

Chapter 5

Using JUNOSe Routers in the SRC Network with the SRC CLI

This chapter describes how to use the SRC CLI 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 SRC configuration applications to configure the SRC software on a Solaris platform. See *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 60
- Adding JUNOSe Routers and Virtual Routers with the CLI on page 60
- Configuring the SAE to Manage JUNOSe Routers with the CLI on page 64
- Using SNMP to Retrieve Information from JUNOSe Routers on page 66
- Developing Router Initialization Scripts on page 68
- Specifying Router Initialization Scripts on the SAE with the CLI on page 70
- Accessing the Router CLI on page 72
- Starting the SRC Client on a JUNOSe Router on page 72
- Stopping the SRC Client on a JUNOSe Router on page 73
- Monitoring Interactions Between the SAE and the JUNOSe Router on page 73
- Troubleshooting Problems with Managing JUNOSe Routers on page 74

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.

Adding JUNOSe Routers and Virtual Routers with the CLI

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:

- In operational mode, enter the following command:

```
request network discovery network network <community community>
```

where:

- *network*—Address (with or without mask) of the network to discover
- *community*—Name of the SNMP community to which the devices belong

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 Routers Individually

Use the following configuration statements to add a router:

```
shared network device name {
    description description;
    management-address management-address;
    device-type (junose| junos| pcmm| proxy);
    qos-profile [qos-profile...];
}
```

To add a router:

1. From configuration mode, access the configuration statements that configure network devices. This procedure uses `junose_boston` as the name of the router.

```
user@host# edit shared network device junose_boston
```

2. (Optional) Add a description for the router.

```
[edit shared network device junose_boston]
user@host# set description description
```

3. (Optional) Add the IP address of the router.

```
[edit shared network device junose_boston]
user@host# set management-address management-address
```

4. (Optional) Specify the type of device that you are adding.

```
[edit shared network device junose_boston]
user@host# set device-type junose
```

5. (Optional) Specify quality of service (QoS) profiles that are configured on the router.

```
[edit shared network device junose_boston]
user@host# set qos-profile [qos-profile...]
```

6. (Optional) Verify your configuration.

```
[edit shared network device junose_boston]
user@host# show
description "Juniper Networks E320";
management-address 10.10.8.27;
device-type junose;
qos-profile dhcp-default;
interface-classifier {
    rule rule-0 {
        script #;
    }
}
```

Adding Virtual Routers Individually

Use the following configuration statements to add a virtual router:

```
shared network device name virtual-router name {
    sae-connection [sae-connection...];
    snmp-read-community snmp-read-community;
    snmp-write-community snmp-write-community;
    scope [scope...];
    local-address-pools local-address-pools;
    static-address-pools static-address-pools;
    tracking-plug-in [tracking-plug-in...];
}
```

To add a virtual router:

1. From configuration mode, access the configuration statements for virtual routers. This procedure uses `junose_boston` as the name of the router and `vr1` as the name of the virtual router.

```
user@host# edit shared network device junose_boston virtual-router vr1
```

2. Specify the addresses of SAEs that can manage this router. This step is required for the SAE to work with the router.

```
[edit shared network device junose_boston virtual-router vr1]
user@host# set sae-connection [sae-connection...]
```

3. (Optional) Specify an SNMP community name for SNMP read-only operations for this VR.

```
[edit shared network device junose_boston virtual-router vr1]
user@host# set snmp-read-community snmp-read-community
```

4. (Optional) Specify an SNMP community name for SNMP write operations for this virtual router.

```
[edit shared network device junose_boston virtual-router vr1]
user@host# set snmp-write-community snmp-write-community
```

5. (Optional) Specify service scopes assigned to this virtual router. The scopes are available for subscribers connected to this virtual router for selecting customized versions of services.

```
[edit shared network device junose_boston virtual-router vr1]
user@host# set scope [scope...]
```

6. (Optional) Specify the list of IP address pools that a JUNOS virtual router currently manages and stores.

```
[edit shared network device junose_boston virtual-router vr1]
user@host# set local-address-pools local-address-pools
```

7. (Optional) Specify the list of IP address pools that a JUNOSe VR manages but does not store.

```
[edit shared network device junose_boston virtual-router vr1]
user@host# set static-address-pools static-address-pools
```

