

Cisco SCE 8000 Service Control Engine

The Cisco® Service Control Engine 8000 (SCE 8000) is a high-capacity, carrier-grade network element specifically designed to perform stateful application and session-based classification and to manage application-level IP traffic per subscriber. The Cisco SCE 8000 (Figure 1) has the highest performance and capacity of the SCE product family, capable of supporting multiple 10-gigabit interfaces.

Figure 1. Cisco Service Control Engine 8000



Product Overview

More than ever before, service providers need visibility into application and subscriber usage patterns, and the capability to manage network bandwidth and to expand and differentiate their service offerings. The Cisco SCE 8000 is designed for carrier-grade deployments that require high-capacity stateful application and session-based classification and management of all IP network traffic. Powered by a patented architecture that employs hardware acceleration with multiple high-speed RISC processors, the Cisco SCE 8000 is the powerhouse of the Cisco Service Control Engine product family. Its highly programmable core can track and manage up to 32 million concurrent unidirectional application sessions over an IP network. The Cisco SCE 8000 is very extensible and scales to meet capacity and performance requirements of IP Next-Generation Networks (NGNs).

The Cisco SCE 8000 may be deployed in a number of capacities within today's service provider networks. It can be integrated into the core, at aggregation peering-points, and at the edge to provide advanced application-level bandwidth optimization, management, and service control functions. The Cisco SCE 8000 is access-independent and can be deployed in any cable, wireline, or mobile IP network environment. The Cisco SCE 8000 is deployed using high-speed 10-gigabit Ethernet interfaces connected to the core, aggregation, and edge elements of today's service provider networks.

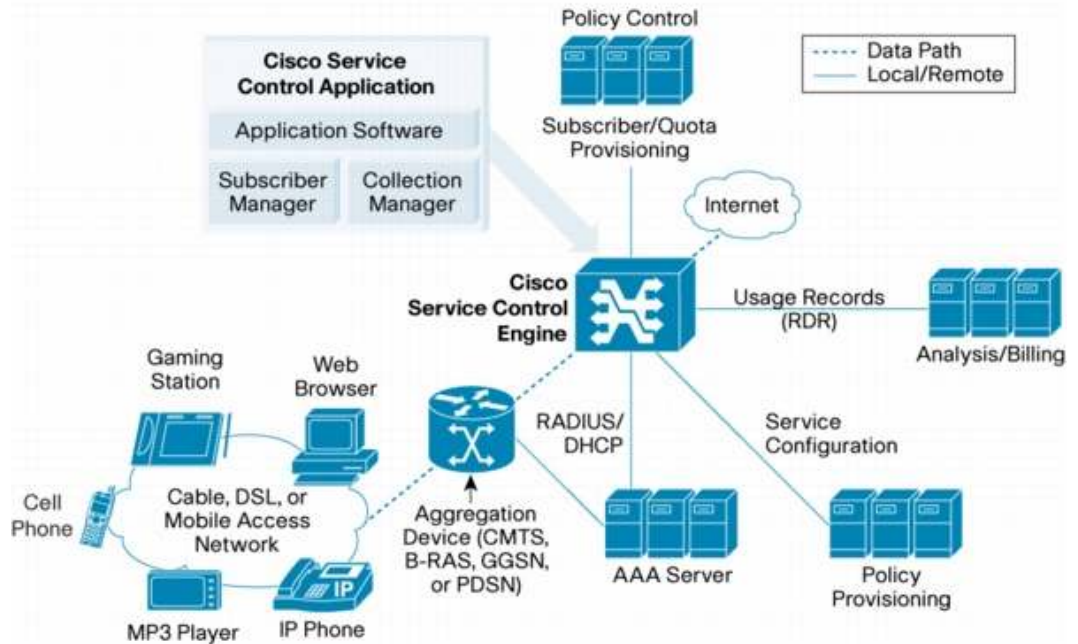
Residing at these critical junctions of the network, the Cisco SCE 8000 is not only a high-performance solution, but also a highly available and robust solution. It employs a number of high-availability and reliability features to meet the expectations of today's most demanding multimedia applications and service-level agreements (SLAs). The Cisco SCE 8000 employs both inter- and intra-chassis redundancy features to help ensure high availability. Multiple Cisco SCE 8000s can be deployed to achieve high availability and failover without imposing any single point of failure. An N+1 high-availability topology is supported by clustering multiple Cisco SCE 8000s, allowing the solution to scale linearly. To achieve higher performance and maximum capacity, the Cisco SCE 8000 takes advantage of patented system logic and stateful Deep Packet Inspection (DPI) technology.

