-Web Interface on page 37
- Configuring RADIUS Authentication with the C-Web Interface on page 38
- Configuring TACACS + Authentication with the C-Web Interface on page 38
- *Configuring More Than One Authentication Method with the C-Web Interface* on page 39
- Configuring Template Accounts for RADIUS and TACACS + Authentication with the C-Web Interface on page 40

Configuring RADIUS and TACACS+ Authentication on a C-series Controller with the C-Web Interface

The SRC software always performs password authentication on a C-series Controller. You can configure RADIUS and/ or TACACS + authentication to complement password authentication. In this case, the software performs RADIUS and/or TACACS + authentication before password authentication.

To configure RADIUS and TACACS + authentication for users who access a C-series Controller:

1. Configure the connection to the RADIUS or TACACS + server.

See *Configuring RADIUS Authentication with the C-Web Interface* on page 38.

See *Configuring TACACS + Authentication with the C-Web Interface* on page 38.

2. Configure the authentication order.

See *Configuring More Than One Authentication Method with the C-Web Interface* on page 39.

3. Configure template accounts.

See *Configuring Template Accounts for RADIUS and TACACS+ Authentication with the C-Web Interface* on page 40.

4. (Optional) Configure individual user profiles.

See *Chapter 3, Configuring User Access with the C-Web Interface*.

Configuring RADIUS Authentication with the C-Web Interface

To configure information about RADIUS servers for authentication:

1. Click **Configure > System**.

The System pane appears.

2. From the Create new list, select **RADIUS Server**.

3. Type an IPv4 address or IPv6 address in the dialog box, and click **OK**.

The RADIUS Server pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

To configure a set of users that share a single account for authorization purposes, you create a template user. See *Configuring Template Accounts for RADIUS and TACACS+ Authentication with the C-Web Interface* on page 40.

Configuring TACACS+ Authentication with the C-Web Interface

To configure information about TACACS+ servers for authentication:

1. Click **Configure**, expand **System**, and then click **Tacplus Server**.

The Tacplus Server pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

To configure a set of users that share a single account for authorization purposes, you create a template user. See *Configuring Template Accounts for RADIUS and TACACS+ Authentication with the C-Web Interface* on page 40.

Configuring More Than One Authentication Method with the C-Web Interface

On a C-series Controller, you can use more than one authentication method. You can configure the C-series Controller to be a RADIUS and TACACS+ client by:

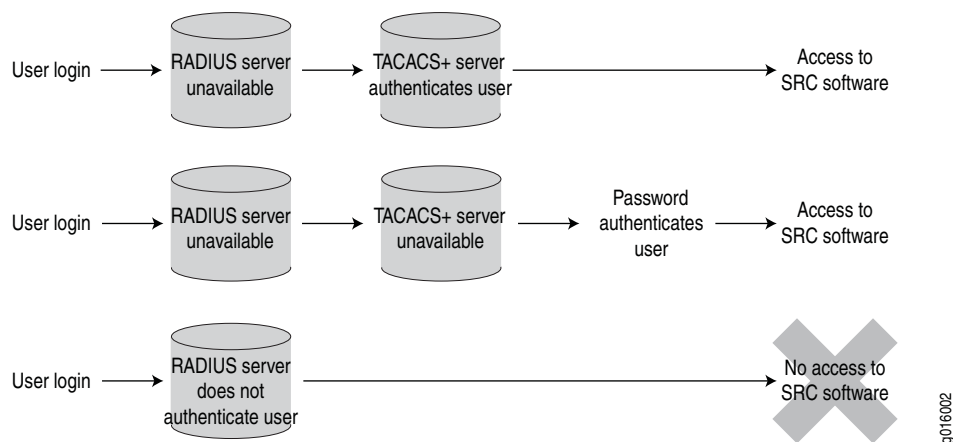
- Configuring RADIUS and TACACS+ authentication.
- Configuring the authentication order to prioritize the order in which the C-series Controller uses configured authentication methods.

For each login attempt, the SRC software tries the authentication methods in the order configured, until the password matches. If one of the authentication methods in the authentication order fails to authenticate a user, the user is denied access to the C-series Controller.

If password authentication does not appear in the prioritized list of authentication methods, the SRC software uses password authentication last. The SRC software always uses password authentication, whether or not it appears in the list of authentication methods to be used. As a result, users can log in to the C-series Controller through password authentication if configured authentication servers are unavailable.

Figure 1 shows three authentication scenarios. In the first two, a user is authenticated while authentication servers are unavailable. In the third scenario, a user is not authenticated by an active server.

Figure 1: Authentication Order: RADIUS, TACACS+, Password



Configuring Authentication Order

To configure the order in which to use authentication servers:

1. Click **Configure > System**.

The System pane appears.

2. In the Authentication Order lists, click the arrow buttons to arrange the authentication servers in the order that you want.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

If you do not configure the authentication order, users are verified based on their configured passwords.

Removing an Authentication Method from the Authentication Order

To delete an authentication method from the authentication order:

- In the System pane, select the authentication method from the Selected Values list, and click the arrow button to move the authentication method to the Suggested Values list.

Configuring Template Accounts for RADIUS and TACACS+ Authentication with the C-Web Interface

When a user logs in to the CLI, the following authentication is performed:

- RADIUS and /or TACSACS + server authentication
- Authentication through a user account configured under [system login user]

For authorization purposes, you can use a template account to create a single account that can be shared by a set of users at the same time.

Typically when you use RADIUS and/or TACACS + authentication, the user account is shared among a group of users who have the same privileges. You create template accounts for sets of users. Template accounts can be named:

- **remote**—(Default) A single account that defines user permissions for all users that authenticate through RADIUS or TACACS +
- **name-of-your-choice**—Account for a group of users

Use a named template account when you need different types of templates. Each template can define a different set of permissions appropriate to a group of users who use that template. For example, you can configure a set of remote users to concurrently share a single user ID.

When a user is part of a group that uses a template account, the command-line interface (CLI) username is the login name; however, the privileges, file ownership, and effective username are inherited from the template account.

Using Named Template Accounts

Template accounts for which you define a name are defined on a C-series Controller and are referenced by the TACACS + and RADIUS authentication servers through usernames. All users who share a local user template account have the same access privileges.

When a user who accesses the C-series Controller through a name template account logs in:

1. The SRC software issues a request to the authentication server to authenticate the user's login name.
2. If a user is authenticated, the server returns the username to the SRC software.
3. The SRC software determines whether a username is specified for that login name.
4. If there is a username, the SRC software selects the appropriate template.
5. If a user template does not exist for the authenticated user, the C-series Controller uses the **remote** template.

Using Remote Template Accounts

To configure the remote template account and specify the privileges that you want to grant to remote users:

1. Click **Configure**, expand **System**, and then click **Login**.

The Login pane appears.

2. From the Create new list, select **User**.
3. Type **remote** in the dialog box, and click **OK**.

The User pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring a Local User Template

To configure a local user template and specify the privileges that you want to grant to the local users to whom the template applies:

1. Click **Configure**, expand **System**, then click **Login**.

The Login pane appears.

2. From the Create new list, select **User**.
3. Type a name for the user in the dialog box, and click **OK**.

The User pane appears.

4. Enter information in the Class, UID, and Full Name boxes as described in the Help text, and click **Apply**.

Part 3

**Managing Systems That Run the SRC
Software**

Chapter 6

Configuring Static Host Mapping with the C-Web Interface

This chapter describes how to configure static host mapping on the Solaris platform or a C-series Controller with the C-Web interface.

You can also configure static host mapping with the SRC CLI. See *SRC-PE Getting Started Guide, Chapter 18, Configuring Static Host Mapping with the SRC CLI*.

Topics in this chapter include:

- Overview of Static Host Mapping on page 45
- Configuring Static Host Mapping with the C-Web Interface on page 45

Overview of Static Host Mapping

You can configure static host mapping to resolve hostnames. To configure static host mapping, you map the name to one or more IP addresses and aliases. Static host mapping supports both forward and reverse name lookups.

Configuring Static Host Mapping with the C-Web Interface

To configure static host mapping:

1. Click **Configure**, expand **System**, and then click **Static Host Mapping**.

The Static Host Mapping pane appears.

2. From the Create new list, select **Static Host Mapping**.

3. Type the actual name for the static host in the dialog box, and click **OK**.

The Static Host Mapping pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Chapter 7

Managing the Juniper Networks Database with the C-Web Interface

This chapter describes the Juniper Networks database and how to configure it. Topics include:

- Enabling the Juniper Networks Database to Run in Standalone Mode with the C-Web Interface on page 48
- Configuring the Juniper Networks Database to Run in Community Mode with the C-Web Interface on page 48
- Securing the Juniper Networks Database with the C-Web Interface on page 49
- Adding a Juniper Networks Database to an Established Community with the C-Web Interface on page 49
- Promoting a Secondary Database to a Primary Role in a Configuration with One Primary Database with the C-Web Interface on page 51
- Updating Data on a Juniper Networks Database with the C-Web Interface on page 52
- Synchronizing Data on a Juniper Networks Database with the C-Web Interface on page 52
- Loading Sample Data in to a Juniper Networks Database with the C-Web Interface on page 53
- Securing Communications Between the Juniper Networks Database and SRC Components with the C-Web Interface on page 54
- Recovering Data in a Community with One Primary Database and One Secondary Database with the C-Web Interface on page 55

Enabling the Juniper Networks Database to Run in Standalone Mode with the C-Web Interface

When you run a Juniper Networks database in standalone mode, the database does not communicate with other Juniper Networks databases.

To enable a Juniper Networks database to run in standalone mode:

1. Click **Configure**, expand **System > LDAP**, and then click **Server**.

The Server pane appears.

2. In the Server pane, select the **Standalone** check box, and then click **Apply**.

Related Topics

- *SRC-PE Getting Started Guide, Chapter 19, Overview of the Juniper Networks Database*
- *Configuring the Juniper Networks Database to Run in Community Mode with the C-Web Interface* on page 48
- *Securing the Juniper Networks Database with the C-Web Interface* on page 49

Configuring the Juniper Networks Database to Run in Community Mode with the C-Web Interface

You configure a Juniper Networks database in community mode to setup redundancy with other Juniper Networks databases.

To configure the Juniper Networks database to run in community mode:

1. Click **Configure**, expand **System > LDAP**, and then click **Server**.

The Server pane appears.

2. In the Server pane, clear the **Standalone** check box, and click **Apply**.

3. In the side pane, click **Commit**.

4. Expand **Server**, and click **Community**.

The Community pane appears.

5. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- *SRC-PE Getting Started Guide, Chapter 19, Overview of the Juniper Networks Database*
- *Adding a Juniper Networks Database to an Established Community with the C-Web Interface* on page 49

- *Enabling the Juniper Networks Database to Run in Standalone Mode with the C-Web Interface* on page 48
- *Securing the Juniper Networks Database with the C-Web Interface* on page 49

Securing the Juniper Networks Database with the C-Web Interface

You can secure connections to a Juniper Networks database by:

- Allowing only Secure Lightweight Directory Access Protocol (LDAPS) connections from remote systems. In this case, both database replication and remote SRC components connect through LDAPS. Restricting all remote connections to LDAPS is supported only on C-series Controllers.
- Allowing only LDAPS connections for database replication, but LDAP or LDAPS connections for other applications. In this case, remote SRC components can connect through LDAP or LDAPS. This form of security is supported only on C-series Controllers.

To secure connections to the Juniper Networks database:

1. Click **Configure**, expand **System > LDAP > Server**, and then click **Security**.

The Security pane appears.

2. Click **Create**, enter information as described in the Help text on the main pane, and then click **Apply**.

Related Topics

- *SRC-PE Getting Started Guide, Chapter 19, Overview of the Juniper Networks Database*

Adding a Juniper Networks Database to an Established Community with the C-Web Interface

When you add a Juniper Networks database to an existing community, make sure that you configure the primary neighbor relationships from the existing primary databases before you enable the new database.



If you assign a primary role to a database new to an existing community before you configure the neighbor relationships from existing community databases that have a primary role, you can lose data on neighbor databases that already have a primary role.

To add a Juniper Networks database to an existing community:

1. On existing databases that have a primary role, configure neighbor relationships for the new database.

For example, configure the new server C-new as a primary neighbors on each of the existing servers C1 and C2:

- a. Click **Configure**, expand System **LDAP > Server**, and then click **Community**.

The Community pane appears.

- b. In the Primary Neighbors box, add the new server C-new, click **Apply**.
- c. In the side pane, click **Commit**.

2. On the new database, enable the primary role and configure primary neighbors.

For example, to enable the database in primary role and configure C1 and C2 as primary neighbors:

- a. Click **Configure**, expand System **LDAP > Server**, and then click **Community**.

The Community pane appears.

- b. If the configuration is not visible, click **Create**.
- c. In the Role box, select **Primary**.
- d. In the Primary Neighbors box, add the C1 and C2 servers, and click **Apply**.
- e. In the side pane, click **Commit**.

Related Topics

- *SRC-PE Getting Started Guide, Chapter 19, Overview of the Juniper Networks Database*
- *Configuring the Juniper Networks Database to Run in Community Mode with the C-Web Interface* on page 48

Promoting a Secondary Database to a Primary Role in a Configuration with One Primary Database with the C-Web Interface

Although all communities should have two databases with a primary role, if a community includes one database assigned a primary role and another database assigned a secondary role, promote the database assigned a secondary role to a primary role.

To promote a Juniper Networks database from a secondary role to a primary role:

1. On the database that has a secondary role, set the role to primary.
 - a. Click **Configure**, expand System **LDAP > Server**, and then click **Community**.
The Community pane appears.
 - b. In the Primary Neighbors box, verify whether the other database is listed as a primary neighbor. If it is not, add it.
 - c. In the Role box, select **Primary**, and click **Apply**.
 - d. In the side pane, click **Commit**.
2. On the existing database that has a primary role, remove the neighbor as secondary and add it as primary.
 - a. Click **Configure**, expand System **LDAP > Server**, and then click **Community**.
The Community pane appears.
 - b. In the Secondary Neighbors box, remove the database listed.
 - c. In the Primary Neighbors box, add the other database in the community, and click **Apply**.
 - d. In the side pane, click **Commit**.
3. (Optional if you have two databases with a primary role in a community) Switch the role of the database that originally had a secondary role back to secondary.
 - a. Click **Configure**, expand System **LDAP > Server**, and then click **Community**.
The Community pane appears.
 - b. In the Primary Neighbors box, remove the database that is to become the secondary database.
 - c. In the Secondary Neighbors box, add the database, and click **Apply**.
 - d. In the side pane, click **Commit**.

Related Topics

- *SRC-PE Getting Started Guide, Chapter 19, Overview of the Juniper Networks Database*
- *Configuring the Juniper Networks Database to Run in Community Mode with the C-Web Interface on page 48*

Updating Data on a Juniper Networks Database with the C-Web Interface

After you bring a Juniper Networks database online after some period of inaccessibility, update the database with any database changes that occurred while the database was offline.

To update data in a neighbor in a community of Juniper Networks databases:

1. Click **Manage > Request > System > LDAP > Community > Force Update**.

The Force Update page appears.

2. In the Neighbor box, enter the name of the neighbor to be updated.

Related Topics

- *SRC-PE Monitoring and Troubleshooting Guide, Chapter 14, Monitoring the System with the C-Web Interface*

Synchronizing Data on a Juniper Networks Database with the C-Web Interface

You can initialize a Juniper Networks database with data from a neighbor. This process also removes any existing data in the database.

To replace data with data from a neighbor (for example, neighbor1):

1. Click **Manage > Request > System > LDAP > Community > Initialize**.

The Initialize page appears.

2. In the Neighbor box, enter the name of the neighbor to be synchronized.

Related Topics

- *Updating Data on a Juniper Networks Database with the C-Web Interface on page 52*
- *SRC-PE Monitoring and Troubleshooting Guide, Chapter 14, Monitoring the System with the C-Web Interface*

Loading Sample Data in to a Juniper Networks Database with the C-Web Interface

The SRC software provides sample data that you can load into the Juniper Networks database. Typically, this data is used for testing or for demonstration purposes. You can load sample data for:

- Enterprise service portals
- SNMP traps for the SNMP agent
- Sample applications:
 - Dynamic Service Activator application (in the SRC Application Library)
 - Intrusion Detection and Prevention (IDP) integration application (unsupported sample application in the SRC Application Library)
 - Instant Virtual Extremity (IVE) Host Checker integration application (unsupported sample application in the SRC Application Library)
 - Traffic-Mirroring Application (unsupported sample application in the SRC Application Library)
 - Sample residential portal (unsupported sample application in the SRC Application Library)
 - Equipment registration mode
 - Internet service provider (ISP) mode

Loading sample data is not required to run the SRC software.

To load sample data from the C-Web interface:

1. Click **Manage > Request > System > LDAP > Load**.

The Load page appears.

2. In the Data box, select the component for which to load sample data, and click **OK**.

Related Topics

- *SRC-PE Getting Started Guide, Chapter 19, Overview of the Juniper Networks Database*

Securing Communications Between the Juniper Networks Database and SRC Components with the C-Web Interface

Communications between SRC components and the Juniper Networks database use password authentication. You can change the default passwords for the following software components to ensure that communications are secure.

- License server
- NIC
- SAE
- SRC CLI
- Configuration for SRC components other than the CLI and the NIC

To change the administrative password for the Juniper Networks database:

1. Click **Manage > Request > System > LDAP > Change Admin Password**.

The Change Admin Password page appears.

2. In the New Password box, enter the new password.

To change a component password:

1. Click **Manage > Request > System > LDAP > Change Component Password**.

The Change Component Password page appears.

2. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- *Securing Communications Between the Juniper Networks Database and SRC Components with the C-Web Interface* on page 54

Recovering Data in a Community with One Primary Database and One Secondary Database with the C-Web Interface

In an environment in which a community includes one database assigned a primary role and another database assigned a secondary role, and the primary database is not operative, you must promote the secondary database to primary and reconfigure the inoperative primary database.

1. On the database that has a secondary role, set the role to primary.
 - a. Click **Configure**, expand **System > LDAP > Server**, and then click **Community**.
The Community pane appears.
 - b. In the Role box, select **Primary**, click **Apply**.
 - c. In the side pane, click **Commit**.
2. On the existing database that has a primary role, remove the neighbor as secondary and add it as primary.
 - a. Click **Configure**, and expand **System > LDAP > Server > Community**.
The Community pane appears.
 - b. In the Secondary Neighbors box, remove the database that is to become the primary database.
 - c. In the Primary Neighbors box, add the database, and click **Apply**.
 - d. In the side pane, click **Commit**.

Related Topics

- *SRC-PE Getting Started Guide, Chapter 20, Managing the Juniper Networks Database with the SRC CLI*
- *SRC-PE Monitoring and Troubleshooting Guide, Chapter 14, Monitoring the System with the C-Web Interface*

Part 4

Configuring Network Components

Chapter 8

Setting Up an SAE with the C-Web Interface

This chapter describes how to initially configure the SAE and how to create grouped SAE configurations with the C-Web interface.

- To use the SRC CLI to set up an SAE, see *SRC-PE Getting Started Guide, Chapter 21, Setting Up an SAE with the SRC CLI*.
- To set up the SAE on a Solaris platform, see *SRC-PE Getting Started Guide, Chapter 35, Setting Up an SAE on a Solaris Platform*.

Topics in this chapter include:

- Initially Configuring the SAE with the C-Web Interface on page 59
- Creating Grouped Configurations for the SAE with the C-Web Interface on page 60
- Configuring Local Properties for the SAE with the C-Web Interface on page 61
- Configuring the RADIUS Local IP Address and NAS ID with the C-Web Interface on page 61
- Configuring the Directory Location for SAE Data with the C-Web Interface: on page 61
- Starting and Stopping the SAE with the C-Web Interface on page 62

Initially Configuring the SAE with the C-Web Interface

To initially configure the SAE:

- (Optional) Create a configuration group for the SAE.

See *Creating Grouped Configurations for the SAE with the C-Web Interface* on page 60

- Configure local properties for the SAE.

See *Configuring Local Properties for the SAE with the C-Web Interface* on page 61

- Configure a local IP address and NAS ID that the SAE uses to communicate with RADIUS servers.

See *Configuring the RADIUS Local IP Address and NAS ID with the C-Web Interface* on page 61

- Configure the location of the directory that contains SAE data.

See *Configuring the Directory Location for SAE Data with the C-Web Interface*: on page 61

Creating Grouped Configurations for the SAE with the C-Web Interface

We recommend that you configure the SAE within a group. When you create a configuration group, the software creates a configuration with default values filled in.

Configuration groups allow you to build hierarchies that define different levels of sharing. The configuration is shared with all SAE instances in the SRC network.

You can then create a grouped SAE configuration that is shared with some SAE instances. For example, if you create an SAE group called region within the shared SAE configuration, you could share the SAE configuration with all SAE instances in a particular region.

You can then create a lower-level group called location in the SAE group region, which could be shared with SAE instances in a particular location.

Configuration options that are defined in a lower-level group override options in a higher-level group. This functionality allows you to define general configuration values (such as plug-in definitions) on a higher level and augment or specialize them on a lower level.

Configuring an SAE Group with the C-Web Interface

.To configure an SAE group:

1. Click **Configure**, expand **Slot**, expand the slot for which you want to configure the group, and then click **SAE**.

The SAE pane appears.

2. From the Shared list, select **/SAE/**.
3. Type a name for the new group in the box below the Shared list using the **/SAE/<path>** format, and click **Add**.
4. Click **Apply**.

The group appears in the side pane.

Configuring Local Properties for the SAE with the C-Web Interface

To configure local properties for the SAE:

1. Click **Configure**, and expand **Slot**.
2. Expand the slot for which you want to configure the SAE, and then click **SAE**.

The Slot SAE pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring the RADIUS Local IP Address and NAS ID with the C-Web Interface

To set the local RADIUS address and network access server (NAS ID):

1. Click **Configure**, and expand **Slot**.
2. Expand the slot for which you want to configure SAE, expand **SAE**, and then click **Radius**.

The Slot SAE pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring the Directory Location for SAE Data with the C-Web Interface:

You can configure the locations for dynamic and static configuration data in the directory.

To configure the directory location for configuration data:

1. Click **Configure**, and expand **Slot**.
2. Expand the slot for which you want to configure SAE, expand **SAE**, and then click **Initial**.

The Initial pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Starting and Stopping the SAE with the C-Web Interface

You must configure licenses before you start the SAE. When you start the SAE, the software verifies that a valid license is available. If no license is found, the SAE does not start.

Starting the SAE with the C-Web Interface

To start the SAE:

1. Click **Manage > Enable**.

The Enable pane appears.

2. From the Component list, select **SAE**, and click **OK**.

Stopping the SAE with the C-Web Interface

To stop the SAE:

1. Click **Manage > Disable**.

The Disable pane appears.

2. From the Component list, select **SAE**, and click **OK**.

Chapter 9

Configuring the SAE with the C-Web Interface

This chapter describes how to use the C-Web interface to configure general SAE properties. You can use the C-Web interface to configure the SAE on a Solaris platform or on a C-series platform.

To use the SRC CLI to configure an SAE on a Solaris platform or on a C-series platform, see *SRC-PE Network Guide, Chapter 2, Configuring the SAE with the SRC CLI*.

Topics in this chapter include:

- Configuring LDAP Access to Directory Data with the C-Web Interface on page 63
- Storing Subscriber and Service Session Data with the C-Web Interface on page 66
- Configuring the Session Store Feature on the C-Web Interface on page 67
- Configuring the Number of Threads for Sessions on the C-Web Interface on page 69

Configuring LDAP Access to Directory Data with the C-Web Interface

The SRC software stores subscriber, service, persistent login, policy, router, and cached subscriber profiles and session data in a directory. The SAE uses LDAP to store and retrieve the data.

If you do not store data in the local directory, you need to configure the LDAP connections to the directories in which the data is stored. You can also select the filter that the SAE uses to search for subscriptions in the directory and directory eventing parameters for data stored in the directory.

The tasks to configure LDAP access to directory data are:

- (Optional) Configuring Access Through LDAPS to Service and Subscriber Data on page 64
- Configuring Access to Subscriber Data on page 65
- Configuring Access to Service Data on page 65

- Configuring Access to Policy Data on page 65
- Configuring Access to the Persistent Login Cache on page 65
- Configuring the Location of Network Device Data on page 65
- Enabling Automatic Discovery of Changes in SAE Configuration Data on page 66
- Setting the Timeout and Number of Events for SAE Directory Eventing on page 66

Configuring Access Through LDAPS to Service and Subscriber Data

You can secure connections between a router and an external directory that contains service data or subscriber data, and you can configure the router to use LDAPS when it connects to the same data source.

To use LDAPS to secure connections between a router and an external directory:

1. Do one of the following:
 - a. To configure service data, click **Configure**, expand **Shared > SAE > LDAP**, and then click **Service Data**.

The Service Data pane appears.

- b. To configure subscriber data, click **Configure**, expand **Shared > SAE > LDAP**, and then click **Subscriber Data**.

The Subscriber Data pane appears.

2. Click **Create**.
3. Select **ldaps** from the Secured Ldap Protocol list.
4. In the router initialization script you specify the directory context.

The `/opt/UMC/sae/lib/poolPublisher.py` script and the `/opt/UMC/sae/lib/IorPublisher.py` script provide examples of how to configure a directory context. For example, from the `/opt/UMC/sae/lib/IorPublisher.py` script:

```
dirContext = Ssp.registry.get('ServiceDataSource.component').getContext()
```

In addition, you can change the directory context.

For information about how to use InitialDirContext class or the DirContext class to specify directory context, see:

<http://java.sun.com/j2se/1.4.2/docs/api/javax/naming/directory/InitialDirContext.html>

<http://java.sun.com/j2se/1.4.2/docs/api/javax/naming/directory/DirContext.html>

Configuring Access to Subscriber Data

To configure SAE access to subscriber data:

1. Click **Configure**, expand **Shared > SAE > LDAP**, and then click **Subscriber Data**.

The Subscriber Data pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Access to Service Data

To configure SAE access to service data:

1. Click **Configure**, expand **Shared > SAE > LDAP**, and then click **Service Data**.

The Service Data pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Access to Policy Data

To configure SAE access to subscriber data:

1. Click **Configure**, expand **Shared > SAE > LDAP**, and then click **Policy Data**.

The Policy Data pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Access to the Persistent Login Cache

To configure SAE access to persistent login cache data:

1. Click **Configure**, expand **Shared > SAE > LDAP**, and then click **Persistent Log Cache**.

The Persistent Login Cache pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring the Location of Network Device Data

To configure SAE access to network device data:

1. Click **Configure**, expand **Shared > SAE**, and then click **Network Device Data**.

The Network Device Data pane appears.

2. Enter information as described in the Help text in the main pane, and click **Apply**.

Enabling Automatic Discovery of Changes in SAE Configuration Data

To enable automatic discovery of changes in SAE configuration data:

1. Click **Configure**, expand **Shared > SAE**, and then click **LDAP**.

The LDAP pane appears.

2. Click **Create**, enable the Enable Directory Eventing box as described in the Help text in the main pane, and then click **Apply**.

Setting the Timeout and Number of Events for SAE Directory Eventing

To configure the directory eventing timeout and the number of simultaneous events that the SAE can receive from the directory:

1. Click **Configure**, expand **Shared > SAE > LDAP**, and then click **Directory Eventing**.

The Directory Eventing pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *SRC-PE Getting Started Guide, Chapter 21, Setting Up an SAE with the SRC CLI*.

Storing Subscriber and Service Session Data with the C-Web Interface

To aid in recovering from an SAE failover, the SAE stores subscriber and service session data in flat files on the SAE host. The SRC component that controls the storage of session data on the SAE is called the session store. The session store queues data and then writes the data to session store files on the SAE host's disk. After the data has been written to disk, it can survive a server reboot.

You can configure how the SAE stores session data for JUNOSe routers, JUNOS routing platforms, simulated routers, and *PacketCable Multimedia Specification* (PCMM) devices.

Session Store Files

Session store files are numbered flat files. Session store files are located in a directory on the SAE host. You can configure the size of session store files. After the maximum size has been reached, the session store creates a new file and begins writing data to the new file.

Store operations, such as adding a session to the store (put store operations) or removing a session from the store (remove store operations), are queued in a buffer before they are written to the session store file. You can configure parameters that determine when the session store writes a queue to a session store file.

Session store files are deleted if they have not been modified and if no session activity has taken place for one week. All the data files that contain the sessions associated with a particular virtual router are deleted at the same time.

Active and Passive Session Stores

You can have a community of SAEs and duplicate session store data on each SAE in the community in case of an SAE failover. SAE communities are made up of SAEs that you configure as connected SAEs for a virtual router object.

SAEs in a community are given the role of either active SAE or passive SAE. The active SAE keeps session data up to date within the community. Each active session store opens a Transmission Control Protocol (TCP) connection to its passive SAE. The TCP connection triggers the creation of a passive session store in that SAE. When the active session store writes operations to the session store file, it passes them to passive session stores on all SAEs in the community.

When you modify a community, wait for passive session stores on the new community members to be updated before you shut down the currently active SAE. Otherwise, if you add a new member to a community, and then a failover from the current active SAE to the new member is triggered immediately, the new member's session store may not have received all data from the active SAE's session store.

Standby SAEs

In a community of SAEs, one SAE can provide redundancy for the active SAE. The redundant (standby) SAE connects to the active SAE through a COPS-PR connection. State as well as session data is replicated from the active SAE to the standby SAE to reduce the failover time from one SAE to another.

A standby SAE can respond to SAE failures and connection failures between an SAE and a JUNOS router. Connection failures between an active SAE and a standby SAE may not be immediately detected, because each SAE continues to function for a period of time. When a standby SAE does detect that state information is different on the two SAEs, it resynchronizes data between the two.



NOTE: We recommend that you use a highly reliable and available connection between an active SAE and a standby SAE to ensure availability of the two SAEs.

Session Store File Rotation

The session store periodically rotates the session store files. During rotation, the session store copies put store operations for live sessions from the oldest file to the end of the newest file. (Live sessions are sessions that have been created but not yet deleted.) It then deletes the oldest file. Sessions are rotated in batches, and you can configure the number of sessions that are rotated at the same time, and how much disk space is used by live sessions before files are rotated. No session store activity can take place while a batch of sessions is rotated.

Configuring the Session Store Feature on the C-Web Interface

You can configure three things for the session store feature:

- Configure session store parameters for a router or device driver. See *Configuring Session Store Parameters for a Device Driver* on page 68.
- Configure global session store parameters that are shared by all session store instances (active or passive) on the SAE. See *Configuring Global Session Store Parameters with the C-Web Interface* on page 68.
- Reduce the size of session objects that the SAE sends across the network for the session store feature. See *Reducing the Size of Objects for the Session Store Feature* on page 69.

Configuring Session Store Parameters for a Device Driver

To configure session store parameters within a device driver configuration:

1. Click **Configure**, expand **Shared > SAE > Configuration**, and then click **Driver**.

The Driver pane appears.

2. In the side pane, expand the type of driver that you want to configure, and then click **Session Store**.

The Session Store pane appears.

3. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Global Session Store Parameters with the C-Web Interface

This section describes how to configure global session store parameters that are shared by all session store instances (active or passive) on the SAE. You can also configure session store parameters within a device driver configuration. See *Configuring Session Store Parameters for a Device Driver* on page 68.

To configure global session store parameters:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **Session Store**.

The Session Store pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Reducing the Size of Objects for the Session Store Feature

You can use serialized data compression to reduce the size of sessions objects that the SAE sends across the network for the session store feature. Enabling this property reduces the size of objects, but increases the CPU load on the SAE.

To specify whether or not session objects are compressed:

1. Click **Configure**, expand **Shared > SAE**, and then click **Configuration**.

The SAE Configuration pane appears.

2. Click **Create**, enable the Compress Session Data box as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *SRC-PE Getting Started Guide, Chapter 21, Setting Up an SAE with the SRC CLI*.

Configuring the Number of Threads for Sessions on the C-Web Interface

To configure the number of threads used to handle session-related activity:

1. Click **Configure**, expand **Shared > SAE**, and then click **Session Job Manager**.

The Session Job Manager pane appears.

2. Click **Create**, enter the number of threads as described in the Help text in the main pane, and then click **Apply**.

Chapter 10

Classifying Interfaces and Subscribers with the C-Web Interface

This chapter provides information for configuring and using classification scripts with the C-Web interface.

- To use the SRC CLI, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 6, Classifying Interfaces and Subscribers with the SRC CLI*.
- To use SDX Admin, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 7, Classifying Interfaces and Subscribers on a Solaris Platform*.

Topics in this chapter include:

- Overview of Classification Scripts on page 71
- Classifying Interfaces with the C-Web Interface on page 76
- Classifying Subscribers with the C-Web Interface on page 79
- Classifying DHCP Subscribers with the C-Web Interface on page 84
- Selecting DHCP Parameters on page 87
- Creating DHCP Profiles with the C-Web Interface on page 90

Overview of Classification Scripts

The SAE uses classification scripts to determine whether it manages router interfaces, to select default policies, to find subscriber profiles, and to choose DHCP profiles. The SAE has three classification scripts:

- Interface classification script—When a subscriber's IP interface comes up on the router, the router sends the subscriber's login and interface information to the SAE. The SAE runs the interface classification script to determine whether the SAE manages the interface and if so, what default policies to send to the router.
- Subscriber classification script—If the SAE is managing the interface, the SAE uses the login and interface information that the router sends to run the subscriber classification script to determine which subscriber profile to load into memory.

- DHCP classification script—For DHCP subscribers, the SAE runs DHCP classification scripts to choose DHCP profiles.

How Classification Scripts Work

Classification scripts are organized into rules. Each rule has a *target* and one or more match *conditions*.

- A target is the result of the classification script. For example, the result of subscriber classification scripts is an LDAP search string that is used to find a unique subscriber profile. The result of interface classification scripts is a policy group.
- Conditions are match criteria. The script attempts to match conditions in the script with information sent from the router. For example, match conditions for a subscriber classification script might be login type or domain name. Match conditions for an interface classification script could be interface IP address or interface description.

Each script can have multiple targets, and each target can have multiple conditions. When an object needs classification, the script processes the targets in turn. Within each target, the script processes conditions sequentially. When it finds that the classification conditions for a target match, it returns the target to the SAE. If the script does not find any targets that can be matched, the classifier engine returns a no-match message to the SAE.

Because classification scripts examine conditions sequentially as the conditions appear in the script, you should put more specific conditions at the beginning of the script and less specific conditions at the end of the script.

Interface Classification Scripts

When a subscriber's IP interface comes up on the router, the router sends the subscriber's login and interface information to the SAE. For example, the router might send the following information:

```
IP address=0.0.0.0
Virtual router name=default@erx5_ssp58
Interface name=FastEthernet3/1.1
PPP login name (PPP)=pebbles@virneo.net
User IP address (PPP)=192.168.55.5
Interface speed=100000000
Interface description=P3/1.1
Interface alias=1st pppoe int
RADIUS class=null
```

The SAE invokes the interface classification script and provides to the script the information that it received from the router. The script engine matches the information sent from the router to the conditions in the interface classification script. The script examines each condition in sequential order to find a match.

- If it finds a match, the script processing stops, and the target for that condition is returned to the SAE. The target is the path of a policy group. This policy group is the default policy. The SAE installs the policy on the interface and begins managing the interface.
- If it does not find a match, the script sends a no-match message to the SAE. The SAE does not manage the interface; that is, the policies installed through RADIUS or the CLI remain in effect. The SAE does not install policies.

Subscriber Classification Scripts

When the SAE begins managing an interface, it determines whether a subscriber is associated with the interface by running the subscriber classification script. The SAE also runs the subscriber classification script when certain login events occur. See *SRC-PE Subscribers and Subscriptions Guide, Chapter 3, Subscriber Logins and Service Activation* for a description of login event types.

To find the matching subscriber profile, the SAE uses interface information that it received from the router when the interface became operational (for example, virtual router name, interface name, interface alias). It also uses login information that it received from the router or the portal application when the subscriber attempted to log in (for example, subscriber IP address, login name, or login event type).

When the SAE runs the subscriber classification script, the script engine matches the information sent from the router to the conditions in the subscriber classification script. The script examines each condition in sequential order to find a match.

- If it finds a match, the script processing stops, and the target for the matching condition is returned to the SAE. The target is an LDAP query that uniquely identifies a subscriber profile. The SAE loads the subscriber entry and uses the entry to create a subscriber session in memory.
- If it does not find a match, the script sends a no-match message to the SAE. The SAE does not load a subscriber session onto the interface, and services cannot be activated for this session.

DHCP Classification Scripts

- DHCP classification scripts choose DHCP profiles. See *SRC-PE Subscribers and Subscriptions Guide, Chapter 8, Overview of Plug-Ins Included with the SAE* for information about how DHCP classification scripts are used.

Classification Targets

A target is the result of the classification script that gets returned to the SAE. There are two special types of targets:

- No-match targets—Targets that begin with a - (single dash) are interpreted as no match. If the conditions of this target are matched, a no-match message is returned to SAE. You can use this type of target to exclude certain patterns or to shortcut known nonmatches. To speed up processing, use this target to specify interfaces that you do not want the SAE to manage.
- Script targets—The content of the script rule is interpreted when the classifier is initially loaded. The script rule can contain definitions of custom functions, which can be called during the matching process. Because you can insert arbitrary code into a script, you can use classification scripts to perform arbitrary tasks.

Because script targets use * (asterisks), you cannot use * in other types of targets.

Target Expressions

A target can contain expressions. These expressions can refer to an object in the SAE's memory or configuration, to specific matching conditions, or to another function or script.

Suppose the classification object in a subscriber classifier contains a field called `userName`. The classifier target `uniqueId = <- userName ->` is expanded to contain the actual content of the `userName` field before it is returned to the SAE; for example, for `userName = juser`, `uniqueId = juser` is returned.

Target expressions are enclosed in angle brackets and hyphens; for example, `<-retailerDn->`. The classifier expands expressions before it returns the target to the SAE. The expression is interpreted by an embedded Python interpreter and can contain variables and Python operations. In the simplest case an expression can be a single variable that is replaced with its current contents. Available variable names are all fields of the object passed to the classifier and names created with regular expression matching.

Because a scripting interpreter interprets expressions, more complex operations are possible. Examples are:

- Indexing—`var[index]` returns the element index of a sequence. The first element is at index 0.
- Slicing—`var[start : end]` creates a substring of the variable `var` starting at index `start` to, but not including, index `end`; for example, `var = Hello`, `var[2:4] = ll`

Classification Conditions

You can configure multiple classification conditions for a rule. For example:

```
rule rule-2 {
  target /ent/EntDefault;
  condition {
    "pppLoginName=\"\"";
    "&interfaceName!=\"fastEthernet0*\"";
    "&interfaceName!=\"null*\"";
    "&interfaceName!=\"loopback*\"";
  }
}
```

If you prefix a condition with an & (ampersand) character, the condition is examined only if the previous condition matches.

If you prefix a condition with a | (pipe) character, the condition is examined only if the previous conditions have not produced a positive match.

You can use glob or regular expression matching to configure each target's conditions.

Glob Matching

Glob matches are of the form:

```
field = match
or
field != match
```

where match is a pattern similar to UNIX filename matching. Glob matches are case insensitive. “field != match” is true, if field = match is not true.

- *—Matches any substring.
- ?—Matches any single character.
- [range]—Matches a single character in the specified range. Ranges can have the form a-z or abcd.
- [!range]—Matches a single character outside the specified range.
- C—Matches the single character c.

The available field names are described for the specific classifiers. Examples are:

- interfaceName = fastEthernet3/0 # matches the string “fastEthernet3/0” directly.
- interfaceName = fast*3/1 # matches any string that starts with “fast” and ends with “3/1”
- interfaceName = fast*3/1.* # starts with “fast”, contains “3/1.” arbitrary ending
- interfaceName = fast*3/[2-57] # starts with “fast”, contains “3/” followed by 2,3,4,5 or 7

Regular Expression Matching

Regular expression matches are of the form:

```
field =~ re
or
field !~ re
```

where `field !~ re` is true if `field = ~ re` is not true. The regular expression is *re*. For a complete description of the syntax, see:

<http://www.python.org/doc/2.0/lib/re-syntax.html>

You can group regular expressions with pairs of parentheses. If such an expression matches, the contents of the groups are made available for target expressions. Group number *n* is available as `G[n]`, where *n* is the number of the opening parenthesis of the group. You can also name groups by using the special notation `(?P<name>...)`.

Examples:

```
ifAlias =~ "SSP(.*)"
# match a string starting with "SSP". The remainder is stored
# in the variable "G[1]"

ifAlias =~ (?P<dn>name=(?P<name>[^\,]*)).*
# match a string starting with "name=". The whole match is
# stored in the variable "dn". A submatch which does not
# contain any ","-characters and starts after "name="
# is stored in variable "name"
```

Classifying Interfaces with the C-Web Interface

To define interface classification scripts:

1. Click **Configure**, and expand **Shared > Network**.
2. Expand the device for which you want to configure interface classification scripts, and then click **Interface Classifier**.

The Interface Classifier pane appears.

3. From the Create new list, select **Rule**.
4. Type a name for the new rule in the dialog box, and click **OK**.

The rule appears in the side pane and the Rule pane.

5. Enter a script or a target as described in the Help text in the Main pane, and click **Apply**.

6. To configure a condition for a target:
 - a. Expand the rule in the side pane, and click **Condition**.
The Condition pane appears.
 - b. From the Create new list, select **Condition**.
 - c. Type the interface classification condition name as described in Interface Classification Conditions, and click **OK**.

The condition appears in the side pane and the Condition pane.

Interface Classification Conditions

Use the fields in this section to define interface classification conditions.

broadcastAddr

- Interface broadcast address.
- Value—Valid broadcast address format
- Example—broadcastAddr.hostAddress = “255.255.255.255”

ifAlias

- Description of an interface.
- Value—Interface description that is configured on the router. For JUNOS routers, it is the description configured with the **interface description** command.
- Example—ifAlias = “1st pppoe int”

ifDesc

- Alternate name of the interface that is used by SNMP. This name is a system-generated name.
- Value
 - On a JUNOS router, the format of the description is
ip<slot>/<port>.<subinterface>
 - On the JUNOS routing platform, ifDesc is the same as interfaceName.
- Example—ifDesc = “IP3/1.1”

interfaceName

- Name of the interface.
- Value
 - Name of the interface in your router CLI syntax
 - FORWARDING_INTERFACE for routing instance (used by traffic mirroring)
- Example—For JUNOS routers: interfaceName = “fastethernet6/0.1”
 For JUNOS routing platforms: interfaceName = “fe-0/1/0.0”
 For forwarding interface: interfaceName = “FORWARDING_INTERFACE”

ipAddress

- Interface IP address.
- Value—Valid IPv4 IP address format
- Example—ipAddress = “10.10.30.1”

ipMask

- Interface network mask.
- Value—Valid IPv4 IP network mask format
- Example—ipMask = “255.255.255.255”

mtu

- Maximum transfer unit configured on the interface.
- Value—32-integer value
- Example—mtu = “1492”

nasPortId

- Port identifier of an interface.
- Value—Includes interface name and additional layer 2 information
- Example—nasPortId = “fastEthernet 3/1” (There is a space between fastEthernet and slot number 3/1 in the nasPortId.)

pppLoginName

- Login name for PPP subscribers.
- Value—Login name in the format username@domain
- Example—pppLoginName = “pebbles@virneo.net”

radiusClass

- RADIUS class attribute.
- Value—RADIUS class name
- Example—radiusClass = “Premium”

serviceBundle

- Content of the vendor-specific RADIUS attribute for the service bundle.
- Value—Name of a service bundle

userIpAddress

- Subscriber IP address (PPP only).
- Value—valid IPv4 address
- Example—userIpAddress = “192.168.30.15”

virtualRouterName

- Name of the virtual router or routing instance.
- Value—For JUNOS routers: name of the virtual router in the format `vrname@hostname`
For JUNOS routing platforms: name of the routing instance
- Example—virtualRouterName = “default@erx5”

Classifying Subscribers with the C-Web Interface

To define subscriber classification scripts:

1. Click **Configure**, expand **Shared > SAE**, and then click **Subscriber Classifier**.

The Subscriber Classifier pane appears.

2. From the Create new list, select **Rule**.
3. Type a name for the new rule in the dialog box, and click **OK**.

The rule appears in the side pane and the Rule pane.

4. Enter a script or a target as described in the Help text in the Main pane, and click **OK**.
5. To configure a condition for a target:

- a. Expand the rule in the side pane, and click **Condition**.

The Condition pane appears.

- b. Type the subscriber classification condition name as described in Subscriber Classification Conditions, and click **OK**.

The condition appears in the side pane and the Condition pane.

Subscriber Classification Conditions

Subscriber classification conditions define match criteria that are used to find the subscriber profile. Use the fields in this section to define subscriber classification conditions.

dhcp

- DHCP options. See *Sending DHCP Options to the JUNOS Router* on page 82.

domainName

- Domain name of the subscriber.
- Value—Valid domain name
- Example—domainName = “isp99.com”

ifAlias

- Description of the interface.
- Value—Interface description that is configured on the router. For JUNOS routers, it is the description configured with the **interface description** command
- Example—ifAlias = “dhcp-subscriber12”

ifDesc

- Alternate name for the interface that is used by SNMP. This name is a system-generated name.
- Value
 - On a JUNOS router, the format of the description is
ip<slot>/<port>.<subinterface>
 - On the JUNOS routing platform, ifDesc is the same as interfaceName.
- Example—ifDesc = “IP3/1.1”

interfaceName

- Name of the interface.
- Value
 - Name of the interface in your router CLI syntax
 - FORWARDING_INTERFACE for routing instance (used by traffic mirroring)
 - Router for a JUNOS router instance
- Example—For JUNOS routers: interfaceName = “fastEthernet6/0”
For JUNOS routing platforms: interfaceName = “fe-0/1/0.0”
For forwarding interface: interfaceName = “FORWARDING_INTERFACE”

loginName

- Name to be used to create a loginName attribute for a subscriber session for JUNOS interfaces that are not otherwise assigned a loginName when a session starts, such as unauthenticated DHCP addresses, unauthenticated IP interfaces (that are not using PPP connections), or core-facing interfaces.

The loginName can also be used to identify a subscriber session through the SAE CORBA remote API.
- Value—Name in the form subscriber@domain

- < Login name >
- Guideline—The format is not defined. A loginName can be of form subscriber, domain\subscriber, subscriber@domain, or as otherwise defined by the login setup of the operator.
- Example—idp@idp

loginType

- Type of subscriber session to be created.
- Value—One of the following login types:
 - ASSIGNEDIP—For assigned IP subscribers. Triggered when an application accesses a subscriber object for an assigned IP subscriber that is not currently loaded into memory. (Supported on JUNOSe routers.)
 - AUTHINTF—For authenticated interface login requests. Triggered when a login Name is reported together with the interface, such as authenticated PPP or autoconfigured ATM interface, by means of the **subscriber** command. (Supported on JUNOSe routers.)
 - INTF—For unauthenticated interface login requests. Triggered when an interface comes up and the interface classification script determines that the SAE should manage the interface. (Supported on JUNOS routing platforms and JUNOSe routers.)
 - ADDR—For unauthenticated address login requests. Triggered when the DHCP server in the JUNOSe router provides an unauthenticated IP address. (Supported on JUNOSe routers.)
 - AUTHADDR—For authenticated address login requests. Triggered when the DHCP server in the JUNOSe router provides an authenticated IP address. (Supported on JUNOSe routers.)
 - PORTAL—Triggered when the portal API is invoked to log in a subscriber. (Supported on JUNOS routing platforms and JUNOSe routers.)
- Example—loginType = "AUTHADDR"

macAddress

- String representation of the DHCP subscriber media access control (MAC) address.
- Value—Valid MAC address
- Example—macAddress = "00:11:22:33:44:55"

nasPortId

- Port identifier of an interface.
- Value—Includes interface name and additional layer 2 information
- Example—nasPortId = "fastEthernet 3/1" (There is a space between fastEthernet and slot number 3/1 in the nasPortId.)

radiusClass

- RADIUS class used for authorization.
- Value—RADIUS class name
- Example—radiusClass = “Premium”

retailerDn

- DN of the retailer object. The object is found when the domain name is mapped to a retailer object in LDAP.
- Value—DN of a retailer

serviceBundle

- Content of the vendor-specific RADIUS attribute for the service bundle.
- Value—Name of a service bundle
- Example—serviceBundle = “goldSubscriber”

unauthenticatedUserDn

- DN of the unauthenticated subscriber profile (usable for target expressions only).
- Value—DN of a subscriber profile

userName

- Name of the subscriber.
- Value—Subscriber name without the domain name
- Example—userName = “peter”

virtualRouterName

- Name of the virtual router or routing instance.
- Value—For JUNOS routers: name of the virtual router in the format vrname@hostname
For JUNOS routing platforms: name of the routing instance
- Example—virtualRouterName = “default@e_series5”

Sending DHCP Options to the JUNOS Router

Subscriber classification scripts support DHCP options conveyed through COPS. When COPS reports an address, the JUNOS router sends DHCP options received for DHCP requests for that address. The DHCP options are available in the subscriber classification context for selecting the subscriber profile to load.