8. (Optional) Specify the plug-ins that track interfaces that the SAE manages on this virtual router.

```
[edit shared network device junose_boston virtual-router vr1]
user@host# tracking-plugin [tracking-plugin...]
```

9. (Optional) Verify your configuration.

```
[edit shared network device junose_boston virtual-router vr1]
user@host# show
sae-connection 192.168.10.25;
  snmp-read-community *****;
  snmp-write-community *****;
  scope POP-Boston;
local-address-pools "(10.25.8.0 10.25.20.255)";
static-address-pools "({10.30.30.0/24,10.30.30.0,10.30.30.255})";
tracking-plugin flexRadius;
```

Related Information

For additional information, see the following sources:

- 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 *SRC-PE Subscribers and Subscriptions Guide, Chapter 12, Configuring Authorization and Accounting Plug-Ins with the CLI*

Configuring the SAE to Manage JUNOS Routers with the CLI

To set up the SAE to manage JUNOS routers, configure a router driver that specifies a COPS server that can accept COPS connections from the COPS client in JUNOS routers.

Use the following configuration statements to configure the SAE to manage JUNOS routers:

```
shared sae configuration driver junose {
  cops-server-port cops-server-port;
  backlog backlog;
  keepalive-interval keepalive-interval;
  message-timeout message-timeout;
  cops-message-maximum-length cops-message-maximum-length;
  cops-message-read-buffer-size cops-message-read-buffer-size;
  cops-message-write-buffer-size cops-message-write-buffer-size;
  pending-address-timeout pending-address-timeout;
  cops-handler-threads cops-handler-threads;
  cached-driver-expiration cached-driver-expiration;
  drop-unmanaged-interfaces-xdr-driver;
  track-unmanaged-interfaces-xdr-driver;
}
```

To configure the SAE to manage JUNOS routers:

1. From configuration mode, access the configuration statement that configures the JUNOS router driver. In this sample procedure, the JUNOS driver is configured in the west-region group.

```
user@host# edit shared sae group west-region configuration driver junose
```

2. Configure the port number of the SAE COPS server. The port number must match the configuration of the SRC client in the JUNOS router.

```
[edit shared sae group west-region configuration driver junose]
user@host# set cops-server-port cops-server-port
```

3. Configure the number of outstanding connection attempts before connections are dropped.

```
[edit shared sae group west-region configuration driver junose]
user@host# set backlog backlog
```

4. Configure the interval between keepalive messages sent from the COPS client (the JUNOS router).

```
[edit shared sae group west-region configuration driver junose]
user@host# set keepalive-interval keepalive-interval
```

5. Configure the timeout interval in which the COPS server waits for a response to COPS requests.

```
[edit shared sae group west-region configuration driver junose]
user@host# set message-timeout message-timeout
```

6. Configure the maximum length of a COPS message.

```
[edit shared sae group west-region configuration driver junose]
user@host# set cops-message-maximum-length cops-message-maximum-length
```

7. Configure the buffer size for receiving COPS messages from the JUNOSe client. We recommend that you use the default setting unless you are instructed to change it by Juniper Networks.

```
[edit shared sae group west-region configuration driver junose]
user@host# set cops-message-read-buffer-size cops-message-read-buffer-size
```

8. Configure the buffer size for sending COPS messages to the JUNOSe client. We recommend that you use the default setting unless you are instructed to change it by Juniper Networks.

```
[edit shared sae group west-region configuration driver junose]
user@host# set cops-message-write-buffer-size cops-message-read-buffer-size
```

9. Configure the maximum time that a DHCP address request remains pending.

```
[edit shared sae group west-region configuration driver junose]
user@host# set pending-address-timeout pending-address-timeout
```

10. Configure the size of the thread pool for handling unsolicited messages. These threads are shared among all JUNOSe router drivers.

```
[edit shared sae group west-region configuration driver junose]
user@host# set cops-handler-threads cops-handler-threads
```

11. Configure the minimum amount of time to keep the state of a router driver after its COPS connection has been closed.

```
[edit shared sae group west-region configuration driver junose]
user@host# set cached-driver-expiration cached-driver-expiration
```

