



# SRC Software

## Application Library Guide

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## SRC Documentation and Release Notes

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For a list of related SRC documentation, see <http://www.juniper.net/techpubs/>.

If the information in the latest *SRC Release Notes* differs from the information in the SRC guides, follow the *SRC Release Notes*.

## Audience

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This documentation is intended for experienced system and network specialists working with routers running Junos OS and JunosE software in an Internet access environment. We assume that readers know how to use the routers, directories, and RADIUS servers that they will deploy in their SRC networks. 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

---

Table 1 on page xx defines the notice icons used in this guide. Table 2 on page xx defines text conventions used throughout this 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 or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Table 2: Text Conventions

Convention	Description	Examples
<b>Bold text like this</b>	<ul style="list-style-type: none"> <li>Represents keywords, scripts, and tools in text.</li> <li>Represents a GUI element that the user selects, clicks, checks, or clears.</li> </ul>	<ul style="list-style-type: none"> <li>Specify the keyword <b>exp-msg</b>.</li> <li>Run the <b>install.sh</b> script.</li> <li>Use the <b>pkgadd</b> tool.</li> <li>To cancel the configuration, click <b>Cancel</b>.</li> </ul>
<b>Bold text like this</b>	Represents text that the user must type.	<b>user@host# set cache-entry-age cache-entry-age</b>
Fixed-width text like this	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"> <li>Represents configuration statements.</li> <li>Indicates SRC CLI commands and options in text.</li> <li>Represents examples in procedures.</li> <li>Represents URLs.</li> </ul>	<ul style="list-style-type: none"> <li><b>system ldap server{ stand-alone;</b></li> <li>Use the <b>request sae modify device failover</b> command with the <b>force</b> option</li> <li><b>user@host# ...</b></li> <li><b>http://www.juniper.net/techpubs/software/management/src/api-index.html</b></li> </ul>
<i>Italic sans serif typeface</i>	Represents variables in SRC CLI commands.	<b>user@host# set local-address local-address</b>
Angle brackets	In text descriptions, indicate optional keywords or variables.	Another runtime variable is <gfwif>.
Key name	Indicates the name of a key on the keyboard.	Press Enter.

Table 2: Text Conventions (*continued*)

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"> <li>Emphasizes words.</li> <li>Identifies book names.</li> <li>Identifies distinguished names.</li> <li>Identifies files, directories, and paths in text but not in command examples.</li> </ul>	<ul style="list-style-type: none"> <li>There are two levels of access: <i>user</i> and <i>privileged</i>.</li> <li><i>SRC PE Getting Started Guide</i></li> <li><i>o=Users, o=UMC</i></li> <li>The <i>/etc/default.properties</i> file.</li> </ul>
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

## Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to [techpubs-comments@juniper.net](mailto:techpubs-comments@juniper.net), or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

## Requesting Technical Support

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

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

## Self-Help Online Tools and Resources

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

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

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

## Opening a Case with JTAC

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

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

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

## PART 1

# Installing Applications

- Installing the SRC Applications on page 3





## CHAPTER 1

# Installing the SRC Applications

- SRC Application Library Software on page 3
- Before You Install the SRC Applications on page 4
- Solaris Packages and Installation Folders for the SRC Application Library on page 5
- Installing SRC Application Packages on page 5
- Uninstalling SRC Packages on page 6
- Installing Sample SRC Data for Applications in the Application Library Guide on page 6
- Installing SRC Web Applications on page 7
- Installing Web Applications Inside JBoss on page 7
- Removing SRC Web Applications on page 9
- Reviewing SRC Port Settings for SRC Applications on page 9

## SRC Application Library Software

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You can access the software for the SRC application library, and the product *Release Notes* on the Juniper networks Web site at: <https://www.juniper.net/support/csc/swdist-erx/src.html>. The application library files are located in the SRC\_APLIB.tar.gz file. Table 3 on page 3 lists the applications provided in the application library.

**Table 3: Application Library Applications**

Application	Type of Application	File or Directory in Archive File
Deep Packet Inspection Script Service	Solaris package	UMCdpi-ss
Dynamic Service Activator	Web application	dsa.war
Threat Mitigation Application	Solaris package	UMCthma
VTA	Solaris package	/vta/UMCvtacnf
Bucket VTA	Web application	/vta/bucketvta.ear

**Table 3: Application Library Applications** *(continued)*

Application	Type of Application	File or Directory in Archive File
Quota VTA	Web application	/vta/quotavta.ear
VTA Configuration	Web application	/vta/config.war

The SRC software also provides sample applications in the SDK+AppSupport+Demos+Samples.tar.gz on the Juniper networks Web site at: <https://www.juniper.net/support/csc/swdist-erx/src.html>.

For information about the sample applications, see the *SRC PE Sample Applications Guide* on the Juniper Networks Web site at <https://www.juniper.net/support/csc/swdist-erx/src.html>.

The SRC Admission Control Plug-In (SRC ACP) component is installed on C Series Controllers as part of the SRC core software. The documentation for SRC ACP is in the *SRC PE Network Guide*.

**Related Documentation**

- Before You Install the SRC Applications on page 4
- Installing Sample SRC Data for Applications in the Application Library Guide on page 6
- Solaris Packages and Installation Folders for the SRC Application Library on page 5
- Installing SRC Application Packages on page 5

## Before You Install the SRC Applications

Before you install applications, install necessary Solaris patches on the installation host, make sure that you understand if you want to root or nonroot users to have access to install and configure the application, and establish users and groups for software administration.

Before you install the UMCthma or UMCvtacnf package, install JBoss on the Solaris host. You can obtain the JBoss software in the SDK+AppSupport+Demos+Samples.tar.gz file available on the Juniper networks Web site at: <https://www.juniper.net/support/csc/swdist-erx/src.html>.

The SRC applications are distributed as Solaris packages or Web application archive (WAR) files.

**Related Documentation**

- SRC Application Library Software on page 3
- Installing SRC Application Packages on page 5
- Solaris Packages and Installation Folders for the SRC Application Library on page 5

## Solaris Packages and Installation Folders for the SRC Application Library

Table 4 on page 5 lists the components for each application, their Solaris package names, and the directories where each component is installed by default. In Table 4 on page 5, the directories listed are all subordinate to */opt/UMC*.

**Table 4: Solaris Packages and Installation Folders for Application Library**

Application	Components Supplied with SRC	Package	Installation Directory
Threat Mitigation Application	<ul style="list-style-type: none"> <li>Threat Mitigation Application</li> <li>Python Runtime Environment</li> </ul>	<ul style="list-style-type: none"> <li>UMCthma</li> <li>SMCpython</li> </ul>	<ul style="list-style-type: none"> <li>conf/thma</li> <li>python</li> </ul>
VTAs	<ul style="list-style-type: none"> <li>VTAs</li> <li>Python Runtime Environment (includes Python additional libraries)</li> </ul>	Solaris packages: <ul style="list-style-type: none"> <li>UMCvtacnf</li> <li>(Optional) JBoss application server: UMCjboss.pkg</li> <li>(Optional) SMCpython and UMCpyadd</li> </ul> <p><b>NOTE:</b> Only Solaris 10 and later is supported for the VTA.</p>	<ul style="list-style-type: none"> <li>conf/vta</li> <li>jboss</li> <li>python</li> </ul>

### Related Documentation

- SRC Application Library Software on page 3
- Before You Install the SRC Applications on page 4
- Installing SRC Application Packages on page 5
- Installing Sample SRC Data for Applications in the Application Library Guide on page 6
- Uninstalling SRC Packages on page 6

## Installing SRC Application Packages

To install an application library package:

1. On the UNIX host where you will install the application library software, log in as root.
2. Copy the Solaris package for an application to a directory such as */tmp*.
3. Launch the **pkgadd** tool.

```
pkgadd -d /tmp
```

The tool displays the available Solaris packages.

4. Enter the desired package(s).

You can enter the name or number for a single package, multiple packages separated by spaces, or the keyword **all** to select all the packages.

The tool displays the license agreement.

5. Press Enter to move through the agreement, and then enter **y** to accept the license agreement when prompted by the tool.
6. Follow the prompt directions to accept the installation directory for the package, to permit the use of superuser scripts required for the package, and so on.



**NOTE:** You can use the UNIX **swmtool** command to install the application packages, but this method requires that you install each application separately. If you use **admintool** directly, you can install multiple applications at the same time.

**Related Documentation**

- SRC Application Library Software on page 3
- Before You Install the SRC Applications on page 4
- Installing SRC Web Applications on page 7
- Uninstalling SRC Packages on page 6
- Solaris Packages and Installation Folders for the SRC Application Library on page 5
- Reviewing SRC Port Settings for SRC Applications on page 9

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## Uninstalling SRC Packages

Use the **pkgrm** command to uninstall application library components. For example, to remove the SRC VTA package, issue the following command, and respond as prompted by the process:

```
pkgrm UMCvtacnf
```

**Related Documentation**

- SRC Application Library Software on page 3
- Installing SRC Application Packages on page 5
- Solaris Packages and Installation Folders for the SRC Application Library on page 5

---

## Installing Sample SRC Data for Applications in the Application Library Guide

You can install sample data from the SRC CLI for the following applications:

- Dynamic Service Activator application
- Traffic-Mirroring Application

**Related Documentation**

- SRC Application Library Software on page 3
- Before You Install the SRC Applications on page 4
- Installing SRC Application Packages on page 5

- Loading Sample Data into a Juniper Networks Database (SRC CLI)
- Overview of Dynamic Service Activator

## Installing SRC Web Applications

---

We supply one WAR file for each Web application in the application library. Web applications must be deployed in a Web application server.

The exact way you install Web applications depends on the Web application server you are using and the particular Web application.

The following procedure provides general steps for installing a Web application:

1. Install the Web application server on the host.
2. If the Web application requires configuration of a properties file, complete the following procedure:
  - a. Copy the WAR file from the archive file to a temporary folder on the host.
  - b. Unpack the WAR file.

For information about unpacking and packing WAR files, see <http://java.sun.com/j2se/1.4/docs/guide/jar/>.

- c. Edit the properties file for the Web application.
  - d. Repack the WAR file.
3. Deploy the WAR file by using the procedure appropriate for your Web application server.

For information about deploying WAR files, see the documentation for your Web application software.

### Related Documentation

- SRC Application Library Software on page 3
- Before You Install the SRC Applications on page 4
- Installing Web Applications Inside JBoss on page 7
- Removing SRC Web Applications on page 9
- Reviewing SRC Port Settings for SRC Applications on page 9

## Installing Web Applications Inside JBoss

---

We provide the JBoss Web application server for Solaris with the sample and demonstration applications in the SDK+AppSupport+Demos+Samples.tar.gz file, available from the Juniper Web site at: <https://www.juniper.net/support/csc/swdist-erx/src.html>.

JBoss is an open-source Java application server that provides full support for J2EE application programming interfaces (APIs). The installation directory of the JBoss Application Server is /opt/UMC/jboss.

For Solaris, the JBoss Web application server package is called UMCjboss.pkg. The following shows an example procedure for installing the Solaris JBoss Web application server:

1. On the UNIX host where you want to install JBoss, log in as root.
2. Copy the Solaris package UMCjboss.pkg to a directory such as /tmp.
3. Launch the **pkgadd** tool.

```
pkgadd -d path to/UMCjboss.pkg
```

The tool displays the available Solaris packages.

```
The following packages are available:
 1  UMCjboss      JBoss J2EE Application Server
                        (sparc) Release jboss-6.0.0
```

```
Select package(s) you wish to process (or 'all' to process all packages).
(default: all) [?,??,q]:
```

4. Enter the desired packages.

You can enter the name or number for a single package or multiple packages separated by spaces. Alternatively, enter the keyword “all” to select all the packages.

```
Processing package instance <UMCjboss> from /tmp/UMCjboss.pkg
JBoss J2EE Application Server(sparc)
Release jboss-6.0.0 http://jboss.org
```

```
Which configuration do you want to use? (default|all|minimal) [default]
[?,q]all
```

5. If you want to deploy the VTA in a clustered Application Server environment, enter **all** as the configuration. By default, the default JBoss configuration is used. This is fine for demonstration purposes.

```
Which user-id shall be running the JBoss server [nobody] [?,q]
```

6. For this example, press **Enter** to select **nobody**.

```
Configuration: "all"
User:          "nobody"
```

```
Is this correct? [y,n,?,q] y
```

7. Enter **y**.

```
*****
* If you want to change these values later, please edit the file *
* /etc/init.d/jboss                                              *
*****
```

```
The selected base directory </opt/UMC/jboss> must exist before installation
is attempted.
```

```
Do you want this directory created now [y,n,?,q] y
```

8. Enter **y** to create the directory.
9. Customize the properties file for the Web application.
10. Deploy the WAR file by copying it into the JBoss default/deploy directory.

```
cp <filename>.war /opt/UMC/jboss/server/default/deploy
```

JBoss automatically starts the Web application when a new WAR file is copied into the deploy directory.

11. (Optional) Start the JBoss application server.

```
/etc/init.d/UMCjboss start
```

12. (Optional) Stop the JBoss application server.

```
/etc/init.d/UMCjboss stop
```

**Related  
Documentation**

- SRC Application Library Software on page 3
- Before You Install the SRC Applications on page 4
- Installing SRC Web Applications on page 7
- Removing SRC Web Applications on page 9
- Reviewing SRC Port Settings for SRC Applications on page 9

---

## Removing SRC Web Applications

The way you remove a Web application depends on the Web application server that you are using. Refer to the documentation on removing Web applications for your server.

To undeploy a Web application from JBoss:

- Remove the WAR file from the JBoss *default/deploy* directory.

**Related  
Documentation**

- SRC Application Library Software on page 3
- Installing SRC Web Applications on page 7
- Installing Web Applications Inside JBoss on page 7

---

## Reviewing SRC Port Settings for SRC Applications

If you use firewall software within your internal network, ensure that firewall settings allow traffic to and from the following ports for the applications that you implement in your environment. Table 5 on page 10 lists the default port settings for SRC applications.

**Table 5: Default Port Settings for SRC Applications**

Component	Type of Communication	Default Port Setting
Threat Mitigation Application	Oracle (if used)	TCP 1521
	PostgreSQL (if used)	TCP 5432
	MySQL (if used)	TCP 3306
SRC Volume-Tracking Application (SRC VTA)	MySQL (if used)	TCP 3306

**Related Documentation**

- SRC Application Library Software on page 3
- Before You Install the SRC Applications on page 4
- Installing SRC Application Packages on page 5
- Installing Sample SRC Data for Applications in the Application Library Guide on page 6
- Installing SRC Web Applications on page 7



## PART 2

# Providing Network Security and Threat Mitigation

- Providing Threat Mitigation Services with the Threat Mitigation Application on page 13
- Managing Threats with the SRC TMP on page 31



## CHAPTER 2

# Providing Threat Mitigation Services with the Threat Mitigation Application

- Overview of the Threat Mitigation Application on page 13
- Before You Install the Threat Mitigation Application on page 14
- Sample Implementation on page 15
- Installing and Initially Configuring the Threat Mitigation Application on page 16
- Configuring Threat Mitigation on page 17
- Configuring Database Properties for the Threat Mitigation Application on page 18
- Configuring Logging on page 24
- Deploying the Threat Mitigation Application on page 25
- Applying Services to Manage Threats on page 26
- Examples: Classifying Subscribers and Interfaces for the Threat Mitigation Application on page 28

### Overview of the Threat Mitigation Application

---

The Threat Mitigation Application helps administrators detect and respond to attacks on the network. The Threat Mitigation Application can be customized based on customer-supplied data to control the description and recommended actions for each type of attack. If the user chooses to take an action, the Threat Mitigation Application activates a service for the source address of the event. The Threat Mitigation Application includes the ability to log all user operations to provide an audit trail of actions.

You can use the Threat Mitigation Application to respond to threats on the network by:

- Executing a script for Juniper Networks NetScreen-Security Manager that posts information about the attack to the SRC Threat Mitigation Portal (SRC TMP)
- Managing attacks with the SRC TMP that provides information about the nature of the attack and possible actions
- Applying policies to the interfaces to manage problem traffic, such as applying policies that reduce the amount of available bandwidth or that block the threat

The Threat Mitigation Application deals with threats in an SRC-managed environment by providing a solution that involves using:

- Juniper Networks Intrusion Detection and Prevention (IDP) sensors to detect the threats.

IDP sensors are IDP hardware appliances that run the IDP sensor software. The sensors monitor network traffic to detect suspicious or anomalous traffic and respond as configured. IDP monitors network traffic to detect potentially detrimental traffic and responds to problem incidents to prevent damage to the network.

- Juniper Networks NetScreen-Security Manager to manage the IDP sensors and to signal the SRC TMP when a threat is detected.

NetScreen-Security Manager is software that enables you to integrate and centralize management of your Juniper Networks security environment. NetScreen-Security Manager delivers integrated, policy-based security and network management for all Juniper Networks security devices. NetScreen-Security Manager is used for its elaborate authorization and auditing functionality, which provides more detailed reporting and analysis.

- The SRC TMP to display detailed information about the threat and the recommended actions to the administrator.

The SRC TMP is the user interface for the Threat Mitigation Application that enables administrators to manage threats and act on them. The administrator can react to the threat by activating a service in the SAE. The service activation can result in pushing policies, for the originating IP address, to the upstream router running JUNOS Software in the core network or to the edge router running JUNOSe Software, depending on the configuration.

#### **Related Documentation**

- Before You Install the Threat Mitigation Application on page 14
- Installing and Initially Configuring the Threat Mitigation Application on page 16
- Configuring Threat Mitigation on page 17
- Configuring Logging on page 24
- Examples: Classifying Subscribers and Interfaces for the Threat Mitigation Application on page 28

---

## **Before You Install the Threat Mitigation Application**

Installing the Threat Mitigation Application into an SRC-managed environment requires:

- The UMCthma package installed with your SRC application library software.
- SRC-managed routers running JUNOSe or JUNOS Software in the network.
- Working knowledge of the NetScreen-Security Manager software and familiarity with NetScreen-Security Manager documentation. See <http://www.juniper.net/techpubs/software/management/security-manager/>.
- Working knowledge of the IDP software and familiarity with IDP documentation. See <http://www.juniper.net/techpubs/software/management/idp/>.

Before you use the Threat Mitigation Application, you typically:

- Install the transactional database. The Threat Mitigation Application provides a sample schema that includes these tables:
  - ATTACK—Attacks
  - ATTACK\_TYPE—Attack types
  - ACTION—Configured actions that the application can execute
  - ATTACK\_TYPE\_CANDIDATE\_ACTION—Candidate actions that can be taken in response to attack types

The administrator maintains the data in the ATTACK\_TYPE, ACTION, and ATTACK\_TYPE\_CANDIDATE\_ACTION tables to ensure that the data defines the relationship between attack types and candidate actions. In cases where attacks do not belong to any defined attack types, the administrator should create a default attack type and the candidate actions for the default attack type.

- Install the IDP sensors. The sensors monitor network traffic to detect suspicious or anomalous traffic and respond as configured.
- Install NetScreen-Security Manager to monitor the IDP sensors. The administrator creates the attack types that are reported to the Threat Mitigation Application.

**Related  
Documentation**

- Overview of the Threat Mitigation Application on page 13
- Sample Implementation on page 15
- Applying Services to Manage Threats on page 26
- Configuring Logging on page 24
- Deploying the Threat Mitigation Application on page 25

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## Sample Implementation

The SRC application library provides a robust sample implementation for mitigating threats using the Threat Mitigation Application in an SRC-managed network.

The sample implementation includes:

- Policies, services, router definitions, and SAE configurations in the sample data. Sample entries for the Threat Mitigation Application have the prefix THMA.

For information about installing sample data, see “Installing and Initially Configuring the Threat Mitigation Application” on page 16.

- Data in the schema to detail attacks, actions that can be executed by the application, and actions that can be used to respond to attacks.

You can use the sample data and application to create a demonstration implementation. The router definitions, identified as THMA<routername> in the sample data, can be configured to act as simulated routers for a demonstration environment. For information about setting up a simulated router, see Configuring Simulated Router Drivers (SRC CLI).

You can also customize the sample data to mitigate threats in your network, or you can use the samples as a guide to create your own implementation.

The sample data uses the following terminology for the type of interface on which the service would be activated:

- Provider edge interface—Subscriber-facing interface on the router running JUNOS Software
- Forwarding interface—Forwarding interface on the router running JUNOS Software
- Subscriber interface—Subscriber interface on the router running JUNOS Software

**Related  
Documentation**

- Overview of the Threat Mitigation Application on page 13
- Configuring Threat Mitigation on page 17
- Configuring Logging on page 24
- Deploying the Threat Mitigation Application on page 25

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## Installing and Initially Configuring the Threat Mitigation Application

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Because the Threat Mitigation Application relies on other components in the SRC network, you must complete several tasks before you install the Threat Mitigation Application software. After you install the software, you must also complete several configuration tasks before the application can function correctly.

For information about the location of the Threat Mitigation Application software, see “Installing SRC Application Packages” on page 5.

Before you install and configure the Threat Mitigation Application, you must:

1. Deploy a working SRC network.  
  
To support the Threat Mitigation Application, you must install SAEs to manage the routers or other devices through which subscribers connect to the network. You must also install and configure the directory in which you will store the SRC data.
2. Install a J2EE application server on the host that supports the Threat Mitigation Application.
3. On the host that supports the Threat Mitigation Application, install a transactional database to store the data for the Threat Mitigation Application.

To install the Threat Mitigation Application:

1. Install the Solaris package for the Threat Mitigation Application on a host that supports JBoss.  
  
See “Installing SRC Application Packages” on page 5.
2. Run the configuration script to configure the Threat Mitigation Application.

3. Run the load script to complete the configuration tasks for deploying the Threat Mitigation Application.

See “Deploying the Threat Mitigation Application” on page 25.

4. On each host, restart JBoss.

You must restart JBoss when you have configured the SRC TMP for the first time or you have changed the database type.

**Related  
Documentation**

- Overview of the Threat Mitigation Application on page 13
- Before You Install the Threat Mitigation Application on page 14
- Configuring Threat Mitigation on page 17
- Configuring Logging on page 24

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## Configuring Threat Mitigation

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To support threat mitigation with the Threat Mitigation Application in an SRC network, configure services that can be activated to act on threats detected by IDP sensors that are managed by NetScreen-Security Manager. We recommend that you activate the services as close as possible to the interfaces where the problem traffic entered the network.

To use the Threat Mitigation Application, perform the following tasks:

- Access the local configuration
- Deploy the application. See “Deploying the Threat Mitigation Application” on page 25
- Apply services. See “Applying Services to Manage Threats” on page 26.

Also see “Examples: Classifying Subscribers and Interfaces for the Threat Mitigation Application” on page 28.

Some sections provide references to entries in the sample data that demonstrate an implementation.

After performing these tasks, configure the script used by NetScreen-Security Manager to implement the messaging that records attacks and identifies actions that the SRC software should take in response to those attacks.

**Related  
Documentation**

- Overview of the Threat Mitigation Application on page 13
- Before You Install the Threat Mitigation Application on page 14
- Installing and Initially Configuring the Threat Mitigation Application on page 16
- Configuring a Database to Store Attack and Response Data on page 18
- Configuring Logging on page 24

## Configuring Database Properties for the Threat Mitigation Application

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- Configuring a Database to Store Attack and Response Data on page 18
- Configuring Attack Types in the Database on page 19
- ATTACK\_TYPE Attributes Used by the Threat Mitigation Application on page 20
- Configuring Actions in the Database on page 21
- ACTION Attributes Used by the Threat Mitigation Application on page 21
- Configuring Candidate Actions in the Database on page 23
- ATTACK\_TYPE\_CANDIDATE\_ACTION Attributes Used by the Threat Mitigation Application on page 23

### Configuring a Database to Store Attack and Response Data

The Threat Mitigation Application requires a transactional database to store attack types and candidate responses. For information about databases that we have tested for use with the Threat Mitigation Application, see the *SRC Application Library Release Notes*.

The Threat Mitigation Application provides sample data for a schema that includes these tables:

- ATTACK\_TYPE—Contains information about the attacks that NetScreen-Security Manager is expected to send to the Threat Mitigation Application. The administrator maintains this data. See “Configuring Attack Types in the Database” on page 19.
- ACTION—Contains information about the SRC services that are activated to respond to attacks. The administrator maintains this data. See “Configuring Actions in the Database” on page 21.
- ATTACK\_TYPE\_CANDIDATE\_ACTION—Contains information about the actions that can be taken in response to specific attack types. The administrator maintains this data. See “Configuring Candidate Actions in the Database” on page 23.
- ATTACK—Contains information about the attacks that are managed by the Threat Mitigation Application. The SRC TMP displays this information on various pages, including the Attack Details page. For information about how the SRC TMP displays the attributes, see “Overview of the Threat Mitigation Application” on page 13.

To use the Threat Mitigation Application, the administrator must create data in the ATTACK\_TYPE, ACTION, and ATTACK\_TYPE\_CANDIDATE\_ACTION tables to define the relationship between attack types and candidate actions. The information in the ATTACK table is managed by the Threat Mitigation Application and must not be modified by an administrator. The attributes specified in the tables are referenced in the XML schema for NetScreen-Security Manager attack events.

To configure the database:

1. Create a database, tables, and user for the database by using the following database schema file:

```
/opt/UMC/conf/thma/etc/<database>/thma.sql
```



where <database> is the selected database when you run the load script. This file is created when you install the Solaris package for the Threat Mitigation Application.

2. Load the sample data for the database using the following file:

```
/opt/UMC/conf/thma/etc/<database>/data.sql
```

where <database> is the selected database when you run the load script. This file is created when you install the Solaris package for the Threat Mitigation Application.

#### Related Documentation

- Installing and Initially Configuring the Threat Mitigation Application on page 16
- Configuring Logging on page 24
- ACTION Attributes Used by the Threat Mitigation Application on page 21
- ATTACK\_TYPE Attributes Used by the Threat Mitigation Application on page 20
- ATTACK\_TYPE\_CANDIDATE\_ACTION Attributes Used by the Threat Mitigation Application on page 23

## Configuring Attack Types in the Database

The ATTACK\_TYPE table contains data about all the attacks that NetScreen-Security Manager is expected to send to the Threat Mitigation Application. Attacks are considered to be the same attack type if their category, subcategory, and definingAttributes values are the same.



**NOTE:** The ATTACK\_TYPE table must contain a special attack type with category and subcategory values of DEFAULT to respond to attacks that do not match a configured attack type.

The entry in the `/opt/UMC/conf/thma/etc/<database>/data.sql` file contains the attributes in the format:

```
INSERT INTO ATTACK_TYPE
VALUES ('<category>', '<subcategory>', '<definingAttributes>', '<description>');
```

For example:

```
INSERT INTO ATTACK_TYPE
VALUES ('DEFAULT', 'DEFAULT', 'srcAddr', 'There is no specific information for this type
of attack.');
```

#### Related Documentation

- Overview of the Threat Mitigation Application on page 13
- Configuring a Database to Store Attack and Response Data on page 18
- ATTACK\_TYPE Attributes Used by the Threat Mitigation Application on page 20
- ATTACK\_TYPE\_CANDIDATE\_ACTION Attributes Used by the Threat Mitigation Application on page 23

## ATTACK\_TYPE Attributes Used by the Threat Mitigation Application

The SRC TMP displays the configured attributes for the attack types that are used by the Threat Mitigation Application.

### *category*

- Category of the attack; displayed in the Attack Details page.
- Value—Text string
- Examples
  - DEFAULT
  - predefined

### *subcategory*

- Subcategory of the attack; displayed in the Attack Type column.
- Value—Text string
- Examples
  - DEFAULT
  - FTP:USER:ROOT
  - ICMP:EXPLOIT:FLOOD

### *definingAttributes*

- Attributes used to identify an attack. Defining attributes determine whether an attack is a new record or an update to an existing attack record. The srcAddr attribute is always considered a defining attribute for the attack, even if it is not specified as a defining attribute.
- Value—List of defining attributes separated by semicolons
  - srcAddr—Source address; displayed in the Source column
  - srcPort—Source port; displayed in the Attack Details page
  - dstAddr—Destination address; displayed in the Destination column
  - dstPort—Destination port; displayed in the Attack Details page
  - protocol—Protocol; displayed in the Attack Details page
  - user—User; displayed in the Attack Details page
  - app—Application; displayed in the Attack Details page
  - uri—Uniform resource identifier; displayed in the Attack Details page
- Examples

- srcAddr
- srcAddr;dstAddr;dstPort
- srcAddr;dstAddr

**description**

- Description of the attack; displayed in the Attack Details page.
- Value—Text string
- Examples
  - There is no specific information for this type of attack.
  - This attack indicates an ICMP session that contains more than 250 ICMP packets per second. This may indicate that an attacker is trying to degrade network performance, causing poor service for legitimate users.

## Configuring Actions in the Database

The ACTION table contains data about services to activate in response to an attack. The administrator must add one ACTION table entry for each SRC service that is used as an action in the Threat Mitigation Application.

The entry in the `/opt/UMC/conf/thma/etc/<database>/data.sql` file contains the attributes in the format:

```
INSERT INTO ACTION
VALUES ('<serviceName>', '<name>', '<description>');
```

For example:

```
INSERT INTO ACTION
VALUES ('BlockAttacker', 'Block Attacker', 'This action blocks all traffic to and from the
attacker.');
```

**Related  
Documentation**

- Overview of the Threat Mitigation Application on page 13
- For information about configuring actions, see the *SRC PE Services and Policies Guide*
- Configuring a Database to Store Attack and Response Data on page 18
- ACTION Attributes Used by the Threat Mitigation Application on page 21
- Configuring Candidate Actions in the Database on page 23

## ACTION Attributes Used by the Threat Mitigation Application

The SRC TMP displays the configured attributes for the actions that are used by the Threat Mitigation Application.

**serviceName**

- Service activated in response to an attack.
- Value—Text string

The following values are passed to the service as parameter substitutions:

- category—Name of the category
  - subcategory—Name of the subcategory
  - severity—Severity level as a number in the range 0–5
    - 0—not set
    - 1—info
    - 2—warning
    - 3—minor
    - 4—major
    - 5—critical
  - srcAddr—IP address; enclose in single quotes if not in IPv4 format
  - srcPort—Port number
  - dstAddr—IP address; enclose in single quotes if not in IPv4 format
  - dstPort—Port number
  - protocol—Protocol number
  - user—Username
  - app—Name of the application
  - uri—Uniform resource identifier

The category, subcategory, user, app, and uri parameters are encoded as valid parameter names (not text strings) so that these parameter values can be provided to the policies.

For example, you could define a policy that takes the app parameter as the value for a policer rate with a default value of 64000. Then, you could define global parameters named after different applications, such as http=32000. When the attack includes an HTTP application, the Threat Mitigation Application would pass app=http, and 32000 would be the value in the policer definition.

- Example—BlockAttacker

*name*

- Name of action; displayed in the Action drop-down list.
- Value—Text string
- Example—Block Attacker

**description**

- Description of the action; displayed in the Action Help page.
- Value—Text string
- Example—This action blocks all traffic to and from the attacker.

## Configuring Candidate Actions in the Database

The ATTACK\_TYPE\_CANDIDATE\_ACTION table contains data about the possible services to activate in response to a particular type of attack.

The entry in the `/opt/UMC/conf/thma/etc/<database>/data.sql` file contains the attributes in the format:

```
INSERT INTO ATTACK_TYPE_CANDIDATE_ACTION
VALUES ('<category>', '<subcategory>', '<serviceName>');
```

For example:

```
INSERT INTO ATTACK_TYPE_CANDIDATE_ACTION
VALUES ('DEFAULT', 'DEFAULT', 'BlockAttack');
```

**Related Documentation**

- Overview of the Threat Mitigation Application on page 13
- For Information about configuring actions, see the *SRC PE Services and Policies Guide*
- Configuring a Database to Store Attack and Response Data on page 18
- Configuring Actions in the Database on page 21

## ATTACK\_TYPE\_CANDIDATE\_ACTION Attributes Used by the Threat Mitigation Application

The SRC TMP displays the configured attributes for the attack type and candidate actions.

**category**

- Category of the attack; displayed in the Attack Details page.
- Value—Text string
- Examples
  - DEFAULT
  - predefined

**subcategory**

- Subcategory of the attack; displayed in the Attack Type column.
- Value—Text string
- Examples
  - DEFAULT
  - FTP:USER:ROOT
  - ICMP:EXPLOIT:FLOOD

***serviceName***

- Service activated in response to an attack.
- Value—Text string
- Example—BlockAttacker

## Configuring Logging

---

To configure logging for the Threat Mitigation Application:

- Edit or accept the default values for the fields in the Loggers tab.

**ConfMagic - Threat Mitigation Portal (etc/config.properties)**

LDAP | **Loggers** | Other

☒ Error Log Filter (e.g. '/error-'): /error-  
 Error Log File: thma\_error.log Browse...  
 Error Rollover File: thma\_error.alt Browse...  
☒ Error Log Rollover Size: 1000000

☒ Info Log Filter (e.g. '/info-'): /info-  
 Info Log File: thma\_info.log Browse...  
 Info Log Rollover File: thma\_info.alt Browse...  
☒ Info Log Rollover Size: 1000000

☐ Debug Log Filter (e.g. '/debug-'): /debug-  
 Debug Log File: thma\_debug.log Browse...  
 Debug Log Rollover File: thma\_debug.alt Browse...  
☒ Debug Log Rollover Size: 1000000

☐ Audit Log Filter (e.g. 'Audit,/info-'): Audit,/info-  
 Audit Log File: thma\_audit.log Browse...  
 Audit Rollover File: thma\_audit.alt Browse...  
☒ Audit Log Rollover Size: 1000000

☐ Error Syslog Filter (e.g. '/error-'): /error-  
 Error Syslog Hostname: loghost

☐ Info Syslog Filter (e.g. '/info-warning'): /info-warning  
 Info Syslog Hostname: loghost

OK Cancel

For more information about logging, see the *SRC PE Monitoring and Troubleshooting Guide*.

## Deploying the Threat Mitigation Application

The Threat Mitigation Application load script configures components (such as the J2EE application server, directory, and database) on the local host. However, depending on the components used, their installation host, and their configuration, you may need to manually configure some of the components or modify the configuration.

The Threat Mitigation Application load script automates the process of deploying the Threat Mitigation Application in JBoss (if it is installed locally) and completes these configuration tasks:

- Configures the *jbosscmp-jdbc.xml* file inside the */opt/UMC/conf/thma/webapp/thma.ear* file and the data source deployment descriptor based on the type of database specified and the database connection information.
- Installs the JDBC driver, data source deployment descriptor, and authentication configurations in JBoss (if JBoss is installed locally).

- Loads the Threat Mitigation Application sample data in the directory.
- Creates the database schema and loads sample database records. Follow the instructions at the end of the load script to complete the database configuration for the selected database. Some databases might require additional steps, such as creating a database user or enabling a remote TCP/IP connection.

To deploy the Threat Mitigation Application:

1. On the host, log in as root or as another authorized administrator.
2. Invoke the script by accessing the folder `/opt/UMC/conf/thma/etc` and running the **load** command.

```
cd /opt/UMC/conf/thma/etc
./load
```

3. Deploy the *thma.ear* file by using the procedure appropriate for your Web application server.

If you are using JBoss, copy the file to the JBoss `/default/deploy` directory. For example:

```
cp /opt/UMC/conf/thma/webapp/thma.ear /opt/UMC/jboss/server/default/deploy
```

#### Related Documentation

- Overview of the Threat Mitigation Application on page 13
- Sample Implementation on page 15
- Installing and Initially Configuring the Threat Mitigation Application on page 16
- Configuring Logging on page 24
- Applying Services to Manage Threats on page 26

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## Applying Services to Manage Threats

You can configure services to control problem traffic, such as limiting bandwidth or blocking traffic, in response to detection of malicious traffic. The Threat Mitigation Application passes the defining attribute values of the attack type to the service as parameters for possible use in the policies. The Threat Mitigation Application supports service activation on the JUNOS forwarding interface, the JUNOS provider edge interface, or the JUNOS subscriber interface. You can configure only one of these interfaces as the service activation interface for the Threat Mitigation Application, but you can use an aggregate service to apply the policies on a combination of those interfaces.

The following example describes how to configure policies to decrease the amount of bandwidth available to the attacker and to block the attack or the attacker as implemented in the sample data. You can use any of these services or create your own services to define actions for the Threat Mitigation Application.

To configure services and policies to handle threats:

1. Create a policy that defines an action to be taken.



The sample data for each type of interface contains these policy groups:

- **blockAttack**—Blocks all traffic between the source and destination addresses for the specified protocol and ports. If the protocol or ports are not specified, then the default value is any protocol and any port.
- **blockAttacker**—Blocks all traffic coming from or going to the source address.
- **default**—Forwards traffic.
- **slowAttacker**—Limits the bandwidth available for all traffic coming from or going to the source address according to the specified rate.

For a policy folder that contains these policy groups for the JUNOS forwarding interface, see *ou=forwardingInterface, ou=thma, o=Policies, o=umc* in the sample data.

For a policy folder that contains these policy groups for the JUNOS provider edge interface, see *ou=peInterface, ou=thma, o=Policies, o=umc* in the sample data.

For a policy folder that contains these policy groups for the JUNOS subscriber interface, see *ou=subInterface, ou=thma, o=Policies, o=umc* in the sample data.

2. Create a new scope or use an existing scope for the services that define actions to be taken in response to attacks on different interfaces.

For a sample scope that applies to the JUNOS forwarding interface, see *l=THMA-ForwardingInterface, o=Scopes, o=umc*.

For a sample scope that applies to the JUNOS provider edge interface, see *l=THMA-PInterface, o=Scopes, o=umc*.

For a sample scope that applies to the JUNOS subscriber interface, see *l=THMA-SubInterface, o=Scopes, o=umc*.

3. For the scope used in Step 2:
  - a. Create a service that defines actions to be taken in response to threats. You can create different types of services. For example, you can create aggregate services to apply the policies on these interfaces.

The sample data contains normal services that specify the policy group configured in Step 1.

For a sample service to block attacks on the forwarding interface, see *serviceName=BlockAttack, l=THMA-ForwardingInterface, o=Scopes, o=umc*.

- b. Assign the scope to a subscriber folder to make the service available to these subscribers.

For a sample on the JUNOS forwarding interface, see *ou=routers, retailerName=SP-THMA, o=Users, o=umc*.

For a sample on the JUNOS provider edge interface, see *ou=subscribers\_pelf, retailerName=SP-THMA, o=Users, o=umc*.

For a sample on the JUNOS subscriber interface, see *ou=subscribers\_subrlf*, *retailerName=SP-THMA*, *o=Users*, *o=umc*.

4. Create service subscriptions for subscribers. In the sample data, we create a subscription at the folder level to allow all subscribers in the folder to inherit the subscription. Configure the subscriptions to manually activate the service through the SRC TMP.

For a sample implementation, see *serviceName=BlockAttack*, *retailerName=SP-THMA*, *o=Users*, *o=umc* in the sample data.

For information about configuring subscriptions, see *Configuring Subscriptions (SRC CLI)*.

**Related  
Documentation**

- *Configuring Threat Mitigation* on page 17
- *Installing and Initially Configuring the Threat Mitigation Application* on page 16
- *Configuring Logging* on page 24
- *Examples: Classifying Subscribers and Interfaces for the Threat Mitigation Application* on page 28

## Examples: Classifying Subscribers and Interfaces for the Threat Mitigation Application

To apply policies to the forwarding interfaces, you configure additional entries in the subscriber classification and interface classification scripts.

### Example: Subscriber Classification Scripts

In the subscriber classification script, threat mitigation requires the assignment of a subscriber profile for the forwarding interface and for any interface other than the forwarding interface (such as the provider edge interface on the router running JUNOS Software).

The Threat Mitigation Application needs to identify subscriber sessions in which to activate services persistently. These subscriber sessions should have a login name so that subscriber entries in the directory can be shared among the managed routers or interfaces. The login name must be unique. We recommend using the interface name and virtual router name to construct a unique login name. The login name must end in *@<retailer's domain>* and must not contain a / (slash) or another @ (at sign).

```
[routerName=commonRouterProfile,ou=routers,retailername=SP-THMA,o=Users,o=UMC?loginName=
<-virtualRouterName.replace("@", "_")+ "@thma"->??]
# host subscriber for JUNOS routers
interfaceName="FORWARDING_INTERFACE"
```

This subscriber classification for the forwarding interface sets the virtual router name as the login name and thma as the service provider's domain name. The domain name must match the value of the Retailer Domain field specified when configuring the SRC TMP.

```
[uniqueID=DefaultTHMASubscriber,ou=subscribers,retailername=SP-THMA,o=Users,
o=UMC?loginName=<-interfaceName.replace("@", "_").replace("/",
"_"+")+ "_" +virtualRouterName.replace("@", "_")+ "@thma"->??]
```

```
# anything that is not the forwarding interface uses default subscriber
interfaceName!="FORWARDING_INTERFACE"
```

This subscriber classification for the provider edge interface sets the interface name as the login name.

To view the subscriber classifications referenced in this section, see *l=THMA*, *l=SAE*, *ou=staticConfiguration*, *ou=Configuration*, *o=Management*, *o=umc* in the sample data.

