Cisco Service Control Application for Broadband

User Guide

Version 3.0.5
OL-7205-04

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*Cisco **SCA BB** User Guide*

CONTENTS

Preface

This preface describes who should read the *Cisco Service Control Application for Broadband User Guide*, how it is organized, its document conventions, and how to obtain documentation and technical assistance.

This guide assumes a basic familiarity with the concept of the Service Control solution, the Service Control Engine (SCE) platforms, and related components.

Document Revision History

Cisco Service Control Release	**Part Number**	**Publication Date**
Release 3.0.5	OL-7205-04	November, 2006

Description of Changes

Added the following new feature:

- *The SCA BB Real-Time Monitoring Configuration Utility* (on page 13-4)

Added the following section to the document:

- *Quick Forwarding* (on page 3-18)

Cisco Service Control Release	**Part Number**	**Publication Date**
Release 3.0.3	OL-7205-03	May, 2006

Description of Changes

Added the following new features:

- *Hitless Upgrade* (on page 4-15)
- *Content Filtering* (on page 7-60)
- *The Service Security Dashboard* (on page 10-1)

Removed the following deprecated feature:

- Attack Filtering and Subscriber Notification

Added the following section to the document:

- Upgrading from Version 3.0.0 to Version 3.0.3

Cisco Service Control Release	Part Number	Publication Date
Release 3.0.0	OL-7205-02	December, 2005

Description of Changes

Document name changed to *Cisco Service Control Application for Broadband User Guide*.

Both the look-and-feel and the functionality of the Cisco Service Control Application for Broadband (***SCA BB***) Console were redesigned for version 3.0. Consequently, this document underwent a major rewrite. The major changes in this document are listed below.

- Appendixes B, C, D of the 2.5.5 release user guide were moved to a new document: the *Cisco Service Control Application for Broadband Reference Guide*.
- Chapter 8 and Appendix A of the 2.5.5 release user guide were moved to a new document: the *Cisco Service Control Application Suite Reporter User Guide*.
- The *Cisco Service Control Application Suite for Broadband Installation Guide* was deprecated; it forms the basis for part of the Getting Started chapter.
- Chapter 5 of the 2.5.5 release user guide (*Constructing Service Configurations*) was completely rewritten and split into three chapters.
- New chapters were added for the new tools included in the Console: the Network Navigator tool and the Signature Editor tool.

Release 2.5.5	OL-7205-01	February, 2005

Description of Changes

Created the *Cisco Service Control Application Suite for Broadband User Guide*.

Audience

This guide is intended for the administrator who is responsible for daily operation of the Cisco Service Control solution and who uses the many features of the Console to gain visibility into, and control over, the distribution of network resources.

Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	*General Overview* (on page 1-1)	Provides a general overview of the Cisco Service Control solution.
Chapter 2	*System Overview* (on page 2-1)	Provides a functional overview of the Cisco Service Control solution.
Chapter 3	*Traffic Processing Overview* (on page 3-1)	Provides a technical overview of the Cisco Service Control solution.

Chapter	Title	Description
Chapter 4	*Getting Started* (on page 4-1)	Guides you through the process of installing or upgrading ***SCA BB*** and describes the concept of the Console as a collection of tools.
Chapter 5	*Using the Network Navigator* (on page 5-1)	Explains how to use the Network Navigator to create a model of all devices that are part of the Cisco Service Control solution and how to manage the devices remotely.
Chapter 6	*Using the Service Configuration Editor* (on page 6-1)	Explains how to use the Service Configuration Editor to manage service configurations.
Chapter 7	*Using the Service Configuration Editor: Traffic Classification* (on page 7-1)	Explains how to configure service configurations to perform traffic classification.
Chapter 8	*Using the Service Configuration Editor: Traffic Accounting and Reporting* (on page 8-1)	Explains how to configure service configurations to perform traffic reporting.
Chapter 9	*Using the Service Configuration Editor: Traffic Control* (on page 9-1)	Explains how to configure service configurations to perform traffic control.
Chapter 10	*Using the Service Configuration Editor: Additional Options* (on page 10-1)	Documents additional, advanced options available in the Service Configuration Editor.
Chapter 11	*Using the Subscriber Manager GUI Tool* (on page 11-1)	Explains how to use the SM GUI tool to configure subscribers on the SCMS-SM database.
Chapter 12	*Using the Signature Editor* (on page 12-1)	Documents the Signature Editor tool, which can create files for updating protocols in ***SCA BB***.
Chapter 13	*Additional Management Tools and Interfaces* (on page 13-1)	Documents and explains other tools that are available for use with ***SCA BB***.

Related Documentation

The following publications are available for the Cisco Service Control Application for Broadband:

- *Cisco Service Control Application for Broadband Reference Guide*
- *Cisco Service Control Application for Broadband Service Configuration API Programmer Guide*
- *Cisco Service Control Management Suite Collection Manager User Guide*
- *Cisco Service Control Management Suite Subscriber Manager User Guide*
- *Cisco Service Control Application Reporter User Guide*
- The SCE platform installation and configuration guides:
  - *Cisco SCE 1000 2xGBE Installation and Configuration Guide*
  - *Cisco SCE 2000 4xGBE Installation and Configuration Guide*
  - *Cisco SCE 2000 4/8xFE Installation and Configuration Guide*

- *Cisco Service Control Engine (SCE) CLI Command Reference*
- *Cisco Service Control Engine (SCE) Software Configuration Guide*

Conventions

This document uses the following conventions:

Convention	Description
boldface font	Commands and keywords are in **boldface**.
italic font	Arguments for which you supply values are in *italics*.
[ ]	Elements in square brackets are optional.
{x | y | z}	Alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string, or the string will include the quotation marks.
`screen` font	Terminal sessions and information that the system displays are in `screen` font.
`boldface screen` font	Information you must enter is in **`boldface screen`** font.
`italic screen` font	Arguments for which you supply values are in *`italic screen`* font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to materials not covered in this manual.

Caution Means *reader be careful*. In this situation, you might do something that could result in loss of data.

Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

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  http://www.cisco.com/pcgi-bin/marketplace/welcome.pl
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

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San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides *Cisco.com* (on page xvi) as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools. For Cisco.com registered users, additional troubleshooting tools are available from the TAC website.

Cisco.com

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To access Cisco.com, go to http://www.cisco.com.

Technical Assistance Center

The Cisco Technical Assistance Center (TAC) website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website *http://www.cisco.com/tac*.

P3 and P4 level problems are defined as follows:

- P3—Your network is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for *Cisco.com* (on page xvi), go to *http://tools.cisco.com/RPF/register/register.do*.

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at *http://www.cisco.com/tac/caseopen*.

Contacting TAC by Telephone

If you have a priority level 1 (P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to *http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml*.

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

CHAPTER 1

General Overview

This chapter provides a general overview of the Cisco Service Control solution. It introduces the Cisco Service Control concept and the Service Control capabilities. It also briefly describes the hardware capabilities of the Service Control Engine (SCE) platform and the Cisco specific applications that together compose the total Cisco Service Control solution.

This chapter contains the following sections:

The Cisco Service Control Concept

The Cisco Service Control solution is delivered through a combination of purpose-built hardware and specific software solutions that address various service control challenges faced by service providers. The SCE platform is designed to support classification, analysis, and control of Internet/IP traffic.

Service Control enables service providers to create profitable new revenue streams while capitalizing on their existing infrastructure. With the power of Service Control, service providers have the ability to analyze, charge for, and control IP network traffic at multigigabit wire line speeds. The Cisco Service Control solution also gives service providers the tools they need to identify and target high-margin content-based services and to enable their delivery.

As the downturn in the telecommunications industry has shown, IP service providers' business models need to be reworked to make them profitable. Having spent billions of dollars to build ever larger data links, providers have incurred massive debts and faced rising costs. At the same time, access and bandwidth have become commodities where prices continually fall and profits disappear. Service providers have realized that they must offer value-added services to derive more revenue from the traffic and services running on their networks. However, capturing real profits from IP services requires more than simply running those services over data links; it requires detailed monitoring and precise, real-time control and awareness of services as they are delivered. Cisco provides Service Control solutions that allow the service provider to bridge this gap.

Service Control for Broadband Service Providers

Service providers of any access technology (DSL, cable, mobile, and so on) targeting residential and business consumers must find new ways to get maximum leverage from their existing infrastructure, while differentiating their offerings with enhanced IP services.

The Cisco Service Control Application for Broadband adds a new layer of service intelligence and control to existing networks that can:

- Report and analyze network traffic at subscriber and aggregate level for capacity planning
- Provide customer-intuitive tiered application services and guarantee application SLAs
- Implement different service levels for different types of customers, content, or applications
- Identify network abusers who are violating the Acceptable Use Policy
- Identify and manage peer-to-peer, NNTP (news) traffic, and spam abusers
- Enforce the Acceptable Use Policy (AUP)
- Integrate Service Control solutions easily with existing network elements and BSS/OSS systems

Cisco Service Control Capabilities

The core of the Cisco Service Control solution is the purpose-built network hardware device: the Service Control Engine (SCE). The core capabilities of the SCE platform, which support a wide range of applications for delivering Service Control solutions, include:

- Subscriber and application awareness—Application-level drilling into IP traffic for real-time understanding and controlling of usage and content at the granularity of a specific subscriber.
  - Subscriber awareness—The ability to map between IP flows and a specific subscriber in order to maintain the state of each subscriber transmitting traffic through the SCE platform and to enforce the appropriate policy on this subscriber’s traffic.

    Subscriber awareness is achieved either through dedicated integrations with subscriber management repositories, such as a DHCP or a Radius server, or via sniffing of Radius or DHCP traffic.
  - Application awareness—The ability to understand and analyze traffic up to the application protocol layer (Layer 7).

    For application protocols implemented using bundled flows (such as FTP, which is implemented using Control and Data flows), the SCE platform understands the bundling connection between the flows and treats them accordingly.
- Application-layer, stateful, real-time traffic control—The ability to perform advanced control functions, including granular BW metering and shaping, quota management, and redirection, using application-layer stateful real-time traffic transaction processing. This requires highly adaptive protocol and application-level intelligence.
- Programmability—The ability to quickly add new protocols and easily adapt to new services and applications in the ever-changing service provider environment. Programmability is achieved using the Cisco Service Modeling Language (SML).

Programmability allows new services to be deployed quickly and provides an easy upgrade path for network, application, or service growth.

- Robust and flexible back-office integration—The ability to integrate with existing third-party systems at the Service Provider, including provisioning systems, subscriber repositories, billing systems, and OSS systems. The SCE provides a set of open and well-documented APIs that allows a quick and robust integration process.
- Scalable high-performance service engines—The ability to perform all these operations at wire speed.

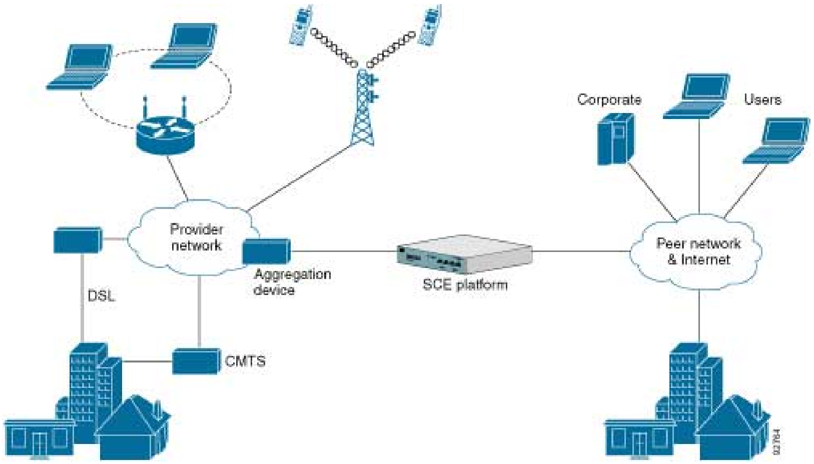
The SCE Platform

The SCE family of programmable network devices is capable of performing application-layer stateful-flow inspection of IP traffic, and controlling that traffic based on configurable rules. The SCE platform is a purpose-built network device that uses ASIC components and RISC processors to go beyond packet counting and delve deeper into the contents of network traffic. Providing programmable, stateful inspection of bidirectional traffic flows and mapping these flows with user ownership, the SCE platforms provide real-time classification of network usage. This information provides the basis of the SCE platform advanced traffic-control and bandwidth-shaping functionality. Where most bandwidth shaper functionality ends, the SCE platform provides more control and shaping options, including:

- Layer 7 stateful wire-speed packet inspection and classification
- Robust support for over 600 protocols and applications, including:
  - General—HTTP, HTTPS, FTP, TELNET, NNTP, SMTP, POP3, IMAP, WAP, and others
  - P2P file sharing—FastTrack-KazaA, Gnutella, BitTorrent, Winny, Hotline, eDonkey, DirectConnect, Piolet, and others
  - P2P VoIP—Skype, Skinny, DingoTel, and others
  - Streaming and Multimedia—RTSP, SIP, HTTP streaming, RTP/RTCP, and others
- Programmable system core for flexible reporting and bandwidth control
- Transparent network and BSS/OSS integration into existing networks
- Subscriber awareness that relates traffic and usage to specific customers

The following diagram illustrates a common deployment of an SCE platform in a network.

Figure 1-1: SCE Platform in the Network



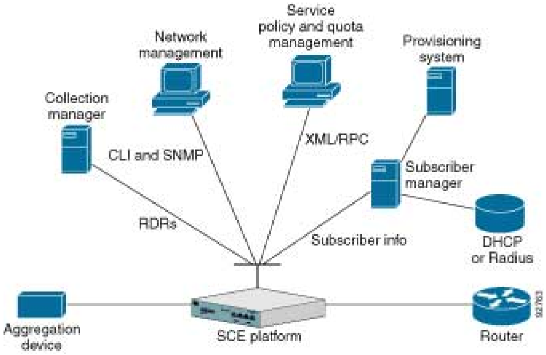
Management and Collection

The Cisco Service Control solution includes a complete management infrastructure that provides the following management components to manage all aspects of the solution:

- Network management
- Subscriber management
- Service Control management

These management interfaces are designed to comply with common management standards and to integrate easily with existing OSS infrastructure.

Figure 1-2: Service Control Management Infrastructure



Network Management

Cisco provides complete network FCAPS (Fault, Configuration, Accounting, Performance, Security) Management.

Two interfaces are provided for network management:

- Command-line interface (CLI)—Accessible through the Console port or through a Telnet connection, the CLI is used for configuration and security functions.
- SNMP—Provides fault management (via SNMP traps) and performance monitoring functionality.

Subscriber Management

Where the Cisco Service Control Application for Broadband (SCA BB) enforces different policies on different subscribers and tracks usage on an individual subscriber basis, the Cisco Service Control Management Suite (SCMS) Subscriber Manager (SM) may be used as middleware software for bridging between the OSS and the SCE platforms. Subscriber information is stored in the SM database and can be distributed between multiple platforms according to actual subscriber placement.

The SM provides subscriber awareness by mapping network IDs to subscriber IDs. It can obtain subscriber information using dedicated integration modules that integrate with AAA devices, such as Radius or DHCP servers.

Subscriber information may be obtained in one of two ways:

- Push Mode—The SM pushes subscriber information to the SCE platform automatically upon logon of a subscriber.
- Pull Mode—The SM sends subscriber information to the SCE platform in response to a query from the SCE platform.

Service Configuration Management

Service configuration management is the ability to configure the general service definitions of a service control application. A service configuration file containing settings for traffic classification, accounting and reporting, and control is created and applied to an SCE platform. SCA BB provides tools to automate the distribution of these configuration files to SCE platforms. This simple, standards-based approach makes it easy to manage multiple devices in a large network.

Service Control provides an easy-to-use GUI to edit and create these files and a complete set of APIs to automate their creation.

Data Collection

The Cisco Service Control solution generates usage data and statistics from the SCE platform and forwards them as Raw Data Records (RDRs), using a simple TCP-based protocol (RDR-Protocol). The Cisco Service Control Management Suite (SCMS) Collection Manager (CM) software implements the collection system, listening in on RDRs from one or more SCE platforms and processing them on the local machine. The data is then stored for analysis and reporting functions, and for the collection and presentation of data to additional OSS systems such as billing.

CHAPTER 2

System Overview

The Cisco Service Control Application for Broadband (***SCA BB***) is the Cisco Service Control solution that allows broadband service providers to gain network-traffic visibility, to control the distribution of network resources, and thereby to optimize traffic in accordance with their business strategies. It enables service providers to reduce network costs, improve network performance and customer experience, and create new service offerings and packages.

This chapter contains the following sections:

System Components

The Cisco Service Control solution consists of four main components:

- The Service Control Engine (SCE) platform—A flexible and powerful dedicated network-usage monitor that is purpose-built to analyze and report on network transactions at the application level.

  For complete information regarding the installation and operation of the SCE platform, see the Cisco SCE Platform Installation and Configuration Guides.

- The Service Control Management Suite (SCMS) Subscriber Manager (SM)—A middleware software component used where dynamic binding of subscriber information and policies is required. The SM manages subscriber information and provisions it in real time to multiple SCE platforms. The SM can store subscriber policy information internally, and act as a stateful bridge between the AAA system (such as Radius and DHCP) and the SCE platforms.

  For complete information regarding the installation and operation of the SM, see the *Cisco Service Control Management Suite Subscriber Manager User Guide*.

  The Quota Manager (QM) is an optional component of the Subscriber Manager. It enables Service Control solution providers to manage subscriber quota across subscriber sessions with a high degree of flexibility.

  For complete information regarding the installation and operation of the QM, see the *Cisco Service Control Management Suite Quota Manager Solution Guide*.

- The Service Control Management Suite (SCMS) Collection Manager (CM)—An implementation of a collection system that receives Raw Data Records (RDRs) from one or more SCE platforms. It collects usage information and statistics, and stores them in a database. The CM also converts subscriber usage information and statistics into simple text-based files for further processing and collection by external systems.

  For complete information regarding the installation and operation of the CM, see the *Cisco Service Control Management Suite Collection Manager User Guide*.

- The Service Control Application (SCA) Reporter—A software component that processes data stored by the CM and provides a set of insightful reports from this data. The SCA Reporter can run as a standalone or as an integrated part of the Console.

Together, the SCE platform, the SCMS-CM, the SCMS-SM, and the SCA Reporter are designed to support detailed classification, analysis, reporting, and control of IP network traffic. The SCMS-CM, the SCA Reporter, and the SCMS-SM are optional components; not all deployments of the Cisco Service Control solution require them. Sites that employ third-party collection and reporting applications, those that do not require dynamic subscriber-aware processing, and those that use a Radius or DHCP sniffing option may not require all of these components.

The following figure illustrates the flow of information in the Cisco Service Control solution.

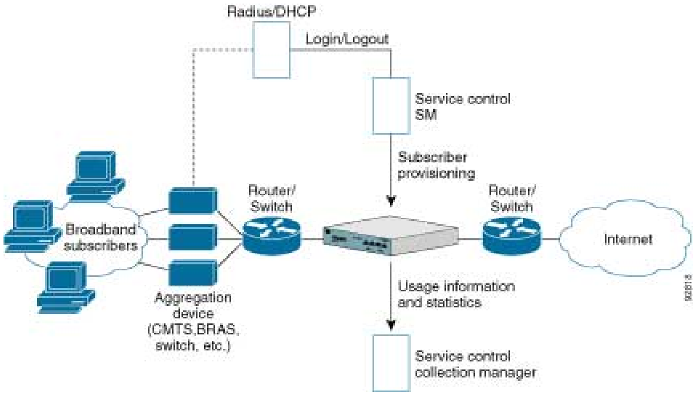
- Horizontal flow—Represents traffic between subscribers and an IP network.

  The SCE platform monitors traffic flow.

- Vertical flow—Represents transmission of the Raw Data Records (RDRs) from the SCE platform to the CM.

  The SM may be added to the control flow to provide subscriber data. This allows ***SCA BB*** to conduct subscriber-level analysis and control.

Figure 2-1: Flow of Information in the Cisco Service Control Application for Broadband



Subscribers and Subscriber Modes

One of the fundamental entities in the Cisco Service Control solution is a *subscriber*. A subscriber is the most granular entity on which ***SCA BB*** can individually monitor, account, and enforce a policy. In the most granular instance of the ***SCA BB*** system a subscriber, is an actual customer of the service provider on whom an individual policy is implemented. However, you can also to use ***SCA BB*** to monitor and control traffic at a higher granularity, such as when monitoring or controlling traffic by subnets or aggregation devices.

One of the most important decisions to be made when designing a service control solution is what subscribers in the system represent. This determines which subscriber mode will be used, which in turn determines what (if any) integrations are required and what policies to define. The following sections describe the different subscriber modes supported and, for each mode, the functions supported, any prerequisites, and the components needed.

SCA BB supports the following four subscriber modes:

- Subscriberless mode—No subscribers are defined. Control and link-level analysis functions are provided at a global platform resolution.
- Anonymous subscriber mode—IP addresses are controlled and monitored individually. The SCE platform automatically identifies IP addresses as they are used and assigns them to a package.
- Static subscriber mode—Incoming IP addresses are bound and grouped statically into “subscribers” as configured by the system operator.
- Subscriber-aware mode—Subscriber information is dynamically bound to the IP address currently in use by the subscriber. This can be achieved by integrating with the system (Radius, DHCP) that assigns IP addresses to subscribers, or by sniffing this information. Policy information is either administered to ***SCA BB*** directly or provisioned dynamically via an integration.

Subscriberless Mode

Subscriberless mode is the choice for sites where control and analysis functions are required only at a global platform resolution. It can be used, for example, to monitor and control the total P2P traffic over the link.

Subscriberless mode requires no integration; hence the SCMS-SM is not required.

Note Subscriberless mode is not influenced by the number of subscribers or inbound IP addresses Thus the total number of subscribers using the monitored link is unlimited from the perspective of the SCE platform.

Anonymous Subscriber Mode

Anonymous subscriber mode provides the means to analyze and control network traffic at subscriber-inbound IP address granularity. Use this mode when you do not require subscriber-differentiated control or subscriber-level quota tracking, when analysis on an IP level is sufficient, or when offline IP-address/subscriber binding can be performed. For example, you can identify which subscribers generate the most P2P traffic by identifying the top IP addresses and correlating them to individual subscribers using Radius or DHCP logs. The total bandwidth of P2P traffic allowed for each subscriber can also be limited.

Anonymous subscriber mode requires no integration or static configuration of the IP addresses used, so the SCMS-SM is not required. Rather, ranges of IP addresses are configured directly on the SCE platform, for which the system dynamically creates “anonymous” subscribers, using the IP address as the subscriber name.

Note The total number of concurrently active anonymous subscribers supported by the SCE platform is the same as the total number of concurrently active subscribers.

Static Subscriber Mode

Static subscriber mode binds incoming IP addresses together into groups, so that traffic from and to defined subscribers can be controlled as a group. For example, you can define all traffic from and to a particular network subnet (used by multiple subscribers concurrently) as a (virtual) “subscriber” and controlled or viewed as a group.

Static subscriber mode supports cases in which the entity controlled by the Cisco Service Control solution uses a constant IP address or address range that does not change dynamically, such as:

- Environments where the subscriber IP addresses do not change dynamically via, for example, DHCP or Radius
- Deployments in which a group of subscribers using a common pool of IP addresses (such as all those served by a particular aggregation device) will be managed together to provide a shared bandwidth to the entire group

The system supports the definition of static subscribers directly on an SCE platform; it does not require external management software (such as the SCMS-SM). Use the SCE platform CLI to define the list of subscribers, their IP addresses, and the associated package.

Subscriber-Aware Mode

In subscriber-aware mode, the SCE is populated by subscriber information (OSS ID and policy) that is dynamically bound to the (IP) address currently in use by the subscribers. Regardless of the IP address in use, this provides differentiated and dynamic control per subscriber and subscriber-level analysis. Use this mode to control and analyze traffic on a subscriber level, to monitor subscriber usage, and to assign and enforce different control policies (packages) for different subscribers.

In this mode, the SCMS-SM may provision the SCE platform with subscriber information.

Subscriber Modes: Summary

The following table summarizes the different subscriber modes supported by the system.

Table 2-1 Summary of Subscriber Modes

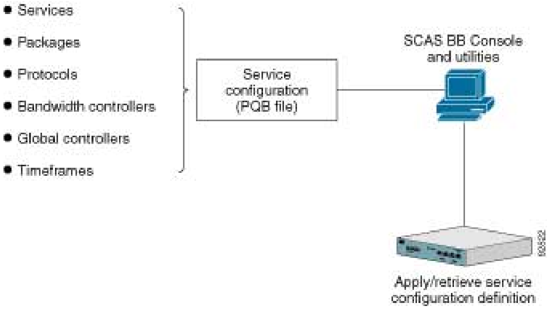
Mode	Features Supported	Main Advantages	Use for ...
Subscriberless mode	• Global (platform-level) analysis and control	No subscriber configuration required.	Global control solution or subscriber-level analysis. Examples: • Control P2P uploads at peering points. • Limit total bandwidth of P2P to a specified percentage.
Anonymous subscriber mode	• Global analysis and control • Individual IP address-level analysis and control	• No subscriber-configuration required; only define subscriber IP address ranges used. • Provide subscriber-level control without integration.	IP-level analysis or control that is not differentiated per subscriber, and where offline IP-address/subscriber binding is sufficient. Examples: • Limit P2P bandwidth per subscriber. • Identify top subscribers by identifying top IP addresses and correlating them with Radius or DHCP logs.
Static subscriber mode	• Global analysis and control • Control based on individual or group IP addresses as configured statically to the SCE platform	• On-time static subscriber configuration, with no integration requirements. • Manage subscriber traffic in logical groups.	Control of traffic of groups of subscribers. Example: • Assign a bandwidth limit for P2P traffic for each group of subscribers using a single CMTS device.
Subscriber-aware mode	• Full system functionality	• Differentiated and dynamic control per subscriber. • Subscriber-level analysis, regardless of IP address in use.	Control and analysis of traffic on a subscriber level. Examples: • Monitor subscriber-usage, regardless of IP addresses. • Assign different control policies (packages) to different subscribers, and change packages dynamically.

Service Configuration

Service configuration defines the way the SCE platform analyses and controls traffic. In very general terms, service configuration defines the following:

- Protocol and service classification
- Packages and policies
- Bandwidth controllers
- Global controllers

Figure 2-2: Service Configuration


Services
Packages
Protocols
Bandwidth controllers
Global controllers
Timeframes
Service configuration (PQB file)
SCAS BB Console and utilities
Apply/retrieve service configuration definition

Service configuration is accomplished using one of the following:

- The Console
- The ***SCA BB*** Service Configuration Utility
- The Service Configuration API

The Console

The Console is a set of GUI tools that are used to manage, configure, and monitor the solution components.

The Console is fully documented in the remainder of this guide.

Service Configuration Utility

The ***SCA BB*** Service Configuration Utility (**servconf**) is a simple command-line utility that you can use to apply PQB configuration files onto SCE platforms or to retrieve the current configuration from an SCE platform and save it as a PQB file. The utility configures SCE platforms with the service configuration defined in a PQB file. You can install and execute it in a Windows or Solaris environment

For full documentation of **servconf**, see *The SCA BB Service Configuration Utility* (on page 13-1).

Service Configuration API

The Service Configuration API is a set of Java classes used to:

- Program and manage service configurations

- Apply service configurations to the SCE platforms
- Integrated applications with third-party systems

This allows service providers to automate and simplify management and operational tasks.

The Service Configuration API is documented in the *Cisco* ***SCA BB*** *Service Configuration API Programmer's Guide*.

Traffic Processing Overview

This chapter describes how the Cisco Service Control Application for Broadband (***SCA BB***) installed on a Service Control Engine (SCE) platform processes traffic.

The chapter also defines the main elements (service configuration entities) of the ***SCA BB*** system and explains how they relate to each other.

This chapter contains the following sections:

Traffic Processing

There are three stages of traffic processing:

- Traffic classification—***SCA BB*** analyses traffic flows and determines their type (for example, browsing, e-mail, file sharing, or voice).
- Traffic accounting and reporting—***SCA BB*** performs bookkeeping and generates Raw Data Records (RDRs) that let you analyze and monitor the network.
- Traffic control—***SCA BB*** limits and prioritizes traffic flows according to their service, subscriber-package, subscriber quota state, and so on.

These three stages are described in the following sections.

You control how classification, reporting, and control are performed by editing *service configurations* and applying them to the SCE platform.

Traffic Classification

Traffic processing starts with *traffic classification*, which categorizes network sessions into services.

For each commercial service that a provider offers to its subscribers, a corresponding service is defined in the Cisco Service Control solution. You can use this service to classify and identify the traffic, report on its usage, and control it.

Services

In the traffic classification process, ***SCA BB*** categorizes network sessions into *services*.

Services are the building blocks for:

- Service configurations (because ***SCA BB*** can enforce different rules on different services)
- Aggregated usage reporting

From a provider’s perspective, a service is a network product sold to a subscriber. The service is usually a network application—such as browsing, e-mail, file sharing, or voice—that the subscriber uses. From a technical perspective, a service consists of one or more service elements, each of which enables a decision about the service associated with a network traffic flow type.

A number of services are predefined in the default service configuration (these services are listed in the “Default Service Configuration Reference Tables” chapter of the *Cisco Service Control Application for Broadband Reference Guide*). You can modify these services and add additional services to a service configuration.

A service configuration can contain up to 500 services.

The classification process occurs when a session starts. The process examines the first few packets of the session and decides to which service the session belongs. The session is then assigned a service ID that remains the same during the session’s life cycle.

Traffic is classified and mapped to services on the basis of some or all of the following service elements:

- Protocol—The protocol used. This allows, for example, the mapping of browsing flows and e-mail flows to separate services.
- Initiating side—Whether the subscriber side or the network side generated the flow. This allows, for example, the mapping of subscriber-initiated and network-initiated peer-to-peer traffic to separate services.
- Zone—Lists of IP addresses of the network-side host of the flow. This allows, for example, the mapping of all voice flows going to a specified server to a specific service.
- Flavor—Specific Layer 7 properties such as host names of the network-side host of the flow. This allows, for example, the mapping of all HTTP flows where the URL matches a certain pattern to a specific service.

SCA BB uses these flow mappings to map each network connection passing through it to a service. You define rules for the different services to implement control policies. The classification rules can contain Layer 3 and Layer 4 parameters (such as port numbers and IP addresses), and also Layer 7 parameters (such as host name and user agent for HTTP connections).

Service Elements

A service consists of one or more service elements; different network traffic flow types are mapped to different service elements.

A service element maps a specific protocol, initiating side, zone, and flavor to the selected service. Some or all of these parameters can take wild-card values.

A traffic flow is mapped to a specific service if it meets all four of the following criteria:

- The flow uses the specified *protocol* of the service element.
- The flow matches the *initiating side* specified for the service element.
- The destination of the flow is an address that belongs to the specified *zone* of the service element.
- The flow matches the specified *flavor* of the service element.

Note If a flow matches two service elements and one is more specific than the other, the flow will be mapped to the more specific of the two.

For example: Service A is defined for browsing and Service B is defined for browsing to a specific list of URLs. A browsing flow to a URL on Service B’s list matches both services, but will be mapped to Service B.

If a flow matches one parameter of one service element and a different parameter of another service element, precedence will be given first to matching flavors, then to protocols, then to zones, and finally to the initiating side.

For example: Service A is defined for e-mail and Service B is defined for all traffic to a specific network zone. An e-mail flow to the specific network zone matches both services, but will be mapped to Service A.

Examples of Services

The following table contains examples of services and their network parameters.

Table 3-1 Examples of Services and Service Parameters

Service Name	**Protocol**	**Initiating Side**	**Zone**	**Flavor**
Web Browsing	HTTP HTTPS	Subscriber-initiated	*	*
Web Hosting (network-initiated browsing)	HTTP HTTPS	Network-initiated	*	*
Local SMTP	SMTP	*	Local-mail servers (215.53.64.0/24)	*

Protocols

One of the main classifications of a flow is the *protocol* of a session (that is, of the network application that generated the session).

A protocol, as defined in the ***SCA BB*** system, is a combination of one or more signatures, one or more port numbers, and a transport type. The protocol of the network flow is identified according to these parameters. For example, if the port number is 80, the transport type is TCP, and content matches the HTTP signature, ***SCA BB*** maps the flow to the HTTP protocol.

The default service configuration contains a long list of predefined protocols. You can add additional protocols.

When a TCP or UDP flow does not match a specific protocol definition, ***SCA BB*** maps the flow to the Generic TCP or Generic UDP protocol.

When a non-TCP/UDP flow does not match a specific protocol definition, ***SCA BB*** maps the flow to the Generic IP protocol.

Protocol Elements

A protocol is a collection of protocol elements.

A *protocol element* maps a specific signature, IP protocol, and port range to the selected protocol. Some or all of these parameters can take wild-card values; port numbers can take range values.

A traffic flow is mapped to a specific protocol if it meets all three of the following criteria:

- The flow matches the specified signature of the protocol element.
- The flow protocol matches the IP Protocol of the protocol element.
- The flow matches the specified port range of the protocol element.

Note If a flow matches two protocol elements and one is more specific than the other, the flow will be mapped to the more specific of the two.
For example: Protocol A is defined for flows that match the FTP signature and Protocol B is defined for flows that match the FTP signature on TCP port 21. An FTP flow on port 21 matches both protocols, but will be mapped to Protocol B.
If a flow matches the signature of one protocol element and the port of another protocol element, it will be mapped to the matching signature.
For example: Protocol A is defined for flows that match the FTP signature and Protocol B is defined for flows on TCP port 21. An FTP flow on port 21 matches both protocols, but will be mapped to Protocol A.

Signatures

SCA BB examines traffic flows using the SCE platform's deep-packet-inspection capabilities, and compares each flow with an installed set of protocol signatures to identify the network application that generated the flow.

SCA BB comes with a set of predefined signatures for common network applications and protocols, such as browsing, e-mail, file sharing, and VoIP.

Cisco periodically publishes protocol packs containing new signatures and updates to existing signatures. You can use these protocol packs to update the set of signatures installed on ***SCA BB***, enhancing its classification capabilities.

Dynamic Signatures

Most signatures used by ***SCA BB*** are predefined and hard-coded. ***SCA BB*** also allows you to add *dynamic signatures*, which can be user-defined.

You can create and edit dynamic signatures in the Signature Editor tool. The Dynamic Signature Script (DSS) engine in ***SCA BB*** carries out the classification using these user-defined signatures in addition to the predefined signatures.

Initiating Side

The SCE platform is usually located between the provider's subscribers and the network. Subscriber-initiated flows are initiated by the subscriber toward the network; network-initiated flows are initiated from the network toward the subscriber.

You can limit some flow-types to one initiating side. For example, with HTTP you can restrict the direction of the flow to subscriber-initiated, because HTTP is always subscriber-initiated when the subscriber ventures outward to surf the Internet. If the direction of the HTTP flow is network-initiated, this probably means that a web server is open on the subscriber's local machine for receiving incoming HTTP traffic. The provider can block network-initiated HTTP.

Zones

A *zone* is a collection of network-side IP addresses.

Zones are configured by the user who arranges IP addresses in groups connected by a common purpose. A subscriber's network flow mapped to a service may be applied to a zone. In practice, zones often define geographical areas.

Zones are used to classify network sessions; each network session can be assigned to a service element based on its destination IP address.

EXAMPLES OF ZONES:

- A "walled garden"—A range of IP addresses of a server farm with premium video content, for which the provider would like to limit access to specific subscribers and to assure traffic priority.
- A zone to differentiate between off-net and on-net flows.

EXAMPLE OF ASSIGNING A ZONE TO A SESSION:

- Zone A and Zone B are two user-defined zones. Zone A includes the IP address range 10.1.0.0/16, and Zone B includes the IP address range 10.2.0.0/16. Analysis of a new session shows that its network IP address is 10.1.1.1—the session belongs to zone A.

Zone Items

A zone is a collection of related zone items.

A *zone item* is an IP address or a range of IP addresses.

Table 3-2 Examples of Zone Items

Network Address	Example
IP address	123.123.3.2
IP address range (and mask)	123.3.123.0/24 This means that the first 24 bits of the IP address must be included as specified and the final 8 bits can take any value. (That is, all IP addresses in the range 123.3.123.0 to 123.3.123.255.)

Flavors

Flavors are advanced classification elements that are used to classify network sessions according to signature-specific Layer 7 properties.

Flavors provide an additional level of granularity in defining services in the Cisco Service Control solution. A protocol flavor uses an additional protocol attribute in classifying a service, making this service a *flavor* of the service based on the protocol only. For example, the user-agent attribute of the HTTP protocol could be added as a protocol flavor, enabling the definition of all HTTP traffic generated by the same browser type (indicated in the user-agent field) as one service.

Examples of flavor types are HTTP User Agent and SIP Source Domain.

Flavor Items

A flavor is a collection of *flavor items*.

The type of a flavor item depends on the flavor type. For a list of available flavor types, see *Flavor Types and Parameters* (on page 7-51).

The default service configuration includes some predefined flavors, such as HTTP Streaming Agents (a flavor of HTTP) and Vonage (a flavor of SIP).

Content Filtering

Content filtering involves classification and control of HTTP flows according to the requested URL. The classification of the URL is performed by accessing an external database.

Service providers require effective Web filtering for their subscribers, for various purposes such as avoiding litigation and providing parental control. The problem is that the Web is huge and constantly growing, and ***SCA BB*** and the SCE Platform are not designed to track and maintain the huge database of URLs that is required for effective filtering.

SCA BB provides content filtering by integrating with SurfControl Content Portal Authority (CPA). SurfControl's technology enhances ***SCA BB*** URL classification capabilities by eliminating the need for a network administrator to manage a URL database or interact with the server, while creating a powerful filtering solution. It provides complete coverage of the Web's most trafficked sites and access to the most accurate and relevant database of URLs classified by risk category, such as sexually explicit, racist, hacker, and so forth.

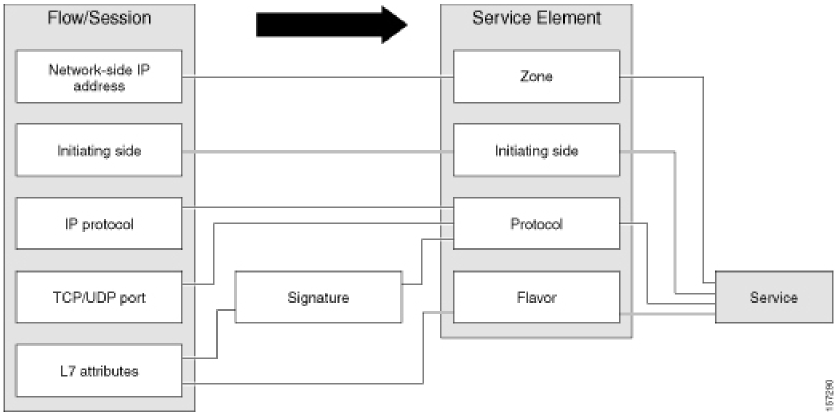
The integration of SurfControl's CPA into ***SCA BB*** provides the required web-filtering solution. ***SCA BB***, running on the SCE Platform, contacts a CPA server to categorize the web site that a subscriber requests. The returned category is then used to classify the HTTP flow. This classification is then used for the normal ***SCA BB*** traffic control and reporting.

Note ***SCA BB*** includes an internal database of URLs that is used by the HTTP URL flavor classification. When a URL is found in both the internal database and the external content filtering database, the URL is classified according to the internal database.

Mapping Flow Attributes to Services

The following figure illustrates the mappings of flow elements of a session to service elements of a service.

Figure 3-1: Mapping Flow Attributes to Service



Traffic Accounting and Reporting

You can use data gathered by the SCE platforms for real-time signaling, billing, and reporting.

Various metrics are collected in different scopes—global (per entire link), per service (or group of services), per package (or group of packages), and per subscriber—based on user-defined counters.

Note Global control bandwidth is based on Layer 1 volume.
Subscriber bandwidth control (and accounting and reporting) is based on Layer 3 volume.

The values from the counters can be either pushed or pulled:

- The SCE platform generates and transmits Raw Data Records (RDRs) that contain flow, usage, and other data.
- The SCE platform maintains an SNMP MIB that can be queried by external systems.

Usage Accounting

SCA BB collects and maintains various network metrics, per service, in different scopes.

The network metrics are:

- Upstream volume (L3 kilobytes)
- Downstream volume (L3 kilobytes)
- Sessions
- Active subscribers
- Concurrent sessions
- Session duration

Note For VoIP services, such as SIP and MGCP, the concurrent sessions counter counts concurrent voice calls, and the session duration counter measures voice call duration.

Per service accounting takes place in the following scopes:

- Per subscriber
- Per group of subscribers (package)
- Per link (global)

Several services may share the same service counter. For example, in the default service configuration, the SMTP service and the POP3 service share the E-Mail Counter. The assignment of services to counters is determined by the service hierarchy, as explained in the following section. Similarly, several packages may share the same package counter, and the assignment of packages to counters is determined by *the package hierarchy* (on page 3-9).

The Service Hierarchy

Services are arranged in a hierarchal tree. A single default service is at the root, and you can place each new service anywhere in the tree.

Services inherit the rule of their parents. When a rule is defined for a particular service (in a specific package), all its child services are controlled by the same rule for that package, unless explicitly specified.

Service Counters

The service hierarchy provides a way to share usage counters and to organize services according to their semantics. Services are accounted in groups, as defined in the service hierarchy. Each service is assigned usage counters.

There are two categories of usage counters for services:

- Global—Used for Link and Package RDRs and reports
- Subscriber—Used for Subscriber RDRs and reports

A global counter and a subscriber counter are assigned to each service. The use of a service can be accounted either exclusively for traffic classified to it or in conjunction with the traffic of its parent service. For example, if a service called Premium Video Content is defined as a child of Streaming, the operator can either define a special usage counter for Premium Video Content or configure it to use the same counter as Streaming. The global counter and the subscriber counter are independent; for the same service, one counter may be the same for parent and child, whereas the other is exclusive to the child.

The Package Hierarchy

Packages (on page 3-11) are arranged in a hierarchal tree. A single default package is the root of the tree, and you can place new packages anywhere in the tree.

Package Counters

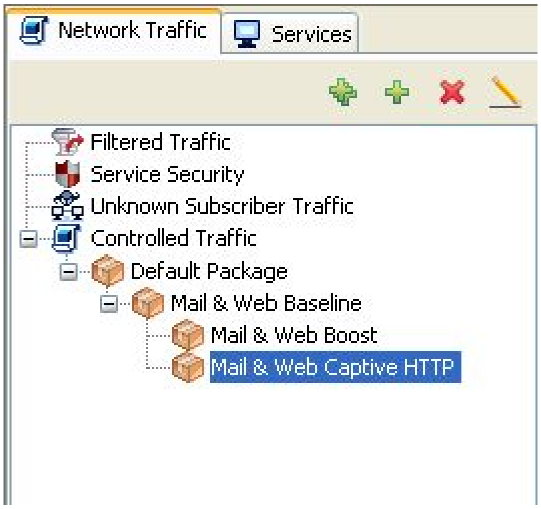
The package hierarchy allows you to organize packages according to their semantics and provides for sharing package usage counters. You can define a maximum of 1024 different exclusive package counters per service configuration, one of which is used for the Unknown Subscriber Traffic package.

Usage reporting at a package level is grouped as follows:

- Package assigned an exclusive package counter—All traffic associated with this package is accounted separately in the assigned counter, along with any children that are not assigned exclusive counters.
- Package NOT assigned an exclusive package counter—All traffic associated with this package is accounted together with its parent package.

For example, in the sample package tree shown in the following figure, if the Mail & Web Baseline package is allocated an exclusive counter, but none of its child packages are, then all Package Usage RDRs and the derived reports (such as “Package Bandwidth per Service”) would group together usage of subscribers assigned to all three packages.

On the other hand, if the Mail & Web Boost package also had an exclusive counter, the traffic for Main & Web Baseline and Mail & Web Captive HTTP would be accounted together, but traffic for Mail & Web Boost would be accounted separately. (In general this is not an efficient configuration. You should use the hierarchical structure to group packages that can share the same counter.)



RDRs

SCE platforms running ***SCA BB*** generate and transmit *Raw Data Records* (RDRs) that contain information relevant to the service provider.

RDRs contain a wide variety of information and statistics, depending on the configuration of the system. The following are the main categories of RDRs:

- Usage RDRs—Generated periodically. These RDRs contain the state of the usage counters, per service and per accounting scope. There are four types of usage RDRs:
  - Link Usage RDRs—Global usage per service, for the entire link.
  - Package Usage RDRs—Usage per group of subscribers, per service.
  - Subscriber Usage RDRs—Usage per subscriber, per service. These RDRs are generated for all subscribers. The Cisco Service Control Management Suite (SCMS) Collection Manager (CM) and Cisco Service Control Application (SCA) Reporter use these RDRs to generate top-subscriber reports and aggregated usage billing records.
  - Real-Time Subscriber Usage RDRs—Generated for specific subscribers selected by the user. The SCMS-CM and SCA Reporter use these RDRs by to generate detailed subscriber activity reports.
- Transaction RDRs—Generated for a sample of the flows. These RDRs are used to create statistical histograms such as Top TCP Ports.

- Transaction Usage RDRs—Generated for every flow according to user-defined filters. These RDRs contain detailed Layer 7 information for browsing, streaming, and voice flows. They are used for flow-based billing.
- Real-Time Signaling RDRs—Generated to indicate specific network events such as flow start or end. These RDRs are used to signal external systems to allow real-time actions across the network.
- Malicious Traffic RDRs—Generated to indicate that the SCE platform has detected a traffic anomaly, such as a DDoS attack.

Traffic Control

Traffic Control provides means to block, limit, or prioritize traffic flows according to service, subscriber package, subscriber quota state, and so on.

Packages

A *package* is a collection of rules describing subscriber policy. The package defines the group of services delivered to a specific group of subscribers and the system's behavior for each service. It may contain restrictions on network flows, guidelines for flows' prioritization, and instructions regarding how to report flows.

Each subscriber in the network is provided a reference to a package to which that subscriber belongs. The system:

1. Maps each network flow to a service by matching the flow with a service element
2. Identifies the subscriber to whom the flow pertains, according to the subscriber's network ID (usually the subscriber's IP address)
3. Identifies the package to which the subscriber belongs
4. Applies the correct rule to the service of the subscriber's network flow

Unknown Subscriber Traffic

The SCE platform tries to identify the subscriber responsible for every traffic flow that it processes. The platform looks at the IP address or VLAN tag of the traffic flow, and checks its internal database for a subscriber that is identified by this IP Address or VLAN tag. If such a subscriber is not found in the database, the traffic flow is mapped to the Unknown Subscriber Traffic category.

Rules

A *rule* is a set of instructions that tell the SCE platform how to treat network flows of a specific service. A rule may:

- Specify that a flow should be blocked or be granted a certain amount of bandwidth
- Define an aggregate volume or session limit, after which a set of different restrictions will be enforced on the flow
- Specify how a flow will be reported for billing or analysis purposes

Calendars

Calendars are used to split the hours of the week into four *time frames*.

After you have configured a calendar, you can add *time-based rules* (on page 3-12) to a package that is using the calendar.

Each service configuration includes one default calendar. You can add nine more calendars, each with a different time-frame configuration. You can use different calendars for different packages. They can also be used where a service provider has customers in more than one time zone.

Time-Based Rules

A *time-based rule* is a rule that applies to only one time frame. Time-based rules allow you to set rule parameters that will only apply at specific times. You might, for example, want to define different rules for peak, off-peak, nighttime, and weekend usage.

You can add time-based rules to any rule. If a time-based rule is not defined for a time frame, the parent rule is enforced.

Often, you will want the rules for the different time frames to be similar. When you add a time-based rule, the settings of the parent rule are copied to the new time-based rule; you can make any needed changes. Subsequent changes to the parent rule do not affect the time-based rule.

Bandwidth Management

The physical link bandwidth is an absolute limit on the bandwidth that can pass through the system. You can limit the total bandwidth passing through the SCE platform even further. For example, if another device sitting next to the SCE platform on the IP stream has limited BW capacity, you can limit the bandwidth passing through the SCE platform to match the capacity of the other device.

Bandwidth control in ***SCA BB*** is accomplished in two stages:

- Global control
- Subscriber bandwidth control

Note Global control bandwidth is based on Layer 1 volume.
Subscriber bandwidth control (and accounting and reporting) is based on Layer 3 volume.

Global Bandwidth Control

Total bandwidth use is controlled by *global controllers*. Global controllers are virtual queues in SCE platforms. You configure them for the entire system, rather than for individual subscribers.

Global controllers provide constraints for large, global volumes of traffic, such as “Total Gold Subscriber Traffic”, or “Total P2P Traffic”. Each global controller defines the maximum percentage of total available bandwidth allocated to all traffic of a particular type. Using a global controller, you can limit total traffic of services such as P2P in the system to any desired percentage of the total available bandwidth. In this way, you keep the total bandwidth consumed by this traffic under control.

The upstream and downstream interfaces are each assigned one default global controller that, by default, controls 100% of the link traffic. You can add up to 1023 more global controllers for each interface, and you can assign a maximum percentage of the total link limit to each global controller separately.

For each global controller, you can define separate values for the maximum percentage of total available bandwidth separately for each time frame. (See *Calendars* (on page 3-12).)

In dual-link systems you can define different bandwidth values for each link. You can also set a limit on the aggregated bandwidth passing on the two links.

Subscriber Bandwidth Control

Bandwidth used by individual subscribers is controlled by *Subscriber BW Controllers* (BWCs). Each BWC controls available bandwidth for selected services. Services controlled by a particular BWC are defined per package, but bandwidth control is per service.

A BWC is specified by the following parameters:

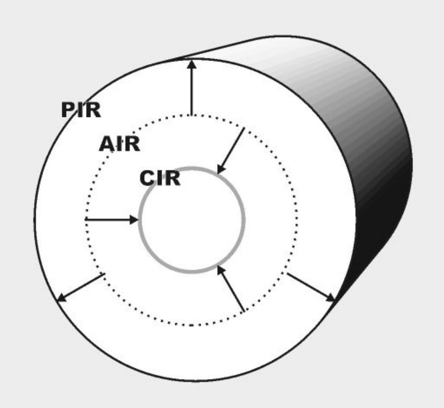
- Committed Information Rate (CIR)—The minimum bandwidth that must be granted to the services that are controlled by the BWC
- Peak Information Rate (PIR)—The maximum bandwidth that will be allocated to the services that are controlled by the BWC
- Global Controller—The global controller to which this BWC links
- Assurance Level (AL)—The rate of change of available bandwidth under conditions of traffic congestion

PIR may be thought of as the “width” of the virtual pipe, where the pipe is flexible and can adjust in width. CIR is the minimum width to which the pipe can contract. During network congestion, the system contracts each pipe differently to differentiate between subscribers and between their services.

The pipe width in this analogy defines the total bandwidth (Admitted Information Rate (AIR)) that is allowed to cross the pipe. AIR ranges between CIR and PIR. The consumed bandwidth (UIR) is the rate that currently flows through the BWC and it is always less than AIR.

It might be that the traffic associated with the BWC does not consume much bandwidth at a particular point in time. However, where there is a growing demand for bandwidth, the BWC ensures that at least the CIR is granted, even in conditions of network congestion (PIR-congestion). Similarly, the BWC ensures that no matter of congestion conditions, the traffic associated with a BWC would always be below the PIR limit.

Figure 3-2: Bandwidth Control Levels



In the preceding figure, the small circle indicates CIR. The big circle indicates PIR. The dashed circle indicates AIR—the maximum rate currently allowed to flow through the BWC: CIR < AIR < PIR. UIR—the rate that currently flows through the BWC—can be smaller than CIR: 0 < UIR < AIR.

The BWC has a third parameter that controls how AIR is determined at different congestion conditions. As indicated, when the network is not congested the system allows PIR and when the network is highly congested the system provides CIR. In between these two extremes, the AIR is determined by a third parameter—Assurance Level (AL). AL controls how fast AIR would decrease from PIR to CIR as congestion builds, or increase from CIR to PIR as congestion decreases. A higher AL ensures a higher AIR compared to a similar BWC with a lower AL.

Controlling Traffic at Two Levels: Total and Internal

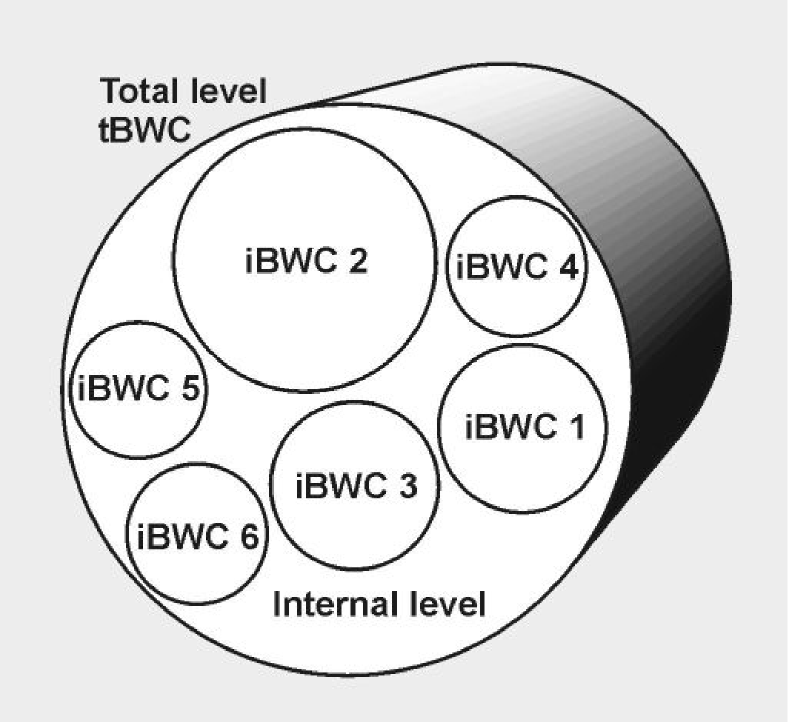
Subscriber BWCs enforce bandwidth at two levels:

- The first level, Primary (Total) BWC, specifies bandwidth service configurations that the *provider* enforces on its subscribers.
- The second level, (Internal) BWC, specifies service configurations that the *subscriber* wants to enforce on its services.

SCA BB provides each subscriber with an independent set of BWCs. A single BWC, the Primary BWC (tBWC), controls the total bandwidth of the subscriber. The other BWCs control the bandwidth of some services of that subscriber. For example, one BWC may control the Streaming Service; another may control the Download and E-mail Services together. These BWCs, which provide second-level control, are referred as iBWCs.

PIR defines the upper limit for the associated services. CIR defines a minimum rate for these services. The system ensures that this minimum is granted under conditions that will be described later.

Figure 3-3: Bandwidth Control on Two Levels



The primary BWC (tBWC) controls the total bandwidth of the subscriber. iBWCs control the bandwidth of portions of this bandwidth that are associated with one or more services.

iBWCs are linked to traffic in the following way:

- In the package general definitions, define a BWC, with its PIR, CIR, AL and CoS.
- When defining a rule, assign each service to one BWC.

Quota Management

You can assign subscribers a quota limit on selected services.

Each subscriber has 16 quota buckets, each of which you can define for volume or sessions. When a subscriber uses a certain service, the amount of consumed volume or number of sessions is subtracted from one of the buckets.

The service configuration determines which bucket to use for each service. Consumption of volume buckets is measured in units of L3 kilobytes. Consumption of session buckets is measured by the number of sessions. For example, you can define that the Browsing and E-Mail services consume quota from Bucket #1, that the P2P service consumes quota from Bucket #2, and that all other services are not bound to any particular bucket.

External quota provisioning systems can use the Quota Provisioning API (see the *Cisco SCMS SCE Subscriber API Programmer's Guide*) to dynamically modify the quota in each bucket. For example, you can increase the quota of a certain bucket when a subscriber purchases additional quota. These external systems can also query the amount of remaining quota in each bucket. This can be used, for example, to show subscribers in a personal web page how much of their quota remains.

External quota provisioning can also be acquired using the Quota Manager (QM), an off-the-shelf solution provided by Cisco. For complete information regarding the installation and operation of the QM, see the *Cisco Service Control Management Suite Quota Manager Solution Guide*.

The internal ***SCA BB*** quota provisioning system replenishes each quota bucket by a fixed amount at fixed intervals.

Subscribers can be notified when they breach the quota in any bucket.

Subscriber Notification

The subscriber notification feature lets you push web-based messages (such as notifications of quota depletion) to a subscriber by redirecting the subscriber HTTP traffic to relevant web pages. HTTP redirection starts when the subscriber notification is activated and ceases when the notification is dismissed.

Other Traffic Processing Features

Service Security

SCA BB includes service security functionality to help protect network operators and their subscribers from attacks and malicious traffic:

- DoS attacks
- DDoS attacks
- VoIP threats
- Worms
- Hacker activity
- Malicious takeover of subscriber computers:

  - Spam zombies
  - E-mail based viruses

Although it is never possible to provide complete protection from network threats, the Cisco Service Control solution provides insight into malicious activity in a network, and can mitigate large scale eruptions of malicious activity that compromise overall network performance.

Networks operators can use ***SCA BB*** to:

- Monitor network traffic for suspicious activity
- Block malicious traffic
- Notify subscribers that are creating or have been affected by malicious traffic

Detecting Malicious Traffic

SCA BB uses three threat detection mechanisms:

- Anomaly Detection—This set of mechanisms monitors the rate of connections (both successful and unsuccessful) to and from each host IP address. High connection rates or a low ratio between successful and unsuccessful connections indicate malicious activity.

  Anomaly detection characteristics can indicate the following categories of malicious activity:

  - IP sweep—Scanning multiple IP addresses, all on the same port (a behavior that is typical of worms)
  - Port scan—Scanning all ports at one IP address (a behavior typical of hackers)
  - DoS attack—An attack (on a single IP address) from a single IP address
  - DDoS attack—An attack (on a single IP address) from multiple IP addresses

  SCA BB will identify a DoS attack with spoofing (using many fake IP addresses instead of one real address) as a DDoS attack.

  The anomaly detection mechanism is effective in addressing new threats as they appear. It does not need knowledge about their exact nature and Layer 7 signatures, but is based on the characteristics of their network activity.

- Mass mailing activity detection—This mechanism monitors SMTP session rates for individual subscribers (using SCE platform subscriber-awareness; it can work in subscriber-aware or anonymous subscriber mode). A high rate of SMTP sessions from an individual subscriber is usually an indicator of malicious activity that involves sending e-mail (either mail-based viruses or spam-zombie activity).
- Signature based detection—The SCE platform’s stateful Layer 7 capabilities are used to detect malicious activity that is not easily detectable by the other mechanisms. Operators can add signatures for such threats, achieving a very quick response time in addressing new threats.

Responding to Malicious Traffic

You can define the following actions when configuring the detection mechanisms described in the preceding section:

- Monitor the network for malicious activity detected by each of these mechanisms.

  You can display graphs based on data collected for malicious activity analysis in the Console.

- Automatically block malicious activity that is detected by the SCE platform to avoid threat propagation and adverse effects to the network.
- Notify subscribers that are involved in malicious activity by redirecting their web sessions to a captive portal.

SCA BB provides a high level of flexibility in tuning the detection methods to define malicious activity and in configuring the actions to be taken when malicious activity is detected.

Traffic Filters

Filter rules are part of service configurations. They allow you to instruct the SCE platform to ignore some types of flow (based on the flow's Layer 3 and Layer 4 properties) and to transmit the flows unchanged.

When a traffic flow enters the SCE platform, the platform checks whether a filter rule applies to the flow. If a filter rule applies to this traffic flow, the SCE platform passes the traffic flow to its transmit queues without generating any RDRs and without enforcing any service configuration rules. These flows will not appear in records generated for analysis purposes and will not be controlled by rules belonging to the active service configuration.

It is recommended that you add filter rules for OSS protocols (such as DHCP) and routing protocols (such as BGP) that might traverse the SCE platform These protocols usually should not be affected by policy enforcement, and their low volume makes them insignificant for reporting.

A number of filter rules are included in the default service configuration.

Quick Forwarding

Quick forwarding is a flow filter rule action whose aim is to ensure low latency for delay sensitive flows. The packets of quick-forwarded flows are duplicated and sent through different paths: one copy goes directly to the transmit queue and thus suffers only a minimal delay, the other copy goes through the normal packet path. Since the ***SCA BB*** application handles quick-forwarded flows in an offline manner, those flows cannot be controlled.

Traffic Forwarding to Value Added Services Servers

Traffic forwarding to Value Added Services (VAS) servers allows the Cisco Service Control solution to use an external expert system for additional traffic processing. When using this feature, traffic is rerouted by the SCE to the preconfigured location of the expert system (VAS server). After processing, the traffic is sent back to the SCE, which then sends it to its original destination. Conceptually, this feature adds one additional step (the expert system redirection) to the traffic processing done by ***SCA BB***.

Service Configurations

A *service configuration* implements and enforces the business strategy and vision of the provider.

A service configuration can take effect only after it is propagated to the appropriate SCE platform. ***SCA BB*** enforces the service configuration by analyzing the network traffic passing through them.

A service configuration consists of:

- Traffic Classification Settings—A service configuration contains services, such as Web Browsing, File Sharing, and Voice. Each service consists of service elements, which define how network traffic is mapped to the service. Protocols, zones, flavors, and signatures are the configuration building blocks of services.
- Traffic Accounting and Reporting Settings—A service configuration contains settings that determine how traffic flows and network usage accounting are reported.
- Traffic Control Settings—A service configuration contains packages, each package consisting of a set of rules (such as bandwidth rate limit and quota limits) defined for different services. Rules, quota buckets, subscriber BWCs, and global controllers are the main configuration building blocks of traffic control settings.

Defining Service Configurations in Practice

In practice, defining service configurations is an iterative process.

It is recommended that you:

- Set up the system.
- Apply the default service configuration.
- Gather data.
- Analyze.
- Only then, decide what you want to do:
  - Continue traffic discovery by further partitioning the traffic into services.
  - Achieve capacity-control and tiered-control goals by creating rules to limit and prioritize traffic according to services and subscriber packages.

CHAPTER 4

Getting Started

This chapter:

- Guides you through the process of installing or upgrading the ***Cisco Service Control Application for Broadband*** (***SCA BB***)
- Explains how to launch the various components of the Console
- Describes the concept of the Console as a collection of tools, presents each tool and its role, and describes how to navigate between the tools
- Concludes with a Quick Start that describes how to apply your first service configuration and generate your first report

This chapter contains the following sections:

Installing SCA BB

Installation of ***SCA BB*** is performed in two stages:

1. Install the ***SCA BB*** front ends:
   - The Console
   - The ***SCA BB*** Service Configuration Utility, the ***SCA BB*** Signature Configuration Utility, and the ***SCA BB*** Real-Time Monitoring Configuration Utility
2. Install the ***SCA BB*** application components:
   - The ***SCA BB*** Service Modeling Language Loadable Image (SLI) and the ***SCA BB*** Service Control Engine (SCE) applicative management plug-in

- The ***SCA BB*** Subscriber Manager applicative management plug-in (for systems with a Cisco Service Control Management Suite (SCMS) Subscriber Manager (SM))

If you are upgrading an existing installation of ***SCA BB***, see *Upgrading from Version 2.5 to Version 3.0.5* (on page 4-7) or *Upgrading from Version 3.0.x to Version 3.0.5* (on page 4-9).

Prerequisites

Before installing ***SCA BB***, verify that the SCE platform and, if used, the SCMS-SM are operational and are running appropriate versions of their software.

To verify that the SCE platform is operational:

Verify that the status LED on the SCE flashes green. (Orange—booting up; flashing orange—warning; red—failure.)

To verify that the SCE platform is running an appropriate version of the OS:

Step 1 At the SCE platform CLI prompt (`SCE#`), type **`show version`**.

Step 2 Press **Enter**.

The response shows the version of the OS running on the SCE platform.

To verify that the SM is correctly installed:

Step 1 Open a Telnet session to the SM.

Step 2 Go to the SM `bin` directory and type **`p3sm --sm-status`**.

Step 3 Press **Enter**.

The response to this command displays the operational status of the SM.

To verify that an appropriate version of the SM is running:

Step 1 Open a Telnet session to the SM.

Step 2 Go to the SM `bin` directory and type **`p3sm --sm-version`**.

Step 3 Press **Enter**.

The response to this command displays the SM version.

The SCA BB Installation Package

The ***SCA BB*** installation package is a ZIP file located in the CCO.

The installation package consists of the following files:

- The installer for the Console: *scas-bb-console-<version>-<build>.exe*.
- A Cisco installation application package file (PQI file) for each platform:
  - A PQI file for each type of SCE platform. Each PQI file is located in a subfolder whose name is the platform name.
  - A PQI file for the SM, located in the *SM* subfolder.
- The file *scas_bb_util.tgz*, which contains the files for the ***SCA BB*** Service Configuration Utility (**servconf**), the ***SCA BB*** Signature Configuration Utility (**sigconf**), and the ***SCA BB*** Real-Time Monitoring Configuration Utility (**rtmcmd**) (together with real-time monitoring report templates).
- The file *PCubeEngageMib.mib*, which defines the SCAS BB MIB, located in the *SNMP* subfolder.
- The ***SCA BB*** Service Configuration Java API distribution file: *serviceconfig-java-api-dist.tgz*.
- The file *surfcontrol.xml*, which lists the content categories for content filtering using SurfControl Content Port Authority, located in the *URL Filtering* subfolder.

Installing SCA BB Front Ends

You should install the following ***SCA BB*** front ends:

- The Console
- The ***SCA BB*** Service Configuration Utility (**servconf**), the ***SCA BB*** Signature Configuration Utility (**sigconf**), and the ***SCA BB*** Real-Time Monitoring Configuration tool (**rtmcmd**) (together with associated real-time monitoring report templates)

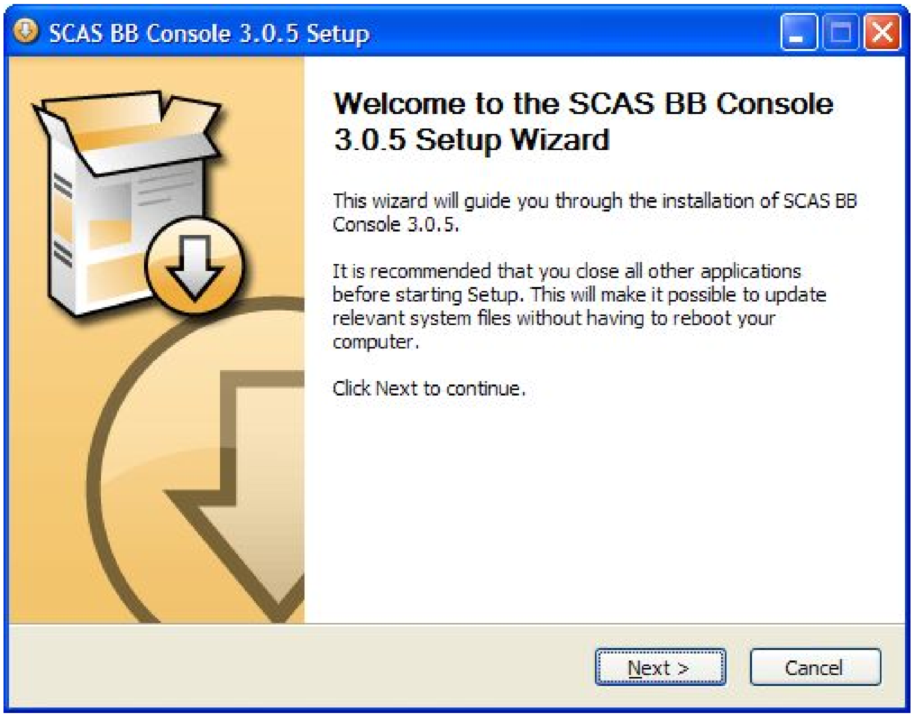
  servconf requires access to the Java Runtime Environment (JRE) (see *Installing the Java Runtime Environment* (on page 4-7)).

Installing the Console

To install the Console:

Step 1 Navigate to the Console installation file, `scas-bb-console-3.0.5.exe`, and double-click it.

The Welcome screen of the SCAS BB Console 3.0.5 Setup Wizard appears.



SCAS BB Console 3.0.5 Setup

Welcome to the SCAS BB Console 3.0.5 Setup Wizard

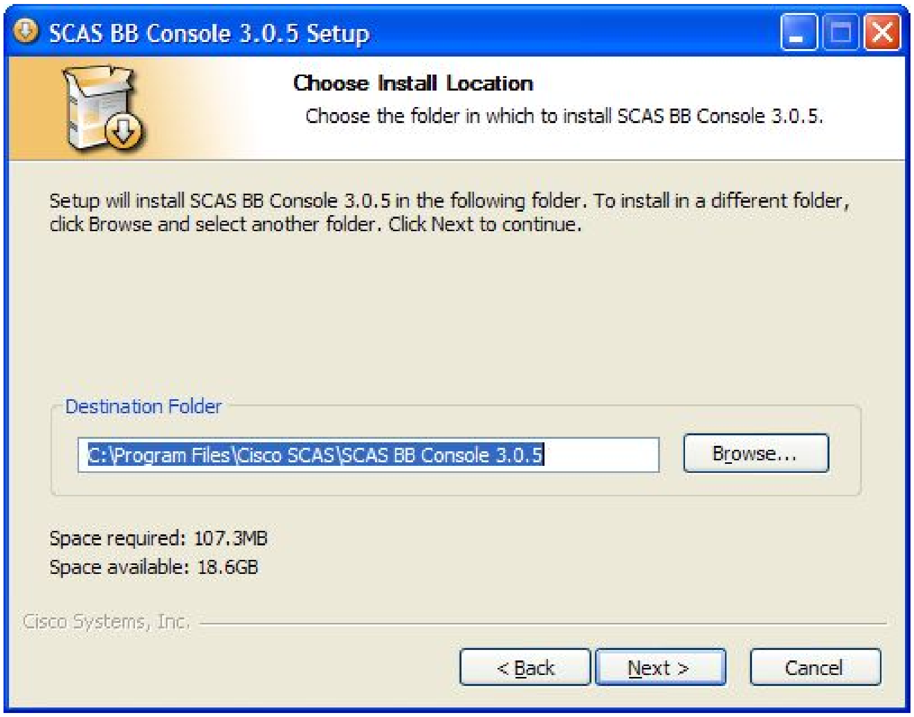
This wizard will guide you through the installation of SCAS BB Console 3.0.5.

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

Step 2 Click **Next**.

The Install Location screen of the Setup Wizard opens.



SCAS BB Console 3.0.5 Setup

Choose Install Location

Choose the folder in which to install SCAS BB Console 3.0.5.

Setup will install SCAS BB Console 3.0.5 in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.

Destination Folder

C:\Program Files\Cisco SCAS\SCAS BB Console 3.0.5

Space required: 107.3MB

Space available: 18.6GB

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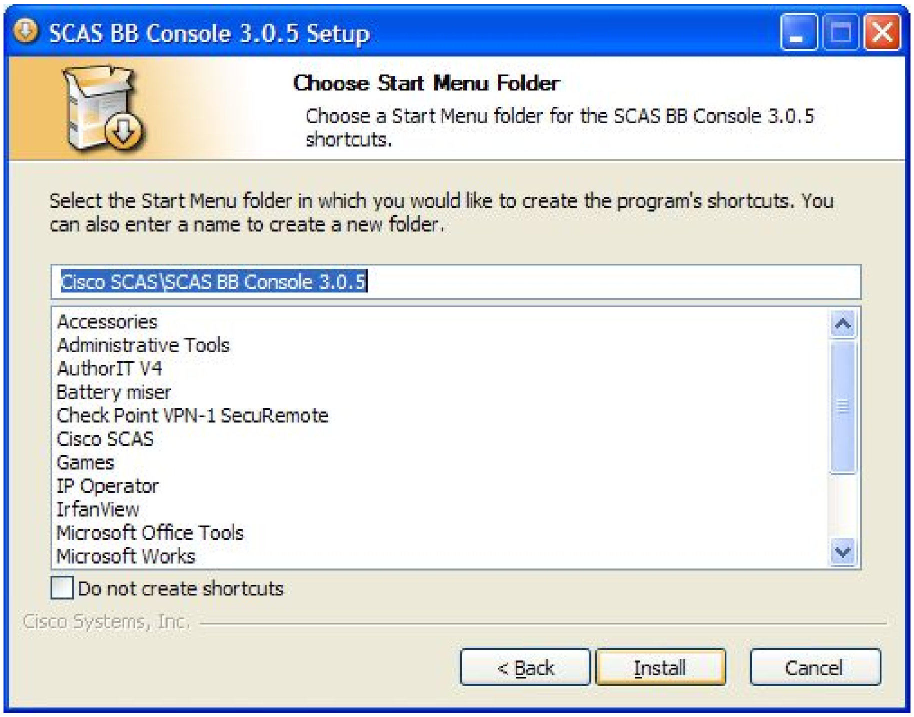
Step 3 (Optional) Click **Browse** and choose a different destination folder.

Step 4 Click **Next**.

The Start Menu Folder screen of the Setup Wizard opens.



SCAS BB Console 3.0.5 Setup

Choose Start Menu Folder

Choose a Start Menu folder for the SCAS BB Console 3.0.5 shortcuts.

Select the Start Menu folder in which you would like to create the program's shortcuts. You can also enter a name to create a new folder.

Cisco SCAS\SCAS BB Console 3.0.5

Accessories
Administrative Tools
AuthorIT V4
Battery miser
Check Point VPN-1 SecuRemote
Cisco SCAS
Games
IP Operator
IrfanView
Microsoft Office Tools
Microsoft Works

□ Do not create shortcuts

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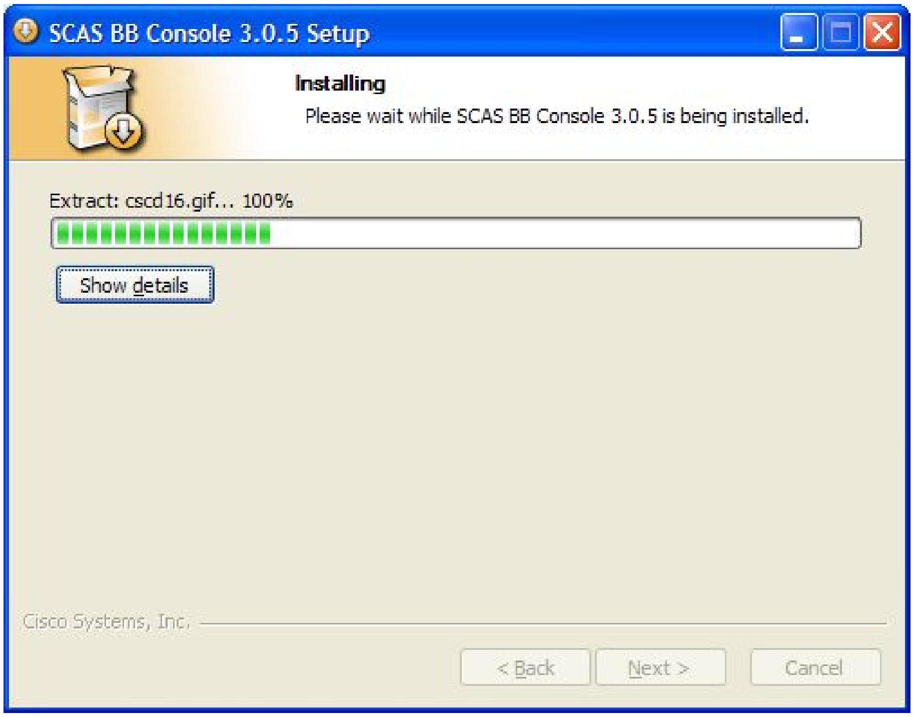
Step 5 (Optional) Enter a different Start Menu folder in the Start Menu Folder field.

Step 6 (Optional) Check the **Do not create shortcuts** check box.

Step 7 Click **Install**.

The Installing screen of the Setup Wizard opens.



SCAS BB Console 3.0.5 Setup

Installing

Please wait while SCAS BB Console 3.0.5 is being installed.

Extract: cscd16.gif... 100%

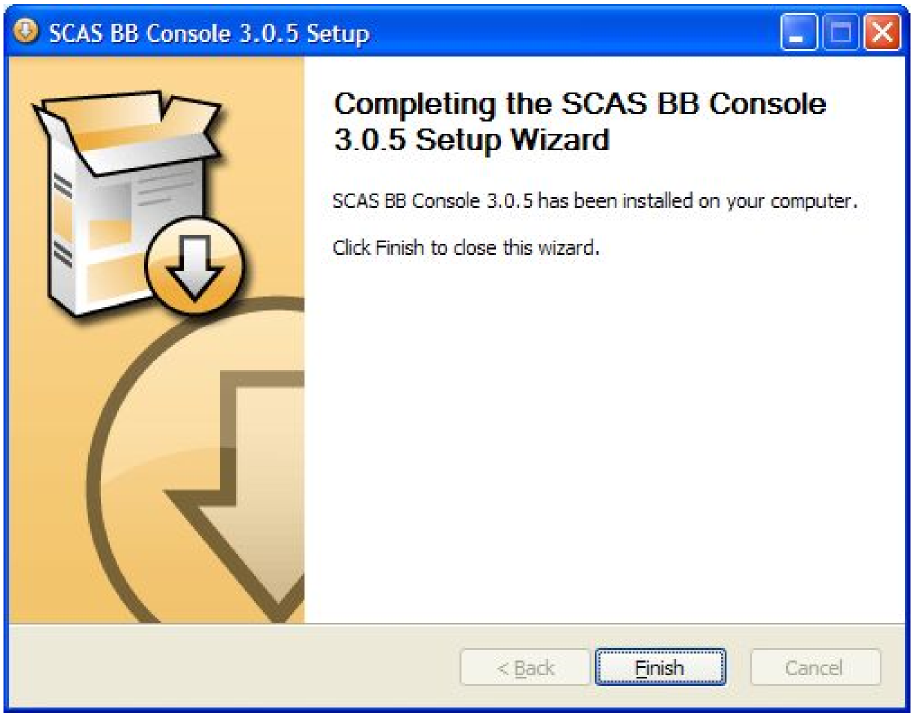
Cisco Systems, Inc.

Step 8 Wait until installation is complete.

The Next button is enabled.

Step 9 Click **Next**.

The Installation Complete screen of the Setup Wizard opens.



SCAS BB Console 3.0.5 Setup

Completing the SCAS BB Console 3.0.5 Setup Wizard

SCAS BB Console 3.0.5 has been installed on your computer.

Click Finish to close this wizard.

Step 10 Click **Finish**.

The SCAS BB Console 3.0.5 Setup Wizard closes.

The Console is now installed on the machine.

Installing the SCA BB Configuration Utilities

To install the ***SCA BB*** configuration utilities:

Step 1 From the ***SCA BB*** installation package, extract the file `scas_bb_util.tgz`, and copy it to a Windows, Solaris, or Linux workstation.

Step 2 Unpack the file to a new folder.

The ***SCA BB*** Service Configuration Utility (**servconf**), the ***SCA BB*** Real-Time Monitoring Configuration Utility (**rtmcmd**) (and associated real-time monitoring report templates), and the ***SCA BB*** Signature Configuration Utility (**sigconf**) are located under the `bin` folder.

Installing the Java Runtime Environment

The ***SCA BB*** Service Configuration Utility, **servconf**, requires access to JRE version 1.4 or 1.5.

You can download a JRE from the Sun™ website at *http://java.sun.com/j2se/1.4.2/download.html*.

To verify that the JRE is installed, run **`java -version`** from the command prompt. The Java version should start with 1.4 or 1.5.

If a different version of JRE is also installed on the workstation, you may need to tell **servconf** where to find the appropriate JRE. Do this by setting the JAVA_HOME environment variable to point to the JRE 1.4 installation directory. For example:

```
JAVA_HOME=C:\Program Files\Java\j2re1.4.2_08
```

Installing SCA BB Application Components

SCA BB has two software components that reside on the SCE platform:

- The ***SCA BB*** SLI, which performs traffic processing
- The ***SCA BB*** SCE applicative management plug-in, which performs some service configuration operations

SCA BB also has one software component that resides on the SM device:

- The ***SCA BB*** SM applicative management plug-in, which performs some application-specific subscriber management operations

To install these components from the Console, see *Installing PQI Files on SCE Devices* (on page 5-14) and *Installing PQI Files on SM Devices* (on page 5-20).

To install these components from a command line, see *Installing PQI Files from the Command Line* (on page 13-8).

Upgrading SCA BB

Upgrading from Version 2.5 to Version 3.0.5

Upgrading ***SCA BB*** includes upgrading each of the following software components:

- The Console
- The SCE PQI file
- The SM PQI file

Note This section describes the upgrade of ***SCA BB*** application components only. For a full description of the entire Cisco solution upgrade procedure, consult the solution upgrade document accompanying the formal release.

To upgrade ***SCA BB*** application components:

Step 1 Using a SCAS BB 2.5 Console, retrieve the service configuration (PQB) from the SCE platform, and save it to the local hard disk.

The upgrade procedure does not require uninstalling the SCAS BB 2.5 Console.

Step 2 *Install the SCA BB 3.0.5 Console* (on page 4-3).

Step 3 Open the SCA BB 3.0.5 Console.

Step 4 Use the Network Navigator tool to install a version 3.0.5 SCE PQI file on the SCE platform:

a) Create an SCE device in the Network Navigator tool. (See *Adding SCE Devices to a Site* (on page 5-3).)

b) Install the PQI file. (See *Installing PQI Files on SCE Devices* (on page 5-14).)

c) Verify that the installation was successful by retrieving the SCE platform’s online status. (See *Retrieving the Online Status of SCE Devices* (on page 5-11).)

Step 5 If your system includes an SM, use the Network Navigator tool to install a version 3.0.5 SM PQI file on the SM device:

a) Create an SM device in the Network Navigator tool. (See *Adding SM Devices to a Site* (on page 5-4).)

b) Install the PQI file. (See *Installing PQI Files on SM Devices* (on page 5-20).)

Step 6 Using the 3.0.5 Service Configuration Editor tool, open the service configuration saved in step 1.

Step 7 When you upgrade old PQB files, new signature-based protocols are not assigned to any service (and are therefore classified as Generic TCP). Check the release notes for a list of new signature-based protocols, and manually assign these protocols to a service.

Step 8 Apply the service configuration to the SCE platform.

Note

- When you upgrade old PQB files, some protocol IDs are changed automatically. Messages such as the following may be displayed to indicate the change:

```
Protocol ID of BaiBao changed from 80 to 43
Protocol ID of PPLive changed from 81 to 44
```

- New ***SCA BB*** versions do not use *the default Dynamic Signature Script (DSS) file* (on page 7-46) that was installed for a previous ***SCA BB*** version.
- If a protocol pack for the new version is available, *install it* (on page 4-12) after the product installation is complete. Do *not* install an old protocol pack on top of a new product installation.

Upgrading from Version 3.0.x to Version 3.0.5

Upgrading ***SCA BB*** includes upgrading each of the following software components:

- The Console
- The SCE PQI file
- The SM PQI file

Note This section describes the upgrade of ***SCA BB*** application components only. For a full description of the entire Cisco solution upgrade procedure, consult the solution upgrade document accompanying the formal release.

To upgrade ***SCA BB*** application components:

Step 1 Using a SCA BB 3.0.x Console, retrieve the service configuration (PQB) from the SCE platform, and save it to the local hard disk.

The upgrade procedure does not require uninstalling the SCA BB 3.0.x Console.

Step 2 *Install the SCA BB 3.0.5 Console* (on page 4-3).

Step 3 Open the SCA BB 3.0.5 Console.

Step 4 Use the Network Navigator tool to install a version 3.0.5 SCE PQI file on the SCE platform:

a) Create an SCE device in the Network Navigator tool. (See *Adding SCE Devices to a Site* (on page 5-3).)

b) Install the PQI file. (See *Installing PQI Files on SCE Devices* (on page 5-14).)

c) Verify that the installation was successful by retrieving the SCE platform’s online status. (See *Retrieving the Online Status of SCE Devices* (on page 5-11).)

Step 5 If your system includes an SM, use the Network Navigator tool to install a version 3.0.5 SM PQI file on the SM device:

a) Create an SM device in the Network Navigator tool. (See *Adding SM Devices to a Site* (on page 5-4).)

b) Install the PQI file. (See *Installing PQI Files on SM Devices* (on page 5-20).)

Step 6 Using the 3.0.5 Service Configuration Editor tool, open the service configuration saved in step 1.

Step 7 When you upgrade old PQB files, new signature-based protocols are not assigned to any service (and are therefore classified as Generic TCP). Check the release notes for a list of new signature-based protocols, and manually assign these protocols to a service.

Step 8 Apply the service configuration to the SCE platform.

Note

- When you upgrade old PQB files, some protocol IDs are changed automatically. Messages such as the following may be displayed to indicate the change:

  ```
  Protocol ID of BaiBao changed from 80 to 43
  Protocol ID of PPLive changed from 81 to 44
  ```

- New ***SCA BB*** versions do not use *the default Dynamic Signature Script (DSS) file* (on page 7-46) that was installed for a previous ***SCA BB*** version.
- If a protocol pack for the new version is available, *install it* (on page 4-12) after the product installation is complete. Do *not* install an old protocol pack on top of a new product installation.

Upgrading the SCA BB Service Configuration Utility

Install the new version of the ***SCA BB*** Service Configuration Utility, **servconf**, in an empty directory (see *Installing the SCA BB Configuration Utilities* (on page 4-6)).

Installing Protocol Packs

SCA BB uses stateful Layer 7 capabilities for classification of traffic flows.

When a traffic flow is handled by the system, it is assigned a signature ID according to the set of Layer 3 to Layer 7 parameters (the *signature*) characterizing this flow. Typically, these signatures come embedded in ***SCA BB***.

In order to enable rapid response to the ever-changing protocol environment, ***SCA BB*** was enhanced to allow signatures to be updated dynamically. You can load a protocol support plug-in onto an operational system, enhancing the system’s protocol support without compromising the stability of the system (no update of an existing software component is required) and without any service downtime.

Protocol Packs

Periodically, Cisco publishes protocol packs containing new and improved protocol signatures for ***SCA BB***. A typical protocol pack is a file containing signatures for detecting network worms, popular peer-to-peer applications, and other relevant protocols. When loaded into SCE platforms, these signatures improve ***SCA BB*** classification abilities.

Note

You can install a protocol pack on an SCE platform only if a PQI is already installed on the platform.

A protocol pack for ***SCA BB*** may be either a DSS file or an SPQI file:

- Loading a DSS file to the SCE platform requires no downtime of ***SCA BB*** or the platform.
- Loading an SPQI file to the SCE platform entails updating the SCE application:
  - If hitless upgrade (see *Hitless Upgrade of the SLI* (on page 4-15)) is enabled, there is no downtime of the SCE platform when loading the SPQI file.

- If hitless upgrade is *not* enabled, loading an SPQI file requires a short downtime (up to one minute) of the SCE platform. During that time, network traffic bypasses the platform and is neither controlled nor reported.

If hitless upgrade is disabled, SPQI installation can cause the loss of the following subscriber data from all subscribers: package ID, real-time monitoring flag, and quota settings. Subscribers are assigned default values for these properties.

Updating Protocols

Verifying Version Compatibility for Protocol Packs

A protocol pack is compatible only with specific versions of the SCE application. When working with protocol packs, it is important to verify that the protocol pack version matches the SCE application version. For example, only use a protocol pack for 3.0.5 on SCE application version 3.0.5.

The version compatibility information for each protocol pack is included in the protocol pack's release notes.

To verify that the protocol pack can be successfully installed:

Step 1 Verify that the correct version of **servconf** is installed and running correctly:

- From the command prompt, type **`servconf --version`**.
- Press **Enter**.

The version of the utility should match that of the protocol pack.

Step 2 Verify that the correct version of the SCE application is installed:

- At the SCE platform CLI prompt (`SCE#`), type **`show version`**.
- Press **Enter**.

The application version should match that of the protocol pack.

Step 3 Verify that a service configuration (PQB) is applied to the SCE platform:

- In the Console, retrieve and view the current PQB.

Distributing Protocol Packs

Installing a protocol pack on an SCE platform is performed using one of the following:

- *The SCA BB Service Configuration Utility* (on page 13-1)
- The Network Navigator tool (described in the following section)

Note If the protocol pack is an SPQI file you can enable and configure the hitless upgrade option using Hitless Upgrade CLI commands. (See *Hitless Upgrade of the SLI* (on page 4-15).)

The tool or utility performs the following steps:

1. Retrieves the current service configuration from the SCE platform and (optionally) stores a backup copy in a user-specified folder.
2. Imports the signatures that are in the DSS or SPQI file into the service configuration. This overwrites any DSS that was previously imported into the service configuration.
3. For each new signature that includes a Buddy Protocol attribute (an attribute that points to an existing protocol) (see *The Buddy Protocol* (on page 12-3))—Adds the new signature to all services that include the buddy protocol.
4. If the protocol pack is an SPQI file—Replaces the SCE application. This causes a short (up to one minute) downtime in SCE platform service.
5. Applies the new service configuration to the SCE platform.

If the protocol pack is an SPQI file and the hitless upgrade option is enabled, you can monitor the progress of the upgrade using *Hitless Upgrade CLI commands* (on page 4-16).

Installing a Protocol Pack with the Network Navigator

The Network Navigator allows easy installation of protocol packs.

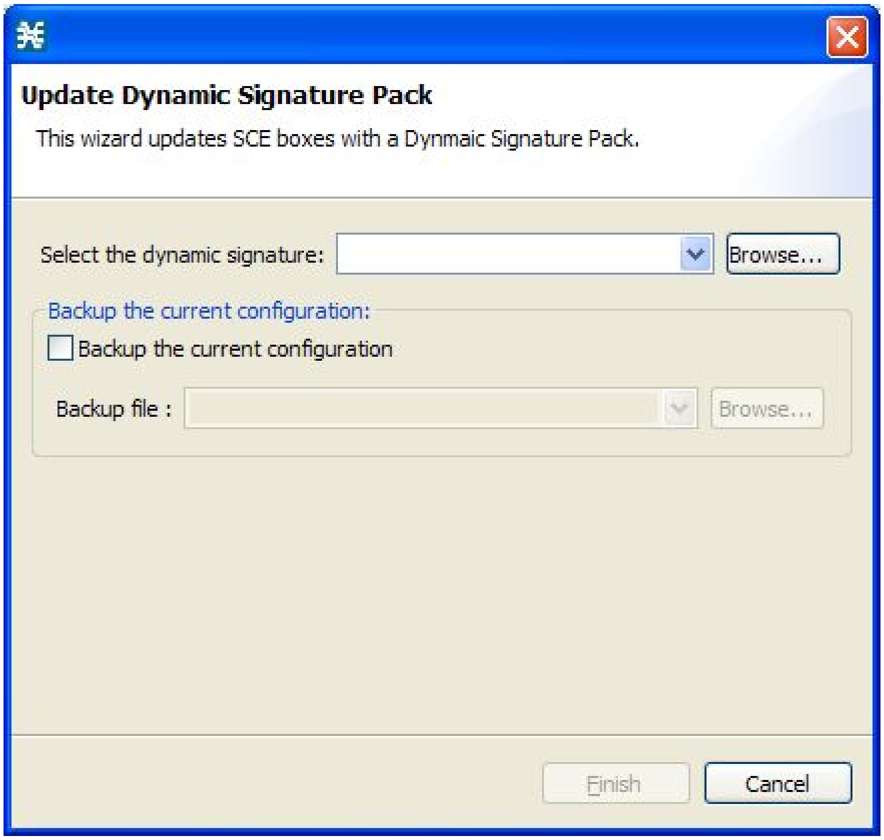
You can install protocol packs on one, several, or all SCE platforms at one or more selected sites.

To install a protocol pack on a single SCE platform:

Step 1 In the Site Manager tree, right-click the SCE where the protocol pack will be installed.

Step 2 From the popup menu that appears, select **Update Dynamic Signature Pack**.

The Update Dynamic Signature Pack dialog box appears.



Update Dynamic Signature Pack

This wizard updates SCE boxes with a Dynmaic Signature Pack.

Select the dynamic signature:

Backup the current configuration:

□ Backup the current configuration

Backup file :

Step 3 Click **Browse**.

A Select file dialog box appears.

Step 4 From the Files of type drop-down list, select ***.spqi** or ***.dss**, according to the file to be installed.

Step 5 Browse to the file to be installed.

Step 6 Click **Open**.

The Select file dialog box closes.

Step 7 (Recommended) Check the **Backup the current configuration** check box, click **Browse**, and select a backup file.

Step 8 Click **Finish**.

A Password Management dialog box appears.

Step 9 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 10 Click **Update**.

The Password Management dialog box closes.

An Update Dynamic Signature Pack progress bar appears.

The service configuration on the SCE platform is updated.

To install a protocol pack on multiple SCE platforms:

Step 1 In the Site Manager tree, select sites or SCE devices where the protocol pack will be installed, and right-click one of them

Step 2 From the popup menu that appears, choose **Update Dynamic Signature Pack**.

The Update Dynamic Signature Pack dialog box appears.

Step 3 Select the protocol pack to be installed.

Step 4 (Recommended) Check the **Backup the current configuration** check box and select a backup directory.

> The backup files will be named `backupPolicy_<SCE Platform IP address>.pqb`.

Step 5 Click **Finish**.

A separate Password Management dialog box appears for each SCE device that you selected.

Step 6 For each SCE device, enter the password and click **Update**.

The protocol pack is installed on each SCE platform in turn.

Verifying the Installation of a Protocol Pack

To verify that the protocol pack was installed successfully:

Step 1 At the SCE platform CLI prompt (`SCE#`), type **`show version`**.

Step 2 Press **Enter**

The response shows the version of the OS running on the SCE platform. This includes information about the installed protocol pack version.

Step 3 Retrieve the PQB from the SCE platform and view it using the Console.

Step 4 Verify that the new protocols from the protocol pack were added to the service configuration.

Troubleshooting the Protocol Pack Installation

The problems that may cause the installation of a protocol pack to fail and their remedies include:

- Missing or incorrect version of the JRE—*Install the correct version of the JRE* (on page 4-7).
- Incorrect or missing SCE application version on the SCE platform—*Verify that the correct SCE application is installed* (on page 4-11).
- No service configuration (PQB) is applied to the SCE platform—Create a new PQB and apply it using the Console.

- **servconf** failed to import the new signatures into the PQB—Use the **`--force-signature`** update signature option when running **servconf**.

When reporting problems to Cisco, please include the **servconf** log file, located at *`<user.home>\.p-cube\servconf.log`*. On Windows, this usually maps to *`C:\Documents and Settings\<username>\.p-cube\servconf.log`*.

Hitless Upgrade of the SLI

Hitless upgrade is the ***SCA BB*** method of upgrading the software components that reside on the SCE platform without incurring any service downtime.

Note Hitless upgrade is available on SCE 2000 and SCE 1000_2U platforms.
Hitless upgrade is not available on SCE 1000_1.5U platforms.

If hitless upgrade is enabled, classification, reporting, and control continue uninterrupted when you install an SPQI file (see *Installing Protocol Packs* (on page 4-10)). You can install SPQI files using either the ***SCA BB*** Console or **servconf**, the ***SCA BB*** Service Configuration Utility. An SPQI file is a package that includes the required (SLI) files.

After the new application is loaded on the SCE platform:

- The new application services all new flows and bundles.
- The old application continues to service existing flows (and new flows that belong to bundles of existing flows).
- Both applications share available memory.

Until all old flows die or are killed, the hitless upgrade is considered to be in progress. In order to make the hitless upgrade process bounded, you can set criteria that will trigger the explicit killing of all flows still executing on the old application. Two such criteria exist:

- When a specified amount of time has passed since the process started.
- When the number of old flows goes below a specified threshold.

The default value for the first criterion is 60 (minutes); the default value for the second is zero (flows). This means that the replace operation is guaranteed to complete after no more than one hour (sooner, if all old flows die naturally), but no old flows are killed by the application before one hour passes.

These criteria are configurable by CLI commands.

You can initiate the explicit killing of all old flows using a manual command.

Hitless Upgrade CLI Commands

You can configure, monitor, and control hitless upgrade using the SCE platform Command-Line Interface (CLI). For more information about the SCE platform CLI, see the *Cisco Service Control Engine (SCE) CLI Command Reference*.

The commands listed here are explained in the following section.

Use the following CLI commands to configure the criteria for completing a hitless upgrade:

- **`replace completion time <minutes>`**
- **`no replace completion time`**
- **`default replace completion time`**
- **`replace completion num-flows <num>`**
- **`no replace completion num-flows`**
- **`default replace completion num-flows`**

These commands are line interface configuration commands. To run these commands you must enter line interface configuration mode and see the `SCE(config if)#` prompt displayed.

To enter line interface configuration mode:

Step 1 At the SCE platform CLI prompt (`SCE#`), type: **`configure`**.

Step 2 Press **Enter**.

The `SCE(config)#` prompt appears.

Step 3 Type: **`interface linecard 0`**.

Step 4 Press **Enter**.

The `SCE(config if)#` prompt appears.

The following two CLI commands are EXEC mode commands.

Use the following CLI command to monitor the progress of a hitless upgrade:

- **`show applications slot <num> replace`**

Use the following CLI command to force immediate completion of a hitless upgrade:

- **`application slot <num> replace force completion`**

Description of Hitless Upgrade CLI Commands

The following table gives a description of the hitless upgrade CLI commands listed in the previous section.

Table 4-1 Hitless Upgrade CLI Commands

Command	Description
replace completion time <minutes>	Sets the time criterion for killing all old flows and completing the hitless upgrade. Specifying a value of zero disables this criterion—the hitless upgrade is completed only when the number-of-flows criterion is met.
no replace completion time	Sets the time criterion for completing the hitless upgrade to zero.
default replace completion time	Resets the time criterion for completing the replace operation to the default value of 60.
replace completion num-flows <num>	Sets the number-of-flows criterion for completing the hitless upgrade operation. When the number of old flows drops below the number specified by this criterion, the remaining flows are killed and the hitless upgrade is complete.
no replace completion num-flows	Sets the number-of-flows criterion for completing the hitless upgrade to zero.
default replace completion num-flows	Resets the number-of-flows criterion for completing the hitless upgrade to the default value of zero.
show applications slot <num> replace	Shows the current hitless upgrade state: • Current replace stage • Current completion criteria • Current completion status (elapsed time and number of flows on each traffic processor) • Whether this is an upgrade or a downgrade • Values for spare memory
application slot <num> replace force completion	Forces the current hitless upgrade process to complete (killing all old flows).

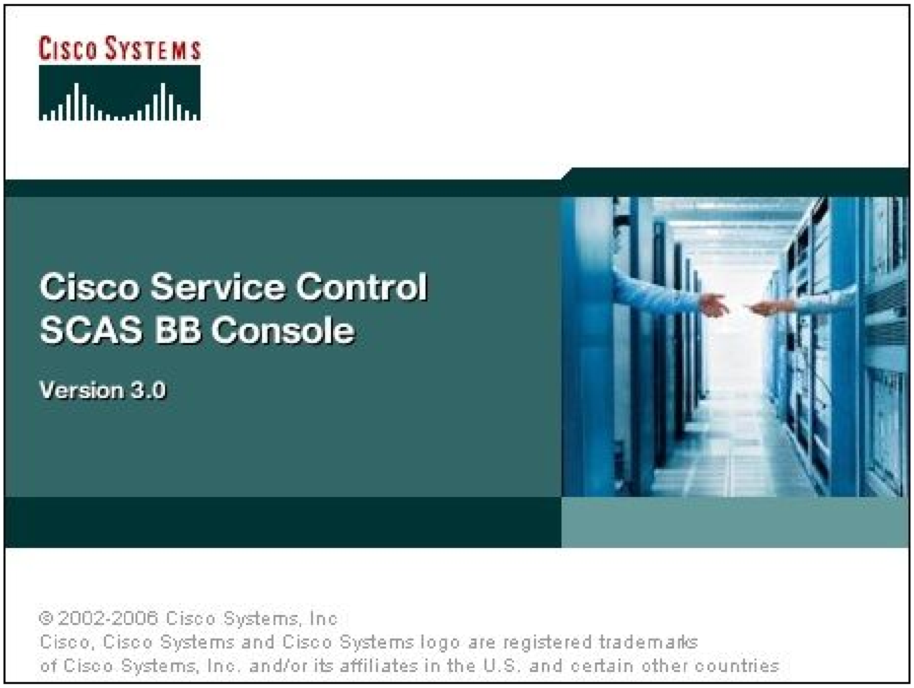
Launching the Console

The SCAS BB Console Setup Wizard adds a shortcut to the start menu for the Console.