This solution provides stateful protocol monitoring to help detect and manage virtually any IP network application, including but not limited to: web browsing, multimedia streaming, and peer-to-peer (P2P). The Cisco SCE 8000 permits service providers to optimize application-level traffic, resulting in an overall reduction of network congestion and associated network capacity upgrades. The Cisco SCE 8000 enables carriers to gradually scale their network, starting with a single processing card and growing to a multiple-chassis solution.

Service Applications

The Cisco SCE 8000 Service Control Engine is the highest-performing member of the Cisco SCE Family. Working with the Cisco Service Control Application for Broadband, it supports application-level classification of IP traffic for the real-time management and control of content-based services for a given subscriber or group (see Figure 2). This solution offers programmable application detection and subscriber awareness.

Figure 2. Cisco Service Control Engine with Cisco Service Control Application



Key Benefits

Superior Performance

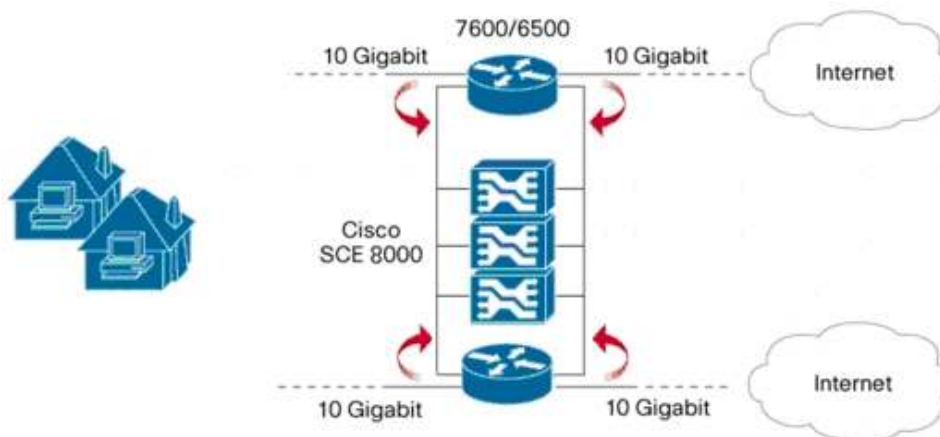
Cisco Service Control solutions analyze the payload of individual packets using stateful DPI at Layer 3–7. The Cisco SCE 8000 uses customized ASICs and hardware acceleration to help ensure carrier-grade performance with the capacity to support two or four 10-gigabit links per chassis and up to 32 million unidirectional flows.

Multi-10-Gigabit Solution

The Cisco SCE 8000 serves as the foundation for Cisco's DPI solution for multi-gigabit and multi-10-gigabit speeds, making Cisco the industry leader in DPI technologies for today's service provider IP NGNs.

A cluster of Cisco SCE 8000s can be configured to support multiple 10-gigabit links, and to load-balance the IP traffic, while ensuring that the each IP session is processed by the same Cisco SCE 8000. This highly robust and scalable configuration protects your investment in existing network equipment, and allows you to scale the solution using a pay-as-you-grow strategy by incrementally inserting additional Cisco SCE 8000s as traffic increases (Figure 3).

Figure 3. Multi-10-Gigabit Solution



Stateful Deep Packet Inspection

Instead of processing packets as individual events, the Cisco SCE 8000 fully reconstructs individual traffic flows and the Layer 7 state of each individual application session. By maintaining state information, the Cisco SCE 8000 readily identifies applications that employ dynamically assigned port numbers, and tracks applications that involve multiple inter-related or spawned flows commonly found in voice-over-IP (VoIP) or multimedia streaming protocols. The Cisco SCE 8000 applies rules as part of controlling the admission policies or session characteristics of a data flow.