The fields in Table 5 are in the classification context of subscriber classification scripts.

Table 5: DHCP Options in UserClassificationContext Field

DHCP Option	UserClassificationContext Field	Comments
giAddr	dhcp.giAddr	Relay agent gateway address
Option 82 data	dhcp.getOption(82)	Content is accessible with getSubOptions()
Client ID	dhcp.getOption(61).getString()	
Lease time	dhcp.getOption(51).getInt()	
Client requested parameter list	dhcp.getOption(55).getBytes()	
Domain name sent to client	dhcp.getOption(12).getString() dhcp.getOption(15).getString()	12 = HostName 15 = DomainName
DNS server address(es) sent to client	dhcp.getOption(6).getIpAddresses()	
Subnet mask	dhcp.getOption(1).getIpAddress()	
NetBios name server address(es) sent to client	dhcp.getOption(44).getIpAddresses()	
NetBios node type	dhcp.getOption(46).getBytes()	
Default router address(es) sent to client	dhcp.getOption(3).getIpAddresses()	

The DHCP options are accessible to the subscriber classification script with the following syntax:

```

dhcp.giAddr = "match"

# interpret option 61 as string
dhcp[61].string = "match"

# interpret option 1 (subnet) as dotted decimal IP
dhcp[1].ipAddress = "match"

# option 82, suboption 1, interpreted as string
dhcp[82].subOptions[1].string = "match"

```

The received DHCP options are also stored in the UserSession and are available through the portal API (method User.getDhcpOptions).

Subscriber Classification Targets

The target of the subscriber classification script is an LDAP search string. The search string uses a syntax similar to an LDAP URL (see RFC 2255—The LDAP URL Format (December 1997)). The syntax is:

```
"baseDN [ ? [ attributes ] [ ? [ scope ] [ ? [ filter ] ] ] ]"
```

- **baseDN**—Distinguished name of object where the LDAP search starts
- **attributes**—Can be used to override attributes in the loaded LDAP object. For example, for static IP subscribers the SAE must learn the IP address assigned to a particular subscriber. This address is defined in the `ipAddress` attribute of the subscriber profile. A target of the form `baseDN?ipAddress = <-function(interfaceName)->` invokes function after the subscriber profile is loaded from LDAP and sets the IP address to the return value of function. The function is defined in the subscriber classification script, and can be used for a variety of things; for example, to query an external database.



NOTE: You can use subscriber classification to override only the `ipAddress`, `loginName`, or `accountingId` attributes. If you configure values to override other attributes, the value is lost when the SAE recovers from a network or server failure.

- **scope**—Scope of search
 - **base**—Is the default, searches the base DN only.
 - **one**—Searches the direct children of the base DN.
 - **sub**—Searches the complete subtree below the base DN.
- **filter**—Is an RFC 2254-style LDAP search filter expression; for example, `(uniqueId = <-userName->)`. See RFC 2254—The String Representation of LDAP Search Filters (December 1997).

With the exception of `baseDN` all the fields are optional.

The result of the LDAP search must be exactly one directory object. If no object or more than one object is found, the subscriber session is terminated.

Classifying DHCP Subscribers with the C-Web Interface

A classification script can contain either a target and a condition or a script. If you do not define a script, the classifier must have both a target and a condition.

To configure DHCP classification scripts:

1. Click **Configure**, expand **Shared > SAE**, and then click **DHCP Classifier**.

The Dhcp Classifier pane appears.

2. From the Create new list, select **Rule**.
3. Type a name for the new rule in the dialog box, and click **OK**.

The rule appears in the side pane and the Rule pane.

4. Enter a script or a target as described in the Help text in the Main pane, and click **OK**.

5. To configure a condition for a target,
 - a. Expand the rule in the side pane, and click Condition.

The Condition pane appears.

- b. Type the DHCP classification condition name as described in DHCP Classification Conditions, and click **OK**.

The condition appears in the side pane and the Condition pane.

DHCP Classification Conditions

DHCP classification conditions define match criteria that are used to find the DHCP profile. Use the fields in this section to define DHCP classification conditions.

authVirtualRouterName

- Name of JUNOS virtual router that is set by an authorization plug-in through the authorization response.
- Value—Name of the virtual router in the format `vrname@hostname`

dhcp

- DHCP options. See *Setting DHCP Parameters with DHCP Options* on page 87.

dhcpProfileDN

- Search base for DHCP profiles. The DN can be used in target expressions.
- Value—DN of DHCP profile

interfaceName

- Name of the interface where the DHCP discover message was received.
- Value—Name of the interface in your router CLI syntax
- Example—`interfaceName = fastEthernet6/0`

ifAlias

- Description of the interface where the DHCP discover request was received.
- Value—Interface description that is configured on the router. For JUNOS routers, it is the description configured with the **interface description** command
- Example—`ifAlias = "dhcp-subscriber12"`

ifDesc

- Alternate name for the interface where the DHCP discover request was received. This is a system-generated name that is used by SNMP.
- Value
 - On a JUNOSe router, the format of the description is:
ip<slot>/<port>.<subinterface>
 - On the JUNOS routing platform, ifDesc is the same as interfaceName.

macAddress

- MAC address of the DHCP client that appears in DHCP request.
- Value—Valid MAC address
- Example—macAddress = “00:11:22:33:44:55”

nasPortId

- Port identifier of an interface.
- Value—Includes interface name and additional layer 2 information
- Example—nasPortId = “fastEthernet 3/1” (There is a space between fastEthernet and slot number 3/1 in the nasPortId.)

poolName

- IP address pool name that is set by an authorization plug-in through the authorization response.
- Value—Name of an address pool configured on the JUNOSe router

virtualRouterName

- Name of the virtual router.
- Value—Name of the virtual router in the format vrname@hostname

DHCP Classification Targets

The target of the DHCP classification script uses a syntax similar to an LDAP URL. With the exception of baseDN, all fields are optional. The syntax is:

```
baseDN [ ? [ attributes ] [ ? [ scope ] [ ? [ filter ] ] ] ]
```

- baseDN—DN of object where search starts.
- attributes—Comma-separated list of properties, in the format attribute = <-value->, that allow you to set specific attributes for directory objects that the script finds; see *DHCP Classification Conditions* on page 85.

You can use the attribute configuration to override attributes in the directory. For example, to override the IP pool name that is stored in the DHCP profile with the pool name that the authorization plug-in sends, use the attribute statement radiusFramedPool = <-poolName->.

- scope—Scope of search in the directory
 - base—Searches the base DN only; default scope
 - one—Searches the direct subordinates of the base DN (one-level search)
 - sub—Searches all objects subordinate to the base DN
- filter—An RFC 2254-style LDAP search filter expression; for example, (uniqueId = <-userName->). See RFC 2254—The String Representation of LDAP Search Filters (December 1997).

Selecting DHCP Parameters

The SAE sends a set of parameters to the DHCP server in the JUNOS router. The DHCP server determines the IP address offered, as well as the options sent to the DHCP client. The parameters comprise IP address authorization parameters, as well as parameters stored in a DHCP profile. Parameters in the DHCP profile override authorization parameters.

For more information about how the SAE handles DHCP subscribers, see:

- *SRC-PE Subscribers and Subscriptions Guide, Chapter 8, Overview of Plug-Ins Included with the SAE*
- *SRC-PE Subscribers and Subscriptions Guide, Chapter 3, Subscriber Logins and Service Activation*

Setting DHCP Parameters with DHCP Options



NOTE: JUNOS routers do not currently support the functionality described in this section. DHCP options and BOOTP options that the SAE sends to the JUNOS router are ignored.

DHCP servers use DHCP options to configure DHCP clients. The DHCP local server in the JUNOS router supports a subset of DHCP options. The SAE supports all DHCP options defined in RFC 2132—DHCP Options and BOOTP Vendor Extensions (March 1997) by name. It also supports other options, but you need to specify them by number and type. The DHCP options allow a flexible definition of parameters offered to DHCP subscribers. For example, they allow integration with cable modems or set-top boxes because you can configure options to control the boot sequence of these devices.

You can configure DHCP options in DHCP profiles and in DHCP classification scripts. Table 6 on page 88 lists the name, number, and type of all supported DHCP options. You can use these fields to configure DHCP options.

The following example shows how to specify an option by number and by type. The two statements identify the same option:

```
dhcp[12]

dhcp['host-name']
```

In SDX software earlier than Release 4.2, you had to include the option type in your option definition. For example:

```
dhcp[12].string = HOST
```

You can now write:

```
dhcp[12] = HOST
```

Note that the earlier method of defining options still works in Release 4.2 and later.

Table 6: DHCP Options Supported on the SAE

Option Name	Option Number	Option Type
subnet-mask	1	ip-address
time-offset	2	int32
routers	3	ip-address
time-servers	4	ip-address
ien116-name-servers	5	ip-address
domain-name-servers	6	ip-address
log-servers	7	ip-address
cookie-servers	8	ip-address
lpr-servers	9	ip-address
impress-servers	10	ip-address
resource-location-servers	11	ip-address
host-name	12	string
boot-size	13	int16
merit-dump	14	string
domain-name	15	string
swap-server	16	ip-address
root-path	17	string
extension-path	18	string
ip-forwarding	19	int8
non-local-source-routing	20	int8
policy-filter	21	ip-address
max-dgram-reassembly	22	int16
default-ip-ttl	23	int8
path-mtu-aging-timeout	24	int32
path-mtu-plateau-table	25	int16
interface-mtu	26	int16
all-subnets-local	27	int8
broadcast-address	28	ip-address
perform-mask-discovery	29	int8

Table 6: DHCP Options Supported on the SAE (continued)

Option Name	Option Number	Option Type
mask-supplier	30	int8
router-discovery	31	int8
router-solicitation-address	32	ip-address
static-routes	33	ip-address
trailer-encapsulation	34	int8
arp-cache-timeout	35	int32
ieee802-3-encapsulation	36	int8
default-tcp-ttl	37	int8
tcp-keepalive-interval	38	int32
tcp-keepalive-garbage	39	int8
nis-domain	40	string
nis-servers	41	ip-address
ntp-servers	42	ip-address
netbios-name-servers	44	ip-address
netbios-dd-server	45	ip-address
netbios-node-type	46	int8
netbios-scope	47	string
font-servers	48	ip-address
x-display-manager	49	ip-address
requested-ip-address	50	ip-address
ip-address-lease-time	51	int32
option-overload	52	int8
dhcp-msg-type	53	int8
server-identifier	54	ip-address
parameter-request-list	55	data-string
message	56	string
maximum-dhcp-msg-size	57	int16
renewal-time	58	int32
rebinding-time	59	int32
vendor-class-identifier	60	data-string
client-identifier	61	data-string
nisplus-domain	64	string
nisplus-servers	65	ip-address
tftp-server-name	66	string
bootfile-name	67	string
mobile-ip-home-agent	68	ip-address
smtp-server	69	ip-address
pop-server	70	ip-address

Table 6: DHCP Options Supported on the SAE (continued)

Option Name	Option Number	Option Type
nntp-server	71	ip-address
www-server	72	ip-address
finger-server	73	ip-address
irc-server	74	ip-address
streettalk-server	75	ip-address
streettalk-directory-assistance-server	76	ip-address

Creating DHCP Profiles with the C-Web Interface

When the SAE receives a DHCP discover request from the router, it uses the client's MAC address to find a DHCP profile in cache or in the directory. If it finds a DHCP profile, the SAE uses the information in the profile to create a discover decision that it returns to the router. The discover decision includes information to select an IP address and DHCP options to configure the DHCP client.

When a DHCP subscriber logs in to the SAE through a Web portal, the SAE registers the subscriber's equipment and creates a cached DHCP profile in the *o = AuthCache* directory. These profiles are keyed by the MAC address of the DHCP client device. They are created by the `grantPublicIp` or the `registerEquipment` methods.

You can also create DHCP profiles manually with SDX Admin or by adding DHCP profile entries to the directory. DHCP profiles are stored in the *o = AuthCache* directory in the `dhcpProfile` object class. The `dhcpProfile` object class is subordinate to the `cachedAuthenticationProfiles` object class. Manually created profiles are keyed by the `cn` (common name) attribute.

For more information about how the SAE handles DHCP subscribers, see:

- *SRC-PE Subscribers and Subscriptions Guide, Chapter 8, Overview of Plug-Ins Included with the SAE*
- *SRC-PE Subscribers and Subscriptions Guide, Chapter 3, Subscriber Logins and Service Activation*

To create a DHCP profile:

1. Click **Configure**, expand **Shared**, and then click **Auth Cache**.
The Auth Cache pane appears.
2. From the Create new list, select **Cached Dhcp Profile**.
3. Type a name for the new cached DHCP profile in the dialog box, and click **OK**.
The cached authentication profile appears in the side pane and in the Cached DHCP Profile pane.
4. Enter information as described in the Help text in the main pane, and click **Apply**.

Chapter 11

Configuring the SAE for a PCMM Environment with the C-Web Interface

This chapter shows how to set up the SAE for a PacketCable Multimedia Specification (PCMM) environment with the C-Web interface.

You can also use the SRC CLI to configure the SAE for a PCMM environment. For more information, see *SRC-PE Solutions Guide, Chapter 5, Configuring the SAE for a PCMM Environment with the SRC CLI*.

Topics in this chapter include:

- Configuring the SAE for a Cable Network Environment with the C-Web Interface on page 91
- Configuring the SAE to Manage PCMM Devices with the C-Web Interface on page 92
- Setting Up SAE Communities with the C-Web Interface on page 93
- Configuring SAE Properties for the Event Notification API with the C-Web Interface on page 94
- Configuring PCMM Record-Keeping Server Plug-Ins with the C-Web Interface on page 94
- Configuring CMTS-Specific RKS Plug-Ins with the C-Web Interface on page 94
- Configuring Record-Keeping Server Peers for Plug-Ins with the C-Web Interface on page 95

Configuring the SAE for a Cable Network Environment with the C-Web Interface

The tasks to configure the SAE for a cable network environment are:

1. Configure the SAE to manage PCMM devices.

See Configuring the SAE to Manage PCMM Devices with the C-Web Interface on page 92.

2. Configure the session store.

See *Chapter 8, Setting Up an SAE with the C-Web Interface*.

3. Set up SAE communities.

See *Setting Up SAE Communities with the C-Web Interface* on page 93.

4. (Optional) Configure SAE properties for the Event Notification API.

See *Configuring SAE Properties for the Event Notification API with the C-Web Interface* on page 94 (if you are using an external address manager).

5. (Optional) Configure record-keeping server peers for plug-ins.

See *Configuring Record-Keeping Server Peers for Plug-Ins with the C-Web Interface* on page 95 (if you are using the RKS plug-in).

6. (Optional) Configure PCMM record-keeping server plug-ins.

See *Configuring PCMM Record-Keeping Server Plug-Ins with the C-Web Interface* on page 94 (if you are using the SAE's embedded policy server).

In addition to configuring the SAE, you need to:

1. Configure the CMTS device in the directory (if you are using the SAE's embedded policy server).

See *Adding Objects for CMTS Devices with the C-Web Interface* on page 185.

2. Configure the NIC (if you are using assigned IP subscribers).

See *SRC-PE Solutions Guide, Chapter 8, Using the NIC Resolver in a PCMM Environment*.

3. Enable the Common Open Policy Service (COPS) interface on the CMTS device. See the documentation for your CMTS device for information about how to do this.

Configuring the SAE to Manage PCMM Devices with the C-Web Interface

The SAE connects to the PCMM device by using a COPS over TCP connection. The PCMM device driver controls this connection.

To configure the SAE to manage PCMM devices:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **PCCM**.

The PCCM pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.

Setting Up SAE Communities with the C-Web Interface

You can configure the following for SAE communities:

- Define the members of an SAE community by adding the IP addresses of SAEs in the community to the virtual router object of the network device in the directory.

See *Creating Virtual Routers for the CMTS Device with the C-Web Interface* on page 186.

- Specify the name of the community manager.

See *Configuring the SAE to Manage PCMM Devices with the C-Web Interface* on page 92.

- Configure parameters for the SAE community manager.

See *Configuring the SAE Community Manager* on page 93.

- If there is a firewall in the network, configure the firewall to allow SAE messages through.

Configuring the SAE Community Manager

To configure the SAE community manager that manages PCMM device communities:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to manage PCMM devices.
2. In the side pane, expand **Configuration > External Interface Features: PCMMCommunityManager**, and then click **Community Manager**.

The Community pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.

Configuring SAE Properties for the Event Notification API with the C-Web Interface

To configure properties for the event notification API:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to manage devices.
2. In the side pane, expand **Configuration > External Interface Features: event**, and then click **Event API**.

The Event API pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.

Configuring PCMM Record-Keeping Server Plug-Ins with the C-Web Interface

To configure an RKS plug-in:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to create RKS plug-ins,
2. In the side pane, expand **Configuration > Plug Ins**.
3. Expand the plug-in that you created for RKS, and then click **PCMM RKS**.
4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

For additional information, see the following sources:

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.

Configuring CMTS-Specific RKS Plug-Ins with the C-Web Interface

You can configure an RKS plug-in for specific CMTS devices. When there are events for the CMTS device, the SAE sends the events to the specified plug-in.

To configure a CMTS-specific RKS plug-in:

1. Click **Configure**, expand **Shared > SAE**, **> Configuration > Driver**, and then click **PCCM**.

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to create CMTS-specific RKS plug-ins.

2. In the side pane, expand **Configuration > Drivers**, and then click **PCCM**.

The PCMM pane appears.

3. From the Create new list, select **CMTS Specific RKS Plug-Ins**.
4. Type a name for the new plug-in in the dialog box, and click **OK**.
5. In the side pane, click the new plug-in.
6. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Record-Keeping Server Peers for Plug-Ins with the C-Web Interface

An RKS peer is an instance of a record-keeping server. A PCMM environment has a primary RKS and optionally a secondary RKS. The primary RKS is mandatory, and you assign the RKS as primary by configuring it as the default peer in the RKS plug-in. The secondary RKS is optional, and it is an RKS peer that is not configured as the default peer. If you define multiple nondefault peers, one of them is randomly chosen to be the secondary RKS.

RKS peers are configured in the peer group for each PCMM RKS plug-in instance. To create an RKS peer group:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to create RKS plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.
3. Expand the plug-in that you created for RKS, and then click **PCMM RKS**.
4. Enter information as described in the Help text in the main pane, and click **Apply**.

For additional information, see the following sources:

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.

Chapter 12

Configuring and Starting the SNMP Agent with the C-Web Interface

This chapter describes how to use the C-Web interface to configure and run the SDX Simple Network Management Protocol (SNMP) agent in the SRC environment. The SNMP agent monitors host resources and the SRC components that use the host resources. You can use the CLI to configure the SNMP agent on a Solaris platform or on a C-series Controller. See *SRC-PE Getting Started Guide, Chapter 28, Configuring and Starting the SNMP Agent with the SRC CLI*.

Topics in this chapter include:

- Configuring the SDX SNMP Agent on page 98
- Configuring General Properties for the SDX SNMP Agent on page 99
- Configuring Initial Properties for the SDX SNMP Agent on page 99
- Configuring Directory Connection Properties for the SDX SNMP Agent on page 99
- Configuring Directory Monitoring Properties for the SDX SNMP Agent on page 99
- Configuring Logging Destinations for the SDX SNMP Agent on page 100
- Configuring JRE Properties on page 100
- Configuring the SNMP Agent on page 100
- Configuring System Information for the SNMP Agent on page 101
- Configuring Access Control for SNMPv3 Users on page 101
- Configuring Access Control for Communities on page 102
- Configuring Access Control for the VACM on page 102
- Configuring Notification Targets on page 104
- Configuring Performance Traps on page 104
- Configuring Event Traps on page 105

- Operating the SNMP Agent on page 105
- Starting the SDX SNMP Agent on page 105
- Stopping the SDX SNMP Agent on page 106
- Monitoring the SDX SNMP Agent on page 106

For more information about the SNMP agent, see *SRC-PE Monitoring and Troubleshooting Guide, Chapter 9, Configuring the SNMP Traps with the SRC CLI*.

Configuring the SDX SNMP Agent

The SNMP agent obtains most of its information from the directory, but you configure the local properties that cannot be stored in the directory.

To configure the local properties for the SDX SNMP agent:

1. Configure general properties for the SDX SNMP agent, including trap history limit, component polling interval, and protocol log level.

See *Configuring General Properties for the SDX SNMP Agent* on page 99.

2. Configure initial properties for the SDX SNMP agent, including the connection from the SDX SNMP agent to the directory and directory monitoring properties.

See *Configuring Initial Properties for the SDX SNMP Agent* on page 99.

See *Configuring Directory Connection Properties for the SDX SNMP Agent* on page 99.

See *Configuring Directory Monitoring Properties for the SDX SNMP Agent* on page 99.

3. Configure logging destinations for the SDX SNMP agent.

See *Configuring Logging Destinations for the SDX SNMP Agent* on page 100.

4. (Optional) Configure the Java heap memory for the SDX SNMP agent.

See *Configuring JRE Properties* on page 100.

After you configure the local properties for the SDX SNMP agent, you can configure the SNMP agent. See *Configuring the SNMP Agent* on page 100.

Related Topics

- For more information about the directory connection and monitoring properties, see *SRC-PE Getting Started Guide, Chapter 30, Configuring Local Properties with the SRC CLI*.

- For more information about logging, see *SRC-PE Monitoring and Troubleshooting Guide, Chapter 2, Configuring Logging for SRC Components* and *SRC-PE Monitoring and Troubleshooting Guide, Chapter 3, Configuring Logging for SRC Components with the CLI*.

Configuring General Properties for the SDX SNMP Agent

To configure properties for the SDX SNMP agent:

1. Click **Configure**, and expand **SNMP > Agent**.

The SNMP pane appears.

2. Enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Initial Properties for the SDX SNMP Agent

To configure properties for the SDX SNMP agent:

1. Click **Configure**, and expand **SNMP > Agent > Initial**.

The Initial pane appears.

2. Enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Directory Connection Properties for the SDX SNMP Agent

To configure directory connection properties:

1. Click **Configure**, and expand **SNMP > Agent > Initial > Directory Connection**.

The Directory Connection pane appears.

2. Enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Directory Monitoring Properties for the SDX SNMP Agent

To configure properties for the SDX SNMP agent:

1. Click **Configure**, and expand **SNMP > Agent > Initial > Directory Eventing**.

The Directory Eventing pane appears.

2. Enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Logging Destinations for the SDX SNMP Agent

To configure logging destinations:

1. Click **Configure**, and expand **SNMP > Agent**.
2. From the Create new list, select **Logger**.
3. Enter a name for the new Logger in the dialog box, and click **OK**.
4. For file-based logging, from the side pane, expand **File**, enter information as described in the Help text in the main pane, and then click **Create**.
5. For syslog-based logging, expand **Syslog**, enter information as described in the Help text in the main pane, and then click **Create**.

Configuring JRE Properties

To configure properties for the SDX SNMP agent:

1. Click **Configure**, and expand **SNMP > Agent > Java**.

The Java pane appears.

2. Enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring the SNMP Agent

To configure the SNMP agent to control its operation:

1. Configure information supplied by the SNMP agent, including the listening address and system information.

See *Configuring System Information for the SNMP Agent* on page 101.

2. Configure access control for the SNMP agent, including access for SNMPv3 users, SNMPv1 and SNMPv2 communities (traditional access control), and the view-based access control model (VACM).

See *Configuring Access Control for SNMPv3 Users* on page 101.

See *Configuring Access Control for Communities* on page 102.

See *Configuring Access Control for the VACM* on page 102.

3. Configure active monitoring.

See *Configuring Notification Targets* on page 104.

Configuring System Information for the SNMP Agent

To configure properties for the SNMP agent:

1. Click **Configure**, and expand **SNMP > Agent**.

The Agent pane appears.

2. Enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Access Control for SNMPv3 Users

To configure access control for SNMPv3 users:

1. Click **Configure**, and expand **SNMP > V3 > USM > Local Engine**.
2. From the Create new list, select **User**.
3. Enter a name for the new User in the dialog box, and click **OK**.
4. From the side pane, expand the name of the user, and (optional) specify the authentication type and (optional) the encryption.



NOTE: Before you configure encryption, you must configure the authentication type.

Configuring Authentication

To configure the authentication type for SNMPv3 users:

1. Click **Configure**, and expand **SNMP > V3 > USM > Local Engine**.
2. To configure MD5 authentication, from the side pane, expand the name of the user, and click **Authentication MD5**.
3. To configure SHA authentication, from the side pane, expand the name of the user, and click **Authentication SHA**.
4. Specify the authentication password as described in the Help text in the main pane, and then click **Create**.

The password must be at least eight characters.

Configuring Encryption

Before you configure encryption, you must configure the authentication type. See *Configuring Authentication* on page 101.

To configure encryption for SNMPv3 users:

1. Click **Configure**, and expand **SNMP > V3 > USM > Local Engine**.
2. To configure AES encryption, from the side pane, expand the name of the user, and click **Privacy AES**.
3. To configure DES encryption, from the side pane, expand the name of the user, and click **Privacy DES**.
4. Specify the authentication password as described in the Help text in the main pane, and then click **Create**.

The password must be at least eight characters.

Configuring Access Control for Communities

To configure community strings:

1. Click **Configure > SNMP**.
2. From the Create new list, select **Community**.
3. Enter a name for the new Community in the dialog box, and click **OK**.
4. From the side pane, expand the name of the community, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Access Control for the VACM

To configure the access control for the view-based access control model (VACM):

1. Map an SNMPv1 or SNMPv2c community name to a security name.

See *Associating Security Names with a Community* on page 102.

2. Define a named view.

See *Defining Named Views* on page 103.

3. Map from a group of users or communities to a view.

See *Defining Access Privileges for an SNMP Group* on page 103.

4. Map a security name into a named group.

See *Assigning Security Names to Groups* on page 104.

Associating Security Names with a Community

For SNMPv1 or SNMPv2c packets, you must assign security names to groups at the [edit snmp v3 vacm security-to-group] hierarchy level, and you must associate a security name with an SNMP community.

To configure the community:

1. Click **Configure > SNMP > V3**.
2. From the Create new list, select **SNMP Community**.
3. Enter a name for the new SNMP Community in the dialog box, and click **OK**.
4. From the side pane, expand the name of the SNMP community, enter information as described in the Help text in the main pane, and then click **Apply**.

Defining Named Views

To configure named views:

1. Click **Configure**, and expand **SNMP**.
2. From the Create new list, select **View**.
3. Enter a name for the new View in the dialog box, and click **OK**.
4. From the side pane, expand the name of the view,
5. From the Create new list, select **OID**.
6. Enter a name for the new OID in the dialog box, and click **OK**.

The View OID pane appears.

7. Enter information as described in the Help text in the main pane, and then click **Apply**.

Defining Access Privileges for an SNMP Group

To configure MIB views with a group for the VACM:

1. Click **Configure**, and expand **SNMP > V3 > VACM > Access**
2. From the Create new list, select **Group**.
3. Enter a name for the new Group in the dialog box, and click **OK**.

The group name is the name for a collection of SNMP security names that belong to the same SNMP access policy.

4. From the side pane, expand the name of the group, click on **Default Context Prefix**,
5. From the Create New box, select the Security Model for access privileges.

6. From the Create New box, select the Security Level for access privileges.

The Security pane appears.

7. Enter information as described in the Help text in the main pane, and then click **Apply**.

Assigning Security Names to Groups

For SNMPv1 or SNMPv2c packets, you must assign security names to groups and you must associate a security name with an SNMP community.

To map security names to groups for the VACM:

1. Click **Configure**, and expand **SNMP > V3 > VACM**.
2. Expand the desired **Security Model** and desired **Security Name**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Notification Targets

To configure notification targets:

1. Click **Configure > SNMP > Notify**.

The Notify pane appears.

2. From the Create New box, select Target, enter the name of the target, and click **OK**.

The Target pane appears.

3. Enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Performance Traps

To configure performance traps:

1. Click **Configure > SNMP > Notify**, and expand **Alarm**.

2. From the Create New box, select the category and associated traps, and click **OK**.

The Alarm pane appears.

3. Enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Event Traps

To configure event traps:

1. Click **Configure > SNMP > Notify**, and expand **Event**.
2. From the Create New box, select the category and the category name, and click **OK**.

The Category pane appears.

3. From the Create New box, select the event and click **OK**,

The Event pane appears.

4. Enter information as described in the Help text in the main pane, and then click **Apply**.

Operating the SNMP Agent

You must configure the SNMP agent and then manually start the agent. If you attempt to manually start the SNMP agent before it is configured, the software displays a message that the agent has not been configured and cannot start.

The SNMP agent automatically restarts in the event of a host reboot or process failure that stops the agent.

Starting the SDX SNMP Agent

Before you start the SDX SNMP agent:

1. Perform the initial configuration tasks.

See *Chapter 4, Configuring a C-series Controller*.

2. Configure the SDX SNMP agent.

See *Configuring the SDX SNMP Agent* on page 98.

Manually start the SDX SNMP agent the first time it runs. Thereafter, the agent automatically restarts.

To start the SNMP agent:

1. Click **Manage > Enable**.
2. From the Component box, select agent.

The system responds with a start message. If the SNMP agent is already running, the system responds with a warning message indicating that fact.

Stopping the SDX SNMP Agent

To stop the SNMP agent:

1. Click **Manage > Disable**.
2. From the Component box, select **agent**.

The system responds with a stop message. If the SNMP agent is not running when you issue the command, the software responds with a warning message indicating that fact.

Monitoring the SDX SNMP Agent

To display the SDX SNMP agent status:

1. Click **Monitor > Component**.

The system responds with a status message.

Chapter 13

Configuring NIC with the C-Web Interface

This chapter describes how you can use the C-Web interface to configure the network information collector (NIC).

Topics in this chapter include:

- Before You Configure the NIC on page 108
- Configuring the NIC with the C-Web Interface on page 109
- Reviewing and Changing Operating Properties for NIC with the C-Web Interface on page 109
- Configuring NIC Replication with the C-Web Interface on page 110
- Reviewing and Changing Operating Properties for NIC with the C-Web Interface on page 109
- Starting the NIC with the C-Web Interface on page 111
- Configuring a NIC Scenario with the C-Web Interface on page 111
- Testing a NIC Resolution with the C-Web Interface on page 114
- Stopping a NIC Host on a C-series Controller with the C-Web Interface on page 115
- Restarting the NIC with the C-Web Interface on page 115
- Changing NIC Configurations with the C-Web Interface on page 115

Before You Configure the NIC

When you use the NIC in a client/server configuration, you configure the NIC scenario before you configure the NIC proxies.

Before you configure NIC hosts from the C-Web interface:

- Plan your NIC implementation:
 - Choose the NIC configuration scenario to use.

The default scenario is OnePop.

For information about NIC configuration scenarios and NIC agents, see *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*.

- If you are using the C-Web interface on a Solaris platform, install the NIC data. If you are using the C-Web interface on a C-series Controller, the NIC data is already installed.

For information about installing the NIC sample data on a Solaris platform, see *SRC-PE Getting Started Guide, Chapter 34, Defining an Initial Configuration on a Solaris Platform*.

- Ensure that the appropriate type of router initialization script is configured for the router or network device.

See *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*.

- Set the editing level for the C-Web interface to basic. This ensures that only the statements that you need to configure are visible.



NOTE: We recommend that you change only those statements visible at the basic editing level. Contact Juniper Professional Services or Juniper Customer Support before you change any of the NIC statements and options not visible at the basic editing level.

To set the editing level for the C-Web interface to basic:

- Click **Preferences > Level Basic**.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Configuring the NIC with the C-Web Interface* on page 109

Configuring the NIC with the C-Web Interface

You configure the NIC to enable the SRC software to locate subscriber information for an application.

To configure the NIC:

1. Review NIC operating properties, and change them if needed.

See *Reviewing and Changing Operating Properties for NIC with the C-Web Interface* on page 109.

2. Configure NIC replication.

See *Configuring NIC Replication with the C-Web Interface* on page 110.

3. Start the NIC component.

See *Reviewing and Changing Operating Properties for NIC with the C-Web Interface* on page 109.

4. (Optional) For the initial configuration if you plan to use a configuration scenario other than OnePop (the default), delete any data for the OnePop scenario. If you are changing from one configuration scenario to another, delete the data for the configuration scenario in use.

See *Changing NIC Configurations with the C-Web Interface* on page 115.

5. Configure a NIC scenario.

See *Configuring a NIC Scenario with the C-Web Interface* on page 111.

6. Verify the NIC configuration.

See *Testing a NIC Resolution with the C-Web Interface* on page 114.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Before You Configure the NIC* on page 108

Reviewing and Changing Operating Properties for NIC with the C-Web Interface

Before you configure a NIC configuration scenario, review the default operating properties and change values as needed. Operating properties are configured for a slot.

To review and change the default NIC operating properties:

1. Click **Configure**, expand **Slot**, then a specified slot (for example, slot0), and then expand **NIC > Initial**. Click **Directory Connection**.

The Directory Connection pane appears.

2. Review the configuration, enter information as described in the Help text in the main pane, and then click **Apply**.
3. In the side pane, click **Directory Eventing**.
The Directory Eventing pane appears.
4. Review the configuration, enter information as described in the Help text in the main pane, and then click **Apply**.
5. In the side pane, click **NIC**.
The NIC pane appears.
6. Review the configuration, enter information as described in the Help text in the main pane, and then click **Apply**.
7. In the left pane, click **Commit**.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Configuring the NIC with the C-Web Interface on page 109*
- *Configuring NIC Replication with the C-Web Interface on page 110*

Configuring NIC Replication with the C-Web Interface

You configure NIC replication to keep the NIC configuration highly available.

Before you configure NIC replication:

- Make sure that you understand how NIC groups are used.
See *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*.
- Identify which NIC hosts are to provide redundancy for each other.
- Specify a name for a group for each of these hosts.

To configure NIC replication:

1. Click **Configure > Slot**, then a specified slot (for example, slot0), and then **NIC**.
The NIC pane appears.
2. Specify a group for NIC replication in the **Runtime Group** box, as described in the Help text; for example, group1.
3. Click **Apply**.
4. In the left pane, click **Commit**.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Configuring the NIC with the C-Web Interface* on page 109
- *Reviewing and Changing Operating Properties for NIC with the C-Web Interface* on page 109

Starting the NIC with the C-Web Interface

Start the NIC component before you configure a NIC configuration scenario.

To start the NIC component:

1. Select **Manage > Enable**.

The Enable pane appears.

2. In the Component box, select **NIC**, and click **OK**.

Related Topics

- *Before You Configure the NIC* on page 108

Configuring a NIC Scenario with the C-Web Interface

To use the NIC to locate subscriber configuration, you must configure one of the NIC configuration scenarios provided with the SRC software. Which agents you configure depends on the NIC configuration scenario that you use.

The OnePop configuration scenario is the default configuration for the NIC. If you want to use another configuration scenario, you first clear data for the configuration scenario. Anytime you change the configuration scenario, you first clear data for the configuration scenario in use. See *Changing NIC Configurations with the C-Web Interface* on page 115.

When you select a NIC configuration scenario, the software adds the default configuration for most properties. You can modify the NIC properties, including those for agents.



NOTE: We recommend that you change only those statements visible at the basic editing level. Contact Juniper Professional Services or Juniper Customer Support before you change any of the NIC statements not visible at the basic editing level.



NOTE: By default, the CORBA naming server on a C-series platform uses port 2809. The NIC host is configured to communicate with this naming server.

To configure a NIC configuration scenario:

1. Click **Configure**, expand **Shared > NIC**, and click the configuration scenario that you want to configure; for example, **Scenario: OnePop**.
2. In the left pane, expand **Agents**.
3. For each directory agent that the NIC configuration scenario includes, review and if needed update NIC agent configuration to define properties specific to your environment, such as server identification and authentication information. For example, for the OnePop configuration scenario:
 - a. Click **Agents**, then a specific agent such as Agent:PoolVr, and then **Configuration > Directory**.
4. For each SAE plug-in agent that the NIC configuration scenario includes, review and if needed update the NIC agent configuration to define properties specific to your environment, such as the event filter and the number of events that the SAE sends to the agent at one time during state synchronization. For example, for the OnePopLogin configuration scenario:
 - a. Click **Agents**, then a specific agent such as Agent:LoginNameVr, and then **Configuration > SAE Plug-In**.

The Directory pane appears.

The SAE Plug-In pane appears.

If you plan to change the event filter for the agent, make sure that you are familiar with:

- Plug-in attributes and values

See *SRC-PE Subscribers and Subscriptions Guide, Chapter 11, Configuring Accounting and Authentication Plug-Ins with the SRC CLI*.

- Filter syntax

See the documentation for the SAE CORBA Remote API in the SAE Core API documentation on the Juniper Networks Web site at:

<http://www.juniper.net/techpubs/software/management/sdx/api-index.html>

- b. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Configuring the NIC with the C-Web Interface* on page 109

Configuring the SAE to Communicate with SAE Plug-In Agents for NIC Replication with the C-Web Interface

For each NIC host that uses SAE plug-in agents, configure a corresponding external plug-in for the SAE. By default, the SAE plug-in agents share events with the single SAE plug-in. You must also configure the SAE to communicate with the SAE plug-in agent in each NIC host that you use in the NIC replication.

To configure an external plug-in:

1. Configure an SAE external plug-in.

See *SRC-PE Subscribers and Subscriptions Guide, Chapter 8, Overview of Plug-Ins Included with the SAE*.

2. Specify the following values for the plug-in:

- CORBA object reference that has the following syntax:

host:port-number/NameService#plugInName

where:

- *host*—IP address or name of the machine on which you installed the NIC host that supports the agent

For local host, use the IP address 127.0.0.1.

- *port-number*—Port on which the name server runs

The default port number is 2809.

- *plugInName*—Name under which the agent is registered in the naming service

Use the format *nicxae_groupname/saePort*, where *groupname* is the name of the replication group. (When replication is not used, the format is *nicxae/saePort*.)

For example: **corbaname::127.0.0.1:2809/NameService#nicxae/saePort**

- Attributes that are sent to the external plug-in for a NIC host. Because the SAE plug-in agents share the event by default, you configure only one for a NIC host.

Specify the plug-in options that the agent uses. You must specify the options **session-id** and **router-name**, and other options that you specified for the agent's network data types and the agent's event filter. Specify attributes options of the PAT_OPAQUE attribute type, such as the option **dhcp-packet**, only if you are using IPv6 addressing.



NOTE: Do not include attributes that are not needed.

- NIC reference as a subscriber tracking plug-in.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Configuring NIC Replication with the C-Web Interface* on page 110
- For information about configuring an external plug-in for the SAE, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 11, Configuring Accounting and Authentication Plug-Ins with the SRC CLI*.

Obtaining Interface Configuration Information for OnePopStaticRouteIp

If you use the OnePopStaticRouteIp configuration scenario, you must obtain JUNOS interface configuration information for the NIC. To get this information, you must run Network Publisher on a Solaris platform to gather the interface information.

To run Network Publisher on a Solaris platform:

1. Install the NIC on a Solaris platform.

See *SRC-PE Getting Started Guide, Chapter 33, Installing the SRC Software on a Solaris Platform*.

2. On the Solaris platform, edit the `/opt/UMC/nic/etc/networkPublisher/config.properties` file and run Network Publisher. When you specify the directory configuration in the file, configure the connection to the directory on a C-series platform.

See *SRC-PE Network Guide, Chapter 12, Obtaining Interface Configuration for OnePopStaticRouteIp on Solaris Platforms*.

Related Topics

- *Configuring a NIC Scenario with the C-Web Interface* on page 111

Testing a NIC Resolution with the C-Web Interface

To test a NIC resolution:

1. Click **Diagnose > NIC > Resolve**.
2. Enter information as described in the Help text in the main pane, and click **OK**.

Related Topics

- *Configuring a NIC Scenario with the C-Web Interface* on page 111

Stopping a NIC Host on a C-series Controller with the C-Web Interface

If you run the NIC in client/server mode, you can stop the NIC host independently of the NIC proxy.

To stop a NIC host:

1. Click **Manage > Disable**.
2. In the Component list in the main pane, select **NIC**, and click **OK**.

Related Topics

- *Restarting the NIC with the C-Web Interface* on page 115

Restarting the NIC with the C-Web Interface

To restart a NIC host:

1. Click **Manage > Restart**.
2. In the Component list in the main pane, select **NIC**, and click **OK**.

Related Topics

- *Stopping a NIC Host on a C-series Controller with the C-Web Interface* on page 115

Changing NIC Configurations with the C-Web Interface

If you change the type of NIC resolution that you use in your network (for example, from the OnePop configuration scenario to the OnePopAllRealms configuration scenario), delete any existing data and specify a static DN that identifies the DN for the new NIC configuration scenario; otherwise, the new NIC configuration may not perform resolutions correctly.

To change the type of NIC resolution that you use in your network:

1. Disable the NIC:
 - a. Click **Manage > Disable**.
 - b. In the Component list in the main pane, select **NIC**, and click **OK**.

2. Delete the NIC configuration data for the existing configuration scenario from the directory.

- a. Click **Manage > Request > NIC > Clear > Scenario Data**.

The Scenario Data pane appears.

- b. In the **Slot** box, enter the number of the slot that contains the NIC scenario configuration (typically, slot 0), and click **OK**.

3. Restart the NIC host:

- a. Click **Manage > Restart**.

- b. In the Component list in the main pane, select **NIC**, and click **OK**.

4. Configure the new NIC scenario.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Configuring a NIC Scenario with the C-Web Interface* on page 111

Chapter 14

Using the C-Web Interface to Configure SRC Applications to Communicate with an SAE

You can use the C-Web interface to configure SRC applications to communicate with network information collector (NIC) hosts. This chapter describes how to configure a NIC proxy from the C-Web interface that runs on a C-series Controller or on a Solaris platform running the SRC software. Topics include:

- Before You Configure a NIC Proxy on page 117
- Configuring a NIC Proxy from the C-Web Interface on page 118
- Configuring NIC Test Data with the C-Web Interface on page 119

Before You Configure a NIC Proxy

Before you configure a NIC proxy, you should have a good understanding of:

- NIC resolution
- NIC data types
- How NIC proxies work

See *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*; *SRC-PE Network Guide, Chapter 17, NIC Resolution Process*; and *SRC-PE Network Guide, Chapter 13, Configuring Applications to Communicate with an SAE*.



NOTE: You cannot configure a local NIC host when the NIC is running on a C-series platform.

Configuring a NIC Proxy from the C-Web Interface

To have an application communicate with the NIC, you configure the type of resolution used by a NIC proxy.

To configure resolution information for a NIC proxy.

1. Click **Configure**, expand **Shared > SAE**, and then click **Configuration**.

The Configuration pane appears.

2. From the Create new list, select **NIC Proxy Configuration**. Type a name for the new NIC proxy in the dialog box, and click **OK**.

The new NIC proxy configuration appears in the side pane.

3. Expand the NIC proxy configuration.
4. To configure resolution information, in the side pane click **Resolution**.

The Resolution pane appears.

5. Click **Create**, enter information as described in the Help text, and click **Apply**.

6. To optimize resolution performance, in the side pane click **Cache**.

The Cache pane appears.

The cache options are available at the Advanced and Expert editing levels.

7. Click **Create**, enter information as described in the Help text, and click **Apply**.
8. To keep the NIC highly available, configure NIC host selection, and define how the NIC proxy handles NIC hosts to which it cannot connect.

The NIC Host Selection options are available at the Advanced and Expert editing levels.

- a. In the side pane, click **NIC Host Selection**.

The NIC Host Selection pane appears.

- b. Click **Create**, enter information as described in the Help text, and then click **Apply**.

- c. Expand **NIC Host Selection**, and click **Blacklisting**.

The Blacklisting pane appears.

- d. Click **Create**, enter information as described in the Help text, and click **Apply**.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Configuring NIC Test Data with the C-Web Interface* on page 119

Configuring NIC Test Data with the C-Web Interface

To test a resolution without NIC, you can configure a NIC proxy stub to take the place of the NIC. The NIC proxy stub comprises a set of explicit mappings of data keys and values in the NIC proxy configuration. When the SAE (or another SRC component configured to use a NIC proxy stub) passes a specified key to the NIC proxy stub, the NIC proxy stub returns the corresponding value. When you use a NIC proxy stub, no NIC infrastructure is required.

For example, you can specify a subscriber's IP address that is associated with a particular SAE. When the SRC component passes this IP address to the NIC proxy stub, the NIC proxy stub returns the corresponding SAE.

To use the NIC proxy stub for the SAE:

1. Click **Configure**, and expand **Shared > SAE**, and then click **Configuration**.

The Configuration pane appears.

2. From the Create new list, select **NIC Proxy Configuration**. Type a name for the new NIC proxy in the dialog box, and click **OK**.

The new NIC proxy configuration appears in the side pane.

3. In the side pane, expand the new NIC proxy configuration, and click **Test NIC Bindings**.

The Test NIC Bindings pane appears.

4. Click **Create**, select the **Use Test Bindings** check box, and then click **Apply**.

5. In the side pane, expand **Test NIC Bindings**, and click **Key Values**.

6. From the Create new list, select **Key Values**. Type a name in the dialog box for the key that indicates the NIC data value for the proxy, and click **OK**.

The Key Values *name* pane appears in the side pane and in the Key Values pane.

7. Enter a value for the key that specifies a value for the NIC data type.

8. Click **Apply**.

Examples: Key Values for NIC Bindings

To set up a login name-to-IP mapping for login name `jane@virneo.com` to the IP address `192.0.2.30`:

1. In the side pane, expand the new NIC proxy configuration, and click **Test NIC Bindings**.

The Test NIC Bindings pane appears.

2. Click **Create**, select the **Use Test Bindings** check box, and then click **Apply**.
3. In the side pane, expand **Test NIC Bindings**, and click **Key Values**.
4. From the Create new list, select **Key Values**. Type the IP address **192.0.2.30** in the dialog box, and click **OK**.

The Key Values pane appears.

5. In the Value box, enter the value **jane@virneo.com**.
6. Click **Apply**.

To set up an IP-to-SAE ID mapping for IP address `190.0.2.30` to an SAE ID identified by the URL for the CORBA IOR `corbaloc::10.227.7.145:8801/SAE`:

1. In the side pane, expand the new NIC proxy configuration, and click **Test NIC Bindings**.

The Test NIC Bindings pane appears.

2. Click **Create**, select the **Use Test Bindings** check box, and click **Apply**.
3. In the side pane, expand **Test NIC Bindings**, and click **Key Values**.
4. From the Create new list, select **Key Values**. Type the IP address **192.0.2.30** in the dialog box, and click **OK**.



NOTE: The SAE writes the value of the CORBA IOR to the `var/run` directory. The IP address in the `corbaloc` URL can be adjusted to the IP address or DNS name of the SAE.

You can use the key **ANY-KEY** to match any key for any key type. For example, if you want all IP addresses to resolve to the same SAE, type **ANY-KEY** for the name in the Key Values box.

The Key Values pane appears.

5. In the Value box, enter the value **corbaloc::10.20.7.145:8801/SAE**.
6. Click **Apply**.

Related Topics

- *SRC-PE Network Guide, Chapter 9, Locating Subscriber Information with the NIC*
- *Configuring a NIC Proxy from the C-Web Interface* on page 118

Chapter 15

Configuring Admission Control with the C-Web Interface

This chapter describes how to use the C-Web interface to configure the SRC Admission Control Plug-In (SRC-ACP) application for use in the SRC network. You can use the C-Web interface to configure SRC-ACP on a Solaris platform or on a C-series platform.

You can also use the following to configure SRC-ACP:

- To use the SRC CLI, see *SRC-PE Network Guide, Chapter 21, Configuring Admission Control with the SRC CLI*.
- To use the Solaris platform, see *SRC-PE Network Guide, Chapter 26, Providing Admission Control with SRC-ACP on a Solaris Platform*.