### Example: Interface Classification Scripts for JUNOS Routing Platforms

An entry is needed in the interface classification script to specify the default policy for forwarding interfaces and provider edge interfaces on the routers running JUNOS Software. For example:

```
[policyGroupName=default,ou=forwardingInterface,ou=thma,o=Policies,o=UMC]
# manage router interface for mirroring
interfaceName=="FORWARDING_INTERFACE"
[policyGroupName=default,ou=peInterface,ou=thma,o=Policies,o=UMC]
# manage interfaces with an alias indicating
# an enterprise customer
interfaceName!="FORWARDING_INTERFACE"
```

To view the interface classifications referenced in this section, see the interface classification for the THMA<number> routers listed under *o=Network*, *o=umc* in the sample data.

### Example: Interface Classification Scripts for JUNOSe Routers

An entry is needed in the interface classification script to specify the default policy for subscriber interfaces on the JUNOSe routers. For example:

```
# generic PPP users
[policyGroupName=default,ou=subInterface,ou=thma,o=Policies,o=UMC]
pppLoginName!=""
# define DHCP interfaces here
[policyGroupName=DHCP,ou=junose,ou=sample,o=Policies,o=umc]
# all fastEthernet interfaces
interfaceName="fastEthernet*"
```

To view the interface classifications referenced in this section, see the interface classification for *orderedCimKeys=THMA\_JUNOSE*, *o=Network*, *o=umc* in the sample data.

#### Related Documentation

- Overview of the Threat Mitigation Application on page 13
- Overview of Classification Scripts



## CHAPTER 3

# Managing Threats with the SRC TMP

- Overview of the SRC TMP on page 31
- Overview of Configuring and Deploying the SRC TMP on page 33
- Accessing the SRC TMP on page 34
- Managing Attacks with the SRC TMP on page 36
- Fields in the thm.py File on page 41

### Overview of the SRC TMP

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The SRC TMP provided with the SRC software is designed to be used with the sample data for the Threat Mitigation Application. The SRC TMP is a Web application that lets you use a Web browser to manage threats.

Once you have configured and deployed the Threat Mitigation Application, you can use the SRC TMP to manage attack events.

When the NetScreen-Security Manager reports incidents to the SRC TMP, the SRC TMP:

- Provides a description of the incident, including source IP address, destination IP address, attack type, severity, time of first received record, time of last received record, count of repeated attacks, and possible actions.
- Allows the administrator to choose how to handle the threat in the appropriate manner by taking action, activating or deactivating a service, or managing an action already taken.
- Displays general information if the SRC software cannot collect information about an attack type because it is not defined in the ATTACK\_TYPE table.

### About the Record Servlet

The record servlet receives messages from the SRC **thm.py** script that runs in NetScreen-Security Manager. The **thm.py** script posts messages to a specified URL. The default pathname in the URL is /thmp/record. For information about changing the default pathname, see “Configuring Logging” on page 24.

NetScreen-Security Manager sends the following information from its XML schema to the record servlet for display in the SRC TMP.

- **dayId**—Date of the record as displayed in the Attack ID column to the left of the colon.
- **recordId**—Identifier for the record as displayed in the Attack ID column to the right of the colon.
- **timeReceived**—Time the attack event is received as displayed in the First Received Time and Last Received Time columns.
- **subCategory**—Subcategory of the attack as displayed in the Attack Type column.
- **srcAddr**—Source address of the attack as displayed in the Source column.
- **dstAddr**—Destination address of the attack as displayed in the Destination column.
- **severity**—Severity of the attack as displayed in the Severity column.
- **repeatCount**—Number of occurrences of the attack as displayed in the Repeat Count field.

The record servlet maps an attack ID with an attack type and its defining attributes (including protocol, source address, source port, destination address, destination port, user, application, uri). If the servlet receives more than one record for the same attack type with the same defining attribute values, the servlet stores the record with that attack ID once and increases the value of Repeat Count for that attack ID by one for each subsequent occurrence. The record servlet also records the highest severity of all attacks with the same defining attribute values and updates the last received timestamp.

If applicable, the SRC TMP displays the following information in the Attack Details page.

- **category**—Category of the attack; displayed in the Attack Type field.
- **subCategory**—Subcategory of the attack; displayed in the Attack Type field.
- **srcAddr**—Source address of the attack; displayed in the Source field.
- **srcDns**—The result of a reverse DNS lookup on the source address of the attack; displayed in the Source DNS field as a comma-separated list.
- **srcPort**—Source port of the attack; displayed in the Source Port field.
- **dstAddr**—Destination address of the attack; displayed in the Destination field.
- **dstDns**—The result of a reverse DNS lookup on the destination address of the attack; displayed in the Destination DNS field as a comma-separated list.
- **dstPort**—Destination port of the attack; displayed in the Destination Port field.
- **protocol**—Protocol of the attack; displayed in the Protocol field.

#### **Related Documentation**

- Overview of Configuring and Deploying the SRC TMP on page 33
- Accessing the SRC TMP on page 34
- Installing and Initially Configuring the Threat Mitigation Application on page 16
- For information about the SRC **thm.py** script that runs in NetScreen-Security Manager, see Fields in the thm.py File on page 41

## Overview of Configuring and Deploying the SRC TMP

---

The SRC TMP provided with the SRC software is designed to be used with the threat mitigation implementation in the sample data.

### Using the NIC Resolver for the SRC TMP

The Threat Mitigation Application pushes policies to the interfaces from which the problem traffic enters the network. To do so, the SRC TMP must be able to map from a given attack source IP address to the SAEs managing the interfaces on the routers where that traffic enters the network. The Threat Mitigation Application uses the network information collector (NIC) to perform this mapping. Each service activation interface uses a different NIC configuration.

For information about the NIC configuration for each interface, see:

- JUNOS provider edge interface—“Configuring the NIC for Provider Edge Interfaces” on page 33
- JUNOS forwarding interface—“Configuring the NIC for Forwarding Interfaces” on page 33
- JUNOS subscriber interface—“Configuring the NIC for Subscriber Interfaces” on page 34

For more information about configuring the service activation interface, see “Configuring Logging” on page 24.

### Configuring the NIC for Provider Edge Interfaces

To configure the NIC to map the source IP address for a given attack to the SAEs managing the JUNOS subscriber-facing interfaces, use the OnePopStaticRouteIp configuration scenario and restart the NIC host. The OnePopStaticRouteIp configuration scenario resolves an assigned IP address for a subscriber whose traffic enters the network through an interface on a router running JUNOS Software to a reference for the SAE that manages the interface. The realm for this configuration accommodates the situation in which the network publisher component gathers interface information for the router running JUNOS Software. The resolution process takes a subscriber’s IP address as a key and returns a reference to the SAE that manages the interface. For information about the NIC, see Locating Subscriber Management Information.

For information about associating an existing address pool with an interface, see Updating Information About Address Pools.

### Configuring the NIC for Forwarding Interfaces

To configure the NIC to map the source IP address for a given attack to the SAEs managing the JUNOS forwarding interfaces, use the OnePop configuration scenario and restart the NIC host. The realm for the OnePop configuration scenario accommodates the situation in which IP address pools are configured locally on each VR. 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. For information about configuring the NIC, see Configuring the NIC (SRC CLI).

## Configuring the NIC for Subscriber Interfaces

To configure the NIC to map the source IP address for a given attack to the SAEs managing the JUNOS subscriber interfaces, use the OnePopAllRealms configuration scenario and restart the NIC host. The realm for the OnePopAllRealms configuration scenario accommodates the situations in which IP address pools are configured locally on each VR or IP address pools are shared by VRs in the same POP. 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. For information about configuring the NIC, see *Configuring the NIC (SRC CLI)*.

If the IP address pools are shared across multiple VRs, you must also configure an external plug-in for the SAE plug-in agent in the NIC host as follows:

```
Plugin.nic.objectref=corbaname::<host>:<port>/NameService#nicsae/saePort
```

- <host> is the name or IP address of the COS name server
- <port> is the TCP port

For information about configuring the SAE for external plug-ins, see *Configuring the SAE for External Plug-Ins (SRC CLI)*.

### Related Documentation

- Overview of the SRC TMP on page 31
- Accessing the SRC TMP on page 34
- Deploying the Threat Mitigation Application on page 25

---

## Accessing the SRC TMP

To access the SRC TMP:

1. In your Web browser, enter the name or IP address of the host and the port number on which you installed the Threat Mitigation Application in the format:

```
http(s)://<host>:<port>/thmp
```

A Connect to dialog box appears.

2. In the Connect to dialog box, enter your username and password, and click **OK**. The default values are:

User name—admin

Password—secret

The Threat Mitigation Portal appears.





## Threat Mitigation Portal

Home

▶	Home
▶	Action Required
▶	Start Pending
▶	Stop Pending
▶	Action Taken

## Threat Mitigation Portal

Welcome to the Threat Mitigation Portal.

- [Action Required Attacks](#)
- [Action Start Pending Attacks](#)
- [Action Stop Pending Attacks](#)
- [Action Taken Attacks](#)

Display  attacks per page.☐ Page refreshes every  seconds.

- To modify the number of attacks displayed on each page from 20, enter the number in the Display attacks per page field.
- To modify the page refresh rate, select the Page refreshes every 30 seconds check box, and enter the number of seconds in the text box.

You can manage the attacks that fall into these categories:

- Action Required—This page displays information about the attacks that require some action to be taken. See “Managing Attacks Requiring Action” on page 36.
- Start Pending—This page displays the attacks that are pending service activation. See “Managing Attacks Pending Service Activation” on page 37.
- Stop Pending—This page displays the attacks that are pending service deactivation. See “Managing Attacks Pending Service Deactivation” on page 38.
- Action Taken—This page displays the attacks for which some action was taken. See “Managing Attacks with Activated Services” on page 40.

The information provided about the attacks include attack ID, source and destination addresses, attack type, severity, first and last time the event was received, action that can be taken or action that was taken, and the time that the action was taken.

#### Related Documentation

- Overview of the SRC TMP on page 31
- Overview of Configuring and Deploying the SRC TMP on page 33
- Configuring Logging on page 24

## Managing Attacks with the SRC TMP

- Managing Attacks Requiring Action on page 36
- Managing Attacks Pending Service Activation on page 37
- Managing Attacks Pending Service Deactivation on page 38
- Managing Attacks with Activated Services on page 40

### Managing Attacks Requiring Action

To manage attacks that require action to be taken:

1. In the Threat Mitigation Portal navigation pane, click **Action Required**.

The Action Required page displays all attacks that require action.

#### Action Required Attacks

Sorted By  Ordered By

Attack ID	Source	Destination	Attack Type	Severity	First Received	Last Received	Repeat Count	Action 	
<a href="#">20051222:3</a>	joe@thma	116.3.2.39	ICMP EXPLOIT FLOOD	major	Thursday, December 22, 2005 7:20:33 AM	Thursday, December 22, 2005 7:21:33 AM	32	<input type="text" value="Slow Attacker to 512kb/s"/>	<input type="button" value="Take Action"/> <input type="button" value="Delete"/>



The Attack ID is linked to the Attack Details page, which displays more information about the attack record.

The help button provides information about the possible actions that can be taken in response to an attack. For example, the Help could recommend blocking the attack, blocking the attacker, or slowing the attacker.

2. To sort the attacks by a different category, select another category from the **Sorted By** drop-down list, and click **Sort**.
3. To sort the attacks in a different order, select the order from the **Ordered By** drop-down list, and click **Sort**.
4. To take action, select the action from the **Action** drop-down list, and click **Take Action** to update the state of the attack in that row and activate the service that represents the action to be taken.

If the attack is no longer in the same state as when you clicked **Take Action**, the action is aborted, and a message explains that the attack has been handled. Otherwise, the result depends on whether the service is activated.

- If a service is activated, the attack is moved to the Action Taken page.

- If a service is waiting to be activated, the attack is placed in a pending state and appears in the Start Pending page.

5. To delete the attack, click **Delete** in the row for the attack.

#### Related Documentation

- Managing Attacks Pending Service Activation on page 37
- Managing Attacks Pending Service Deactivation on page 38
- Managing Attacks with Activated Services on page 40
- Configuring Attack Types in the Database on page 19
- Fields in the thm.py File on page 41

## Managing Attacks Pending Service Activation


To manage attacks waiting for service activation:

1. In the Threat Mitigation Portal navigation pane, click **Start Pending**.

The Start Pending page displays all attacks whose status is pending due to service activation.

### Service Start Pending Attacks

Sorted By  Ordered By

Attack ID	Source	Destination	Attack Type	Severity	First Received	Last Received	Repeat Count	Action 	Last Failure Time	
<a href="#">20060512:65</a>	jane@virneo.com	labsrv-net7.kanlab.jnpr.net	TELNET USER ROOT	minor	Friday, May 12, 2006 11:28:58 AM	Friday, May 12, 2006 11:28:58 AM	1	Slow Attacker to 512kb/s	Friday, May 12, 2006 12:07:01 PM	<input type="button" value="Cancel"/> <input type="button" value="Force Cleanup"/>

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The Attack ID is linked to the Attack Details page, which displays more information about the attack record.

The help button provides information about the possible actions that can be taken in response to an attack. For example, the Help could recommend blocking the attack, blocking the attacker, or slowing the attacker.

2. To sort the attacks by a different category, select another category from the **Sorted By** drop-down list, and click **Sort**.
3. To sort the attacks in a different order, select the order from the **Ordered By** drop-down list, and click **Sort**.
4. In the Service Start Pending Attacks table, you have the following options:
  - Click **Cancel** in a row to remove the attack from the Start Pending page and deactivate the service.

If the attack is no longer in the same state as when you clicked **Cancel**, the action is aborted, and a message explains that the attack has been handled. Otherwise, the result depends on whether the service is deactivated.

- If the service is deactivated, the attack is moved to the Action Required page.
- If the service is waiting to be deactivated, the attack is placed in a pending state and appears in the Stop Pending page. The Last Failure Time column indicates the time when the service deactivation was triggered.
- Click **Force Cleanup** in a row to delete the attack from the database.

You are responsible for ensuring that the service is deactivated. The SRC TMP does not try to deactivate the service in this case.

- Click **Retry** in a row to manually reactivate the service.

If the attack is no longer in the same state as when you clicked **Retry**, the action is aborted, and a message explains that the attack has been handled. Otherwise, the result depends on whether the service is activated.

- If the service is activated, the attack is moved to the Action Taken page.
- If the service is waiting to be activated, the attack stays in the same state and continues to appear in the Start Pending page. The Last Failure Time column indicates the time when the service activation was triggered.

The SRC TMP automatically tries to reactivate the service according to the configuration properties (see “Configuring Logging” on page 24).

#### **Related Documentation**

- Managing Attacks Requiring Action on page 36
- Managing Attacks Pending Service Deactivation on page 38
- Managing Attacks with Activated Services on page 40
- Configuring Attack Types in the Database on page 19
- Fields in the thm.py File on page 41

## **Managing Attacks Pending Service Deactivation**

To manage attacks waiting for service deactivation:

1. In the Threat Mitigation Portal navigation pane, click **Stop Pending**.

The Stop Pending page displays all attacks whose status is pending due to service deactivation.

### Service Stop Pending Attacks

Sorted By  Ordered By

Attack ID	Source	Destination	Attack Type	Severity	First Received	Last Received	Repeat Count	Action	Last Failure Time	
<a href="#">20060512:63</a>	null	labsrv-net7.kanlab.jnpr.net	TELNET USER ROOT	minor	Friday, May 12, 2006 11:15:47 AM	Friday, May 12, 2006 11:16:10 AM	2	Slow Attacker to 512kb/s	Friday, May 12, 2006 12:13:01 PM	<input type="button" value="Cancel"/> <input type="button" value="Force Cleanup"/> <input type="button" value="Retry"/>

Juniper yourNet

The Attack ID is linked to the Attack Details page, which displays more information about the attack record.

The help button provides information about the possible actions that can be taken in response to an attack. For example, the Help could recommend blocking the attack, blocking the attacker, or slowing the attacker.

2. To sort the attacks by a different category, select another category from the **Sorted By** drop-down list, and click **Sort**.
3. To sort the attacks in a different order, select the order from the **Ordered By** drop-down list, and click **Sort**.
4. In the Service Stop Pending Attacks table, you have these options.

- Click **Cancel** in a row to remove the attack from the Stop Pending page and activate the service.

If the attack is no longer in the same state as when you clicked Cancel, the action is aborted, and a message explains that the attack has been handled. Otherwise, the result depends on whether the service is activated.

- If the service is activated, the attack is moved to the Actions Taken page.
- If the service is waiting to be activated, the attack record is placed in a pending state and appears in the Start Pending page. The Last Failure Time column indicates the time when the service activation was triggered.

- Click **Force Cleanup** in a row to delete the attack from the database.

You are responsible for ensuring that the service is deactivated. The SRC TMP does not try to deactivate the service in this case.

- Click **Retry** in a row to try to manually deactivate the service again.

If the attack is no longer in the same state as when you clicked **Retry**, the action is aborted, and a message explains that the attack has been handled. Otherwise, the result depends on whether the service is deactivated.

- If the service is deactivated, the attack is moved to the Action Required page.
- If the service is waiting to be deactivated, the attack record stays in the same state and continues to appear in the Stop Pending page. The Last Failure Time column indicates the time when the service deactivation was triggered.

The SRC TMP automatically tries to deactivate the service again according to the configuration properties (see “Configuring Logging” on page 24).

#### Related Documentation

- Managing Attacks Requiring Action on page 36
- Managing Attacks Pending Service Activation on page 37
- Managing Attacks with Activated Services on page 40
- Configuring Attack Types in the Database on page 19
- Fields in the thm.py File on page 41

## Managing Attacks with Activated Services

To manage attacks for which some action was taken:

1. In the Threat Mitigation Portal navigation pane, click **Action Taken**.

The Action Taken page displays all attack records whose status is action taken.

### Action Taken Attacks

Sorted By  Ordered By

Attack ID	Source	Destination	Attack Type	Severity	First Received	Last Received	Repeat Count	Action	Action Taken Time	
<a href="#">20060404:33</a>	joe@thma	hactar.kanlab.jnpr.net	ICMP EXPLOIT FLOOD	minor	Thursday, April 27, 2006 6:32:13 PM	Thursday, April 27, 2006 6:32:13 PM	1	Block Attack	Thursday, April 27, 2006 12:24:50 PM	<input type="button" value="Stop"/> <input type="button" value="Force Cleanup"/>
<a href="#">20051222:2</a>	116.3.2.79	116.3.1.45	TROJAN AUTOPROXY INFECTED-HOST	critical	Thursday, December 22, 2005 7:20:57 AM	Thursday, December 22, 2005 7:20:57 AM	4	Block Attacker	Friday, December 30, 2005 11:46:35 AM	<input type="button" value="Stop"/> <input type="button" value="Force Cleanup"/>
<a href="#">20051222:1</a>	116.3.1.22	116.3.3.193	FTP USER ROOT	minor	Thursday, December 22, 2005 7:18:58 AM	Thursday, December 22, 2005 7:19:58 AM	84	Block Attack	Wednesday, January 11, 2006 3:39:28 PM	<input type="button" value="Stop"/> <input type="button" value="Force Cleanup"/>



The Attack ID is linked to the Attack Details page, which displays more information about the attack record.

The help button provides information about the possible actions that can be taken in response to an attack. For example, the Help could recommend blocking the attack, blocking the attacker, or slowing the attacker.

2. To sort the attacks by a different category, select another category from the **Sorted By** drop-down list, and click **Sort**.

3. To sort the attacks in a different order, select the order from the **Ordered By** drop-down list, and click **Sort**.
4. To cancel the action, click **Stop** in that row to update the state and deactivate the service that represents the action that was taken.

If the attack is no longer in the same state as when you clicked **Stop**, the action is aborted, and a message explains that the attack has been handled. Otherwise, the result depends on whether the service is deactivated.

- If a service is deactivated, the attack is moved to the Action Required page.
  - If a service is waiting to be deactivated, the attack record is placed in a pending state and appears in the Stop Pending page.
5. To delete the attack, click **Force Cleanup** in the row for the attack.

You are responsible for ensuring that the service is deactivated. The SRC TMP does not try to deactivate the service in this case.

#### Related Documentation

- Managing Attacks Requiring Action on page 36
- Managing Attacks Pending Service Activation on page 37
- Managing Attacks Pending Service Deactivation on page 38
- Configuring Attack Types in the Database on page 19
- Fields in the thm.py File on page 41

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## Fields in the thm.py File

The following list describes the fields in the thm.py file used by the SRC TMP.

### **RECORD URL**

- URL of the record interface for the SRC TMP that stores information received from NetScreen-Security Manager. The interface records information about detrimental traffic in the ATTACK table in the database. The security rules configured in NetScreen-Security Manager determine the type of incidents recorded.
- Value—URL in the form “http(s)://<user>:<password>@<host>:<port>/thmp/record”
  - <user>—Client ID
  - <password>—Password associated with the client ID

- <host>—Hostname or IP address of the server on which the SRC TMP runs
- <port>—Port number used by the SRC TMP on the server
- Guidelines—Enclose the URL in quotation marks because this entry is a Python string.
- Default—RECORD\_URL=" http://admin:secret@127.0.0.1:8080/thmp/record"
- Example—RECORD\_URL=" https://admin:secret@192.0.2.25:8443/thmp/record"

***FAIL\_DIR***

- Pathname to the directory that records incidents that were not successfully sent to the record URL.
- Value—Pathname in the form " <pathname>"
- Guidelines—Enclose the pathname in quotation marks because this entry is a Python string.
- Default—FAIL\_DIR = " failedEvents"

***FAIL\_FILE\_LIMIT***

- Maximum number of events that will be recorded in the fail directory. If this number is exceeded, the oldest event is deleted to make room for the most recent event. If this number is 0, the script will not add any failed events, check the fail directory for failed events, or spawn the daemon process.
- Value—Integer in the range 0–2147483647
- Default—FAIL\_FILE\_LIMIT = 100

***NUM\_RETRIES***

- Number of times the script (and daemon process) will retry sending an event to the record URL if the first attempt fails. If the retry limit is reached, the script gives up and writes the event to the fail directory. If the retry limit is reached by the daemon process, it stops trying to send failed events until its next interval. For example, if NUM\_RETRIES is 2, then the script will try at most 3 times to send an event to the record URL.
- Value—Integer in the range 0–2147483647
- Default—NUM\_RETRIES = 2

***DAEMON\_INTERVAL***



- Amount of time that the daemon process will take between attempts to send events to the fail directory. When first started, the daemon process will wait this number of seconds before trying to send events recorded in the fail directory. If it fails to send any event in the fail directory, it will not try to send any more events for this amount of time.
- Value—Number of seconds in the range 0–604800 (1 week)
- Default—DAEMON\_INTERVAL = 30

### ***DEBUG***

- Specifies whether or not to print debugging messages.
- Value
  - True—Print messages.
  - False—Do not print messages.
- Guidelines—Set this value to True only for troubleshooting. Set this value to False to minimize the effects on performance.
- Default—DEBUG = True

### ***SEND\_XML***

- Specifies whether or not to send attack log events to the SRC TMP as an XML document.
- Value
  - True—The attack log event is sent to the SRC TMP as an XML document.
  - False—The script parses the XML document and posts the relevant data as individual request parameters.
- Guidelines—Set this value to True to minimize CPU resources consumed by this script. Set this value to False to minimize the CPU resources used by the SRC TMP in recording the attack. Setting this value to False will cause the script to consume approximately 60% more CPU resources.
- Default—SEND\_XML = False

### ***BACKGROUND\_LOG\_FILE***

- Name of the file that logs messages for the process that retries sending attack log events. This file is created in the directory specified by FAIL\_DIR.
- Value—Filename in the form “ <filename>”
- Guidelines—Enclose the filename in quotation marks because this entry is a Python string. Set this value to None for no background logging.
- Default—BACKGROUND\_LOG\_FILE = “ thm.log”

### ***BACKGROUND\_LOG\_FILE\_LIMIT***

- Maximum size of the background log file. If this number is exceeded, a sequence number is appended to the filename and a new log file is started.
- Value—Number of bytes in the range 0–2147483647
- Default—BACKGROUND\_LOG\_FILE\_LIMIT = 50000

## PART 3

# Managing Network Resources

- Providing Application-Level Session Tracking and QoS Control on page 47



## CHAPTER 4

# Providing Application-Level Session Tracking and QoS Control

- Overview of Application-Level Session Tracking and QoS Control on page 47
- Integration of the SRC Software and the Ellacoya DPI Platform on page 48
- Subscriber Login and Logout in a DPI Environment on page 52
- Service Activation and Deactivation in a DPI Environment on page 52
- Loading the Sample Data for the DPI on page 53
- Configuring the SRC Software for DPI Integration on page 54
- Configuring the Ellacoya DPI Platform for Integration on page 59

## Overview of Application-Level Session Tracking and QoS Control

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The SRC software has been integrated with the Ellacoya Networks Deep Packet Inspection (DPI) platform to provide a traffic management solution that combines the advanced traffic identification and reporting features of the Ellacoya DPI with the SRC software's intelligent service policy enforcement. With this solution, providers can identify, monitor, and control traffic on a per-application or per-subscriber basis.

Application traffic such as peer-to-peer file sharing or instant messaging, which in many cases originates or terminates outside a provider's network, can cause abusive or indiscriminate consumption of bandwidth and affect a provider's ability to deliver its own services. In particular, services that require higher, guaranteed levels of performance, such as voice over IP (VoIP) or video on demand, can be affected. Having visibility into applications that are transported over the network and their associated bandwidth consumption at various times is important, as is the ability to control those applications.

The DPI solution allows providers to implement service control policies on specific traffic flows quickly and effectively. Such policies include throttling back, capping volume, or even enhancing bandwidth or service quality for sanctioned peer-to-peer applications.

## Benefits of Application-Level Session Tracking and QoS Control

By identifying and effectively controlling traffic at the application level, service providers can:

- Put usage controls on applications on a subscriber basis. For example, you can put a quota limit on the amount of peer-to-peer traffic that a subscriber can consume in a month.

Once subscribers have used their quota, you can apply a policy that throttles back or blocks a subscriber's peer-to-peer traffic, bill the subscriber for additional usage, or allow the subscriber to purchase additional quota.

- Limit the total percentage of network resources that a specific type of traffic is allowed to consume.
- Provide higher or guaranteed levels of performance for premium services by applying QoS control to application sessions. For example, two subscribers start an Xbox Live session. The Ellacoya DPI platform detects activity for this application, and sends application usage counters to the SRC software. The SRC software pushes policies that deliver a specific level of QoS for this application session to a router or other network device.
- Charge subscribers based on their usage of premium content-based services.
- Offer and charge for tiered Internet services based on both speed and application.
- Better support network planning functions by gaining an in-depth understanding of traffic flows and patterns on a per-subscriber and per-application basis.

#### **Related Documentation**

- Integration of the SRC Software and the Ellacoya DPI Platform on page 48
- Subscriber Login and Logout in a DPI Environment on page 52
- Loading the Sample Data for the DPI on page 53
- Configuring the Script Service on page 56

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## **Integration of the SRC Software and the Ellacoya DPI Platform**

This topic describes the integration of the SRC software with the Ellacoya DPI platform.

### **Ellacoya Networks DPI Platform**

The SRC software is integrated with the Ellacoya IP Service Control System (IPSCS), which delivers comprehensive monitoring tools and extensive reporting that gives providers network visibility into and control over their subscribers, network, and service offerings (see Figure 1 on page 49). The IPSCS includes the following components:

- IPSCS e30 Switch, which provides application session and usage information based on real-time deep inspection of network traffic.
- Service logic engine (SLE), which is the control component of the IPSCS software. The SLE includes the Usage Quota Management System (UQMS) applications programming interfaces (API) that the SRC software can call to collect usage data and to indicate that subscriber sessions have started, changed, or stopped. Calls for the API are carried between the SLE and the SRC software by the Remote Method Invocation (RMI) protocol.

The IPSCS allows the creation of Usage Quota Management Systems, which allows third-party systems, such as the SRC software, to be integrated with the IPSCS. The UQMS is a provisioning system that determines business rules and communicates them to the IPSCS and other network components.

Service providers provision business rules on the UQMS. Based on the configuration instructions from the UQMS, the IPSCS collects usage statistics on specified intervals and applications, and then forwards the data to the UQMS for processing. The UQMS sends authentication and configuration information for subscribers to the IPSCS.

## Juniper Networks Platforms

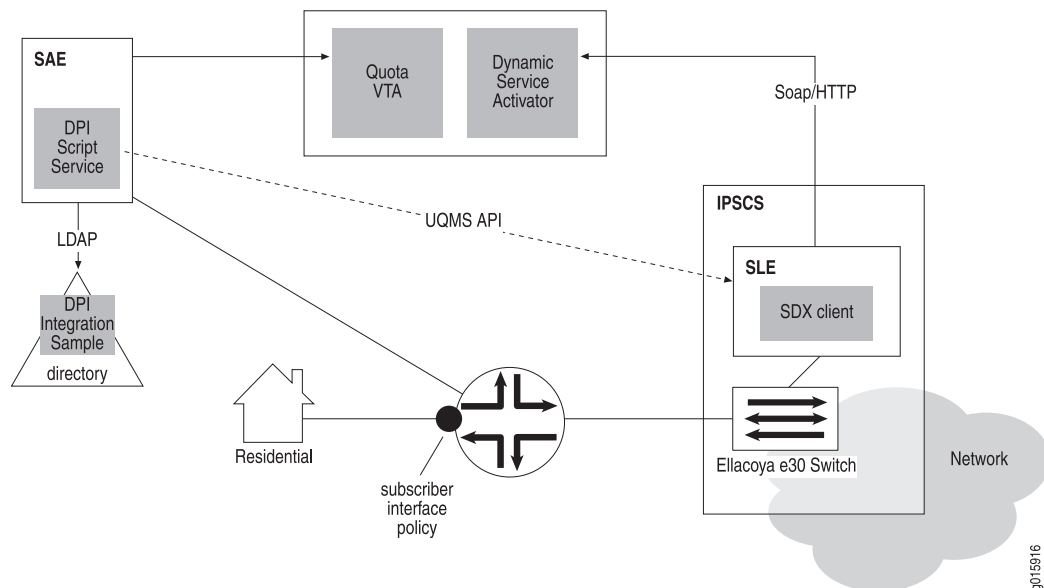
As shown in Figure 1 on page 49, the SRC software is integrated with the Ellacoya DPI platform through an SAE script service that works as a UQMS to the IPSCS. The script service sends event messages to and receives messages from the SLE through the UQMS API. The script service translates subscriber logins and logouts and service activation and deactivation to corresponding RMI function calls in the SLE. The script service collects accounting data from the SLE and maps the data to SRC service session usage data. The SRC software is integrated with the Ellacoya platform in a way that makes services implemented by the e30 Switch just like any other SRC service.

The SRC software supports the DPI solution on routers running JUNOS or JUNOS Software, and on PacketCable Multimedia Specification (PCMM) policy servers and cable modem termination system (CMTS) devices.

You can integrate the SLE with the SRC software through a SOAP interface to the NIC and the SAE.

Figure 1 on page 49 shows the components involved in the SRC-DPI integration.

**Figure 1: DPI Integration Overview**



## IPSCS Service Offers and Service Bundles

The Ellacoya IPSCS has the concept of service offers that contain a collection of service bundles. Service bundles are applied to a subscriber and contain a set of policy rules that define the patterns needed to recognize application sessions between specified source and destination networks. The service bundle includes the actions to take on application sessions, including marking specified streams with a DiffServ code point. Each rule in a service bundle can also have an activation period to control the time it is active.

A service offer also allows the association of traffic-accounting profiles (TAPs) with service bundles. TAPs are used to interface with external accounting systems. If a TAP is applied to a service bundle for a subscriber, then the counters for that service bundle are accumulated in accounting records indexed by TAP name.

## Mapping Service Offers and Service Bundles to SRC Concepts

A service offer applied to a subscriber in the IPSCS corresponds to the SRC concept of the set of services active for a subscriber. A service bundle in an applied service offer corresponds to an SRC service activation.

A TAP applied to a service bundle roughly corresponds to accounting being enabled on an SRC policy.

The DPI integration maps SRC service activations and deactivations to changing the service offer applied to the subscriber so that it contains the corresponding set of service bundles. For example, a service provider offers three SRC services—Web access, e-mail, and peer-to-peer file sharing—to its subscribers. Each service can be dynamically enabled or disabled. The Ellacoya DPI system provides eight service offers that accommodate all possible combinations of the three SRC services.

## Synchronization Between the SRC Software and the Ellacoya System

Table 6 on page 50 outlines the interactions that must be synchronized between the SRC software and the Ellacoya system.

**Table 6: Synchronization Between the SRC Software and the Ellacoya System**

Object	Source	Description
Service offer	Provisioned on the Ellacoya system	Contains the definition of the profile set in terms of network policies. For example, rate limits and ToS marking.
Subscriber	Dynamic	Subscribers are dynamically created in the Ellacoya database as the SRC software provisions them through the UQMS API.
Subscriber/Service offer binding	Dynamic	The binding of the subscriber to a service offer is done dynamically when the SRC software provisions the subscriber through the UQMS API.



**Table 6: Synchronization Between the SRC Software and the Ellacoya System** *(continued)*

Object	Source	Description
Subscriber/IP address binding	Dynamic	The binding between the subscriber and IP address is a transient binding communicated from the SRC software when the subscriber session starts.

## Collecting Accounting Data

The IPSCS has a bulk statistics architecture where usage counters are collected for all active subscribers and services in bulk, and is controlled by a global accounting interval. The DPI script service polls for new usage data through the UQMS API based on the SLE global accounting interval. The SLE returns a list of file Uniform Resource Identifiers (URIs) of bulkstats files that have not been processed by the DPI script service.

After the DPI script service collects accounting data from the SLE, it maps the accounting data to usage data for an SRC service, and provides the usage data to the SAE. Because the SLE reports accounting data in the last accounting interval and the SAE expects service usage data since the service started, the script service adds the usage data in each accounting interval since the script service started. The script service keeps the counters in memory and also stores them so they can be recovered if there is an SAE failover.

The script service also stores a timestamp for the last time new data was reported to the SAE. This way, if there is a failover, the script service can determine when the `doneWithFile` method can be called for a file and whether or not a piece of usage data has been processed. The new SAE (after failover) requests the accounting data for sessions where the data in the file was reported to the previous SAE. At this time, the script service can compare timestamps (records in the file are also timestamped) to recognize that the data was previously reported and to recognize when all of the data in a file has been processed.

The IPSCS provides only one accounting record per accounting interval, per service offer, and per subscriber. This behavior means that if a DPI script service is stopped and restarted during one IPSCS accounting interval (usually 15 minutes), service usage of the two service sessions within that interval are allocated to one of the service sessions—the first service session for which the SAE requests an accounting update.

### Related Documentation

- Overview of Application-Level Session Tracking and QoS Control on page 47
- Provisioning the IPSCS on page 59
- Subscriber Login and Logout in a DPI Environment on page 52
- Service Activation and Deactivation in a DPI Environment on page 52
- SRC Script Services for DPI on page 54

## Subscriber Login and Logout in a DPI Environment

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Login events are not directly handled by the SAE, and there is no need for subscriber tracking plug-ins. When a script service is activated, the script service determines the Ellacoya service offer name based on the SRC services that are to be activated on login for the subscriber. Then, the script service calls the `startSubscriberRadiusSession` method of the UQMS API, which starts a subscriber session, and provides the subscriber's IP address, ID, and service offer name to the SLE.

When a script service is deactivated because the subscriber logs out, the script service notifies the SLE to remove the subscriber session, and it ignores all subsequent service deactivations for the subscriber.

### Related Documentation

- Overview of Application-Level Session Tracking and QoS Control on page 47
- Service Activation and Deactivation in a DPI Environment on page 52
- SRC Script Services for DPI on page 54
- Configuring Subscriptions to DPI Services on page 59
- Loading the Sample Data for the DPI on page 53

## Service Activation and Deactivation in a DPI Environment

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When the SAE activates the first DPI script service or deactivates the last DPI script service, the script service calls the `startSubscriberRadiusSession()` or `stopSubscriberRadiusSession()` methods (which start and stop subscriber sessions) in the UQMS API.

You can set up the script service so that when the first service that a script service implements is activated at login, the script service starts all other activate-on-login and persistently activated services for the subscriber that are also implemented by the script service. The combination of all activate-on-login and persistent services maps to one service offer in the SLE.

When there is a change to the subscriber's services that triggers a service activation—for example, the subscriber activates a service with a portal, the service provider adds new services, or the subscriber's quota is replenished—the script service calls the SLE `changeSubscriberSession()` method (which changes a subscriber session) with the new service offer name that corresponds to the combination of active DPI script services of the subscriber.

When deactivation of script services is triggered by changes to a subscriber's services—for example, the scheduled time for a service has ended, the service provider removes a service, or a subscriber exceeds the quota—the DPI script service calls the SLE `changeSubscriberSession()` method with the new service offer name that corresponds to the combination of active DPI script service of the subscriber.

The SAE expects the script service to return its final usage data when it stops the service. However, the SLE does not return the final accounting record synchronously when the

changeSubscriberSession() method is called. When a DPI script service is stopped, the script service signals to the SAE that accounting data is to be collected at a later time.

**Related Documentation**

- Integration of the SRC Software and the Ellacoya DPI Platform on page 48
- Subscriber Login and Logout in a DPI Environment on page 52
- SRC Script Services for DPI on page 54
- Configuring Subscriptions to DPI Services on page 59
- Adding a Service Scope on page 54
- Configuring the Script Service on page 56

## Loading the Sample Data for the DPI

The DPI sample data includes directory entries for service and policy configurations that are provided as a guide for how to set up an IPSCS-based service to be used as a quota service for the SRC VTA.

To load the sample data for the DPI feature:

1. Go to the dpi folder. The default folder is:

```
/opt/UMC/sae/var/scriptservice/dpi
```

2. Enter the following command, and respond to the prompts.

```
# ./loadsample
Please enter the authentication dn [cn=umcadmin,o=umc]:
Please enter the authentication password [admin123]:
Please enter the directory host address [127.0.0.1]:
Please enter the directory port [389]:
```

The software adds the following sample data:

```
adding new entry l=dpi, o=Scopes, o=UMC
```

```
adding new entry serviceName=service1, l=dpi, o=Scopes, o=UMC
adding new entry serviceName=service2, l=dpi, o=Scopes, o=UMC
adding new entry serviceName=service3, l=dpi, o=Scopes, o=UMC
adding new entry retailername=SP-DPI, o=Users, o=umc
adding new entry ou=local, retailername=SP-DPI, o=Users, o=umc
adding new entry uniqueID=jane,ou=local, retailername=SP-DPI, o=Users, o=umc
adding new entry serviceName=service3,ou=local, retailername=SP-DPI, o=Users, o=umc
adding new entry serviceName=service1,ou=local, retailername=SP-DPI, o=Users, o=umc
adding new entry serviceName=service2,ou=local, retailername=SP-DPI, o=Users, o=umc
```

**Related Documentation**

- Integration of the SRC Software and the Ellacoya DPI Platform on page 48
- Provisioning the IPSCS on page 59
- Subscriber Login and Logout in a DPI Environment on page 52
- SRC Script Services for DPI on page 54

- Configuring a Virtual Router Object for DPI on page 58

## Configuring the SRC Software for DPI Integration

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To set up the SRC software for the DPI solution, perform the following tasks:

- SRC Script Services for DPI on page 54
- Adding a Service Scope on page 54
- Creating a DPI Script Service on page 55
- Configuring the Script Service on page 56
- Configuring a Virtual Router Object for DPI on page 58
- Configuring Subscriptions to DPI Services on page 59

### SRC Script Services for DPI

Every subscriber must have at least one DPI script service active during subscriber login. This DPI script service corresponds to a service bundle in the SLE that provides the default policy for processing subscriber traffic. To match the service bundle with the script service, the service bundle must have the same name as the DPI script service and be prefixed by SDX\_. For example, if the script service is called dpiService1, the service bundle must be called SDX\_dpiService1.

You can create a service scope to hold your script services. Putting a script service in a service scope allows the service to be used in different regions of the network. (See “Configuring a Virtual Router Object for DPI” on page 58 for more information.) The DPI sample data contains a service scope called DPI. You can model your script services after the sample data.

After you configure a service scope, you need to configure script services for the scope and configure parameters for the script service. For more information about configuring service scopes, script services, and parameters, see *Configuring Service Scopes (SRC CLI)*.