To launch the Console:

Step 1 Choose **start > All Programs > Cisco SCAS > SCAS BB Console 3.0.5 > SCAS BB Console 3.0.5**.

The Cisco Service Control SCAS BB Console splash screen appears.



CISCO SYSTEMS

Cisco Service Control
SCAS BB Console

Version 3.0

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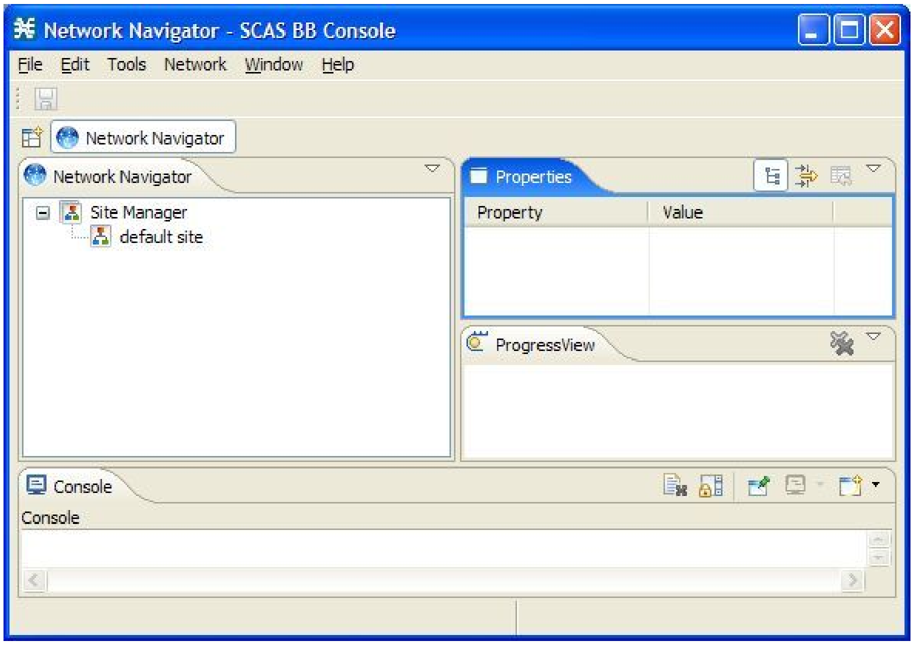
Step 2 After the Console has loaded, the main window of the Console appears, with the Network Navigator tool open.



Note When you close the Console, it will remember which tools are open and which is the active tool, and apply this the next time you launch the Console.

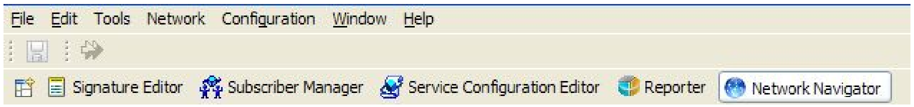
Using the Concole

The Console is the front end of the Cisco Service Control Application for Broadband. You use it to configure the services that the SP offers its clients.

The Console consists of the following tools:

- Network Navigator tool
- Service Configuration Editor tool
- Signature Editor tool
- Subscriber Manager GUI tool
- Reporter tool

The Console GUI has a menu bar and a standard toolbar. Underneath the toolbar is another bar that displays the button of any Console tool that is open. When you launch a tool, a button is added to this bar. To switch between open tools, click the appropriate button on the bar.


File Edit Tools Network Configuration Window Help
Signature Editor
Subscriber Manager
Service Configuration Editor
Reporter
Network Navigator

Note The title of the Console window shows the active tool and the active service configuration.

The Network Navigator Tool

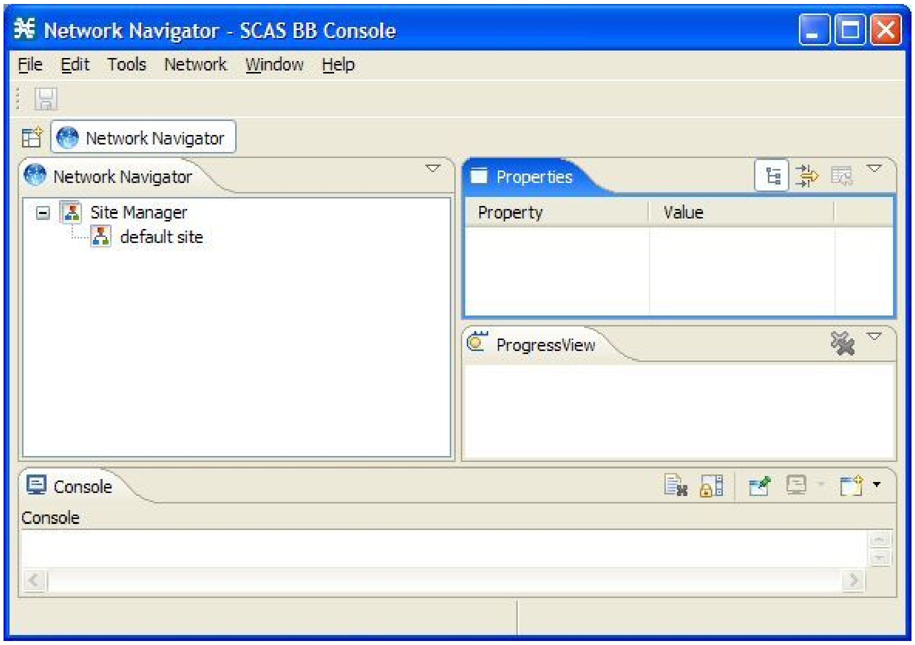
The Network Navigator is a tool that allows you to create and manage a simple model of all local and remote devices that are part of the Cisco Service Control solution.

For more information about the Network Navigator, see *Using the Network Navigator* (on page 5-1).

To open the Network Navigator tool:

From the Console main menu, choose **Tools** > **Network Navigator**.

The Network Navigator tool opens.



To close the Network Navigator tool:

Step 1 Right-click the **Network Navigator** button.

Step 2 From the popup menu that appears, select **Close**.

The Network Navigator tool closes.

The Service Configuration Editor Tool

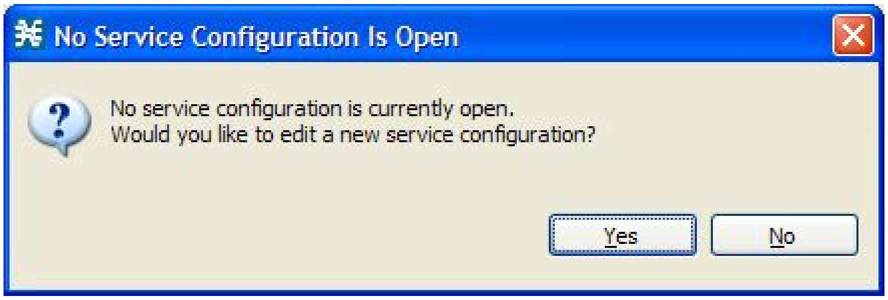
The Service Configuration Editor is a tool that allows you to create service configurations. A *service configuration* is a data structure that defines how the SCE platform analyses network traffic, what rules apply to the traffic, and what actions the SCE platform takes to enforce these rules.

Most of this document discusses using the Service Configuration Editor. See *Using the Service Configuration Editor* (on page 6-1).

To open the Service Configuration Editor tool:

Step 1 From the Console main menu, choose **Tools** > **Service Configuration Editor**.

A No Service Configuration Is Open dialog box appears.

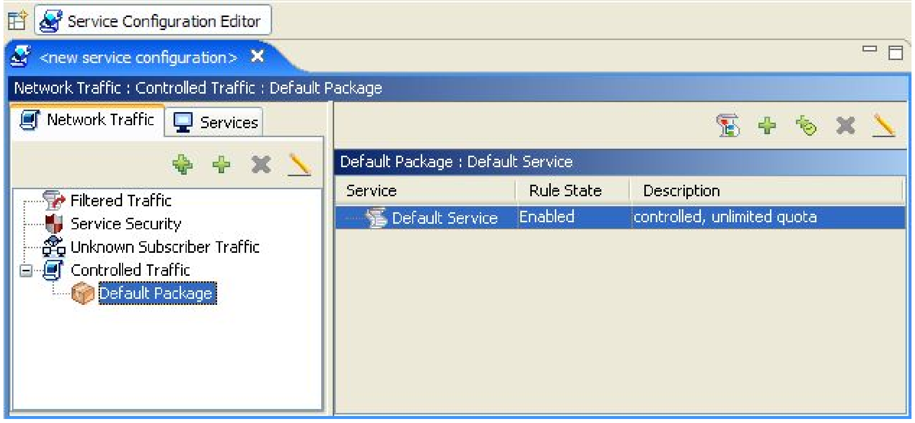


No Service Configuration Is Open

No service configuration is currently open.
Would you like to edit a new service configuration?

Step 2 Click **Yes**.

A default service configuration opens in the Service Configuration Editor tool.



Service Configuration Editor
<new service configuration>
Network Traffic : Controlled Traffic : Default Package
Network Traffic
Services
Filtered Traffic
Service Security
Unknown Subscriber Traffic
Controlled Traffic
Default Package
Default Package : Default Service

Service	Rule State	Description
Default Service	Enabled	controlled, unlimited quota

To close the Service Configuration Editor tool:

Step 1 Right-click the **Service Configuration Editor** button.

Step 2 From the popup menu that appears, select **Close**.

The Service Configuration Editor tool closes.

The Signature Editor Tool

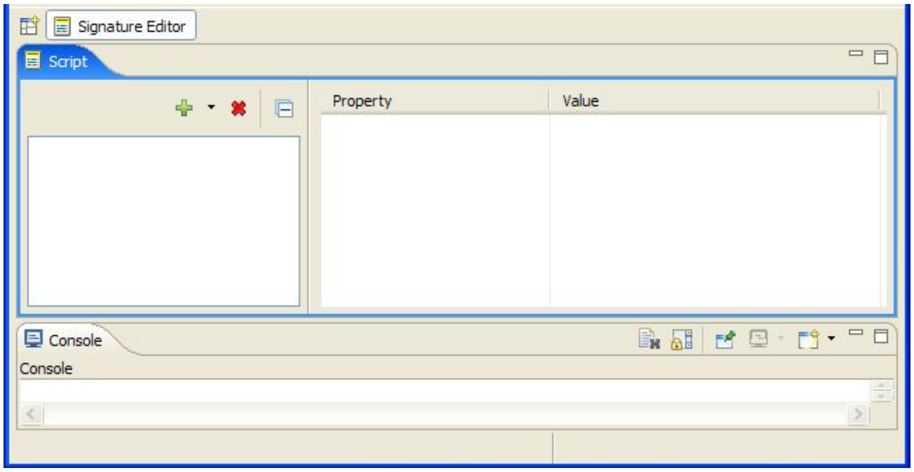
The Signature Editor is a tool that allows you to create and modify files that can add and modify protocols and protocol signatures in ***SCA BB***.

For more information about the Signature Editor, see *Using the Signature Editor* (on page 12-1).

To open the Signature Editor tool:

From the Console main menu, choose **Tools** > **Signature Editor**.

The Signature Editor tool opens.



To close the Signature Editor tool:

Step 1 Right-click the **Signature Editor** button.

Step 2 From the popup menu that appears, select **Close**.

The Signature Editor tool closes.

The Subscriber Manager GUI Tool

The Subscriber Manager (SM) GUI is a tool that allows you to connect to an SCMS-SM and then manage subscribers, assign packages to subscribers, edit subscriber parameters, and manually add subscribers.

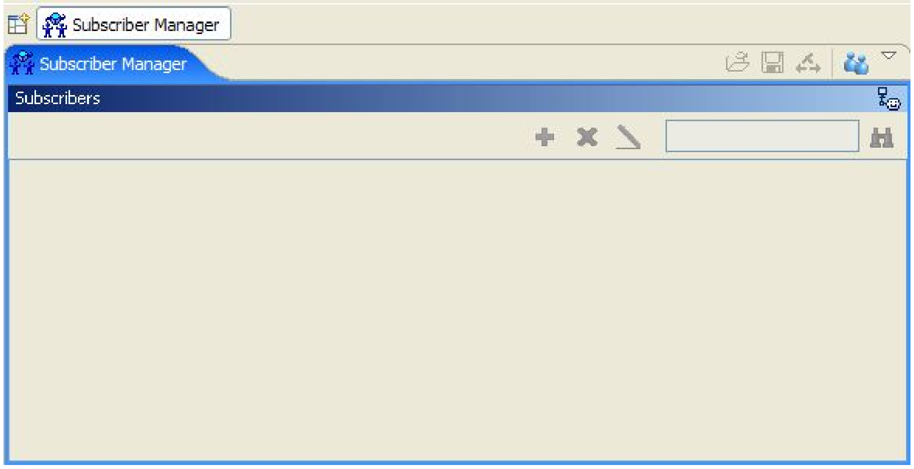
For more information about connecting to an SCMS-SM and using the SM GUI, see *Using the Subscriber Manager GUI Tool* (on page 11-1).

For more information about the SCMS-SM, see the *Cisco Service Control Management Suite Subscriber Manager User Guide*.

To open the SM GUI tool:

From the Console main menu, choose **Tools** > **Subscriber Manager**.

The SM GUI tool opens.



To close the SM GUI tool:

Step 1 Right-click the **Subscriber Manager** button.

Step 2 From the popup menu that appears, select **Close**.

The SM GUI tool closes.

The Reporter Tool

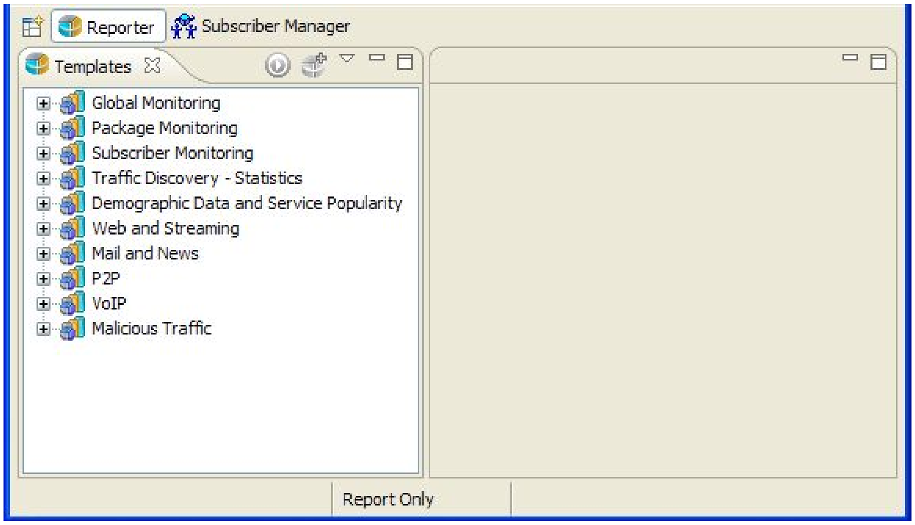
The Cisco Service Control Application (SCA) Reporter is a tool that allows you to query the Cisco Service Control Management Suite (SCMS) Collection Manager (CM) RDR database, and present the results in a chart or a table. This is a valuable tool for understanding the habits and resource consumption of the applications and subscribers that use your network. It can also be used for judging the efficacy of various rules and the possible impact of their implementation on the network. You can view the reports in both tabular and chart formats, export them, save them, and edit their appearance.

You can run the SCA Reporter as a standalone or inside the Reporter tool in the Console. For more information about the SCA Reporter, see the *Cisco Service Control Application Reporter User Guide*.

To open the Reporter tool:

From the Console main menu, choose **Tools** > **Reporter**.

The Reporter tool opens.



Note You can run the SCA Reporter only if the Console is connected to the CM.

To close the Reporter tool:

Step 1 Right-click the **Reporter** button.

Step 2 From the popup menu that appears, select **Close**.

The Reporter tool closes.

Accessing Online Help

You can access relevant parts of this user guide from the Console.

To access online help:

From the Console main menu, choose **Help** > **Help Contents**.

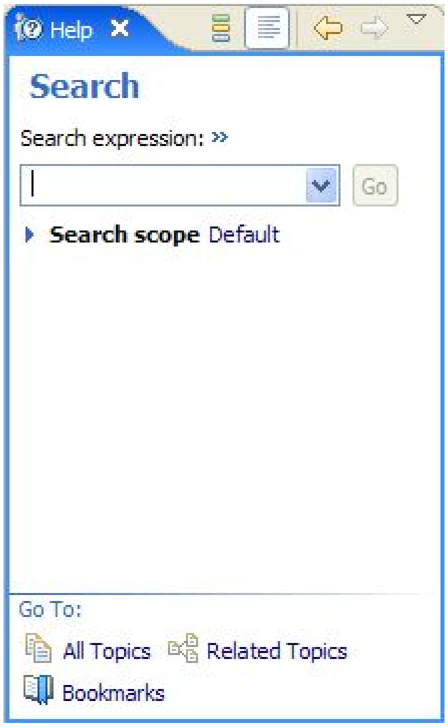
Online help opens in a separate window.

You can also search online help from the current tool.

To search online help:

Step 1 From the Console main menu, choose **Help** > **Search**.

A new area containing a Help tab is added next to the current tool.



Step 2 Enter a word, phrase, or more complex search expression in the **Search expression** field.

The Go button is enabled.

Click >> **(Expand)** for an explanation of how to construct search expressions.

Step 3 Click **Go**.

Help topics containing your search expression are listed under Local Help.

Step 4 Click a help topic to view its contents.

You can bookmark topics for later reference.

Step 5 By clicking the appropriate link at the bottom of the Help tab, you can switch to:

- All topics
- Related topics
- Bookmarks

Quick Start with the Console

This Quick Start section will help you get started with the Console. You will add an SCE device to the default site and apply the default service configuration to the SCE.

Step 1 Launch the Console:

Choose **start** > **All Programs** > **Cisco SCAS** > **SCAS BB Console 3.0.5** > **SCAS BB Console 3.0.5**.

Step 2 Open the Network Navigator:

From the Console main menu, choose **Tools** > **Network Navigator**.

This step sets up the Console for network device operations.

Note that the Network Navigator tool is open the first time you launch the Console.

You should now be able to see the default site displayed in the Network Navigator tab.

Step 3 Add an SCE device to the default site:

a) Right-click the default site, and, from the popup menu that appears, select **New** > **SCE**.

The Create new SCE wizard appears.

b) In the Address field, enter the actual IP address of an SCE platform.

c) Click **Finish**.

The Create new SCE wizard closes.

The new device is added to the site.

Step 4 Check the SCE platform version and operational state:

a) Right-click the SCE device and, from the popup menu that appears, select **Online Status**.

A Password Management dialog box appears.

b) Enter the username and password for managing the SCE, and click **Extract**.

The SCE online status is retrieved.

c) Check that the system and application versions are correct, and that the operational state is Active.

Step 5 Open the Service Configuration Editor:

From the Console main menu, choose **Tools** > **Service Configuration Editor**.

A No Editor Is Open dialog box appears.

Step 6 Create a new service configuration by clicking **Yes** in the No Editor Is Open dialog box.

A default service configuration opens in the Service Configuration Editor tool.

Step 7 Apply the service configuration to the SCE platform:

a) From the toolbar, select ➡ (**Apply Service Configuration to SCE Devices**).

A Password Management dialog box appears.

b) Enter the username and password for managing the SCE, and click **Apply**.

The service configuration is applied to the SCE platform.

CHAPTER 5

Using the Network Navigator

To manage a network entity—Service Control Engine (SCE) platform, Subscriber Manager (SM), or Collection Manager (CM)—from the Console, you must first define it as a device in the Network Navigator. The Network Navigator tool allows you to create a simple model of all local and remote devices that are part of the Cisco Service Control solution, and manage the devices remotely.

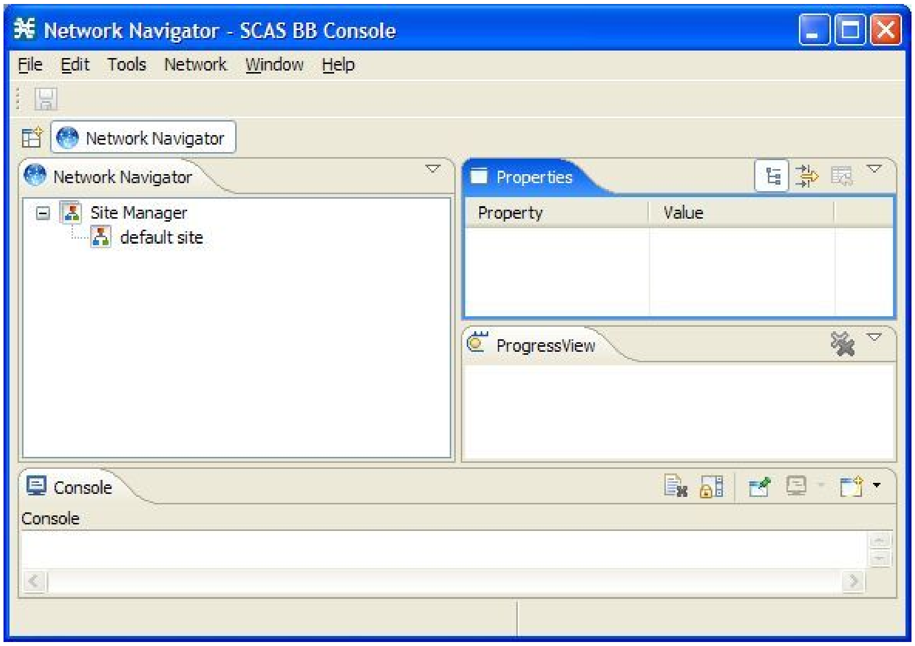
This chapter contains the following sections:

The Network Navigator Tool

The Network Navigator tool contains four tabs:

- Network Navigator—Displays, in the Site Manager tree, all sites and devices that you have defined as part of your system
- Properties—Displays the editable properties of the node selected in the Site Manager tree in the Network Navigator tab
- ProgressView—When an operation is performed on a site or device in the Site Manager tree, displays a progress bar

- Console—Displays log messages concerning actions performed in the Network Navigator tool



Managing Sites

You can manage an SCE, SM, or CM from the Console only if the network entity is defined as a device in the Network Navigator. After a device is added to the Network Navigator, you can perform management and monitoring operations on the device.

You can also perform operations on a group of devices. For example, you can apply the same service configuration to a group of SCE Platforms. The Network Navigator allows you to group devices by adding them under the same *site*. A site is a group of devices that can be managed together. At installation, the Network Navigator contains a default site with no devices. You can add devices to this site or add additional sites, as described in the following sections.

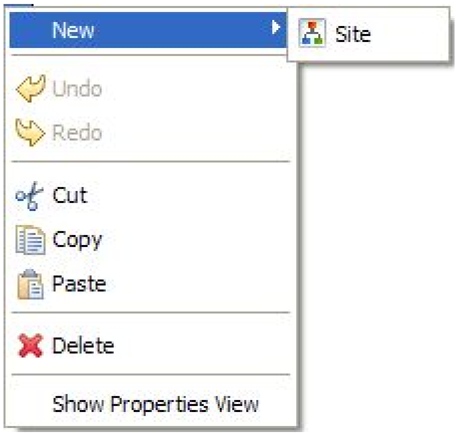
Grouping devices in sites can also help to manage the passwords for these devices *(see Password Manage*ment (on page 5-8)).

Adding a Site to the Site Manager

To add a site to the Site Manager

Step 1 In the Network Navigator tab, right-click the Site Manager node.

A popup menu appears.



Step 2 From the menu, select **New** > **Site**.

A new Site node is added to the Site Manager.

Step 3 In the Properties tab, enter a name for the site in the Name cell.

Step 4 (Optional) In the Version cell, enter a version number.

Adding Devices to a Site

You can add SCE, SM, CM, or database devices to a site.

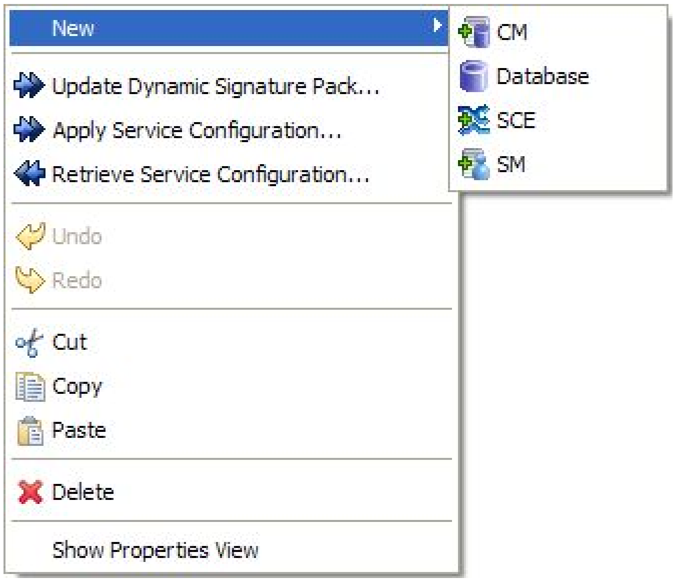
Adding SCE Devices to a Site

To use the Network Navigator to configure, monitor, and update the software of an SCE platform, you must first add the SCE platform to a site.

To add an SCE device to a site:

Step 1 In the Site Manager tree, right-click a site.

A popup menu appears.


New
Update Dynamic Signature Pack...
Apply Service Configuration...
Retrieve Service Configuration...
Undo
Redo
Cut
Copy
Paste
Delete
Show Properties View
CM
Database
SCE
SM

Step 2 From the menu, select **New** > **SCE**.

The Create New SCE wizard appears.

Step 3 In the Address field, enter the IP address of the SCE.

Step 4 (Optional) In the Name field, enter a meaningful name for the SCE.

Step 5 Click **Finish**.

The Create new SCE wizard closes.

The new device is added to the site.

Adding SM Devices to a Site

To use the Network Navigator to configure, monitor, and update the software of an SM, you must first add the SM to a site.

To add an SM device to a site:

Step 1 In the Site Manager tree, right-click a site.

A popup menu appears.

Step 2 From the menu, select **New** > **SM**.

The Create New SM wizard appears.

Step 3 In the Address field, enter the IP address of the SCMS-SM.

Step 4 (Optional) In the Name field, enter a meaningful name for the SM.

Step 5 Click **Finish**.

The Create new SM wizard closes.

The new device is added to the site.

Adding CM Devices to a Site

To use the Network Navigator to monitor a CM, you must first add the CM to a site.

To add a CM device to a site:

Step 1 In the Site Manager tree, right-click a site.

A popup menu appears.

Step 2 From the menu, select **New** > **CM**.

The Create New CM wizard appears.

Step 3 In the Address field, enter the IP address of the CM.

Step 4 (Optional) In the Name field, enter a meaningful name for the CM.

Step 5 Click **Finish**.

The Create new CM wizard closes.

The new device is added to the site.

Adding Database Devices to a Site

To add a database device to a site:

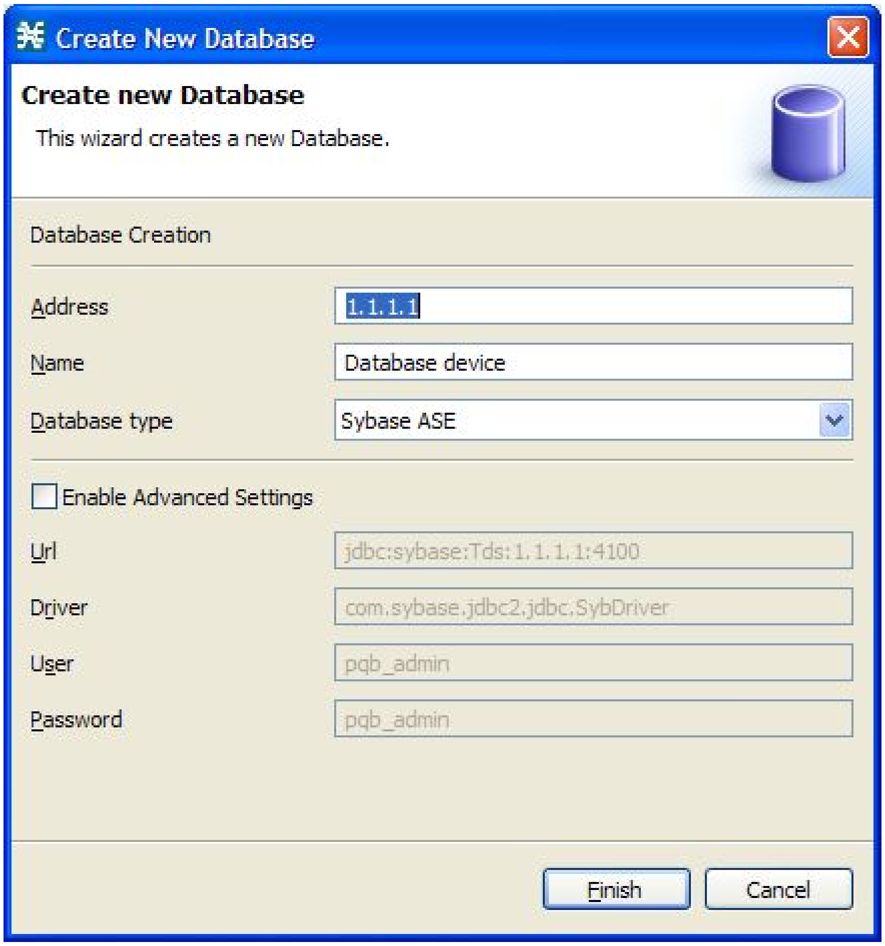
Step 1 In the Site Manager tree, right-click a site.

A popup menu appears.

Step 2 From the menu, select **New** > **Database**.

The Create New Database wizard appears.

Figure 5-1: Create New Database Wizard



Create New Database

Create new Database

This wizard creates a new Database.

Database Creation

Address: 1.1.1.1

Name: Database device

Database type: Sybase ASE

□ Enable Advanced Settings

Url: jdbc:sybase:Tds:1.1.1.1:4100

Driver: com.sybase.jdbc2.jdbc.SybDriver

User: pqb_admin

Password: pqb_admin

Step 3 In the Address field, enter the IP address of the database.

Step 4 (Optional) In the Name field, enter a meaningful name for the database.

Step 5 From the Database type drop-down list, select a database type.

Step 6 (Optional) Check the **Enable Advanced Settings** check box and enter new values in the Url, Driver, User, and Password fields.

Step 7 Click **Finish**.

The Create new Database wizard closes.

The new device is added to the site.

Deleting Devices

To delete a device:

Step 1 In the Site Manager tree, right-click a device.

A popup menu appears.

Step 2 From the menu, select **Delete**.

The device is deleted and removed from the Site Manager tree.

Deleting Sites

To delete a site:

Step 1 In the Site Manager tree, right-click a site in the Site Manager tree.

A popup menu appears.

Step 2 From the menu, select **Delete**.

The site and all its devices are deleted and the site is removed from the Site Manager tree.

Managing Devices

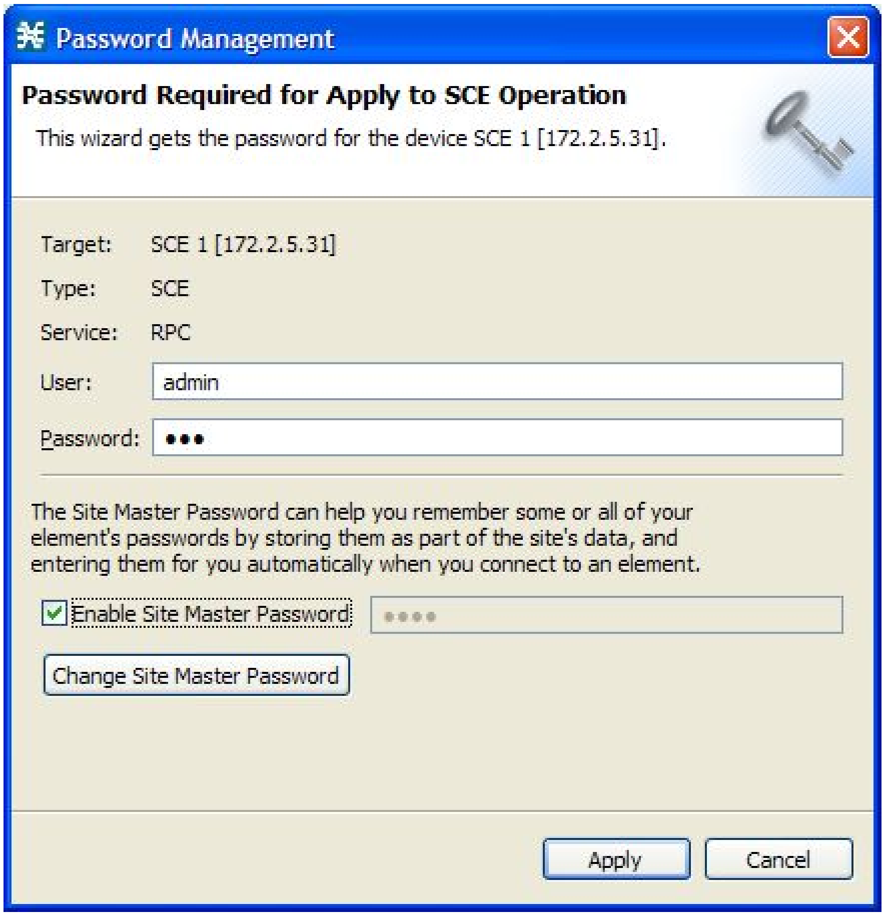
The Network Navigator allows you to manage SCE, SM, CM, and database devices.

Password Management

Normally, before you can access a device (SCE, SM, CM, or database), you must enter its password. When you try to perform any operation on a site device, the Network Navigator first asks for the device username and password. (Repeating the same operation on the same device does not always require a second entry of the password.)

When performing operations on multiple devices, password entry can become tedious. The Site Master Password can help you remember some or all of your element's usernames and passwords by storing them as part of the site's data, and entering them for you automatically when you connect to an element.

The Site Master Password protects saved usernames and passwords in the password manager. The Console prompts you for the site's master password when you wish to activate the site password manager. If you have multiple sites, each site will require a separate master password.



Password Required for Apply to SCE Operation

This wizard gets the password for the device SCE 1 [172.2.5.31].

Target: SCE 1 [172.2.5.31]

Type: SCE

Service: RPC

User: admin

Password: ●●●

The Site Master Password can help you remember some or all of your element's passwords by storing them as part of the site's data, and entering them for you automatically when you connect to an element.

☑ Enable Site Master Password ●●●●

For each site, when the Password Management dialog box appears, check the **Enable Site Master Password** check box.

Managing SCE Devices

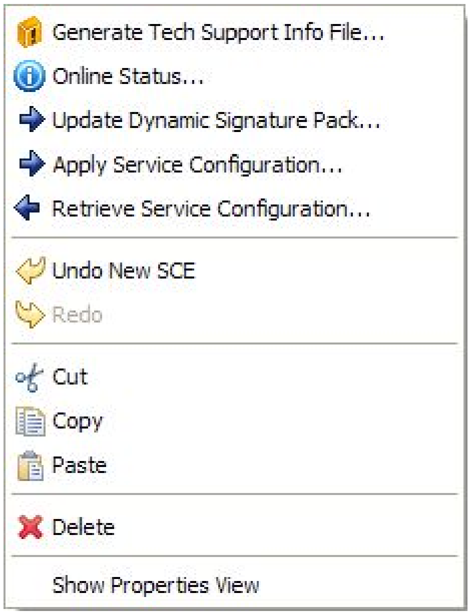
Generating Tech Support Info Files for SCE Devices

This operation generates the SCE platform’s support file, for the use of Cisco technical support staff.

To generate a tech support info file for an SCE:

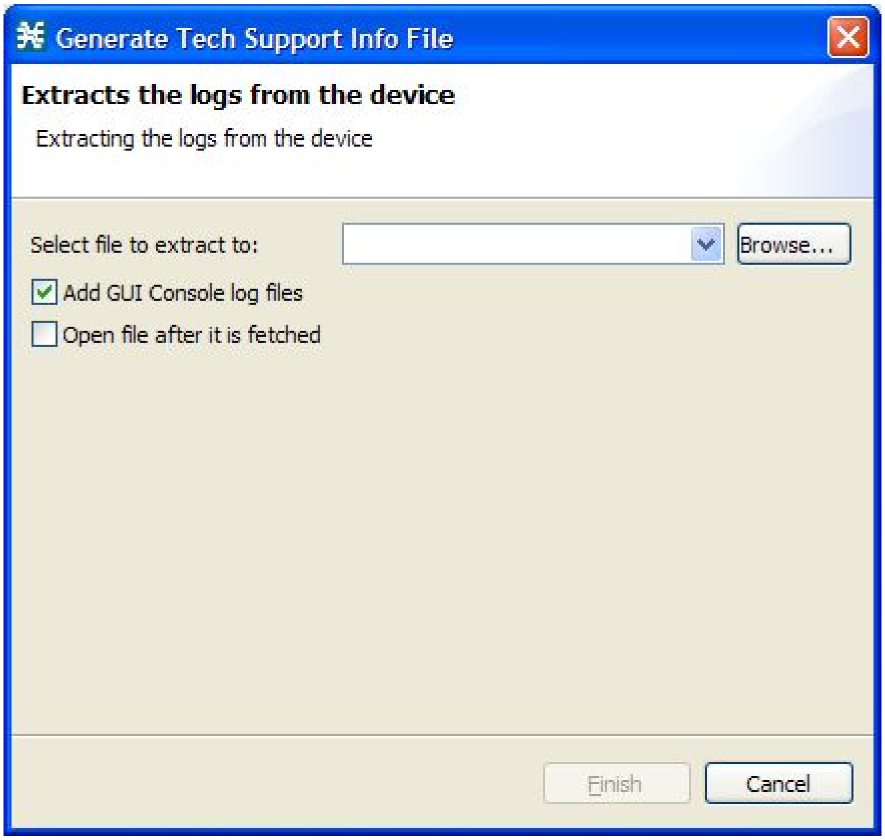
Step 1 In the Site Manager tree, right-click an SCE device.

A popup menu appears.


Generate Tech Support Info File...
Online Status...
Update Dynamic Signature Pack...
Apply Service Configuration...
Retrieve Service Configuration...
Undo New SCE
Redo
Cut
Copy
Paste
Delete
Show Properties View

Step 2 From the menu, select **Generate Tech Support Info File**.

The Generate Tech Support Info File dialog box appears.



Generate Tech Support Info File

Extracts the logs from the device

Extracting the logs from the device

Select file to extract to:

☑ Add GUI Console log files

□ Open file after it is fetched

Step 3 Click **Browse**.

A Select File dialog box appears.

Step 4 Browse to the folder where you want to save the tech support info file.

Step 5 In the File name field, enter a new file name, or select an existing ZIP file.

Step 6 Click **Open** to select the file.

If the file exists, it will be overwritten when you generate the tech support info.

The Select File dialog box closes.

Step 7 (Optional) To add log files to the output tech support info file, check the **Add GUI Console log files** check box.

Step 8 (Optional) Check the **Open file after it is fetched** check box.

Step 9 Click **Finish**.

The Generate Tech Support Info File dialog box closes.

A Password Management dialog box appears.

Step 10 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 11 Click **Generate**.

The Password Management dialog box closes.

A Generate tech support info file progress bar appears.

The file is generated.

Retrieving the Online Status of SCE Devices

This operation provides information about the SCE platform’s current software version and operational status.

To retrieve the online status of an SCE device:

Step 1 In the Site Manager tree, right-click an SCE device.

A popup menu appears.

Step 2 From the menu, select **Online Status**.

A Password Management dialog box appears.

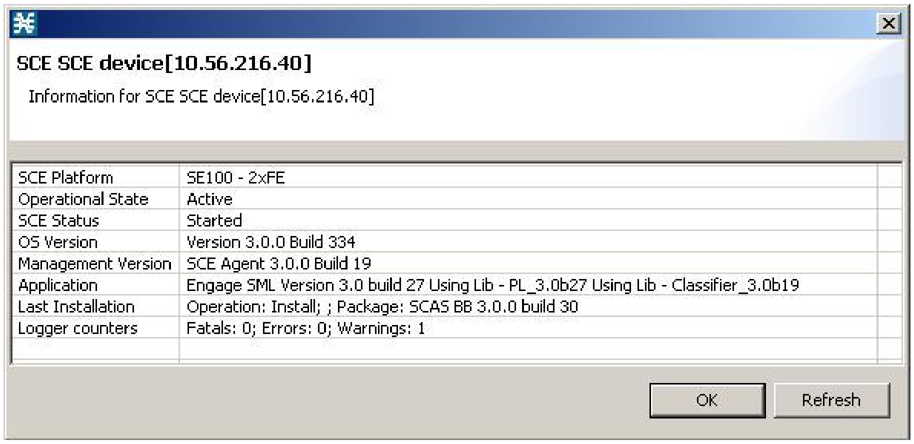
Step 3 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 4 Click **Extract**.

The Password Management dialog box closes.

An Extracting info progress bar appears.

The SCE online status is retrieved.



SCE SCE device[10.56.216.40]

Information for SCE SCE device[10.56.216.40]

SCE Platform	SE100 - 2xFE
Operational State	Active
SCE Status	Started
OS Version	Version 3.0.0 Build 334
Management Version	SCE Agent 3.0.0 Build 19
Application	Engage SML Version 3.0 build 27 Using Lib - PL_3.0b27 Using Lib - Classifier_3.0b19
Last Installation	Operation: Install; ; Package: SCAS BB 3.0.0 build 30
Logger counters	Fatals: 0; Errors: 0; Warnings: 1

Installing Protocol Packs on SCE Devices

You can install a protocol pack on a single SCE platform, on selected SCE platforms, or on all SCE platforms at one or more selected sites (see *Installing a Protocol Pack* (on page 4-12)).

Applying Service Configurations to SCE Devices

You can apply a service configuration to a single SCE platform, to selected SCE platforms, or to all SCE platforms at one or more selected sites.

Note The service configuration that you are applying must be open in the Service Configuration Editor.

To apply a service configuration to a single SCE platform:

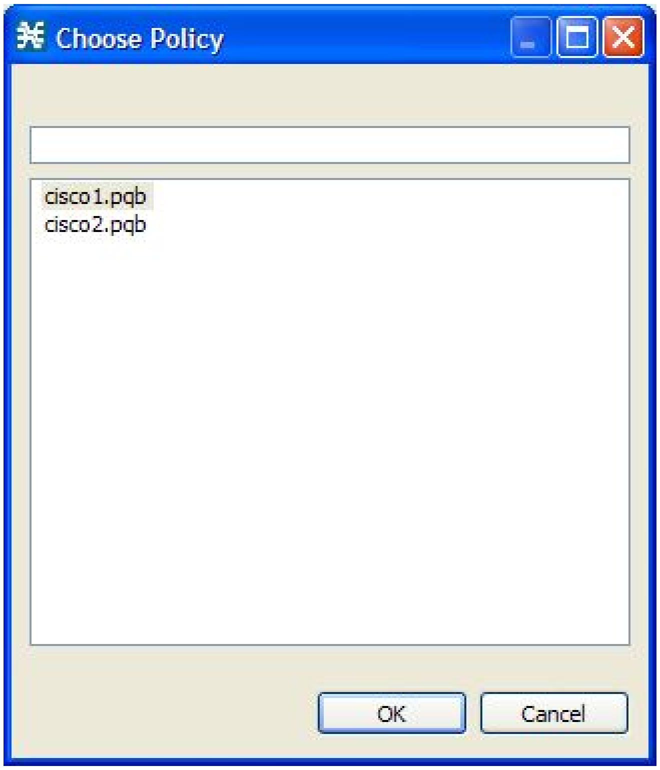
Step 1 In the Site Manager tree, right-click an SCE device.

A popup menu appears.

Step 2 From the menu, select **Apply Service Configuration**.

The Choose Policy dialog box appears, listing all service configurations that are open in the Service Configuration Editor.

If only one service configuration is open in the Service Configuration Editor, a Password Management dialog box appears. Continue at step 5. (If no service configurations are open in the Service Configuration Editor, an error message is displayed.)



Step 3 Select a service configuration from the list.

Step 4 Click **OK**.

A Password Management dialog box appears.

Step 5 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 6 Click **Apply**.

The Password Management dialog box closes.

An Applying service configuration to SCE progress bar appears.

The service configuration is applied to the selected SCE platform.

To apply a service configuration to multiple SCE platforms:

Step 1 In the Site Manager tree, select sites or SCE devices to which you are applying the service configuration and right-click one of them.

Step 2 From the popup menu that appears, select **Apply Service Configuration**.

The Choose Policy dialog box appears, listing all service configurations that are open in the Service Configuration Editor.

If only one service configuration is open in the Service Configuration Editor, a Password Management dialog box appears. Continue at step 4. (If no service configurations are open in the Service Configuration Editor, an error message is displayed.)

Step 3 Select a service configuration from the list and click **OK**.

A separate Password Management dialog box appears for each SCE device that you have selected.

Step 4 For each SCE device, enter the password and click **Apply**.

The service configuration is applied to each selected SCE platform in turn.

Retrieving Service Configurations from SCE Devices

You can retrieve service configurations from a single SCE platform, from selected SCE platforms, or from all SCE platforms at one or more selected sites.

To retrieve a service configuration from a single SCE platform:

Step 1 In the Site Manager tree, right-click an SCE device.

A popup menu appears.

Step 2 From the menu, select **Retrieve Service Configuration**.

A Password Management dialog box appears.

Step 3 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 4 Click **Retrieve**.

The Password Management dialog box closes.

A Retrieving from SCE progress bar appears.

The service configuration is retrieved from the SCE platform and opened in the Service Configuration Editor.

To retrieve service configurations from multiple SCE platforms:

Step 1 In the Site Manager tree, select sites or SCE devices whose service configurations you want to retrieve, and right-click one of them.

Step 2 From the popup menu that appears, select **Retrieve Service Configuration**.

A separate Password Management dialog box appears for each SCE device that you have selected.

Step 3 For each SCE device, enter the password and click **Retrieve**.

The service configuration is retrieved from each SCE platform in turn, and is opened in the Service Configuration Editor.

Installing PQI Files on SCE Devices

This operation installs the Cisco Service Control Application for Broadband on the SCE platform. For more information, see *Installing SCA BB* (on page 4-1).

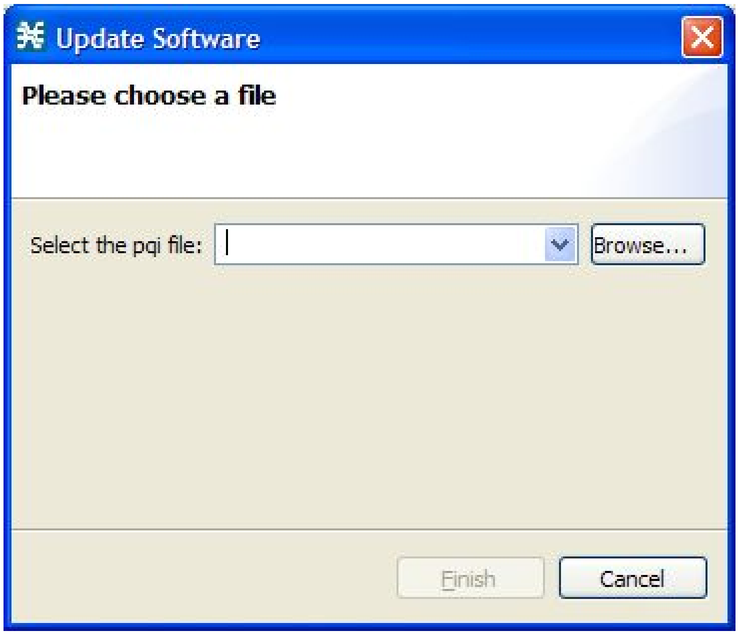
Note Installing a PQI file usually takes a few minutes.

To install a PQI file on an SCE device:

Step 1 In the Site Manager tree, select an SCE device.

Step 2 From the Console main menu, choose **Network** > **Install PQI**.

The Update Software dialog box appears.



Step 3 Click **Browse**.

A Select file dialog box appears.

Step 4 Browse to the PQI file that you are installing.

Step 5 Click **Open**.

The Select file dialog box closes.

Step 6 Click **Finish**.

A Password Management dialog box appears.

Step 7 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 8 Click **Apply**.

The Password Management dialog box closes.

An Updating software to SCE progress bar appears.

The PQI file is installed on the selected SCE.

Installing the SCE OS Software Package on SCE Devices

This operation installs the SCE OS software package (the operating system software and firmware of the SCE platform).

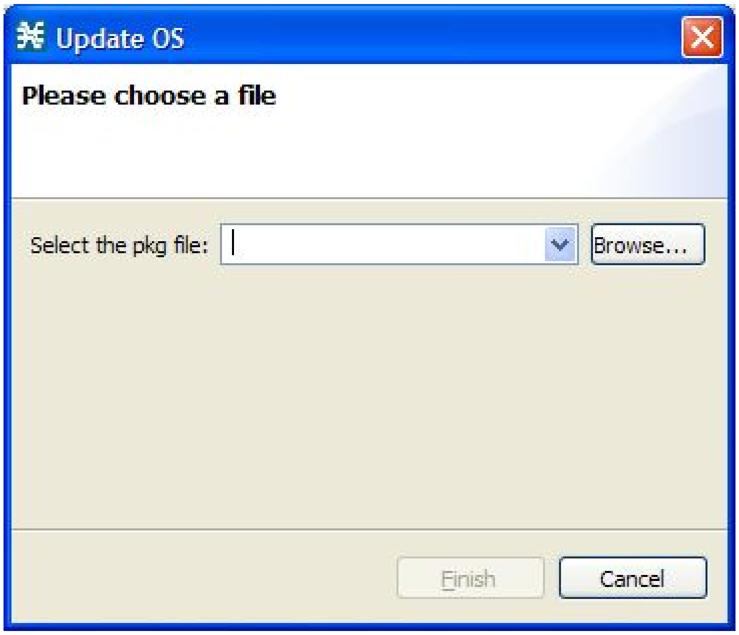
For more information, see “Upgrading SCE Platform Firmware” in the “Operations” chapter of the *Cisco Service Control Engine (SCE) Software Configuration Guide*.

To install an operating system (OS) file on an SCE device:

Step 1 In the Site Manager tree, select an SCE device.

Step 2 From the Console main menu, choose **Network** > **Install OS**.

The Update OS dialog box appears.



Step 3 Click **Browse**.

A Select file dialog box appears.

Step 4 Browse to the PKG file containing the OS that you are installing.

Step 5 Click **Open**.

The Select file dialog box closes.

Step 6 Click **Finish**.

A Password Management dialog box appears.

Step 7 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 8 Click **Apply**.

The Password Management dialog box closes.

An Updating software to SCE progress bar appears.

The PQI file is installed on the selected SCE.

Managing SM Devices

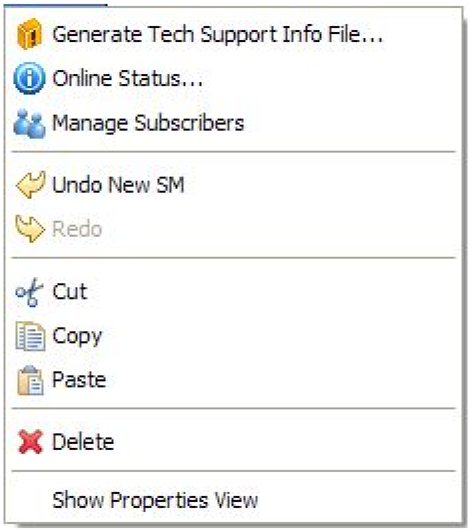
Generating Tech Support Info Files for SM Devices

This operation generates the SM’s support file, for the use of Cisco technical support staff.

To generate a tech support info file for an SM:

Step 1 In the Site Manager tree, right-click an SM device.

A popup menu appears.



Step 2 From the menu, select **Generate Tech Support Info File**.

The Generate Tech Support Info File dialog box appears.

Step 3 Click **Browse**.

A Select File dialog box appears.

Step 4 Browse to the folder where you want to save the tech support info file.

Step 5 In the File name field, enter a new file name, or select an existing ZIP file.

Step 6 Click **Open** to select the file.

If the file exists, it will be overwritten.

The Select File dialog box closes.

Step 7 (Optional) To add log files to the output tech support info file, check the **Add GUI Console log files** check box.

Step 8 (Optional) Check the **Open file after it is fetched** check box.

Step 9 Click **Finish**.

The Generate Tech Support Info File dialog box closes.

A Password Management dialog box appears.

Step 10 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 11 Click **Generate**.

The Password Management dialog box closes.

A Generate tech support info file progress bar appears.

The file is generated.

Retrieving the Online Status of SM Devices

This operation provides information about the SM's current software version and operational status.

To retrieve the online status of an SM device:

Step 1 In the Site Manager tree, right-click an SM device.

A popup menu appears.

Step 2 From the menu, select **Online Status**.

A Password Management dialog box appears.

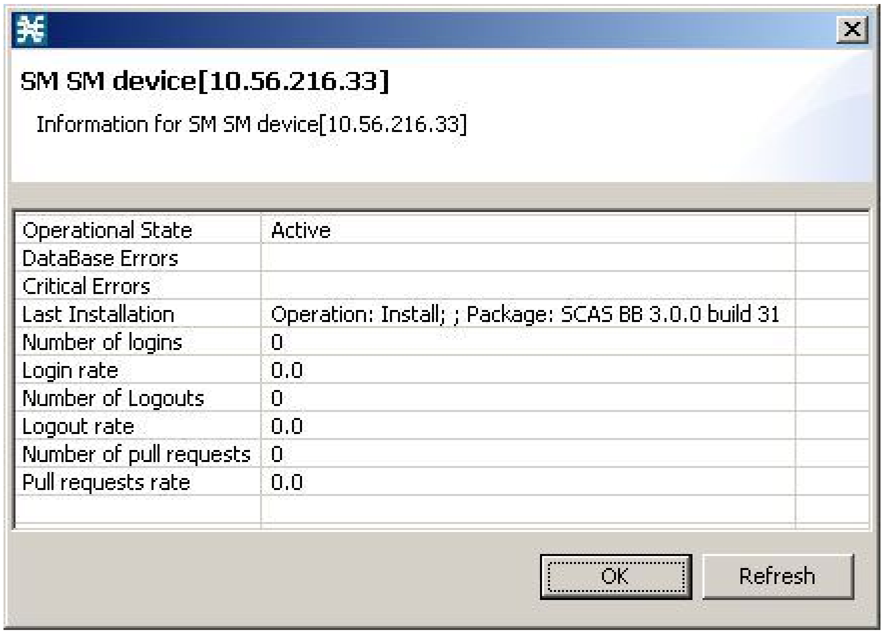
Step 3 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 4 Click **Extract**.

The Password Management dialog box closes.

An Extracting info progress bar appears.

The SCMS-SM online status is retrieved.



SM SM device[10.56.216.33]

Information for SM SM device[10.56.216.33]

Operational State	Active
DataBase Errors	
Critical Errors	
Last Installation	Operation: Install; ; Package: SCAS BB 3.0.0 build 31
Number of logins	0
Login rate	0.0
Number of Logouts	0
Logout rate	0.0
Number of pull requests	0
Pull requests rate	0.0

Connecting to SM Devices

In order to manage subscribers using the SM GUI tool, you must connect to an SM device.

Note The SM GUI tool performs authentication on the SCMS-SM by opening a PRPC connection to port 14374 and attempting to log in using the username and password that you entered in the Password Management dialog box. If a PRPC server with this user is not running on the SCMS-SM, authentication will fail.

To connect to an SM device:

Step 1 In the Site Manager tree, right-click an SM device.

A popup menu appears.

Step 2 From the menu, select **Manage Subscribers**.

A Password Management dialog box appears.

Step 3 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 4 Click **Connecting**.

The Password Management dialog box closes.

A Connecting to progress bar appears.

You connect to the SM, and the Console switches to the SM GUI tool.

See *Using the Subscriber Manager GUI Tool* (on page 11-1) for an explanation of how to proceed.

Installing PQI Files on SM Devices

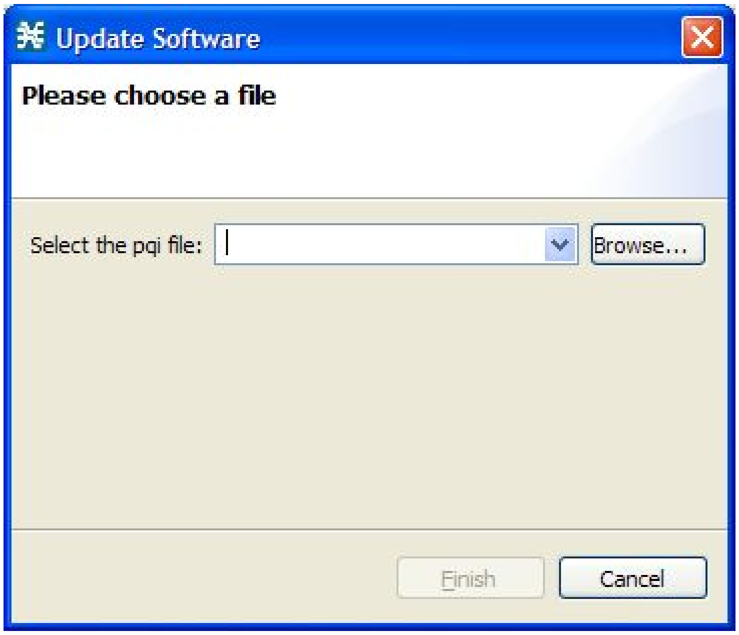
Note Installing a PQI file usually takes a few minutes.

To install a PQI file on an SM device:

Step 1 In the Site Manager tree, select an SM device.

Step 2 From the Console main menu, choose **Network** > **Install PQI**.

The Update Software dialog box appears.



Step 3 Click **Browse**.

A Select file dialog box appears.

Step 4 Browse to the PQI file that you are installing.

Step 5 Click **Open**.

The Select file dialog box closes.

Step 6 Click **Finish**.

A Password Management dialog box appears.

Step 7 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 8 Click **Apply**.

The Password Management dialog box closes.

An Updating software to SM progress bar appears.

The PQI file is installed on the selected SM.

Managing CM Devices

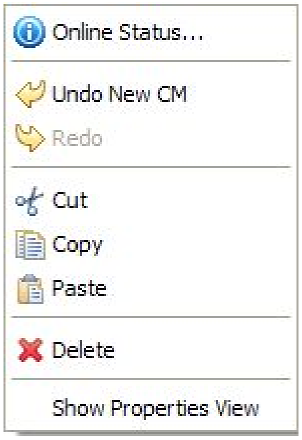
Retrieving the Online Status of CM Devices

This operation provides information about the CM's current software version and operational status.

To retrieve the online status of a CM device:

Step 1 In the Site Manager tree, right-click a CM device.

A popup menu appears.



Step 2 From the menu, select **Online Status**.

A Password Management dialog box appears.

Step 3 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 4 Click **Extract**.

The Password Management dialog box closes.

An Extracting info progress bar appears.

The SCMS-CM online status is retrieved.

For an example of a retrieved online status window (for an SCE platform), see *Retrieving the*

Online Status of SCE Devices (on page 5-11).

Managing Database Devices

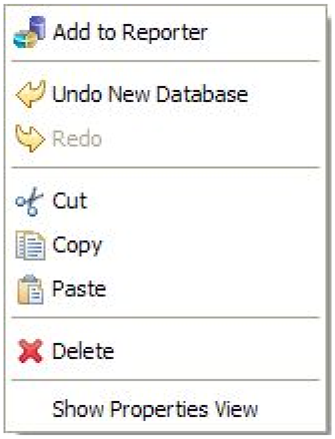
Making Databases Accessible to the SCA Reporter

Note An alternative procedure is described in “Configuring a Database Connection” in the “Using the SCA Reporter” chapter of the *Cisco Service Control Application Reporter User Guide*.

To make databases accessible to the SCA Reporter:

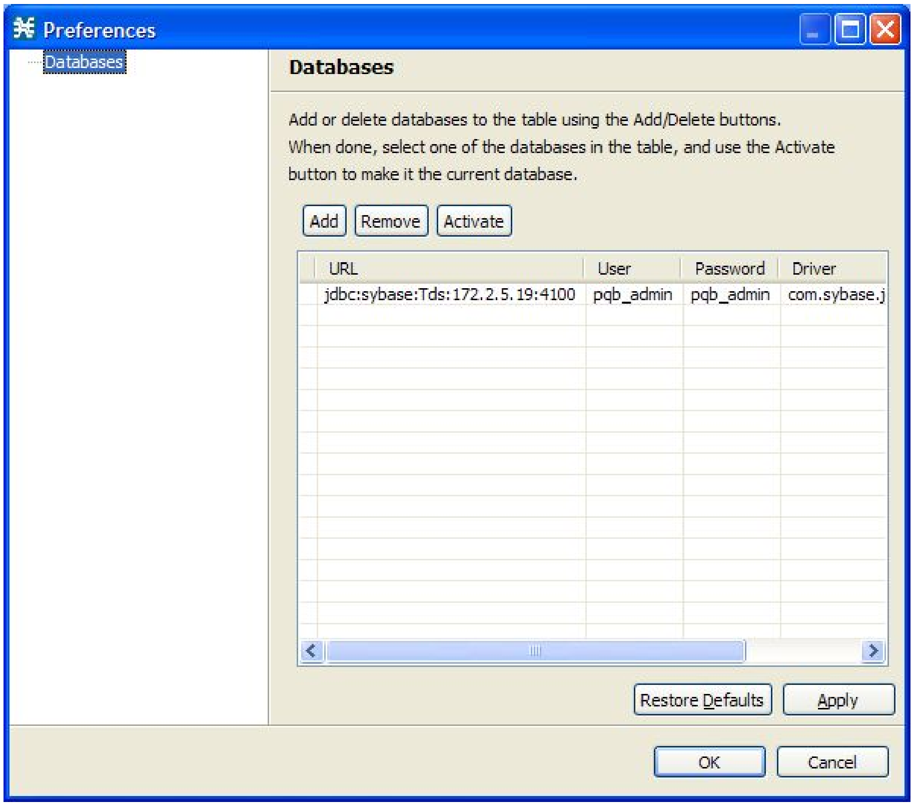
Step 1 In the Site Manager tree, right-click a database device.

A popup menu appears.



Step 2 From the menu, select **Add to Reporter**.

The Preferences dialog box appears.

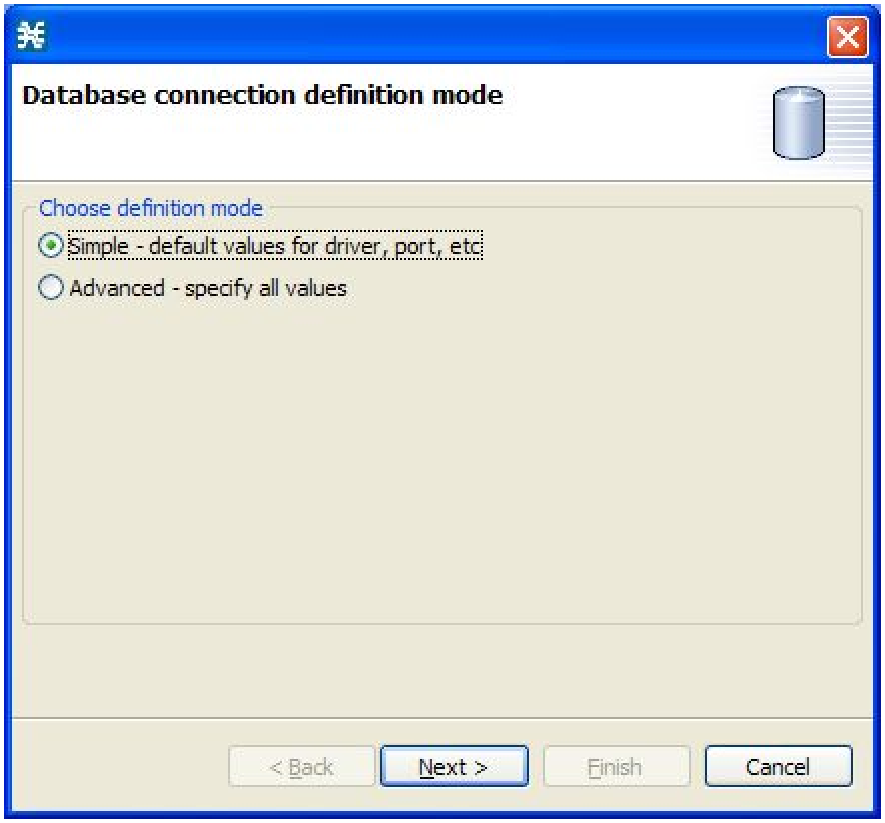


Add or delete databases to the table using the Add/Delete buttons.
When done, select one of the databases in the table, and use the Activate button to make it the current database.

URL	User	Password	Driver
jdbc:sybase:Tds:172.2.5.19:4100	pqb_admin	pqb_admin	com.sybase.j

Step 3 Click **Add**.

The Add Database wizard appears.



Database connection definition mode

Choose definition mode

● Simple - default values for driver, port, etc

○ Advanced - specify all values

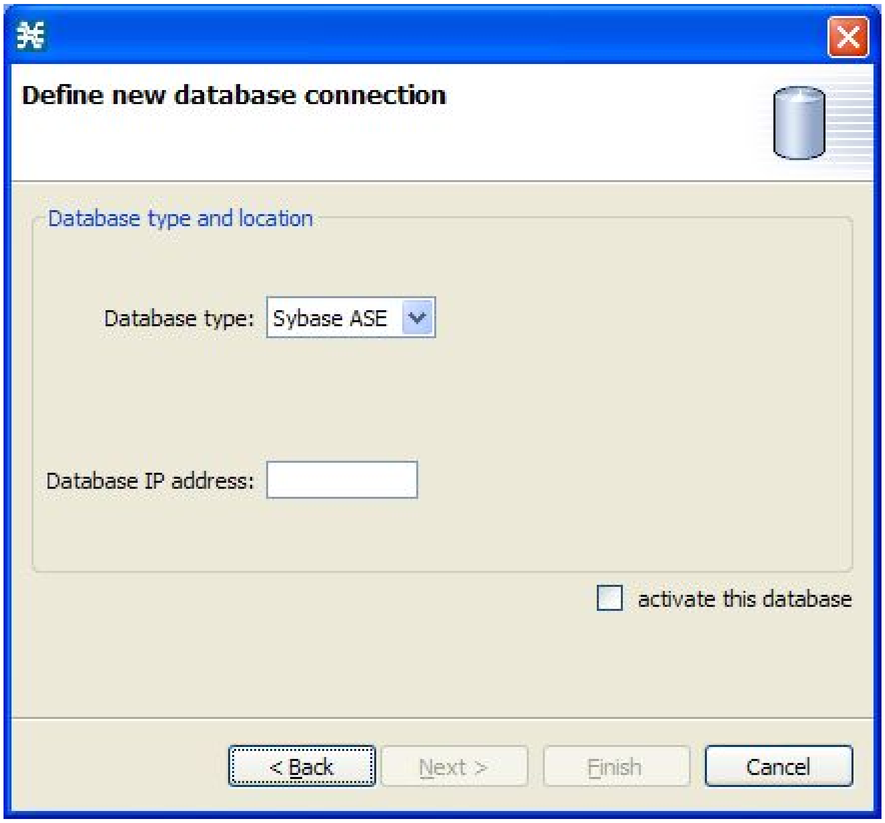
Step 4 Select one of the **Choose definition mode** radio buttons:

- **Simple**
- **Advanced**

Step 5 Click **Next**.

The Define new database connection screen of the Add Database wizard opens.

If you selected Simple in step 4, the Define new database connection screen looks like this:



Define new database connection

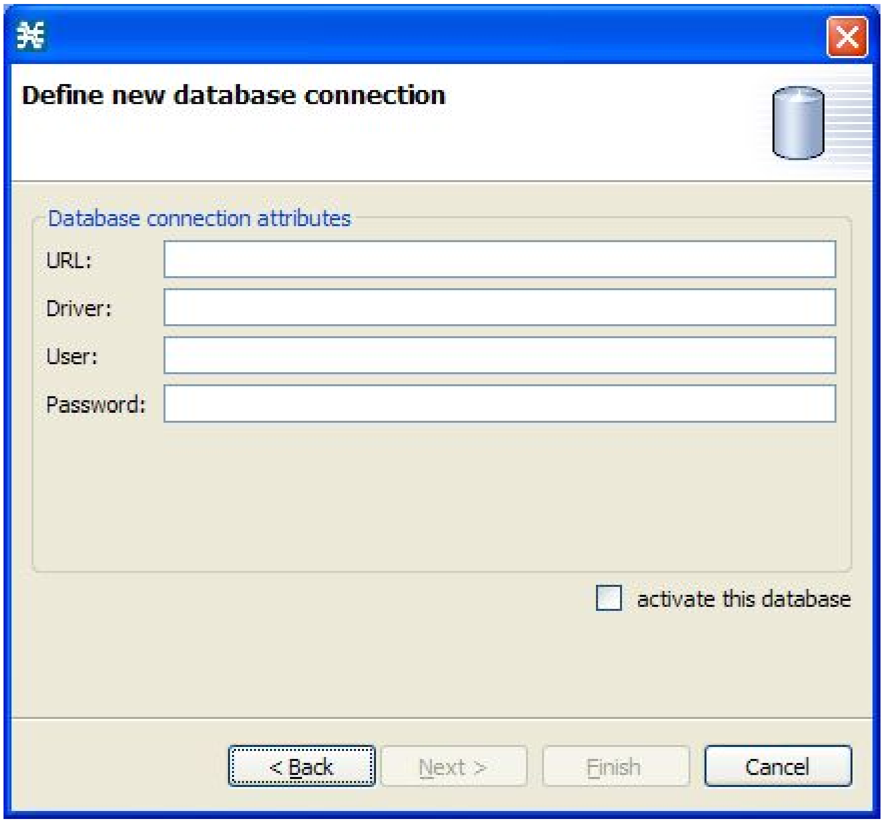
Database type and location

Database type: Sybase ASE

Database IP address:

□ activate this database

If you selected Advanced in step 4, the Define new database connection screen looks like this:



Step 6 Fill in all the fields.

Step 7 Click **Finish**.

The Add Database wizard closes.

The definition of the database is added to the list in the Preferences dialog box.

Step 8 Repeat steps 3 to 7 for other databases.

Step 9 Remove database connection information, if necessary.

Step 10 Make sure that the correct database is activated.

Step 11 Click **OK**.

The Preferences dialog box closes.

Working with Network Navigator Configuration Files

After you add sites and devices to the Network Navigator, you can export this data to a file to back up your settings and to share them with other users, who can import your Network Navigator settings into their Console.

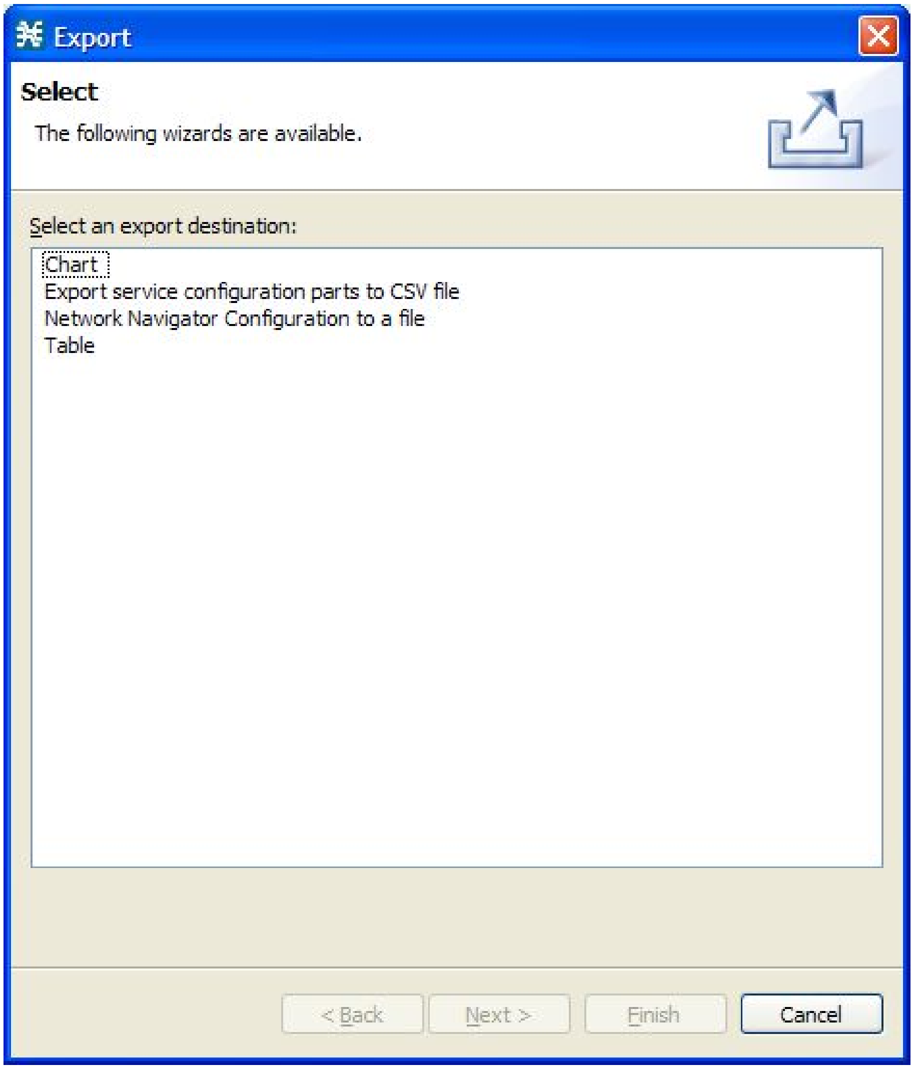
If you use the Site Master Password to store the passwords of the network devices, the passwords are also exported, in encrypted form. This means that other users who import this data need only provide the Site Master Password to access the devices.

Exporting a Network Navigator Configuration

To export a Network Navigator configuration to a file:

Step 1 From the Console main menu, choose **File** > **Export**.

The Export dialog box appears.

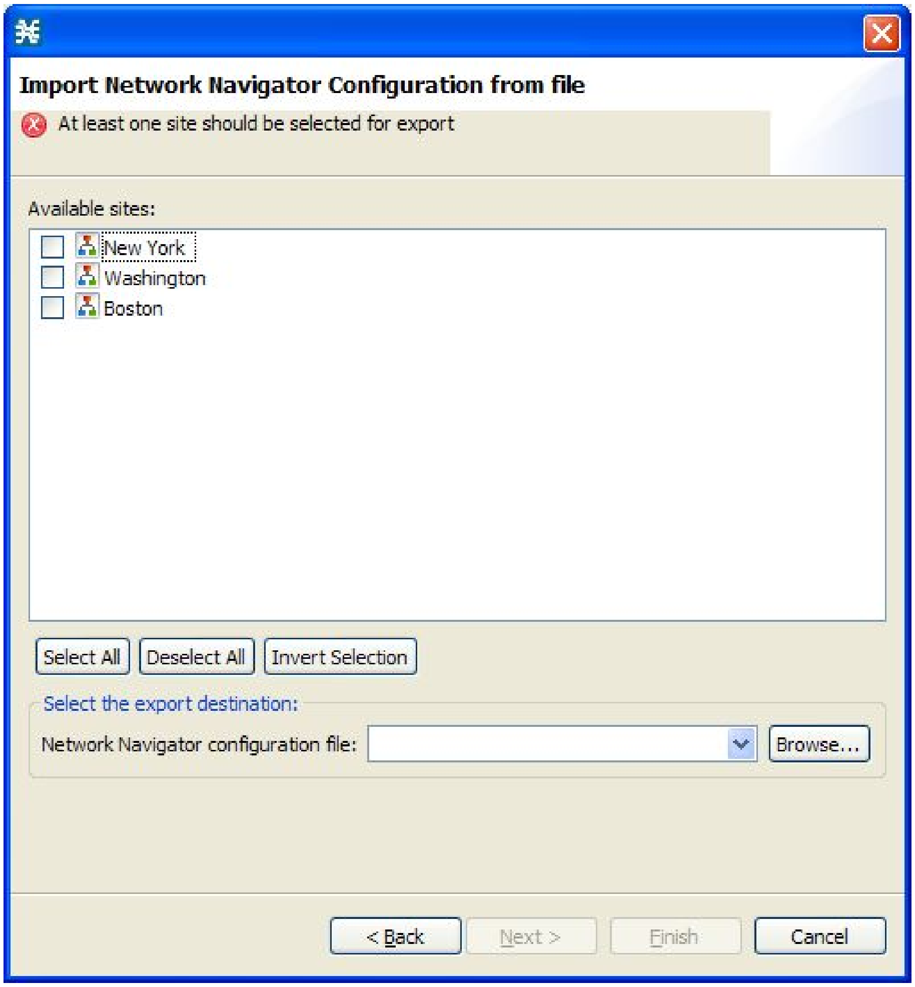


Export
Select
The following wizards are available.
Select an export destination:
Chart
Export service configuration parts to CSV file
Network Navigator Configuration to a file
Table
< Back
Next >
Finish
Cancel

Step 2 From the export destination list, select **Network Navigator Configuration to a file**.

Step 3 Click **Next**.

The Export Network Navigator Configuration to a file dialog box appears.



Import Network Navigator Configuration from file

At least one site should be selected for export

Available sites:

□ New York
□ Washington
□ Boston

Select the export destination:

Network Navigator configuration file:

The Available sites pane lists all of the sites in the configuration.

Step 4 Select the sites to export, using the check boxes and the select buttons.

Step 5 In the Select the export destination area, click **Browse**.

An Open dialog box appears.

Step 6 Browse to the folder where you want to save the configuration file.

Step 7 In the File name field, enter a new file name, or select an existing `site_xml` file.

Step 8 Click **Open** to select the file.

If the file exists, it will be overwritten.

The Open dialog box closes.

Step 9 Click **Finish**.

The Export Network Navigator Configuration dialog box closes.

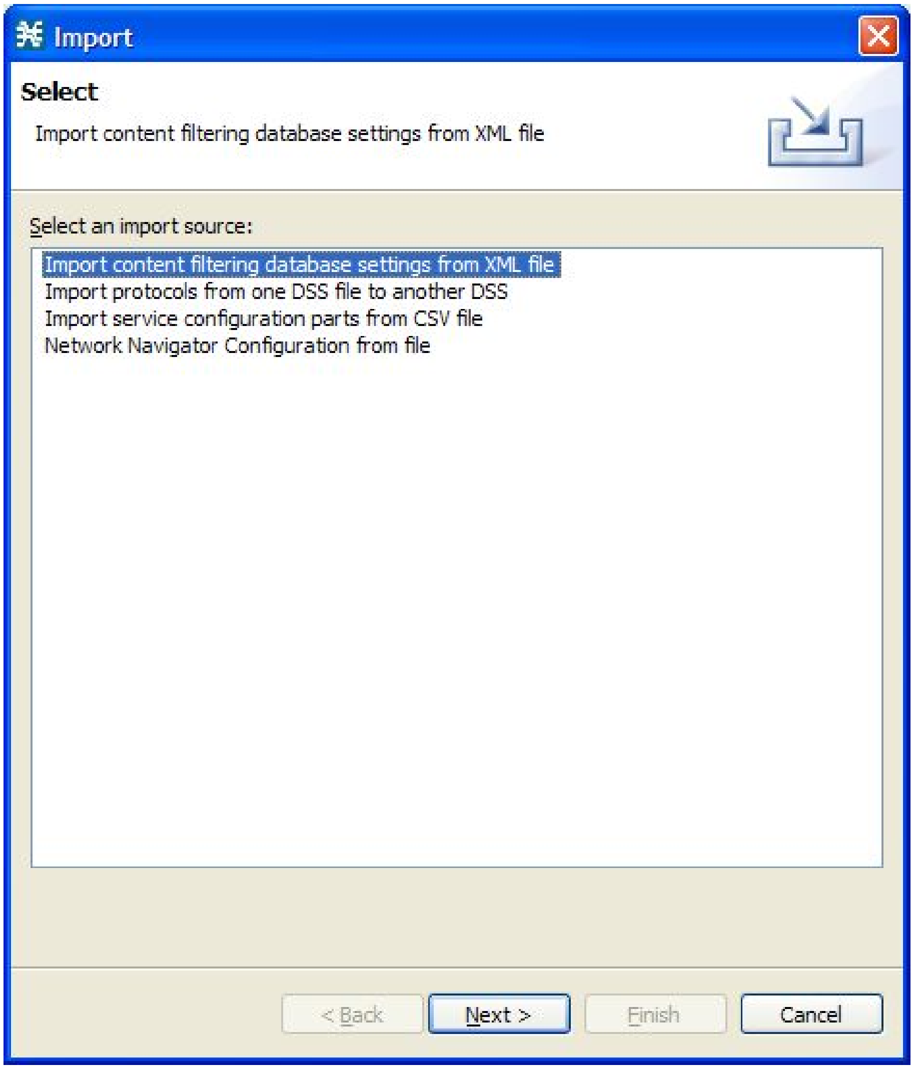
The configuration is saved to the file.

Importing a Network Navigator Configuration

To import a Network Navigator configuration to a file:

Step 1 From the Console main menu, choose **File** > **Import**.

The Import dialog box appears.



Import content filtering database settings from XML file

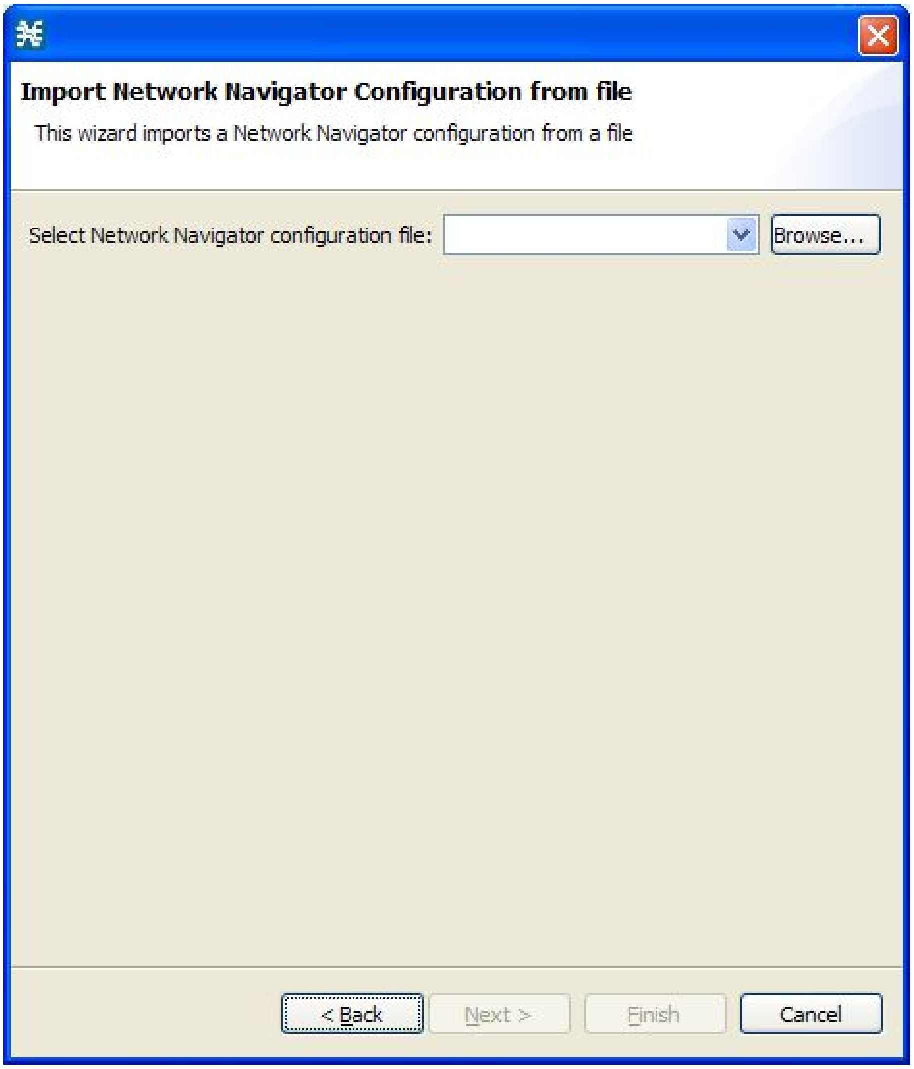
Select an import source:

- Import content filtering database settings from XML file
- Import protocols from one DSS file to another DSS
- Import service configuration parts from CSV file
- Network Navigator Configuration from file

Step 2 From the import source list, select **Network Navigator Configuration from file**.

Step 3 Click **Next**.

The Import Network Navigator Configuration from file dialog box appears.



Import Network Navigator Configuration from file

This wizard imports a Network Navigator configuration from a file

Select Network Navigator configuration file:

Step 4 Click **Browse**.

An Open dialog box appears.

Step 5 Browse to the folder containing the file to import, and select a `site_xml` file.

Step 6 Click **Open** to select the file.

The Open dialog box closes.

Step 7 Click **Finish**.

The Import Network Navigator Configuration dialog box closes.

The configuration is imported from the file.

Network Settings Requirements

Firewall/NAT Requirements

The following table lists the firewall/NAT open port settings required for the Network Navigator to operate properly.

Table 5-1 Required Firewall/NAT Settings

Source	Destination	Comments
Workstation	SCE port 14374/TCP	PRPC—Required for all SCE operations
SCE	Workstation port 21/TCP	FTP—Required for the following SCE operations: • Install OS • Generate Tech Support Info File
SCE	Workstation ports 21000/TCP to 21010/TCP	FTP—Alternative to port 21/TCP, required if port 21/TCP is already used by another application on the workstation
Workstation	SM port 14374/TCP	PRPC—Required for all SM operations
Workstation	CM port 14375/TCP	PRPC—Required for the CM Online Status operation and for CM authentication

The SCA Reporter may have additional requirements for connecting to the database. See the *Cisco Service Control Application Reporter User Guide* for more information.

User Authentication

User authentication is performed when a PRPC connection is made to an SCE platform, a CM, or an SM. For authentication to succeed, a PRPC server must be running at the destination, and you must know the username and password of a user of the server.

You define the username and password using a command-line utility in the SM and CM, or the user/password mechanism in the SCE platform.

For more information about defining users, see the following:

CM—“Managing Users” in the “Managing the Collection Manager” chapter of the *Cisco Service Control Management Suite Collection Manager User Guide*

- SM—“p3rpc Utility” in the “Command-Line Utilities” appendix of the *Cisco Service Control Management Suite Subscriber Manager User Guide*
- SCE—“TACACS+ Authentication, Authorization, and Accounting” in the “Configuring the Management Interface and Security” chapter of the *Cisco Service Control Engine (SCE) Software Configuration Guide*

CHAPTER 6

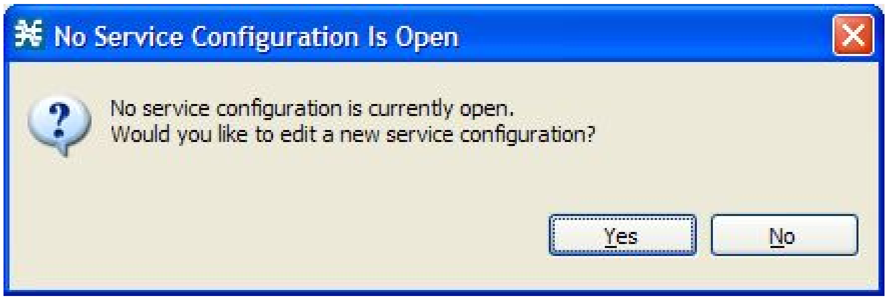
Using the Service Configuration Editor

This chapter describes how to use the Service Configuration Editor tool.

This chapter contains the following sections:

The Service Configuration Editor Tool

When you first open the Service Configuration Editor tool, a No Service Configuration Is Open dialog box appears.



No Service Configuration Is Open

No service configuration is currently open.
Would you like to edit a new service configuration?

- To create a new service configuration (see *Adding New Service Configurations* (on page 6-2)) click **Yes**.
- To open an existing service configuration (see *Opening Existing Service Configurations* (on page 6-3)) click **No**.

When you first add or open a service configuration, the Configuration option is added to the main menu.

You can have many service configurations open at one time; each is displayed in its own tab, and you click a tab to make that service configuration active.

When a service configuration has unsaved changes, an asterisk precedes its name on the tab.

Managing Service Configurations

A *service configuration* is a data structure that defines how the Service Control Engine (SCE) platform analyses network traffic, what rules apply to the traffic, and what actions the SCE platform takes to enforce these rules.

A service configuration consists of the following two main elements:

- Services—Define the categories to which transactions are classified
- Packages—Define how the SCE platform acts upon transactions from different services

Service configurations are stored as PQB files.

Adding New Service Configurations

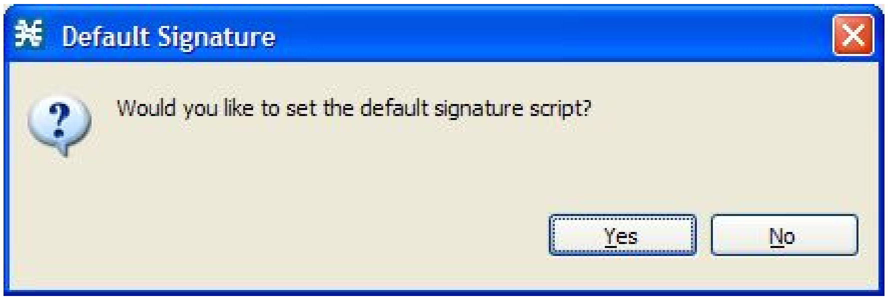
You can add a new service configuration whenever necessary.

Note You cannot add a second new service configuration until you have saved the first one.

To add a new service configuration:

In the toolbar, click (**New Service Configuration**).

- If you have set a default DSS file (see *The Default DSS File* (on page 7-46)), a Default Signature message appears.

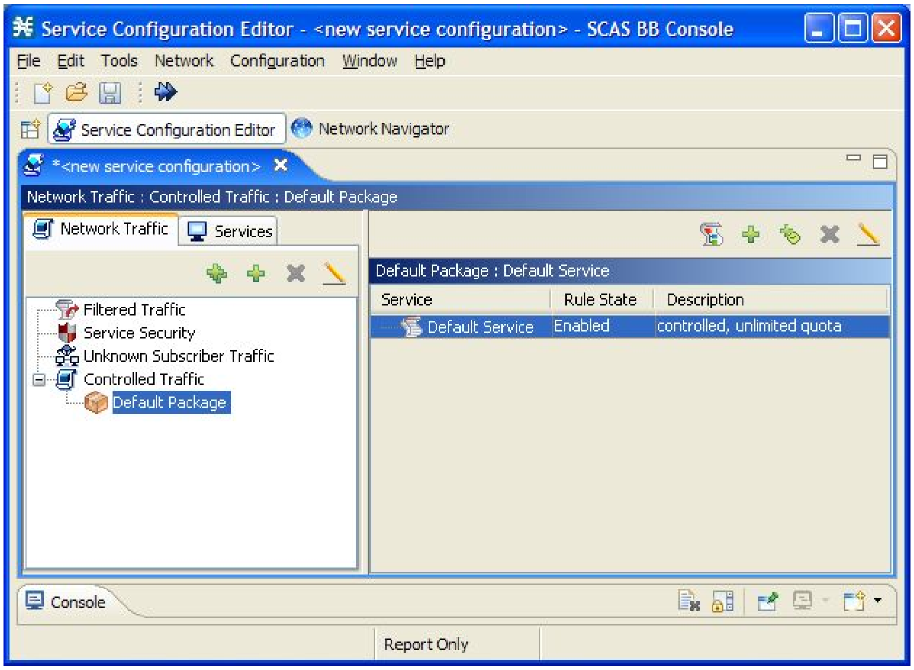


Default Signature

Would you like to set the default signature script?

- (Recommended) Click **Yes** to import the default DSS file.
- Click **No** to continue without importing the default DSS file.

The new service configuration is added to the Console window, open on the Network Traffic tab, and becomes the active service configuration.


Service Configuration Editor - <new service configuration> - SCAS BB Console
File Edit Tools Network Configuration Window Help
Service Configuration Editor
Network Navigator
*<new service configuration>
Network Traffic : Controlled Traffic : Default Package
Network Traffic
Services
Filtered Traffic
Service Security
Unknown Subscriber Traffic
Controlled Traffic
Default Package
Default Package : Default Service
Console
Report Only

Service	Rule State	Description
Default Service	Enabled	controlled, unlimited quota

When a new service configuration opens, it contains the default service configuration supplied with ***SCA BB***. This includes a default package, which contains a default service rule.

Opening Existing Service Configurations

You can open a saved service configuration for viewing or for editing, or to apply it to an SCE platform.

Service configuration files have the extension PQB.

To open a service configuration file:

Step 1 Do one of the following:

- From the Console main menu, choose **File** > **Open Service Configuration**.
- In the toolbar, click (**Open A Service Configuration File**).

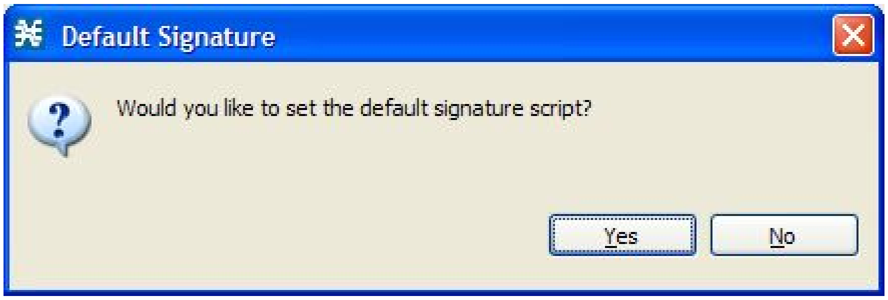
An Open dialog box appears.

Step 2 Browse to a service configuration file.

Step 3 Click **Open**.

The Open dialog box closes.

Step 4 If the default DSS file has not been imported into the service configuration, a Default Signature message appears.


Default Signature

Would you like to set the default signature script?

- (Recommended) Click **Yes** to import the default DSS file.
- Click **No** to continue without importing the default DSS file.

The service configuration is loaded into the Console:

- This service configuration becomes the active service configuration.
- The title of the Console window displays the name of this service configuration.

Saving the Current Service Configuration

You can save the active service configuration.

To save the current service configuration to a service configuration file:

Step 1 From the Console main menu, choose **File** > **Save As**.

A Save As dialog box appears.

Step 2 Browse to the folder where you want to save the file containing the service configuration.

Step 3 In the File name field, enter a new file name, or select an existing PQB file.

Step 4 Click **Save**.

The service configuration is saved to the selected file. If the file exists, it is overwritten.

During processing, a Saving Service Configuration File message appears.

To save the current service configuration to the file from which it was loaded:

In the toolbar, click 💾 (**Save).**

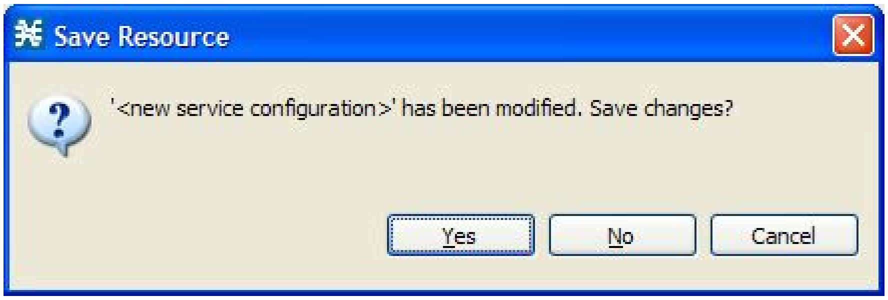
If the current service configuration was not loaded from a PQB file (that is, if it is new, or it was retrieved from an SCE platform), the Save As dialog box opens as in the previous procedure.

Closing Service Configurations

To close a service configuration:

On a service configuration tab, click ☒ (**Close**).

- If there are no unsaved changes, the service configuration tab closes.
- If there are unsaved changes a Save Resource message appears.



Save Resource

'<new service configuration>' has been modified. Save changes?

Click **Yes**:

- If this is an existing edited service configuration, the changes are saved and the service configuration tab closes.
- If this is a new service configuration, a Save As dialog box opens.

  Enter a name for the service configuration and click **Save.**

  The Save As dialog box closes, the changes are saved, and the service configuration tab closes.

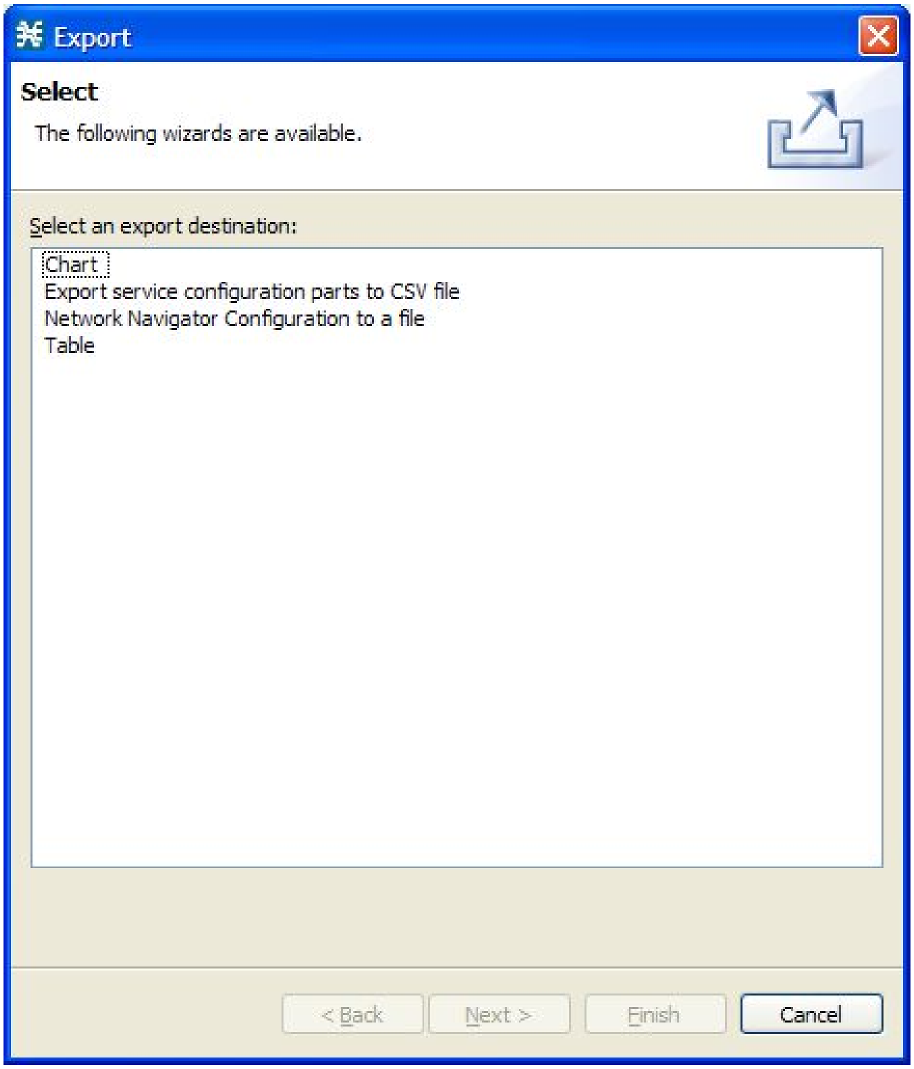
Exporting Service Configuration Data

You can export service configuration data from the current service configuration to CSV files. The CSV file formats are described in the “CSV File Formats” chapter of the *Cisco Service Control Application Suit for Broadband Reference Guide*.

