Cisco SCE Service Control Engine

At-A-Glance

Why Is the Cisco Service Control Engine Important for Service Providers?

The Cisco® SCE Service Control Engine is a network element that provides a powerful service management point based on stateful deep packet inspection (DPI). Instead of processing packets as individual events, the Cisco SCE fully reconstructs flows and the Layer 7 state of each application flow for application- and session-based classification and management of IP traffic for each subscriber. With the Cisco SCE, service providers can:

- Analyze, report on, and bill for subscriber and application usage
- Classify and manage application sessions (including web browsing, multimedia streaming, and peer-to-peer applications)
- Enforce quality-of-service (QoS) policies and service guarantees for latency-sensitive applications (such as VoIP and interactive gaming)
- Implement fair-use policies and manage network congestion by optimizing application-level traffic
- Deploy service tiers based on volume, time, content, and premium IP service delivery
- Introduce differentiated subscription services such as parental controls, turbo buttons, etc.
- Introduce personalized, localized advertising on web pages
- Partner with "over-the-top" web-based content providers by enabling unique service-level guarantees

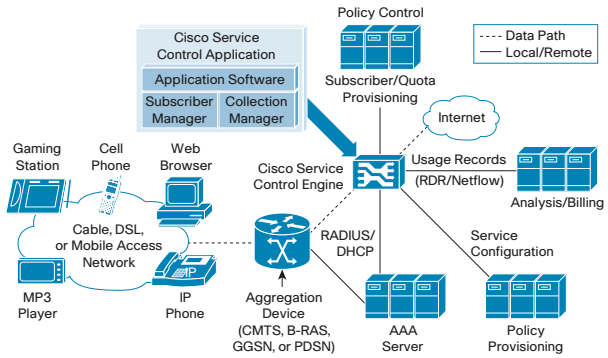
What Problems Are Solved?

With millions of subscribers worldwide connecting to an array of media from many sources, service providers have not been able to fully track and bill for all of these services. To reduce network congestion and increase average revenue per user (ARPU) and overall profits, they must do a better job of identi¬fying and tracking subscribers, traffic types and patterns, and managing bandwidth resources.

How Does the Cisco SCE Work?

The Cisco SCE is deployed at the network access or aggregation layer (Figure 1). In the basic implementation, the Cisco SCE views packets and flows at the application level. It exports traffic records to the Cisco Service Control Collection Manager, which provides data to the reporting tool, including information about frequent users, applications most used, and peak flows.

Figure 1. Cisco Service Control Engine Topology



The Cisco SCE is accompanied by a set of auxiliary components that help enable a transparent integration of the technology into a provider's OSS.

Solution components include the following:

The Cisco Service Control Application Console is a simple-to-use, GUI-based front end that helps the network operator to quickly configure new traffic policies, develop and distribute new signatures, and view reports and device status. It provides a comprehensive set of management tools necessary to efficiently and reliably manage and operate a service control deployment of any size.

Cisco Service Control Collection Manager performs real-time collection of usage data exported by the Cisco SCE. It aggregates usage data collected by the SCE and stores them in a Structured Query Language (SQL) database or text files for further processing. When the data is stored in the database, the Cisco reporting tool can be used to easily generate a wide range of reports on network activities and application usage. Operators can use the Cisco Service Control Collection Manager for a simple and efficient solution or integrate the Cisco SCE with existing usage-management, mediation, and billing solutions.

Cisco Service Control Subscriber Manager dispatches subscriber-level traffic management policies and IP address association to the Cisco SCE. It allows operators to account for and manage traffic on an individual subscriber basis in environments where IP addresses change dynamically. The Cisco Subscriber Manager is an integration point for authentication, authorization, and accounting (AAA), Dynamic Host Configuration Protocol (DHCP), and policy management systems. The Cisco Subscriber Manager software provides a simple way to rapidly develop complex, highly scalable service control solutions while simplifying integration with OSS and policy management products.

Carrier-Class Features

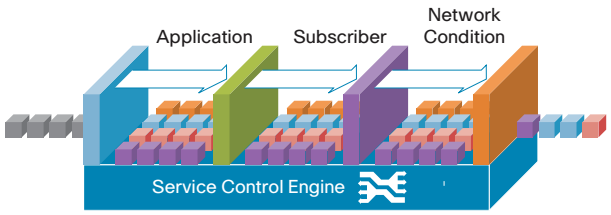
- **Industry-leading performance:** The Cisco SCE serves as the foundation for Cisco's stateful DPI solution for multi-gigabit and 10 Gigabit Ethernet speeds, making Cisco the industry's first company to implement service control functionality for these very fast network connections.
- **High availability:** Deployments requiring high reliability are supported by two Cisco SCEs used in a unique cascading configuration. The primary SCE processes the IP traffic of two links while sharing

state information with the second SCE, which takes over if the primary unit fails.

Key Benefits of Cisco SCE

The intelligent inspection and management of IP packets with the Cisco SCE gives service providers the ability to classify end-user applications, determine application semantics, and map sessions to subscriber identity, policies, and Layer 7 state. Actions can be taken (from allowing the session to proceed or throttling back bandwidth) based on network conditions such as time of day, degree of congestion, or other concurrent activities (see Figure 2).

Figure 2. Service Control Process Determined by Network Conditions



Service control provides:

- Greater visibility of application usage and subscriber behavior to improve customer intimacy and insight
- Ability to offer customized and personalized subscription services that increase revenue and reduce customer turnover
- Reduced operational costs through network optimization (for example, limiting bandwidth-intensive applications such as peer-to-peer)
- Improved quality of experience for all subscribers by implementing fair-use policies

Choice of Cisco SCE Models

The Cisco SCE 1000, 2000, and 8000 Series models can track and manage up to 32 million concurrent, unidirectional traffic flows in metropolitan-area, cable, DSL, mobile, or Wi-Fi networks.

Table 1. Cisco Service Control Engine Models

Model	Maximum Throughput	Concurrent Subscribers
Cisco SCE 1000 Series	2 Gbps per unit	Up to 40,000 per unit
Cisco SCE 2000 Series	4 Gbps per unit. Up to 40 Gbps in a Multi-Gigabit Service Control Platform	Up to 80,000 per unit
Cisco SCE 8000 Series	Up to 30 Gbps per unit Up to 240 Gbps in a Multigigabit Service Control Platform	Up to 250,000 per unit, with future enhancements to 1M per unit

Cisco is incorporating DPI technology into its router and switch portfolio, in addition to the Cisco SCE Service Control Engines.

Designed for carrier-grade deployments, the Cisco SCEs are programmable, extensible, and powered by a patented archi¬tecture with hardware acceleration and multiple high-speed RISC processors.

The Cisco SCEs integrate with existing network infrastructure, management, provisioning, operation, and support systems using standard APIs.

Why Cisco?

Cisco SCEs are fully programmable to eliminate the need for expensive upgrades for new services, billing solutions, or emerging broadband protocols. Only the Cisco SCEs can fully reconstruct data flows while analyzing the Layer 7 state of each application for true application and subscriber awareness at wire speed. The Cisco SCEs can easily obtain subscriber contexts and deliver application-based accounting information through integration with the Cisco Broadband Remote Access Server products using a dedicated control bus.

To help with Cisco SCEs and related solutions, Cisco offers innovative services through people, processes, tools, and partners to protect network investments, optimize operations, and extend the intelligence of the IP Next-Generation Network (IP NGN).

For More Information

Please contact your Cisco account manager or trusted Cisco partner to learn more about Cisco SCE Service Control Engines

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