#### **Related Documentation**

- Integration of the SRC Software and the Ellacoya DPI Platform on page 48
- Provisioning the IPSCS on page 59
- Adding a Service Scope on page 54
- Creating a DPI Script Service on page 55
- Configuring the Script Service on page 56
- Loading the Sample Data for the DPI on page 53

### Adding a Service Scope

To add a service scope:

1. Add a service scope with the SRC CLI or the C-Web interface.

See Configuring Service Scopes (SRC CLI) and Configuring Service Scopes (C-Web Interface)

2. Optionally, configure a precedence for the service scope.

#### **Related Documentation**

- SRC Script Services for DPI on page 54
- Service Activation and Deactivation in a DPI Environment on page 52
- Configuring Subscriptions to DPI Services on page 59
- Creating a DPI Script Service on page 55
- Configuring the Script Service on page 56

## Creating a DPI Script Service

To create a script service within the service scope:

1. Within the service scope, create a script service with the SRC CLI or the C-Web interface.

See Customizing Service Implementations or Configuring Script Services (C-Web Interface)

2. Specify the values for the following options for the service.

#### **Script Type**

- Type of script that the script service uses.
- Value—You must use URL for DPI script services

#### **Class Name**

- Name of the class that implements the ScriptService SPI. The SAE instantiates this class when it starts the script service.
- Value—You must enter `net.juniper.sgmt.dpi.sle.EllacoyaScriptService` for DPI script services

#### **File/URL**

- URL to the Java archive (JAR) files that are associated with the script.
- Value—For a DPI script service, you must include all of the following JAR files.
  - `file:///opt/UMC/sae/var/scriptservice/dpi/lib/dpi-ss.jar,`
  - `file:///opt/UMC/sae/var/scriptservice/dpi/lib/sle-client.jar,`
  - `file:///opt/UMC/sae/var/scriptservice/dpi/lib/jbossall-client.jar,`
  - `file:///opt/UMC/sae/var/scriptservice/dpi/lib/jdom.jar,`
  - `file:///opt/UMC/sae/var/scriptservice/dpi/lib/jnet.jar,`
  - `file:///opt/UMC/sae/var/scriptservice/dpi/lib/log4j.jar`



**NOTE:** All JAR files except dpi-ss.jar are Ellacoya SLE files, and must be compatible with the version of the SLE that is being used. Check the release notes for the version of the SLE that the JAR files packaged with the SRC software are from. If in doubt, replace the JAR files from the SLE installation, which can be found in `<SLE install dir>/lib` (for example: `/opt/ellacoya/lib`).

#### Related Documentation

- SRC Script Services for DPI on page 54
- Service Activation and Deactivation in a DPI Environment on page 52
- Configuring Subscriptions to DPI Services on page 59
- Adding a Service Scope on page 54
- Configuring the Script Service on page 56

## Configuring the Script Service

To configure the script service, you provide parameter substitutions with the values of the configuration parameters that are in the service definitions. To do so:

1. Configure parameters for the script service. See Customizing Service Implementations or Configuring Script Services (C-Web Interface)
2. Configure all the parameters listed in Table 7 on page 56.

**Table 7: Parameter Definitions for DPI Services**

Parameter Name	Description
dpi_sle_connection_servers	<p>IP address or hostname of the Ellacoya SLE server.</p> <p>If there is more than one server, separate entries with a comma. Enter the SLE addresses in priority order, with the primary server first. When the script service makes a connection to an SLE, it tries the addresses in the order that you entered them until it succeeds in connecting.</p> <p>If the connection is broken, the script service attempts to connect again, beginning with the first address in the list. Once the script connects to an SLE, it does not test the connection to the primary server and fail back to the primary server if the server recovers from a failure.</p>

Table 7: Parameter Definitions for DPI Services (*continued*)

Parameter Name	Description
dpi_sle_subscriber_nameattr	<p>Attribute that is used to identify a subscriber. This parameter instructs the SLE how to identify the subscriber. Usually subscribers are identified by their login name. You can also use the MAC address, primary user, NAS-Port ID, or interface name. The values for the parameter definition are:</p> <ul style="list-style-type: none"> <li>• loginname</li> <li>• primaryusername</li> <li>• macaddr</li> <li>• interfacename</li> <li>• nasportid</li> </ul>
dpi_sle_subscriber_ipv6supported	Specifies whether or not IPv6 is supported for the DPI service. Must currently be false because IPv6 is not supported on Ellacoya systems.
dpi_sle_connection_domainName	Name of the domain that contains the service bundles for this service. The Ellacoya software configures service bundles by domain. This parameter value should match the domain that is configured in the Ellacoya Service Creation Manager.
dpi_sle_connection_username	Name used for authentication with the SLE. It must match the username that is configured in the Ellacoya Service Creation Manager.
dpi_sle_connection_password	Password used for authentication with the SLE.
dpi_sle_accountingmgr_storesize	<p>Size limit of usage and accounting data that is stored. (A script services loads usage data from the SLE.) All script services in a virtual router share the same store.</p> <p>When the SAE requests usage data more slowly than the script service loads it from the SLE, the data accumulates in the store. When the store is filled, the script service suspends loading usage data from the SLE. However, as the SAE requests usage data, space in the store is freed, allowing the script service to resume loading data from the SLE.</p>

Table 7: Parameter Definitions for DPI Services (*continued*)

Parameter Name	Description
dpi_sle_activate_inoneshot	<p>The values for the parameter are true or false. The default value is true.</p> <p>If true, when a DPI script service is activated as an AOL subscription during subscriber login, the script service finds all AOL subscriptions and persistent sessions of the subscriber. The script service assumes that the SAE will activate all the subscriptions and sessions, and it starts an SLE subscriber session with a service offer that corresponds to the combination of the AOL subscriptions and persistent sessions.</p> <p>This optimization avoids repeatedly changing the subscriber's service offer while multiple AOL subscription or persistent sessions are activated one by one.</p> <p>Set this parameter to false if an AOL subscription or persistent session is not guaranteed to be activated during subscriber login; for example, an authorization plug-in or mutex group could prevent the activation of the services.</p>
dpi_sle_subscriber_prefix	<p>Set this parameter to match the subscriber prefix configured in the SLE. The DPI script service adds this prefix to subscriber IDs used in SLE subscriber sessions that the DPI script service starts.</p> <p>The default value is BBIP, which is also the default value used in the SLE. You can change the SLE subscriber prefix in the SubscriberPrefix field in the Accounting Service window of the SLE Configuration Console.</p>

#### Related Documentation

- SRC Script Services for DPI on page 54
- Service Activation and Deactivation in a DPI Environment on page 52
- Configuring Subscriptions to DPI Services on page 59
- Adding a Service Scope on page 54
- Creating a DPI Script Service on page 55

## Configuring a Virtual Router Object for DPI

You must create a virtual router object in the router to which the subscriber logs in, and attach the DPI service scope to the virtual router.

Each time a DPI script service is invoked by an activation, deactivation, or interim accounting request, the script service checks the service involved to see if the configuration in the service's parameter substitutions is different or newer than the parameters in the script service's configuration. If so, the script service instance updates its configuration according to the service. This functionality means you can change the configuration of the script service by updating the parameter substitutions in the service.



If you want to use the same DPI configuration throughout your network, make sure that all DPI script services have the same configuration. If you have several SLEs in your network that are responsible for the traffic coming from different sets of routers, you must ensure that the DPI script service gets the appropriate configuration on a per router basis. You can accomplish this by putting the script services into a scope and attaching the scope to the router for an SLE. Every service in the scope must have the same configuration so that the correct SLE handles all subscribers on routers that use the scope.

To attach a service scope to a virtual router configuration, configure the name of the DPI service scope for the DPI for the Scope field option of the virtual router configuration. See *SRC PE Network Guide*.

**Related  
Documentation**

- Integration of the SRC Software and the Ellacoya DPI Platform on page 48
- Subscriber Login and Logout in a DPI Environment on page 52
- Service Activation and Deactivation in a DPI Environment on page 52
- SRC Script Services for DPI on page 54
- Loading the Sample Data for the DPI on page 53

## Configuring Subscriptions to DPI Services

You need to configure subscriptions to the DPI services. You can set up the subscriptions to activate immediately on login.

**Related  
Documentation**

- Service Activation and Deactivation in a DPI Environment on page 52
- Subscriber Login and Logout in a DPI Environment on page 52
- SRC Script Services for DPI on page 54
- Configuring the Script Service on page 56
- Creating a DPI Script Service on page 55
- *SRC PE Subscribers and Subscriptions Guide*

## Configuring the Ellacoya DPI Platform for Integration

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To set up the SRC software to for the DPI solution, you need to perform the following tasks:

- Provisioning the IPSCS on page 59
- Configuring the SLE on page 60
- Synchronizing System Clocks on page 61

## Provisioning the IPSCS

For integration with the SRC software, the IPSCS must be provisioned in a specific way. All IPSCS service objects, including application signatures, service elements, TAPs, service bundles, and service offers, must be created.

Before you introduce a new service that will be implemented by a DPI script service, you must create the service bundle and service offers. Before you remove a service, you must deactivate all sessions for the service before removing the corresponding service offers and bundles from the IPSCS.

See “Integration of the SRC Software and the Ellacoya DPI Platform” on page 48.

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### Service Bundles

Enable usage collection on service bundles by checking Collect Start/Stop Usage Data and the Collect Transmit and Receive Byte Counts checkboxes in Service Creation Manager.

Every DPI script service must have a corresponding ISPCS service bundle. To match the service bundle with the script service, the service bundle must have the same name as the DPI script service, but be prefixed by SDX\_. For example, if the script service is called dpiService1, the service bundle must be called SDX\_dpiService1.

---

### Service Offers

Enable usage collection on service offers by checking the Enable Usage Collection checkbox in Service Creation Manager.

For every combination of implemented services that could be active at the same time, there must be a service offer with the name prefixed by “SDX\_” configured in the IPSCS. The service offer must contain the service bundles that correspond to the services.

When a script service activates or deactivates a service session, it checks the list of services that will be active after the activation or deactivation. The script service then searches for a service offer with the right set of service bundles. The script service keeps a local cache of all service offer names and which bundles they contain. If the cache does not contain a service offer with the right set of bundles, the script service reloads the service offers from the SLE. If necessary, the script service queries the SLE for all service offers in the configured domain. If the appropriate offer is not found after a reload, the service activation or deactivation fails with an exception.

---

### Traffic-Accounting Profiles

For every service bundle, there must be a TAP with the same name as the service bundle.

#### Related Documentation

- Overview of Application-Level Session Tracking and QoS Control on page 47
- Configuring the SLE on page 60
- Synchronizing System Clocks on page 61

## Configuring the SLE

In Service Creation Manager, configure the following:

1. Create passive authentication configuration, and enable subscriber learning.
2. Create a switch configuration, and apply the passive authentication configuration to the switch configuration.

3. Create a switch that corresponds to your e30 Switch, and apply the switch configuration \*to the switch.

You also need to enable accounting in the SLE. To do so, log in to the SLE Configuration Console console, and check the AccountingEnabled service attribute in the AccountingService window.

- Related Documentation**
- Provisioning the IPSCS on page 59
  - Integration of the SRC Software and the Ellacoya DPI Platform on page 48
  - Configuring a Virtual Router Object for DPI on page 58

## Synchronizing System Clocks

The system clock in the e30 Switch must keep synchronized with the SAE. Make sure that the system clock of the Ellacoya switch does not use daylight savings mode.

- Related Documentation**
- Provisioning the IPSCS on page 59
  - Integration of the SRC Software and the Ellacoya DPI Platform on page 48



## PART 4

# Controlling Volume Usage with the SRC VTA

- Overview of Controlling Volume Usage with the SRC VTA on page 65
- Installing and Initially Configuring the SRC VTA on page 81
- Configuring the SRC VTA with VTA Configuration Manager on page 105
- Managing Subscriber Accounts with VTA Portals on page 181
- Example of a Bucket VTA on page 195



## CHAPTER 5

# Overview of Controlling Volume Usage with the SRC VTA

- Overview of the SRC VTA on page 65
- SRC VTA Architecture and Connections to SRC Components on page 68
- How the SRC VTA Works on page 68
- SRC VTA Operation on page 73
- Managing VTA Accounts and Sessions on page 74
- Example: Limiting Subscriber Access Based on Account Balances on page 78

## Overview of the SRC VTA

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The SRC Volume-Tracking Application (SRC VTA) allows service providers to track and control the network usage of subscribers and services. You can control volume and time usage on a per-subscriber or per-service basis. This level of control means that service providers can offer tiered services that use volume as a metric, while also controlling abusive subscribers and applications.

When a subscriber or service exceeds bandwidth limits (or quotas), the SRC VTA can take actions, including directing the subscriber to a portal to activate additional services or purchase additional bandwidth, imposing rate limits on traffic, sending an e-mail notification, or charging extra for additional bandwidth consumed.

If you use the SRC VTA with the deep packet inspection (DPI) feature, you can control the volume of traffic for specific applications, such as peer-to-peer file sharing.

## Types of VTAs

SRC software releases earlier than Release 6.3.x supported two types of VTAs—quota and threshold. You can now configure the quota VTA to provide the same functionality as the threshold VTA. (See “Example of a Bucket VTA” on page 195.)

## Terminology

Table 8 on page 66 defines terms that are used in the SRC VTA documentation and sample data.

Table 8: SRC VTA Terms

Term	Definition
Behaving service	Service that a VTA activates for subscribers when the SRC VTA is not restricting their rates of data transfer.
Bought quota	Allowance of data volume that subscribers purchase and can transfer (upload or download) at any time.
Bought account	Record that details a subscriber's use of bought quota.
Bucket account	Account that is periodically measured and refilled depending on the usage of the account.
Misbehaving service	Service that a VTA activates for subscribers when the SRC VTA is restricting their rates of data transfer.
Periodic quota	Allowance of data volume that a service provider allocates to subscribers on a recurrent basis. Subscribers use this allowance to upload or download data.
Periodic account	Record that tracks a subscriber's use of periodic quota.
Quota service	Service for which a VTA monitors usage. The SRC VTA activates the service for subscribers when they have a positive balance in their VTA accounts, and deactivates the service when the VTA account has a negative balance.
VTA account	Record of credit and debit entries that track a subscriber's use of a particular network resource.
VTA session	Period of activity between a VTA subscriber and a VTA.

## VTA Service and Subscriber Accounts

A VTA account represents the resources available to a service or a subscriber. You can configure VTA accounts and then charge a particular service or subscriber's usage against the account. Each subscriber or service can have a different quota, or allowance of data volume.

You can set up the way the VTA charges accounts and how account balances are updated.

You can also configure actions in response to changes in account balances. Available actions include stopping a service, starting a service, updating an account balance, sending an e-mail, and running a script. For example, if account A is emptied, the action might be to stop services X and Y, and start service Z.

The SRC VTA requires a relational database to store information about accounts. The SRC VTA installation includes sample schemas and configurations for the MySQL and Oracle databases.



## VTA Sessions

The SRC VTA tracks subscriber activity through VTA sessions. A VTA session does not necessarily correspond to an individual subscriber session or service session. For example, a single service session can correspond to multiple VTA sessions if the service session covers multiple billing periods.

The SRC VTA not only can track the volume and time of a service session, it can track any state of a subscriber derived from SAE plug-in events and respond to the state change.

The SRC VTA requires a relational database to store information about sessions. The SRC VTA installation includes sample schemas and configurations for the MySQL and Oracle databases.

## Managing Subscriber Accounts with Portals

We provide two sample portals that manage subscriber accounts. One is an administrator portal that administrators can use to manage VTA subscriber accounts. The second is a subscriber portal that subscribers can use to manage their own accounts. Before you can use these portals, you need to configure the Web applications for the SRC VTA.

The suggested billing model for services managed by the SRC VTA is one in which subscribers pay for services when they select them through a Web portal.

## Volume-Based Services

The SRC VTA lets you set triggers at multiple levels to provide flexible and extensive volume-based services. For example:

- When the volume level reaches 300 MB, turn on the internet-256 service, turn off the internet-512 service, and send an e-mail to the subscriber.
- When the volume level reaches 100 MB, send an e-mail warning to the subscriber.
- When the volume level is 0 MB, turn on the continue-TCP-only service, turn off the internet-256 service, send an e-mail to the subscriber, and notify the accounting server.
- When the volume level is –100 MB, turn off the continue-TCP-only service, send an e-mail to subscriber, and notify the accounting server.

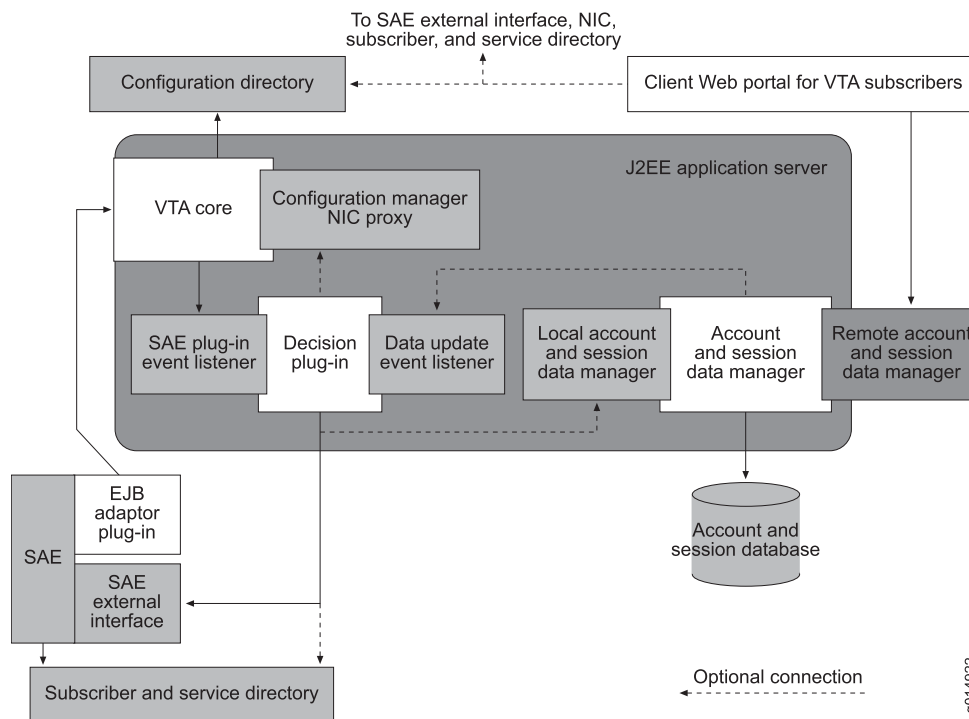
### **Related Documentation**

- How the SRC VTA Works on page 68
- SRC VTA Operation on page 73
- Before You Install the SRC VTA on page 81
- Accessing the Subscriber Portal on page 190
- Installing the SRC VTA and Running the Configuration Script on page 82
- SRC VTA Architecture and Connections to SRC Components on page 68

## SRC VTA Architecture and Connections to SRC Components

Figure 2 on page 68 shows the SRC VTA architecture and the position of a VTA in the SRC network.

**Figure 2: SRC VTA Architecture and Position in the SRC Network**



### Related Documentation

- Overview of the SRC VTA on page 65
- How the SRC VTA Works on page 68
- SRC VTA Operation on page 73
- Installing the SRC VTA and Running the Configuration Script on page 82

## How the SRC VTA Works

The SRC VTA manages subscriber accounts using a rule-driven event-processing system that can prioritize the actions taken for certain conditions. The SRC VTA is triggered by events, such as the logging in of subscribers, the use of network services, or the changing of account balances. These events can cause actions, such as updating account balances, starting or stopping network services, or running scripts to perform external actions.

A VTA processes external events based on its configuration. A VTA configuration is made up of:

- Event handlers

- Actions
- Processors

## Events

Each VTA event corresponds to one subscriber and contains some attributes. The SRC VTA supports the following types of events:

- Service- and subscriber-tracking events from the SAE; for example, start or stop tracking events.
- Account update events triggered by updating database accounts.
- Callback events triggered by a method call.

## Event Attributes

Each event carries attributes. Table 9 on page 69 describes the types of attributes that are available for each type of event.

**Table 9: Event Attributes**

Event Type	Available Attributes
Service and subscriber tracking events from the SAE	<ul style="list-style-type: none"> <li>• Plug-in attributes, such as PA_SERVICE_NAME or PA_LOGIN_NAME, associated with an SAE plug-in event. For a list of SAE plug-in events, see the SAE CORBA plug-in SPI online documentation on the Juniper Networks Web site at <a href="http://www.juniper.net/techpubs/software/management/sdx/api-index.html">http://www.juniper.net/techpubs/software/management/sdx/api-index.html</a> or in the SDK+AppSupport+Demos+Samples.tar.gz file on the Juniper Web site at <a href="https://www.juniper.net/support/csc/swdist-erx/src.html">https://www.juniper.net/support/csc/swdist-erx/src.html</a>.</li> <li>• currentTime attribute—Time since January 1, 1970 UTC when the SRC VTA receives the event. The value is the number of milliseconds in the range 0–9223372036854775807.</li> <li>• subscriberId—Defines how to calculate the subscriber ID based on attributes of a service or a subscriber-tracking event. The subscriberId event attribute is a result of the calculation. It identifies the subscriber of the corresponding VTA event.</li> </ul>

Table 9: Event Attributes (*continued*)

Event Type	Available Attributes
Account update events	<ul style="list-style-type: none"> <li>old_status_&lt;accountname&gt;—Returns the old status of the account.</li> <li>new_status_&lt;accountname&gt;—Returns the new status of the specified account.</li> <li>old_lastUpdateTime_&lt;accountname&gt;—Returns the old last update time of the account.</li> <li>new_lastUpdateTime_&lt;accountname&gt;—Returns the new last update time of the account.</li> <li>old_balance_&lt;accountname&gt;—Returns the old balance of the account.</li> <li>new_balance_&lt;accountname&gt;—Returns the new balance of the specified account</li> <li>The currentTime attribute, which is the time since January 1, 1970 UTC, when the SRC VTA receives the event. The value is the number of milliseconds in the range 0–9223372036854775807.</li> <li>subscriberId—Defines how to calculate the subscriber ID based on attributes of a service or a subscriber-tracking event. The subscriberId event attribute is a result of the calculation. It identifies the subscriber of the corresponding VTA event.</li> </ul>
Callback events	<ul style="list-style-type: none"> <li>callId—Includes all parameters provided with the callback.</li> <li>currentTime—Time since January 1, 1970 UTC, when the SRC VTA receives the event. The value is the number of milliseconds in the range 0–9223372036854775807.</li> <li>subscriberId—Defines how to calculate the subscriber ID based on attributes of a service or a subscriber-tracking event. The subscriberId event attribute is a result of the calculation. It identifies the subscriber of the corresponding VTA event.</li> </ul>

## Event Handlers

An event handler defines how the SRC VTA processes an event. VTA event handlers consist of:

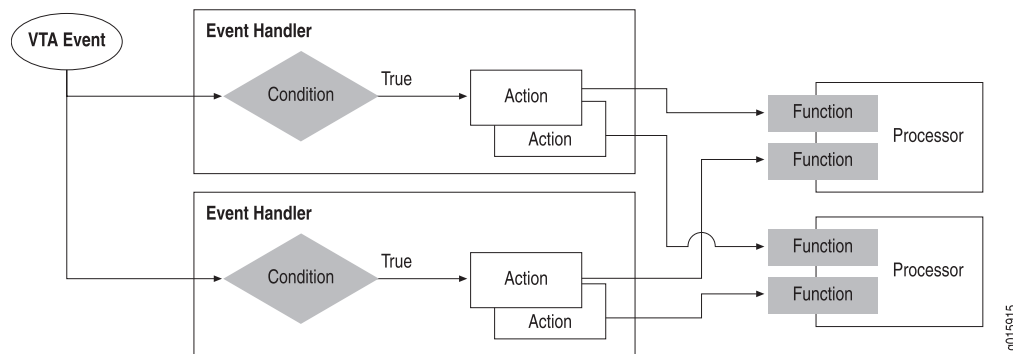
- Type of event—Tracking, update, or callback event; for example, a subscriber start-tracking event or a service start-tracking event.
- Priority—Priority at which event handlers are evaluated and executed. Event handlers are evaluated and executed from high to low priority.
- Condition—Condition that the event handler evaluates to determine whether the event handler should handle the event.
- Actions—List of actions to be performed by the event handler.

You can set up multiple event handlers to process events. For example, the first event handler could retrieve the balance for a quota account, and the next event handler could refill the quota account, depending on whether the condition of the second event handler is met.

Figure 3 on page 71 shows the event handler model. The SRC VTA processes an event as follows:

1. The event handler with the highest priority receives the event, determines whether the event's type is the same as the event type of the event handler, and determines whether the event satisfies the condition of the event handler.
2. If the condition is met, the SRC VTA performs the corresponding actions based on the event attributes. An action invokes a function and provides the parameters required by that function to the processor.
3. When an event handler finishes processing an event, the next applicable event handler according to the priority of the event handler processes the event.

Figure 3: VTA Event Handler Model



## Actions

You can specify actions that the SRC VTA takes in response to an event; for example, updating an account balance, starting a service, or stopping a service. The actions are performed if the event is of the specified type and matches the specified condition. An action is modeled as a call to a function.

An action can update event attributes or add new attributes to an event for subsequent processing of the same event by another event handler.

An action configuration includes:

- Function—Function that the action invokes
- Parameter—Parameters and corresponding values to be passed to the function

## Processors

Processors receive and process events. The SRC VTA has four processors:

- Database engine processor—Acts as a proxy to a database.
- Mail processor—Sends e-mail notifications when certain events occur.
- SAE proxy processor—Acts as a proxy to the SAE.
- Script runner processor—Runs external scripts or JavaScript programs.

## Database Engine Processor

The database engine processor is a proxy to a database. You can use the database engine processor to:

- Calculate the use of network resources for a service.
- Calculate the interim accounting interval for each service based on a subscriber's remaining resources and use of the service.
- Update VTA accounts with a JavaScript program.
- Terminate a VTA session. This feature is usually used at the end of a billing period so that you can finish collecting data for the current billing period and start a new VTA session for the new billing period.

## Mail Processor

You use the mail processor to set up the SRC VTA to send e-mail notifications to subscribers when certain events occur.

## SAE Proxy Processor

You can use the SAE proxy processor to:

- Set an interim interval for a service.
- Set a service session timeout for a subscription.
- Set a session timeout for a subscriber.
- Start a subscription to a service. You can specify the parameter substitutions to use when the service is started.
- Stop a subscription to a service. You can include a reason for the subscription's being stopped. When the service is stopped, the reason is sent to the billing system so it can differentiate between service stops.

The SAE proxy processor is a proxy to the SAE external interface that resolves the subscriber interface based on the event types to which functions are applied.

- If a function is applied to SAE subscriber-tracking or service-tracking events, the processor finds the SAE reference in the event message.

There is an exception if the `CurrentSubscriberOnly` parameter is set to false. In this case, the function finds subscribers in all SAEs with the NIC.

- If a function is applied to other events, the processor uses subscriber's ID in the event as the key for the NIC to find the SAE reference.

## Script Runner Processor

The Script runner processor can invoke external executable scripts or JavaScripts. We recommend using JavaScript, where possible, for better performance.

- External scripts are executable programs, such as shell scripts, that are available on the SRC VTA's host. Each external script can perform a task and return a value. If the script returns a value, the value can be added to the current event as an event attribute.
- JavaScript programs are used to process attributes of a VTA event. For example, it can convert a VTA event attribute in a timestamp to a date string and add it to the event as a new attribute. The attribute can then be used for subsequent actions, such as sending an e-mail notification to the subscriber. The JavaScript program can refer to any attributes of the event being processed, and it must return a value.

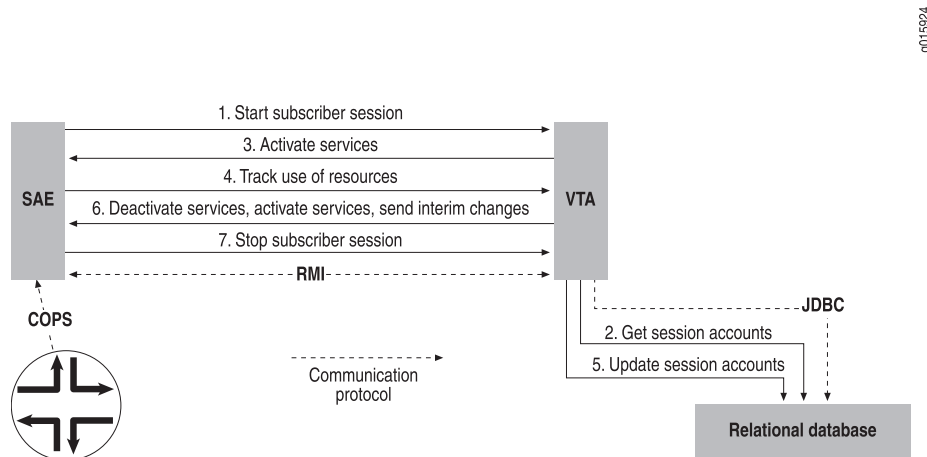
#### Related Documentation

- Overview of the SRC VTA on page 65
- SRC VTA Operation on page 73
- Installing the SRC VTA and Running the Configuration Script on page 82
- Configuring Events on page 156
- Configuring Event Handlers on page 158
- SRC VTA Architecture and Connections to SRC Components on page 68

## SRC VTA Operation

Figure 4 on page 73 illustrates the SRC VTA operation process.

Figure 4: Operation of the SRC VTA



The SRC VTA operates as follows:

1. When an event that activates a service occurs (for example, a subscriber logs in), the SAE sends a session start event to the SRC VTA through the SAE external plug-in interface.
2. Optionally, the SRC VTA queries a database for the subscriber's current set of sessions and accounts.
3. Depending on the configuration of the SRC VTA, it may activate or deactivate services based on the subscriber's use of resources.

4. The SRC VTA tracks the subscriber's use of resources for a period of time.
5. The SRC VTA updates sessions and account balances in the database.
6. The SRC VTA sends to the SAE changes in the interim accounting interval and takes action to limit excessive bandwidth use or to allow increased bandwidth use.
7. When an event that deactivates a service occurs (for example, the subscriber logs out), the SRC VTA updates the VTA session, closes the VTA session, and may update the account balances.

Events received through the remote interface can also cause the SRC VTA to activate services, deactivate services, or change the accounting interval.

**Related  
Documentation**

- Overview of the SRC VTA on page 65
- How the SRC VTA Works on page 68
- Installing the SRC VTA and Running the Configuration Script on page 82
- SRC VTA Architecture and Connections to SRC Components on page 68

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## Managing VTA Accounts and Sessions

The SRC VTA allows service providers to manage accounts and sessions by:

- Identifying Subscribers, SAEs, and Sessions on page 74
- Managing VTA Accounts and Sessions on page 75
- Using SRC VTA Keys to Manage Accounts and Sessions on page 75
- Managing Subscriber Sessions and Service Sessions on page 76
- Using SRC VTA Keys to Manage Subscriber and Server Sessions on page 77

### Identifying Subscribers, SAEs, and Sessions

The SRC VTA must be able to identify each subscriber by a unique identifier. The SRC VTA uses the identifier to manage:

- VTA accounts and sessions
- Subscriber and service sessions

You can configure the SRC VTA to use data keys to identify corresponding data values for these management tasks. The data keys depend on the subscriber's identifier and comprise one or more plug-in attributes.

Some identifiers are suitable for residential subscribers and some for enterprise subscribers. Because the SRC software supports only enterprise subscribers on routers running JUNOS Software, you cannot use some identifiers.

**Related  
Documentation**

- Overview of the SRC VTA on page 65
- Managing VTA Accounts and Sessions on page 75
- Managing Subscriber Sessions and Service Sessions on page 76



- Locating the SAE That Manages a Subscriber for the SRC VTA on page 101
- Configuring Identifiers for Subscribers and Sessions on page 163

## Managing VTA Accounts and Sessions

Depending on the information that identifies subscribers in your SRC configuration, you can configure the SRC VTA to use several types of plug-in attributes as data keys to identify accounts and sessions in the VTA database. If you use a NIC with the VTA portals, the SRC VTA can also use some of these plug-in attributes to construct a data key that the NIC can use to determine which SAE manages a subscriber. When the NIC identifies an SAE, the SRC VTA can also obtain a key to identify the subscriber session that the SAE is managing for the subscriber.

You configure the data keys that identify accounts and sessions in the SRC VTA Subscriber ID field. See “Configuring Identifiers for Subscribers and Sessions” on page 163.

### Related Documentation

- Overview of the SRC VTA on page 65
- Managing Subscriber Sessions and Service Sessions on page 76
- Configuring a Database to Store Account and Session Data on page 86
- Configuring the SRC VTA to Manage Database Accounts on page 113
- Using SRC VTA Keys to Manage Accounts and Sessions on page 75
- Example: Limiting Subscriber Access Based on Account Balances on page 78

## Using SRC VTA Keys to Manage Accounts and Sessions

Table 10 on page 76 shows the keys that you can specify for the SRC VTA to query the VTA database, NIC, and SAE. For the SRC VTA to use a subscriber identifier, the plug-in event must include the corresponding attribute(s) that are listed in the subscriber identifier row (attributes start with PA\_). For more information about plug-in attributes, see the documentation for the SAE CORBA plug-in on the Juniper Networks Web site at

<http://www.juniper.net/techpubs/software/management/src/api-index.html>

**Table 10: Keys That the SRC VTA Constructs to Manage Accounts and Sessions**

Subscriber's Identifier	Database Key	Corresponding NIC Key	Corresponding SAE Key
Accounting ID	PA_ACCOUNTING_ID	PA_ACCOUNTING_ID	IP address that is returned from the NIC lookup
Subscriber DN	PA_USER_DN	PA_USER_DN	PA_USER_DN
Interface alias	PA_INTERFACE_ALIAS	None	None
Interface alias & VR	PA_INTERFACE_ALIAS@PA_ROUTER_NAME	PA_ROUTER_NAME	None
Interface name & VR	PA_INTERFACE_NAME@PA_ROUTER_NAME	PA_ROUTER_NAME	PA_INTERFACE_NAME
Login name	PA_LOGIN_NAME	PA_LOGIN_NAME	PA_LOGIN_NAME (default)
MAC address	PA_USER_MAC_ADDRESS	None	None
PPP login name or public DHCP name	PA_PRIMARY_USER_NAME	None	PA_PRIMARY_USER_NAME
Port on router	PA_PORT_ID@PA_ROUTER_NAME	None	None

**Related Documentation**

- Overview of the SRC VTA on page 65
- Identifying Subscribers, SAEs, and Sessions on page 74
- Managing VTA Accounts and Sessions on page 75
- Configuring the SRC VTA to Manage Subscriber Accounts on page 117
- Using SRC VTA Keys to Manage Subscriber and Server Sessions on page 77

**Managing Subscriber Sessions and Service Sessions**

When the SRC VTA receives plug-in events, it may need to start or stop a subscriber session or service session. The plug-in events identify the SAE that manages a subscriber; however, the SRC VTA must construct a data key from one or more plug-in attributes to identify the subscriber session or service session. Depending on the information that identifies subscribers in your SRC configuration, you must configure the SRC VTA to use the keys shown in “Using SRC VTA Keys to Manage Subscriber and Server Sessions” on page 77. You configure these data keys in the SAE Subscriber Lookup field. See “Configuring Identifiers for Subscribers and Sessions” on page 163.

**Related Documentation**

- Overview of the SRC VTA on page 65
- Identifying Subscribers, SAEs, and Sessions on page 74
- Using SRC VTA Keys to Manage Accounts and Sessions on page 75
- Example: Limiting Subscriber Access Based on Account Balances on page 78

**Using SRC VTA Keys to Manage Subscriber and Server Sessions**

Depending on the information that identifies subscribers in your SRC configuration, you must configure the SRC VTA to use the keys shown in Table 11 on page 77.

**Table 11: Keys That the SRC VTA Constructs to Manage Subscriber and Service Sessions**

Subscriber's Identifier	SAE Key
DN	PA_USER_DN
Interface name on router	A combination of the following plug-in attributes: <ul style="list-style-type: none"> <li>• PA_INTERFACE_NAME</li> <li>• PA_ROUTER_NAME</li> </ul>
IP address	A combination of the following plug-in attributes: <ul style="list-style-type: none"> <li>• PA_USER_IP_ADDRESS</li> <li>• PA_EVENT_TIME</li> </ul>
IP address of the subscriber on an interface	A combination of the following plug-in attributes: <ul style="list-style-type: none"> <li>• PA_USER_IP_ADDRESS</li> <li>• PA_INTERFACE_NAME</li> <li>• PA_ROUTER_NAME</li> </ul>
Login name	PA_LOGIN_NAME
PPP login name or public DHCP name	PA_PRIMARY_USER_NAME

**Related Documentation**

- Overview of the SRC VTA on page 65
- Identifying Subscribers, SAEs, and Sessions on page 74
- Managing VTA Accounts and Sessions on page 75
- Configuring the SRC VTA to Manage Subscriber Accounts on page 117
- Using One VTA Account for Multiple Subscriber Sessions on page 165
- Using SRC VTA Keys to Manage Accounts and Sessions on page 75

## Example: Limiting Subscriber Access Based on Account Balances

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The sample data provides an example called Quota that limits a subscriber's access rate based on the balances of accounts that record the subscriber's use of network resources. Subscribers receive a quota of transfer (upload and download) volume in two ways:

- Periodic quota—Volume that is periodically added to a subscriber's account. For example, a subscriber may receive a 25-MB periodic quota each month. The periodic quota is tracked in the periodic account.
- Bought quota—Additional volume that a subscriber can purchase and use at any time. For example, a subscriber may purchase 25 MB of bought quota in January, and use the bought quota between January and March. Bought quota is tracked in a bought account.

As a subscriber consumes volume, the SRC VTA debits the accounts, using first the periodic quota and, if no periodic quota is available, the bought quota.

Subscribers managed by a VTA require a subscription to quota services—services for which a VTA monitors and manages usage. You must configure these subscriptions to be activated when the subscriber logs in. When a subscriber logs in to the SAE, the SAE tries to activate the quota services. However, if neither the periodic account nor the bought account has a positive balance, the SRC VTA deactivates the quota services, and the SAE applies to the subscriber either the default policy or another policy that implements a service with a lower bandwidth.

The units of the accounts depend on the formula that you define to determine the use of network resources. With this formula, the SRC VTA calculates the change to the accounts and the interim accounting interval.

The Quota configuration example provides a VTA that operates as follows:

1. When a service session for the quota service starts, the SAE sends a start event to the SRC VTA.
2. The SRC VTA starts a VTA session that has the same identifier as the service session and a qualifier of zero.
3. When the SRC VTA receives the first interim update from the SAE in a VTA session, it records a balance change that details the use of resources and the event time for the VTA session. When the SRC VTA receives interim updates in the VTA session, it updates the use of resources and the event time in the balance change recorded previously.
  - If the periodic account contains sufficient resources to cover the balance change, the SRC VTA changes only the balance of that account.
  - If the periodic account does not contain sufficient resources for the change, the SRC VTA records one balance change for the resources available in that account and records another balance change for the difference in the bought account. In this case, the SRC VTA records subsequent balance changes to the bought account.

- If neither account has sufficient resources, the SRC VTA deactivates the quota service.
- 4. If the SAE session ends, the VTA session ends. When a new service session starts, Steps 1 to 3 recur. However, a service session may last for several VTA sessions. In this case, the SAE and SRC VTA continue the process described in Step 3.
- 5. When an administrator replenishes the periodic quota, the SRC VTA ends the VTA session, finalizes all balance changes for the session, and records a credit to the periodic account.
- 6. When the subscriber buys additional volume, the SRC VTA ends the VTA session, finalizes all balance changes for the session, and records a credit to the bought account.
- 7. When the SRC VTA next receives an interim update event from the SAE, it starts a new VTA session. The SRC VTA obtains the start time for the VTA session from the SAE event, and records debits to the accounts as described in Step 3.

The SRC VTA always ends the VTA session when an administrator replenishes periodic quota or the subscriber buys volume. However, a service session may last for several billing periods. In this case, when the SRC VTA starts a new VTA session, it continues to assign the SAE session identifier to the VTA session and increments the qualifier by one. Keeping the VTA session within a billing period allows the SRC VTA to finalize balance changes.

**Related  
Documentation**

- Overview of the SRC VTA on page 65
- Identifying Subscribers, SAEs, and Sessions on page 74
- Managing VTA Accounts and Sessions on page 75
- Managing Subscriber Sessions and Service Sessions on page 76



## CHAPTER 6

# Installing and Initially Configuring the SRC VTA

- Before You Install the SRC VTA on page 81
- Installing the SRC VTA and Running the Configuration Script on page 82
- Using JavaScript Programs in VTA Configurations on page 85
- Additional SRC VTA Configuration Script Tasks on page 85
- Configuring a Database to Store Account and Session Data on page 86
- Configuring the J2EE Application Server on page 87
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- Example: Configuring the Oracle Database as the VTA Database on page 89
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- Specifying Tracking Plug-Ins for Enterprise Subscribers on JUNOS Routing Platforms on page 97
- Configuring the Event Queue on page 98
- Using NICs with the SRC VTA on page 101
- Renaming a VTA on page 103
- Modifying the VTA Renaming Rules on page 103

### Before You Install the SRC VTA

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Because VTAs rely on other components in the SRC network, you must complete several tasks before you install the SRC VTA software. After you install the software, you must also complete several configuration tasks before the application can function correctly.

Before you install and configure a VTA, you must:

1. Deploy a working SRC network.

To support the SRC VTA, you must install SAEs to manage the routers or other devices through which subscribers connect to the network. You must also install and configure the directory in which you will store the SRC data.

2. Install a J2EE application server on the host that supports the SRC VTA.

For information about installing JBoss (the J2EE application server provided with the SRC software), see “Installing Web Applications Inside JBoss” on page 7.



**NOTE:** If you are installing a J2EE application server other than JBoss, you need to remove the JBoss client libraries from the `opt/UMC/sae/lib/plugins/ejb` directory on every SAE and replace them with the relevant client libraries for the application server you are using.

3. On the host that supports the SRC VTA, install a relational database to store the data that the SRC VTA tracks.

#### Related Documentation

- Overview of the SRC VTA on page 65
- How the SRC VTA Works on page 68
- SRC VTA Operation on page 73
- Installing the SRC VTA and Running the Configuration Script on page 82
- SRC VTA Architecture and Connections to SRC Components on page 68

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## Installing the SRC VTA and Running the Configuration Script

For information about the SRC VTA software, see “SRC Application Library Software” on page 3.