Topics in this chapter include:

- Configuring SRC-ACP on page 124
- Creating Grouped Configurations for SRC-ACP with the C-Web Interface on page 124
- Configuring Local Properties for SRC-ACP on page 125
- Configuring the SAE for SRC-ACP with the C-Web Interface on page 126
- Configuring SRC-ACP Properties on page 128
- Configuring SRC-ACP to Manage the Edge Network on page 133
- Configuring SRC-ACP to Manage the Backbone Network on page 135
- Configuring Congestion Point Classification with the C-Web Interface on page 138
- Defining a Congestion Point Profile on page 140

Configuring SRC-ACP

To use SRC-ACP in the SRC network, you must perform some configuration. For information about these configuration procedures, see:

1. (Optional) Creating Grouped Configurations for SRC-ACP with the C-Web Interface on page 124
2. Configuring Local Properties for SRC-ACP on page 125
3. Configuring the SAE for SRC-ACP with the C-Web Interface on page 126
4. Configuring SRC-ACP Properties on page 128
5. (Edge and dual mode only) Configuring SRC-ACP to Manage the Edge Network on page 133
6. (Backbone and dual mode only) Configuring SRC-ACP to Manage the Backbone Network on page 135

You can automate and scale the configuration of congestion points using congestion point classification. For more information, see *SRC-PE Network Guide, Chapter 22, Configuring Congestion Point Classification with the SRC CLI* and Configuring Congestion Point Classification with the C-Web Interface on page 138.

Creating Grouped Configurations for SRC-ACP with the C-Web Interface

We recommend that you configure SRC-ACP within a group. When you create a configuration group, the software creates a configuration with default values filled in.

Configuration groups allow you to share the SRC-ACP configuration with different SRC-ACP instances in the SRC network. You can also set up different configurations for different instances.

You can then create a grouped SRC-ACP configuration that is shared with some SRC-ACP instances. For example, if you create two different SRC-ACP groups called config1 and config2 within the shared SRC-ACP configuration, you could select the SRC-ACP configuration that should be associated with a particular SRC-ACP instance.

Configuring an SRC-ACP Group

To select a group for an SRC-ACP instance as part of the local configuration:

1. Click **Configure**, expand **Slot** to configure the group, and then click **ACP**.

The ACP pane appears

2. Type a name for the new group in the Shared box using the / <path> format, and click **Apply**.
3. To configure the desired group, click **Configure > Shared > ACP**, select the group, and configure the SRC-ACP properties.

Related Topics

- For more information, see *Configuring Basic Local Properties for SRC-ACP* on page 125.
- For more information, see *Configuring SRC-ACP Properties* on page 128.

Configuring Local Properties for SRC-ACP

To configure the local properties for SRC-ACP:

1. Configure basic local properties, including Java heap memory.

See *Configuring Basic Local Properties for SRC-ACP* on page 125.

2. Configure initial properties, including directory connection and directory eventing properties.

See *Configuring Initial Properties for SRC-ACP* on page 125.

See *Configuring Directory Connection Properties for SRC-ACP* on page 125.

See *Configuring Initial Directory Eventing Properties for SRC-ACP* on page 126.

Configuring Basic Local Properties for SRC-ACP

To configure basic local properties:

1. Click **Configure > Slot > Slot:0 > ACP**.
2. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Initial Properties for SRC-ACP

To configure initial properties for SRC-ACP:

1. Click **Configure > Slot > Slot:0 > ACP > Initial**.
2. If desired, specify the properties for ACP as described in the Help text in the main pane, and click **Apply**.

Configuring Directory Connection Properties for SRC-ACP

To configure directory connection properties:

1. Click **Configure > Slot > Slot:0 > ACP > Initial > Directory Connection**.

The Directory Connection pane appears.

2. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Initial Directory Eventing Properties for SRC-ACP

To configure initial directory eventing properties:

1. Click **Configure > Slot > Slot:0 > ACP > Initial > Directory Eventing**.
The Directory Eventing pane appears.
2. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For more information about configuring local properties for the SRC components, see *SRC-PE Getting Started Guide, Chapter 30, Configuring Local Properties with the SRC CLI*.

Configuring the SAE for SRC-ACP with the C-Web Interface

You must configure the SAE to recognize SRC-ACP by adding information about SRC-ACP to the SAE properties. To do so:

1. Configure SRC-ACP as an external plug-in for the SAE.
2. Configure event publishers.
3. (Backbone and dual mode only) Optionally, configure a hosted plug-in that monitors the state of interfaces on VRs.

Configuring SRC-ACP as an External Plug-In

To configure SRC-ACP as an external plug-in for the SAE:

1. Click **Configure > Shared > SAE**, and then expand the SAE group for which you want to configure a plug-in.

The Group pane appears.

2. From the side pane, expand **Configuration > Plug Ins**.

The Plug Ins pane appears.

3. In the Create new list, select **Name**.
4. Type a name for the new plug-in in the dialog box, and click **OK**.

The plug-in appears in the side pane and in the Plug In pane.

5. From the side pane, expand the new plug-in, and then click **External**.

The External pane appears.

6. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Event Publishers

You must configure the SAE to publish the following types of events to SRC-ACP:

- (Edge and dual mode only) Global subscriber tracking
- Global service authorization
- Global service tracking

Configuring the SAE to Monitor Interfaces for Congestion Points



NOTE: Configure this feature only if SRC-ACP is in backbone or dual mode.

The SAE uses a hosted internal plug-in to monitor the state of interfaces on a VR for backbone congestion points. If a subscriber tries to activate a service on an interface that is unavailable, the SAE denies the request. The plug-in also monitors the directory for new backbone congestion points.

When this plug-in initializes, it reads all the backbone services from the directory and generates a list of the DNs (network interfaces) of the backbone congestion points. The SAE sends interface tracking events, which contain the names of the interfaces, VRs, and routers to this plug-in. For this feature to work correctly, the interface, VR, and router must be configured (see *Configuring Network Interfaces in the Directory (Backbone Network)* on page 135).

To configure the ACP interface listener as an internal plug-in for the SAE:

1. Click **Configure > Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.

The Group pane appears.

2. From the side pane, expand **Configuration > Plug-Ins**.
3. Expand the plug-in that you created for file accounting, and then click **ACP Interface Listener**.

The ACP Interface Listener pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.

- For information about configuring event publishers, see *Chapter 28, Configuring Accounting and Authentication Plug-Ins with the C-Web Interface*. Identify the instance of SRC-ACP by the name of the host on which you configured it.
- For information about creating a plug-in instance for a group, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 9, Configuring Internal, External, and Synchronization Plug-Ins with the SRC CLI*.

Configuring SRC-ACP Properties

To configure SRC-ACP properties, perform these tasks:

- Configuring Logging Destinations for SRC-ACP on page 128
- Configuring SRC-ACP Operation on page 129
- Configuring CORBA Interfaces on page 132
- Configuring SRC-ACP Redundancy on page 132
- Configuring Connections to the Subscribers' Directory on page 132
- Configuring Connections to the Services' Directory on page 132
- Configuring SRC-ACP Scripts and Classification on page 133

Configuring Logging Destinations for SRC-ACP

SRC-ACP groups contain default file logging configurations. You can modify an existing configuration or create a new one.

To modify logging destinations that store log messages in a file:

1. Click **Configure > Shared > ACP**, expand the group for which you want to configure logging and expand **Configuration**.

Several Logger:file configurations appear.

2. In the Create new list, select **Logger**.
3. Type a name for the new logger in the dialog box, and click **OK**.

The logger appears in the side pane.

4. Select the configuration that you want to modify, enter information as described in the Help text in the main pane, and click **Apply**.

To create logging destinations to store log messages in a file:

1. Click **Configure > Shared > ACP**, and expand the group for which you want to configure logging destinations and expand **Configuration**.
2. From the Create new list, select **Logger**.
3. Type a name for the new logging configuration, and click **OK**.

The logger appears in the side pane.

4. Expand the new logging configuration, select **File**, and enter information as described in the Help text in the main pane, and click **Apply**.

You can configure logging destinations to send log messages to the system logging facility. SRC-ACP groups contain default system logging configurations. You can modify an existing configuration or create a new one.

To modify an existing system logging configuration:

1. Click **Configure > Shared > ACP**, expand the group for which you want to modify an existing configuration, and expand **Configuration**.

Several Logger:syslog configurations appear.

2. Select the configuration that you want to modify, enter information as described in the Help text in the main pane, and click **Apply**.

To create a configuration that causes logging destinations to send log messages to the system logging facility:

1. Click **Configure > Shared > ACP**, and expand the group for which you want to modify an existing configuration.
2. In the Create new list, select **Logger**. Type a name for the new logging configuration, and click **OK**.

The logger appears in the side pane.

3. Expand the new logging configuration, select **Syslog**, and enter information as described in the Help text in the main pane, and click **Apply**.

Configuring SRC-ACP Operation

To configure SRC-ACP operation:

1. Click **Configure > Shared > ACP**, expand the group for which you want to modify an existing configuration, and expand **Configuration**.
2. Click **ACP Options**, enter information as described in the Help text in the main pane, and click **Create**.

Specifying Values That SRC-ACP Looks for in Remote Update Database

In the Remote Update Database Index Keys box, you specify the values that SRC-ACP looks for in the remote update database. Specifying index keys can improve performance by filtering the data. Configure the index keys by entering a list of attributes, separated by commas. An attribute is one of the following text strings:

- accountingId—Value of directory attribute accountingUserId.
- dhcpPacket—Content of the DHCP discover request.
- hostname— Name of the host on which the SAE is installed.
- ifIndex—SNMP index of the interface. This attribute is not supported on JUNOS routing platforms.
- ifRadiusClass—RADIUS class attribute on the JUNOS interface. This attribute is not supported on JUNOS routing platforms.
- ifSessionId—Identifier for RADIUS accounting on the JUNOS interface. This attribute is not supported on JUNOS routing platforms.
- interfaceAlias—Alias of the interface; that is, the IP description in the interface configuration.
- interfaceDescr—SNMP description of the interface.
- interfaceName—Name of the interface.
- loginName—Subscriber's login name.
- nasInetAddress—IP address of the router; using a byte array instead of an integer.
- nasPort—NAS port used by the router to identify the interface to RADIUS.
- portId—Identifier of VLAN or virtual circuit. For a virtual circuit, use the format <VPI> / <VCI> . This attribute is not supported on JUNOS routing platforms.
 - <VPI> —Virtual path identifier
 - <VCI> —Virtual connection identifier
- primaryUserName—PPP login name or the public DHCP username. This attribute is not supported on JUNOS routing platforms.
- routerName—Name of the virtual router in the format <virtualRouter> @ <router> .
 - <virtualRouter> —Virtual router name
 - <router> —Router name
- routerType—Type of router driver.

- `userInetAddress`—IP address of the subscriber that uses a byte array instead of an integer.
- `userMacAddress`—MAC address of the DHCP subscriber. This attribute is not supported on JUNOS routing platforms.
- `userRadiusClass`—RADIUS class attribute of the subscriber session for a service. This attribute can occur multiple times and can be returned by an authorization plug-in.
- `userType`—Type of subscriber.

Specifying Interface Tracking Events That SRC-ACP Ignores

In the Interface Tracking Filter box, you specify the interface tracking events that the SRC-ACP ignores. The value is filter strings in the format of a list of `<attribute> = <value>` pairs. The filter strings can be contained within query operations.

- `<attribute>` —Name of an attribute for an interface tracking event.
- `<value>` —Filtering string of the following types:
 - `*`—Any value
 - Explicit string—Any value matching the specified string (not case-sensitive)
 - String containing an asterisk—Any value containing the specified string (not case-sensitive)
- To perform query operations on filter strings, you can use the following values in your filter strings:
 - `()`—Match no objects.
 - `(*)`—Match all objects.
 - `(& <filter> <filter> ...)`—Performs logical AND operation on filter strings; true if all filter strings match.
 - `(| <filter> <filter> ...)`—Performs logical OR operation on filter strings; true if at least one filter string matches.
 - `(! <filter>)`—Performs logical NOT operation on filter string; true if the filter string does not match.

Configuring CORBA Interfaces

To configure CORBA interfaces:

1. Click **Configure > Shared > ACP > Configuration**, and then click **CORBA**.

The CORBA pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring SRC-ACP Redundancy

To configure SRC-ACP redundancy and state synchronization with the SAE:

1. Click **Configure > Shared > ACP > Redundancy**.

The Redundancy pane appears.

2. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Connections to the Subscribers' Directory

To configure how SRC-ACP connects to the directory that stores subscriber information:

1. Click **Configure > Shared > ACP > LDAP**, and expand **Subscriber Data**.

The Subscriber Data pane appears.

2. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Connections to the Services' Directory

To configure how SRC-ACP connects to the directory that stores service information:

1. Click **Configure > Shared > ACP > LDAP**, and expand **Service Data**.

The Service Data pane appears.

2. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring SRC-ACP Scripts and Classification

To configure SRC-ACP scripts and classification:

1. Click **Configure > Shared > ACP > Configuration** and then expand **Scripts and Classification**.

The Scripts and Classification pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring SRC-ACP to Manage the Edge Network

To configure SRC-ACP to manage the edge network, you must:

1. Configure network interfaces that represent locations of congestion points in the directory.
2. Configure guaranteed bandwidths for subscribers.
3. Assign network interfaces to subscribers.
4. Configure guaranteed bandwidths for services.

Configuring Network Interfaces in the Directory (Edge Network)

You must add network interfaces to the directory. For the edge network, you do so by specifying the network interfaces of the routers and the switches in the access network between subscribers and the SRC network.

To configure the network interfaces of the routers and the switches in the access network:

1. Click **Configure > Shared > Admission Control**, expand the desired device.
2. If the device does not exist, from the Create new list, select **Interface**. Type a name for the new interface in the dialog box, and click **OK**.

The Interface pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Bandwidths for Subscribers (Edge Network)

You must configure bandwidths for subscribers that SRC-ACP manages in the edge region of the network.

If congestion points cannot be derived from network access information, you must provide the following information for each subscriber.

- Provisioned downstream bandwidth
- Provisioned upstream bandwidth

- Actual downstream bandwidth for the current subscriber session
- Actual upstream bandwidth for the current subscriber session
- List of DNs of interfaces associated with congestion points

For further information, see *SRC-PE Network Guide, Chapter 20, Overview of Providing Admission Control with SRC-ACP*.

To configure bandwidths for subscribers:

1. Click **Configure > Subscribers**.
2. In the side pane, expand the desired retailer, expand the desired subscriber folder, and expand the desired subscriber.

The Admission Control pane appears.

3. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Assigning Network Interfaces to Subscribers

You must assign to the subscriber object interfaces (including the router interfaces) for all congestion points between the subscriber and the router.



NOTE: You must define the interface in the directory before you can assign it to a residential subscriber (see *Configuring Network Interfaces in the Directory (Edge Network)* on page 133).

To assign an interface:

1. Click **Configure > Subscribers**.
2. In the side pane, expand the desired retailer, and then click the desired subscriber folder.

The Admission Control pane appears.

3. Enter information in the Congestion Points box as described in the Help text in the main pane, and click **Apply**.

Configuring Bandwidths for Services

Upstream and downstream bandwidths must be specified for services that SRC-ACP manages. You can obtain bandwidths for services in two ways:

- Provide static values through the directory.
- Allow the values to be provided through the SAE core API.

For example, a business partner may need to specify the required values for a particular piece of content through the SAE core API.

To configure values for services:

1. For global configuration, click **Configure > Services > Global** and expand **Service**.
2. For scope configuration, click **Configure > Services > Scope** and expand **Service**.
3. In the side pane, expand the desired service and click **Admission Control**.

The Admission Control pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For information about configuring subscribers, see *Chapter 29, Configuring Subscribers and Subscriptions with the C-Web Interface*.
- For more information about configuring residential subscribers, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 12, Configuring Subscribers and Subscriptions with the SRC CLI*.
- For more information about configuring services, see *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI*.

Configuring SRC-ACP to Manage the Backbone Network

To configure SRC-ACP to manage the backbone network, you must:

1. Configure network interfaces that represent locations of congestion points in the directory.
2. (Optional) Configure an action congestion point.
3. Configure guaranteed bandwidths for services.
4. Assign network interfaces to services.
5. Create congestion points in the directory.
6. Assign network interfaces to congestion points.

Configuring Network Interfaces in the Directory (Backbone Network)

You configure network interfaces in the directory in the same way for edge and backbone congestion points. However, for backbone congestion points, you can add only VRs and their interfaces. For information about this procedure, see *Configuring Network Interfaces in the Directory (Edge Network)* on page 133.

Extending SRC-ACP Congestion Points

You can extend SRC-ACP congestion points to initialize and execute applications defined in a backbone congestion point. SRC-ACP provides a service provider interface (SPI) to:

- Create custom congestion point applications that authorize service activation and track service start and stop events.
- Obtain congestion point information from remote updates.
- Retrieve congestion point status.
- Track congestion point state.

The SPI for ACP provides a Java interface that a congestion point application implements. For information about the SPI for ACP, see the documentation in the SRC application library distribution in the folder *SDK/doc/acp*.

The implementation of the SPI for ACP can be a customized application that performs certain tasks, such as creating or removing congestion points on the router. SRC-ACP acts as an interface tracking plug-in, and interface tracking events are treated as remote updates for congestion points when they are created, modified, or removed.

SRC-ACP supports applications written in Java or Jython. For scripts written in Java, you must compile and package the implemented SPI for ACP to make it available for use by SRC-ACP. A Java implementation can include more than one Java archive (JAR) file.

To use congestion point applications with SRC-ACP, configure an action congestion point that references the script (see *Configuring Action Congestion Points* on page 136).

Configuring Action Congestion Points

You can define an application in a backbone congestion point so that SRC-ACP can execute it in a predefined manner. Backbone congestion points that are configured to run an application are called action congestion points. If you want to use an action congestion point to execute an application that requires real-time congestion point status, you must enable SRC-ACP state synchronization with the SAE (see *Configuring SRC-ACP Redundancy* on page 132).

Before you configure an action congestion point, make sure that you know the location of the application file.

To configure an action congestion point:

1. Click **Configure > Shared**, and expand **Service**.
2. In the side pane, expand the desired retailer, and then click the desired subscriber folder.

The Admission Control pane appears.

3. Enter information in the Congestion Points box as described in the Help text in the main pane, and click **Apply**.

Configuring Bandwidths for Services (Backbone Network)

You configure bandwidths for services in the same way for edge and backbone congestion points. For information about this procedure, see *Configuring Bandwidths for Services* on page 134.

Configuring Congestion Points for Services

You must assign a congestion point to each service that SRC-ACP manages.

To configure values for services:

1. For global configuration, click **Configure > Services > Global** and expand **Service**.
2. For scope configuration, click **Configure > Services > Scope** and expand **Service**.
3. In the side pane, expand the desired service, and click **Admission Control**.

The Admission Control pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Congestion Points in the Directory

To configure individual backbone congestion points:

1. Click **Configure > Shared > Congestion Points**.

The Congestion Points pane appears.

2. In the Create new list, select **Profile**. Type a name for the new profile in the dialog box, and click **OK**.

The Congestion Point Profile screen appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Assigning Interfaces to Congestion Points

You must assign interfaces either to VRs or to individual services under the VRs. Services inherit interface assignments from the associated VR unless you assign an interface to the individual service. This network interface lists the DNs of interfaces associated with backbone congestion points.

To assign interfaces to congestion points:

1. Click **Configure > Shared > Congestion Points**.
2. In the side pane, expand the desired profile.

The Profile pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For more information about configuring services, see *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI*.

Configuring Congestion Point Classification with the C-Web Interface

Congestion point classification allows you to automate and scale the configuration of congestion points. SRC-ACP uses classification scripts to determine which congestion point to load for a subscriber. SRC-ACP can select the congestion point from congestion point profiles or subscriber profiles.

Congestion Point Classification Scripts

The congestion point classification scripts consist of targets and criteria.

- A target is the result of the classification script. The result of congestion point classification scripts is an LDAP search string that is used to find a unique congestion point profile in the directory. If no classification scripts are configured, the result of congestion point classification scripts is an LDAP search string for the subscriber profile of the particular subscriber.
- Criteria are match criteria. The script attempts to match criteria in the script to information sent from the router.

Each script can have multiple targets, and each target can have multiple criteria. When an object needs classification, the script processes the targets in turn. Within each target, the script processes criteria sequentially. When it finds that the classification criteria for a target match, it returns the target to SRC-ACP.

Because classification scripts examine criteria sequentially as the criteria appear in the script, you should put more specific criteria at the beginning of the script and less specific criteria at the end of the script.

Congestion Point Profiles

Congestion point profiles are used to share congestion points that are generated based on dynamic configuration information. SRC-ACP uses congestion point profiles to determine the set of congestion points based on the classification script results.

Configuring Targets and Criteria for Classification Scripts

To define a target and criteria for the congestion point classification script:

1. Click **Configure > Shared > ACP > Configuration > Scripts and Classification**.

The Scripts and Classification pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Classification Scripts Contents for Classification Scripts

To use the contents of a classification script to point to another object for the congestion point classification script:

1. Click **Configure > Shared > ACP**, expand the desired group, and click **Congestion Point Classifier**.

The Congestion Point Classifier pane appears.

2. In the Create new list, select **Rule**.
3. Type a name for the new rule, and click **OK**.
4. In the side pane, expand the new rule, enter information for the script as described in the Help text in the main pane, and click **Apply**.

Configuring Congestion Point Classification Targets

The target of the congestion point classification script is an LDAP search string. The search string uses a syntax similar to an LDAP URL (see RFC 2255—The LDAP URL Format (December 1997)). The syntax is:

```
baseDN [ ? [ attributes ] [ ? [ scope ] [ ? [ filter ] ] ] ]
```

- baseDN—Distinguished name (DN) of the object where the LDAP search starts.
- attributes—Is ignored.
- scope—Scope of search in the directory:
 - base—Default; searches the base DN only.
 - one—Searches the direct children of the base DN.
 - sub—Searches the complete subtree below the base DN.

- filter—An RFC 2254–style LDAP search filter expression; for example, (uniqueId = <-userName->). See RFC 2254—The String Representation of LDAP Search Filters (December 1997).

With the exception of baseDN all the fields are optional.

The result of the LDAP search must be exactly one directory object. If no object or more than one object is found, congestion points for the subscriber are not loaded, and all service activations for the subscriber are denied.

Selecting Congestion Point Classification Criteria

Congestion point classification criteria define match criteria that are used to find the congestion point profile. See *SRC-PE Network Guide, Chapter 22, Configuring Congestion Point Classification with the SRC CLI*.

Defining a Congestion Point Profile

You can create a congestion point profile that automatically performs congestion point classification. This profile supports only edge mode and dual mode for SRC-ACP.

To define a congestion point profile:

1. Click **Configure > Shared > Congestion Points**.

The Congestion Point Profile pane appears.

2. In the Create new list, select **Profile**. Type a name for the new profile in the dialog box, and click **OK**.

The Profile screen appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Congestion Point Expressions

You can enter a congestion point expression by using the syntax listed in this section. You can also embed Python scripting expressions within the congestion point expression.

If you embed Python expressions within a congestion point expression, use the escape sequence <- then -> to enclose the Python expression. See *Methods for Use with Scripting Expressions* on page 141 and *Match Criteria for Congestion Point Classification* on page 142.

The syntax for a congestion point expression is:

`< NetworkDevice > / < NetworkInterface > [/ < CongestionPoint >]`

- `< NetworkDevice >` —Network device listed in the directory.

For information about network devices, see *SRC-PE Network Guide, Part 2, Using Juniper Networks Routers in the SRC Network*.

- `< NetworkInterface >` —Network interface listed in the directory.

For information about interfaces, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 6, Classifying Interfaces and Subscribers with the SRC CLI*.

- `< CongestionPoint >` —(Optional) Name of an instance of a congestion point that is automatically created.

If one of the elements with the path contains a slash (/), use a backslash (\) as an escape character for the slash. For example, V.

Expressions in Templates for Congestion Point Profiles

You can create a congestion point profile to be used as a template for other profiles. Templates simplify management of congestion points. Rather than configuring each congestion point individually, you can create templates to define common parameters for a class of individual congestion points.

For example, in an environment in which VLAN interfaces GigabitEthernet1/0.1 through GigabitEthernet1/0.1000 have the same available bandwidth, you can specify the characteristics of the VLAN interface once and have SRC-ACP create the congestion points based on the template configuration.

When a congestion point expression has the third element (`< CongestionPoint >`), SRC-ACP uses the `< NetworkDevice > / < NetworkInterface >` part of the expression to load the congestion point from the directory, and uses it as a template to create a congestion point in memory for subscriber. The `< CongestionPoint >` part of the expression distinguishes each congestion point (available bandwidth) created from this template.

Methods for Use with Scripting Expressions

SRC-ACP provides the following methods to use in scripting expressions:

- `slot(nasPortId)`—Collects the slot number from the `nasPortId` or `interfaceName`

Example—`slot("atm 4/5:0.32")` = = "4"

- `port(nasPortId)`—Collects the port number from the `nasPortId` or `interfaceName`

Example—`port("atm 4/5:0.32")` = = "5"

- `l2id(nasPortId)`—Collects the layer 2 ID from the `nasPortId` (VLAN id or ATM vpi.vci)

Example—`l2id("atm 4/5:0.32")` = = "0.32"

- `escape(string)`—Replaces any slash with the escape sequence `\`

Example—`escape("atm 4/5")` = `"atm 4\5"`

Match Criteria for Congestion Point Classification

You can use the match criteria in Python scripting expressions for a congestion point expression. For more information about the match criteria, see *SRC-PE Network Guide, Chapter 22, Configuring Congestion Point Classification with the SRC CLI* and *Selecting Congestion Point Classification Criteria* on page 140.

Part 5

Integrating Network Devices

Chapter 16

Configuring the JPS with the C-Web Interface

This chapter describes how to use the C-Web interface to configure the Juniper Policy Server (JPS), a component of the SRC software that acts as a policy server in the PacketCable Multimedia Specification (PCMM) environment.

You can also use the CLI to configure the JPS on a Solaris platform or on a C-series Controller:

- To use the SRC CLI interface, see *SRC-PE Solutions Guide, Chapter 10, Configuring the JPS with the SRC CLI*.
- To use the Solaris platform, see *SRC-PE Solutions Guide, Chapter 11, Configuring the JPS on a Solaris Platform*.

Topics in this chapter include:

- Configuring the JPS with the C-Web Interface on page 146
- Modifying the JPS Configuration with the C-Web Interface on page 146
- Modifying the Subscriber Configuration with the C-Web Interface on page 149
- Configuring the SAE to Interact with the JPS with the C-Web Interface on page 151
- Using the NIC Resolver with the C-Web Interface on page 153
- Managing the JPS with the C-Web Interface on page 154

For information about the JPS, see *SRC-PE Solutions Guide, Chapter 9, Using PCMM Policy Servers*.

Configuring the JPS with the C-Web Interface

You can modify the JPS configuration, which includes configuring the logging destinations and connections to the JPS interfaces. Any configuration changes will be applied within 15 seconds.

You can configure the subscriber, which maps a subscriber address to the CMTS address.

The tasks to configure the JPS for a cable network environment are:

1. Modifying the JPS Configuration with the C-Web Interface on page 146
2. Modifying the Subscriber Configuration with the C-Web Interface on page 149

In addition to configuring the JPS, you might need to perform these tasks:

1. Configuring the SAE to Interact with the JPS with the C-Web Interface on page 151
2. Using the NIC Resolver with the C-Web Interface on page 153

Modifying the JPS Configuration with the C-Web Interface

Tasks to modify the current JPS configuration are:

1. *Configuring General Properties for the JPS with the C-Web Interface* on page 146
2. *Specifying a Policy Server Identifier in Messages with the C-Web Interface* on page 147
3. *Configuring Logging Destinations with the C-Web Interface* on page 147
4. *Specifying Connections to the Application Managers with the C-Web Interface* on page 147
5. *Specifying Connections to RKs with the C-Web Interface* on page 148
6. *Specifying Connections to CMTS Devices with the C-Web Interface* on page 149

Configuring General Properties for the JPS with the C-Web Interface

To configure general properties for the JPS:

1. Click **Configure**, and expand **Slot > Slot: 0**, and then click **JPS**.

The JPS pane appears.

2. Enter the information in the main pane as described in the Help text, and click **Apply**.

Specifying a Policy Server Identifier in Messages with the C-Web Interface

To configure a policy server identifier for the JPS:

1. Click **Configure**, expand **Slot > Slot: 0**, and then click **JPS**.

The JPS pane appears.

2. In the Policy Server ID box, enter a value as described in the Help text in the main pane.
3. Enter information in the remaining boxes as described in the Help text in the main pane, and click **Apply**.

Configuring Logging Destinations with the C-Web Interface

You can configure the logging destination to store messages in a file, or to a system logging facility (Syslog)

You can create or modify loggers. By default, the JPS has four logging destinations (log1, log2, log3, and log4).

Related Topics

- *SRC-PE Monitoring and Troubleshooting Guide, Chapter 4, Configuring Logging for SRC Components with the C-Web Interface*

Specifying Connections to the Application Managers with the C-Web Interface

This section describes how to configure the application manager-to-policy server interface (PKT-MM3) so that the policy server can communicate with application managers.

To configure the connections to the application managers:

1. Click **Configure**, expand **Slot > Slot: 0 > JPS**, and then click **AM Interface**.

The AM Interface pane appears.

2. Enter the information in the main pane as described in the Help text, and click **Apply**.

Related Topics

- *Restarting the JPS with the C-Web Interface* on page 155

Specifying Connections to RKSs with the C-Web Interface

To configure the policy server-to-RKS interface (PKT-MM4) so that policy events can be sent to the RKS, you can configure RKS pairs and their associated application managers.

To configure the policy server-to-RKS interface:

1. Click **Configure**, expand **Slot > Slot: 0 > JPS**, and then click **RKS Interface**.

The RKS Interface pane appears.

2. Enter the information in the main pane as described in the Help text, and click **Apply**.

Configuring RKS Pairs with the C-Web Interface

By default, the JPS has four RKS pairs. All parameters that share the same RKS pair name configure the connection to that RKS pair. Any configured RKS pair can be used as the value for the default RKS pair or the RKS pair associated with a specific application manager.



NOTE: When running more than one JPS in a group to provide redundancy, all the JPSs in that group must have the same RKS pair configuration (including the default RKS pair and any configured RKS pairs associated with a specific application manager).

To configure the RKS pair:

1. Click **Configure**, and expand **Slot > Slot: 0 > JPS > RKS Interface**.
2. Click the specified RKS pair (for example, pair 1).

The RKS Pair:pair 1 pane appears.

3. Enter the information in the main pane as described in the Help text, and click **Apply**.

Configuring RKS Pairs for Associated Application Managers with the C-Web Interface

By default, the JPS has four associated application managers. All parameters that share the same application manager name configure the RKS pair to which events associated with a specific application manager are sent.

To configure the associated application manager:

1. Click **Configure**, and expand **Slot > Slot: 0 > JPS > RKS Interface**.
2. Click the specified AM (for example, AM:1).

The RKS Interface/AM:1 pane appears.

3. Enter the information in the main pane as described in the Help text, and click **Apply**.

Specifying Connections to CMTS Devices with the C-Web Interface

To configure the policy server-to-CMTS interface (PKT-MM2) so that the policy server can communicate with CMTS devices:

1. Click **Configure**, expand **Slot > Slot: 0 > JPS**, and then click **CMTS Interface**.

The CMTS Interface pane appears.

2. Enter the information in the main pane as described in the Help text, and click **Apply**.

Modifying the Subscriber Configuration with the C-Web Interface

To locate the CMTS device associated with a subscriber, the JPS maps the subscriber IP address in a message to the CMTS IP address to which the message must be delivered. This mapping specifies the subscriber IP pools associated with CMTS devices.

The tasks to configure a CMTS device to which the JPS can connect and the pools of subscriber IP addresses that are managed by that CMTS device are:

1. *Configuring Subscriber IP Pools as IP Address Ranges with the C-Web Interface* on page 150
2. *Configuring Subscriber IP Pools as IP Subnets with the C-Web Interface* on page 150

Configuring Subscriber IP Pools as IP Address Ranges with the C-Web Interface

To configure subscriber IP pools that are managed by the CMTS device as IP address ranges:

1. Click **Configure**, expand **Slot > Slot: 0 > JPS**, and then click **CMTS Registry**.

The CMTS Registry pane appears.

2. From the Create new list, select **CMTS**.
3. In the dialog box, type an IPv4 or IPv6 address for the new CMTS, and click **OK**.

The CMTS: *< ip address >* pane appears.

4. From the Create new list, select **Range Pool**.
 5. In the dialog box, enter a number for the new Range Pool, and click **OK**.
- The Range Pool: *< number >* pane appears.
6. Enter the information in the main pane as described in the Help text, and click **Apply**.

Configuring Subscriber IP Pools as IP Subnets with the C-Web Interface

To configure subscriber IP pools that are managed by the CMTS device as IP subnets:

1. Click **Configure**, expand **Slot > Slot: 0 > JPS**, and then click **CMTS Registry**.

The CMTS Registry pane appears.

2. From the Create new list, select **CMTS**.
3. In the dialog box, type an IPv4 or IPv6 address for the new CMTS, and click **OK**.

The CMTS: *< ip address >* pane appears.

4. From the Create new list, select **Subnet Pool**.
5. In the dialog box, enter a network IP address/mask for the new Subnet Pool, and click **OK**.

The Subnet Pool: *< ip address/mask >* pane appears.

6. Enter the information in the main pane as described in the Help text, and click **Apply**.

Configuring the SAE to Interact with the JPS with the C-Web Interface

You must configure the SAE as an application manager to allow it to interact with PCMM-compliant policy servers. The policy server acts as a policy decision point that manages the relationships between application managers and CMTS devices. Policy servers that manage the same group of CMTS devices are grouped together and are simultaneously active. The policy server group provides a way for the SAE to communicate with any CMTS device that is managed by a policy server in the policy server group. To provide redundancy, the SAEs are grouped in an SAE community that connects to a policy server group. Only one of the SAEs in the SAE community is active. The active SAE establishes connections to all the policy servers in the policy server group. The active SAE will fail over to a redundant SAE only when it loses the connection to all the policy servers in the policy server group. State synchronization enables the SAE to synchronize its state with all the CMTS devices connected to a policy server group.

The tasks to configure the SAE as an application manager are:

- Specifying Application Managers for the Policy Server with the C-Web Interface on page 151
- *Specifying Application Manager Identifiers for Policy Servers with the C-Web Interface* on page 152
- *Adding Objects for Policy Servers to the Directory with the C-Web Interface* on page 152
- *Configuring Initialization Scripts with the C-Web Interface* on page 153
- Enabling State Synchronization with the C-Web Interface on page 153

Specifying Application Managers for the Policy Server with the C-Web Interface

To specify the SAE community that connects to a policy server group, you need to add an application manager group object to the directory.

To specify the application manager for the policy server:

1. Click **Configure**, expand **Shared**, and then click **Network**.

The Network pane appears.

2. From the Create new list, select **Application Manager Group**.
3. In the dialog box, enter a name for the new Application Manager Group, and click **OK**.

The Application Manager Group: < name > pane appears.

4. Enter the information in the main pane as described in the Help text, and click **Apply**.

Related Topics

- *Adding Objects for Policy Servers to the Directory with the C-Web Interface* on page 152
- *Configuring Initialization Scripts with the C-Web Interface* on page 153.

Specifying Application Manager Identifiers for Policy Servers with the C-Web Interface

The application manager identifier (AMID) identifies the application manager (such as the SAE) in messages sent to and from the policy server. The SAE constructs the AMID value by concatenating two fields: Application Manager Tag and Application Type.

The Application Manager Tag value is obtained from the specification of application managers for policy servers.

The Application Type value is obtained during service activation from the specification of the PCMM Application Type value when you configure normal services.

Related Topics

- *Specifying Application Manager Identifiers for Policy Servers with the C-Web Interface* on page 152
- *Configuring Services with the C-Web Interface* on page 235

Adding Objects for Policy Servers to the Directory with the C-Web Interface

To communicate with policy servers, the SAE creates and manages pseudointerfaces that it associates with a policy decision point object in the directory. Each policy server in the SRC network must appear in the directory as a policy decision point object.

To add a policy server to the directory:

1. Click **Configure**, expand **Shared**, and then click **Network**.

The Network pane appears.

2. From the Create new list, select **Policy Decision Point**.
3. In the dialog box, enter a name for the new Policy Decision Point, and click **OK**.

The Policy Decision Point: < name > pane appears.

4. Enter the information in the main pane as described in the Help text, and click **Apply**.

Related Topics

- *Specifying Application Manager Identifiers for Policy Servers with the C-Web Interface* on page 152

Configuring Initialization Scripts with the C-Web Interface

When the SAE establishes a connection with a policy server, it runs an initialization script to customize the setup of the connection.

To configure initialization scripts for the SAE:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **Scripts**.

The Scripts pane appears.

2. Click the **Create** button.
3. In the Pcomm box, enter the information as described in the Help text in the main pane, and click **Apply**. For the JPS, we recommend setting this value to **amlorPublisher**.

The script is run when the connection between a policy server and the SAE is established and again when the connection is dropped.

Enabling State Synchronization with the C-Web Interface

State synchronization is achieved when the SAE is configured to communicate with the policy server over the COPS connection.

To enable state synchronization with policy servers:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **Pcomm**.

The Pcomm pane appears.

2. Click the **Create** button.
3. Clear the Disable Full Sync checkbox to enable full synchronization.
4. If the policy server or devices do not support policies defined in PCMM-I03, make sure the Disable PCMM I03 checkbox is selected and that the correct value is displayed in the Session Recovery Retry Interval box. Refer to the Help text in the main pane as needed.
5. Click **Apply**.

Using the NIC Resolver with the C-Web Interface

If you are using the NIC to map the subscriber IP address to the SAE, you need to configure a NIC host. The NIC system uses IP address pools to map IP addresses to SAEs. You configure the local address pools in the application manager configuration for a policy server group. These pools are published in the NIC. The NIC maps subscriber IP addresses in requests received through the portal or Advanced Services Gateway to the policy server group that currently manages that CMTS device.

The OnePopPcmm sample configuration data supports this scenario for a PCMM environment in which you use the assigned IP subscriber method to log in subscribers and in which you use the NIC to determine the subscriber's SAE. The OnePopPcmm configuration supports one point of presence (POP). NIC replication can be used to provide high availability. The realm for this configuration accommodates the situation in which IP pools are configured locally on each application manager group object.

The resolution process takes a subscriber's IP address as the key and returns a reference to the SAE managing this subscriber as the value.

The following agents collect information for resolvers in this realm:

- Directory agent PoolVr collects and publishes information about the mappings of IP pools to the policy server group.
- Directory agent VrSaeld collects and publishes information about the mappings of policy server groups to SAEs.

Related Topics

- *Specifying Application Manager Identifiers for Policy Servers with the C-Web Interface* on page 152
- *Configuring NIC with the C-Web Interface* on page 107

Managing the JPS with the C-Web Interface

After you have installed the JPS and applied the local configuration of the JPS, you can perform these tasks:

- Starting the JPS with the C-Web Interface on page 155
- Restarting the JPS with the C-Web Interface on page 155
- Stopping the JPS with the C-Web Interface on page 155
- Displaying JPS Status with the C-Web Interface on page 156

Related Topics

- *Modifying the JPS Configuration with the C-Web Interface* on page 146
- *SRC-PE Monitoring and Troubleshooting Guide, Chapter 14, Monitoring the System with the C-Web Interface*

Starting the JPS with the C-Web Interface

You must start the JPS when you install the JPS without rebooting the JPS host.

To start the JPS:

1. Click **Manage > Enable**.

The Enable pane appears.

2. From the **Component** list, select **JPS**, and click **OK**.

The system responds with a start message. If the JPS is already running, the system responds with a warning message.

Related Topics

- *Starting the JPS with the C-Web Interface* on page 155
- *Stopping the JPS with the C-Web Interface* on page 155
- *Displaying JPS Status with the C-Web Interface* on page 156

Restarting the JPS with the C-Web Interface

To restart the JPS:

1. Click **Manage > Restart**.

The Restart pane appears.

2. From the **Component** list, select **JPS**, and click **OK**.

The system responds with a start message. If the JPS is already running, the system responds with a shutdown message and then a start message.

Related Topics

- *Starting the JPS with the C-Web Interface* on page 155
- *Stopping the JPS with the C-Web Interface* on page 155
- *Displaying JPS Status with the C-Web Interface* on page 156

Stopping the JPS with the C-Web Interface

To stop the JPS:

1. Click **Manage > Disable**.

The Disable pane appears.

2. From the **Component** list, select **JPS**, and click **OK**.

The system responds with a shutdown message. If the JPS is not running when you issue the command, the system responds with a status message.

Related Topics

- *Starting the JPS with the C-Web Interface* on page 155
- *Restarting the JPS with the C-Web Interface* on page 155
- *Displaying JPS Status with the C-Web Interface* on page 156

Displaying JPS Status with the C-Web Interface

To display the JPS status:

1. Click **Monitor > Component**.

The Installed Components pane appears.

2. Locate jps in the Name column. The Version and Status columns display the JPS status.

Related Topics

- *Starting the JPS with the C-Web Interface* on page 155
- *Restarting the JPS with the C-Web Interface* on page 155
- *Stopping the JPS with the C-Web Interface* on page 155

Chapter 17

Using JUNOSe Routers in the SRC Network with the C-Web Interface

This chapter describes how to use the C-Web interface to set up the SRC software and how to set up a JUNOSe router so that the router can be used in the SRC network. It also shows how to monitor the interactions between the SAE and the JUNOSe router and how to troubleshoot SRC problems on the router.

You can also use the following to configure JUNOSe routers:

- To use the SRC CLI, see *SRC-PE Network Guide, Chapter 5, Using JUNOSe Routers in the SRC Network with the SRC CLI*.
- To use the Solaris platform, see *SRC-PE Network Guide, Chapter 6, Using JUNOSe Routers in the SRC Network with a Solaris Platform*.

Topics in this chapter include:

- COPS Connection Between JUNOSe Routers and the SAE on page 158
- Adding JUNOSe Routers and Virtual Routers with the C-Web Interface on page 158
- Configuring the SAE to Manage JUNOSe Routers with the C-Web Interface on page 160
- Using SNMP to Retrieve Information from JUNOSe Routers on page 160
- Developing Router Initialization Scripts on page 161
- Specifying JUNOSe Router Initialization Scripts on the SAE with the C-Web Interface on page 164
- Accessing the Router CLI on page 164
- Starting the SRC Client on a JUNOSe Router on page 165
- Stopping the SRC Client on a JUNOSe Router on page 165
- Monitoring Interactions Between the SAE and the JUNOSe Router on page 166
- Troubleshooting Problems with Managing JUNOSe Routers on page 166

COPS Connection Between JUNOSe Routers and the SAE

Configuring the SRC client on a JUNOSe router opens a Common Open Policy Service (COPS) protocol layer connection to the SAE. When the SRC client software establishes a TCP/IP connection to the SAE, the SAE starts to manage the JUNOSe router. Subsequently, the SRC client sends configuration changes made on the JUNOSe router to the SAE, and the SAE updates SRC configurations for services and policies accordingly.

The SAE supports two versions of COPS:

- COPS usage for policy provisioning (COPS-PR)
- COPS External Data Representation Standard (COPS-XDR)

The version of COPS that you use depends on the version of COPS that your JUNOSe router supports. When you set up your JUNOSe router to work with the SAE, you enable either COPS-PR mode or COPS-XDR mode.

Highly Available Connections to JUNOSe Routers

JUNOSe routers maintain state information, a feature that allows an active, managing SAE to reconnect to a JUNOSe router without performing a data resynchronization in the following instances:

- The network connection between the SAE and the JUNOSe router is disrupted, and the router reconnects to the SAE
- For JUNOSe routers with high availability configured, when the secondary SRP module takes control from a failed SRP it can reconnect to the SAE

Adding JUNOSe Routers and Virtual Routers with the C-Web Interface

The SAE uses router and virtual router objects to manage interfaces on JUNOSe virtual routers. Each JUNOSe router in the SRC network and its virtual routers (VRs) must have a configuration.

There are two ways to add routers:

- Detect operative routers and configured JUNOSe VRs in the SRC network and add them to the configuration.
- Add each router and VR individually.

Adding Operative JUNOSe Routers and Virtual Routers

To add routers and JUNOSe VRs that are currently operative and have an operating SNMP agent:

1. Click **Manage > Request > Network > Discovery**.
2. Enter information as described in the Help text in the main pane, and click **Apply**.

If you add a router using the discover network feature, the software adds the IP address of the first SNMP agent on the router to respond to the discover request.

Adding JUNOSe Routers Individually

Use the following configuration statements to add a router:

To add a router:

1. Click **Configure**, expand **Shared**, and then click **Network**.

The Shared Network pane appears.

2. From the Create new list, select **Device**.

3. Type a name for the new device in the dialog box, and click **OK**.

The Device pane appears.

4. From the Device Type list, select **JUNOSe**.

5. Enter information as described in the Help text in the main pane, and click **Apply**.

Adding Virtual Routers Individually

To add a virtual router to an existing router:

1. Click **Configure**, expand **Shared > Network**, and then click a JUNOSe router.

The Device pane appears.

2. From the Create new list, select **Virtual Router**.

3. Type a name for the new device in the dialog box, and click **OK**.

The Virtual Router pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For information about service scopes, see *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI*.
- For information about local IP address pools, see *Developing Router Initialization Scripts* on page 80.
- For information about tracking plug-ins, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.

Configuring the SAE to Manage JUNOSe Routers with the C-Web Interface

To set up the SAE to manage JUNOSe routers, configure a router driver that specifies a COPS server that can accept COPS connections from the COPS client in JUNOSe routers.

To configure the SAE to manage JUNOSe routers:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **JUNOSe**.

The JUNOSe pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.

Using SNMP to Retrieve Information from JUNOSe Routers

Some scripts in the SRC software use SNMP to get information from the router. For example, the **poolPublisher** router initialization script uses SNMP to read the IP pools.

- On the router, you can configure access to the router's SNMP server. See *Configuring the SNMP Server on the JUNOSe Router* on page 160.
- On the SAE, you can configure global default SNMP communities that are used for read and write access to the router. See *Configuring Global SNMP Communities in the SRC Software with the C-Web Interface* on page 161.
- You can specify SNMP communities for each virtual router. We recommend that you specify communities for each virtual router instead of configuring global communities. See *Adding Virtual Routers Individually* on page 159.

Configuring the SNMP Server on the JUNOSe Router

Access to the SNMP server on the router by an SNMP client is governed by a proprietary SNMP community table. This table identifies communities that have read-only, read-write, or administrative permission to the SNMP Management Information Base (MIB) stored on a particular server.

When an SNMP server receives a request, the server extracts the client's IP address and the community name. The SNMP server searches the community table for a matching community.

- If a match is found, its access list name is used to validate the IP address.
 - If the access list name is null, the IP address is accepted.
 - If an invalid IP address results, an SNMP authentication error is sent to the SNMP client.
- If a match is not found, an SNMP authentication error results.

To configure the SNMP agent on the JUNOSe router:

1. Switch to the virtual router for which you want to create an SRC client.

```
host1#(config)virtual-router <vrName>
```

2. Enable the SNMP agent.

```
host1:<vrName>#(config)snmp-server
```

3. Configure at least one authorized SNMP read-write community (SNMPv1/v2c), which provides SNMP client access.

```
host1:<vrName>(config)#snmp-server community boston rw
```

4. (Optional) Configure a read-only community.

5. host1: < vrName > #(config)snmp-server public ro

Configuring Global SNMP Communities in the SRC Software with the C-Web Interface

You can configure global default SNMP communities that are used if a VR does not exist on the router or if the community strings have not been configured for the VR.

To configure global default SNMP communities:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **SNMP**.

The SNMP pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Developing Router Initialization Scripts

When the SAE establishes a connection with a router, it can run a router initialization script to customize the setup of the connection. Router initialization scripts are run when the connection between a router and the SAE is established and again when the connection is dropped.

For JUNOS VRs that supply IP addresses from a local pool, a router initialization script is provided that identifies which VR supplies each IP pool and writes the information to the configuration. The SAE runs the script only when a COPS connection is established to the JUNOS router. Consequently, if you modify information about IP pools on a VR after the COPS connection is established, the SAE will not automatically register the changes, and you must update the configuration.

Table 7 describes the router initialization scripts that we provide with the SRC software in the */opt/UMC/sae/lib* folder.