12. (Optional) If you are using COPS-XDR, specify whether or not the JUNOSe router driver keeps a record of unmanaged interfaces.

```
[edit shared sae group west-region configuration driver junose]
user@host# set drop-unmanaged-interfaces-xdr-driver
```

13. (Optional) Enable or disable sending of interface-tracking events for unmanaged interfaces for the XDR router driver.

```
[edit shared sae group west-region configuration driver junose]
user@host# set track-unmanaged-interfaces-xdr-driver
```

14. (Optional) Verify your configuration.

```
[edit shared sae group west-region configuration driver junose]
user@host# show
cops-server-port 3288;
backlog 50;
keepalive-interval 45;
message-timeout 120000;
cops-message-maximum-length 200000;
```

```
cops-message-read-buffer-size 30000;
cops-message-write-buffer-size 30000;
pending-address-timeout 5000;
cops-handler-threads 20;
cached-driver-expiration 600;
drop-unmanaged-interfaces-xdr-driver;
track-unmanaged-interfaces-xdr-driver;
```

Related Information

For additional information, see the following source:

- For information about setting up SAE groups, see *SRC-PE Getting Started Guide, Chapter 16, Setting Up an SAE with the SRC CLI*.

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 66.
- 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* on page 67.
- 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 62.

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.

```
host1:<vrName>#(config)snmp-server public ro
```

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.

Use the following configuration statements to configure global default SNMP communities:

```
shared sae configuration driver snmp {
    read-only-community-string read-only-community-string;
    read-write-community-string read-write-community-string;
}
```

To configure global default SNMP communities:

1. From configuration mode, access the configuration statements that configure default SNMP communities. In this sample procedure, the JUNOSe driver is configured in the west-region group.

```
user@host# edit shared sae group west-region configuration driver snmp
```

2. Configure the default SNMP community string used for read access to the router.

```
[edit shared sae group west-region configuration driver snmp]
user@host# set read-only-community-string read-only-community-string
```

3. Configure the default SNMP community string used for write access to the router.

```
[edit shared sae group west-region configuration driver snmp]
user@host# set read-write-community-string read-write-community-string
```

4. (Optional) Verify your configuration.

```
[edit shared sae group west-region configuration driver snmp]
user@host# show
read-only-community-string *****;
read-write-community-string *****;
```

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 4 describes the router initialization scripts that we provide with the SRC software in the `/opt/UMC/sae/lib` folder.

Table 4: 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 5 describes the fields that the SAE exports.

Table 5: Exported Fields

Ssp Attribute	Description
Ssp.properties	System properties object (class: java.util.Properties)—The properties should be treated as read-only by the script.
Ssp.errorLog	Error logger—Use the SsperrorLog.println (message) to send error messages to the log.
Ssp.infoLog	Info logger—Use the Ssp.infoLog.println (message) to send informational messages to the log.
Ssp.debugLog	Debug logger—Use the Ssp.debugLog.println (message) 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 Router Initialization Scripts on the SAE with the CLI

Use the following configuration statements to specify router initialization scripts for JUNOS routers:

```
shared sae configuration driver scripts {
    extension-path extension-path;
    general general;
    junose-pr junose-pr;
    junose-xdr junose-xdr;
}
```

To configure router initialization scripts for JUNOSe routers:

1. From configuration mode, access the configuration statements that configure router initialization scripts. In this sample procedure, the scripts are configured in the west-region group.

```
user@host# edit shared sae group west-region configuration driver scripts
```

2. Specify the script for JUNOSe routers when the JUNOSe driver uses COPS-PR mode when connecting to the SAE.

```
[edit shared sae group west-region configuration driver scripts]
user@host# set junose-pr junose-pr
```

3. Specify the script for JUNOSe routers when the JUNOSe driver uses COPS-XDR mode when connecting to the SAE.

```
[edit shared sae group west-region configuration driver scripts]
user@host# set junose-xdr junose-xdr
```

In COPS-XDR mode, the router does not send the network access server (NAS) IP address to the SAE. If your configuration requires this value, add the following line to a JUNOSe script:

```
import ERXnasip
```

When you add the **import ERXnasip** entry, the script obtains the NAS-IP address from the router through SNMP. This mechanism can affect performance, especially when the SAE manages a large number of virtual routers.