To install each VTA:

1. On the UNIX host where you will install the VTA, log in as root.
2. (Optional) Install the SMCPython package. Copy the package to a directory such as `/tmp` and install it using the **pkgadd** tool.

```
pkgadd -d path to/SMCPython.pkg
```

The installation process is interactive. Step through the installation process by selecting the default prompts.

3. Install the VTA software package on hosts that support JBoss by copying the package to a directory such as `/tmp` and installing it using the **pkgadd** tool..

```
pkgadd -d path to/UMCvtacnf.pkg
```

The installation process is interactive. Step through the installation process by selecting the default prompts.



4. Run the VTA configuration script on each SRC VTA host. The script configures JBoss for the SRC VTA and loads sample data. To invoke the script, access the folder `/opt/UMC/conf/vta`, and run the **load** command.

```
cd /opt/UMC/conf/vta
./load
```

5. (Optional) During the last interaction of the load process, you are prompted to copy the JBoss 6.0.0 client libraries.

If you are using JBoss release 3.2.6 on the host, the client libraries are packed with the SAE and located in the `/opt/UMC/sae/lib/plugins/ejb` directory, and you do not need to complete the following tasks.

If you are using JBoss release 6.0.0, the JBoss client libraries need to be transferred to the system hosting the SAE. The system prompts you to copy the JBoss client libraries.

```
The JBoss 6.0.0 client libraries need to be transferred to the system,
hosting the SAE.
```

```
Do you want to copy the JBoss 6.0.0 client libraries? [y,n,?,q] y
```

Enter **y** to copy the client libraries.

6. (Optional) You are prompted to enter the SRC SAE host address.

```
SRC SAE host: [?,q] 10.10.10.10
```

Enter the IP address of the system hosting the SAE.

7. (Optional) You are prompted twice to enter the password in order to access the system hosting the SAE.

```
User, existing on system 10.10.10.10: [?,q] root
Password:
Password:
```

In this sample procedure, this would be the root password of the system 10.10.10.10.

8. (Optional) The system also advises you to manually change the ejb-adaptor plugin configuration for the SAE configuration.

```
You need to change the classpath in your SAE ejb-adaptor plugin
configuration
```

The classpath configuration can be modified only if you set the SRC CLI level to Expert by entering:

```
user@host# set cli level expert
```



**NOTE:** The required configuration change for this step depends on which release of SAE you are using.

- If you want to use the VTA with a release prior to SRC Release 4.1—for example release 4.0—you must manually enter the following classpath:

```
[edit]
user@host# edit shared sae group name configuration plug-ins name name
    ejb-adaptor
user@host# set classpath
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/concurrent.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ha-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jbossall-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-integration.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-interceptor-core.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-common-core.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-interceptors-api_1.1_spec.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-async-impl.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-interceptor-spi.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-async-spi.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-j2se.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-common-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-logging.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-context-spi.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-remoting-3.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-core-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-remoting.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6
    /jboss-ejb3-embedded-standalone.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-security-spi.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-ext-api-impl.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-serialization.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-ext-api.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jbosssx-as-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6
    /jboss-ejb3-proxy-clustered-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jbosssx-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-proxy-impl-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-system-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-proxy-spi-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jnp-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-security-client.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/log4j.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb3-singleton-proxy-impl.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/pluginejbadaptor.jar,
    file:///opt/UMC/sae/lib/plugins/ejb/jboss6/jboss-ejb-api_3.1_spec.jar
user@host# commit
```

- If you are using the VTA with SRC Release 4.1 or later, enter the following for the classpath configuration:

```
[edit]
user@host# edit shared sae group name configuration plug-ins name name
    ejb-adaptor
user@host# set classpath JBoss-AS-6.x
user@host# commit
```

9. On each host, restart JBoss and the SAE.
10. Configure the SRC VTA and associated components (see “Additional SRC VTA Configuration Script Tasks” on page 85 and “Running VTA Configuration Manager” on page 106 ).

**Related Documentation**

- Overview of the SRC VTA on page 65
- Before You Install the SRC VTA on page 81
- Configuring VTA Services and Policies on page 91
- Installing VTA Configuration Manager on page 106

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## Using JavaScript Programs in VTA Configurations

You can use JavaScript programs in your VTA configuration for such tasks as calculating a usage metric or an interim accounting interval, specifying an event condition, updating event attributes in processors, and writing scripts to update accounts.

You can include referenced variables in a JavaScript program, such as plug-in attributes, event attributes, or account balances.

When a variable is referenced or updated in the JavaScript program, enclose it in angle brackets (<>) so that the JavaScript program retrieves only the necessary information. Within the JavaScript program, only one instance of the referenced variable must be enclosed in angle brackets.

You define formulas in the JavaScript scripting language (see <http://wp.netscape.com/eng/mozilla/3.0/handbook/javascript/index.html>). The Quota VTA executes the script in the Rhino JavaScript implementation (see <http://www.mozilla.org/rhino>).

**Related Documentation**

- How the SRC VTA Works on page 68
- Configuring JavaScript Programs on page 145
- Configuring VTA Actions to Run Scripts on page 152
- Loading and Importing VTA Configurations on page 107
- Installing the SRC VTA and Running the Configuration Script on page 82

---

## Additional SRC VTA Configuration Script Tasks

The VTA configuration script configures the components that it finds and accesses on each host. However, depending on your configuration and the components you use, such as the type of database and J2EE application server, you may need to manually configure some of the components or the configuration. The following topics describe the configuration procedures related to the SRC VTA; each topic explains which procedures the VTA configuration script completes. Topics include:

- Configuring a Database to Store Account and Session Data on page 86
- Configuring the J2EE Application Server on page 87
- Configuring VTA Services and Policies on page 91
- Configuring Subscribers and Subscriptions to VTA Services on page 91
- Accessing the J2EE Application Server's Client Libraries on page 92
- Specifying How the SRC VTA Loads Configurations from the Directory on page 93
- Configuring the SAE to Send Tracking Events to the SRC VTA on page 94
- Specifying Tracking Plug-Ins for Enterprise Subscribers on JUNOS Routing Platforms on page 97

**Related Documentation**

- Overview of the SRC VTA on page 65
- How the SRC VTA Works on page 68
- Installing the SRC VTA and Running the Configuration Script on page 82
- Configuring Scripts That Update Accounts on page 116

---

## Configuring a Database to Store Account and Session Data

The SRC VTA requires a relational database to store accounts and session data. For information about databases that we have tested for use with the SRC VTA, see the *SRC Application Library Release Notes*.

To configure a database:

1. For each VTA, create a database that uses the schema for the SRC VTA.

To view the database schemas, see the following files, which are created when you install the Solaris package for the SRC VTA.

- `/opt/UMC/conf/vta/quota/vtadata.sql`
- `/opt/UMC/conf/vta/bucket/vtadata.sql`
- `/opt/UMC/conf/vta/quota/vtadata_oracle.sql`
- `/opt/UMC/conf/vta/bucket/vtadata_oracle.sql`

2. Configure access to the database for an administrator by using the SRC VTA to monitor and manage subscribers.

The access parameters that you configure must match the access parameters that you configure for the data sources created in the J2EE application server (see “Configuring the J2EE Application Server” on page 87).

**Related Documentation**

- Overview of the SRC VTA on page 65
- Managing VTA Accounts and Sessions on page 75

- Configuring the SRC VTA to Manage Database Accounts on page 113
- Troubleshooting Database Deadlocks on page 90
- Using SRC VTA Keys to Manage Accounts and Sessions on page 75
- Deleting Information from the VTA's Database on page 188

## Configuring the J2EE Application Server

Before configuring the J2EE application server, install the JDBC driver that allows your database to connect to the J2EE application server, and restart the J2EE application server. See the documentation for the database to determine the required JDBC driver. For example, for JBoss, copy the driver to */opt/UMC/jboss/server/default/lib*.



**NOTE:** If you use JBoss, the VTA configuration script configures the J2EE application server, and you do not need to complete these tasks.

To configure the J2EE application server to support the SRC VTA:

1. For each VTA, create a data source with a Java Naming and Directory Interface (JNDI) name that matches the name of the data source (see Table 12 on page 88 for the default names).

The load script copies default data-source deployment descriptors. These descriptors are appropriate for an environment in which you use JBoss with the MySQL database and have both of these applications running on the same host. The descriptor files begin with *mysql-*. For more information about these files, see the documentation for the version of JBoss included with the SRC software.

To modify the names of the VTA deployment descriptors, see “Creating Deployment Descriptors” on page 88.

2. Set up a Java Message Service (JMS) connection factory, and link it to the resource environment reference *jms/QueueConnectionFactory*.

The way you link the JMS connection factory to the resource environment reference depends on the J2EE application server. See the documentation for the J2EE application.

3. For each VTA, create a JMS queue for the *ConnectionFactory* class with the appropriate name for the SRC VTA (see Table 12 on page 88).
4. Create a role called VTA-Admin, and configure the administrator profiles so that administrators can access the VTA administration portal with this role.
5. Specify an authentication mechanism, and access parameters (such as a username and password) by which administrators can access the data source through the portals.

The access parameters that you configure must match the access parameters that you configure for the database (see “Configuring a Database to Store Account and Session Data” on page 86).

**Table 12: Names for Data Sources and JMS Queues**

Type of VTA	Default Name for Data Sources	Name for JMS Queue
Quota	Quota/MySQLS	queue/Quota/SAEEventQueue
Bucket	Bucket/MySQLS	queue/Bucket/SAEEventQueue

**Related Documentation**

- Accessing the J2EE Application Server’s Client Libraries on page 92
- SRC VTA Architecture and Connections to SRC Components on page 68
- Using SRC VTA Keys to Manage Subscriber and Server Sessions on page 77

## Creating Deployment Descriptors

The enterprise archives (EAR files) for a VTA contain several modules that require deployment descriptors for the J2EE application server. In these EAR files are sample deployment descriptors for several J2EE application servers. See the *Release Notes* for information about the J2EE servers that we have tested with the SRC VTA.

To determine the names of the files that contain the descriptors and how to edit them, see the documentation for your J2EE application server.

To deploy the SRC VTA in a J2EE application server that we have not tested, you may need to develop your own deployment descriptors. In this case, you may be able to use the samples we provide as a guide.

To create a deployment descriptor:

1. Create a folder for the VTA on a host.

```
mkdir vta
```

2. Copy the EAR file for the VTA from the archive file to the folder that you created in Step 1.
3. From the EAR file, extract the following files into the folder you created:

- *vtacore.jar*
- *datamgr.jar*
- *quotadp.jar*

For example:

```
cd vta  
jar xvf quotavta.ear datamgr.jar
```

4. For each JAR file you extracted, extract the file that defines the deployment descriptors for the J2EE application server. For example, for JBoss:

```
jar xvf datamgr.jar META-INF/jboss.xml
```

5. Edit the file that defines the deployment descriptors for the J2EE application server.
6. Replace in the JAR file the file that defines the deployment descriptors for the J2EE application server. For example:

```
jar uvf datamgr.jar META-INF/jboss.xml
```

7. Replace the JAR file in the EAR file. For example:

```
jar uvf quotavta.ear datamgr.jar
```

#### Related Documentation

- How the SRC VTA Works on page 68
- SRC VTA Operation on page 73
- Configuring the J2EE Application Server on page 87
- Accessing the J2EE Application Server's Client Libraries on page 92

## Example: Configuring the Oracle Database as the VTA Database

To connect VTA with an Oracle database:

1. For each VTA, create a database that uses the schema for the SRC VTA.

To view the database schemas, see the following files, which are created when you install the Solaris package for the SRC VTA.

- */opt/UMC/conf/vta/quota/vtadata\_oracle.sql*
- */opt/UMC/conf/vta/bucket/vtadata\_oracle.sql*

2. Install the JDBC driver that allows your database to connect to the J2EE application server. For example, for JBoss, copy the driver to */opt/UMC/jboss/server/default/lib*.

3. Modify the Oracle data source configuration file with the access parameters (connection-url, user-name and password) and copy it to */opt/UMC/jboss/server/default/deploy*.

- For quota VTA—*quota/oracle-quotavta-ds.xml*
- For bucket VTA—*bucket/oracle-bucketvta-ds.xml*

4. Change the data source name and mapping in the EAR file for the VTA (*quotavta.ear* or *bucketvta.ear*).

- a. Extract *datamgr.jar* from the EAR file.

For example:

```
jar xvf quotavta.ear datamgr.jar
```

- b. Extract *META-INF/jbosscmp-jdbc.xml* from *datamgr.jar*.

```
jar xvf datamgr.jar META-INF/jbosscmp-jdbc.xml
```

- c. In the *jbosscmp-jdbc.xml* file, change the data source name in the `<jbosscmp-jdbc><defaults></defaults></jbosscmp-jdbc>` XML element.

- For quota VTA—`java:/Quota/OracleDS`
- For bucket VTA—`java:/Bucket/OracleDS`

- d. In the *jbosscmp-jdbc.xml* file, change the data source mapping in the `<jbosscmp-jdbc><defaults></defaults></jbosscmp-jdbc>` XML element.

- For Oracle8—Oracle 8
- For Oracle 9i or higher—Oracle9i

- e. Replace *META-INF/jbosscmp-jdbc.xml* in *datamgr.jar*.

```
jar uvf datamgr.jar META-INF/jbosscmp-jdbc.xml
```

- f. Replace *datamgr.jar* in the EAR file.

For example:

```
jar uvf quotavta.ear datamgr.jar
```

**Related Documentation**

- [Configuring a Database to Store Account and Session Data on page 86](#)
- [Configuring the SRC VTA to Manage Database Accounts on page 113](#)

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## Troubleshooting Database Deadlocks

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**Problem** The JBoss application server logs the following error when the database reports a deadlock—a condition in which the database operation cannot continue because two processes are both waiting for the other process to be completed before they proceed.

```
java.sql.SQLException: General error, message from server: "Deadlock found when trying to get lock; Try restarting transaction"
```

**Solution** Deadlocks can occur for a variety of reasons in normal database operation. The SRC VTA resolves deadlocks in the database, and you should ignore this message.

**Related Documentation**

- [Installing Web Applications Inside JBoss on page 7](#)
- [Configuring a Database to Store Account and Session Data on page 86](#)
- [Configuring the SRC VTA to Manage Database Accounts on page 113](#)
- [Deleting Information from the VTA's Database on page 188](#)



## Configuring VTA Services and Policies

---

You do not need to complete the tasks in this topic if you used the VTA configuration script to load the sample data. The sample data includes services for the SRC VTA and policies for the services, and it configures the services to generate tracking events.

Only the SRC VTA should activate and deactivate services that the SRC VTA controls, and you must ensure that these services are not visible on a portal for subscribers to control manually. You can use other services with a VTA if you design the policies and priorities for those services to work together.

For example, if you manage subscribers with a VTA, you can allow subscribers to manually activate a service that overrides the quota service, and consequently prevents charges in the periodic and bought accounts. You would account for use of this service through RADIUS rather than a VTA, and subscribers would incur an extra cost for using the service. In this case, you configure the overriding service with a higher precedence than the quota service.

To configure services for the SRC VTA:

1. Create services for which a VTA monitors and manages usage.
2. Configure policies that specify ingress and egress accounting rules consistent with the usage formula.

For information about configuring accounting rules for a policy, see Policy Management Overview.

### Related Documentation

- How the SRC VTA Works on page 68
- Managing Subscriber Sessions and Service Sessions on page 76
- Configuring Subscribers and Subscriptions to VTA Services on page 91
- Installing the SRC VTA and Running the Configuration Script on page 82

## Configuring Subscribers and Subscriptions to VTA Services

---

You need to add retailers and subscribers to the directory. If you are using the SRC VTA for testing or demonstration purposes, you can use the retailers and subscribers that are provided in the sample data. (For information about loading sample data, see “Installing the SRC VTA and Running the Configuration Script” on page 82.) If you do not load the sample data, you need to create at least one shared subscriber.

To configure subscribers to VTA services:

1. Add a retailer and at least one shared subscriber.  
See Adding Retailers (SRC CLI).
2. For all subscribers managed by the SRC VTA, create an individual or a group subscription to services for which a VTA monitors and manages usage.

See Configuring Subscriptions (SRC CLI).

3. For the service, configure the subscriptions to automatically activate the service when the subscribers log in.

**Related  
Documentation**

- Overview of the SRC VTA on page 65
- Automatic Login of Subscribers on page 182
- Locating the SAE That Manages a Subscriber for the SRC VTA on page 101
- Configuring VTA Services and Policies on page 91
- Configuring the SRC VTA to Manage Subscriber Accounts on page 117
- Accessing the Subscriber Portal on page 190

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## Accessing the J2EE Application Server's Client Libraries

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If you are using JBoss release 3.2.6 on the host, the client libraries are packed with the SAE and located in the `/opt/UMC/sae/lib/plugins/ejb` directory, and you do not need to complete the following tasks.

If you are using JBoss release 6.0.0, the JBoss client libraries need to be transferred to the system hosting the SAE. When you run the load configuration script, the system prompts you to copy the JBoss client libraries. Enter the IP address of the system hosting the SAE. The load script also prompts you to change the classpath in your SAE ejb-adaptor plugin configuration. The proper change to the classpath depends on which release of the SRC software you are using. If you are using the VTA with an SRC release prior to 4.1, you need to manually enter the changes for the classpath.



**NOTE:** For details on the proper classpath changes, see “Installing the SRC VTA and Running the Configuration Script” on page 82.

---

If you are using an application server other than JBoss, you need to remove the JBoss client libraries from this directory, and replace them with the relevant client libraries for the application server you are using by completing the following tasks on every SAE.

Each SAE that interacts with the SRC VTA requires access to the J2EE application server's client libraries. To provide this access:

1. Refer to the documentation for the J2EE application server to determine the locations and names of the files for the client libraries.

When you install the SAE, the files for the JBoss client libraries are placed in the folder `/opt/UMC/sae/lib/plugins/ejb`.

2. Delete the JBoss client libraries from the `/opt/UMC/sae/lib/plugins/ejb` directory.
3. Copy the files for the application server client libraries to the `/opt/UMC/sae/lib/plugins/ejb` directory on each host that supports an SAE.

4. Using the **shared sae group name configuration plug-ins name ejb-adaptor** statement, set **classpath** option with the correct filename for the new libraries.
5. Restart the SAE on each host to which you copied the client libraries.

**Related  
Documentation**

- Using JavaScript Programs in VTA Configurations on page 85
- Configuring the J2EE Application Server on page 87
- Configuring JavaScript Programs on page 145
- Specifying How the SRC VTA Loads Configurations from the Directory on page 93
- Loading a Configuration from a Directory on page 108

## Specifying How the SRC VTA Loads Configurations from the Directory

Bootstrap properties specify how the SRC VTA loads configurations from the directory. If you install the directory on a different host than the J2EE application server, you must modify the bootstrap properties to specify the directory host.

To configure the bootstrap properties for each VTA:

1. Create a folder for the VTA on a host.

```
mkdir vta
```

2. Copy the EAR file for the VTA from the archive file to the folder that you created in Step 1.

3. From the EAR file, extract the file *vtacore.jar* into the folder you created.

```
cd vta
jar xvf quotavta.ear vtacore.jar
```

4. From the file *vtacore.jar*, extract the file *META-INF/ejb-jar.xml*.

```
jar xvf vtacore.jar META-INF/ejb-jar.xml
```

5. In the folder that you created in Step 1, edit the *META-INF/ejb-jar.xml* file.

See “Properties in *ejb-jar.xml* file” on page 94 for information about the properties in this file.

6. Replace the file *META-INF/ejb-jar.xml* in the file *vtacore.jar*.

```
jar uvf vtacore.jar META-INF/ejb-jar.xml
```

7. Replace the file *vtacore.jar* in the EAR file.

```
jar uvf quotavta.ear vtacore.jar
```

**Related  
Documentation**

- Loading and Importing VTA Configurations on page 107
- Loading a Configuration from a Directory on page 108

- Importing a VTA Configuration from a Local File on page 111
- Committing a VTA Configuration to a Directory on page 177
- Exporting a VTA Configuration to a Local File on page 178

## Properties in ejb-jar.xml file

This topic describes the properties in the ejb-jar.xml file.

*Config.java.naming.provider.url*, *Config.java.naming.security.principal*, *Config.java.naming.security.credentials*, *Config.java.naming.security.protocol*

- Standard JNDI properties.
- Value—See Configuring Initial Directory Eventing Properties for SRC Components.

*Config.net.juniper.smgmt.lib.config.staticConfigDN*

- Root of the static configuration properties for the SRC VTA.
- Value—DN
- Default—*/=VTA, ou=staticConfiguration, ou=Configuration, o=Management, o=umc*

*Config.net.juniper.smgmt.lib.config.dynamicConfigDN*

- Root of the dynamic configuration properties for the SRC VTA.
- Value—DN
- Default—*ou=dynamicConfiguration, ou=Configuration, o=Management, o=umc*

*Config.net.juniper.smgmt.des.<propertySuffix>*

- Defines how the SRC VTA monitors values that it reads from the directory.
- Value—See Configuring Initial Directory Eventing Properties for SRC Components.

*vta.namespace*

- Root namespace of the SRC VTA.
- Value—Path, relative to the root of the static configuration properties, that defines where the VTA's configuration is stored
- Example—*/Applications/Quota*

---

## Configuring the SAE to Send Tracking Events to the SRC VTA

The SRC VTA communicates with the SAE through the Enterprise JavaBean (EJB) adapter plug-in. This plug-in is an SAE plug-in and performs the following functions:

- Filters SAE plug-in events for the SRC VTA.
- Adapts internal SAE events to EJB-compatible methods.

- Sends SAE tracking plug-in events to the SRC VTA.

To configure the EJB adapter plug-in:

1. From configuration mode, access the EJB adapter plug-in configuration. In this sample procedure, the EJB adapter plug-in called QuotaVTA is configured in the nw-area SAE group.

```
user@host# edit shared sae group nw-area configuration plug-ins name QuotaVTA
ejb-adaptor
```

2. Configure the class name of the J2EE application server's JNDI service provider.

```
[edit shared sae group nw-area configuration plug-ins name QuotaVTA ejb-adaptor]
user@host# set jndi-service-provider jndi-service-provider
```

3. Configure the URL of J2EE application server that is running JNDI service.

```
[edit shared sae group nw-area configuration plug-ins name QuotaVTA ejb-adaptor]
user@host# set application-server-url application-server-url
```

4. Configure the JNDI name of the SAEEventListener EJB of the peer VTA.

```
[edit shared sae group nw-area configuration plug-ins name QuotaVTA ejb-adaptor]
user@host# set jndi-sae-event-listener jndi-sae-event-listener
```

5. (Optional) Configure the LDAP filter that determines the subscriber and service events that the EJB adapter plug-in sends to the VTA. If you specify plug-in attributes in this field, you must include the same attributes in the attributes option.

```
[edit shared sae group nw-area configuration plug-ins name QuotaVTA ejb-adaptor]
user@host# set event-admitter event-admitter
```

Table 13 on page 95 lists the values that you can use for LDAP filter strings.

**Table 13: Settings for Filter Strings**

Filter String	Action
()	Matches no objects
(*)	Matches all objects

Table 13: Settings for Filter Strings (*continued*)

Filter String	Action
List of <attribute>= <value> pairs  <attribute>—Name of a property or attribute <ldapAttributeName>  <value>—One of the following: <ul style="list-style-type: none"> <li>• * (asterisk)</li> <li>• Explicit string</li> <li>• String that contains an *</li> </ul> <b>Note:</b> To define a special character (*, &, !,  , \) in a string, precede it with the backslash symbol (\).	<ul style="list-style-type: none"> <li>• If &lt;value&gt; is *, checks for any value.</li> <li>• If &lt;value&gt; is an explicit string, checks whether any value of the property matches the string, regardless of case.</li> <li>• If &lt;value&gt; is a string that contains a *, checks whether any value of the property contains the string, regardless of case.</li> </ul>
(&<filter><filter>...)	True if all filters match
( <filter><filter>...)	True if at least one filter matches
(!<filter>)	True if the filter does not match

The variables in the filter include the names of plug-in attributes and a PluginEventType variable. The value of this variable is the name of the type of event, such as PE\_START\_SERVICE. For names of plug-in attributes and plug-in event types, see the SAE CORBA plug-in documentation on the Juniper Networks Web site at <http://www.juniper.net/techpubs/software/management/src/api-index.html> or in the SDK+AppSupport+Demos+Samples.tar.gz file on the Juniper Web site at <https://www.juniper.net/support/csc/swdist-erx/src.html>.

6. (Optional) Specifies whether or not the J2EE application server uses load balancing to determine the location that manages requests to the VTA.

```
[edit shared sae group nw-area configuration plug-ins name QuotaVTA ejb-adaptor]
user@host# set use-ejb-cluster
```

7. Configure load-balancing scheme of the J2EE application server that hosts the VTA. See the documentation for the J2EE application server to determine which load-balancing scheme it supports.

```
[edit shared sae group nw-area configuration plug-ins name QuotaVTA ejb-adaptor]
user@host# set ejb-clustering-strategy (EJBOjectClustering | EJBHomeClustering |
JNDIClustering)
```

8. (Optional) Configure the plug-in attributes that the EJB adapter plug-in sends to the VTA listener. If you do not define a list of attributes, the EJB adapter plug-in sends all plug-in attributes to the VTA. Sending unnecessary plug-in attributes can adversely affect the performance of SRC components.

```
[edit shared sae group nw-area configuration plug-ins name QuotaVTA ejb-adaptor]
user@host# set attributes [(host | router-name | interface-name | ...)...]

```

Specify at least the following plug-in attributes: router-name, session-id, login-name, user-ip-address, ssp-host, domain, service-name, event-time, session-time, in-octets, out-octets, in-packets, out-packets, session-timeout, downstream-bandwidth, upstream-bandwidth, service-session-name, subscription-name. You may need to add attributes if you use them for the event admitter.

**Related Documentation**

- How the SRC VTA Works on page 68
- Configuring the SAE Proxy Processor on page 138
- Configuring Actions for the SAE Proxy Processor on page 139
- Configuring the J2EE Application Server on page 87
- Specifying Tracking Plug-Ins for Enterprise Subscribers on JUNOS Routing Platforms on page 97

## Specifying Tracking Plug-Ins for Enterprise Subscribers on JUNOS Routing Platforms

When user-tracking plug-ins are attached to the retailer on routers running JUNOS Software, login names are needed to trigger the user-tracking plug-in and generate user-tracking events. Because enterprise subscribers do not have a login name, the SRC VTA cannot get the required user-tracking events.

To allow enterprise subscribers on routers running JUNOS Software to use retailer-attached user-tracking plug-ins, configure the EJB adapter plug-in to filter SAE plug-in events for the SRC VTA and send SAE tracking events to the SRC VTA.

To use the EJB adapter plug-in to send events for a specific retailer:

1. Configure the event admitter of the EJB adapter plug-in (see “Configuring the SAE to Send Tracking Events to the SRC VTA” on page 94).

Specify the PA\_USER\_DN event attribute with the retailer’s relative distinguished name (RDN). For example, the following event admitter matches events from subscribers in the SP-Quota retailer:

```
PA_USER_DN=*SP-Quota*
```

2. Configure the EJB adapter plug-in as the global subscriber-tracking plug-in for the SAE. See Configuring Tracking Plug-Ins (SRC CLI).

In the sample procedure, the EJB adapter plug-in called QuotaVTA is configured as the subscriber-tracking plug-in in the nw-area SAE group.

```
[edit shared sae group nw-area configuration plug-ins event-publishers]
user@host# set subscriber-tracking QuotaVTA
```

**Related Documentation**

- Types of Internal Plug-Ins
- Properties in ejb-jar.xml file on page 94
- Configuring Administrative Information for Enterprise Subscribers (SRC CLI)

## Configuring the Event Queue

---

You can configure event queues that hold plug-in events from the SAE until the VTA processes them.

- Setting the Size of the Event Queue on page 98
- Calculating the Size of the Nonpersistent Event Queue on page 98
- Specifying the Type of Event Queue on page 99
- Configuring the Maximum Size of the Event Queue on page 100

### Setting the Size of the Event Queue

The VTA has an event queue that holds plug-in events from the SAE until the VTA processes them. There are two types of event queues:

- With a persistent event queue, no events are lost even if the VTA or the J2EE application server fails and is restarted. If you are using a persistent event queue, set the size of the VTA event queue to about the number of events your VTA can process in 60 seconds.
- With a nonpersistent (in memory) event queue, events can be lost if the VTA or the J2EE application server fails. However, for performance reasons you may want to configure a nonpersistent event queue. By default, the queues are configured as persistent event queues. If you want to configure nonpersistent event queues, you need to edit the `/opt/UMC/jboss/server/all/deploy/hornetq/hornetq-configuration.xml` file and add the `<persistence-enabled>false</persistence-enabled>` statement.

If you configure a nonpersistent event queue, the event queue size is the maximum number of events that can be lost if the application server or the VTA fails. If the SAE sends events faster than the VTA can process them, the event queue fills, and the VTA signals the SAE to stop sending events for 60 seconds. Your VTA instances should be deployed on a host or cluster with sufficient throughput to handle events above the average rate generated by the SAEs in normal operation. This way, the event queue is sufficient to buffer peak event generation rates.

#### Related Documentation

- Calculating the Size of the Nonpersistent Event Queue on page 98
- Specifying the Type of Event Queue on page 99
- Configuring the Maximum Size of the Event Queue on page 100
- Configuring Events on page 156

### Calculating the Size of the Nonpersistent Event Queue

If communication between the SAE and VTA is lost for an extended period, a large backlog of events can build up in the SAE fail queue. This backlog can result in the SAE sending events far in excess of the average rate for an extended period. Note, however, that smaller event queue sizes affect recovery time if the connection between the SAE and the VTA is disrupted. When the VTA event queue fills, the VTA signals the SAE to stop sending events, and the SAE does not send any events for 60 seconds. If the VTA event



queue is limited to less than the number of events the VTA can process in 60 seconds, it will empty the queue and be idle until the SAE starts sending it events again.

For example, if you set the VTA event queue size to the number of events the VTA can process in 30 seconds, after an SAE-VTA communication disruption the SAE rapidly sends events that it has stored in its local fail queue. After the VTA has collected the events that take it 30 seconds to process, it signals the SAE to stop sending events, and the SAE stops for 60 seconds. The VTA will complete processing the events in its queue in 30 seconds and then will be idle for 30 further seconds before the SAE starts to send events again. In this example, the VTA could clear the backlog of events in the SAE's fail queue twice as fast if the VTA's event queue was large enough to hold the number of events it can process in 60 seconds. To configure the maximum size of the event queue (*max-size-byte*), you need to take the number of events the VTA can process in your chosen interval and multiply it by the average size of the plug-in attributes sent to the queues. As a rough estimate, you can use 1024 bytes for twenty plug-in attributes sent to the queue.

Contact the Juniper Technical Assistance Center or Juniper Professional Services if you need further advice about sizing the VTA event queue.

#### Related Documentation

- Setting the Size of the Event Queue on page 98
- Specifying the Type of Event Queue on page 99
- Configuring the Maximum Size of the Event Queue on page 100
- Configuring Events on page 156

## Specifying the Type of Event Queue

To specify whether the event queue is persistent or nonpersistent:

1. Create a folder for the VTA on a host.

```
mkdir vta
```

2. Copy the EAR file for the VTA from the archive file to the folder that you created in Step 1.

3. From the EAR file, extract the file *vtacore.jar* into the folder you created.

```
cd vta
jar xvf quotavta.ear vtacore.jar
```

4. From the file *vtacore.jar*, extract the file *META-INF/ejb-jar.xml*.

```
jar xvf vtacore.jar META-INF/ejb-jar.xml
```

5. In the folder that you created in Step 1, edit the *META-INF/ejb-jar.xml* file.

See “Disabling Persistent Event Queues” on page 100 for information about the property that specifies the type of event queue.

6. Replace the file *META-INF/ejb-jar.xml* in the file *vtacore.jar*.

```
jar uvf vtacore.jar META-INF/ejb-jar.xml
```

7. Replace the file *vtacore.jar* in the EAR file.

```
jar uvf quotavta.ear vtacore.jar
```

**Related Documentation**

- Setting the Size of the Event Queue on page 98
- Calculating the Size of the Nonpersistent Event Queue on page 98
- Configuring the Maximum Size of the Event Queue on page 100
- Configuring Events on page 156

### Disabling Persistent Event Queues

---

This topic describes how to disable persistent event queues. If you want to configure nonpersistent event queues, you need to edit the `/opt/UMC/jboss/server/all/deploy/hornetq/hornetq-configuration.xml` file and add the `<persistence-enabled>>false</persistence-enabled>` statement.

**PersistentQueue**

- Type of queue—persistent or nonpersistent.
- Value—true or false
- Default—true (or line missing in the XML file)

### Configuring the Maximum Size of the Event Queue

To configure the maximum size of the VTA event queue for JBoss, edit the `max-size-byte` attribute in the `address-setting` node in the `/opt/UMC/jboss/server/all/deploy/hornetq/hornetq-configuration.xml` file. This value specifies the maximum size (in bytes) of messages that can be delivered to this queue. The value “-1” indicates no limit. If the `attribute-setting match="#"` is set (default setting) in the node, the configuration is valid for all queues. If you want this setting to apply only to the VTA queues, add a new match set to `attribute-setting match="jms.queue.Quota"`. For other application servers, consult the documentation for information about how to configure message queues.

**Related Documentation**

- Setting the Size of the Event Queue on page 98
- Calculating the Size of the Nonpersistent Event Queue on page 98
- Specifying the Type of Event Queue on page 99
- Configuring Events on page 156

## Using NICs with the SRC VTA

You use the Network Information Collector (NIC) to locate the SAE that manages a subscriber for an SRC VTA:

- Locating the SAE That Manages a Subscriber for the SRC VTA on page 101
- Configuring a NIC on page 101
- Configuring NIC Proxies for the VTA on page 102

### Locating the SAE That Manages a Subscriber for the SRC VTA

You can use NIC proxies if the SRC VTA software needs to locate the SAE that manages a particular subscriber. For example, if the VTA receives an account update event and determines that it needs to reconfigure the corresponding SAE session, the VTA must find the SAE that is managing the session. The VTA can do this through the NIC.

You can also use the NIC with the SRC VTA to allow the following:

- Automatically log in subscribers to the VTA Web portals—The NIC maps the subscriber's IP address to the subscriber's login name, DN, or name of the interface and VR to which the subscriber connects. This scenario is for subscribers who connect to the SRC network through a JUNOS router.
- Immediately activate subscriptions to quota services—The VTA immediately activates a subscriber's quota service when a deposit is made to the subscriber's account. In this case, the NIC maps the subscriber's identifier to the SAE reference. This scenario is for subscribers who connect to the network through routers running JUNOS or JUNOS Software.

If you do not set up a NIC for this purpose or you use an identifier that the NIC cannot map to an SAE reference, subscribers must log out and log in again before the VTA can activate their quota services when deposits are made to their accounts.

- Allow subscribers to log in with their IP addresses. The NIC maps the subscriber's IP address to the identifier that you use for subscribers in the VTA database. To use the sample VTA portals, you must implement this type of NIC. If you do not implement this NIC, you can provide another way for subscribers to log in, such as a central Web page on which subscribers can enter their usernames and passwords. This scenario is for subscribers who connect to the SRC network through a JUNOS router.

#### Related Documentation

- Identifying Subscribers, SAEs, and Sessions on page 74
- Configuring Subscribers and Subscriptions to VTA Services on page 91
- Configuring a NIC on page 101
- Configuring NIC Proxies for the VTA on page 102

### Configuring a NIC

For demonstrations and installations with few subscribers, you can configure the VTA to use a NIC proxy stub, which explicitly defines a set of data mappings. However, for

standard installation with a significant number of subscribers and multiple SAEs, you must set up a full NIC configuration.

To configure a NIC for the VTA management portals:

1. Use the OnePopLogin configuration scenario (see NIC Configuration Scenarios).
2. Plan and configure the NIC hosts. See Configuring the NIC (SRC CLI).
3. Add the NIC SAE agents to each SAE configuration as external plug-ins. Specify these plug-in attributes: router-name, session-id, user-type, login-name, user-ip-address.

For information about configuring SAE plug-ins, see Configuring the SAE for External Plug-Ins (SRC CLI).

4. (Optional) Configure a NIC proxy stub. See Configuring NIC Test Data (SRC CLI) for information about configuring the NIC proxy stub.
5. Configure a NIC proxy for the VTA. See “Configuring NIC Proxies for the VTA” on page 102.

**Related  
Documentation**

- Before You Configure the NIC
- Locating the SAE That Manages a Subscriber for the SRC VTA on page 101
- Starting the NIC (SRC CLI)
- Configuration Statements for the NIC

## Configuring NIC Proxies for the VTA

For information about NIC proxies, see Overview of NIC Proxy Configuration.

To configure NIC proxies, select the NIC proxy that you want to configure.

- If subscribers connect to the network through a JUNOSe router, you can configure a NIC proxy that passes the subscriber's IP address and receives the identifier that you configured for the subscriber. This NIC allows customers to log in through the Web portals.

You must also specify the namespace of the NIC proxy in the *CONSTANTS.incl* file of the Web applications for the VTA portals (see “Properties for VTA Portals” on page 183).

- You can configure a NIC proxy that passes the subscriber's identifier to a NIC resolver and receives the corresponding SAE reference. This NIC allows the VTA to immediately activate a subscriber's quota service when a deposit is made to the subscriber's account. This feature is available for subscribers who connect to the network through routers running JUNOSe or JUNOS Software.

For information about the parameters that you can configure for NIC proxies, see Configuration Statements for NIC Proxies.

**Related  
Documentation**

- Before You Configure a NIC Proxy
- Locating the SAE That Manages a Subscriber for the SRC VTA on page 101

- Configuring a NIC on page 101

## Renaming a VTA

---

When multiple VTA configurations are deployed on the same application server, each VTA must have a unique JNDI name. You can use a script to change the JNDI name of a VTA by generating a new EAR file in the `/opt/UMC/conf/vta` directory based on the renaming rules specified in the `/opt/UMC/conf/vta/rules.xml` file.

To rename a VTA, specify the absolute path of the EAR file by executing the **rename** command in the `/opt/UMC/conf/vta` folder:

```
./rename <earFilePathName> [<rulesFilePathName>]
```

where `<earFilePathName>` is the absolute pathname of the EAR file that you want to rename, and `<rulesFilePathName>` is the absolute pathname of the renaming rules file.

You must specify `<rulesFilePathName>` if you change the default location from the `/opt/UMC/conf/vta` file or you are using a different rules file. By default, the renaming rules rename the Quota VTA called *quotavta.ear* to *bucketvta.ear*.

```
cd /opt/UMC/conf/vta
./rename /opt/UMC/conf/vta/quotavta.ear
```

### Related Documentation

- Overview of the SRC VTA on page 65
- SRC VTA Operation on page 73
- Installing the SRC VTA and Running the Configuration Script on page 82
- Additional SRC VTA Configuration Script Tasks on page 85
- Modifying the VTA Renaming Rules on page 103

## Modifying the VTA Renaming Rules

---

To modify the rules used to rename a VTA, edit the `/opt/UMC/conf/vta/rules.xml` file. For example, you can substitute different `oldString` and `newString` attributes for the `<replace>` element values and save the new values to a new file that you specify as the renaming rules file for the **rename** command.

For information about modifying the renaming rules, see the `/opt/UMC/conf/vta/rules.xml` file. This file contains details about the replacement values for the VTA names.

### Related Documentation

- Overview of the SRC VTA on page 65
- SRC VTA Operation on page 73
- Renaming a VTA on page 103
- Installing the SRC VTA and Running the Configuration Script on page 82



## CHAPTER 7

# Configuring the SRC VTA with VTA Configuration Manager

- Installing VTA Configuration Manager on page 106
- Running VTA Configuration Manager on page 106
- Loading and Importing VTA Configurations on page 107
- Loading a Configuration from a Directory on page 108
- Connecting to the Directory Fields on page 110
- Importing a VTA Configuration from a Local File on page 111
- Accessing the VTA Configuration on page 112
- Configuring the SRC VTA to Manage Database Accounts on page 113
- Configuring Scripts That Update Accounts on page 116
- Configuring the SRC VTA to Manage Subscriber Accounts on page 117
- Configuring a Usage Metric for Service Accounts on page 119
- Sample Formulas for Usage Metrics for the SRC VTA on page 122
- Configuring an Interim Accounting Interval for Service Accounts on page 123
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- Service Variables on page 126
- Configuring Actions for the Database Engine Processor on page 128
- Setting Up the SRC VTA to Send E-Mail Notifications on page 132
- Configuring the SRC VTA to Send E-Mail Notifications on page 134
- Configuring the SAE Proxy Processor on page 138
- Configuring Actions for the SAE Proxy Processor on page 139
- Configuring the SRC VTA to Run Scripts on page 145
- Configuring JavaScript Programs on page 145
- JavaScript Fields on page 148
- Configuring External Scripts on page 149
- External Script Fields on page 151
- Configuring VTA Actions to Run Scripts on page 152

- Configuring Events on page 156
- Configuring Event Handlers on page 158
- Configuring Identifiers for Subscribers and Sessions on page 163
- Using One VTA Account for Multiple Subscriber Sessions on page 165
- Logging Event Messages for the SRC VTA on page 167
- Logging Events Messages to a Text File on page 168
- Logging Events Messages to a System Logging Server on page 173
- Validating VTA Configurations on page 176
- Committing a VTA Configuration to a Directory on page 177
- Exporting a VTA Configuration to a Local File on page 178

---

## Installing VTA Configuration Manager

VTA Configuration Manager is a Web application that lets you use a Web browser to configure the SRC VTA. To install VTA Configuration Manager:

1. Copy the *vtaconfig.war* file from the archive file to the *jboss/server/default/deploy* folder.
2. If you have not run the VTA configuration script, copy the *roles.properties* and *users.properties* files from */opt/UMC/conf/vta* to your *jboss/server/default/conf* folder.
3. In the *roles.properties* file, add the following property.