Table 7: Router Initialization Scripts

Script Name	Function	When to Use Script
iorPublisher	Publishes the IOR of the SAE into an internal part of the shared configuration so that a NIC can associate a router with an SAE.	Use with JUNOS routers that do not supply IP addresses from local pools, and with JUNOS routing platforms.
poolPublisher	Publishes the IOR of the SAE and local IP address pools in the directory so that a NIC can associate a router with an SAE and resolve the IP-to-SAE mapping.	Use with JUNOS virtual routers that supply IP addresses from local pools.

Interface Object Fields

Router initialization scripts are written in the Python programming language (www.python.org) and executed in the Jython environment (www.jython.org).

Router initialization scripts interact with the SAE through an interface object called *Ssp*. The SAE exports a number of fields through the interface object to the script and expects the script to provide the entry point to the SAE.

Table 8 describes the fields that the SAE exports.

Table 8: Exported Fields

Ssp Attribute	Description
Ssp.properties	System properties object (class: <code>java.util.Properties</code>)—The properties should be treated as read-only by the script.
Ssp.errorLog	Error logger—Use the <code>Ssp.errorLog.println (message)</code> to send error messages to the log.
Ssp.infoLog	Info logger—Use the <code>Ssp.infoLog.println (message)</code> to send informational messages to the log.
Ssp.debugLog	Debug logger—Use the <code>Ssp.debugLog.println (message)</code> to send debug messages to the log.

The router initialization script must set the field `Ssp.routerInit` to a factory function that instantiates a router initialization object:

- `<VRName>` —Name of the virtual router in which the COPS client has been configured, format: `virtualRouterName@RouterName`
- `<virtualIp>` —Virtual IP address of the SAE (string, dotted decimal; for example: 192.168.254.1)
- `<realIp>` —Real IP address of the SAE (string, dotted decimal; for example, 192.168.1.20)
- `<VRip>` —IP address of the virtual router (string, dotted decimal)
- `<transportVR>` —Name of the virtual router used for routing the COPS connection, or `None`, if the COPS client is directly connected

The factory function must implement the following interface:

```
Ssp.routerInit(VRName,
               virtualIp,
               realIp,
               VRip,
               transportVR)
```

The factory function returns an interface object that is used to set up and tear down a connection for a given COPS server. A common case of a factory function is the constructor of a class.

The factory function is called directly after a COPS server connection is established. In case of problems, an exception should be raised that leads to the termination of the COPS connection.

Required Methods

Instances of the interface object must implement the following methods:

- `setup()`—Is called when the COPS server connection is established and is operational. In case of problems, an exception should be raised that leads to the termination of the COPS connection.
- `shutdown()`—Is called when the COPS server connection to the virtual router is terminated. This method should not raise any exceptions in case of problems.

Example: Router Initialization Script

The following script defines a router initialization class named `SillyRouterInit`. The interface class does not implement any useful functionality. The interface class just writes messages to the `infoLog` when the router connection is created or terminated.

```
class SillyRouterInit:
    def __init__(self, vrName, virtualIp, realIp, vrIp, transportVr):
        """ initialize router initialization object """
        self.vrName = vrName
        Ssp.infoLog.println("SillyRouterInit created")
```

```

def setup(self):
    """ initialize connection to router """
    Ssp.infoLog.println("Setup connection to VR %(vrName)s" %
                        vars(self))

def shutdown(self):
    """ shutdown connection to router """
    Ssp.infoLog.println("Shutdown connection to VR %(vrName)s" %
                        vars(self))

#
# publish interface object to Ssp core
#
Ssp.routerInit = SillyRouterInit

```

Specifying JUNOSe Router Initialization Scripts on the SAE with the C-Web Interface

To configure router initialization scripts for JUNOSe routers:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **Scripts**.

The Scripts pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Accessing the Router CLI

You can access the CLIs of Juniper Networks routers through a Telnet or secure shell connection.

- To open a Telnet session to a router, use the **telnet** operational mode command. For example:

```
user@host> telnet 10.10.10.3
```

- To open a secure shell connection, use the **ssh** operational command. For example:

```
user@host> ssh host 10.10.10.3
```

Starting the SRC Client on a JUNOSe Router

JUNOSe routers use an SRC client to interact with the SAE. See *JUNOSe Broadband Access Configuration Guide* for complete information about configuring the SRC client on a JUNOSe router.

To start the SRC client:

1. Access the router CLI.
2. Access Global configuration mode.

```
host1#configure terminal
```

3. Switch to the virtual router for which you want to create an SRC client.

```
host1(config)#virtual-router <vrName>
```

4. Enable the SRC client.

To enable COPS-PR mode:

```
host1:<vrName>(config)#sscc enable cops-pr
```

To enable COPS-XDR mode:

```
host1:<vrName>(config)#sscc enable
```

5. Set the primary address from the configuration directory.

```
host1:<vrName>(config)#sscc primary address <ipAddress> port 3288
```

Stopping the SRC Client on a JUNOSe Router

JUNOSe routers use an SRC client to interact with the SAE. See *JUNOSe Broadband Access Configuration Guide* for complete information about configuring the SRC client on the JUNOSe router.

To stop the SRC client:

1. Access the router CLI.

See *Accessing the Router CLI* on page 164.

2. Access Global configuration mode.

```
host1#configure terminal
```

3. Switch to the virtual router for which you want to stop an SRC client.

```
host1(config)#virtual-router <vrName>
```

4. Disable the SRC client.

```
host1:<vrName>(config)#no sscc enable
```

Monitoring Interactions Between the SAE and the JUNOSe Router

To monitor the connection between the router and the SAE:

- Use the `show sssc info` command on the JUNOSe router.

To display the version number of the SRC client:

- Use the `show sssc version` command on the JUNOSe router.

See the *JUNOSe Command Reference Guide* for details about these commands.

You can also monitor the interactions between the SRC software and the router in the log files for the SAE and in the log files generated by the JUNOSe router.

- For information about configuring logging for the SAE, see *SRC-PE Monitoring and Troubleshooting Guide, Chapter 3, Configuring Logging for SRC Components with the CLI*.
- For information about configuring logging on JUNOSe routers, see *JUNOSe System Event Logging Reference Guide*.

Troubleshooting Problems with Managing JUNOSe Routers

You can troubleshoot problems with the SRC client on JUNOSe routers and with managed JUNOSe routers, interfaces, and services on the SAE.

Troubleshooting the SRC Client on JUNOSe Routers

To troubleshoot SRC problems on the router:

1. Look at the log files for the SAE and the log files generated by the SRC client on the JUNOSe router.
 - If the log files indicate a problem with specific interfaces on the router, review the configuration of the associated policies in the SRC software, and fix any errors.
 - If the log files indicate a problem with a specific service or its associated policy rules, review the configuration of the service or policies in the SRC software, and fix any errors.
 - If the log files indicate only that the SRC client is not responding, ensure that the values in the SAE configuration match the values in the SRC client configuration on the router.
2. Restart the SRC client on the JUNOSe router.

When you restart the SRC client, the SRC client removes all policies that were installed by the SRC software and reports all interfaces again.



NOTE: DHCP addresses that were managed are not reported again, so we recommend that you do not restart the SRC client if you are managing DHCP sessions.

To restart the SRC client in COPS-PR mode, enter the following commands:

```
host1:<vrName>(config)#no ssc enable
host1:<vrName>(config)#sscc enable cops-pr
```

To restart the SRC client in COPS-XDR mode, enter the following commands:

```
host1:<vrName>(config)#no ssc enable
host1:<vrName>(config)#sscc enable
```

If restarting the SRC client does not resolve the problem, rebuild the router configuration and restart the client.

Viewing the State of JUNOSe Device Drivers with the C-Web Interface

If the log files indicate a problem with a specific driver, review the configuration of the associated with the JUNOSe router driver with the C-Web interface.

1. Click **Monitor > SAE > Drivers**.

The Drivers pane appears.

2. Enter information as described in the Help text in the main pane, and click **OK**.

The Drivers pane displays information about the JUNOSe device driver.

Viewing Statistics for Specific JUNOSe Device Drivers with the C-Web Interface

To view SNMP statistics about a specific JUNOSe device driver:

1. Click **Monitor > SAE > Statistics > Device**.

The Device pane appears.

2. In the Device Name box, enter a full or partial device driver name for which you want to display information, or leave the box blank to display all devices.

For JUNOSe router drivers, use the format:

<virtual router name>@<router name>

3. Enter information as described in the Help text in the main pane, and click **OK**.

The Device pane displays statistics for a specific JUNOSe device driver.

Viewing Statistics for All JUNOSe Device Drivers with the C-Web Interface

To view SNMP statistics for all JUNOSe device driver:

1. Click **Monitor > SAE > Statistics > Device > Common**.

The Common pane appears.

2. Enter information as described in the Help text in the main pane, and click **OK**.

The Common pane displays statistics for the JUNOSe device driver.

Chapter 18

Using JUNOS Routing Platforms in the SRC Network with the C-Web Interface

This chapter describes how to use the C-Web interface to set up the SRC software and how to set up JUNOS routing platforms so that the routing platforms can be used in the SRC network. It also shows how to monitor the interactions between the SAE and JUNOS routing platforms and how to troubleshoot SRC problems on JUNOS routing platforms.

You can also use the following to configure JUNOS routers:

- To use the SRC CLI, see *SRC-PE Network Guide, Chapter 7, Using JUNOS Routing Platforms in the SRC Network with the SRC CLI*.
- To use the Solaris platform, see *SRC-PE Network Guide, Chapter 8, Using JUNOS Routing Platforms in the SRC Network with a Solaris Platform*.

Topics in this chapter include:

- BEEP Connection Between JUNOS Routing Platforms and the SAE on page 170
- Adding JUNOS Routing Platforms and Virtual Routers with the C-Web Interface on page 170
- Configuring the SAE to Manage JUNOS Routing Platforms with the C-Web Interface on page 172
- Configuring Secure Connections Between the SAE and JUNOS Routing Platforms on page 172
- Checking Changes to the JUNOS Configuration with the C-Web Interface on page 176
- Using SNMP to Retrieve Information from JUNOS Routing Platforms on page 177
- Developing Router Initialization Scripts on page 177
- Specifying JUNOS Router Initialization Scripts on the SAE with the C-Web Interface on page 179
- Accessing the Router CLI on page 180

- Configuring JUNOS Routing Platforms to Interact with the SAE on page 180
- Disabling Interactions Between the SAE and JUNOS Routing Platforms on page 181
- Monitoring Interactions Between the SAE and JUNOS Routing Platforms on page 182
- Troubleshooting Problems with the SRC Software Process with the C-Web Interface on page 182

BEEP Connection Between JUNOS Routing Platforms and the SAE

For information about which JUNOS routing platforms and releases a particular SRC release supports, see the *SRC Release Notes*.

The SAE interacts with a JUNOS software process, referred to as the SRC software process in this documentation, on the JUNOS routing platform. The SAE and the SRC software process communicate using the Blocks Extensible Exchange Protocol (BEEP). You can secure the BEEP connection by using Transport Layer Security (TLS).

When the SRC software process establishes a BEEP session for the SAE, the SAE configures an interface on the JUNOS routing platform. The SAE builds the configuration for an interface using the policies stored in the directory. If the policies are subsequently modified, the SAE builds a new configuration and reconfigures the interface on the JUNOS routing platform. The JUNOS routing platform stores data about interfaces and services that the SAE manages in a configuration group called *sdx*. You must create this configuration group on the JUNOS routing platform.

Adding JUNOS Routing Platforms and Virtual Routers with the C-Web Interface

On JUNOS routing platforms, the SAE manages interfaces. The SRC software associates a virtual router called *default* with each JUNOS routing platform. Each JUNOS routing platform in the SRC network and its associated virtual router (VR) called *default* must appear in the directory. The VRs are not actually configured on the JUNOS routing platform; the VR in the directory provides a way for the SAE to manage the interfaces on the JUNOS routing platform.

There are two ways to add routers:

- Detect operative routers and configured JUNOS VRs in the SRC network and add them to the configuration.
- Add each router and VR individually.

Adding Operative JUNOS Routing Platforms

To add to the directory routers and JUNOS VRs that are currently operative and have an operating SNMP agent:

1. Click **Manage > Request > Network > Discovery**.
2. Enter information as described in the Help text in the main pane, and click **Apply**.

If you add a router using the discover network feature, the software adds the IP address of the first SNMP agent on the router to respond to the discover request.

Adding JUNOS Routers Individually

To add a router:

1. Click **Configure**, expand **Shared**, and then click **Network**.

The Shared Network pane appears.

2. From the Create new list, select **Device**.
3. Type a name for the new device in the dialog box, and click **OK**.

The Device pane appears.

4. From the Device Type list, select **JUNOS**.
5. Enter information as described in the Help text in the main pane, and click **Apply**.

Adding Virtual Routers Individually

To add a virtual router to an existing router:

1. Click **Configure**, expand **Shared > Network**, and then click a JUNOS router.

The Device pane appears.

2. From the Create new list, select **Virtual Router**.
3. Type a name for the new device in the dialog box, and click **OK**.

The Virtual Router pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For information about service scopes, see *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI*
- For information about tracking plug-ins, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*

Configuring the SAE to Manage JUNOS Routing Platforms with the C-Web Interface

A JUNOS routing platform interacts with the SAE by using a JUNOS software process called `sdx`. When the `sdx` process establishes a TCP/IP connection to the SAE, the SAE begins to manage the router. The JUNOS router driver configuration defines parameters related to the interactions between the SAE and the `sdx` process.

To configure the SAE to manage JUNOS routers:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **JUNOS**.

The JUNOS pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.

Configuring Secure Connections Between the SAE and JUNOS Routing Platforms

You can use TLS to protect communication between the SAE and JUNOS routing platforms.

To complete the handshaking protocol for the TLS connection, the client (JUNOS routing platform) and the server (SAE) must exchange and verify certificates. You need to create a client certificate and a server certificate. Both certificates must be signed by a certificate authority (CA). JUNOS software supports VeriSign, Inc. (<http://www.verisign.com>). You must then install both certificates on the SAE and on the JUNOS routing platform.

You can use the C-Web interface to manage certificates manually, or through the Simple Certificate Enrollment Protocol (SCEP).

Certificates are in the format defined in the X.509 standard for public key infrastructure. The certificate requests are in the Public Key Cryptology Standard (PKCS) #10 format.

Tasks to set up the SAE and the JUNOS routing platform to use TLS are:

1. Manually Obtaining Digital Certificates on page 173
- Or
2. Obtaining Digital Certificates through SCEP on page 174
3. Installing the Server Certificate on the Router on page 174
4. Creating a Client Certificate for the Router on page 175
5. Installing the Client Certificate on the Router on page 175
6. Configuring the SAE to Use TLS on page 175
7. Configuring TLS on the SAE on page 176

Manually Obtaining Digital Certificates

You can manually add digital certificates, or you can use SCEP to help manage how you obtain certificates. See *Obtaining Digital Certificates through SCEP* on page 174.

To manually add a signed certificate:

1. Create a certificate signing request.
 - a. Click **Manage > Request > Security > General Certificate Certificate**.
 - b. Enter information as described in the Help text in the main pane, and click **Apply**.

By default, this request creates the file `/tmp/certreq.csr` and encodes the file by using Privacy-Enhanced Mail (pem) encoding.

2. Copy the file generated in Step 1 to another system, and submit the certificate signing request file generated in Step 1 to VeriSign, Inc. (<http://www.verisign.com>) for signing.

You can transfer the file through FTP by using the `file copy` command.

```
user@host> file copy source_file ftp://username@server[:port]/destination_file
```

VeriSign authenticates you and returns a certificate, signed by them, that authenticates your public key.

3. When you receive the signed certificate, copy the file back to the SRC system to the `/tmp` directory.

You can transfer the file through FTP, as shown in Step 2.

4. Add the certificate to the SRC configuration.
 - a. Click **Manage > Request > Security > Import Certificate**.
 - a. Enter information as described in the Help text in the main pane, and click **Apply**.

Obtaining Digital Certificates through SCEP

You can use SCEP to help manage how you obtain digital certificates, or you can manually add certificates. See *Manually Obtaining Digital Certificates* on page 173.

Before you can obtain certificates for your use, you must get the CA's certificate and install it in the local store of trusted certificates.

To add a signed certificate that you obtain through SCEP:

1. Request your CA's certificate through SCEP.
 - a. Click **Manage > Request > Security > Get GA Certificate**.
 - b. Enter information as described in the Help text in the main pane, and click **Apply**.
2. Request that the certificate authority automatically sign the certificate request:
 - a. Click **Manage > Request > Security > Enroll**.
 - b. Enter information as described in the Help text in the main pane, and click **Apply**.

Installing the Server Certificate on the Router

The TLS client (JUNOS routing platform) needs a copy of the certificate that was used to sign the SAE certificate so that it can verify the SAE certificate. To install the SAE certificate on the JUNOS routing platform:

1. Include the following statements at the [edit security certificates certificate-authority] hierarchy level.


```
[edit security certificates certificate-authority]
security{
  certificates{
    certificate-authority SAE Cert{
      file /var/db/certs/cert.pem;
    }
  }
}
```
2. Include the following statements at the [system services service-deployment] hierarchy level.

```
system{
  services{
    service-deployment{
```



```

servers {
  server-address port port-number{
    security-options {
      tls;
    }
  }
}

```

Creating a Client Certificate for the Router

For information about how to obtain a certificate for the router from a certificate authority, see *Obtaining a Certificate from a Certificate Authority* in the *JUNOS System Basics Configuration Guide*.

Installing the Client Certificate on the Router

To install the client (router) certificate on the JUNOS routing platform:

1. Include the following statements at the [edit security certificates certificate-authority] hierarchy level.

```

[edit security certificates certificate-authority]
security{
  certificates{
    local clientCERT { .... } ;
  }
}

```

2. Include the following statements at the [system services service-deployment] hierarchy level.

```

system{
  services{
    service-deployment{
      local-certificate clientCert;
    }
  }
}

```

Configuring the SAE to Use TLS

To configure the SAE to accept TLS connections:

1. Click **Configure**, expand **Shared > Network**, and then click a JUNOS router.
The Device pane appears.
2. Type a port number in the Beep Server Port box, and click **Apply**.

Configuring TLS on the SAE

To configure TLS on the SAE:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver > JUNOS**, and then click **Security**.

The Security pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Checking Changes to the JUNOS Configuration with the C-Web Interface

The SAE can check the configuration of a JUNOS routing platform under its control to detect whether the configuration has changed by a means other than through the SAE. If the SAE finds a disparity between the router and the SAE configurations, it can take several actions. The SAE checks the configuration installed on the router against the state of the SAE session layer (subscriber, service, and interface sessions). While the check is occurring, the SAE does not handle jobs from the router, and all provisioning activity is blocked, including event notifications.

The SAE can take the following actions if it finds a disparity between the router and SAE configurations:

- The SAE takes the state of the session layer on the router to be correct and updates its local state to be consistent with the router. The SAE then sends stop events for all sessions where the corresponding provisioning in the router has been removed.
- The SAE takes its local state to be the correct state and updates the router to be consistent with its local state.
- The SAE does not solve the state discrepancy. It reports disparities through the SAE device driver event trap called `routerConfOutOfSynch` and through the info log.

Note that it is not possible to check the consistency of individual objects that the SAE provisions. Therefore, modifications to a provisioning object while the SAE is disconnected from the router cannot be detected.

Setting Up Periodic Configuration Checking

Use the following configuration statements to configure the SAE to periodically check the configuration of the JUNOS routing platform:

To configure the SAE to periodically check the configuration of the JUNOS routing platform:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver > JUNOS**, and then click **Configuration Checking**.

The Configuration Checking pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Using SNMP to Retrieve Information from JUNOS Routing Platforms

You can use SNMP to retrieve information from the router. For example, if you create a router initialization script that uses SNMP, you need to specify the SNMP communities that are on the router.

We recommend that you specify SNMP communities for each virtual router. (See *Adding Virtual Routers Individually* on page 171.) You can also configure global default SNMP communities.

Configuring Global SNMP Communities in the SRC Software

You can configure global default SNMP communities that are used if a VR does not exist on the router or if the community strings have not been configured for the VR.

To configure global default SNMP communities:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **SNMP**.

The SNMP pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Developing Router Initialization Scripts

When the SAE establishes a connection with a router, it can run a router initialization script to customize the setup of the connection. Router initialization scripts are run when the connection between a router and the SAE is established and again when the connection is dropped.

We provide the `iorPublisher` script in the `/opt/UMC/sae/lib` folder. The `iorPublisher` script publishes the IOR of the SAE into an internal part of the shared configuration so that a NIC can associate a router with an SAE.

Interface Object Fields

Router initialization scripts are written in the Python programming language (www.python.org) and executed in the Jython environment (www.jython.org).

Router initialization scripts interact with the SAE through an interface object called `Ssp`. The SAE exports a number of fields through the interface object to the script and expects the script to provide the entry point to the SAE.

Table 9 describes the fields that the SAE exports.

Table 9: Exported Fields

Ssp Attribute	Description
<code>Ssp.properties</code>	System properties object (class: <code>java.util.Properties</code>)—The properties should be treated as read-only by the script.
<code>Ssp.errorLog</code>	Error logger—Use the <code>Ssp.errorLog.println (message)</code> to send error messages to the log.
<code>Ssp.infoLog</code>	Info logger—Use the <code>Ssp.infoLog.println (message)</code> to send informational messages to the log.
<code>Ssp.debugLog</code>	Debug logger—Use the <code>Ssp.debugLog.println (message)</code> to send debug messages to the log.

The router initialization script must set the field `Ssp.routerInit` to a factory function that instantiates a router initialization object:

- `<VRName>` —Name of the virtual router in which the COPS client has been configured, in the format: `virtualRouterName@RouterName`
- `<virtualIp>` —Virtual IP address of the SAE (string, dotted decimal; for example: `192.168.254.1`)
- `<realIp>` —Real IP address of the SAE (string, dotted decimal; for example, `192.168.1.20`)
- `<VRIp>` —IP address of the virtual router (string, dotted decimal)
- `<transportVR>` —Name of the virtual router used for routing the COPS connection, or `None`, if the COPS client is directly connected

The factory function must implement the following interface:

```
Ssp.routerInit(VRName,
               virtualIp,
               realIp,
               VRIp,
               transportVR)
```

The factory function returns an interface object that is used to set up and tear down a connection for a given COPS server. A common case of a factory function is the constructor of a class.

The factory function is called directly after a COPS server connection is established. In case of problems, an exception should be raised that leads to the termination of the COPS connection.

Required Methods

Instances of the interface object must implement the following methods:

- *setup()*—Is called when the COPS server connection is established and is operational. In case of problems, an exception should be raised that leads to the termination of the COPS connection.
- *shutdown()*—Is called when the COPS server connection is terminated to the virtual router. This method should not raise any exceptions in case of problems.

Example: Router Initialization Script

The following script defines a router initialization class named *SillyRouterInit*. The interface class does not implement any useful functionality; it just writes messages to the infoLog when the router connection is created or terminated.

```
class SillyRouterInit:
    def __init__(self, vrName, virtualIp, realIp, vrIp, transportVr):
        """ initialize router initialization object """
        self.vrName = vrName
        Ssp.infoLog.println("SillyRouterInit created")

    def setup(self):
        """ initialize connection to router """
        Ssp.infoLog.println("Setup connection to VR %(vrName)s" %
                           vars(self))

    def shutdown(self):
        """ shutdown connection to router """
        Ssp.infoLog.println("Shutdown connection to VR %(vrName)s" %
                           vars(self))

#
# publish interface object to Ssp core
#
Ssp.routerInit = SillyRouterInit
```

Specifying JUNOS Router Initialization Scripts on the SAE with the C-Web Interface

To configure router initialization scripts for JUNOS routing platforms:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **Scripts**.

The Scripts pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Accessing the Router CLI

You can access the CLIs of Juniper Networks routers through a Telnet or secure shell connection.

- To open a Telnet session to a router, use the **telnet** operational mode command. For example:

```
user@host> telnet 10.10.10.3
```

- To open a secure shell connection, use the **ssh** operational command. For example:

```
user@host> ssh host 10.10.10.3
```

Configuring JUNOS Routing Platforms to Interact with the SAE

To configure the JUNOS routing platform to interact with the SAE:

1. Include the following statements at the [edit system services service-deployment] hierarchy level.

```
[edit system services service-deployment]
servers server-address {
  port port-number;
}
source-address source-address;
```

2. Use the following guidelines for the variables in these statements.

server-address

- Specifies the IP address of the host on which you install the SAE.
- Value—IP address
- Guidelines—Be sure this setting matches the corresponding value in the SAE configuration.
- Default—None
- Example—192.0.2.2

port-number

- Specifies the port number for the SAE.
- Value—TCP port number
- Guidelines—Be sure this setting matches the corresponding value in the SAE configuration.
- Default—3333
- Example—3333

source-address

- Specifies the IP address of the source that sends traffic to the SAE.
- Value—IP address
- Guidelines—This setting is optional.
- Default—None
- Example—192.0.2.2

Configuring the JUNOS Routing Platform to Apply Changes It Receives from the SAE

To configure the JUNOS routing platform to receive configuration statements from the SAE and apply those statements to the configuration:

1. Create a configuration group called `sdx` that contains the configuration statements that the SAE sends to the JUNOS routing platform. To do so, include the `groups` statement at the `[edit]` level, and specify the name `sdx`.

```
[edit]
groups {
  sdx;
}
```

2. Configure the JUNOS routing platform to apply these statements to the configuration. To do so, include the `apply-groups` statement at the `[edit]` level.

```
[edit]
set apply-groups sdx;
```

Disabling Interactions Between the SAE and JUNOS Routing Platforms

To disable the SRC software process, enter the following command:

```
root@ui1#set system processes service-deployment disable
root@ui1#commit
```

When you disable the SRC software process, it is still available on the JUNOS routing platform.

To reenable the SRC software process, enter the following command:

```
root@ui1#delete system processes service-deployment disable
root@ui1#commit
```

The SRC software process attempts to reconnect the JUNOS routing platform to the SAE.

Monitoring Interactions Between the SAE and JUNOS Routing Platforms

Use the following command on JUNOS routing platforms to monitor the connection between the JUNOS routing platform and the SAE.

```
root@ui1> show system services service-deployment
Connected to 172.17.20.151 port 3333 since 2004-02-06 14:50:31 PST
Keepalive settings: Interval 15 seconds
Keepalives sent: 100, Last sent: 6 seconds ago
Notifications sent: 0
Last update from peer: 00:00:06 ago
```

You can also monitor the interactions between the SRC software and JUNOS routing platforms in the log files for the SAE and in the log files generated by the SRC software process on the JUNOS routing platform.

- For information about configuring logging for the SAE, see *SRC-PE Monitoring and Troubleshooting Guide, Chapter 3, Configuring Logging for SRC Components with the CLI*.
- For information about configuring logging on JUNOS routing platforms, see *JUNOS System Basics Configuration Guide*.

Troubleshooting Problems with the SRC Software Process with the C-Web Interface

To troubleshoot SRC problems on the JUNOS routing platform, review the log files for the SAE and the log files generated by the SRC software process on the router. If the log files indicate that the SRC software process on the JUNOS routing platform is not responding:

1. Look at the status of the process on the JUNOS routing platform.

```
root@ui1>show system services service-deployment
Connected to 172.17.20.151 port 3333 since 2004-02-06 14:50:31 PST
Keepalive settings: Interval 15 seconds
Keepalives sent: 100, Last sent: 6 seconds ago
Notifications sent: 0
Last update from peer: 00:00:06 ago
```

2. If you see the message “error: the service-deployment subsystem is not running,” reenable the SRC software process. See *Disabling Interactions Between the SAE and JUNOS Routing Platforms* on page 181.
3. If the process is already enabled, review the configurations of the router and the SAE in the directory, and fix any problems.
4. Restart the SRC software process on the router.

```
root@ui1>restart service-deployment
```

The SAE synchronizes with the SRC software process and deletes unnecessary data from the router.

Deleting All SRC Data on JUNOS Routing Platforms

If deleting parts of the SRC data on a JUNOS routing platform fails to solve problems, delete all the SRC data and restart the SRC software process. To do so:

1. Delete all SRC interfaces and services.

```
delete groups sdx  
root@ui1#commit
```

2. If you are running SDX software releases 5.0 through 6.1, you should also delete interface sessions. (After release 6.2, session data is no longer stored on the router, it is stored on the SAE host using the session store feature.)

```
delete groups sdx-sessions  
root@ui1#commit
```

3. Restart the SRC software process on the router.

```
root@ui1>restart service-deployment
```

Viewing the State of JUNOS Device Drivers with the C-Web Interface

If the log files indicate a problem with a specific driver, review the configuration of the associated with the JUNOS device driver with the C-Web interface.

1. Click **Monitor > SAE > Drivers**.

The Drivers pane appears.

2. Enter information as described in the Help text in the main pane, and click **OK**.

The Drivers pane displays information about the JUNOS device driver.

Viewing Statistics for Specific JUNOS Device Drivers with the C-Web Interface

To view SNMP statistics about a specific JUNOS device driver:

1. Click **Monitor > SAE > Statistics > Device**.

The Device pane appears.

2. In the Device Name box, enter a full or partial device driver name for which you want to display information, or leave the box blank to display all devices.

For JUNOS router drivers and PCMM drivers, use the format:

```
default@<router name>
```

3. Enter information as described in the Help text in the main pane, and click **OK**.

The Device pane displays statistics for a specific JUNOS device driver.

Viewing Statistics for All JUNOS Device Drivers with the C-Web Interface

To view SNMP statistics for all JUNOS device drivers:

1. Click **Monitor > SAE > Statistics > Device > Common**.

The Common pane appears.

2. Enter information as described in the Help text in the main pane, and click **OK**.

The Common pane displays statistics for the JUNOS device drivers.

Chapter 19

Adding Objects for CMTS Devices with the C-Web Interface

This chapter describes how to configure objects for cable modem termination system (CMTS) devices with the C-Web interface. You can also use the SRC CLI or SDX Admin to add objects for CMTS devices:

- To use the SRC CLI, see *SRC-PE Solutions Guide, Chapter 6, Adding Objects for CMTS Devices with the SRC CLI*.
- To use SDX Admin, see *SRC-PE Solutions Guide, Chapter 7, Adding Objects for CMTS Devices to the Directory with SDX Admin*.

Topics in this chapter include:

- *Adding Objects for CMTS Devices with the C-Web Interface* on page 185
- *Creating Virtual Routers for the CMTS Device with the C-Web Interface* on page 186

Adding Objects for CMTS Devices with the C-Web Interface

To manage CMTS devices, the SAE creates and manages pseudointerfaces that it associates with a virtual router object. Each CMTS device in the SRC network must appear in the configuration as a router object, and it must be associated with a virtual router object called default. The router and virtual router are not actually configured on the CMTS device; the router and virtual router provide a way for the SAE to manage the CMTS device by using the SAE's embedded policy server.

To add a router:

1. Click **Configure**, expand **Shared**, and then click **Network**.

The Shared Network pane appears.

2. From the Create new list, select **Device**.
3. Type a name for the new device in the dialog box, and click **OK**.

The Device pane appears.

4. From the Device Type list, select **pccm**.
5. Enter information as described in the Help text in the main pane, and click **Apply**.

Creating Virtual Routers for the CMTS Device with the C-Web Interface

You need to add a virtual router object called default to the CMTS device.

To add a virtual router to an existing router:

1. Click **Configure**, expand **Shared > Network**, and then click a CMTS device.

The Device pane appears.

2. From the Create new list, select **Virtual Router**.
3. Type a name for the new device in the dialog box, and click **OK**.

The Virtual Router pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Chapter 20

Integrating Third-Party Network Devices into the SRC Network with the C-Web Interface

This chapter describes how to use the C-Web interface to integrate third-party network devices into the SRC network. You can use the C-Web interface to configure the SRC software on a Solaris platform or on a C-series Controller.

You can also use the SRC CLI to integrate third-party devices. For more information, see *SRC-PE Integration Guide, Chapter 1, Integrating Third-Party Network Devices into the SRC Network with the SRC CLI*.

Topics in this chapter include:

- Overview of Integrating Network Devices into the SRC Network on page 188
- Logging In Subscribers and Creating Sessions on page 189
- Configuration Tasks for Integrating Third-Party Network Devices with the C-Web Interface on page 193
- Setting Up Script Services with the C-Web Interface on page 194
- Adding Objects for Network Devices with the C-Web Interface on page 194
- Setting Up SAE Communities with the C-Web Interface on page 195
- Configuring SAE Properties for the Event Notification API with the C-Web Interface on page 196
- Developing Initialization Scripts for Network Devices with the C-Web Interface on page 196
- Using SNMP to Retrieve Information from Network Devices with the C-Web Interface on page 198
- Using the NIC Resolver with the C-Web Interface on page 199

Overview of Integrating Network Devices into the SRC Network

You can integrate third-party routers and other network devices into your SRC network. The SAE provides a driver that you can use to integrate the SAE with a third-party device. This device driver uses the session store to store and replicate subscriber and service session data within a community of SAEs.

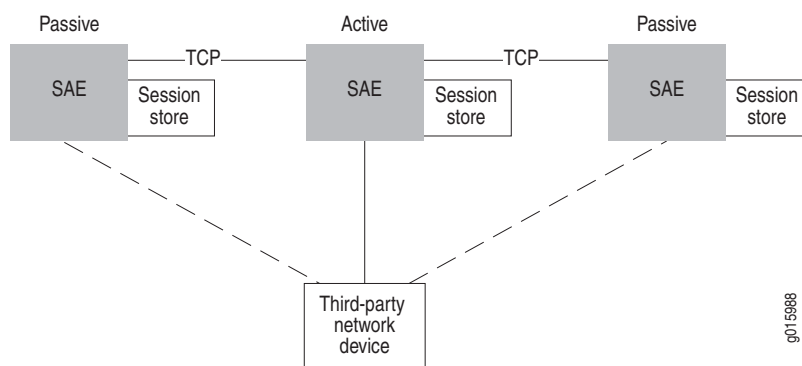
To log in subscribers to the SAE, you use assigned IP subscribers or event notification from an IP address manager.

To activate services and provision policies on the device, you use script services. You can also activate aggregate services for subscribers. However, you cannot activate normal services that require policies to be provisioned on the device.

SAE Communities

For SAE redundancy in an SRC network, you can have a community of two or more SAEs. SAEs in a community are given the role of either active SAE or passive SAE. The active SAE manages the connection to the network device and keeps session data up to date within the community. Figure 2 shows a typical SAE community.

Figure 2: SAE Community



When an SAE starts, it negotiates with other SAEs to determine which SAE controls the network device. The SAE community manager and members of the community select the active SAE.

A passive SAE needs to take over as active SAE in any of the following cases:

- The active SAE shuts down. In this case, the active SAE notifies the passive SAEs, and one of the passive SAEs takes over as active SAE.
- A passive SAE does not receive a keepalive message from the active SAE within the keepalive interval. In this case, the passive SAE attempts to become the active SAE.

Storing Session Data

To aid in recovering from an SAE failover, the SAE stores subscriber and service session data. When the SAE manages a network device, session data is stored in the SAE host's file system. The SRC component that controls the storage of session data on the SAE is called the session store. The session store queues data and then writes the data to session store files on the SAE host's disk. After the data has been written to disk, it can survive a server reboot.

For more information, see *Chapter 9, Configuring the SAE with the C-Web Interface*.

Using Script Services to Provision Third-Party Devices

You use script services to activate services and provision policies on third-party network devices. A script service is a service into which you can insert or reference a script. You write a script that will activate services and provision policies on the third-party device, and then you insert the script into the script service or reference the script in the service. When the SAE activates a service, it runs the script. The script provisions policies on the device using a means that the device supports. You can also include an interface in the script that causes the SAE to send authentication and tracking events when it activates, modifies, or deactivates a script service session.

The SAE core application programming interface (API) includes two interfaces for creating a script:

- **ScriptService**—Defines a service provider interface (SPI) that the script service must implement. The implementation of the ScriptService interface activates, modifies, or deactivates the service.
- **ServiceSessionInfo**—Provides a callback interface into the SAE and provides information about the service session to the script service.

For information about the ScriptService interface and the ServiceSessionInfo interface, see the script service documentation in the SRC software distribution in the folder *SDK/doc/sae* or in the SAE core API documentation on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx/api-index.html>

You can write the script in Java or Jython.

Logging In Subscribers and Creating Sessions

You can use two mechanisms to obtain subscriber address requests and other information and to set up a pseudointerface on the network device. (You must choose one mechanism; you cannot mix them.)

- **Assigned IP subscriber.** The SAE learns about a subscriber through subscriber-initiated activities, such as activating a service through the portal or through the SRC SOAP Gateway (SRC-SG).

With this method, you use the assigned IP subscriber login type along with the network interface collector (NIC) to map IP addresses to the SAE.

- Event notification from an IP address manager. The SAE learns about subscribers through notifications from an external IP address manager, such as a DHCP server or a RADIUS server.

With this method, you use the event notification application programming interface (API). The API provides an interface to the IP address manager, and lets the IP address manager notify the SAE of events such as IP address assignments.

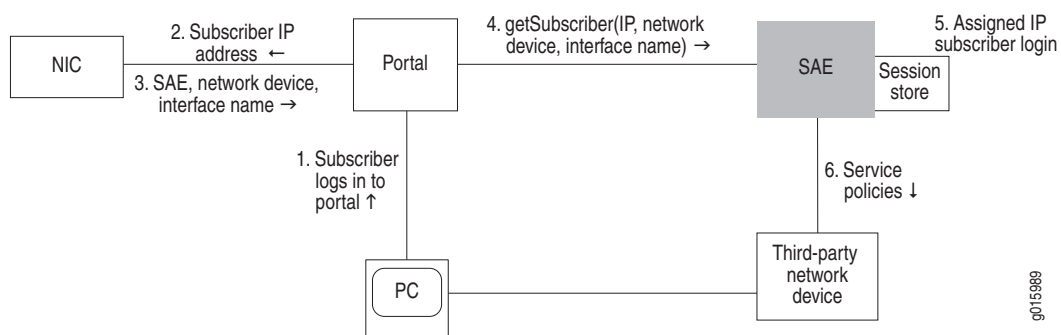
Assigned IP Subscribers

With the assigned IP subscriber method of logging in subscribers and creating sessions, the SRC software uses IP address pools along with network information collector (NIC) resolvers to provide mapping of IP addresses to SAEs. You configure the static address pools or dynamically discovered address pools in the virtual router configuration for a network device. These pools are published in the NIC. The NIC maps subscriber IP addresses in requests received through the portal or SRC-SG to the SAE that currently manages that network device.

Login Interactions with Assigned IP Subscribers

This section describes login interactions for assigned IP subscribers. In the example shown in Figure 3, the subscriber activates a service through a portal. You could also have the subscriber activate a service through the SRC-SG.

Figure 3: Login Interactions with Assigned IP Subscribers



The sequence of events for logging in and creating sessions for assigned IP subscribers is:

1. The subscriber logs in to the portal.
2. The portal sends the subscriber's IP address to the NIC.
3. Based on the IP address, the NIC looks up the subscriber's SAE, network device, and interface name, and returns this information to the portal.
4. The portal sends a getSubscriber message to the SAE. The message includes the subscriber's IP address, network device, and interface name.

5. The SAE creates an assigned IP subscriber and performs a subscriber login. Specifically, it:
 - a. Runs the subscriber classification script with the IP address of the subscriber. (Use the ASSIGNEDIP login type in subscriber classification scripts.)
 - b. Loads the subscriber profile.
 - c. Runs the subscriber authorization plug-ins.
 - d. Runs the subscriber tracking plug-ins.
 - e. Creates a subscriber session and stores the session data in the session store file.
6. The SAE pushes service policies for the subscriber session to the network device.

Because the SAE is not notified when the subscriber logs out, the assigned IP idle timer begins when no service is active. The SAE removes the interface subscriber session when the timeout period ends.

Event Notification from an IP Address Manager

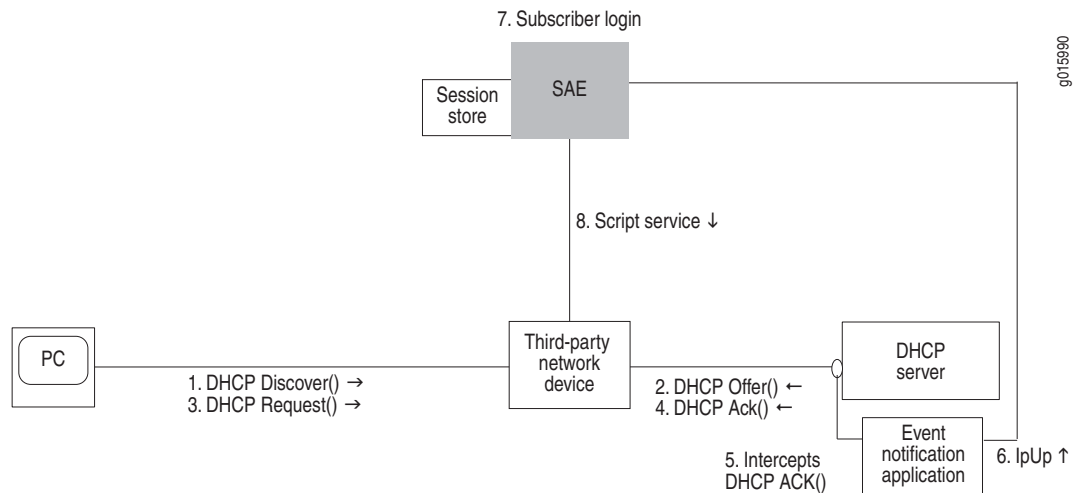
With the event notification method of logging in subscribers and creating subscriber sessions, the subscriber logs in to the network device and obtains an IP address through an address server, usually a DHCP server. The SAE receives notifications about the subscriber, such as the subscriber's IP address, from an event notification application that is installed on the DHCP server.

To use this method of logging in subscribers, you can use the event notification API to create the application that notifies the SAE when events occur between the DHCP server and the network device. You can also use Monitoring Agent, an application that was created with the event notification API and that monitors DHCP or RADIUS messages for DHCP or RADIUS servers. See the *SRC Sample Applications Guide*.

Login Interactions with Event Notification

This section describes login interactions by means of event notifications.

Figure 4: Login Interactions with Event Notification Application



The sequence of events for logging in subscribers and creating sessions is:

1. The DHCP client in the subscriber's computer sends a DHCP discover request to the DHCP server.
2. The DHCP server sends a DHCP offer to the subscriber's DHCP client.
3. The DHCP client sends a DHCP request to the DHCP server.
4. The DHCP server acknowledges the request by sending a DHCP Ack message to the DHCP client.
5. The event notification application that is running on the DHCP server intercepts the DHCP Ack message.
6. The event notification application sends an ipUp message to the SAE that notifies the SAE that an IP address is up.
7. The SAE performs a subscriber login. Specifically, it:
 - a. Runs the subscriber classification script.
 - b. Loads the subscriber profile.
 - c. Runs the subscriber authorization plug-ins.
 - d. Runs the subscriber tracking plug-ins.
 - e. Creates a subscriber session and stores the session in the session store file.
8. The SAE can start script services.

The ipUp event should be sent with a timeout set to the DHCP lease time. The DHCP server sends an ipUp event for each Ack message sent to the client. The SAE restarts the timeout each time it receives an ipUp event.

If the client explicitly releases the DHCP address (that is, it sends a DHCP release event), the DHCP server sends an ipDown event. If the client does not renew the address, the lease expires on the DHCP server and the timeout expires on the SAE.

Configuration Tasks for Integrating Third-Party Network Devices with the C-Web Interface

To integrate third-party devices into your SRC network, complete the following tasks:

- Write a script and add a script service that references the script.
See Setting Up Script Services with the C-Web Interface on page 194.
- Add objects for the devices.
See Adding Objects for Network Devices with the C-Web Interface on page 194.
- Configure an SAE community.
See Setting Up SAE Communities with the C-Web Interface on page 195.
- (Optional) Configure SAE properties for the event notification API if you are using the event notification method to log in subscribers.
See Configuring SAE Properties for the Event Notification API with the C-Web Interface on page 196.
- Configure the session store.
See Chapter 9, Configuring the SAE with the C-Web Interface.
- If you are using the event notification method to log in subscribers, integrate the SAE with an IP address manager. There are two ways to do so:
 - Use the event notification API to create an application that notifies the SAE when events occur between the DHCP server and the network device.

See the event notification API documentation in the SRC software distribution in the folder *SDK/doc/sae* or in the SAE CORBA remote API documentation on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx/api-index.html>
 - Use Monitoring Agent, an application that was created with the event notification API and that monitors DHCP or RADIUS messages for DHCP or RADIUS servers.

See the SRC Sample Applications Guide.

Setting Up Script Services with the C-Web Interface

To set up script services:

1. Write a script that implements the ScriptService interface, a service provider interface (SPI) for the SAE.

See *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI*.

See the script service documentation in the SRC software distribution in the folder *SDK/doc/sae* or in the SAE core API documentation on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx/api-index.html>

2. Add a script service that references the script.

See *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI*.

Adding Objects for Network Devices with the C-Web Interface

For each network device that the SAE manages, add a router object and virtual router object.

Adding a Router Object

To add a router object:

1. Click **Configure**, expand **Shared**, and then click **Network**.

The Shared Network pane appears.

2. From the Create new list, select **Device**.
3. Type a name for the new device in the dialog box, and click **OK**.

The Device pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Adding Virtual Router Objects

To add a virtual router to an existing router object:

1. Click **Configure**, expand **Shared > Network**, and then click an existing device.

The Device pane appears.

2. From the Create new list, select **Virtual Router**.

3. Type a name for the new device in the dialog box, and click **OK**.

The Virtual Router pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Setting Up SAE Communities with the C-Web Interface

Tasks to configure SAE communities are:

- Configuring the SAE Community Manager on page 195
- Specifying the Community Manager in the SAE Device Driver on page 195
- Specifying Interface Object Fields on page 196
- If there is a firewall in the network, configuring the firewall to allow SAE messages through.

Configuring the SAE Community Manager

To configure the SAE community manager that manages third-party device communities:

1. Click **Configure**, expand **Shared > SAE**, and then click the SAE group for which you want to manage third-party devices.

The Group pane appears.

2. In the side pane, expand **Configuration > External Interface Features: PCMMCommunityManager**, and then click **Community Manager**.

The Community Manager pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Specifying the Community Manager in the SAE Device Driver

To specify the community manager in the SAE device driver:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **Third Party**.

The Third Party pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring SAE Properties for the Event Notification API with the C-Web Interface

To configure properties for the event notification API:

1. Click **Configure**, expand **Shared > SAE**, and then click the SAE group for which you want to manage devices.

The Group pane appears.

2. In the side pane, expand **Configuration > External Interface Features: Event**, and then click **Event API**.

The Event API pane appears.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Developing Initialization Scripts for Network Devices with the C-Web Interface

When the SAE establishes a connection with a network device, it can run a script to customize the setup of the connection. These scripts are run when the connection between a network device and the SAE is established and again when the connection is dropped.

We provide the `IorPublisher` script in the `/opt/UMC/sae/lib` folder. The `IorPublisher` script publishes the interoperable object reference (IOR) of the SAE in the directory so that a NIC can associate a router with an SAE.

Interface Object Fields

Scripts for network devices interact with the SAE through an interface object called `Ssp`. The SAE exports a number of fields through the interface object to the script and expects the script to provide the entry point to the SAE.

Table 10 describes the fields that the SAE exports.

Table 10: Exported Fields

Ssp Attribute	Description
<code>Ssp.properties</code>	System properties object (class: <code>java.util.Properties</code>)—The properties should be treated as read-only by the script.
<code>Ssp.errorLog</code>	Error logger—Use the <code>SsperrorLog.println (message)</code> to send error messages to the log.
<code>Ssp.infoLog</code>	Info logger—Use the <code>Ssp.infoLog.println (message)</code> to send informational messages to the log.
<code>Ssp.debugLog</code>	Debug logger—Use the <code>Ssp.debugLog.println (message)</code> to send debug messages to the log.

The script must set the field `Ssp.routerInit` to a factory function that instantiates a router initialization object:

- `<VRName>` —Name of the virtual router object that has been configured for the network device in the format: `virtualRouterName@RouterName`
- `<virtualIp>` —Virtual IP address of the SAE (string, dotted decimal; for example: 192.168.254.1)
- `<realIp>` —Real IP address of the SAE (string, dotted decimal; for example, 192.168.1.20)
- `<VRip>` —IP address of the virtual router (string, dotted decimal)
- `<transportVR>` —Name of the virtual router

The factory function must implement the following interface:

```
Ssp.routerInit(VRName,
virtualIp,
realIp,
VRip,
transportVR)
```

The factory function returns an interface object that is used to set up and tear down a connection. A common case of a factory function is the constructor of a class.