To export one type of service configuration element to a CSV file:

Step 1 From the Console main menu, choose **File** > **Export**.

The Export dialog box appears.



Select

The following wizards are available.

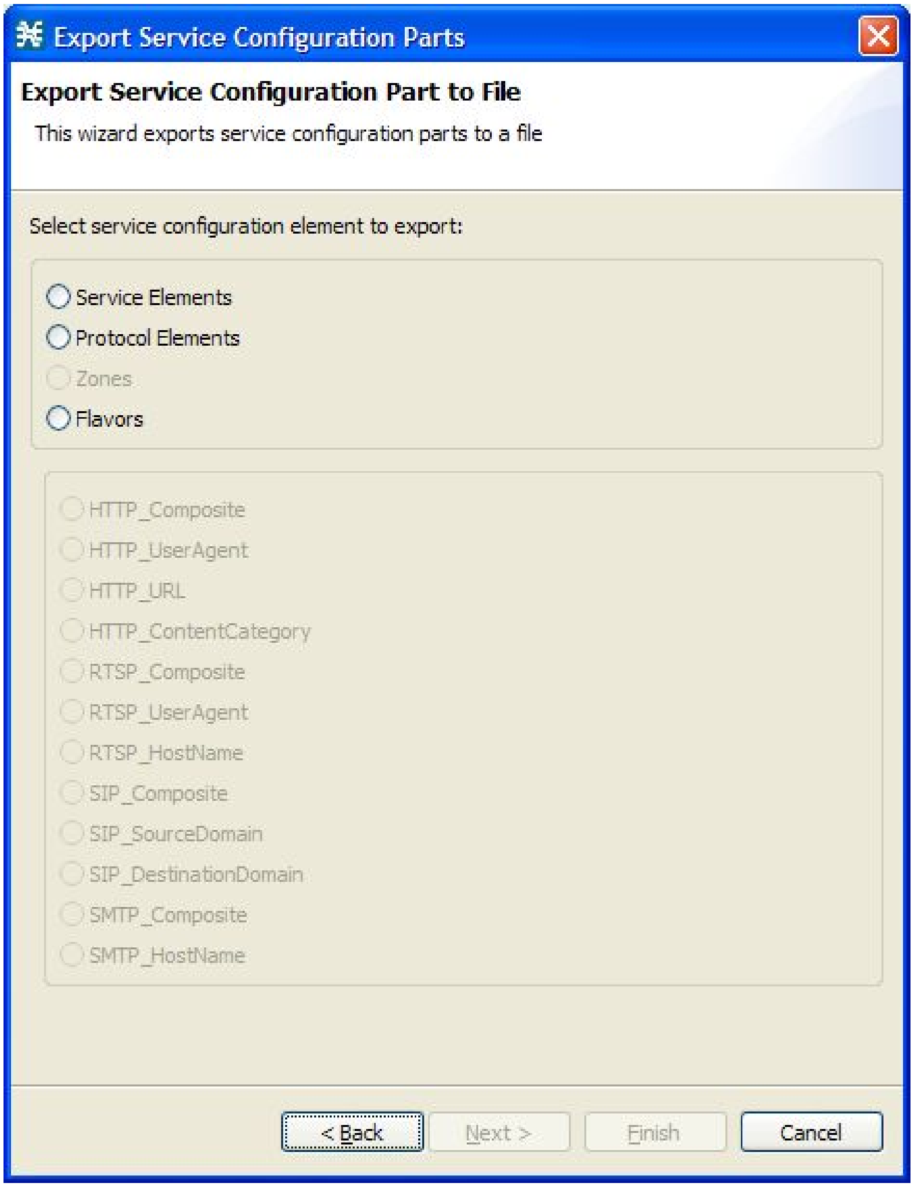
Select an export destination:

- Chart
- Export service configuration parts to CSV file
- Network Navigator Configuration to a file
- Table

Step 2 From the export destination list, select **Export service configuration parts to CSV file**.

Step 3 Click **Next**.

The Export Service Configuration Parts dialog box appears.



Export Service Configuration Parts

Export Service Configuration Part to File

This wizard exports service configuration parts to a file

Select service configuration element to export:

○ Service Elements
○ Protocol Elements
○ Zones
○ Flavors

○ HTTP_Composite
○ HTTP_UserAgent
○ HTTP_URL
○ HTTP_ContentCategory
○ RTSP_Composite
○ RTSP_UserAgent
○ RTSP_HostName
○ SIP_Composite
○ SIP_SourceDomain
○ SIP_DestinationDomain
○ SMTP_Composite
○ SMTP_HostName

Step 4 Select one of the **Select service configuration element to export** radio buttons:

- **Service Elements**
- **Protocol Elements**
- **Zones**
- **Flavors**

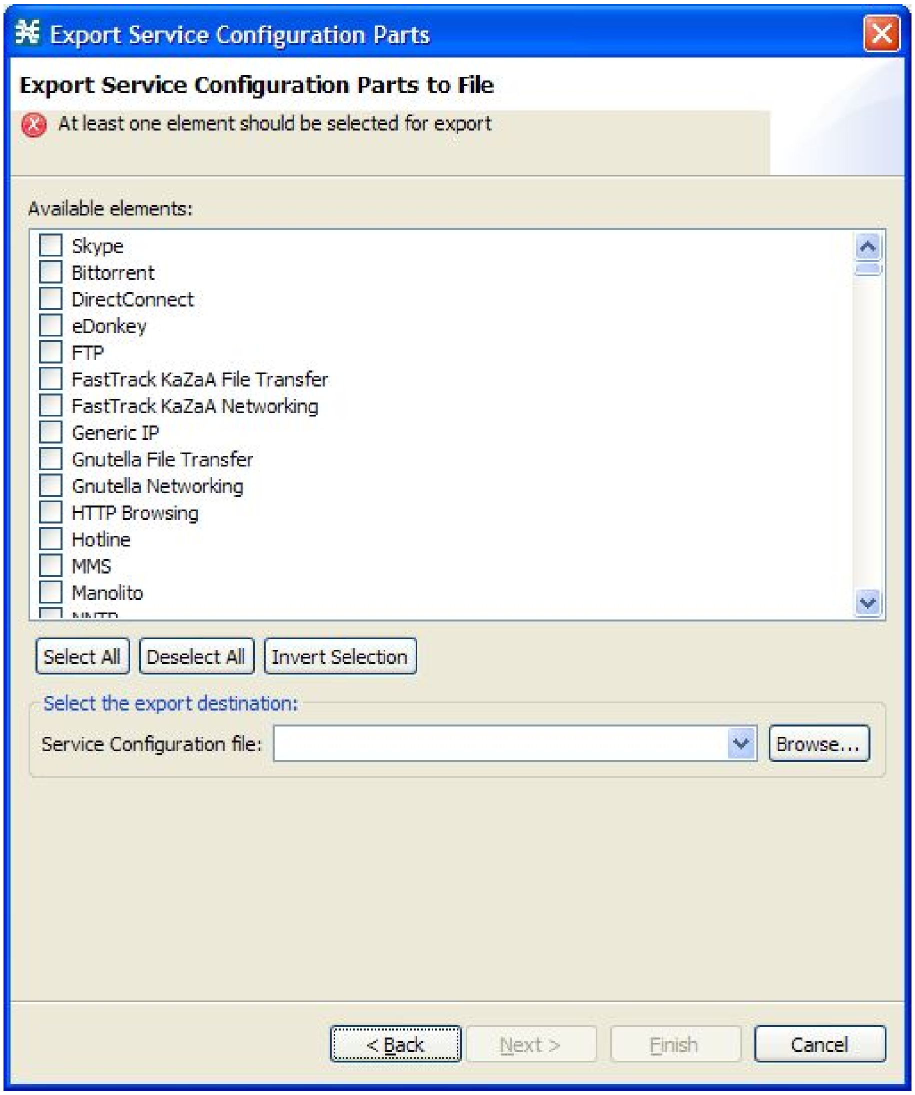
If you select Flavors, the flavors in the flavor area of the dialog box are enabled.

Only those flavors for which a flavor type is defined in this service configuration are enabled.

Step 5 If you selected Flavors, select one of the **flavor type** radio buttons.

Step 6 Click **Next**.

The second screen of the Export Service Configuration Parts dialog box opens.



Export Service Configuration Parts

Export Service Configuration Parts to File

At least one element should be selected for export

Available elements:

- □ Skype
- □ Bittorrent
- □ DirectConnect
- □ eDonkey
- □ FTP
- □ FastTrack KaZaA File Transfer
- □ FastTrack KaZaA Networking
- □ Generic IP
- □ Gnutella File Transfer
- □ Gnutella Networking
- □ HTTP Browsing
- □ Hotline
- □ MMS
- □ Manolito

Select the export destination:

Service Configuration file:

The Available elements pane lists all elements in the service configuration of the selected type.

Step 7 Select the elements to export, using the check boxes and the select buttons.

Step 8 In the Select the export destination area, click **Browse**.

An Open dialog box appears.

Step 9 Browse to the folder where you want to save the file containing the service configuration elements.

Step 10 In the File name field, enter a new file name, or select an existing CSV file.

Step 11 Click **Open** to select the file.

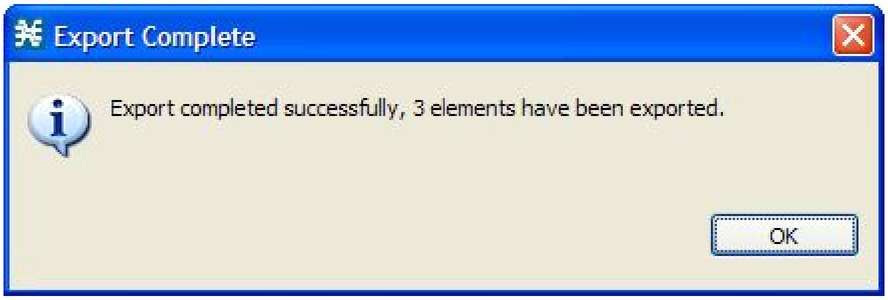
If the file exists, it will be overwritten.

The Open dialog box closes.

Step 12 Click **Finish**.

The selected service configuration elements are exported to the file.

An Export Complete message appears.



Export completed successfully, 3 elements have been exported.

Step 13 Click **OK**.

The Export Service Configuration Parts dialog box closes.

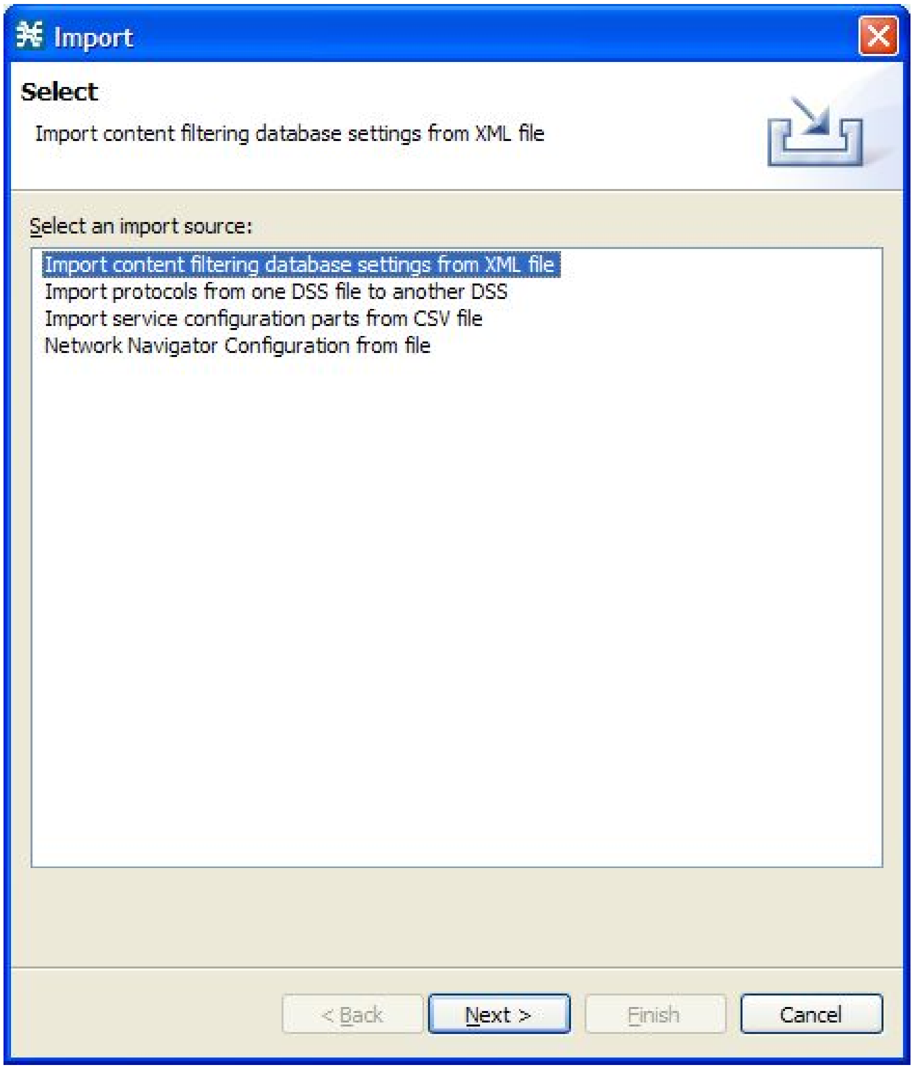
Importing Service Configuration Data

You can import service configuration data to the current service configuration from CSV files. The CSV file formats are described in the “CSV File Formats” chapter of the *Cisco Service Control Application Suit for Broadband Reference Guide*.

To import one type of service configuration element from a CSV file:

Step 1 From the Console main menu, choose **File** > **Import**.

The Import dialog box appears.

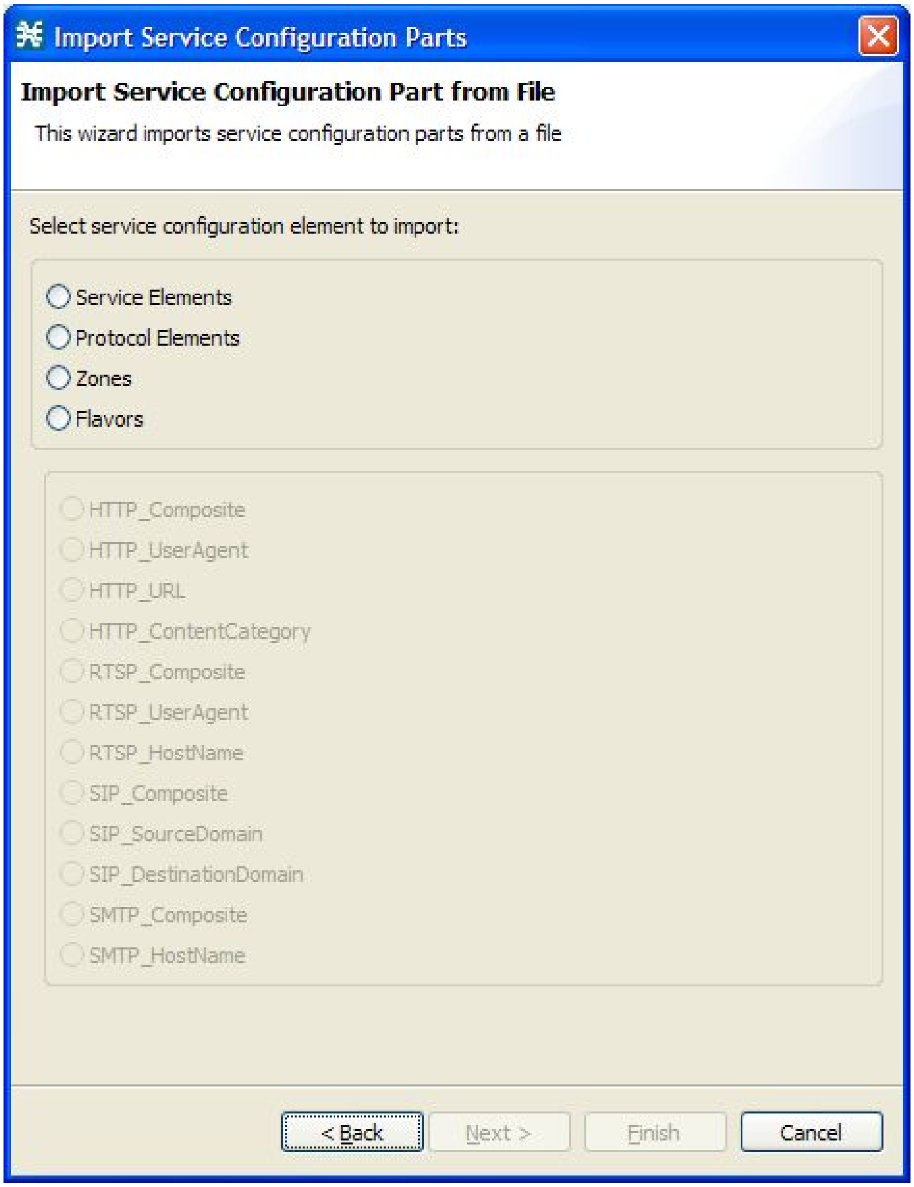


Import
Select
Import content filtering database settings from XML file
Select an import source:
Import content filtering database settings from XML file
Import protocols from one DSS file to another DSS
Import service configuration parts from CSV file
Network Navigator Configuration from file
< Back
Next >
Finish
Cancel

Step 2 From the Select an import source list, select **Import service configuration parts from CSV file**.

Step 3 Click **Next**.

The Import Service Configuration Parts dialog box appears.



Import Service Configuration Parts

Import Service Configuration Part from File

This wizard imports service configuration parts from a file

Select service configuration element to import:

○ Service Elements
○ Protocol Elements
○ Zones
○ Flavors

○ HTTP_Composite
○ HTTP_UserAgent
○ HTTP_URL
○ HTTP_ContentCategory
○ RTSP_Composite
○ RTSP_UserAgent
○ RTSP_HostName
○ SIP_Composite
○ SIP_SourceDomain
○ SIP_DestinationDomain
○ SMTP_Composite
○ SMTP_HostName

Step 4 Select one of the **Select service configuration element to import** radio buttons:

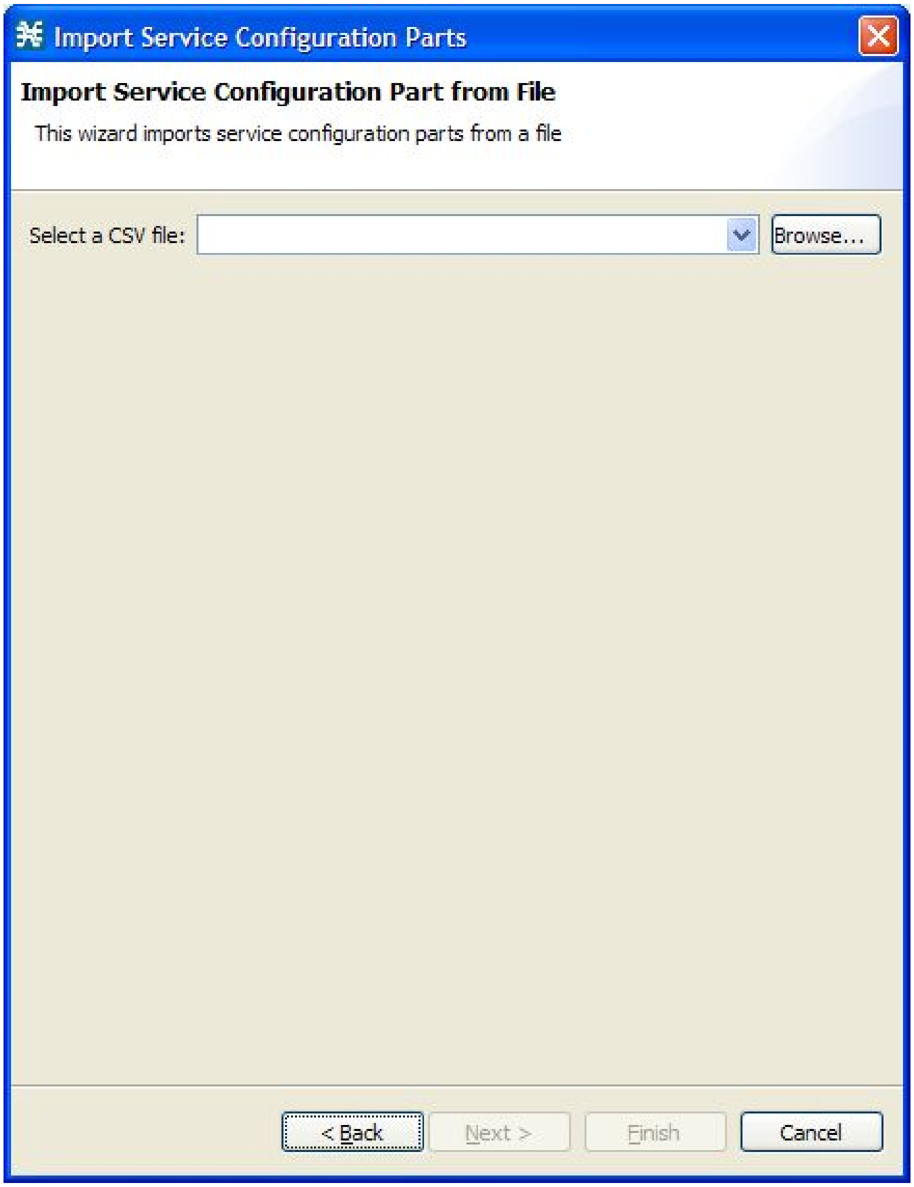
- **Service Elements**
- **Protocol Elements**
- **Zones**
- **Flavors**

If you select Flavors, the flavors in the flavor area of the dialog box are enabled.

Step 5 If you selected Flavors, select one of the **flavor type** radio buttons.

Step 6 Click **Next**.

The second screen of the Import Service Configuration Parts dialog box opens.


Import Service Configuration Parts
Import Service Configuration Part from File
This wizard imports service configuration parts from a file
Select a CSV file:
Browse...
< Back
Next >
Finish
Cancel

Step 7 Click **Browse**.

An Open dialog box appears.

Step 8 Browse to the folder containing the file to import, and select a CSV file.

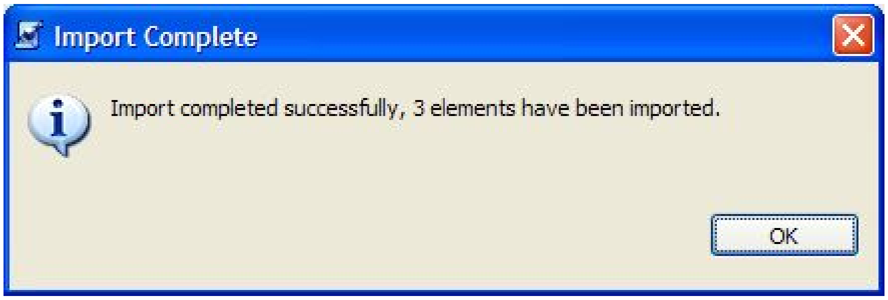
Step 9 Click **Open** to select the file.

The Open dialog box closes.

Step 10 Click **Finish**.

The configuration elements are imported from the file.

An Import Complete message appears.



Import Complete

Import completed successfully, 3 elements have been imported.

Step 11 Click **OK**.

The Import Service Configuration Parts dialog box closes.

Applying and Retrieving Service Configurations

For a new or edited service configuration to take effect, you must apply it to the SCE platform. Otherwise, the SCE platform continues to enforce the previous service configuration.

You can use the Service Configuration Editor to apply a service configuration to an SCE platform, but *not* to retrieve a service configuration.

You can apply *or* retrieve a service configuration using:

- *The Network Navigator* (on page 5-1)
- **servconf**, the ***SCA BB*** Service Configuration Utility (see *Using the* ***SCA BB*** *Service Configuration Utility* (on page 13-1))

Validating the Current Service Configuration

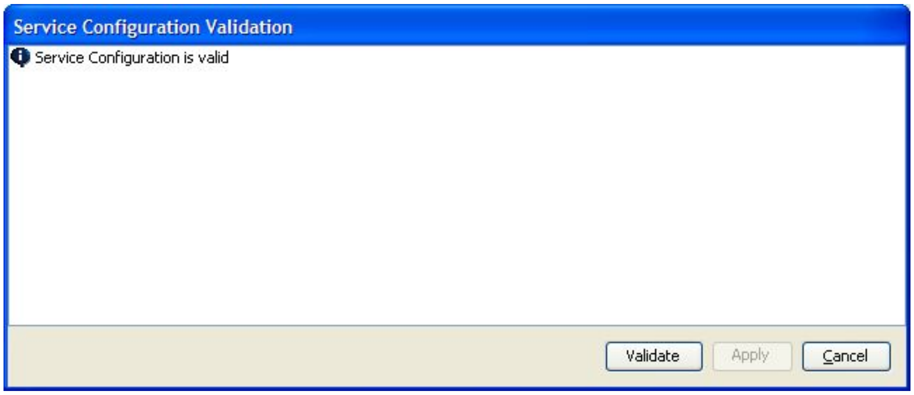
Use the Validate option to validate the new or updated service configuration currently displayed. The validation process checks for overall service configuration coherence, and points out possible pitfalls in the service configuration.

The Validate process runs automatically when you select Apply Service Configuration to SCE devices. The Service Configuration Validation dialog box appears only if the procedure found errors or issued warnings regarding the current service configuration.

To validate the current service configuration:

Step 1 From the Console main menu, choose **File** > **Validate**.

The Service Configuration Validation dialog box appears.



Service Configuration is valid

Any problems with the service configuration are listed in the dialog box.

Step 2 Click **Cancel**.

The Service Configuration Validation dialog box closes.

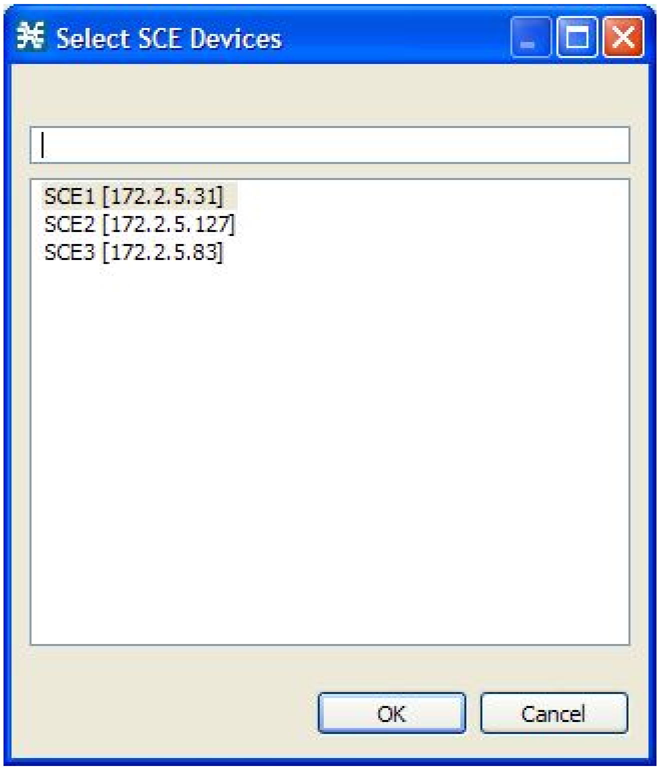
Applying a Service Configuration to SCE Platforms

When you click **Apply Service Configuration to SCE Devices**, the current service configuration is validated. If there is a problem and the validation process ends with a warning or error, the service configuration Validation dialog box appears, supplying the validation results. Select **Apply**, or correct the problem before applying the service configuration. Use the **Validation** menu command to manually validate the service configuration.

To apply the current service configuration to SCE platforms:

Step 1 In the toolbar, click ⇒ (**Apply Service Configuration to SCE Devices**).

The Select SCE Devices dialog box appears.



SCE1 [172.2.5.31]
SCE2 [172.2.5.127]
SCE3 [172.2.5.83]

All SCE platforms defined in the Network Navigator are listed in the dialog box.

Step 2 Select one or more SCE platforms from the list.

Step 3 Click **OK**.

A Password Management dialog box appears for each platform selected.

Step 4 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 5 Click **Apply**.

The Password Management dialog box closes.

An Applying service configuration to SCE progress bar appears for each SCE platform selected.

The service configuration is applied to the selected SCE platforms.

CHAPTER 7

Using the Service Configuration Editor: Traffic Classification

Traffic classification is the first step in creating a Cisco Service Control Application for Broadband (***SCA BB***) service configuration. Traffic is classified according to services.

For each commercial service that providers offer to their subscribers, a corresponding service is defined in the Cisco Service Control solution. You can use this service to classify and identify the traffic, report on its usage, and control it.

This chapter how explains how to work with services and their elements and subelements.

This chapter contains the following sections:

Managing Services

Services are used to classify controlled traffic.

A service consists of one or more service elements; different network traffic transaction types are mapped to different service elements.

Traffic is classified on the basis of some or all of the following:

- Protocol—The protocol used by the transaction, as identified by the Service Control Engine (SCE) platform
- Initiating side—Where the transaction was initiated
- Zone—IP address of the network-side host of the transaction
- Flavor—Specific Layer 7 properties of the transaction; for instance, hostnames of the network-side host of the transaction

A service configuration can contain up to 500 services and 10,000 service elements. Every service element in a service configuration must be unique.

Service Parameters

A service is defined by the following parameters:

- General parameters:
    - Name—A unique name
    - Description—(Optional) A description of the service
- Hierarchy parameters:
    - Parent Service

      The default service, which is the base of the service hierarchy, does not have a parent.

The parent service is important when services share usage counters (see next parameter).

- Service Usage Counters—Used by the system to generate data about the total use of each service. A service can use either its own usage counters, or those of the parent service.

  Each usage counter has:
    - A name assigned by the system (based on the service name).

An asterisk is appended to a service counter name whenever the counter applies to more than one service.

- A unique counter index—A default value of the counter index is provided by the system. Do not modify this value.

- Advanced parameter:
    - Service Index—A unique number by which the system recognizes the service (changing the service name does not affect SCE platform activity). A default value of the service index is provided by the system. Do not modify this value.

These parameters are defined when you add a new service (see *Adding and Defining Services* (on page 7-4)). You can modify them at any time (see *Editing Services* (on page 7-8)).

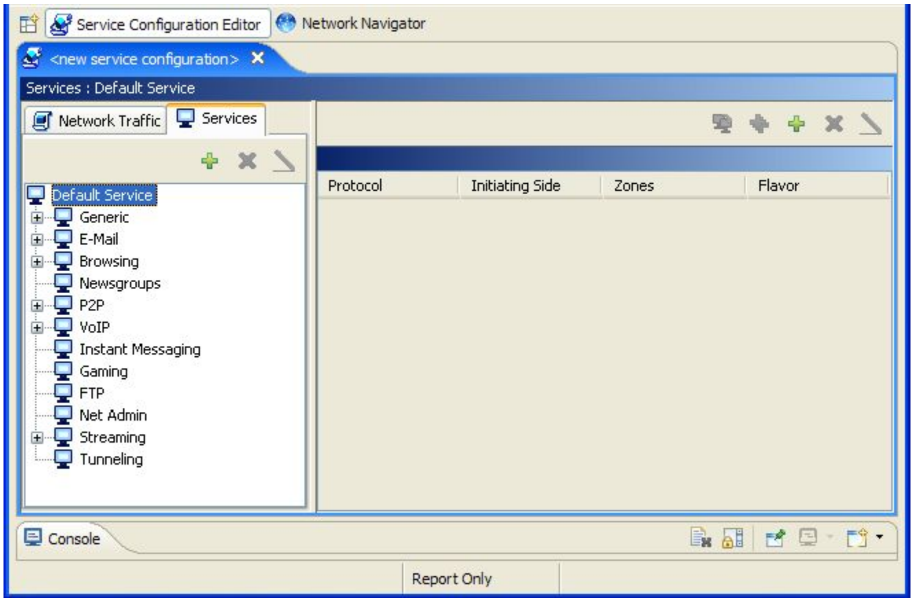
Viewing Services

You can view a hierarchy tree of all existing services and see their associated service elements.

To view all services:

Step 1 In the current service configuration, click the **Services** tab.

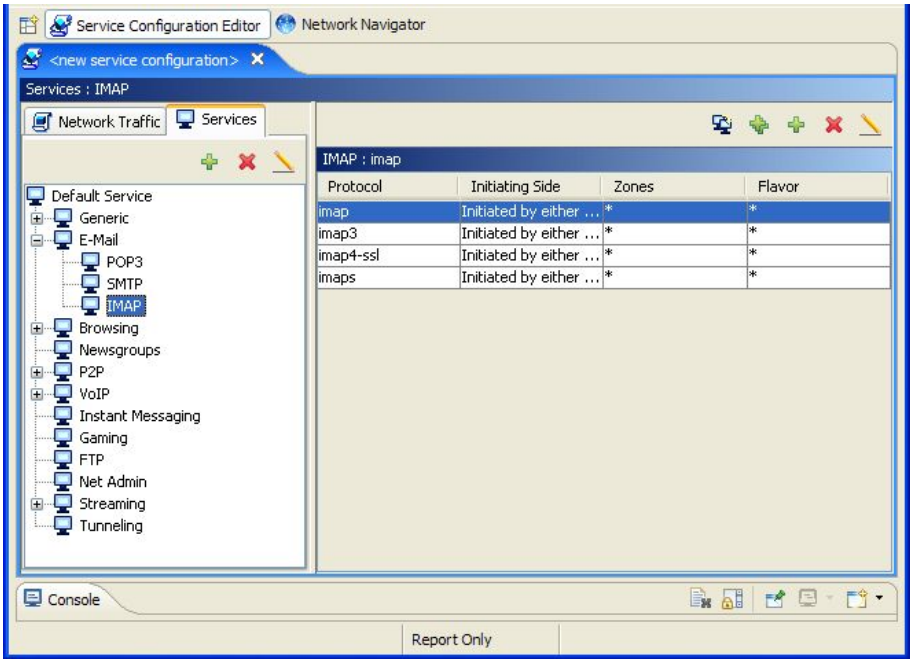
The Services tab appears.



A list of all services is displayed in the service tree (left pane).

Step 2 Click a service in the hierarchy to display its service elements.

A list of all service elements defined for this service is displayed in the right (Service Element) pane.



IMAP : imap

Protocol	Initiating Side	Zones	Flavor
imap	Initiating by either ...	*	*
imap3	Initiating by either ...	*	*
imap4-ssl	Initiating by either ...	*	*
imaps	Initiating by either ...	*	*

Step 3 To view more information about a service, select a service from the service tree and click ✎ (**Edit Service**).

The Service Settings dialog box appears.

Adding and Defining Services

A number of services are predefined in the Console installation. You can add additional services to a service configuration, subject to the limit of 500 services (including predefined services) per service configuration.

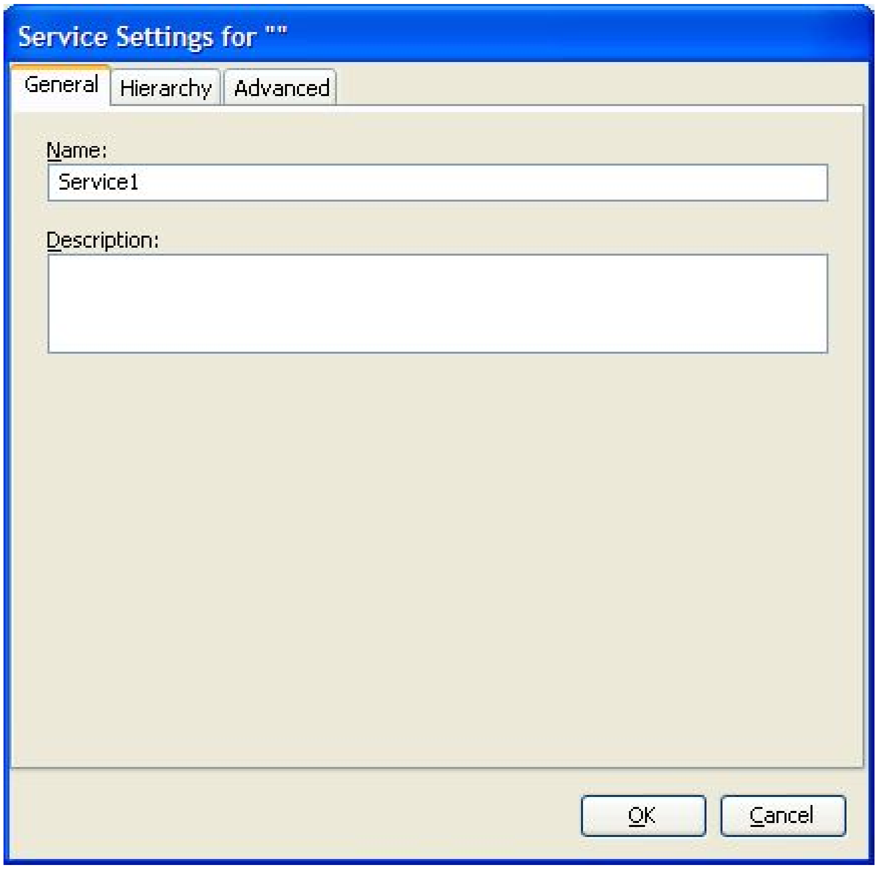
After you have added and defined a new service, you can add service elements to the service (see *Adding Service Elements* (on page 7-11)).

To add a service to a service configuration:

Step 1 In the Services tab, select a service from the service tree. This service will be the parent of the service you are adding.

Step 2 In the left pane, click ✚ (**Add Service**).

The Service Settings dialog box appears.



Service Settings for ""

Name:
Service1

Description:

Step 3 In the Name field, enter a unique and relevant name for the service.

Step 4 (Optional) In the Description field, enter a meaningful and useful description of the service.

Step 5 To set exclusive usage counters for this service, or to change the parent service you selected when adding the service, continue with the instructions in the section *Defining Hierarchical Settings for a Service* (on page 7-5).

Step 6 To specify an index for this service, continue with the instructions in the section *Setting the Service Index* (on page 7-6).

> The system automatically assigns a free number for the new service. Modify this number only where a specific index value must be assigned to a specific service.

Step 7 Click **OK**.

The Service Settings dialog box closes.

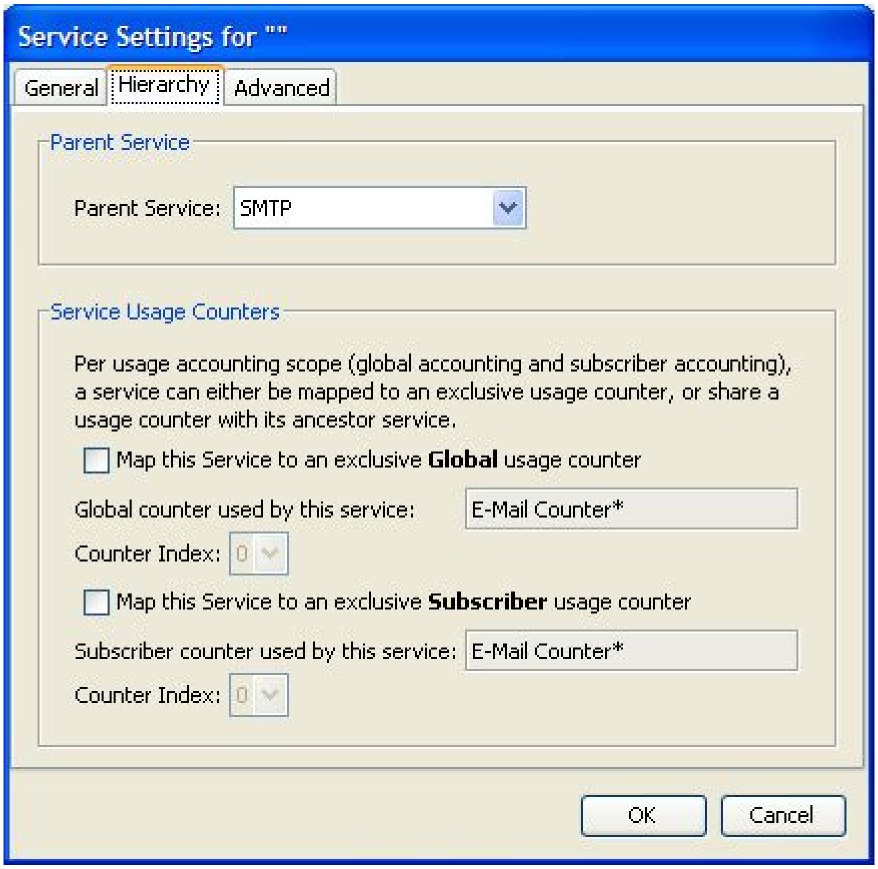
The service is added to the service tree as a child to the service you selected in the hierarchy.

Defining Hierarchical Settings for a Service

To select a parent service and set the service usage counters:

Step 1 In the Service Settings dialog box, click the **Hierarchy** tab.

The Hierarchy tab opens.



Service Settings for ""

General | Hierarchy | Advanced

Parent Service

Parent Service: SMTP

Service Usage Counters

Per usage accounting scope (global accounting and subscriber accounting), a service can either be mapped to an exclusive usage counter, or share a usage counter with its ancestor service.

☐ Map this Service to an exclusive **Global** usage counter

Global counter used by this service: E-Mail Counter*

Counter Index: 0

☐ Map this Service to an exclusive **Subscriber** usage counter

Subscriber counter used by this service: E-Mail Counter*

Counter Index: 0

Step 2 To set a different parent service, select the desired parent from the Parent Service drop-down list.

Step 3 By default, a new service uses its parent’s global usage counter. To define an exclusive global usage counter, check the **Map this Service to an exclusive Global usage counter** check box.

The name in the read-only Global counter of this service field changes to reflect your choice.

The Counter Index drop-down list is enabled.

(Optional) Select a value for the counter index from the Counter Index drop-down list.

A default value of the counter index is provided by the system. Do not modify this value.

Step 4 By default, a new service uses its parent’s subscriber usage counter. To define an exclusive subscriber usage counter, check the **Map this Service to an exclusive Subscriber usage counter** check box.

The name in the read-only Subscriber counter of this service field changes to reflect your choice.

The Counter Index drop-down list is enabled.

(Optional) Select a value for the counter index from the Counter Index drop-down list.

A default value of the counter index is provided by the system. Do not modify this value.

Step 5 To specify an index for this service, continue with the instructions in the section *Setting the Service Index* (on page 7-6).

The system automatically assigns a free number for the new service. Modify this number only where a specific index value must be assigned to a specific service.

Step 6 Click **OK**.

The Service Settings dialog box closes.

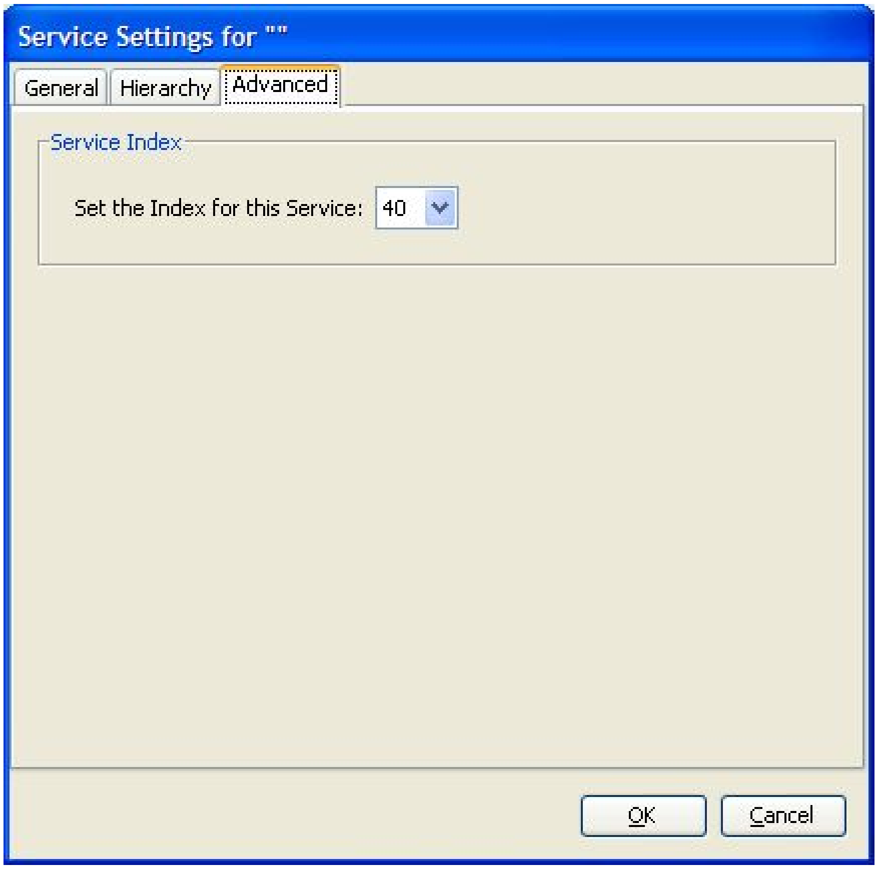
The service is added to the service tree as a child to the service selected in the Parent Service drop-down list.

Setting the Service Index

To set a value for the service index:

Step 1 In the Service Settings dialog box, click the **Advanced** tab.

The Advanced tab opens.



Set the Index for this Service: 40

Step 2 From the Set the Index for this Service drop-down list, select a service index.

The service index must an integer in the range 1 to 499; zero is reserved for the default service.

> The system automatically assigns a free number for the new service. Modify this number only where a specific index value must be assigned to a specific service.

Step 3 Click **OK**.

The Service Settings dialog box closes.

The service is added to the service tree as a child to the service selected in the Parent Service drop-down list.

Editing Services

You can modify the parameters of a service, even those included in the Console installation.

To add, modify, or delete service elements, see *Managing Service Elements* (on page 7-10).

To edit a service:

Step 1 In the Services tab, select a service from the service tree.

Step 2 In the left pane, click ✎ (**Edit Service**).

The Service Settings dialog box appears.

Step 3 To give a new name to the service, enter a new name in the Name field.

Step 4 To give a new description for the service, enter a new description in the Description field.

Step 5 To change hierarchical settings, click the **Hierarchy** tab.

The Hierarchy tab opens.

a) To set a different parent service, select the desired service from the Parent Service drop-down list.

b) To share a global usage counter with the parent service, uncheck the **Map this Service to an exclusive Global usage counter** check box.

The name of the parent service's counter is displayed in the Global counter used by this service field.

c) To define an exclusive global usage counter:

1. Check the **Map this Service to an exclusive Global usage counter** check box.

   The name in the read-only Global counter of this service field changes to reflect your choice.

   The Counter Index drop-down list is enabled.

2. Select a value for the counter index from the Counter Index drop-down list.

A default value of the counter index is provided by the system. Do not modify this value.

d) To share a subscriber usage counter with the parent service, uncheck the **Map this Service to an exclusive Subscriber usage counter** check box.

The name of the parent service's counter is displayed in the Subscriber counter used by this service field.

e) To define an exclusive subscriber usage counter:

1. Check the **Map this Service to an exclusive Subscriber usage counter** check box.

   The name in the read-only Subscriber counter of this service field changes to reflect your choice.

   The Counter Index drop-down list is enabled.

2. Select a value for the counter index from the Counter Index drop-down list.

A default value of the counter index is provided by the system. Do not modify this value.

Step 6 To change the service index:

a) In the Service Settings dialog box, click the **Advanced** tab.

The Advanced tab opens.

b) From the Set the Index for this Service drop-down list, select a service index.

The service index must an integer in the range 1 to 499; zero is reserved for the default service.

A default value of the service index is provided by the system. Do not modify this value.

Step 7 Click **OK**.

The Service Settings dialog box closes.

The changes to the service are saved.

Deleting Services

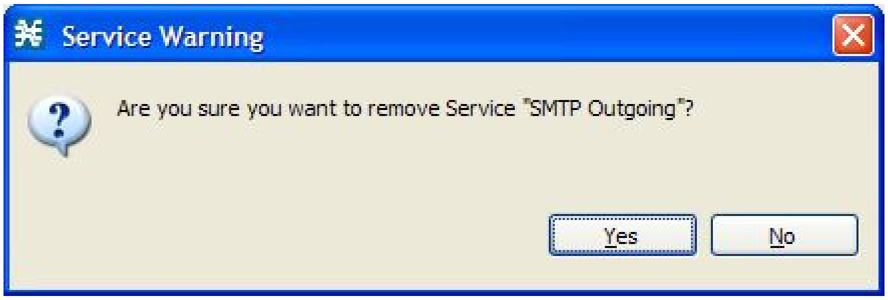
You can delete all services, even those in the Console installation, with the exception of the default service.

To delete a service:

Step 1 In the Services tab, select a service from the service tree.

Step 2 In the left pane, click ✖ (**Delete Service**).

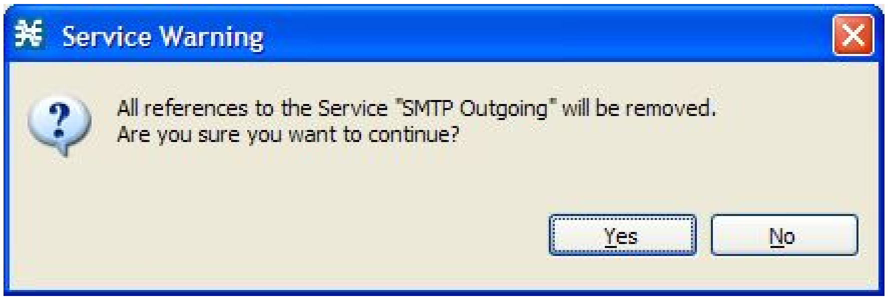
Step 3 A Service Warning message appears.



Are you sure you want to remove Service "SMTP Outgoing"?

Step 4 Click **Yes**.

- If any package has a rule for this service (see *Managing Rules* (on page 9-10)), a second Service Warning message appears.



Service Warning

All references to the Service "SMTP Outgoing" will be removed.
Are you sure you want to continue?

Click **Yes**.

The service is deleted and is no longer displayed in the service tree. Any rules for the service are also deleted.

Children of the deleted service are not deleted; they move up one level in the service tree.

Managing Service Elements

A service is a collection of *service elements*. Therefore, to complete the definition of a service, you must define its service elements. A service element maps a specific protocol, initiating side, zone, and flavor to the selected service.

For more information, see *Managing Protocols* (on page 7-21), *Managing Zones* (on page 7-32), and *Managing Flavors* (on page 7-51).

A service configuration can contain up to 10,000 service elements. Every service element must be unique.

A traffic flow is mapped by a service element to the service element's service if it meets all five of the following criteria:

- The flow uses the specified protocol of the service element.
- The flow is initiated by the side (network, subscriber, or either) specified for the service element.
- The destination of the flow is an address that belongs to the specified zone of the service element.
- The flow matches the specified flavor of the service element.
- The service element is the most specific service element satisfying the first four criteria.

Adding Service Elements

When necessary, you can add new service elements to a service. (The most useful service elements are included in the Console installation.) A service may have any number of service elements (subject to the limit of 10,000 service elements per service configuration).

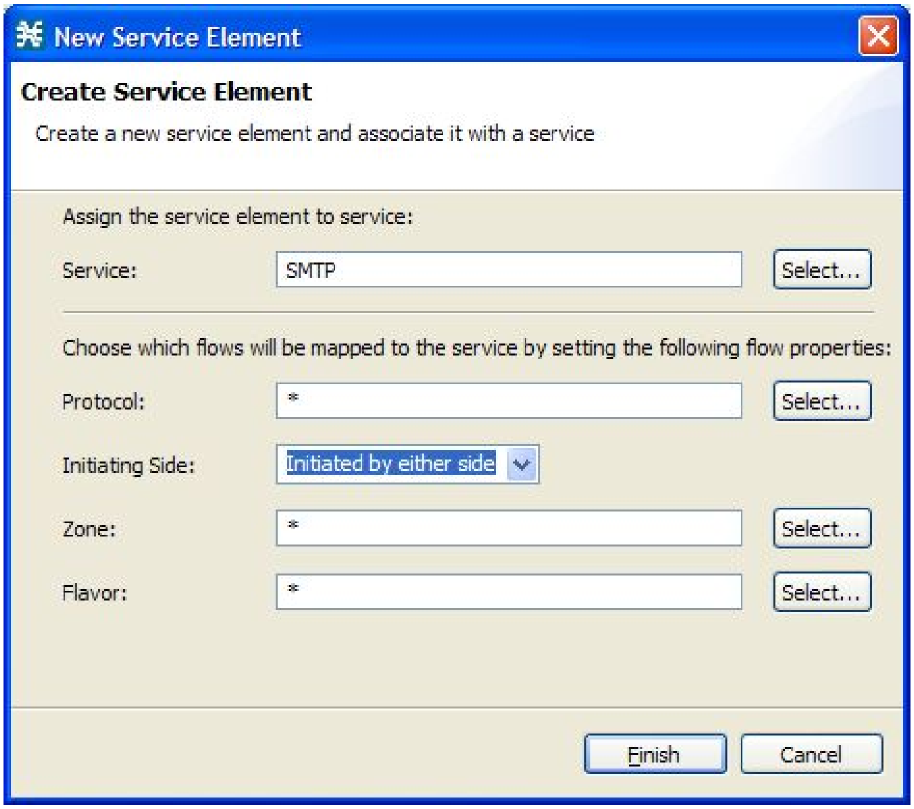
Note Every service element must be unique; if, at any stage, the new service element is the same as an existing one, an error message is displayed in the dialog box and the Finish button is dimmed. If this occurs, modify the value in at least one field.

To add and define a service element:

Step 1 In the Services tab, select a service from the service tree.

Step 2 In the right (Service Elements) pane, click ✚ (**Add Service Element**).

The New Service Element dialog box appears.



New Service Element

Create Service Element

Create a new service element and associate it with a service

Assign the service element to service:

Service: SMTP

Choose which flows will be mapped to the service by setting the following flow properties:

Protocol: *

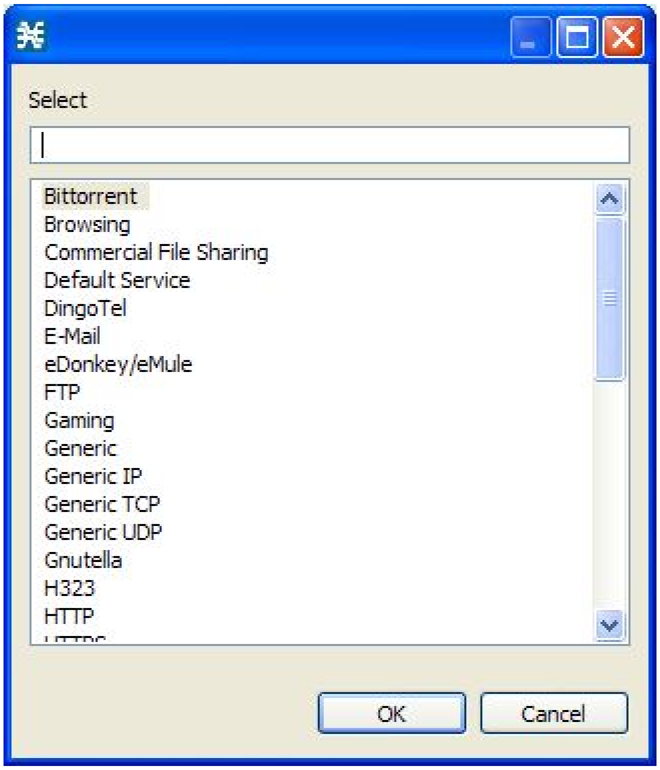
Initiating Side: Initiated by either side

Zone: *

Flavor: *

Step 3 To change the service to which this service element is assigned, click the **Select** button next to the Service field.

The Select a Service dialog box appears, displaying a list of all services.



Step 4 Select a service from the list.

Step 5 Click **OK**.

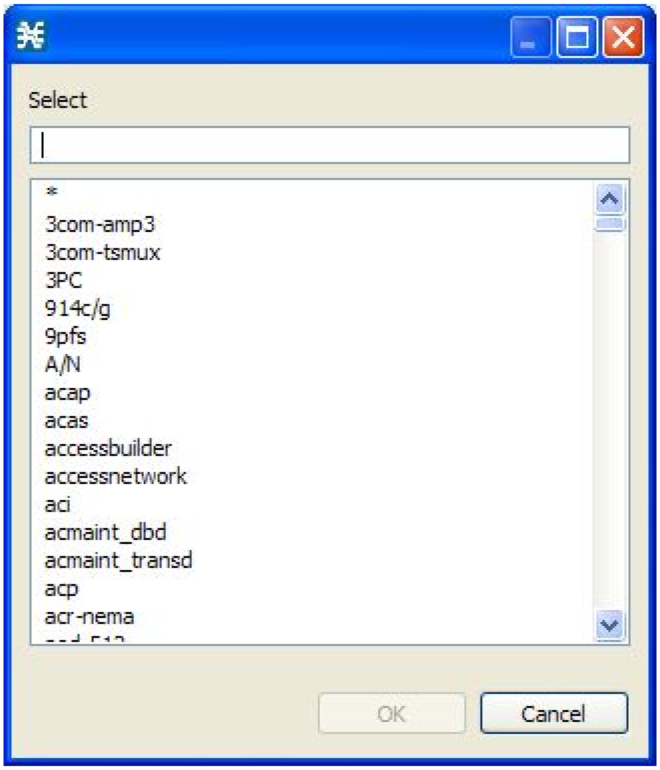
The Select a Service dialog box closes.

The selected service is displayed in the Service field of the New Service Element dialog box.

Step 6 Click the **Select** button next to the Protocol field.

> The default value (an asterisk, *) means that no protocol checking is performed when testing if a flow maps to this service element.

The Select a Protocol dialog box appears, displaying a list of all protocols.



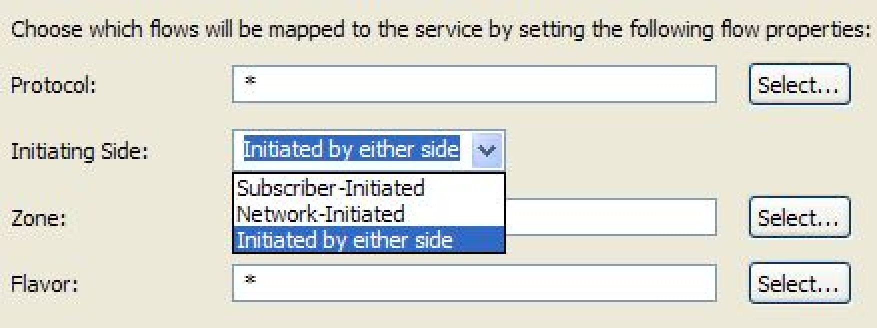
Step 7 Select a protocol from the list. You can type in the field at the top of the dialog box to help locate the desired protocol.

Step 8 Click **OK**.

The Select a Protocol dialog box closes.

The selected protocol is displayed in the Protocol field of the New Service Element dialog box.

Step 9 In the Initiating Side field, click the drop-down arrow.



Choose which flows will be mapped to the service by setting the following flow properties:

Protocol: *

Initiating Side: Initiated by either side

Flavor: *

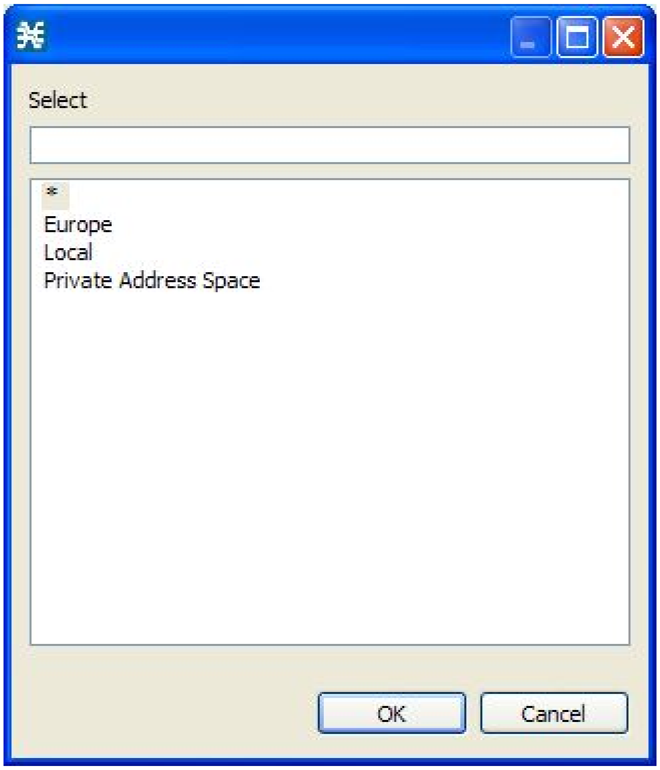
Step 10 Select the appropriate initiating side from the drop-down list. The following options are available:

- **Subscriber-Initiated**—Transactions are initiated at the subscriber side towards (a server at) the network side.
- **Network-Initiated**—Transactions are initiated at the network side towards (a server at) the subscriber side.
- **Initiated by either side**

Step 11 Click the **Select** button next to the Zone field.

The default value (an asterisk, *) means that no zone checking is performed when testing if a flow maps to this service element.

The Select a Zone dialog box appears, displaying a list of all zones.



Step 12 Select a zone from the list.

Step 13 Click **OK**.

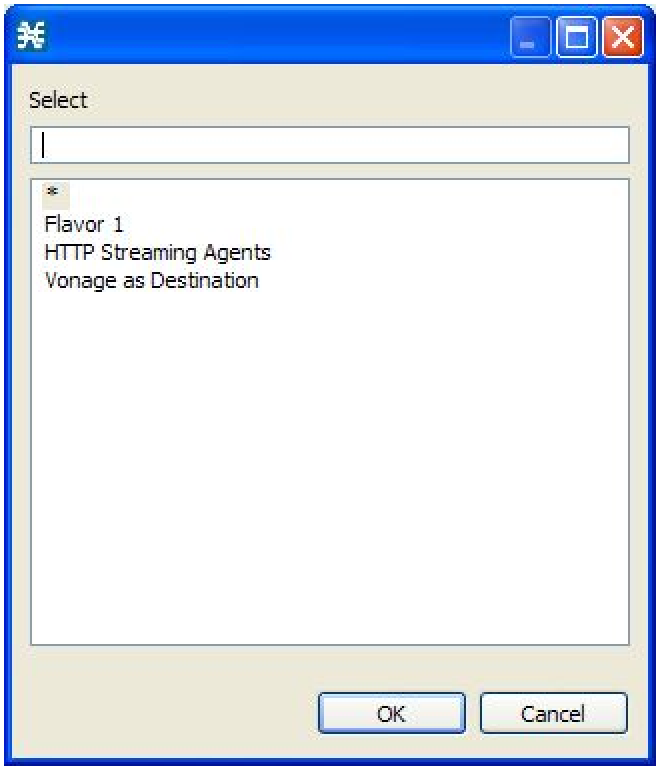
The Select a Zone dialog box closes.

The selected zone is displayed in the Zone field of the New Service Element dialog box.

Step 14 Click the **Select** button next to the Flavor field.

The default value (an asterisk, *) means that no flavor checking is performed when testing if a flow maps to this service element.

The Select a Flavor dialog box appears, displaying a list of all flavors.



Step 15 Select a flavor from the list.

Step 16 Click **OK**.

The Select a Flavor dialog box closes.

The selected flavor is displayed in the Flavor field of the New Service Element dialog box.

Step 17 Click **Finish**.

The New Service Element dialog box closes.

The new service element is added to the service.

A new row, representing the service element, is added to the service element list in the Service Elements pane.

Duplicating Service Elements

Duplicating an existing service element is a useful way to add a new service element that is similar to an existing service element. It is faster to duplicate a service element and then make changes than to define the service element from scratch.

Note Every service element must be unique; if, at any stage, the new service element is the same as an existing one, an error message is displayed in the dialog box and the Finish button is dimmed. If this occurs, modify the value in at least one field.

To duplicate a service element:

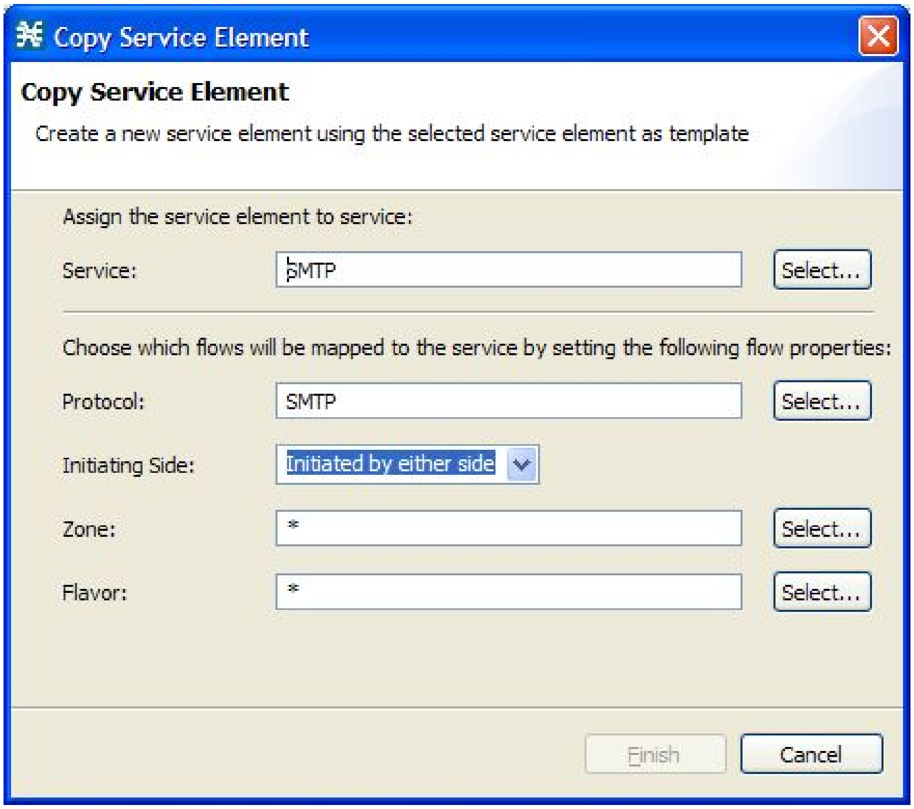
Step 1 In the Services tab, select a service from the service tree.

A list of associated service elements is displayed in the Service Elements pane.

Step 2 In the Service Elements pane, select a service element to duplicate.

Step 3 Click ✚ (**Duplicate Service Element**).

The Copy Service Element dialog box appears.



Copy Service Element

Create a new service element using the selected service element as template

Assign the service element to service:

Service: SMTP

Choose which flows will be mapped to the service by setting the following flow properties:

Protocol: SMTP

Initiating Side: Initiated by either side

Zone: *

Flavor: *

Step 4 Modify the service element (see *Editing Service Elements* (on page 7-17)).

Before you can save the new service element, you must change the value in at least one field.

Editing Service Elements

You can modify all service elements, even those included in the Console installation.

Note Every service element must be unique. If, at any stage, the modified service element is the same as an existing one, an error message is displayed in the dialog box and the Finish button is dimmed. If this occurs, modify the value in at least one field.

To edit a service element:

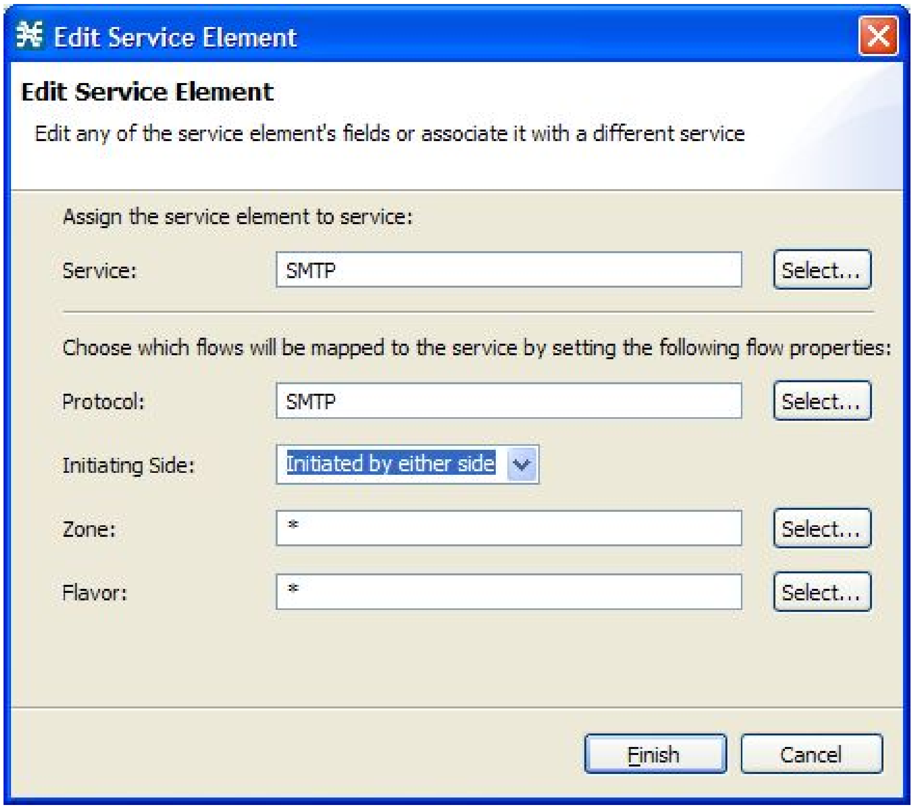
Step 1 In the Services tab, select a service from the service tree.

A list of associated service elements is displayed in the Service Elements pane.

Step 2 In the Service Elements pane, select a service element to edit.

Step 3 In the Services Elements pane, click ✎ (**Edit Service Element**).

The Edit Service Element dialog box appears.



Edit Service Element

Edit Service Element

Edit any of the service element's fields or associate it with a different service

Assign the service element to service:

Service: SMTP

Choose which flows will be mapped to the service by setting the following flow properties:

Protocol: SMTP

Initiating Side: Initiated by either side

Zone: *

Flavor: *

Step 4 To change the service to which this service element is assigned, click the **Select** button next to the Service field.

The Select a Service dialog box appears, displaying a list of all services.

Step 5 Select a service from the list.

Step 6 Click **OK**.

The Select a Service dialog box closes.

The selected service is displayed in the Service field of the Edit Service Element dialog box.

Step 7 To change the protocol of this service element, click the **Select** button next to the Protocol field.

An asterisk (*) means that no protocol checking is performed when testing if a flow maps to this service element.

The Select a Protocol dialog box appears, displaying a list of all protocols.

Step 8 Select a protocol from the list; you can type in the field at the top of the dialog box to help locate the desired protocol.

Step 9 Click **OK**.

The Select a Protocol dialog box closes.

The selected protocol is displayed in the Protocol field of the Edit Service Element dialog box.

Step 10 To change the initiating side of this service element, click the drop-down arrow in the Initiating Side field.

Step 11 Select the appropriate initiating side from the drop-down list. The following options are available:

- **Subscriber-Initiated**—Transactions are initiated at the subscriber side towards (a server at) the network side.
- **Network-Initiated**—Transactions are initiated at the network side towards (a server at) the subscriber side.
- **Initiated by either side**

Step 12 To change the zone of this service element, click the **Select** button next to the Zone field.

An asterisk (*) means that no zone checking is performed when testing if a flow maps to this service element.

The Select a Zone dialog box appears, displaying a list of all zones.

Step 13 Select a zone from the list.

Step 14 Click **OK**.

The Select a Zone dialog box closes.

The selected zone is displayed in the Zone field of the Edit Service Element dialog box.

Step 15 To change the flavor of this service element, click the **Select** button next to the Flavor field.

An asterisk (*) means that no flavor checking is performed when testing if a flow maps to this service element.

The Select a Flavor dialog box appears, displaying a list of all flavors.

Step 16 Select a flavor from the list.

Step 17 Click **OK**.

The Select a Flavor dialog box closes.

The selected flavor is displayed in the Flavor field of the Edit Service Element dialog box.

Step 18 Click **Finish**.

The Edit Service Element dialog box closes.

The changes to the service element are saved.

The changes to the service element appear in the service element list in the Service Elements pane.

Deleting Service Elements

You can delete all service elements, even those included in the Console installation.

To delete a service element:

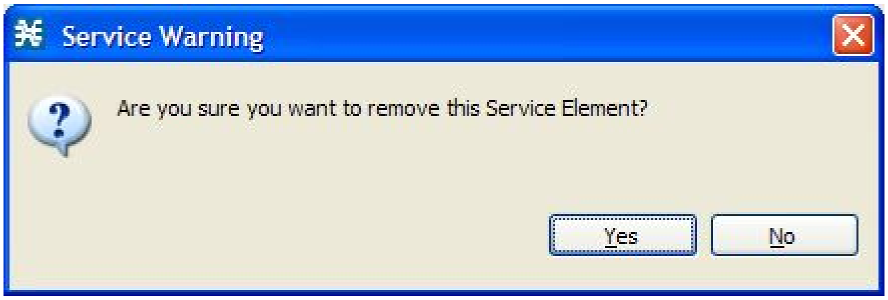
Step 1 In the Services tab, select a service from the service tree.

A list of associated service elements is displayed in the Service Elements pane.

Step 2 In the Service Elements pane, select a service element to delete.

Step 3 In the Service Elements pane, click ✖ (**Delete Service Element**).

A Service Warning message appears.



Service Warning

Are you sure you want to remove this Service Element?

Step 4 Click **Yes**.

The service element is deleted and is no longer part of the selected service.

Moving Service Elements

You can move an existing service element from one service to a different service.

To move a service element:

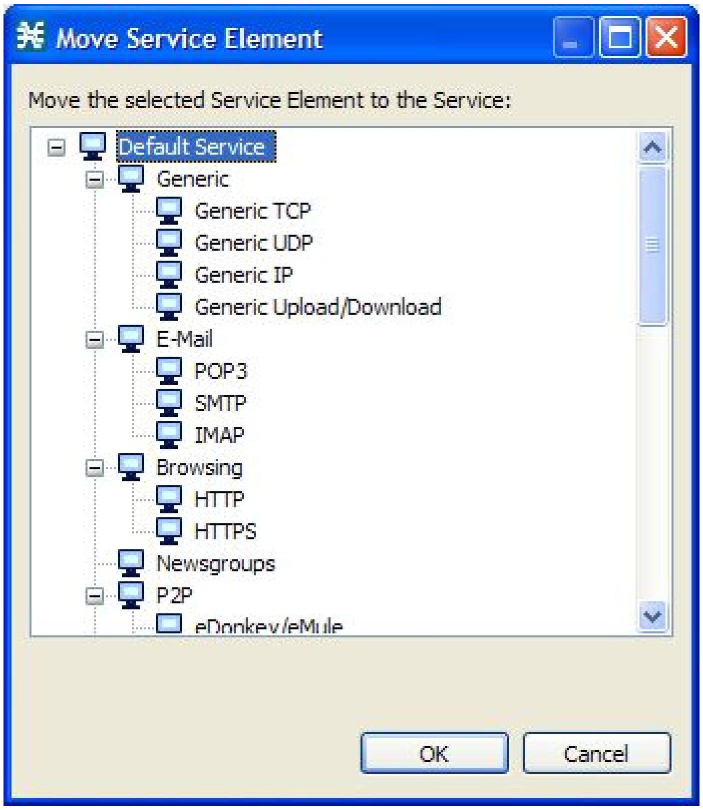
Step 1 In the Services tab, select a service from the service tree.

A list of associated service elements is displayed in the Service Elements pane.

Step 2 In the Service Elements pane, select a service element to move.

Step 3 Click (**Move Service Element to Another Service**).

The Move Service Element dialog box appears, displaying the complete service tree.


Move Service Element

Move the selected Service Element to the Service:

Step 4 From the service tree, select a service.

Step 5 Click **OK.**

The Move Service Element dialog box closes.

The service element is moved to the selected service.

Managing Protocols

A *protocol* is composed of an application protocol signature, the destination port or ports, a unique name, and an optional description.

Protocols are used to define service elements (see *Managing Service Elements* (on page 7-10)).

You can add new protocols (for example, to classify a new gaming protocol that uses a specific port). You can also edit or delete existing ones.

A service configuration can contain up to 10,000 protocols.

SCA BB supports many commercial and common protocols. For a complete list of protocols included with the current release of ***SCA BB***, see “Protocols” in the “Default Service Configuration Reference Tables” chapter of the *Cisco Service Control Application for Broadband Reference Guide*. As new protocols are released, Cisco provides files containing the new protocol signatures so that you can add the signatures to your service configuration. (See *Adding Signatures to a Service Configuration* (on page 7-43).)

Viewing Protocols

You can view a list of all protocols and their associated protocol elements.

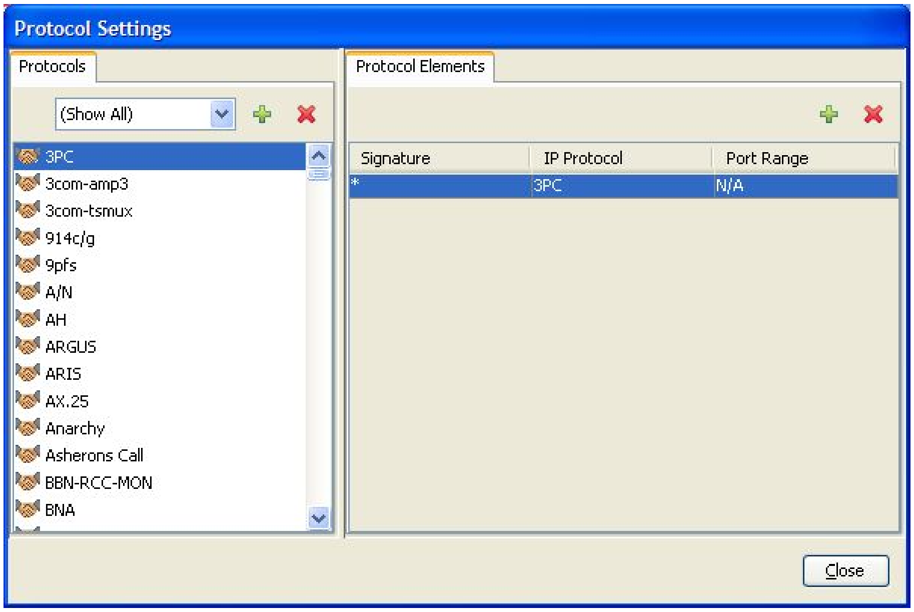
The protocols are listed in ASCII sort order (that is, 0 ... 9, A ... Z, a ... z).

The protocol elements are not sorted; they are listed in the order in which they were added to the protocol.

To view a list of all protocols:

Step 1 From the Console main menu, choose **Configuration** > **Protocols**.

The Protocol Settings dialog box appears.



3PC
3com-amp3
3com-tsmux
914c/g
9pfs
A/N
AH
ARGUS
ARIS
AX.25
Anarchy
Asherons Call
BBN-RCC-MON
BNA

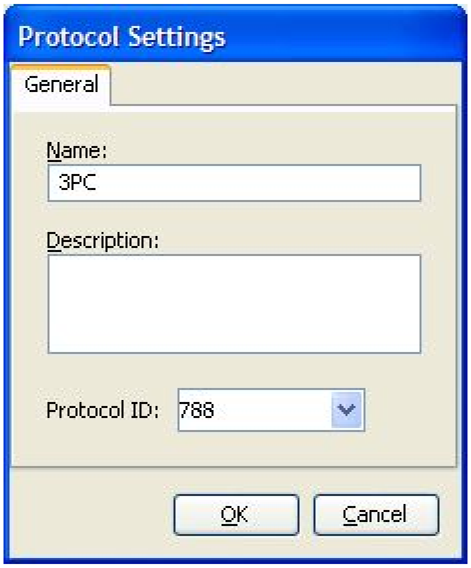
Signature	IP Protocol	Port Range
*	3PC	N/A

The Protocols tab displays a list of existing protocols.

Step 2 To view the description and ID of a protocol:

a) Double-click a protocol.

The Protocol Settings dialog box appears, displaying the protocol name, description, and ID.



Protocol Settings

Name: 3PC

Description:

Protocol ID: 788

b) Click **Cancel**.

The Protocol Settings dialog box closes.

Step 3 To view a list of protocol elements, select a protocol in the list in the Protocol Settings dialog box.

The protocol elements are displayed in the Protocol Elements tab.

Step 4 Click **Close**.

The Protocol Settings dialog box closes.

Filtering the List in the Protocols View Tab

You can filter the protocols by type, so that the Protocols tab displays only the selected type of protocol.

There are nine categories of protocols:

- Generic Protocols—Generic IP, Generic TCP, and Generic UDP protocols, used for transactions that are not specifically mapped to a protocol by any other protocol type.
- IP Protocols—Protocols (such as ICMP), other than TCP and UDP protocols, identified according to the IP protocol number of the transaction.
- Port-Based Protocols—TCP and UDP protocols, classified according to their well-known ports. The default service configuration includes more than 750 common port-based protocols.
- Signature-Based Protocols—Protocols classified according to a Layer 7 application signature. Includes the most common protocols, such as HTTP and FTP, and a large group of popular P2P protocols.

- P2P Protocols—Peer-to-peer file sharing application protocols classified according to a Layer 7 application signature.
- VOIP Protocols—Voice-over-IP application protocols classified according to a Layer 7 application signature.
- SIP Protocols—Protocols classified according to a Layer 7 application signature that is SIP or has SIP characteristics.
- Worm Protocols—Protocols classified according to a Layer 7 application signature that is based on traffic patterns of internet worms.
- Packet Stream Pattern-Based Protocols—Protocols classified according to a Layer 7 application signature that is based on the pattern of the packet stream (for instance, the stream’s symmetry, average packet size, and rate) rather than on the packet’s payload content.

Note Some protocols belong to more than one category. In particular, all predefined P2P, VOIP, SIP, Worm, and Packet Stream Pattern-Based Protocols are also defined as Signature-Based Protocols.

To filter the protocol list:

Step 1 From the Console main menu, choose **Configuration** > **Protocols**.

The Protocol Settings dialog box appears.

Step 2 From the drop-down list in the Protocols tab, select the type of protocol to display.

The protocols of the selected type appear in the Protocols tab.

Step 3 Click **Close**.

The Protocol Settings dialog box closes.

The setting in the drop-down list is not saved. The next time you open the Protocol Settings dialog box, all protocols will be displayed.

Adding Protocols

You can add new protocols to a service configuration, subject to the limit of 10,000 protocols per service configuration.

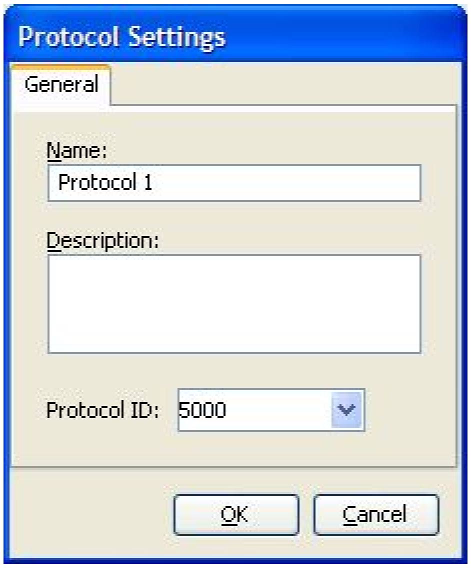
To add a new protocol:

Step 1 From the Console main menu, choose **Configuration** > **Protocols**.

The Protocol Settings dialog box appears.

Step 2 In the Protocols tab, click ✚ (**Add Protocol**).

The Protocol Settings dialog box appears.



Name: Protocol 1

Description:

Protocol ID: 5000

Step 3 In the Name field, enter a unique name for the new protocol.

Step 4 (Optional) From the Protocol ID drop-down list, select an ID for the protocol.

The protocol ID must be an integer in the range 5000 to 9998; lower values are reserved for protocols provided by ***SCA BB***.

The value of the protocol ID is supplied automatically by the system. Do not modify this field.

Step 5 Click **OK**.

The Protocol Settings dialog box closes.

The new protocol is displayed in the Protocols tab. You can now add protocol elements to it. See *Adding Protocol Elements* (on page 7-27).

Editing Protocols

You can modify the parameters of a protocol, even those included in the Console installation.

To add, modify, or delete protocol elements, see *Managing Protocol Elements* (on page 7-26).

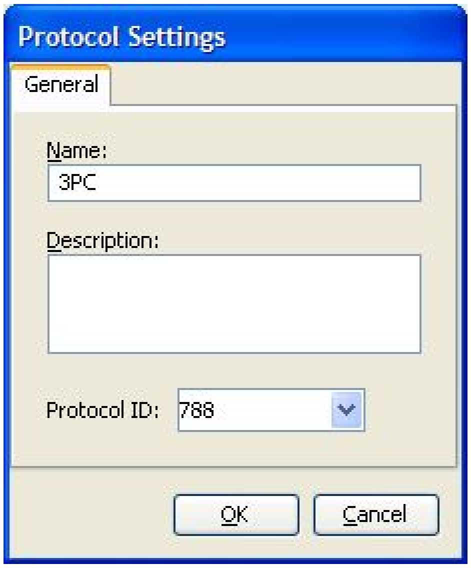
To edit a protocol:

Step 1 From the Console main menu, choose **Configuration** > **Protocols**.

The Protocol Settings dialog box appears.

Step 2 In the Protocols tab, double-click a protocol.

The Protocol Settings dialog box appears.



Name: 3PC

Description:

Protocol ID: 788

Step 3 Modify fields in the dialog box:

- In the Name field, enter a new name for the protocol.
- From the Protocol ID drop-down list, select an ID for the protocol.

  The protocol ID must be an integer in the range 5000 to 9998; lower values are reserved for protocols provided by ***SCA BB***.

The value of the protocol ID is supplied automatically by the system. Do not modify this field.

Step 4 Click **OK**.

The Protocol Settings dialog box closes.

The new values of the protocol parameters are saved.

Step 5 Click **Close**.

The Protocol Settings dialog box closes.

Deleting Protocols

You can delete all protocols, even those included in the Console installation.

To delete a protocol:

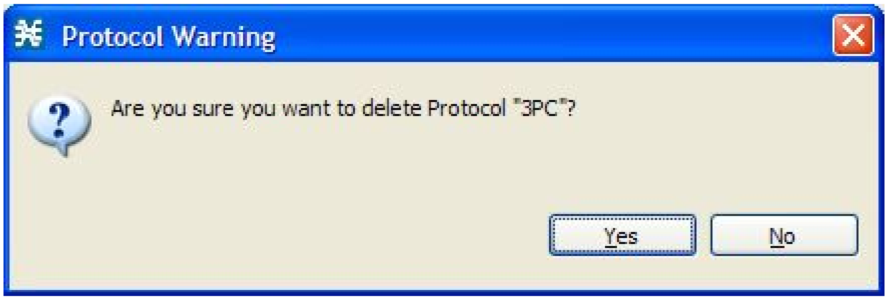
Step 1 From the Console main menu, choose **Configuration** > **Protocols**.

The Protocol Settings dialog box appears.

Step 2 In the Protocols tab, select a Protocol.

Step 3 In the Protocols tab**,** click ✖ (**Delete Protocol**).

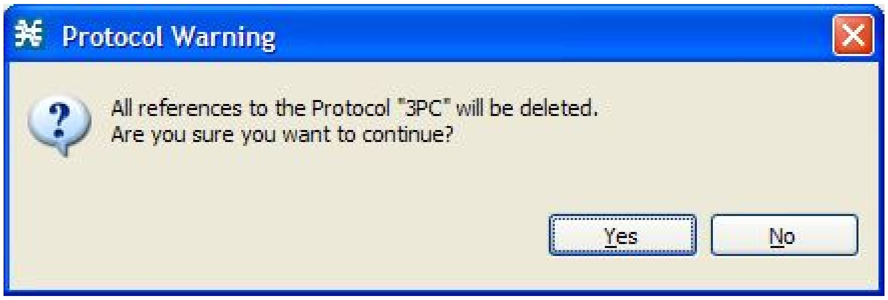
A Protocol Warning message appears.



Are you sure you want to delete Protocol "3PC"?

Step 4 Click **Yes**.

- If any service element maps the selected protocol to a service (see *Managing Service Elements* (on page 7-10)), a second Protocol Warning message appears (even if the service is not used by any package).



All references to the Protocol "3PC" will be deleted.
Are you sure you want to continue?

Click **Yes**.

The Protocol is deleted from the Protocols tab.

Step 5 Click **Close**.

The Protocol Settings dialog box closes.

Managing Protocol Elements

A protocol is a collection of *protocol elements*.

To complete the definition of a protocol, you must define its protocol elements. A protocol element maps a specific signature, IP protocol, and port range to the selected protocol. Every protocol element in a service configuration must be unique.

A traffic flow is mapped to a specific protocol if it meets all four of the following criteria:

- The flow belongs to the specified signature of the protocol element.
- The flow protocol is the specified IP protocol of the protocol element.
- (If the IP protocol is TCP or UDP) The destination port is within the specified port range of the protocol element.
- The protocol element is the most specific protocol element satisfying the first three criteria.

Adding Protocol Elements

You can add any number of protocol elements to a protocol.

Note When you set the parameters of the protocol element, the values of the parameters are saved as you enter them.

To add and define a protocol element:

Step 1 From the Console main menu, choose **Configuration** > **Protocols**.

The Protocol Settings dialog box appears.

Step 2 In the Protocols tab, select a protocol.

Step 3 In the Protocol Elements tab, click ✚ (**Add Protocol Element**).

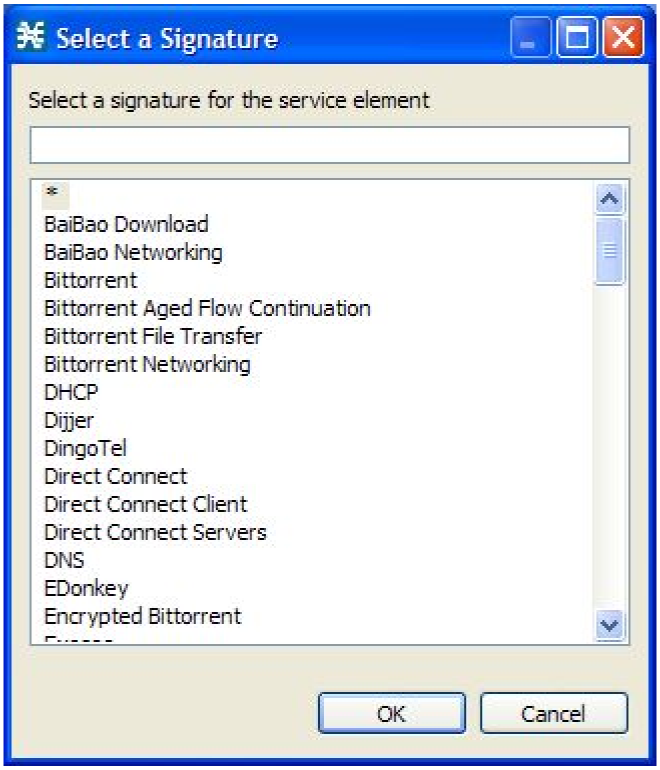
A protocol element is added to the protocol.

A new row, representing the protocol element, is added to the protocol element list in the Protocol Element tab.

Step 4 Click in the Signature cell of the protocol element, and then click the **Browse** button that appears in the cell.

The default value (an asterisk, *) means that no signature checking is performed when testing if a flow maps to this protocol element.

The Select a Signature dialog box appears, displaying a list of all signatures.



Select a Signature

Select a signature for the service element

*
BaiBao Download
BaiBao Networking
Bittorrent
Bittorrent Aged Flow Continuation
Bittorrent File Transfer
Bittorrent Networking
DHCP
Dijjer
DingoTel
Direct Connect
Direct Connect Client
Direct Connect Servers
DNS
EDonkey
Encrypted Bittorrent

Step 5 Select a signature from the list.

Select the Generic signature to allow a flow that has no matching signature in the protocol signature database to be mapped to this protocol element (if the flow also matches the IP protocol and port range of the protocol element).

Step 6 Click **OK**.

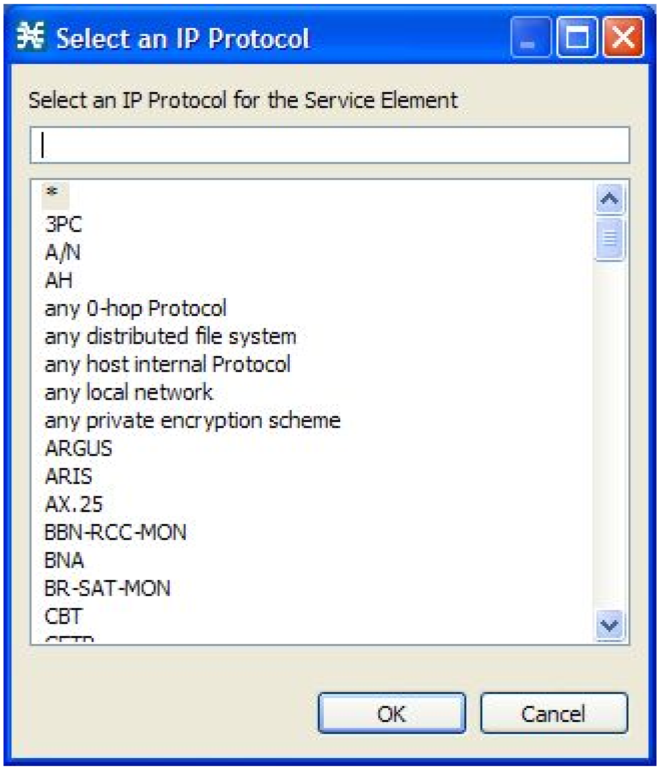
The Select a Signature dialog box closes.

The selected signature is displayed in the Signature cell of the Protocol Settings dialog box.

Step 7 Click in the IP Protocol cell of the protocol element, and then click the **Browse** button that appears in the cell.

The default value (an asterisk, *) means that no IP protocol checking is performed when testing if a flow maps to this protocol element.

The Select an IP Protocol dialog box appears, displaying a list of all IP protocols.


Select an IP Protocol
Select an IP Protocol for the Service Element
*
3PC
A/N
AH
any 0-hop Protocol
any distributed file system
any host internal Protocol
any local network
any private encryption scheme
ARGUS
ARIS
AX.25
BBN-RCC-MON
BNA
BR-SAT-MON
CBT
OK
Cancel

Step 8 Select an IP protocol from the list.

Step 9 Click **OK**.

The Select an IP Protocol dialog box closes

The selected IP protocol is displayed in the IP Protocol cell of the Protocol Settings dialog box.

Step 10 In the Port Range cell, enter a port or range of ports. (For a range of ports, use a hyphen between the first and last ports in the range.)

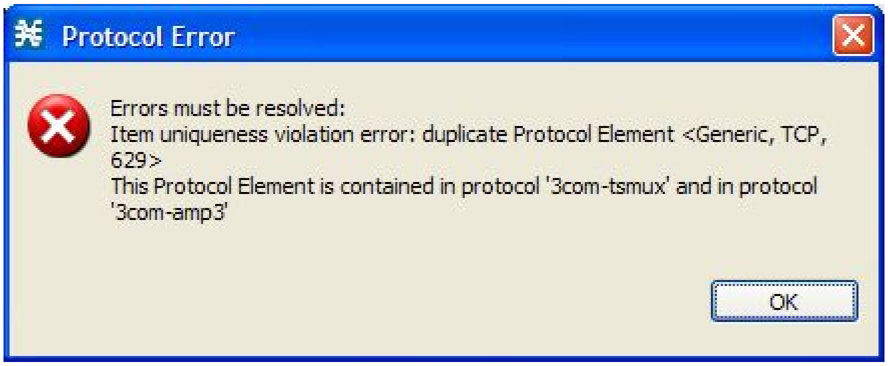
> Specifying a port range is only possible when the specified IP protocol is either TCP or UDP (or undefined, taking the wild-card value, *).

Only a flow whose port matches one of these ports will be mapped to this protocol element.

The protocol element is defined.

Step 11 Click **Close**.

- If the protocol element that you have defined is not unique in this service configuration, a Protocol Error message appears.



Errors must be resolved:
Item uniqueness violation error: duplicate Protocol Element <Generic, TCP, 629>
This Protocol Element is contained in protocol '3com-tsmux' and in protocol '3com-amp3'

a) Click **OK**.

b) Modify or delete the protocol element.

c) Click **Close**.

The Protocol Settings dialog box closes.

Editing Protocol Elements

You can modify all protocol elements, even those included in the Console installation.

Note All changes to the protocol element are saved as you make them.

To edit a protocol element:

Step 1 From the Console main menu, choose **Configuration** > **Protocols**.

The Protocol Settings dialog box appears.

Step 2 In the Protocols tab, select a protocol.

Step 3 In the Protocol Elements tab, select a protocol element.

Step 4 Click in the Signature cell of the protocol element, and then click the **Browse** button that appears in the cell.

The Select a Signature dialog box appears.

Step 5 Select a signature from the list.

Step 6 Click **OK**.

The Select a Signature dialog box closes.

Step 7 Click in the IP Protocol cell of the protocol element, and then click the **Browse** button that appears in the cell.

The Select an IP Protocol dialog box appears.

Step 8 Select an IP protocol from the list.

Step 9 Click **OK**.

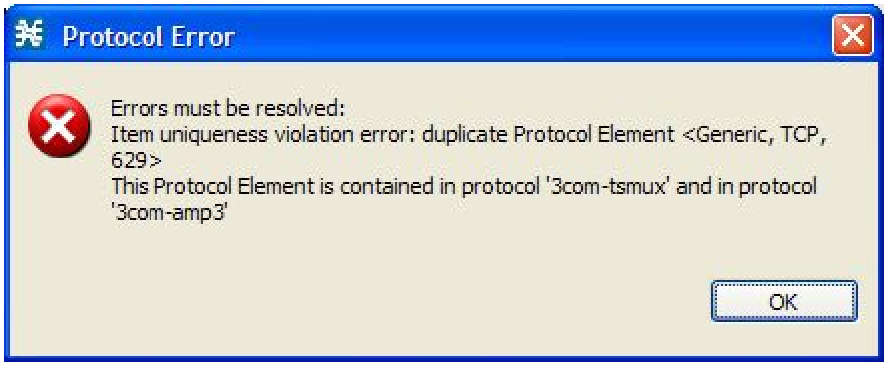
The Select an IP Protocol dialog box closes.

Step 10 In the Port Range cell of the protocol element, enter a port or range of ports.

Changes to the protocol element are saved as you make them.

Step 11 Click **Close**.

- If the protocol element that you have modified is not unique in this service configuration, a Protocol Error message appears.



Errors must be resolved:
Item uniqueness violation error: duplicate Protocol Element <Generic, TCP, 629>
This Protocol Element is contained in protocol '3com-tsmux' and in protocol '3com-amp3'

a) Click **OK**.

b) Modify or delete the protocol element.

c) Click **Close**.

The Protocol Settings dialog box closes.

Deleting Protocol Elements

You can delete all protocol elements, even those included in the Console installation.

To delete a protocol element:

Step 1 From the Console main menu, choose **Configuration** > **Protocols**.