**admin=VTA\_Admin**

VTA\_Admin is used as the login username for VTA Configuration Manager. You can configure a different login username; however, you cannot change " =VTA\_Admin."

4. In the *users.properties* file, add the following property.

**admin=secret**

where secret is the password used to log in to VTA Configuration Manager.

### Related Documentation

- How the SRC VTA Works on page 68
- Configuring Web Applications for the SRC VTA on page 182
- Installing the SRC VTA and Running the Configuration Script on page 82
- Running VTA Configuration Manager on page 106

---

## Running VTA Configuration Manager

To begin using VTA Configuration Manager:

1. In your Web browser, enter the name or IP address of the VTA host and the port number for VTA Configuration Manager in the format:



`http://<host>:8080/vtaconfig`

A Connect to dialog box appears

2. In the Connect to dialog box, enter your username and password, and click **OK**. The default values are:

User name—admin

Password—secret

The main VTA Configuration Manager page appears.



## VTA Configuration Manager

Home

- ▶ Home
- ▶ Dir Connection
- ▶ Configuration

### VTA Configuration Manager

Welcome to the VTA Configuration Manager.

You can use this application to view and edit Volume Tracking Application's configuration.

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#### Related Documentation

- How the SRC VTA Works on page 68
- Installing the SRC VTA and Running the Configuration Script on page 82
- Installing VTA Configuration Manager on page 106
- Loading and Importing VTA Configurations on page 107
- Accessing the VTA Configuration on page 112

## Loading and Importing VTA Configurations

You can store your VTA configurations in a directory or in a file on the local host:

- Directory—If you store the configurations in a directory, you need to load a configuration before you work on it in VTA Configuration Manager. When you are finished with a configuration, you need to commit the configuration to the directory.

If you loaded the VTA sample data, it is in the following files in the directory:

- `/Applications/Bucket`
- `/Applications/HostCheck`
- `/Applications/Quota`

See “Loading a Configuration from a Directory” on page 108.

- Local host—If you store the configurations in files on the local host, you need to import a configuration file before you work on the configuration in VTA Configuration Manager. When you are finished with a configuration, you need to export the configuration to a file.

See “Importing a VTA Configuration from a Local File” on page 111.

**Related  
Documentation**

- Specifying How the SRC VTA Loads Configurations from the Directory on page 93
- Installing the SRC VTA and Running the Configuration Script on page 82
- Accessing the VTA Configuration on page 112
- Committing a VTA Configuration to a Directory on page 177
- Exporting a VTA Configuration to a Local File on page 178

---

## Loading a Configuration from a Directory

---

If your VTA configuration is stored in a directory, you need to connect to the directory before you load configurations into VTA Configuration Manager.

To connect to a directory and load a configuration from the directory:

1. In the VTA Configuration Manager navigation pane, select **Dir Connection**.  
The Connecting to the Directory page appears.



## VTA Configuration Manager

Directory Connection

- ▶ Home
- ▶ Dir Connection
- ▶ Configuration

## Connecting to the Directory

## Directory Information

Please enter your directory information.

Directory Host	<input type="text" value="ldap://127.0.0.1:389/"/>
Bind DN	<input type="text" value="cn=umcadmin,o=umc"/>
Static Configuration DN	<input type="text" value="l=VTA,ou=staticConfiguration,ou=Configuration,o=Management,o=umc"/>
Configuration Namespace	<input type="text" value="/Applications/Quota"/>
Password	<input type="password" value="••••••••"/>
<input type="button" value="Connect"/>	

2. Edit or accept the default values for the fields, and click **Connect**.

See “Connecting to the Directory Fields” on page 110.

3. In the VTA Configuration Manager navigation pane, select **Load**.

The software loads the configuration that you specified in the Configuration Namespace field, and the Edit Configuration page appears with your configuration. From this page, you can view or change your VTA configuration.

**Related Documentation**

- Loading and Importing VTA Configurations on page 107
- Importing a VTA Configuration from a Local File on page 111
- Committing a VTA Configuration to a Directory on page 177
- Specifying How the SRC VTA Loads Configurations from the Directory on page 93
- Accessing the VTA Configuration on page 112

## Connecting to the Directory Fields

---

Use the fields described in this section to configure the connection to the VTA configuration in the directory. In VTA Configuration Manager, you can edit the following fields in the Connecting to the Directory screen.

### **Directory Host**

- Location of the directory in which VTA configurations are stored.
- Value—`ldap://<IP address or hostname>:<port number>/`
- Default—`ldap://127.0.0.1:389/`

### **Bind DN**

- DN used to authenticate access to the directory.
- Value—DN
- Default—`cn=umcadmin, o=umc`

### **Static Configuration DN**

- Subtree in the directory in which the VTA configuration is stored.
- Value—<DN>
- Default—`l=VTA, ou=staticConfiguration, ou=Configuration, o=Management, o=umc`

### **Configuration Namespace**

- Name and path of the configuration file that you want to load from the directory or that you want to commit to the directory.
- Value—Directory path and name of the configuration file. The sample data is in the following files:
  - `/Applications/Bucket`
  - `/Applications/HostCheck`
  - `/Applications/Quota`
- Default—`/Applications/Quota_Test`

### **Password**

- Password used to connect to the directory.
- Value—Valid directory password
- Default—admin123

## Importing a VTA Configuration from a Local File

If your VTA configuration is stored in a local file, you need to import the file into VTA Configuration Manager. To do so:

1. In the VTA Configuration Manager navigation pane, select **Import**.

The Import Configuration page appears.



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VTA Configuration Manager *Import Configuration*

▶ Home  
 ▶ Dir Connection  
 ▼ Configuration  
   ▶ Create  
   ▶ Edit  
   ▶ Load  
   ▶ Commit  
   ▶ **Import**  
   ▶ Export

**Import:**

Please choose a property file from the local file system.

From file:

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2. Enter the filename and path in the From file field, or click **Browse** and select a file from the local host.
3. Click **Finish**.

### Related Documentation

- Loading a Configuration from a Directory on page 108
- Loading and Importing VTA Configurations on page 107
- Committing a VTA Configuration to a Directory on page 177
- Specifying How the SRC VTA Loads Configurations from the Directory on page 93
- Accessing the VTA Configuration on page 112

## Accessing the VTA Configuration

To configure the SRC VTA, select Configuration in the VTA Configuration Manager navigation pane.

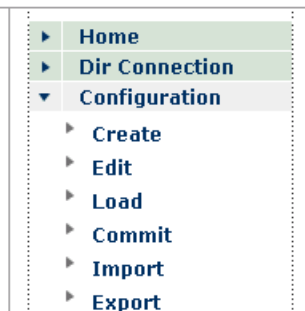


**CAUTION:** If you have previously loaded or imported a configuration, and you select Create and create a new configuration, the configuration that you loaded or imported will be overwritten by the new configuration when you commit or export the configuration.



### VTA Configuration Manager

Configuration



#### Configuration

You have the following options:

- [Create](#) a VTA configuration
- [Edit](#) a VTA configuration
- [Load](#) a VTA configuration from the directory
- [Commit](#) a VTA configuration to the directory
- [Import](#) a VTA configuration from a local file
- [Export](#) a VTA configuration to a local file

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From this screen you can perform the following tasks:

- Configuring the SRC VTA to Manage Database Accounts on page 113
- Setting Up the SRC VTA to Send E-Mail Notifications on page 132
- Configuring the SAE Proxy Processor on page 138
- Configuring the SRC VTA to Run Scripts on page 145
- Configuring Events on page 156
- Configuring Event Handlers on page 158
- Configuring Identifiers for Subscribers and Sessions on page 163
- Using One VTA Account for Multiple Subscriber Sessions on page 165
- Logging Event Messages for the SRC VTA on page 167

- Validating VTA Configurations on page 176
- “Committing a VTA Configuration to a Directory” on page 177

**Related  
Documentation**

- Before You Install the SRC VTA on page 81
- Installing the SRC VTA and Running the Configuration Script on page 82
- Installing VTA Configuration Manager on page 106
- Loading and Importing VTA Configurations on page 107
- Exporting a VTA Configuration to a Local File on page 178

---

## Configuring the SRC VTA to Manage Database Accounts

The SRC VTA uses the database engine processor to update database accounts. The database engine processor works as a proxy to a database. It can calculate usage, update account balances, get account and active service session data, and set initial balances of subscriber accounts. You can also use it to dynamically adjust interim accounting intervals based on a service or based on a subscriber’s remaining resources and use of the network for that service.

The database engine processor consists of account update scripts, subscriber accounts, service accounts, and actions.

To configure the database engine processor:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, select **Processors**.

A list of processors appears.



The screenshot shows the Juniper Networks VTA Configuration Manager interface. The top header includes the Juniper Networks logo and the text 'VTA Configuration Manager' with a link to 'Edit Configuration'. A left-hand navigation menu lists options: Home, Dir Connection, Configuration (expanded), Create, Edit, Load, Commit, Import, and Export. The main content area is titled 'Current Configuration' and features three tabs: 'Event Handlers', 'Actions', and 'Processors' (selected). Under the 'Processors' tab, the section 'Quota VTA Processors' lists four processors with their status buttons:

Processor Name	Status
<a href="#">Database Engine Processor</a>	Disable
<a href="#">Mailer Processor</a>	Enable
<a href="#">SAE Proxy Processor</a>	Disable
<a href="#">Script Runner Processor</a>	Enable

The Juniper logo and 'yourNet' tagline are visible at the bottom of the interface.

- Click **Enable** to enable the processor and display the configuration page for the database engine processor, or click **Database Engine Processor**.

The Database Engine Processor screen appears.



### Current Configuration

[Event Handlers](#)
[Actions](#)
[Processors](#)

Quota VTA Processors

**Database Engine Processor** Disable

Name	Value						
Account Update Script	<table border="1"> <thead> <tr> <th>Account Update Script Name</th> <th>Account Update Script Content</th> <th></th> </tr> </thead> <tbody> <tr> <td>DebitQuotaUsage</td> <td> <pre>var newPeriodicBalance=0; var newBoughtBalance=0; if(&lt;currentUsage&gt;&lt;=&lt;balance_PeriodicQuota&gt;){   newPeriodicBalance=&lt;balance_PeriodicQuota&gt;-&lt;currentUsage&gt;   newBoughtBalance=&lt;balance_BoughtQuota&gt;;</pre> </td> <td>Delete</td> </tr> </tbody> </table> <div>Add Account Update Script</div>	Account Update Script Name	Account Update Script Content		DebitQuotaUsage	<pre>var newPeriodicBalance=0; var newBoughtBalance=0; if(&lt;currentUsage&gt;&lt;=&lt;balance_PeriodicQuota&gt;){   newPeriodicBalance=&lt;balance_PeriodicQuota&gt;-&lt;currentUsage&gt;   newBoughtBalance=&lt;balance_BoughtQuota&gt;;</pre>	Delete
Account Update Script Name	Account Update Script Content						
DebitQuotaUsage	<pre>var newPeriodicBalance=0; var newBoughtBalance=0; if(&lt;currentUsage&gt;&lt;=&lt;balance_PeriodicQuota&gt;){   newPeriodicBalance=&lt;balance_PeriodicQuota&gt;-&lt;currentUsage&gt;   newBoughtBalance=&lt;balance_BoughtQuota&gt;;</pre>	Delete					

Save

Database Engine Account

<a href="#">PeriodicQuota</a>	Delete
<a href="#">BoughtQuota</a>	Delete
New Database Engine Account	<input type="text"/> <div>Create</div>

Database Engine Service

<a href="#">QuotaLocal</a>	Delete
<a href="#">QuotaInternet</a>	Delete
New Database Engine Service	<input type="text"/> <div>Create</div>

4. You can enable or disable the processor and perform the following tasks:
  - Configuring Scripts That Update Accounts on page 116
  - Configuring the SRC VTA to Manage Subscriber Accounts on page 117
  - Configuring a Usage Metric for Service Accounts on page 119
  - Adjusting the Interim Accounting Interval for a Service on page 125
  - “Configuring Actions for the Database Engine Processor” on page 128

#### Related Documentation

- Database Engine Processor Fields on page 124
- Accessing the VTA Configuration on page 112
- Troubleshooting Database Deadlocks on page 90

## Configuring Scripts That Update Accounts

You can set up scripts to update balances in the accounts from which the usage of a service is charged and update accounts by assigning values to variables for the account balances.

You can create or delete account update scripts:

- To add a script, click **Add Account Update Script**, enter a name for the script in the Add Account Update Script field that appears, and click **Create**.
- To delete a script, click **Delete** next to the script that you want to delete.

Database Engine Processor

Disable

Name	Value		
Account Update Script ⓘ	Account Update Script Name	Account Update Script Content	
	DebitBehavingUsage	<pre>var newBalance = Math.min(&lt;balance_Bucket&gt;-&lt;currentUsage&gt;, &lt;balance_Bucket&gt; = newBalance&lt;0?-1073741824:newBalance; &lt;lastUpdateTime_Bucket&gt;=&lt;currentTime&gt;;</pre>	Delete
	DebitMisbehavingUsag	<pre>&lt;balance_Bucket&gt;=Math.max(&lt;balance_Bucket&gt;-&lt;currentUsage&gt;, &lt;lastUpdateTime_Bucket&gt;=&lt;currentTime&gt;;</pre>	Delete
	RefillBucketWithBeha	<pre>var bucketFill = (&lt;currentTime&gt;-&lt;lastUpdateTime_Bucket&gt;)*3 &lt;balance_Bucket&gt;=Math.min(&lt;balance_Bucket&gt;+bucketFill, 214 &lt;lastUpdateTime_Bucket&gt;=&lt;currentTime&gt;;</pre>	Delete
	RefillBucketWithMisb	<pre>var bucketFill = (&lt;currentTime&gt;-&lt;lastUpdateTime_Bucket&gt;)*1 &lt;balance_Bucket&gt;=Math.min(&lt;balance_Bucket&gt;+bucketFill, 214 if(&lt;balance_Bucket&gt;&gt;0) &lt;balance_Bucket&gt;=&lt;balance_Bucket&gt;/1775.3668*3550.7336; &lt;lastUpdateTime_Bucket&gt;=&lt;currentTime&gt;;</pre>	Delete
Add Account Update Script			

- Related Documentation**
- Configuring the SRC VTA to Run Scripts on page 145
  - Configuring the SRC VTA to Manage Database Accounts on page 113
  - Example of a Bucket VTA on page 195

## Account Update Script Fields

### Account Update Script Name

- Name of the script.
- Value—Name of a script
- Default—No value

#### **Account Update Script Content**

- JavaScript program that updates a subscriber's account. The script can refer to the attribute name of any attributes in the event being processed.
- Value—Fields of an account can be updated by assigning values to the following parameters:
  - balance\_<accountName>—Values written to this parameter are put in the balance field of the account.
  - status\_<accountName>—Values written to this parameter are put in the status field of the account.
  - lastUpdateTime\_<accountName>—Values written to this parameter are put in the last\_update\_time field of the account.
- Example—<balance\_PeriodicQuota>=<balance\_PeriodicQuota>-\  
<currentUsage>;<lastUpdateTime\_PeriodicQuota>=<currentTime>;

## **Configuring the SRC VTA to Manage Subscriber Accounts**

A subscriber account is a record of credit and debit entries in the database that track a subscriber's use of a particular network resource.

You configure subscriber accounts in the Database Engine Account section of the Database Engine Processor configuration page. For example:

#### **Database Engine Account**

<a href="#">PeriodicQuota</a>	<input type="button" value="Delete"/>
<a href="#">BoughtQuota</a>	<input type="button" value="Delete"/>
<b>New Database Engine Account</b> <input type="text"/>	
<input type="button" value="Create"/>	

You can create, delete, or modify accounts:

- To add an account, enter a name for the account in the New Database Engine Account field, and click **Create**.
- To delete an account, click **Delete** next to the account that you want to delete.
- To modify an account, select the account that you want to modify.

If you create or modify an account, the account configuration screen appears.

The screenshot shows the Juniper VTA Configuration Manager interface. The top header includes the Juniper Networks logo and the title "VTA Configuration Manager" with a link to "Edit Configuration". A left sidebar contains a navigation menu with options: Home, Dir Connection, Configuration (selected), Create, Edit, Load, Commit, Import, and Export. The main content area is titled "Current Configuration" and has three tabs: Event Handlers, Actions, and Processors (selected). Under "Processors", there is a section for "Quota VTA Processors" with a link to "Database Engine Processor" and a "Disable" button. Below this is the "Database Engine Account" section, which contains a "Bucket" table with columns "Name" and "Value". The table has two rows: "Initial Balance" with a value of 2147483648 and "Initial Status" with a value of Active. There is a "Save" button below the table. At the bottom of the "Database Engine Account" section, there is a "New Database Engine Account" label, a text input field, and a "Create" button. The footer of the interface includes the Juniper logo and the text "Juniper yourNet".

**Current Configuration**

Event Handlers Actions **Processors**

**Quota VTA Processors**

[Database Engine Processor](#)

**Database Engine Account**

**Bucket**

Name	Value
Initial Balance	2147483648
Initial Status	Active

**New Database Engine Account**

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- Related Documentation**
- Configuring the SRC VTA to Manage Database Accounts on page 113
  - Configuring VTA Services and Policies on page 91
  - Configuring Subscribers and Subscriptions to VTA Services on page 91

## Database Engine Processor Buckets

### Initial Balance

- Initial balance for the subscriber account.
- Value—Integer in the range –9223372036854775807 through 9223372036854775807
- Default—No value

### ***Initial Status***

- Initial status for the subscriber account.
- Value—Text string
- Example—active

## **Configuring a Usage Metric for Service Accounts**

You configure VTA service accounts in the Database Engine Service section of the Database Engine Processor configuration page. For example:

### **Database Engine Service**

<a href="#">QuotaLocal</a>	<input type="button" value="Delete"/>
<a href="#">QuotaInternet</a>	<input type="button" value="Delete"/>
<b>New Database Engine Service</b>	<input type="text"/>
<input type="button" value="Create"/>	

You can create, delete, or modify accounts:

- To add an account, enter a name for the account in the New Database Engine Service field, and click **Create**.
- To delete an account, click **Delete** next to the account that you want to delete.
- To modify an account, select the account that you want to modify.

If you create or modify an account, the account configuration screen appears.

**Juniper** NETWORKS

## VTA Configuration Manager

*Edit Configuration*

- Home
- Dir Connection
- Configuration
  - Create
  - Edit
  - Load
  - Commit
  - Import
  - Export

### Current Configuration

Event Handlers Actions **Processors**

**Quota VTA Processors**

**Database Engine Processor** Disable

**Database Engine Service**

Name	Value
<a href="#">QuotaLocal</a>	<span>Delete</span>
<b>QuotaInternet</b>	
Usage Metric	return <upStreamBytes>+<downSt
Interim Interval	return Math.min(7200, Math.max

Save

**New Database Engine Service**

Create

**Juniper yourNet**

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- Related Documentation**
- Defining a Formula for Determining Network Resource Usage That the SRC VTA Evaluates on page 121
  - Configuring an Interim Accounting Interval for Service Accounts on page 123
  - Viewing Information About the Account on page 191
  - Sample Formulas for Usage Metrics for the SRC VTA on page 122

## Defining a Formula for Determining Network Resource Usage That the SRC VTA Evaluates

In the Usage Metric box in the VTA Configuration Manager, you define a formula that determines the use of network resources for a service. Each service in a VTA can use a different formula. You can configure the SRC VTA software to evaluate this formula for every accounting event it receives from the SAE for each quota service. It can then debit the result from the accounts. Use the variables described in this section to define the formula.

### *downStreamBytes*

- Amount of data that the subscriber downloaded from the network since the last accounting event.
- Value—Number of bytes in the range 0–9223372036854775807

### *downStreamPackets*

- Number of data packets that the subscriber downloaded from the network since the last accounting event.
- Value—Integer in the range 0–9223372036854775807
- Guidelines—Do not use `downStreamPackets` in a usage formula and `maxUsageRate` in the interim interval formula for the same service at the same time.

### *interimTime*

- Time since the last accounting event.
- Value—Number of seconds in the range 0–2147483647
- Guidelines—Generally, this value equals the interim accounting interval; however, it may exceed the interim accounting interval if an accounting event is lost. Similarly, the value may be less than the interim accounting interval if a stop event occurs in the middle of an accounting interval.

### *upStreamBytes*

- Amount of data that the subscriber uploaded to the network since the last accounting event.
- Value—Number of bytes in the range 0–9223372036854775807

### *upStreamPackets*

- Number of data packets that the subscriber uploaded to the network since the last accounting event.
- Value—Integer in the range 0–9223372036854775807
- Guidelines—Do not use upStreamPackets in a usage formula and maxUsageRate in the interim interval formula for the same service at the same time.

## Sample Formulas for Usage Metrics for the SRC VTA

Table 14 on page 122 provides examples of usage formulas.

**Table 14: Examples of Formulas That Calculate Use of Network Resources**

Formula	Description	Function
return <upStreamBytes> + <downStreamBytes>	Number of bytes sent and received by the subscriber.	Tracks volume of data that the subscriber transfers.
return 2*<upStreamBytes> + <downStreamBytes>	Twice the number of sent bytes plus the number of received bytes.	Allows higher charges for subscribers who are operating servers.
return <interimTime>	Time the subscriber is connected.	Tracks time that the subscriber connects rather than volume of data transfer.
return <downStreamBytes>/<interimTime>	Rate of downstream data transfer.	Allows higher charges for higher transfer rates.
QuotaInternet formula: return <upStreamBytes> + <downStreamBytes> – (<upStreamPackets> + <downStreamPackets>)*20  QuotaLocal formula: return (<upStreamBytes> + <downStreamBytes> – (<upStreamPackets> + <downStreamPackets>)*20)/2	Formulas for separate, complementary services in a single VTA.  The following expression returns the total number of bytes in the IP headers of packets uploaded and downloaded by the service, and as such is not subscriber data. It is not counted as usage.  (<upStreamPackets> + <downStreamPackets>)*20	Provides support for two services: QuotaInternet for Internet service and QuotaLocal for local service.  Allows higher charges for Internet service than for local service. By allocating a fixed usage limit for both services to each subscriber, encourages subscribers to access local resources due to decreased cost.

### Related Documentation

- Configuring a Usage Metric for Service Accounts on page 119



- Defining a Formula for Determining Network Resource Usage That the SRC VTA Evaluates on page 121

## Configuring an Interim Accounting Interval for Service Accounts

You configure VTA service accounts in the Database Engine Service section of the Database Engine Processor configuration page. For example:

### Database Engine Service

<a href="#">QuotaLocal</a>	<input type="button" value="Delete"/>
<a href="#">QuotaInternet</a>	<input type="button" value="Delete"/>
<b>New Database Engine Service</b> <input type="text"/>	
<input type="button" value="Create"/>	

You can create, delete, or modify accounts:

- To add an account, enter a name for the account in the New Database Engine Service field, and click **Create**.
- To delete an account, click **Delete** next to the account that you want to delete.
- To modify an account, select the account that you want to modify.

If you create or modify an account, the account configuration screen appears.

The screenshot shows the Juniper VTA Configuration Manager interface. The top navigation bar includes the Juniper logo and the title 'VTA Configuration Manager' with a link to 'Edit Configuration'. A left sidebar contains a menu with 'Home', 'Dir Connection', 'Configuration' (expanded), 'Create', 'Edit', 'Load', 'Commit', 'Import', and 'Export'. The main content area is titled 'Current Configuration' and has three tabs: 'Event Handlers', 'Actions', and 'Processors' (selected). Under 'Processors', there is a section for 'Quota VTA Processors' with a 'Database Engine Processor' link and a 'Disable' button. Below this is the 'Database Engine Service' section, which contains a table with two rows: 'QuotaLocal' (with a 'Delete' button) and 'QuotaInternet'. The 'QuotaInternet' section has a table with columns 'Name' and 'Value'. The 'Usage Metric' row has a value of 'return <upStreamBytes>+<downSt' and the 'Interim Interval' row has a value of 'return Math.min(7200, Math.max'. There is a 'Save' button below the table. At the bottom of the 'Database Engine Service' section, there is a 'New Database Engine Service' label and a 'Create' button. The footer of the interface includes the 'Juniper yourNet' logo and copyright information: 'Copyright © 1998-2005, Juniper Networks, Inc.' and 'SDX\_6.3.0\_integration 20051214T155722'.

#### Related Documentation

- Configuring a Usage Metric for Service Accounts on page 119
- Configuring VTA Services and Policies on page 91
- Adjusting the Interim Accounting Interval for a Service on page 125
- Viewing Information About the Account on page 191
- Database Engine Processor Fields on page 124

## Database Engine Processor Fields

### New Database Engine Service

- Name of the service account.
- Value—Text string
- Default—No value

### **Usage Metric**

- Formula that calculates usage based on an accounting event for the specified service. The formula is in the form of a JavaScript program, and it can specify variables.  
For information about these variables, see *Defining a Formula for Determining Network Resource Usage That the SRC-VTA Evaluates*.
- Example—return (<upStreamBytes>+<downStreamBytes>-(<upStreamPackets>+<downStreamPackets>)\*20)/2;
- Default—No value

---

## **Adjusting the Interim Accounting Interval for a Service**

In the Interim Interval box, you define a formula to dynamically adjust the interim accounting interval for each service based on the subscriber's remaining resources and use of the network for that service. Each service in the SRC VTA can use a different formula. You can configure the SRC VTA software to evaluate the formula to obtain the accounting intervals. Depending on the result, the SRC VTA performs the following functions:

- If the result is zero, the SRC VTA disables interim accounting.
- If the result is a negative number, the SRC VTA does not change the interim accounting interval.
- If the result is a positive number, the SRC VTA changes the interim accounting interval to this value.

The variables are categorized as:

- Current service—Provides session data of the service for the current service-tracking event.
- Other service—Provides service session usage information for another subscriber service for the current service-tracking event. For example, if a subscriber has two quota services, QuotaLocal and QuotaInternet, the interim formula for QuotaLocal can provide usage information to QuotaInternet.
- Account balance—Provides the balance in the account.

### **Related Documentation**

- Configuring an Interim Accounting Interval for Service Accounts on page 123
- Configuring VTA Services and Policies on page 91
- Service Variables on page 126

## Service Variables

---

Use the variables described in this section to define formulas.

### Current Service Variables

Use the variables described in this section to define a formula for the current service.

#### *lastInterimTime*

- Last interim time interval.
- Value—Number of seconds in the range 1–2147483647

#### *sessionLength*

- Length of the current session.
- Value—Number of seconds in the range 0–2147483647; value is 0 when the SRC VTA is calculating the interim time of start events. For other events, value is set by the PA\_SESSION\_TIME attribute.

#### *maxUsageRate*

- Maximum rate at which the subscriber can use network resources according to the formula described in Table 15 on page 128.
- Value—Integer in the range 0–9223372036854775807
- Guidelines—This formula corresponds to the usage formula for the same service as the interim formula.

The maxUsageRate variable is calculated for a service by means of the following values for the variables in the corresponding usage formula:

- upStreamBytes=PA\_UPSTREAM\_BANDWIDTH
  - downStreamBytes=PA\_DOWNSTREAM\_BANDWIDTH
  - interimTime=lastInterimTime
  - upStreamPackets=0
  - downStreamPackets=0

If you use the parameters upStreamPackets (PA\_IN\_PACKETS) and downStreamPackets (PA\_OUT\_PACKETS) in the usage formula and at the same time maxUsageRate in the interim interval formula, the maxUsageRate is not accurate, because the values for maximum upStreamPackets and downStreamPackets are unknown.

#### *averageUsageRate*

- Average rate at which the subscriber is consuming volume in units per second. The unit can be a value such as dollars, bytes, or packets. The type of unit depends on the value specified in the formula. Measurement begins when the service starts.
- Value—Integer in the range 0–9223372036854775807; the value is 0 when the SRC VTA is calculating the interim time of start events.

For other events, the value is the usage formula divided by PA\_SESSION\_TIME. The usage formula is calculated from PA\_IN\_PACKETS, PA\_OUT\_PACKETS, PA\_OUT\_OCTETS, PA\_IN\_OCTETS, and PA\_SESSION\_TIME.

#### ***latestUsageRate***

- Rate of service usage since the last usage report.
- Value—Integer in the range 0–9223372036854775807; the value is 0 when the SRC VTA is calculating the interim time of start events.

The value is calculated by using the result of the usage formula divided by the length of the service session since the previous usage report for the same service.

### **Other Service Variables**

Use the variables described in this section to define a formula for another service.

System requirements to calculate service usage, in the form of the averageUsageRate and the sessionLength variables, can affect system performance. Using a longer interim interval means that there are fewer interim events to process, which requires fewer system resources.

#### ***averageUsageRate\_<serviceName>***

- Average rate at which the service is consuming volume in units per second. The unit can be a value such as dollars, bytes, or packets. The type of unit depends on the value specified in the formula. Measurement begins when the service starts.
- Value—Integer in the range 0–9223372036854775807; the value is 0 when the SRC VTA is calculating the interim time of start events.
- Guidelines—Service names can contain alphanumeric characters and dashes (-).

#### ***sessionLength\_<serviceName>***

- Length of a service session for the service.
- Value—Integer in the range 0–2147483647; the value is 0 when the SRC VTA is calculating the interim time of start events.
- Guidelines—Service names can contain alphanumeric characters and dashes (–).

## Account Balance Variable

Use the variable described in this section to provide balance information from each of the subscriber's accounts.

### *balance\_<accountName>*

- Balance for the specified account before the new usage value is applied.
- Value—Integer in the range 0–9223372036854775807
- Example—balance\_PeriodicQuota refers to the balance for the PeriodicQuota account.

## Sample Formulas for Interim Accounting Interval

Table 15 on page 128 provides examples of formulas to dynamically adjust the interim accounting interval for a service.

**Table 15: Examples of Interim Accounting Interval**

Formula	Description
return 900	Accounting interval is fixed at 900 seconds (15 minutes).
return (<balance_Periodic> + <balance_Bought>) / <maxUsageRate>	Minimum time required for the subscriber to empty the periodic and bought accounts.
return <sessionLength> >= 60*15 ? (<balance_Periodic> + <balance_Bought>) / <averageUsageRate> / 2 : (<balance_Periodic> + <balance_Bought>) / <maxUsageRate>	Half the time required for the subscriber to empty the accounts at the current average rate, or the minimum time if the session is shorter than 15 minutes.  Because the average rate may not be representative early in the session, check when the account is half empty.

### Related Documentation

- Adjusting the Interim Accounting Interval for a Service on page 125
- Defining a Formula for Determining Network Resource Usage That the SRC VTA Evaluates on page 121

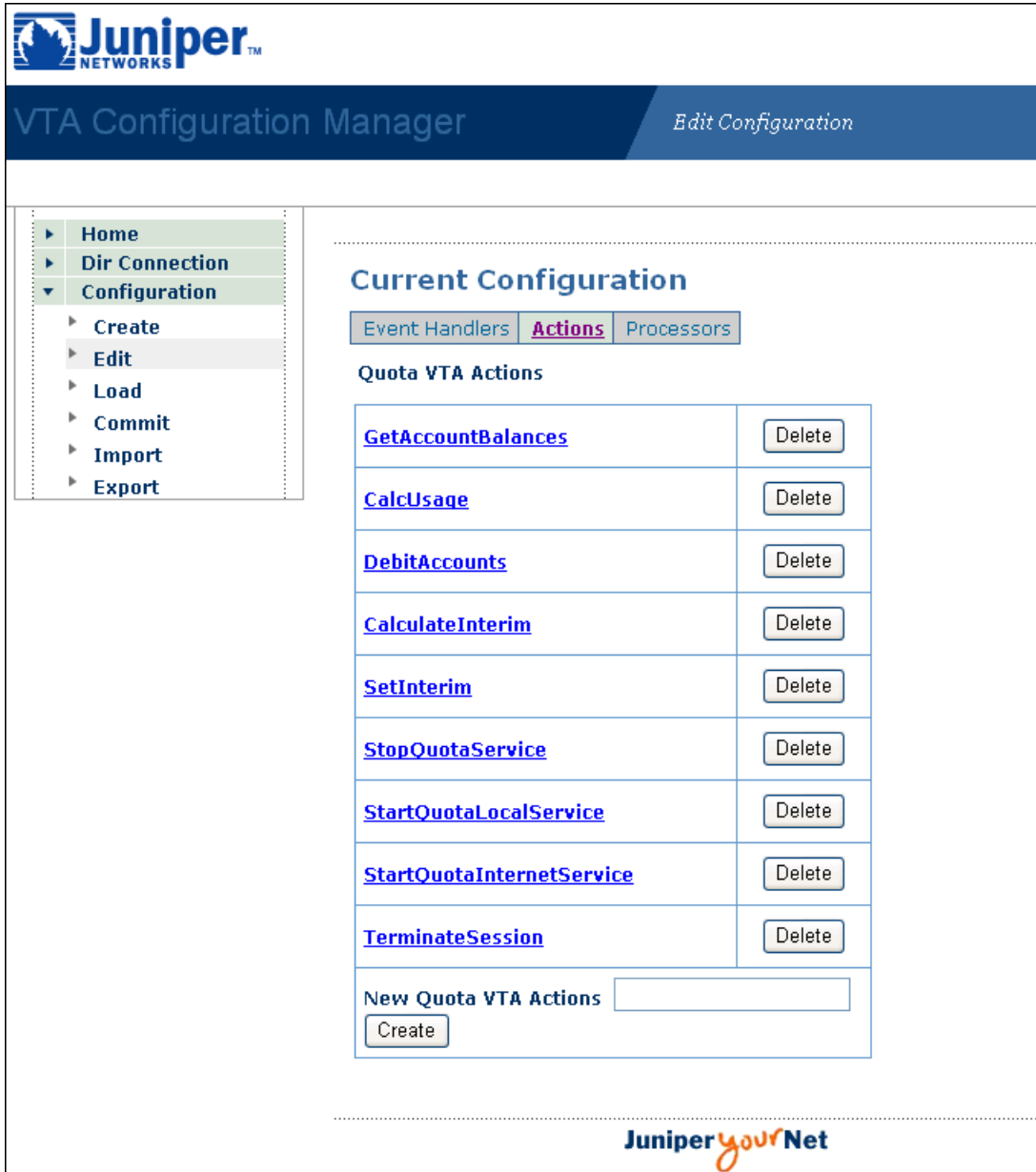
## Configuring Actions for the Database Engine Processor

You can configure actions that the database engine processor performs on events. For example, you can set up an action to calculate usage in a service-tracking event by using the usage metric that you configured for a service.

To configure actions for the database engine processors:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, select **Actions**.

A list of actions appears. For example:



The screenshot shows the Juniper VTA Configuration Manager interface. The top header includes the Juniper Networks logo and the text 'VTA Configuration Manager' with a link to 'Edit Configuration'. A left navigation pane lists options: Home, Dir Connection, Configuration (expanded), Create, Edit (selected), Load, Commit, Import, and Export. The main content area is titled 'Current Configuration' and has three tabs: Event Handlers, Actions (selected), and Processors. Under the 'Actions' tab, there is a section for 'Quota VTA Actions' containing a table of actions with 'Delete' buttons. At the bottom, there is a 'New Quota VTA Actions' section with a text input field and a 'Create' button. The Juniper logo and 'yourNet' tagline are at the bottom right.

Current Configuration	
Event Handlers   <b>Actions</b>   Processors	
<b>Quota VTA Actions</b>	
<a href="#">GetAccountBalances</a>	Delete
<a href="#">CalcUsage</a>	Delete
<a href="#">DebitAccounts</a>	Delete
<a href="#">CalculateInterim</a>	Delete
<a href="#">SetInterim</a>	Delete
<a href="#">StopQuotaService</a>	Delete
<a href="#">StartQuotaLocalService</a>	Delete
<a href="#">StartQuotaInternetService</a>	Delete
<a href="#">TerminateSession</a>	Delete
New Quota VTA Actions <input type="text"/> <input type="button" value="Create"/>	

3. To add an action, enter a name for the action in the New Quota VTA Actions field, and click **Create**.

The action configuration screen appears.

CalculateInterim					
Name	Value				
Processor	DBEngine ▼				
Function	CalculateInterim				
Parameter ⓘ	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> </tr> </thead> <tbody> <tr> <td colspan="2">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content	Add Parameter	
Parameter Name	Parameter Content				
Add Parameter					
Abort On Error	<div> <input type="text"/> <input type="button" value="Enable"/> </div>				
<input type="button" value="Save"/>					

4. Select DBEngine in the Processor field, and click **Save**. (If DBEngine does not appear in the drop-down list, enable the database engine processor.)

An expanded configuration screen for the action appears.

RefillBucketWithBehavingRate											
Name	Value										
Processor	DBEngine ▼										
Function	UpdateAccounts										
Parameter ⓘ	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> <th></th> </tr> </thead> <tbody> <tr> <td>ScriptName</td> <td>RefillBucketWithBehavingRate</td> <td> <input type="button" value="Delete"/> <input type="button" value="Disable"/> </td> </tr> <tr> <td colspan="3">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content		ScriptName	RefillBucketWithBehavingRate	<input type="button" value="Delete"/> <input type="button" value="Disable"/>	Add Parameter			
Parameter Name	Parameter Content										
ScriptName	RefillBucketWithBehavingRate	<input type="button" value="Delete"/> <input type="button" value="Disable"/>									
Add Parameter											
Abort On Error	<div> <input type="text"/> <input type="button" value="Enable"/> </div>										

5. Edit the action fields.  
See “Action Fields for the Database Engine Processor” on page 131.
6. If you are finished configuring the SRC VTA, save the configuration to a directory or local file.  
See “Committing a VTA Configuration to a Directory” on page 177.

#### Related Documentation

- Database Engine Processor Fields on page 124
- Configuring a Usage Metric for Service Accounts on page 119
- Configuring VTA Actions to Run Scripts on page 152
- Configuring Actions for the SAE Proxy Processor on page 139



## Action Fields for the Database Engine Processor

In VTA Configuration Manager, you can edit the following fields in the Quota VTA Actions screen.

### *Processor*

- Processor for which you are configuring the action.
- Value—DBEngine
- Default—No value

### *Function*

- Function calls that the database engine processor invokes. These functions are variables that you can use to update database accounts.
- Value
  - CalculateInterim—Calculates the interim interval in the service-tracking event by using the interim interval configured for the service. It has no parameters. It adds the following attribute to the event after the function is executed:
    - interimInterval—Interim interval of the service
  - CalculateUsage—Calculates usage in the service-tracking event by using the usage metric configured for the service. It has no parameters. It adds the following attributes to the event after the function is executed:
    - currentUsage—Usage since the previous usage report
    - sessionSinceLastReport—Session length since the previous usage report
  - GetAccounts—Gets account data for the corresponding subscriber for the event. Subsequent event handlers of the event can use the retrieved data. It has no parameters. It adds the following attributes to the event after the function is executed:
    - balance\_<accountName>—Balance for the account.
    - lastUpdateTime\_<accountName>—Last update time in milliseconds since January 1, 1970 UTC for the account.
    - status\_<accountName>—Status of the account.
  - TerminateSession—Closes active VTA sessions that have a status of Start or Interim. It does not stop the corresponding services in the SAE. You can use this function to stop a service at the end of a billing period. Usage data collected after the VTA session is stopped is stored in new VTA session records.
  - UpdateAccounts—Runs an account update script that changes the account balances of the corresponding subscriber for the event. It adds the following attributes to the event after the function is executed:
    - balance\_<accountName>—Balance for the account after it is updated.