The factory function is called directly after a connection is established. In case of problems, an exception should be raised that leads to the termination of the connection.

Required Methods

Instances of the interface object must implement the following methods:

- `setup()`—Is called when the connection is established and is operational. In case of problems, an exception should be raised that leads to the termination of the connection.
- `shutdown()`—Is called when the connection is terminated to the virtual router. This method should not raise any exceptions in case of problems.

Example: Initialization Script

The following script defines a router initialization class named *SillyRouterInit*. The interface class does not implement any useful functionality. The interface class just writes messages to the `infoLog` when the router connection is created or terminated.

```
class SillyRouterInit:
    def __init__(self, vrName, virtualIp, realIp, vrIp, transportVr):
        """ initialize router initialization object """
        self.vrName = vrName
        Ssp.infoLog.println("SillyRouterInit created")
```

```

def setup(self):
    """ initialize connection to router """
    Ssp.infoLog.println("Setup connection to VR %(vrName)s" %
                        vars(self))

def shutdown(self):
    """ shutdown connection to router """
    Ssp.infoLog.println("Shutdown connection to VR %(vrName)s" %
                        vars(self))

#
# publish interface object to Ssp core
#
Ssp.routerInit = SillyRouterInit

```

Copying Initialization Scripts to the C-series Controller

If you use a script that is not provided with the SRC software, you need to use the `file copy` command to copy your script to the C-series Controller. For example:

```

user@host> file copy ftp://user@myserver/routerinit.py /opt/UMC/sae/lib
Password:

```

Specifying Initialization Scripts on the SAE

To configure initialization scripts for third-party devices:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **Scripts**.

The Scripts pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Using SNMP to Retrieve Information from Network Devices with the C-Web Interface

You can use SNMP to retrieve information from a network device. For example, if you create a script that uses SNMP, specify the SNMP communities that are on the network device.

We recommend that you specify SNMP communities for each virtual router object. (See *Adding Virtual Router Objects* on page 194.) You can also configure global default SNMP communities.

Configuring Global SNMP Communities in the SRC Software

You can configure global default SNMP communities that are used if a VR does not exist on the router or the community strings have not been configured for the VR.

To configure global default SNMP communities:

1. Click **Configure**, expand **Shared > SAE > Configuration > Driver**, and then click **SNMP**.

The SNMP pane appears.

2. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Using the NIC Resolver with the C-Web Interface

If you are using the assigned IP subscriber method of logging in subscribers, and you are using the NIC to determine the subscriber's SAE, you need to configure a resolver on the NIC. The OnePopDynamicIp sample configuration data supports this scenario. The OnePopDynamicIp configuration supports one point of presence (POP) and provides no redundancy. The realm for this configuration accommodates the situation in which IP pools are configured locally on each virtual router object.

You can access the OnePopDynamicIp configuration in the SRC CLI. See *SRC-PE Network Guide, Chapter 10, Configuring NIC with the SRC CLI* for information about configuring NIC scenarios.

Part 6

Configuring Policies and Services

Chapter 21

Configuring and Managing Policies with the C-Web Interface

This chapter describes how to use the C-Web interface to configure and manage policies. You can also use the following to configure and manage policies:

- To use the SRC CLI, see *SRC-PE Services and Policies Guide, Chapter 10, Configuring and Managing Policies with the SRC CLI*.
- To use Policy Editor, see *SRC-PE Services and Policies Guide, Chapter 11, Configuring and Managing Policies with Policy Editor*.

Topics in this chapter include:

- Before You Configure Policies on page 203
- Enabling the Policy Configuration on the C-Web Interface on page 205
- Configuring Policy Folders with the C-Web Interface on page 205
- Configuring Policy Groups with the C-Web Interface on page 206
- Configuring Policy Lists with the C-Web Interface on page 206
- Configuring Policy Rules with the C-Web Interface on page 206
- Configuring Classify-Traffic Conditions with the C-Web Interface on page 208
- Configuring QoS Conditions with the C-Web Interface on page 217
- Configuring Actions with the C-Web Interface on page 218

Before You Configure Policies

Building policies is a top-down operation. For example, before you can add a subordinate to the policy group, the policy group itself must exist.

Creating a Worksheet

Before you configure policies, you must determine what information you want to enter and where it will go. It is best to create a worksheet where you can record such things as names, priorities, addresses, and so on.

To create a worksheet:

1. Determine the policy requirements for your system.
2. Consider information that contains (at a minimum) names and parameters for:
 - Policy group
 - Policy list
 - Policy rules
 - Conditions
 - Actions
3. Record the policy information about the worksheet.

Naming Objects

Object names must be unique and must conform to LDAP distinguished name (DN) constraints.

Using the `apply-groups` Statement

When you use the `apply-groups` statement on the JUNOS routing platform to apply a configuration group to a hierarchy level in a configuration, you need to make sure that the SAE configuration group (default name is `sdx`) is in the first position in the `apply-groups` statement.

Using Expressions

Many of the policy options can take expressions in addition to literal values. If you can enter an expression for an option, the expression type is noted in the documentation for the command. For information about using and formatting expressions, see *Expressions* in *SRC-PE Services and Policies Guide, Chapter 14, Defining and Acquiring Values for Parameters*.

Policy Values

As you are planning your policy configuration, you need to understand how invalid values in policies are handled on JUNOS routing platforms and JUNOSe routers.

SAE to JUNOS Routing Platforms

When the SAE sends policies to JUNOS routing platforms, it uses JUNOScript on the Blocks Extensible Exchange Protocol (BEEP), which is an XML-based protocol. Many of the configuration values in JUNOScript are strings in which the value is a number. If you enter an integer value that is too large, the policy software flags the entry as invalid, but the value is still sent to the router because JUNOScript on BEEP allows for its transmission. The router is the authority that decides whether values are valid for the particular version of the JUNOS software and the routing platform. If the value is too large, the router sends an error message to the SAE.

For example, the valid range for the burst size limit in a policer action is 1,500 to 100,000,000. If you specify a value greater than 100,000,000, it is flagged as invalid. However, as usual, the SRC software attempts to activate the service, but the activation will fail because the burst size is an invalid value on the router.

SAE to JUNOSe Routers

When the SAE sends policies to JUNOSe routers, it uses the Common Open Policy Service (COPS) protocol with specific standard Policy Information Bases (PIBs) and private PIBs. Many of the configuration values in the PIBs are not strings in which the value is a number. Sometimes the numeric range in the PIB is larger than the valid range of values on the router. For integer values in policies, the eventual policy on the router has only the portion of a value that can be converted to an integer in the usable range.

The example below for ToS byte is such a case. From the JUNOSe-IP-PIB:

```
...
JunoselpPolicyClaclRuleEntry ::= SEQUENCE {
...
junoselpPolicyClaclRuleTosByte Integer32,
junoselpPolicyClaclRuleTosMask Integer32,
...
}
```

If a policy has a literal ToS byte value of 300, the high bits are ignored (or a mask of 255 is used) so that the value used for the ToS byte is 44; that is, 300 minus 256.

Enabling the Policy Configuration on the C-Web Interface

Before you can configure policies with the C-Web interface, you must enable the policy, service, and subscriber editor. To do so:

1. Click **Manage > Enable**.
2. From the Component list, select **editor**.
3. Click **OK**.

Configuring Policy Folders with the C-Web Interface

You use policy folders to organize policy groups.

To create a policy folder:

1. Click **Configure > Policies**.
2. From the Create new list, select **Folder**. Type a name for the new folder, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Policy Groups with the C-Web Interface

Policy groups hold policy lists. You can create policy groups at the Policies level or within policy folders.

To create a policy group:

1. Click **Configure > Policies**. You can add the policy group at the Policies level, or you can expand **Policies** and select a folder for which you want to add the group.
2. From the Create new list, select **Group**. Type a name for the new group, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Policy Lists with the C-Web Interface

When you add a policy list, you specify whether the policy list is for JUNOS routing platforms, JUNOSe routers (junose-ipv4 or junose-ipv6), or a CMTS device (pcmm). The type of policy list that you add controls the type of policy rules that you can add to the policy list.

You create policy lists within policy groups.

To add a policy list:

1. Click **Configure > Policies**.
2. Expand **Policies**, and expand the policy group for which you want to add the list.
3. From the Create new list, select **List**. Type a name for the new list, and click **OK**.
4. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Policy Rules with the C-Web Interface

The type of policy rule that you can create depends on the type and applicability of the policy list in which you create the policy rule. For JUNOSe policy rules, there are two types—IPv4 and IPv6. For PCMM policy rules, there is only one type. For JUNOS policy lists, you can create the following policy rule types:

- JUNOS ASP—Applicability of policy list must be both.
- JUNOS FILTER—Applicability of policy list must be input or output.
- JUNOS POLICER—Applicability of policy list must be input or output.
- JUNOS SCHEDULER—Applicability of policy list must be both.

- JUNOS SHAPING—Applicability of policy list must be both.

Before You Configure JUNOS Policy Rules

The following are prerequisites to using policy rules on JUNOS routing platforms.

JUNOS Scheduler and JUNOS Shaping Policy Rules

Before you use the JUNOS scheduler and JUNOS shaping policy rules, check that your Physical Interface Card (PIC) supports JUNOS scheduling and shaping rate. Also, check that your interface supports the per-unit-scheduler.

You must enable the per-unit-scheduler on the interface. To do so, on the JUNOS routing platform, include the **per-unit-scheduler** statement at the [edit interfaces interface-name] hierarchy level:

```
[edit interfaces interface-name]
per-unit-scheduler;
```

JUNOS ASP Policy Rules

Before you use the Adaptive Services PIC (ASP) policy rule to create a stateful firewall or NAT policy, you must configure the Adaptive Services PIC on the JUNOS routing platform. For example:

```
sp-0/1/0 {
  unit 0 {
    family inet {
      address 10.10.1.1/32;
    }
  }
}
```

For more information about configuring Adaptive Services PICs, see the *JUNOS Services Interfaces Configuration Guide*.

Setting the Policy Rule Precedence

Policy lists can have more than one policy rule. Policy rules are assigned a precedence that determines the order in which the policy manager applies policy rules. Rules are evaluated from lowest to highest precedence value. For JUNOS policies, rules with equal precedence are evaluated in the order of creation. For JUNOS policies, rules with equal precedence are evaluated in random order.

Note that for JUNOS SCHEDULER and JUNOS POLICER policy rules, precedence is not a factor.

The router classifies packets beginning with the classify condition in the policy list that has the policy rule with the lowest precedence.

- If the packet matches the condition, the router applies the policy rule actions to the packet and does not continue to examine further conditions.
- If the packet does not match the condition, the router tries to match the packet with the classify condition in the policy rule with the next higher precedence.

- If the packet does not match any of the classify conditions, it is forwarded. There are some exceptions. For example, in the case of a JUNOS ASP stateful firewall, packets that do not match the classify conditions are dropped. Only matching packets are forwarded.

For JUNOSe routers, if you want the router to take two corresponding actions on a packet, you would create a JUNOSe policy list that has more than one policy rule with the same precedence. For example, you may want a policy rule that marks a packet and a policy rule that forwards the packet to the next interface. Or you could have a policy rule that applies a traffic class and a policy rule that forwards the packet to the next hop.

Adding a Policy Rule

You create policy rules within policy lists.

To add a policy rule:

1. In the side pane, select a policy list that has already been created and configured.
2. From the Create new list, select **Rule**. Type a name for the new rule, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Classify-Traffic Conditions with the C-Web Interface

You create classify-traffic conditions in JUNOSe policy rules, in JUNOS ASP and JUNOS filter policy rules, and in PCMM policy rules.

The available configuration statements change depending on the type of policy rule that holds the condition and on the type of protocol that you specify.

To configure a classify-traffic condition, do the following:

1. Create a classify-traffic condition. See:
 - [Creating a Classify-Traffic Condition on page 212](#)
2. Configure source networks. You can configure source networks in one of two formats. See:
 - [Configuring Source Networks on page 212](#)
 - [Configuring Source Grouped Networks on page 212](#)
3. Configure destination networks. You can configure destination networks in one of two formats. See:
 - [Configuring Destination Networks on page 212](#)
 - [Configuring Destination Grouped Networks on page 212](#)

4. Configure protocol conditions. The type of protocol condition that you use depends on your configuration.
 - To configure protocol conditions that do not include ports, see:
 - Configuring Protocol Conditions on page 213
 - To configure protocol conditions that include ports, see:
 - Configuring Protocol Conditions with Ports on page 213
 - To configure protocol conditions in which the protocol that you specify is a parameter, see:
 - Configuring Protocol Conditions with Parameters on page 214
 - To configure protocol conditions in which the protocol is TCP, see:
 - Configuring TCP Conditions on page 214
 - To configure protocol conditions in which the protocol is ICMP, see:
 - Configuring ICMP Conditions on page 215
 - To configure protocol conditions in which the protocol is IGMP, see:
 - Configuring IGMP Conditions on page 215
 - To configure protocol conditions in which the protocol is IPSec, see:
 - Configuring IPSec Conditions on page 215
 - To configure a ToS byte condition, see:
 - Configuring ToS Byte Conditions on page 215
5. For JUNOS filter policies, configure a JUNOS filter condition. See:
 - Configuring JUNOS Filter Conditions on page 216
6. For the stateful firewall and NAT policies, configure an application protocol condition. See:
 - Configuring Application Protocol Conditions on page 216



NOTE: PCMM classifiers support only the following classifiers:

- Source and destination IP addresses
- Network protocol
- Source or destination port
- Type-of-service (ToS) byte and ToS mask

The policy engine ignores all other values.

Before You Configure Classify-Traffic Conditions

If you are configuring classifiers for PCMM policies, you can specify whether the classifier will be used in a PCMM IO2 or IO3 network. By default, the software translates classify-traffic conditions into PCMM IO2 classifiers.

- See *Specifying the PCMM Classifier Type* on page 210.

For JUNOS policies, you can specify that the SAE expand the classifier into multiple classifiers before it installs the policy on the router.

- See *Enabling Expansion of JUNOS Classify-Traffic Conditions* on page 210.

Enabling Expansion of JUNOS Classify-Traffic Conditions

For information about expanded classifiers, see *Expanded Classifiers* in *SRC-PE Services and Policies Guide, Chapter 6, Policy Management Overview*.

To specify whether or not the SAE expands the JUNOS classify-traffic conditions into multiple classifiers before it installs the policy on the router:

1. Select **Configure**, and expand **Shared > SAE > Configuration > Policy Management Configuration**.
2. Check or clear the Enable JUNOS Classifier Expansion box, and click **Apply**.

Specifying the PCMM Classifier Type

To specify whether or not the SAE sends to the router classifiers that comply with PCMM IO3:

1. Select **Configure**, expand **Shared > SAE > Configuration > Driver**, and select **pcmm**.
2. Check or clear the Disable PCMM IO3 Policy box, and click **Apply**.

Specifying Port Access for Traffic Classification

In the SRC software, the way that you specify a range of port numbers greater than or less than a specific value in a traffic classifier is different from the way you define a range in the configuration on JUNOS routers.

In the C-Web interface, you specify ranges by setting values in the Port Operation boxes.

To specify a range of port numbers greater or less than a specified value, you can:

- Define the full set of port numbers in the range to be allowed.
- Define the full set of port numbers in the range not allowed.

To configure port numbers greater than a defined value by specifying which values are allowed:

1. From the Port Operation list, select **eq**.
2. In the From Port box, enter the range of ports allowed.

For example, to specify access to all port numbers greater than 10, specify **11..65535**.

To configure port numbers greater than a defined value by specifying which values are not allowed:

1. From the Port Operation list, select **neq**.
2. In the From Port box, enter the range of ports not allowed.

For example, to specify access to all port numbers greater than 10, specify **1..9**.

To configure port numbers less than a defined value by specifying which values are allowed:

1. From the Port Operation list, select **eq**.
2. In the From Port box, enter the range of ports.

For example, to specify access to all port numbers less than 10, specify **1..9**.

To configure port numbers less than a defined value by specifying which values are not allowed:

1. From the Port Operation list, select **neq**.
2. In the From Port box, enter the range of ports.

For example, to specify access to all port numbers less than 10, specify **11..65535**.

Creating a Classify-Traffic Condition

You create classify-traffic conditions within policy rules.

To add a classify-traffic condition:

1. In the side pane, select a policy rule.
2. From the Create new list, select **Traffic Condition**. Type a name for the traffic condition, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Source Networks

To configure a source network in a classify-traffic condition:

1. In the side pane, expand a traffic condition, expand **Source Network**, and select **Network**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Source Grouped Networks

You can configure source networks in grouped format. For JUNOS ASP policy rules, you must enter source networks in grouped format.

To configure a grouped source network in a classify-traffic condition:

1. In the side pane, expand a traffic condition, expand **Source Network**, and select **Group Network**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Destination Networks

To configure a destination network in a classify-traffic condition:

1. In the side pane, expand a traffic condition, expand **Destination Network**, and select **Network**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Destination Grouped Networks

You can configure destination networks in grouped format. For JUNOS ASP policies rules, you must enter destination networks in grouped format.

To configure a grouped destination network in a classify-traffic condition:

1. In the side pane, expand a traffic condition, expand **Destination Network**, and select **Group Network**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Protocol Conditions

The procedure in this sections shows how to configure general protocol conditions.

- If your condition includes port numbers, use the procedure in *Configuring Protocol Conditions with Ports* on page 213.
- If your condition consists of a protocol that is assigned with a parameter value, use the procedure in *Configuring Protocol Conditions with Parameters* on page 214.

To configure general protocol conditions in a classify-traffic condition:

1. In the side pane, expand a traffic condition, and select **Protocol Condition**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Protocol Conditions with Ports

To configure general protocol conditions with ports in a classify-traffic condition:

1. In the side pane, expand a traffic condition, and select **Protocol Port Condition**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

To configure source and destination ports for protocol conditions:

1. In the side pane, expand **Protocol Port Condition > Source Port**, and select **Port**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.
3. In the side pane, expand **Protocol Port Condition > Destination Port**, and select **Port**.
4. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Protocol Conditions with Parameters

Before you assign a parameter for the protocol, you must create a parameter of type protocol and commit the parameter configuration.

To configure a protocol condition that contains a parameter value for the protocol:

1. In the side pane, select a policy rule.
2. From the Create new list, expand a traffic condition, and select **Parameter Protocol Condition**.
3. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.
4. (Optional) To configure protocol attributes:
 - a. In the side pane, expand **Parameter Protocol Condition**, and select **Proto Attr**.
 - b. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

To configure source and destination ports:

1. In the side pane, expand **Proto Attr > Source Port**, and select **Port**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.
3. In the side pane, expand **Proto Attr > Destination Port**, and select **Port**.
4. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring TCP Conditions

To configure TCP conditions:

1. In the side pane, expand a traffic condition, and select **TCP Condition**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

To configure source and destination ports for TCP conditions:

1. In the side pane, expand **TCP Condition > Source Port**, and select **Port**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.
3. In the side pane, expand **TCP Condition > Destination Port**, and select **Port**.
4. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring ICMP Conditions

To configure ICMP conditions:

1. In the side pane, expand a traffic condition, and select **Icmp Condition**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring IGMP Conditions

To configure IGMP conditions:

1. In the side pane, expand a traffic condition, and select **Igmp Condition**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring IPsec Conditions

You can configure IPsec conditions for JUNOS policy rules.

To configure IPsec conditions:

1. In the side pane, expand a JUNOS traffic condition, and select **Ipsec**.
2. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring ToS Byte Conditions

Use this condition to define a particular traffic flow to the service's network for the DA IP field in the IP packet.

The CoS feature on JUNOS routing platforms supports DiffServ as well as six-bit IP header ToS byte settings. The DiffServ protocol uses the ToS byte in the IP header. The most significant six bits of this byte form the Differentiated Services code point (DSCP). The CoS feature uses DSCPs to determine the forwarding class associated with each packet. It also uses the ToS byte and ToS byte mask to determine IP precedence.

To configure ToS byte conditions in a classify-traffic condition:

1. In the side pane, expand a traffic condition, and select **ToS**.
2. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring JUNOS Filter Conditions

To configure traffic match conditions in JUNOS filter policy rules:

1. In the side pane, select a JUNOS filter policy rule.
2. From the Create new list, select **Traffic Condition**. Type a name for the traffic condition, and click **OK**.
3. In the side pane, expand the traffic condition, and select **Traffic Match Condition**.
4. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Application Protocol Conditions

You can define application protocols for the stateful firewall and NAT services to use in match condition rules. An application protocol defines application parameters by using information from network layer 3 and above. Examples of such applications are FTP and H.323.

Creating and Configuring an Application Protocol Condition

To create and configure an application protocol condition:

1. In the side pane, select an ASP policy rule.
2. From the Create new list, select **Traffic Condition**. Type a name for the traffic condition, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.
4. From the Create new list, select Application Protocol Condition. Type a name for the application protocol condition, and click **OK**.
5. Enter information as described in the Help text in the main pane, and click **Apply**.
6. (Optional) To configure protocol attributes:
 - a. In the side pane, expand the application protocol condition, and select **Proto Attr**.
 - b. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.
7. (Optional) To configure source ports:
 - a. In the side pane, expand **Proto Attr > Destination Port**, and select **Port**.
 - b. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.
8. (Optional) To configure destination ports:

- a. In the side pane, expand **Proto Attr > Source Port**, and select **Port**.
- b. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Using Map Expressions in Application Protocol Conditions

The application protocol condition is a case in which you might use a map expression to define multiple attributes in one option—the **application-protocol** option. Maps are a list of attributeName = value pairs separated by commas and enclosed in curly brackets. For example, the map {applicationProtocol = “ftp”, sourcePort = 123, inactivityTimeout = 60} supplies the application protocol, source port, and inactivity timeout in one option.

Another map {applicationType = “tcp”, inactivityTimeout = 60, destinationPort = 80} supplies the protocol, inactivity timeout, and destination port.

You can also create a local parameter, add a map expression as the default value of the parameter, and then enter the local parameter in the **application-protocol** option.

Configuring QoS Conditions with the C-Web Interface

You can create QoS conditions within JUNOS scheduler policy rules.

To create a QoS condition:

1. In the side pane, select a JUNOS scheduler policy rule.
2. From the Create new list, select **Qos Condition**. Type a name for the QoS condition, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Actions with the C-Web Interface

Actions define the action taken on packets that match conditions in a policy rule. You create actions within policy rules. The type of action that you can create depends on the type of policy rule. See *Supported Conditions and Actions* in *SRC-PE Services and Policies Guide, Chapter 6, Policy Management Overview*.

Configure the action as described in the following sections:

- Configuring DOCSIS Actions on page 219
- Configuring Filter Actions on page 219
- Configuring FlowSpec Actions on page 220
- Configuring Forward Actions on page 220
- Configuring Forwarding Class Actions on page 220
- Configuring Gate Spec Actions on page 221
- Configuring Loss Priority Actions on page 221
- Configuring Mark Actions on page 221
- Configuring NAT Actions on page 222
- Configuring Next-Hop Actions on page 222
- Configuring Next-Interface Actions on page 223
- Configuring Next-Rule Actions on page 223
- Configuring Policer Actions on page 224
- Configuring QoS Profile Attachment Actions on page 224
- Configuring Rate-Limit Actions on page 225
- Configuring Reject Actions on page 226
- Configuring Routing Instance Actions on page 226
- Configuring Scheduler Actions on page 227
- Configuring Service Class Name Actions on page 227
- Configuring Stateful Firewall Actions on page 228
- Configuring Traffic-Class Actions on page 228
- Configuring Traffic-Mirror Actions on page 228
- Configuring Traffic-Shape Actions on page 229

Configuring DOCSIS Actions

You can configure Data over Cable Service Interface Specifications (DOCSIS) actions for *PacketCable Multimedia Specification* (PCMM) policy rules.

The types of DOCSIS actions that you can create are:

- Best effort
- Downstream
- Non-real-time polling service
- Real-time polling service
- Unsolicited grant service
- Unsolicited grant service with activity detection
- Parameter—This is a DOCSIS action with the service flow scheduling type set to a trafficProfileType parameter. You must enter a trafficProfileType parameter that has been created and committed.

To configure a DOCSIS action:

1. In the side pane, select a PCMM policy rule.
2. From the Create new list, select the type of DOCSIS action that you want to create. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Filter Actions

Use this action to discard packets. You can configure filter actions for JUNOS filters and JUNOSe policy rules.

To configure a filter action:

1. In the side pane, select a JUNOS filter or JUNOSe policy rule.
2. From the Create new list, select **Filter**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring FlowSpec Actions

A FlowSpec is made up of two parts, a traffic specification (TSpec) and a service request specification (RSpec). The TSpec describes the traffic requirements for the flow, and the RSpec specifies resource requirements for the desired service. You can configure FlowSpec actions for PCMM policy rules.

To configure a FlowSpec action:

1. In the side pane, select a PCMM policy rule.
2. From the Create new list, select **Flow Spec**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Forward Actions

Use this action to forward packets, such as packets that are sent by means of a routing table. You can configure forward actions for JUNOS filters and JUNOS policy rules.

To configure a forward action:

1. In the side pane, select a JUNOS filter or JUNOS policy rule.
2. From the Create new list, select **Forward**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Forwarding Class Actions

You can configure forwarding class actions for JUNOS filter policy rules. The forwarding class action causes the router to assign a forwarding class to packets that match the associated classify-traffic condition.

To configure a forwarding class action:

1. In the side pane, select a JUNOS filter policy rule.
2. From the Create new list, select **Forwarding Class**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Gate Spec Actions

You can configure GateSpec actions for PCMM policy rules. See *Session Class ID* in *SRC-PE Services and Policies Guide, Chapter 6, Policy Management Overview* for more information.

To configure a Gate Spec action:

1. In the side pane, select a PCMM policy rule.
2. From the Create new list, select **Gate Spec**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Loss Priority Actions

You can configure loss priority actions for JUNOS filter policy rules. The loss priority action causes the router to assign a packet loss priority to packets that match the associated classify-traffic condition.

To configure a loss priority action:

1. In the side pane, select a JUNOS filter rule.
2. From the Create new list, select **Loss Priority**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Mark Actions

Use this action to mark packets. You can configure mark actions for JUNOSe and PCMM policy rules.

To configure a mark action:

1. In the side pane, select a JUNOSe or PCMM policy rule.
2. From the Create new list, select **Mark**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.
4. Expand the mark action, and select **Info**.
5. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring NAT Actions

You can configure NAT actions for JUNOS ASP policy rules. To configure a NAT action:

1. In the side pane, select a JUNOS ASP policy rule.
2. From the Create new list, select **NAT**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.
4. To configure the port range to restrict port translation when the NAT translation type is configured in dynamic-source mode:
 - a. In the side pane, select **Port**.
 - b. Click create, and enter information as described in the Help text in the main pane, and click **Apply**.
5. To configure the IP address ranges.
 - a. In the side pane, select **IP Network**.
 - b. In the main pane, click **Create**.
 - c. In the side pane, expand **IP Network**, and select **Group Network**.
 - d. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Next-Hop Actions

Use this action for the ingress side of the interface to specify the next IP address where the classified packets should go. You can configure next-hop actions for JUNOS filters and JUNOS policy rules.

Using the Next-Hop Action with the Captive Portal

The captive portal feature is used to intercept HTTP requests from a subscriber to an unauthorized Web resource and redirect the requests to a dedicated Web page, the captive portal page. See *SRC-PE Subscribers and Subscriptions Guide, Chapter 14, Redirecting Subscriber Traffic*.

In a captive portal environment, you would typically set up a next-hop action on a subscriber's interface that forwards traffic to the redirect engine. In this case, you would set the next-hop address to the address of the redirect server.

When you set up redirect server redundancy, both the active and redundant redirect servers share a virtual IP address so that subscribers can always reach the active redirect server. Subscribers send requests to the virtual IP address, and the router automatically sends the request to the active redirect server by means of a static route. In this case, you would set the next-hop address to the virtual IP address.

Configuring Next-Hop Action

To configure a next-hop action:

1. In the side pane, select a JUNOS filters or JUNOSe policy rules.
2. From the Create new list, select **Next Hop**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Next-Interface Actions

Use this action to forward packets to a particular interface and/or a next-hop address. You can configure next-interface actions for JUNOS filters and JUNOSe policy rules. On JUNOSe routers, you can use this action for both ingress and egress parts of the interface.

To configure a next-interface action:

1. In the side pane, select a JUNOS filter or JUNOSe policy rule.
2. From the Create new list, select **Next Interface**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Next-Rule Actions

You can configure next-rule actions for JUNOS filter policy rules. If a packet matches the classify-traffic condition, the next-rule action causes the router to continue to the next rule in the policy list for evaluation.

To configure a next-rule action:

1. In the side pane, select a JUNOS filter policy rule.
2. From the Create new list, select **Next Rule**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Policer Actions

The policer action specifies rate and burst size limits and the action taken if a packet exceeds those limits. You can create policer actions in JUNOS policer and JUNOS filter policy rules.

Each policer action has a packet action. The packet action specifies the action taken on a packet that exceeds its rate limits. You configure packet actions within policer actions. There are four types of actions that you can configure:

- **Filter**—Packets are discarded.
- **Forwarding class**—Packets are assigned to the forwarding class that you specify.
- **Loss priority**—Packets are assigned the loss priority that you specify.
- **Parameter**—The action specified by the parameter is applied. Before you assign a parameter, you must create a parameter of type packetOperation and commit the parameter configuration.

To configure a policer action:

1. In the side pane, select a JUNOS policer or JUNOS filter policy rule.
2. From the Create new list, select **Policer**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.
4. From the Create new list for the policer action, select **Packet Action**. Type a name for the action, and click **OK**.
5. Expand the packet action, and click on the type of packet action that you want to configure for this policer action.
6. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Configuring QoS Profile Attachment Actions

Use this action to specify the name of the QoS profile to attach to the router interface when this action is taken. You can configure QoS actions for JUNOS policy rules.

The router allows only one QoS profile to be attached to an interface at one time. Therefore, as a subscriber activates and deactivates different services, the QoS profile running on the interface needs to change. The SRC software provides a QoS-tracking plug-in (QTP) that you can use to ensure that as a subscriber activates and deactivates services, the required QoS profile is attached to the subscriber interface. See c.

To configure a QoS profile attachment action:

1. In the side pane, select a JUNOS policy rule.
2. From the Create new list, select **Qos Attach**. Type a name for the QoS profile attachment action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Rate-Limit Actions

Use this action to define the quality of service. You can configure rate-limit actions for JUNOS policy rules.

To configure a rate-limit action:

1. In the side pane, select a JUNOS policy rule.
2. From the Create new list, select **Rate Limit**. Type a name for the rate-limit action, and click **OK**.
3. From the **Type** list, select the type of rate-limit action, either `one_rate` or `two_rate`, and click **Apply**.

The screen changes to display the parameters that you can configure for the type of rate-limit action that you selected.

Configuring Actions for Rate-Limit Actions

Under the rate-limit action, there are three types of actions that you can configure:

- Committed action—Takes action on traffic flows that do not exceed the committed rate.
- Conformed action—Takes action on traffic flows that exceed the committed rate but remain below the peak rate.
- Exceed action—Takes action on traffic flows that exceed the peak rate.

For each committed, conformed, and exceed action, you can select one action to configure—filter, forward, mark, or parameter.

To configure an action for rate-limit actions:

1. Expand the rate-limit action, and expand the action that you want to configure.
1. To set an action to filter, in the side pane select **Filter**, and then click **Create** in the main pane.
2. To set an action to forward, in the side pane select **Forward**, and then click **Create** in the main pane.
3. To set an action to mark:

- a. In the side pane, expand **Mark** and select **Mark Info**.
 - b. In the main pane, click **Create**.
 - c. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.
4. To set an action to parameter:
 - a. Make sure that you have a packetOperation parameter configured.
 - b. In the side pane, select **Parameter**, and then click **Create** in the main pane.
 - c. In the **Action** list, select a parameter.
 - d. Click **Apply**.

Configuring Reject Actions

You can configure reject actions for JUNOS filter policy rules. The reject action causes the router to discard a packet and send an ICMP destination unreachable message.

To configure a reject action:

1. In the side pane, select a JUNOS filter policy rule.
2. From the Create new list, select **Reject**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Routing Instance Actions

You can configure routing instance actions for JUNOS filter policy rules. Use routing instance actions for filter-based forwarding to direct traffic to a specific routing instance configured on the router.

To configure a routing instance action:

1. In the side pane, select a JUNOS filter policy rule.
2. From the Create new list, select **Routing Instance**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Scheduler Actions

You use scheduler actions along with QoS conditions and traffic-shape actions to configure transmission scheduling and rate control. Schedulers define the priority, bandwidth, delay buffer size, rate control status, and random early detection (RED) drop profiles to be applied to a particular class of traffic. You can create scheduler actions in JUNOS scheduler policy rules.

To configure a scheduler action:

1. In the side pane, select a JUNOS schedule policy rule.
2. From the Create new list, select **Scheduler Action**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Drop Profiles

You configure drop profiles within scheduler actions. Drop profiles support the RED process by defining the drop probabilities across the range of delay-buffer occupancy. For a packet to be dropped, it must match the drop profile. When a packet arrives, RED checks the queue fill level. If the fill level corresponds to a nonzero drop probability, the RED algorithm determines whether to drop the arriving packet. Depending on the drop probabilities, RED might drop packets aggressively long before the buffer becomes full, or it might drop only a few packets even if the buffer is almost full.

In drop profiles you configure the queue threshold and drop probability as paired values. The values can be either percentage values (segmented) or data points (interpolated). These two alternatives enable you to configure each drop probability at up to 64 fill-level/drop-probability paired values, or to configure a profile represented as a series of line segments. For more information about configuring fill level and drop probabilities, see the JUNOS routing platform documentation.

To configure drop profiles:

1. In the side pane, select a scheduler action.
2. From the Create new list, select **Drop Profile**. Type a name for the drop profile, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Service Class Name Actions

You can configure service class name actions for PCMM policy rules.

To configure a service class name action:

1. In the side pane, select a PCMM policy rule.
2. From the Create new list, select **Service Class Name**. Type a name for the action, and click **OK**.

3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Stateful Firewall Actions

You can configure stateful firewall actions for JUNOS ASP policy rules. Stateful firewall actions specify the action to take on packets that match the classify-traffic condition.

1. In the side pane, select a JUNOS ASP policy rule.
2. From the Create new list, select **Stateful Firewalls**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.
4. Expand the policy list and expand **Packet Action**.

A list of actions that can be taken on a packet appears in the side pane. You can configure one type of action.

5. Select the action that you want to configure for the stateful firewall, and click **Create**.
6. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Traffic-Class Actions

Use this action to put packets in a particular traffic class. You can configure traffic-class actions for JUNOS policy rules.

To configure a traffic-class action:

1. In the side pane, select a JUNOS policy rule.
2. From the Create new list, select **Traffic Class**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Traffic-Mirror Actions

Use this action to mirror traffic from a destination to a source or from a source to a destination. You can configure traffic-mirror actions for JUNOS filter input policy rules.

Before you use traffic-mirror actions, you must configure forwarding options on JUNOS routing platforms for port mirroring and next-hop group. For information about how these features work on the router, see the *JUNOS Policy Framework Configuration Guide*.

The rule containing a traffic-mirror action must comply with these conditions:

- It must be combined with forward actions in the same rule. One of the forward actions must accept the traffic if the source and/or destination IP addresses do not match the conditions.
- It contains either no classify-traffic condition or only one classify-traffic condition.
- It can be marked for accounting.

To configure a traffic-mirror action:

1. In the side pane, select a JUNOS filter policy rule.
2. From the Create new list, select **Traffic Mirror**. Type a name for the action, and click **OK**.
3. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Traffic-Shape Actions

Traffic-shape actions specify the maximum rate of traffic transmitted on an interface. You can create traffic-shape actions in JUNOS shaping policy rules.

To configure a traffic-shape action:

1. In the side pane, select a JUNOS shaping policy rule.
2. From the Create new list, select **Traffic Shape**. Type a name for the action, and click **OK**.
3. To create a new value for the Rate parameter, enter a value in the box, and click **Add**.
4. Enter information as described in the Help text in the main pane, and click **Apply**.

Chapter 22

Configuring Local and Global Parameters with the C-Web Interface

This chapter describes how to configure global and local parameters with the C-Web Interface. You can also use the following to configure parameters:

- To use the SRC CLI, see *SRC-PE Services and Policies Guide, Chapter 10, Configuring and Managing Policies with the SRC CLI*.
- To use Policy Editor, see *SRC-PE Services and Policies Guide, Chapter 9, Configuring Local and Global Parameters with Policy Editor*.

Topics in this chapter include:

- Viewing Predefined Global Parameters with the C-Web Interface on page 231
- Configuring Global Parameters with the C-Web Interface on page 232
- Configuring Local Parameters with the C-Web Interface on page 232
- Viewing Runtime Parameters with the C-Web Interface on page 233

Viewing Predefined Global Parameters with the C-Web Interface

To view predefined global parameters:

1. Click **Configure > Policies**, and then expand Global Parameters.

Configuring Global Parameters with the C-Web Interface

If you change global variables for policies, the change takes effect the next time a service is activated; the change does not take effect for active service sessions.

To create a global parameter:

1. Click **Configure > Policies**, and select **Global Parameters**.
2. In the Create new list, select **Parameter**. Type a name for the new parameter, and click **OK**.
3. Enter information as described in the help text in the main pane, and click **Apply**.

Related Topics

For valid values of each parameter type, see *SRC-PE Services and Policies Guide, Chapter 8, Overview of Using Local and Global Parameters*.

Configuring Local Parameters with the C-Web Interface

You create local parameters within a policy group.

To configure local parameters:

1. In the side pane, expand a policy group, and select **Local Parameters**.
2. In the Create new list, select **Parameter**. Type a name for the new parameter, and click **OK**.
3. Enter information as described in the help text in the main pane, and click **Apply**.

Related Topics

For valid values of each parameter type, see *SRC-PE Services and Policies Guide, Chapter 8, Overview of Using Local and Global Parameters*.

Viewing Runtime Parameters with the C-Web Interface

Runtime parameters are parameters that are filled in with an actual value from the running system when the policy is installed. The SRC software comes with many predefined runtime parameters.

To view runtime parameters:

1. Click **Configure > Policies > Global Parameters > Runtime Parameters**.
2. In the side pane, select the runtime parameter that you want to view.

Chapter 23

Configuring Services with the C-Web Interface

This chapter describes how to configure services with the C-Web interface.

You can also use the following to configure services:

- To use the SRC CLI, see *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI*.
- To configure the SRC software on a Solaris platform, see *SRC-PE Services and Policies Guide, Chapter 2, Managing Services on a Solaris Platform*.

Topics in this chapter include:

- Enabling the Service Configuration on the C-Web Interface on page 236
- Before You Configure Services on page 236
- Adding a Normal Service with the C-Web Interface on page 236
- Setting Parameter Values for Services with the C-Web Interface on page 237
- Configuring Service Fragments for an Aggregate Service with the C-Web Interface on page 237
- Configuring Timers for Aggregate Services with the C-Web Interface on page 238
- Adding an Infrastructure Service with the C-Web Interface on page 238
- Configuring Script Services with the C-Web Interface on page 239
- Adding a Mutex Group with the C-Web Interface on page 239
- Configuring Service Scopes with the C-Web Interface on page 240
- Example: Configuring a Limited Set of Services for Organizations with the C-Web Interface on page 241
- Example: Customizing Generic Services to Particular Regions with the C-Web Interface on page 243

Enabling the Service Configuration on the C-Web Interface

Before you can configure services with the C-Web interface, you must enable the policy, service, and subscriber editor on the C-Web interface. To do so:

1. Click **Manage > Enable**.

The Enable pane appears.

2. From the Component list, select **editor**, and click **OK**.

Before You Configure Services

Before you configure services:

- Plan the services that you want to make available to subscribers.
- Configure the policies for a service to use. For information about configuring policies, see *Configuring and Managing Policies with the C-Web Interface* on page 203.

Related Topics

- *SRC-PE Services and Policies Guide, Chapter 3, Managing Service Schedules*

Adding a Normal Service with the C-Web Interface

To add a normal service:

1. Click **Configure**, and expand **Services**.
2. You can add a normal service to the global service scope or to a service scope.
 - To add a normal service to the global service scope, click **Global**.
 - To add a normal service to the service scope, click the specified scope.
3. In the Create new list, select **Service**.
4. In the dialog box, type a name for the new Service. and click **OK**.

The Service: *< name >* pane appears.

5. Enter information as described in the Help text in the main pane, and click **Apply**.

Setting Parameter Values for Services with the C-Web Interface

Using parameters, you can define general settings in one SRC object and provide specific values for that setting in another object. For example, you can define the general settings for a rate limiter in a policy, insert a parameter for a rate in the policy, and provide specific values for the rate in each service that uses this policy. For information about the concept of parameters, see *SRC-PE Services and Policies Guide, Chapter 14, Defining and Acquiring Values for Parameters*.

To configure parameters for services:

1. Click **Configure**, and expand **Services**.
2. You can configure a parameter for services in the global service scope or in a service scope.
 - To configure a parameter for services in the global service scope, expand **Global**, and then expand the specified service.
 - To configure a parameter for services in the service scope, expand the specified scope and service.
3. Click **Parameter**.

The Parameter pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Service Fragments for an Aggregate Service with the C-Web Interface

To configure service fragments for an aggregate service:

1. Click **Configure**, and expand **Services**.
2. You can configure service fragments for an aggregate service in the global service scope or in a service scope.
 - To configure service fragments for an aggregate service in the global service scope, expand **Global**, and then expand the specified service.
 - To configure service fragments for an aggregate service in the service scope, expand the specified scope and service.

Related Topics

- *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI, Aggregating Services*

Configuring Timers for Aggregate Services with the C-Web Interface

You can change the values for several timers to specify the intervals associated with monitoring and activating aggregate sessions.

To configure timers used by aggregate services:

1. Click **Configure**, and expand **Shared > SAE > Configuration**.
2. Click **Aggregate Services**.

The Aggregate Services pane appears.

3. Click the **Create** button.

The Aggregate Services pane reappears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI, Aggregating Services*

Adding an Infrastructure Service with the C-Web Interface

To add an infrastructure service:

- Add the service to be shared, as described in *Adding a Normal Service with the C-Web Interface* on page 236.
 - a. When entering information in the Services pane, select **Infrastructure** from the Type list.
 - b. Type a name in the RADIUS Class box to configure the name of the service to be shared.

Related Topics

- *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI, Sharing Service Provisioning*

Configuring Script Services with the C-Web Interface

Before you configure a script service, make sure that you know the location of the script file that the service will reference.

To configure a script service:

1. Add a service as described in *Adding a Normal Service with the C-Web Interface* on page 236.
2. When entering information in the Services pane, select **Script** from the Type list.

Related Topics

- *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI, Extending Service Implementations with Script Services*

Adding a Mutex Group with the C-Web Interface

You can add a mutex group in the global service scope or in a service scope.

To add a mutex group:

1. Click **Configure**, and expand **Services**.
2. To add a mutex group in the global service scope:
 - a. Click **Global**.
 - b. From the Create new list, select **Mutex Group**.
 - a. Type a name for the new mutex group in the dialog box, and click **OK**.
3. To add a mutex group in the service scope:
 - a. Click the specified scope.
 - b. From the Create new list, select **Mutex Group**.
 - c. Type a name for the new mutex group in the dialog box, and click **OK**.
4. The Mutex Group: *< name >* pane appears.
5. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI, Restricting Simultaneous Activation of Services*

Configuring Service Scopes with the C-Web Interface

The tasks to configure a service scope are:

1. Adding Service Scopes with the C-Web Interface on page 240
2. Assigning Services and Mutex Groups to Service Scopes with the C-Web Interface on page 240
3. Assigning Service Scopes to VRs or Subscribers with the C-Web Interface on page 241

Adding Service Scopes with the C-Web Interface

To add a service scope:

1. Click **Configure > Services**.

The Services pane appears.

2. From the Create new list, select **Scope**.
3. Enter a name for the new Scope, and click **OK**.

The Scope: *< name >* pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Assigning Services and Mutex Groups to Service Scopes with the C-Web Interface

To assign services and mutex groups to a scope:

1. Click **Configure**, and expand **Services**.
2. Click the specified scope.

The Scope: *< name >* pane appears.

3. From the Create new list, select **Mutex Group** or **Service**.
4. In the dialog box, type a name for the new mutex group or service, and click **OK**.

Assigning Service Scopes to VRs or Subscribers with the C-Web Interface

You can assign multiple service scopes to a VR or subscriber, and you can assign a service scope to multiple VRs and subscribers.

To assign a service scope:

1. Click **Configure**, and expand **Shared**.
2. Expand **Network** and the specified device.
3. Click the specified virtual router.

The Virtual Router: *<name>* pane appears.

4. In the **Scope** box, select a virtual router as described in the Help text in the main pane, and click **Apply**.

Related Topics

- *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI, Restricting and Customizing Services for Subscribers*

Example: Configuring a Limited Set of Services for Organizations with the C-Web Interface

You can use service scopes to create a limited set of services to be made available to specified organizations. For enterprise users, you can define a set of services available on the JUNOS routing platform.

To deliver a small set of services to specified enterprises:

1. Create a scope for the services to be made available. For example, see the EntJunos scope in the sample data. For information about loading the sample data, see the *SRC-PE Getting Started Guide*.

To display the sample data:

- a. Click **Configure**, and expand **Services**.
- b. Click **EntJUNOS**.

The EntJUNOS pane appears.

2. Add services to the scope, such as those in the sample data in the EntJunos scope.
 - a. Expand **EntJunos** to view the list of services in the sample data.
 - b. To add services to the scope:
 - From the Create new list, select **Service**.
 - In the dialog box, type a name for the new service, and click **OK**.

The Service pane appears.

 - Enter information as described in the Help text in the main pane, and click **Apply**.
3. Assign the scope to one or more enterprise subscribers. For example, assign the EntJunos scope to the Acme enterprise.

To assign the EntJunos scope to the Acme enterprise:

- a. Click **Configure > Subscribers**.
- The Subscribers pane appears.
- b. From the Create new list, select **Retailer**.
 - c. In the dialog box, type **ENT**, and click **OK**.
 - d. In the side pane, click **Ent**.
- The Subscribers pane appears.
- e. From the Create new list, select **Subscriber Folder**.
 - f. In the dialog box, type **entAcme**, and click **OK**.
 - g. In the side pane, click **entAcme**.
- The Subscriber pane appears.
- h. From the Create new list, select **Enterprise**.
 - i. In the dialog box, type **Acme**, and click **OK**.
 - j. From the Scope box in the main pane, select **EntJunos**, and click **Apply**.

If you use a portal to manage enterprises, you see only the services for the specified scope from the portal. Other services are not visible to the IT managers who manage services and subscriptions from the enterprise service portal. To see the services available to Acme from Enterprise Manager Portal, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 24, Managing Services with Enterprise Manager Portal*.

Example: Customizing Generic Services to Particular Regions with the C-Web Interface

You can use service scopes to customize a generic audio service called Audio-Bronze on a regional basis. This example assumes that the network is configured so that VR boston serves the Boston subnet and VR chicago serves the Chicago subnet.

When the network starts operating, the SAE substitutes the parameters you specified in the service scope definition for the corresponding fields in the service subordinate to that scope.

To customize the new service Audio-Bronze for the Boston and Chicago subnets:

1. Add the Audio-Bronze service within a service scope called boston, and configure the IP address and mask used by VR boston in the parameter configuration.

This IP address and mask determine an access point to the service provider's equipment.

- a. Click **Configure**, and expand **Services**.
- b. Click **POP-Boston**.
- c. From the Create new list, select **Service**.
- d. In the dialog box, enter **Audio-Bronze**, and click **OK**.
- e. In the side pane, expand **Audio-Bronze**, and click **Parameter**.

The Parameter pane appears.

- f. Click the **Create** button.
- g. In the Service IP Address box, type **10.10.40.33**.
- h. In the Service IP Mask box, type **255.255.255.255**, and click **Apply**.
2. Add another Audio-Bronze service within a service scope called chicago, and specify the IP address and mask used by VR chicago.

To do this:

- a. Click **Services**.

The Services pane appears.

- b. From the Create new list, select **Scope**.
- c. In the dialog box, enter **chicago**.
- d. In the side pane, click **chicago**.
- e. From the Create new list, select **Service**.