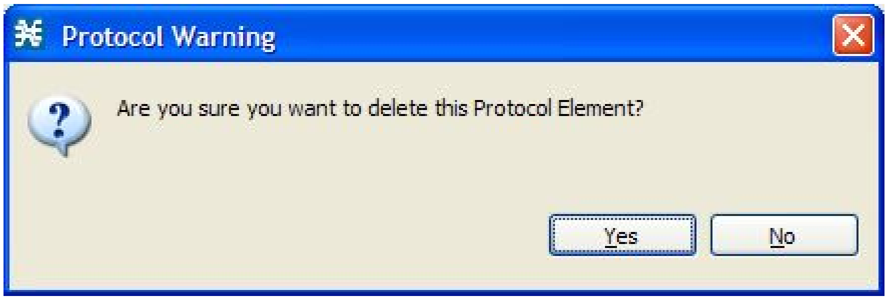
The Protocol Settings dialog box appears.

Step 2 Select a protocol in the Protocols tab.

Step 3 In the Protocol Elements tab, select a protocol element.

Step 4 In the Protocol Elements tab, click ✖ (**Delete Protocol Element**).

A Protocol Warning message appears.



Protocol Warning

Are you sure you want to delete this Protocol Element?

Step 5 Click **Yes**.

The protocol element is deleted from the Protocol Elements tab.

Step 6 Click **Close**.

The Protocol Settings dialog box closes.

Managing Zones

A *zone* is a collection of destination IP addresses; usually the addresses in one zone will be related in some way.

Zones are used to classify network sessions; each network session is assigned to a service element based on its destination IP address.

A service configuration can contain up to 10,000 zone items. Every zone item must be unique.

Viewing Zones

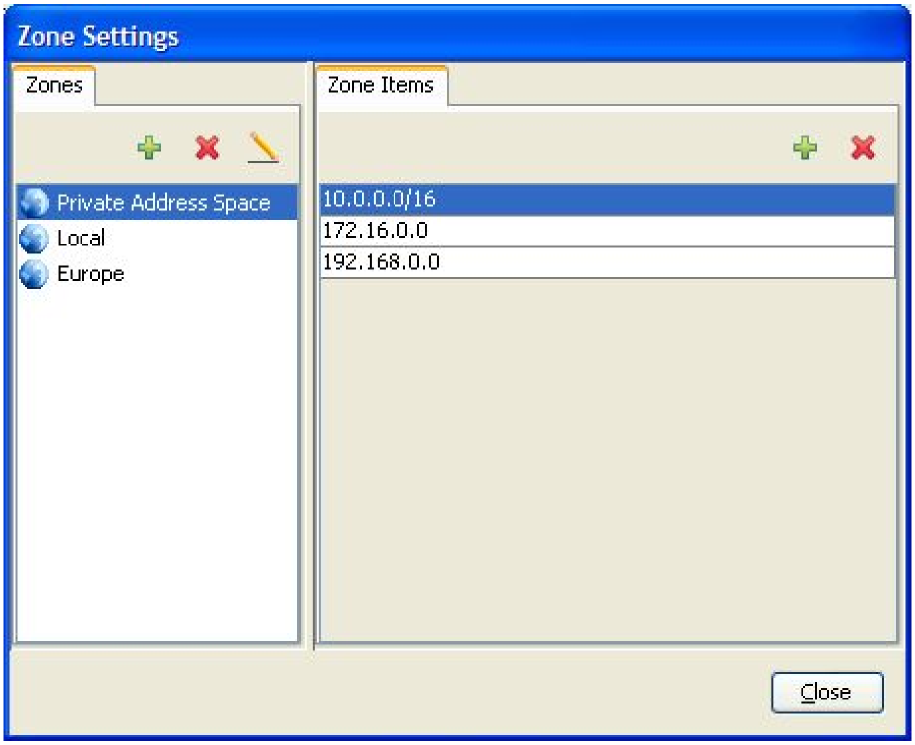
You can view a list of all zones and their associated zone items.

To view a list of all zones:

Step 1 From the Console main menu, choose **Configuration** > **Zones**.

The Zone Settings dialog box appears.

The Zones tab displays a list of all zones. The first zone in the list is selected, and its zone items are displayed in the Zone Items tab.



Step 2 Click a zone in the list to display its zone items.

The zone items of the selected zone are displayed in the Zone Items tab.

Step 3 Click **Close**.

The Zone Settings dialog box closes.

Adding Zones

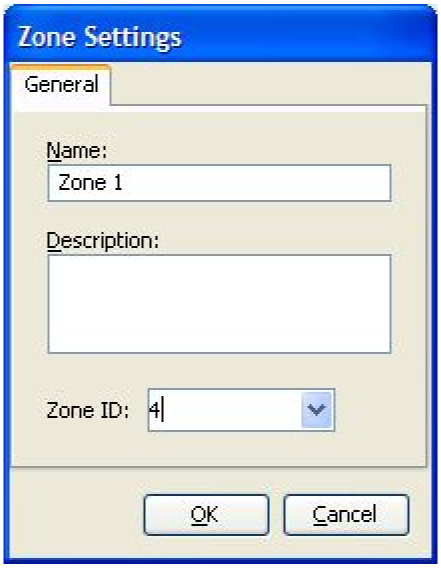
To add a zone to a service configuration:

Step 1 From the Console main menu, choose **Configuration** > **Zones**.

The Zone Settings dialog box appears.

Step 2 In the Zones tab, click ✚ (**Add Zone**).

The Zone Settings dialog box appears.



Name: Zone 1

Description:

Zone ID: 4

Step 3 In the Name field, enter a unique name for the new zone.

Step 4 (Optional) From the Zone ID drop-down list, select an ID for the zone.

The zone ID must be a positive integer in the range 1 to 32767.

The value of the zone ID is supplied automatically by the system. Do not modify this field.

Step 5 Click **OK**.

The Zone Settings dialog box closes.

The new zone is added to the Zones tab. You can now add zone items. (See *Adding Zone Items* (on page 7-36).)

Editing Zones

You can modify zone parameters at any time.

To add, modify, or delete zone items, see *Managing Zone Items* (on page 7-36).

To edit a zone:

Step 1 From the Console main menu, choose **Configuration** > **Zones**.

The Zone Settings dialog box appears.

Step 2 In the Zones tab, select a zone.

Step 3 Click ✎ (**Edit Zone**).

The Zone Settings dialog box appears.

Step 4 Modify fields in the dialog box:

- In the Name field, enter a new name for the zone.
- From the Zone ID drop-down list, select an ID for the zone.

  The zone ID must be a positive integer in the range 1 to 32767.

The value of the zone ID is supplied automatically by the system. Do not modify this field.

Step 5 Click **OK**.

The Zone Settings dialog box closes.

The new values of the zone parameters are saved.

Step 6 Click **Close**.

The Zone Settings dialog box closes.

Deleting Zones

You can delete any or all zones.

To delete a zone:

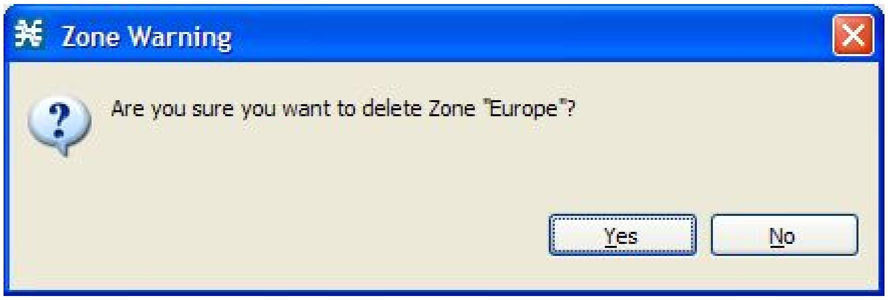
Step 1 From the Console main menu, choose **Configuration** > **Zones**.

The Zone Settings dialog box appears.

Step 2 In the Zones tab, select a zone.

Step 3 In the Zones tab, click ✖ (**Delete Zone**).

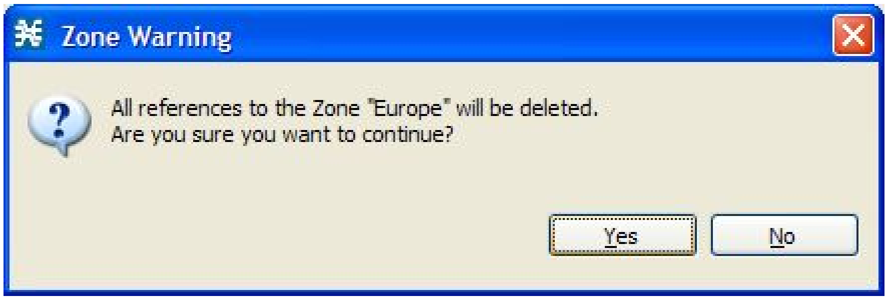
A Zone Warning message appears.



Are you sure you want to delete Zone "Europe"?

Step 4 Click **OK.**

- If any service element references the selected zone, a second Zone Warning message appears.



All references to the Zone "Europe" will be deleted.
Are you sure you want to continue?

Click **Yes**.

Every service element that references the selected zone is deleted.

The zone is deleted and is no longer displayed in the Zones tab.

Step 5 Click **Close**.

The Zone Settings dialog box closes.

Managing Zone Items

A zone is a collection of related *zone items*.

A zone item is an IP address or a range of IP addresses.

A service configuration can contain up to 10,000 zone items. Every zone item must be unique.

Adding Zone Items

You can add any number of zone items to a zone (subject to the limitation of 10,000 zone items per service configuration).

To add zone items to a zone:

Step 1 From the Console main menu, choose **Configuration** > **Zones**.

The Zone Settings dialog box appears.

Step 2 In the Zones tab, select a zone.

Step 3 In the Zone Items tab, click ✚ (**Add Zone Item**).

A new line is added to the Zone Items table.

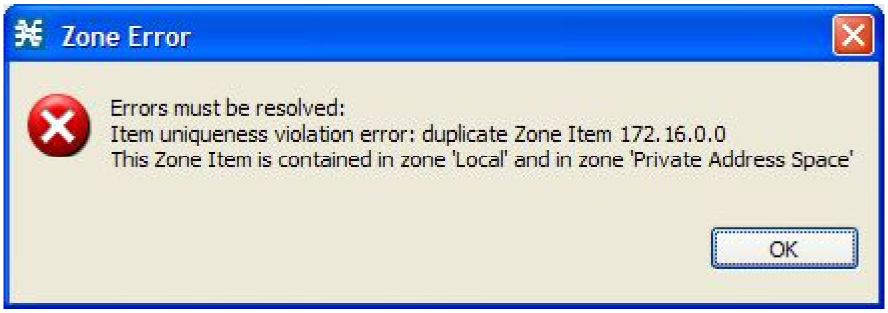
Step 4 Double-click the new list item and enter a valid value.

Valid values are single IP addresses (for example, 63.111.106.7) or a range of IP addresses (for example, 194.90.12.0/24).

Step 5 Repeat steps 3 and 4 for other IP addresses that will be part of this zone.

Step 6 Click **Close**.

- If the zone item that you have defined is not unique in this service configuration, a Zone Error message appears.



Errors must be resolved:
Item uniqueness violation error: duplicate Zone Item 172.16.0.0
This Zone Item is contained in zone 'Local' and in zone 'Private Address Space'

a) Click **OK**.

b) Modify or delete the zone item.

c) Click **Close**.

The Zone Settings dialog box closes.

Editing Zone Items

To edit a zone item:

Step 1 From the Console main menu, choose **Configuration** > **Zones**.

The Zone Settings dialog box appears.

Step 2 In the Zones tab, select a zone.

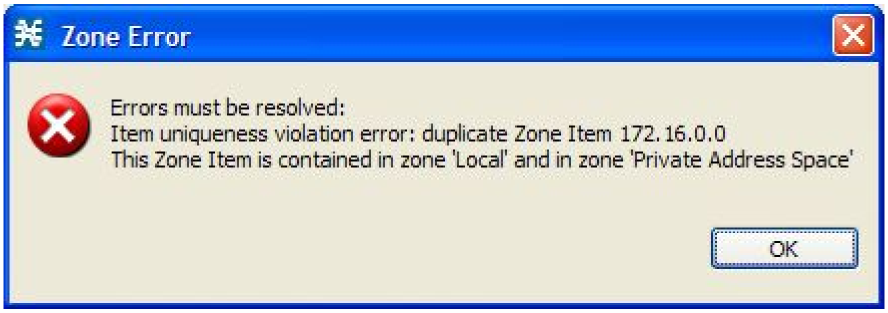
Step 3 In the Zone Items tab, double-click a zone item.

Step 4 Enter a new value for the zone item.

Valid values are single IP addresses (for example, 63.111.106.7) or a range of IP addresses (for example, 194.90.12.0/24).

Step 5 Click **Close**.

- If the zone item that you have modified is not unique in this service configuration, a Zone Error message appears.



Errors must be resolved:
Item uniqueness violation error: duplicate Zone Item 172.16.0.0
This Zone Item is contained in zone 'Local' and in zone 'Private Address Space'

a) Click **OK**.

b) Modify or delete the zone item.

c) Click **Close**.

The Zone Settings dialog box closes.

Deleting Zone Items

To delete a zone item:

Step 1 From the Console main menu, choose **Configuration** > **Zones**.

The Zone Settings dialog box appears.

Step 2 In the Zones tab, select a zone.

Step 3 In the Zone Items tab, select a zone item.

Step 4 In the Zone Items tab, click ✖ (**Delete Zone Item**).

The zone item is deleted.

Step 5 Click **Close**.

The Zone Settings dialog box closes.

Managing Protocol Signatures

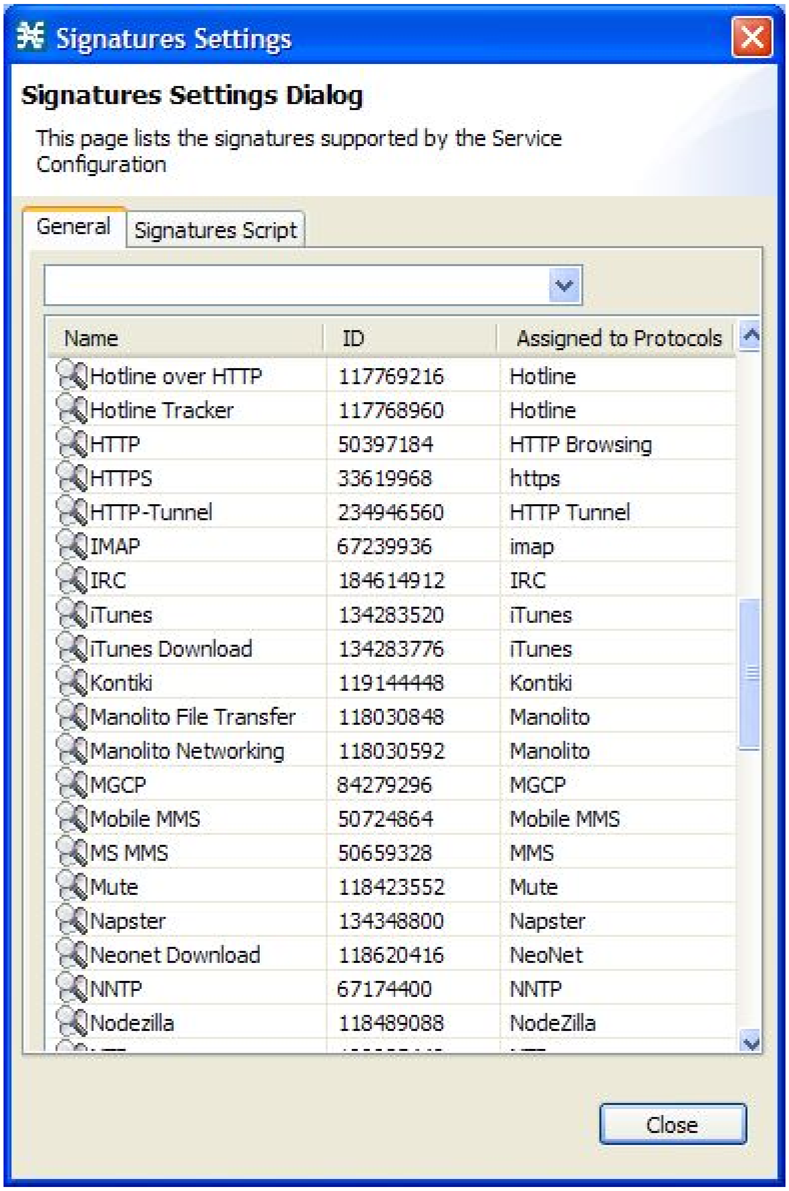
Viewing Signatures

You can view a list of all signatures and the protocol to which each is assigned.

To view a list of all signatures:

Step 1 From the Console main menu, choose **Configuration** > **Signatures Settings**.

The Signatures Settings dialog box appears.



Signatures Settings Dialog

This page lists the signatures supported by the Service Configuration

Name	ID	Assigned to Protocols
Hotline over HTTP	117769216	Hotline
Hotline Tracker	117768960	Hotline
HTTP	50397184	HTTP Browsing
HTTPS	33619968	https
HTTP-Tunnel	234946560	HTTP Tunnel
IMAP	67239936	imap
IRC	184614912	IRC
iTunes	134283520	iTunes
iTunes Download	134283776	iTunes
Kontiki	119144448	Kontiki
Manolito File Transfer	118030848	Manolito
Manolito Networking	118030592	Manolito
MGCP	84279296	MGCP
Mobile MMS	50724864	Mobile MMS
MS MMS	50659328	MMS
Mute	118423552	Mute
Napster	134348800	Napster
Neonet Download	118620416	NeoNet
NNTP	67174400	NNTP
Nodezilla	118489088	NodeZilla

Step 2 Click **Close**.

The Signatures Settings dialog box closes.

Filtering Signature Settings

You can filter the signature by type, so that the Signatures Settings dialog box lists only the selected type of signature.

There are seven categories of signatures:

- DSS Contributed Signatures

- Not Assigned to any Protocol
- P2P Signatures
- VOIP Signatures
- SIP Signatures
- Worm Signatures
- Packet Stream Pattern Based Protocols Signatures

Note Some signatures belong to more than one category.

To filter the signature list:

Step 1 From the Console main menu, choose **Configuration** > **Signatures Settings**.

The Signatures Settings dialog box appears.

Step 2 From the drop-down list, select the type of signature to display.

The signatures of the selected type appear in the dialog box.

Step 3 Click **Close**.

The Signatures Settings dialog box closes.

Dynamic Signatures

New protocols are being introduced all the time. *Dynamic signatures* is a mechanism that allows new protocols to be added to the protocol list and, from there, to service configurations. This is especially useful for classifying the traffic of a new protocol (for example, a new P2P protocol in a P2P-Control solution).

- Installing new signatures to an active service configuration is described in *Installing Protocol Packs* (on page 4-10).
- Creating and modifying signatures is described in *Using the Signature Editor* (on page 12-1).
- Using **servconf**, the ***SCA BB*** Server Configuration Utility, to apply signatures is described in *The SCA BB Service Configuration Utility* (on page 13-1).

The following sections describe working with dynamic signatures in the Service Configuration Editor.

Dynamic Signature Script Files

Dynamic signatures are provided in special Dynamic Signatures Script (DSS) files that you can add to a service configuration using either the Console or the Service Configuration API. After a DSS file is imported into a service configuration, the new protocols it describes:

- Appear in the protocol list

- May be added to services
- Are used when viewing reports

To simplify the configuration of new protocols added by a DSS, the DSS may specify a *Buddy Protocol* for a new protocol. If, when loading a DSS, the application encounters the Buddy Protocol, it automatically duplicates the set of service elements that use the Buddy Protocol, and replaces all references to the Buddy Protocol with references to the new protocol. The association of the new protocol to services will match that of the Buddy Protocol.

The following configuration actions are performed automatically when you import a DSS into a service configuration:

- Signatures are updated and new signatures are loaded
- Protocol elements are created for new signatures of existing protocols
- New protocols are added to the protocol list, and protocol elements are created for them
- Service elements are created for new protocols according to the configuration of Buddy Protocols

The import procedure preserves all service and protocol settings.

Note After importing a DSS, associate the newly added protocols with services.

DSS files are periodically released by Cisco or its partners in accordance with customer requirements and market needs. DSS files contain new protocols and signatures, and update previously defined signatures. Updating a service configuration with the new DSS is explained in *Adding Signatures to a Service Configuration* (on page 7-43).

Note You can create your own DSS files or modify the Cisco release DSS file using the Signature Editor tool (see *Managing DSS Files* (on page 12-1)).

Viewing Current Dynamic Signatures Information

To view information about the current dynamic signatures:

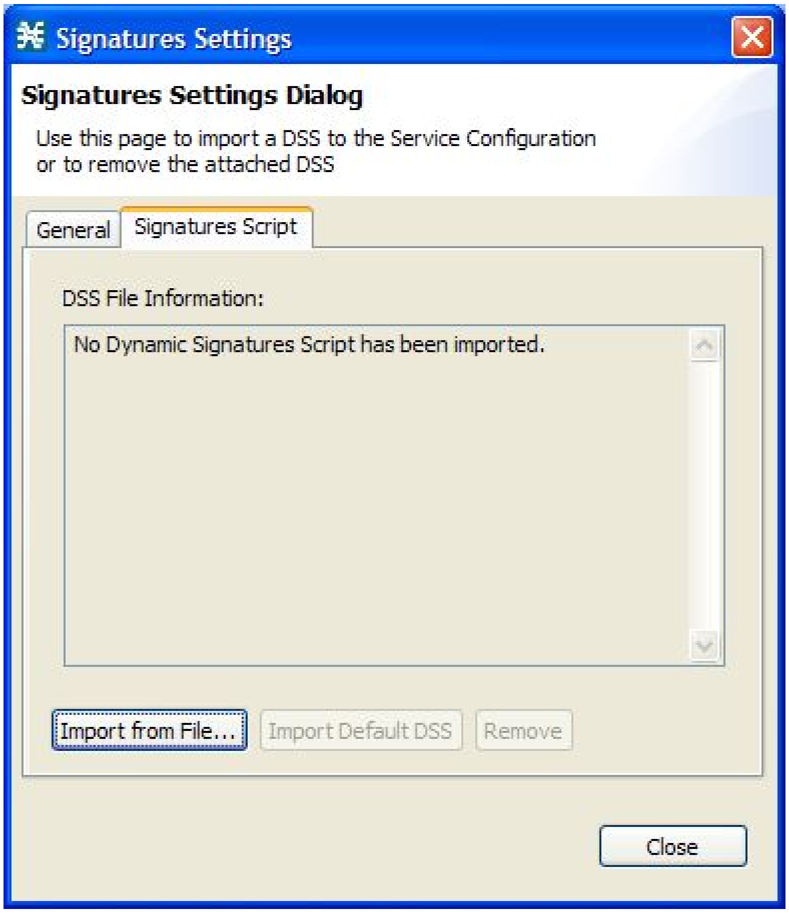
Step 1 From the Console main menu, choose **Configuration** > **Signatures Settings**.

The Signatures Settings dialog box appears.

Step 2 Click the **Signatures Script** tab.

The Signatures Script tab opens.

- If no DSS file was imported into the current service configuration, the Signatures Settings dialog box displays a message informing you of this.



Signatures Settings

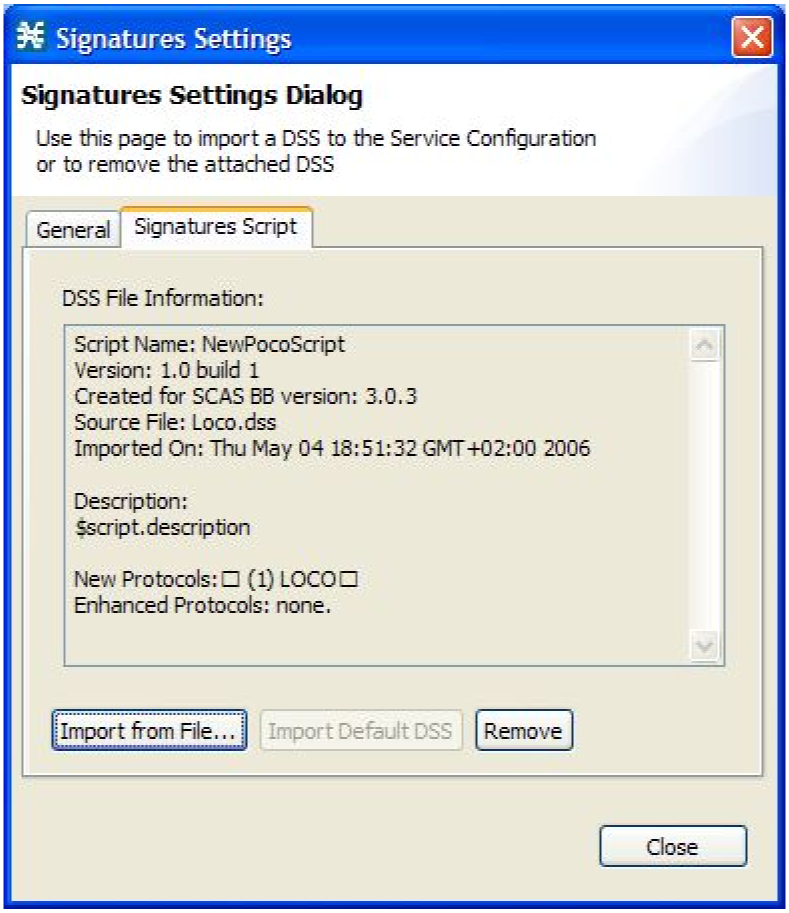
Signatures Settings Dialog

Use this page to import a DSS to the Service Configuration or to remove the attached DSS

DSS File Information:

No Dynamic Signatures Script has been imported.

- If a DSS file was imported into the current service configuration, the Signatures Settings dialog box displays information about the current dynamic signatures and the DSS file from which they were imported.


Signatures Settings
Signatures Settings Dialog
Use this page to import a DSS to the Service Configuration or to remove the attached DSS
General
Signatures Script
DSS File Information:

Script Name: NewPocoScript
Version: 1.0 build 1
Created for SCAS BB version: 3.0.3
Source File: Loco.dss
Imported On: Thu May 04 18:51:32 GMT+02:00 2006

Description:
$script.description

New Protocols:□ (1) LOCO□
Enhanced Protocols: none.

Import from File...
Import Default DSS
Remove
Close

Step 3 Click **Close**.

The Signatures Settings dialog box closes.

Adding Signatures to a Service Configuration

You can import signatures into a service configuration from a DSS file provided by Cisco or one of its partners (described in this section), or from a DSS file that you have created or modified using the Signature Editor tool (see *Managing DSS Files* (on page 12-1)).

Note It is recommended that you import the latest default DSS file (see *Importing Dynamic Signatures from the Default DSS File* (on page 7-49)) when creating a service configuration, and that you use this option only to apply a new DSS to existing service configuration.

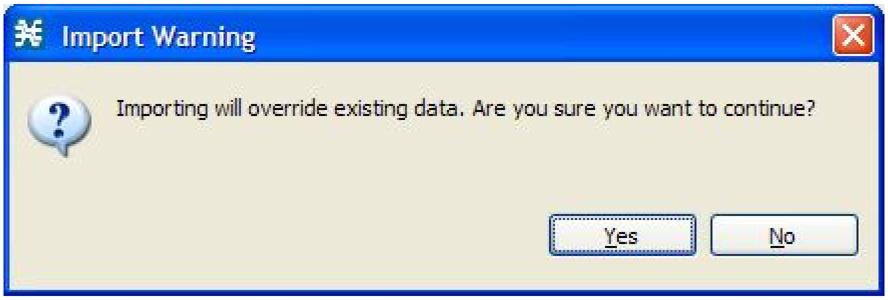
To import a dynamic signature script from a DSS file:

Step 1 From the Console main menu, choose **Configuration** > **Signatures Settings**.

The Signatures Settings dialog box appears.

Step 2 Click **Import from File**.

An Import Warning message appears.



Import Warning

Importing will override existing data. Are you sure you want to continue?

Step 3 Click **Yes**.

The Import from file dialog box appears.

Step 4 Browse to the DSS file and click **Open**.

The Import from file dialog box closes.

The signatures in the DSS file are imported into the service configuration.

Information about the imported signatures and their DSS file is displayed in the Signatures Settings dialog box.

Step 5 Click **Close**.

The Signatures Settings dialog box closes.

Removing Dynamic Signatures

You can remove the installed dynamic signatures from a service configuration.

Note The DSS file is not deleted.

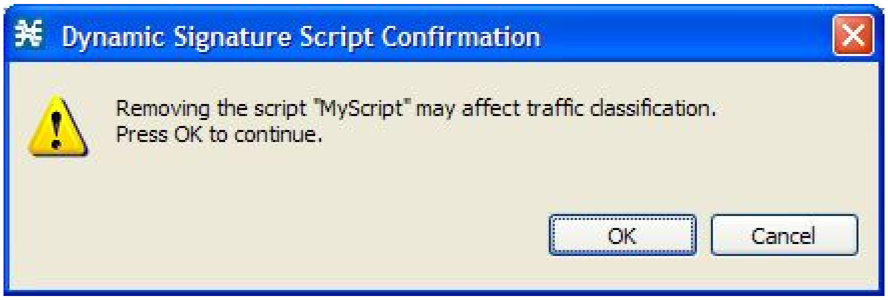
To remove the current dynamic signatures information:

Step 1 From the Console main menu, choose **Configuration** > **Signatures Settings**.

The Signatures Settings dialog box appears.

Step 2 In the Signatures Settings dialog box, click **Remove**.

A Dynamic Signature Script Confirmation message appears.

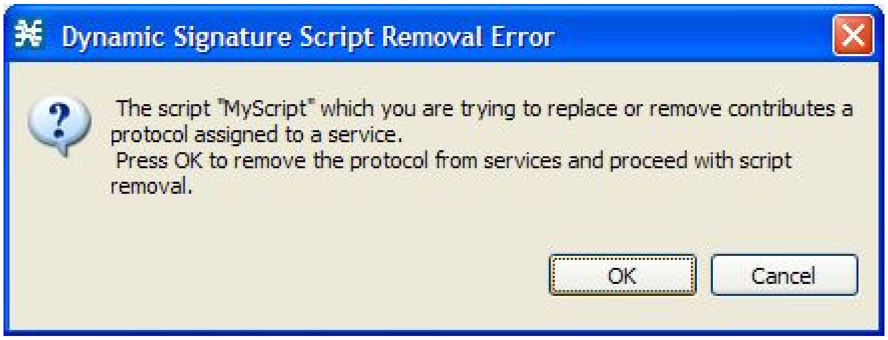


Dynamic Signature Script Confirmation

Removing the script "MyScript" may affect traffic classification.
Press OK to continue.

Step 3 Click **OK.**

- If any service element references a protocol whose signature is included in the imported DSS file, a Dynamic Signature Script Removal Error message appears.



Dynamic Signature Script Removal Error

The script "MyScript" which you are trying to replace or remove contributes a protocol assigned to a service.
Press OK to remove the protocol from services and proceed with script removal.

Click **Yes**.

Every service element that references a protocol whose signature is included in the imported DSS file is deleted.

The dynamic signatures are removed from the service configuration.

The Remove button is dimmed.

If the dynamic signatures were imported from the default DSS file, the Import Default DSS button is enabled.

Step 4 Click **Close**.

The Signatures Settings dialog box closes.

The Default DSS File

Whenever a protocol pack becomes available from Cisco (or one of its partners), you should update offline service configurations (stored as PQB files on the workstation). *The protocol pack* (on page 4-10) is provided as either an SPQI file or a DSS file.

Either offer updates automatically to every service configuration created or edited at the workstation or apply them from the workstation to the SCE platform. You make the latest update available by installing the most recent DSS or SPQI file as the default DSS file. You can install the file on the workstation either from the Console or by using *the SCA BB Signature Configuration Utility* (on page 13-7).

- The default DSS file is automatically offered for import when any service configuration operation (such as creating a new service configuration or editing an existing one) is performed from the Console on a service configuration that was not yet updated.
- The default DSS file is imported by default when any service configuration operation (such as applying an existing service configuration) is performed using **servconf**, *the SCA BB Service Configuration Utility* (on page 13-1). You can disable this option.

Note Users are expected to update the default DSS on their management workstation whenever they obtain a new protocol pack, as explained in the following section.

Setting the Default DSS File

The default DSS file should normally be the latest protocol pack provided by Cisco (or one of its partners). If necessary, modify the protocol pack using the Signature Editor tool (see *Editing DSS Files* (on page 12-12)) to add signatures of new protocols until they become available from Cisco.

Whenever a new protocol pack becomes available, set it as the default DSS file. There is no need to clear the current default DSS file; it will be overwritten by the new protocol pack.

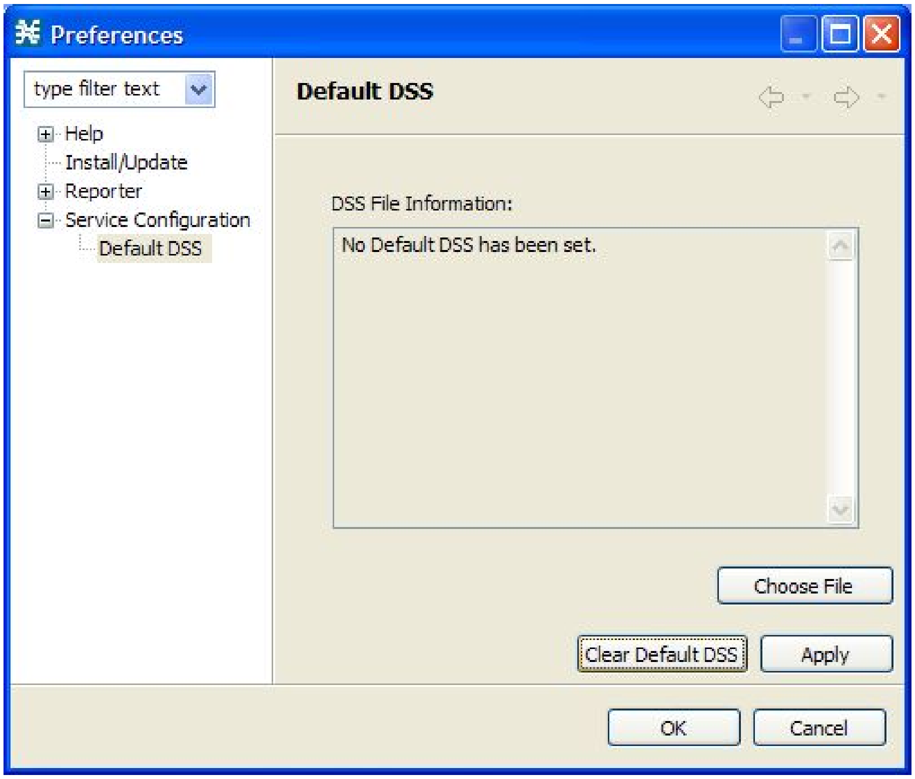
To set a protocol pack as the default DSS file:

Step 1 From the Console main menu, choose **Window** > **Preferences**.

The Preferences dialog box appears.

Step 2 From the menu tree in the left pane of the dialog box, choose **Service Configuration** > **Default DSS**.

The Default DSS area opens in the right pane of the dialog box.



No Default DSS has been set.

Step 3 Click **Choose File**.

An Open dialog box appears.

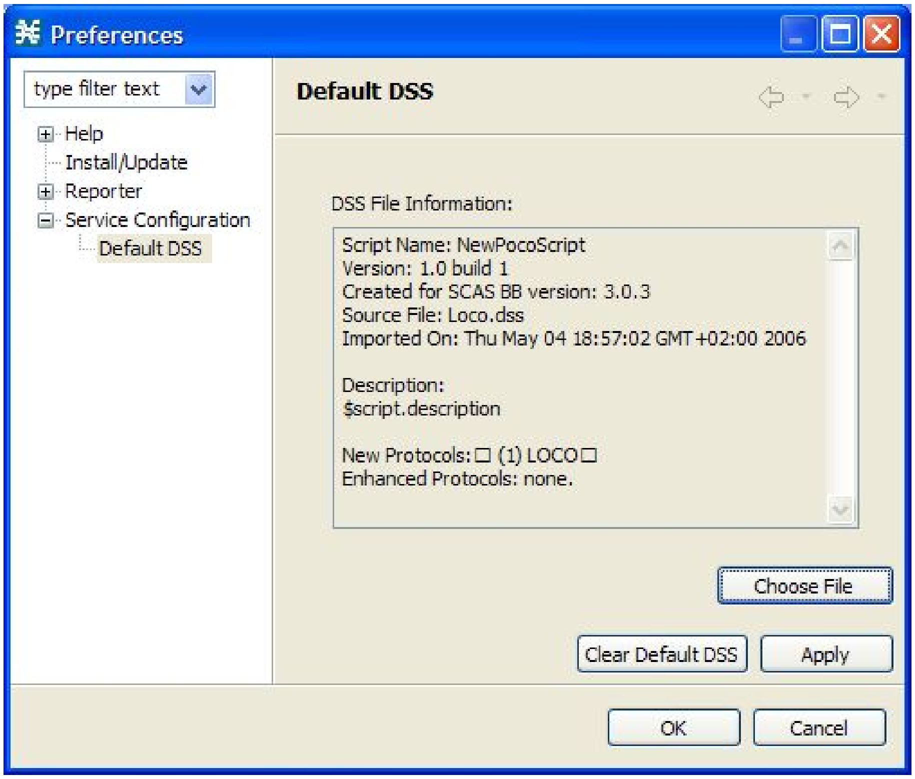
Step 4 From the Files of type drop-down list, select the file type of the protocol pack.

Step 5 Browse to the protocol pack.

Step 6 Click **Open**.

The Open dialog box closes.

Information about the default DSS file is displayed in the Default DSS area of the Preferences dialog box.



DSS File Information:

Script Name: NewPocoScript
Version: 1.0 build 1
Created for SCAS BB version: 3.0.3
Source File: Loco.dss
Imported On: Thu May 04 18:57:02 GMT+02:00 2006

Description:
$script.description

New Protocols: □ (1) LOCO□
Enhanced Protocols: none.

Step 7 Click **OK**.

The DSS file is copied to *`C:\Documents and Settings\<user name>\.p-cube\default3.0.5.dss`* as the default DSS file.

The Preferences dialog box closes.

To clear the default DSS file:

Step 1 From the Console main menu, choose **Window** > **Preferences**.

The Preferences dialog box appears.

Step 2 From the menu tree in the left pane of the dialog box, choose **Service Configuration** > **Default DSS**.

The Default DSS area opens in the right pane of the dialog box.

Step 3 Click **Clear Default DSS**.

The default DSS file, *`C:\Documents and Settings\<user name>\.p-cube\default3.0.5.dss`* is deleted.

All information is deleted from the Default DSS area.

Deleting the default DSS file does not remove the imported dynamic signatures from the current service configuration.

Step 4 Click **OK**.

The Preferences dialog box closes.

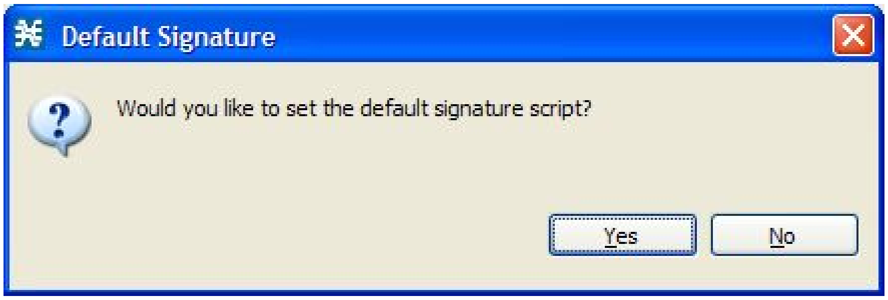
Importing Dynamic Signatures from the Default DSS File

If a default DSS file is installed, the application offers to import the dynamic signatures from the file when you create a new service configuration or when you open an existing service configuration that has not imported the signatures. Alternatively, you can manually import the dynamic signatures.

To import the default DSS file automatically:

Step 1 Open an existing service configuration or create a new one.

A Default Signature message appears.



Default Signature

Would you like to set the default signature script?

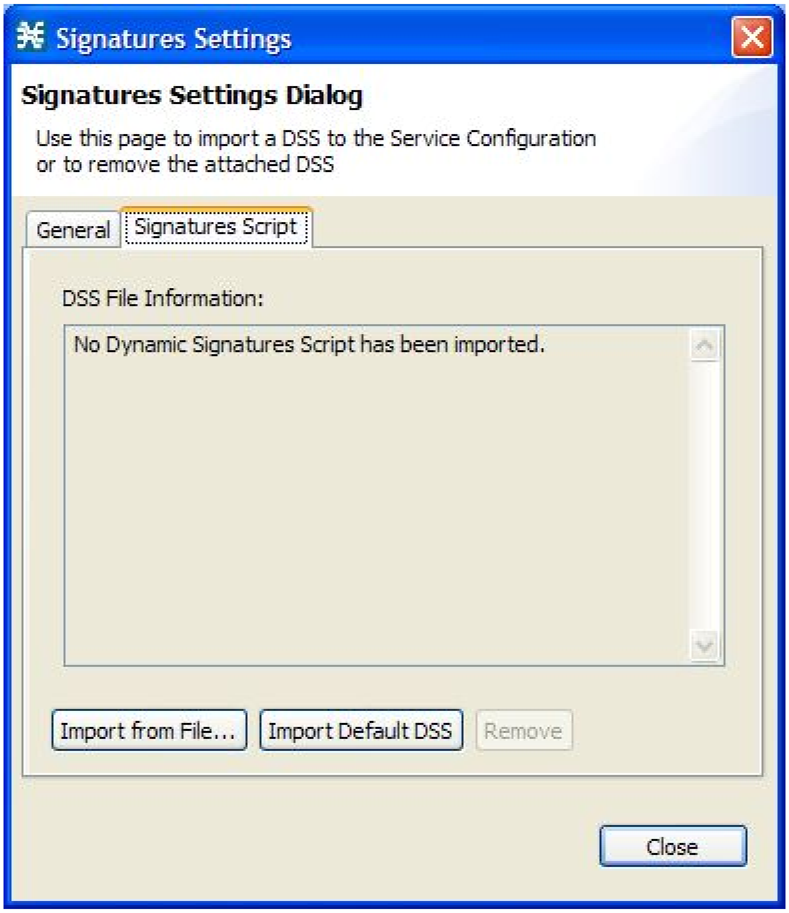
Step 2 Do one of the following:

- Click **Yes** to import the default DSS file.
- Click **No** to continue without importing the default DSS file.

To import the default DSS file manually:

Step 1 From the Console main menu, choose **Configuration** > **Signatures Settings**.

The Signatures Settings dialog box appears, with the Import Default DSS button enabled.



Signatures Settings

Signatures Settings Dialog

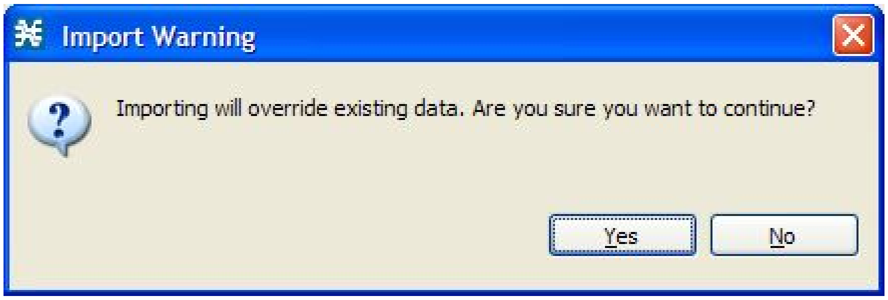
Use this page to import a DSS to the Service Configuration or to remove the attached DSS

DSS File Information:

No Dynamic Signatures Script has been imported.

Step 2 Click **Import Default DSS**.

An Import Warning message appears.



Import Warning

Importing will override existing data. Are you sure you want to continue?

Step 3 Click **Yes**.

The signatures in the default DSS file are imported into the service configuration.

The Import Default DSS button is dimmed.

Information about the imported signatures and the default DSS file is displayed in the Signatures Settings dialog box.

Step 4 Click **Close**.

The Signatures Settings dialog box closes.

Managing Flavors

Flavors are advanced classification elements that are used to classify network sessions.

Flavors are based on specific Layer 7 properties. For instance, users can associate an HTTP flow with a service based on different parts of the destination URL of the flow.

Flavors are supported only for small number of protocols, and for each such protocol there are different applicable flavor types. Flavor types are listed in the table in the following section.

There is a maximum number of flavor items for each flavor type (see *Maximum Number of Flavor Items per Flavor Type* (on page 7-56)). For each flavor type, every flavor item must be unique.

Flavor Types and Parameters

The following table lists available flavor types.

Table 7-1 SCA BB Flavors

Flavor Type	**Valid Values**
HTTP User Agent	Prefix string
HTTP URL	<host suffix, path prefix, path suffix, URL parameters prefix> • Host—From the beginning of the URL till the first "/" • Path—The section from the first "/" to the "?" • URL parameters—Any string following the "?" (You do not need to start the parameters prefix with "?")
HTTP Composite	<HTTP User Agent flavor, HTTP URL flavor>
HTTP Content Category	Value selected from Select a Content Category dialog box
RTSP User Agent	Prefix string
RTSP Host Name	Host suffix
RTSP Composite	<RTSP User Agent flavor, RTSP Host Name flavor>
SIP Source Domain	Host suffix
SIP Destination Domain	Host suffix
SIP Composite	<SIP source domain, SIP destination domain>
SMTP Host Name	Host suffix

Note Composite Flavors are pairs of two defined flavors.

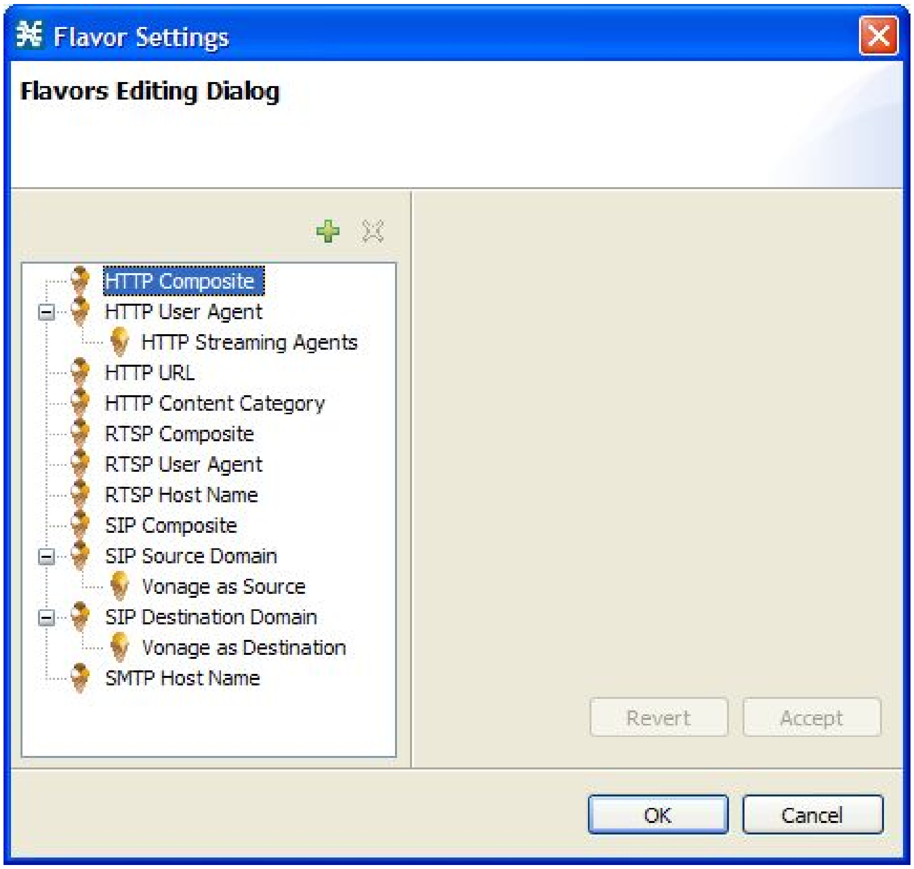
Viewing Flavors

You can view a list of all flavors and their associated flavor items.

To view a list of all flavors:

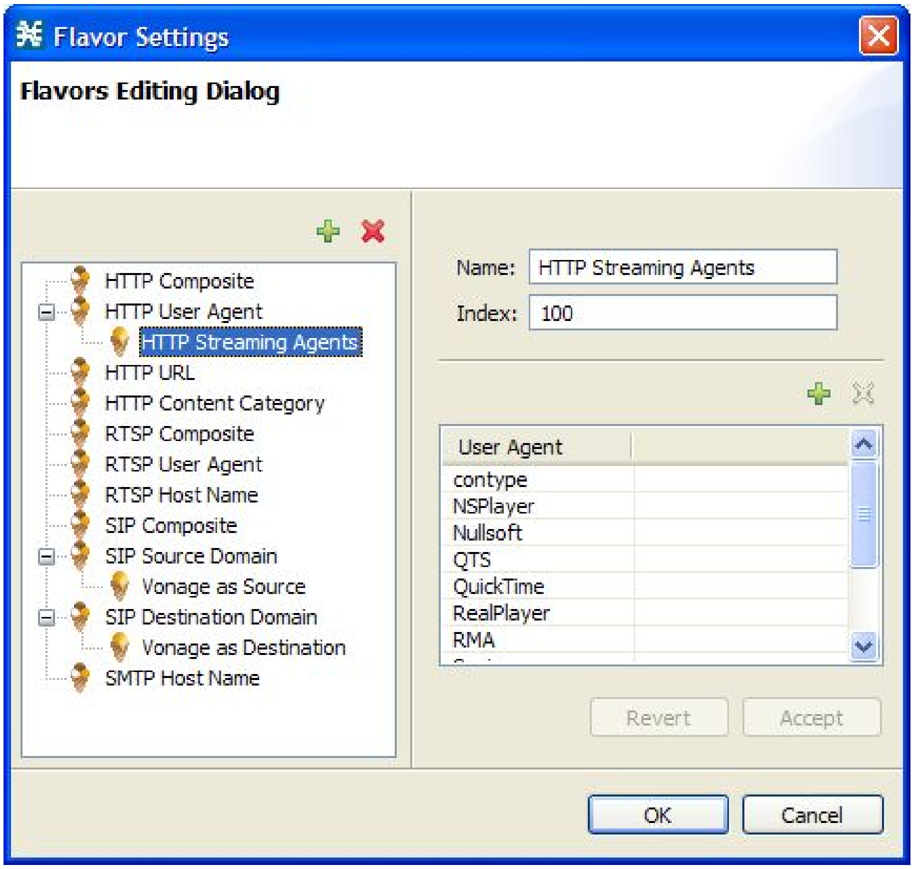
Step 1 From the Console main menu, choose **Configuration** > **Flavors**.

The Flavor Settings dialog box appears.



The left area displays a tree showing all flavors of each flavor type.

Step 2 Click a flavor in the tree to display its flavor items.



Name: HTTP Streaming Agents

Index: 100

User Agent
contype
NSPlayer
Nullsoft
QTS
QuickTime
RealPlayer
RMA

The flavor items are displayed in the right area.

Step 3 Click **OK**.

The Flavor Settings dialog box closes.

Adding Flavors

You can add any number of flavors to a service configuration.

To add a flavor:

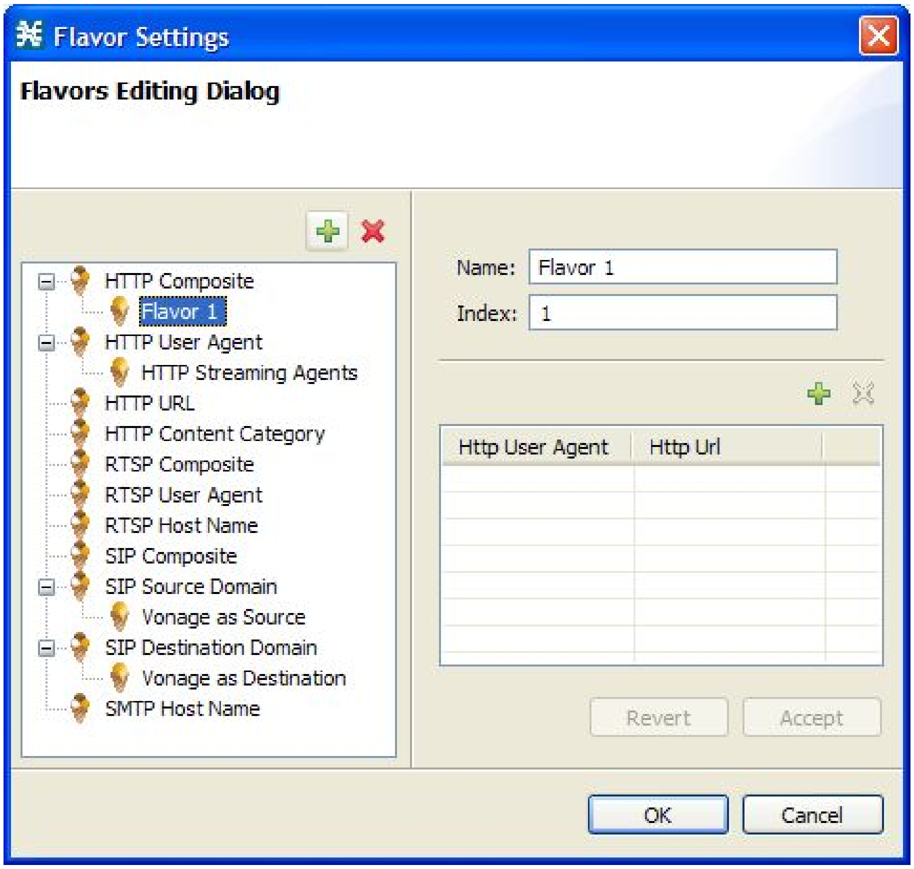
Step 1 From the Console main menu, choose **Configuration** > **Flavors**.

The Flavor Settings dialog box appears.

Step 2 In the flavor tree, select a flavor type.

Step 3 Click ✚.

A new flavor of the selected type is added to the flavor tree.



Flavor Settings

Flavors Editing Dialog

- HTTP Composite
  - Flavor 1
- HTTP User Agent
  - HTTP Streaming Agents
- HTTP URL
- HTTP Content Category
- RTSP Composite
- RTSP User Agent
- RTSP Host Name
- SIP Composite
- SIP Source Domain
  - Vonage as Source
- SIP Destination Domain
  - Vonage as Destination
- SMTP Host Name

Name: Flavor 1

Index: 1

Http User Agent	Http Url

Step 4 In the Name field, enter a name for the new flavor.

You can use the default name for the flavor. It is recommended that you enter a meaningful name.

Step 5 (Optional) In the Index field, enter a unique integer value.

SCA BB provides a value for the Index. There is no need to change it.

The flavor index must be a positive integer in the range 1 to 32767.

You have defined the flavor. You can now add flavor items. (See *Adding Flavor Items* (on page 7-57).)

Editing Flavors

You can modify flavor parameters at any time.

To add, modify, or delete flavor items, see *Managing Flavor Items* (on page 7-56).

To edit a flavor:

Step 1 From the Console main menu, choose **Configuration** > **Flavors**.

The Flavor Settings dialog box appears.

Step 2 In the flavor tree, select a flavor.

The name and index of the flavor (and its flavor items) are displayed in the right area.

Step 3 Modify fields in the dialog box:

- In the Name field, enter a new name for the flavor.
- In the Index field, enter a new, unique index for the flavor.

  The flavor index must be a positive integer in the range 1 to 32767.

Step 4 Click **OK**.

The Flavor Settings dialog box closes.

Deleting Flavors

You can delete any or all flavors.

To delete a flavor:

Step 1 From the Console main menu, choose **Configuration** > **Flavors**.

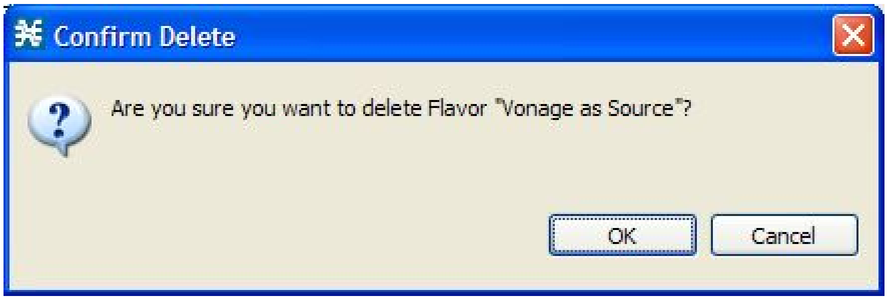
The Flavor Settings dialog box appears.

Step 2 In the flavor tree, right-click a flavor.

A popup menu appears.

Step 3 Click ✖ (**Delete**).

A Confirm Delete message appears.

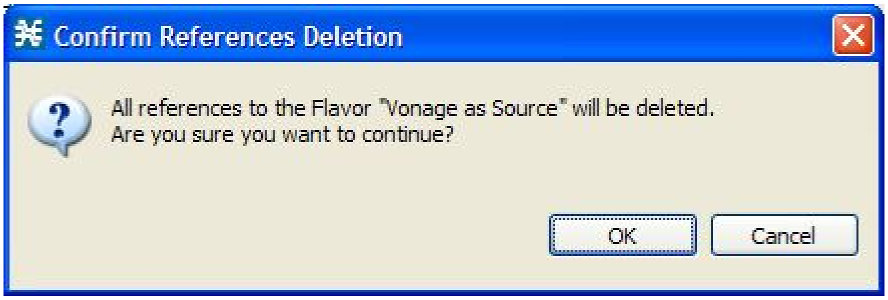


Confirm Delete

Are you sure you want to delete Flavor "Vonage as Source"?

Step 4 Click **OK.**

- If any service element references the selected flavor, a Confirm References Delete message appears.



All references to the Flavor "Vonage as Source" will be deleted.
Are you sure you want to continue?

Click **Yes**.

Every service element that references the selected flavor is deleted.

The flavor is deleted and is no longer displayed in the flavor tree.

Step 5 Click **Close**.

The Flavor Settings dialog box closes.

Managing Flavor Items

A flavor is a collection of related *flavor items*.

A flavor item is a value of a property or properties of a flow. These properties depend on the flavor type (see *Flavor Types and Parameters* (on page 7-51)).

There is a maximum number of flavor items for each flavor type (see the following section). For each flavor type, every flavor item must be unique.

Maximum Number of Flavor Items per Flavor Type

The following table lists the maximum number of flavor items for each flavor type.

Table 7-2 Maximum Number of Flavor Items per Flavor Types

Flavor Type	Maximum No. of Flavor Items
HTTP Composite	10,000
HTTP User Agent	128
HTTP URL	100,000
HTTP Content Category	—
RTSP Composite	10,000
RTSP User Agent	128
RTSP Host Name	10,000

Flavor Type	**Maximum No. of Flavor Items**
SIP Composite	10,000
SIP Source Domain	128
SIP Destination Domain	128
SMTP Host Name	10,000

Adding Flavor Items

You can add any number of flavor items to a flavor (subject to the limitation of the total number of each type of flavor item per service configuration, as listed in the previous section).

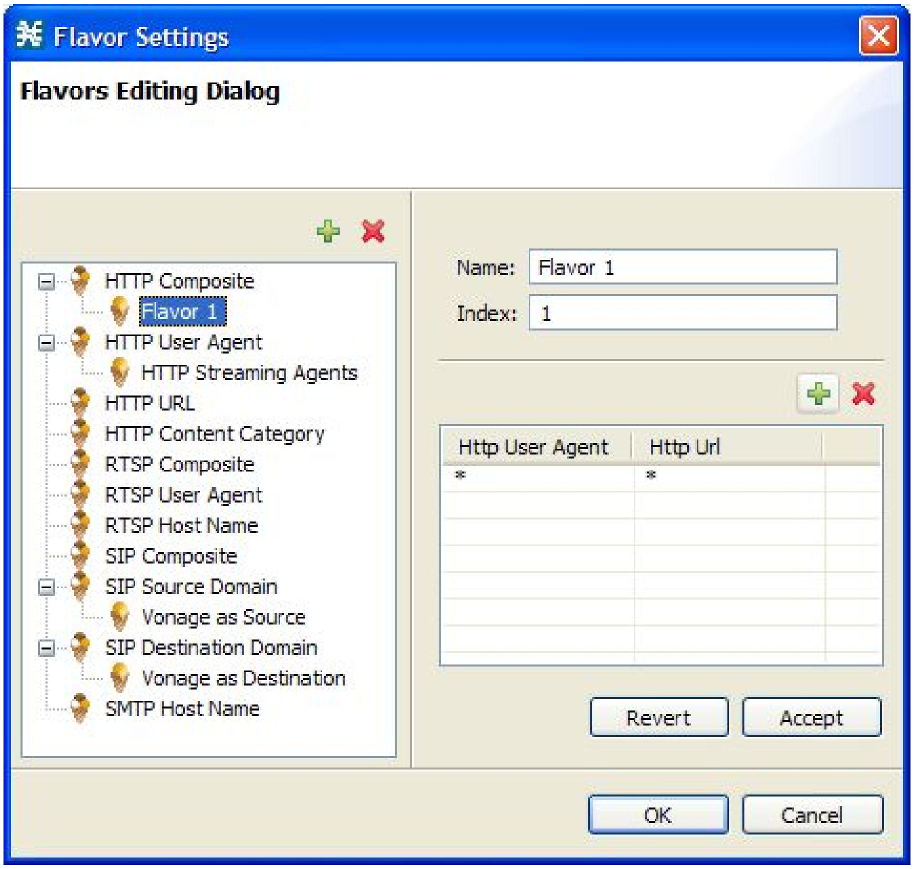
To add flavor items to a flavor:

Step 1 From the Console main menu, choose **Configuration** > **Flavors**.

The Flavor Settings dialog box appears.

Step 2 In the flavor tree, click a flavor.

Step 3 Above the flavor item list, click + (**Create New Flavor Item**).



Name: Flavor 1

Index: 1

Http User Agent	Http Url
*	*

A new flavor item is added to the flavor item list. The number and type of parameters in the flavor item depend on the flavor type (see *Flavor Types and Parameters* (on page 7-51)).

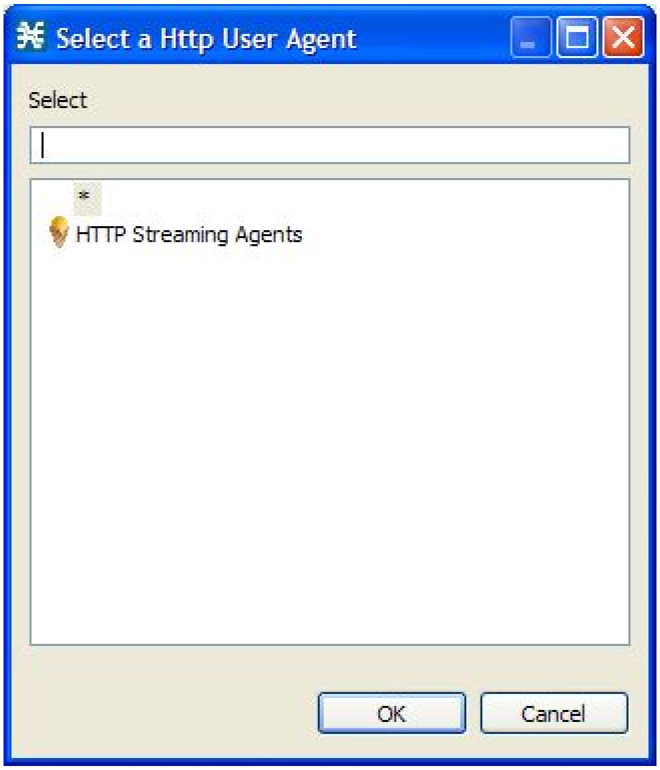
The new flavor item has a default value of all wild cards (*, asterisks).

Step 4 For each cell of the new flavor item, click the asterisk and then enter an appropriate value.

Step 5 For the composite flavors, and for HTTP Content Category flavor, a Browse button is displayed when you click the asterisk.

a) Click the **Browse** button.

A Select dialog box appears, displaying all valid values for the parameter.



b) Select an appropriate value from the list.

c) Click **OK**.

The Select dialog box closes.

The selected value is displayed in the cell.

Step 6 Repeat steps 3 to 5 for other flavor items.

Step 7 Click **OK**.

The Flavor Settings dialog box closes.

Editing Flavor Items

To edit a flavor item:

Step 1 From the Console main menu, choose **Configuration** > **Flavors**.

The Flavor Settings dialog box appears.

Step 2 In the flavor tree, select a flavor.

Step 3 In the flavor item list, select a flavor item.

Step 4 For each cell of the flavor item, enter an appropriate new value.

Step 5 For the composite flavors, and for HTTP Content Category flavor:

a) Click in a cell.

A Browse button is displayed.

b) Click the **Browse** button.

A Select dialog box appears, displaying all valid values for the parameter.

c) Select an appropriate value from the list.

d) Click **OK**.

The Select dialog box closes.

The selected value is displayed in the cell.

Step 6 Click **OK**.

The Flavor Settings dialog box closes.

Deleting Flavor Items

To delete a flavor item:

Step 1 From the Console main menu, choose **Configuration** > **Flavors**.

The Flavor Settings dialog box appears.

Step 2 In the flavor tree, select a flavor.

Step 3 In the flavor item list, right-click anywhere in a flavor item.

A popup menu appears.

Step 4 Click ✖ (**Delete**).

The flavor item is deleted and is no longer displayed in the flavor item list.

Step 5 Click **Close**.

The Flavor Settings dialog box closes.

Managing Content Filtering

Content filtering involves classification and control of HTTP flows according to the requested URL. The classification of the URL is performed by accessing an external database.

SCA BB provides content filtering by integrating with a SurfControl Content Portal Authority (CPA) server.

Content Filtering Overview

The Cisco HTTP Content Filtering solution consists of:

- The SCE application—The Cisco service control application that runs on the SCE platform. It forwards HTTP URLs that it extracts from traffic to the CPA client and uses the categorization results to classify the original HTTP flow to a service. This classification is then used for the normal ***SCA BB*** traffic control and reporting.
- Cisco CPA Client—The CPA client runs on the SCE platform. It sends URL queries to the CPA server for categorization, and updates ***SCA BB*** with categorization results.
- SurfControl CPA Server—The CPA server runs on a dedicated machine. It receives categorization requests from the CPA client, connects to the SurfControl Content Database, and responds with the category ID of the queried URL.

The SCE application classifies the HTTP flow according to the category returned by the CPA server. This classification is then used for ***SCA BB*** traffic control and reporting. For example, users can define a rule to block browsing of the “Adult/Sexually Explicit” category or to generate reports on the volume consumed by browsing the “Kids” or “Shopping” categories.

Installing the SurfControl CPA Server

The SurfControl CPA Server is installed on a separate server that must be accessible from the SCE platform.

The details of the installation are not within the scope of this document.

Configuring the Cisco CPA Client

The Cisco CPA client runs on the SCE platform. It is installed as part of the ***SCA BB*** application (PQI) installation. Use the SCE platform Command-Line Interface (CLI) to configure and monitor the client.

The Content Filtering CLI

You can configure content filtering using SurfControl CPA and monitored using the SCE platform Command-Line Interface (CLI). For more information about the SCE platform CLI, see the *Cisco Service Control Engine (SCE) CLI Command Reference*.

The commands listed here are explained in the following section.

Use the following CLI commands to configure the Cisco CPA client:

- **`[no] cpa-client`**
- **`cpa-client destination <address> [port <port>]`**
- **`cpa-client retries <number_of_retries>`**

These commands are line interface configuration commands. To run these commands you must enter line interface configuration mode and see the `SCE(config if)#` prompt displayed.

To enter line interface configuration mode:

Step 1 At the SCE platform CLI prompt (`SCE#`), type **`configure`**.

Step 2 Press **Enter**.

The `SCE(config)#` prompt appears.

Step 3 Type **`interface linecard 0`**.

Step 4 Press **Enter**.

The `SCE(config if)#` prompt appears.

Use the following CLI command in EXEC mode to monitor the status of the Cisco CPA client:

- **`show interface linecard <slot> cpa-client`**

Description of CPA Client CLI Commands

The following table gives a description of the Cisco CPA client CLI commands listed in the previous section and their default values.

Table 7-3 CPA Client CLI Commands

Command	**Description**	**Default Value**
[no] cpa-client	Enables or disables the CPA client	Disabled
cpa-client destination <address> [port <port>]	Enables the CPA client and sets the CPA server IP address and port	• Destination—not defined • Port—9020
cpa-client retries <number_of_retries>	Sets the number of retries to send to the CPA server	3
show interface linecard <slot> cpa-client	Monitors the CPA client status (See the following table)	—

The following table displays the information shown when monitoring the Cisco CPA client.

Table 7-4 CPA Client: Monitored Parameters

Parameter	Description
Mode	Enabled or disabled
CPA Address	
CPA Port	
CPA Retries	
Status	(If enabled) Active or error (and last error description)
Counters	• Number of successful queries • Number of queries that failed because of no server response • Number of pending queries • Rate of queries per second (average over the last 5 seconds)
Timestamps	• CPA started • Last query • Last response • Last error

Configuring the RDR Formatter

The SCE application communicates with the CPA client using Raw Data Records (RDRs). To enable the RDR formatter to issue HTTP categorization requests, configure the RDR formatter on the SCE platform using the SCE platform CLI:

```
#>RDR-formatter destination 127.0.0.1 port 33001 category number 4 priority 100
```

For more information about configuring the RDR formatter, see the “Configuring the RDR Formatter” chapter of the *Cisco Service Control Engine (SCE) Software Configuration Guide*.

Managing Content Filtering Settings

Applying HTTP URL content filtering requires the following steps in the Service Configuration Editor:

Step 1 Import the content filtering configuration file into your service configuration.

By default, ***SCA BB*** creates a separate flavor (of type HTTP Content Category) for each content category and a service element for each new flavor. A new top-level service, “HTTP Browsing with Categories”, is created, comprising these service elements.

Step 2 Create new services and map the new category flavors to them.

Step 3 Add content filtering rules to existing packages or create new packages that include content filtering rules.

Step 4 Enable content filtering for selected packages.

Step 5 Apply the service configuration.

Importing Content Filtering Categories

Before you can control HTTP flows based on content, you must import an XML file provided with the installation.

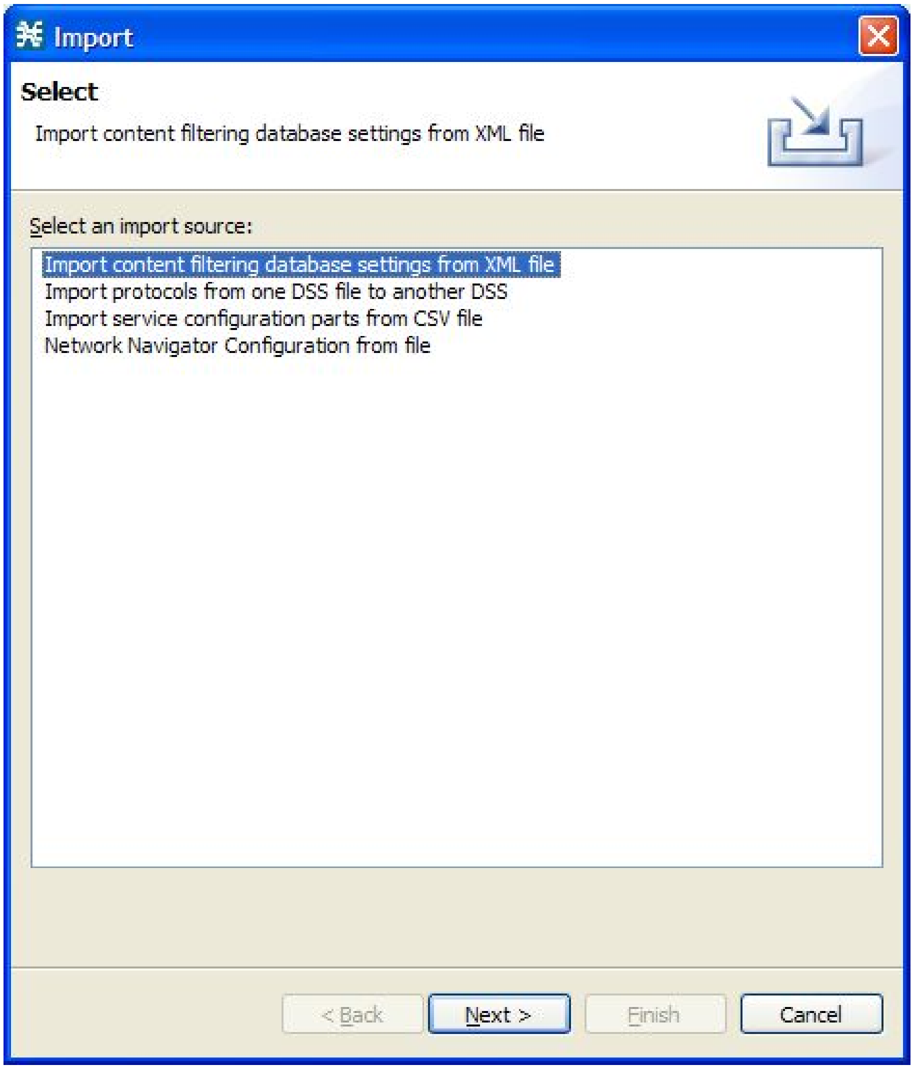
After you unzip the installation package, this file is located in the *`URL Filtering`* subfolder.

You can import content filtering categories using either the **File** > **Import** menu option or the **Configuration** > **Content Filtering** menu option.

To import content filtering categories using the Import dialog box:

Step 1 From the Console main menu, choose **File** > **Import**.

The Import dialog box appears.

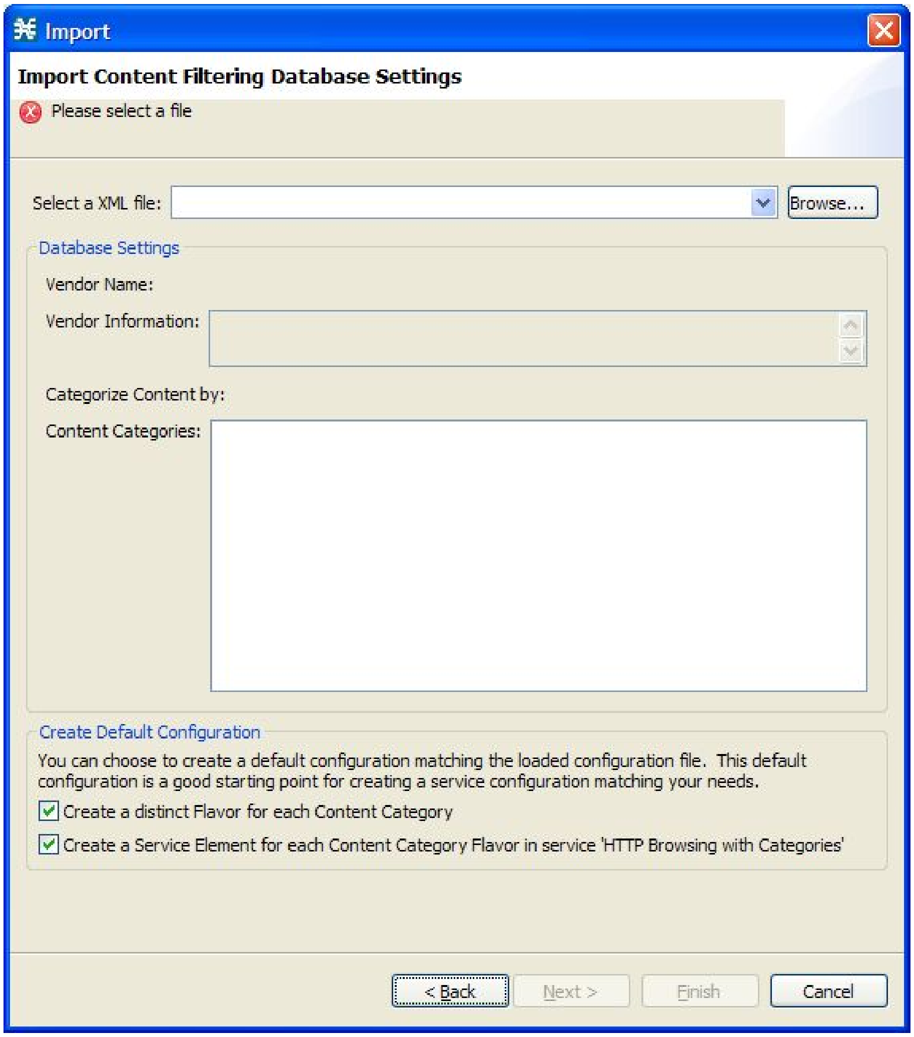


Import
Select
Import content filtering database settings from XML file
Select an import source:
Import content filtering database settings from XML file
Import protocols from one DSS file to another DSS
Import service configuration parts from CSV file
Network Navigator Configuration from file
< Back
Next >
Finish
Cancel

Step 2 From the import source list, select **Import content filtering database settings from XML file**.

Step 3 Click **Next**.

The Import Content Filtering Database Settings dialog box appears.



Import Content Filtering Database Settings

☒ Please select a file

You can choose to create a default configuration matching the loaded configuration file. This default configuration is a good starting point for creating a service configuration matching your needs.

☑ Create a distinct Flavor for each Content Category

☑ Create a Service Element for each Content Category Flavor in service 'HTTP Browsing with Categories'

Step 4 Click the **Browse** button next to the Select a XML file field.

An Open dialog box appears.

Step 5 Browse to the folder containing the file to import, and select it.

For SurfControl's CPA, the file is named *`surfcontrol.xml`*.

Step 6 Click **Open** to select the file.

The Open dialog box closes.

Information about the content of the XML file is displayed in the Database Settings pane of the Import Content Filtering Database Settings dialog box.

Step 7 By default, ***SCA BB*** creates a separate flavor (of type HTTP Content Category) for each content category when importing the XML file.

- To disable this option, uncheck the **Create a distinct Flavor for each Content Category** check box.

It is recommended that you do not disable this option.

Step 8 By default, ***SCA BB*** creates a service element for each flavor created in the previous step. A new top-level service, HTTP Browsing with Categories, is created, comprising these service elements.

- To disable this option, uncheck the **Create a Service Element for each Content Category Flavor in Service 'HTTP Browsing with Categories'** check box.

It is recommended that you do not disable this option.

Step 9 Click **Finish**.

The Import Content Filtering Database Settings dialog box closes.

To import content filtering categories using the HTTP Content Filtering Settings dialog box:

This is equivalent to the previous procedure.

Step 1 From the Console main menu, choose **Configuration** > **Content Filtering**.

The HTTP Content Filtering Settings dialog box appears.

Step 2 Click the **Database Settings** tab.

The Database Settings tab opens.

Step 3 Click **Import**.

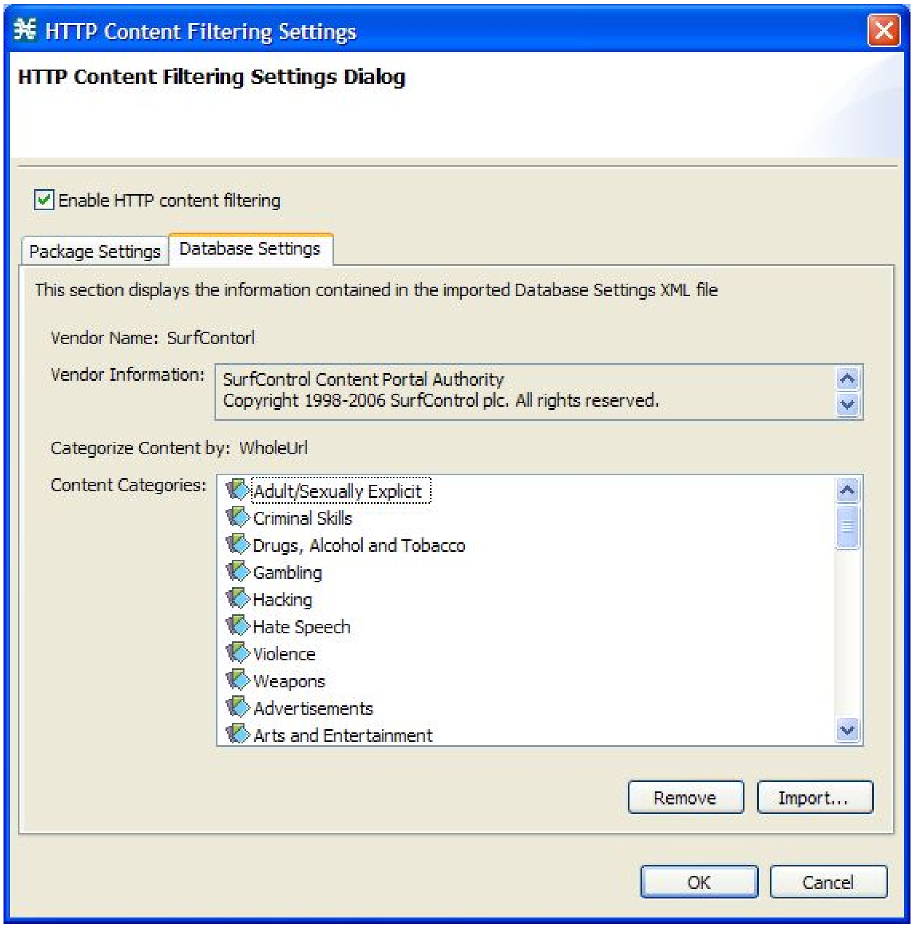
The Import Content Filtering Database Settings dialog box appears.

Step 4 Perform steps 4 to 8 of the preceding procedure.

Step 5 Click **Finish**.

The Import Content Filtering Database Settings dialog box closes.

Information from the imported file is displayed in the Database Settings tab of the HTTP Content Filtering Settings dialog box.



HTTP Content Filtering Settings

HTTP Content Filtering Settings Dialog

☑ Enable HTTP content filtering

This section displays the information contained in the imported Database Settings XML file

Vendor Name: SurfContorl

Vendor Information: SurfControl Content Portal Authority
Copyright 1998-2006 SurfControl plc. All rights reserved.

Categorize Content by: WholeUrl

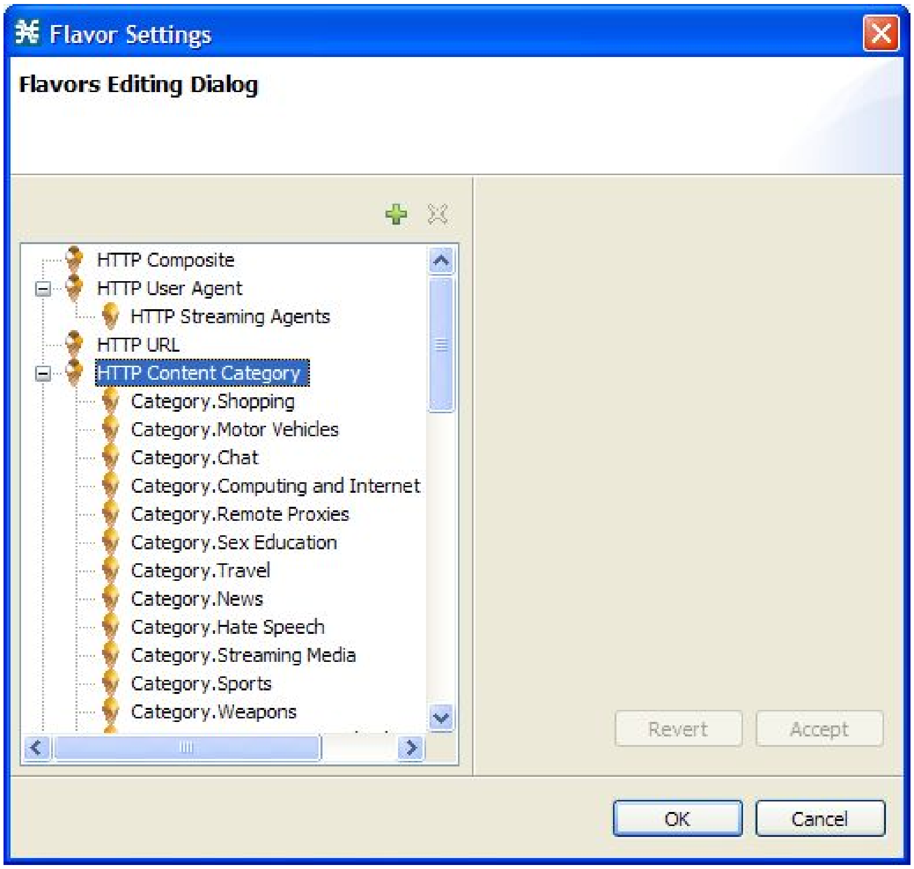
Content Categories:
- Adult/Sexually Explicit
- Criminal Skills
- Drugs, Alcohol and Tobacco
- Gambling
- Hacking
- Hate Speech
- Violence
- Weapons
- Advertisements
- Arts and Entertainment

Step 6 Click **OK**.

The HTTP Content Filtering Settings dialog box closes.

HTTP Content Category Flavors

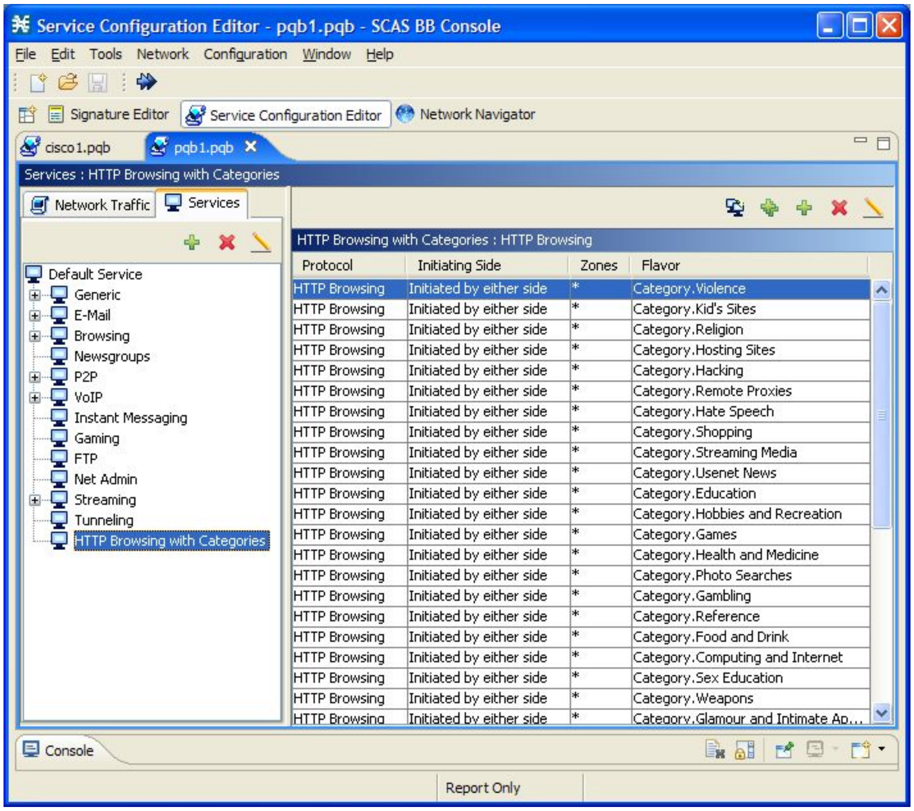
By default, ***SCA BB*** creates a separate flavor (of type HTTP Content Category) for each content category when importing the XML file.



You can create additional HTTP Content Category Flavors that include two or more content categories. (See *Adding Flavors* (on page 7-53).)

HTTP Browsing with Categories Service Elements

By default, ***SCA BB*** creates a service element for each flavor created in the previous step. A new top-level service, HTTP Browsing with Categories, is created, comprising these service elements.


Service Configuration Editor - pqb1.pqb - SCAS BB Console
File Edit Tools Network Configuration Window Help
Signature Editor
Service Configuration Editor
Network Navigator
cisco1.pqb
pqb1.pqb
Services : HTTP Browsing with Categories
Network Traffic
Services
Default Service
Generic
E-Mail
Browsing
Newsgroups
P2P
VoIP
Instant Messaging
Gaming
FTP
Net Admin
Streaming
Tunneling
HTTP Browsing with Categories
HTTP Browsing with Categories : HTTP Browsing
Console
Report Only

Protocol	Initiating Side	Zones	Flavor
HTTP Browsing	Initiated by either side	*	Category.Violence
HTTP Browsing	Initiated by either side	*	Category.Kid's Sites
HTTP Browsing	Initiated by either side	*	Category.Religion
HTTP Browsing	Initiated by either side	*	Category.Hosting Sites
HTTP Browsing	Initiated by either side	*	Category.Hacking
HTTP Browsing	Initiated by either side	*	Category.Remote Proxies
HTTP Browsing	Initiated by either side	*	Category.Hate Speech
HTTP Browsing	Initiated by either side	*	Category.Shopping
HTTP Browsing	Initiated by either side	*	Category.Streaming Media
HTTP Browsing	Initiated by either side	*	Category.Usenet News
HTTP Browsing	Initiated by either side	*	Category.Education
HTTP Browsing	Initiated by either side	*	Category.Hobbies and Recreation
HTTP Browsing	Initiated by either side	*	Category.Games
HTTP Browsing	Initiated by either side	*	Category.Health and Medicine
HTTP Browsing	Initiated by either side	*	Category.Photo Searches
HTTP Browsing	Initiated by either side	*	Category.Gambling
HTTP Browsing	Initiated by either side	*	Category.Reference
HTTP Browsing	Initiated by either side	*	Category.Food and Drink
HTTP Browsing	Initiated by either side	*	Category.Computing and Internet
HTTP Browsing	Initiated by either side	*	Category.Sex Education
HTTP Browsing	Initiated by either side	*	Category.Weapons
HTTP Browsing	Initiated by either side	*	Category.Glamour and Intimate Ap...

Configuring Content Filtering

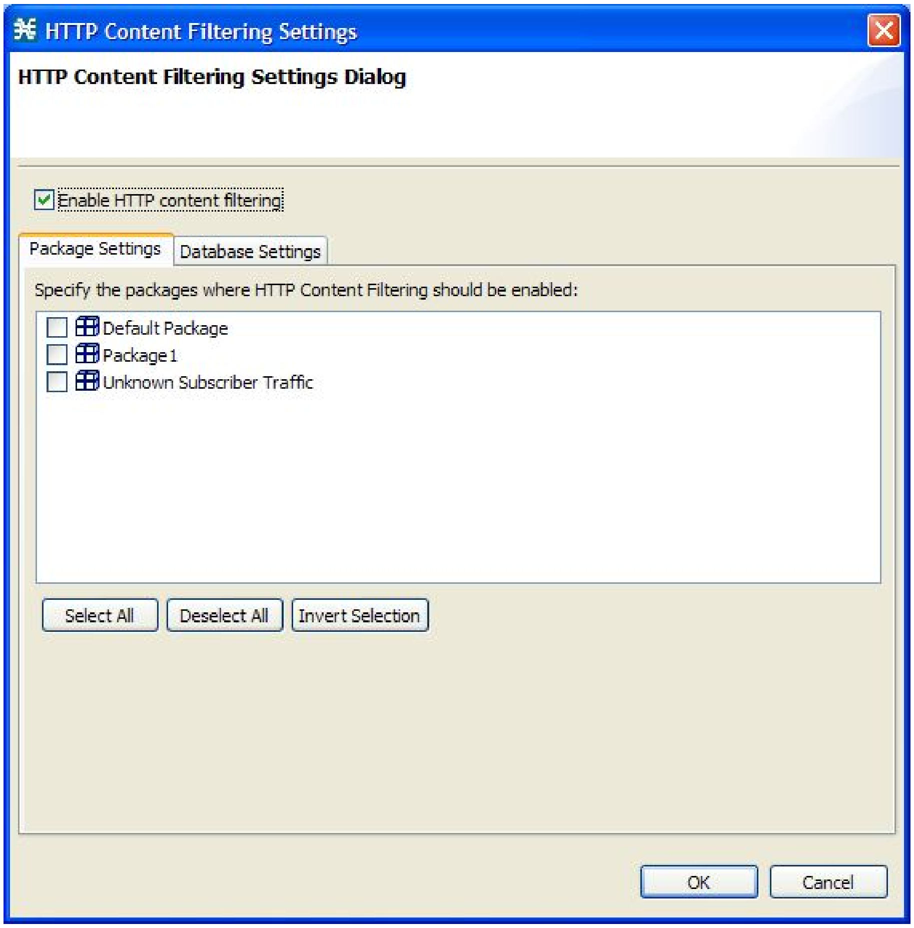
You can specify the packages where content filtering will be enabled. For packages where content filtering is disabled, HTTP flows will be classified normally.

To configure content filtering:

Step 1 From the Console main menu, choose **Configuration** > **Content Filtering**.

The HTTP Content Filtering Settings dialog box appears.

The Package Settings tab displays a list of all packages defined for the current service configuration.


HTTP Content Filtering Settings

HTTP Content Filtering Settings Dialog

☑ Enable HTTP content filtering

Package Settings | Database Settings

Specify the packages where HTTP Content Filtering should be enabled:

- □ Default Package
- □ Package1
- □ Unknown Subscriber Traffic

Step 2 Check the **Enable HTTP content filtering** check box.

Step 3 Check the check box next to each package for which content filtering is to be applied.

Step 4 Click **OK**.

The HTTP Content Filtering Settings dialog box closes.

Viewing Content Filtering Settings

You can view whether content filtering is enabled and to which packages content filtering is applied, and information about the content filtering vendor and the vendor's content categories.

To view content filtering settings:

Step 1 From the Console main menu, choose **Configuration** > **Content Filtering**.

The HTTP Content Filtering Settings dialog box appears.

The Package Settings tab displays a list of all packages defined for the current service configuration, and shows for which packages content filtering is enabled.

Step 2 Click the **Database Settings** tab.

The Database Settings tab opens.

This tab displays information about the content filtering vendor and the vendor’s content categories.

Step 3 Click **OK**.

The HTTP Content Filtering Settings dialog box closes.

Removing Content Filtering Settings

You can remove all content filtering settings at any time.

Removing the settings:

- Removes content category flavor items from flavors
- Deletes all the content category flavor items
- Disables content filtering

To remove all content filtering settings:

Step 1 From the Console main menu, choose **Configuration** > **Content Filtering**.

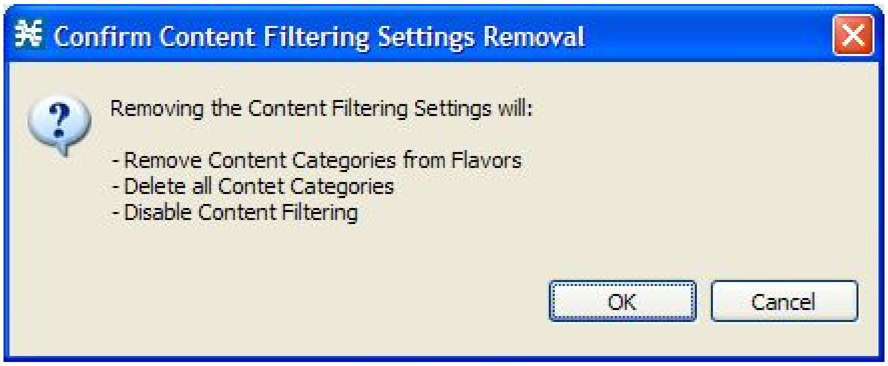
The HTTP Content Filtering Settings dialog box appears.

Step 2 Click the **Database Settings** tab.

The Database Settings tab opens.

Step 3 Click **Remove**.

A Confirm Content Filtering Settings Removal dialog box appears.



Confirm Content Filtering Settings Removal

Removing the Content Filtering Settings will:

- Remove Content Categories from Flavors
- Delete all Contet Categories
- Disable Content Filtering

Step 4 Click **OK**.

All content filtering settings are removed.

Vendor Name, Vendor Information, and Content Categories are deleted from the HTTP Content Filtering Settings dialog box.

Step 5 Click **OK**.

The HTTP Content Filtering Settings dialog box closes.

CHAPTER 8

Using the Service Configuration Editor: Traffic Accounting and Reporting

Traffic Accounting and Reporting is the second step in creating a Cisco Service Control Application for Broadband (***SCA BB***) service configuration.

This chapter how explains how to work with usage counters and Raw Data Records (RDRs).

This chapter contains the following sections:

Managing Usage Counters

The ***SCA BB*** collects and maintains various network metrics (such as volume and number of sessions), per service. This accounting takes place per subscriber, per group of subscribers (package or group of packages), and for the entire link.

Services may share a usage counter. For example, in the default service configuration the SMTP and POP3 services share the E-Mail service usage counters. The assignment of services to usage counters is determined by the service hierarchy. *Editing Services* (on page 7-8) explains how to configure the service hierarchy.

Similarly, packages may share a usage counter. The assignment of packages to usage counters is determined by the package hierarchy. *Setting Advanced Package Options* (on page 9-5) explains how to configure the package hierarchy.

Managing RDR Settings

Service Control Engine (SCE) platforms generate and transmit *Raw Data Records* (RDRs) that contain information that is relevant to the service provider. These RDRs contain a wide variety of information and statistics, depending on the configuration of the system. For more details about the content of each type of RDR, see the "Raw Data Records: Formats and Field Contents" chapter of the *Cisco Service Control Application for Broadband Reference Guide*.

Note RDRs are not generated for filtered traffic (see *Filtering the Traffic Flows* (on page 10-19)).

The RDR Settings dialog box allows you to control the generation of RDRs for an entire service configuration. This dialog box contains seven tabs:

- Usage RDRs—Allows you to enable the generation of each type of Usage RDR, and define their generation intervals
- Traffic Discovery—Allows you to enable the generation of Transaction RDRs and define their maximum rate of generation
- Quota RDRs—Allows you to enable the generation of each type of Quota RDR, and define their generation parameters
- Transaction Usage RDRs—Allows you to specify the packages and services for which Transaction Usage RDRs will be generated
- Log RDRs—Allows you to specify the packages and services for which Log RDRs will be generated
- Real-Time Subscriber RDRs—Allows you to enable the generation of Real-Time Subscriber Usage RDRs, and define their generation intervals and maximum rate of generation
- Real-Time Signaling RDRs—Allows you to specify the packages and services for which Real-Time Signaling RDRs will be generated

Media Flow RDRs and Malicious Traffic Periodic RDRs are enabled and configured in the *Advanced Service Configuration Options dialog box* (on page 10-39).

Note All RDR data is based on Layer 3 volume.

Managing Usage RDRs

The SCE platform can generate three types of Usage RDRs. Usage RDRs of each type are generated for each service usage counter; service usage counters aggregate usage for either one service or a group of related services in the service hierarchy.

- Link Usage RDRs—Contain data relating to total usage of a particular group of services for the entire link
- Package Usage RDRs—Contain data relating to total usage of a particular group of services by all subscribers to a particular package

- Subscriber Usage RDRs—Contain data relating to total usage of a particular group of services by a particular subscriber

You can enable or disable the generation of each type of Usage RDR, and set the generation interval for each type of Usage RDR. You can limit the generation rate of Subscriber Usage RDRs (advisable when there are a large number of subscribers).