- `lastUpdateTime_<accountName>`—Last update time in milliseconds since January 1, 1970 UTC for the account after it is updated.
- `status_<accountName>`—Status of the account after it is updated.
- Default—No value

#### ***Parameter Name***

- Parameters to pass to the function.
- Value
  - Event attribute name; the event attribute name is replaced by the attribute's value wherever it appears.
  - For the `UpdateAccounts` function, you can configure the following parameter:
    - `scriptName`—Name of the account update script defined in the database engine processor
- Example—`ScriptName`

#### ***Parameter Content***

- Values for the parameters.
- Value
  - For the `scriptName` parameter—Name of the account update script defined in the database engine processor
- Example—`DebitQuotaUsage`

#### ***Abort On Error***

- Disables or enables and sets the processing in response to an error.
- Value
  - Break—Stop processing the current event.
  - Continue—Continue with the next action, if any, in the same event handler.
  - Next Event Handler—Continue with the next event handler (if any).
- Default—No value

---

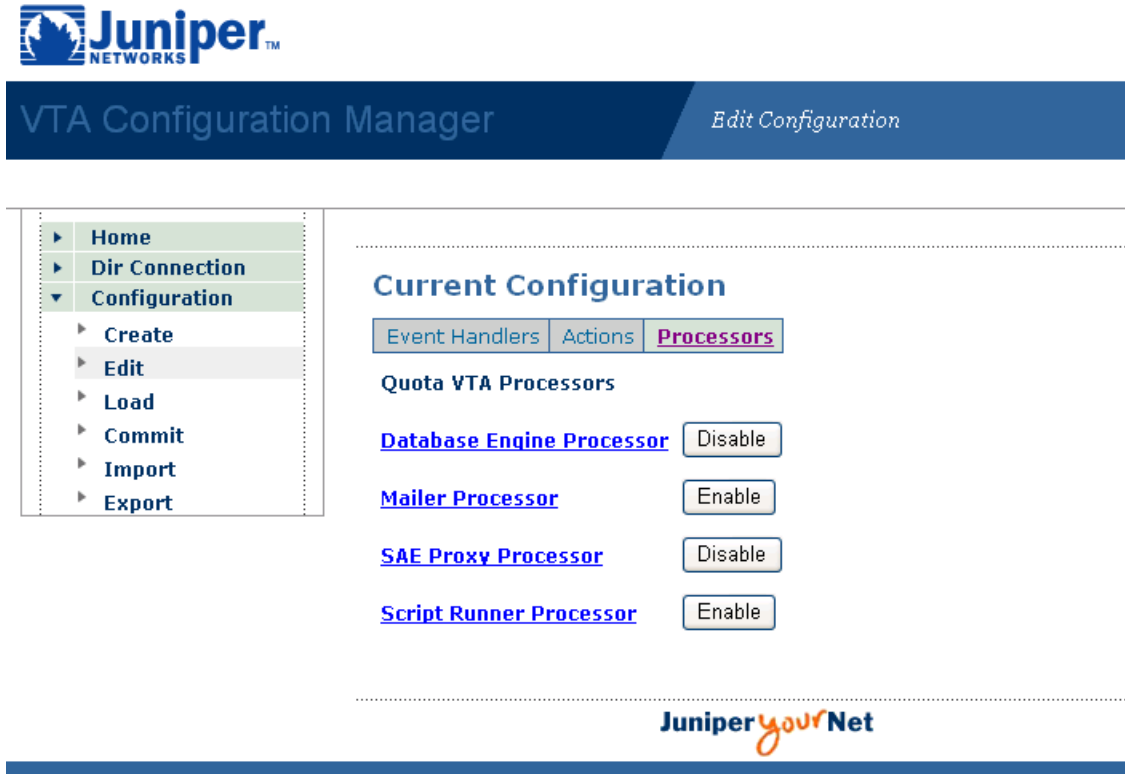
## **Setting Up the SRC VTA to Send E-Mail Notifications**

Use the mailer processor to specify the SMTP server to use for e-mail messages that the SRC VTA sends to subscribers.

To configure the mailer processor:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, select **Processors**.

A list of processors appears.



3. Click **Enable** to enable the processor and display the configuration page for the mailer processor, or click **Mailer Processor**.

The Mailer Processor screen appears.



## VTA Configuration Manager

[Edit Configuration](#)

- ▶ Home
- ▶ Dir Connection
- ▼ Configuration
  - ▶ Create
  - ▶ Edit
  - ▶ Load
  - ▶ Commit
  - ▶ Import
  - ▶ Export

### Current Configuration

Event Handlers
Actions
Processors

**Quota VTA Processors**

**Mailer Processor** Enable

Name	Value
SMTP Server	<input style="width: 90%;" type="text"/>
<span style="border: 1px solid #ccc; padding: 2px 10px;">Save</span>	

4. Fill in the SMTP server box, and click **Save**.
5. Configure an action for the mailer processor. See “Configuring the SRC VTA to Send E-Mail Notifications” on page 134.

### Related Documentation

- Configuring the SAE Proxy Processor on page 138
- Configuring the SRC VTA to Manage Subscriber Accounts on page 117
- Database Engine Processor Fields on page 124

### Mail Processor Field

#### SMTP Server

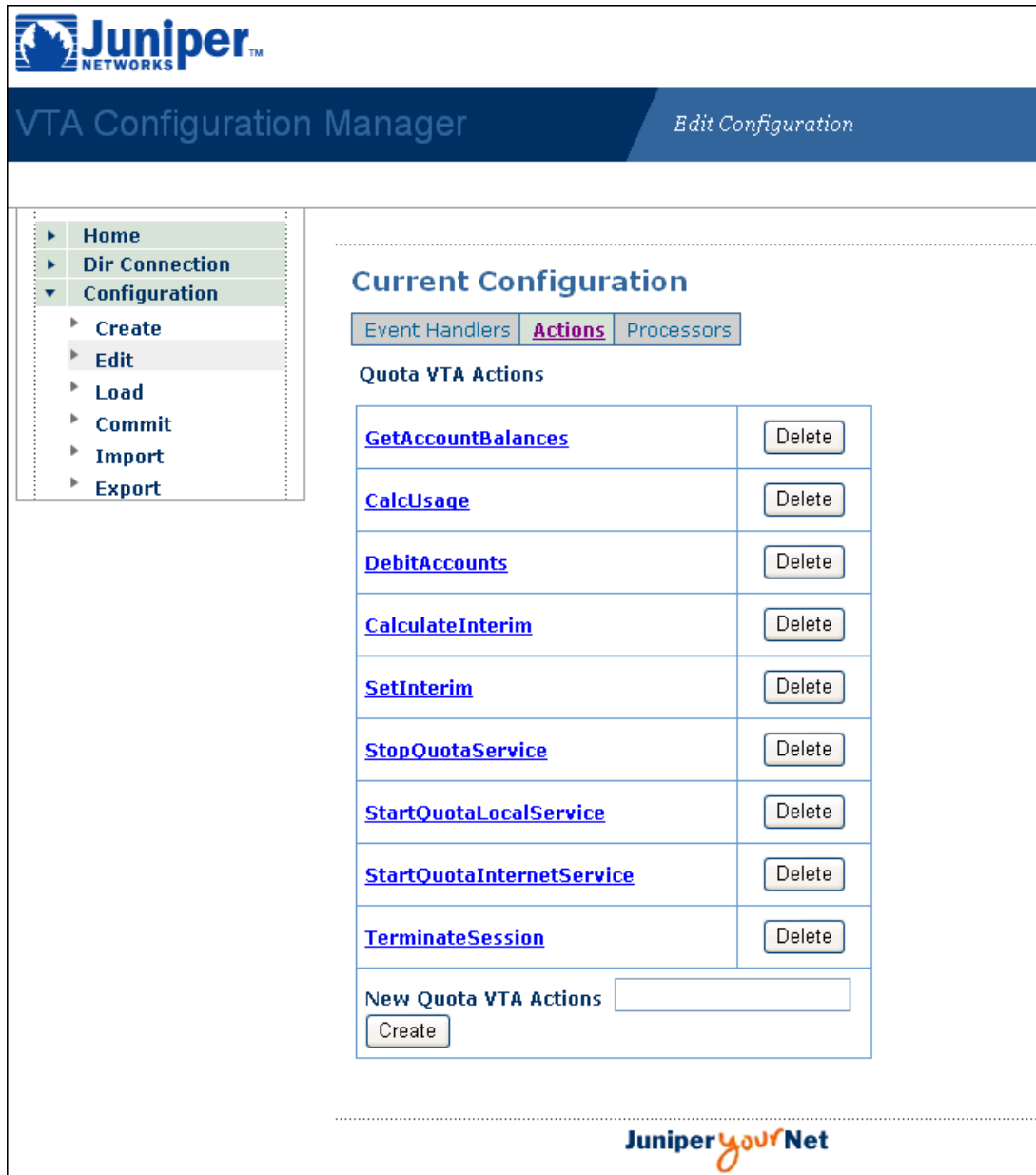
- SMTP server for outgoing e-mail.
- Value—Hostname or IP address of the SMTP server
- Default—No value

### Configuring the SRC VTA to Send E-Mail Notifications

You can configure actions for the mailer processor that cause the SRC VTA to send e-mail notifications. To configure actions to the mailer processor:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, select **Actions**.

A list of actions appears. For example:



The screenshot shows the Juniper VTA Configuration Manager interface. The top navigation bar includes the Juniper Networks logo and the text 'VTA Configuration Manager' and 'Edit Configuration'. The left sidebar contains a navigation menu with options: Home, Dir Connection, Configuration (selected), Create, Edit (highlighted), Load, Commit, Import, and Export. The main content area is titled 'Current Configuration' and has three tabs: Event Handlers, Actions (selected), and Processors. Below the tabs, the section is titled 'Quota VTA Actions' and displays a table of actions with a 'Delete' button for each.

Action Name	Delete
<a href="#">GetAccountBalances</a>	Delete
<a href="#">CalcUsage</a>	Delete
<a href="#">DebitAccounts</a>	Delete
<a href="#">CalculateInterim</a>	Delete
<a href="#">SetInterim</a>	Delete
<a href="#">StopQuotaService</a>	Delete
<a href="#">StartQuotaLocalService</a>	Delete
<a href="#">StartQuotaInternetService</a>	Delete
<a href="#">TerminateSession</a>	Delete

Below the table, there is a section titled 'New Quota VTA Actions' with a text input field and a 'Create' button.

At the bottom right of the interface is the 'Juniper yourNet' logo.

3. To add an action, enter a name for the action in the New Quota VTA Actions field, and click **Create**.

The action configuration screen appears.

EmailNotification					
Name	Value				
Processor	Mailer				
Function					
Parameter	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> </tr> </thead> <tbody> <tr> <td colspan="2">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content	Add Parameter	
Parameter Name	Parameter Content				
Add Parameter					
Abort On Error	<div> <input type="checkbox"/> <input type="checkbox"/> </div>				
Save					

- Select **Mailer** in the Processor field, and click **Save**. (If Mailer does not appear in the drop-down list, enable the mailer processor.)

An expanded configuration area for the action appears.

EmailNotification											
Name	Value										
Processor	Mailer										
Function	SendEmail										
Parameter	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td> <input type="button" value="Delete"/> <input type="button" value="Disable"/> </td> </tr> <tr> <td colspan="3">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content				<input type="button" value="Delete"/> <input type="button" value="Disable"/>	Add Parameter			
Parameter Name	Parameter Content										
		<input type="button" value="Delete"/> <input type="button" value="Disable"/>									
Add Parameter											
Abort On Error	<div> <input type="checkbox"/> <input type="checkbox"/> </div>										
Save											

- Edit the action fields.

#### Related Documentation

- Setting Up the SRC VTA to Send E-Mail Notifications on page 132
- Configuring Actions for the Database Engine Processor on page 128
- Installing VTA Configuration Manager on page 106
- Example of a Bucket VTA on page 195

## E-Mail Notification Fields

### Processor

- Processor for which you are configuring the action.
- Value—Mailer (If Mailer does not appear in the drop-down list, enable the mailer processor.)
- Default—No value

***Function***

- Function calls that the mail processor invokes.
- Value
  - SendEmail—Sends e-mail messages. It provides no output.
- Default—No value

***Parameter Name***

- Parameters to pass to the processor.
- Value
  - “Recipient” —Address of the e-mail recipient
  - “From” —Address of the e-mail sender
  - “Subject” —Subject of the e-mail
  - “Text” —Text of the e-mail
- Default—No value

***Parameter Content***

- Values for the parameters.
- Value
  - Recipient—Address of the e-mail recipient
  - From—Address of the e-mail sender
  - Subject—Subject of the e-mail
  - Text—Text of the e-mail
- Default—No value

***Abort On Error***

- Disables or enables and sets the processing in response to an error.
- Value
  - Break—Stop processing the current event.
  - Continue—Continue with the next action, if any, in the same event handler.

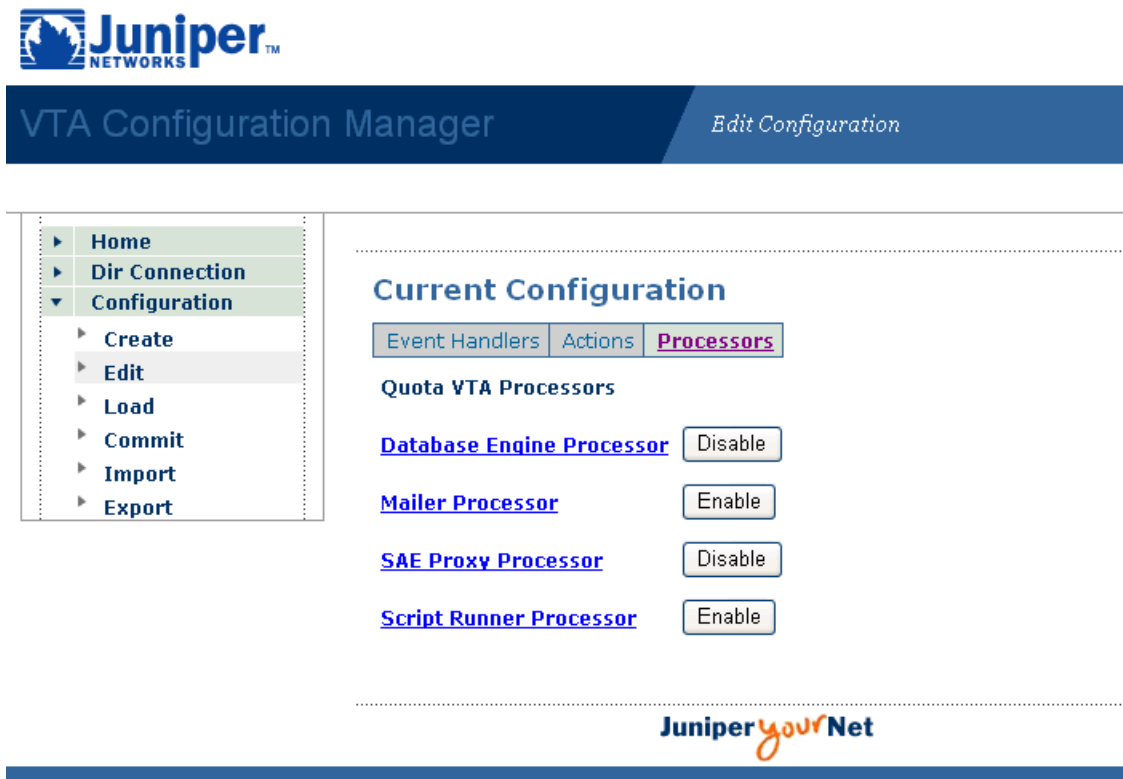
- Next Event Handler—Continue with the next event handler (if any).
- Default—No value

## Configuring the SAE Proxy Processor

To configure the SAE proxy processor:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, select **Processors**.

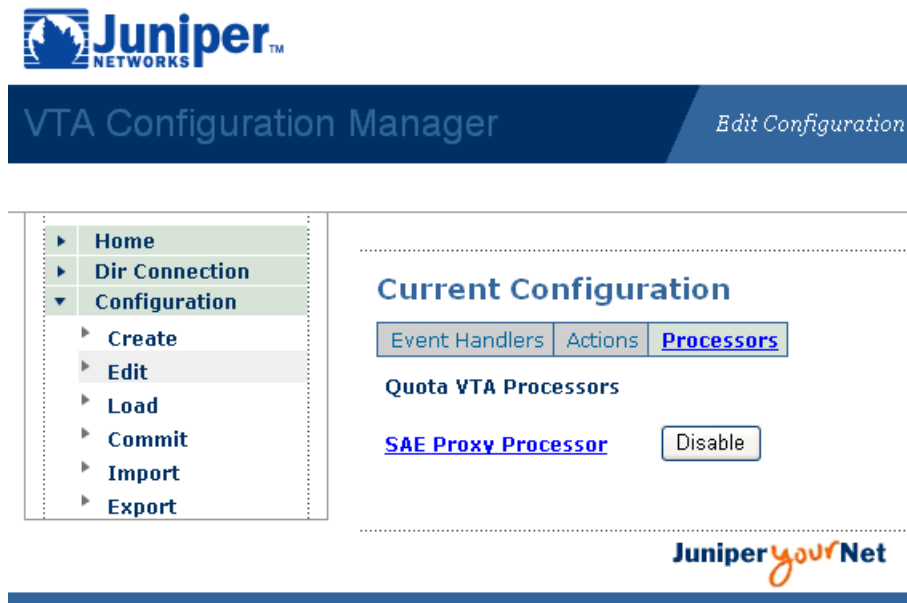
A list of processors appears.



3. Click **Enable** next to SAE Proxy Processor to enable the processor.

The SAE Proxy Processor area appears.





4. There are no fields to configure for the SAE proxy processor, but you must configure actions for the processor. See “Configuring Actions for the SAE Proxy Processor” on page 139.

- Related Documentation**
- Configuring VTA Actions to Run Scripts on page 152
  - Example of a Bucket VTA on page 195

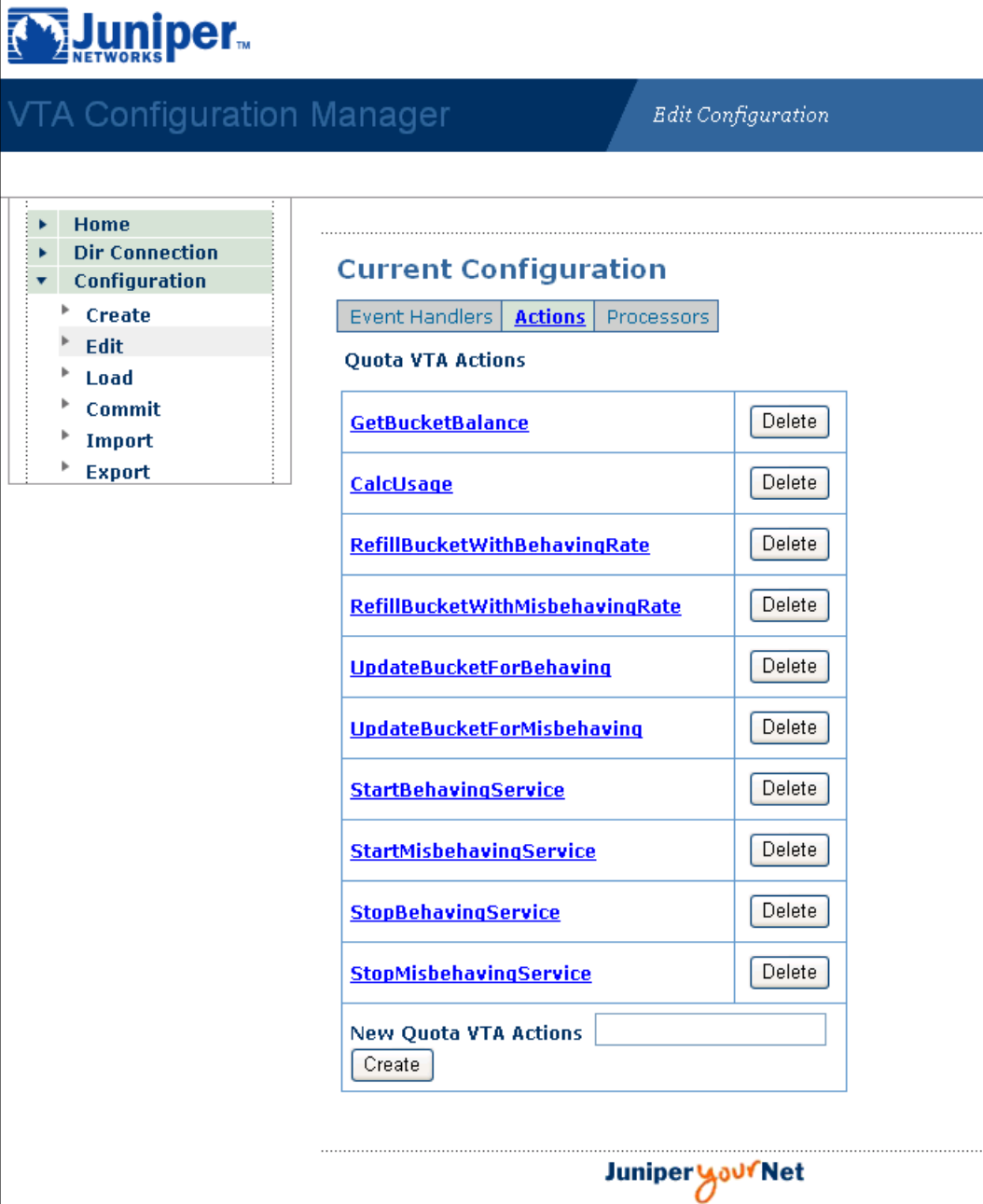
## Configuring Actions for the SAE Proxy Processor

You can configure actions that the SAE proxy processor performs on events. For example, you can set up an action to start or stop a service.

To configure actions for the SAE proxy processor:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, select Actions.

A list of actions appears. For example:



**Juniper NETWORKS**

**VTA Configuration Manager** *Edit Configuration*

- Home
- Dir Connection
- Configuration
  - Create
  - Edit**
  - Load
  - Commit
  - Import
  - Export

### Current Configuration

Event Handlers **Actions** Processors

#### Quota VTA Actions

<a href="#">GetBucketBalance</a>	Delete
<a href="#">CalcUsage</a>	Delete
<a href="#">RefillBucketWithBehavingRate</a>	Delete
<a href="#">RefillBucketWithMisbehavingRate</a>	Delete
<a href="#">UpdateBucketForBehaving</a>	Delete
<a href="#">UpdateBucketForMisbehaving</a>	Delete
<a href="#">StartBehavingService</a>	Delete
<a href="#">StartMisbehavingService</a>	Delete
<a href="#">StopBehavingService</a>	Delete
<a href="#">StopMisbehavingService</a>	Delete

New Quota VTA Actions

Create

**Juniper yourNet**

- To add an action, enter a name for the action in the New Quota VTA Actions field, and click **Create**.

The action configuration area appears.

StartBehavingService					
Name	Value				
Processor	SAEProxy ▼				
Function	<input type="text"/>				
Parameter ?	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> </tr> </thead> <tbody> <tr> <td colspan="2">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content	Add Parameter	
Parameter Name	Parameter Content				
Add Parameter					
Abort On Error	<input type="text"/> ▼ <input type="button" value="Disable"/>				
<input type="button" value="Save"/>					

4. Select **SAEProxy** in the Processor field, and click **Save**. (If SAEProxy does not appear in the drop-down list, enable the SAE proxy processor.)

An expanded configuration area for the action appears.

StartBehavingService											
Name	Value										
Processor	SAEProxy ▼										
Function	<input type="text" value="StartService"/>										
Parameter ?	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> <th></th> </tr> </thead> <tbody> <tr> <td>SubscriptionName</td> <td>Behaving</td> <td> <input type="button" value="Delete"/> <input type="button" value="Disable"/> </td> </tr> <tr> <td colspan="3">Add Parameter</td> </tr> </tbody> </table>		Parameter Name	Parameter Content		SubscriptionName	Behaving	<input type="button" value="Delete"/> <input type="button" value="Disable"/>	Add Parameter		
Parameter Name	Parameter Content										
SubscriptionName	Behaving	<input type="button" value="Delete"/> <input type="button" value="Disable"/>									
Add Parameter											
Abort On Error	<input type="text"/> ▼ <input type="button" value="Enable"/>										

5. Fill in the fields described in this section.

#### Related Documentation

- Configuring the SAE Proxy Processor on page 138
- Configuring the SAE to Send Tracking Events to the SRC VTA on page 94
- Example of a Bucket VTA on page 195

## StartBehavingService Fields

### Processor

- Processor for which you are configuring the action.
- Value—SAEproxy (If SAEProxy does not appear in the drop-down list, enable the SAE proxy processor.)
- Default—No value

### **Function**

- Function calls that the SAE proxy processor invokes.
- Value
  - SetInterimInterval—Sets the interim interval for the service by using the interimInterval attribute in the event. Before this function is called, the CalculateInterim function of the database engine processor must be called.
  - SetServiceTimeout—Sets the service session timeout for the subscription.
  - SetUserTimeout—Sets the subscriber session timeout of the current subscriber to the corresponding VTA event.
  - StartService—Starts the specified subscription to the service with the specified substitutions.
  - StopService—Stops the specified subscription to the specified service.
- Default—No value

### **Parameter Name**

- Parameters to pass to the processor.
- Value
  - For the SetServiceTimeout function:
    - SubscriptionName—Name of the subscription. Default subscriptions have the same name as the service. This parameter is optional when a service-tracking event is being processed. If this parameter is omitted, the current service session is stopped.
    - SessionName—Name of the service session. If the subscriptionName is omitted, this parameter is ignored. If this parameter is omitted, the default service session is used.
    - SessionTimeout—Length of the service session timeout. When the session timeout expires, the service session is stopped.
    - CurrentSubscriberOnly—Specifies whether the function is applied to the current subscriber only or to all subscribers who have the same subscriber ID.
  - For the SetUserTimeout function:
    - SessionTimeout—Length of timeout. When the session timeout expires, the subscriber is logged out.

- **CurrentSubscriberOnly**—Specifies whether the function is applied to the current subscriber only or to all subscribers who have the same subscriber ID.
- For the **StartService** function:
  - **SubscriptionName**—Name of the subscription. Default subscriptions have the same name as the service.
  - **SessionTimeout**—Length of the service session timeout. If this parameter is omitted, the default is no timeout.
  - **SessionName**—Name of the service session. If this parameter is omitted, the default service session is used.
  - **CurrentSubscriberOnly**—Specifies whether the function is applied to the current subscriber only or to all subscribers who have the same subscriber ID.
  - **Substitution.<substitutionName>**—Name of a substitution to use when starting the service. If this parameter is omitted, the service is started without substitutions.
  - **Persistent**—Specifies whether a service session is persistent. If you use the SRC VTA to activate a service with the persistent option, this service is subsequently activated by the SAE every time the subscriber connects to the network. This option provides efficiency because the SRC VTA does not need to make a decision to activate the service on subsequent logins and because applications such as deep packet inspection (DPI) can more efficiently activate a group of services at login.
- For the **StopService** function:
  - **SubscriptionName**—Name of the subscription. Default subscriptions have the same name as the service. If this parameter is omitted, the current service session is stopped.
  - **SessionName**—Name of the service session. If the **subscriptionName** parameter is omitted, this parameter is ignored. If this parameter is omitted, the default service session is used.
  - **Reason**—Reason for the termination. When the service is stopped, the termination cause is sent to the billing system so it can differentiate between service stops. If this parameter is omitted, no termination cause is provided to the billing system.
  - **CurrentSubscriberOnly**—Specifies whether the function is applied to the current subscriber only or to all subscribers who have the same subscriber ID.
  - **Persistent**—Specifies whether a service session is persistent. If you use the SRC VTA to activate a service with the persistent option, this service is subsequently activated by the SAE every time the subscriber connects to the network. This option provides efficiency because the SRC VTA does not need to make a decision

to activate the service on subsequent logins and because applications such as DPI can more efficiently activate a group of services at login.

- Example—Quota

#### ***Parameter Content***

- Values for the parameters.
- Value
  - For the subscriptionName parameter:
    - Name of the subscription in the format <serviceName>%<subscriptionId>.
  - For the sessionName parameter:
    - Name of the service session.
  - For the sessionTimeout parameter:
    - Length of the service session timeout in seconds. If the session timeout is set to 0, the service session is stopped immediately.
  - For the substitution parameter:
    - Name of a substitution to use.
  - For the reason parameter:
    - Integer that identifies the termination cause. Possible values are defined in RFC 2866—RADIUS Accounting (June 2000).
  - For the CurrentSubscriberOnly parameter:
    - Set to true to apply to current subscriber only. If you do not set this parameter, true is the default behavior.
    - Set to false to apply to all subscribers who have the same subscriber ID.
  - For the persistent parameter:
    - Set to true to cause the session to be persistent. We recommend that you set this value to true for service sessions that are started in the DPI environment.
    - Set to false to specify that the session is not persistent and the service is activated or deactivated for the current subscriber session only.
- Example—Quota

#### ***Abort On Error***

- Disables or enables and sets the processing in response to an error.
- Value
  - Break—Stop processing the current event.

- Continue—Continue with the next action, if any, in the same event handler.
- Next Event Handler—Continue with the next event handler (if any).
- Default—No value

## Configuring the SRC VTA to Run Scripts

---

The script runner processor can invoke external executable scripts or JavaScript programs. We recommend using JavaScript for better performance.

- External scripts are executable programs, such as shell scripts, that are available on the VTA's host. Each external script can perform a task and return a value. If the script returns a value, the value can be added to the current event as an event attribute.
- JavaScript programs are used to process attributes of a VTA event. For example, it can convert a VTA event attribute in a timestamp to a date string and add it to the event as a new attribute. The attribute can then be used for subsequent actions, such as sending an e-mail notification to the subscriber. The JavaScript program can refer to any attributes of the event being processed, and it must return a value.

To configure the script runner processor:

1. Configure a JavaScript program or an external script. See:
  - Configuring JavaScript Programs on page 145
  - Configuring External Scripts on page 149
2. Configure an action for the script runner processor. See:
  - Configuring VTA Actions to Run Scripts on page 152

### Related Documentation

- Configuring Events on page 156
- JavaScript Fields on page 148
- External Script Fields on page 151

## Configuring JavaScript Programs

---

To configure a JavaScript program:

1. In VTA Configuration Manager, select **Edit** or **Create** in the navigation pane.  
The Current Configuration window appears.
2. Select **Processors**.
3. Select **Script Runner Processor**.  
The Script Runner Processor configuration appears.

**Juniper**  
NETWORKS

## VTA Configuration Manager

[Edit Configuration](#)

- Home
- Dir Connection
- Configuration
  - Create
  - Edit
  - Load
  - Commit
  - Import
  - Export

### Current Configuration

Event Handlers Actions **Processors**

Quota VTA Processors

[Script Runner Processor](#)

External Script

New External Script

Javascript

New Javascript

**Juniper** yourNet

4. If the script runner processor is disabled, click **Enable** to enable it.
5. Enter the name of the script in the New Javascript box, and click **Create**.  
The JavaScript configuration appears.



The screenshot shows the Juniper VTA Configuration Manager interface. On the left is a navigation menu with options: Home, Dir Connection, Configuration (selected), Create, Edit, Load, Commit, Import, and Export. The main content area is titled 'Current Configuration' and has tabs for 'Event Handlers', 'Actions', and 'Processors' (selected). Under 'Processors', there is a section for 'Quota VTA Processors' with a link to 'Script Runner Processor' and an 'Enable' button. Below this is the 'Javascript' configuration section, which contains a table with the following fields:

Name	Value
JavaScript	<input type="text"/>
Parameter	<input type="text"/>
Return Attribute	<input type="text"/>
Return Type	<input type="text"/>

Below the table is a 'Save' button. At the bottom of the configuration section, there is a 'New Javascript' label, an input field, and a 'Create' button. The Juniper logo and 'Juniper yourNet' tagline are at the bottom of the page.

6. Edit the fields for the JavaScript.

See “JavaScript Fields” on page 148.

7. Configure a VTA action for the script.

See “Configuring VTA Actions to Run Scripts” on page 152.

**Related Documentation**

- Using JavaScript Programs in VTA Configurations on page 85
- Configuring the SRC VTA to Run Scripts on page 145

## JavaScript Fields

---

This section describes the fields used to configure JavaScript programs.

### ***New Javascript***

- Name of the JavaScript program.
- Value—Text string
- Default—No value

### ***Javascript***

- A function body in JavaScript.
- Value—Path name. To refer to the event attributes being processed, include the attribute name delimited by angle brackets (<and>). The JavaScript can verify whether the event has the referred attribute. If a referred attribute does not exist in the event, the attribute's value is null. The JavaScript must return a value.
- Default—No value

### ***Parameter***

- Parameters required by the script. When invoking the script from an action, the action must supply values for these parameters.
- Value—Comma-separated list of parameters
- Default—No value
- Example—fullLoginName

### ***Return Attribute***

- Attribute that provides the return value of the script as a valid Java identifier that subsequent actions and event handlers can refer to.
- Value—Attribute name
- Guidelines—JavaScripts must return an attribute value. The name of a return attribute cannot start with an underscore (\_), because these event attributes are reserved for internal use.
- Default—No value

### ***Return Type***

- Java type of the return attribute.
- Value
  - Integer
  - Long

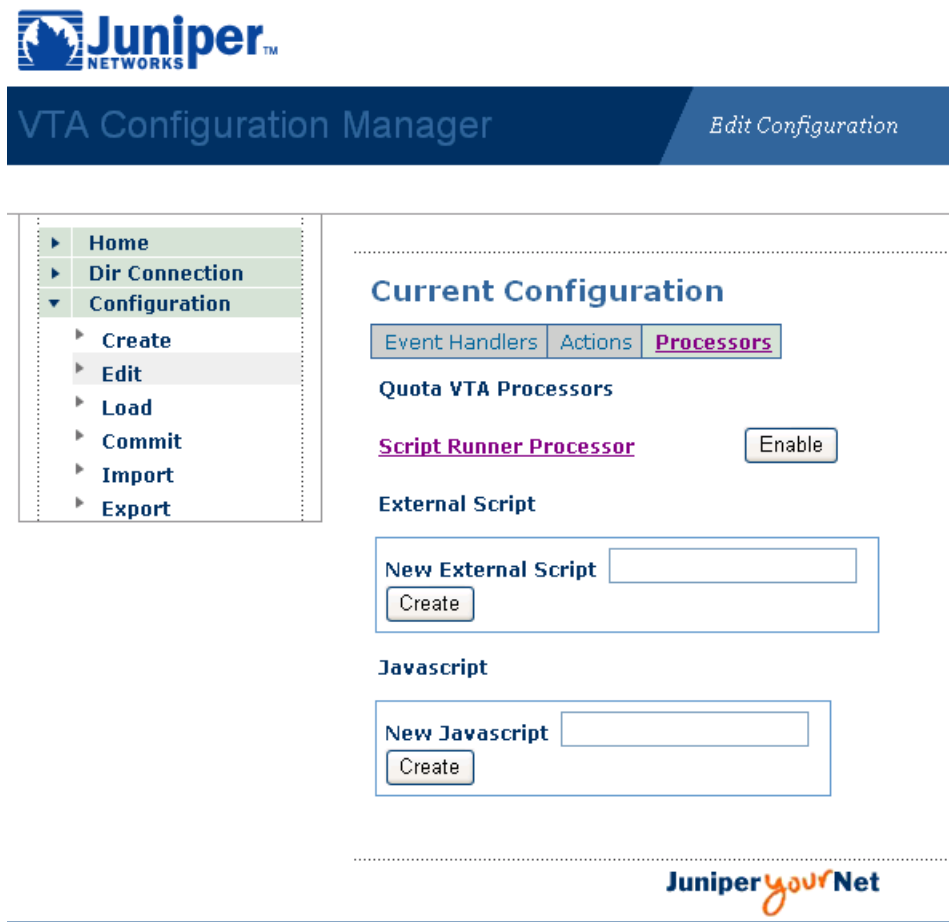
- Float
- Double
- String
- Boolean

## Configuring External Scripts

To configure an external script:

1. In VTA Configuration Manager, select **Edit** or **Create** in the navigation pane.  
The Current Configuration window appears.
2. Select **Processors**.
3. Select **Script Runner Processor**.

The Script Runner Processor configuration appears.

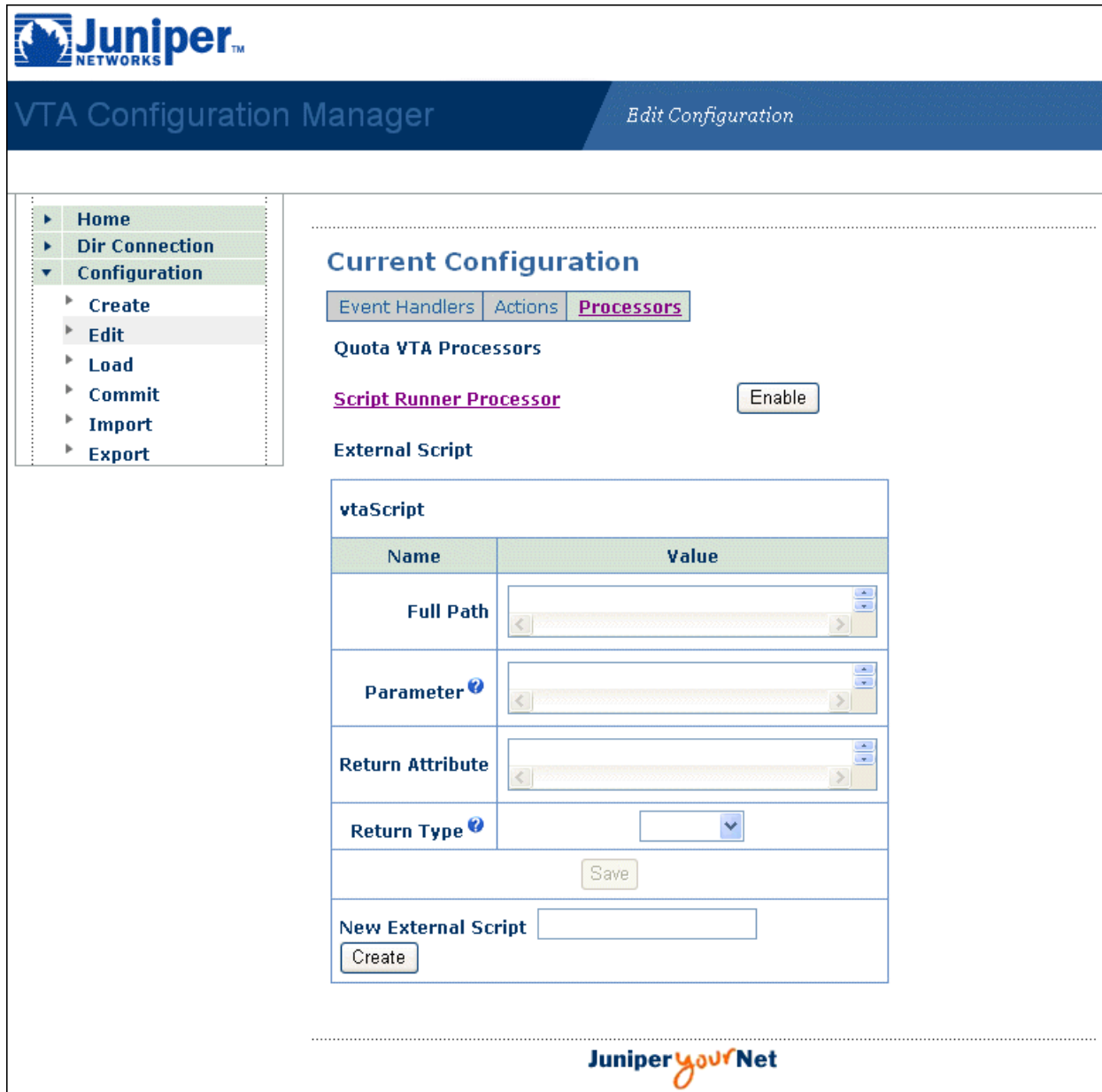


The screenshot shows the Juniper VTA Configuration Manager interface. At the top is the Juniper Networks logo and the title "VTA Configuration Manager" with an "Edit Configuration" link. On the left is a navigation pane with a tree structure: Home, Dir Connection, and Configuration (expanded). Under Configuration, there are links for Create, Edit (highlighted), Load, Commit, Import, and Export. The main content area is titled "Current Configuration" and has three tabs: Event Handlers, Actions, and Processors (selected). Under the Processors tab, there is a section "Quota VTA Processors" with a link to "Script Runner Processor" and an "Enable" button. Below this is the "External Script" section, which includes a "New External Script" label, a text input field, and a "Create" button. At the bottom of this section is the "Javascript" section, which includes a "New Javascript" label, a text input field, and a "Create" button. The footer of the interface features the "Juniper your Net" logo.

4. If the Script Runner processor is disabled, click **Enable** to enable it.

5. Enter the name of the script in the New External Script box, and click **Create**.

The External Script configuration appears.



The screenshot shows the Juniper VTA Configuration Manager interface. The top header includes the Juniper Networks logo and the title "VTA Configuration Manager" with a sub-header "Edit Configuration". A left sidebar contains a navigation menu with options: Home, Dir Connection, Configuration (selected), Create, Edit, Load, Commit, Import, and Export. The main content area is titled "Current Configuration" and has three tabs: Event Handlers, Actions, and Processors (selected). Under the Processors tab, there is a section for "Quota VTA Processors" with a link to "Script Runner Processor" and an "Enable" button. Below this is the "External Script" configuration section, which includes a table for "vtaScript" with columns "Name" and "Value". The table has four rows: "Full Path", "Parameter" (with a help icon), "Return Attribute", and "Return Type" (with a help icon). Each row has a corresponding text input field. Below the table is a "Save" button. At the bottom of the configuration section, there is a "New External Script" label, a text input field, and a "Create" button. The footer of the interface features the "Juniper yourNet" logo.

6. Edit the fields for the external script.

See "External Script Fields" on page 151.

7. Configure a VTA action for the script.

See "Configuring VTA Actions to Run Scripts" on page 152.

- Related Documentation**
- [Configuring Scripts That Update Accounts on page 116](#)
  - [Configuring the SRC VTA to Run Scripts on page 145](#)

## External Script Fields

---

This section describes the fields used to configure external scripts.