Application-level classification of IP traffic helps ensure real-time analysis and control of content-based services for a given subscriber or group of subscribers. Real-time advanced control functions include granular bandwidth shaping, quota, and redirection that uses protocol-specific, state-based traffic flow analysis.

High Availability

The performance requirements of a carrier-grade network demand that all network elements be capable of 24-hour operations.

You can achieve high availability by using two Cisco SCE 8000 Service Control Engines in a unique cascading configuration overlaying dual 10-gigabit links, without imposing any single point of failure. The primary Cisco SCE 8000 processes the IP traffic of the two links while sharing state information with the secondary engine, which takes over if an interruption in the operation of the primary platform occurs. This unique architecture provides for stateful DPI in network environments with asymmetrical traffic flows. An alternative high-availability N+1 scheme can be managed by the multi-10-gigabit solution.

Programmability

The Cisco SCE 8000 is programmable and extensible, and therefore can readily adapt to new protocols and IP traffic-management requirements. SML, a programming language specifically developed for service delivery, can adapt the Cisco SCE engines to the dynamic requirements of application-level analysis and traffic optimization while enabling the system to identify and manage complex protocols such as Session Initiation Protocol (SIP), Real Time Streaming Protocol (RTSP), and obfuscated P2P protocols.

The programmability of the Cisco SCE 8000 helps ensure that carriers can protect their network investments and adapt their service control infrastructure to meet the changing needs of new and emerging protocols and applications. The Cisco SCE 8000 allows carriers to reduce capital equipment and operational costs by providing a flexible, extensible network element for overall service control of application traffic.

Integration and Management

The Cisco SCE 8000 Service Control Engine integrates with existing network infrastructure, management, provisioning, operation, and support systems using industry-standard APIs.

Powerful management capabilities and infrastructure support CLI and SNMP for configuration, monitoring, and fault management to facilitate transparent deployment and interoperability. Extensible Markup Language (XML)- and GUI-based interfaces are provided for service management and delivery.

Features

The Cisco SCE 8000 manages a wide variety of IP traffic while providing high throughput and supporting a large number of concurrent subscribers. Additionally, the system is equipped to provide failover protection, helping to ensure that no single point of failure exists for management of application-level traffic. This powerful solution is provided in a 5-rack unit (RU) form factor (Table 1).

Table 1. Cisco SCE 8000 Features

Feature	Benefit
Traffic Handling	
Programmable Protocol Detection	<ul style="list-style-type: none"> • More than 600 protocols supported • Extensible to emerging protocols • Adaptive peer-to-peer (P2P) recognition • Asymmetric traffic classification support

Feature	Benefit
Differentiated Classes of Service (CoSs)	Support for: <ul style="list-style-type: none"> • Differentiated Services (DiffServ) • Type-of-service (ToS) byte
Capacity and Performance¹	
Maximum Throughput	Up to 30 Gbps ²
Number of Concurrent Subscribers	Up to 1,000,000
Simultaneous Unidirectional Flows	Up to 32,000,000
Maximum flow open rate	Up to 15 million flows per second ³
Reliability, Availability, and Serviceability (RAS) and Failover	
High Availability	<ul style="list-style-type: none"> • Dual-cascaded system design to provide redundancy and failover protection • Multi-10gigabits solution providing N+1 redundancy and load balancing
System Bypass for Link Preservation	Support for integrated or external optical bypass module (one per 10-gigabit link)
Field-Replaceable Units	Power supplies, fan module, service control module, shared port adapters (SPAs), SPA interface processor (SIP), XFP optics, SFP optics, optical bypass module
Internal Redundancy	<ul style="list-style-type: none"> • Redundant power supplies • Redundant fans
Line Feeds	AC or DC power supplies with dual feeds
Integration and Management	
Integration	Industry-standard application programming interfaces (APIs) to ensure easy integration with: <ul style="list-style-type: none"> • Provisioning systems • Operations support systems (OSSs) • Management systems • Billing systems
Management	Powerful management capabilities offering: <ul style="list-style-type: none"> • GUI-based interfaces for service management • Command-line interface (CLI) and Simple Network Management Protocol (SNMP) interfaces for configuration, monitoring, and fault management

