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.

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 more information about 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 that is 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 more information about 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 more information about 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 more information about 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.

Figure 2-1 illustrates the flow of information in the Cisco Service Control solution.

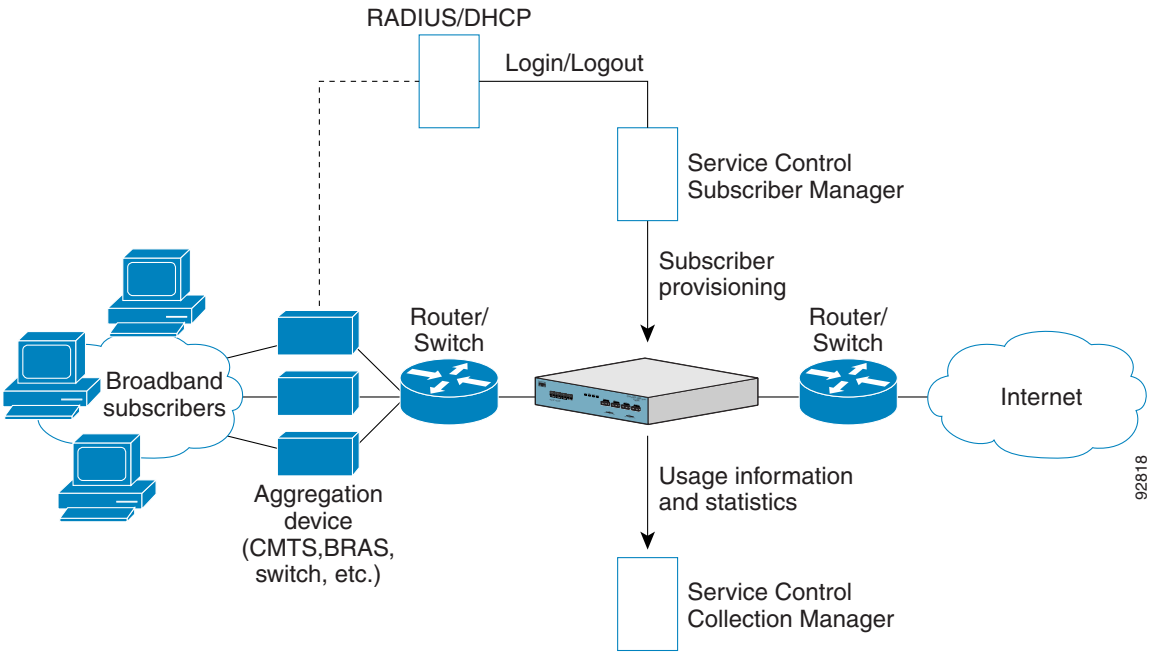
- Horizontal flow—Represents traffic between subscribers and an IP network.

  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 SCA BB



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 point of view 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

Table 2-1 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.

Table 2-1 Summary of Subscriber Modes (continued)

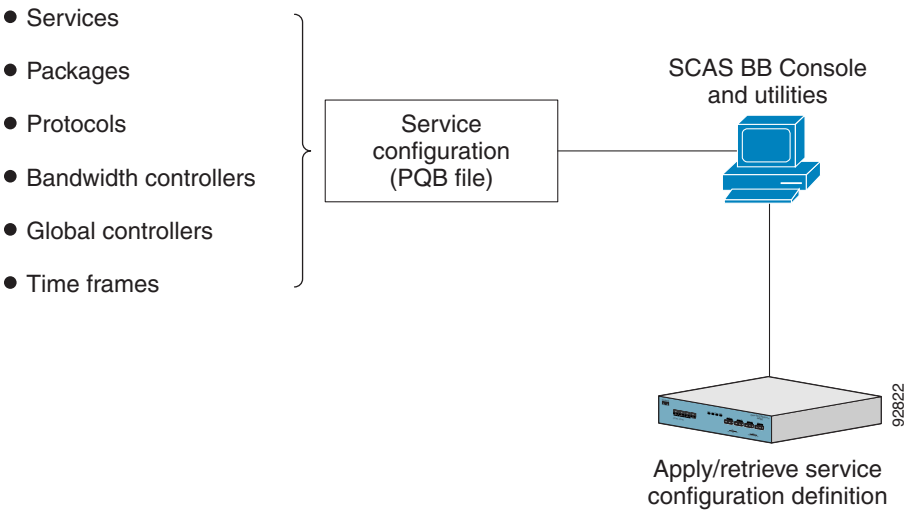
Mode	Features Supported	Main Advantages	Use for...
Static subscriber mode	• Global analysis and control • Control based on individual or group IP addresses as configured statically to the SCE platform	• One-time static subscriber configuration, with no integration requirements. • Manage subscriber traffic 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, as illustrated in Figure 2-2, service configuration defines the following:

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

Figure 2-2 Service Configuration



Service configuration is accomplished using one of the following:

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

The SCA BB Console

The SCA BB 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.

The 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, page 13-1.

The 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 Service Control Application for Broadband Service Configuration API Programmer Guide*.