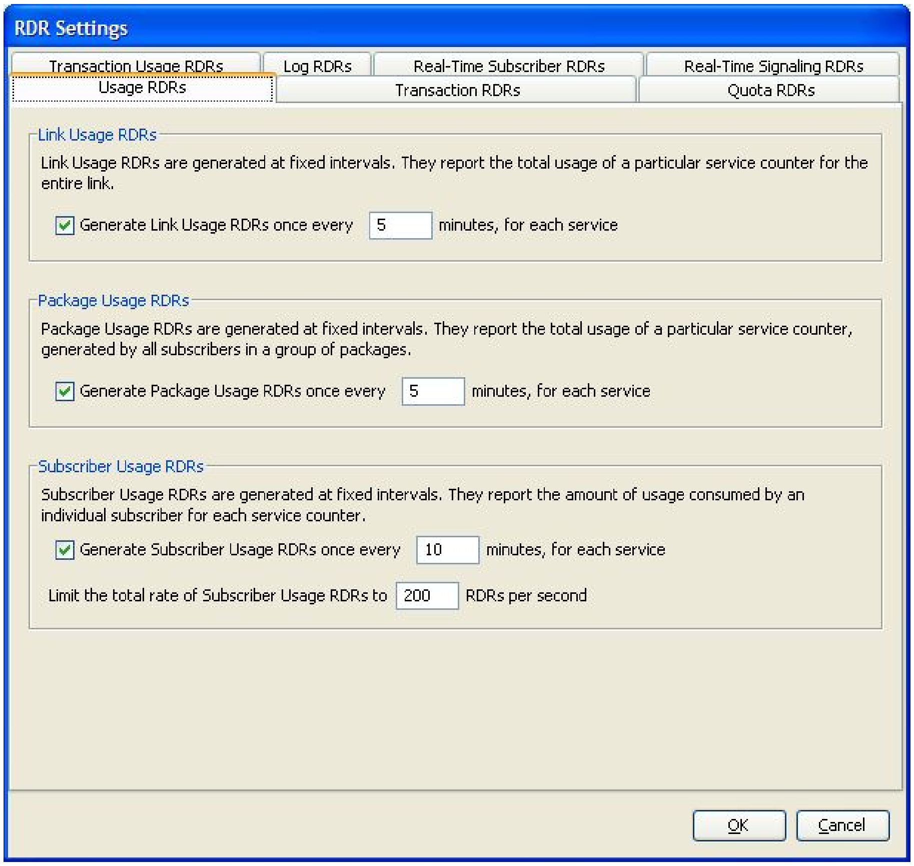
By default, all three types of Usage RDRs are enabled. Each RDR is generated once every five minutes.

Note Usage RDRs are not generated for blocked sessions. A session is blocked if the service that the session is mapped to is blocked for this user's package (see *Defining Per-Flow Actions for a Rule* (on page 9-14)), or if the user has exceeded the allowed quota for this service (see *Managing Quotas* (on page 9-47)).

To configure the generation of Usage RDRs:

Step 1 From the Console main menu, choose **Configuration** > **RDR Settings**.

The RDR Settings dialog box appears.



Link Usage RDRs

Link Usage RDRs are generated at fixed intervals. They report the total usage of a particular service counter for the entire link.

☑ Generate Link Usage RDRs once every 5 minutes, for each service

Package Usage RDRs

Package Usage RDRs are generated at fixed intervals. They report the total usage of a particular service counter, generated by all subscribers in a group of packages.

☑ Generate Package Usage RDRs once every 5 minutes, for each service

Subscriber Usage RDRs

Subscriber Usage RDRs are generated at fixed intervals. They report the amount of usage consumed by an individual subscriber for each service counter.

☑ Generate Subscriber Usage RDRs once every 10 minutes, for each service

Limit the total rate of Subscriber Usage RDRs to 200 RDRs per second

Step 2 To enable the generation of a selected type of Usage RDR:

- Check the appropriate **Generate Usage RDRs** check box.

To disable the generation of a selected type of Usage RDR:

- Uncheck the appropriate **Generate Usage RDRs** check box.

Step 3 To change the generation interval for a selected type of Usage RDR:

- Enter the interval in minutes between each generation of this type of Usage RDRs in the appropriate Generate Usage RDRs field.

Step 4 To limit the generation rate of Subscriber Usage RDRs:

- Enter the maximum number of Subscriber Usage RDRs to be generated per second in the Limit the Total Rate of Subscriber Usage RDRs field.

Step 5 To configure Transaction RDRs, continue with step 2 of the instructions in the section *Managing Transaction RDRs* (on page 8-4).

Step 6 Click **OK**.

The RDR Settings dialog box closes.

The new configuration for the generation of RDRs is saved.

Managing Transaction RDRs

The SCE platform can generate Transaction RDRs for selected service types. Each Transaction RDR contains data about a single network transaction. You can use these RDRs, for example, to generate statistical histograms that help understand the traffic that is traversing the network.

You can enable or disable the generation of Transaction RDRs, set the maximum number of RDRs generated per second, and select for which services the RDRs are generated. You can also assign a relative weight to each service. The relative weight determines the relative number of Transaction RDRs that will be generated for this service, compared to other services.

By default, at most 100 Transaction RDRs are generated per second, and all services are given the same weight.

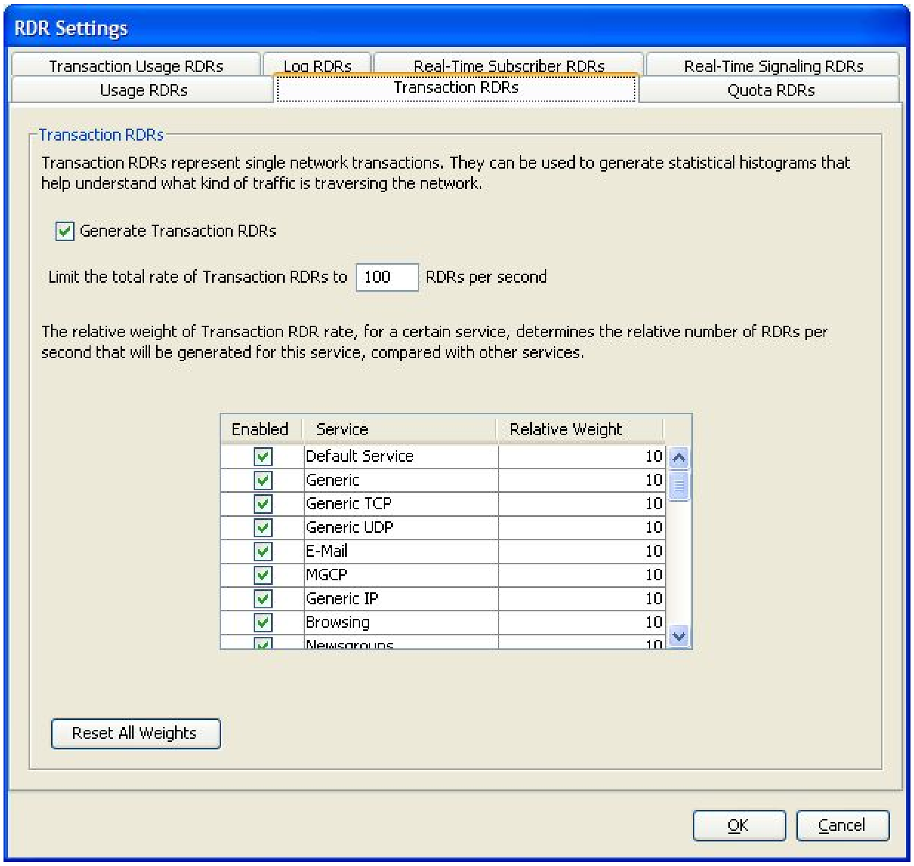
To configure the generation of Transaction RDRs:

Step 1 From the Console main menu, choose **Configuration** > **RDR Settings**.

The RDR Settings dialog box appears.

Step 2 Click the **Traffic Discovery** tab.

The Traffic Discovery tab opens.



Transaction RDRs

Transaction RDRs represent single network transactions. They can be used to generate statistical histograms that help understand what kind of traffic is traversing the network.

☑ Generate Transaction RDRs

Limit the total rate of Transaction RDRs to 100 RDRs per second

The relative weight of Transaction RDR rate, for a certain service, determines the relative number of RDRs per second that will be generated for this service, compared with other services.

Enabled	Service	Relative Weight
☑	Default Service	10
☑	Generic	10
☑	Generic TCP	10
☑	Generic UDP	10
☑	E-Mail	10
☑	MGCP	10
☑	Generic IP	10
☑	Browsing	10
☑	Newsgroups	10

Step 3 To enable the generation of Transaction RDRs:

- Check the **Generate Transaction RDRs** check box.

To disable the generation of Transaction RDRs:

- Uncheck the **Generate Transaction RDRs** check box.

Step 4 To change the maximum generation rate for Transaction RDRs:

- Enter the desired rate in the Limit the Total Rate of Transaction RDRs field.

Step 5 To disable the generation of Transaction RDRs for a selected service:

- Uncheck the **Enabled** check box next to the service name.

Step 6 To set the relative weight for a selected service:

- Double-click in the appropriate cell in the **Relative Weight** column, and enter the desired weight.

Step 7 To configure Quota RDRs, continue with step 2 of the instructions in the section *Managing Quota RDRs* (on page 8-6).

Step 8 Click **OK**.

The RDR Settings dialog box closes.

The new configuration for the generation of RDRs is saved.

Managing Quota RDRs

SCA BB generates Quota RDRs per subscriber. There are three types of Quota RDRs:

- Quota Breach RDRs—When a quota bucket is depleted, services that try to consume from that bucket are regarded as breached. ***SCA BB*** can generate a Quota Breach RDR when a quota breach occurs.

  When a subscriber's service is breached, the service is handled according to its breach-handling settings. For example, you can block flows of a specific service when the quota for that service is consumed.
- Remaining Quota RDRs—As quota is consumed, ***SCA BB*** can generate Remaining Quota RDRs.

  The Remaining Quota RDR is only generated if a bucket state has change since the last RDR was generated.
- Quota Threshold RDRs—When the remaining quota in a bucket falls below a threshold, ***SCA BB*** can generate a Quota Threshold RDR. External systems can treat this RDR as a quota request and provision the subscriber with an additional quota before the bucket is depleted.
- Quota State Restore RDRs—When a subscriber logs out, their remaining quota is stored in the Cisco Service Control Management Suite (SCMS) Subscriber Manager (SM). When the subscriber logs in again, this quota is restored from the SM. ***SCA BB*** can generate a Quota State Restore RDR when the subscriber is introduced.

You can enable or disable the generation each type of Quota RDR and define the rate of generation of these RDRs.

- For Remaining Quota RDRs, you can set the generation interval, and limit the generation rate (advisable when there are a large number of subscribers).
- For Quota Threshold RDRs, you can configure the threshold.

By default, all Quota RDRs are disabled.

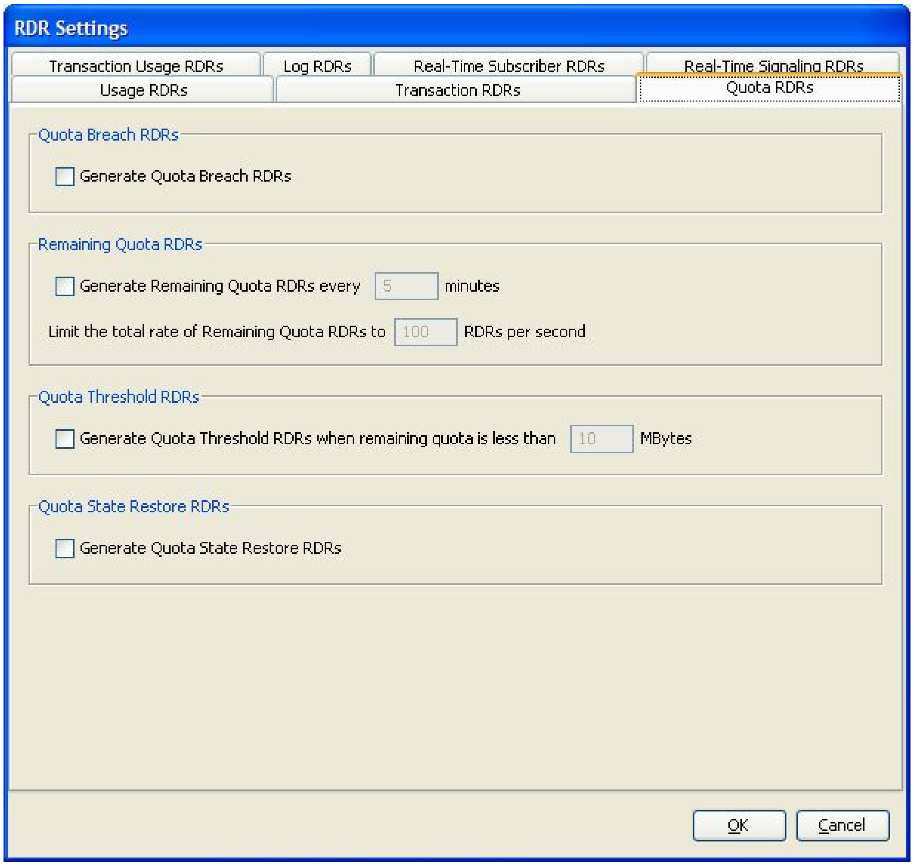
To configure the generation of Quota RDRs:

Step 1 From the Console main menu, choose **Configuration** > **RDR Settings**.

The RDR Settings dialog box appears.

Step 2 Click the **Quota RDRs** tab.

The Quota RDRs tab opens.



Quota Breach RDRs

□ Generate Quota Breach RDRs

Remaining Quota RDRs

□ Generate Remaining Quota RDRs every 5 minutes

Limit the total rate of Remaining Quota RDRs to 100 RDRs per second

Quota Threshold RDRs

□ Generate Quota Threshold RDRs when remaining quota is less than 10 MBytes

Quota State Restore RDRs

□ Generate Quota State Restore RDRs

Step 3 To enable the generation of Quota Breach RDRs:

- Check the **Generate Quota Breach RDRs** check box.

Step 4 To enable the generation of Remaining Quota RDRs:

- Check the **Generate Remaining Quota RDRs** check box.

Step 5 To change the generation interval of Remaining Quota RDRs:

- In the Generate Remaining Quota RDRs field, enter the interval in minutes between each generation of the RDR.

Step 6 To limit the maximum generation rate of Remaining Quota RDRs:

- In the Limit the Total Rate of Remaining Quota RDRs field, enter the maximum number of Remaining Quota RDRs to be generated per second.

Step 7 To enable the generation of Quota Threshold RDRs:

- Check the **Generate Quota Threshold RDRs** check box.

Step 8 To change the Threshold for Quota Threshold RDRs:

- In the Generate Quota Threshold RDRs field, enter the threshold for which Quota Threshold RDR will be generated.

Step 9 To enable the generation of Quota State Restore RDRs:

- Check the **Generate Quota State Restore RDRs** check box.

Step 10 To configure Transaction Usage RDRs, continue with step 2 of the instructions in the section *Managing Transaction Usage RDRs* (on page 8-8).

Step 11 Click **OK**.

The RDR Settings dialog box closes.

The new configuration for the generation of RDRs is saved.

Managing Transaction Usage RDRs

The SCE platform can generate Transaction Usage RDRs for all transactions of selected packages, or for selected services per package. Each Transaction Usage RDR contains data about a single network transaction. You can use these RDRs to build detailed usage logs for specific services and subscribers, suitable, for example, for transaction-based billing.

Caution Generating and collecting an RDR for each transaction can cause performance penalties. Enable Transaction Usage RDR generation only for those services and packages that must be monitored or controlled by the system.

You can select the packages and services for which Transaction Usage RDRs are generated. The following RDRs will also be generated for these packages and services:

- HTTP Transaction Usage RDR
- RTSP Transaction Usage RDR
- VoIP Transaction Usage RDR

By default, no Transaction Usage RDRs are generated.

Note Media Flow RDRs are enabled in the *Advanced Service Configuration Options dialog box* (on page 10-39).
(When enabled, Media Flow RDRs are generated at the end of every SIP and Skype media flow; you can use them to distinguish between SIP voice and video calls.)

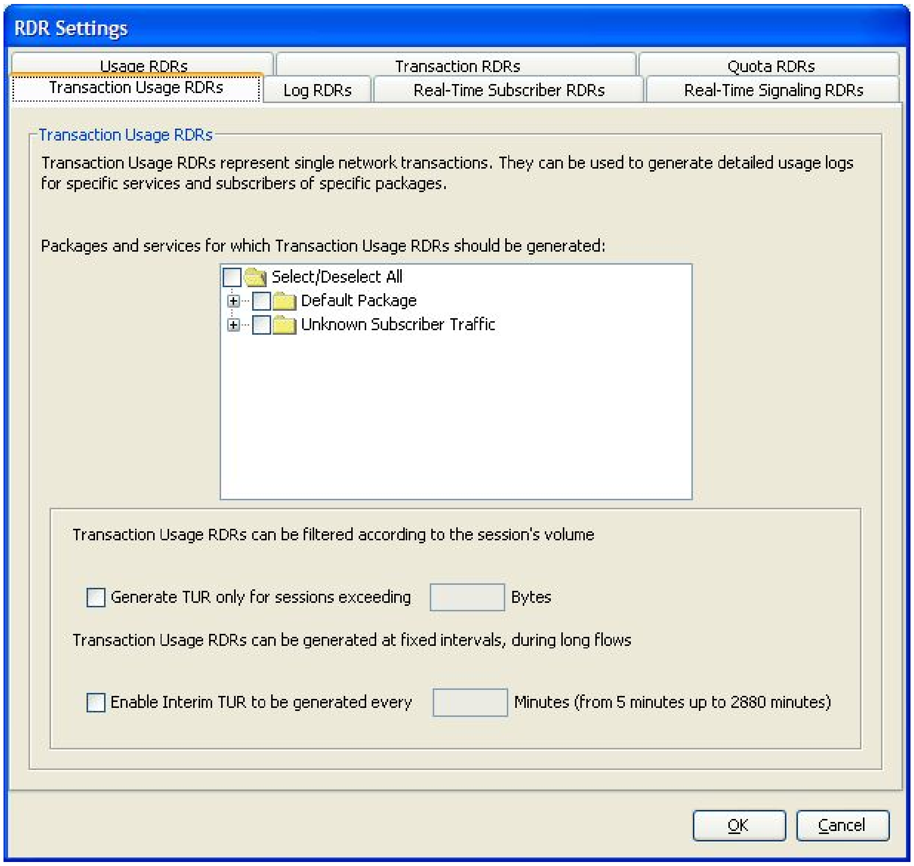
To configure the generation of Transaction Usage RDRs:

Step 1 From the Console main menu, choose **Configuration** > **RDR Settings**.

The RDR Settings dialog box appears.

Step 2 Click the **Transaction Usage RDRs** tab.

The Transaction Usage RDRs tab opens.



Transaction Usage RDRs represent single network transactions. They can be used to generate detailed usage logs for specific services and subscribers of specific packages.

Packages and services for which Transaction Usage RDRs should be generated:

- □ Select/Deselect All
  - □ Default Package
  - □ Unknown Subscriber Traffic

Transaction Usage RDRs can be filtered according to the session's volume

□ Generate TUR only for sessions exceeding Bytes

Transaction Usage RDRs can be generated at fixed intervals, during long flows

□ Enable Interim TUR to be generated every Minutes (from 5 minutes up to 2880 minutes)

Step 3 To enable the generation of Transaction Usage RDRs for selected packages:

- Check the check box next to the package name in the package tree.

  The package expands to show all component services of the package; all the services are checked.

Step 4 To enable the generation of Transaction Usage RDRs for selected services of a package:

a) Expand the node of the desired package.

b) Check the check box next to the service name of each desired service.

Step 5 To limit the generation of Transaction Usage RDRs to “large” sessions:

a) Check the **Generate TUR only for sessions exceeding** check box.

The Bytes field is enabled.

b) Enter the minimum session size in bytes for which a Transaction Usage RDR should be generated for the session.

Step 6 Usually, a Transaction Usage RDR is only generated at when a flow closes. To enable the generation of additional, interim Transaction Usage RDRs for long flows:

a) Check the **Enable Interim TUR to be generated every** check box.

The Minutes field is enabled.

b) Enter the time in minutes between each generation of a Transaction Usage RDR for each flow.

Step 7 To configure Log RDRs, continue with step 2 of the instructions in the section *Managing Log RDRs* (on page 8-10).

Step 8 Click **OK**.

The RDR Settings dialog box closes.

The new configuration for the generation of RDRs is saved.

Managing Log RDRs

Log RDRs provide information regarding system events. ***SCA BB*** generates them in response to specific actions or state changes. There are two types of Log RDRs:

- Blocking RDRs—***SCA BB*** can generate a Blocking RDR each time a transaction is blocked
- Breach RDRs—***SCA BB*** generates a Breach RDR each time a bucket exceeds the global threshold

You can set the maximum number of Log RDRs generated per second, and select the packages and services for which Blocking RDRs are generated.

By default, Blocking RDRs are generated for all packages. Breach RDRs are always generated.

Note At most 20 Log RDRs are generated per second.

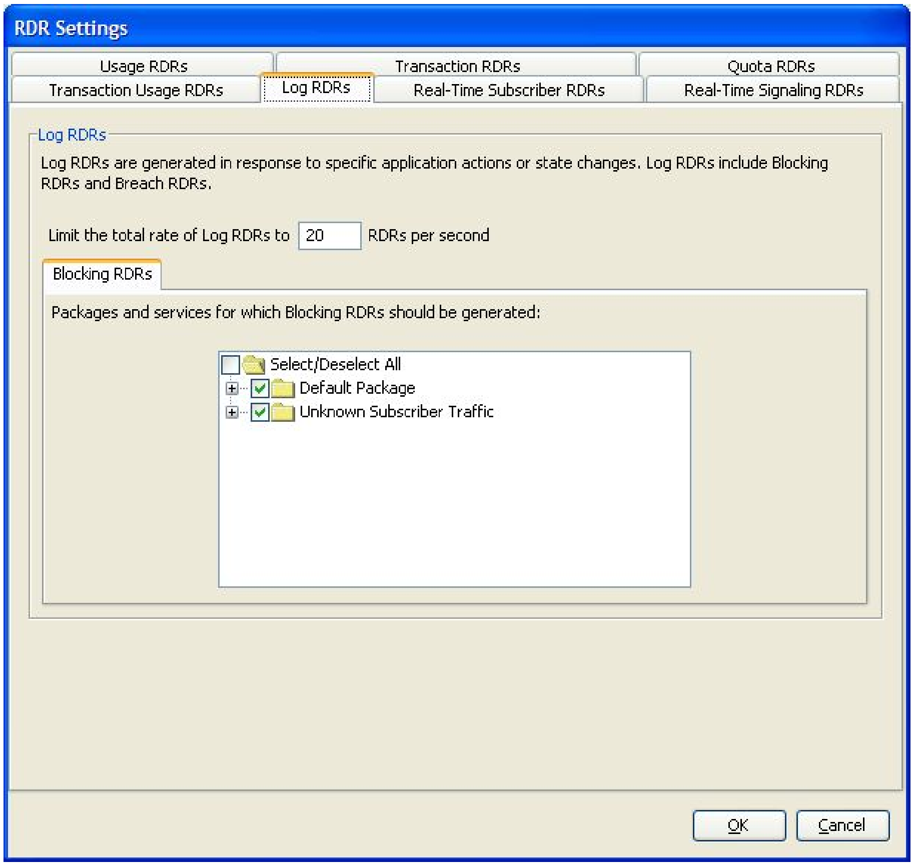
To configure the generation of Log RDRs:

Step 1 From the Console main menu, choose **Configuration** > **RDR Settings**.

The RDR Settings dialog box appears.

Step 2 Click the **Log RDRs** tab.

The Log RDRs tab opens.



RDR Settings

Log RDRs

Log RDRs are generated in response to specific application actions or state changes. Log RDRs include Blocking RDRs and Breach RDRs.

Limit the total rate of Log RDRs to 20 RDRs per second

Blocking RDRs

Packages and services for which Blocking RDRs should be generated:

- □ Select/Deselect All
- ☑ Default Package
- ☑ Unknown Subscriber Traffic

Step 3 To change the maximum generation rate for Log RDRs:

- Enter the desired rate in the Limit the Total Rate of Log RDRs field.

Step 4 To enable the generation of Blocking RDRs for selected packages:

- Check the check box next to the package name in the package tree.

  The package expands to show all component services of the package; all the services are checked.

Step 5 To enable the generation of Blocking RDRs for selected services of a package:

a) Expand the node of the desired package.

b) Check the check box next to the service name of each desired service.

Step 6 To configure Real-Time Subscriber Usage RDRs, continue with step 2 of the instructions in the section *Managing Real-Time Subscriber Usage RDRs* (on page 8-12).

Step 7 Click **OK**.

The RDR Settings dialog box closes.

The new configuration for the generation of RDRs is saved.

Managing Real-Time Subscriber Usage RDRs

Real-Time Subscriber Usage RDRs are RDRs that report subscriber usage. These RDRs are generated for each individual subscriber for each service used, at specified intervals. These RDRs permit a more granular monitoring of selected subscribers when necessary.

See *Selecting Subscribers for Real-Time Usage Monitoring* (on page 13-12) for more information on selecting subscribers to be monitored.

⚠

Caution Generating and collecting Real-Time Subscriber Usage RDRs for many subscribers can cause performance penalties. Enable Real-Time Subscriber Usage RDR generation only for those subscribers that must actually be monitored by the system.

You can enable or disable the generation of Real-Time Subscriber Usage RDRs, set the generation interval for the RDRs, and set the maximum number of RDRs generated per second.

By default, Real-Time Subscriber Usage RDRs are generated (but only for selected subscribers). An RDR for each subscriber is generated once every minute. At most 100 RDRs are generated per second.

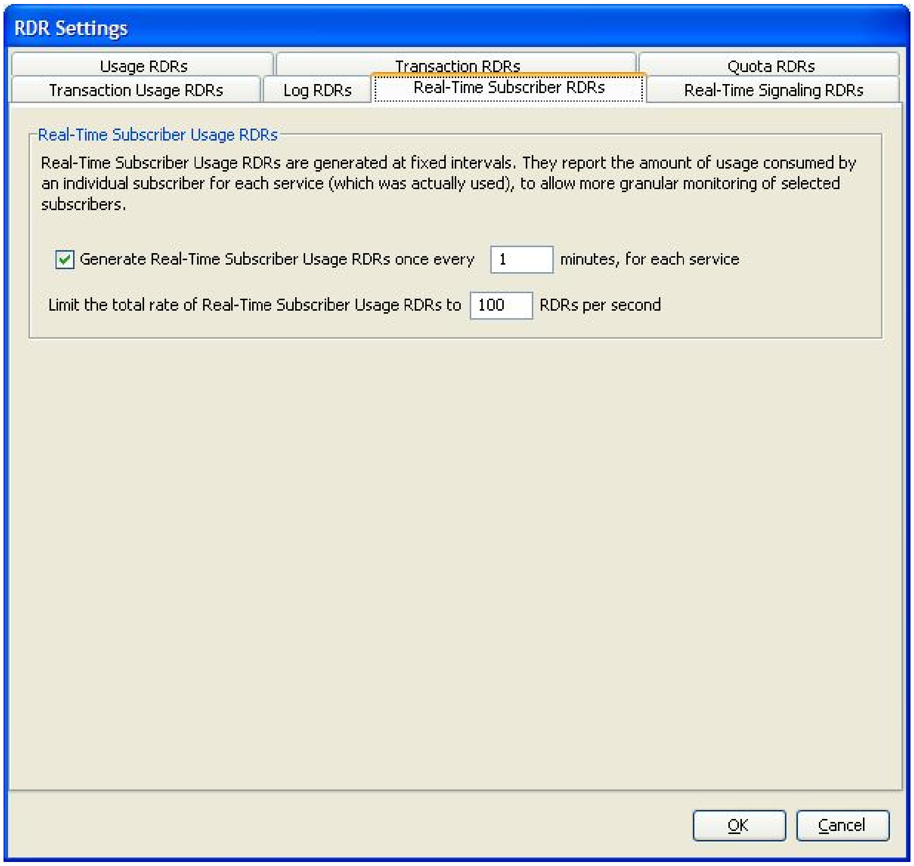
To configure the generation of Real-Time Subscriber Usage RDRs:

Step 1 From the Console main menu, choose **Configuration** > **RDR Settings**.

The RDR Settings dialog box appears.

Step 2 Click the **Real-Time Subscriber RDRs** tab.

The Real-Time Subscriber RDRs tab opens.



Real-Time Subscriber Usage RDRs

Real-Time Subscriber Usage RDRs are generated at fixed intervals. They report the amount of usage consumed by an individual subscriber for each service (which was actually used), to allow more granular monitoring of selected subscribers.

☑ Generate Real-Time Subscriber Usage RDRs once every 1 minutes, for each service

Limit the total rate of Real-Time Subscriber Usage RDRs to 100 RDRs per second

Step 3 To enable the generation of Real-Time Subscriber Usage RDRs:

- Check the **Generate Real-Time Subscriber Usage RDRs** check box.

Step 4 To change the generation interval for Real-Time Subscriber Usage RDRs:

- Enter the desired interval in minutes between each generation of the RDRs in the Generate Real-Time Subscriber Usage RDRs field.

Step 5 To limit the generation rate of Real-Time Subscriber Usage RDRs:

- Enter the maximum number of Real-Time Subscriber Usage RDRs to be generated per second in the Limit the total rate of Real-Time Subscriber Usage RDRs field.

Step 6 To configure Real-Time Signaling RDRs, continue with step 2 of the instructions in the section *Managing Real-Time Signaling RDRs* (on page 8-14).

Step 7 Click **OK**.

The RDR Settings dialog box closes.

The new configuration for the generation of RDRs is saved.

Managing Real-Time Signaling RDRs

SCA BB can generate Real-Time Signaling RDRs at the beginning and end of a flow, at specified intervals after the beginning of the flow, and at the beginning and end of a network attack.

You can use these RDRs to signal external systems concerning events detected by the SCE platform, allowing real-time actions to be taken across the network.

There are two groups of Real-Time Signaling RDRs:

- Flow Signaling RDRs:
    - Flow Start Signaling RDRs
    - Flow Stop Signaling RDRs
    - Flow Interim Signaling RDRs
- Attack Signaling RDRs:
    - Attack Start Signaling RDRs
    - Attack Stop Signaling RDRs

You can enable or disable the generation of Flow Signaling RDRs for selected packages, or for selected services per package, and set the generation interval for Flow Interim Signaling RDRs. Flow Interim Signaling RDRs can only be generated if Flow Start and Flow Stop Signaling RDRs are enabled.

You can enable or disable the generation of Attack Signaling RDRs for selected packages.

Note Malicious Traffic Periodic RDRs are enabled and configured in the *Advanced Service Configuration Options dialog box* (on page 10-39).

By default, no Real-Time Signaling RDRs are generated.

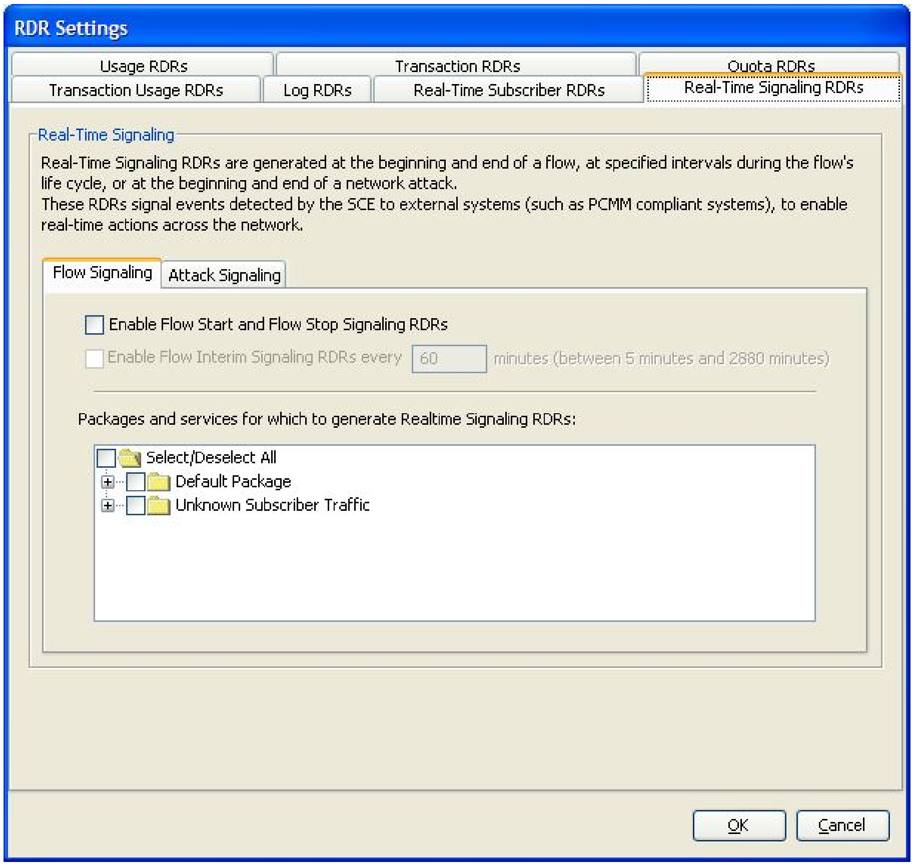
To configure the generation of Real-Time Signaling RDRs:

Step 1 From the Console main menu, choose **Configuration** > **RDR Settings**.

The RDR Settings dialog box appears.

Step 2 Click the **Real-Time Signaling RDRs** tab.

The Real-Time Signaling RDRs tab opens.



Real-Time Signaling RDRs are generated at the beginning and end of a flow, at specified intervals during the flow's life cycle, or at the beginning and end of a network attack.
These RDRs signal events detected by the SCE to external systems (such as PCMM compliant systems), to enable real-time actions across the network.

□ Enable Flow Start and Flow Stop Signaling RDRs

□ Enable Flow Interim Signaling RDRs every 60 minutes (between 5 minutes and 2880 minutes)

Packages and services for which to generate Realtime Signaling RDRs:

□ Select/Deselect All
⊞ □ Default Package
⊞ □ Unknown Subscriber Traffic

Step 3 To enable the generation of Flow Start and Flow Stop Signaling RDRs:

- Check the **Enable Flow Start and Flow Stop Signaling RDRs** check box.

  The Enable Flow Interim Signaling RDRs check box is enabled.

Step 4 To enable the generation of Flow Interim Signaling RDRs:

- Check the **Enable Flow Interim Signaling RDRs** check box.

  The Enable Flow Interim Signaling RDRs field is enabled.

Step 5 To change the generation interval for Flow Interim Signaling RDRs:

- Enter the interval in minutes between each generation of the RDRs in the Enable Flow Interim Signaling RDRs field.

Step 6 To enable the generation of Flow Interim Signaling RDRs for selected packages:

- Check the check box next to the package name in the package tree.

  The package expands to show all component services of the package; all the services are checked.

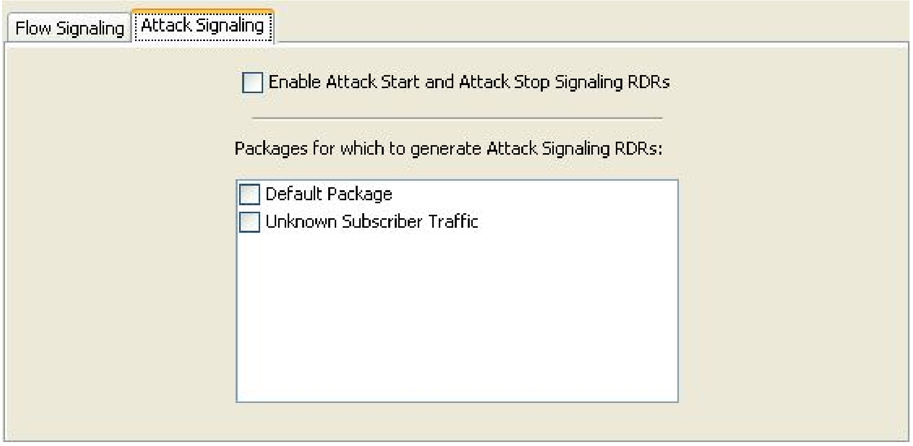
Step 7 To enable the generation of Flow Interim Signaling RDRs for selected services of a package:

a) Expand the node of the desired package.

b) Check the check box next to the service name of each desired service.

Step 8 To enable the generation of Attack Signaling RDRs:

a) In the body of the Real-Time Signaling RDRs tab, click the **Attack Signaling** tab.



□ Enable Attack Start and Attack Stop Signaling RDRs

Packages for which to generate Attack Signaling RDRs:

□ Default Package
□ Unknown Subscriber Traffic

b) Check the **Enable Attack Start and Attack Stop Signaling RDRs** check box.

Step 9 To enable the generation of Attack Signaling RDRs for selected packages:

- Check the check box next to the package name in the package list.

Step 10 Click **OK**.

The RDR Settings dialog box closes.

The new configuration for the generation of RDRs is saved.

CHAPTER 9

Using the Service Configuration Editor: Traffic Control

The *Traffic Control* capabilities of the Service Control Engine (SCE) platform and the Cisco Service Control Application for Broadband (***SCA BB***) are used to limit and prioritize traffic flows. Control of traffic is based on parameters such as the service of the flow, the subscriber's package, and the subscriber's quota state.

This chapter contains the following sections:

Managing Packages

A *package* is a description of subscriber policy. It is a collection of rules that defines the system's reaction when it encounters flows that are mapped to the service to which the rule is related. It is recommended that you first define services (see *Managing Services* (on page 7-1)) and only then add and define packages.

Every ***SCA BB*** service configuration contains a package, the *default package*, which is the root package and cannot be deleted.

A subscriber is mapped to the default package if no other package is specifically assigned to the subscriber, or if a nonexistent package is assigned to the subscriber.

A service configuration can contain up to 5000 packages.

Package Parameters

A package is defined by the following parameters:

- General parameters:
  - Package Name—A unique name for the package

  - Description—(Optional) A description of the package
- Quota Management parameters:
  - Quota Management Mode—Specifies whether subscriber quotas are managed by an external quota manager or replenished periodically by ***SCA BB***.
  - Aggregation Period Type—The quota aggregation period used when quotas are replenished periodically.
  - Quota Buckets—16 resource buckets used for quota management.
- Subscriber BW Controllers parameters:
  - Subscriber relative priority—The relative priority given to subscribers of the package at times of network congestion. Separate priorities are defined for upstream and downstream flows.
  - Subscriber Bandwidth Controllers—A list of BW controllers (BWCs) that are available to services that are part of the package. Various parameters are defined for each BWC, including a mapping to a global controller. Separate BWCs are defined for upstream and downstream flows.
- Advanced parameters:
  - Package Index—The unique number by which the system recognizes a packages. (Changing the package name does not affect SCE platform activity.) A default value of the package index is provided by the system. Do not modify this value.
  - Parent Package—The package one level higher in the package hierarchy. The parent package is important when packages share usage counters. The default package is the base of the package hierarchy, and does not have a parent.
  - Package Usage Counter—Used by the system to generate data about the total use by each package. A package can use either an exclusive package usage counter or the package usage counter of the parent package.

    Each usage counter has:
    - A name assigned by the system (based on the package name).

An asterisk is appended to a package counter name whenever the counter applies to more than one package.

    - A unique counter index—A default value of the counter index is provided by the system. Do not modify this value.
  - Calendar—The calendar that is used as the basis for the time-based rules of the package.
  - VAS Traffic Forwarding Table—The forwarding table used by the package.

These parameters are defined when you add a new package (see *Adding Packages* (on page 9-4)). You can modify them at any time (see *Editing Packages* (on page 9-7)).

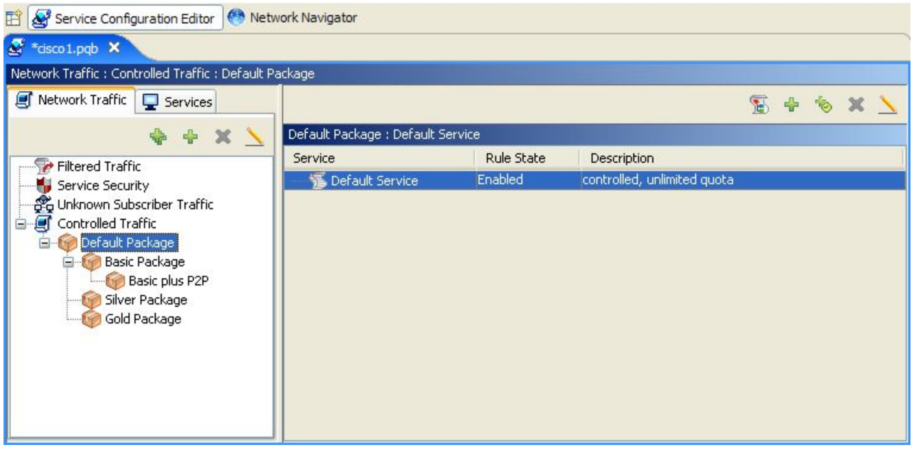
Viewing Packages

You can view a hierarchy tree of all existing packages, and you can see a list of services for which specific rules are defined for any selected package.

To view all packages:

Step 1 In the current service configuration, click the **Network Traffic** tab.

The Network Traffic tab appears.



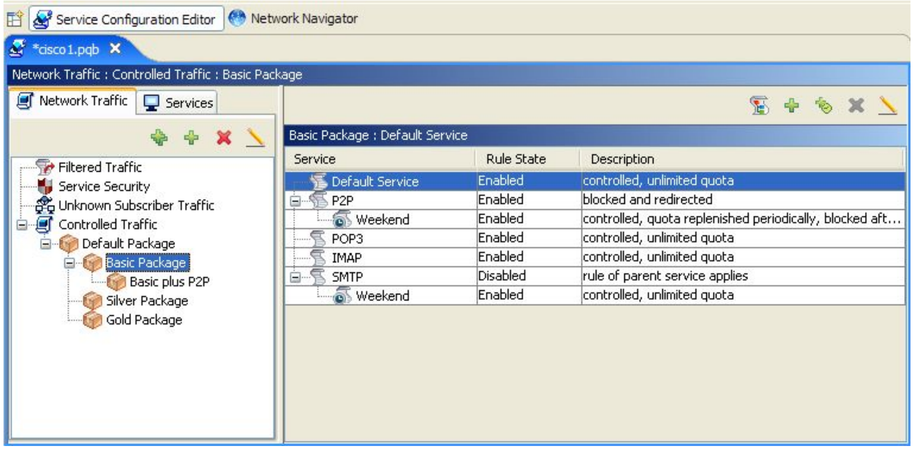
Service	Rule State	Description
Default Service	Enabled	controlled, unlimited quota

A list of all packages is displayed in the package tree.

To view more information about a package, open the Package Settings dialog box *(see Editing Pack*ages (on page 9-7)).

Step 2 Click a package in the hierarchy to display the rules of the package.

A list of all rules of this package is displayed in the right (Rule) pane.



Service	Rule State	Description
Default Service	Enabled	controlled, unlimited quota
P2P	Enabled	blocked and redirected
Weekend	Enabled	controlled, quota replenished periodically, blocked aft…
POP3	Enabled	controlled, unlimited quota
IMAP	Enabled	controlled, unlimited quota
SMTP	Disabled	rule of parent service applies
Weekend	Enabled	controlled, unlimited quota

Adding Packages

A default package is predefined in the Console installation. You can add additional packages to a service configuration, subject to the limit of 5000 packages per service configuration.

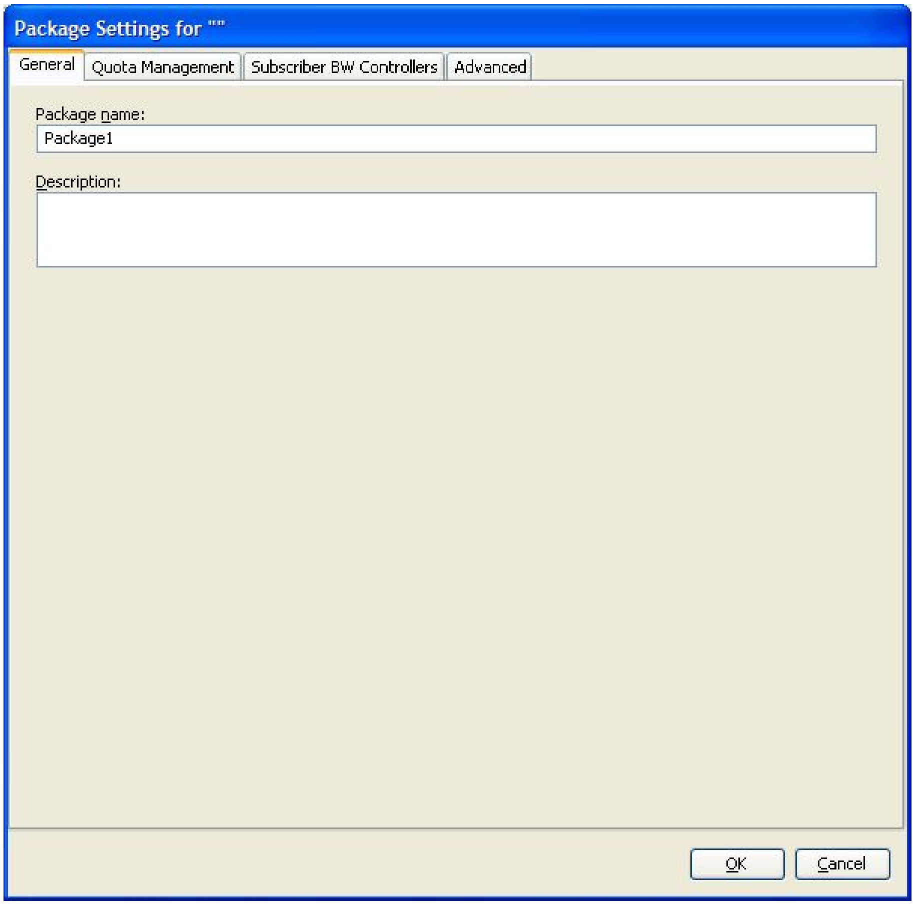
After you have added a new package, you can define rules for the package (see *Adding Rules to a Package* (on page 9-12)).

To add a package to a service configuration:

Step 1 In the Network Traffic tab, select a package from the package tree. This package will be the parent of the package you are adding.

Step 2 In the Network Traffic tab, click + (**Add Package**).

The Package Settings dialog box appears.



Package name: Package1

Description:

Step 3 In the Package name field, enter a unique and relevant name for the package.

Step 4 (Optional) In the Description field, enter a meaningful and useful description of the package.

Step 5 To configure parameters in the Advanced tab, continue with the instructions in the following section.

Step 6 Click **OK**.

The Package Settings dialog box closes.

The new package is added as a child to the package selected in the package tree and becomes the selected package. The default service rule is displayed in the right (Rule) pane.

To edit the default service rule, and to add new rules to the package, see *Managing Rules* (on page 9-10).

To configure parameters in the Quota Management tab see *Editing Package Quota Management Settings* (on page 9-47).

To configure parameters in the Subscriber BW Controllers tab, see *Editing Package Subscriber BWCs* (on page 9-38).

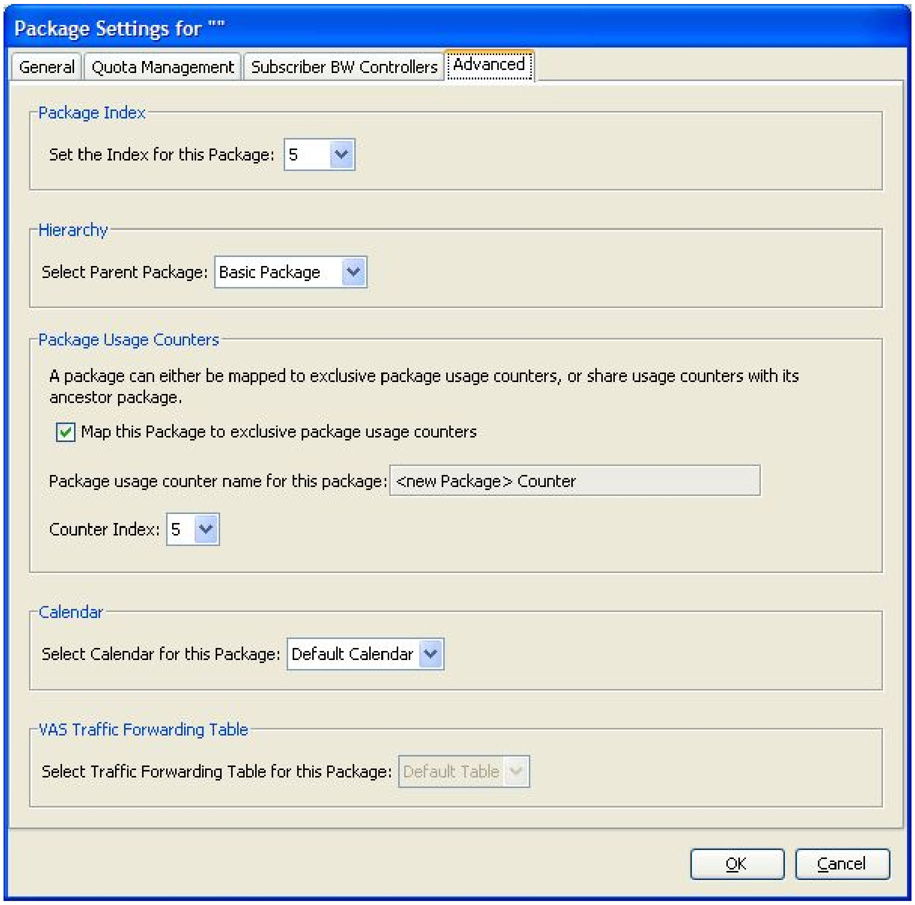
Setting Advanced Package Options

You can change the index for the package, specify an exclusive usage counter, or select a calendar for the package in the Advanced tab.

To set the package advanced options:

Step 1 In the Package Settings dialog box, click the **Advanced** tab.

The Advanced tab opens.



Package Index

Set the Index for this Package: 5

Hierarchy

Select Parent Package: Basic Package

Package Usage Counters

A package can either be mapped to exclusive package usage counters, or share usage counters with its ancestor package.

☑ Map this Package to exclusive package usage counters

Package usage counter name for this package: <new Package> Counter

Counter Index: 5

Calendar

Select Calendar for this Package: Default Calendar

VAS Traffic Forwarding Table

Select Traffic Forwarding Table for this Package: Default Table

Step 2 To change the package index for this package, from the Set the Index for this Package drop-down list, select a package index.

A default value of the index is provided by the system. Do not modify this value unless a specific index value must be assigned to the package.

Step 3 To set a different parent package for this package, select the desired parent from the Select Parent Package drop-down list.

Step 4 By default, a new package uses an exclusive usage counter. To share the parent package usage counter, uncheck the **Map this Service to exclusive package usage counters** check box.

The name in the read-only Package usage counter name for this package field changes to reflect your choice.

The Counter Index drop-down list is dimmed.

Step 5 To change the counter index (if you are using an exclusive package usage counter), select a value for the index from the Counter Index drop-down list.

A default value of the index is provided by the system. Do not modify this value.

Step 6 To set a calendar for this package (to use its time frames for time-based rules), select the desired calendar from the Select Calendar for this Package drop-down list.

Step 7 To set a VAS traffic-forwarding table for this package, select the desired traffic-forwarding table from the Select Traffic Forwarding Table for this Package drop-down list.

> If VAS traffic forwarding is disabled (the default), the drop-down list is dimmed. To enable VAS traffic forwarding, see *Enabling VAS Traffic Forwarding* (on page 10-45).

Step 8 Click **OK**.

The Package Settings dialog box closes.

The new package is added as a child to the selected parent package and becomes the selected package. The default service rule is displayed in the right (Rule) pane.

To edit the default service rule, and to add new rules to the package, see *Managing Rules* (on page 9-10).

Duplicating Packages

Duplicating an existing package is a useful way to create a new package that is similar to an existing package. It is faster to duplicate a package and then make changes than to define the package from scratch.

A duplicated package is added at the same level in the package tree as the original package.

To duplicate a package:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the Network Traffic tab, click ✚ (**Duplicate Package**).

A duplicate package is created with all the same attributes as the original package. The name of the new package is the name of the selected package followed by “(1)” (or “(2)”, and so on if a package is duplicated many times).

Step 3 Modify the package parameters (see *Editing Packages* (on page 9-7)).

Editing Packages

You can modify the parameters of a package (including the default package) at any time.

To edit a package:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the Network Traffic tab, click ✎ (**Edit Package**).

The Package Settings dialog box appears.

Step 3 In the Package name field, enter a new name for the package.

Step 4 In the Description field, enter a new description of the package.

Step 5 To change quota management settings, see *Editing Package Quota Management Settings* (on page 9-47).

Step 6 To change bandwidth control settings, see *Editing Package Subscriber BWCs* (on page 9-38).

Step 7 To change advanced settings, click the **Advanced** tab.

The Advanced tab opens.

a) To change the package index for this package, from the Set the Index for this Package drop-down list, select a Package Index.

A default value of the counter index is provided by the system. Do not modify this value unless a specific index value must be assigned to the package.

b) To change the parent package of this package, select the desired parent from the Select Parent Package drop-down list.

c) To share the parent package usage counter, uncheck the **Map this Service to exclusive package usage counters** check box.

The name in the read-only Package usage counter name for this package field changes to reflect your choice.

The Counter Index drop-down list is dimmed.

d) To use an exclusive package usage counter, check the **Map this Service to exclusive package usage counters** check box.

The name in the read-only Package usage counter name for this package field changes to reflect your choice.

The Counter Index drop-down list is enabled.

e) To change the counter index if you are using the exclusive package usage counter, select a value for the index from the Counter Index drop-down list.

A default value of the counter index is provided by the system. Do not modify this value.

f) To change the calendar used by this package, select the desired calendar from the Select Calendar for this Package drop-down list.

g) To change the VAS traffic-forwarding table for this package, select the desired traffic-forwarding table from the Select Traffic Forwarding Table for this Package drop-down list.

If VAS traffic forwarding is disabled (the default), the drop-down list is dimmed. To enable VAS traffic forwarding, see *Enabling VAS Traffic Forwarding* (on page 10-45).

Step 8 Click **OK**.

The Package Settings dialog box closes.

All changes to the package parameters are saved.

Deleting Packages

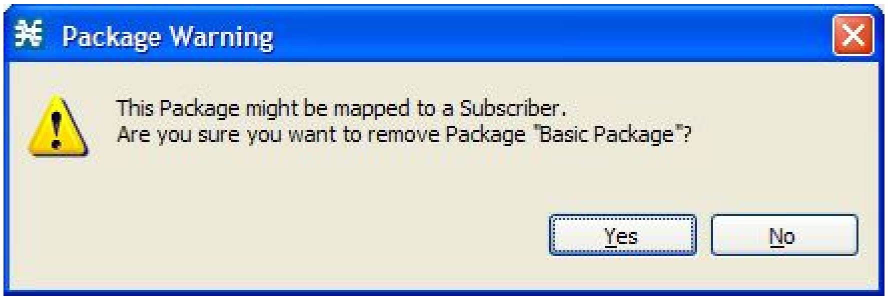
You can delete user-defined packages. The default package cannot be deleted.

To delete a package:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the Network Traffic tab, click ✖ (**Delete Package**).

A Package Warning message appears.



Package Warning

This Package might be mapped to a Subscriber.
Are you sure you want to remove Package "Basic Package"?

Step 3 Click **Yes**.

The package is deleted and is no longer displayed in the package tree.

Unknown Subscriber Traffic

If a traffic flow does not match any filter rule (see *Filtering the Traffic Flows* (on page 10-19)), and so is processed by the SCE platform, the SCE platform tries to identify the subscriber responsible for the traffic flow. The SCE platform looks at the IP address or VLAN tag of the traffic flow, and checks its internal database for a subscriber that is identified by this IP Address or VLAN tag. If such a subscriber is not found in the database, the traffic flow is mapped to the Unknown Subscriber Traffic category.

The Unknown Subscriber Traffic category is included in the tree in the Network Traffic tab, but it is not part of the package hierarchy. The Unknown Subscriber Traffic category cannot be deleted.

Unknown Subscriber Traffic is traffic:

- That does not match any Filtered Traffic Rule.

  and

- The IP address or VLAN ID of the flow does not match any subscriber in the database.

Traffic of one unknown subscriber cannot be distinguished from traffic of other unknown subscribers. This gives the following limitations when controlling unknown subscriber traffic:

- You cannot define per-subscriber usage limits.
- You cannot define subscriber-level metering with subscriber BWCs. You can only use subscriber BWCs to link a selected service to a global controller.

The Unknown Subscriber Traffic category behaves like a package with the following parameters:

- Package Name = Unknown Subscriber Traffic.
- Package Index = 4999.
- An exclusive package usage counter is defined; it is named Unknown Subscriber Traffic Counter and has Counter Index = 1023.

The following procedures are available for the Unknown Subscriber Traffic category:

- Editing the Unknown Subscriber Traffic package settings:
  - Adding extra BWCs (see *Editing Package Subscriber BWCs* (on page 9-38))
  - Selecting a calendar (see *Setting Advanced Package Options* (on page 9-5))
- Editing the default service rule:
  - Changing the Rule State (see *Editing Rules* (on page 9-16))
  - Changing per-flow actions for the rule (see *Defining Per-Flow Actions for a Rule* (on page 9-14))
- Adding rules to the Unknown Subscriber Traffic package:
  - Adding rules (see *Adding Rules to a Package* (on page 9-12)); editing (see *Editing Rules* (on page 9-16)) and deleting (see *Deleting Rules* (on page 9-18)) these rules
  - Adding time-based rules (see *Adding Time-Based Rules to a Rule* (on page 9-20*));* editing (see Editing Time-Based Rules (on page 9-22)) and deleting (see *Deleting Time-Based Rules* (on page 9-24)) these rules

Managing Rules

After you have defined services and basic packages, you can define *rules* for the package.

You can configure rules to do some or all of the following:

- Block the service
- Set a quota for the service
- Define maximum bandwidth for the service
- Define behavior when the quota for this service is breached

A rule usually applies at all times. To allow additional flexibility, you can divide the week into four separate time frames. You can define subrules—*time-based rules*—for each time frame.

Viewing the Rules of a Package

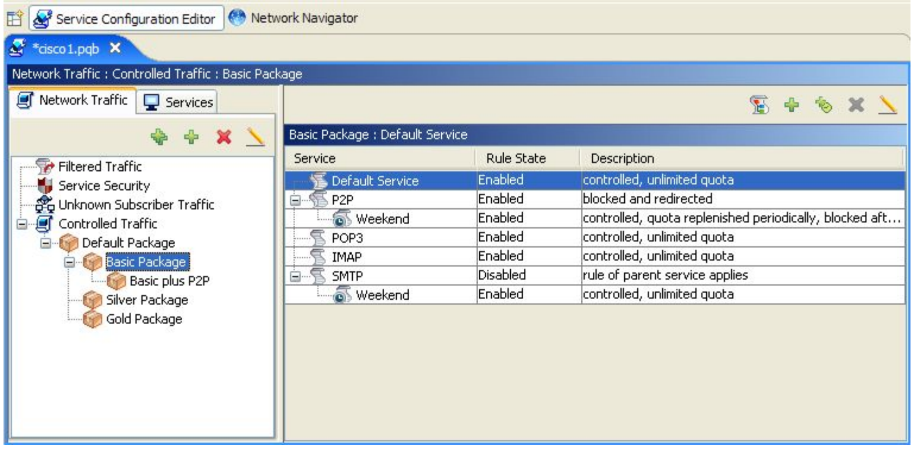
You can view a list of the rules of a package.

The listing for each rule includes an icon, the name of the service or group of services to which the rule applies, whether the rule is enabled or disabled, and a brief description of the rule.

To view the rules of a package:

Step 1 In the Network Traffic tab, select a package from the package tree.

A list of all rules defined for this package is displayed in the right (Rule) pane.



Network Traffic : Controlled Traffic : Basic Package

Basic Package : Default Service

Service	Rule State	Description
Default Service	Enabled	controlled, unlimited quota
P2P	Enabled	blocked and redirected
Weekend	Enabled	controlled, quota replenished periodically, blocked aft...
POP3	Enabled	controlled, unlimited quota
IMAP	Enabled	controlled, unlimited quota
SMTP	Disabled	rule of parent service applies
Weekend	Enabled	controlled, unlimited quota

To see more information about a rule, open the Edit Rule for Service dialog box (see *Editing Rules* (on page 9-16)).

To see more information about a time-based rule, open the Edit Time-Based Rule for Service dialog box (see *Editing Time-Based Rules* (on page 9-22)).

The Default Service Rule

A *default service rule* is assigned to every package. It cannot be deleted or disabled.

The default values of this rule are:

- Admit (do not block) traffic.
- Map traffic to the default BWCs.
- Do not limit quotas for either upstream or downstream traffic.

Rule Hierarchy

The SCE platform will apply the most specific rule to any flow.

For example, if you define rules for E-Mail and POP3, any flow that is mapped to the POP3 service will be handled according to the POP3 rule—any flow that is mapped to the SMTP or IMAP service will be handled according to the E-Mail rule. This means, for instance, that POP3 can have its own usage limits, whereas SMTP and IMAP must share usage limits.

Note If you add a rule for a child service, the settings for the parent rule are not copied to the new rule. All new rules start with default values.

Any rule that also applies to child services is indicated by . Rules that do not apply to any child services are shown by .

Time-based rules are shown as children of the relevant rule. The icon for a time-based rule also shows if the rule applies to child services (or).

See also *Displaying the Services Affected by a Rule* (on page 9-19).

Adding Rules to a Package

A default service rule is assigned to every package. You can add additional rules to a package.

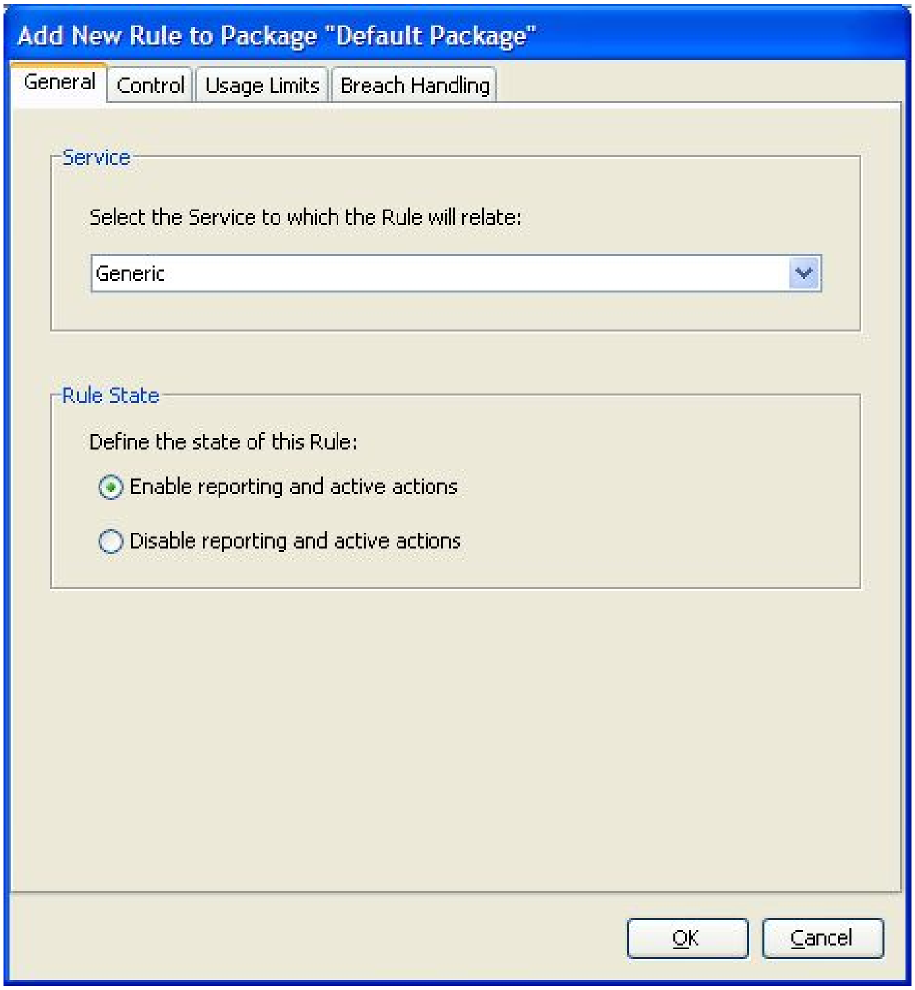
Adding time-based rules is described in the section *Adding Time-Based Rules to a Rule* (on page 9-20).

To add a rule to a package:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the right (Rule) pane, click ✚ (**Add Rule**).

The Add New Rule to Package dialog box appears.



Add New Rule to Package "Default Package"

Service

Select the Service to which the Rule will relate:

Generic

Rule State

Define the state of this Rule:

● Enable reporting and active actions

○ Disable reporting and active actions

Step 3 In the Service area of the Add New Rule to Package dialog box, select a service from the Select the Service to Which the Rule will Relate drop-down list.

Services for which a rule is already defined for this package are dimmed.

Step 4 In the Rule State area, select one of the **Define the State of this Rule** radio buttons:

- **Enable reporting and active actions**
- **Disable reporting and active actions**

You can enable or disable a rule at any time (see *Editing Rules* (on page 9-16)).

Step 5 To set behavior per traffic flow for this rule, continue with the instructions in the *section Defining Per-Flow Actions for* a Rule (on page 9-14).

Step 6 Click **OK**.

The Add New Rule to Package dialog box closes.

The new rule is added to the list of rules displayed in the right (Rule) pane.

Usage limits and breach handling are part of quota management (see *Managing Quotas* (on page 9-47)):

- To configure parameters in the Usage Limits tab see *Selecting Quota Buckets for Rules* (on page 9-48).
- To configure parameters in the Breach Handling tab, see *Editing Breach-Handling Parameters for a Rule* (on page 9-50).

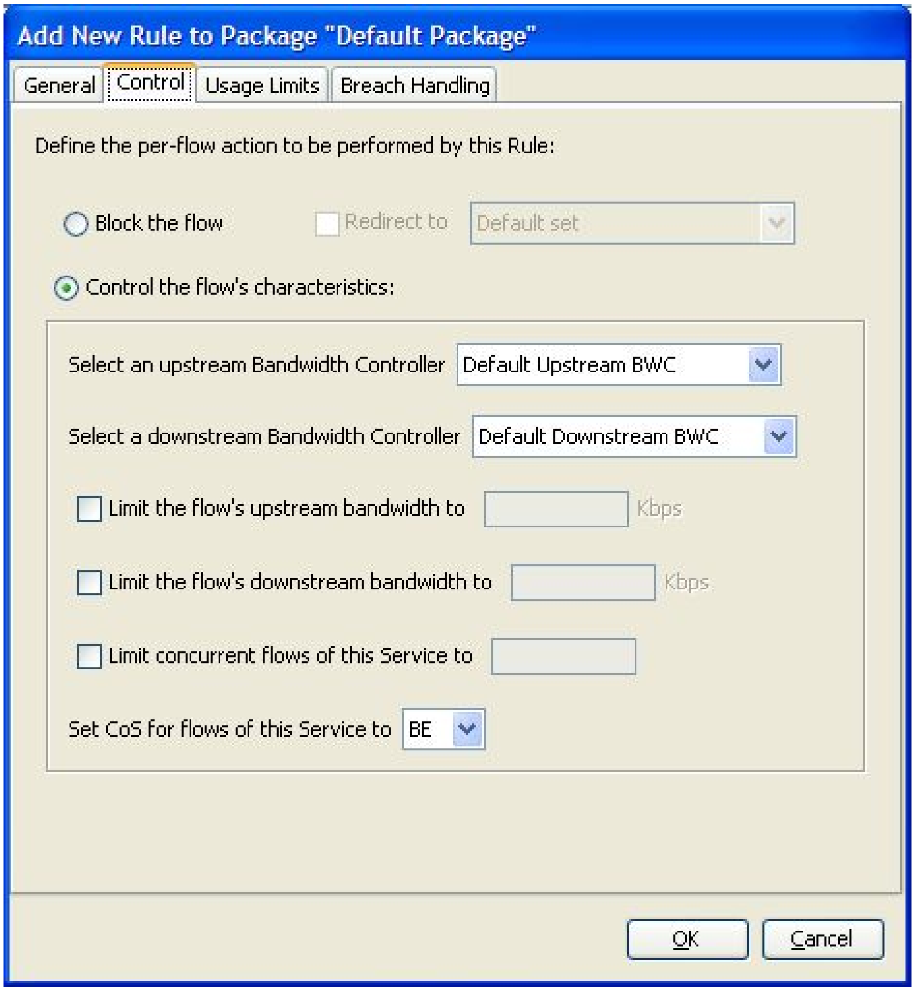
Defining Per-Flow Actions for a Rule

The Control tab of the Add New Rule to Package dialog box allows you to set behavior per traffic flow for sessions that are mapped to the current service.

To define the traffic-flow behavior of the rule:

Step 1 In the Add New Rule to Package dialog box, click the **Control** tab.

The Control tab opens.



Add New Rule to Package "Default Package"

Define the per-flow action to be performed by this Rule:

○ Block the flow □ Redirect to Default set

● Control the flow's characteristics:

Select an upstream Bandwidth Controller: Default Upstream BWC

Select a downstream Bandwidth Controller: Default Downstream BWC

□ Limit the flow's upstream bandwidth to Kbps

□ Limit the flow's downstream bandwidth to Kbps

□ Limit concurrent flows of this Service to

Set CoS for flows of this Service to: BE

To control flows that are mapped to the service of this rule, continue at step 5.

Step 2 To block flows that are mapped to the service of this rule, select the **Block the flow** radio button.

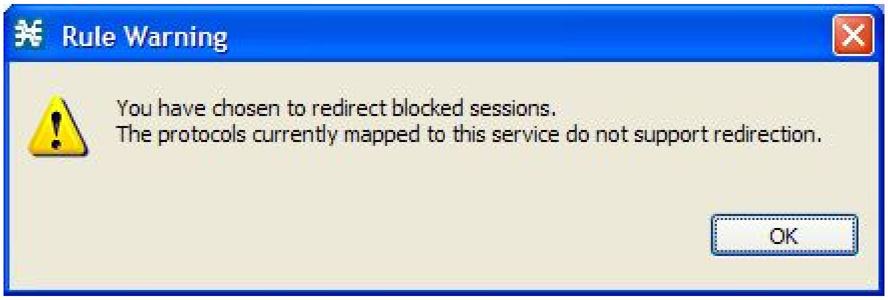
The Redirect to check box is enabled.

Only three protocol types support redirection: HTTP, HTTP Streaming, and RTSP.

Step 3 (Optional) To redirect blocked flows, check the **Redirect to** check box.

The Redirection URL Set drop-down list is enabled.

- If the service or service group for this rule includes protocols that cannot be redirected, a Rule Warning message appears.



Rule Warning

You have chosen to redirect blocked sessions.
The protocols currently mapped to this service do not support redirection.

Click **OK**.

From the Redirection URL Set drop-down list, select a URL set to serve as the redirection target. (URL redirection sets are defined in the System Settings dialog box, see *Configuring the Redirection Parameters* (on page 10-37).)

Step 4 Continue at step 12.

Step 5 Select the **Control the flow's characteristics** radio button.

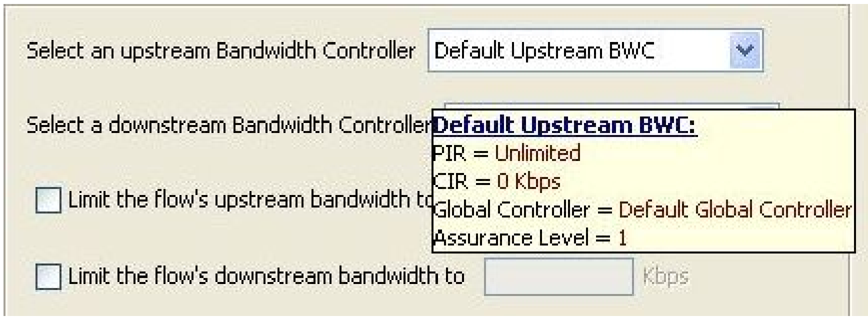
The options in the Flow Characteristic area are enabled.

Step 6 From the upstream Bandwidth Controller drop-down list, select an upstream BWC. This sets up bandwidth metering of all concurrent flows mapped to this rule, based on the characteristics of the selected BWC.

The BWCs in this drop-down list are defined when creating or editing the package (see *Editing Package Subscriber BWCs* (on page 9-38)).

Important Note for time-based rules: If you need different global controller settings for different time frames, define maximum bandwidths per time frame for one global controller (see *Setting Maximum Bandwidth of Global Controllers* (on page 9-34)) instead of creating separate global controllers for each time frame and then assigning them to time-based rules.

When the mouse is placed over the drop-down list, a tooltip appears containing the BW controller properties of the selected BW controller (Peak Information Rate (PIR), Committed Information Rate (CIR), Global Controller, and Assurance Level).



Select an upstream Bandwidth Controller: Default Upstream BWC

Select a downstream Bandwidth Controller

□ Limit the flow's upstream bandwidth to

□ Limit the flow's downstream bandwidth to Kbps

Default Upstream BWC:
PIR = Unlimited
CIR = 0 Kbps
Global Controller = Default Global Controller
Assurance Level = 1

Step 7 From the downstream Bandwidth Controller drop-down list, select a downstream BWC.

Step 8 (Optional) To set a per-flow upstream bandwidth limit, check the **Limit the flow's upstream bandwidth** check box and enter a value in the Kbps field.

Per-flow bandwidth has a granularity of 1 Kbps up to 57 Mbps.

Step 9 (Optional) To set a per-flow downstream bandwidth limit, check the **Limit the flow's downstream bandwidth** check box and enter a value in the Kbps field.

Step 10 (Optional) To set the maximum number of concurrent flows (mapped to this rule) permitted to a subscriber, check the **Limit concurrent flows of this Service** check box and enter a value in the associated field.

Step 11 From the Set CoS for flows of this Service drop-down list, select a class-of-service.

Step 12 Click **OK**.

The Add New Rule to Package dialog box closes.

The new rule is added to the list of rules displayed in the right (Rule) pane.

Editing Rules

You can edit any rule, including the default service rule.

Note You cannot disable the default service rule.

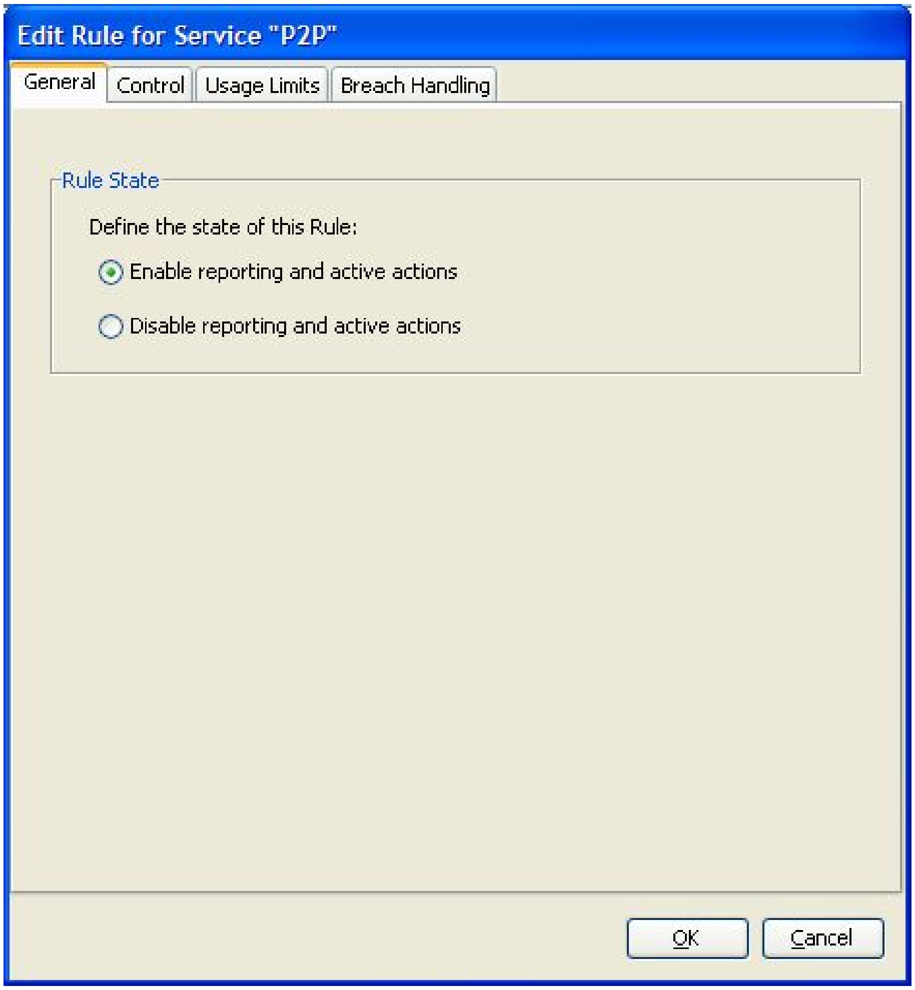
To edit a rule:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the right (Rule) pane, select a rule.

Step 3 Click ✎ (**Edit Rule**).

The Edit Rule for Service dialog box appears.



Rule State

Define the state of this Rule:

● Enable reporting and active actions

○ Disable reporting and active actions

Step 4 In the Rule State area, select one of the **Define the State of this Rule** radio buttons:

- **Enable reporting and active actions**
- **Disable reporting and active actions**

Step 5 To change behavior per traffic flow:

a) Click the **Control** tab.

The Control tab opens.

b) Follow the instructions in *Defining Per-Flow Actions for a Rule* (on page 9-14).

Step 6 To change usage limits:

a) Click the **Usage Limits** tab.

The Usage Limits tab opens.

b) Follow the instructions in *Selecting Quota Buckets for Rules* (on page 9-48).

Step 7 To define behavior when a quota is breached:

a) Click the **Breach Handling** tab.

The Breach Handling tab opens.

b) Follow the instructions in *Editing Breach-Handling Parameters for a Rule* (on page 9-50).

Step 8 Click **OK**.

a) The Edit Rule for Service dialog box closes.

All changes to the rule are saved.

Note The tabs of the Edit Rule for Service dialog box are the same as the tabs of the Add New Rule to Package dialog box, except for the General tab—you cannot change the service to which the rule applies.

Deleting Rules

You can delete any user-defined rule. The default service rule cannot be deleted.

Note You can *disable* a rule without losing its profile (see step 4 of *Editing Rules* (on page 9-16)). This allows you to enable the rule again later, without having to reset all its parameters. You cannot disable the default service rule.

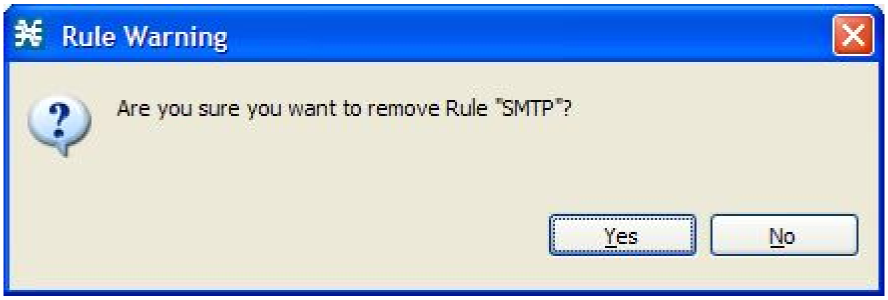
To delete a rule:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the right (Rule) pane, select a rule.

Step 3 In the Rule pane, click ✖ (**Delete Rule**).

A Rule Warning message appears.



Rule Warning

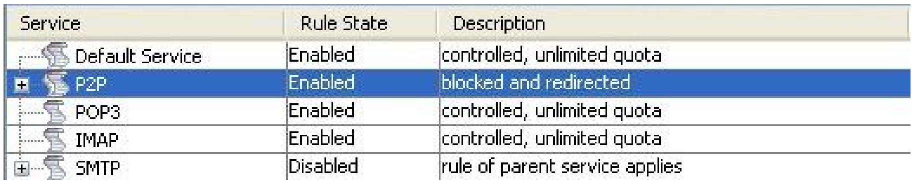
Are you sure you want to remove Rule "SMTP"?

Step 4 Click **Yes**.

The selected rule is deleted.

Displaying the Services Affected by a Rule

You can define a service as the child of another service (the parent service is a *service group*). Until you define a separate rule for a child service, the child service is governed by the rule of the parent service. A rule that affects any of a service's children is indicated in the rules list by a different icon, as illustrated for the default service rule and the P2P rule in the following figure.



Service	Rule State	Description
Default Service	Enabled	controlled, unlimited quota
⊞ P2P	Enabled	blocked and redirected
POP3	Enabled	controlled, unlimited quota
IMAP	Enabled	controlled, unlimited quota
⊞ SMTP	Disabled	rule of parent service applies

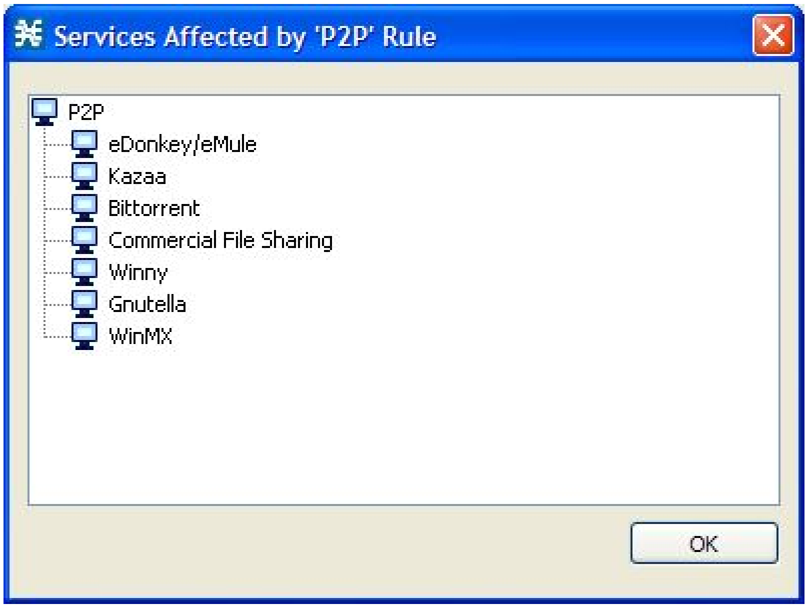
You can display all (child) services that are affected by a rule.

Note The default service rule applies to all services for which a specific rule is *not* defined.

To display all services that are affected by a specific rule:

Step 1 In the right (Rule) pane of the Network Traffic tab, select a rule and click (**Show All Services Affected By This Rule**).

The Service Affected dialog box appears.



Services Affected by 'P2P' Rule

- P2P
  - eDonkey/eMule
  - Kazaa
  - Bittorrent
  - Commercial File Sharing
  - Winny
  - Gnutella
  - WinMX

Step 2 Click **OK**.

The Service Affected dialog box closes.

Managing Time-Based Rules

The Console allows you to split the week into four time frames (see *Managing Calendars* (on page 9-25)). A *time-based rule* is a rule that applies to one time frame.

You can add time-based rules to any rule. If a time-based rule is not defined for a time frame, the parent rule is enforced.

Often, you will want the rules for the different time frames to be similar. When you add a time-based rule, the settings of the parent rule are copied to the new time-based rule; you can make any needed changes. Subsequent changes to the parent rule do not affect the time-based rule.

You must define the calendar before defining the related time-based rules.

Adding Time-Based Rules to a Rule

Adding a time-based rule to a rule allows you to specify alternate rule parameters applicable only for a specific time frame. If a time-based rule is not defined for a time frame, the parent rule is enforced.

Note When you add a time-based rule, all parameters are initially set to the values defined for the parent rule. Subsequent changes to the parent rule do not change the time-base rule.

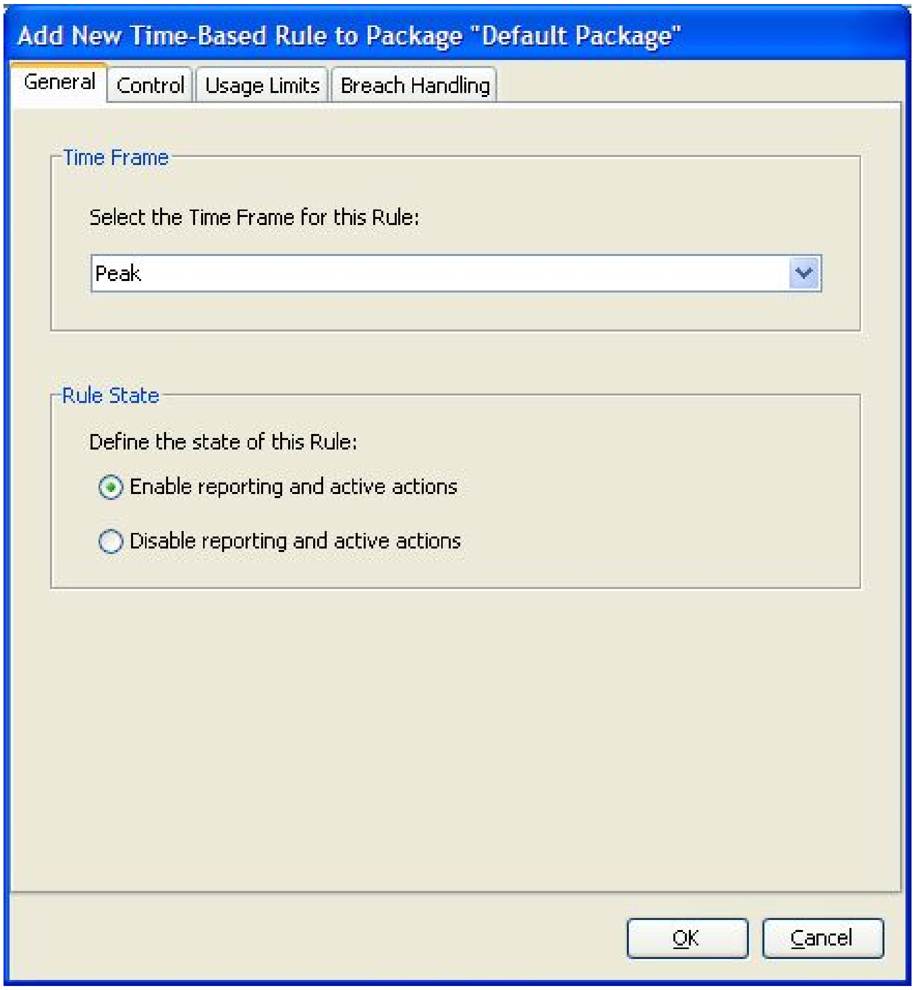
To add a time-based rule:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the right (Rule) pane, select a rule.

Step 3 Click (**Add Time-Based Rule**).

The Add New Time-Based Rule dialog box appears.



Add New Time-Based Rule to Package "Default Package"

Time Frame

Select the Time Frame for this Rule:

Peak

Rule State

Define the state of this Rule:

● Enable reporting and active actions

○ Disable reporting and active actions

Step 4 In the Time Frame area, from the Select the Time Frame for this Rule drop-down list, select one of the four time frames.

Step 5 In the Rule State area, select one of the **Define the State of this Rule** radio buttons:

- **Enable reporting and active actions**
- **Disable reporting and active actions**

Step 6 To define behavior per traffic flow:

a) Click the **Control** tab.

The Control tab opens.

b) Follow the instructions in *Defining Per-Flow Actions for a Rule* (on page 9-14).

Step 7 To change usage limits:

a) Click the **Usage Limits** tab.

The Usage Limits tab opens.

b) Follow the instructions in *Selecting Quota Buckets for Rules* (on page 9-48).

Step 8 To define behavior when a quota is breached:

a) Click the **Breach Handling** tab.

The Breach Handling tab opens.

b) Follow the instructions in *Editing Breach-Handling Parameters for a Rule* (on page 9-50).

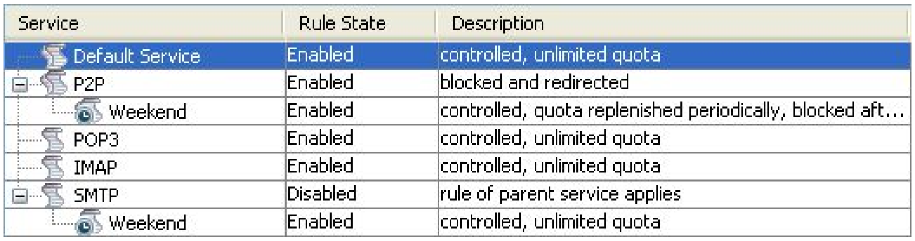
Step 9 Click **OK**.

The Add New Time-Based Rule dialog box closes.

The new time-based rule is displayed as a child of the rule in the Rule pane.

Note The tabs of the Add New Time-Based Rule dialog box are the same as the tabs of the Add New Rule to Package dialog box, except for the General tab. In the Add New Rule to Package dialog box, you select a service; in the Add New Time-Based Rule dialog box, you select a time frame.

A service whose time-based rule affects any of its child services is indicated in the rules list by a modified icon, as illustrated for the Weekend time-based rule of the P2P rule in the following screen capture.



Service	Rule State	Description
Default Service	Enabled	controlled, unlimited quota
P2P	Enabled	blocked and redirected
Weekend	Enabled	controlled, quota replenished periodically, blocked aft...
POP3	Enabled	controlled, unlimited quota
IMAP	Enabled	controlled, unlimited quota
SMTP	Disabled	rule of parent service applies
Weekend	Enabled	controlled, unlimited quota

Editing Time-Based Rules

You can edit time-based rules.

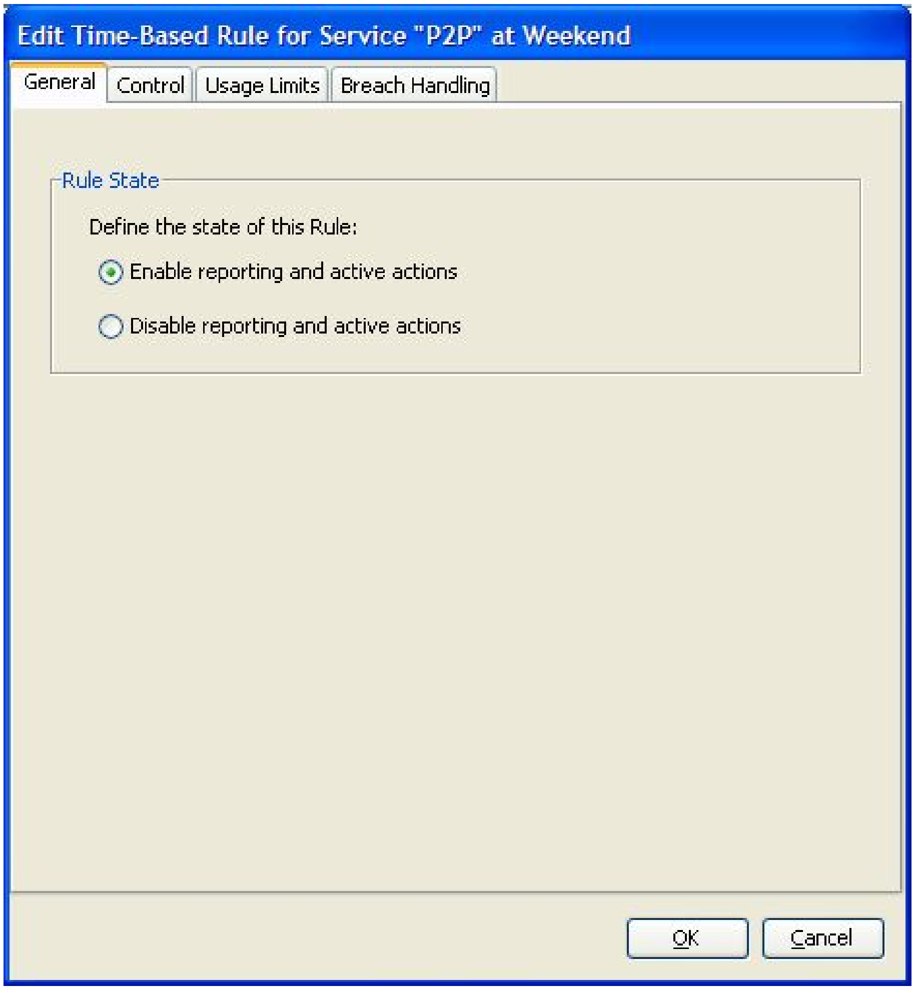
To edit a time-based rule:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the right (Rule) pane, select a time-based rule.

Step 3 Click ✎ (**Edit Rule**).

The Edit Time-Based Rule for Service dialog box appears.



Rule State

Define the state of this Rule:

● Enable reporting and active actions

○ Disable reporting and active actions

Step 4 In the Rule State area, select one of the **Define the State of this Rule** radio buttons:

- **Enable reporting and active actions**
- **Disable reporting and active actions**

Step 5 To change behavior per traffic flow:

a) Click the **Control** tab.

The Control tab opens.

b) Follow the instructions in *Defining Per-Flow Actions for a Rule* (on page 9-14).

Step 6 To change usage limits:

a) Click the **Usage Limits** tab.

The Usage Limits tab opens.

b) Follow the instructions in *Selecting Quota Buckets for Rules* (on page 9-48).

Step 7 To define behavior when a quota is breached:

a) Click the **Breach Handling** tab.

The Breach Handling tab opens.

b) Follow the instructions in *Editing Breach-Handling Parameters for a Rule* (on page 9-50).

Step 8 Click **OK**.

The Edit Time-Based Rule for Service dialog box closes.

All changes to the time-based rule are saved.

Note The tabs of the Edit Time-Based Rule for Service dialog box are the same as the tabs of the Add New Time-Based Rule dialog box, except for the General tab. You cannot change the time frame to which the rule applies.

Deleting Time-Based Rules

You can delete any time-based rule.

Note You can *disable* a rule without losing its profile (see *Editing Time-Based Rules* (on page 9-22)). This allows you to enable the rule again later, without having to reset all its parameters.

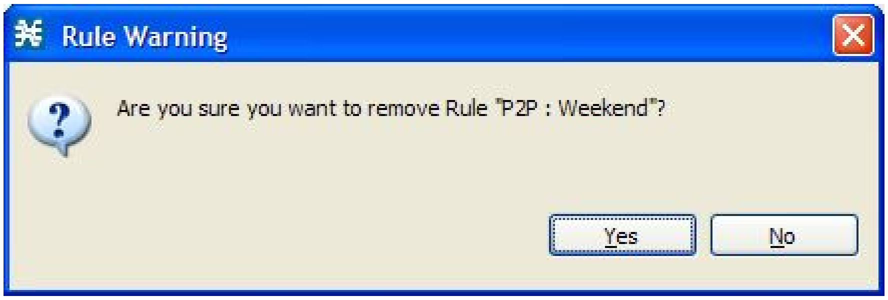
To delete a time-based rule:

Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the right (Rule) pane, select a time-based rule.

Step 3 In the Rule pane, click ✖ (**Delete Rule**).

A Rule Warning message appears.



Are you sure you want to remove Rule "P2P : Weekend"?

Step 4 Click **Yes**.

The selected rule is deleted.

Managing Calendars

Calendars are used to split the hours of the week into four *time frames*.

After you have configured a calendar, you can add time-based rules to a package that is using the calendar. A *time-based rule* is a rule that applies to only one time frame. Time-based rules allow you to set rule parameters that will apply only at specific times. You might, for example, want to define different rules for peak, off-peak, nighttime, and weekend usage.

Each service configuration includes one default calendar. You can add nine more calendars, each with a different time-frame configuration. You can use different calendars for different packages. You can also use different calendars where a service provider has customers in more than one time zone by configuring calendars with a one-hour offset from each other.

Managing calendars includes the following:

- *Viewing Calendars* (on page 9-25)
- *Adding Calendars* (on page 9-26)
- *Renaming the Time Frames* (on page 9-26)
- *Deleting Calendars* (on page 9-27)
- *Configuring the Time Frames* (on page 9-28)

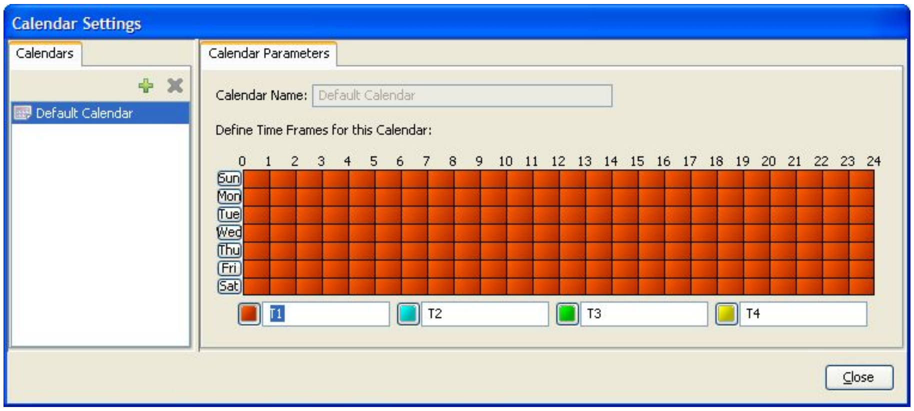
Viewing Calendars

You can view a list of existing calendars and their time frames.

To view the weekly calendars:

Step 1 From the Console main menu, choose **Configuration** > **Weekly Calendars**.

The Calendar Settings dialog box appears.



Calendar Name: Default Calendar

T1 T2 T3 T4

The Calendars tab displays a list of existing calendars. Click a calendar in the list to display its time-frame settings.

The time frames for the selected calendar are displayed and configured in the Calendar Parameters tab.

Step 2 Click **Close**.

The Calendar Settings dialog box closes.

Adding Calendars

Each service configuration includes one default calendar. You can add up to nine more calendars.

To add a calendar:

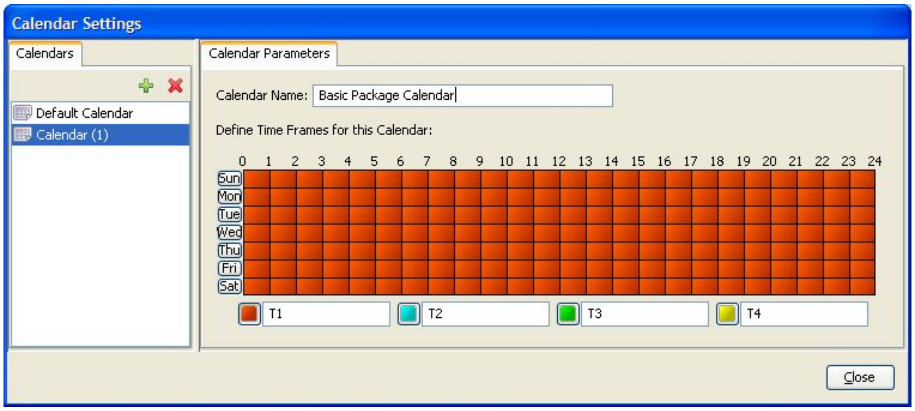
Step 1 From the Console main menu, choose **Configuration** > **Weekly Calendars**.

The Calendar Settings dialog box appears.

Step 2 In the Calendar tab, click + (**Add**).

A new calendar is added with the name Calendar (1).

Step 3 In the Calendar Parameters tab, click in the Calendar Name field and enter the name for this calendar.



Calendar Name: Basic Package Calendar

Define Time Frames for this Calendar:

Step 4 Click **Close**.

The Calendar Settings dialog box closes, and the new calendar name is saved.

Renaming the Time Frames

By default, the time frames are named T1, T2, T3, and T4. You can change these names at any time; for example, you may want to name the time frames Peak, Off Peak, Night, and Weekend.

Note Although you can configure the time frames differently in each calendar, the names of the time frames are the same in all of the calendars. If you change the name when configuring one calendar, the names are also changed for all other calendars.

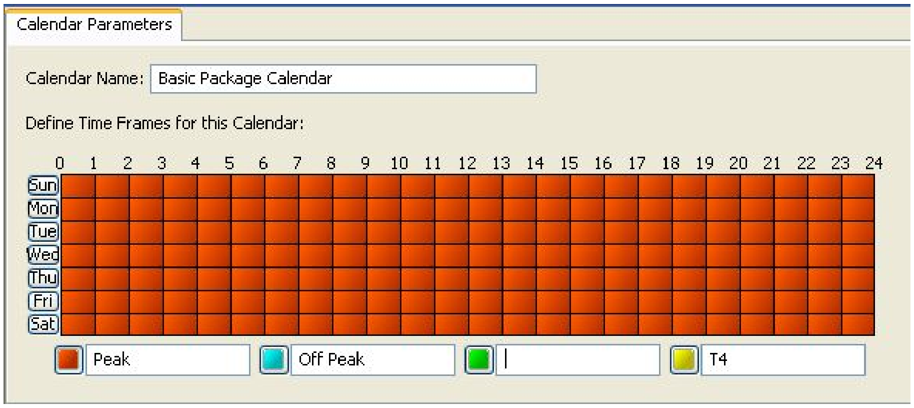
To rename the time frames:

Step 1 From the Console main menu, choose **Configuration** > **Weekly Calendars**.