- f. In the dialog box, enter **Audio-Bronze**, and click **OK**.
 - g. In the side pane, expand **Audio-Bronze**, and click **Parameter**.
The Parameter pane appears.
 - h. Click the **Create** button.
 - i. In the Service IP Address box, type **10.10.55.1**.
 - j. In the Service IP Mask box, type **255.255.255.255**, and click **Apply**.
3. Assign service scope boston to virtual router boston.
To do this:
 - a. In the side pane, expand **Shared**, and click **Network**.
The Network pane appears.
 - b. From the Create new list, select **Device**.
 - c. In the dialog box, type **BostonRouter**, and click **OK**.
 - d. In the side pane, click **BostonRouter**.
The Device: BostonRouter pane appears.
 - e. From the Create new list, select **Virtual Router**.
 - f. In the dialog box, type **multimedia**, and click **OK**.
 - g. In the side pane, click **multimedia**.
The Virtual Router: multimedia pane appears.
 - h. In the Scope box, type **multimedia**.
4. Assign service scope chicago to virtual router chicago.
 - a. Expand **Shared**, and click **Network**.
The Network pane appears.
 - b. From the Create new list, select **Device**.
 - c. In the dialog box, type **ChicagoRouter**, and click **OK**.
 - d. In the side pane, click **ChicagoRouter**.
The Device:ChicagoRouter pane appears.

- e. From the Create new list, select **Virtual Router**.
- f. In the dialog box, enter **chicago**, and click **OK**.
- g. In the side pane, click **chicago**.

The Virtual Router: chicago pane appears.

- h. In the Scope box, select **chicago**, and click **Apply**.

Chapter 24

Scheduling Services with the C-Web Interface

This chapter describes how to create and manage schedules for services with the C-Web interface. You can also use the following to schedule services:

- To use the SRC CLI, see *SRC-PE Services and Policies Guide, Chapter 4, Scheduling Services with the SRC CLI*.
- To use the Solaris platform, see *SRC-PE Services and Policies Guide, Chapter 5, Scheduling Services on a Solaris Platform*.

Topics in this chapter include:

- Setting the Action Threshold and Preparation Time with the C-Web Interface on page 248
- Authorizing Scheduled Services with the C-Web Interface on page 248
- Adding a Service Schedule with the C-Web Interface on page 249
- Example: Configuring Different Service Tiers for Different Days with the C-Web Interface on page 256
- Example: Configuring a Service to Be Active During Nonwork Hours with the C-Web Interface on page 259
- Example: Configuring a Service to Be Available for a Specified Interval with the C-Web Interface on page 264

Setting the Action Threshold and Preparation Time with the C-Web Interface

You can set the action threshold and preparation time for all schedules; you cannot set these values for individual schedules.

To set the action threshold and preparation time for an SAE:

1. Click **Configure**, expand **Shared > SAE > Configuration**, and click **Time Based Policies**.

The Time Based Policies pane appears.

2. Click the **Create** button.
3. Enter the information as described in the Help text in the main pane, and click **Apply**.

Authorizing Scheduled Services with the C-Web Interface

You can configure an authorization plug-in to authorize a scheduled service by specifying the name of the plug-in that authorizes the schedule in the service definition. You can configure an authorization plug-in for a service in the global configuration and in the service scope.

Defining an Authorization Plug-In for a Scheduled Service in the Global Configuration with the C-Web Interface

To define an authorization plug-in for a scheduled service in the global configuration:

1. Click **Configure**, and expand **Services > Global**.

The Global pane appears.

2. Click the specified **Service**.

The Service: *<name>* pane appears.

3. In the Authorization Plug In box, select the name of the authorization plug-in that will authorize the schedule for this service. For example, select **scheduleAuth** in the Suggested values box, and click the right arrow to move it to the Selected values box.
4. Click **Apply**.

Defining an Authorization Plug-In for a Scheduled Service in the Service Scope with the C-Web Interface

To define an authorization plug-in for a scheduled service in the service scope:

1. Click **Configure**, and expand **Services** and the specified scope.
2. Click the specified service.

The Service: < name > pane appears.

3. In the Authorization Plug In box, select the name of the authorization plug-in that will authorize the schedule for this service. For example, select **scheduleAuth** in the Suggested values box, and click the right arrow to move it to the Selected values box.
4. Click **Apply**.

Related Topics

- *Adding a Service Schedule with the C-Web Interface* on page 249

Adding a Service Schedule with the C-Web Interface

You can create a service schedule for the following objects:

- Scopes
- Services
- Retailers
- Enterprises
- Subscribers in an enterprise



NOTE: If you change or remove the name of a service that is referenced by a schedule, the SRC software treats this case like one in which no subscribers have a subscription to this service. In both cases, the action for the service is not taken. The software does not regard either case as an error in the schedule; a failure is not reported.

Adding a Service Schedule for Scopes with the C-Web Interface

To add a service schedule for scopes:

1. Click **Configure**, expand **Services**, and click the specified scope.

The Scope: < name > pane appears.

2. From the Create new list, select **Schedule**.

3. In the dialog box, enter a name for the new Schedule, and click **OK**.

The Schedule: < *name* > pane appears.

4. In the Description box, type a unique name for the service schedule, and click **Apply**.

5. A number of schedule events, or rules, constitute each service schedule. To create schedule events for the service schedule:

- a. From the Create new list, select **Event**.
- b. In the dialog box, type a name for the new Event, and click **OK**.

An event consists of the schedule time, any excluded times, and a list of actions.

- To specify the time schedule, see *Setting the Time Schedule with the C-Web Interface* on page 253.
- To specify the actions, see *Setting the Action with the C-Web Interface* on page 255.

Adding a Service Schedule for Services with the C-Web Interface

To add a service schedule for services:

1. Click **Configure**, expand **Services**, and click **Global**.

The Global pane appears.

2. From the Create new list, select **Schedule**.
3. In the dialog box, enter a name for the new Schedule, and click **OK**.
The Schedule: < *name* > pane appears.
4. In the Description box, type a name for the service schedule, and click **Apply**.
5. A number of schedule events, or rules, constitute each service schedule. To create schedule events for the service schedule:
 - a. From the Create new list, select **Event**.
 - b. In the dialog box, type a name for the new Event, and click **OK**.

An event consists of the schedule time, any excluded times, and a list of actions.

- To specify the time schedule, see *Setting the Time Schedule with the C-Web Interface* on page 253.
- To specify the actions, see *Setting the Action with the C-Web Interface* on page 255.

Adding a Service Schedule for Retailers with the C-Web Interface

To add a service schedule for retailers:

1. Click **Configure**, expand **Subscribers**, and click a specified retailer.
The Retailer: *< name >* pane appears.
2. From the Create new list, select **Schedule**.
3. In the dialog box, enter a name for the new Schedule, and click **OK**.
The Schedule: *< name >* pane appears.
4. In the Description box, type a name for the service schedule, and click **Apply**.
5. A number of schedule events, or rules, constitute each service schedule. To create schedule events for the service schedule:
 - a. From the Create new list, select **Event**.
 - b. In the dialog box, type a name for the new Event, and click **OK**.

An event consists of the schedule time, any excluded times, and a list of actions.

- To specify the time schedule, see *Setting the Time Schedule with the C-Web Interface* on page 253.
- To specify the actions, see *Setting the Action with the C-Web Interface* on page 255.

Adding a Service Schedule for Enterprises with the C-Web Interface

To add a service schedule for enterprises:

1. Click **Configure**, and expand **Subscribers**.
2. Navigate to the enterprise for which you want to configure a schedule. For example, expand the following specified folders:
retailer > subscriber folder > enterprise > schedule.
The Schedule: *< name >* pane appears.
3. From the Create new list, select **Schedule**.
4. In the dialog box, enter a name for the new Schedule, and click **OK**.
The Schedule: *< name >* pane appears.
5. In the Description box, type a name for the service schedule, and click **Apply**.

6. A number of schedule events, or rules, constitute each service schedule. To create schedule events for the service schedule:
 - a. From the Create new list, select **Event**.
 - b. In the dialog box, type a name for the new Event, and click **OK**.

An event consists of the schedule time, any excluded times, and a list of actions.

- To specify the time schedule, see *Setting the Time Schedule with the C-Web Interface* on page 253.
- To specify the actions, see *Setting the Action with the C-Web Interface* on page 255.

Adding a Service Schedule for Subscribers in an Enterprise with the C-Web Interface

To add a service schedule for subscribers in an enterprise:

1. Click **Configure**, and expand **Subscribers**.
2. Navigate to the schedule configuration for the specified schedule. For example, expand the following specified folders:
retailer > subscriber folder > subscriber > schedule.

The Schedule: < name > pane appears.

3. From the Create new list, select **Schedule**.
4. In the dialog box, enter a name for the new Schedule, and click **OK**.

The Schedule: < name > pane appears.

5. In the Description box, type a description for the service schedule, and click **Apply**.
6. A number of schedule events, or rules, constitute each service schedule. To create schedule events for the service schedule:
 - a. From the Create new list, select **Event**.
 - b. In the dialog box, type a name for the new Event, and click **OK**.

An event consists of the schedule time, any excluded times, and a list of actions.

- To specify the time schedule, see *Setting the Time Schedule with the C-Web Interface* on page 253.
- To specify the actions, see *Setting the Action with the C-Web Interface* on page 255.

Setting the Time Schedule with the C-Web Interface

Before you configure the time schedule, create the schedule. See *Adding a Service Schedule for Scopes with the C-Web Interface* on page 249.

When you set up a time schedule for an event, you specify:

- For event schedules—Time at which an action is to occur; the from date and time information
- For schedules for services that have authorization configured—Beginning and end of the interval; the to date and time information
- For exclusions—Times to be excluded from that schedule

To configure the time schedule:

1. Click **Configure**, and navigate to the specified service schedule.
2. From the Create new list, select **Except** (to set an exclusion).
3. In the dialog box, type a name for the new Except. The specified name is not stored as an identifier, so the arbitrary value can be as simple as a number.
4. Click **From** in the side pane.

The From pane appears.

5. Click the **Create** button.

The From pane reappears. This pane allows you to specify the effective period in which to schedule the event. This period is the interval after the associated from or to time during which the scheduled action can be initiated by a subscriber who is logging in to a subscriber session.

6. Enter the information as described in the Help text in the main pane, and click **Apply**. Use the guidelines in *Guidelines for Entering Time Values* on page 254.
7. Click **To** in the side pane.

The To pane appears.

8. Click the **Create** button.

The To pane reappears. This pane allows you to specify the effective period in which to schedule the event. This period is the interval after the associated from or to time during which the scheduled action can be initiated by a subscriber who is logging in to a subscriber session.

9. Enter the information as described in the Help text in the main pane, and click **Apply**. Use the guidelines in *Guidelines for Entering Time Values* on page 254.

Guidelines for Entering Time Values

When you enter time schedules, you can use the values in the following list. See *Setting the Time Schedule with the C-Web Interface* on page 253 for a description of the options.



NOTE: Dates in the **to** statements apply only to services that have an authorization plug-in configured. If an authorization plug-in is not configured for the service associated with the schedule, the events in the **to** statements are ignored. For more information, see *Authorizing Scheduled Services with the C-Web Interface* on page 248.

- *—Asterisks are interpreted as follows:
 - Minutes and hours:
 - 0 if used in the **from** or **to** statements of a scheduled event
 - First or last if used in the statements of a schedule exclusion
 - Time zones—Local SAE time zone
 - All other options—First through last
 - For options in the **to** statements, * for the end time is equivalent to “deny service activation after this start date.”
 - For dates in the **from** statements, * is equivalent to “deny service activation before this end date.”
- Range of numbers separated by a hyphen. The range is inclusive; for example, 1-5 for the hour specifies hours 1, 2, 3, 4, and 5.
- List of numbers or ranges separated by commas. For example, 1,2,5,9 or 0-4,8-12.
- Skip values in ranges:
 - To skip a number’s value through the range, follow a range with / < number > . For example, 0-23/2 used in the **hour** option specifies that the event occurs every other hour.
 - Skip values with *. If you want to specify every two hours, use */2.



NOTE: If you set both a day of the month and a day of the week, the day of the month is used.

Setting the Action with the C-Web Interface

Before you configure the time schedule, create the schedule. See *Adding a Service Schedule for Scopes with the C-Web Interface* on page 249.

To configure the actions for the service schedule:

1. Click **Configure**, and navigate to the specified service schedule.
2. Click **Event** in the side pane.

The Event: *< name >* pane appears.

3. From the Create new list:

- a. Select **Action**.
- b. In the dialog box, type a name for the new Action, and click **OK**. The specified name is not stored as an identifier, so the arbitrary value can be as simple as a number.

The Action: *< name >* pane appears.

4. Enter the information as described in the Help text in the main pane, and click **Apply**.

- The Type values (deny and deny-deactivate) apply only to services that have an authorization plug-in configured. For more information, see *Authorizing Scheduled Services with the C-Web Interface* on page 248.
- For more information about the Substitution box, see the `activateService` method of the SAE external interface in the SAE CORBA remote API documentation in the SRC software distribution in the folder *SDK/doc/idl* or on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx/api-index.html>

Related Topics

- *Example: Configuring Different Service Tiers for Different Days with the C-Web Interface* on page 256
- *SRC-PE Services and Policies Guide, Chapter 14, Defining and Acquiring Values for Parameters*

Defining Attributes for Service Activation with the C-Web Interface

To define the attributes for service activation:

1. Click **Configure** and access the service schedule for the objects for which you can create a service schedule. The following example provides steps for defining attributes for service activation for a subscriber action.
2. Expand **Subscribers** and expand the following specified folders:
retailer > subscriber folder > subscriber > schedule > event > action.
3. Click **Attribute**.

The Attribute pane appears.

4. From the Create new list, select the attribute to set before the service is activated.

The Attribute < name > pane appears.

5. In the dialog box, type a value as described in the Help text in the main pane, and click **Apply**.

Subscription attributes apply only to service activations.

For more information about subscription attributes, see the *Subscription.html* file in the SAE core portal API documentation in the *SDK/doc/sae/net/juniper/smg/sae/portal* directory in the SRC software distribution or on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx/api-index.html>

Example: Configuring Different Service Tiers for Different Days with the C-Web Interface

This example shows how to configure a schedule for an audio service to provide:

- Gold level of service on weekends
- Bronze level of service on weekdays

The sample schedule:

- Uses the Audio-Gold and Audio-Bronze services in the sample data.
- Activates the Audio-Gold service and denies the Audio-Bronze service on Saturday.
- Activates the Audio-Bronze service and denies and deactivates the Audio-Gold service on Monday.
- Does not have a preparation time configured for the SAE.

For demonstration purposes, the sample schedule is configured in the global configuration to make the service schedule available to all subscribers to the two audio services. It is assumed that subscribers are continuously logged in to the system to access the audio services.

To configure a schedule to make the Audio-Gold service available on Saturday and Sunday and the Audio-Bronze service available for the rest of the week:

1. Enter a unique name for the service schedule (for example, audioSchedule):
 - a. Click **Configure**, expand **Services**, and Click **Global**.
The Global pane appears.
 - b. From the Create new list, select **Schedule**.
 - c. In the dialog box, type **audioSchedule** as the name of the new Schedule, and click **OK**.
The Schedule: audioSchedule pane appears.
 - d. In the Description box, type a description of the service schedule, and click **Apply**.
2. Enter a name for the schedule event (for example, audioTime1):
 - a. From the Create new list, select **Event**.
 - b. In the dialog box, type **audioTime1** as the name of the new Event, and click **OK**.
 - c. From the Create new list, select **Action**.
 - d. In the dialog box, type **action-1**, and click **OK**.
The Action: action-1 pane appears.
 - From the Service list, select **Audio-Gold**.
 - From the Type list, select **activate**, and click **Apply**.
 - e. In the side pane, click **From** under the **Event: audioTime1** folder.
The From pane appears.
 - f. Click the **Create** button.
The From pane reappears.

3. For the time, specify the day of the week as Saturday, and for the actions, specify activate for the Audio-Gold Service and deny-deactivate for the Audio-Bronze service:
 - a. In the Day Of Week box, type **6** (specifying Saturday), and click **Apply**.
 - b. In the side pane, click **Event: audioTime1**.
The Event: audioTime1 pane appears.
 - c. From the Create new list, select **Action**.
 - d. In the dialog box, type **action-2**, and click **OK**.
The Action: action-2 pane appears.
 - From the Service list, select **Audio-Bronze**.
 - From the Type list, select **deny-deactivate**, and click **Apply**.
4. Enter a name for the schedule event (for example, audioTime2):
 - a. In the side pane, click **Schedule: audioSchedule**.
The Schedule: audioSchedule pane appears.
 - b. From the Create new list, select **Event**.
 - c. In the dialog box, type **audioTime2** as the name of the new Event, and click **OK**.
 - d. From the Create new list, select **Action**.
 - e. In the dialog box, type **action-1**, and click **OK**.
The Action: action-1 pane appears.
 - From the Service list, select **Audio-Bronze**.
 - From the Type list, select **activate**, and click **Apply**.
 - f. In the side pane, click **From** under the **Event: audioTime2** folder.
The From pane appears.
 - g. Click the **Create** button.
The From pane reappears.

5. For the time, specify the day of the week as Monday, and for the actions, specify activate for the Audio-Bronze service and deny-deactivate for the Audio-Gold service:
 - a. In the Day Of Week box, type **1** (specifying Monday), and click **Apply**.
 - b. In the side pane, click **Event: audioTime2**.
The Event: audioTime2 pane appears.
 - c. From the Create new list, select **Action**.
 - d. In the dialog box, type **action-2**, and click **OK**.
The Action: action-2 pane appears.
 - From the Service list, select **Audio-Gold**.
 - From the Type list, select **deny-deactivate**, and click **Apply**.

Example: Configuring a Service to Be Active During Nonwork Hours with the C-Web Interface

This example shows how to configure a schedule for the Internet-Gold service in the sample data to be active:

- Monday–Friday outside the 8:30 AM to 4:30 PM work day
- January 1 of the following year—All day

The sample schedule:

- Deactivates the Internet-Gold service from 8:30 AM through 4:29 PM.
- Activates the service at 4:30 PM.
- Does not have a preparation time configured for the SAE.

This configuration avoids schedule overlap.

For demonstration purposes, the sample schedule is configured in the global configuration to make the service schedule available to all subscribers to the Internet-Gold service.

To configure a schedule to make a service available outside work hours and on January 1:

1. Specify the default schedule authorization plug-in for the Internet-Gold service:

- a. Click **Configure**, expand **Services > Global**, and click **Service: Internet-Gold**.

The Service: Internet-Gold pane appears.

- b. In the Authorization Plug In box:

- Type **scheduleAuth** in the Optionally, add a new value box, and click **Add**.

ScheduleAuth displays in the Selected values box.

- In the Selected values box, select **scheduleAuth** and click **Apply**.

2. Enter a unique name for the service schedule (for example, afterHours):

- a. Click **Global**.

The Global pane appears.

- b. From the Create new box, select **Schedule**.

- c. In the dialog box, type **afterHours** as the name of the new Schedule, and click **OK**.

The Schedule: afterHours pane appears.

- d. In the Description box, enter a description for the schedule, and click **Apply**.

3. Enter a name for the schedule event (for example, goldTime):

- a. From the Create new list, select **Event**.

- b. In the dialog box, type **goldTime** as the name of the new Event, and click **OK**.

4. For the time, specify the day of the week as Monday through Friday, and the schedule starting at 8:30 AM and ending at 4:29 PM (16:29) each day:
 - a. In the side pane, expand **Event: goldTime**, and click **From**.
The From pane appears.
 - b. Click the **Create** button, and enter these values in the following boxes:
 - Day Of Week: 1
 - Hour: 8
 - Minute: 30
 - c. Click **Apply**.
 - d. In the side pane, click **To** under the **Event: goldTime** folder.
The To pane appears.
 - e. Click the **Create** button, and enter these values in the following boxes:
 - Day Of Week: 5
 - Hour: 16
 - Minute: 29
 - f. Click **Apply**.
5. Enter a name for the exclusion (for example, exclude-1), and specify a one-time exclusion for January 1:
 - a. In the side pane, click **Event: goldTime**.
 - b. From the Create new box, select **Except**.
 - c. In the dialog box, type **exclude-1**
 - d. In the side pane, click **From** under the **Except: exclude-1** folder.
The From pane appears.
 - e. Enter these values in the following boxes:
 - Day of Month: 1
 - Month: 1

By excluding January 1 from the schedule, the Internet-Gold service is active all day.
 - f. Click **Apply**.

6. Enter a name for the action (for example, action-1), and specify deny-deactivate for the Internet-Gold service:
 - a. In the side pane, click **Event: goldTime**.

The Event: goldTime pane appears.
 - b. From the Create new list, select **Action**.
 - c. In the dialog box, type **action-1** as the name of the new Action, and click **OK**.

The Action: action-1 pane appears.

 - In the Service list, select **Internet-Gold**.
 - In the Type list, select **deny-deactivate**, and click **Apply**.
7. Enter a name for the schedule event (for example, goldTime2):
 - a. In the side pane, click **Schedule: afterHours**.

The Schedule: afterHours pane appears.
 - b. In the Create new list, select **Event**.
 - c. In the dialog box, type **goldTime2**, and click **OK**.
8. Specify the time schedule as 4:30 PM (that is, 16:30):
 - a. In the side pane, expand **Event: goldTime2**, and click **From**.

The From pane appears.
 - b. Click the **Create** button.

The From pane reappears.
 - c. Enter these values in the following boxes:
 - Hour: 16
 - Minute: 30
 - d. Click **Apply**.

9. Enter a name for the exclusion (for example, exclude-2), and specify a one-time exclusion for January 1:

- a. In the side pane, click **Event: goldTime2**.
- b. From the Create new box, select **Except**.
- c. In the dialog box, type **exclude-2**, and click **OK**.
- d. In the side pane, click **From** under the **Except: exclude-2** folder.

The From pane appears.

- e. Enter these values in the following boxes:

- Set Month: 1
- Set Day-Of-Month: 1

By excluding January 1 from the schedule, the Internet-Gold service is active all day.

- f. Click **Apply**.

10. Enter a name for the action (for example, action-2), and specify activate for the Internet-Gold service:

- a. In the side pane, click **Event: goldTime2**.
- b. From the Create new list, select **Action**.
- c. In the dialog box, type **action-2** as the name of the new Action, and click **OK**.

The Action: action-2 pane appears.

- In the Service list, select **Internet-Gold**.
- In the Type list, select **activate**, and click **Apply**.

Example: Configuring a Service to Be Available for a Specified Interval with the C-Web Interface

You can use an effective period for a schedule to make a service available to subscribers who log in during a specified time period. The following example shows how to configure a schedule to make a service available from 8 AM until 4 PM.

To make a specified service available from 8 AM until 4 PM:

1. Enter a unique name for the service schedule (for example, `effectiveHours`):
 - a. Click **Configure**, expand **Services**, and click **Global**.

The Global pane appears.
 - b. From the Create new list, select **Schedule**.
 - c. In the dialog box, type **effectiveHours**, and click **OK**.

The Schedule: `effectiveHours` pane appears.
 - d. In the Description box, enter a description for the schedule, and click **Apply**.
2. Enter a name for the schedule event (for example, `availableTime`):
 - a. From the Create new list, select **Event**.
 - b. In the dialog box, type **availableTime** as the name of the new Event, and click **OK**.
3. For the time, specify when the service is first available — 8:00 AM — and for how long the service is to be available — 480 minutes:
 - a. In the side pane, expand **Event: availableTime**, and click **From**.

The From pane appears.
 - b. Click the **Create** button and enter these values in the following boxes:
 - Hour: 8
 - Effective: 480
 - c. Click **Apply**.

4. Enter a name for the action (for example, action-1), and specify activate for the Internet-Gold service:

- a. In the side pane, click **Event: availableTime**.

The Event: availableTime pane appears.

- b. From the Create new list, select **Action**.

- c. In the dialog box, type **action-1** as the name of the new Action, and click **OK**.

The Action: action-1 pane appears.

- In the Service list, select **Internet-Gold**.
- In the Type list, select **activate**, and click **Apply**.

Chapter 25

Managing Tiered and Premium Services with QoS on JUNOSe Routers with the C-Web Interface

This chapter describes how to use the C-Web interface to manage QoS services that are available on JUNOSe routers.

You can also use the SRC CLI to manage QoS services. For more information, see *SRC-PE Solutions Guide, Chapter 1, Managing Tiered and Premium Services with QoS on JUNOSe Routers with the SRC CLI*.

Topics include:

- Overview of QoS on JUNOSe Routers on page 267
- Dynamically Managing QoS Profiles on page 268
- Configuring QoS Profile-Tracking Plug-Ins with the C-Web Interface on page 273
- Updating QoS Profile Data in the Directory on page 274
- Searching for QoS Policy Data in the Directory on page 277

Overview of QoS on JUNOSe Routers

Tiered Internet access and premium services such as video on demand, gaming, or videoconferencing require QoS profiles to be running on the subscriber interface on the JUNOSe router. The router allows only one QoS profile to be attached to an interface at one time. Therefore, as a subscriber activates and deactivates different services, the QoS profile running on the interface needs to change. Also, as subscribers activate services, they may have multiple QoS services running at the same time; for example, internet-gold with videoconferencing.

With the SRC software, you can:

- Dynamically manage QoS profiles on the JUNOSe router to control a combination of services that require QoS.
- Update the directory and SDX Admin with a list of QoS profiles that are currently configured on a JUNOSe router.
- Search the directory for QoS policy information.

Dynamically Managing QoS Profiles

The SAE provides a QoS-tracking plug-in (QTP) that you can use to ensure that, as a subscriber activates and deactivates services, the required QoS profile is attached to the subscriber interface. With the QTP, the QoS profile selected is based on the activation state of an aggregation of services, not just one service.

For example, a subscriber activates a QoS service on a subscriber interface that requires a QoS profile that supports 512 best effort. The subscriber then activates a faster service (for example, 1024 best effort), as well as video on demand, and now has two QoS services running on an interface. The subscriber now needs a QoS profile to be attached to the interface that supports both video on demand and 1024 best-effort service. The QTP can determine which QoS profile the subscriber needs, and can cause the existing QoS profile to be removed from the subscriber interface and the new QoS profile to be attached to the interface.

Note that if a profile is installed on a subscriber interface and the QTP installs a new profile, the new profile is based on QoS services that are currently active. The new profile does not combine the functionality of the previous profile with the new profile. For example, if a subscriber has a default policy with QoS profile be-512 installed on the subscriber interface, and the subscriber activates a video-on-demand service, the QTP does not combine the functionality of be-512 with the profile that supports video on demand.

How QoS Profile Tracking Works

The SAE manages policies on router interfaces through service sessions. Service session configurations contain the policy that needs to be installed on an interface when a service is activated. The policy definition can include the name of a QoS profile to attach to the interface when the policy is installed.

When you set up the QTP, you create a QoS profile attachment service. The purpose of this service is to attach the required QoS profile to an interface. This service is hidden from subscribers and is under only QTP control.

Because profiles need to be changed only when QoS services are activated or deactivated, the QTP tracks services and reacts to service state changes by adjusting the QoS profile attachment as needed by deactivating and activating the QoS profile attachment service.

Subscribers who need their services managed by the QTP are subscribed to the QoS profile attachment service.

Identifying QoS Services

When you set up a service, you identify the service as a QoS service in one of the fields in the service definition. For example, you can assign a service name or category to indicate that the service is a QoS service, or you could assign the QTP instance name in the Tracking Plugin field.

When the SAE notifies the QTP that a service has been activated or deactivated, the QTP determines whether it is a QoS service by searching attributes in the service object. The QTP uses a search filter that you set up to search an attribute for the information that you assigned to the service to indicate that it is a QoS service.

For example, suppose you enter myqtp in the tracking plug-in field of QoS services to indicate that the service is a QoS service. You would set up the search filter to search tracking plug-in attributes for any service that contains myqtp:

```
(attribute.trackPlug=*myqtp*)
```

Or you might configure the category to indicate that a service is a QoS service. The following filter searches service category attributes for any entry that contains ultra, video on demand, or video telephony:

```
((serviceCategory=*ultra*)((serviceCategory=*video on  
demand*)(serviceCategory=*video telephony*)))
```

To obtain a list of attribute names for the sspService object class, see the LDAP schema documentation in the SRC software distribution in the folder *SDK/doc/ldap* or on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx>

Determining the QoS Profile

After the QTP determines that a service is a QoS service, it needs to obtain the name of the QoS profile for the service. The QTP generates a QoS profile name based on active QoS services as follows:

1. Obtains QoS profile input values.

The QTP obtains these values by taking the value of an attribute in the service definition. You specify which attribute that you want the QTP to use as the input value. For example, you can specify the service name, the category, or the contents of the design and graphics attribute.

2. Compiles a list of the QoS profile input values.
3. Removes duplicate values from the list.
4. Sorts the remaining list by using a case-sensitive alphanumeric comparison.
5. Concatenates the values with a separator. The default value for the separator is a hyphen (-). You can specify a different separator.

Table 11 shows how lists of QoS profile input values are sorted and then concatenated.

Table 11: Examples of Concatenated QoS Profile Input Values

Input – QoS Profile Input Values	Output – Concatenated Name
be512, vod	be512-vod
game, be1024, vod	be1024-game-vod
be128	be128

6. Adds a prefix to the resulting name. The default prefix is qos-profile. (You can specify a different value.) The output from our examples in Table 11 now looks like this:

- qos-profile-be512-vod
- qos-profile-be1024-game-vod
- qos-profile-be128

The names that result from this process are the QoS profile names.

As you can see from this process, you need to design services and configure the QTP so that the resulting QoS profile names match the names of the QoS profiles configured on the JUNOS router.

Typically, a QoS designer creates a number of QoS profiles that support all the services that are expected to be used. This design results in various QoS profiles that need to be configured on each router. If a required QoS profile is not configured on the router, the hidden QoS profile attachment service cannot be activated. Services are still activated for the subscriber, but the services will not provide the expected traffic requirements. When this happens, the SAE logs the error but does not send an error message to the subscriber.

Setting Up Policy Groups

You need to create two types of policy groups in your QTP configuration. The QoS profile attachment service needs a policy group that attaches the required QoS profile to the subscriber interface when the attachment service is activated. QoS services need policy groups that classify traffic and specify the action to take on traffic that matches the classifier. (You can set up traffic classifiers to match any traffic.)

Policy Group for QoS Profile Attachment Service

The policy group for the hidden QoS profile attachment service must have an egress policy list with only one policy rule that contains a QoS profile attachment action. The QoS profile attachment action must have a variable parameter in the QoS profile field.



NOTE: The policy group for the QoS profile attachment service must contain only one egress policy list and must contain one and only one QoS profile attachment action. Otherwise, the SRC software will require a license for the hidden service.

When the profile attachment service is activated, the QTP substitutes the QoS profile attribute in the policy with the QoS profile name that it determined, as described in *Determining the QoS Profile* on page 269. The service then loads the policy.

The following example creates a policy group for the QoS profile attachment service. This policy group does not match any traffic.

1. Create a policy group called Pg-qos-attach, and add an egress policy list.
2. In the egress policy list, create a policy rule that has a classify-traffic condition that will not match any real traffic. For example, set both the source and destination addresses to 0.0.0.0/32.
3. In the egress policy list, create a policy rule that has a QoS profile attachment action with QoS profile qpName.

By default, the QTP looks for qpName as the variable parameter.

When the QTP determines the required QoS profile name, it substitutes qpName with the value that it acquired.

Setting Up Services

You need to set up a QoS profile attachment service and QoS services. Both types of services are value-added (SSP) services.

In the QoS profile attachment service, assign the policy group that you configured for the service. For example, policyGroupName = Pg-qos-attach, ou = ent, o = Policies, o = umc.

In QoS services, assign the policy group that you configured for the service.

Subscribe subscribers to the QoS profile attachment service and to the appropriate QoS services.

Reestablishing Default QoS Profile

A default QoS profile may be installed on the subscriber interface before the QTP installs QoS profiles in response to the activation of QoS services. For example, a profile may have been attached to the subscriber interface when the default policy was installed. Once QoS services are no longer active on the interface, the QTP can reestablish the QoS profile that was installed on the interface before the QTP began tracking services and installing profiles on the interface.

Example: How QTP Activates a QoS Service

The following example shows the process that QTP uses when a subscriber activates a QoS service. In this example, QoS profile input values are taken from the service name attribute. The hidden QoS profile attachment service is named svc-qos-attach. The svc-qos-attach service contains a policy that has the variable parameter qpName assigned as the QoS profile name.

1. The subscriber does not have any active services.
2. The subscriber activates service be512, which is a QoS service.
 - a. The SAE sends a Service Session Start event to the QTP.
 - b. The QTP searches an attribute in the service definition and determines that the service is a QoS service.
 - c. Using the SAE Common Object Request Broker Architecture (CORBA) remote application programming interface (API), the QTP gets a list of the subscriber's active QoS services.

The list contains only service be512 because that is the only service that the subscriber has activated.

- d. The QTP adds the default prefix to the QoS profile input value to obtain the QoS profile name. The result is:

qos-profile-be512
 - e. The QTP deactivates the hidden svc-qos-attach service. Because this svc-qos-attach service was not active before, this operation does not have any effect.
 - f. The QTP activates the hidden svc-qos-attach service, and it substitutes variable parameter qpName with '\$qos-profile-be512' as the QoS profile name in the policy.
 - g. The policy loads qos-profile-be512 on the subscriber interface.
3. The subscriber activates service vod, which is a QoS service.
 - a. The SAE sends a Service Session Start event to the QTP.
 - b. QTP searches attributes in active service definitions and determines that the service is a QoS service.
 - c. The QTP gets a list of the subscriber's active QoS services. The result is:

be512, vod
 - d. The QTP sorts the list and concatenates the QoS profile input values with the separator. The result is:

be512-vod
 - e. The QTP adds the default prefix to the concatenated name to obtain the QoS profile name. The result is:

qos-profile-be512-vod.
 - f. The QTP deactivates the hidden svc-qos-attach service.

- g. The QTP activates the hidden svc-qos-attach service, and it substitutes variable parameter qpName with '\$qos-profile-be512-vod' as the QoS profile name in the policy.
- h. The policy loads qos-profile-be512-vod.
- 4. The subscriber deactivates service vod.
 - a. The QTP follows the same procedure as in Step 2 above and determines that the QoS profile name is qos-profile-vod.
 - b. The QTP deactivates the hidden svc-qos-attach service.
 - c. The QTP reactivates the hidden svc-qos-attach service, and it substitutes variable parameter qpName with '\$qos-profile-be512' as the QoS profile name in the policy.
 - d. The policy loads qos-profile-be512.

Configuring QoS Profile-Tracking Plug-Ins with the C-Web Interface

To configure the QoS profile-tracking plug-in with the C-Web interface:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure a QoS tracking plug-in.
2. From the side pane, click **Configuration > Plug Ins**.
3. Click the plug-in for which you want to configure QoS tracking, and then click **QoS Profile Tracking**.

The QoS Profile Tracking pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

For additional information, see the following sources:

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.

Configuring Search Filters for QoS Profile-Tracking Plug-Ins

The SAE uses a search filter to search service objects in the directory to find QoS services. You can set up the filter to search the values of any attribute in the service object, such as service name, category, or tracking plug-in. The search is successful when a value matches the filter.

For information about obtaining a list of attribute names for the sspService object class, see the documentation for the LDAP schema in the SRC software distribution in the folder *SDK/doc/ldap* or on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx>

Configure the search filter in a format similar to the LDAP search filter. Table 12 lists the values that you can use for filters. Each filter string *<filter>* contains a simplified LDAP query.

Table 12: Settings for Filter Strings

Filter String	Action
()	Matches no objects
(*)	Matches all objects
List of <i><attribute> = <value></i> pairs <i><attribute></i> —Name of a property or attribute <i><ldapAttributeName></i> <i><value></i> —One of the following <ul style="list-style-type: none"> ■ * (asterisk) ■ Explicit string ■ String that contains an * Note: To define a special character (* & , ! \) in a string, precede it with the backslash symbol (\).	<ul style="list-style-type: none"> ■ If <i><value></i> is *, checks for any value. ■ If <i><value></i> is an explicit string, checks whether any value of the property matches the string, regardless of case. ■ If <i><value></i> is a string that contains a *, checks whether any value of the property contains the string, regardless of case.
(& <i><filter></i> <i><filter></i> ...)	True if all filters match
(<i><filter></i> <i><filter></i> ...)	True if at least one filter matches
(! <i><filter></i>)	True if the filter does not match

- Default—(attribute.trackPlug =); note that you need to add a search value after the equal sign
- Examples
 - To search tracking plug-in attributes for any entry that contains qtp:
(attribute.trackPlug=*qtp*)
 - To search service category attributes for any entry that contains ultra, video on demand, or video telephony:
(|(serviceCategory=*ultra*)|(serviceCategory=*video on demand*)(serviceCategory=*video telephony*)))

Updating QoS Profile Data in the Directory

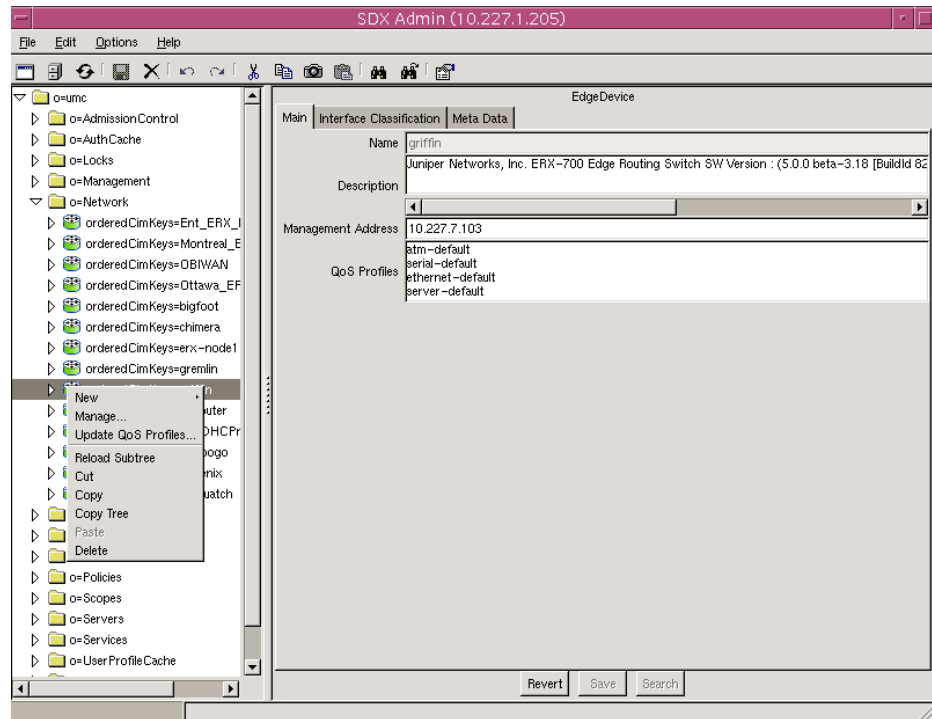
You can update the directory and SDX Admin with a list of QoS profiles that are currently configured on a JUNOS router. You can do so by using either SDX Admin or a program called qosProfilePublish.

Note that this feature is not supported on the C-series Controllers.

Using SDX Admin to Update QoS Profile Data

To update the directory with SDX Admin:

1. In the navigation pane, expand the object *o = Network*.
2. Select the router for which you want to update QoS profiles, and right-click.



3. Select Update QoS Profiles.

The SDX Admin dialog box appears.

4. Enter the IP address for the router; enter the SNMP community if the default value is incorrect; and click **OK**.

SDX Admin updates the QoS profiles for the router in the directory and displays the information in the QoS Profiles field of the Main tab in the EdgeDevice pane.

Using qosProfilePublish to Update QoS Profile Data

Because QoS profiles are part of the global configuration of JUNOS routers, when a QoS profile is configured on the router, all virtual routers (VRs) can use that profile. Therefore, you update QoS profiles per router, not per VR as you do with IP pools. However, when you run `qosProfilePublish`, you still must define a VR using the `-v` option.

The syntax for qosProfilePublish is:

```
qosProfilePublish { { -v <vrName> @ <routerName> -i <ipAddress> } *
-h <host> -b <baseDn> -D <bindDN> -w <password>
-c <readCommunity> ] | -H }
```

To update QoS profile data using the **qosProfilePublish** command:

1. On the SAE host, access the folder */opt/UMC/sae/etc*.

```
cd /opt/UMC/sae/etc
```

2. Run the command.

```
./qosProfile -v vr1@erx1 -i 192.0.2.1 -v vr2@erx2 -i 192.0.2.3 -h 192.0.2.5 -w
admin123 -D cn=umcAdmin,o=umc -b o=Network,o=umc -c public
```

<vrName>

- Name of the VR.
- Value—Text string (value is case sensitive and must match the name in the JUNOS configuration)
- Example—vr-boston

<routerName>

- Name of the JUNOS router from which you want to update QoS profiles.
- Value—Text string (value is case sensitive and must match the name in the JUNOS configuration)
- Example—erx1

<ipAddress>

- JUNOS router IP address.
- Value—IP address or text string
- Example—192.0.2.1

<host>

- IP address or name of the host that supports the directory.
- Value—IP address or text string
- Example—192.0.2.2 or ottawa

<baseDn>

- DN of the root of the tree in the directory.
- Value—DN
- Example—o = Network,o = umc

<bindDn>

- DN of the username for authentication with the directory server.
- Value—DN
- Example—*cn = umcAdmin,o = umc*

<password>

- Password for authentication with the directory server.
- Value—Text string
- Example—*admin123*

<readCommunity>

- Name of the SNMP read community for a VR. If the SNMP read community for a VR is defined in the directory, you do not need to specify this value.
- Value—Text string
- Example—*Public*

-H

- Online help for this tool.

To update QoS profiles with qosProfilePublish:

1. Access the folder in which qosProfilePublish is installed.

```
cd /opt/UMC/sae/etc
```

2. Run qosProfilePublish.

The program accesses QoS profiles for the router that you specify and updates the information in the specified directory.

```
# ./qosProfilePublish -v default@erx1 -i 10.10.7.28 -h 10.10.227.7 -w admin123
-D cn=umcAdmin,o=umc -b o=Network,o=umc -c public
erx1 profiles are: ['atm-default', 'serial-default',
'ethernet-default', 'server-default']
```

Searching for QoS Policy Data in the Directory

Note that this feature is not supported on the C-series Controllers.

You can run queries of the directory data to find:

- QoS profiles configured on a JUNOSe router.
- QoS profiles in a policy group.
- Policy groups that contain a particular QoS profile.
- JUNOSe routers that have a QoS profile configured.

- Policy groups supported on a router. For a policy group to be supported on a router, both the policy group and the router must contain the same QoS profile.
- Routers that can be supported by a policy group. The query provides a list of routers that contain QoS profile(s) that are also in the specified policy group.

You can run these queries by using either Policy Editor or Policy Web Admin.

Using Policy Editor to Search for QoS Policy Information

Before using Policy Editor to run a query, you need to:

- Connect Policy Editor to a directory server. See *Starting Policy Editor* in *SRC-PE Services and Policies Guide, Chapter 7, Using Policy Editor*.
- Update the directory with a list of QoS profiles that are on the router(s) that you want to search. See *Updating QoS Profile Data in the Directory* on page 274.

Running Queries from Policy Editor

To run queries with Policy Editor:

1. In the Policy Editor window, click Tools in the menu bar; then click Query.

The Router Query window appears.

2. Fill in the fields, and click **Query**.

To erase query results from the screen, click **Clear**.

Condition Type

- Object to be searched.
- Value—router, QoS profile, or policy group
- Default—No value

Condition Value

- Name of the QoS profile, router, or policy group that you want to search.
- Value—Name of the router, QoS profile, or policy group. If you selected router or policy group as a condition type, you can select a name from the drop-down menu. If the condition type is QoS profile, continue selecting entries in the drop-down menu until you reach the name of a policy group.
- Default—No value

Find

- Object that you want to find. The software searches for this object on the QoS profile, router, or policy group defined in condition type and condition value.
- Value—router, QoS profile, or policy group
- Default—No value

Supported

- Whether or not to search for the condition type that exists or does not exist on the router, QoS profile, or policy group.
- Value—Checked or unchecked
 - Checked—Searches for the condition type that is on the router, QoS profile, or policy group
 - Unchecked—Searches for the condition type that is not on the router, QoS profile, or policy group
- Default—No value

Examples

The query example in Figure 5 searches for all QoS profiles on router chimera.

Figure 5: Searching for All QoS Profiles on a Router

The screenshot shows a window titled "Router Query". It contains the following fields and values:

- Aspect: QoS Profile Configuration
- Condition Type: Router
- Condition Value: chimera
- Find: QoS Profile
- Supported: ☒

The results area displays the following text:

```
The following QoS Profiles are supported by Router "chimera" for QoS Profile configuration:  
aasp  
aasp1  
atm-default  
ethernet-default  
serial-default  
server-default
```

At the bottom of the window are three buttons: Query, Clear, and Close.

The query in Figure 6 searches for QoS profiles in policy group DHCP.

Figure 6: Searching for QoS Profiles in a Policy Group

The screenshot shows a window titled "Router Query". It contains the following fields and values:

- Aspect: QoS Profile Configuration
- Condition Type: Policy Group
- Condition Value: DHCP
- Find: QoS Profile
- Supported: ☒

The results area displays the following text:

```
The following QoS Profile is supported by Policy Group "DHCP" for QoS Profile Configuration:  
atm-default atm-vc atm-vp
```

At the bottom of the window are three buttons: Query, Clear, and Close.

The query in Figure 7 searches for all policy groups that router bigfoot supports. For a policy group to be supported on a router, both the policy group and the router must contain the same QoS profile.

Figure 7: Searching for All Policy Groups on a Router

The screenshot shows a window titled "Router Query". It has several input fields: "Aspect" is set to "QoS Profile Configuration", "Condition Type" is set to "Router", "Condition Value" is set to "bigfoot", "Find" is set to "Policy Group", and "Supported" is checked. Below these fields is a text area containing the following text:

```
The following Policy Groups are supported by Router "bigfoot" for QoS Profile configuration:
content-provider (policyGroupName=content-provider,o=Policies,o=UMC)
content-provider-fast (policyGroupName=content-provider-fast,o=Policies,o=UMC)
content-provider-medium (policyGroupName=content-provider-medium,o=Policies,o=UMC)
content-provider-slow (policyGroupName=content-provider-slow,o=Policies,o=UMC)
DHCP (policyGroupName=DHCP,o=Policies,o=UMC)
eglimit (policyGroupName=eglimit,ou=ent,o=Policies,O=UMC)
EntDefault (policyGroupName=EntDefault,ou=ent,o=Policies,O=UMC)
internet-fast (policyGroupName=internet-fast,o=Policies,o=UMC)
internet-medium (policyGroupName=internet-medium,o=Policies,o=UMC)
internet-slow (policyGroupName=internet-slow,o=Policies,o=UMC)
ISP (policyGroupName=ISP,o=Policies,o=UMC)
PPP (policyGroupName=PPP,o=Policies,o=UMC)
PPP-special (policyGroupName=PPP-special,o=Policies,o=UMC)
redirect (policyGroupName=redirect,ou=ent,o=Policies,O=UMC)
```

At the bottom of the window are three buttons: "Query", "Clear", and "Close".

Using Policy Web Admin to Search for QoS Policy Information

Before you use Policy Web Admin, deploy the WAR file for the Policy Web Admin in the Web application server. You can find this file, *pomAdmin.war*, in the folder *webapp* on the SRC software distribution. Refer to the documentation for the Web application server for information about deploying applications.

To deploy Policy Web Admin inside JBoss:

- Copy the file to the JBoss *server/default/deploy* directory.

```
cp /cdrom/cdrom0/webapp/pomAdmin.war
/opt/UMC/jboss/server/default/deploy
```

JBoss automatically starts the application when a WAR file is copied into the deploy directory.