### ***New External Script***

- Name of the external script.
- Value—Text string
- Default—No value

### ***Full Path***

- Full pathname of the external script.
- Value—Pathname
- Default—No value

### ***Parameter***

- Parameters required by the script. When an action invokes the script, the action must supply values for these parameters.
- Value—Comma-separated list of parameters
- Guidelines—External scripts require parameters.
- Default—No value
- Example—fullLoginName

### ***Return Attribute***

- Attribute that provides the return value of the script as a valid Java identifier that subsequent actions and event handlers can refer to. If this attribute is not set, the return value is not used by the event. The external script returns the value by printing to standard output.
- Value—Attribute
- Guidelines—The name of a return attribute cannot start with an underscore (`_`), because these event attributes are reserved for internal use.
- Default—No value

### ***Return Type***

- Java type of the return attribute.
- Value
  - Integer
  - Long
  - Float
  - Double
  - String
  - Boolean
- Default—No value

---

## Configuring VTA Actions to Run Scripts

You can configure actions that the script runner processor performs on events. For example, you can set up an action to run either an external script or a JavaScript program.

To configure actions for the script runner processor:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, click **Actions**.

A list of actions appears. For example:

**Juniper NETWORKS**

VTA Configuration Manager *Edit Configuration*

- ▶ Home
- ▶ Dir Connection
- ▼ Configuration
  - ▶ Create
  - ▶ **Edit**
  - ▶ Load
  - ▶ Commit
  - ▶ Import
  - ▶ Export

### Current Configuration

Event Handlers **Actions** Processors

#### Quota VTA Actions

<a href="#">GetAccountBalances</a>	Delete
<a href="#">CalcUsage</a>	Delete
<a href="#">DebitAccounts</a>	Delete
<a href="#">CalculateInterim</a>	Delete
<a href="#">SetInterim</a>	Delete
<a href="#">StopQuotaService</a>	Delete
<a href="#">StartQuotaLocalService</a>	Delete
<a href="#">StartQuotaInternetService</a>	Delete
<a href="#">TerminateSession</a>	Delete

New Quota VTA Actions

Create

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- To add an action, enter a name for the action in the New Quota VTA Actions field, and click **Create**.

The action configuration screen appears.

RunJavaScript					
Name	Value				
Processor	ScriptRunner				
Function					
Parameter	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> </tr> </thead> <tbody> <tr> <td colspan="2">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content	Add Parameter	
Parameter Name	Parameter Content				
Add Parameter					
Abort On Error	<div> <input type="checkbox"/> <input type="button" value="Disable"/> </div>				
<input type="button" value="Save"/>					

4. Select ScriptRunner in the Processor field, and click **Save**. (If ScriptRunner does not appear in the drop-down list, enable the script runner processor.)

An expanded configuration screen for the action appears.

RunJavaScript											
Name	Value										
Processor	ScriptRunner										
Function	ExecJavaScript										
Parameter	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td> <input type="button" value="Delete"/> <input type="button" value="Disable"/> </td> </tr> <tr> <td colspan="3">Add Parameter</td> </tr> </tbody> </table>		Parameter Name	Parameter Content				<input type="button" value="Delete"/> <input type="button" value="Disable"/>	Add Parameter		
Parameter Name	Parameter Content										
		<input type="button" value="Delete"/> <input type="button" value="Disable"/>									
Add Parameter											
Abort On Error	<div> <input type="checkbox"/> <input type="button" value="Disable"/> </div>										

5. Fill in the fields described in this section.

- Related Documentation**
- Configuring the SRC VTA to Run Scripts on page 145
  - Configuring JavaScript Programs on page 145
  - Configuring External Scripts on page 149

## RunJavaScript Fields

### Processor



- Processor for which you are configuring the action.
- Value—ScriptRunner (If ScriptRunner does not appear in the drop-down list, enable the script runner processor.)
- Default—No value

***Function***

- Function calls that the script runner processor invokes.
- Value
  - ExecExtScript—Runs an external script defined in the processor. It provides any defined ReturnAttribute attribute for the corresponding script as output by adding the attribute to the event.
  - ExecJavaScript—Runs a JavaScript defined in the processor. It provides any defined ReturnAttribute attribute for the corresponding script as output by adding the attribute to the event.
- Default—No value

***Parameter Name***

- Parameters to pass to the processor.
- Value
  - For external scripts:
    - ScriptName—Name of the script
    - Parameters that you declared in the script
  - For JavaScripts:
    - ScriptName—Name of the script

***Parameter Content***

- Parameter values to pass to the processor.
- Value
  - For ScriptName parameters—Name of the script
  - For other parameters—Values of parameters that you declared in the script

***Abort On Error***

- Disables or enables and sets the processing in response to an error.
- Value
  - Break—Stop processing the current event.
  - Continue—Continue with the next action, if any, in the same event handler.

- Next Event Handler—Continue with the next event handler (if any).
- Default—No value


## Configuring Events

---

To configure events:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Select **Event Handlers**.

A list of configured events appears. For example:



VTA Configuration Manager
Edit Configuration

- Home
- Dir Connection
- Configuration
  - Create
  - Edit
  - Load
  - Commit
  - Import
  - Export

### Current Configuration

Event Handlers
Actions
Processors


Quota VTA Events and Handlers

[Available Events](#)

Name	Value	
ACCOUNTUPDATE		Delete
CALLBACK(TERMINATESSESSION)		Delete
SERVICEINTERIM(QuotaInternet)		Delete
SERVICEINTERIM(QuotaLocal)		Delete
SERVICESTART(QuotaInternet)		Delete
SERVICESTART(QuotaLocal)		Delete
SERVICESTOP(QuotaInternet)		Delete
SERVICESTOP(QuotaLocal)		Delete
USERINTERIM		Delete
USERSTART		Delete
USERSTOP		Delete

Add Event

Save



3. Click **Add Event**.

A blank field appears at the top of the event list.

4. Fill in the Value box, and then click **Save**.

**Related  
Documentation**

- How the SRC VTA Works on page 68
- Configuring Event Handlers on page 158
- Event Handler Fields on page 162
- Example of a Bucket VTA on page 195

## Available Events Field

**Value**

- Value of the event.
- Value
  - ACCOUNTUPDATE—Database update event
  - CALLBACK(<callId>)—External callback event for the specified call
  - SERVICEINTERIM(<serviceName>)—Service interim—tracking event for the specified service
  - SERVICESTART(<serviceName>)—Service start—tracking event for the specified service
  - SERVICESTOP(<serviceName>)—Service stop—tracking event for the specified service
  - USERINTERIM—User interim—tracking event
  - USERSTART—User start—tracking event
  - USERSTOP—User stop—tracking event
- Example—SERVICESTART(QuotaInternet), CALLBACK(TERMINATESESSION)

## Configuring Event Handlers

---

Event handlers are defined by events, condition, priority, and actions. When an event is received, the corresponding event type and condition of the handler are evaluated based on the priority. When a condition is met, the corresponding actions are performed according to the event attributes. The action can update or add event attributes to the events for subsequent processing of the same event. An action invokes a function provided by a processor and must provide the parameters required by that function. After an event handler has completed its processing, event processing continues with the next applicable event handler.

To configure event handlers:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Select **Current Event Handlers**.

A list of configured event handlers appears. For example:

The screenshot displays the Juniper VTA Configuration Manager web interface. The top header features the Juniper Networks logo and the text 'VTA Configuration Manager' with a 'Edit Configuration' link. A left-hand navigation pane lists options: Home, Dir Connection, Configuration (selected), Create, Edit (highlighted), Load, Commit, Import, and Export. The main content area is titled 'Current Configuration' and includes tabs for 'Event Handlers' (selected), 'Actions', and 'Processors'. Below the tabs, the text 'Quota VTA Events and Handlers' is followed by a link to 'Current Event Handlers'. A table lists ten event handlers, each with a 'Delete' button. At the bottom of the table is a 'New Event Handler' section with a text input field and a 'Create' button. The footer contains the Juniper logo and copyright information.


Current Configuration	
<a href="#">Event Handlers</a>   <a href="#">Actions</a>   <a href="#">Processors</a>	
Quota VTA Events and Handlers	
<a href="#">Current Event Handlers</a>	
Event Handler	
<a href="#">GetBucket</a>	<button>Delete</button>
<a href="#">RefillBucketWithBehavingRate</a>	<button>Delete</button>
<a href="#">RefillBucketWithMisbehavingRate</a>	<button>Delete</button>
<a href="#">StartBehavingOnUserStart</a>	<button>Delete</button>
<a href="#">StartMisbehavingOnUserStart</a>	<button>Delete</button>
<a href="#">UpdateBehavingUsage</a>	<button>Delete</button>
<a href="#">UpdateMisbehavingUsage</a>	<button>Delete</button>
<a href="#">ToBehaving</a>	<button>Delete</button>
<a href="#">ToMisbehaving</a>	<button>Delete</button>
New Event Handler <input type="text"/> <input type="button" value="Create"/>	

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You can create, delete, or modify event handlers.

- To add an event handler, enter a name for the action in the New Event Handler box, and click **Create**.
- To delete an event handler, click **Delete** next to the event handler that you want to delete.
- To modify an event handler, select the event handler that you want to modify.

If you create or modify an event handler, the event handler configuration screen appears. For example:



VTA Configuration Manager
Edit Configuration

- Home
- Dir Connection
- Configuration
  - Create
  - Edit
  - Load
  - Commit
  - Import
  - Export

### Current Configuration

[Event Handlers](#)
[Actions](#)
[Processors](#)

Quota VTA Events and Handlers


[Current Event Handlers](#)

Event Handler

<a href="#">GetQuota</a>	Delete
<a href="#">RecordUsage</a>	Delete
<a href="#">SetInterim</a>	Delete
<a href="#">NoQuota</a>	Delete

QuotaRefilled

Name	Value
Priority	333
Events	<div> ACCOUNTUPDATE  CALLBACK(TERMINATESESSION)  SERVICEINTERIM(QuotaInternet)  SERVICEINTERIM(QuotaLocal)  SERVICESTART(QuotaInternet) </div>
Condition	<div> var newBalance=&lt;balance_BoughtQuota&gt;+&lt;balance_PeriodicQu  if(&lt;old_balance_PeriodicQuota&gt;==null) &lt;old_balance_Perio  if(&lt;old_balance_BoughtQuota&gt;==null) &lt;old_balance_BoughtQ  return &lt;old_balance_PeriodicQuota&gt;+&lt;old_balance_BoughtQu </div> <div>Disable</div>
Actions	<div> <div> <div>Available Actions</div> <div> CalculateInterim  CalcUsage  DebitAccounts  GetAccountBalances  SetInterim </div> </div> <div> Add &gt;&gt;  &lt;&lt; Remove </div> <div> <div>Selected Actions</div> <div> StartQuotaInternetService  StartQuotaLocalService </div> </div> </div> <div>Save</div>
<a href="#">EndofBilling</a>	Delete
New Event Handler <div>Create</div>	



- Related Documentation**
- How the SRC VTA Works on page 68
  - Configuring Events on page 156
  - Event Handler Fields on page 162
  - Example of a Bucket VTA on page 195

## Event Handler Fields

In VTA Configuration Manager, you can edit the following fields in the Event Handler screen.

### *Priority*

- Priority for evaluating and running this event handler.
- Value—Integer in the range 1–1000; the smaller number has the higher priority
- Default—No value

### *Events*

- List of events.
- Value—Select from the list of configured events. Use the Ctrl or Shift keys to select multiple events.
- Default—No value

### *Condition*

- Condition that the event handler evaluates to determine whether the event handler should handle the event.
- Value—You can specify the condition as a formula, as a JavaScript program, or as one of the following values returned by the JavaScript program:
  - true—Event handler should handle the event.
  - false—Event handler should not handle the event.
- Guidelines—If no condition is specified, true is returned as the value. If a referenced attribute does not exist in the event, the referenced attribute's value is null.
- Default—true
- Example—The following example is a condition that must be met to refill a quota:

```
var newBalance=<balance_BoughtQuota>+<balance_PeriodicQuota>;
if(<old_balance_PeriodicQuota>==null)
  <old_balance_PeriodicQuota>=<balance_PeriodicQuota>;
if(<old_balance_BoughtQuota>==null)
  <old_balance_BoughtQuota>=<balance_BoughtQuota>;
return
  <old_balance_PeriodicQuota>+<old_balance_BoughtQuota><=0&&newBalance>0;
```



### Actions

- Actions that the event handler performs in response to an event.
- Value—Use the Add and Remove buttons to create a list of selected actions. Multiple actions are performed in the order specified in the list.
- Default—No value

## Configuring Identifiers for Subscribers and Sessions

To configure identifiers for subscribers and sessions:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Select **Subscriber ID and Lookup**.

The Subscriber ID and Lookup screen appears.

**Juniper NETWORKS**

VTA Configuration Manager *Edit Configuration*

Home  
Dir Connection  
Configuration  
  Create  
  Edit  
  Load  
  Commit  
  Import  
  Export

### Current Configuration

Name	Value
VTA Subscriber ID	LOGIN_NAME
VTA NicProxy Namespace	/NicProxies/IdToSaeNicProxy
SAE Subscriber Lookup	USER_IP_ADDRESS

Save

**Juniper yourNet**

3. Edit or accept the default values for the fields, and click **Save**.  
See “Subscriber ID and Lookup Fields” on page 164.
4. If you are finished configuring the SRC VTA, save the configuration to a directory or local file.

See “Committing a VTA Configuration to a Directory” on page 177.

For more information about this topic, see “Identifying Subscribers, SAEs, and Sessions” on page 74.

**Related  
Documentation**

- Overview of the SRC VTA on page 65
- Using One VTA Account for Multiple Subscriber Sessions on page 165
- Automatic Login of Subscribers on page 182

## Subscriber ID and Lookup Fields

In VTA Configuration Manager, you can edit the following fields in the Subscriber ID and Lookup screen.

### *VTA Subscriber ID*

- Data key that identifies subscriber accounts and sessions in the VTA database. Some settings also provide information that the NIC and the SAE use to identify subscribers. For more information, see Table 10 on page 76.
- Value—One of the following data keys:
  - LOGIN\_NAME— Login name (JUNOSe routers only), which is the data key for the VTA database, the NIC, and the SAE
  - USER\_DN—Subscriber DN, which is the data key for the VTA database, the NIC, and the SAE
  - INTERFACE\_NAME@ROUTER\_NAME—Interface name and virtual router
    - Provides the ROUTER\_NAME data key for NIC
    - Provides the INTERFACE\_NAME data key for SAE
  - INTERFACE\_ALIAS—Interface alias
  - INTERFACE\_ALIAS@ROUTER\_NAME—Interface alias and virtual router
  - USER\_MAC\_ADDRESS—Subscriber MAC address
  - PRIMARY\_USER\_NAME—Primary login name
  - PORT\_ID@ROUTER\_NAME —NAS port ID and virtual router (JUNOSe router only)
  - ACCOUNTING\_ID—Accounting ID, which is the data key for the VTA database and the NIC. The NIC uses ACCOUNTING\_ID to look up the SAE, and it returns SAE

references and subscriber IP address. The SRC VTA uses the returned IP address as the SAE data key.

- Guidelines—LOGIN\_NAME, USER\_DN, and INTERFACE\_NAME@ROUTER\_NAME also provide data keys for the NIC and the SAE; the other settings do not.
- Default—LOGIN\_NAME

#### ***VTA NicProxy Namespace***

- If you are using a NIC to map subscriber identifiers to an SAE, and you select a VTA subscriber ID value that provides a data key for the NIC, specify the NIC proxy that uses that data key.
- Value—Location of the NIC proxy configuration relative to the configuration properties for the SRC VTA.
- Guidelines—To cause the NIC to look up the SAE using the accounting ID, configure */NicProxies/AcctIdToSaeNicProxy*.
- Default—*/Nic/Proxies/IdToSaeNicProxy*

#### ***SAE Subscriber Lookup***

- Data key that uniquely identifies the subscriber in your SRC configuration. The SRC VTA uses this data key to identify a subscriber session or service session when it receives a plug-in event. For more information, see Table 11 on page 77.
- Value—One of the following data keys:
  - USER\_IP\_ADDRESS—Subscriber IP address (JUNOSe routers only)
  - USER\_DN—Subscriber DN
  - LOGIN\_NAME —Login name (JUNOSe router only)
  - INTERFACE\_NAME@ROUTER\_NAME—Interface name and virtual router
  - PRIMARY\_USER\_NAME—Primary login name
- Default—Subscriber IP address

---

### **Using One VTA Account for Multiple Subscriber Sessions**

The SRC VTA allows multiple subscriber sessions to share the same VTA account. The SRC VTA debits usage from all the subscriber sessions from the account. When the account is empty, service sessions for all subscribers are stopped. When the account is refilled, the SRC VTA starts services for all subscriber sessions that share the account.

To use this feature, you use the subscriberId event attribute to map a group of subscribers to the VTA account. You then use the ACCOUNTING\_ID plug-in attribute as the VTA subscriber ID. You also set up the NIC to use the accounting ID to look up the SAE that manages a subscriber.

To set up the SRC software to use one VTA account for multiple subscribers:

1. In the subscriber classifier script, assign a value to the accountingUserId attribute. For example, you could assign it to the userName, interfaceName, loginName, or a combination of classification criteria. The purpose of the assignment is to allow the SRC VTA to identify subscribers by many different subscriber attributes using accountingUserId as a wrapper.

For example, the following subscriber classifier script assigns the value of the userName to the accountingUserId attribute:

```
[<-retailerDn->?accountingUserId=<-userName->?sub?(uniqueID=<-userName->)]
```

2. Configure the SAE to publish the PA\_ACCOUNTING\_ID plug-in attribute in subscriber tracking events to the NIC SAE agent plug-in.

See *Configuring Internal Plug-Ins (SRC CLI)*.

3. Configure the NIC to use the OnePopAcctId NIC scenario.

See *Configuring the NIC (SRC CLI)*.

4. In VTA Configuration Manager, configure the following in the Subscriber ID and Lookup screen:

- In the VTA Subscriber ID box, enter ACCOUNTING\_ID.
- In the VTA NicProxy Namespace field, enter */NicProxies/AcctIdToSaeNicProxy*, which causes the NIC to look up the SAE using the accounting ID.

See “Configuring Identifiers for Subscribers and Sessions” on page 163.

5. If you are using the VTA portals to manage subscriber accounts, configure the following property in the CONSTANTS.incl file:

```
NIC_PROXY_NAMESPACE=/NicProxies/IpToAcctIdNicProxy
```

See “Managing Subscriber Accounts with the Administrator Portal” on page 186.

6. (Optional) Set up an action for the SAE proxy processor to apply functions to all subscriber sessions that share the same VTA account. For example, the following action starts services for all subscriber sessions that have the same subscriber ID.

ApplyToSubscribers		
Name	Value	
Processor	SAEProxy ▼	
Function	StartService	
Parameter ⓘ	Parameter Name	Parameter Content
	CurrentSubscriberOnly	false
	<div> Delete Disable </div>	
<div>Add Parameter</div>		
Abort On Error	<div> ▼ Disable </div>	
<div>Save</div>		

#### Related Documentation

- Overview of the SRC VTA on page 65
- Managing VTA Accounts and Sessions on page 75
- Managing Subscriber Sessions and Service Sessions on page 76
- Configuring Subscribers and Subscriptions to VTA Services on page 91
- Configuring the SRC VTA to Manage Subscriber Accounts on page 117

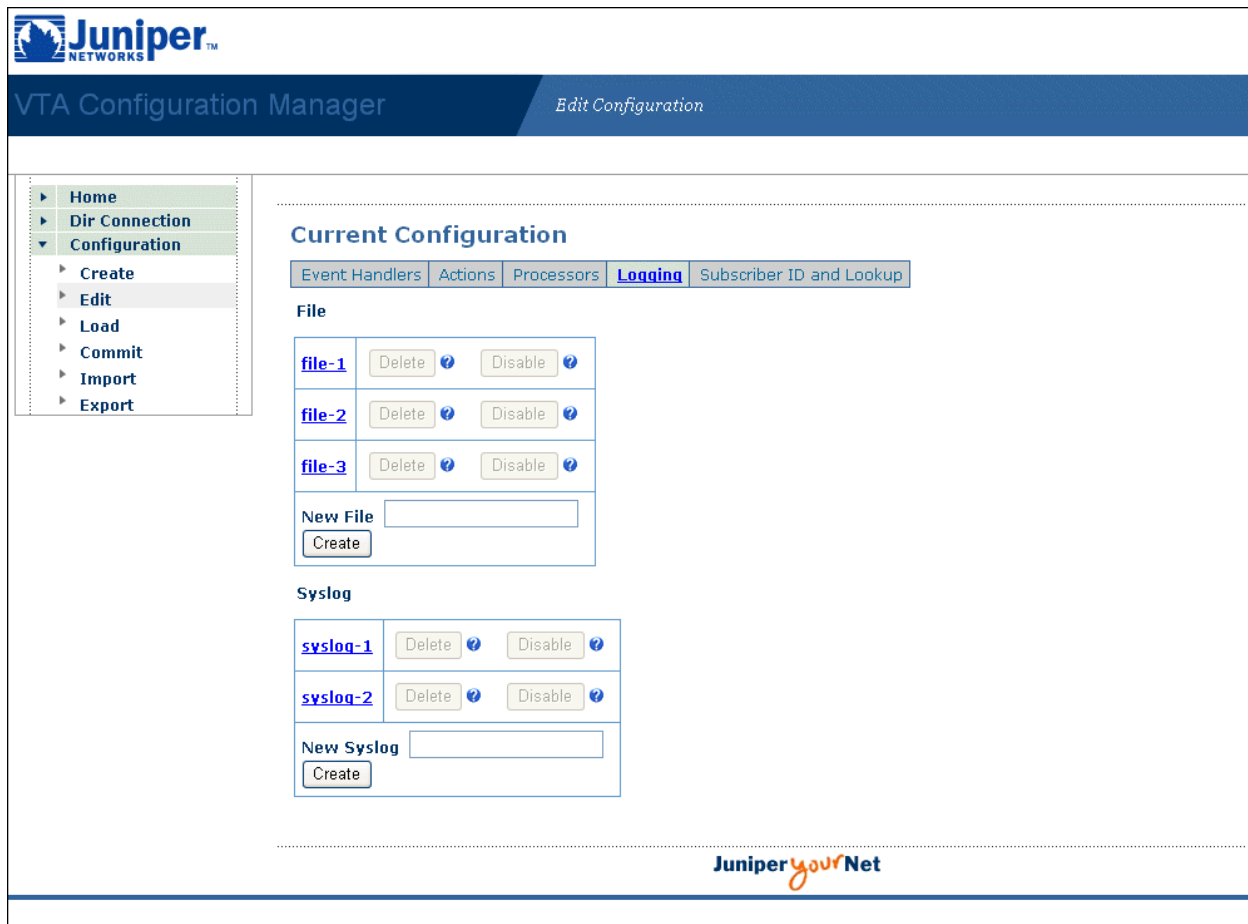
## Logging Event Messages for the SRC VTA

The SRC VTA generates event messages that you can save in logs—either by writing the messages to text files or by using the system log (syslog) facilities.

To access the logging configuration:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, select **Logging**.

The current File and Syslog configurations appear.



3. You can now configure a text file or syslog configuration. See:
  - “Logging Events Messages to a Text File” on page 168.
  - “Logging Events Messages to a System Logging Server” on page 173.

#### Related Documentation

- How the SRC VTA Works on page 68
- File Logging Fields on page 170
- System Logging Fields on page 174
- Example of a Bucket VTA on page 195

## Logging Events Messages to a Text File

To set up the SRC VTA to save event messages in text files:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
2. Under Current Configuration, select **Logging**.

3. In the File section, select a file logging configuration to modify, or type a new file name in the New File box, and click **Create**.

The current file logging configuration appears.

## Current Configuration

Event Handlers	Actions	Processors	<b>Logging</b>	Subscriber ID and Lookup
----------------	---------	------------	----------------	--------------------------

### File

file-1	
Name	Value
Filter	/debug-
File Name	vta_debug.log
Maximum File Size	1000000 <input type="button" value="Enable"/>
Rollover File Name	vta_debug.alt
<input type="button" value="Save"/>	
<a href="#">file-2</a>	<input type="button" value="Delete"/> <input type="button" value="Disable"/>
<a href="#">file-3</a>	<input type="button" value="Delete"/> <input type="button" value="Disable"/>
New File	<input type="text"/>
<input type="button" value="Create"/>	

4. Edit the file logging fields.  
See "File Logging Fields" on page 170 .
5. If you are finished configuring the SRC VTA, save the configuration to a directory or local file.  
See "Committing a VTA Configuration to a Directory" on page 177 .

### Related Documentation

- Logging Event Messages for the SRC VTA on page 167
- Logging Events Messages to a System Logging Server on page 173
- System Logging Fields on page 174
- Example of a Bucket VTA on page 195

## File Logging Fields

In VTA Configuration Manager, you can modify the following fields in the File section of the Logging screen.

### Filter

- Filter that determines the type of messages that this log file contains.
- Value—Expression. The software filters events by evaluating each subexpression from left to right. When the software finds a match, it logs or ignores the message accordingly. You can specify an unlimited number of subexpressions. The order in which you specify the subexpressions affects the result. Expressions have the format:

singlematch [,singlematch]

where

singlematch—[!] ( <category> | ([<category>]/[<severity>] |  
[<minimumSeverity>]-[<maximumSeverity>] ))

- !—Do not log matching events
- <category>—SRC component that generated the event message. To log only events in a specific category, you can define the category, which is a text string that matches the name of a category. The text string is not case sensitive. For the names of categories, view a log file for a default filter. Juniper Networks Technical Assistance Center (JTAC) can also provide category names.
- [<severity>] | [<minimumSeverity>]-[<maximumSeverity>] —Name or number in the range 1–127. A higher number indicates a higher severity level. Table 16 on page 170 shows common severity levels that you can specify by name.

**Table 16: Named Severity Levels**

Name	Severity Level
logmin	1
debug	10
info	20
notice	30
warning	40
error	50
crit	60
alert	70



Table 16: Named Severity Levels (*continued*)

Name	Severity Level
emerg	80
panic	90
logmax	127

Enabling debug log messages has a negative affect on system performance. Do not enable debug log messages unless JTAC instructs you to do so.

You can define a severity level as follows:

- Specify an explicit severity. For example:  
warning—Defines only warning messages
- Specify a minimum severity and a maximum severity. For example:  
info-warning—Defines messages of minimum severity level of info and a maximum severity level of warning
- Accept the default minimum (logmin) or maximum (logmax) severity by omitting the minimum or maximum severity. For example:  
info—Defines messages of minimum severity level info and maximum severity level logmax

-warning—Defines messages of minimum severity level logmin and maximum severity level warning

- Specify no severity to log all event messages.
- Default—No value
- Example—Table 17 on page 172 shows some examples of filters.

**Table 17: Examples of Filters for Event Messages**

Syntax	Event Messages Saved
/	All event messages
/info-	Event messages of level info and above from all categories
vta/debug	Debug events from the VTA category only
!vta,/debug	All debug events except those from the VTA category
!VtaMsg/info-,vtaMsg,vta	All messages from the VTA category, except those from VtaMsg category with level less than info

### **Filename**

- Filename that contains the current logs.
- Value—Path and filename of the current log file in the format:  
<pathname>/<filename.log>
- Guidelines—Make sure you have write access to the folder.
- Default—By default, SRC components and applications write log files in the folder where the application is started. If you are using the version of JBoss packaged with the SRC software, the pathname is */opt/UMC/jboss/server/default/log/*.
- Example—*/opt/UMC/jboss/server/default/log/vta\_debug.log*

### **Maximum File Size**

- Disables or enables and sets the maximum size of the log file and the rollover file.
- Value—Number of kilobytes in the range 0–4294967295
- Guidelines—Do not set the maximum file size to a value greater than the available disk space.
- Default—1000000

### **Rollover Filename**

- Path and filename of the rollover log file. When the log file reaches the maximum size, the software closes the log file and renames it with the name you specify for the rollover file. If a previous rollover file exists, the software overwrites it. The software then reopens the log file and continues to save event messages in it.
- Value—Path and filename of the rollover log file in the format <pathname>/<filename.alt>
- Default—No value
- Example—vta\_debug.alt

## Logging Events Messages to a System Logging Server

To configure the SRC VTA to save event messages on a system logging server:

1. In the VTA Configuration Manager navigation pane, select **Edit**.
  2. Under Current Configuration, select **Logging**.
- The current logging configuration appears.
3. To add a system log configuration, enter a name for the configuration in the New Syslog box, and click **Create**.

The Syslog configuration screen appears.

### Current Configuration

Event Handlers	Actions	Processors	Logging	Subscriber ID and Lookup
<b>Syslog</b>				
<b>syslog-1</b>				
<b>Name</b>		<b>Value</b>		
<b>Filter</b>		/error- <span>Enable</span>		
<b>Syslog Host</b>		loghost		
<b>Syslog Facility</b>		<div> <div></div> <div></div> <div></div> </div> <span>Disable</span> <span>?</span>		
<span>Save</span>				
<b>syslog-2</b>		<span>Delete</span> <span>?</span> <span>Disable</span> <span>?</span>		
<b>New Syslog</b>		<input type="text"/>		
<span>Create</span>				

4. Edit the fields.

See “System Logging Fields” on page 174.

5. If you are finished configuring the SRC VTA, save the configuration to a directory or local file.

See “Committing a VTA Configuration to a Directory” on page 177.

#### Related Documentation

- Logging Event Messages for the SRC VTA on page 167
- Logging Events Messages to a Text File on page 168
- File Logging Fields on page 170
- Example of a Bucket VTA on page 195

## System Logging Fields

In VTA Configuration Manager, you can edit the following fields in the syslog section of the Logging screen.

#### Filter

- Filter that determines the type of messages that this log file contains.
- Value—Expression. The software filters events by evaluating each subexpression from left to right. When the software finds a match, it logs or ignores the message accordingly. You can specify an unlimited number of subexpressions. The order in which you specify the subexpressions affects the result. Expressions have the format:

singlematch [,singlematch]

where

singlematch—[!] ( <category> | ([<category>]/[<severity>] | [<minimumSeverity>]-[<maximumSeverity>] ))

- !—Do not log matching events
- <category>—SRC component that generated the event message. To log only events in a specific category, you can define the category, which is a text string that matches the name of a category. The text string is not case sensitive. For the names of categories, view a log file for a default filter. Juniper Networks Technical Assistance Center (JTAC) can also provide category names.
- [<severity>] | [<minimumSeverity>]-[<maximumSeverity>] —Name or number in the range 1–127. A higher number indicates a higher severity level. Table 18 on page 174 shows common severity levels that you can specify by name.

**Table 18: Named Severity Levels**

Name	Severity Level
logmin	1
debug	10

Table 18: Named Severity Levels (*continued*)

Name	Severity Level
info	20
notice	30
warning	40
error	50
crit	60
alert	70
emerg	80
panic	90
logmax	127

Enabling debug log messages has a negative affect on system performance. Do not enable debug log messages unless JTAC instructs you to do so.

You can define a severity level as follows:

- Specify an explicit severity. For example:  
warning—Defines only warning messages
- Specify a minimum severity and a maximum severity. For example:  
info-warning—Defines messages of minimum severity level of info and a maximum severity level of warning
- Accept the default minimum (logmin) or maximum (logmax) severity by omitting the minimum or maximum severity. For example:  
info—Defines messages of minimum severity level info and maximum severity level logmax

-warning—Defines messages of minimum severity level logmin and maximum severity level warning

- Specify no severity to log all event messages.
- Guidelines—This field is mandatory.
- Default—No value
- Example—Table 19 on page 176 shows some examples of filters.

**Table 19: Examples of Filters for Event Messages**

Syntax	Event Messages Saved
/	All event messages
/info-	Event messages of level info and above from all categories
vta/debug	Debug events from the VTA category only
!vta,/debug	All debug events except those from the VTA category
!VtaMsg/info-,vtaMsg,vta	All messages from the VTA category, except those from VtaMsg category with level less than info

### **Syslog Host**

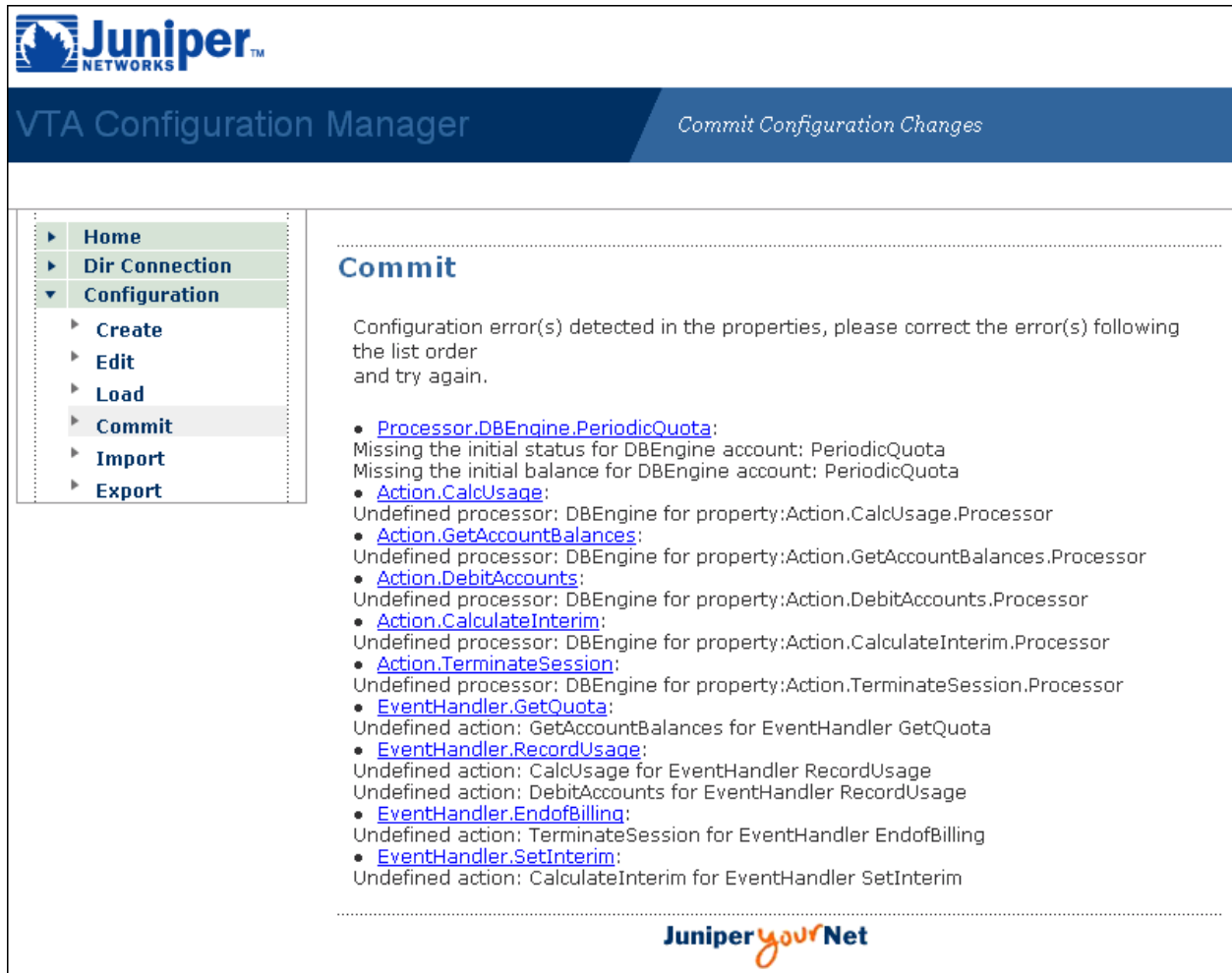
- IP address or name of a host that collects event messages with a standard system logging daemon.
- Value—IP address or text string
- Default—No value

### **Syslog Facility**

- Type of system log in accordance with the system logging protocol.
- Value—Integer in the range 0–23; each integer corresponds to the standard number for a system logging client. See The syslog Protocol—draft-ietf-syslog-protocol-16.txt (July 2006 expiration).
- Default—No value

## **Validating VTA Configurations**

When you commit a configuration to a directory or export the configuration to a file, VTA Configuration Manager validates the VTA configuration. If there are errors in the configuration, a screen detailing the errors and containing links to configuration objects that failed validation appears. For example:



The screenshot shows the Juniper VTA Configuration Manager interface. The top navigation bar includes the Juniper Networks logo and the title "VTA Configuration Manager". A secondary bar on the right says "Commit Configuration Changes". On the left, a sidebar menu lists options: Home, Dir Connection, Configuration (expanded), Create, Edit, Load, Commit (highlighted), Import, and Export. The main content area is titled "Commit" and displays a message: "Configuration error(s) detected in the properties, please correct the error(s) following the list order and try again." Below this, a list of errors is shown, each preceded by a bullet point and a link to the specific configuration property. The errors include missing initial status and balance for DBEngine accounts, undefined processors for various actions, and undefined actions for event handlers. At the bottom right of the main content area is the "Juniper yourNet" logo.

If you click on a link, the VTA Configuration Manager displays the page that contains the error and lists errors for that page at the bottom of the screen.

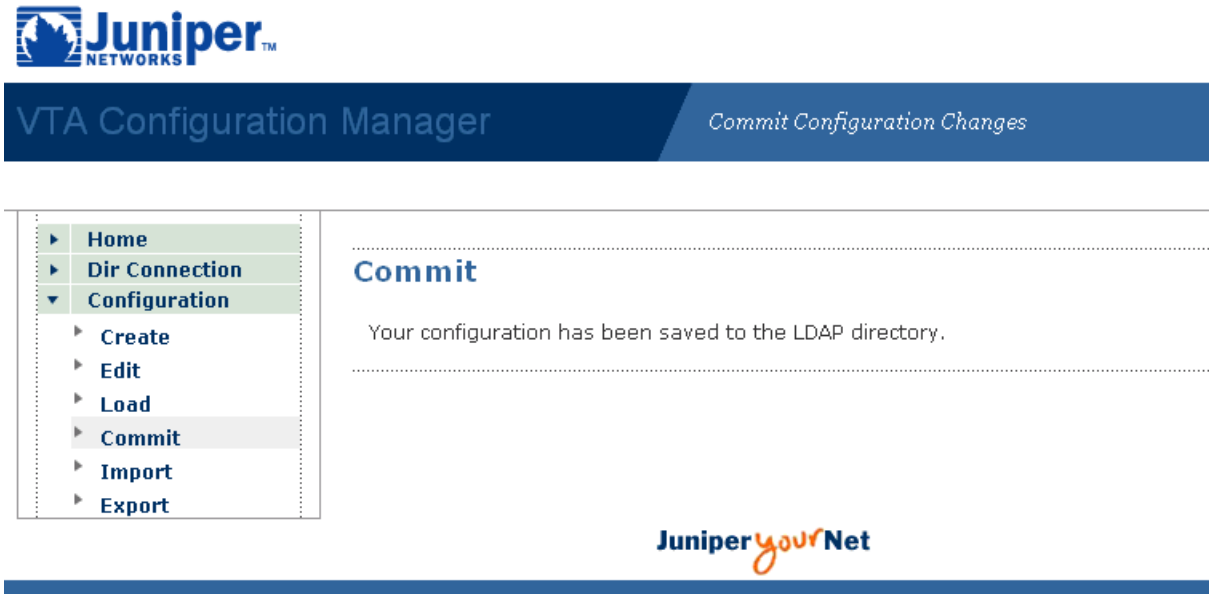
#### Related Documentation

- Overview of the SRC VTA on page 65
- Installing the SRC VTA and Running the Configuration Script on page 82
- Accessing the VTA Configuration on page 112
- Testing the VTA Configuration on page 189
- Committing a VTA Configuration to a Directory on page 177

## Committing a VTA Configuration to a Directory

Before you commit your VTA configuration to a directory, you need to connect to the directory and specify the name and location of your configuration in the Configuration Namespace field of the Connecting to the Directory page. See "Loading a Configuration from a Directory" on page 108.

To commit your VTA configuration to a directory, in the navigation pane, select **Commit**. The software copies your configuration to the directory and the Commit page.



- Related Documentation**
- Loading and Importing VTA Configurations on page 107
  - Importing a VTA Configuration from a Local File on page 111
  - Exporting a VTA Configuration to a Local File on page 178
  - Specifying How the SRC VTA Loads Configurations from the Directory on page 93

## Exporting a VTA Configuration to a Local File

To export a VTA configuration to a local file:

1. In the VTA Configuration Manager navigation pane, select **Export**.  
The Export The Current Configuration page appears.





## VTA Configuration Manager

Export Configuration

▶	Home
▶	Dir Connection
▼	Configuration
▶	Create
▶	Edit
▶	Load
▶	Commit
▶	Import
▶	Export

**Export The Current Configuration:**

To save the configuration, please click the right button of the mouse on the link [here](#).