The Calendar Settings dialog box appears.

In the Calendar Parameters tab, below the grid, each of the four time frames is listed in a field next to a colored square.

Step 2 Click in a Time Frame Name field, and enter a new name for the time frame.



Calendar Parameters

Calendar Name: Basic Package Calendar

Define Time Frames for this Calendar:

🟥 Peak 🟦 Off Peak 🟩 | 🟨 T4

Step 3 Repeat step 2 for the other three time frames.

Step 4 Click **Close**.

The Calendar Settings dialog box closes, and the changes to the names of the time frames are saved.

Deleting Calendars

You can delete any user-added calendar. The default calendar cannot be deleted.

Note A calendar that is being used by any package cannot be deleted. (When you select the calendar, the Delete icon is dimmed.)
To delete the calendar, you must first select a different calendar for each package that is using the calendar that will be deleted. See *Setting Advanced Package Options* (on page 9-5) for information about changing the calendar that is associated with a package.

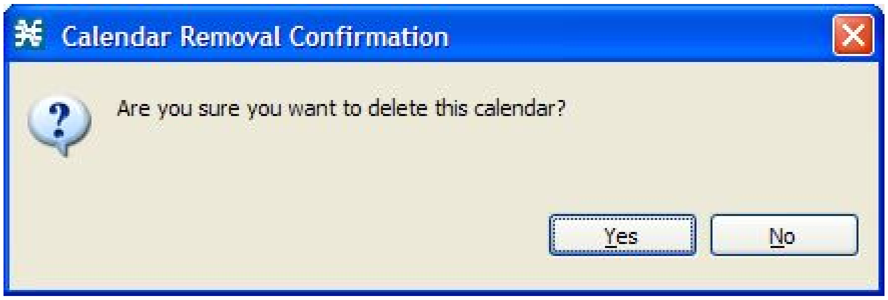
To delete a calendar:

Step 1 From the Console main menu, choose **Configuration** > **Weekly Calendars**.

The Calendar Settings dialog box appears.

Step 2 In the Calendar tab, select a calendar and click ✖ (**Delete**).

A Calendar Removal Confirmation message appears.



Calendar Removal Confirmation

Are you sure you want to delete this calendar?

Step 3 Click **Yes**.

The calendar is deleted.

Step 4 Click **Close**.

The Calendar Settings dialog box closes.

Configuring the Time Frames

By default, all the hours of the week belong to one time frame. The Console allows you to assign each of the 168 (24x7) hours of the week to one of four separate time frames. These time frames allow you to supply time-dependent differentiated services and to impose constraints on any service.

You might want, for example, to divide the week as follows:

- Peak
- Off Peak
- Night
- Weekend

You can define different time frames for each calendar.

To configure the time frames:

Step 1 From the Console main menu, choose **Configuration** > **Weekly Calendars**.

The Calendar Settings dialog box appears.

Step 2 In the Calendars tab, select a calendar to configure.

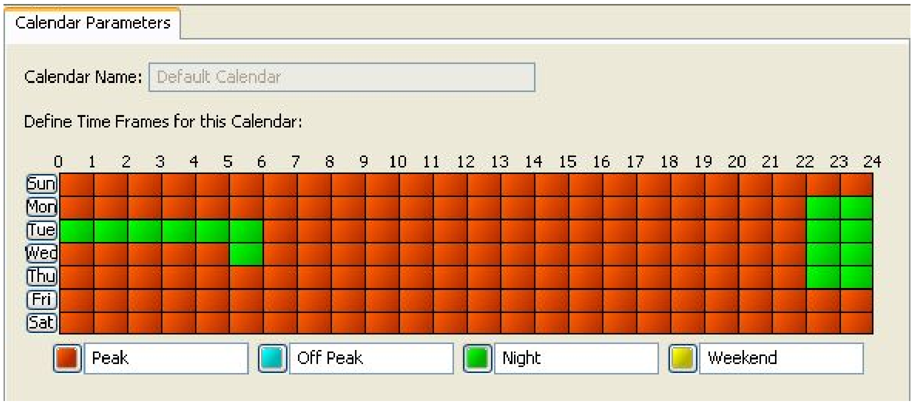
In the Calendar Parameters tab, the selected calendar’s **Define Time Frames for this Calendar** grid is displayed. The grid, representing one week, is laid out in a format of 24 hours x 7 days. Each cell represents one hour.

Below the grid, the name of each time frame appears next to a colored button.

Step 3 Click one of the colored buttons.

Step 4 Select all the cells in the grid that represent hours that will be part of the selected time frame.

You can select a group of cells by holding down the mouse button and dragging across the cells.



Calendar Parameters

Calendar Name: Default Calendar

Define Time Frames for this Calendar:

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sun	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
Mon	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟩	🟩
Tue	🟩	🟩	🟩	🟩	🟩	🟩	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟩	🟩
Wed	🟥	🟥	🟥	🟥	🟥	🟩	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟩	🟩
Thu	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟩	🟩
Fri	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
Sat	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥

🟥 Peak 🟦 Off Peak 🟩 Night 🟨 Weekend

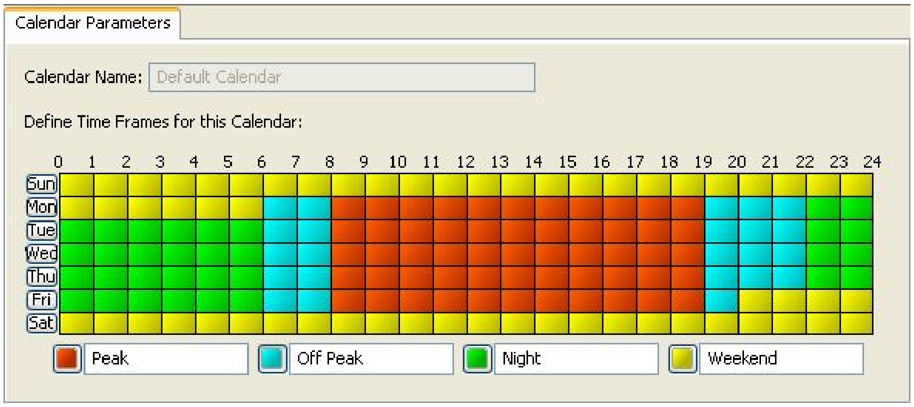
The changes are written to the service configuration as you make them.

Step 5 Repeat steps 3 and 4 for the other time frames until you have mapped the entire grid.

Step 6 Click **Close**.

The Calendar Settings dialog box closes.

You have now mapped the week into four different time frames. The following figure illustrates a possible time partition plan:



Calendar Parameters

Calendar Name: Default Calendar

Define Time Frames for this Calendar:

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sun	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨
Mon	🟨	🟨	🟨	🟨	🟨	🟨	🟦	🟦	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟦	🟦	🟦	🟩	🟩
Tue	🟩	🟩	🟩	🟩	🟩	🟩	🟦	🟦	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟦	🟦	🟦	🟩	🟩
Wed	🟩	🟩	🟩	🟩	🟩	🟩	🟦	🟦	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟦	🟦	🟦	🟩	🟩
Thu	🟩	🟩	🟩	🟩	🟩	🟩	🟦	🟦	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟦	🟦	🟦	🟩	🟩
Fri	🟩	🟩	🟩	🟩	🟩	🟩	🟦	🟦	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟦	🟨	🟨	🟨	🟨
Sat	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨

🟥 Peak 🟦 Off Peak 🟩 Night 🟨 Weekend

Managing Bandwidth

The upstream and downstream interfaces are each assigned one default global controller. You can add additional global controllers.

A service configuration can contain up to 1024 upstream global controllers and 1024 downstream global controllers (including the default global controllers).

After you have defined global controllers, you can add subscriber BW Controllers (BWCs) to packages, and map these subscriber BWCs to different global controllers.

Managing Global Bandwidth

The upstream and downstream interfaces are each assigned one default global controller that, by default, controls 100% of the link traffic. You can add up to 1023 more global controllers for each interface, and assign a maximum percentage of the total link limit to each global controller separately.

You can also define the bandwidth total link limit to be less than the physical capacity of the SCE platform for each interface separately. When another device that has limited BW capacity is next to the SCE platform on the IP stream, you can have this limitation enforced in a policy-aware manner by the SCE platform, instead of having it enforced arbitrarily by the other device.

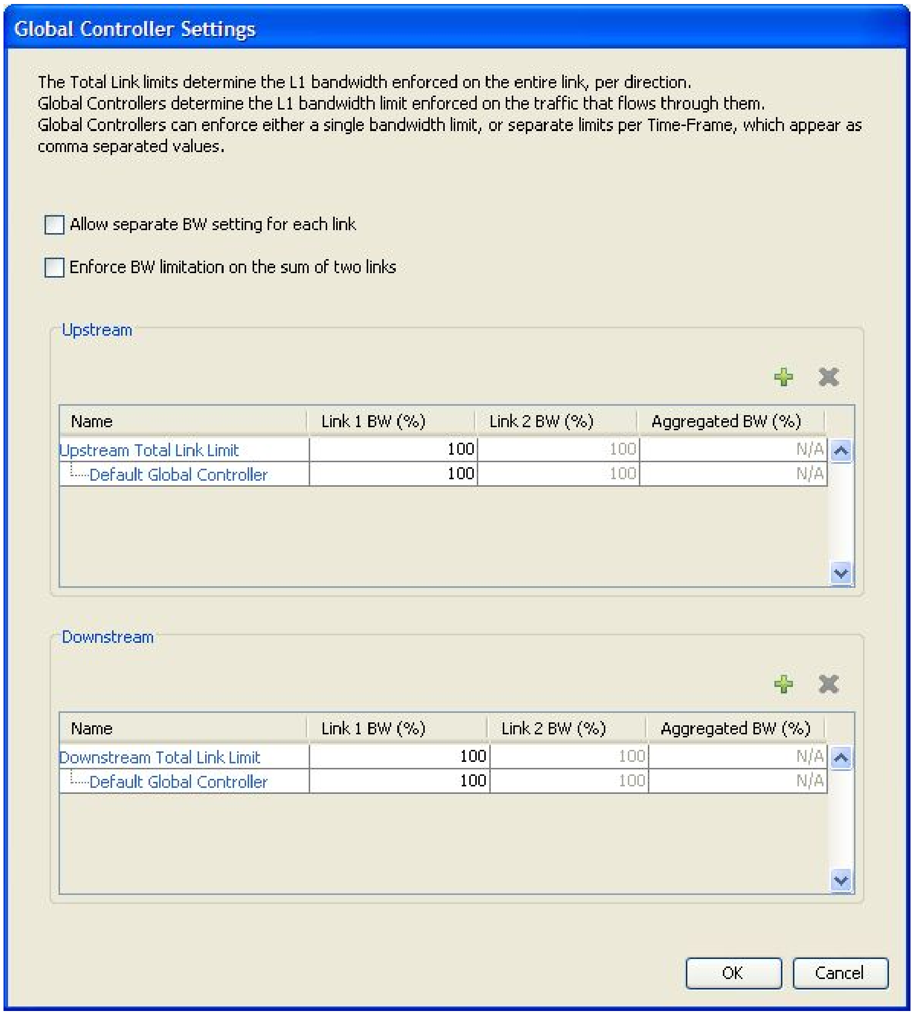
Viewing Global Controller Settings

Note Global controller bandwidth is based on Layer 1 volume.
(Accounting, reporting, and subscriber bandwidth control in ***SCA BB*** is based on Layer 3 volume.)

To view global controller settings:

Step 1 From the Console main menu, choose **Configuration** > **Global Controllers**.

The Global Controller Settings dialog box appears.



Global Controller Settings

The Total Link limits determine the L1 bandwidth enforced on the entire link, per direction.
Global Controllers determine the L1 bandwidth limit enforced on the traffic that flows through them.
Global Controllers can enforce either a single bandwidth limit, or separate limits per Time-Frame, which appear as comma separated values.

□ Allow separate BW setting for each link

□ Enforce BW limitation on the sum of two links

Upstream

Name	Link 1 BW (%)	Link 2 BW (%)	Aggregated BW (%)
Upstream Total Link Limit	100	100	N/A
Default Global Controller	100	100	N/A

Downstream

Name	Link 1 BW (%)	Link 2 BW (%)	Aggregated BW (%)
Downstream Total Link Limit	100	100	N/A
Default Global Controller	100	100	N/A

The two check boxes at the top of the Global Controller Settings dialog box are used only in dual-link systems (see *Defining Global Controllers in a Dual-Link System* (on page 9-36)).

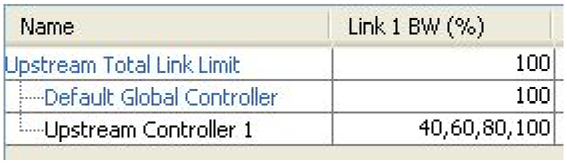
The main part of the dialog box contains the Upstream area listing upstream global controllers and the Downstream area listing downstream global controllers. Each list has four columns; the third and fourth columns are relevant to dual-link systems:

- **Name**—A unique name assigned to the global controller. The system automatically assigns the names Controller 1, Controller 2, and so on.
- **Link 1 BW (%)**—The maximum percentage of the total link limit permitted to this global controller.

  For each global controller you can set different values for the maximum bandwidth for each of the four time frames defined by the default calendar (see *Managing Calendars* (on page 9-25)):

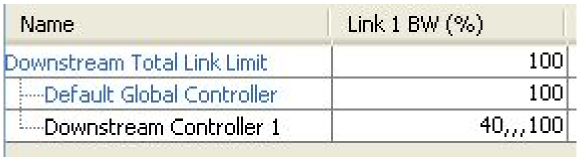
  - A single value in this field indicates that the maximum bandwidth for this global controller is constant.

- If each time frame has a different maximum bandwidth, the maximum bandwidth for each time frame is displayed, separated by commas.



Name	Link 1 BW (%)
Upstream Total Link Limit	100
Default Global Controller	100
Upstream Controller 1	40,60,80,100

- If two time frames have the same maximum bandwidth, the value is not repeated. (So **40,,,100** means that the first three time frames have a maximum bandwidth of 40% of the total link limit, and the fourth time frame has a maximum bandwidth equal to the total link limit.)

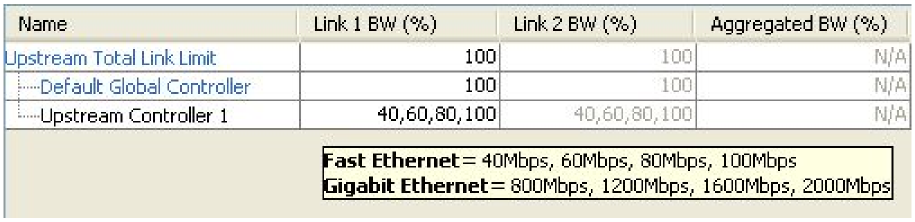


Name	Link 1 BW (%)
Downstream Total Link Limit	100
Default Global Controller	100
Downstream Controller 1	40,,,100

- Trailing commas are suppressed. (So **40,100** means that the first time frame has a maximum bandwidth of 40% of the total link limit, and the other three time frames have a maximum bandwidth equal to the total link limit.)

Step 2 To view the actual maximum bandwidth values, place the cursor over the Link 1 BW (%) cell.

A tooltip appears, showing the actual maximum bandwidth permitted to this global controller, in Mbps. This figure is calculated automatically by the system based on the possible SCE platform types (Gigabit Ethernet or Fast Ethernet), the controller maximum bandwidth percentage, and the total link bandwidth percentage.



Name	Link 1 BW (%)	Link 2 BW (%)	Aggregated BW (%)
Upstream Total Link Limit	100	100	N/A
Default Global Controller	100	100	N/A
Upstream Controller 1	40,60,80,100	40,60,80,100	N/A

Fast Ethernet= 40Mbps, 60Mbps, 80Mbps, 100Mbps
Gigabit Ethernet= 800Mbps, 1200Mbps, 1600Mbps, 2000Mbps

Step 3 Click **OK**.

The Global Controller Settings dialog box closes.

Editing the Total Link Limits

You can limit the total bandwidth passing through the SCE platform.

For example, if another device sitting next to the SCE platform on the IP stream has limited BW capacity, you can limit the bandwidth passing through the SCE platform to match the capacity of the other device.

The total link limits for upstream and downstream traffic are defined independently.

To edit the total link limit:

Step 1 From the Console main menu, choose **Configuration** > **Global Controllers**.

The Global Controller Settings dialog box appears.

Step 2 Click in the Link 1 BW (%) cell of the Upstream Total Link Limit or Downstream Total Link Limit, and enter the maximum percentage of the SCE platform capacity that the platform will carry.

The values displayed in the tooltips of all the cells in the Link 1 BW (%) cells change to reflect the new total link limit.

Step 3 Click **OK**.

Your changes are saved.

The Global Controller Settings dialog box closes.

Adding Global Controllers

You can add up to 1023 upstream global controllers and 1023 downstream global controllers to a service configuration.

To add a global controller:

Step 1 From the Console main menu, choose **Configuration** > **Global Controllers**.

The Global Controller Settings dialog box appears.

Step 2 Above the area (Upstream or Downstream) of the desired interface, click ✚ (**Add**).

A new global controller is added to the interface global controller list with a maximum bandwidth capacity of 100% of the total link limit.

Step 3 In the Name cell of the new global controller, enter a meaningful name.

You can use the default name for the global controller. It is recommended that you enter a meaningful name.

Step 4 To edit the maximum bandwidth of the global controller, continue with the instructions in the section *Setting Maximum Bandwidth of Global Controllers* (on page 9-34).

Step 5 Click **OK**.

Your changes are saved.

The Global Controller Settings dialog box closes.

Setting Maximum Bandwidth of Global Controllers

You can edit the maximum bandwidth (as a percentage of the total link limit) that a global controller can carry.

You can set a different maximum bandwidth for each of the four available time frames.

In a dual-link system, you can set different values for each link and for the aggregated BW of the two links.

To set the maximum bandwidth of global controllers:

Step 1 From the Console main menu, choose **Configuration** > **Global Controllers**.

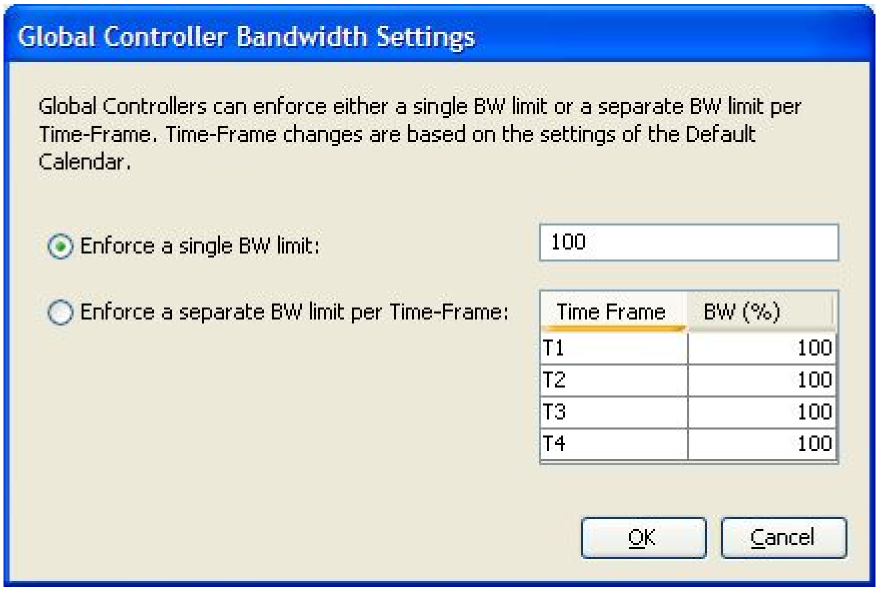
The Global Controller Settings dialog box appears.

Step 2 Click in a BW (%) cell of a global controller listing.

A Browse button appears in the cell.

Step 3 Click the **Browse** button.

The Global Controller Bandwidth Settings dialog box appears.



Global Controller Bandwidth Settings

Global Controllers can enforce either a single BW limit or a separate BW limit per Time-Frame. Time-Frame changes are based on the settings of the Default Calendar.

● Enforce a single BW limit: 100

○ Enforce a separate BW limit per Time-Frame:

Time Frame	BW (%)
T1	100
T2	100
T3	100
T4	100

Step 4 To set a single value for the maximum percentage of the total link limit that this global controller carries:

- Select **Enforce a single BW limit**, and enter the desired value for the maximum percentage of bandwidth.

Step 5 To have the maximum percentage of the total link limit that this global controller carries vary according to time frame:

- Select **Enforce a separate BW limit per Time Frame**, and enter the desired value in each BW (%) cell.

These values will be applied to the time frames of the default calendar.

Step 6 Click **OK**.

The Global Controller Bandwidth Settings dialog box closes.

The value in the BW (%) cell changes to reflect the new bandwidth limits.

Step 7 Repeat steps 2 to 6 for other global controllers.

Step 8 Click **OK**.

Your changes are saved.

The Global Controller Settings dialog box closes.

Deleting Global Controllers

You can delete unused global controllers at any time. The default global controller and the Total Link Limit cannot be deleted.

To delete a global controller:

Step 1 From the Console main menu, choose **Configuration** > **Global Controllers**.

The Global Controller Settings dialog box appears.

Step 2 Select a global controller.

Step 3 Click ✖ (**Delete**).

If the specified global controller is being used by a subscriber BWC (see *Editing Package Subscriber BWCs* (on page 9-38)), a Global Controller cannot be removed message is displayed. The global controller cannot be deleted until you unassign it from all subscriber BWCs.

The global controller is deleted.

Step 4 Click **OK**.

Your changes are saved.

The Global Controller Settings dialog box closes.

Defining Global Controllers in a Dual-Link System

In a dual-link system, you can define each global controller's maximum bandwidth separately for each link.

Alternatively, you can apply bandwidth limitations to the sum of the two links.

Setting Global Controller Bandwidth Limits Separately for Each Link

To define global controllers separately for each link in a dual-link system:

Step 1 From the Console main menu, choose **Configuration** > **Global Controllers**.

The Global Controller Settings dialog box appears.

Step 2 Add global controllers, as described in *Adding Global Controllers* (on page 9-33).

Step 3 Check the **Allow separate BW setting for each link** check box.

The cells in the Link 2 BW (%) column are enabled.

Each cell has the same value as the parallel cell in the Link 1 BW (%) column.

Step 4 Define the bandwidth percentages (Link 1 BW (%)) for the global controllers for link 1.

Changes to bandwidth percentages are not copied to the Link 2 tab.

Step 5 In the Link 2 BW (%) column, define the bandwidth percentages for the global controllers for link 2.

Step 6 Click **OK**.

Your changes are saved.

The Global Controller Settings dialog box closes.

Setting Global Controller Bandwidth Limits as the Sum of Two Links

To set a single bandwidth limit as the sum of two links in a dual-link system:

Step 1 From the Console main menu, choose **Configuration** > **Global Controllers**.

The Global Controller Settings dialog box appears.

Step 2 Check the **Enforce BW limitation on the sum of two links** check box.

The cells in the Aggregated BW (%) column are enabled and contain the value 100.

Step 3 Click **OK**.

Your changes are saved.

The Global Controller Settings dialog box closes.

Managing Subscriber Bandwidth

After you have defined global controllers, you can add subscriber BWCs to packages and map these subscriber BWCs to different global controllers.

A *Subscriber BWC* is a mechanism that supports the control of subscriber bandwidth consumption for upstream or downstream flows. A subscriber BWC allows the control and metering of the bandwidth of an aggregation of traffic flows of a service or group of services.

Each package has its own set of BWCs that determine the bandwidth available per package subscriber for each available service.

There are two *Primary BWCs* that operate at the subscriber level, one for upstream traffic and one for downstream traffic. The Primary BWCs allocate bandwidth to specific subscribers, depending upon the Committed Information Rate (CIR), Peak Information Rate (PIR), and the Subscriber relative priority settings. You can configure these parameters, but the Primary BWCs cannot be deleted.

There are two default BWCs, one for upstream traffic and one for downstream traffic. By default, all services are mapped to one of these two BWCs. The BWC mechanism controls rate subpartitioning within the default BWC rate control, based on the CIR, PIR, CoS, and AL. You can configure these parameters, but the default BWCs cannot be deleted.

You can add up to 32 user-defined BWCs per package:

- *Subscriber BWCs* operate at the service-per-subscriber level. They allocate bandwidth for each subscriber's service, based upon the CIR, PIR, Global Controller and Assurance Level (AL) set for the BWC. Each rule defines a link between the service's flows and one of the BWCs (unless the flows are to be blocked). See *Defining Per-Flow Actions for a Rule* (on page 9-14).
- An *Extra BWC* is a unique capability that also operates at the subscriber level. Extra BWCs are allocated for services that are not included in the Primary BWC. Extra BWCs are defined (based on CIR, PIR, Global Controller, and AL), in addition to the Primary BWC. Define an Extra BWC for services that are not often used but have strict bandwidth requirements, for example, a video conference call. The Extra BWCs are BWCs that control a single service (or service group). BWCs cannot borrow bandwidth from Extra BWCs and vice versa.

Each user-defined BWC controls either downstream or upstream traffic.

Bandwidth control is explained in greater detail in the section *Subscriber Bandwidth Control* (on page 3-13).

Subscriber BWC Parameters

The following are the configuration parameters in the Subscriber BW Controllers tab of the Package Settings dialog box:

- Name—A unique name for each BWC.
- CIR (L3 Kbps)—The minimum bandwidth that must be granted to traffic that is controlled by the BWC.
- PIR (L3 Kbps)—The maximum bandwidth allowed to traffic that is controlled by the BWC.

Bandwidth for a subscriber BWC has a granularity of 16 Kbps:

If you specify a bandwidth of, for instance, 64 Kbps, the bandwidth will be stable at this value.

If you specify a bandwidth of, for instance, 70 Kbps, the bandwidth will be unstable and oscillate between 64 Kbps and 80 Kbps.

- Global Controller—The global controller with which this subscriber BWC is associated. The global controllers are virtual queues that are part of the bandwidth control mechanism (see *Global Bandwidth Control* (on page 3-13)). Direct traffic with similar bandwidth control properties to the same global controller.
- AL—How fast bandwidth decreases from PIR to CIR as congestion builds, or increases from CIR to PIR as congestion decreases. A higher AL ensures a higher bandwidth compared to a similar BWC with a lower AL. 1 is the lowest assurance value, 10 (persistent) is the highest assurance value.

  Assurance Level 10 (persistent) has the added quality that it does not ever reduce below the relevant CIR, unless the total line rate cannot sustain this.
- Subscriber relative priority—Assurance Level given to the Total BWC of the subscriber. It determines the assurance given to all the subscriber traffic when competing for bandwidth with subscribers to other packages. 1 is the lowest value and 10 is the highest value.

Note Subscriber bandwidth control (and accounting and reporting) is based on Layer 3 volume. Global controller bandwidth is based on Layer 1 volume.

Editing Package Subscriber BWCs

To edit the package BWC settings:

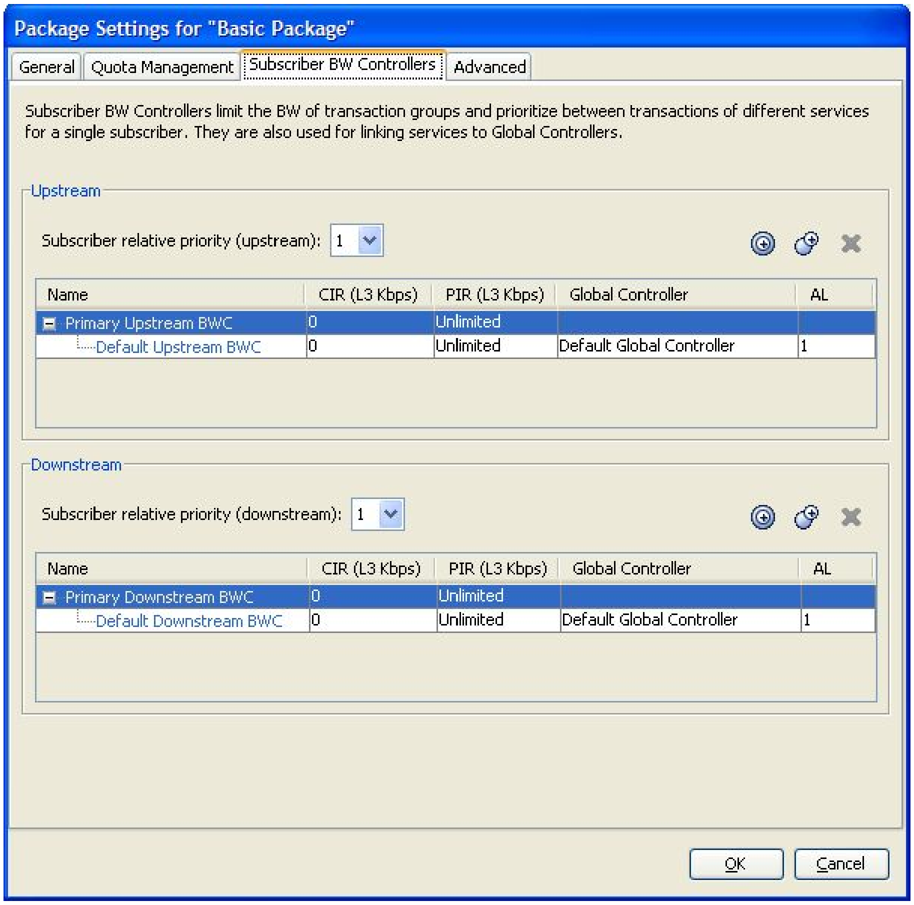
Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the Network Traffic tab, click ✎ (**Edit Package**).

The Package Settings dialog box appears.

Step 3 In the Package Settings dialog box, click the **Subscriber BW Controllers** tab.

The Subscriber BW Controllers tab opens.


Package Settings for "Basic Package"
General
Quota Management
Subscriber BW Controllers
Advanced
Upstream
Downstream
OK
Cancel

Subscriber BW Controllers limit the BW of transaction groups and prioritize between transactions of different services for a single subscriber. They are also used for linking services to Global Controllers.

Upstream

Subscriber relative priority (upstream): 1

Name	CIR (L3 Kbps)	PIR (L3 Kbps)	Global Controller	AL
Primary Upstream BWC	0	Unlimited		
Default Upstream BWC	0	Unlimited	Default Global Controller	1

Downstream

Subscriber relative priority (downstream): 1

Name	CIR (L3 Kbps)	PIR (L3 Kbps)	Global Controller	AL
Primary Downstream BWC	0	Unlimited		
Default Downstream BWC	0	Unlimited	Default Global Controller	1

Step 4 Set your requirements for upstream bandwidth control in the Upstream area of the dialog box:

a) Select a value from the Subscriber relative priority drop-down list.

1 is the lowest priority and 10 is the highest.

b) Set the parameters for the Primary Upstream BWC:

- In the CIR field, enter the BWC CIR in Kbps.
- In the PIR field, select **Unlimited** from the drop-down list, or enter the BWC PIR in Kbps.

c) To add BWCs to the package, click ⊕ (**Add a sub BW Controller**) once for each additional BWC.

d) To add Extra BWCs to the package, click ⊕ (**Add an extra BW Controller**) once for each additional BWC.

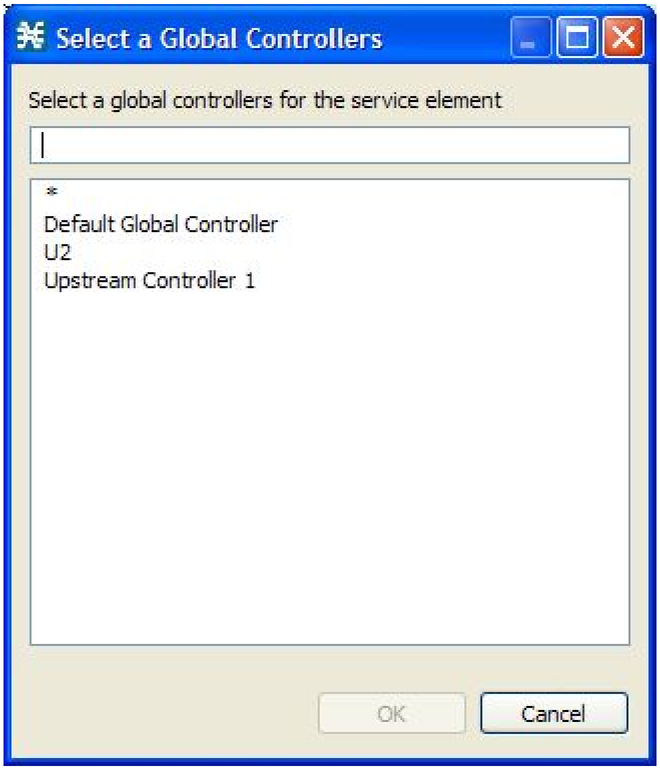
e) Set the parameters for each BWC (including the Primary and Default BWCs):

- In the CIR field, enter the BWC CIR in Kbps.
- In the PIR field, select **Unlimited** from the drop-down list, or enter the BWC PIR in Kbps.
- To set the global controller with which this BWC is associated:

Click in the Global Controller cell of the BWC, and click the **Browse** button that appears.

The Select a Global Controller dialog box appears.

Figure 9-1: Select a Global Controller dialog box



Select a global controllers for the service element

*
Default Global Controller
U2
Upstream Controller 1

Select a global controller and click **OK**.

- Select a value from the AL drop-down list.

1 is the lowest value and Persistent is the highest value.

Step 5 Repeat step 4 for downstream bandwidth control in the Downstream area of the dialog box.

Step 6 Click **OK**.

The Package Settings dialog box closes.

All changes to the BWC settings are saved.

Managing Bandwidth: a Practical Example

This section explains how to combine the global controllers and subscriber BWCs to achieve effective bandwidth control.

To configure total bandwidth control:

Step 1 Configure the necessary global controllers.

Try to ascertain which services are likely to be problematic, and what the maximum percentage of total bandwidth should be for each. You do not need to configure services and packages that are unlikely to be problematic; you can include them in the default global controllers.

Step 2 Configure the subscriber BWCs for the package:

a) Add a subscriber BWC for each type of upstream or downstream traffic that you want to limit, and configure the Committed Information Rate (CIR) and the Peak Information Rate (PIR) accordingly.

b) Select an appropriate global controller for each subscriber BWC.

Step 3 Create a rule for each service that is to have its own BWC.

Select appropriate upstream and downstream BWCs for each service.

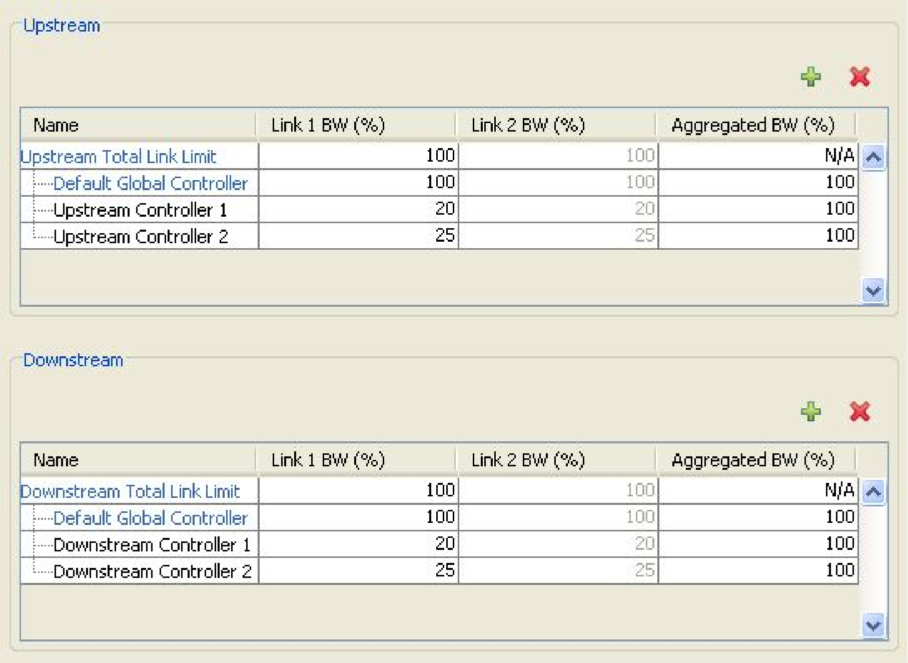
EXAMPLE

To limit P2P and streaming traffic:

This example assumes that the traffic flow is bidirectional; you may decide that you only need upstream controllers *or* downstream controllers.

Step 1 Define two upstream global controllers and two downstream global controllers and assign the desired percentage of traffic to each global controller.

Upstream Controller 1 and Downstream Controller 1 will be used for P2P traffic, and Upstream Controller 2 and Downstream Controller 2 will be used for streaming traffic.



Upstream

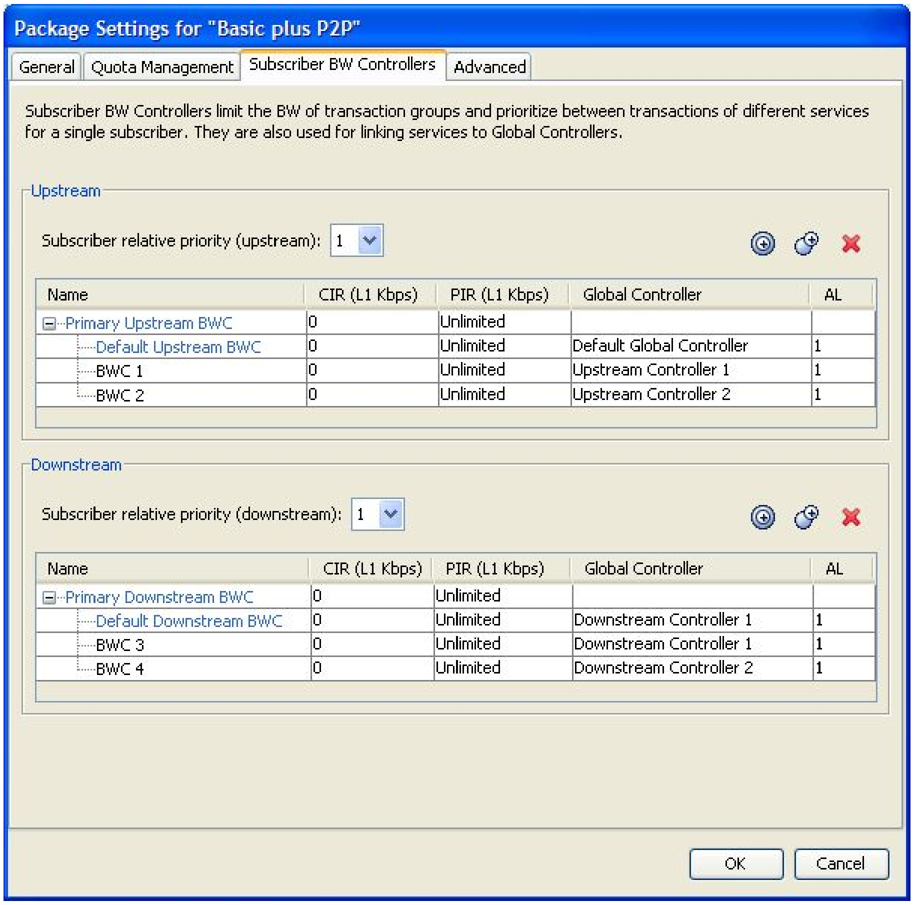
Name	Link 1 BW (%)	Link 2 BW (%)	Aggregated BW (%)
Upstream Total Link Limit	100	100	N/A
Default Global Controller	100	100	100
Upstream Controller 1	20	20	100
Upstream Controller 2	25	25	100

Downstream

Name	Link 1 BW (%)	Link 2 BW (%)	Aggregated BW (%)
Downstream Total Link Limit	100	100	N/A
Default Global Controller	100	100	100
Downstream Controller 1	20	20	100
Downstream Controller 2	25	25	100

Step 2 In a package add two upstream BWCs and two downstream BWCs, map them to the appropriate global controllers, and set their parameters (CIR, PIR, AL).

(BWC1 is for upstream P2P traffic and BWC3 is for downstream P2P traffic; BWC2 is for upstream streaming traffic and BWC4 is for downstream streaming traffic.)



Package Settings for "Basic plus P2P"

Subscriber BW Controllers limit the BW of transaction groups and prioritize between transactions of different services for a single subscriber. They are also used for linking services to Global Controllers.

Upstream

Subscriber relative priority (upstream): 1

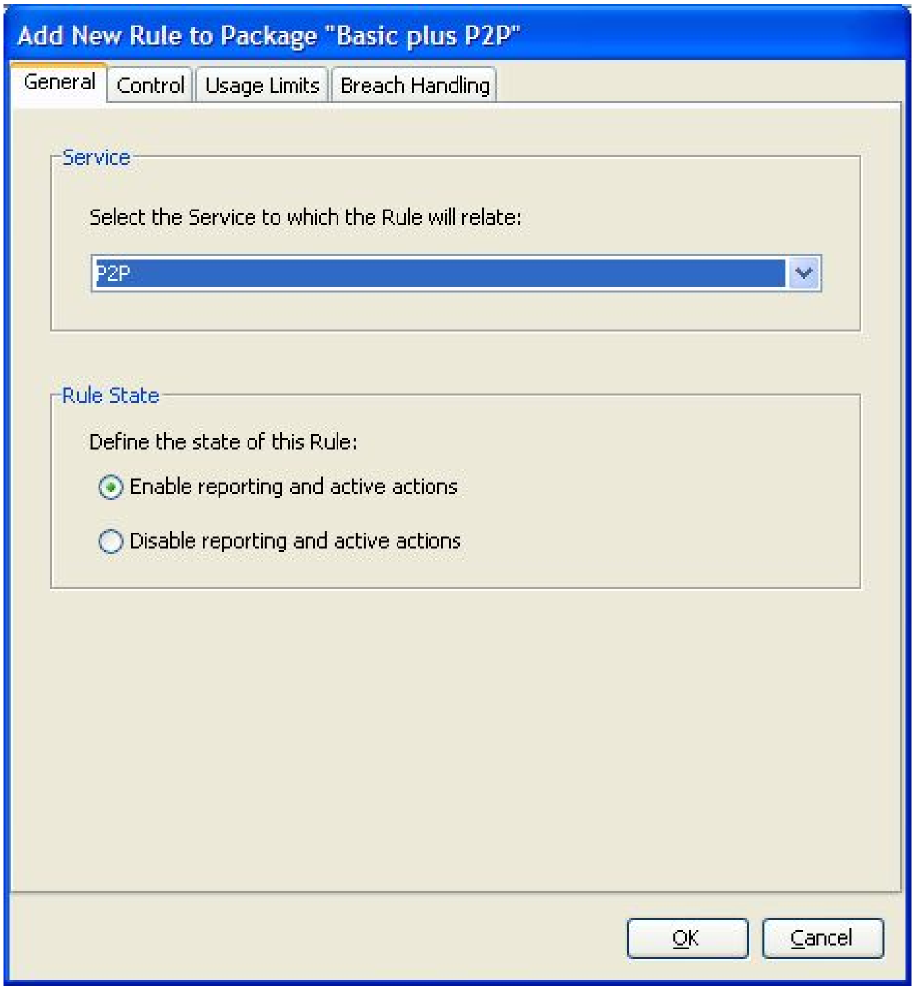
Name	CIR (L1 Kbps)	PIR (L1 Kbps)	Global Controller	AL
⊟ Primary Upstream BWC	0	Unlimited		
Default Upstream BWC	0	Unlimited	Default Global Controller	1
BWC 1	0	Unlimited	Upstream Controller 1	1
BWC 2	0	Unlimited	Upstream Controller 2	1

Downstream

Subscriber relative priority (downstream): 1

Name	CIR (L1 Kbps)	PIR (L1 Kbps)	Global Controller	AL
⊟ Primary Downstream BWC	0	Unlimited		
Default Downstream BWC	0	Unlimited	Downstream Controller 1	1
BWC 3	0	Unlimited	Downstream Controller 1	1
BWC 4	0	Unlimited	Downstream Controller 2	1

Step 3 Add a rule for the P2P service.



Add New Rule to Package "Basic plus P2P"

General | Control | Usage Limits | Breach Handling

Service

Select the Service to which the Rule will relate:

P2P

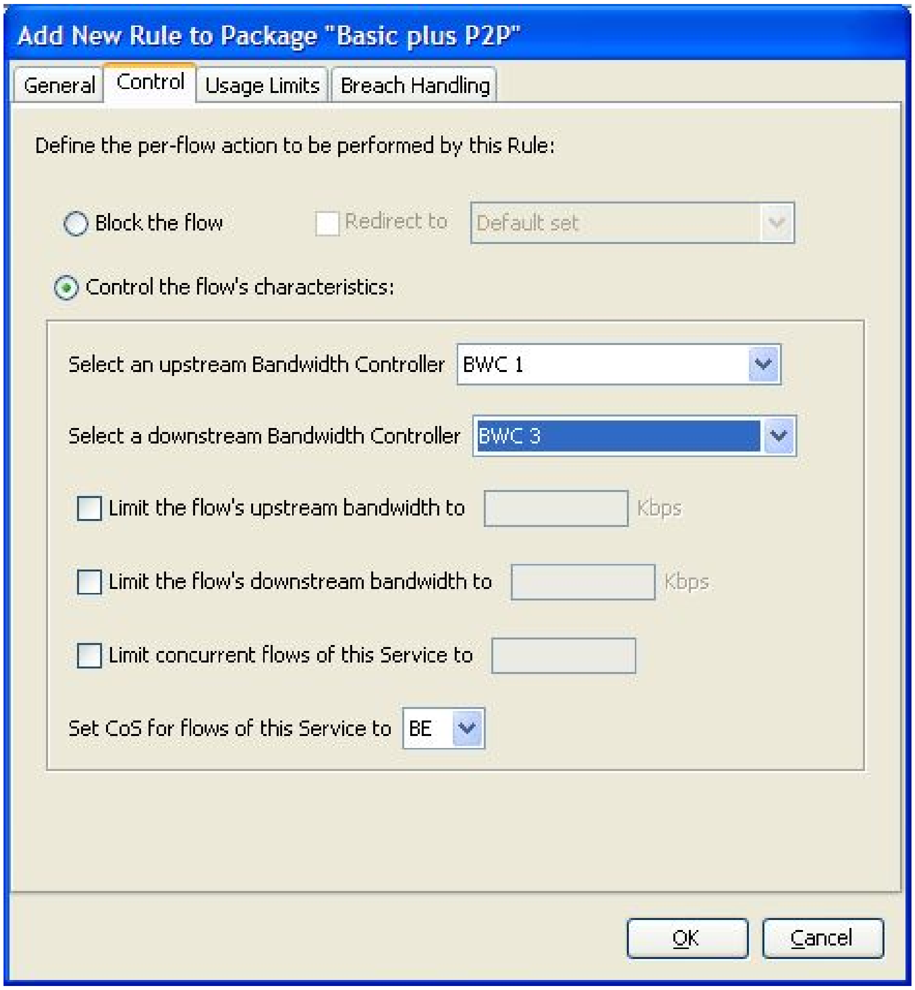
Rule State

Define the state of this Rule:

● Enable reporting and active actions

○ Disable reporting and active actions

Step 4 In the Control tab, assign BWC 1 as the upstream BWC and BWC 3 as the downstream BWC.



Add New Rule to Package "Basic plus P2P"

Define the per-flow action to be performed by this Rule:

○ Block the flow □ Redirect to Default set

● Control the flow's characteristics:

Select an upstream Bandwidth Controller: BWC 1

Select a downstream Bandwidth Controller: BWC 3

□ Limit the flow's upstream bandwidth to Kbps

□ Limit the flow's downstream bandwidth to Kbps

□ Limit concurrent flows of this Service to

Set CoS for flows of this Service to: BE

Step 5 Repeat steps 3 and 4 for the Streaming service, using BWC 2 and BWC 4.

All subscriber traffic using these services will be added to the virtual queue total for these queues, and, in turn, the bandwidth available to the subscriber for these protocols will fluctuate depending on how “full” these queues are.

Setting BW Management Prioritization Mode

Relative priority is the level of assurance that internal BWCs get when competing against other internal BWCs for bandwidth. There are two relative priority options:

- Global Prioritization Mode—Flows that go through internal BWCs get their relative priority from the BWC’s assurance level.
- Subscriber Prioritization Mode (default)—The relative priority of the flow is determined by the relative priority of the subscriber.

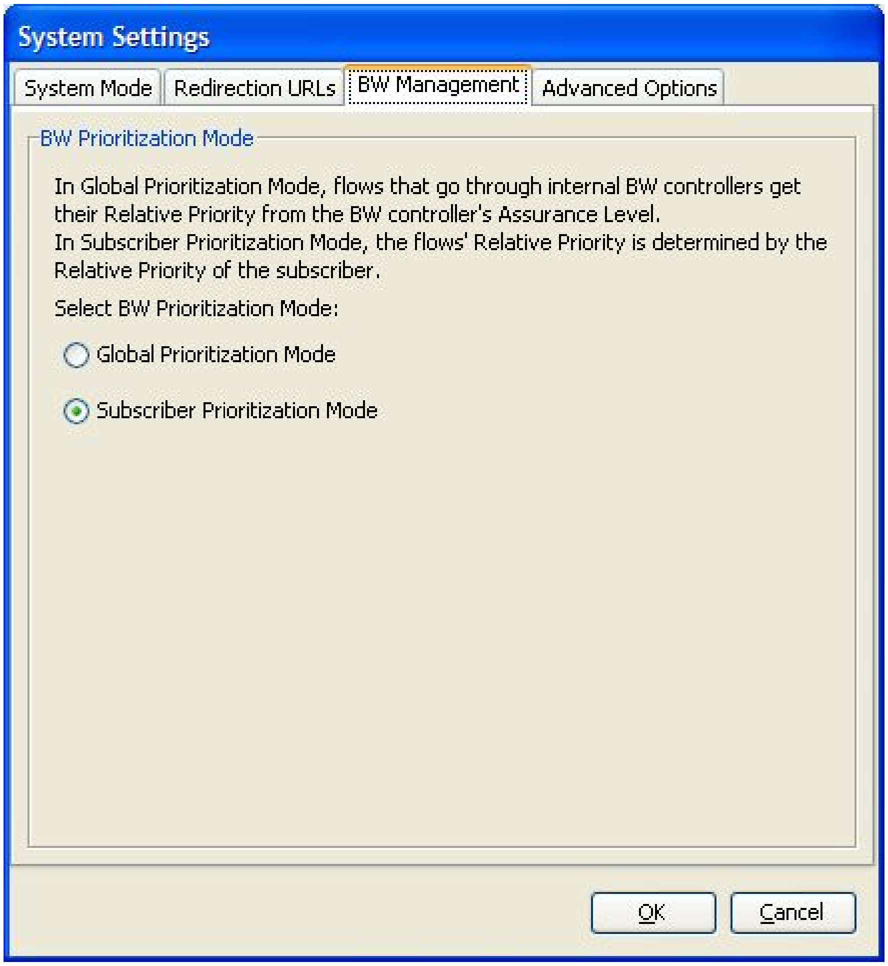
To set the BW Management parameters:

Step 1 From the Console main menu, choose **Configuration** > **System Settings**.

The System Settings dialog box appears.

Step 2 Click the **BW Management** tab.

The BW Management tab opens.



In Global Prioritization Mode, flows that go through internal BW controllers get their Relative Priority from the BW controller's Assurance Level.
In Subscriber Prioritization Mode, the flows' Relative Priority is determined by the Relative Priority of the subscriber.

Select BW Prioritization Mode:

○ Global Prioritization Mode

● Subscriber Prioritization Mode

Step 3 Select one of the **BW Prioritization Mode** radio buttons:

- **Global Prioritization Mode**
- **Subscriber Prioritization Mode**

Step 4 Click **OK**.

The System Settings dialog box closes.

The selected BW management parameter is saved.

Managing Quotas

Editing Package Quota Management Settings

You can define whether quota management is performed by an external quota manager, or by ***SCA BB***.

You also define the quota buckets associated with the package. Rules can use quota buckets to set limits to the consumption of particular service groups (see the following section).

To edit the package quota management settings:

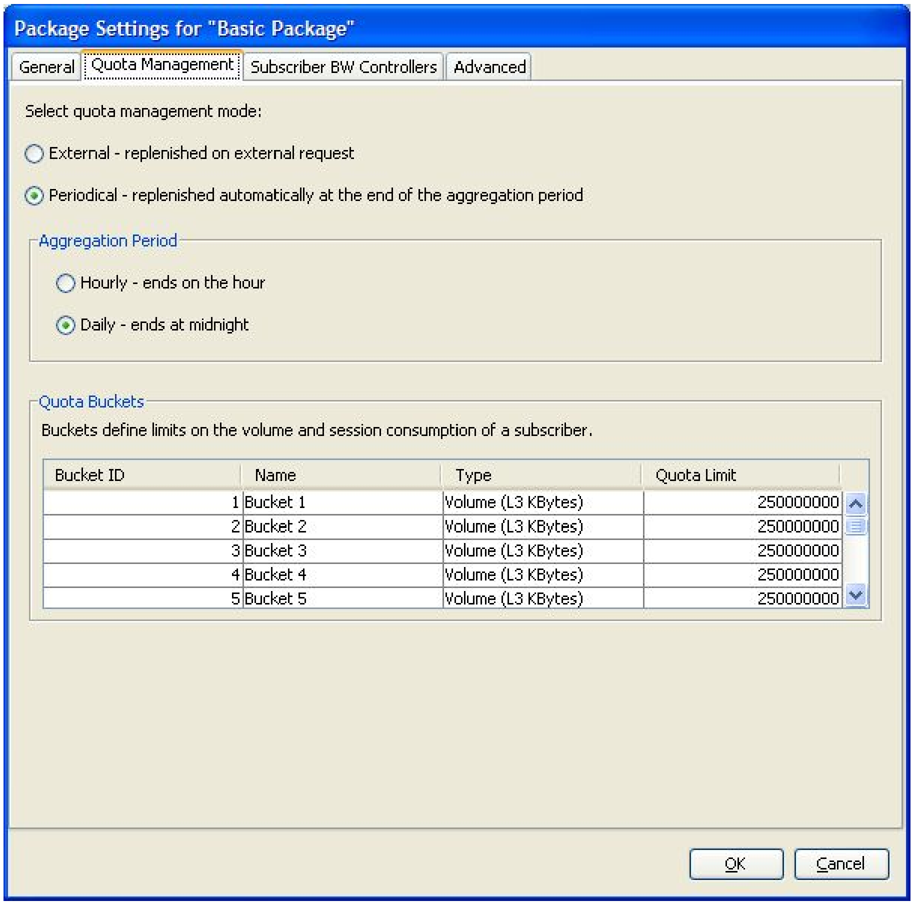
Step 1 In the Network Traffic tab, select a package from the package tree.

Step 2 In the Network Traffic tab, click ✎ (**Edit Package**).

The Package Settings dialog box appears.

Step 3 In the Package Settings dialog box, click the **Quota Management** tab.

The Quota Management tab opens.


Package Settings for "Basic Package"
General
Quota Management
Subscriber BW Controllers
Advanced
OK
Cancel

Select quota management mode:

○ External - replenished on external request

● Periodical - replenished automatically at the end of the aggregation period

Aggregation Period

○ Hourly - ends on the hour

● Daily - ends at midnight

Quota Buckets

Buckets define limits on the volume and session consumption of a subscriber.

Bucket ID	Name	Type	Quota Limit
1	Bucket 1	Volume (L3 KBytes)	250000000
2	Bucket 2	Volume (L3 KBytes)	250000000
3	Bucket 3	Volume (L3 KBytes)	250000000
4	Bucket 4	Volume (L3 KBytes)	250000000
5	Bucket 5	Volume (L3 KBytes)	250000000

Step 4 Select one of the **Select quota management mode** radio buttons:

- **External**—Replenishes on external request

- **Periodical**—Replenishes automatically

Step 5 If you selected periodical quota management, select one of the **Aggregation Period** radio buttons to specify when the quota is renewed for the package:

- **Hourly Resolution**—Ends at each hour change
- **Daily Resolution**—Ends at midnight

Step 6 Configure the quota buckets. Make sure that the configuration of the quota buckets is appropriate to the rules that you will apply to the package. For example, if you do not configure a bucket with Type = Number of sessions, you cannot define a rule with usage limits defined in number of sessions.

To edit a bucket:

- **Bucket ID**—*Display only*.
- **Name**—Enter a name for the bucket in the Name cell.

You can use the default name for the protocol. It is recommended that you enter a meaningful name.

- **Type**—Click in the Type cell, click the drop-down arrow that appears in the cell, and then select either **Volume (L3 Kbytes)** or **Number of sessions** from the drop-down list.
- **Quota Limit**—Define the actual limit for this bucket in kilobytes or number of sessions, depending on the selected Type.

Quota limits can only be set if you selected periodical quota management in step 4.

Step 7 Click **OK**.

The Package Settings dialog box closes.

All changes to the quota management settings are saved.

Selecting Quota Buckets for Rules

You can select the quota buckets that the flows mapped to a rule will use. The quota buckets in the drop-down lists were defined during package setup (see *Editing Package Quota Management Settings* (on page 9-47)). If no quota bucket is appropriate for the rule, add a new quota bucket to the package, or edit an existing bucket.

To select quota buckets for a rule:

Step 1 In the Network Traffic tab, select a package from the package tree.

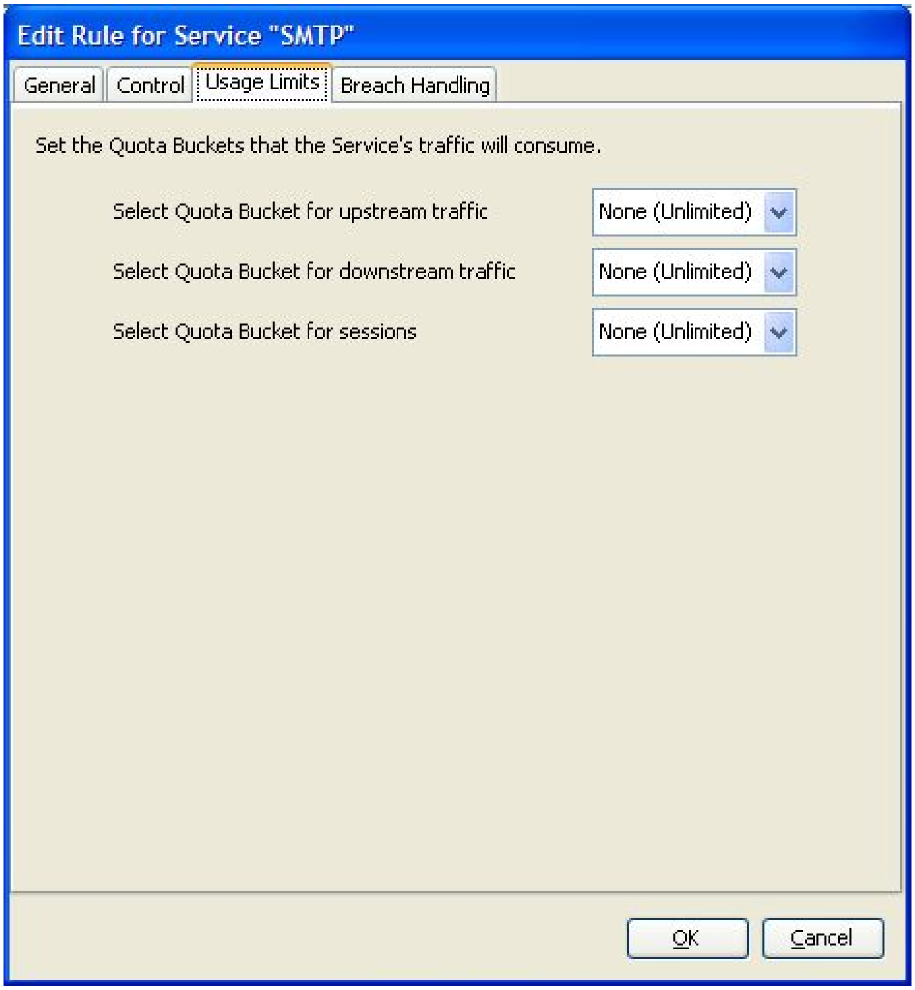
Step 2 In the right (Rule) pane, select a rule.

Step 3 Click ✎ (**Edit Rule**).

The Edit Rule for Service dialog box appears.

Step 4 Click the **Usage Limits** tab.

The Usage Limits tab opens.



Edit Rule for Service "SMTP"

Set the Quota Buckets that the Service's traffic will consume.

Select Quota Bucket for upstream traffic: None (Unlimited)

Select Quota Bucket for downstream traffic: None (Unlimited)

Select Quota Bucket for sessions: None (Unlimited)

Step 5 Select the desired bucket from each drop-down list:

- **Select Quota Bucket for upstream traffic**
- **Select Quota Bucket for downstream traffic**
- **Select Quota Bucket for sessions**

Select **None (Unlimited)** for unlimited quota.

Step 6 To define behavior when a quota is breached, if you have selected a quota bucket for any for the options in step 5, continue with the instructions in the following section.

Step 7 Click **OK**.

The Edit Rule for Service dialog box closes.

All changes to the rule are saved.

Breach-Handling Parameters

The following are the configuration parameters in the Breach Handling tab of the Edit Rule for Service Settings dialog box.

- You determine what happens to flows identified as belonging to this rule when a quota is breached:
  - No changes to active control—Flows mapped to this rule are not affected when quota is breached. ***SCA BB*** can generate Quota Breach RDRs even when this option is selected (see *Managing Quota RDRs* (on page 8-6)).
  - Block the flow—Flows mapped to this rule are blocked when quota is breached.
    - Redirect to—Redirect the flow to a specified, protocol-dependent URL, where a posted web page explains the reason for the redirection. URL redirection sets are defined in the System Settings dialog box. (See *Configuring the Redirection Parameters* (on page 10-37).) Only three protocol types support redirection: HTTP, HTTP Streaming, and RTSP.
  - Control the flow characteristics—The behaviors of flows mapped to this rule change when quota is breached:
    - Select an upstream Bandwidth Controller—Map this rule's traffic flows to a specific upstream BWC. This sets up bandwidth metering of all concurrent flows mapped to this rule, based on the characteristics of the selected BWC.
    - Select a downstream Bandwidth Controller—The same functionality as the previous option, but for downstream flow.
    - Limit the flow's upstream bandwidth—Set a per-flow upstream bandwidth limit (for flows mapped to the service of this rule).
    - Limit the flow's downstream bandwidth—Set a per-flow downstream bandwidth limit.
    - Limit concurrent flows of this Service—Set the maximum number of concurrent flows (mapped to this rule) permitted to a subscriber.
- Activate a Subscriber Notification—Activate a Subscriber Notification when subscribers exceed their quota limit. This notification can, for example, convey the quota breach situation to the subscriber and provide information on how to obtain additional quota.

  To define Subscriber Notifications, see *Managing Subscriber Notifications* (on page 10-26).

Editing Breach-Handling Parameters for a Rule

You can define the SCE platform behavior when an aggregated volume limit or the total number-of-sessions limit is exceeded. You can also notify subscribers when they exceed their quotas.

To define breach-handling behavior for the rule:

Step 1 In the Network Traffic tab, select a package from the package tree.

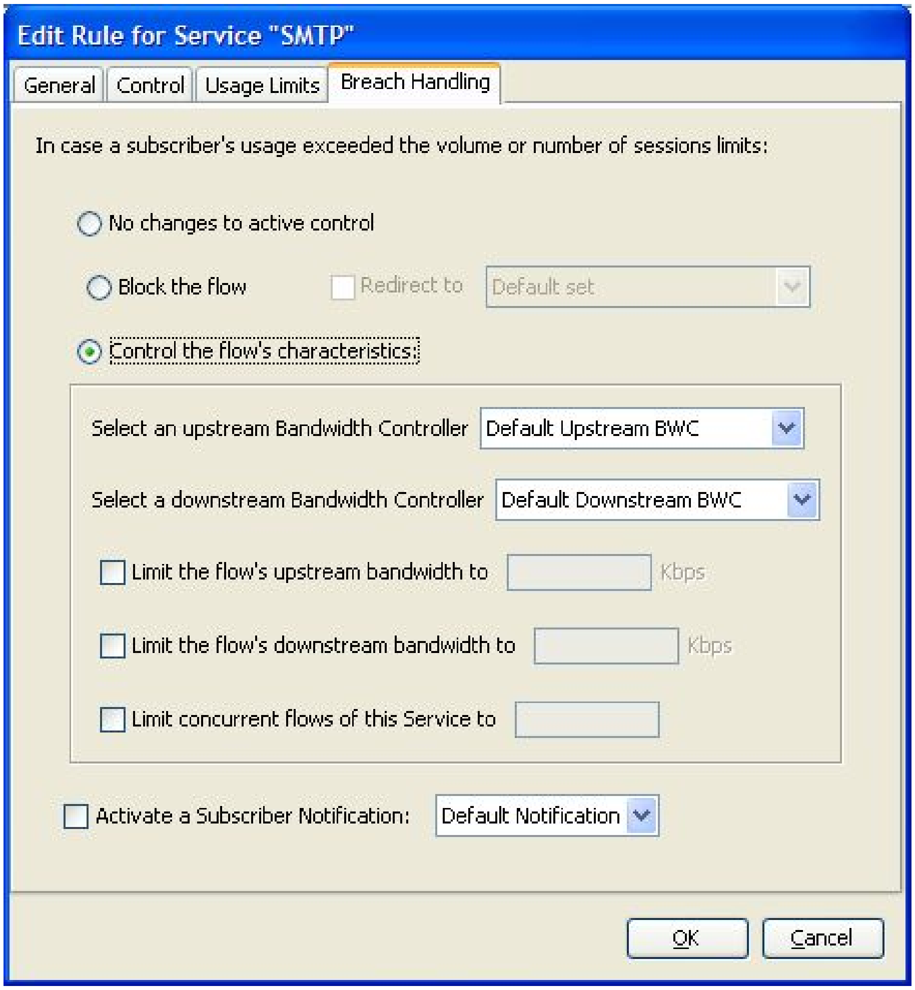
Step 2 In the right (Rule) pane, select a rule.

Step 3 Click ✏ (**Edit Rule**).

The Edit Rule for Service dialog box appears.

Step 4 Click the **Breach Handling** tab.

The Breach Handling tab opens.



In case a subscriber's usage exceeded the volume or number of sessions limits:

○ No changes to active control

○ Block the flow □ Redirect to Default set

● Control the flow's characteristics:

Select an upstream Bandwidth Controller: Default Upstream BWC

Select a downstream Bandwidth Controller: Default Downstream BWC

□ Limit the flow's upstream bandwidth to Kbps

□ Limit the flow's downstream bandwidth to Kbps

□ Limit concurrent flows of this Service to

□ Activate a Subscriber Notification: Default Notification

Step 5 To block the flow when quota is breached, continue at step 7.

To change the flow's characteristics when quota is breached, continue at step 9.

To leave the flow unchanged when quota is breached, select the **No changes to active control** radio button.

Step 6 Continue at step 10.

Step 7 To block flows that are mapped to the service of this rule:

a) Select the **Block the flow** radio button.

The Redirect to check box is enabled.

b) (Optional) To redirect blocked flows (for HTTP, HTTP Streaming, and RTSP), check the **Redirect to** check box.

The Redirection URL Set drop-down list is enabled.

If the service or service group for this rule includes protocols that cannot be redirected, a Rule Warning message appears.

Click **OK** to continue.

c) Select a redirection URL set from the Redirect drop-down list.

Step 8 Continue at step 10.

Step 9 Select the **Control the flow's characteristics** radio button.

The options in the Flow Characteristic area are enabled:

- From the upstream Bandwidth Controller drop-down list, select an upstream BWC.

  The BWCs in this drop-down list are defined when creating or editing the package (see *Editing Package Subscriber BWCs* (on page 9-38)).

  When the mouse is placed over the drop-down list, a tooltip appears containing the properties of the selected BWC (Peak Information Rate (PIR), Committed Information Rate (CIR), Global Controller, and Assurance Level).
- From the downstream Bandwidth Controller drop-down list, select a downstream BW Controller.
- (Optional) Check the **Limit the flow's upstream bandwidth** check box and enter a value in the Kbps field.
- (Optional) Check the **Limit the flow's downstream bandwidth** check box and enter a value in the Kbps field.
- (Optional) Check the **Limit concurrent flows of this Service** check box and enter a value in the associated field.

Step 10 (Optional) Activate subscriber notification:

- Check the **Activate a Subscriber Notification** check box and then select the desired subscriber notification from the drop-down list. .

A subscriber notification can be activated in addition to any of the three breach-handling options.

Step 11 Click **OK**.

The Edit Rule for Service dialog box closes.

All changes to the rule are saved.

CHAPTER 10

Using the Service Configuration Editor: Additional Options

This chapter explains how to use additional, advanced functionality that is available in the Service Configuration Editor.

This chapter contains the following sections:

The Service Security Dashboard

The Service Security Dashboard allows you to view and control all ***SCA BB*** security functionality.

The Dashboard is a gateway to a set of features that help you protect your network from security threats such as worms, DDoS attacks, and spam zombies. It allows configuration of the detection mechanisms (for example, attack thresholds) and of the actions to be taken when an attack is detected.

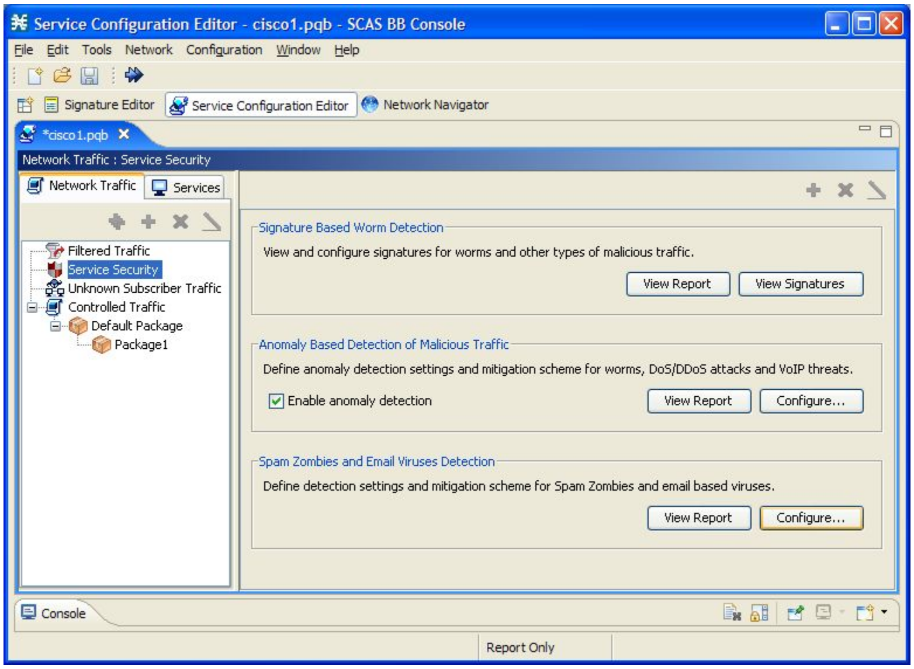
The Dashboard also allows you to access malicious traffic reports in the Reporter tool.

Viewing the Service Security Dashboard

To view the Service Security Dashboard:

Step 1 In the Network Traffic tab, select **Service Security**.

Step 2 The Service Security Dashboard is displayed in the right pane.


Service Configuration Editor - cisco1.pqb - SCAS BB Console
File Edit Tools Network Configuration Window Help
Signature Editor
Service Configuration Editor
Network Navigator
*cisco1.pqb
Network Traffic : Service Security
Network Traffic
Services
Filtered Traffic
Service Security
Unknown Subscriber Traffic
Controlled Traffic
Default Package
Package1
Signature Based Worm Detection
View Report
View Signatures
Anomaly Based Detection of Malicious Traffic
View Report
Configure...
Spam Zombies and Email Viruses Detection
View Report
Configure...
Console
Report Only

View and configure signatures for worms and other types of malicious traffic.

Define anomaly detection settings and mitigation scheme for worms, DoS/DDoS attacks and VoIP threats.

☑ Enable anomaly detection

Define detection settings and mitigation scheme for Spam Zombies and email based viruses.

Viewing and configuring the various detection mechanisms and viewing malicious traffic reports are described in the following sections.

Worm Detection

SCA BB uses three mechanisms for detecting worms:

- Signature based detection—The SCE platform's stateful Layer 7 capabilities can detect malicious activity that is not easily detectable by other mechanisms. You can add signatures for new worms.
- Anomaly based detection—Overall traffic analysis can detect anomalies that might indicate worm activity. See *Managing Anomaly Detection* (on page 10-3).
- Mass-mailing based detection—E-mail traffic analysis can detect anomalies that might indicate e-mail-based worms. See *Configuring Spam Detection Settings* (on page 10-16).

To view supported worm signatures:

Step 1 In the Service Security Dashboard, click **View Signatures**.

The Signatures Settings dialog box appears, with Worm Signatures selected in the Signature Type drop-down list.

All supported worm signatures are listed.

Step 2 Click **Close**.

The Signatures Settings dialog box closes.

To add new worm signatures to a service configuration:

Do one of the following:

- Import the latest DSS or SPQI file provided by Cisco.
- Create a DSS file containing any worm signatures that you wish to add to the service configuration.

For more information, see *Managing Protocol Signatures* (on page 7-38).

Managing Anomaly Detection

The most comprehensive threat detection method is anomaly detection.

The basic principle of anomaly detection is monitoring successful (correctly established for TCP, bi-directional for other protocols) and unsuccessful (not properly established for TCP, unidirectional for other protocols) connection rates both to and from any IP address viewed by the system, and triggering an anomaly detection condition based of one of the following criteria:

- The total connection rate exceeds a predefined threshold.
- The suspicious connection rate exceeds a predefined threshold *and* the ratio of suspicious to unsuspicious connections exceeds a predefined threshold.

The ratio metric is a particularly robust indicator of malicious activity, and together with a rate qualifier serves as a reliable identifier for malicious activity.

Anomaly detection is split into three categories based on the directional nature of the detected anomaly condition. The concepts used for the three categories are identical, but the nature of the detected malicious activity is different for each category.

- Scan/Sweep detector—Detects malicious activity that is based on an anomaly in connection rates *from* an IP address.
- DoS detector—Detects an anomaly in the connection rate between a pair of IP addresses: one of them is attacking the other. This can be either an isolated attack or part of a larger scale DDoS attack.
- DDoS detector—Detects an anomaly in the connection rate coming *to* an IP address, which means that it is being attacked. The attack can be by either a single IP address (DoS) or multiple IP addresses.

For all kinds of anomaly detection conditions, maximum flexibility is provided by the ability to define detection thresholds and the trigger actions to be taken for each:

- Flow direction
- Flow protocol
- (Optional) Port uniqueness for TCP and UDP

Note The GUI configuration described here replaces the CLI command set for configuring the Attack Filtering Module of the SCE platform, which was available in previous releases.

Anomaly Detection Parameters

For each anomaly detector category (Scan/Sweep, DoS, DDoS) there is one default detector. You can add additional detectors of each category. Detectors in each category are checked in order; the first match (according to the detector’s threshold settings) triggers detection. You set the order in which detectors are checked; the default detector is checked last.

Anomaly detectors can contain up to 12 anomaly types associated with malicious traffic:

- Network initiated—Malicious traffic initiated from the network side:
  - TCP—Aggregate TCP traffic on all ports
  - TCP Specific Ports—TCP traffic on any single port
  - UDP—Aggregate UDP traffic on all ports
  - UDP Specific Ports—UDP traffic on any single port
  - ICMP—Aggregate ICMP traffic on all ports
  - Other—Aggregate traffic using other protocol types on all ports
- Subscriber initiated—Malicious traffic initiated from the subscriber side:
  - TCP
  - TCP Specific Ports
  - UDP
  - UDP Specific Ports
  - ICMP
  - Other

ICMP and Other anomaly types are not available for DoS attack detectors.

Each anomaly type on a detector has the following attributes associated with it:

- Detection thresholds—There are two thresholds, crossing either of them means that an attack is defined to be in progress:
  - Session Rate threshold—The number of sessions (per second) over specified ports for a single IP address that trigger the anomaly detection condition.
  - Suspected sessions threshold—*Suspected sessions* are sessions that are not properly established (for TCP), or that are unidirectional sessions (for other protocols). Exceeding both the Suspected Session Rate and the Suspected Session Ratio will trigger the anomaly detection condition. (A relatively high session rate with a low response rate typically indicates malicious activity.)
    - Suspected Session Rate—The number of suspected sessions (per second) over specified ports for a single IP address.

  - Suspected Session Ratio—The ratio (as a percentage) between the suspected session rate and the total session rate. A high ratio indicates that many sessions received no response, an indication of malicious activity.
- Actions—Zero or more of the following actions may be taken when an anomaly detection condition is triggered (by default, no action is enabled):

  Logging of the anomaly to an on-device log file and generation of RDRs is not configurable per anomaly type.

  - Alert User—Generate an SNMP trap (see the "SCA BB Proprietary MIB Reference" chapter of the *Cisco Service Control Application for Broadband Reference Guide* for information about the Cisco proprietary MIB) indicating the beginning and end of an anomaly.
  - Notify Subscriber—Notify the relevant subscriber of the malicious activity, by redirecting his browsing sessions to a captive portal. To configure network attack subscriber notification, see *Managing Subscriber Notifications* (on page 10-26).
  - Block Attack—Block the relevant sessions. Blocking is performed based on the specification of the malicious traffic that triggered the anomaly detection condition. If subscriber notification is enabled for the anomaly type, blocking is not applied to the port relevant for browsing (by default, this is TCP port 80; see *Managing Advanced Service Configuration Options* (on page 10-39)).

User defined detectors can also have one or more of the following attributes:

- IP address list—Limit detection to the listed IP address ranges. This applies to the source IP when detecting IP sweeps and port scans. It applies to the destination IP when detecting DoS and DDoS attacks.
- TCP port list—Limit detection to the listed destination TCP ports. This list is applied to TCP Specific Ports anomaly types only.
- UDP port list—Limit detection to the listed destination UDP ports. This list is applied to UDP Specific Ports anomaly types only.

Viewing Anomaly Detection Settings

You can view a list of all anomaly detectors. The anomaly detectors are displayed in a tree, grouped according to detector category (Scan/Sweep, DoS, or DDoS).

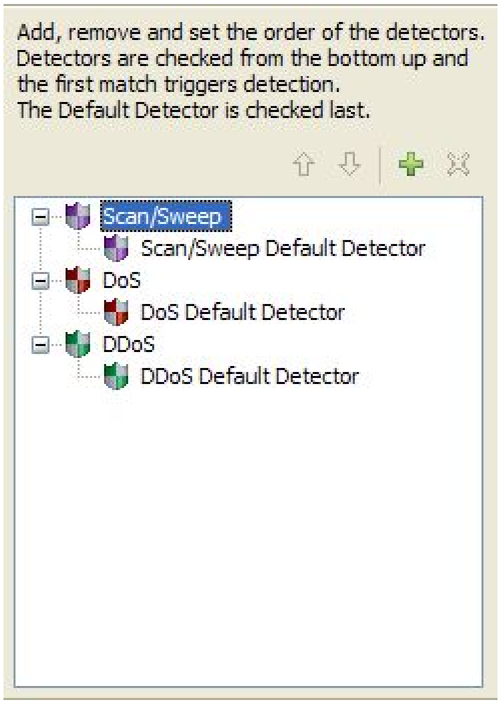
For each anomaly detector you can view its associated parameters and see a list of all anomaly types included in the detector, together with their parameters.

To view anomaly detection settings:

Step 1 In the Service Security Dashboard, in the Anomaly Based Detection of Malicious Traffic pane, click **Configure**.

The Anomaly Detection Settings dialog box appears.

The detector tree is displayed in the left area of the dialog box; the right area is empty.

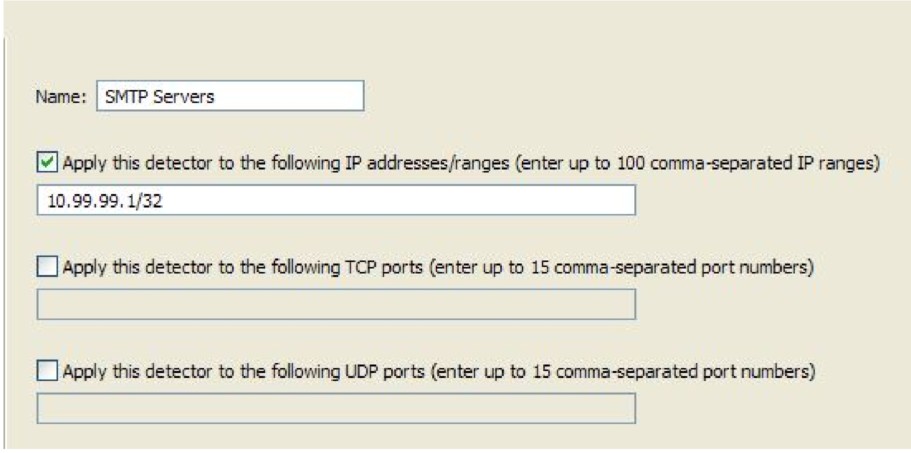


Add, remove and set the order of the detectors. Detectors are checked from the bottom up and the first match triggers detection.
The Default Detector is checked last.

- Scan/Sweep
  - Scan/Sweep Default Detector
- DoS
  - DoS Default Detector
- DDoS
  - DDoS Default Detector

Step 2 In the detector tree, select a detector.

The detector parameters are displayed in the upper right area of the dialog box.



Name: SMTP Servers

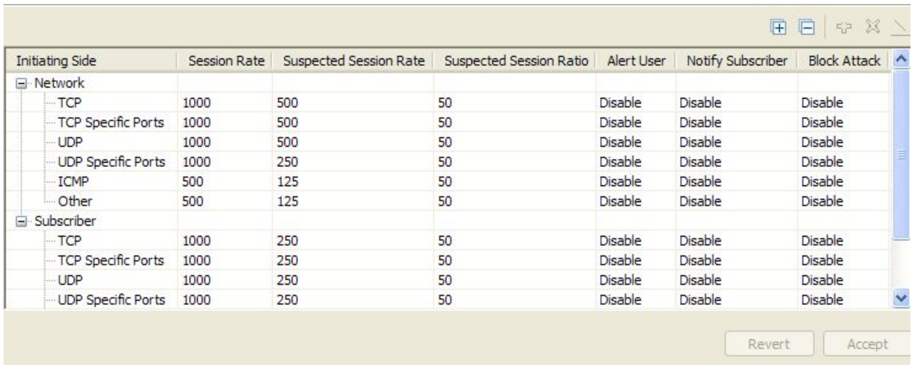
☑ Apply this detector to the following IP addresses/ranges (enter up to 100 comma-separated IP ranges)

10.99.99.1/32

□ Apply this detector to the following TCP ports (enter up to 15 comma-separated port numbers)

□ Apply this detector to the following UDP ports (enter up to 15 comma-separated port numbers)

The detector's defined anomaly types are listed in the lower right area of the dialog box, together with the value of each parameter. The following screen capture shows the default parameter values for the Scan/Sweep default detector.



Initiating Side	Session Rate	Suspected Session Rate	Suspected Session Ratio	Alert User	Notify Subscriber	Block Attack
⊟ Network						
TCP	1000	500	50	Disable	Disable	Disable
TCP Specific Ports	1000	500	50	Disable	Disable	Disable
UDP	1000	500	50	Disable	Disable	Disable
UDP Specific Ports	1000	250	50	Disable	Disable	Disable
ICMP	500	125	50	Disable	Disable	Disable
Other	500	125	50	Disable	Disable	Disable
⊟ Subscriber						
TCP	1000	250	50	Disable	Disable	Disable
TCP Specific Ports	1000	250	50	Disable	Disable	Disable
UDP	1000	250	50	Disable	Disable	Disable
UDP Specific Ports	1000	250	50	Disable	Disable	Disable

Step 3 Click **OK**.

The Anomaly Detection Settings dialog box closes.

Adding Anomaly Detectors

You can add new anomaly detectors. A service configuration can contain up to 100 anomaly detectors.

You define IP address ranges and TCP and UDP ports for the new detector, and one anomaly type.

After you have defined the detector, you can add other anomaly types (see *Editing Anomaly Detectors* (on page 10-11)).

To add an anomaly detector:

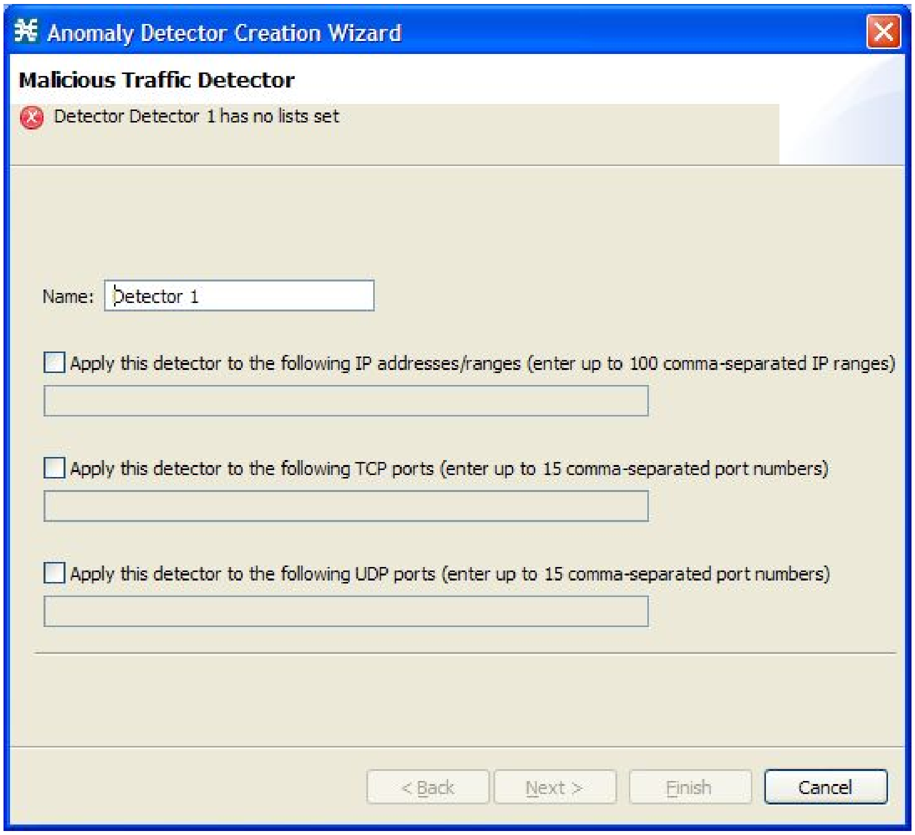
Step 1 In the Service Security Dashboard, in the Anomaly Based Detection of Malicious Traffic pane, click **Configure**.

The Anomaly Detection Settings dialog box appears.

Step 2 In the detector tree, select a detector category.

Step 3 Click ✚.

The Anomaly Detector Creation Wizard appears, open to the Malicious Traffic Detector screen.



Anomaly Detector Creation Wizard

Malicious Traffic Detector

Detector Detector 1 has no lists set

Name: Detector 1

□ Apply this detector to the following IP addresses/ranges (enter up to 100 comma-separated IP ranges)

□ Apply this detector to the following TCP ports (enter up to 15 comma-separated port numbers)

□ Apply this detector to the following UDP ports (enter up to 15 comma-separated port numbers)

Step 4 In the Name field, enter a meaningful name for the detector.

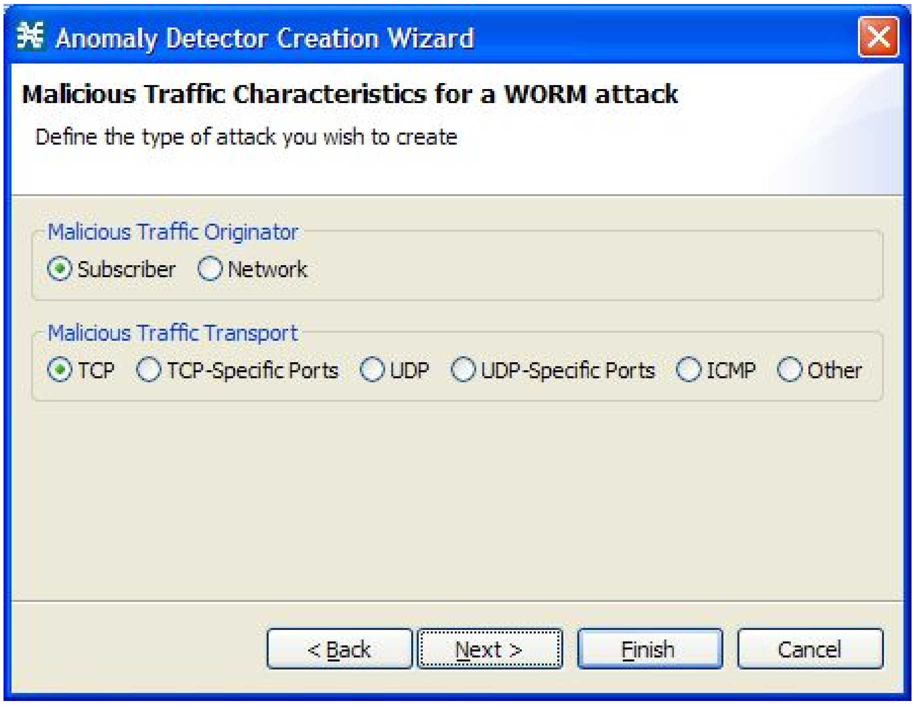
Step 5 Check one or more of the check boxes to limit the scope of the detector.

The relevant fields are enabled.

Step 6 Enter lists of IP addresses or ports in the relevant fields.

Step 7 Click **Next**.

The Malicious Traffic Characteristics for a WORM attack screen of the Anomaly Detector Creation Wizard opens.


Anomaly Detector Creation Wizard

Malicious Traffic Characteristics for a WORM attack

Define the type of attack you wish to create

Malicious Traffic Originator

● Subscriber ○ Network

Malicious Traffic Transport

● TCP ○ TCP-Specific Ports ○ UDP ○ UDP-Specific Ports ○ ICMP ○ Other

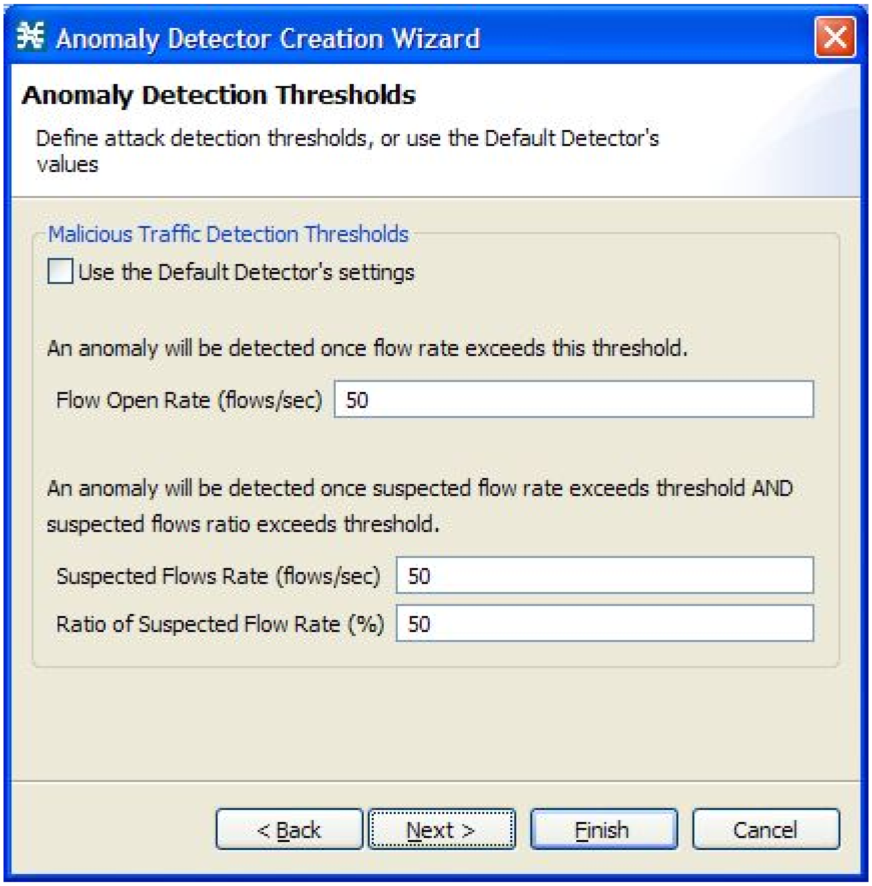
Step 8 If you are defining a Scan/Sweep detector or a DoS detector, select the originating side for the anomaly type you are defining.

If you are defining a DDoS detector, select the target side for the anomaly type you are defining.

Step 9 Select a transport type for the anomaly type you are defining.

Step 10 Click **Next**.

The Anomaly Detection Thresholds screen of the Anomaly Detector Creation Wizard opens.



Anomaly Detector Creation Wizard

Anomaly Detection Thresholds

Define attack detection thresholds, or use the Default Detector's values

Malicious Traffic Detection Thresholds

□ Use the Default Detector's settings

An anomaly will be detected once flow rate exceeds this threshold.

Flow Open Rate (flows/sec) 50

An anomaly will be detected once suspected flow rate exceeds threshold AND suspected flows ratio exceeds threshold.

Suspected Flows Rate (flows/sec) 50

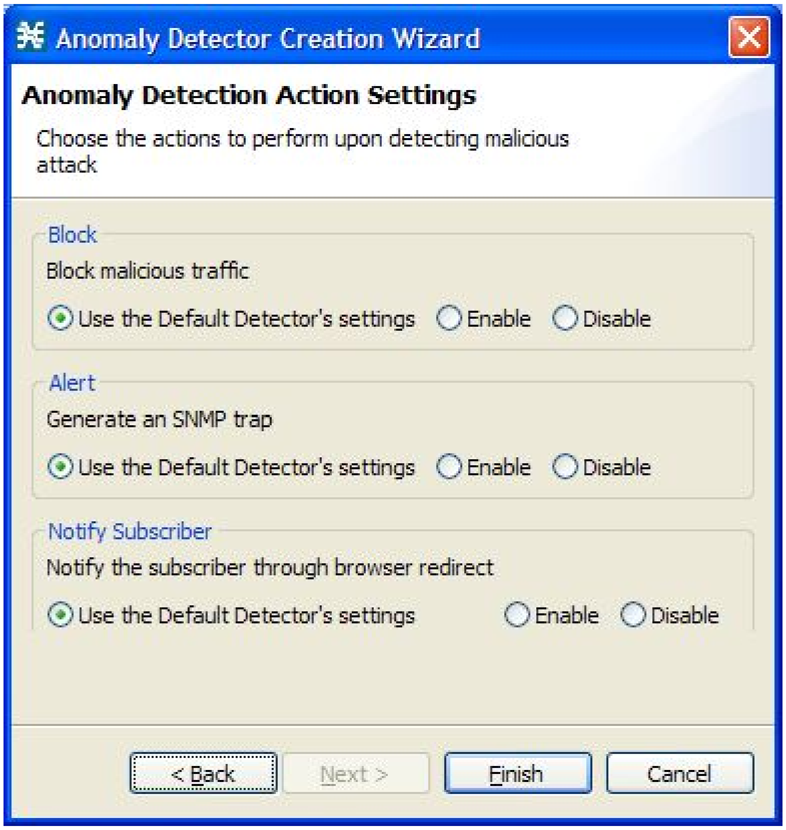
Ratio of Suspected Flow Rate (%) 50

Step 11 Do one of the following:

- To use the default detector’s settings for this anomaly type, check the **Use the Default Detector**’**s settings** check box.
- Enter values in the Flow Open Rate, Suspected Flows Rate, and Ratio of Suspected Flow Rate fields.

Step 12 Click **Next**.

The Anomaly Detection Action Settings screen of the Anomaly Detector Creation Wizard opens.



Anomaly Detection Action Settings

Choose the actions to perform upon detecting malicious attack

Block

Block malicious traffic

● Use the Default Detector's settings ○ Enable ○ Disable

Alert

Generate an SNMP trap

● Use the Default Detector's settings ○ Enable ○ Disable

Notify Subscriber

Notify the subscriber through browser redirect

● Use the Default Detector's settings ○ Enable ○ Disable

Step 13 Select Block, Alert, and Notify Subscriber actions.

Step 14 Click **Finish**.

The Anomaly Detector Creation Wizard closes.

The new detector is added to the detector tree.

Step 15 You can now add additional anomaly types to the detector. (See *Editing Anomaly Detectors* (on page 10-11).)

Editing Anomaly Detectors

You can perform the following on a user-defined anomaly detector:

- Edit detector parameters.
- Edit anomaly types.
- Add anomaly types.
- Delete anomaly types.
- Change the order of the detectors in the detector tree.

  For each detector category, detectors are checked, *bottom-up*, in the order that they are listed in the detector tree; the default detector is checked last.

You can edit the anomaly types of the three default detectors.

Edit detector parameters:

Step 1 In the Service Security Dashboard, in the Anomaly Based Detection of Malicious Traffic pane, click **Configure**.

The Anomaly Detection Settings dialog box appears.

Step 2 In the detector tree, select a detector.

The detector parameters are displayed in the upper right area of the dialog box.

Step 3 In the Name field, enter a new name for the detector.

Step 4 Check or uncheck the IP address range and ports check boxes.

Step 5 Enter or modify lists of IP addresses or ports in the relevant fields.

Step 6 Click **OK**.

The Anomaly Detection Settings dialog box closes.

Your changes are saved.

To edit an anomaly type:

Step 1 In the Service Security Dashboard, in the Anomaly Based Detection of Malicious Traffic pane, click **Configure**.

The Anomaly Detection Settings dialog box appears.

Step 2 In the detector tree, select a detector.

Information about the anomaly types is displayed in the lower right area of the dialog box.

Step 3 Double-click an anomaly type.

The Anomaly Detector Creation Wizard appears, open to the Anomaly Detection Thresholds screen (see *Adding Anomaly Detectors* (on page 10-7)).

Step 4 Do one of the following:

- To use the default detector's settings for this anomaly type, check the **Use the Default Detector's settings** check box.
- Change the values in the Flow Open Rate, Suspected Flows Rate, and Ratio of Suspected Flow Rate fields.

Step 5 Click **Next**.

The Anomaly Detection Action Settings screen of the Anomaly Detector Creation Wizard opens.

Step 6 Change Block, Alert, and Notify Subscriber actions.

Step 7 Click **Finish**.

The Anomaly Detector Creation Wizard closes.

The anomaly type is updated with your changes.

Step 8 Repeat steps 3 to 7 (or steps 2 to 7) for other anomaly types.

Step 9 Click **OK**.

The Anomaly Detection Settings dialog box closes.

To add an anomaly type:

Step 1 In the Service Security Dashboard, in the Anomaly Based Detection of Malicious Traffic pane, click **Configure**.

The Anomaly Detection Settings dialog box appears.

Step 2 In the detector tree, select a detector.

The anomaly types are listed in the lower right area of the dialog box.

Step 3 Click ✚ (**Create New Detector Item Under Detector Items Feature**).

The Anomaly Detector Creation Wizard appears, open to the Malicious Traffic Characteristics for a WORM attack screen (see *Adding Anomaly Detectors* (on page 10-7)).