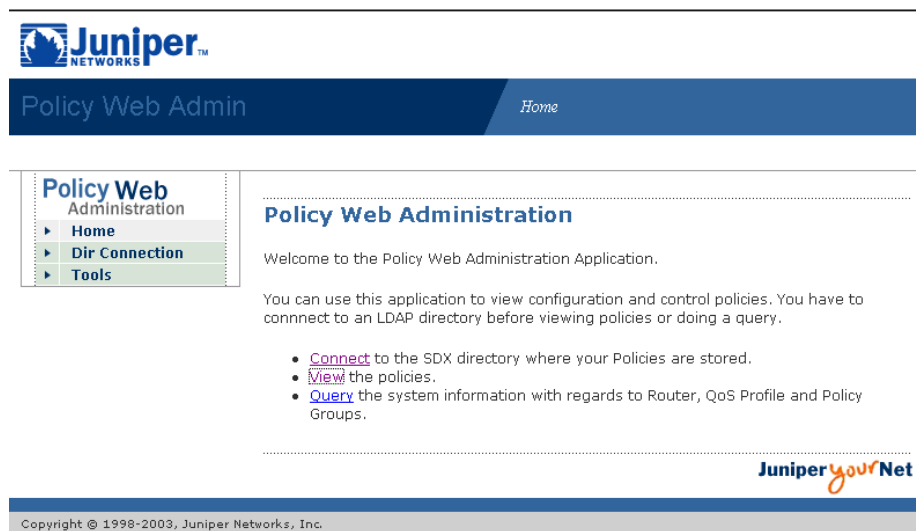
Launching Policy Web Admin

To launch Policy Web Admin:

1. Start your Web browser.
2. Enter the location of Policy Web Admin in the following format:

`https://<web-server-name or ip-address>:<port>/pomAdmin`

The Policy Web Admin page appears.



Connecting to a Directory

Before you run queries, you need to connect to the directory where policies are stored. To connect to the directory:

1. From the Policy Web Admin main window, click **Dir Connection**.

The Directory Connection page appears.

2. Enter the connection information for the directory that contains the policies, and click **Connect**.

The Tools page appears.

Querying the Directory for QoS Information

To search the directory for QoS information:

1. In the Tools page, click **Query**.

The Query page appears.

Juniper
NETWORKS

Policy Web Admin Query

Policy Web Administration

- Home
- Dir Connection
- Tools
 - Query**

Query

Query Information

Enter your query and press query.

Aspect: QoS Profile Configuration

Condition Type: QoS Profile

Condition Value: best-effort

Find: Router

Supported: ☐

Response :

Clear Query

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2. Fill in the parameters, and click **Query**.

The results appear in the Response field.

For examples of queries, see *Examples* on page 280.

Part 7

Configuring Subscribers and Subscriptions

Chapter 26

Configuring Subscriber-Related Properties on the SAE with the C-Web Interface

This chapter describes how to use the C-Web interface to configure subscriber-related properties on the SAE.

- To use the SRC CLI, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 4, Configuring Subscriber-Related Properties on the SAE with the SRC CLI*.
- To use the C-Web interface to configure the SAE on a Solaris platform, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 5, Configuring Subscriber-Related Properties on the SAE on a Solaris Platform*.

Topics in this chapter include:

- Configuring the Length of Time That MAC Addresses Remain in SAE Cache with the C-Web Interface on page 288
- Identifying a Profile for Unauthenticated Subscribers with the C-Web Interface on page 288
- Configuring Interim Accounting for Services and Subscribers with the C-Web Interface on page 289
- Avoiding Overcharges for Sessions That Time Out with the C-Web Interface on page 290
- Allowing Multiple Logins from the Same IP Address with the C-Web Interface on page 290
- Authenticating Registered Username/Password Pairs with the C-Web Interface on page 291
- Configuring Timers for Session Reactivation with the C-Web Interface on page 291

Configuring the Length of Time That MAC Addresses Remain in SAE Cache with the C-Web Interface

When a DHCP subscriber transitions from an authenticated IP address to an unauthenticated IP address or vice-versa, the SAE:

1. Logs out the subscriber associated with the original IP address.
2. Caches the subscriber profile in the in-memory cache, indexed by the DHCP subscriber's MAC address.
3. Waits until the DHCP subscriber with the cached MAC address obtains its new IP address, and then logs in the subscriber and associates it with the new IP address.

The period during which the subscriber profile remains in the in-memory cache can last until the DHCP lease time for the original address. If something happens during this period—for example, the subscriber turns off the client computer—the subscriber profile remains in the SAE's in-memory cache forever. When a new IP address is assigned to the same DHCP client, problems can occur. To avoid such problems, entries in the in-memory cache are removed after a configurable amount of time.

Configure the amount of time that entries remain in cache to be greater than the time required for a DHCP subscriber to transition from an unauthenticated IP address to an authenticated IP address or vice versa. The time required for a DHCP subscriber to transition from one IP address to another depends on the lease times configured on the JUNOS router and the instructions given to the subscriber on the Web portal, such as reboot your PC now.

To configure the amount of time that subscriber profiles remain in the SAE's in-memory cache:

1. Click **Configure**, expand **Shared > SAE**, and then click **Driver**.

The Driver pane appears.

2. Click **Create**, specify the amount of time that subscriber profiles remain in the SAE's cache as described in the Help text in the Main pane, and then click **Apply**.

Identifying a Profile for Unauthenticated Subscribers with the C-Web Interface

The SAE uses an unauthenticated subscriber profile as a transitional profile for subscribers who are not logged in to the SAE. For example, if a subscriber logs out of the SAE using the API method `Subscriber.logout()`, an unauthenticated subscriber session is created. The unauthenticated subscriber profile must exist and can be subscribed to services available for unauthenticated subscribers. The portal implementation determines whether unauthenticated (anonymous) subscribers can access the portal.

To specify an unauthenticated subscriber profile:

1. Click **Configure**, expand **Shared > SAE**, and then click **Driver**.

The Driver pane appears.

2. Click **Create**, specify a subscriber profile for unauthenticated access to the portal as described in the Help text, and then click **Apply**.

Configuring Interim Accounting for Services and Subscribers with the C-Web Interface

You can enable and disable interim accounting and set intervals between interim accounting messages for services and subscribers. These settings apply to all subscriber sessions and service sessions unless you override these settings for specific services by configuring an accounting interim interval in the value-added service configuration.

To set up interim accounting:

1. Click **Configure**, expand **Shared > SAE**, and then click **Interim Accounting**.

The Interim Accounting pane appears.

2. Click **Create**.
3. (Optional) Enable service interim accounting as described in the Help text.
4. Specify the interval between service interim accounting messages as described in the Help text.
5. (Optional) Enable interim accounting for subscribers as described in the Help text.
6. Specify the interval between subscriber interim accounting messages as described in the Help text.
7. Click **Apply**.

Avoiding Overcharges for Sessions That Time Out with the C-Web Interface

When an idle timeout terminates a session, you can set up the SAE to reduce the session time reported in the accounting stop message by the idle time. This way the session time is accurately reported; the report avoids overcharges for the session.

To adjust the session time:

1. Click **Configure**, expand **Shared > SAE**, and then click **Idle Timeout**.

The Idle Timeout pane appears.

2. Enable when an idle timeout terminates a session as described in the Help text.

The session time reported in the accounting stop message is reduced by the idle time.

3. Click **Apply**.

Allowing Multiple Logins from the Same IP Address with the C-Web Interface

You can specify whether the SAE allows a login from the same IP address without requiring that the previous session log out first.

- If you enable this setting, the SAE logs in the new subscriber session and automatically logs out the previous session.
- If you disable this setting, the SAE denies login requests if a subscriber session for an IP address is active.

To specify whether the SAE allows a login from the same IP address without requiring that the previous session log out first:

1. Click **Configure**, expand **Shared > SAE**, and then click **Subscriber Sessions**.

The Subscriber Sessions pane appears.

2. Enable or disable whether the SAE allows a login from the same IP address without requiring that the previous session log out first, as described in the Help text.
3. Click **Apply**.

Authenticating Registered Username/Password Pairs with the C-Web Interface

You can specify whether the application programming interface (API) method `registerLoginCredentials` authenticates the registered username/password or creates the registration without authentication. Enable this setting if your authentication server does not allow authentication while a session for the authenticated username is active.

To specify whether or not registered username/password pairs are authenticated:

1. Click **Configure**, expand **Shared > SAE**, and then click **Login Registration**.

The Login Registration pane appears.

2. Enable or disable whether registered username/password pairs are authenticated, as described in the Help text.
3. Click **Apply**.

Configuring Timers for Session Reactivation with the C-Web Interface

If a service session fails unexpectedly, the SAE tries to start the session again in the background. You can change how many times the SAE tries to activate the session and the interval between these attempts. In most instances, you do not need to change the default values.

To configure session reactivation behavior:

1. Click **Configure**, expand **Shared > SAE**, and then click **Service Activation**.

The Service Activation pane appears.

2. Configure the number of times the SAE tries to activate a service session if activation fails or to deactivate a service session if deactivation fails, as described in the Help text.
3. Configure the time between attempts to activate a service session if activation fails or to deactivate a service session if deactivation fails, as described in the Help text.
4. Click **Apply**.

Chapter 27

Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface

This chapter describes how to use the C-Web interface to configure internal, external, and state synchronization plug-ins.

You can also use the following to configure plug-ins:

- To use the SRC CLI, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 9, Configuring Internal, External, and Synchronization Plug-Ins with the SRC CLI*.
- To use the Solaris platform, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 10, Overview of Configuring Plug-Ins for Solaris Platforms*.

Topics in this chapter include:

- Creating Plug-In Instances with the C-Web Interface on page 293
- Configuring Internal Plug-Ins with the C-Web Interface on page 294
- Configuring the SAE for External Plug-Ins with the C-Web Interface on page 295
- Configuring the State Synchronization Plug-In Interface with the C-Web Interface on page 296

Creating Plug-In Instances with the C-Web Interface

You can use the C-Web interface to create a plug-in instance and choose the type of plug-in that you want to create. You can create plug-ins for all SAE configurations or for groups.



NOTE: When you create a plug-in instance and specify a plug-in type, all the other available types are removed from the side pane when you commit the configuration. To change the type, create a new plug-in.

Creating a Plug-In Instance for All SAE Configurations

To create a plug-in instance for all SAE configurations:

1. Click **Configure**, expand **Shared > SAE > Configuration**, and then click **Plug Ins**.
2. From the Create new list, select **Name**.
3. Type a name for the new plug-in in the dialog box, and click **OK**.

The plug-in appears in the side pane and in the Plug In pane.

4. From the side pane, expand the plug-in, and select the type of plug-in that you want to configure.

Creating a Plug-In Instance for an SAE Group

To create a plug-in instance for an SAE group:

1. Click **Configure > Shared > SAE**, and then expand the SAE group for which you want to configure a plug-in.
2. From the side pane, expand **Configuration**, and click **Plug Ins**.

The Plug Ins pane appears.

3. From the Create new list, select **Name**.
4. Type a name for the new plug-in in the dialog box, and click **OK**.

The plug-in appears in the side pane and in the Plug In pane.

5. From the side pane, expand the plug-in, and select the type of plug-in that you want to configure.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.

Configuring Internal Plug-Ins with the C-Web Interface

To configure an internal plug-in:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure a plug-in.
2. From the side pane, expand **Configuration**, and click **Plug Ins**.

The Plug Ins pane appears.

3. From the Create new list, select **Name**.

4. Type a name for the new plug-in in the dialog box, and click **OK**.

The plug-in appears in the side pane and in the Plug In pane.

5. In the side pane, expand the new plug-in, and then click **Internal**.

The Internal pane appears.

6. Enter information as described in the Help text in the main pane, and click **Apply**.

7. To configure properties for the plug-in:

- a. In the side pane, expand the plug-in, and then click **Internal > Properties**.
- b. From the Create new list, select **Properties**.

The new property appears in the side pane and in the Properties pane.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Creating Plug-In Instances with the C-Web Interface* on page 293.

Configuring the SAE for External Plug-Ins with the C-Web Interface

You need to configure SAE external plug-ins for SAE plug-in agents in the NIC, for Admission Control Plug-Ins, and for custom plug-ins developed in Common Object Request Broker Architecture (CORBA). For information about external plug-ins, see *SRC-PE Network Guide, Chapter 1, Overview of the SAE*.

When you use an external plug-in, you need to export its object reference to the SAE. When the SAE sends the first event to a registered plug-in, it resolves the object reference. In case of a failure, the SAE resolves the object reference again. In this case, if a plug-in restarts and instantiates a different object (that is, a different object reference), the SAE learns about the new object through the naming service or the file reference.

You can configure the SAE to resolve the object reference and specify which attributes to send to the external plug-in.

To configure an external plug-in:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure a plug-in.
2. From the side pane, expand **Configuration**, and click **Plug Ins**.

The Plug Ins pane appears.

3. From the Create new list, select **Name**.
4. Type a name for the new plug-in in the dialog box, and click **OK**.

The plug-in appears in the side pane and in the Plug In pane.

5. From the side pane, expand the new plug-in, and then click **External**.
6. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Creating Plug-In Instances with the C-Web Interface* on page 293.

Configuring the State Synchronization Plug-In Interface with the C-Web Interface

Some external plug-ins, such as the Admission Control Plug-In (ACP) application and the SAE plug-in agent for the NIC, support state synchronization with the SAE. The state synchronization plug-in interface allows external plug-ins to maintain the state of active subscriber, service, and interface sessions without having to store intermediate versions of the state locally.

To configure the state synchronization plug-in interface:

1. To configure the state synchronization plug-in interface:
 - a. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure a plug-in.
 - b. In the side pane, expand **Configuration > Plug Ins**, and then click **State Synchronization**.

The State Synchronization pane appears.

- c. Enter information as described in the Help text in the main pane, and click **Apply**.

2. To configure the number of threads:
 - a. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure a plug-in.
 - b. In the side pane, expand **Configuration > Plug Ins**, and then click **Manager**.
 - c. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Creating Plug-In Instances with the C-Web Interface* on page 293.

Chapter 28

Configuring Accounting and Authentication Plug-Ins with the C-Web Interface

This chapter describes how to configure authentication and accounting plug-ins with the C-Web interface. It also describes how to configure global and default retailer event publishers.

You can also use the SRC CLI to configure authorization and accounting plug-ins. For more information, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 11, Configuring Accounting and Authentication Plug-Ins with the SRC CLI*.

Topics in this chapter include:

- Creating RADIUS Peers on page 300
- Tracking Plug-Ins with the C-Web Interface on page 301
- Configuring Flat File Accounting Plug-Ins on page 301
- Configuring Basic RADIUS Accounting Plug-Ins on page 304
- Configuring Flexible RADIUS Accounting Plug-Ins on page 304
- Configuring Custom RADIUS Accounting-Plug-Ins on page 305
- Configuring Authentication Plug-Ins with the C-Web Interface on page 306
- Limiting Subscribers on Router Interfaces on page 307
- Configuring Basic RADIUS Authentication Plug-Ins on page 307
- Configuring Flexible RADIUS Authentication Plug-Ins on page 308
- Configuring Custom RADIUS Authentication Plug-Ins on page 309
- Configuring LDAP Authentication Plug-Ins on page 310
- Configuring UDP Ports for RADIUS Plug-Ins with the C-Web Interface on page 310

- Defining RADIUS Packets for Flexible RADIUS Plug-Ins with the C-Web Interface on page 311
- Configuring Event Publishers with the C-Web Interface on page 319

Creating RADIUS Peers

RADIUS peers are instances of RADIUS servers. If you define multiple servers, the SAE uses them in cases of failover or as alternate routers for load-balancing purposes.

Each RADIUS plug-in requires a default peer. Configure a RADIUS peer before you configure the plug-in.

RADIUS peers are configured in the peer group for each RADIUS plug-in.

To create a RADIUS peer:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.
3. Expand the plug-in that you created for RADIUS accounting and authentication, and click one of the following:
 - **Custom RADIUS Accounting**
 - **Custom RADIUS Authentication**
 - **Flex RADIUS Accounting**
 - **Flex RADIUS Accounting**
 - **RADIUS Accounting**
 - **RADIUS Authentication**
4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.

Tracking Plug-Ins with the C-Web Interface

Table 13 describes the tracking plug-ins that you can configure with the C-Web interface.

By default, the fileAcct plug-in instance tracks all subscriber and service sessions and writes all available attributes to a file. You can use this plug-in instance or create new one.



NOTE: When you use the NAS-Port attribute in tracking plug-ins, the SAE calculates the NAS-Port value based on the NAS-Port-Id value that it receives from the JUNOS router. You can change the NAS-Port format in the JUNOS software. However, because the SAE has no indication of which format is configured on the JUNOS router, the calculation of the NAS-Port attribute is correct only if the router uses the default configuration.

Table 13: Tracking Plug-Ins

Plug-In	Description
Basic RADIUS accounting	Sends accounting information to an external RADIUS accounting server or a group of redundant servers. Java class name—net.juniper.smgt.sae.plugin.RadiusTrackingPluginEventListener
Custom RADIUS accounting	Provides customized functions that can also be found in the flexible RADIUS accounting plug-ins. Custom plug-ins are internal plug-ins that are designed to deliver better system performance than the flexible RADIUS plug-ins. You can extend this plug-in by using the RADIUS client library. Java class name—net.juniper.smgt.sae.plugin.CustomRadiusAccounting
Flat file accounting	Writes tracking information to a file in comma-separated format. Java class name—net.juniper.smgt.sae.plugin.FileTrackingPluginEventListener
Flexible RADIUS accounting	Performs the same functions as the basic RADIUS accounting plug-in, but also lets you customize RADIUS accounting packets that the SAE sends to RADIUS servers. You can specify which fields are included in RADIUS accounting packets and what information is contained in the fields. Java class name—net.juniper.smgt.sae.plugin.FlexibleRadiusTrackingPluginEventListener
PCMM record-keeping server plug-in	Sends accounting information to an external PCMM record-keeping server (RKS). See <i>Configuring PCMM Record-Keeping Server Plug-Ins with SRC CLI</i> in <i>SRC-PE Solutions Guide, Chapter 5, Configuring the SAE for a PCMM Environment with the SRC CLI</i> . Java class name—net.juniper.smgt.sae.plugin.RksEventListener
QoS profile tracking	Ensures that as a subscriber activates and deactivates services, the correct QoS profile is attached to the subscriber interface. See <i>SRC-PE Solutions Guide, Chapter 1, Managing Tiered and Premium Services with QoS on JUNOS Routers with the SRC CLI</i> . Java class name—net.juniper.smgt.sae.plugin.qtp.QosProfileTrackingPluginEventListener

Configuring Flat File Accounting Plug-Ins

Flat file accounting plug-ins write information to a file in a comma-separated format. The SRC software has a default flat file accounting plug-in instance called fileAcct. The fileAcct instance logs all possible attributes for 24-hour periods in the file `var/acct/log`.

Another item that you can configure for flat files is the names of the headers that appear in the file. See *Configuring Headers for Flat File Accounting Plug-Ins* on page 302.

To create flat-file accounting plug-ins:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.
2. In the side pane, expand **Configuration > Plug-Ins**.
3. Expand the plug-in that you created for file accounting, and then click **File Accounting**.

The File Accounting pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Headers for Flat File Accounting Plug-Ins

When the SAE writes data to a flat file, it writes into the first line the headers that identify the attributes in the file. For example, in the following accounting file, the first line lists headers for all attribute fields in the file, and the following lines list the actual data in each field:

```
Accounting Status,NAS ID,SSP Host,Router Name,Interface Name,Interface
Alias,Interface Description,NAS port ID,User IP Address,User ID,User Accounting
ID,User Authentication ID,INTF Radius Class,INTF,SessionId, Service Name,Radius
Class,Timestamp,SessionId, Terminate Cause,Session Time,Input Octets,Output
Octets,Input Packets,Output Packets,NAS IP,User Mac address,Service Session
Name,Service Session Tag,User Session Type,User Session Radius Class,User
Session ID
```

```
start,SSPuelmo,uemo,default@erx7_ssp57,FastEthernet1/1.1,,IP1/1.1,default@erx7
_ssp57 FastEthernet1/1:65535, 10.10.10.20,pebbles@virneo.net,,,,,erx fastEthernet
1/1:0001048619,Video-Gold,Video-Gold,Fri Jan 30 14:23:29 EDT 2004,
VideoGold:null:1064946209182, 0,0,0,0,0,0, 10.10.7.17,,,,PPP,
pebbles:1064946144841
```

You can assign your own names to the headers that appear in the file. To do so, define the header names in a template, and then set up file accounting plug-in instances to use the template. The default template, FileAccounting.std, defines header names for all possible attributes. You can use the default template or create your own templates.

To set up a file accounting template:

- Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.

To set up a file accounting template from the default template:

1. In the side pane, expand **Configuration > File Accounting Template:std > Attributes**.

The Attributes pane appears.

2. In the side pane, click one of the attributes, enter information as described in the Help text in the main pane, and then click **Apply**.

To create a new file accounting template and add attributes:

1. In the side pane, click **Configuration**.

The Configuration pane appears.

2. From the Create new list, select **File Accounting Template**.

3. In the dialog box, type a name for the template, and click **OK**.

The new template appears in the side pane and in the File Accounting pane.

4. To add attributes to your template, expand the template in the side pane, and click **Attributes**.

The Attributes pane appears.

5. From the Create new list, select the attribute that you want to create.
6. Enter information as described in the Help text in the main pane, and click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.

Configuring Basic RADIUS Accounting Plug-Ins

You can use basic RADIUS accounting plug-ins to send accounting information to an external RADIUS accounting server or to a group of redundant servers. To communicate with nonredundant servers, you need to create multiple instances of the plug-in.

To set up basic RADIUS accounting plug-ins:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.
3. Expand the plug-in that you created for basic RADIUS accounting, and then click **RADIUS Accounting**.

The RADIUS Accounting pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.
- For information about setting up default peers, see *Creating RADIUS Peers* on page 300.

Configuring Flexible RADIUS Accounting Plug-Ins

Flexible RADIUS accounting plug-ins provide the same features as basic RADIUS accounting plug-ins. In addition, they allow you to customize RADIUS accounting packets that the SAE sends to RADIUS servers. You can specify which fields are included in the RADIUS accounting packets and what information is contained in the fields.

To set up flexible RADIUS accounting plug-ins:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.

3. Expand the plug-in that you created for flexible RADIUS accounting, and then click **Flex RADIUS Accounting**.

The Flex RADIUS Accounting pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.
- For information about setting up default peers, see *Creating RADIUS Peers* on page 300.
- For information about defining RADIUS packet templates, see *Defining RADIUS Packets for Flexible RADIUS Plug-Ins with the C-Web Interface* on page 311.

Configuring Custom RADIUS Accounting-Plug-Ins

The custom RADIUS accounting plug-ins provide the same functions as the flexible RADIUS accounting plug-ins, but are designed to deliver better system performance. To use a custom plug-in, you must provide a Java class that implements the service provider interface (SPI) defined in the RADIUS client library. Use this SPI to specify which fields and field values to include in RADIUS accounting packets. The RADIUS client library is part of the SAE core application programming interface (API).

See the documentation for the RADIUS client library in the SRC software distribution in the folder *SDK/doc/sae/net/juniper/smg/sae/radiuslib* or in the SAE core API documentation on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx/api-index.html>

For a sample implementation, see the following directory in the SRC software distribution:

SDK/plugin/java/src/net/juniper/smg/sample/radiuslib/RadiusPacketHandlerImpl.java.

To set up custom RADIUS accounting plug-ins:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.

- Expand the plug-in that you created for custom RADIUS accounting, and then click **Custom RADIUS Accounting**.

The Custom RADIUS Accounting pane appears.

- Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.
- For information about setting up default peers, see *Creating RADIUS Peers* on page 300.

Configuring Authentication Plug-Ins with the C-Web Interface

Table 14 describes the authentication plug-ins you can configure with the C-Web interface. Because authentication and authorization are similar, the plug-in user interface does not distinguish between them. However, when you configure plug-ins, you need to set them up to perform the correct behavior, either authentication or authorization.

You can configure multiple authentication plug-ins. The plug-ins are called in an arbitrary order, and each plug-in can return authorization values. (If multiple plug-ins return a session-timeout value, the smallest value is used.) Authentication or authorization succeeds if all plug-in calls succeed.

Table 14: Authentication Plug-Ins

Plug-In	Description
Basic RADIUS authentication	Sends authentication information to an external RADIUS authentication server or a group of redundant servers. Java class name— <code>net.juniper.smgt.sae.plugin.RadiusAuthPluginEventListener</code>
Custom RADIUS authentication	Provides customized functions that can also be found in the flexible RADIUS authentication plug-ins. Custom plug-ins are internal plug-ins that are designed to deliver better system performance than the flexible RADIUS plug-ins. You can extend this plug-in by using the RADIUS client library. Java class name— <code>net.juniper.smgt.sae.plugin.CustomRadiusAuth</code>
Flexible RADIUS authentication	Performs the same functions as the basic RADIUS authentication plug-in, but also lets you customize RADIUS authentication packets that the SAE sends to RADIUS servers. You can specify which fields are included in RADIUS authentication packets and what information is contained in the fields. Java class name— <code>net.juniper.smgt.sae.plugin.FlexibleRadiusAuthPluginEventListener</code>

Table 14: Authentication Plug-Ins (continued)

Plug-In	Description
LDAP authentication	<p>Performs authentication against different directories using different authentication methods. There are two LDAP authentication plug-ins: one authenticates subscribers, and the second authenticates SRC administrators so that they can access the SAE Web Admin application.</p> <p>Java class name of the subscriber authentication plug-in—<code>net.juniper.smgmt.sae.plugin.LdapAuthenticator</code></p> <p>Java class name of the administrator authentication plug-in—<code>net.juniper.smgmt.sae.plugin.adminLdap</code></p>
Limiting subscribers	<p>Limits the number of authenticated subscribers who connect to an IP interface on the router.</p> <p>Java class name—<code>net.juniper.smgmt.sae.plugin.LimitNumSubscriberPerIntfAuthPluginListener</code></p>

Limiting Subscribers on Router Interfaces

You can limit the number of authenticated subscribers who connect to an IP interface on the router. This plug-in does not limit the number of unauthenticated subscribers who connect to an IP interface, and does not limit the number of subscribers who connect to a physical or link-layer interface. In the case of subscriber interfaces, the plug-in limits the number of authenticated subscribers on the subscriber interface but not on the underlying primary IP interface.

To set up a plug-in that limits the number of subscribers on interfaces:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure subscriber limits.
2. In the side pane, expand **Configuration > Plug Ins**.
3. Expand the plug-in that you created for limiting subscribers, and then click **Interface Subscriber Limit**.

The Interface Subscriber Limit pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Basic RADIUS Authentication Plug-Ins

You can use basic RADIUS authentication plug-ins to send authentication information to an external RADIUS accounting server or a group of redundant servers. To communicate with nonredundant servers, you need to create additional instances of the plug-in.

To set up basic RADIUS authentication plug-ins:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.

3. Expand the plug-in that you created for basic RADIUS authentication, and then click **RADIUS Authentication**.

The RADIUS Authentication pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.
- For information about setting up default peers, see *Creating RADIUS Peers* on page 300.

Configuring Flexible RADIUS Authentication Plug-Ins

Flexible RADIUS authentication plug-ins provide the same features as basic RADIUS authentication plug-ins. In addition, they allow you to customize RADIUS authentication packets that the system sends to RADIUS servers and specify which fields are included in the RADIUS authentication packets and what information is contained in the fields.

To set up flexible RADIUS authentication plug-ins:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.
3. Expand the plug-in that you created for flexible RADIUS authentication, and then click **Flex RADIUS Authentication**.

The Flex RADIUS Authentication pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.
- For information about setting up default peers, see *Creating RADIUS Peers* on page 300.
- For information about defining RADIUS packet templates, see *Defining RADIUS Packets for Flexible RADIUS Plug-Ins with the C-Web Interface* on page 311.

Configuring Custom RADIUS Authentication Plug-Ins

The custom RADIUS authentication plug-ins provide the same functions as the flexible RADIUS authentication plug-ins, but are designed to deliver better system performance. To use a custom plug-in, you must provide a Java class that implements the SPI defined in the RADIUS client library. Use this SPI to specify which fields and field values to include in RADIUS accounting packets. The RADIUS client library is part of the SAE core API.

See the documentation for the RADIUS client library in the SRC software distribution in the folder `SDK/doc/sae/net/juniper/smg/sae/radiuslib` or the SAE core API documentation on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/sdx/api-index.html>

For a sample implementation, see the following directory in the SRC software distribution:
`SDK/plugin/java/src/net/juniper/smg/sample/radiuslib/RadiusPacketHandlerImpl.java`.

To set up custom RADIUS authentication plug-ins:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure RADIUS plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.
3. Expand the plug-in that you created for custom RADIUS authentication, and then click **Custom RADIUS Authentication**.

The Custom RADIUS Authentication pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.
- For information about setting up default peers, see *Creating RADIUS Peers* on page 300.

Configuring LDAP Authentication Plug-Ins

To create LDAP authentication plug-ins:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure LDAP authentication plug-ins.
2. In the side pane, expand **Configuration > Plug Ins**.
3. Expand the plug-in that you created for LDAP authentication, and then click **LDAP Authentication**.

The LDAP Authentication pane appears.

4. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.
- For information about creating a plug-in instance for a group, see *Chapter 27, Configuring Internal, External, and Synchronization Plug-Ins with the C-Web Interface*.

Configuring UDP Ports for RADIUS Plug-Ins with the C-Web Interface

In RADIUS packets that RADIUS plug-ins send to a RADIUS server, the plug-in uses an identifier field to match requests to replies. This field provides for a maximum of 256 identifiers. Once all identifiers are used, the plug-in cannot send any more requests until it receives replies that match the requests already sent. In high-load systems, this limit can slow performance.

To overcome this limitation, you can configure a pool of UDP ports for RADIUS plug-ins. Having a pool of ports allows RADIUS plug-ins to create one queue per port to wait for RADIUS replies. Each queue can wait for 256 RADIUS packets. The RADIUS plug-ins send RADIUS packets through the pool of ports in a round-robin mode.

You can configure a global source UDP port or pool of ports that RADIUS plug-ins use to communicate with RADIUS servers. You can also configure UDP ports for each plug-in instance. If you do not configure a UDP port for a plug-in instance, the plug-in uses the global UDP port.

Configuring Global UDP Ports

To configure global UDP ports:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure global UDP ports.
2. In the side pane, expand **Configuration**, and then click **Global RADIUS UDP Port**.

The Global RADIUS UDP Port pane appears.

3. Click **Create**, enter information as described in the Help text in the main pane, and click **Apply**.

Defining RADIUS Packets for Flexible RADIUS Plug-Ins with the C-Web Interface

Flexible RADIUS accounting and authentication plug-ins allow you to define the content of RADIUS packets that the SAE sends to RADIUS servers. You can specify which attributes are included in different types of RADIUS packets (for example, session start or stop requests, or accounting on or off requests). You can also specify what information is contained in the attribute fields.

A RADIUS attribute configuration consists of RADIUS attribute instances. Each instance defines attributes for a specific type of packet—For example, start requests or accounting off requests.

Within each attribute instance, you define individual RADIUS attributes. The following is a RADIUS attribute instance for authentication requests:

```
radius-attributes auth {
  attributes {
    User-Name loginId;
    User-Password password;
    NAS-Identifier localNasId;
    NAS-IP-Address localNasIp;
    NAS-Port nasPort;
  }
}
```

Each RADIUS packet template can consist of multiple RADIUS attribute instances.

Using Default RADIUS Templates

The SRC software comes with two default templates:

- **stdAcct**—Defines RADIUS accounting packets and is used in the default RADIUS flexible accounting plug-in instance **flexRadiusAcct**.
- **stdAuth**—Defines RADIUS authentication packets and is used in the default RADIUS flexible authentication plug-in instance **flexRadiusAuth**.

Naming RADIUS Attribute Instances

Attribute instances define attributes for a specific type of RADIUS packet. The name that you assign to an attribute instance specifies the type of packet to which the attribute definition is applied. Table 15 lists the available packet types.

Table 15: RADIUS Attribute Instance Names

Attribute Instance (Packet-Type)	Type of RADIUS Packet to Which Attribute Definition Is Applied
acct	Any accounting request
auth	Any authentication request
authresp	Any authorization response
dhcpresep	DHCP response
off	Accounting-Off requests
on	Accounting-On requests
onoff	Accounting-On or Accounting-Off requests
start	Start requests
startstop	Start, Stop, or Interim Update requests
stop	Stop or Interim Update requests
svcacct	Service Session Start, Stop, or Interim requests
svcresep	Any service authorization response
svcstart	Service Session Start requests
svcstop	Service Session Stop or Interim requests
useracct	Subscriber Session Start, Stop, or Interim requests
userresp	Any subscriber authorization response
userstart	Subscriber Session Start requests
userstop	Subscriber Session Stop, or Interim requests

Defining RADIUS Attributes

RADIUS attribute definitions consist of a RADIUS attribute and a value for the RADIUS attribute.

You can define values for standard RADIUS attributes or JUNOS vendor-specific attributes (VSAs).

Standard RADIUS Attributes

For standard RADIUS attributes, use a name or number as defined in RFC 2865—Remote Authentication Dial In User Service (RADIUS) (June 2000), RFC 2866—RADIUS Accounting (June 2000), or RFC 2869—RADIUS Extensions (June 2000). For a full list, see www.iana.org/assignments/radius-types.

Juniper Networks VSAs

For Juniper Networks VSAs, use one of the following formats:

- Vendor-Specific.4874. <vsa# > . <type >
- 26.4874. <vsa# > . <type >

where <type > is one of the following:

- text—Indicates that the value is 1–253 octets containing UTF-8 encoded characters
- string—Indicates that the value is 1–253 octets containing binary data
- address—Indicates that the value is a 32-bit value
- integer—Indicates that the value is a 32-bit unsigned value
- time—Indicates that the value is a 32-bit unsigned value, seconds since 00:00:00 UTC, January 1, 1970

The following is an example of RADIUS attribute instances that define RADIUS VSAs.

```
radius-attributes svcresp {
  attributes {
    Session-Timeout setSessionTimeout(ATTR);
    Idle-Timeout setIdleTimeout(ATTR);
    vendor-specific.Juniper.Sdx-Session-Volume-Quota setSessionVolumeQuota(ATTR);
    vendor-specific.WISPr.Redirection-URL "setProperty(\"startURL=%s\" % ATTR)";
    vendor-specific.WISPr.Bandwidth-Min-Up "setSubstitution(\"min_up_rate=%s\" % ATTR)";
    vendor-specific.WISPr.Bandwidth-Min-Down "setSubstitution(\"min_down_rate=%s\" % ATTR)";
    vendor-specific.WISPr.Bandwidth-Max-Up "setSubstitution(\"max_up_rate=%s\" % ATTR)";
    vendor-specific.WISPr.Bandwidth-Max-Down "setSubstitution(\"max_down_rate=%s\" % ATTR)";
  }
}

radius-attributes dhcresp {
  attributes {
    Framed-Pool setPoolName(ATTR);
    Framed-IP-Address setUserIpAddress(ATTR);
    26.4874.1.text setAuthVirtualRouterName(ATTR);
    26.4874.2.text setPoolName(ATTR);
    26.4874.31.text setServiceBundle(ATTR);
  }
}
```

Defining the Values of RADIUS Attributes

The values of RADIUS attributes can be a standard value (see Table 16) or an expression. Expressions are evaluated with Python. For example: `lowWord(inOctets)` extracts the lower 32 bits of the 64-bit `inOctets` counter. You can define multiple values for an expression in a comma-separated list.

Table 16: Standard Values for RADIUS Attributes

Value	Type of Plug-In	Comments
<code>accountingId</code>	User and service tracking	
<code>authUserId</code>	Service tracking	
<code>dhcp</code>	User and service tracking	Provides access to DHCP packet. See Table 13 on page 301 for details.
<code>domain</code>	Authorization	
<code>eventTime</code>	User and service tracking	Seconds since 1970-01-01T00:00Z
<code>ifRadiusClass</code>	User and service tracking	
<code>ifSessionId</code>	User and service tracking	
<code>inOctets</code>	Service tracking	64-bit counter
<code>inPackets</code>	Service tracking	
<code>interfaceAlias</code>	User and service tracking	
<code>interfaceDescr</code>	User and service tracking	
<code>interfaceName</code>	User and service tracking	
<code>localNasId</code>	All	Configured NAS-ID
<code>localNasIp</code>	All	Configured NAS-IP
<code>loginId</code>	User and service authorization	ID provided by the subscriber; the <code>loginId</code> value is not separated into UID and domain name.
<code>loginName</code>	User and service tracking	Name that the subscriber uses to log in to portal
<code>nasIp</code>	User and service tracking	NAS IP address of the router
<code>nasPort</code>	User and service tracking	32-bit integer
<code>outOctets</code>	Service tracking	64-bit counter
<code>outPackets</code>	Service tracking	
<code>password</code>	User and service authorization	
<code>portId</code>	User and service tracking	ID of the port on the JUNOSe router; for example, <code>FastEthernet 3/1:2001</code>
<code>primaryUserName</code>	User and service tracking	Name that the subscriber uses for DHCP/PPP authentication
<code>radiusClass</code>	User tracking, user and service authorization	For service tracking, this value is taken from the RADIUS Access-Accept response. If the response does not contain a value, the RADIUS class defined in the service definition is used. This attribute can be set by an authorization response.
<code>replyMessage</code>	User and service authorization	This attribute can only be set.
<code>routerName</code>	User and service tracking	
<code>serviceBundle</code>	User tracking and authorization	This attribute can be set by an authorization response.

Table 16: Standard Values for RADIUS Attributes (continued)

Value	Type of Plug-In	Comments
serviceName	Service tracking	Sets an arbitrary attribute (for example, class) to the name of the service.
serviceSessionName	Service tracking	Named service session; empty for default session
serviceSessionTag	Service tracking	
sessionId	User and service tracking	
sessionTime	User and service tracking	
sessionTimeout	User tracking, user and service authorization	This attribute can be set by an authorization response.
sessionVolumeQuota	User authorization	<p>This attribute can only be set. It is sent for session tracking events and can be returned by service authorization events. It can be set and retrieved through the portal API and can also be defined through an LDAP attribute in the service definition.</p> <p>If the attribute is defined multiple times, the following precedence is observed:</p> <ol style="list-style-type: none"> 1. Service definition (lowest) 2. Authorization 3. API call (highest) <p>NOTE: The SAE does not enforce a volume quota directly; it only makes the attribute available to an external application that can control the volume quota.</p>
setAcctInterimTime	User authorization	Integer
setAuthVirtualRouterName	DHCP authorization	Text
setIdleTimeout(ATTR)	User authorization	
setLoadServices(ATTR)	User authorization	This attribute can only be set.
setPoolName	DHCP authorization	Text
setRadiusClass(ATTR)	User and service authorization	
setReplyMessage(ATTR)	User and service authorization	
setSessionTimeout(ATTR)	User and service authorization	
setServiceBundle(ATTR)	User authorization	
setSessionVolumeQuota(ATTR)	User authorization	
setSubstitution	User authorization	Text. Substitutions can be set only for service sessions.
setTerminateTime	User authorization	Text
setUserIpAddress	DHCP authorization	Integer
sspHost	User and service tracking	
terminateCause	User and service tracking	
uid	User and service authorization	
userDn	User and service tracking	
userIpAddress	User and service tracking	
userMacAddress	User and service tracking	
userRadiusClass	Service tracking	RADIUS class of associated subscriber session
userSessionId	Service tracking	RADIUS session ID of associated subscriber session

Configuring a RADIUS Packet Template

There are two ways to define RADIUS packets for flexible RADIUS accounting and authentication plug-ins:

- Define attributes in a template, and then apply the template to flexible RADIUS accounting and authentication plug-ins.
- Define attributes in the packet definition configuration of a flexible plug-in instance. These definitions override definitions in packet templates.

To configure attributes in a template:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure a RADIUS template.
2. To configure a new RADIUS accounting template:
 - a. In the side pane, expand **Configuration**, and then click **RADIUS Packet Template: stdAcct**.

The RADIUS Packet Template: stdAcct pane appears.

- b. From the Create new list, select **RADIUS Attributes**, type the RADIUS attribute name in the dialog box, and click **OK**.

The new RADIUS accounting template appears in the side pane.

3. To configure a new RADIUS authentication template:
 - a. In the side pane, expand **Configuration**, and then click **RADIUS Packet Template: stdAuth**.

The RADIUS Packet Template: stdAuth pane appears.

- b. From the Create new list, select **RADIUS Attributes**, type the RADIUS attribute name in the dialog box, and click **OK**.

The new RADIUS authentication template appears in the side pane.

More About Using Flexible RADIUS Packet Definitions

This section shows some of the ways you can use flexible RADIUS packet definitions. Remember that the name of the attribute instance determines the type of RADIUS packet in which the packet definition is used.

- To use the Challenge Handshake Authentication Protocol (CHAP) to authenticate subscribers, include the Chap-Password and optionally the Chap-Challenge attributes in authentication requests. (We recommend that you use Chap-Password only. Use Chap-Challenge only if required.) To use a CHAP password, include the following in attribute instance auth:

Chap-Password = password

- To cause the Calling-Station-Id attribute to use the subscriber's MAC address:

Calling-Station-Id = userMacAddress

- To set the value to prefix N followed by the service name and the prefix S followed by the service session name:

'N'+serviceName, 'S'+serviceSessionName

- To construct a value for the Nas-Port-Id attribute by concatenating the value of routerName, a space, and the Nas-Port-ID on the router:

Nas-Port-Id=routerName + " " + portId

For example, the constructed value might be:

default@phoenix FastEthernet 4/2

- The following example sets the User-Name attribute as follows:

- Sets the value to accountingId, or
- If accountingId is empty, sets the value to loginName, or
- If loginName is also empty, sets the value to NN

User-Name = accountingId or loginName or "NN"

- To extract the lower 32 bits of the 64-bit inOctets counter:

Acct-Input-Octets = lowWord(inOctets)

- To set the counter fields in the RADIUS packet to the appropriate 32-bit values:

```
Acct-Input-Octets = lowWord(inOctets)
Acct-Output-Octets = lowWord(outOctets)
Acct-Input-Packets = inPackets
Acct-Output-Packets = outPackets
```

```
Acct-Input-Gigawords = highWord(inOctets)
Acct-Output-Gigawords = highWord(outOctets)
```

- The inOctets and outOctets are 64-bit values and must be split into lower 32-bit (Acct-*-Octets) and upper 32-bit (Acct-*-Gigawords) values.
- The inPacket and outPacket counters are 32-bit values and can be assigned directly.

Setting Values in Authentication Response Packets

You can use some special attribute values to set values in authentication response packets. For example:

- setRadiusClass(ATTR)
- setSessionTimeout(ATTR)
- setSessionVolumeQuota(ATTR)

Table 16 on page 314 lists the type of packets (authresp, userresp, or svcresp) in which you can use these values.

When the RADIUS client finds one of these attribute values in an authentication response, it binds ATTR to the current attribute and executes the defined expression. The expression calls one of the available set methods to set the value in the plug-in event.

Below are some examples.

- To set a session timeout:
`Session-Timeout = setSessionTimeout(ATTR)`
- To set the RADIUS class:
`Class = setRadiusClass(ATTR)`
- To set the service bundle in VSA 31:
`26.4874.31.text = setServiceBundle(ATTR)`
- To set the session volume quota:
`26.4874.50.text = setSessionVolumeQuota(ATTR)`

Selecting IP Address Pools Using DHCP Response Packets

For DHCP subscribers, you can set up RADIUS authorization plug-ins to return to the router attributes that can be used to select a DHCP address such as framed IP address and pool. You can also set up the name of the virtual router on which the address pool is located and select a fixed address for each subscriber.

- Framed IP address—Selects the pool from which the address is allocated; if the framed IP address is not available, the DHCP server allocates the next available address in the pool; use the `setUserIpAddress` value.
- Framed IP pool—Name of the address pool on the router from which an IP address is assigned; use the `setPoolName` value.
- Virtual router name—Name of the virtual router on which the address pool is located; use the `setAuthVirtualRouterName` value.

You can also select a fixed address for each subscriber. If you identify subscribers by port information (for example, NAS-IP and NAS-Port), the authorization response can select a fixed IP address for each subscriber.



NOTE: Parameters set in the DHCP profile override parameters set by DHCP authorization plug-ins.

Configuring Event Publishers with the C-Web Interface

This topic shows how to configure event publishers. It covers the following tasks:

- Configuring Global and Default Retailer Event Publishers on page 319
- Configuring Service-Specific Event Publishers on page 320
- Configuring Retailer-Specific Event Publishers on page 320
- Configuring Virtual Router-Specific Event Publishers on page 320

Configuring Global and Default Retailer Event Publishers

To configure global and default retailer event publishers:

1. Click **Configure**, expand **Shared > SAE**, and then expand the SAE group for which you want to configure a event publisher.
2. In the side pane, expand **Plug Ins**, and then click **Event Publishers**.

The Event Publishers pane appears.

3. Click **Create**, enter information as described in the Help text in the main pane, and then click **Apply**.

Configuring Service-Specific Event Publishers

In the value-added services definition, you can configure two event publishers for a service:

- Authorization plug-ins—Authenticate subscribers of the service and/or authorize service sessions for this service. These plug-in instances are called before a subscription to this service is activated.
- Tracking plug-ins—Track service sessions of this service. These plug-in instances are called when a service session is started and stopped and during interim updates.

See *SRC-PE Services and Policies Guide, Chapter 1, Managing Services with the SRC CLI*.

Configuring Retailer-Specific Event Publishers

In the retailer definition, you can configure three event publishers for a retailer:

- Authentication plug-ins—Authenticate subscribers who log in to the domains of the retailer. These plug-in instances are called when a subscriber tries to log in to the SAE through the portal login.

If you do not specify retailer-specific authentication plug-ins, the default retailer authentication plug-ins are called. If you do not specify default retailer authentication plug-ins, subscribers are admitted without authentication.

- Tracking plug-ins—Track sessions of subscribers who log in to the domains of the retailer. These plug-in instances are called after a subscriber session has started and when the session is stopped.
- DHCP authorization plug-ins—Authenticate DHCP address requests for subscribers who log in to the domains of the retailer.

See *Adding Retailers with the C-Web Interface* on page 323.

Configuring Virtual Router-Specific Event Publishers

In the virtual router definition, you can configure an interface-tracking plug-in event publisher for a virtual router. These plug-in instances are called when a managed interface is started and stopped. They are called after an interface comes up, when new policies are installed on the interface, and when the interface goes down.

For information about configuring virtual routers for JUNOS routers, see *SRC-PE Network Guide, Chapter 5, Using JUNOS Routers in the SRC Network with the SRC CLI*.

For information about configuring virtual routers for JUNOS routing platforms, see *SRC-PE Network Guide, Chapter 7, Using JUNOS Routing Platforms in the SRC Network with the SRC CLI*.

Related Topics

- For information about setting up SAE groups, see *Chapter 8, Setting Up an SAE with the C-Web Interface*.

Chapter 29

Configuring Subscribers and Subscriptions with the C-Web Interface

This chapter describes how to use the C-Web interface to configure subscribers and managers and to configure subscriptions to services.

You can also use the following to configure subscribers and subscriptions:

- To use the SRC CLI on a C-series Controller, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 12, Configuring Subscribers and Subscriptions with the SRC CLI*.
- To use the SDX Admin on a Solaris platform, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 13, Configuring Subscribers and Subscriptions with SDX Admin*.

Topics in this chapter include:

- Overview of Configuring Subscribers and Subscriptions on page 322
- Enabling the Subscriber and Subscription Configuration on the C-Web Interface on page 322
- Adding Subscribers with the C-Web Interface on page 323
- Adding Retailers with the C-Web Interface on page 323
- Adding Subscriber Folders with the C-Web Interface on page 324
- Adding Residential Subscribers with the C-Web Interface on page 325
- Adding Enterprises with the C-Web Interface on page 325
- Adding Sites with the C-Web Interface on page 326
- Adding Devices as Subscribers with the C-Web Interface on page 327
- Adding Managers with the C-Web Interface on page 327
- Configuring Subscriptions with the C-Web Interface on page 328
- Configuring Accesses with the C-Web Interface on page 329

Overview of Configuring Subscribers and Subscriptions

This section gives an overview of configuring subscribers and subscriptions for the SRC software.

Specifying the Activation Order for Subscriptions

You can specify the order in which the SAE activates subscriptions that are set up to activate on login for a particular subscriber. To specify the order, you define a precedence for the activation of each subscription. The SAE activates services in ascending order of precedence; if multiple services have the same precedence, the SAE activates them in an unspecified order.

You can configure the activation order by setting that option when you configure a subscription to a service. See *Configuring Subscriptions with the C-Web Interface* on page 328. The enterprise manager portal automatically sets the activation order of some subscriptions to ensure that they are activated before other subscriptions that depend on them.