4. Configure a router initialization script that can be used for all types of routers that the SRC software supports.

```
[edit shared sae group west-region configuration driver scripts]
user@host# set general general
```

5. Configure a path to router initialization scripts that are not in the default location, */opt/UMC/sae/lib*.

```
[edit shared sae group west-region configuration driver scripts]
user@host# set extension-path extension-path
```

6. (Optional) Verify your router initialization script configuration.

```
[edit shared sae group west-region configuration driver scripts]
user@host# show
junose-xdr poolPublisher;
```

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 72.

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 ssrc enable

Monitoring Interactions Between the SAE and the JUNOSe Router

To monitor the connection between the router and the SAE:

- Use the **show ssrc info** command on the JUNOSe router

To display the version number of the SRC client:

- Use the **show ssrc 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 ssrc 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 ssrc 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 SRC CLI

To display the state of JUNOSe drivers, use the following operational mode command.

```
show sae drivers <device-name device-name> < (brief) > <maximum-results
maximum-results>
```

For example:

```
user@host> show sae drivers device-name default@dryad
JUNOSe Driver
Device name                default@dryad
Device type                junose
Device IP                  10.227.7.244
Local IP                   10.227.7.172
TransportRouter            default@dryad
Device version              7.2.0
Start time                 Tue Feb 13 14:18:44 EST 2007
Number of notifications    20
Number of processed added  14
Number of processed changed 0
Number of processed deleted 6
Number of provisioning attempt 30
Number of provisioning attempt failed 0
Number of outstanding decisions 0
Number of SAP              7
Number of PAP              1

Job Queue
Size                0
Age (ms)            1
Total enqueued      28
Total dequeued      28
Average job time (ms) 426

State Synchronization
Number recovered subscriber sessions 0
Number recovered service sessions    0
Number recovered interface sessions  0
Number invalid subscriber sessions    0
Number invalid service sessions       0
Number invalid interface sessions     0
Background restoration start time     Tue Feb 13 14:18:49 EST 2007
Background restoration end time       Tue Feb 13 14:18:49 EST 2007
Number subscriber sessions restored in background 0
Number of provisioning objects left to collect 0
Total number of provisioning objects to collect 11
Start time                 Tue Feb 13 14:18:45 EST 2007
End time                   Tue Feb 13 14:18:47 EST 2007
Number of synched contexts  7
Number of post-sync jobs    6
```

Viewing Statistics for Specific JUNOSe Device Drivers with the SRC CLI

To display statistics for a specific JUNOSe device driver, use the following operational mode command:

```
show sae statistics device <name name> < (brief) >
```

For example:

```
user@host> show sae statistics device name default@dryad
SNMP Statistics
Add notification handle time      6
Change notification handle time   0
Client ID                        default@dryad
Delete notification handle time   0
Failover IP                      0.0.0.0
Failover port                    0
Handle message time              60
Job queue age                    0
Job queue time                   4
Number message send              158
Number of added jobs             9
Number of add notifications      4
Number of change notifications    0
Number of delete notifications   0
Number of managed interfaces     4
Number of message errors         0
Number of message timeouts       0
Number of removed jobs          9
Number of user session established 0
Number of user session removed   0
Router type                      JUNOSe COPS
Up time                          172286
Using failover server            false
```

Viewing Statistics for All JUNOSe Device Drivers with the SRC CLI

To display SNMP statistics for all JUNOSe device drivers, use the following operational mode command:

```
show sae statistics device common junose-cops
```

For example:

```
user@host> show sae statistics device common junose-cops
SNMP Statistics
Driver type                      JUNOSe COPS
Number of close requests         0
Number of connections accepted   2
Number of current connections    1
Number of open requests          2
Server address                   0:0:0:0:0:0:0:0
Server port                      3288
Time since last redirect         186703
```

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. Select **SAE** from the side pane, and click **Drivers**.

The Drivers pane appears.