2. Right-click the word **here**, and then use your browser to save the file.

**Related Documentation**

- Accessing the VTA Configuration on page 112
- Loading and Importing VTA Configurations on page 107
- Loading a Configuration from a Directory on page 108
- Importing a VTA Configuration from a Local File on page 111
- Committing a VTA Configuration to a Directory on page 177



## CHAPTER 8

# Managing Subscriber Accounts with VTA Portals

- Overview of Managing Subscriber Accounts with VTA Portals on page 181
- Automatic Login of Subscribers on page 182
- Configuring Web Applications for the SRC VTA on page 182
- Managing Subscriber Accounts with the Administrator Portal on page 186
- Accessing the Administrator Portal on page 186
- Viewing Subscriber Accounts on page 187
- Replenishing Periodic Accounts on page 188
- Deleting Information from the VTA's Database on page 188
- Testing the VTA Configuration on page 189
- Allowing Subscribers to Manage Their Accounts with the Subscriber Portal on page 189
- Accessing the Subscriber Portal on page 190
- Viewing Information About the Account on page 191
- Purchasing a Periodic Account on page 191
- Suspending a Periodic Account on page 192
- Purchasing Extra Bandwidth on page 193

## Overview of Managing Subscriber Accounts with VTA Portals

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We provide two sample portals that manage subscriber accounts. One is an administrator portal that administrators can use to manage VTA subscriber accounts. The second is a subscriber portal that subscribers can use to manage their own accounts. Before you can use these portals, you need to configure the Web applications for the SRC VTA (see “Configuring Web Applications for the SRC VTA” on page 182).

The sample portals run inside the J2EE application server and use the VTA core's NIC proxy.

To customize the portals to operate outside the VTA's J2EE application server, you must:

- Develop a way to connect them to the VTA's remote account and session manager interfaces.

- If the software automatically logs in subscribers with their current IP addresses (JUNOS only), configure NIC proxies for the client (see “Configuring NIC Proxies for the VTA” on page 102).

## Automatic Login of Subscribers

---

By using a NIC with the SRC VTA, you can enable subscribers who connect to the SRC network through a JUNOS router to log in through the VTA Web portals. The NIC must map the subscriber’s IP address to one of the following values:

- Subscriber’s login name
- Subscriber’s DN
- Name of the interface and VR to which the subscriber connects

The value to which this NIC maps the subscriber’s IP address depends on the information that identifies subscribers in your SRC configuration.

If subscribers connect to the network through a router running JUNOS Software or you choose not to implement this NIC with a router running JUNOS Software, you can provide subscribers with access to this information through another method, such as a central login page where subscribers can enter their usernames and passwords.

### Related Documentation

- Locating the SAE That Manages a Subscriber for the SRC VTA on page 101
- Specifying Tracking Plug-Ins for Enterprise Subscribers on JUNOS Routing Platforms on page 97
- Configuring Subscribers and Subscriptions to VTA Services on page 91
- Viewing Subscriber Accounts on page 187
- Accessing the Subscriber Portal on page 190

## Configuring Web Applications for the SRC VTA

---

To configure Web applications for the SRC VTA:

1. If you have not already done so, create a folder for the SRC VTA on a host, and copy the EAR file for the SRC VTA to the VTA folder.

```
mkdir vta
cp <file> /quotavta.ear vta
```

2. From the EAR file, extract the file *<vtaName>CustCare.war* into the folder you created.

```
cd vta
jar xvf quotavta.ear quotaCustCare.war
```

3. From the file *<vtaName>CustCare.war*, extract the file *CONSTANTS.incl*.

```
jar xvf quotaCustCare.war CONSTANTS.incl
```

4. Edit the properties in the file `CONSTANTS.incl`.

See “Properties for VTA Portals” on page 183 for a description of the properties in the `CONSTANTS.incl` file.

5. Replace the file `CONSTANTS.incl` into the file `<vtaName>CustCare.war`.

```
jar uvf quotaCustCare.war CONSTANTS.incl
```

6. Replace the file `<vtaName>CustCare.war` into the EAR file.

```
jar uvf quotavta.ear quotaCustCare.war
```

#### Related Documentation

- Installing SRC Web Applications on page 7
- Installing Web Applications Inside JBoss on page 7
- Managing Subscriber Accounts with the Administrator Portal on page 186

## Properties for VTA Portals

This section describes the properties in the `CONSTANTS.incl` file.

### ***PERIODIC\_QUOTA***

- Quota initially deposited into a subscriber's periodic account when the subscriber activates the account through the subscriber portal. This value must match the value that the administrator specifies when replenishing periodic accounts. (See “Replenishing Periodic Accounts” on page 188).
- Value—Integer in the range 1–9223372036854775807 followed by the letter L or calculation in Java code
- Default—50000000000L

### ***SUBSCRIBER\_ACTIVATE\_DESCRIPTION***

- Description recorded for a balance change in the periodic account when the subscriber activates the account through the subscriber portal. This description records the change in the account status; however, the actual change in the balance is zero.
- Value—Text string
- Default—Activated by subscriber

### ***PERIODIC\_QUOTA\_INITIAL\_TOP\_UP\_DESCRIPTION***

- Description recorded for a balance change in the periodic account when the subscriber activates the account through the subscriber's portal. This change in the balance is the value of the `PERIODIC_QUOTA` property.
- Value—Text string
- Default—Periodic replenishment to 5,000 MB

### ***SUBSCRIBER\_DEACTIVATE\_DESCRIPTION***

- Description for a balance change in the periodic account when the subscriber deactivates the account through the subscriber's portal. This description records the change in the account status; however, the actual change in the balance is zero. When the periodic account is inactive but the balance is nonzero, the SRC VTA continues to use the account until the administrator invalidates inactive accounts through the administrator's portal.
- Value—Text string
- Default—Deactivated by subscriber

***PERIODIC\_QUOTA\_INACTIVE\_TOP\_UP\_DESCRIPTION***

- Description for a balance change in inactive periodic accounts when the administrator replenishes periodic accounts through the administrator's portal. This action sets the balance of inactive periodic accounts to zero.
- Value—Text string
- Default—Expiration of deactivated periodic account's balance

***SUBSCRIBER\_PURCHASE\_DESCRIPTION***

- Description recorded for a balance change in the bought account when the subscriber buys bandwidth through the subscriber portal.
- Value—Text string
- Default—Subscriber purchased bandwidth

***NIC\_PROXY\_NAMESPACE***

- Namespace of the NIC proxy. This NIC proxy maps the subscriber's IP address to the identifier that the SRC VTA uses as the key to the subscriber's records in the VTA database.
- Value—Path, relative to the root of the static configuration properties, that defines where the NIC proxy configuration is stored.
- Guidelines—If you are using the accounting ID to identify the SAE that manages a subscriber, set this property to /NicProxies/AcctIdToSaeNicProxy
- Default—/NicProxies/IpToldNicProxy

***BOUGHT\_QUOTA\_ACCOUNT\_NAME***

- Name of account that stores bought quota.
- Value—Text string
- Guidelines—If you change this value from the default, you must also update the sample Quota VTA configuration to use the same account names and statuses.
- Default—BoughtQuota

***PERIODIC\_QUOTA\_ACCOUNT\_NAME***

- Name of account that stores periodic quota.
- Value—Text string
- Guidelines—If you change this value from the default, you must also update the sample Quota VTA configuration to use the same account names and statuses.
- Default—PeriodicQuota

***ACTIVE\_STATUS***

- Status string.
- Value—Text string
- Guidelines—If you change this value from the default, you must also update the sample Quota VTA configuration to use the same account names and statuses.
- Default—Active

***INACTIVE\_STATUS***

- Status string.
- Value—Text string
- Guidelines—If you change this value from the default, you must also update the sample Quota VTA configuration to use the same account names and statuses.
- Default—Inactive

***SSPORTAL\_SIGNIN\_URL***

- URL of the portal login page for the Quota VTA to authenticate users, primarily users with addresses that are assigned externally whose sessions are not detected automatically by the SAE.
- Value
  - <URL>—URL in the format "http://<server>:<port>/"

- null—Keyword not enclosed in quotation marks
- Guidelines—If the URL is specified, the SRC VTA redirects the subscriber to the portal login page when the SRC VTA cannot resolve a subscriber by IP address. If the value is null and the SRC VTA cannot resolve the subscriber by IP address, an unknown subscriber message appears.
- Default—null

---

## Managing Subscriber Accounts with the Administrator Portal

We provide a sample administrator portal for the Quota VTA that manages VTA subscriber accounts. You can use this portal to demonstrate and test the SRC VTA. In a production environment, you must integrate your customer interface with these portals. For more information, contact Juniper Networks Professional Services.

The sample portal is designed to be used with the Quota configuration example in the sample data. As a result, the portals expect the Periodic and Bought accounts.

### Related Documentation

- Overview of the SRC VTA on page 65
- Managing VTA Accounts and Sessions on page 75
- Configuring the SRC VTA to Manage Subscriber Accounts on page 117
- Accessing the Administrator Portal on page 186
- Viewing Subscriber Accounts on page 187

---

## Accessing the Administrator Portal

To access the sample administrator portal:

1. Enter the following URL in your Web browser.

**http://<host>:<port>/quotaCustCare/admin.jsp**

- <host>—IP address or name of the host on which you installed the SRC VTA
  - <port>—HTTP port for the J2EE application server.
2. When prompted, enter the username and password configured for the J2EE application server (see “Accessing the J2EE Application Server’s Client Libraries” on page 92).



**NOTE:** If you are using JBoss and ran the configuration script, the script creates the username admin and the password secret for demonstration purposes.

The administrator portal appears.



**Virneo**  
The network that keeps you surfing

Welcome administrator admin  
You are managing customer jane@virneo-quota.com.

Virneo Customer Care

Change Task

Please choose an administrative task.

### Manage a Customer

You can manage a specific customer, using the same web portal that is available to customers when they are connected to Virneo's network:

Customer login ID:

Manage Customer

### Top-up Periodic Accounts

You can top-up the balance of one or more customers' periodic accounts:

Increase periodic account balance to:  MB

For customers with login IDs:  
(separate IDs with spaces, tabs, newlines, carriage-returns, or form-feeds)

Optional description:

Top-up

### Purge Database

You can delete from the Volume Tracking Application's database all usage sessions and all account transactions and all customer accounts that were last modified before a specific date (the "purge date"):

Purge date:  August 8, 2003

Purge

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#### Related Documentation

- Configuring Web Applications for the SRC VTA on page 182
- Properties for VTA Portals on page 183
- Managing Subscriber Accounts with the Administrator Portal on page 186
- Allowing Subscribers to Manage Their Accounts with the Subscriber Portal on page 189

## Viewing Subscriber Accounts

**Purpose** To view a subscriber account:

1. On the administrator portal, click Manage a Customer.
2. In the Customer login ID box, enter the subscriber's login ID.
3. Click Manage Customer.

The subscriber portal appears. For information about using the subscriber's portal, see "Allowing Subscribers to Manage Their Accounts with the Subscriber Portal" on page 189.

**Related Documentation**

- Configuring the SRC VTA to Manage Subscriber Accounts on page 117
- Replenishing Periodic Accounts on page 188
- Viewing Information About the Account on page 191

---

## Replenishing Periodic Accounts

A periodic account is an account into which volume is periodically added to the subscriber's account. The periodic quota is tracked in the periodic account.

To replenish subscriber periodic accounts:

1. On the administrator portal, scroll to the Top-up Periodic Accounts area.
2. In the Increase periodic account balance to box, enter the value to which the customer's account should be replenished.
3. In the For customers with login IDs box, enter the login IDs of the subscribers whose accounts you wish to replenish.
4. (Optional) In the Optional description box, enter a summary of your action, which will appear in the subscriber accounts.
5. Click **Top-up**.

**Related Documentation**

- Purchasing a Periodic Account on page 191
- Suspending a Periodic Account on page 192
- Viewing Information About the Account on page 191
- Viewing Subscriber Accounts on page 187

---

## Deleting Information from the VTA's Database

To delete information about subscriber accounts, account transactions, and session histories:

1. On the administrator portal, scroll to the Purge Database area.
2. In the Purge date box, enter the date before which all data should be deleted from the database.
3. Click **Purge**.

**Related Documentation**

- Configuring a Database to Store Account and Session Data on page 86
- Configuring the SRC VTA to Manage Database Accounts on page 113

- Troubleshooting Database Deadlocks on page 90

## Testing the VTA Configuration

To test the VTA configuration:

1. On the administrator portal, scroll to the Test VTA Configuration area.
2. Click **Test** to generate a simulated event for testing.

The VTA Configuration Tester page appears.

3. Enter the subscriber ID and event type. The corresponding Web page for the specified event type appears.
4. Enter the event attributes to test, click **Send** to process the event in the Quota VTA, and print the results into VTA log files. You can also load an event from a file by selecting the file with **Browse** and clicking **Load**.
5. (Optional) Save the event created in the VTA Configuration Tester to a file by clicking **Save**.

### Related Documentation

- Validating VTA Configurations on page 176
- Installing the SRC VTA and Running the Configuration Script on page 82
- Installing VTA Configuration Manager on page 106
- Accessing the VTA Configuration on page 112
- Loading and Importing VTA Configurations on page 107
- Committing a VTA Configuration to a Directory on page 177

## Allowing Subscribers to Manage Their Accounts with the Subscriber Portal

We provide a sample subscriber portal for the Quota VTA that subscribers can use to manage their accounts. You can use this portal to demonstrate and test the SRC VTA.

In a production environment, you must integrate your customer interface with these portals. For more information, contact Juniper Networks Professional Services.

The sample portal is designed to be used with the Quota configuration example in the sample data. As a result, the portals expect the Periodic and Bought accounts.

The Quota VTA creates an account with zero balance and inactive status the first time that the subscriber logs in. Typically, you direct subscribers to the subscriber portal when they log in for the first time. The subscriber can activate the periodic account and buy bandwidth. Subscribers are billed according to the choices they make. When an administrator replenishes periodic accounts, the subscriber receives a new quota of bandwidth and is billed for that quota.

Subscribers can deactivate their periodic accounts. Subscribers who do so can use the balance of their periodic quotas before you replenish periodic accounts. At this time, inactive accounts expire, and their balances are set to zero. Subscribers can reactivate their accounts at any time and will be billed for the new periodic quota.

#### Related Documentation

- Overview of the SRC VTA on page 65
- Managing Subscriber Accounts with the Administrator Portal on page 186
- Accessing the Subscriber Portal on page 190
- Replenishing Periodic Accounts on page 188
- Example of a Bucket VTA on page 195

## Accessing the Subscriber Portal

To access the sample subscriber portal, enter the following URL in your Web browser:

<http://<host>:<port>/quotaCustCare/custcare.jsp>

- <host> is the IP address or name of the host on which you installed the SRC VTA.
- <port> is the HTTP port for the J2EE application server.

The subscriber portal appears.

Virneo  
The network that keeps you surfing

Welcome jane@virneo-quota.com

Virneo Customer Care

Navigation ▾ Balances ▾

Balances  
History  
Sessions  
Buy Bandwidth

Your account balances as of Mon Sep 08 16:11:56 EDT 2003:

Account	Status	Last Activity	Balance
BoughtQuota	Active	Thu Sep 04 16:32:42 EDT 2003	999.100 MB
PeriodicQuota	Inactive	Thu Sep 04 16:29:49 EDT 2003	0.000 MB

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- Related Documentation**
- Overview of the SRC VTA on page 65
  - Allowing Subscribers to Manage Their Accounts with the Subscriber Portal on page 189
  - Managing Subscriber Accounts with the Administrator Portal on page 186
  - Viewing Subscriber Accounts on page 187

## Viewing Information About the Account

**Purpose** View account balances, account history, or current sessions.

**Action** Click the appropriate button in the navigation area of the subscriber portal. The corresponding Web page appears.

The screenshot displays the Virneo Customer Care portal. At the top left is the Virneo logo with the tagline "The network that keeps you smiling". At the top right, it says "Welcome jane@virneo-quota.com". Below this is a blue header bar with "Virneo Customer Care". On the left is a navigation menu with "Navigation" and "History" tabs. The "History" tab is active, showing a table of account transactions. The table has columns for "Date", "Description", and "Balance Change". The transactions are for a "BoughtQuota Account" and a "PeriodicQuota Account". The "BoughtQuota Account" table shows a series of transactions from September 4, 2003, to September 8, 2003, with a final ending balance of 998.576 MB. The "PeriodicQuota Account" table shows a single transaction on September 4, 2003, with an ending balance of 0.000 MB.

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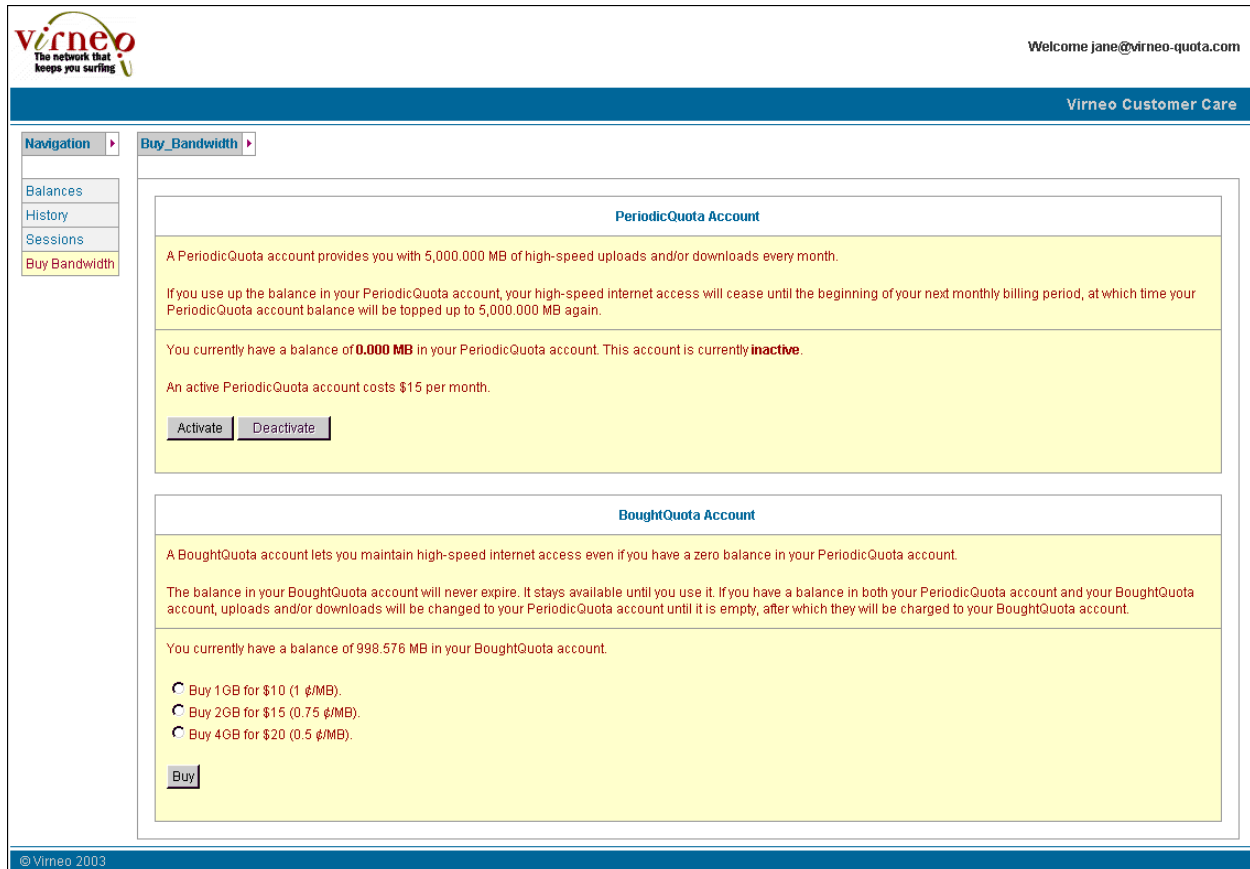
- Related Documentation**
- Configuring a Database to Store Account and Session Data on page 86
  - Configuring Subscribers and Subscriptions to VTA Services on page 91
  - Viewing Subscriber Accounts on page 187

## Purchasing a Periodic Account

A periodic account is an account into which the service provider periodically adds volume. The periodic quota is tracked in the periodic account.

To purchase an account that your service provider replenishes periodically:

1. In the navigation pane, click **Buy Bandwidth**.
2. Navigate to the PeriodicQuota Account area.
3. Click **Activate**.



#### Related Documentation

- Suspending a Periodic Account on page 192
- Replenishing Periodic Accounts on page 188
- Purchasing Extra Bandwidth on page 193
- Viewing Information About the Account on page 191

## Suspending a Periodic Account

To suspend an account that your service provider replenishes periodically:

1. In the navigation pane, click **Buy Bandwidth**.
2. Navigate to the PeriodicQuota Account area.
3. Click **Deactivate**.

- Related Documentation**
- Purchasing a Periodic Account on page 191
  - Replenishing Periodic Accounts on page 188
  - Purchasing Extra Bandwidth on page 193
  - Viewing Information About the Account on page 191

## Purchasing Extra Bandwidth

---

To purchase extra bandwidth:

1. In the navigation pane, click **Buy Bandwidth**.
2. Navigate to the BoughtQuota Account area.
3. Select the option you want to purchase.
4. Click **Buy**.

If this is the first time you have purchased extra bandwidth, your bought account will be activated. The bandwidth you purchased will be added to your bought account.

- Related Documentation**
- Purchasing a Periodic Account on page 191
  - Viewing Information About the Account on page 191





## CHAPTER 9

# Example of a Bucket VTA

- Example of a Bucket VTA on page 195

### Example of a Bucket VTA

---

- Overview of Bucket VTA Example on page 195
- Events for Bucket VTA on page 195
- Event Handlers for Bucket VTA on page 196
- Database Engine Processor for Bucket VTA on page 199
- SAE Proxy Processor for Bucket VTA on page 201
- Actions for Bucket VTA on page 203

### Overview of Bucket VTA Example

In this example each subscriber has a bucket account; that is, an account that is periodically measured and refilled depending on the usage of the account.

In this example, there are two bucket sizes:


- Behaving bucket size—2 GB
- Misbehaving bucket size—1 GB

The rate at which the buckets are refilled depends on usage. If the subscriber is staying within the behaving rate, the bucket account is refilled at the rate of 2 GB per week. If the subscriber is exceeding the behaving rate, the bucket account is refilled at the rate of 1 GB per week:

- Behaving refill rate—3550 bps, or 2 GBs per 7 days
- Misbehaving refill rate —1775 bps, or 1 GB per 7 days

### Events for Bucket VTA

The bucket VTA example has the following events:



VTA Configuration Manager
Edit Configuration

- Home
- Dir Connection
- Configuration
  - Create
  - Edit
  - Load
  - Commit
  - Import
  - Export

### Current Configuration

[Event Handlers](#)
[Actions](#)
[Processors](#)
[Logging](#)
[Subscriber ID and Lookup](#)


#### Quota VTA Events and Handlers

[Available Events](#)

Name	Value
Event	SERVICEINTERIM(Behaving) <a href="#">Delete</a>
	SERVICEINTERIM(Misbehaving) <a href="#">Delete</a>
	SERVICESTOP(Behaving) <a href="#">Delete</a>
	SERVICESTOP(Misbehaving) <a href="#">Delete</a>
	USERSTART <a href="#">Delete</a>

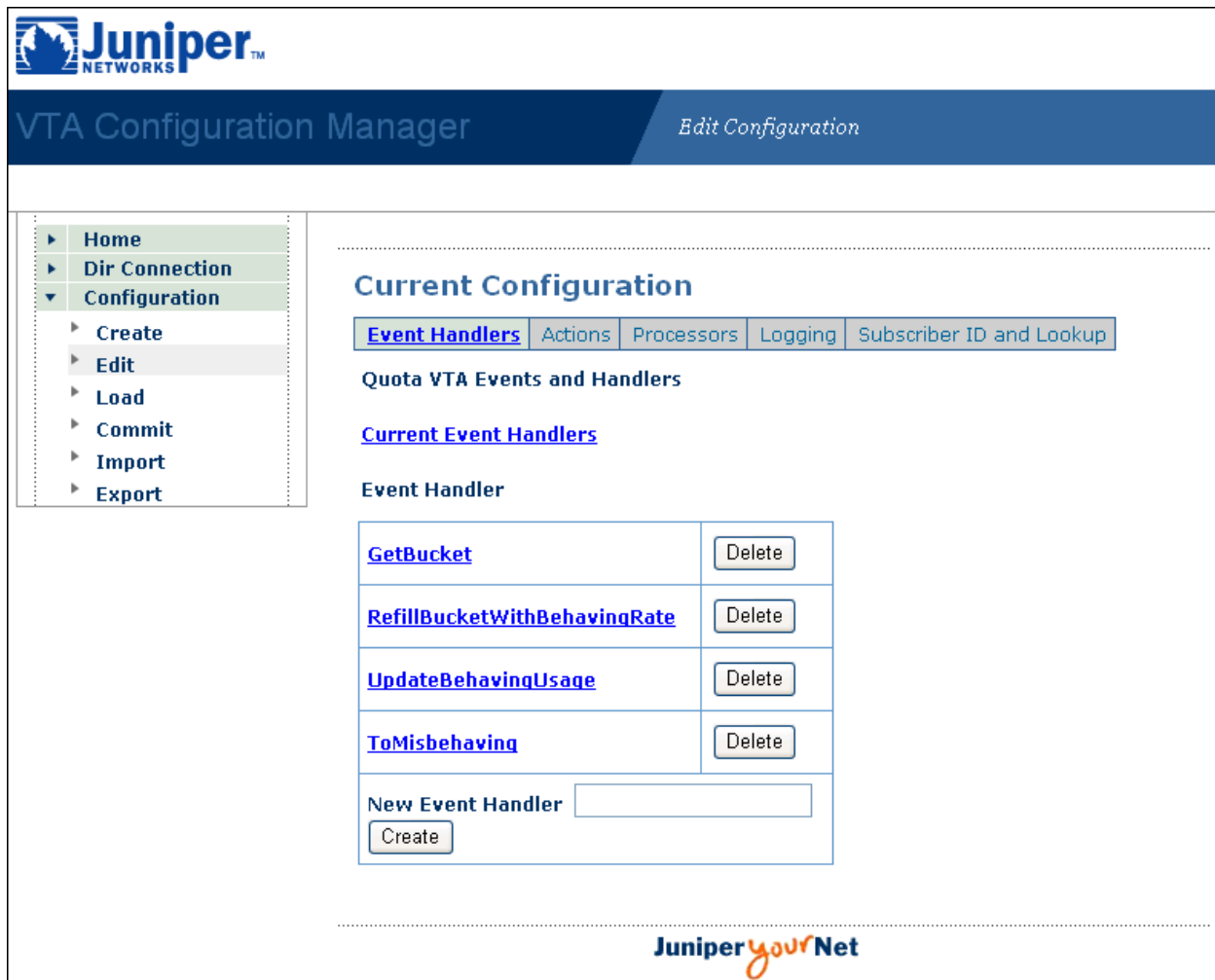
[Add Event](#)

[Save](#)



## Event Handlers for Bucket VTA

The bucket VTA includes the following event handlers.



The screenshot shows the Juniper VTA Configuration Manager interface. The top navigation bar includes the Juniper Networks logo and the title "VTA Configuration Manager" with a link to "Edit Configuration". A left sidebar contains a menu with options: Home, Dir Connection, Configuration (expanded), Create, Edit, Load, Commit, Import, and Export. The main content area is titled "Current Configuration" and features a tabbed interface with tabs for Event Handlers, Actions, Processors, Logging, and Subscriber ID and Lookup. The "Event Handlers" tab is active, displaying "Quota VTA Events and Handlers" and a link to "Current Event Handlers". Below this, a table lists four event handlers: GetBucket, RefillBucketWithBehavingRate, UpdateBehavingUsage, and ToMisbehaving, each with a "Delete" button. At the bottom of the table is a "New Event Handler" section with a text input field and a "Create" button. The footer of the interface displays the "Juniper your Net" logo.

### GetBucket Event Handler

The GetBucket event handler retrieves the balance of the bucket account when the subscriber logs in.

GetBucket	
Name	Value
Priority ?	1
Events	<div> SERVICEINTERIM(Behaving)  SERVICEINTERIM(Misbehaving)  SERVICESTOP(Behaving)  SERVICESTOP(Misbehaving)  USERSTART </div>
Condition	<input type="text"/> <input type="button" value="Enable"/>
Actions	<div> CalcUsage  GetBucketBalance  RefillBucketWithBehavingRate  StartBehavingService  StartMisbehavingService </div>

#### RefillBucketWithBehavingRate Event Handler

The RefillBucketWithBehavingRate event handler refills the bucket with the behaving rate and starts the behaving service if the bucket account has a positive balance.

RefillBucketWithBehavingRate	
Name	Value
Priority ?	5
Events	<div> SERVICEINTERIM(Behaving)  SERVICEINTERIM(Misbehaving)  SERVICESTOP(Behaving)  SERVICESTOP(Misbehaving)  USERSTART </div>
Condition	<input type="text" value="return &lt;balance_Bucket&gt;&gt;0"/> <input type="button" value="Disable"/>
Actions	<div> CalcUsage  GetBucketBalance  RefillBucketWithBehavingRate  StartBehavingService  StartMisbehavingService </div>

#### UpdateBehavingUsage Event Handler

The UpdateBehavingUsage event handler updates the bucket account with the usage from the behaving service.

UpdateBehavingUsage	
Name	Value
Priority ?	5
Events	<div> SERVICEINTERIM(Behaving)  SERVICEINTERIM(Misbehaving)  SERVICESTOP(Behaving)  SERVICESTOP(Misbehaving)  USERSTART </div>
Condition	<input type="text"/> <input type="button" value="Enable"/>
Actions	<div> CalcUsage  GetBucketBalance  RefillBucketWithBehavingRate  StartBehavingService  UpdateBucketForBehaving </div>

### ToMisbehaving Event Handler

The ToMisbehaving event handler changes the subscriber to misbehaving mode when the bucket has zero or negative balance.

ToMisbehaving	
Name	Value
Priority ?	10
Events	<div> SERVICEINTERIM(Behaving)  SERVICEINTERIM(Misbehaving)  SERVICESTOP(Behaving)  SERVICESTOP(Misbehaving)  USERSTART </div>
Condition	<input type="text" value="return &lt;balance_Bucket&gt;&lt;=0;"/> <input type="button" value="Disable"/>
Actions	<div> RefillBucketWithBehavingRate  StartBehavingService  StartMisbehavingService  StopBehavingService  UpdateBucketForBehaving </div>

### Database Engine Processor for Bucket VTA

The bucket VTA contains a database engine processor that is configured as follows.

#### Account Update Scripts

The database engine processor contains two account update scripts:

- DebitBehavingUsage—Debits the usage of the behaving service from the bucket account and resets the balance of the bucket account based on the new balance.
- RefillBucketWithBehavingRate—Refills the bucket account with the behaving rate.

### Current Configuration

Event Handlers
Actions
**Processors**

**Quota VTA Processors**

[Database Engine Processor](#) Disable

Name	Value	
<b>Account Update Script</b> ⓘ	<b>Account Update Script Name</b>	<b>Account Update Script Content</b>
	DebitBehavingUsage	<pre>var newBalance = Math.min(&lt;balance_Bucket&gt;-&lt;currentUsage&gt;, 2147483648); &lt;balance_Bucket&gt; = newBalance&lt;=0?-1073741824:newBalance; &lt;lastUpdateTime_Bucket&gt;=&lt;currentTime&gt;;</pre> <span>Delete</span>
	RefillBucketWithBehavin	<pre>var bucketFill = (&lt;currentTime&gt;-&lt;lastUpdateTime_Bucket&gt;)*3550/1000; &lt;balance_Bucket&gt;=Math.min(&lt;balance_Bucket&gt;+bucketFill, 2147483648); &lt;lastUpdateTime_Bucket&gt;=&lt;currentTime&gt;;</pre> <span>Delete</span>
<span>Add Account Update Script</span>		
<span>Save</span>		

### Subscriber Account

The subscriber account sets the initial balance of the account to 2147483648 and sets the initial status of the account to active.

### Current Configuration

Event Handlers
Actions
**Processors**

**Quota VTA Processors**

[Database Engine Processor](#) Disable

**Database Engine Account**

Bucket	
Name	Value
<b>Initial Balance</b>	2147483648
<b>Initial Status</b>	Active
<span>Save</span>	
<b>New Database Engine Account</b> <input type="text"/>	
<span>Create</span>	

## Service Accounts

The service account has the following usage metric:

### Current Configuration

Event Handlers	Actions	<b>Processors</b>
----------------	---------	-------------------

#### Quota VTA Processors


#### Database Engine Processor

#### Database Engine Service

Behaving	
Name	Value
Usage Metric	<pre>var bucketFill = (&lt;currentTime&gt;-&lt;lastUpdateTime_Bucket&gt;)*3550 var bucketDrain = &lt;upStreamBytes&gt;+&lt;downStreamBytes&gt;; return bucketDrain-bucketFill;</pre>
Interim Interval	<input type="text"/> <input type="button" value="Enable"/>
<input type="button" value="Save"/>	
New Database Engine Service	<input type="text"/>
<input type="button" value="Create"/>	

## SAE Proxy Processor for Bucket VTA

The SAE proxy processor is set to enabled.



**VTa Configuration Manager** *Edit Configuration*

- ▶ Home
- ▶ Dir Connection
- ▼ Configuration
  - ▶ Create
  - ▶ **Edit**
  - ▶ Load
  - ▶ Commit
  - ▶ Import
  - ▶ Export

### Current Configuration

Event Handlers Actions **Processors**

Quota VTA Processors

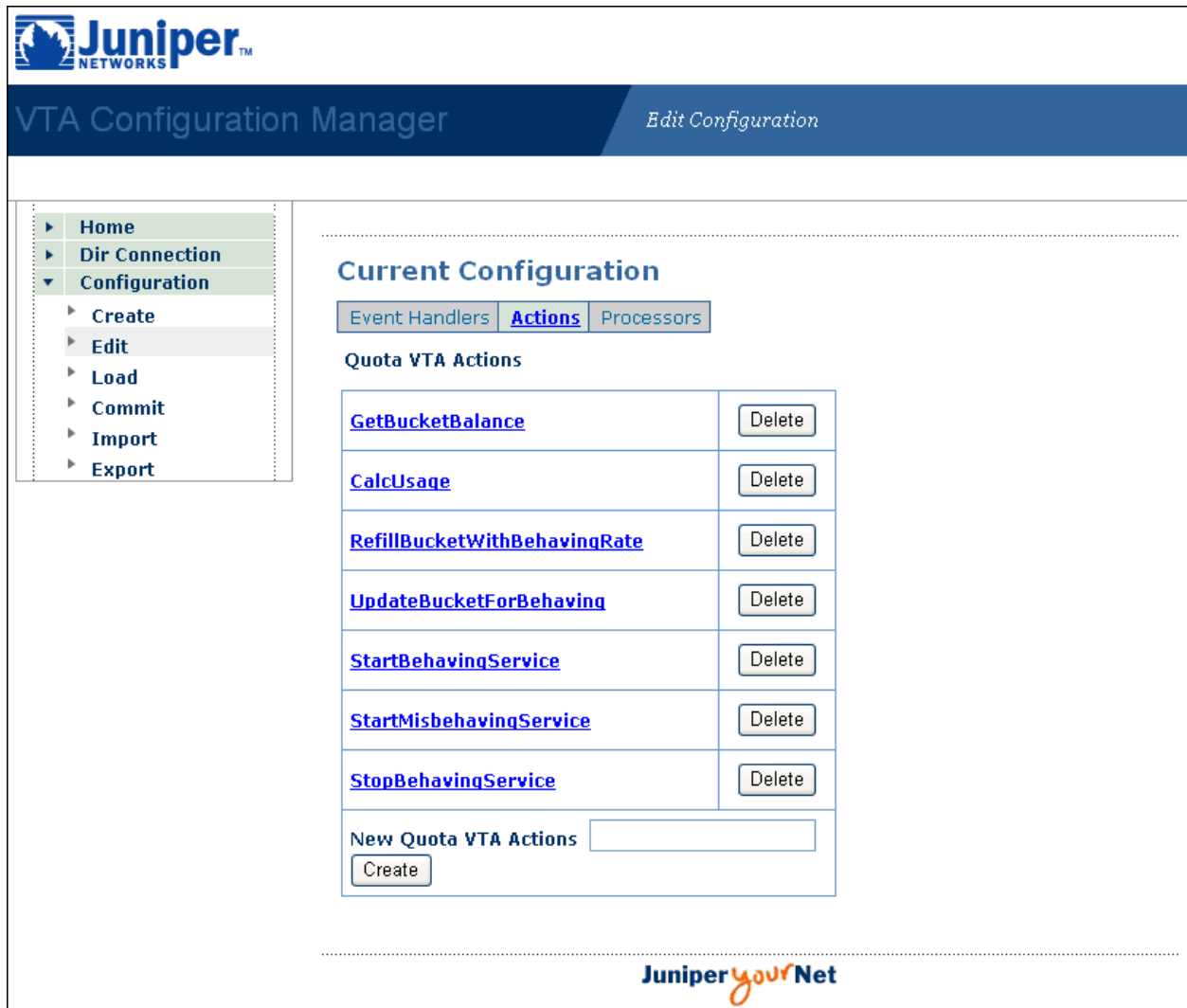
[SAE Proxy Processor](#)

**Juniper** yourNet



## Actions for Bucket VTA

The bucket VTA includes the following actions:



The screenshot displays the Juniper VTA Configuration Manager interface. The top navigation bar includes the Juniper Networks logo and the title 'VTA Configuration Manager' with a link to 'Edit Configuration'. A left sidebar contains a menu with options: Home, Dir Connection, Configuration (expanded), Create, Edit, Load, Commit, Import, and Export. The main content area is titled 'Current Configuration' and features three tabs: Event Handlers, Actions (selected), and Processors. Under the 'Actions' tab, the section 'Quota VTA Actions' lists several actions, each with a 'Delete' button:

<a href="#">GetBucketBalance</a>	Delete
<a href="#">CalcUsage</a>	Delete
<a href="#">RefillBucketWithBehavingRate</a>	Delete
<a href="#">UpdateBucketForBehaving</a>	Delete
<a href="#">StartBehavingService</a>	Delete
<a href="#">StartMisbehavingService</a>	Delete
<a href="#">StopBehavingService</a>	Delete

Below the table, there is a section for 'New Quota VTA Actions' with a text input field and a 'Create' button. The footer of the interface features the 'Juniper yourNet' logo.

### GetBucketBalance Action

The GetBucketBalance action retrieves account balances.

GetBucketBalance					
Name	Value				
Processor	DBEngine ▼				
Function	GetAccounts				
Parameter ⓘ	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> </tr> </thead> <tbody> <tr> <td colspan="2">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content	Add Parameter	
Parameter Name	Parameter Content				
Add Parameter					
Abort On Error	<input type="text"/> ▼ <input type="button" value="Enable"/>				

### CalcUsage Action

The CalcUsage action calculates usage in the service-tracking event by using the usage metric configured for the service.

CalcUsage					
Name	Value				
Processor	DBEngine ▼				
Function	CalculateUsage				
Parameter ⓘ	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> </tr> </thead> <tbody> <tr> <td colspan="2">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content	Add Parameter	
Parameter Name	Parameter Content				
Add Parameter					
Abort On Error	<input type="text"/> ▼ <input type="button" value="Enable"/>				

### UpdateBucketForBehaving Action

The UpdateBucketForBehaving action debits usage of the behaving service from the bucket account.

UpdateBucketForBehaving										
Name	Value									
Processor	DBEngine ▼									
Function	UpdateAccounts									
Parameter ⓘ	<table border="1"> <thead> <tr> <th>Parameter Name</th> <th>Parameter Content</th> <th></th> </tr> </thead> <tbody> <tr> <td>ScriptName</td> <td>DebitBehavingUsage</td> <td> <input type="button" value="Delete"/> <input type="button" value="Disable"/> </td> </tr> <tr> <td colspan="3">Add Parameter</td> </tr> </tbody> </table>	Parameter Name	Parameter Content		ScriptName	DebitBehavingUsage	<input type="button" value="Delete"/> <input type="button" value="Disable"/>	Add Parameter		
Parameter Name	Parameter Content									
ScriptName	DebitBehavingUsage	<input type="button" value="Delete"/> <input type="button" value="Disable"/>								
Add Parameter										
Abort On Error	<input type="text"/> ▼ <input type="button" value="Enable"/>									

### RefillBucketWithBehavingRate Action

The RefillBucketWithBehavingRate action refills the bucket with the behaving rate.

RefillBucketWithBehavingRate		
Name	Value	
Processor	DBEngine ▼	
Function	UpdateAccounts	
Parameter ⓘ	Parameter Name	Parameter Content
	ScriptName	RefillBucketWithBehavingRate
	<div> <input type="button" value="Delete"/> <input type="button" value="Disable"/> </div>	
<div> <input type="button" value="Add Parameter"/> </div>		
Abort On Error	<div> <input type="button" value="Enable"/> </div>	

### StartMisbehavingService Action

The StartMisbehavingService action starts the misbehaving service.

StartMisbehavingService		
Name	Value	
Processor	SAEProxy ▼	
Function	StartService	
Parameter ⓘ	Parameter Name	Parameter Content
	SubscriptionName	Misbehaving
	<div> <input type="button" value="Delete"/> <input type="button" value="Disable"/> </div>	
<div> <input type="button" value="Add Parameter"/> </div>		
Abort On Error	<div> <input type="button" value="Enable"/> </div>	

### StopBehavingService Action

The StopBehavingService action stops the behaving service.

StopBehavingService		
Name	Value	
Processor	SAEProxy ▼	
Function	StopService	
Parameter ⓘ	Parameter Name	Parameter Content
	SubscriptionName	Behaving
	<div> <input type="button" value="Delete"/> <input type="button" value="Disable"/> </div>	
<div> <input type="button" value="Add Parameter"/> </div>		
Abort On Error	<div> <input type="button" value="Enable"/> </div>	

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