Step 4 Select an origin for the anomaly type you are defining.

Step 5 Select a transport type for the anomaly type you are defining.

Step 6 Click **Next**.

The Anomaly Detection Thresholds screen of the Anomaly Detector Creation Wizard opens.

Step 7 Do one of the following:

- To use the default detector's settings for this anomaly type, check the **Use the Default Detector's settings** check box.
- Enter values in the Flow Open Rate, Suspected Flows Rate, and Ratio of Suspected Flow Rate fields.

Step 8 Click **Next**.

The Anomaly Detection Action Settings screen of the Anomaly Detector Creation Wizard opens.

Step 9 Select Block, Alert, and Notify Subscriber actions.

Step 10 Click **Finish**.

The Anomaly Detector Creation Wizard closes.

The new anomaly type is added to the anomaly type list.

Step 11 Repeat steps 3 to 10 (or steps 2 to 10) for other anomaly types.

Step 12 Click **OK**.

The Anomaly Detection Settings dialog box closes.

To delete an anomaly type:

Step 1 In the Service Security Dashboard, in the Anomaly Based Detection of Malicious Traffic pane, click **Configure**.

The Anomaly Detection Settings dialog box appears.

Step 2 In the detector tree, select a detector.

The anomaly types are listed in the lower right area of the dialog box.

Step 3 In the anomaly type list, select an anomaly type.

Step 4 Click ✖.

The selected anomaly type is deleted from the anomaly type list.

Step 5 Repeat steps 3 and 4 (or steps 2 to 4) for other anomaly types.

Step 6 Click **OK**.

The Anomaly Detection Settings dialog box closes.

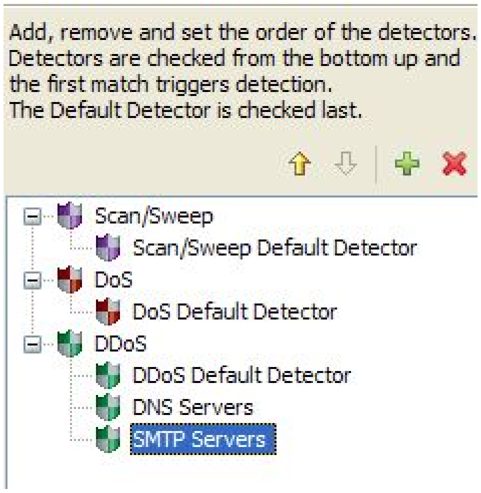
To change the order in which detectors are checked:

Step 1 In the Service Security Dashboard, in the Anomaly Based Detection of Malicious Traffic pane, click **Configure**.

The Anomaly Detection Settings dialog box appears.

Step 2 In the detector tree, select a detector.

The move up arrow, the move down arrow, or both are enabled, depending on the detectors location in the tree.



Add, remove and set the order of the detectors.
Detectors are checked from the bottom up and
the first match triggers detection.
The Default Detector is checked last.

Step 3 Using these navigation arrows, move the detector to its desired location.

Step 4 Repeat steps 2 and 3 for other detectors.

Step 5 Click **OK**.

The Anomaly Detection Settings dialog box closes.

Your changes are saved.

Deleting Anomaly Detectors

You can delete any or all user-defined detectors.

You cannot delete the three default detectors.

To delete an anomaly detector:

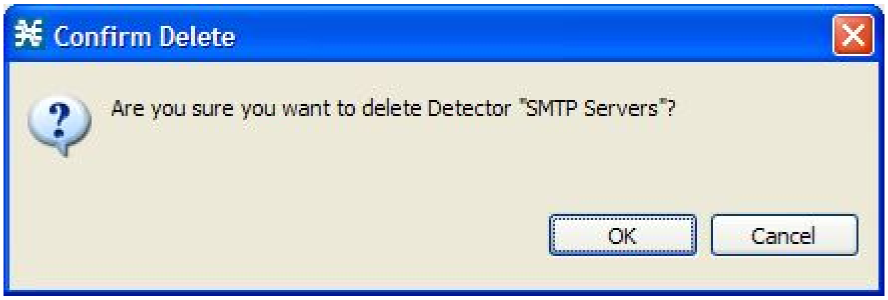
Step 1 In the Service Security Dashboard, in the Anomaly Based Detection of Malicious Traffic pane, click **Configure**.

The Anomaly Detection Settings dialog box appears.

Step 2 In the detector tree, select one or more user-defined detectors.

Step 3 Click ✖.

A Confirm Delete message appears.



Are you sure you want to delete Detector "SMTP Servers"?

Step 4 Click **OK.**

The selected detectors are deleted and are no longer displayed in the detector tree.

Step 5 Click **OK**.

The Anomaly Detection Settings dialog box closes.

Spam Detection

The anomalous e-mail detection method monitors SMTP session rates for individual subscribers. A high rate of SMTP sessions from an individual subscriber is usually an indicator of malicious activity that involves sending e-mail (either mail-based viruses or spam-zombie activity).

This method will work only if the system is configured in subscriber-aware or anonymous subscriber mode. This allows the SCE to accurately account the number of SMTP sessions generated per subscriber.

The detection method is based on the following:

- Typical broadband subscribers generate a small number of SMTP sessions (at most a single session each time they send an e-mail message).
- Typical broadband subscribers normally use the ISP’s SMTP server (as configured in their mail client) as their only mail relay, and do not communicate with off-net SMTP servers.
- Spam zombies create many SMTP sessions, mainly to off-net servers (the mail servers of the destined recipient of the messages).

When configuring spam detection, you select an appropriate service to monitor. By default, this is the built-in SMTP service. To improve detection sensitivity, you can create a more specific service to narrow the scope of detection. Two possible services are:

- “Outbound SMTP”—SMTP sessions generated by the subscriber.
- “OffNet SMTP”—SMTP sessions that are *not* targeted to the SMTP server of the subscriber’s ISP. Limiting the service to OffNet can avoid accounting for legitimate sessions.

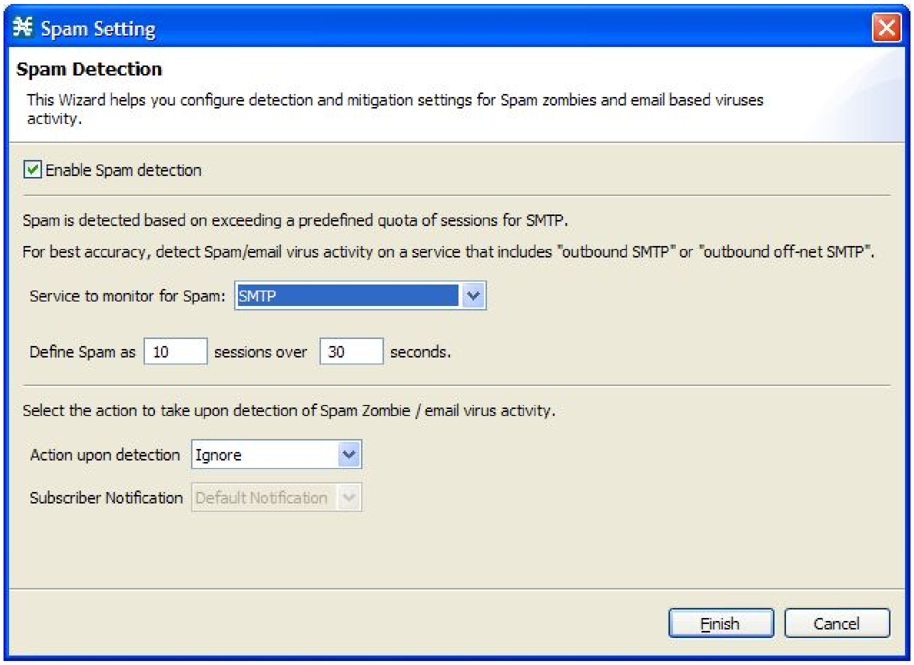
Note Prominent non-ISP e-mail providers (for example, Google and Yahoo!) now provide SMTP-based service, so OffNet is no longer a very good differentiator between legitimate and illegitimate activity. To refine the OffNet service, you must include an SMTP server list in the “OnNet SMTP” service definition; all other SMTP servers will be OffNet.

Configuring Spam Detection Settings

To configure spam detection settings:

Step 1 In the Service Security Dashboard, in the Spam Zombies and Email Viruses Detection pane, click **Configure**.

The Spam Setting dialog box appears.



Spam Detection

This Wizard helps you configure detection and mitigation settings for Spam zombies and email based viruses activity.

☑ Enable Spam detection

Spam is detected based on exceeding a predefined quota of sessions for SMTP.

For best accuracy, detect Spam/email virus activity on a service that includes "outbound SMTP" or "outbound off-net SMTP".

Service to monitor for Spam: SMTP

Define Spam as 10 sessions over 30 seconds.

Select the action to take upon detection of Spam Zombie / email virus activity.

Action upon detection: Ignore

Subscriber Notification: Default Notification

Step 2 Uncheck the **Enable Spam detection** check box to disable spam detection.

All other fields are disabled.

Continue at step 7.

Step 3 From the Service to monitor for Spam drop-down list, select a service.

> Leave the default value for the monitored service (SMTP), unless you have defined a more specific service, such as “Outbound SMTP” or “OffNet SMTP”.

Step 4 Define the threshold e-mail session rate for anomalous behavior.

Step 5 From the Action upon detection drop-down list, select the action to be taken when malicious activity is detected.

- Ignore
- Block
- Notify
- Block and notify

Step 6 If you selected Notify or Block and notify, the Subscriber Notification drop-down list is enabled. Select a subscriber notification.

> To define an appropriate subscriber notification, see *Managing Subscriber Notifications* (on page 10-26).

Step 7 Click **Finish**.

The Spam Setting dialog box closes.

Viewing Malicious Traffic Reports

Information about detected traffic anomalies is stored in the CM database. You can use this information for network trending, detection of new threats, and tracking of malicious hosts or subscribers.

A number of reports dealing with malicious traffic can be displayed in the Reporter tool:

- Global reports:
  - Global Scan or Attack Rate
  - Global DoS Rate
  - Infected Subscribers
  - DoS Attacked Subscribers
  - Top Scanned or Attacked ports
- Individual subscriber or hosts reports:
  - Top Scanning or Attacking hosts
  - Top DoS Attacked hosts
  - Top DoS Attacked Subscribers
  - Top Scanning or Attacking Subscribers

To view a service security report:

Step 1 In the Service Security Dashboard, in the relevant pane, click **View Report**.

A Choose a report dialog box appears, displaying a tree of relevant reports.

Step 2 Select a report from the report tree.

Step 3 Click **OK**.

The Choose a report dialog box closes.

The Reporter tool opens in the Console, and displays the requested report.

Step 4 For information about manipulating and saving the report, see the “Working with Reports” chapter of the *Cisco Service Control Application Reporter User Guide*.

Filtering the Traffic Flows

Filter rules are part of service configurations. They allow you to instruct the Service Control Engine (SCE) platform to ignore some types of flow based on the flow's Layer 3 and Layer 4 properties and to transmit the flows unchanged.

When a traffic flow enters the SCE platform, the platform checks whether a filter rule applies to this flow.

If a filter rule applies to this traffic flow, the SCE platform passes the traffic flow to its transmit queues. No RDR generation or service configuration enforcement is performed; these flows will not appear in any records generated for analysis purposes and will not be controlled by any rule belonging to the active service configuration.

It is recommended that you add filter rules for OSS protocols (such as DHCP) and routing protocols (such as BGP) that might traverse the SCE platform. These protocols usually should not be affected by policy enforcement, and their low volume makes them insignificant for reporting.

A number of filter rules are included in every new service configuration.

Note By default, some, but not all, of the predefined filter rules are active.

Viewing Filter Rules

You can view a list of the filter rules included in a service configuration.

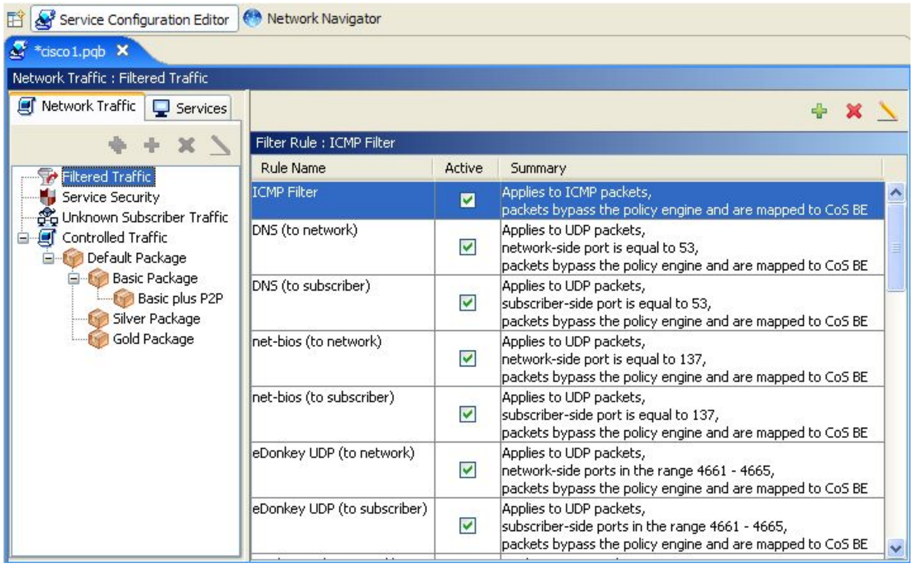
The listing for each filter rule includes the name, the status, and a brief description (generated by the system) of the rule.

To see more information about a filter rule, open the Edit Filter Rule dialog box (see *Editing Filter Rules* (on page 10-25)).

To view the rules for a package:

Step 1 In the Network Traffic tab, select the **Filtered Traffic** node.

A list of all filter rules is displayed in the right (Rule) pane.



Rule Name	Active	Summary
ICMP Filter	☑	Applies to ICMP packets, packets bypass the policy engine and are mapped to CoS BE
DNS (to network)	☑	Applies to UDP packets, network-side port is equal to 53, packets bypass the policy engine and are mapped to CoS BE
DNS (to subscriber)	☑	Applies to UDP packets, subscriber-side port is equal to 53, packets bypass the policy engine and are mapped to CoS BE
net-bios (to network)	☑	Applies to UDP packets, network-side port is equal to 137, packets bypass the policy engine and are mapped to CoS BE
net-bios (to subscriber)	☑	Applies to UDP packets, subscriber-side port is equal to 137, packets bypass the policy engine and are mapped to CoS BE
eDonkey UDP (to network)	☑	Applies to UDP packets, network-side ports in the range 4661 - 4665, packets bypass the policy engine and are mapped to CoS BE
eDonkey UDP (to subscriber)	☑	Applies to UDP packets, subscriber-side ports in the range 4661 - 4665, packets bypass the policy engine and are mapped to CoS BE

Adding Filter Rules

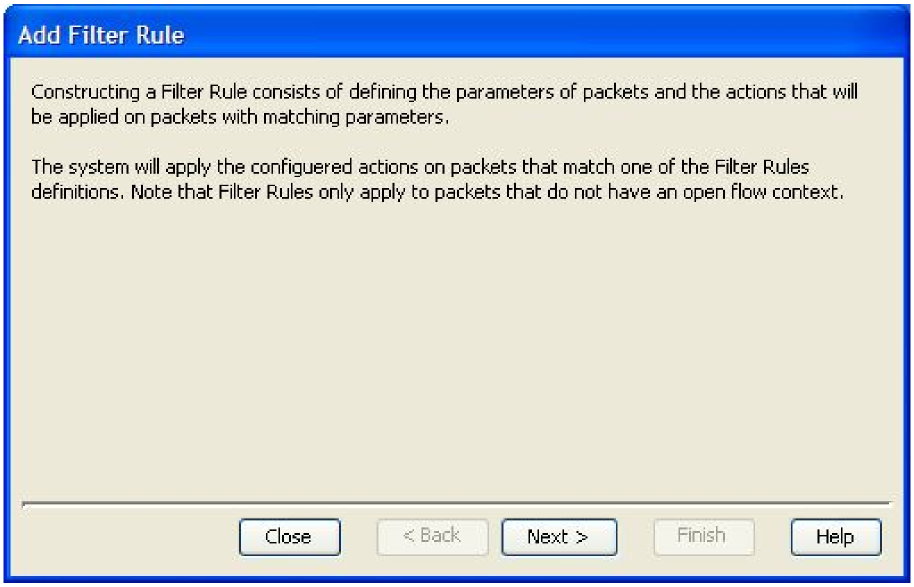
The Add Filter Rule wizard guides you through the process of adding a filter rule.

To add a filter rule:

Step 1 In the Network Traffic tab, select the **Filtered Traffic** node.

Step 2 Click ✚ (**Add Rule**) in the right (Rule) pane.

The Add Filter Rule wizard appears.

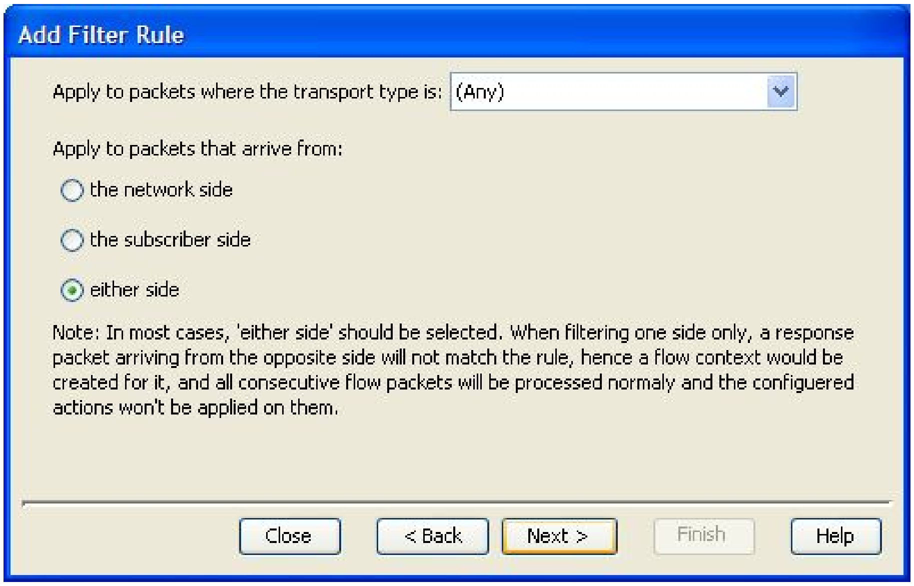

Add Filter Rule

Constructing a Filter Rule consists of defining the parameters of packets and the actions that will be applied on packets with matching parameters.

The system will apply the configuered actions on packets that match one of the Filter Rules definitions. Note that Filter Rules only apply to packets that do not have an open flow context.

Step 3 Click **Next**.

The Transport Type and Direction screen of the Add Filter Rule wizard opens.



Add Filter Rule

Apply to packets where the transport type is: (Any)

Apply to packets that arrive from:

○ the network side

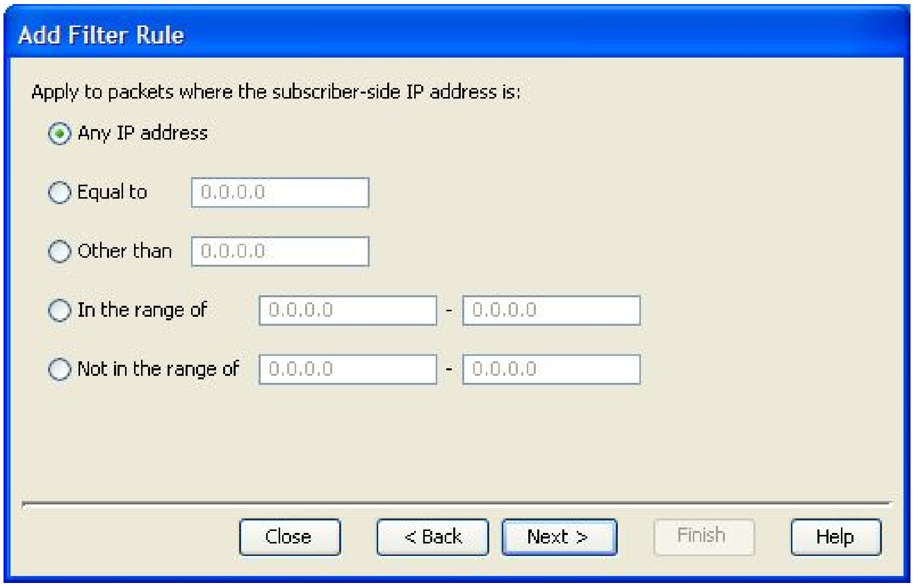
○ the subscriber side

● either side

Note: In most cases, 'either side' should be selected. When filtering one side only, a response packet arriving from the opposite side will not match the rule, hence a flow context would be created for it, and all consecutive flow packets will be processed normaly and the configured actions won't be applied on them.

Step 4 Select the transport type and initiating side, and click **Next**.

The Subscriber-Side IP Address screen of the Add Filter Rule wizard opens.



Add Filter Rule

Apply to packets where the subscriber-side IP address is:

● Any IP address

○ Equal to 0.0.0.0

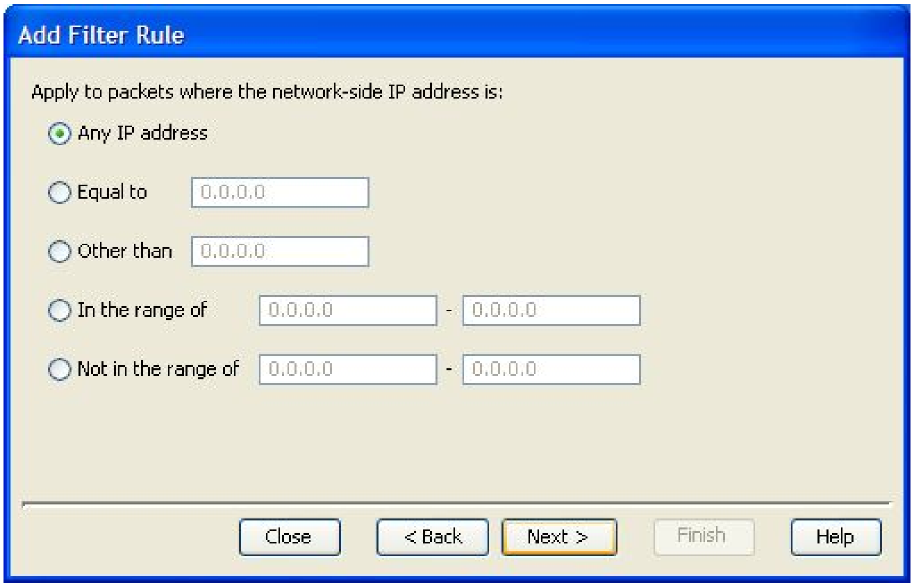
○ Other than 0.0.0.0

○ In the range of 0.0.0.0 - 0.0.0.0

○ Not in the range of 0.0.0.0 - 0.0.0.0

Step 5 Define the subscriber-side IP address and click **Next**.

The Network-Side IP Address screen of the Add Filter Rule wizard opens.



Add Filter Rule

Apply to packets where the network-side IP address is:

● Any IP address

○ Equal to 0.0.0.0

○ Other than 0.0.0.0

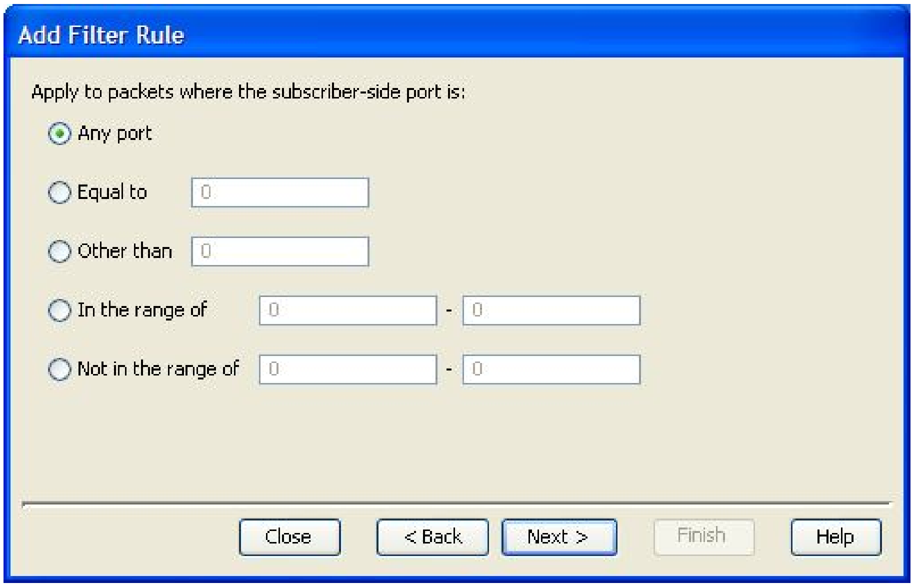
○ In the range of 0.0.0.0 - 0.0.0.0

○ Not in the range of 0.0.0.0 - 0.0.0.0

Step 6 Define the network-side IP address and click **Next**.

If the transport type selected in step 4 was *not* TCP or UDP, the ToS screen of the Add Filter Rule wizard opens. Go to step 9.

If the transport type selected in step 4 was TCP or UDP, the Subscriber-Side Port screen of the Add Filter Rule wizard opens.



Add Filter Rule

Apply to packets where the subscriber-side port is:

● Any port

○ Equal to 0

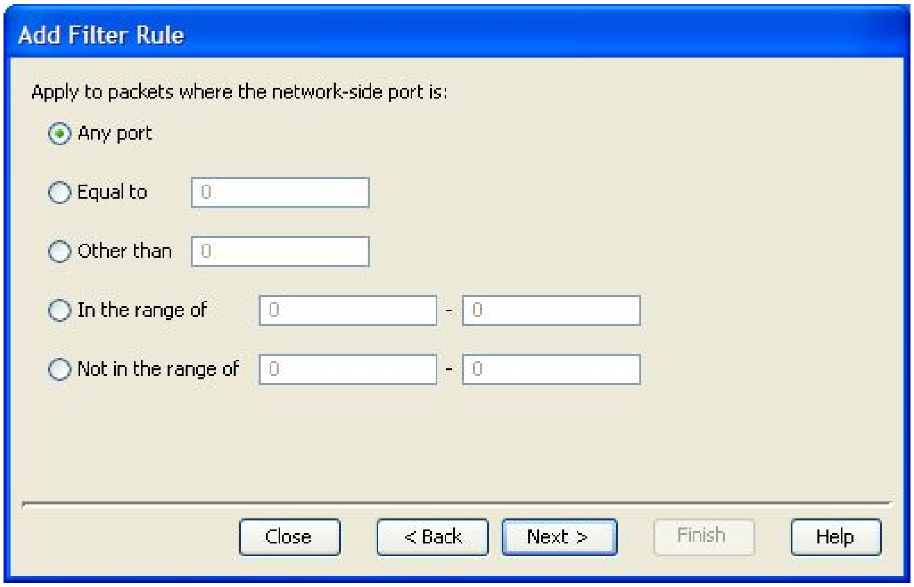
○ Other than 0

○ In the range of 0 - 0

○ Not in the range of 0 - 0

Step 7 Define the subscriber-side port and click **Next**.

The Network-Side Port screen of the Add Filter Rule wizard opens.



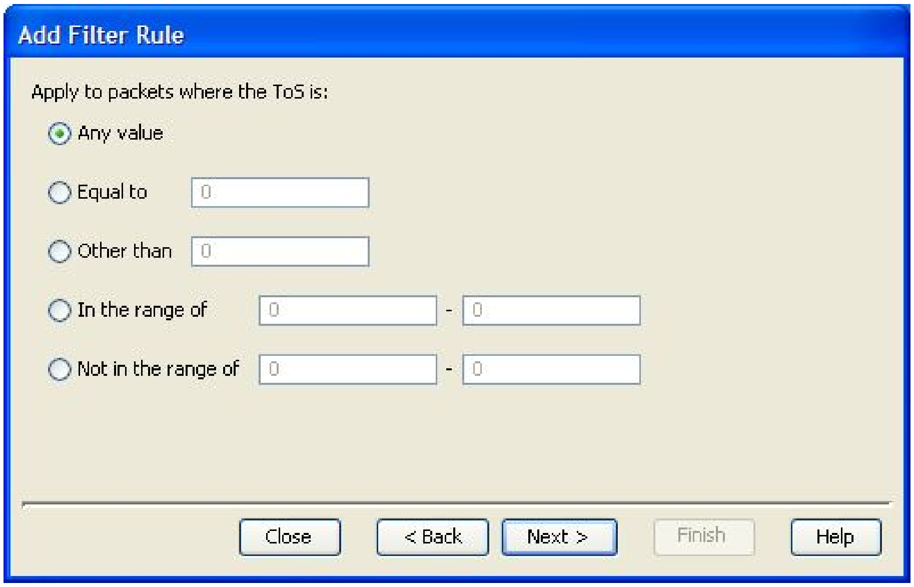
Add Filter Rule

Apply to packets where the network-side port is:

- ● Any port
- ○ Equal to 0
- ○ Other than 0
- ○ In the range of 0 - 0
- ○ Not in the range of 0 - 0

Step 8 Define the network-side port and click **Next**.

The ToS screen of the Add Filter Rule wizard opens.



Add Filter Rule

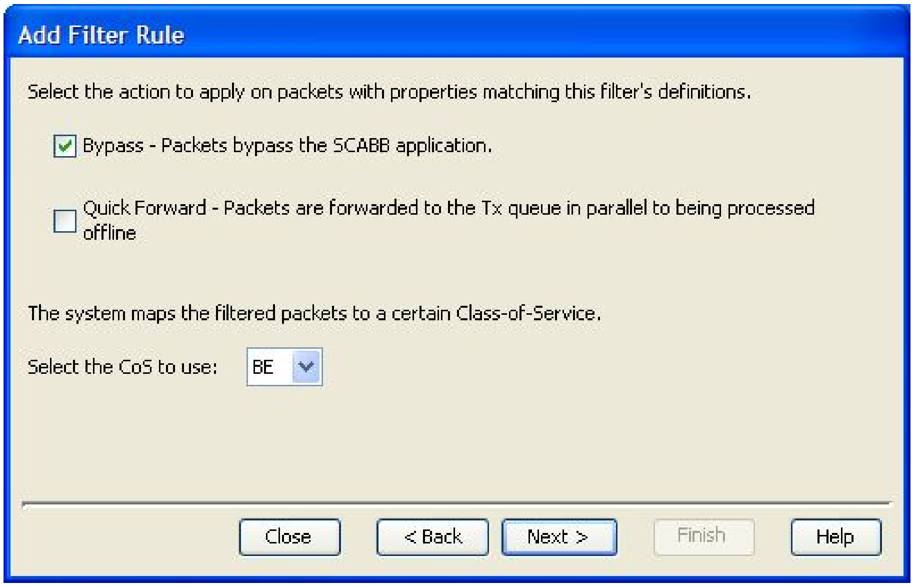
Apply to packets where the ToS is:

- ● Any value
- ○ Equal to 0
- ○ Other than 0
- ○ In the range of 0 - 0
- ○ Not in the range of 0 - 0

Step 9 Define the ToS and click **Next**.

Acceptable values for ToS are 0 to 63.

The Action and Class-of-Service screen of the Add Filter Rule wizard opens.


Add Filter Rule

Select the action to apply on packets with properties matching this filter's definitions.

☑ Bypass - Packets bypass the SCABB application.

□ Quick Forward - Packets are forwarded to the Tx queue in parallel to being processed offline

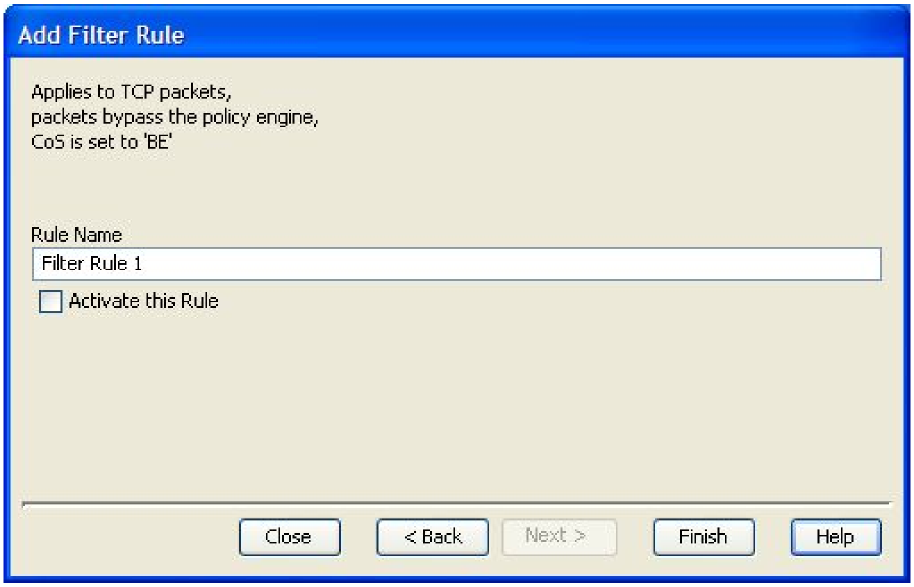
The system maps the filtered packets to a certain Class-of-Service.

Select the CoS to use: BE

- Bypass—Packets that match this filter rule are not passed to ***SCA BB***.
- Quick Forward—The SCE platform ensures low latency for packets that match this filter rule (use for delay sensitive flows). Packets are duplicated and passed to ***SCA BB*** for processing.
- Bypass and Quick Forward—The SCE platform ensures low latency for packets that match this filter rule (use for delay sensitive flows). Packets are not passed to ***SCA BB***.

Step 10 Check or uncheck required actions and select a Class-of-Service value, and click **Next**.

The Finish screen of the Add Filter Rule wizard opens.


Add Filter Rule

Applies to TCP packets,
packets bypass the policy engine,
CoS is set to 'BE'

Rule Name
Filter Rule 1

□ Activate this Rule

Step 11 In the Rule Name field, enter a unique name for the new filter rule.

> You can use the default name for the filter rule. It is recommended that you enter a meaningful name.

Step 12 (Optional) To activate the filter rule, check the **Activate this rule** check box. Traffic is filtered according to the rule only when it is activated.

Step 13 Click **Finish**.

The Add Filter Rule wizard closes.

The filter rule is added and is displayed in the Filter Rule table.

Editing Filter Rules

You can view and edit the parameters of a filter rule.

To edit a filter rule:

Step 1 In the Network Traffic tab, select the **Filtered Traffic** node.

A list of all filter rules is displayed in the right (Rule) pane.

Step 2 Select a rule in the Filter Rule table.

Step 3 Click ✏ (**Edit Rule**).

The Introduction screen of the Edit Filter Rule wizard appears.

The Edit Filter Rule Wizard is the same as the Add Filter Rule wizard.

Step 4 Follow the instructions in the section *Adding Filter Rules* (on page 10-20), steps 4 to 11.

Step 5 Click **Finish**.

The filter rule is changed and relevant changes appear in the Filter Rule table.

Deleting Filter Rules

You can delete filter rules. This is useful, for example, when you want the system to resume handling the IP addresses and their attributes according to the individual rules that were previously defined for each subscriber IP address.

To delete a filter rule:

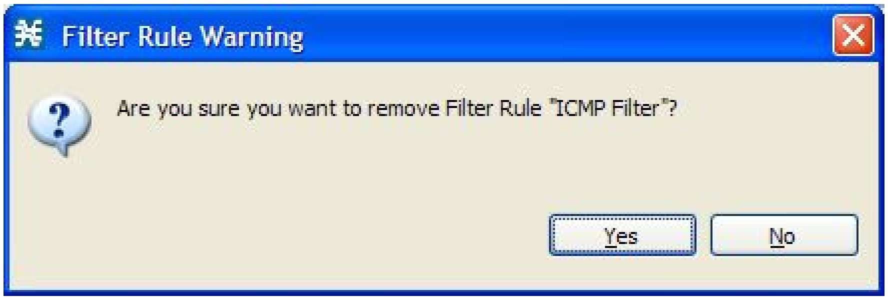
Step 1 In the Network Traffic tab, select the **Filtered Traffic** node.

A list of all filter rules is displayed in the right (Rule) pane.

Step 2 Select a rule in the Filter Rule table.

Step 3 Click ✖ (**Delete Rule**).

A Filter Rule Warning message appears.



Are you sure you want to remove Filter Rule "ICMP Filter"?

Step 4 Click **Yes**.

The filter rule is deleted and is no longer displayed in the Filter Rule table.

Activating and Deactivating Filter Rules

You can activate or deactivate filter rules at any time. Deactivating a filter rule has the same effect as deleting it, but the parameters are retained in the service configuration, and you can reactivate the filter rule at a later date.

To change the status of a filter rule:

Step 1 In the Network Traffic tab, select the **Filtered Traffic** node.

A list of all filter rules is displayed in the right (Rule) pane.

Step 2 Select a rule in the Filter Rule table.

Step 3 To activate the rule, check the **Active** check box.

Step 4 To deactivate the rule, uncheck the **Active** check box.

Step 5 Repeat steps 3 to 5 for other rules.

Managing Subscriber Notifications

The subscriber notification feature pushes web-based messages to a subscriber by redirecting the subscriber HTTP traffic to relevant web pages. These web pages contain information relevant to the subscriber, such as notifications of quota depletion. HTTP redirection starts when the subscriber notification is activated and ceases when the notification is dismissed.

The Cisco Service Control Application for Broadband (***SCA BB***) supports a maximum of 31 subscriber notifications, including the default notification and the Network Attack Notification.

Subscriber Notification Parameters

A subscriber notification is defined by the following parameters:

- Name—Each subscriber notification must have a unique name.

  You cannot change the name of the Default Notification or the Network Attack Notification.

- Destination URL—A configurable destination URL to which the subscriber's HTTP flows are redirected after redirection is activated. This web page usually contains the message that needs to be conveyed to the subscriber.
- Notification Parameters—The query part of the destination URL, which can be optionally added upon redirection.

  The format of the notification parameters to be added to the destination URL is:

  ```
  ?n=<notification-ID>&s=<subscriber-ID>
  ```

  where `<notification-ID>` is the ID of the notification that redirected the subscriber and `<subscriber-ID>` is the subscriber name.

  There is a different format for the *notification parameters of the Network Attack Notification* (on page 10-32).

  The destination web server can use these parameters to carry a more purposeful message to the subscriber.

- Dismissal method—Indicates when to dismiss, or deactivate, the notification state. May be any one of the following:
  - Subscriber browses to destination URL (default)—As soon as the subscriber browses to the destination URL, they are considered as notified and the notification state is dismissed.

    For example, if a subscriber has exceeded their quota, the notification state is dismissed as soon as they browse to the destination URL that informs them of this fact (even though the subscriber still remains in a breach state).

  - The condition that activated the notification no longer holds—The dismissal of the notification state is dependent on the resolution of the condition, rather than on the subscriber.

    For instance, if a subscriber has exceeded their quota, the notification state is dismissed only when they have completed the procedure to refresh their quota.

  This option is *not* available for the Network Attack Notification. A subscriber must respond to the notification before the notification is dismissed.

  - Subscriber browses to dismissal URL—The notification state is not dismissed until the subscriber proceeds from the destination URL to a different, final URL.

    All HTTP flows are redirected until the notification is dismissed, which takes place when the subscriber accesses the dismissal URL. By default, the destination URL is also the dismissal URL, and a notification is dismissed as soon as the first redirection takes place. However, you can define a different dismissal URL, so that the subscriber must acknowledge the notification.

For instance, if a subscriber has exceeded their quota, the web page at the destination URL may ask the subscriber to press an **Acknowledge** button after reading the message. The acknowledge URL would be defined as the dismissal URL and would deactivate further notifications.

The dismissal URL is composed of the URL hostname and the URL path, separated by a colon, in the following format:

```
[*]<hostname>:<path>[*]
```

- `<hostname>` may optionally be preceded by a wildcard (*), to match all hostnames with the same suffix.
- The path element must always start with “/”.
- `<path>` may be followed by a wildcard, to match all paths with common prefix.

For example, the entry:

```
*.some-isp.net:/redirect/*
```

matches all the following URLs:

- `www.some-isp.net/redirect/index.html`
- `support.some-isp.net/redirect/info/warning.asp`
- `noquota.some-isp.net/redirect/acknowledge.aspx?ie=UTF-8`

- List of Allowed URLs—A list of URLs that will not be blocked and redirected even though redirection is activated.

  After redirection is activated, all HTTP flows, except flows to the destination URL and to the dismissal URL, are blocked and redirected to the destination URL. However, subscribers can be permitted to access an additional set of URLs. This is useful, for example, to give subscribers access to additional support information.

  Allowed URLs have the same format as the dismissal URL.

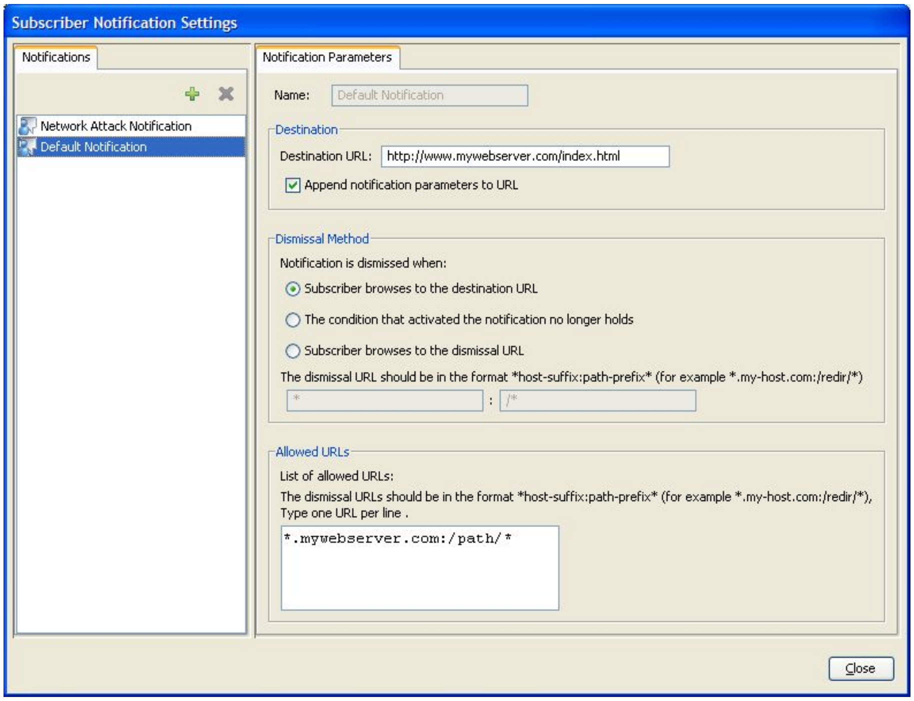
These parameters are defined when you add a new subscriber notification (see *Adding Subscriber Notifications* (on page 10-29)). You can modify them at any time (see *Editing Subscriber Notifications* (on page 10-30)).

Viewing Subscriber Notifications

To view subscriber notifications:

Step 1 From the Console main menu, choose **Configuration** > **Subscriber Notifications**.

The Subscriber Notifications Settings dialog box appears.



Network Attack Notification
Default Notification

Name: Default Notification

Destination

Destination URL: http://www.mywebserver.com/index.html

☑ Append notification parameters to URL

Dismissal Method

Notification is dismissed when:

● Subscriber browses to the destination URL

○ The condition that activated the notification no longer holds

○ Subscriber browses to the dismissal URL

The dismissal URL should be in the format *host-suffix:path-prefix* (for example *.my-host.com:/redir/*)

* : /*

Allowed URLs

List of allowed URLs:

The dismissal URLs should be in the format *host-suffix:path-prefix* (for example *.my-host.com:/redir/*), Type one URL per line .

```
*.mywebserver.com:/path/*
```

The Notifications tab displays a list of all subscriber notifications.

Step 2 Click a subscriber notification in the list to display its parameters.

The parameters of the subscriber notification are displayed in the Notification Parameters tab.

Step 3 Click **Close**.

The Subscriber Notifications Settings dialog box closes.

Adding Subscriber Notifications

You can add up to 29 subscriber notifications to a service configuration.

To add a subscriber notification:

Step 1 From the Console main menu, choose **Configuration** > **Subscriber Notifications**.

The Subscriber Notifications Settings dialog box appears.

Step 2 Click ✚ (**Add**).

Step 3 In the Name field, enter a unique name for the new subscriber notification.

You can use the default name for the subscriber notification. It is recommended that you enter a meaningful name

Step 4 In the Destination URL field, enter the destination URL.

Step 5 (Optional) If notification parameters will be appended to the destination URL, check the **Append notification parameters to URL** check box.

Step 6 Select the dismissal method by clicking a **Dismissal Method** radio button:

- **Subscriber browses to the destination URL**
- **The condition that activated the notification no longer holds**
- **Subscriber browses to the dismissal URL**

Step 7 If you selected Subscriber browses to the dismissal URL in step 6, enter the dismissal URL host-suffix and path-prefix in the fields provided.

Step 8 Enter any allowed URLs, one per line, in the Allowed URLs text box.

Step 9 Click **Close**.

The Subscriber Notifications Settings dialog box closes.

Note Creating a subscriber notification does not activate the subscriber notification feature. After the subscriber notification is defined, it must be activated for a particular package. (See *Editing Breach-Handling Parameters for a Rule* (on page 9-50).)

Editing Subscriber Notifications

You can modify notification parameters at any time.

To edit a subscriber notification:

Step 1 From the Console main menu, choose **Configuration** > **Subscriber Notifications**.

The Subscriber Notifications Settings dialog box appears.

Step 2 Click a subscriber notification in the Notifications tab to display its parameters.

Step 3 Edit the parameters of the subscriber notification in the Notification Parameters tab.

Step 4 Click **Close**.

The Subscriber Notifications Settings dialog box closes.

Deleting Subscriber Notifications

You can delete subscriber notifications at any time.

You cannot delete the default notification or the Network Attack Notification.

To delete a subscriber notification:

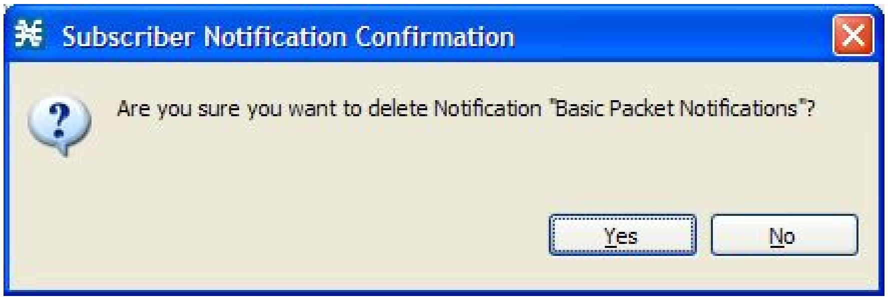
Step 1 From the Console main menu, choose **Configuration** > **Subscriber Notifications**.

The Subscriber Notifications Settings dialog box appears.

Step 2 Click a subscriber notification in the Notifications tab.

Step 3 Click ✖ (**Delete**).

A Subscriber Notification Confirmation message appears.

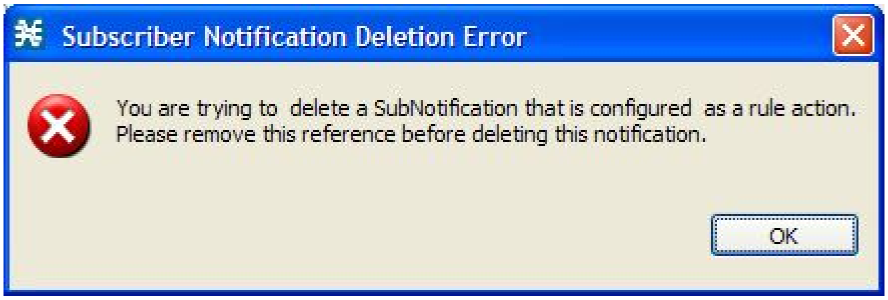


Subscriber Notification Confirmation

Are you sure you want to delete Notification "Basic Packet Notifications"?

Step 4 Click **Yes**.

- If the specified subscriber notification is being used by a rule, a Subscriber Notification Deletion Error message is displayed.



Subscriber Notification Deletion Error

You are trying to delete a SubNotification that is configured as a rule action.
Please remove this reference before deleting this notification.

The subscriber notification cannot be deleted until you unassign it or deactivate it in all service rules. (See *Editing Breach-Handling Parameters for a Rule* (on page 9-50).)

The selected subscriber notification is deleted.

Step 5 Click **Close**.

The Subscriber Notifications Settings dialog box closes.

Network Attack Notification

Subscriber notification informs a subscriber in real-time about current attacks involving IP addresses mapped to that subscriber. (Enabling these notifications is described in *The Service Security Dashboard* (on page 10-1).) ***SCA BB*** notifies the subscriber about the attack by redirecting HTTP flows originating from the subscriber to a server that supplies information about the attack.

One subscriber notification, Network Attack Notification, is dedicated to providing these notifications; it cannot be deleted. A Network Attack Notification is *not* dismissed at the end of an attack; subscribers *must* respond to it.

To allow redirection when blocking traffic, the system is configured to leave open one specified TCP port (by default, port 80). See *Managing Advanced Service Configuration Options* (on page 10-39).

Caution In earlier versions of ***SCA BB***, configuring network attack notifications was performed using CLI commands. CLI commands should no longer be used for this purpose.

Network Attack Notification Parameters

When a network attack is detected, HTTP flows of the subscriber are redirected to a configurable destination URL. This web page should display the warning that needs to be conveyed to the subscriber.

Optionally, the destination URL can include a query part containing notification parameters. The destination web server can use these parameters to create a more specific warning to the subscriber.

The query part of the URL has the following format:

```
?ip=<ip>&side=<side>&dir=<dir>&prot=<protocol>&no=<open-
flows>&nd=<suspected-flows>&to=<open-flows-
threshold>&td=<suspected-flows-
threshold>&ac=<action>&nh=<handled-flows>
```

The meaning of each field in the tail is described in the following table:

Table 10-1 Description Tail Fields

Field	Description	Possible Values
ip	Detected IP address	
side		• s—Subscriber • n—Network
dir		• s—Source • d—Destination

Field	Description	Possible Values
protocol		• TCP • UDP • ICMP • OTHER
open-flows	Number of open flows	
suspected flows	Number of attack-suspected flows	
open-flows-threshold	Threshold for open flows	
suspected-flows-threshold	Threshold for attack-suspected flows	
action		• R—Report • B—Block and report
handled-flows	Number of flows handled since the attack began (Non-zero only during and at the end of an attack)	

EXAMPLE OF URL WITH DESCRIPTION TAIL:

```
http://www.some-isp.net/warning?ip=80.178.113.222&side=s&dir=s&prot=TCP&no=3
4&nd=4&to=34&td=10&ac=B&nh=100
```

Managing the System Settings

The Console allows you to determine various system parameters that control:

- The operational state of the system
- The redirection URLs for protocols that support redirection
- BW prioritization mode (see *Setting BW Management Prioritization Mode* (on page 9-45))
- Advanced service configuration options

Setting the Operational Mode of the System

The Console allows you to select the operational mode of the system. This feature defines how the system handles network traffic.

Note Each rule has its own operational mode (state). If this differs from the system mode, the “lower” of the two modes is used. For example, if a rule is enabled, but the system mode is report-only, the rule will only generate RDRs.

The three System Modes are:

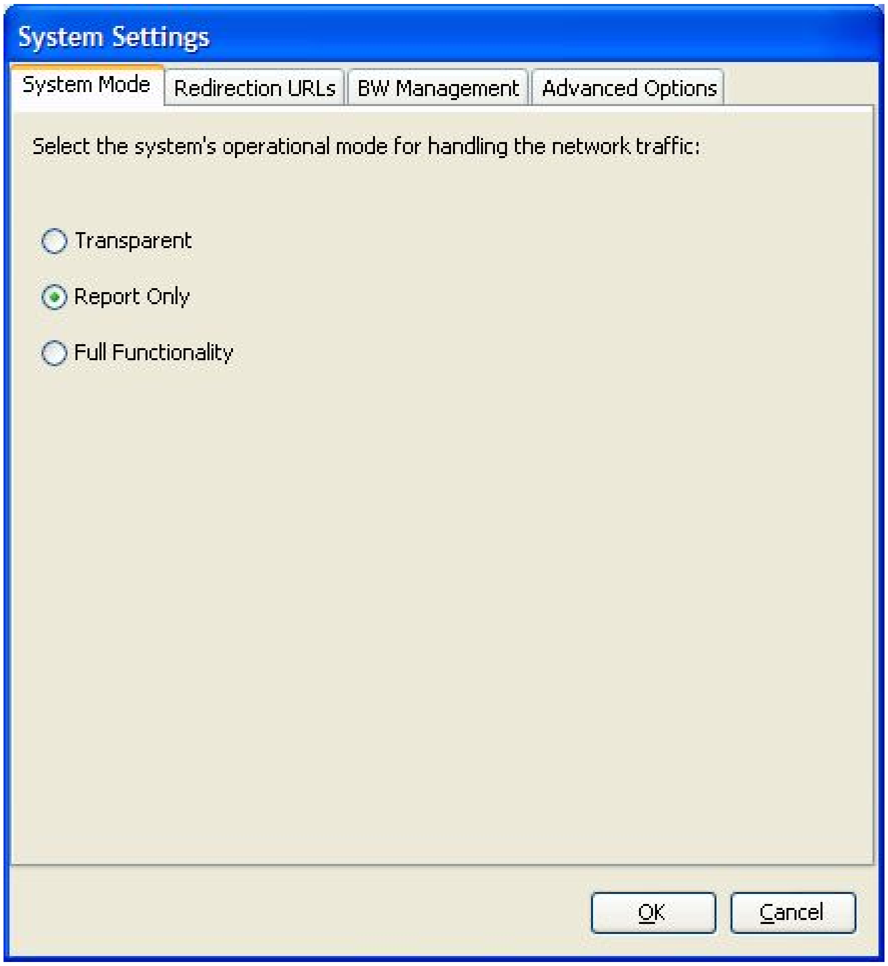
- Full Functionality—The system enforces active rules on the network traffic and performs reporting functions (that is, generates RDRs).

- Report Only—The system generates RDRs only. No active rule enforcement is performed on the network traffic.
- Transparent—The system does not generate RDRs and does not enforce active rules on the network traffic.

To configure the system mode parameter:

Step 1 From the Console main menu, choose **Configuration** > **System Settings**.

The System Settings dialog box appears.



Select the system's operational mode for handling the network traffic:

○ Transparent

● Report Only

○ Full Functionality

Step 2 Select one of the **operational mode** buttons:

- **Transparent**
- **Report only**
- **Full functionality**

Step 3 Click **OK**.

The System Settings dialog box closes.

The new System Mode setting is saved.

Setting Redirection Parameters

The rules for a package may deny access to selected protocols. When a subscriber to the package tries to access a protocol that is blocked, the traffic flow can be redirected to a server where a posted web page explains the reason for the redirection (for example, a “Silver” subscriber trying to access a service that is available only to “Gold” subscribers). This web page can offer subscribers the opportunity to upgrade their packages. You configure which *redirection set* to use when defining rules (see *Defining Per-Flow Actions for a Rule* (on page 9-14)).

The Console Redirection feature supports only three protocols:

- HTTP Browsing
- HTTP Streaming
- RTSP Streaming

Each redirection set contains one redirection option for each of these three protocols. The system provides a default redirection set, which cannot be deleted. You can add up to 49 additional sets.

Each redirection URL includes the URL specified name, the Subscriber ID, and the Service ID in the following format:

```
<URL>?n=<subscriber-ID>&s=<service-ID>
```

Adding a Set of Redirection URLs

You can add up to 49 redirection sets.

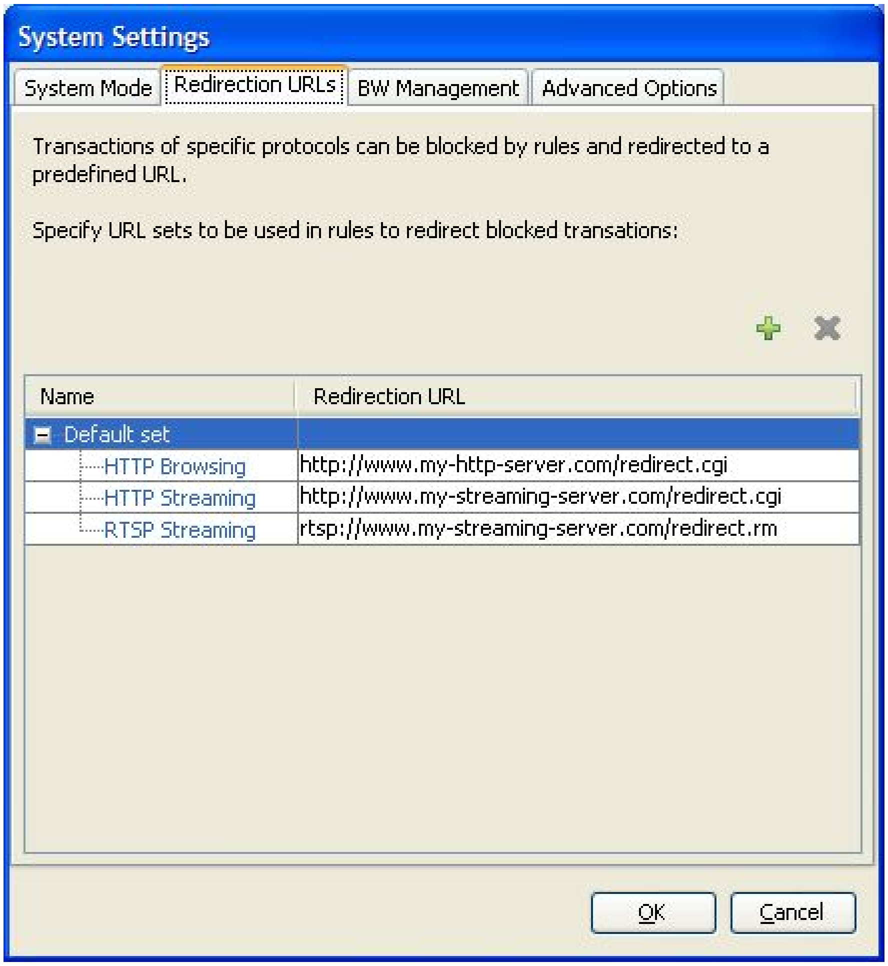
To add a redirection set:

Step 1 From the Console main menu, choose **Configuration** > **System Settings**.

The System Settings dialog box appears.

Step 2 Click the **Redirection URLs** tab.

The Redirection URLs tab opens.



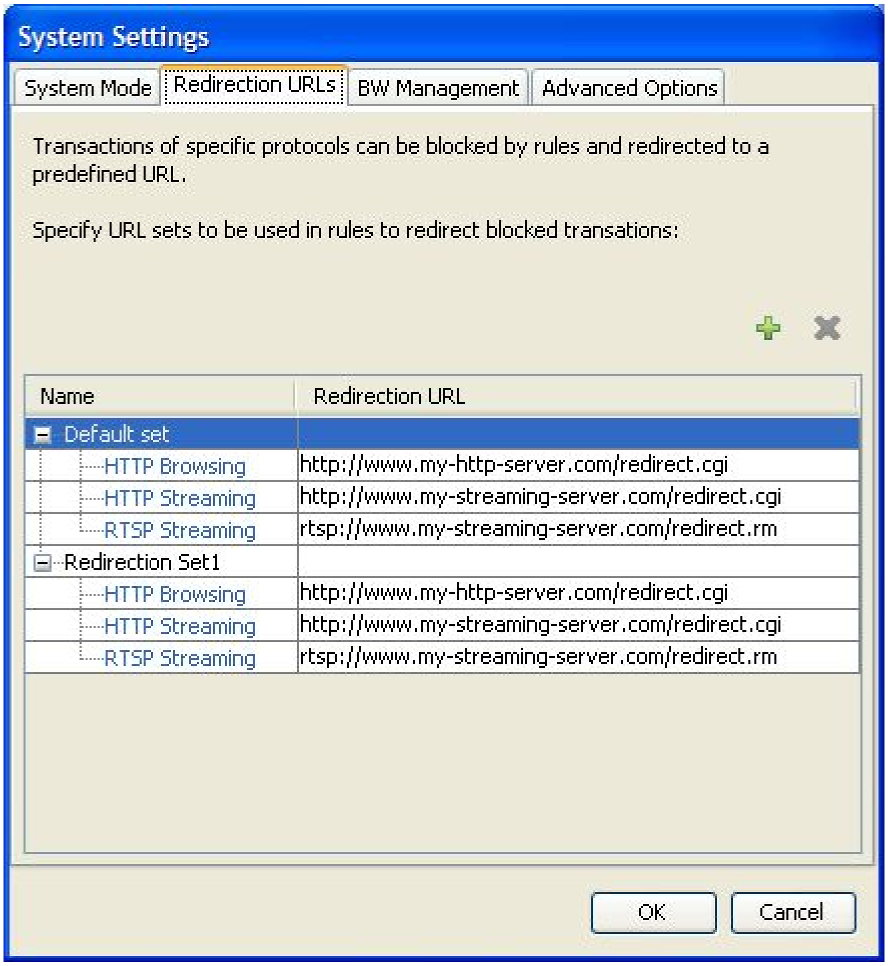
Transactions of specific protocols can be blocked by rules and redirected to a predefined URL.

Specify URL sets to be used in rules to redirect blocked transations:

Name	Redirection URL
⊟ Default set	
HTTP Browsing	http://www.my-http-server.com/redirect.cgi
HTTP Streaming	http://www.my-streaming-server.com/redirect.cgi
RTSP Streaming	rtsp://www.my-streaming-server.com/redirect.rm

Step 3 Click ✚ (**Add**).

A new redirection set containing the default redirection URLs is added to the redirection set list.



Transactions of specific protocols can be blocked by rules and redirected to a predefined URL.

Specify URL sets to be used in rules to redirect blocked transations:

Name	Redirection URL
Default set	
HTTP Browsing	http://www.my-http-server.com/redirect.cgi
HTTP Streaming	http://www.my-streaming-server.com/redirect.cgi
RTSP Streaming	rtsp://www.my-streaming-server.com/redirect.rm
Redirection Set1	
HTTP Browsing	http://www.my-http-server.com/redirect.cgi
HTTP Streaming	http://www.my-streaming-server.com/redirect.cgi
RTSP Streaming	rtsp://www.my-streaming-server.com/redirect.rm

Step 4 In the Name field, enter a unique name for the new redirection set.

You can use the default name for the redirection set, but it is recommended that you enter a meaningful name.

Step 5 Enter new values in the Redirection URL cells of the new redirection set.

Step 6 Click **OK**.

The System Settings dialog box closes.

The Redirection group is added to the redirection set list.

Configuring the Redirection Parameters

To edit an existing set of Redirection URLs:

Step 1 From the Console main menu, choose **Configuration** > **System Settings**.

The System Settings dialog box appears.

Step 2 Click the **Redirection URLs** tab.

The Redirection URLs tab opens.

Step 3 Click a URL in the **Redirection URL** column.

Step 4 Enter a new URL.

Step 5 Click **OK**.

The System Settings dialog box closes.

The Redirection settings are saved.

Deleting a Set of Redirection URLs

To delete a redirection set:

Step 1 From the Console main menu, choose **Configuration** > **System Settings**.

The System Settings dialog box appears.

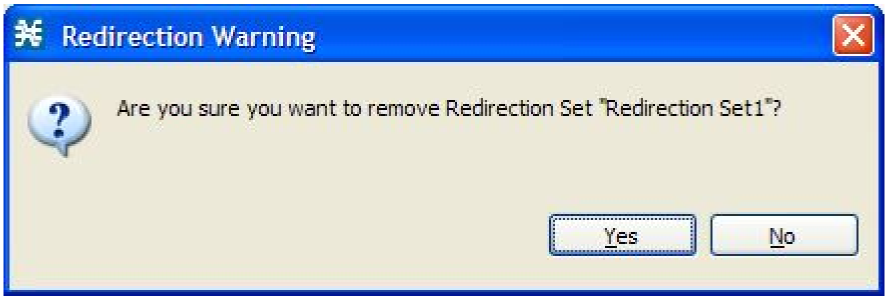
Step 2 Click the **Redirection URLs** tab.

The Redirection URLs tab opens.

Step 3 Click the name of a redirection set.

Step 4 Click ✖ (**Delete**).

A Redirection Warning message appears.



Are you sure you want to remove Redirection Set "Redirection Set1"?

Step 5 Click **Yes**.

The redirection set is deleted.

Step 6 Click **OK**.

The System Settings dialog box closes.

Managing Advanced Service Configuration Options

Advanced service configuration options control the more sophisticated and less frequently changed attributes of the system. It is recommended that you do not change these options.

The following table lists these options:

Table 10-2 Advanced Service Configuration Properties

Property	Default Value	Description
Classification		
Classification based on recent classification history enabled	True	*Recent classification history* is a heuristic mechanism used to classify flows according to previous traffic classification decisions. This mechanism improves the classification of Warez, Skype, and Winny2 flows.
Guruguru detailed inspection mode enabled	False	The Guruguru protocol is used by the Guruguru file-sharing application that is popular in Japan. ***SCA BB*** provides two inspection modes for classification of this protocol: • Default—Suitable for networks where little Guruguru traffic is expected. This is usual in all countries except Japan. • Detailed—Suitable for networks where Guruguru traffic is expected to be common. This should occur in Japanese networks only.
Kuro detailed inspection mode enabled	False	The Kuro protocol is used by the Kuro file-sharing application that is popular in Japan. ***SCA BB*** provides two inspection modes for classification of this protocol: • Default—Suitable for networks where little Kuro traffic is expected. This is usual in all countries except Japan. • Detailed—Suitable for networks where Kuro traffic is expected to be common. This should occur in Japanese networks only.

Property	Default Value	Description
Soribada detailed inspection mode enabled	False	The Soribada protocol is used by the Soribada file-sharing application that is popular in Japan. ***SCA BB*** provides two inspection modes for classification of this protocol: • Default—Suitable for networks where little Soribada traffic is expected. This is usual in all countries except Japan. • Detailed—Suitable for networks where Soribada traffic is expected to be common. This should occur in Japanese networks only.
TCP destination port signatures	1720:H323	TCP destination port numbers for signatures that require a port hint for correct classification. Valid values are comma-separated items, each item in the form <port-number>:<signature-name>. Applicable signature names are: H323, Radius Access, Radius Accounting, and DHCP.
UDP destination port signatures	67:DHCP, 1812:Radius Access, 1645:Radius Access, 1813:Radius Accounting, 1646:Radius Accounting	UDP destination port numbers for signatures that require a port hint for correct classification. Valid values are comma-separated items, each item in the form <port-number>:<signature-name>. Applicable signature names are: H323, Radius Access, Radius Accounting, and DHCP.
UDP ports for which flow should be opened on first packet	5060, 5061, 67, 69, 1812, 1813, 1645, 1646, 2427, 2727, 9201, 9200, 123, 1900	Enhanced flow-open mode is disabled on the specified UDP ports, to allow classification according to the flow’s first packet.
UDP source port signatures	1812:Radius Access, 1645:Radius Access, 1813:Radius Accounting, 1646:Radius Accounting	UDP source port numbers for signatures that require a port hint for correct classification. Valid values are comma-separated items, each item in the form <port-number>:<signature-name>. Applicable signature names are: H323, Radius Access, Radius Accounting, and DHCP.

Property	Default Value	Description
V-Share detailed inspection mode enabled	False	The V-Share protocol is used by the V-Share file-sharing application that is popular in Japan. ***SCA BB*** provides two inspection modes for classification of this protocol: • Default—Suitable for networks where little V-Share traffic is expected. This is usual in all countries except Japan. • Detailed—Suitable for networks where V-Share traffic is expected to be common. This should occur in Japanese networks only.
Winny detailed inspection mode enabled	False	The Winny P2P protocol is used by the Winny file-sharing application that is popular in Japan. ***SCA BB*** provides two inspection modes for classification of this protocol: • Default—Suitable for networks where little Winny traffic is expected. This is usual in all countries except Japan. • Detailed—Suitable for networks where Winny traffic is expected to be common. This should occur in Japanese networks only.
Generic Upload/Download		
Accelerated packet skip used in detection of behavioral patterns	True	Specifies whether to skip the first packet by waiting for the next packet or by going into bypass mode.
Detection of generic upload/download based on behavioral patterns enabled	False	Specifies whether to use the generic download search.
Minimal average size of the sampled TCP packets (bytes)	1200	The minimum size of a TCP packet allowed when looking for generic download flow.
Minimal average size of the sampled UDP packets (bytes)	1200	The minimum size of a UDP packet allowed when looking for generic download flow.
Minimal up:down volume ratio of the sampled TCP packets (10:N)	500	The minimum upload:download ratio allowed (after sampling all packets) for TCP flows.
Minimal up:down volume ratio of the sampled UDP packets (10:N)	500	The minimum upload:download ratio allowed (after sampling all packets) for UDP flows.
Malicious Traffic		
Malicious Traffic RDRs enabled	True	Specifies whether to generate Malicious Traffic RDRs.

Property	Default Value	Description
Number of seconds between Malicious Traffic RDRs on the same attack	60	A Malicious Traffic RDR is generated when an attack is detected. Malicious Traffic RDRs are then generated periodically, at user-configured intervals, for the duration of the attack.
TCP port that should remain open for Subscriber Notification	80	You can choose to block flows that are part of any detected network attack, but this may hinder subscriber notification of the attack. The specified TCP port will not be blocked to allow notification of the attack to be sent to the subscriber.
Policy Check		
Ongoing policy check mode enabled	True	Specifies whether policy changes affect flows that are already open.
Time to bypass between policy checks	30	Maximum time (in seconds) that may pass before policy changes affect flows that are already open.
Quota Management		
Grace period before first breach	2	The time (in seconds) to wait after a quota limit is breached before the breach action is performed. Policy servers should use this period to provision quota to a subscriber that just logged in.
Length of the time frame for quota replenish scatter (minutes)	0	The size of the window across which to randomly scatter the periodic quota replenishment.
Time to bypass between policy checks for quota limited flows	30	Maximum time (in seconds) that may pass before a quota breach affects flows that are already open.
Volume to bypass between policy checks for quota limited flows	0	Maximum flow volume (in bytes) that may pass before a quota breach affects flows that are already open. A value of zero means that unlimited volume may pass.
Reporting		
Media Flow RDRs enabled	True	Specifies whether to generate Media Flow RDRs.
Reporting of P2P file extensions enabled	False	For some P2P applications, ***SCA BB*** can extract file extensions of P2P file downloads and report them in Transaction RDRs. This information is used by the SCA Reporter to produce a new Top P2P File Extensions report.

Property	Default Value	Description
Subscriber Accounting RDR enabled	False	Specifies whether to generate Subscriber Accounting RDRs. The Subscriber Accounting RDR is used for SM-ISG integration. For more information, see the ISG documentation in the "Managing the SCMP" chapter of the *Cisco Service Control Engine (SCE) Software Configuration Guide*.

Editing Advanced Service Configuration Options

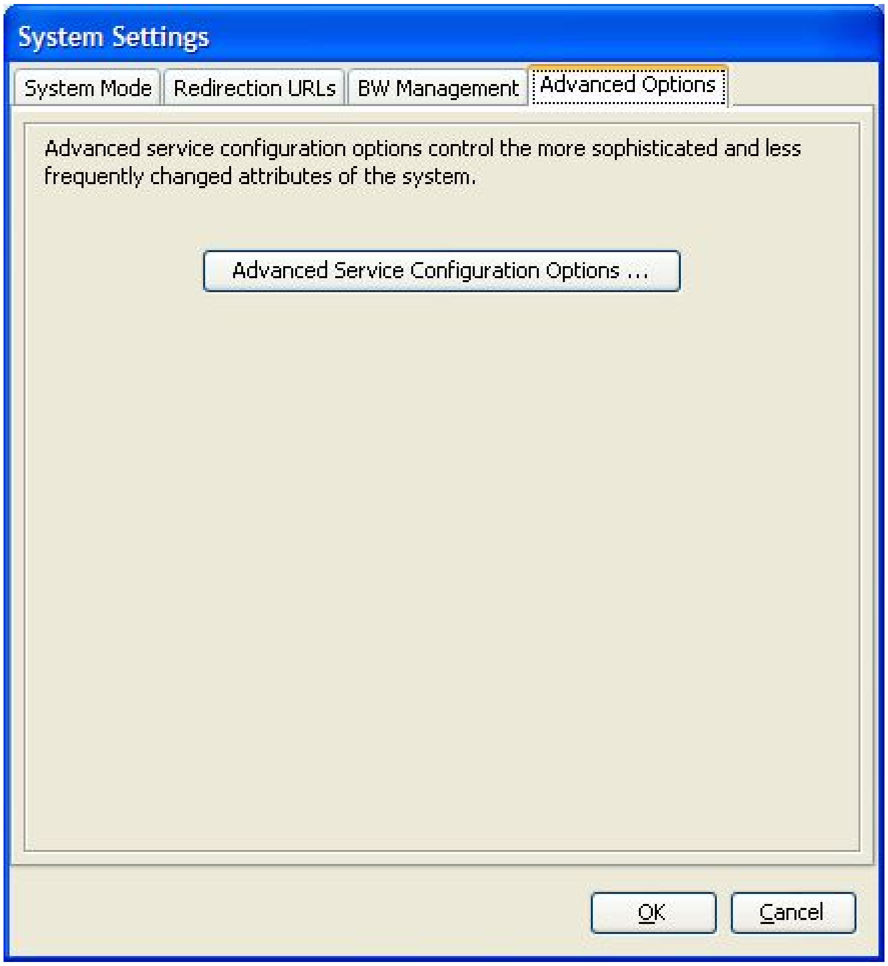
To edit the advanced service configuration options:

Step 1 From the Console main menu, choose **Configuration** > **System Settings**.

The System Settings dialog box appears.

Step 2 Click the **Advanced Options** tab.

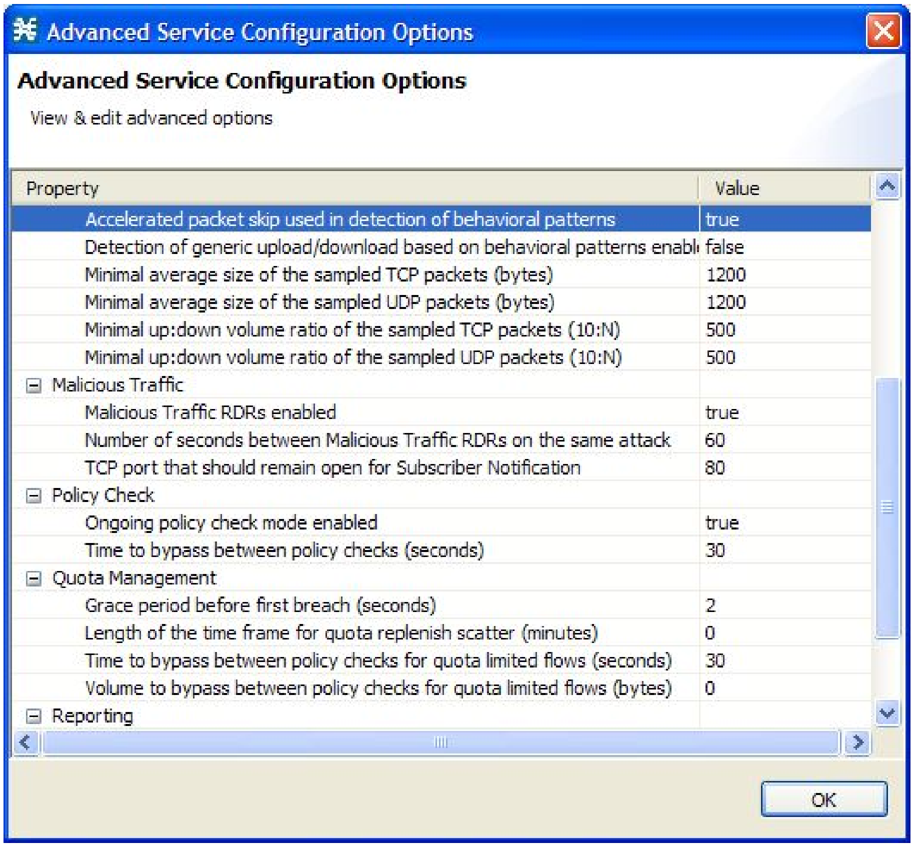
The Advanced Options tab opens.



Advanced service configuration options control the more sophisticated and less frequently changed attributes of the system.

Step 3 Click **Advanced Service Configuration Options**.

The Advanced Service Configuration Options dialog box opens.



Advanced Service Configuration Options

View & edit advanced options

Property	Value
Accelerated packet skip used in detection of behavioral patterns	true
Detection of generic upload/download based on behavioral patterns enabl	false
Minimal average size of the sampled TCP packets (bytes)	1200
Minimal average size of the sampled UDP packets (bytes)	1200
Minimal up:down volume ratio of the sampled TCP packets (10:N)	500
Minimal up:down volume ratio of the sampled UDP packets (10:N)	500
⊟ Malicious Traffic	
Malicious Traffic RDRs enabled	true
Number of seconds between Malicious Traffic RDRs on the same attack	60
TCP port that should remain open for Subscriber Notification	80
⊟ Policy Check	
Ongoing policy check mode enabled	true
Time to bypass between policy checks (seconds)	30
⊟ Quota Management	
Grace period before first breach (seconds)	2
Length of the time frame for quota replenish scatter (minutes)	0
Time to bypass between policy checks for quota limited flows (seconds)	30
Volume to bypass between policy checks for quota limited flows (bytes)	0
⊟ Reporting	

Step 4 Make your changes to the configuration options.

Step 5 Click **OK**.

The Advanced Service Configuration Options dialog box closes.

The changes to the advanced options are saved.

Step 6 Click **OK**.

The System Settings dialog box closes.

Managing VAS Traffic-Forwarding Settings

Traffic forwarding to Value Added Services (VAS) servers allows you to use an external expert system (VAS server) for additional traffic processing, such as intrusion detection and content filtering to subscribers. After processing, flows are sent back to the SCE platform, which then sends them to their original destinations.

The flows to be forwarded are selected based on the subscriber package and the flow type (IP protocol type and destination port number).

VAS traffic forwarding has the following limitations:

- Only the SCE 2000 4xGBE platform supports VAS traffic forwarding.
- A single SCE platform can support up to eight VAS servers.
- A service configuration can contain up to 64 traffic-forwarding tables.
- A traffic-forwarding table can contain up to 64 table parameters.

Note Because of the complexity of the VAS traffic-forwarding feature, VAS flows are not subject to global bandwidth control.

To use VAS traffic forwarding, you must also configure VAS services on the SCE platform. Additional information is available in the “Value Added Services (VAS) Traffic Forwarding” chapter of the *Cisco Service Control Engine (SCE) Software Configuration Guide*.

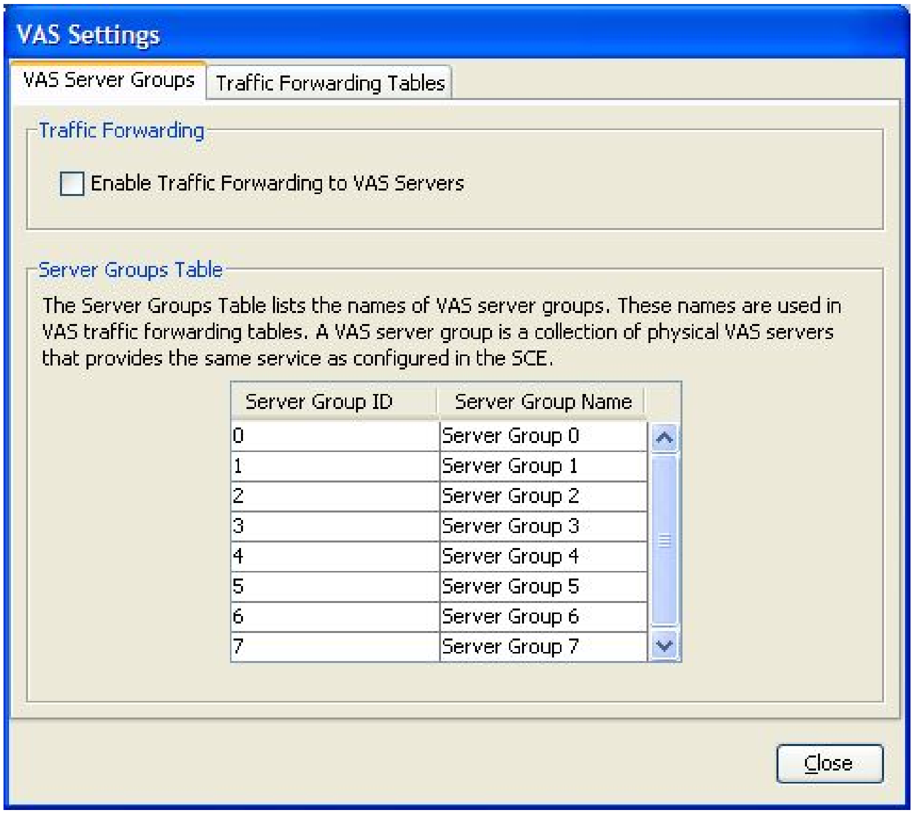
Enabling VAS Traffic Forwarding

By default, VAS traffic forwarding is disabled. You can enable it at any time.

To enable VAS traffic forwarding:

Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box appears.



□ Enable Traffic Forwarding to VAS Servers

The Server Groups Table lists the names of VAS server groups. These names are used in VAS traffic forwarding tables. A VAS server group is a collection of physical VAS servers that provides the same service as configured in the SCE.

Server Group ID	Server Group Name
0	Server Group 0
1	Server Group 1
2	Server Group 2
3	Server Group 3
4	Server Group 4
5	Server Group 5
6	Server Group 6
7	Server Group 7

Step 2 Check the **Enable Traffic Forwarding to VAS Servers** check box.

The VAS Traffic Forwarding Table drop-down list in the Advanced tab of the Package Settings dialog box is enabled (see *Setting Advanced Package Options* (on page 9-5)).

Step 3 Click **Close**.

The VAS Settings dialog box closes.

To disable VAS traffic forwarding:

Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box appears.

Step 2 Uncheck the **Enable Traffic Forwarding to VAS Servers** check box.

VAS traffic forwarding is disabled.

Step 3 Click **Close**.

The VAS Settings dialog box closes.

Renaming VAS Server Groups

An SCE platform can forward flows to up to eight different VAS server groups. By default, the eight server groups are named "Server Group n", where n takes a value from 0 to 7. Give the server groups meaningful names; the names you give will appear in the drop-down list in the Advanced tab of the Package Settings dialog box (see *Setting Advanced Package Options* (on page 9-5)) and in the Server Group field of the table parameters added to each traffic-forwarding table (see *Managing VAS Table Parameters* (on page 10-50)).

To rename VAS server groups:

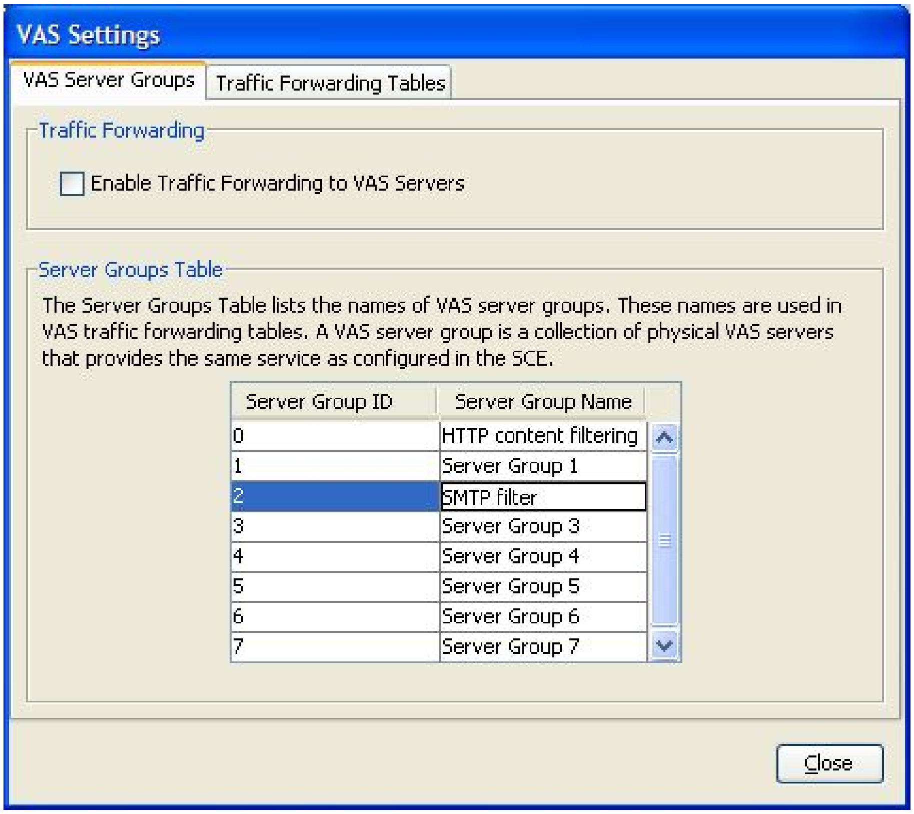
Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box appears.

Step 2 In the table in the Server Groups Table area, double-click in a cell containing a server group name.

Step 3 Enter a meaningful name in the cell.

Step 4 Repeat steps 2 and 3 for other server groups you wish to rename.



The Server Groups Table lists the names of VAS server groups. These names are used in VAS traffic forwarding tables. A VAS server group is a collection of physical VAS servers that provides the same service as configured in the SCE.

Server Group ID	Server Group Name
0	HTTP content filtering
1	Server Group 1
2	SMTP filter
3	Server Group 3
4	Server Group 4
5	Server Group 5
6	Server Group 6
7	Server Group 7

Step 5 Click **Close**.

The VAS Settings dialog box closes.

Viewing VAS Traffic Forwarding Tables

SCA BB decides whether a flow passing through an SCE platform should be forwarded to a VAS server group based on a *traffic-forwarding table*. Each entry (*table parameter*) in a traffic-forwarding table defines to which VAS server group the specified flows should be forwarded.

To view VAS traffic-forwarding tables:

Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box appears.

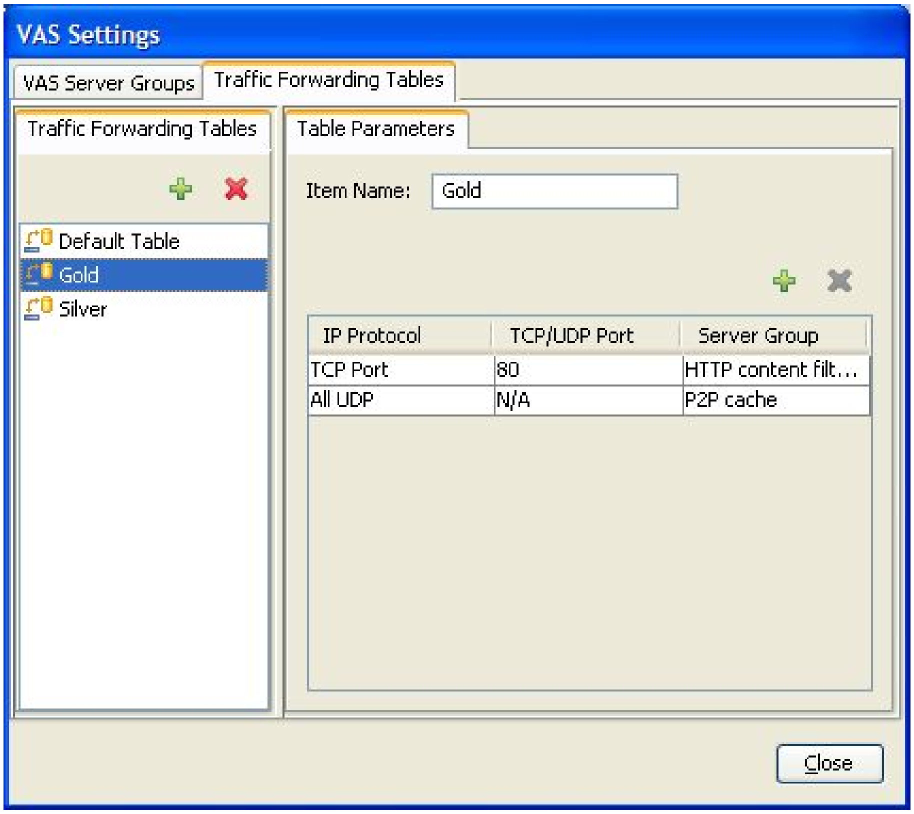
Step 2 Click the **Traffic Forwarding Tables** tab.

The Traffic Forwarding Tables tab opens.

A list of all traffic-forwarding tables is displayed in the Traffic Forwarding Tables area.

Step 3 Click a table in the list of traffic-forwarding tables to display its table parameters.

A list of all table parameters defined for this traffic-forwarding table opens in the Table Parameters tab.



Item Name: Gold

IP Protocol	TCP/UDP Port	Server Group
TCP Port	80	HTTP content filt...
All UDP	N/A	P2P cache

Step 4 Click **Close**.

The VAS Settings dialog box closes.

Deleting VAS Traffic-Forwarding Tables

You can delete all user-created traffic-forwarding tables. The default traffic-forwarding table cannot be deleted.

Note A traffic-forwarding table cannot be deleted while it is associated with a package.

To delete a VAS traffic-forwarding table:

Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box opens.

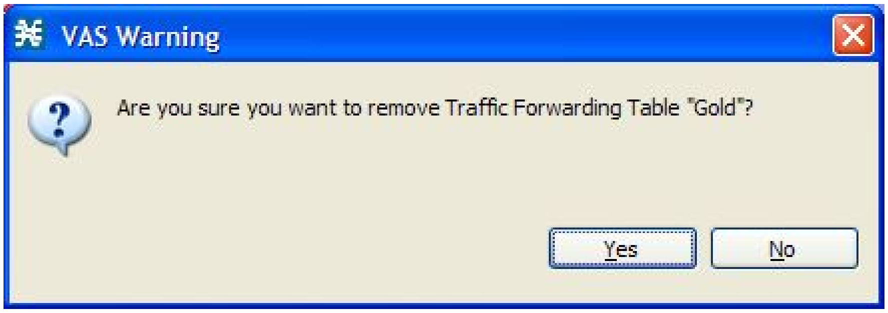
Step 2 Click the **Traffic Forwarding Tables** tab.

The Traffic Forwarding Tables tab opens.

Step 3 From the list of traffic-forwarding tables in the Traffic Forwarding Tables area, select a table.

Step 4 Click ✖ (**Delete**).

A VAS Warning message appears.


VAS Warning

Are you sure you want to remove Traffic Forwarding Table "Gold"?

Step 5 Click **Yes**.

The selected table is deleted and is no longer displayed in the list of traffic-forwarding tables.

Step 6 Click **Close**.

The VAS Settings dialog box closes.

Adding VAS Traffic-Forwarding Tables

A default traffic-forwarding table is included in the service configuration. You can add up to 63 more traffic-forwarding tables, and then assign different traffic-forwarding tables to different packages.

To add a VAS traffic-forwarding table:

Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box appears.

Step 2 Click the **Traffic Forwarding Tables** tab.

The Traffic Forwarding Tables tab opens.

Step 3 In the Traffic Forwarding Tables area, click ✚ (**Add**).

A new table named Table (n), where n is a value between 1 and 63, is added to the list of traffic-forwarding tables in the Traffic Forwarding Tables area.

The table name is also displayed in the Item Name box in the Table Parameters tab.

Step 4 In the Item Name field, enter a unique and relevant name for the traffic-forwarding table.

You can now add table parameters to the new traffic-forwarding table, see *Adding VAS Table Parameters* (on page 10-50).

Managing VAS Table Parameters

A table parameter is an IP protocol type, an associated TCP/UDP port (where applicable), and a VAS server group or a range of IP addresses.

A traffic-forwarding table is a collection of related table parameters.

A traffic-forwarding table can contain up to 64 table parameters.

Adding VAS Table Parameters

You can add up to 64 table parameters to a traffic-forwarding table.

To add a VAS traffic-forwarding table:

Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box appears.

Step 2 Click the **Traffic Forwarding Tables** tab.

The Traffic Forwarding Tables tab opens.

Step 3 From the list of traffic-forwarding tables in the Traffic Forwarding Tables area, select a table.

Step 4 In the Table Parameters tab, click ✚ (**Add**).

A new table parameter is added to the list of table parameters in the Table Parameters tab.

Each new table parameter has the following default values:

IP Protocol = TCP Port

TCP/UDP Port = 80

Server Group = Server Group 0

You can now edit the new table parameter, as described in the following section.

Step 5 Click **Close**.

The VAS Settings dialog box closes.

Editing VAS Table Parameters

To edit a VAS traffic-forwarding table:

Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box appears.

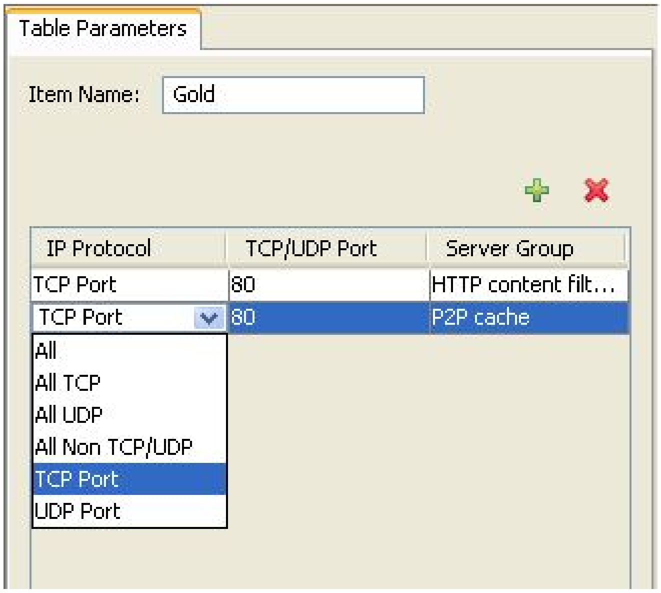
Step 2 Click the **Traffic Forwarding Tables** tab.

The Traffic Forwarding Tables tab opens.

Step 3 From the list of traffic-forwarding tables in the Traffic Forwarding Tables area, select a table.

Step 4 In the table in the Table Parameters tab:

a) Click in a cell in the IP Protocol column, and, from the drop-down list that opens, select an IP protocol type.



Item Name: Gold

IP Protocol	TCP/UDP Port	Server Group
TCP Port	80	HTTP content filt...
TCP Port	80	P2P cache

If you select All, All TCP, All UDP, or All Non TCP/UDP, “N/A” will appear in the TCP/UDP Port cell when you move to another cell in the table.

b) If you selected TCP Port or UDP Port, double-click in the cell in the TCP/UDP Port column, and enter the port number.

You cannot enter a range of ports in the TCP/UDP Port cell; you must add a separate table parameter for each port.

c) Click in the cell in the Server Group column, and, from the drop-down list that opens, select a server group.

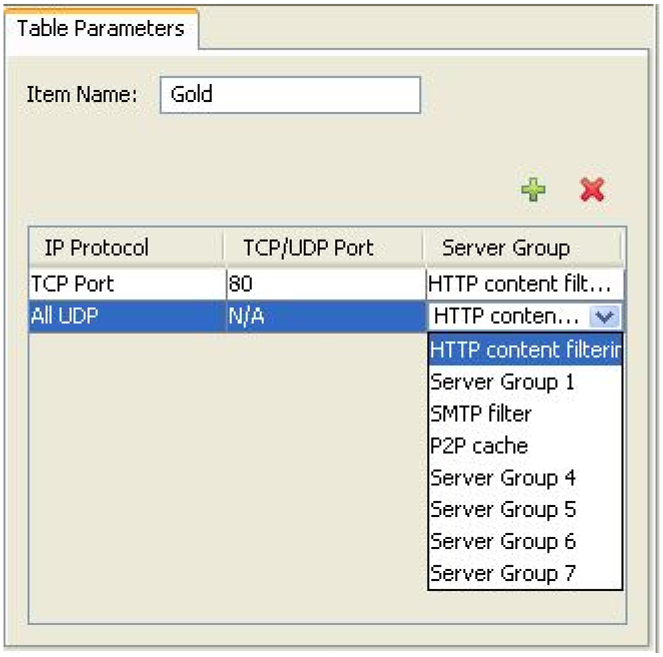


Table Parameters

Item Name: Gold

IP Protocol	TCP/UDP Port	Server Group
TCP Port	80	HTTP content filt...
All UDP	N/A	HTTP conten...

Step 5 Click **Close**.

The VAS Settings dialog box closes.

Deleting VAS Table Parameters

To delete a VAS table parameter:

Step 1 From the Console main menu, choose **Configuration** > **VAS Settings**.

The VAS Settings dialog box appears.

Step 2 Click the **Traffic Forwarding Tables** tab.

The Traffic Forwarding Tables tab opens.

Step 3 From the list of traffic-forwarding tables in the Traffic Forwarding Tables area, select a table.

Step 4 From the list of table parameters in the Table Parameters tab, select a table parameter.

Step 5 Click ✖ (**Delete**).

The selected table parameter is deleted and is no longer displayed in the list of table parameters.

Step 6 Click **Close**.

The VAS Settings dialog box closes.

CHAPTER 11

Using the Subscriber Manager GUI Tool

This chapter describes how to use the Subscriber Manager (SM) GUI tool to configure subscribers in the Cisco Service Control Management Suite (SCMS) Subscriber Manager (SM) database.

The SM GUI tool is especially useful when the SCMS-SM holds a static list of subscribers. It is not applicable when the Cisco Service Control Application for Broadband (***SCA BB***) is operating in subscriberless mode or in anonymous subscriber mode (see *Subscribers and Subscriber Modes* (on page 2-3)).

This chapter contains the following sections:

The SM GUI Tool

The SM GUI tool allows you to manage subscribers on an SCMS-SM. The SCMS-SM functions as middleware software that bridges between the OSS and the Service Control Engine (SCE) platforms. SCE platforms use the subscriber information to provide subscriber-aware functionality, per-subscriber reporting, and policy enforcement. Subscriber information is stored in the SCMS-SM database and can be distributed between multiple platforms according to actual subscriber placement.

You can use the SM GUI tool to import and export subscriber files, and to perform operations on individual subscribers, such as adding a new subscriber, editing parameters of an existing subscriber, and deleting a subscriber.

Note To access an SCMS-SM from the SM GUI tool, you must first add the SCMS-SM to the Site Manager tree in the Network Navigator tool (see *Adding SM Devices to a Site* (on page 5-4)).

The SM GUI tool provides only a subset of the functionality that is provided by the SM Command-Line Utility. For more information about the SCMS-SM, see the *Cisco Service Control Management Suite Subscriber Manager User Guide*.

Connecting to an SCMS-SM

You can connect to an SCMS-SM:

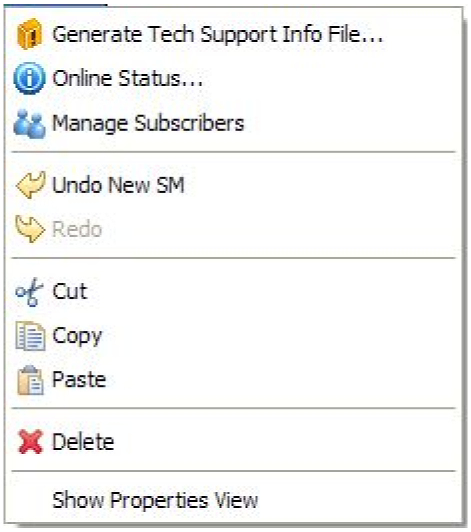
- From the Network Navigator tool
- From anywhere else in the Console
- From the Subscriber Manager GUI tool

Note The SM GUI tool performs authentication on the SCMS-SM by opening a PRPC connection to port 14374 and attempting to log in using the username and password that you entered in the Password Management dialog box. If a PRPC server with this user is not running on the SCMS-SM, authentication will fail.