Product Specifications

Table 2. Product Specifications of Cisco SCE 8000 Service Control Engine

Specification	Description
Models	Cisco SCE 8000 Service Control Engine
Management Interfaces	2 x 10/100/1000 Mbps Ethernet RJ-45
Console Interface	2 x RS-232 RJ-45
Optical Bypass Interface	2 x RJ-11 enable software activation of the optical bypass

¹ Capacity and performance of the Cisco SCE 8000 with two SCE8000-SCM-E cards installed

² Depends on exact traffic mix

³ Refers to all the flows the Cisco SCE 8000 starts processing

Specification	Description
Interfaces	2/4-port 10 Gigabit Ethernet supporting the following XFP optics: <ul style="list-style-type: none"> • Single-mode fiber long-reach (LR) 1310nm • Single-mode fiber extended-reach (ER) 1550nm • Single-mode fiber long-haul (ZR) 1550nm • Multimode fiber 850nm 8/16-port Gigabit Ethernet supporting the following SFP optics: <ul style="list-style-type: none"> • Single-mode fiber 1310nm • Single-mode fiber 1550nm • Multimode fiber 850nm
Weight	42.25 Kg / 92.95 lb (fully populated unit excluding optical bypass)
Dimensions (H x W x D)	8.75 x 17.5 x 21.75 in. (22.23 x 44.45 x 55.25 cm)
Temperature	Nominal 32 to 104°F (0 to 40°C), Storage: -4 to 149 °F (-20 to 65°C)
Humidity	Relative humidity: operating: 10 to 85%, storage: 5 to 95% (noncondensing)
Power	Power requirements: <ul style="list-style-type: none"> • AC: 110 (85 to 130) or 240 (170 to 260) VAC; 47 to 63Hz • DC: -41 to -72 VDC • 1000W / 3415 Btus for one SCM blade (DPI processing) configuration or 1600W / 5464 Btus for two SCM blades configuration
Cooling and Airflow	Redundant cooling fans
Regulatory compliance	EMC: <ul style="list-style-type: none"> • FCC Part 15 (CFR 47) Class A, ICES-003 Class A, EN55022 Class A, • CISPR22 Class A, AS/NZS CISPR22 Class A, VCCI Class A, EN55024, • ETS300 386, EN50082-1, EN61000-3-2, EN61000-3-3 Regulatory Compliance: <ul style="list-style-type: none"> • UL 60950, IEC 60825-1, -2, IEC 60950, EN 60950, EN 60825-1, -2, • CAN/CSA-C22.2 No. 60950-00, AS/NZS 3260-1993, 21CFR1040
Safety and environmental standards compliance	Under certification process of GR-63-Core NEBS Level 3 and GR-1089-Core NEBS Level 3 <ul style="list-style-type: none"> • ETSI 300 019 Storage Class 1.1, ETSI 300 019 Transportation Class 2.3 • ETSI 300 019 Stationary Use Class 3.1
Minimum software release	Cisco Service Control Software release 3.1.6

Ordering Information

Table 3. Ordering Information for the Cisco SCE 8000 Service Control Engine

Product Name	Part Number
Cisco SCE 8000 Service Control Engine	SCE8000
Cisco SCE 8000 2 x 10GE interfaces bundle	SCE8000-2X10G-E
Cisco SCE 8000 4 x 10GE interfaces bundle	SCE8000-4X10G-E
Cisco SCE 8000 8 x GE interfaces bundle	SCE8000-8XGE-E
Cisco SCE 8000 16 x GE interfaces bundle	SCE8000-16XGE-E
Cisco SCE 8000 8 x GE & 1 x 10G interfaces bundle	SCE8000-8XGE-E-HA
Cisco SCE 8000 16 x GE & 2 x 10G interfaces bundle	SCE8000-16XGE-E-HA
Cisco Service Control Application View Only	SCA-BB-VO-R3
Cisco Service Control Application Capacity Control	SCA-BB-CC-R3
Cisco Service Control Application Tiered Control	SCA-BB-TC-8000-R3
Cisco Service Control Application Tiered Control	SCA-BB-TC-XXX-R3*

*XXX represents number of subscribers: 10,000, 50,000, 250,000, or 1 million

Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you to protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, refer to [Cisco Technical Support Services](#) or [Cisco Advanced Services](#).

For More Information

For more information about Cisco Service Control, visit <http://www.cisco.com>.



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