Inheritance of Properties and Subscriptions

Subordinate subscribers inherit properties and SAE subscriptions from their parent subscribers, unless you specify a different value for the subordinate. Properties that a subscriber can inherit include the maximum number of concurrent logins and the session timeout. For example, if you configure a subscription to a video service for an enterprise and configure a different subscription to the same video service for a site within that enterprise, the site uses its own subscription rather than the inherited subscription.

Enabling the Subscriber and Subscription Configuration on the C-Web Interface

Before you can configure subscribers and subscriptions with the C-Web interface, you must enable the policy, service, and subscriber editor on the C-Web interface. To do so :

1. Click **Manage > Enable**.

The Enable pane appears.

2. From the Component list, select **Editor**, and click **OK**.

If you are using multiple C-series Controllers, we recommend that you enable the policy, service, and subscriber editor on only one C-series Controller on your network.



CAUTION: If you enable the editor on multiple platforms, there is a risk that configuration changes will conflict. In this case, the second edit that is committed to the platform is lost.

Adding Subscribers with the C-Web Interface

This section describes how to add and configure subscribers with the C-Web interface.

The tasks to configure subscribers are:

- Add retailers.

See *Adding Retailers with the C-Web Interface* on page 323.

- Add subscriber folders.

See *Adding Subscriber Folders with the C-Web Interface* on page 324.

The subscriber hierarchy requires that the objects immediately subordinate to retailers be subscriber folders. You can, however, use subscriber folders subordinate to other subscriber objects to organize groups of subscribers.

- Add residential subscribers.

See *Adding Residential Subscribers with the C-Web Interface* on page 325.

- Add enterprises.

See *Adding Enterprises with the C-Web Interface* on page 325.

- Add sites.

See *Adding Sites with the C-Web Interface* on page 326.

- Add devices as subscribers.

See *Adding Devices as Subscribers with the C-Web Interface* on page 327.

Related Topics

- *Adding Managers with the C-Web Interface* on page 327
- *Configuring Subscriptions with the C-Web Interface* on page 328.

Adding Retailers with the C-Web Interface

If you customize the SRC software for only one Internet service provider (ISP), use the retailer called *default* that is provided in the sample data. If the SRC software will manage multiple ISPs, add a retailer for each ISP.

To add a retailer:

1. Click **Configure > Subscribers**.

The Subscribers pane appears.

2. From the Create new list, select **Retailer**.

3. In the dialog box, type a name for the new Retailer (for example, retailer-one), and click **OK**.

The Retailer: *< name >* pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Administrative Information for Retailers with the C-Web Interface

To add administrative information about retailers:

1. Click **Configure**, and expand **Subscribers**.
2. Expand the specified retailer, and click **Info**.

The Info pane appears.

3. Click the **Create** button.

The Info pane reappears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Adding Subscriber Folders with the C-Web Interface

You can create subscriber folders for retailers, existing subscriber folders, enterprises, and sites. You must create a subscriber folder in a retailer object before you can add other types of subscribers.

To create a subscriber folder:

1. Click **Configure**, and expand **Subscribers**.
2. Click the specified retailer.
3. From the Create new list, select **Subscriber Folder**.
4. In the dialog box, enter a name for the new Subscriber Folder, and click **OK**.

The Subscriber Folder: *< name >* pane appears.

5. Enter information as described in the Help text in the main pane, and click **Apply**.

Adding Residential Subscribers with the C-Web Interface

To add a residential subscriber:

1. Click **Configure**, and expand **Subscribers**.
2. Expand the specified retailer, and the specified subscriber folder.
3. Click the specified subscriber.

The Subscriber: <name> pane appears.

4. From the Create new list, select **Subscriber**.
5. In the dialog box enter a name for the new Subscriber, and click **OK**.

The Subscriber: <name> pane appears.

6. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Administrative Information for Residential Subscribers with the C-Web Interface

To add administrative information about residential subscribers:

1. Click **Configure**, and expand **Subscribers**.
2. Expand the specified retailer and the specified subscriber folder.
3. Expand the specified subscriber, and click **Info**.

The Info pane appears.

4. Click the **Create** button.
5. Enter information as described in the Help text in the main pane, and click **Apply**.

Adding Enterprises with the C-Web Interface

To add an enterprise subscriber:

1. Click **Configure**, and expand **Subscribers**.
 2. Expand the specified retailer, and then click the specified subscriber folder.
- The Subscriber Folder: <name> pane appears.
3. From the Create new list, select **Enterprise**.
 4. In the dialog box, enter a name for the new Enterprise, and click **OK**.

The Enterprise: <name> pane appears.

5. Enter information as described in the Help text in the main pane, and click **Apply**.
6. Configure an access subscription for the enterprise. (See *Configuring Accesses with the C-Web Interface* on page 329.)

Configuring Administrative Information for Enterprise Subscribers with the C-Web Interface

To add administrative information about enterprise subscribers:

1. Click **Configure**, and expand **Subscribers**.
2. Expand the specified retailer and subscriber folder.
3. Expand the specified enterprise, and click **Info**.

The Info pane appears.

4. Click the **Create** button.

The Info pane reappears.

5. Enter information as described in the Help text in the main pane, and then click **Apply**.

Adding Sites with the C-Web Interface

To add a site:

1. Click **Configure**, and expand **Subscribers**.
2. Expand the specified retailer and the subscriber folder.
3. Click the specified enterprise.

The Enterprise: < name > pane appears.

4. From the Create new list, select **Site**.
5. In the dialog box, enter a name for the new Site, and click **OK**.

The Site: < name > pane appears.

6. Enter information as described in the Help text in the main pane, and click **Apply**.
7. Configure an access for the site. (See *Configuring Accesses with the C-Web Interface* on page 329.)

Adding Devices as Subscribers with the C-Web Interface

You can configure a device subscriber for subscriber sessions that manage the forwarding interface on JUNOS routing platforms and the router pseudo-subscriber on JUNOSe routers.

You can add devices as subscribers to subscriber folders, enterprises, and sites.

To add a device as a subscriber:

1. Click **Configure**, and expand **Subscribers** and the specified retailer.
2. Click the specified subscriber folder.

The Subscriber Folder: *< name >* pane appears.

3. From the Create new list, select **Device**.
4. In the dialog box, enter a name for the new Device, and click **OK**.

The Device: *< name >* pane appears.

5. Enter information as described in the Help text in the main pane, and click **Apply**.

Adding Managers with the C-Web Interface

To add a manager:

1. Click **Configure**, and expand **Subscribers**.
2. Expand the specified retailer and subscriber folder.
3. Click the specified enterprise.

The Enterprise: *< name >* pane appears.

4. From the Create new List, select **Manager**.
5. In the dialog box, enter a name for the new Manager, and click **OK**.

The Manager: *< name >* pane appears.

6. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring Subscriptions with the C-Web Interface

After you add subscribers, you configure subscriptions for the subscribers. Residential or enterprise subscribers may also be able to configure subscriptions through the portal, and managers assigned to a subscriber object may be able to configure subscriptions for that object.

You must add a service to the directory before you can specify that service for subscribers.

After you configure a subscription to a service, the service is available to the subscriber through the portal. Depending on the configuration, the subscriber may need to activate the service. You can configure schedules to define when services are available to subscribers.

To configure a subscription to a service:

1. Click **Configure**, and expand **Subscribers** and the specified retailer.
2. Click the specified subscriber folder.

The Subscriber Folder: *< name >* pane appears.

3. From the Create new list, select the type of subscription that you want to configure.

The Subscription: *< name >* pane appears.

4. Enter information as described in the Help text in the main pane, and click **Apply**.

Allowing Multiple Subscriptions to the Same Service per Subscriber

To allow a subscriber to have multiple subscriptions to the same service, each subscription:

- Must have its own parameter substitutions.
- Can be activated or deactivated independently.

An object for each subscription is created in the directory. The name of the object has the following format:

`<ServiceName>%<SubscriptionId>`

- `<ServiceName>` —Name of the service
- `<SubscriptionId>` —Name of the subscription

Other than the naming convention, multiple subscriptions are identical to regular subscriptions.

Configuring Accesses with the C-Web Interface

You must configure an access for an enterprise or a site. An access determines the way that the enterprise or site accesses Internet services, and specifies a set of services that are available to the particular access.

Subscriber classification scripts can use access subscription properties to match the interface in the network with an access in the directory. Typically, the interface alias, interface description, interface name, unique ID, NAS port ID, and router name are used to match an interface to an access.

You can specify multiple accesses; for example, you might want to specify primary and backup services for Internet access.

To configure a subscription to an access service:

1. Click **Configure**, and expand **Subscribers**.
2. Expand the specified retailer and the subscriber folder.
3. Click the specified enterprise.
The Enterprise: *< name >* pane appears.
4. From the Create new list, select **Access**.
5. In the dialog box, enter a name for the new Access, and click **OK**.
The Access: *< name >* pane appears.
6. Enter information as described in the Help text in the main pane, and click **Apply**.

Chapter 30

Configuring Traffic Redirection with the C-Web Interface

This chapter describes how to use the C-Web interface to configure the redirect server for a C-series Controller. You can also use the following to configure the redirect server for a C-series Controller:

- To use the SRC CLI interface, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 15, Configuring Traffic Redirection with the SRC CLI*.
- To use the Solaris platform, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 16, Configuring Traffic Redirection on a Solaris Platform*.

Topics in this chapter include:

- Before You Configure the Redirect Server on a C-series Controller on page 332
- Configuring the Redirect Server with the C-Web Interface on page 332
- Configuring General Properties for the Redirect Server with the C-Web Interface on page 333
- Configuring a Connection Between the Redirect Server and the Directory with the C-Web Interface on page 334
- Defining Traffic to Transmit to the Redirect Server with the C-Web Interface on page 334
- Changing the Number of Requests That the Redirect Server Accepts with the C-Web Interface on page 335
- Specifying Extensions for Files That the Redirect Server Accepts with the C-Web Interface on page 335
- Configuring the DNS Server for the Redirect Server with the C-Web Interface on page 336
- Configuring the Redirect Server to Support HTTP Proxies with the C-Web Interface on page 336
- Configuring a Redundant Redirect Server with the C-Web Interface on page 337
- Configuring Logging for the Redirect Server on page 337

- Changing the Configuration for the Redirect Server on page 337
- Assessing Load for Redirect Server with the C-Web Interface on page 338

For information about the redirect server, including information about what you should do before using the redirect server, see *SRC-PE Subscribers and Subscriptions Guide, Chapter 14, Redirecting Subscriber Traffic*.

For information about monitoring the redirect server, see *SRC-PE Monitoring and Troubleshooting Guide, Chapter 21, Monitoring Redirect Server with the SRC CLI*.

Before You Configure the Redirect Server on a C-series Controller

Before you configure the redirect server on a C-series Controller:

- Configure policies on a B-RAS to define which traffic to send to the redirect server; typically, a next-hop policy specifies a destination address that is the virtual IP address of the active redirect server.
- If you plan to configure a redundant redirect server, make sure that you are familiar with the network configuration required.

See *SRC-PE Subscribers and Subscriptions Guide, Chapter 14, Redirecting Subscriber Traffic*.

Configuring the Redirect Server with the C-Web Interface

Configure the redirect server on a C-series Controller to manage IP layer redirection.

To configure the redirect server:

1. Configure general properties for the redirect server.

See *Configuring General Properties for the Redirect Server with the C-Web Interface* on page 333.

2. Configure a connection from the redirect server to the directory.

See *Configuring a Connection Between the Redirect Server and the Directory with the C-Web Interface* on page 334.

3. (Optional) Define traffic to be forwarded to the redirect server. In most cases you can accept the default values—traffic destined for port 80 (Web requests) and forwarded from all interface on a C-series Controller.

See *Defining Traffic to Transmit to the Redirect Server with the C-Web Interface* on page 334.

4. (Optional) Configure the number of requests that the redirect server accepts.

See *Changing the Number of Requests That the Redirect Server Accepts with the C-Web Interface* on page 335.

5. (Optional) Configure the types of files for which the redirect server accepts requests.

See *Specifying Extensions for Files That the Redirect Server Accepts with the C-Web Interface* on page 335.

6. (Optional) For a configuration to support HTTP proxies, configure DNS. You can configure the DNS server included with the redirect server, or another DNS server on your network. If you use another DNS server, you do not need to configure the DNS server included with the redirect server.

For information about configuring the DNS server included with the redirect server, see *Configuring the DNS Server for the Redirect Server with the C-Web Interface* on page 336.

7. (Optional) Configure support for HTTP proxies.

See *Configuring the Redirect Server to Support HTTP Proxies with the C-Web Interface* on page 336.

8. (Optional) Configure a redundant redirect server.

See *Configuring a Redundant Redirect Server with the C-Web Interface* on page 337.

Configuring General Properties for the Redirect Server with the C-Web Interface

To configure general properties for the redirect server:

1. Click **Configure > Redirect Server**.

The Redirect Server pane appears.

2. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring a Connection Between the Redirect Server and the Directory with the C-Web Interface

To configure a connection between the redirect server and the directory:

1. Click **Configure**, expand **Redirect Server**, then click **Ldap**.

The Ldap pane appears.

2. Enter information as described in the Help text in the main pane, and click **Apply** to trigger an automatic commit.

Defining Traffic to Transmit to the Redirect Server with the C-Web Interface

You can define traffic to be forwarded to the redirect server by identifying the destination port number (typically, port 80 for Web requests) for packets and the physical interface on a C-series Controller from which subscriber traffic is forwarded to the redirect server. In most cases you can accept the default values for configuration for IP redirection. If you do not specify an interface, traffic is accepted on all interfaces.

To change the values of the port for traffic and/or the C-series interface on which traffic is forwarded to the redirect server:

1. Click **Configure**, expand **Redirect Server**, and then click **IP Redirect**.

The IP Redirect pane appears.

2. Click the **Create** button.

The IP Redirect pane reappears.

3. Enter the information as described in the Help text in the main pane, and click **Apply**.

Changing the Number of Requests That the Redirect Server Accepts with the C-Web Interface

If you want to change the number of redirection requests that the redirect server accepts, change the values for the request rates and the client rates.

To configure the number of redirection requests that the redirect server can accept:

1. Click **Configure > Redirect Server**.

The Redirect Server pane appears.

2. Change the values in the following boxes as described in the Help text in the main pane:

- Request Rate
- Request Burst Size
- Client Rate
- Client Burst Size

3. Click **Apply**.

Specifying Extensions for Files That the Redirect Server Accepts with the C-Web Interface

If you do not specify the types of files that the redirect server accepts, the redirect server accepts all file types. You can identify file types by specifying the file extensions for the files that the redirect server is to accept.

To specify the extensions for the types of files accepted by the redirect server:

1. Click **Configure > Redirect Server**.

The Redirect Server pane appears.

2. To enable or disable checking file extensions, clear or select the Check File Extensions box as described in the Help Text in the main pane.
3. Click **Apply**.

Configuring the DNS Server for the Redirect Server with the C-Web Interface

A DNS server is required to support HTTP proxies to resolve the name of any HTTP proxy, even if the name is valid only in the private domain of the client. You can use an external DNS or the DNS server that is included with the redirect server for this purpose.



NOTE: If you plan to use an external DNS server, do not follow this procedure.

The following procedure describes how to configure the DNS server that is included with the redirect server.

Proxy support must be enabled before configuring the DNS server. See *Configuring the Redirect Server to Support HTTP Proxies with the C-Web Interface* on page 336.

To configure the DNS server that is included with the redirect server:

1. Click **Configure**, expand **Redirect Server**, and click **DNS**.

The DNS pane appears.

2. Enter information as described in the Help text in the main pane, and click **Apply**.

Configuring the Redirect Server to Support HTTP Proxies with the C-Web Interface

Support for proxy requests is an optional feature of the redirect server. If you configure proxy support, you must also have DNS configured. You can use DNS servers already installed on your network, or use the server included with the SRC software.

For information about configuring the DNS server included with the SRC software, see *Configuring the DNS Server for the Redirect Server with the C-Web Interface* on page 336.

To configure the redirect server to support HTTP proxies:

1. Click **Configure > Redirect Server**.

The Redirect Server pane appears.

2. Clear the Proxy Support checkbox box to disable HTTP proxy support. Select the checkbox to enable HTTP proxy support. Refer to the information in the Help text in the main pane.
3. In the Destination Url box, type the URL sent as a response to proxy requests.
4. Click **Apply**.

Configuring a Redundant Redirect Server with the C-Web Interface

Although configuration of a redundant redirect server is optional, we recommend that you configure redundancy to maintain high availability for the server.

To configure redundancy for the redirect server:

1. Click **Configure > Redirect Server**.

The Redirect Server pane appears.

2. To enable or disable redundancy for the redirect server, clear (or select) the Redundancy checkbox as described in the Help text in the main pane.

Configuring Logging for the Redirect Server

The redirect server logs incoming HTTP requests through system logging with a priority of Info and log facility of Local7.

Changing the Configuration for the Redirect Server

When you change the configuration for the redirect server and commit that configuration, the redirect server is automatically restarted.

Assessing Load for Redirect Server with the C-Web Interface

You can view the number of requests sent to the redirect server, and whether the requests reach the configured limit for the server and for server users. You can then use this information to fine-tune the properties for redirect server.

To view statistics for redirect server:

1. Click **Monitor > Redirect Server > Statistics**.

The Redirect Server Statistics pane appears.

2. From the Output Style list, select an output style as described in the Help text in the main pane.
3. Click **OK**. The Redirect Server pane displays the following statistics:
 - Uptime
 - Accepted requests
 - Rejected requests
 - Number of user-limit leaky buckets
 - Number of user limits reached
 - Number of global limits reached

You can also obtain statistics for redirect server through SNMP. The name of the MIB for redirect server is Juniper-SDX-REDIRECTOR-MIB.

Index

Symbols

! regular expression operator	31
\$ regular expression operator	31
() regular expression operator	31
* regular expression operator	31
+ regular expression operator	31
. regular expression operator	31
[] regular expression operator	31
^ regular expression operator	31

A

access privilege levels	
permission options	26
accesses	
configuring subscriptions	
C-Web interface	328, 329
accounting	
basic RADIUS accounting plug-in	301
custom RADIUS accounting plug-ins	301
flat file accounting plug-ins	301
flexible RADIUS accounting plug-ins	301
action congestion points	
configuring with C-Web interface	136
action threshold, service schedules	
setting	
C-Web interface	248
admin permission	26
admin-control permission	26
aggregate services	
adding	
C-Web interface	237
timers, configuring	
C-Web interface	238
all permission	26
announcements at system login	35
applications	
SRC on CD	xxiii
apply-groups statement, JUNOS routing platforms ..	204
assigned IP subscribers	
third-party devices	190
IP address pools	190

assigning

edge congestion points to subscribers	
with C-Web interface	134
interfaces to backbone congestion points	
with C-Web interface	138
interfaces to subscribers with C-Web interface ..	134
audience for documentation	xxi
authentication	
multiple methods with C-Web interface	39
NTP authentication keys	16, 17
RADIUS	
configuring	37
configuring with C-Web interface	38
shared user accounts	41
TACACS+ , configuring with C-Web interface ..	37, 38
template accounts	
configuring local user with C-Web interface ..	41
configuring remote users with	
C-Web interface	41
named	40
overview	40
authentication order	
configuring with C-Web interface	39
overview	39
removing authentication method	40
authentication plug-ins	
configuring	
SRC CLI	306
authorization plug-ins	
configuring	
SRC CLI	306

B

backbone congestion points	127
configuring for services with C-Web interface ..	137
configuring with C-Web interface	136, 137
running applications from	136
backbone network	135
backbone network management with SRC-ACP	
configuring with C-Web interface	135
backbone network with SRC-ACP	
managing with C-Web interface	135

bandwidth	
configuring	
for services with C-Web interface	134, 137
for subscribers with C-Web interface	133
bandwidths and congestion points for subscribers with C-Web interface	
configuring	133
basic RADIUS accounting plug-in	301
configuring	
SRC CLI	304
basic RADIUS authentication plug-in	306
configuring	
SRC CLI	307
BEEP, JUNOS routing platforms	
connection	170
C	
captive portal	
using with next-hop action	
C-Web interface	222
certificate authority (CA)	172
classification scripts	
conditions	72
glob matching	75
joining	75
regular expression matching	76
congestion point classification	
criteria	138, 140
description	138
how it works	138
targets	138, 139
descriptions	71
DHCP classification, C-series platform	
conditions	85
description	72
targets	86
DHCP subscriber classification, C-series platform	
C-Web interface	84
interface classification, C-series platform	
conditions	77
C-Web interface	76
description	71
how it works	72
targets	79
structure	
C-Web interface	72
subscriber classification, C-series platform	
condition	79
C-Web interface	79
description	71
DHCP options	82
how it works	73
targets	83
target, C-series platform	
definition	72
expressions	74
types	74
classify-traffic condition	
application protocol	
defining, C-Web interface	216
map expressions, C-Web interface	217
configuring	
C-Web interface	208–217
destination grouped network, configuring	
C-Web interface	212
destination network, configuring	
C-Web interface	212
expanded classifiers	
configuring, C-Web interface	210
extended classifiers	
configuring, C-Web interface	210
ICMP conditions, setting	
C-Web interface	215
IGMP conditions, setting	
C-Web interface	215
IPSec conditions, setting	
C-Web interface	215
JUNOS filter conditions, setting	
C-Web interface	216
PCMM I02 and I03	
configuring, C-Web interface	210
port definitions, overview	
C-Web interface	211
protocol conditions with parameters, setting	
C-Web interface	214
protocol conditions with ports, setting	
C-Web interface	213
protocol conditions, setting	
C-Web interface	213
source grouped network, configuring	
C-Web interface	212
source network, setting	
C-Web interface	212
TCP conditions, setting	
C-Web interface	214
ToS byte conditions, setting	
C-Web interface	215
clear permission	26
CMTS devices	
adding objects to directory	
C-Web interface	185
adding virtual router objects to directory	
SRC CLI	186
configuration statements	185, 186
commands	
access to	30
Common Open Policy Service. <i>See</i> COPS	

- community manager
 - configuring, third-party devices
 - C-Web interface 195
- configuration group, JUNOS routing platforms 170, 181
- configuration statements
 - access to 30
- configure permission 26
- congestion point applications
 - SPI for ACP 136
- congestion point classification scripts. *See* classification scripts
- congestion point expressions 140
- congestion point profiles
 - congestion point expressions 140
 - defining with C-Web interface 140
- congestion points
 - configuring 133
- control permission 26
- conventions defined
 - icons xxii
 - text xxii
- COPS (Common Open Policy Service)
 - connection with JUNOSe routers 158
 - configuring SAE, C-Web interface 160
 - disabling on router 165
 - enabling on router 165
- CORBA (Common Object Request Broker Architecture) IOR location 120
- CORBA interfaces
 - SRC-ACP 132
- CoS (class of service)
 - ToS byte, setting
 - C-Web interface 215
- C-series and remote host connections, securing with the C-Web interface 9
- C-series Controllers
 - interfaces 4
- C-series platform, configuring to accept SSH
 - connections with the C-Web interface 10
- C-series platform, configuring to accept telnet
 - connections with the C-Web interface 11
- custom RADIUS accounting plug-ins 301
 - configuring
 - SRC CLI 305
- custom RADIUS authentication plug-ins 306
 - configuring
 - SRC CLI 309
- customer support xxvi

D

- data recovery
 - Juniper Networks database 55
- Data-over-Cable Service Interface Specifications. *See* DOCSIS
- device drivers
 - JUNOS
 - configuring, C-Web interface 172
 - viewing state, C-Web interface 183
 - viewing statistics, C-Web interface 183, 184
 - JUNOSe
 - configuring, C-Web interface 160
 - configuring, SRC CLI 172
 - viewing state, C-Web interface 167
 - viewing statistics, C-Web interface 167, 168
- DHCP (Dynamic Host Configuration Protocol)
 - classification scripts. *See* classification scripts
 - options 87
 - profiles
 - C-Web interface 90
- Differentiated Services code point, ToS byte
 - C-Web interface 215
- directory
 - services for SRC-ACP 132
 - subscribers for SRC-ACP 132
- DOCSIS policy actions
 - configuring
 - C-Web interface 219
- documentation set, SRC. *See* SRC documentation set
- drop profile maps
 - configuring
 - C-Web interface 227
 - drop probability, setting
 - C-Web interface 227
 - fill level, setting
 - C-Web interface 227
- DSCP (Differentiated Services code point), ToS byte C-Web interface 215

E

- edge congestion points
 - assigning to subscribers with C-Web interface 134
- edge network 133
- edge network management, configuring
 - with C-Web interface 133
- enterprise subscribers
 - adding
 - C-Web interface 325
- event notification, PCMM network
 - configuration statements 94
 - properties, configuring
 - SRC CLI 94

event notification, third-party devices	
configuring properties	
C-Web interface	196
description	191
event publishers	
configuring	
SRC CLI	319
retailer-specific	320
service-specific	320
virtual router-specific	320
events, publishing	127
exclusions to service schedule	
defining C-Web interface	253
expanded classifiers	
configuring C-Web interface	210
expressions	
map, application protocol conditions	
C-Web interface	217
extended classifiers, PCMM	
configuring C-Web interface	210
external plug-ins	
configuring C-Web interface	295
F	
field permission	27
filter actions	
configuring C-Web interface	219
firewall permission	27
firewall-control permission	27
flat file accounting plug-ins	301
configuring SRC CLI	301
configuring headers SRC CLI	302
flexible RADIUS accounting plug-ins	301
attributes, defining	
SRC CLI	311
configuring	304
RADIUS packets, defining	311
flexible RADIUS authentication plug-ins	306
attributes, defining	
examples	317
SRC CLI	311
configuring	
SRC CLI	308
RADIUS packets, defining	
SRC CLI	311
setting responses	
SRC CLI	318
FlowSpec actions	
configuring C-Web interface	220
forward actions	
configuring C-Web interface	220
forwarding class actions	
configuring C-Web interface	220
G	
gateSpec actions	
configuring C-Web interface	221
Gigabit Ethernet interfaces for IPv4, configuring	
with the C-Web interface	6
Gigabit Ethernet interfaces for IPv6, configuring	
with the C-Web interface	7
global parameters	
configuring C-Web	232
predefined	
viewing with C-Web	231
GRE tunnel interfaces	8
H	
hosted internal plug-in	127
I	
icons defined, notice	xxii
idle timeout values, login classes	32
infrastructure services	238
interface classification scripts.	
<i>See</i> classification scripts	
interface-control permission	27
interfaces	
C-series Controllers	4
Gigabit Ethernet, configuring	6, 7
loopback, configuring	4, 5
permission	27
tunnel, configuring	8
interfaces, assigning to backbone congestion	
points with C-Web interface	138
interim accounting, configuring on SAE	
SDX Configuration Editor	289
internal plug-ins	
configuring	
C-Web interface	294
IOR	
router initialization scripts	162, 177
IP-over-IP tunnel interfaces	8
IPv6 in IPv4 tunnel interfaces	8

J

- JPS (Juniper Policy Server)
 - application manager-to-policy server
 - interface, configuring C-Web interface 147
 - monitoring
 - C-Web interface 156
 - operational status 156
 - policy server-to-CMTS interface, configuring
 - C-Web interface 149
 - starting
 - C-Web interface 155
 - stopping
 - C-Web interface 155
 - subscriber address mappings, configuring
 - C-Web interface 149
 - subscriber configuration, modifying
 - C-Web interface 149
- Juniper Networks database
 - community mode, adding Juniper Networks database
 - C-Web interface 49
 - community mode, configuring
 - C-Web interface 48
 - data recovery
 - C-Web interface 55
 - initialize date
 - C-Web interface 52
 - loading sample data 53
 - roles, changing secondary to primary
 - C-Web interface 51
 - security configuration
 - C-Web interface 49, 54
 - standalone mode 48
 - updating data
 - C-Web interface 52
- JUNOS ASP policy rules
 - NAT actions
 - configuring, C-Web interface 222
 - network, specifying
 - C-Web interface 212
 - stateful firewall actions, configuring
 - C-Web interface 228
- JUNOS filter policy rules
 - conditions, setting
 - C-Web interface 216
- JUNOS policer policy rules
 - policer actions
 - configuring, C-Web interface 224
- JUNOS routing platforms
 - accessing router CLI 180
 - configuration groups 170, 181
 - configuring to interact with SAE 180
 - default virtual router
 - adding with C-Web interface 170
 - disabling interactions with SAE 181
 - enabling interactions with SAE 181
 - monitoring interactions with SAE 182
 - router objects, adding
 - SRC CLI 171
 - SRC software process 170
 - statements for integration
 - port-number 180
 - server-address 180
 - source-address 181
 - troubleshooting 182
 - VR objects, adding individually
 - C-Web interface 171
- JUNOS scheduler policy rules
 - actions
 - configuring, C-Web interface 227
 - QoS conditions, configuring
 - C-Web interface 217
 - See also* drop profile maps
- JUNOSE routers
 - accessing router CLI 164
 - COPS connection
 - configuring, C-Web interface 160
 - integration overview 158
 - monitoring interactions with SAE 166
 - router objects, adding
 - C-Web interface 158
 - SNMP communities, configuring
 - C-Web interface 161
 - SNMP server
 - configuring on router 160
 - SRC client 158
 - starting 165
 - stopping 165
 - troubleshooting 166
 - VR objects
 - adding individually, C-Web interface 159
 - discovering, C-Web interface 158

L

LDAP access. <i>See</i> SAE (service activation engine), configuring	
LDAP authentication plug-in	307
configuring	
SRC CLI	310
limiting subscribers plug-in	307
configuring	
SRC CLI	307
local parameters	
configuring	
C-Web interface	232
local password authentication	41
logging	
redirect server	
C-Web interface	337
<i>See also</i> system log server	
logging properties	
configuring for SRC-ACP with C-Web interface.	128
login announcements, system	35
login classes	
configuration	33
configuration prerequisites	
C-Web interface	33
default classes	29
idle timeout values	32
options	26
overview	
C-Web interface	26
predefined	29
privilege level options	
C-Web interface	26
privilege levels	
commands	30
configuration statements	30
login process	
assigned IP subscribers, third-party devices	190
event notification method, third-party devices	192
login registration	
configuring	
SRC CLI	291
loopback interfaces for IPv4, configuring	
with the C-Web interface	4
loopback interfaces for IPv6, configuring	
with the C-Web interface	5
loss priority actions	
configuring	
C-Web interface	221

M

maintenance permission	27
managers	
configuring	
C-Web interface	327
managing	
edge network with SRC-ACP	133
manuals, SRC	
comments	xxv
map expressions	
application protocol conditions	
C-Web interface	217
mark actions	
configuring	
C-Web interface	221
messages	
severity levels for logging	20
monitoring	
backbone congestion points with C-Web interface	
127	
mutex group	
adding	
SRC CLI	239

N

NAS ID, configuring for SAE	
C-Web interface	61
NAT (Network Address Translation) policies	
actions	
configuring, C-Web interface	222
application protocol condition	
defining, C-Web interface	216
map expressions, C-Web interface	217
network	
permission	27
network interfaces	133, 135
next-hop actions	
captive portal feature	
C-Web interface	222
configuring	
C-Web interface	222
next-interface actions	
configuring	
C-Web interface	223
next-rule actions	
configuring	
C-Web interface	223

- NIC (network information collector)
 - configuration overview 109
 - configuration prerequisites 108
 - configuration, changing
 - C-Web interface 115
 - operating properties 109
 - replication
 - configuring with C-Web interface 110
 - SAE plug-in agents 113
 - restarting
 - C-Web interface 115
 - starting
 - C-Web interface 111
 - testing
 - any key 120
 - test data 119
 - testing resolution
 - C-Web interface 114
- NIC configuration scenarios
 - changing
 - C-Web interface 115
 - configuring
 - C-Web interface 111
 - OnePopStatisRoutelp 114
- NIC hosts
 - configuration prerequisites 108
 - stopping
 - C-Web interface 115
- NIC proxies
 - configuration prerequisites 117
- notice icons defined xxii
- notification targets
 - configuring with C-Web interface 104
- NTP (Network Time Protocol)
 - authentication key configuration
 - C-Web interface 16
 - broadcast mode
 - C-Web interface 15
 - configuration
 - C-Web interface 14
 - multicast client configuration
 - C-web interface 16
 - peer configuration
 - C-Web interface 15
 - server configuration
 - C-Web interface 14
- O**
 - objectives of guide xxi
 - operation
 - SRC-ACP, configuring with C-Web interface 129
 - operator login class 29
 - operators, regular expression 31
- P**
 - PacketCable Multimedia Specifications. *See* PCMM
 - parameter values, setting in services 237
 - parameters
 - global. *See* global parameters
 - local. *See* local parameters
 - runtime. *See* runtime parameters
 - passwords
 - RADIUS 38
 - shared user 41
 - user accounts 34
 - PCMM (PacketCable Multimedia)
 - configuring SAE
 - C-Web interface 91
 - PCMM device driver
 - configuration statements 92
 - configuring
 - C-Web interface 92
 - PCMM policies
 - DOCSIS parameters
 - configuring, C-Web interface 219
 - extended classifiers
 - configuring, C-Web interface 210
 - FlowSpec parameters
 - configuring, C-Web interface 220
 - gateSpec parameters, configuring
 - C-Web interface 221
 - I02 and I03 classifiers
 - configuring, C-Web interface 210
 - service class name
 - configuring, C-Web interface 227
 - PCMM record-keeping server plug-in
 - configuration statements 94
 - configuring
 - C-Web interface 94
 - permissions
 - C-Web interface 26
 - plug-ins
 - authentication
 - configuring, SRC CLI 306
 - authorization
 - configuring, SRC CLI 306
 - basic RADIUS accounting 301
 - configuring, SRC CLI 304
 - basic RADIUS authentication 306
 - configuring, SRC CLI 307
 - custom RADIUS accounting 301
 - configuring, SRC CLI 305
 - custom RADIUS authentication 306
 - configuring, SRC CLI 309
 - defining RADIUS packets
 - SRC CLI 311
 - external
 - configuring, C-Web interface 295

flat file accounting	301	QoS profile attachment	
configuring, SRC CLI.....	301	configuring, C-Web interface.....	224
flexible RADIUS accounting.....	301	rate limit	
configuring.....	304	configuring, C-Web interface.....	225
flexible RADIUS authentication	306	reject	
configuring, SRC CLI.....	308	configuring, C-Web interface.....	226
hosted internal plug-in	127	routing instance	
internal		configuring, C-Web interface.....	226
configuring RADIUS peers, SRC CLI	300	scheduler	
configuring, C-Web interface.....	294	configuring, C-Web interface.....	227
RADIUS attributes, SRC CLI.....	311	service class name	
LDAP authentication.....	307	configuring, C-Web interface.....	227
configuring, SRC CLI.....	310	stateful firewall	
limiting subscribers	307	configuring, C-Web interface.....	228
configuring, SRC CLI.....	307	traffic class	
state synchronization		configuring, C-Web interface.....	228
configuring, C-Web interface.....	296	traffic mirror	
tracking		configuring, C-Web interface.....	228
configuring, SRC CLI.....	301	traffic-shape	
policer actions		configuring, C-Web interface.....	229
configuring		policy folders	
C-Web interface	224	configuring	
policy actions		C-Web interface	205
configuring		policy groups	
C-Web interface	218–229	configuring	
DOCSIS		C-Web interface	206
configuring, C-Web interface.....	219	policy lists	
filter		configuring	
configuring, C-Web interface.....	219	C-Web interface	206
FlowSpec		policy rules	
configuring, C-Web interface.....	220	configuring	
forward		C-Web interface	206
configuring, C-Web interface.....	220	precedence	
forwarding class		C-Web interface	207
configuring, C-Web interface.....	220	policy servers	
gateSpec		adding application manager groups	
configuring, C-Web interface.....	221	C-Web interface	151
loss priority		adding objects to directory	
configuring, C-Web interface.....	221	C-Web interface	152
mark		specifying application managers	
configuring, C-Web interface.....	221	C-Web interface	151
NAT		specifying SAE communities	
configuring, C-Web interface.....	222	C-Web interface	151
next hop		Policy Web Admin	
configuring, C-Web interface.....	222	connecting to directory	283
next interface		launching.....	282
configuring, C-Web interface.....	223	querying directory.....	284
next rule		searching for QoS Policy data.....	281
configuring, C-Web interface.....	223	ports	
policer		RADIUS server	38
configuring, C-Web interface.....	224	precedence	
		policy rules	
		C-Web interface	207
		predefined login classes.....	29

preparation time, service schedules	
setting	
C-Web interface	248
privilege levels.....	29
C-Web interface.....	26
properties	
SRC-ACP	128
publishing events.....	127

Q

QoS (quality of service)	
condition	
configuring, C-Web interface.....	217
QoS profile attachment actions	
configuring, C-Web interface.....	224
QoS profile, configuring	
C-Web interface	224
searching for policies in directory.....	278, 281
QoS profiles, JUNOS routers	
how tracking works	268
managing dynamically	268–273
updating directory, using	
qosProfilePublish	275
SDX Admin	275
QoS profile-tracking plug-in	
description	268
QoS tracking plug-in.....	301
quality of service. <i>See</i> QoS	

R

RADIUS	
address for SAE	
C-Web interface	61
RADIUS attributes	
defining in RADIUS plug-ins	
SRC CLI.....	311
examples, defining in RADIUS plug-ins	
SRC CLI.....	317
RADIUS authentication. <i>See</i> authentication	
RADIUS authorization. <i>See</i> authentication	
RADIUS peers	
configuring in plug-ins	
SRC CLI.....	300
RADIUS plug-ins	
authentication.....	306
UDP port.....	310
<i>See also</i> plug-ins	
rate-limit actions	
configuring	
C-Web interface	225
read-only login class.....	29

redirect server	
assessing load	
C-Web interface.....	338
changing request accepted, C-Web interface	335
configuration prerequisites	332
configuring	
C-series platform.....	332
C-Web interface.....	332
configuring connection with C-Web interface	334
configuring DNS server for	
C-Web interface.....	336
configuring general properties with C-Web interface	333
configuring redundant	
C-Web interface.....	337
configuring to support HTTP proxies	
C-Web interface.....	336
defining traffic	
C-Web interface.....	334
defining traffic to transmit	334
logging	337
number of requests.....	335
specifying extensions for files	
C-Web interface.....	335
redundant redirect server, configuring.....	337
regular expressions	
operators	31
usage guidelines	31
reject actions	
configuring	
C-Web interface.....	226
release notes	xxv
reset permission	27
residential subscribers	
adding	
C-Web interface.....	325
resolving host names	
C-Web interface.....	45
retailers	
subscribers	
adding, C-Web interface.....	323
RKS (record-keeping server)	
peers, configuration statements.....	95
peers, configuring in plug-ins	
C-Web interface.....	95
plug-in, configuring	
C-Web interface.....	94

router initialization scripts		NIC replication, configuring	
iorPublisher.....	162	C-Web interface	113
JUNOS.....	177	router initialization scripts. <i>See</i> router initialization scripts	
configuring location, SRC CLI.....	179	session store	
example	179	C-series platforms	66
JUNOSe.....	161	starting	
configuring location, C-Web interface.....	164	SRC CLI.....	62
example	163	SRC client on JUNOSe router.....	165
poolPublisher.....	162	stopping	
router subscribers		SRC CLI.....	62
adding		SRC client on JUNOSe router.....	165
C-Web interface	327	SAE (service activation engine), configuring	
routers		COPS connection	
accessing router CLI.....	164	C-Web interface	160
adding JUNOS routing platforms		directory eventing, SAE configuration data	
SRC CLI	170	C-Web interface	66
adding JUNOSe		interim accounting	
C-Web interface	158	C-Web interface	289
integrating JUNOS routing platform	170	LDAP access, C-Web interface	
integrating JUNOSe.....	158	device data.....	65
routing instance actions		directory data	63
configuring		persistent login cache data	65
C-Web interface	226	policy data	65
routing permission	27	service data.....	65
routing-control permission	27	subscriber data	65
RTPS (real-time polling service)		login registration	
configuring.....	219	C-Web interface	291
runtime parameters		multiple logins from same IP address	
viewing with C-Web.....	233	C-Web interface	290
S		reduce reported session time	
SAE (service activation engine)		C-Web interface	290
classification scripts. <i>See</i> classification scripts		router initialization script location	
configuring as an application manager		SRC CLI.....	179
C-Web interface	151	serialized data compression	
configuring for SRC-ACP with C-Web interface.....	126	C-Web interface	69
configuring groups		session job manager	
C-Web interface	60	C-Web interface	69
configuring initial properties		session reactivation timers	
C-Web interface	61	C-Web interface	291
configuring to monitor backbone congestion		session store	
points with C-Web interface.....	127	C-Web interface	68
disabling interactions with JUNOS routing platform	181	SNMP communities	
enabling interactions with JUNOS routing platform	181	C-series platforms	160
initial properties, overview		time for MAC address in cache	
C-Web interface	59	C-Web interface	288
JUNOS routing platform client.....	180	unauthenticated user DN	
monitoring interactions		C-Web interface	288
JUNOS routing platform	182	SAE (service activation engine), configuring router initialization script location	
JUNOSe routers	166	C-Web interface.....	164

- SAE (service activation engine), configuring
 - community manager
 - SRC CLI..... 93
 - event notification API properties
 - SRC CLI..... 94
 - PCMM device driver
 - C-Web interface 92
 - SRC CLI..... 92
- SAE (service activation engine), configuring
 - directory location for SAE data C-Web interface 61
- SAE (service activation engine), configuring
 - groups C-Web interface 60
- SAE (service activation engine), configuring
 - NAS ID C-Web interface 61
- SAE (service activation engine), configuring
 - RADIUS address C-Web interface 61
- SAE communities
 - configuration overview
 - SRC CLI..... 93
 - configuration statements 93
 - configuring manager
 - SRC CLI..... 93
 - description, third-party devices 188
- sample data, loading
 - Juniper Networks database,C-Web interface 53
- scheduler actions
 - configuring
 - C-Web interface 227
 - See also* drop profile maps
- script services
 - adding
 - SRC CLI..... 239
 - for third-party devices 189
- secret permission 27
- secret-control permission 28
- security permission 28
- security-control permission 28
- serial port, C-series platform 4
- serialized data compression, configuring
 - C-Web interface..... 69
- service class name actions
 - configuring
 - C-Web interface 227
- service permission..... 28
- service schedules
 - action threshold, setting
 - C-Web interface 248
 - configuring
 - C-Web interface 249–256
 - examples
 - C-Web interface 256, 259, 264
 - exclusions, defining
 - C-Web interface..... 253
 - preparation time, setting
 - C-Web interface..... 248
- service scopes
 - adding
 - C-Web interface..... 240
 - assigning services and Mutex groups
 - C-Web interface..... 240
 - assigning to VRs or subscribers
 - C-Web interface..... 241
 - configuring
 - C-Web interface..... 240
 - example
 - SRC CLI..... 243
- service-control permission 28
- services
 - adding aggregate
 - C-Web interface..... 237
 - adding infrastructure
 - C-Web interface..... 238
 - adding Mutex group
 - C-Web interface..... 239
 - adding normal
 - SRC CLI..... 236
 - adding script services
 - C-Web interface..... 239
 - configuring bandwidth for
 - with C-Web interface 137
 - configuring bandwidth for with C-Web
 - interface 134
 - setting parameter values 237
 - C-Web interface..... 237
- session job manager, configuring
 - C-Web interface 69
- session store
 - configuring, C-Web interface
 - device driver 68
 - global parameters 68
 - configuring, SRC CLI
 - compressing session objects..... 69
 - C-series platforms 66
 - in third-party networks..... 189
- setting paramater values
 - C-Web interface 237
- shared user accounts..... 41
- shell permission 28
- sites
 - subscriber
 - adding, C-Web interface..... 326
- SNMP
 - retrieving information from network devices.... 198

SNMP agent	
access control, configuring on C-series Controllers with C-Web interface	
VACM	102
configuring	
C-series Controllers	100
C-series Controllers with C-Web interface	98
C-Web interface	100
configuring with C-Web interface	
SRC CLI	98
description	97
directory connection parameters, configuring	
C-Web interface	99
local properties, configuring	
with C-Web interface	98
monitoring	
C-Web interface	106
starting	
C-Web interface	105
stopping	
C-Web interface	106
SNMP communities	
configuring on SAE	
SRC CLI	160
snmp control permission	28
snmp permission	28
SNMP server	
configuring on JUNOSe router	160
SRC client, JUNOSe routers	
configuring	158
starting	165
stopping	165
SRC documentation set	
comments	xxv
obtaining	xxv
SRC documentation CD	xxiii
SRC software distribution	xxv
SRC software process, JUNOS routing platforms	170
disabling	181
reenabling	181
SRC-ACP (SRC Admission Control Plug-In)	133
backbone network management,	
configuring with C-Web interface	135
classification scripts	
configuring with C-Web interface	133
configuring with C-Web interface	124
congestion points	127
connections to services directory,	
configuring with C-Web interface	132
connections to subscribers' directory,	
configuring with C-Web interface	132
CORBA interfaces, configuring with C-Web interface	132
event publishers, configuring with	
C-Web interface	127
groups, configuring with C-Web interface	124
logging properties, configuring with C-Web interface	128
operation, configuring with C-Web interface	129
properties	128
redundancy	
configuring with C-Web interface	132
SAE, configuring with C-Web interface	126
state synchronization	
configuring with C-Web interface	132
state synchronization plug-in interface	
configuring	
C-Web interface	296
stateful firewall policies	
actions	
configuring, C-Web interface	228
application protocol conditions	
defining, C-Web interface	216
map expressions, C-Web interface	217
static host mapping	
configuring	
C-Web interface	45
overview	45
static route, configuring to devices on other networks with the C-Web interface	9
subscriber classification scripts.	
<i>See</i> classification scripts	
subscriber folders	
adding	
C-Web interface	324
subscriber permission	28
subscriber-control permission	28
subscribers	
adding	
C-Web interface	323
assigning interfaces to with C-Web interface	134
configuring bandwidths and congestion points for	133
with C-Web interface	134
enterprise	
adding, C-Web interface	325
inheriting properties	322
inheriting subscriptions	322
residential	
adding, C-Web interface	325
retailer	
adding, C-Web interface	323

- router
 - adding, C-Web interface 327
- sites
 - adding, C-Web interface 326
- subscriptions
 - access, configuring
 - C-Web interface 329
 - activation order, specifying
 - C-Web interface 322
 - configuring
 - C-Web interface 328
 - enabling
 - C-Web interface 322
 - multiple per subscriber 328
- super-user login class 29
- support, requesting xxvi
- system authentication. *See* authentication
- system log server
 - configuration prerequisites 21
 - message groups 20
 - message severity levels 20
 - messages, file
 - C-Web interface 21
 - messages, server
 - C-Web interface 21
 - messages, user notification
 - C-Web interface 22
 - overview 19
- system login
 - C-Web interface 35
- system permission 29
- system-control permission 29

T

- TACACS+ authentication. *See* authentication
- targets. *See* classification scripts
- technical support, requesting xxvi
- template authentication accounts
 - configuring with C-Web interface 40
- text conventions defined xxii
- third-party devices
 - creating sessions 189
 - initialization scripts
 - C-Web interface 196
 - integrating into SRC network
 - C-Web interface 188–199
 - logging in subscribers
 - assigned IP method 190
 - event notification method 191
 - overview 189
 - provisioning with script services 189
 - SAE communities 188
 - VR objects, adding
 - C-Web interface 194

- tracking plug-ins
 - configuring
 - SRC CLI 301
- traffic mirror actions
 - configuring
 - C-Web interface 228
- traffic shape actions
 - configuring
 - C-Web interface 229
- traffic-class actions
 - configuring
 - C-Web interface 228
- troubleshooting
 - JUNOS routing platforms 182
 - JUNOSE routers 166
- tunnel interfaces, configuring with the
 - C-Web interface 8

U

- UDP ports
 - RADIUS plug-ins 310
- UGS (unsolicited grant service)
 - configuring
 - C-Web interface 219
- UGS-AD (unsolicited grant service with activity detection)
 - configuring
 - C-Web interface 219
- unauthorized login class 29
- user accounts
 - authentication
 - configuring passwords 35
 - configuring SSH authentication 35
 - authentication method and password 34
 - configuring with C-Web interface 34
 - overview 34
 - C-Web interface 25, 33
 - shared 41
 - See also* login classes
- User Datagram Protocol. *See* UDP
- user notification messages 22

V

- view permission 29
- view-configuration permission 29
- virtual routers
 - adding for third-party devices
 - C-Web interface 194
 - adding individually for JUNOS routing platforms 171
 - adding individually for JUNOSE routers
 - C-Web interface 159
 - adding operative VRs 171
 - C-Web interface 158