To connect to an SCMS-SM from the Network Navigator:

Step 1 In the Site Manager tree in the Network Navigator tab, right-click an SM device.

A popup menu appears.



Step 2 From the menu, select **Manage Subscribers**.

A Password Management dialog box appears.

Step 3 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 4 Click **Connecting**.

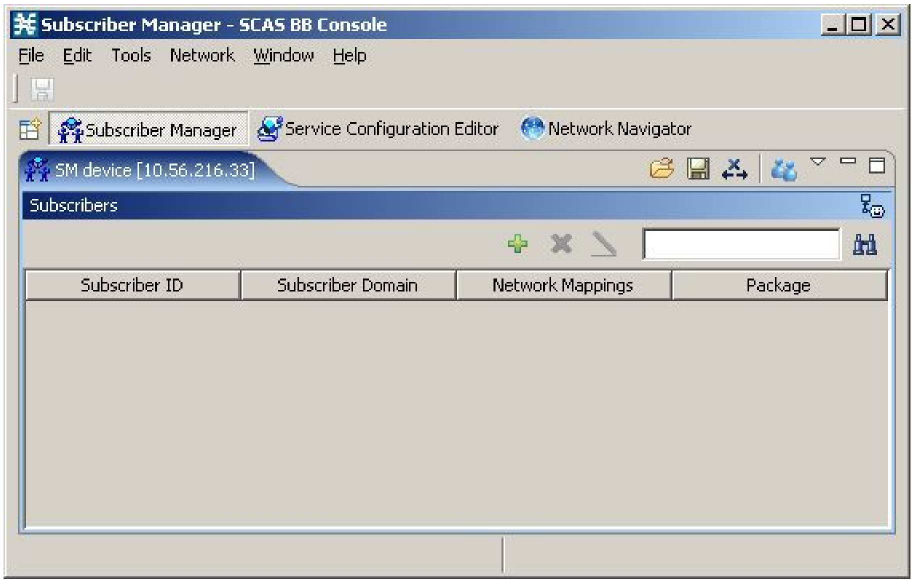
The Password Management dialog box closes.

A Connecting to progress bar appears.

The system connects to the SCMS-SM.

📂 (**Import subscribers from CSV file**), 💾 (**Export subscribers to CSV file**), and

(**Disconnect from SM**) are enabled.



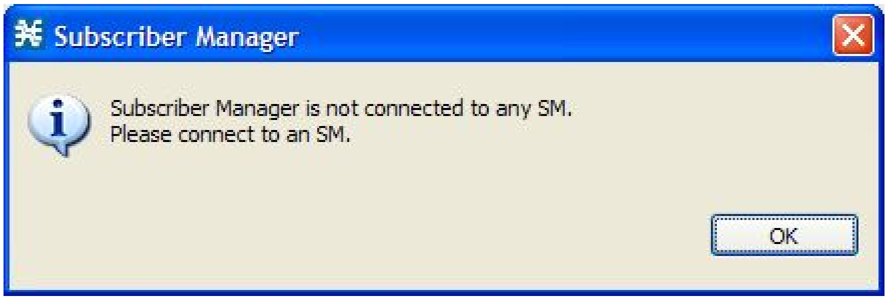
To connect to an SCMS-SM from the Console:

(If you are already in the SM GUI tool, start at step 3.)

Step 1 From the Console main menu, choose **Tools** > **Subscriber Manager**.

The SM GUI tool opens.

A Subscriber Manager is not connected message appears.



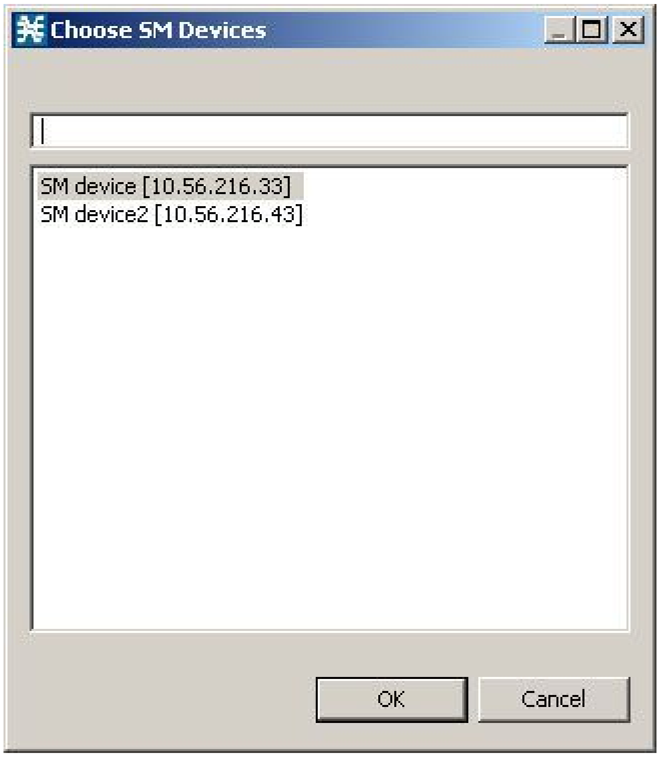
Subscriber Manager is not connected to any SM.
Please connect to an SM.

Step 2 Click **OK**.

The Subscriber Manager is not connected message closes.

Step 3 In the SM GUI toolbar, click (**Connect to an SM**).

If more than one SCMS-SM device is configured in the Network Navigator, the Choose SM Devices dialog box appears.



SM device [10.56.216.33]
SM device2 [10.56.216.43]

Step 4 Select a device and click **OK**.

A Password Management dialog box appears.

Step 5 Enter the appropriate password. (For more information, refer to *Password Management* (on page 5-8).)

Step 6 Click **Connecting**.

The Password Management dialog box closes.

A Connecting to progress bar appears.

The system connects to the SCMS-SM.

(**Import subscribers from CSV file**), (**Export subscribers to CSV file**), and (**Disconnect from SM**) are enabled.

Disconnecting from an SCMS-SM

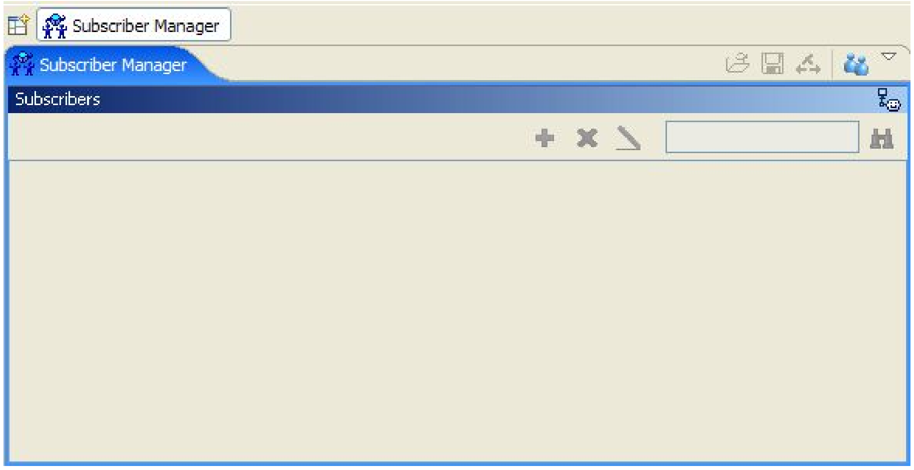
To disconnect from the current SCMS-SM:

In the SM GUI toolbar, click (**Disconnect from SM**).

The Console disconnects from the SCMS-SM, but the SM GUI tool remains open.

(**Import subscribers from CSV file**), (**Export subscribers to CSV file**), and (**Disconnect from SM**) are dimmed.

The subscriber list is empty.



Working with Subscriber CSV Files

Because of the large number of subscribers that must be introduced into the system, it is not feasible to enter subscriber information manually. Subscriber information is usually generated by a Radius server (or some similar source) and imported into the SM GUI tool.

You can also export updated subscriber information to a CSV file.

The format of subscriber CSV files is described in the “CSV File Formats” chapter of the *Cisco Service Control Application for Broadband Reference Guide*.

Importing Subscriber Files

You can import subscriber data that was exported to a CSV file into the SM GUI tool.

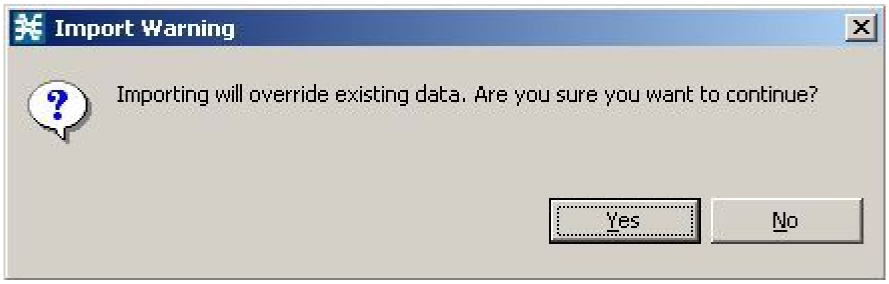
To import subscriber information from a CSV file:

Step 1 In the SM GUI toolbar, click (**Import subscribers from CSV file**).

An Import from File dialog box appears.

Step 2 Browse to the file that is to be imported, and click **Open**.

An Import Warning message appears.



Import Warning

Importing will override existing data. Are you sure you want to continue?

Step 3 Click **Yes**.

The Import from File dialog box closes.

The selected file is imported into the SM GUI tool; the imported subscribers are listed in the subscriber list.

Exporting Subscriber Files

You can export subscriber information to a CSV file (for example, when data in the SCMS-SM database is updated).

To export subscriber information to a CSV file:

Step 1 Select the subscribers whose data you want to save (see *Selecting Subscribers* (on page 11-8)).

Step 2 In the SM toolbar, click 💾 (**Export subscribers to CSV file**).

An Export to File dialog box appears.

Step 3 Browse to the folder in which you want to save the exported file.

Step 4 In the File name field, enter a file name.

Step 5 Click **Save**.

The Export to File dialog box closes.

The selected subscribers are saved to the CSV file.

Managing Subscribers

After importing subscribers into the system, you can maintain and update the database.

You can perform the following operations:

- Add subscribers.
- Edit information for existing subscribers.

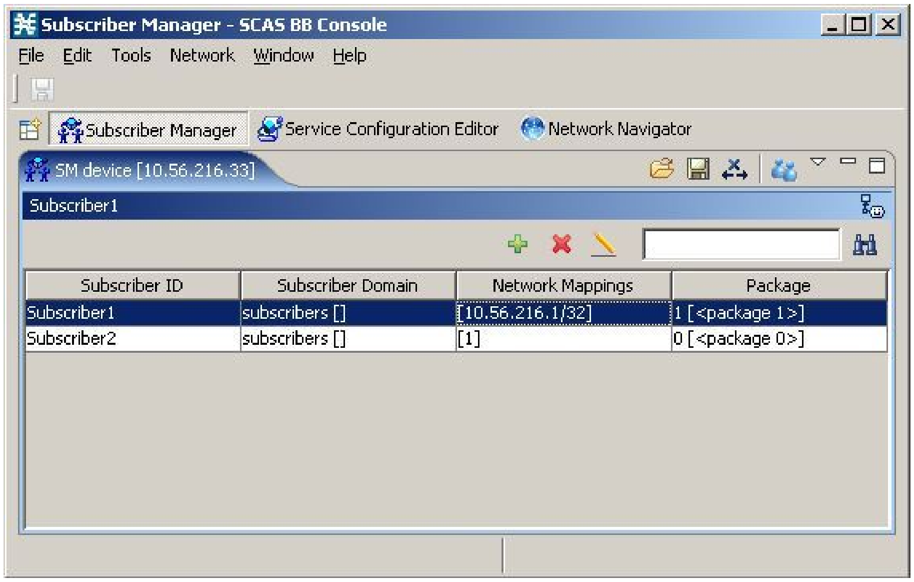
- Delete subscribers.

Subscriber Information

All subscribers currently introduced into ***SCA BB*** are displayed in a list in the SM GUI tool. Use this list to manage individual subscribers or groups of subscribers. Use the Find function to display a subset of the subscribers (see *Finding Subscribers* (on page 11-8)).

The subscriber list has the following columns:

- Subscriber ID—Name of the subscriber in the system.
- Subscriber Domain—Domain to which the subscriber is assigned. The names of the SCE platforms that belong to each domain appear in square brackets.
- Network Mappings—IP address, range of IP addresses, or VLAN tag mapped to the subscriber.
- Package—Package ID assigned to the subscriber. The name of the package is shown in square brackets.



Subscriber ID	Subscriber Domain	Network Mappings	Package
Subscriber1	subscribers []	[10.56.216.1/32]	1 [<package 1>]
Subscriber2	subscribers []	[1]	0 [<package 0>]

Finding and Selecting Subscribers

For ease of use, the SM GUI tool incorporates two standard features:

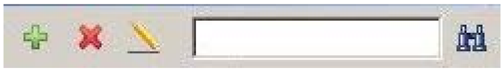
- Find—Search for a specific subscriber.
- Multiple Select—Select a range of subscribers or a number of individual subscribers.

Finding Subscribers

Use this feature to find a specific subscriber or a group of subscribers according to a subscriber ID prefix. This is useful for editing the parameters of either a specific subscriber or a group of subscribers (see *Editing Subscribers* (on page 11-11)).

To find a subscriber or group of subscribers:

Step 1 In the Find field (see the following illustration), enter the prefix to be matched.



Step 2 Click 🔍 (**Find Subscribers**).

Only those subscribers that match the specified prefix are displayed in the subscriber list.

Selecting Subscribers

You can edit, export, or delete a group of subscribers at one time by selecting subscribers displayed in the subscriber list. The group may be either of the following:

- A range of contiguous subscribers
- A number of noncontiguous subscribers

To select a range of subscribers:

Step 1 Select the first subscriber in the range.

Step 2 Press the **Shift** key and click the last subscriber in the range.

All subscribers in the range are selected.

You can combine this function with the search function; search to display specific subscribers and then select the entire range.

To select a number of noncontiguous subscribers:

Press the **Ctrl** key while selecting subscribers.

You can combine this function with selecting a range of subscribers; first select the range of subscribers and then select additional subscribers.

Adding Subscribers

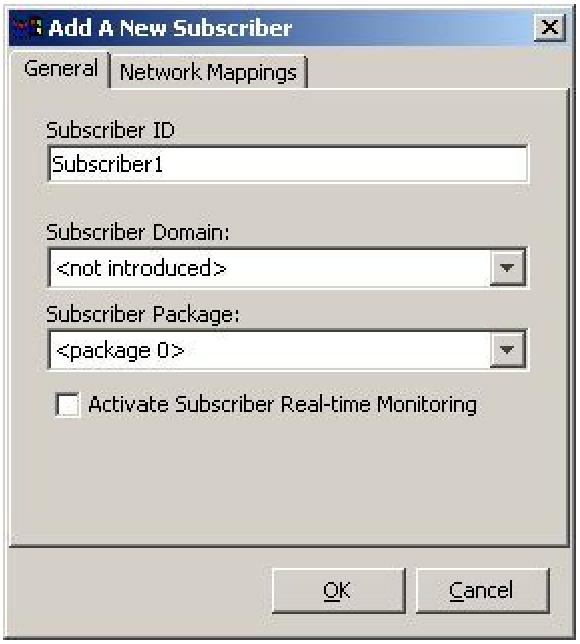
You can add additional individual subscribers to the SCMS-SM.

To add large number of subscribers, export their information from a Radius (or DHCP) server to a CSV file, and then import the CSV file (see *Working with Subscriber CSV Files* (on page 11-5)).

To add a subscriber:

Step 1 In the SM toolbar, click ✚ (**Add Subscriber**).

The Add A New Subscriber dialog box appears.



Subscriber ID
Subscriber1

Subscriber Domain:
<not introduced>

Subscriber Package:
<package 0>

☐ Activate Subscriber Real-time Monitoring

Step 2 In the Subscriber ID field, enter text that identifies the subscriber.

Step 3 From the Subscriber Domain drop-down list, select the appropriate domain for the new subscriber.

Step 4 From the Subscriber Package drop-down list, select a package to assign to this subscriber.

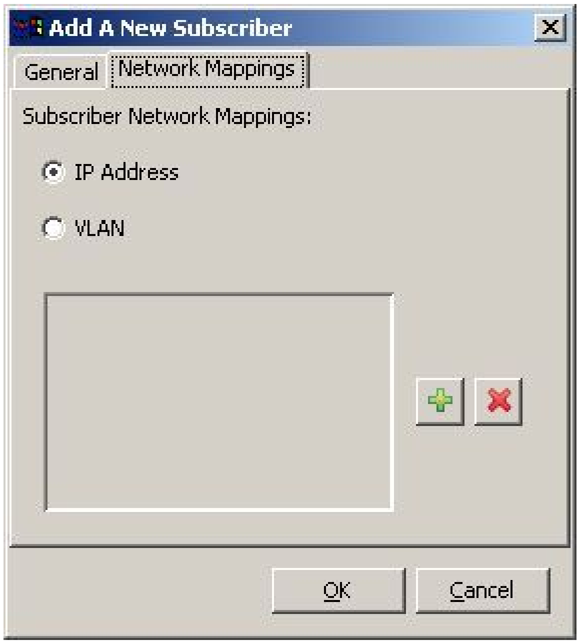
The contents of the list depend on the selected subscriber domain.

Step 5 To activate subscriber real-time monitoring, check the **Activate Subscriber Real-time Monitoring** check box. This causes the SCE application to generate Real-Time Subscriber Usage RDRs for this subscriber. For more information, see *Managing Real-Time Subscriber Usage RDRs* (on page 8-12).

If you are not going to define network mappings for this subscriber, continue at step 11.

Step 6 Click the **Network Mappings** tab.

The Network Mappings tab opens.



The system supports either IP addresses or VLAN tags as network identification for subscribers.

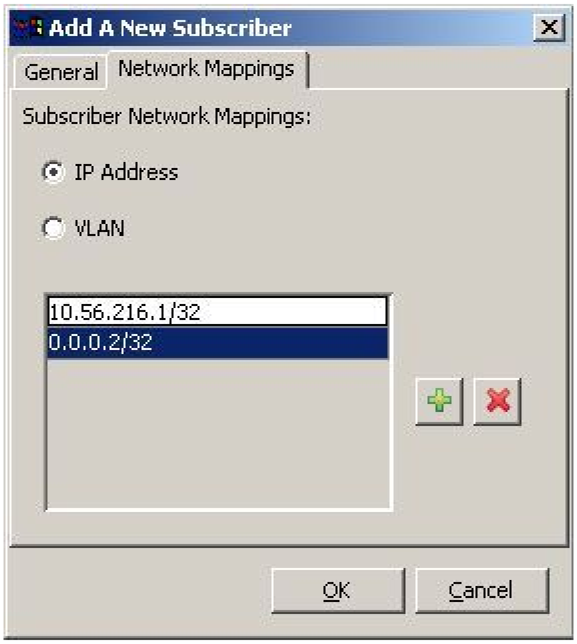
Step 7 Select one of the **Subscriber Network Mappings** radio buttons:

- **IP Address**
- **VLAN**

Step 8 Click ✚ (**Add**) to add a network mapping of the type selected in the previous step.

A new network-mapping entry is added to the subscriber network mappings list, displaying a default value.

Step 9 Edit the network-mapping entry.



● IP Address

○ VLAN

10.56.216.1/32
0.0.0.2/32

Step 10 Repeat steps 8 and 9 for other network mappings.

Step 11 Click **OK**.

The Add A New Subscriber dialog box closes.

The new subscriber is added to the database, and to the subscriber list displayed in the SM GUI tool.

Editing Subscribers

You can edit parameters of single or multiple subscribers.

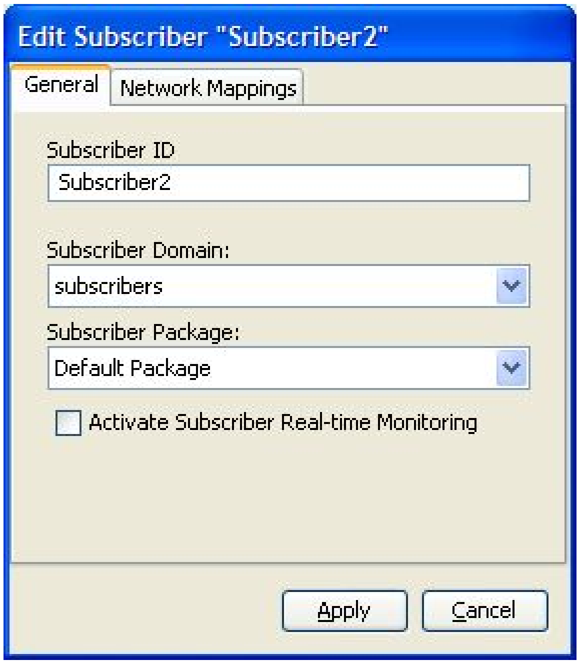
Editing Single Subscribers

To edit subscriber information:

Step 1 *Find* (on page 11-8) and select a subscriber.

Step 2 In the SM toolbar, click ✎ (**Edit Subscriber**).

The Edit Subscriber dialog box appears.



Edit Subscriber "Subscriber2"

Subscriber ID: Subscriber2

Subscriber Domain: subscribers

Subscriber Package: Default Package

□ Activate Subscriber Real-time Monitoring

Step 3 Modify subscriber details:

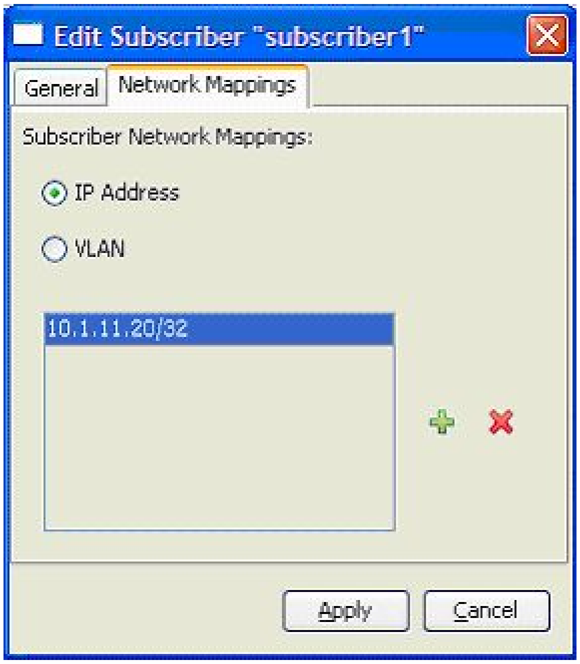
- Edit the entry in the Subscriber ID field.
- From the Subscriber Domain drop-down list, select a subscriber domain.
- From the Subscriber Package drop-down list, select a package to assign to this subscriber.

  The contents of the list depend on the selected subscriber domain.
- Check or uncheck the **Activate Subscriber Real-time Monitoring** check box.

If you are not editing the network mappings for this subscriber, continue at step 6.

Step 4 Click the **Network Mappings** tab.

The Network Mappings tab opens.



Subscriber Network Mappings:

● IP Address

○ VLAN

10.1.11.20/32

Step 5 Modify subscriber network mappings:

a) Select one of the **Subscriber Network Mappings** radio buttons:

- **IP Address**
- **VLAN**

b) To add a new network mapping to the list, click ✚ (**Add**), and edit the network-mapping field that is added to the Subscriber Network Mappings list.

c) To delete a network mapping from the list, select an entry in the subscriber network mappings list and click ✖ (**Delete**).

Step 6 Click **Apply**.

The Edit Subscriber dialog box closes.

The modified subscriber information is saved to the database and displayed in the subscriber list in the SM GUI tool.

Editing Multiple Subscribers

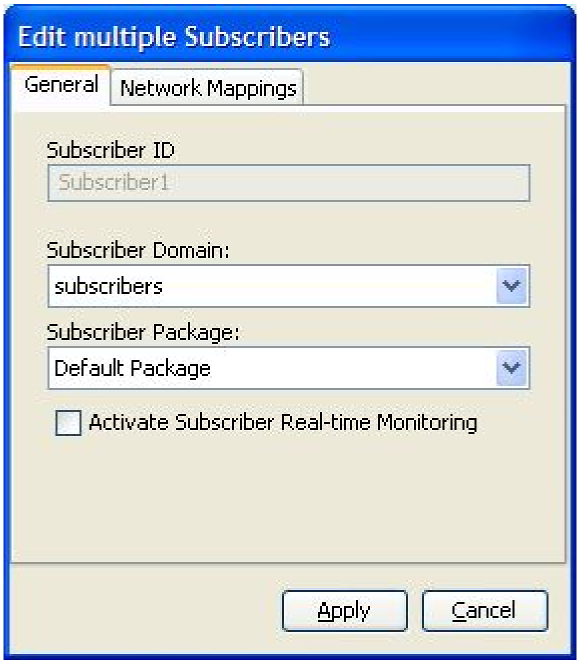
You can assign the same package or domain to many subscribers at one time.

To edit details for a group of subscribers:

Step 1 Select a group of subscribers to modify (see *Selecting Subscribers* (on page 11-8)).

Step 2 In the SM toolbar, click ✎ (**Edit**).

The Edit Multiple Subscribers dialog box appears.



Subscriber ID: Subscriber1

Subscriber Domain: subscribers

Subscriber Package: Default Package

□ Activate Subscriber Real-time Monitoring

The Subscriber ID field is dimmed and the Network Mappings tab is disabled.

Step 3 Modify fields in the General tab:

- From the Subscriber Domain drop-down list, select a subscriber domain.
- From the Subscriber Package drop-down list, select a package to assign to this subscriber.

  The contents of the list depend on the selected subscriber domain.
- Check or uncheck the **Activate Subscriber Real-time Monitoring** check box.

Step 4 Click **Apply**.

The Edit multiple Subscribers dialog box closes.

The modified subscriber information is saved to the database and displayed in the subscriber list in the SM GUI tool.

Deleting Subscribers

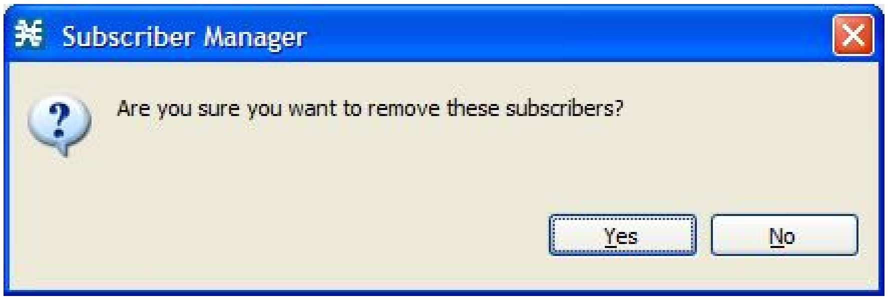
You can delete subscribers from the database.

To delete a subscriber from the database:

Step 1 Select a single subscriber or a group of subscribers (see *Selecting Subscribers* (on page 11-8)).

Step 2 In the SM toolbar, click ✖ (**Delete Subscriber**).

The system asks for confirmation before deleting the selected subscribers:



Are you sure you want to remove these subscribers?

Step 3 Click **Yes** to confirm.

The selected subscribers are deleted from the database and removed from the subscriber list displayed in the SM GUI tool.

Using the Signature Editor

The Signature Editor tool allows you to create and modify Dynamic Signature Script (DSS) files that can add and modify protocols and protocol signatures in the Cisco Service Control Application for Broadband (***SCA BB***), based on your knowledge of new network protocols that are not yet supported by ***SCA BB***.

This chapter contains the following sections:

Managing DSS Files

- Installing new signatures to an active service configuration is described in *Installing Protocol Packs* (on page 4-10).
- Working with signatures in the Service Configuration Editor is described in *Managing Protocol Signatures* (on page 7-38).
- Using **servconf**, the Server Configuration Utility, to apply signatures is described in *The SCA BB Service Configuration Utility* (on page 13-1).

The DSS file components, and the creation and editing of DSS files, are explained in the following sections.

DSS File Components

The DSS file components are displayed in the Script pane of the Signature Editor, in a tree structure. By selecting the appropriate node of the DSS component tree, you can define the properties associated with the node in the Property pane.

The DSS file components are described in the following sections.

The DSS File

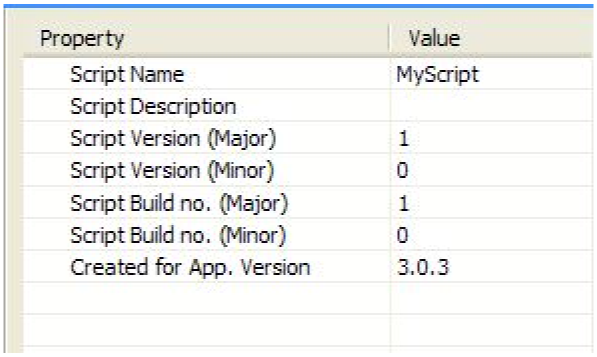
The DSS file name is the root node of the DSS file component tree.

When you select the root node, you can define the following properties for the DSS file:

- Script Name—Enter a meaningful name for this script.
- Script Description—Enter the reason for creating this script and describe its contents.

- Script Version (Major)
- Script Version (Minor)
- Script Build Number (Major)
- Script Build Number (Minor)
- Created for Application Version—Select from a list of predefined values.

The following screen capture shows the default values for the DSS file properties.



Property	Value
Script Name	MyScript
Script Description	
Script Version (Major)	1
Script Version (Minor)	0
Script Build no. (Major)	1
Script Build no. (Minor)	0
Created for App. Version	3.0.3

The DSS file contains a single protocol list.

DSS Protocol List

The protocol list has no properties to define. It contains all the protocols that are being added, modified, or enhanced.

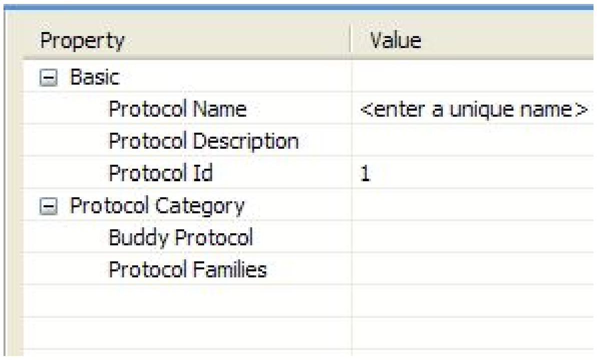
DSS Protocols

When you select a Protocol node in the DSS file component tree, you can define the following properties of the protocol:

- Basic:
  - Protocol Name—See *Setting Protocol Name and ID* (on page 12-3).
  - Protocol Description
  - Protocol ID—See *Setting Protocol Name and ID* (on page 12-3).
- Protocol Category:
  - Buddy Protocol—See *The Buddy Protocol* (on page 12-3).
  - Protocol Families—Assign the protocol to one or more protocol families:
    - P2P
    - SIP
    - VOIP
    - Worm

  Associating a protocol with a protocol family allows reports about the family to include the new protocol.

The following screen capture shows the default values for the protocol properties.



Property	Value
⊟ Basic	
Protocol Name	<enter a unique name>
Protocol Description	
Protocol Id	1
⊟ Protocol Category	
Buddy Protocol	
Protocol Families	

Protocols contain signatures.

Setting Protocol Name and ID

A DSS can include two types of protocols:

- A protocol that is new to ***SCA BB***—The protocol is being defined in the DSS.
- A protocol that ***SCA BB*** already supports—The protocol identification is being enhanced or modified in the DSS.

Selecting a name and ID is different for the two cases:

- For a protocol that is new to ***SCA BB***, the name must not match any of the protocol names that ***SCA BB*** already supports. To see a list of supported-protocol names, open the Protocol Settings dialog box in the Service Configuration Editor (see *Viewing Protocols* (on page 7-21)). Assign the protocol a unique ID in the range 5000 to 9998.
- For an existing protocol, the protocol name and ID in the DSS must be identical to the protocol name and ID in the service configuration. Locate the name and ID in the Protocol Settings dialog box in the Service Configuration Editor (see *Viewing Protocols* (on page 7-21)).

The Buddy Protocol

To simplify the configuration of new protocols added by a DSS, the DSS may specify a *Buddy Protocol* for a new protocol. If, when importing a DSS to a service configuration, the application encounters service elements referring to the Buddy Protocol, it automatically duplicates the set of service elements that use the Buddy Protocol and replaces all references to the Buddy Protocol with references to the new protocol. The association of the new protocol to services will match that of the Buddy Protocol.

DSS Signatures

A protocol may contain as many different signatures as necessary.

Four different types of signatures may be added to a protocol:

- String Match Signatures
- Payload Length Signatures
- HTTP User Agent Signatures

- HTTP x-Header Signatures

Each of the four signature types tests different conditions against the first payload packet of the flows.

These signature types and their conditions are described in the following subsections.

String Match Signatures and Payload Length Signatures can contain deep inspection clauses. A signature whose first payload packet conditions are met will accept a flow if the conditions of any of its deep inspection clauses are also met.

DSS String Match Signature

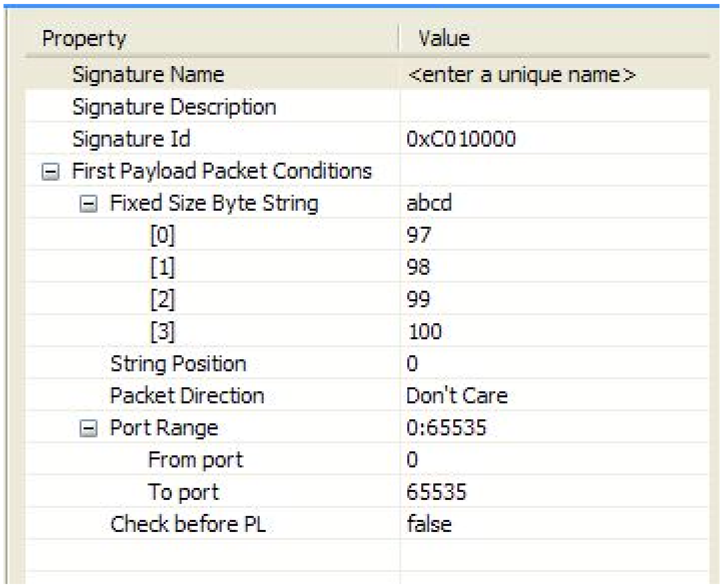
When you select a String Match Signature node in the DSS file component tree, you can define the following properties of the signature:

- Signature Name—A unique name
- Signature Description
- Signature ID—A value in the range 0xC010000 to 0xC0100FF (decimal 201392128 to 201392383)
- First Payload Packet Conditions:
  - Fixed Size Byte String—(Display only) Shows the string formed by the next four fields:
    - [0]—Enter the ASCII code for the first byte of the string, or enter “*” to indicate that any value is acceptable.
    - [1]—Enter the ASCII code for the second byte of the string, or enter “*” to indicate that any value is acceptable.
    - [2]—Enter the ASCII code for the third byte of the string, or enter “*” to indicate that any value is acceptable.
    - [3]—Enter the ASCII code for the fourth byte of the string, or enter “*” to indicate that any value is acceptable.
  - String Position—The position of the Fixed Size Byte String in the packet. The position is the location of the first byte of the string, counting from the first byte in the packet. To match the string with the beginning of the packet, this value should be zero. The value must be an integer divisible by four.
  - Packet Direction—The initiating side of the first packet in the flow that has a payload. This field can have one of three values:
    - From Server
    - From Client
    - Don’t Care (either side)
  - Port Range—(Display only) The port range formed by the next two fields. The default value is the entire port range: 0 to 65535.
    - From Port—Lower bound of the port range (inclusive)
    - To Port—Upper bound of the port range (inclusive)
  - Check before PL—Toggles between the values `true` and `false`.

This field indicates whether to test the signature before or after the execution of the ***SCA BB*** built-in PL (Protocol Library) classification. Testing this signature before the execution of the built-in classification means that if the flow matches this signature, the PL classification will be skipped. If this field is set to “false”, this signature will be tested only if the PL classification fails to identify any of its supported protocol signatures.

Caution Set Check before PL to `true` only if the signature identifies the protocol according to the first payload packet only. If the signature also uses a Deep Inspection Condition that looks into later packets, and the signature does not match the flow, the PL classification will not perform properly.

The following screen capture shows the default values for the String Match Signature properties.



Property	Value
Signature Name	<enter a unique name>
Signature Description	
Signature Id	0xC010000
⊟ First Payload Packet Conditions	
⊟ Fixed Size Byte String	abcd
[0]	97
[1]	98
[2]	99
[3]	100
String Position	0
Packet Direction	Don't Care
⊟ Port Range	0:65535
From port	0
To port	65535
Check before PL	false

A flow that matches the first payload packet conditions of a String Match Signature will then be compared against the deep inspection conditions of the signature (see *DSS Deep Inspection Conditions* (on page 12-8)).

DSS Payload Length Signature

When you select a Payload Length Signature node in the DSS file component tree, you can define the following properties of the signature:

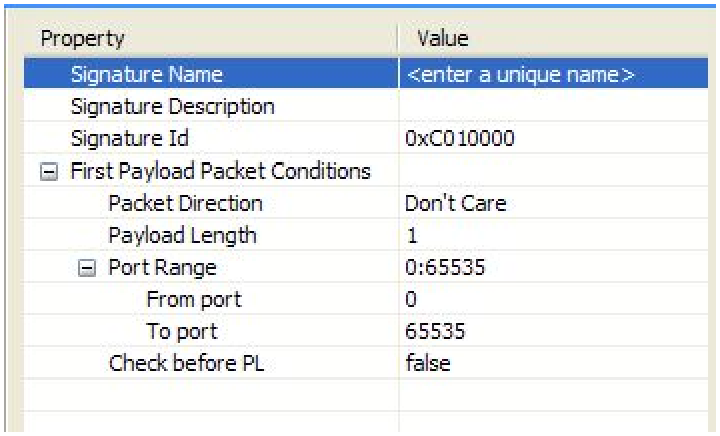
- Signature Name—A unique name
- Signature Description
- Signature ID—A value in the range 0xC010000 to 0xC0100FF (decimal 201392128 to 201392383)
- First Payload Packet Conditions:
    - Packet Direction—The initiating side of the first packet in the flow that has a payload. This field can have one of three values:
        - From Server

  - From Client
  - Don’t Care (either side)
- Payload Length—The number of bytes in the payload packet.
- Port Range—(Display only) The port range formed by the next two fields. The default value is the entire port range: 0 to 65535.
  - From Port—Lower bound of the port range (inclusive)
  - To Port—Upper bound of the port range (inclusive)
- Check before PL—Toggles between the values true and `false`.

  This field indicates whether to test the signature before or after the execution of the ***SCA BB*** built-in PL (Protocol Library) classification. Testing this signature before the execution of the built-in classification means that if the flow matches this signature, the PL classification will be skipped. If this field is set to “false”, this signature will be tested only if the PL classification fails to identify any of its supported protocol signatures.

Caution Set Check before PL to `true` only if the signature identifies the protocol according to the first payload packet only. If the signature also uses a Deep Inspection Condition that looks into later packets, and the signature does not match the flow, the PL classification will not perform properly.

The following screen capture shows the default values for the Payload Length Signature properties.



Property	Value
Signature Name	<enter a unique name>
Signature Description	
Signature Id	0xC010000
⊟ First Payload Packet Conditions	
Packet Direction	Don't Care
Payload Length	1
⊟ Port Range	0:65535
From port	0
To port	65535
Check before PL	false

A flow that matches the first payload packet conditions of a Payload Length Signature will then be compared against the deep inspection conditions of the signature (see *DSS Deep Inspection Conditions* (on page 12-8)).

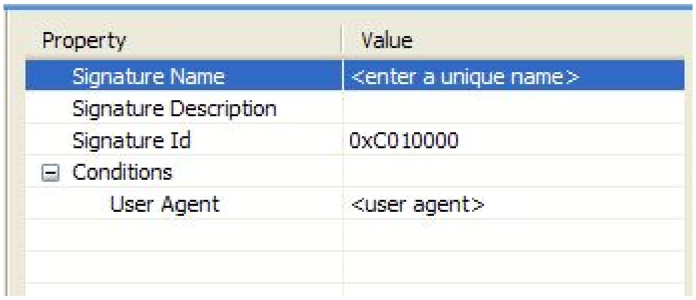
DSS HTTP User Agent Signature

When you select an HTTP User Agent Signature node in the DSS file component tree, you can define the following properties of the signature:

- Signature Name—A unique name
- Signature Description

- Signature ID—A value in the range 0xC010000 to 0xC0100FF (decimal 201392128 to 201392383)
- Conditions:
  - User Agent—The value of the User Agent field in the HTTP header

The following screen capture shows the default values for the HTTP User Agent signature properties.



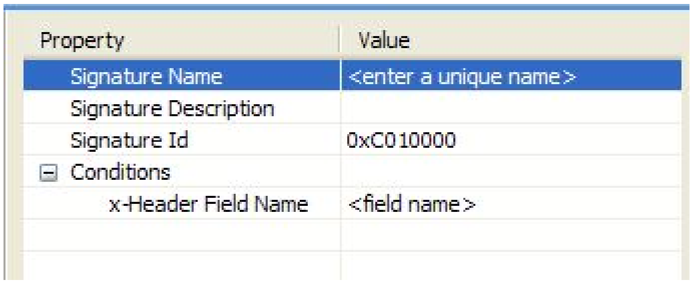
Property	Value
Signature Name	<enter a unique name>
Signature Description	
Signature Id	0xC010000
⊟ Conditions	
User Agent	<user agent>

DSS HTTP x-Header Signature

When you select an HTTP x-Header Signature node in the DSS file component tree, you can define the following properties of the signature:

- Signature Name—A unique name
- Signature Description
- Signature ID—A value in the range 0xC010000 to 0xC0100FF (decimal 201392128 to 201392383)
- Conditions:
  - x-Header Field Name—A name of a field in the x-Header of the HTTP header

The following screen capture shows the default values for the DSS file properties.



Property	Value
Signature Name	<enter a unique name>
Signature Description	
Signature Id	0xC010000
⊟ Conditions	
x-Header Field Name	<field name>

DSS Deep Inspection Clauses

A deep inspection clause is a conjunctive clause of deep inspection conditions—a signature will accept a flow *only* if all conditions in a clause are met.

Note If a signature has multiple deep inspection clauses, the clauses (and the deep inspection conditions making up each clause) are tested in an order based on the value of the Packet Number property of the deep inspection conditions.
After the first payload packet is accepted by the first payload packet conditions, the clause containing the condition with the lowest Packet Number is tested. The other conditions in this clause are checked in ascending Packet Number order. Thus, the Packet Number of any condition in a clause cannot be less than the largest Packet Number in the clause it succeeds.

DSS Deep Inspection Conditions

A deep inspection condition is a set of conditions that are checked against flows that pass the first payload packet conditions screening of String Match Signatures or Payload Length Signatures.

When you select a Deep Inspection Condition node in the DSS file component tree, you can define the following properties of the deep inspection condition:

- Packet Direction—The initiating side of the first packet in the flow that has a payload. This field can have one of three values: From Server, From Client or Don't Care (either side).
- Packet Number—The number of the packet in the flow. The payload packets are numbered from zero; packets are counted in both directions.
- Payload Length—The length of the packet in bytes. Enter zero to indicate that any value is acceptable.
- Printable Characters—Test if the inspected packet contains only printable characters. This field can have one of three values: Printable Characters Only, At Least One Non-Printable, or Don't Care.
- Substring Search—Match a search string with a specific location in the packet. Leave the Search String fields empty if this condition is irrelevant.
  - Position Offset—The position from which to start searching for the search string in the packet. The offset is relative to the location specified in the Start Search From field.
  - Start Search From—This field can have one of two values:
    - Packet beginning
    - Last match

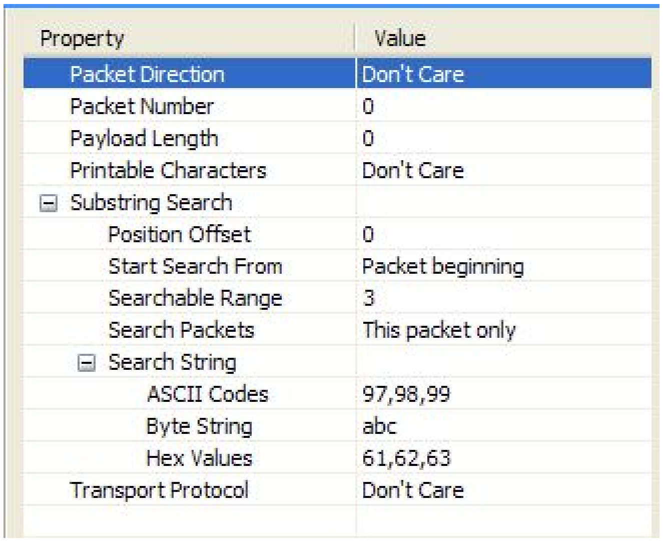
    Last match means that the search for this search string starts where the last search match ended. The last match may be from a previous substring search or from the last string-based first payload packet condition.
  - Searchable Range—Search in this number of bytes for the search string.
  - Search Packets—This field can have one of two values:
    - This packet only
    - Multiple packets

Multiple Packets means that the search may span across packets, as long as the overall number of bytes is less than the number specified in the Searchable Range field.

- Search String—Enter the search string in one of the following three fields (the other two fields will be updated automatically):
  - ASCII Codes—Enter the ASCII codes for the characters of the search string. Separate each code by a comma.
  - Byte String—Enter the actual search string.
  - Hex Values—Enter the hexadecimal values of the ASCII codes for the characters of the search. string. Separate each code by a comma.

- Transport Protocol—This field can have one of three values:
  - TCP
  - UDP
  - Don't Care (either TCP or UDP)

The following screen capture shows the default values for the deep inspection condition properties.



Property	Value
Packet Direction	Don't Care
Packet Number	0
Payload Length	0
Printable Characters	Don't Care
⊟ Substring Search	
Position Offset	0
Start Search From	Packet beginning
Searchable Range	3
Search Packets	This packet only
⊟ Search String	
ASCII Codes	97,98,99
Byte String	abc
Hex Values	61,62,63
Transport Protocol	Don't Care

The structure of deep inspection conditions is the same for String Match Signatures and Payload Length Signatures.

Creating DSS Files

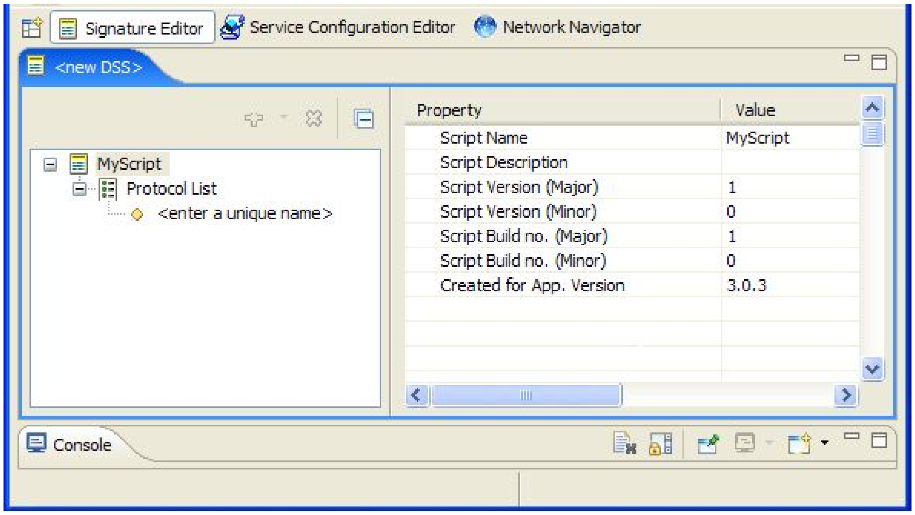
Caution If you have a DSS file open in the Signature Editor, save it before you create a new DSS file. All unsaved changes will be lost.

To create a new DSS file:

Step 1 From the toolbar, click (**Create a New DSS File**).

A DSS component tree containing a DSS File node, a Protocol List node, and a Protocol node, is displayed in the Script tab.

The default properties of the new DSS file are displayed in the Properties tab.



Property	Value
Script Name	MyScript
Script Description	
Script Version (Major)	1
Script Version (Minor)	0
Script Build no. (Major)	1
Script Build no. (Minor)	0
Created for App. Version	3.0.3

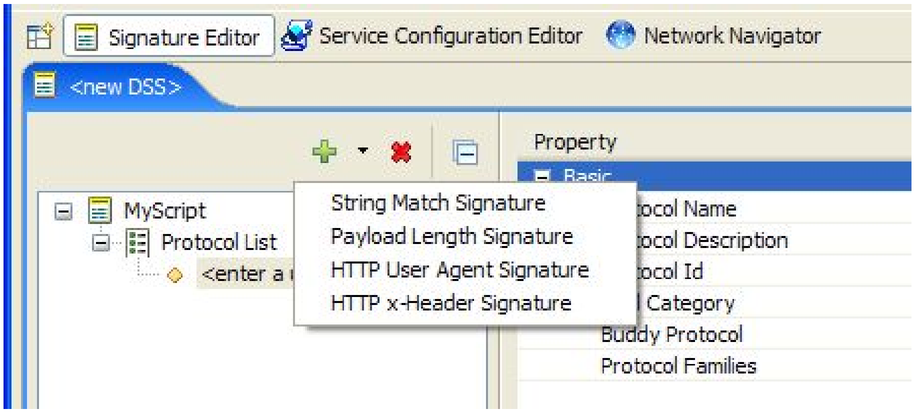
Step 2 Edit the DSS file properties (see *The DSS File* (on page 12-1) for an explanation of the properties).

Step 3 Click the Protocol node.

The protocol properties appear in the Properties tab.

Step 4 Edit the protocol properties (see *DSS Protocols* (on page 12-2) for an explanation of the properties).

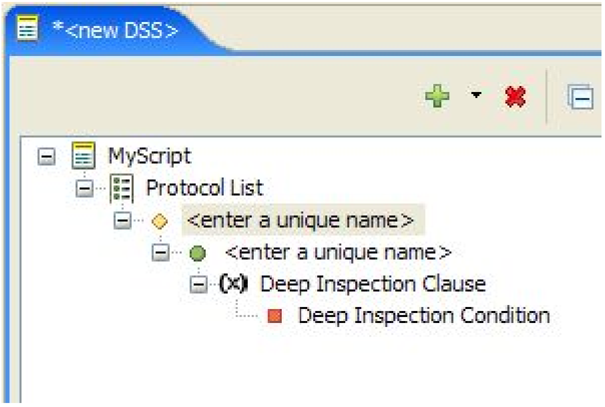
Step 5 Click the drop-down arrow next to the ✚ button.



Step 6 From the drop-down menu that appears, select a signature type.

A Signature node is added under the Protocol node.

If you selected a String Match Signature or a Payload Length Signature, a Deep Inspection Clause node and a Deep Inspection Condition node are also added.



Step 7 Click the Signature node.

The signature properties appear in the Properties tab.

Step 8 Edit the signature properties (see *DSS Signatures* (on page 12-3) for an explanation of the properties).

Step 9 If you selected a String Match Signature or a Payload Length Signature:

a) Click the Deep Inspection Condition node.

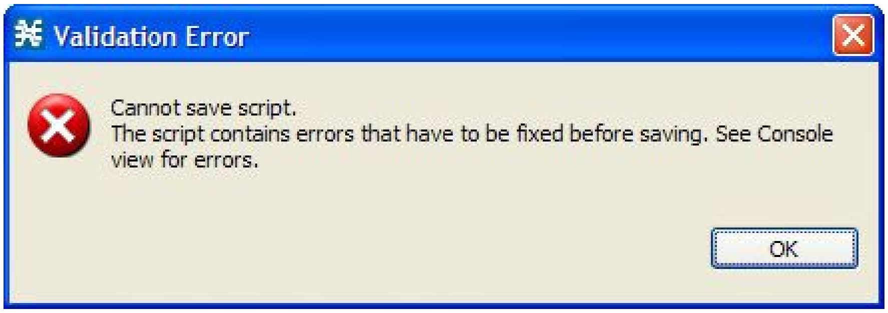
The deep inspection condition properties appear in the Properties tab.

b) Edit the deep inspection condition properties (see *DSS Deep Inspection Conditions* (on page 12-8) for an explanation of the properties).

Step 10 Add additional deep inspection conditions, deep inspection clauses, signatures, and protocols as needed.

Step 11 From the toolbar, click (**Save**).

- If there are duplicate protocol names or protocol IDs, a Validation Error message appears.



Cannot save script.
The script contains errors that have to be fixed before saving. See Console view for errors.

Click **OK**, remove the duplication, and then click (**Save**) again.

A Save As dialog box appears.

Step 12 Browse to the folder where you want to save the new DSS file.

Step 13 In the File name field, enter an appropriate name for the DSS file.

Step 14 Click **Save**.

The Save As dialog box closes.

The DSS file is saved.

Editing DSS Files

You can edit an existing DSS file, and add new protocols, or modify or delete existing protocols.

Caution If you have a DSS file open in the Signature Editor, save it before you open a different DSS file. All unsaved changes will be lost.

To edit an existing DSS file:

Step 1 From the toolbar, click (**Open a DSS File**).

An Open dialog box appears.

Step 2 Browse to the DSS file that you want to edit.

Step 3 Click **Open**.

The Open dialog box closes.

The DSS Component tree of the selected file is displayed in the Script tab.

The DSS File node is selected, and the properties of the DSS file are displayed in the Properties tab.

Step 4 Add, edit, or delete DSS file components. (See the subsections of *DSS File Components* (on page 12-1) for an explanation of the properties of the different components.)

Step 5 Save the modified DSS file:

- To overwrite the current DSS file with the changes you have made:

  From the toolbar, click (**Save**).

  The changes to the DSS file are saved.

- To save the modified DSS file with a new name:

a) From the **File** > **Save As**.

A Save As dialog box appears.

b) Browse to the folder where you want to save the new DSS file.

c) In the File name field, enter an appropriate name for the DSS file.

d) Click **Save**.

The Save As dialog box closes.

The modified DSS file is saved with the new name.

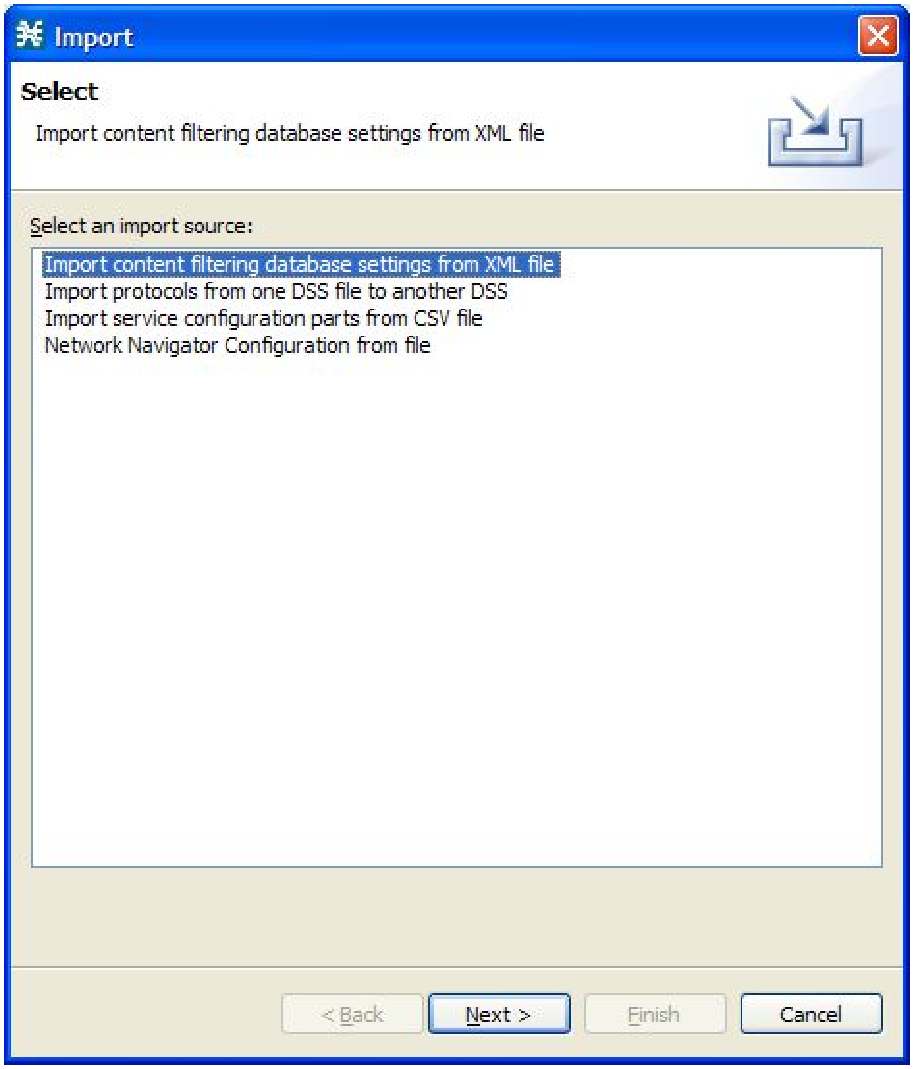
Importing Signatures

You can import DSS files into the file you are currently editing.

To import a DSS file:

Step 1 From the Console main menu, choose **File** > **Import**.

The Import dialog box appears.



Select

Import content filtering database settings from XML file

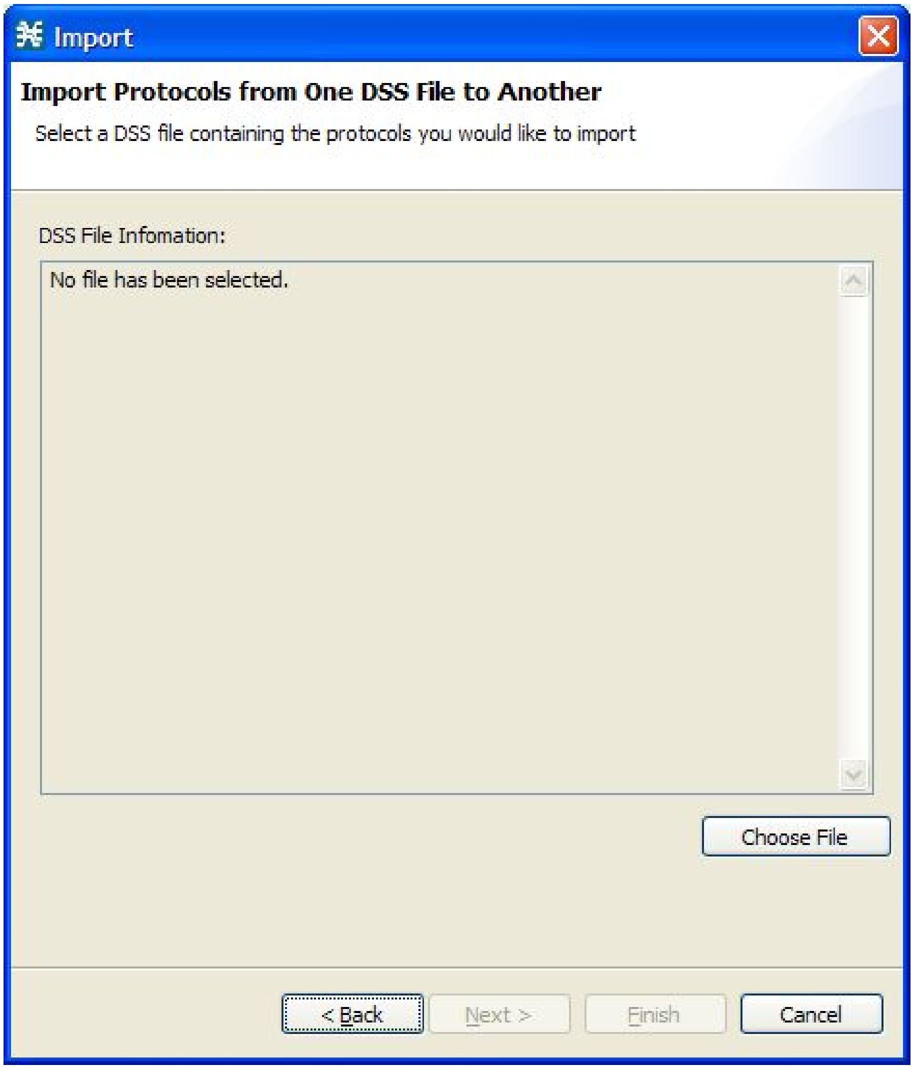
Select an import source:

- Import content filtering database settings from XML file
- Import protocols from one DSS file to another DSS
- Import service configuration parts from CSV file
- Network Navigator Configuration from file

Step 2 From the import source list, select **Import protocols from one DSS file to another DSS**.

Step 3 Click **Next**.

The second screen of the Import dialog box opens.



Import Protocols from One DSS File to Another

Select a DSS file containing the protocols you would like to import

DSS File Infomation:

No file has been selected.

Step 4 Click **Choose File**.

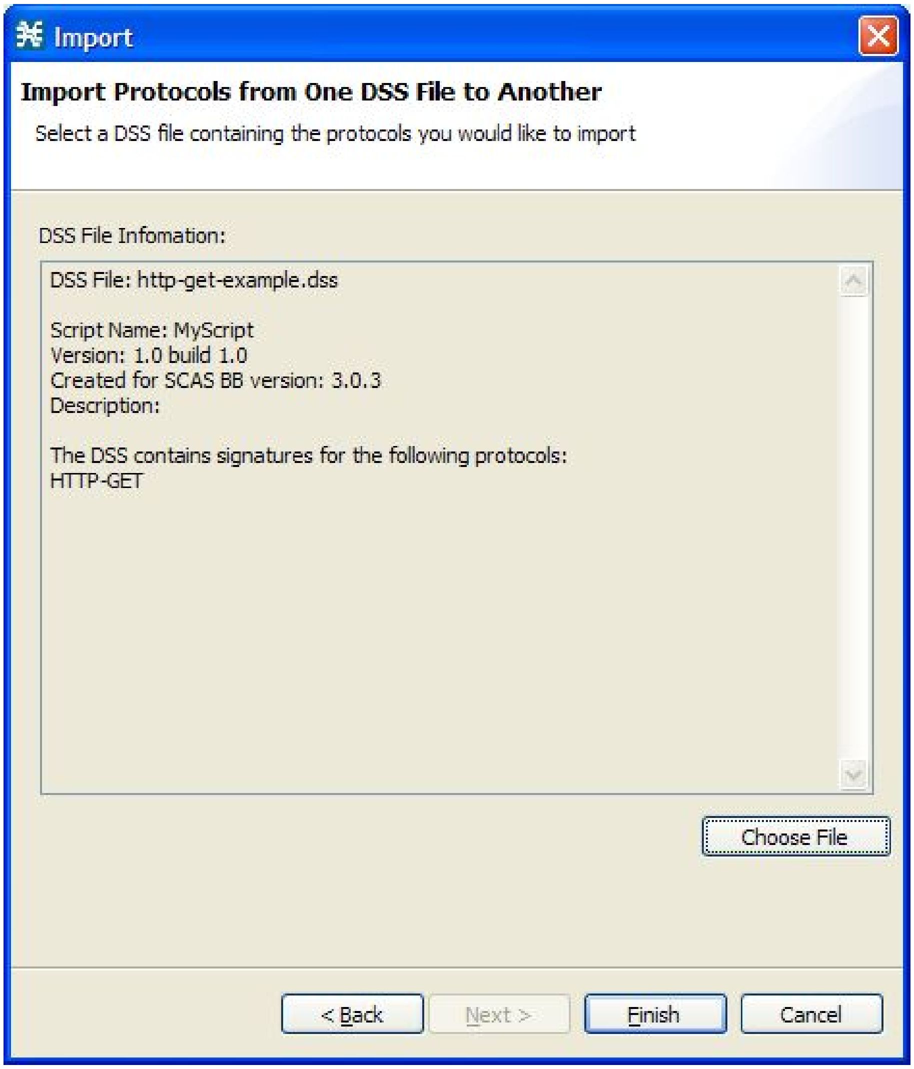
An Open dialog box appears.

Step 5 Browse to the DSS file to import.

Step 6 Click **Open**.

The Open dialog box closes.

Information about the DSS file that you have chosen is displayed in the DSS File Information area.



Import Protocols from One DSS File to Another

Select a DSS file containing the protocols you would like to import

DSS File Infomation:

DSS File: http-get-example.dss

Script Name: MyScript
Version: 1.0 build 1.0
Created for SCAS BB version: 3.0.3
Description:

The DSS contains signatures for the following protocols:
HTTP-GET

Step 7 Click **Finish**.

The Import dialog box closes.

The content of the selected DSS file is imported into the Signature Editor.

Note Importing signatures may create duplication of protocol names or protocol IDs.

The Signature Editor Console

The Signature Editor writes log and error messages to the Signature Editor Console (in the Console tab), when appropriate.

CHAPTER 13

Additional Management Tools and Interfaces

This chapter contains the following sections:

The SCA BB Service Configuration Utility

The Cisco Service Control Application for Broadband (***SCA BB***) Service Configuration Utility (**servconf**) is a command-line utility (CLU) for applying and retrieving service configurations. Use it in a scripting environment to automate service configuration tasks on multiple Service Control Engine (SCE) platforms.

The Service Configuration Utility can run in Windows, Solaris, and Linux environments.

For installation instructions, see *Installing the SCA BB Configuration Utilities* (on page 4-6).

Using the SCA BB Service Configuration Utility

The command-line syntax of the ***SCA BB*** Service Configuration Utility is:

```
servconf <operation> [<option>] [<option>] ...
```

The following tables list the **servconf** operations and options.

Table 13-1 servconf Operations

Operation	Abbreviation (if applicable)	Description
`--apply`	**`-a`**	Copies the specified service configuration file to the specified SCE platforms and activates it
`--retrieve`	**`-r`**	Retrieves the current service configuration

Operation	Abbreviation (if applicable)	Description
--update-dc	**-u**	Updates a Cisco Service Control Management Suite (SCMS) Collection Manager (CM) with service configuration values
--status		Shows the service configuration status on the SCE platform
--update-signature		Updates the SCE platform with a new protocol pack
--update-signature-pqi		Updates the SCE platform with a new SPQI protocol pack
--signature-info	**-i**	Shows information about the Dynamic Signature Script (DSS) file
--help		Displays help, then exits
--version		Displays the program version number, then exits

Table 13-2 servconf File Options

File Option	Abbreviation	Description
--file=*filename*	**-f**	Specifies a service configuration file or DSS file
--backup-directory=*directory*	**-b**	Specifies the directory to which to save the retrieved PQB file before applying a new protocol pack

Table 13-3 servconf Connection Options

File Option	Abbreviation	Description
--se=*address*	**-S**	Specifies the IP address of the destination SCE platform. To specify multiple SCE platforms, list the IP addresses separated by semicolons (see Example 1 in the following section). When using a semicolon in a Unix command line, the command-line argument must be enclosed in quotation marks.
--dc=*address*	**-D**	Specifies the IP address of the destination SCMS-CM platform (required only for the `--update-dc` operation).
--password=*password*	**-P**	Specifies the password for connecting to the SCE platform.

File Option	Abbreviation	Description
--username=*username*	**-U**	Specifies the username for connecting to the SCE platform. If this option is not specified, the following default values are used: • SCE—admin • CM—pcube • SM—pcube

Table 13-4 servconf Reference SCE Option

File Option	Description
--refer-se=*address*	Specifies the IP address of the SCE platform to which the service configuration values refer (required only for `--update-dc` operation)

Table 13-5 servconf Apply Options

File Option	Description
--no-dc	(Optional) Specifies that the `--apply` operation should not automatically update the SCMS-CM with service configuration values.
--no-default-signature	Applies the service configuration without adding the default DSS to it.
--force-default-signature	Forces the replacement of the DSS in the retrieved PQB with the default DSS, even if the signatures of the existing DSS are mapped to services. Without this flag, trying to update a PQB containing a DSS will fail.

Table 13-6 servconf Update Signature Option

File Option	Description
--force-signature	Forces replacement of the DSS in the retrieved PQB, even if the signatures of the existing DSS are mapped to services. Without this flag, trying to update a PQB containing a DSS will fail.

SCA BB Service Configuration Utility Examples

EXAMPLE 1

To copy the service configuration file *config.pqb* from the local machine to two SCE platforms (at 63.111.106.7 and 63.111.106.12), and activate this configuration:

```
servconf ″--se=63.111.106.7;63.111.106.12″ --username Alice --password *****
--apply --file config.pqb
```

EXAMPLE 2

To retrieve the current service configuration from the SCE platform at 63.111.106.7, and save it in file *my_files\config.pqb* on the local machine:

```
servconf -S 63.111.106.7 -U Bob -P ***** --retrieve --file
my_files\config.pqb
```

EXAMPLE 3

To update the SCMS-CM at 63.121.116.17 with service configuration values from file *config.pqb*, as if they were applied to the SCE platform at 63.111.106.7 (but without actually applying them to the SCE platform):

```
servconf -D 63.121.116.17 -U Alice -P ***** --update-dc
--refer-se 63.111.106.7 --file config.pqb
```

EXAMPLE 4

To distribute the protocol pack file *new_signature.spqi* to the SCE platforms at 10.56.216.33 and 10.56.216.36:

```
servconf --update-signature-pqi -f new_signature.spqi
-S ”10.56.216.33;10.56.216.36” -U user123 -P *****
```

The SCA BB Real-Time Monitoring Configuration Utility

SNMP-based monitoring tools, such as MRTG, allow network administrators to monitor the activity and health of network devices in real time. ***SCA BB*** includes an SNMP-based real-time monitoring solution, which is implemented using MRTG and a graphics utility (RRDTool).

The ***SCA BB*** Real-Time Monitoring Configuration Utility (**rtmcmd**) is a command-line utility (CLU) for automating the production of the files required by the MRTG tool.

For installation instructions, see *Installing the* ***SCA BB*** *Configuration Utilities* (on page 4-6). For more information about installing and using the ***SCA BB*** SNMP-based real-time monitoring solution, see the *Cisco SCA BB SNMP Real-Time Monitoring User Guide*.

Using the SCA BB Real-Time Monitoring Configuration Utility

The command-line syntax of the ***SCA BB*** Real-Time Monitoring Configuration Utility is:

```
rtmcmd --sce <SCE (SNMP) addresses> {--file <PQB filename> | (--pqb-sce
<SCE (PQB) addresses> --username <username> --password <password>)}
--source-dir <dir> --dest-dir <dir> --config-file <file>
```

The following table lists the **rtmcmd** options.

Table 13-7 rtmcmd Options

Option	Abbreviation	Description
--sce *address*	**-S**	Specifies the IP address or hostname of the SCE platform from which SNMP data will be collected. To specify multiple SCE platforms, list the IP addresses separated by semicolons. When using a semicolon in a Unix command line, the command-line argument must be enclosed in quotation marks.

Option	Abbreviation	Description
--file *filename*	**-f**	(Required if **--pqb-sce** is not included) Specifies the service configuration file to use when generating the configuration and report files. If this option is specified, the **--username**/**-U** and **--password**/**-P** options are prohibited.
--pqb-sce *address*	**-q**	(Required if **--file** is not included) Specifies the hostname or IP address of the SCE platform from which the service configuration should be retrieved. This option requires the **--username**/**-U** and **--password**/**-P** options.
--username <*username*>	**-U**	(Required if **--pqb-sce** is included) Specifies the username for connecting to the SCE platform.
--password <*password*>	**-P**	(Required if **--username** is included) Specifies the password for connecting to the SCE platform.
--source-dir <*dir*>	**-s**	Specifies the location of the report template files.
--dest-dir <*dir*>	**-d**	Specifies the directory where the processed report templates should be stored.
--config-file <*file*>	**-c**	Specifies *the user configuration file* (on page 13-6).

You can invoke additional operations to display information about the **rtmcmd** using the following syntax:

```
rtmcmd <operation>
```

The following table lists these additional **rtmcmd** operations.

Table 13-8 rtmcmd Operations

Operation	Description
--version	Displays the program version number, then exits
--help	Displays help, then exits

SCA BB Real-Time Monitoring Configuration Utility Examples

EXAMPLE 1

To use the service configuration file *servicecfg.pqb* to create configuration and report files for the collecting and reporting of SNMP information from two SCE platforms (at 63.111.106.7 and 63.111.106.12):

```
rtmcmd --sce="63.111.106.7;63.111.106.12" --file=servicecfg.pqb
--source-dir=/rtm-templates --dest-dir=/rtm-output -c ./rtmcmd.cfg
```

EXAMPLE 2

To use the service configuration loaded on the SCE platform at 63.111.106.7 to create configuration and report files for the collecting and reporting of SNMP information from two SCE platforms (at 63.111.106.7 and 63.111.106.12):

```
rtmcmd -S "63.111.106.7;63.111.106.12" -U user123 -P ****
--pqb-sce=63.111.106.7 --source-dir=/rtm-templates
--dest-dir=/rtm-output -c ./rtmcmd.cfg
```

The User Configuration File

The user configuration file contains user-specific information required by the **rtmcmd** utility. The SCA BB utilities distribution package contains a sample configuration file, named *rtmcmd.cfg*. You should edit this file according to the details of your setup.

The following table lists the configuration parameters that should be present in the user configuration file:

Table 13-9 User Configuration File Parameters

Parameter	Description	Default Value	Required/ Optional
rrdtool_bin_dir	The absolute path to the directory where RRDTool and RRDCGI binary files are installed.		Required
rtm_dir	The absolute path to the directory where RRD archives and CGI files are stored. This is under the web server web directory.		Required
mrtg_bin_dir	The absolute path to the directory where MRTG binary files are installed. This location is used to create MRTG invocation commands in the crontab sample file.		Required
snmpCommunityString	The SNMP community string to use when accessing the SCE platforms.	Public	Required

The configuration text file is a listing of key-value pairs, where the key is one of the parameters listed above, in the following format:

- Each key-value pair is on a separate line.
- A key-value pair may be extended across several adjacent lines by putting a backslash character, “\”, at the end of each line.
- To use an actual backslash in the value (as in directory names on Windows), the backslash should be escaped with a second backslash, like this: “\\” (or use a slash “/”).
- To comment a line, add “#” or “!” at the beginning of the line.

For example:

```
# This is a comment line.
# Directory names should use escape backslashes:
rtm_dir=D:\\PROGRA~1\\APACHE~1\\Apache2.2\\htdocs
```

rtmcmd User Configuration File Example

```
#The absolute path to the RRD tool's execution files folder
#Use '\\' or '/' as path separator
rrdtool_bin_dir=C:/rrdtool-1.2.15/rrdtool/Release

#The absolute path where RTM files will be placed.
#This path will be used by MRTG to create and update the RRD files
#Note: path must not contain white spaces!
rtm_dir=C:/PROGRA~1/APACHE~1/Apache2.2/htdocs

#The absolute path to the MRTG bin folder.
#This path will be used to create file crontab.txt
mrtg_bin_dir=C:/mrtg-2.14.5/bin

#The SCE's community string
snmpCommunityString=public
```

The SCA BB Signature Configuration Utility

The ***SCA BB*** Signature Configuration Utility (**sigconf**) is a command-line utility for installing and managing the default DSS.

The signature configuration utility can run in Windows, Solaris, and Linux environments.

For installation instructions, see *Installing the* ***SCA BB*** *Configuration Utilities* (on page 4-6).

Using the SCA BB Signature Configuration Utility

The command-line syntax of the ***SCA BB*** Signature Configuration Utility is:

```
sigconf <operation> [--file <filename>]
```

The following tables list the **sigconf** operations and options.

Table 13-10 sigconf Operations

Operation	Abbreviation	Description
`--set-default-dynamic-signature`	**`-d`**	Installs the default DSS on this workstation
`--remove-default-dynamic-signature`		Uninstalls the default DSS from this workstation
`--get-default-dynamic-signature`		Fetches the default DSS installed on this workstation
`--help`		Displays help, then exits

Table 13-11 sigconf File Option

File Option	Abbreviation	Description
`--file=`*`filename`*	**`-f`**	Specifies DSS file

SCA BB Signature Configuration Utility Examples

EXAMPLE 1

To install the file *new_signature.dss* as the default DSS:

```
sigconf --set-default-dynamic-signature --file new_signature.dss
```

EXAMPLE 2

To retrieve the installed default DSS file, and save it as *default_backup.dss*:

```
sigconf --get-default-dynamic-signature --file default_backup.dss
```

Installing PQI Files from the Command Line

Installing a SCA BB PQI File on an SCE Platform

You can install a ***SCA BB*** PQI file on an SCE platform using the SCE platform Command-Line Interface (CLI).

To install a ***SCA BB*** PQI file on an SCE platform:

Step 1 Do one of the following:

- Locate the PQI file on the SCE platform.
- Upload the appropriate PQI file to the SCE via FTP.

Step 2 At the SCE platform CLI prompt (SCE#), type **configure**.

Step 3 Press **Enter**.

The SCE(config)# prompt appears.

Step 4 Type **interface linecard 0**.

Step 5 Press **Enter**.

The SCE(config if)# prompt appears.

Step 6 Type **pqi install file engXXXXX.pqi**.

Step 7 Monitor the installation progress until it is completed.

The PQI file is now installed.

Note After you install the Console, you can use the Network Navigator tool to install PQI files. See *Installing PQI Files on SCE Devices* (on page 5-14).

Installing a SCA BB PQI File on an SM Device

You can install a ***SCA BB*** PQI file on a Cisco Service Control Management Suite (SCMS) Subscriber Manager (SM) using the SM Command-Line Utility (CLU).

To install a ***SCA BB*** PQI file on an SM device:

Step 1 Upload the appropriate PQI file to the SM via FTP.

Step 2 Open a Telnet session to the SM.

Step 3 Go to the SM `bin` directory and type **`p3inst --install --file=sm_engXXXXX.pqi`**.

Step 4 Press **Enter**.

Step 5 Monitor installation progress until installation is completed.

The PQI file is now installed.

Note After you install the Console, you can use the Network Navigator tool to install PQI files. See *Installing PQI Files on SM Devices* (on page 5-20).

SNMP, MIB, and Traps: Overview

Cisco provides complete network FCAPS (Fault, Configuration, Accounting, Performance, Security) Management.

Two interfaces are provided for network management:

- Command-line interface (CLI)—Accessible through the Console port or through a Telnet connection, the CLI is used for configuration and security functions.
- SNMP (Simple Network Management Protocol)—Provides fault management (via SNMP traps) and performance monitoring functionality.

SNMP

SNMP is a set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters.

The SCE platform operating system includes an SNMP agent. Configuring the SNMP agent parameters and enabling the SNMP interface is described in the “Configuring the Management Interface and Security” chapter of the *Cisco Service Control Engine (SCE) Software Configuration Guide*.

MIB

Management Information Bases (MIBs) are databases of objects that can be monitored by a network management system. SNMP uses standardized MIB formats that allow standard SNMP tools to monitor any device defined by a MIB.

The SCE platform supports the following MIBs:

- MIB-II—Defined in *RFC 1213, Management Information Base for Network Management of TCP/IP-based Internets*
- Cisco Service Control Enterprise MIB—Described by a number of MIB files

The Cisco proprietary MIB allows external management systems to retrieve general information regarding the SCE platform operating status and resources utilization, extract real-time measurements of bandwidth utilization and network statistics, and receive notifications of critical events and alarms.

The part of the Cisco proprietary MIB that provides configuration and runtime status for ***SCA BB*** is documented in the “SCA BB Proprietary MIB Reference” chapter of the *Cisco Service Control Application for Broadband Reference Guide*. Other parts of the Cisco proprietary MIB are documented in the “Proprietary MIB Reference” appendix of the *Cisco Service Control Engine (SCE) Software Configuration Guide*. These books also explain the order in which the MIB must be loaded.

Traps

Traps are unsolicited messages generated by the SNMP agent that resides inside the SCE platform. Traps are generated when an event occurs. When the Network Management System receives the trap message, it can take suitable actions, such as logging the occurrence or ignoring the signal.

The SCE platform supports two general categories of traps:

- Standard SNMP traps—As defined in RFC 1157 and using the conventions defined in RFC 1215
- Proprietary Cisco Service Control Enterprise traps—As defined in the Cisco proprietary MIB

For a description of the SNMP traps and an explanation of how to configure the SNMP trap managers, see “SNMP Configuration and Management” in the “Configuring the Management Interface and Security” chapter of the *Cisco Service Control Engine (SCE) Software Configuration Guide*.

Managing Subscribers via Other System Components

Other components of the Cisco Service Control solution offer alternatives for subscriber management (as opposed to using the Subscriber Manager GUI tool in the Console):

- The Cisco Service Control Management Suite (SCMS) Subscriber Manager (SM) has options that are not available from the Console.
- The SCE platform has a wide range of subscriber-related functions.

This section gives an overview of these alternatives, with emphasis on the ***SCA BB***-specific subscriber management options. For in-depth explanations, see the appropriate Service Control documentation.

Anonymous Subscriber Mode

An *anonymous subscriber* is one with a name that is generated automatically by the SCE platform according to an anonymous subscriber group specification. An anonymous subscriber is always mapped to a single IP address. The actual identity of the customer is unknown to the system. (See *Subscribers and Subscriber Modes* (on page 2-3).)

An *anonymous group* is a specified IP range, possibly assigned a subscriber template. If an anonymous group is configured, the SCE platform generates anonymous subscribers for that group when it detects traffic with an IP address that is in the specified IP range. If a subscriber template is assigned to the group, the anonymous subscribers generated have properties defined by that template. If no subscriber template is assigned, the default template is used, which cannot be changed by template import operations. Initially, 32 templates are preconfigured, one for each package ID.

Anonymous subscriber groups and subscriber templates are managed using the SCE platform Command-Line Interface (CLI). You can enter CLI commands via a Telnet session. For more information, see the *Cisco Service Control Engine (SCE) CLI Command Reference*.

Use the following commands to import anonymous subscriber groups and subscriber templates from CSV files and to export subscriber data to these files:

- `subscriber anonymous-group import csv-file`
- `subscriber anonymous-group export csv-file`
- `subscriber template import csv-file`
- `subscriber template export csv-file`

Note The preceding CLI commands are line interface configuration commands. You must enter line interface configuration mode and see the `SCE(config if)#` prompt displayed before entering a command.

Use the following commands to delete anonymous groups or subscriber templates from the system.

- `no subscriber anonymous-group [all] [name <groupname>]`
- `clear subscriber anonymous`
- `default subscriber template all`

Note The preceding CLI commands are line interface configuration commands. You must enter line interface configuration mode and see the `SCE(config if)#` prompt displayed before entering a command.

Use the following commands to display anonymous subscriber information:

- `show interface linecard 0 subscriber templates [index]`

- `show interface linecard 0 subscriber anonymous-group [all] [name <groupname>]`
- `show interface linecard 0 subscriber amount anonymous [name <groupname>]`
- `show interface linecard 0 subscriber anonymous [name <groupname>]`

Selecting Subscribers for Real-Time Usage Monitoring

Real-Time Subscriber Usage RDRs report the network activity of a single subscriber per service per metric, in real-time. You must enable the generation of these subscriber usage RDRs separately for each subscriber that you wish to monitor.

Caution Generating and collecting Real-Time Subscriber Usage RDRs for many subscribers can cause performance penalties. Enable Real-Time Subscriber Usage RDR generation only for those subscribers that must actually be monitored by the system.

Generation of Real-Time Subscriber Usage RDRs is controlled by the **monitor** subscriber property. By default, generation of these RDRs is disabled (`monitor = 0`). To enable generation of the RDRs, change the value of the property to 1.

You can modify this property for selected subscribers using either the SM Command-Line Utility (CLU) or the SCE platform CLI.

Managing Subscriber Monitoring via the SM

You can enable or disable the generation of the Real-Time Subscriber Usage RDRs using the SM p3subs utility. You can also create a file that processes a batch of subscribers. For more information, see the *Cisco Service Control Management Suite Subscriber Manager User Guide*.

To enable subscriber monitoring for subscriber Smith:

Run the following from the command line:

```
sm/server/bin/p3subs --set --subscriber Smith --property monitor=1
```

To disable subscriber monitoring for subscriber Smith:

Run the following from the command line:

```
sm/server/bin/p3subs --set --subscriber Smith --property monitor=0
```

To enable subscriber monitoring for a group of subscribers:

Step 1 Create a text file (named *monitor.txt* in this example) containing the sequence of CLU invocations. The file would look something like this:

```
p3subs --set --subscriber Jerry --property monitor=1
p3subs --set --subscriber George --property monitor=1
p3subs --set --subscriber Elaine --property monitor=1
p3subs --set --subscriber Kramer --property monitor=1
p3subs --set --subscriber Newman --property monitor=1
```

Step 2 Run the following from the command line:

```
sm/server/bin/p3batch -f monitor.txt
```

You can check to see whether subscriber monitoring is enabled for a specific subscriber.

To see whether subscriber monitoring is enabled for subscriber Smith:

Run the following from the command line:

```
sm/server/bin/p3subs --show-property --subscriber Smith --property monitor
```

Managing Subscriber Monitoring via the SCE Platform

You can also enable or disable the generation of the Real-Time Subscriber Usage RDRs using the SCE platform. For more information, see the *Cisco Service Control Engine (SCE) CLI Command Reference*.

(The prompt is included in these examples to illustrate how it changes. You must see the `SCE(config if)#` prompt to invoke the actual subscriber command.)

To enable subscriber monitoring for subscriber “Smith”:

Run the following from the command line:

```
SCE# configure
SCE(config)# interface LineCard 0
SCE(config if)# subscriber name Smith property monitor value 1
```

To disable subscriber monitoring for subscriber “Smith”:

Run the following from the command line:

```
SCE# configure
SCE(config)# interface LineCard 0
SCE(config if)# subscriber name Smith property monitor value 0
```

To enable subscriber monitoring for a group of subscribers:

Step 1 Create a text file (named *monitor.txt* in this example) containing the sequence of CLI invocations, including the commands to access the appropriate CLI mode. The file would look something like this:

```
configure
interface LineCard 0
subscriber name Jerry property monitor value 1
subscriber name George property monitor value 1
subscriber name Elaine property monitor value 1
subscriber name Kramer property monitor value 1
subscriber name Newman property monitor value 1
```

Step 1 Run the following from the command line:

```
SCE# script run monitor.txt
```

You can check to see whether subscriber monitoring is enabled for a specific subscriber.

To see whether subscriber monitoring is enabled for subscriber “Smith”:

Run the following from the command line:

```
SCE# show interface LineCard 0 subscriber name Smith properties
```

The properties are displayed; **monitor** is the relevant parameter.

```
  Subscriber smith properties:
  subscriberPackage=0
  monitor=1
  Subscriber 'smith' read-only properties
```

Subscriber-Aware Mode

In subscriber-aware mode, each subscriber is a specific customer with an externally generated name. This externally generated name allows the subscriber to be mapped to more than one IP address and still be identified. Each traffic session (single IP flow, or a group of related IP flows) processed by the SCE platform is assigned to a recognized subscriber on the basis of the configured subscriber mappings.

There are three options for introducing and managing these subscribers:

- *The SM GUI* (on page 11-1)
- *SCE platform CLI* (on page 13-15)
- *SM Command-Line Utilities (CLU)* (on page 13-16)

SCE Platform Subscriber CLI

Use the following commands to import subscriber data from CSV files and to export subscriber data to these files:

Note The following CLI commands are line interface configuration commands. You must enter line interface configuration mode and see the `SCE(config if)#` prompt displayed.

- `subscriber import csv-file`
- `subscriber export csv-file`

Note The preceding CLI commands are line interface configuration commands. You must enter line interface configuration mode and see the `SCE(config if)#` prompt displayed before entering a command.

Use the following command to remove subscribers from the system.

- `no subscriber [all] [name <subscriber-name>]`

Note The preceding CLI command is a line interface configuration command. You must enter line interface configuration mode and see the `SCE(config if)#` prompt displayed before entering the command.

Use the following commands to display subscribers meeting various criteria:

- `show interface linecard 0 subscriber [amount] [prefix <prefix>] [property <propertyname> equals|greater-than|less-than <property-val>]`
- `show interface linecard 0 subscriber [amount] prefix <prefix>`
- `show interface linecard 0 subscriber [amount] suffix <suffix>`
- `show interface linecard 0 subscriber mapping IP <iprange>`
- `show interface linecard 0 subscriber [amount] mapping intersecting IP <iprange>`
- `show interface linecard 0 subscriber mapping VLANid <vlanid>`

Use the following commands to display information about a specific subscriber:

- `show interface linecard 0 subscriber properties`
- `show interface linecard 0 subscriber name <name>`
- `show interface linecard 0 subscriber name <name> mappings`
- `show interface linecard 0 subscriber name <name> counters`
- `show interface linecard 0 subscriber name <name> properties`

SM CLU

Use the **p3subs** SM utility to manage subscribers. You can add or remove subscribers. You can also manage subscriber properties and mappings with this utility.

For more information, see the *Cisco Service Control Management Suite Subscriber Manager User Guide*.

To manage subscribers:

At the Solaris shell prompt, enter a command having the following general format:

```
p3subs <operation> --subscriber=<Subscriber-Name> [--ip=<IP-address>]
[--property=<property-name=value>] [--domain=<domain-name>] [--overwrite]
```

The following table lists the **p3subs** operations relevant to managing subscribers.

Table 13-12 p3subs Subscriber Operations

Operation	Description
--add	Adds a subscriber or replaces the existing subscriber configuration
--set	Updates mappings and properties for the specified subscriber
--remove	Removes the specified subscriber
--show	Displays information for specified subscriber

Managing CSV Files

Use the p3subsdb SM utility to import and export subscriber CSV files. You can import subscriber information for a group of subscribers from a CSV file into the SM database. You can also export subscriber information from the SM database to a CSV file.

For more information, see the *Cisco Service Control Management Suite Subscriber Manager User Guide*.

CSV file structure is described in the “CSV File Formats” chapter of the *Cisco Service Control Application for Broadband Reference Guide*.

To import CSV files:

Step 1 At the Solaris shell prompt, enter a command having the following general format:

```
p3subsdb --import filename
```

To export CSV files:

Step 1 At the Solaris shell prompt, enter a command having the following general format:

```
p3subsdb --export filename
```

EXAMPLE:

To export subscribers with filtering options to a specified CSV file:

```
p3subsdb --export --prefix=a -–output=silverSubscriberFile.csv
```

Glossary of Terms

A

Anonymous subscriber mode

A mode in which entities defined as IP addresses or VLANs are treated as subscribers. The correlation to actual subscriber IDs is not performed by the system, but is performed externally by the collection system. Anonymous subscriber mode does not require an SCMS-SM.

B

BW Controllers

See Subscriber BW Controllers

C

CLI

One of the management interfaces to the SCE platform. The CLI is accessed through a Telnet session or directly via the console port on the front panel of the SCE platform.

CM

A software application running on a Solaris or Linux platform that is responsible for receiving RDRs from the SCE platform and processing them.

Command-Line Interface

See CLI.

D

Downstream traffic

Traffic entering the SCE platform from the network side (that is, flowing toward the subscribers).

Dynamic Signature

A dynamic signature is a signature that can be loaded to a running application. After it is loaded, the application can identify the protocol associated with this signature.

E

External Quota Management

Provisioning of per-service quotas for individual subscribers by an external system, such as a prepaid server or a policy controller.

In external quota provisioning, usage counters are not automatically reset at the end of an aggregation period, nor is a specific quota limit provided uniformly to all subscribers as part of the package parameters. Instead, the quotas are provisioned individually via the external quota management system.

External Quota Provisioning

See External Quota Management.

F

Filter Rules

The part of a service configuration that instructs the SCE platform to ignore some types of transactions based on Layer 3 and Layer 4 properties, and transmit them unchanged, bypassing the Cisco Service Control solution service.

Flow

All packets traveling in both directions on a single application-layer connection (such as a TCP or UDP connection). A flow is identified by the tuple information: <Source IP, Destination IP, Source Port, Destination Port, IP Protocol>. (Note that if the IP protocol is neither TCP nor UDP, the port number is defined as 0.)

In this guide, the term “flow” represents bidirectional flows (packets from both the client and server of each connection). A unidirectional flow is always mentioned explicitly.

Flow bundle

A group of one or more flows comprising the set of application-layer connections (such as a TCP or UDP connection) used in a single, logical application session. The semantics of flow bundles are application dependent and relate to the way each application spawns and negotiates additional flows as part of a single session. A few common examples are:

- An SIP (VoIP) flow bundle comprises the signaling flow and all the RTP/UDP flows containing the actual media data (voice)
- An RTSP (Streaming) flow bundle comprises the signaling flow and the RTP/UDP flows containing the audio and video transmissions
- AN FTP (file transfer) flow bundle comprises the control flow (used to log in to an FTP server) and the actual file-transfer flows

In each of these examples, the SCE platform tracks the application communication to identify new connections created and bundle them into a single context. This is important for classification and accounting, otherwise these spawned flows would be misclassified.

G

Global Controllers

Global controllers are used to control the total bandwidth percentage for a selected protocol or package for all subscribers.

See also Subscriber BW Controllers.

I

Inline connection mode

The SCE platform physically resides on the data link between the subscriber side and the network side. It can both receive and transmit traffic.

L

List

An IP address range or list of web addresses used to define a service.

N

Network-initiated transactions

Transactions that are initiated by a host, on the network side, toward a subscriber.

O

Online subscriber

A subscriber that is currently online. At any particular time, a number of online subscribers will be idle.

P

Package

A collection of business policy rules, defining access levels to various services, charging parameters, and traffic control actions to be taken upon predefined events. Subscribers are assigned packages (plans) that determine how their network transactions are controlled and charged.

PQI (Cisco Installation) File

An application package file that is installed on the network SCE platforms and on the Cisco Service Control Management Suite Collection Managers.

Q

Quota

A (subscriber’s) limit for a specific metric, such as bandwidth or volume.

Quota buckets

When the external quota management mode is selected, subscriber usage of a service is consumed from a predefined subscriber quota bucket. Each subscriber has four subscriber quota buckets. When a quota bucket is depleted, services that try to consume from that bucket are *breached*.

A quota manager that is external to the Service Control system replenishes quota buckets.

R

Raw Data Record

See RDR.

RDR

A data record produced by the SCE platform that reports events in the traffic. RDRs produced by the SCE platform are sent to the Cisco Service Control Management Suite Collection Manager and then stored in the Collection Manager database or forwarded to third-party systems. The RDR typically contains a quota (*see* Quota) request or reports service usage.

RDR Formatter

An internal component of the SCE platform that gathers the Raw Data Records (RDRs), formats them, and sends them to an external Cisco Service Control Management Suite Collection Manager.

Real-time subscriber usage monitoring

Subscribers are monitored in detail. Usage information is reported frequently by the SCE platform to facilitate detailed reports.

Receive-only connection mode

The SCE platform does not reside physically on the data link, and therefore can receive but not transmit data.

Rule

A service is assigned to a package by defining a rule for the package.

S

SCA BB Console[bb]

The user interface used for controlling the Cisco Service Control Application for Broadband. You use the Console to create, modify, and apply service configurations.

SCE platform

The SCE platform is a purpose-built service component and active enforcing system designed for enhancing service providers and backbone carrier networks. By identifying, classifying, and manipulating complex traffic flows at wire speed, the SCE platform transforms simple transport networks into differentiated service delivery infrastructures for a wide variety of value-added IP applications, such as video streaming, VoIP, tiered services, and bilateral application-level SLAs.

The SCE platform seamlessly interfaces with existing network elements—including routers, switches, aggregators, subscriber management devices, and operational support systems—using industry-standard interfaces and communications protocols.

The need to guarantee that packets passing through the network are processed at the rate at which they arrive makes it necessary to provide a custom-made hardware solution.

The SCE platform comes in three models—SCE 1000, SCE 2000 4xGBE, and SCE 2000 4/8xFE. There may be one or more SCE platforms in the provider network. In the SCE platform, network transactions are analyzed and mapped to services that enforce the provider’s policies.

The SCE platform also implements the business logic of the system solution and performs transaction analysis in real-time. When so instructed, the SCE platform creates a Raw Data Record (RDR) that is sent for storage to the system’s data repository, the Cisco Service Control Management Suite Collection Manager, or carries out other operations such as bandwidth or volume control.

Service

A value-added offering given by the service provider to its subscribers on top of its access network.

For each such commercial service the providers offer to their subscribers, a corresponding service is defined in the Cisco Service Control solution for classifying and identifying network transaction associated with the service, reporting on its usage, and controlling its traffic according to the business policy.

Service Configuration

The definition of services in the Cisco Service Control solution, the mapping of network transactions to their corresponding services, and the behavior of the SCE platform on them. A service configuration includes the definition of services, packages, bandwidth controllers, filter rules, and so on.

Service Control

The basic Cisco concept for enabling service providers to differentiate subscribers, detect real-time events, create premium services, actively control applications, and leverage their existing infrastructure.

Service Control Application

An SML program (*see* SML) that determines how the SCE platform operates.

Service Control Engine platform

See SCE platform.

Service Control Management Suite Collection Manager

See CM.

Service Control Management Suite Subscriber Manager

See SM.

Service Modeling Language

See SML.

Session (also called Transaction)

An instance of communication between network hosts. A precise definition of a session is application-protocol (Layer 7) dependent.

Signature

A set of parameters that uniquely identify a protocol.

SLI (SML Loadable Image) File

A software package (part of a Cisco Service Control Application solution) containing the SML application that is loaded onto an SCE platform. The SML application determines the behavior of the SCE platform. Different SCE platforms can have different SML applications, even when they are in the same POP. (Operators do not need to access the SLI file.)

SM

A middleware software component used where dynamic binding of subscriber information and service configurations is required. The SM manages subscriber information and provisions it in real time to multiple SCE platforms. It can store subscriber service configurations information internally, and act as a stateful bridge between the AAA system (for example, RADIUS and DHCP) and the SCE platforms.

SML

The Cisco scripting language, which allows the definition of service-related events and the execution of actions on those events.

Static subscriber mode

A mode in which a specific IP address is bound to each subscriber. This mode is useful when controlling enterprise customers, or when controlling subscribers in groups of predefined subnets (such as users of a specific CMTS/BRAS).

Subscriber

Service Provider client. There are two types of subscribers:

- Introduced Subscriber—A specific subscriber with an externally generated name. May be mapped to more than one IP address.
- Anonymous subscriber group—A subscriber with a name generated automatically by the SCE platform according to an anonymous subscriber group specification. Always mapped to a single IP address. The actual identity of the subscriber is unknown to the system.

Subscriber Bandwidth Controllers

See Subscriber BW Controllers.

Subscriber BW Controllers

Subscriber BW Controllers control traffic bandwidth for an individual subscriber.

See also Global Controllers.

Subscriber-aware mode

A mode in which actual subscribers are defined in the system, thus requiring no external correlation to subscriber IDs.

Subscriber-aware mode

A mode in which the actual subscriber ID is associated with an IP address when the subscriber logs onto the network and is assigned an IP address. To operate in this mode, the system must be integrated with the OSS system that assigns IP addresses to subscribers (typically based on Radius or DHCP).

Subscriber-initiated transactions

Transactions that are initiated by a host of a subscriber.

Subscriberless mode

A mode of the Cisco Service Control solution that requires no integration, so that the SCMS-SM is not required. This mode is not influenced by the number of subscribers or inbound IP addresses; the total number of subscribers using the monitored link is unlimited from the perspective of the SCE platform. Use subscriberless mode at sites where control and level analysis functions are required only at a global platform resolution.

T

Time-Based Rule

An added-value rule that can be attached either to the default service rule or to any other rule. A time-based rule is applied for one of the user-defined time frames.

Traffic Discovery Reports

Statistics reports on network activity based on transaction usage records.

Transaction (also called Session)

An event in traffic that is recognized by a service control application. A transaction is distinguished according to its Layer 3, Layer 4, or Layer 7 characteristics. Different protocols may have different transaction types.

U

Upstream traffic

Traffic entering the SCE platform from the subscriber side.

Index