The screenshot shows the Juniper C-Web interface. On the left is a navigation pane with a tree structure. The 'SAE' node is selected and highlighted in orange. Under 'SAE', the 'Drivers' sub-item is also highlighted. The main content area is titled 'Drivers' and contains three input fields: 'Name Of Device Driver', 'Style', and 'Maximum Results'. The 'Name Of Device Driver' field has a text input box and a help text: 'Name of device drivers. Please enter: All or part of the device driver name. For JUNOS router drivers and PCMM drivers, use the format default@routerName.' The 'Style' field has a dropdown menu with a help text: 'Output style Choices: brief: Display only virtual router names'. The 'Maximum Results' field has a text input box with a help text: 'Number of results to be displayed. Legal range: 1 .. INF Default value: 25'. Below these fields are 'OK' and 'Reset' buttons. At the bottom of the interface, there is a footer with copyright information and the Juniper logo.

2. In the Name of Device Driver 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. Use the format:

<virtual router name>@<router name>

3. Select an output style from the Style list.
4. In the Maximum Results box, enter the maximum number of results that you want to receive.
5. Click **OK**.

The Drivers pane displays information about the JUNOSe device driver.

Viewing Statistics for Specific JUNOS Device Drivers with the C-Web Interface

To view SNMP statistics about devices:

1. Select **SAE** from the side pane, click **Statistics**, and then click **Device**.

The Device pane appears.

The screenshot shows the Juniper C-Web interface. At the top, there's a navigation bar with 'Monitor', 'Logged in as: admin', and links for 'About', 'Refresh', and 'Logout'. Below this, a breadcrumb trail reads 'SAE > Statistics > Device'. The left sidebar contains a list of components: ACP, CLI, Component, Date, Disk, Interfaces..., JPS, NIC, NTP, Redirect Server, Route..., SAE (highlighted), Security, and System. The main content area is titled 'Device' and contains a form with two input fields: 'Device Name' (a text box) and 'Style' (a dropdown menu). To the right of these fields, there is explanatory text: 'Name of a device. Please enter: All or part of the device name. For JUNOS router drivers and PCMM drivers, use the format default@routerName.' and 'Output style Choices: brief: Display only device names'. Below the form are 'OK' and 'Reset' buttons. At the bottom of the page, there is a copyright notice: 'Copyright © 2007, Juniper Networks, Inc. All Rights Reserved. Trademark Notice. Privacy.' and the Juniper logo.

2. In the Device Name box, enter a full or partial device name for which you want to display information, or leave the box blank to display all devices.
3. Select an output style from the Style list.
4. Click **OK**.

The Device pane displays statistics for all devices.

Viewing Statistics for All JUNOSe Device Drivers with the C-Web Interface

To view SNMP statistics about specific devices:

1. Select **SAE** from the side pane, click **Statistics**, click **Device**, and then click **Common**.

The Common pane appears.

The screenshot shows the Juniper C-Web Interface. On the left is a navigation pane with a tree structure. The 'SAE' item is selected and highlighted in orange. The main content area is titled 'Common' and contains a form with two input fields: 'Device Name' and 'Type'. The 'Device Name' field is a text box, and the 'Type' field is a dropdown menu. To the right of these fields is a text area containing instructions and a list of choices. Below the form are 'OK' and 'Reset' buttons. The top of the interface shows the user is logged in as 'admin' and includes links for 'About', 'Refresh', and 'Logout'. The bottom of the interface contains copyright information and the Juniper logo.

Monitor		Logged in as: admin		About	Refresh	Logout
ACP	SAE	SAE > Statistics > Device > Common				
CLI	Common					
Component						
Date						
Disk						
Interfaces...						
JPS						
NIC						
NTP						
Redirect Server						
Route...						
SAE						
Security						
System						

Device Name

Type

Name of a device.
Please enter: All or part of the device name. For JUNOS router drivers and PCMM drivers, use the format default@routerName.
Display SNMP statistics for a specified device driver type.
Choices:
junos: Display SNMP statistics for JUNOS router drivers
junose-cops: Display SNMP statistics for JUNOSe router drivers
packetable-cops: Display SNMP statistics for PCMM device drivers
proxy: Display SNMP statistics for third-party drivers

OK
Reset

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2. In the Device Name box, enter a full or partial device name for which you want to display information, or leave the box blank to display all devices.
3. Select **junose-cops** from the Type list.
4. Click **OK**.

The Common pane displays statistics for the specified device.

