Cisco Service Control Engine 10000

The Cisco® Service Control Engine 10000 (SCE 10000) is a high-capacity, carrier-grade network element designed to perform stateful application and session-based classification and to manage application-level IP traffic per subscriber. It has the highest performance and capacity of the Cisco SCE product family and supports multiple 10-gigabit interfaces.

Figure 1. Cisco Service Control Engine 10000

With this platform, providers can identify content transported over any protocol, provide detailed analysis and control of complex content-based applications, and prioritize sessions in real time. Cisco Service Control technology is transport- and content-independent, fully extensible, and fully programmable, and it easily integrates into the existing fabric of the network. As a result, it helps optimize use of network resources, customize service levels, and enhance subscriber experience. With this exclusive, high-performance, stateful architecture, operators have better capabilities for profitably delivering an array of services customized to individual subscriber needs.

Product Overview

More than ever before, service providers need visibility into application and subscriber usage patterns. In addition, they need to be able to manage network bandwidth and expand and differentiate their service offerings through innovative services and features. The Cisco SCE 10000 is designed for carrier-grade deployments that require high-capacity stateful application and session-based classification, as well as management of all IP network traffic. Powered by a patented architecture that uses flow acceleration with multiple high-speed x86 processors, the Cisco SCE 10000 is the powerhouse of the Cisco Service Control Engine product family. Its highly programmable platform can track and manage up to 20 million concurrent bidirectional application sessions over an IP network. That means the Cisco SCE 10000 can scale to meet capacity and performance requirements of IP Next-Generation Networks (NGNs).

The Cisco SCE 10000 may be deployed in a number of capacities in 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 10000 is access-independent and can be deployed in any cable, wireline, or mobile IP network environment. Deployment uses high-speed 10-gigabit Ethernet interfaces connected to the core, aggregation, and edge elements of today's service provider networks.

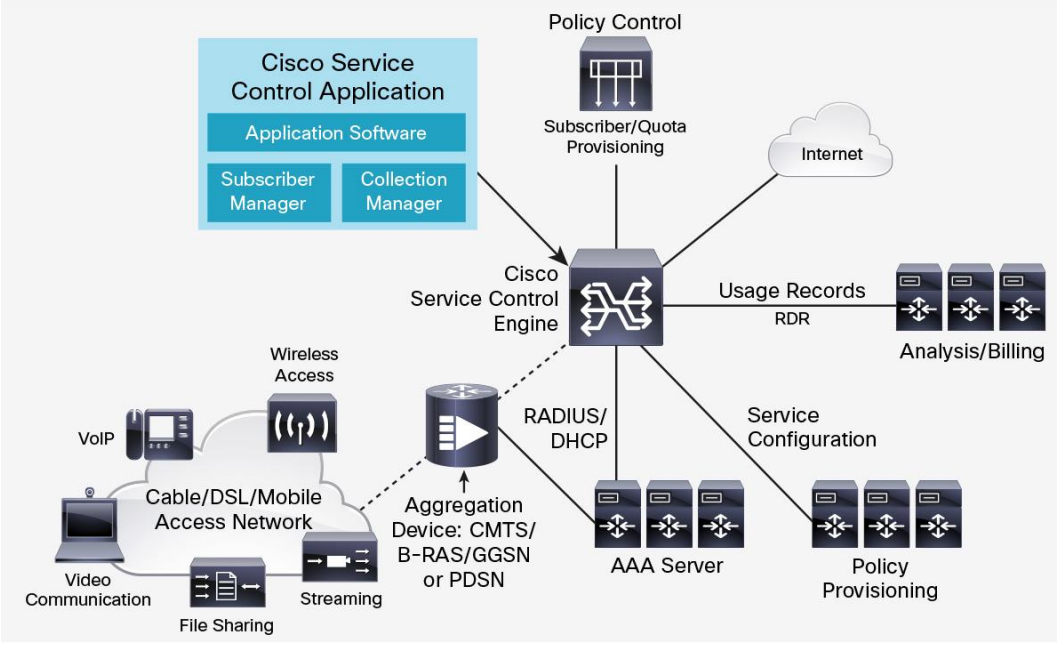
Placed at these critical junctions of the network, the Cisco SCE 10000 is a high-performance solution, highly available, and robust solution. Its high-availability and reliability features can meet the expectations of today's most demanding multimedia applications and service-level agreements (SLAs). Inter- and intra-chassis redundancy features, for example, help ensure high availability. And multiple Cisco SCE 10000 platforms can be deployed to achieve high availability and failover without any single point of failure. An N+1 high-availability topology is supported by clustering multiple Cisco SCE 10000s, allowing the solution to scale linearly. To achieve higher performance and capacity, the platform 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 (HTTP/HTTPS), streaming, social media services, voice over IP (VoIP), mobile communications over IP (MoIP), and peer-to-peer (P2) applications. The Cisco SCE 10000 helps service providers optimize application-level traffic, reducing network congestion and associated network capacity upgrades. The Cisco SCE 10000 allows carriers to gradually scale their networks, starting with a single processing card and growing to a multichassis solution.

Service Applications

The Cisco SCE 10000 Service Control Engine is the highest-performing member of the Cisco SCE Family. It works with the Cisco Service Control Application for Broadband to support application-level classification of IP traffic, providing real-time management and control of content-based services for a given subscriber or group (Figure 2). This solution offers programmable application detection and subscriber awareness.

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



Main Benefits

Superior Performance

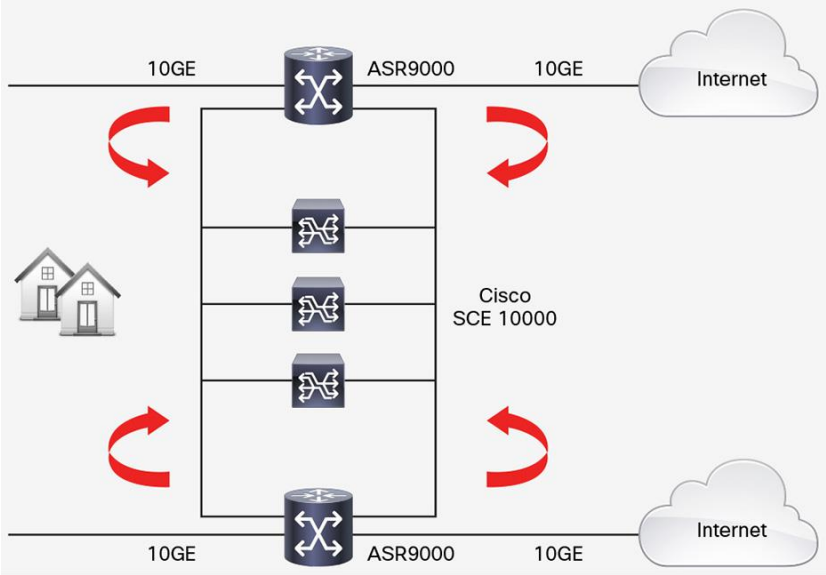
The Cisco SCE 10000 uses patented flow acceleration technology to help ensure carrier-grade performance, with the capacity to support eight 10-gigabit links per chassis, 2 million subscribers, and up to 20 million bidirectional flows. Flow acceleration facilitates prioritization of delay-sensitive traffic, speeds marking of traffic at line rate, operates at exceptionally low latency (in the order of micro-seconds), and helps bypass traffic effectively during congestion without causing any drops.

Multi-10-Gigabit Solution

The Cisco SCE 10000 serves as the foundation for Cisco's DPI solution and for “multi-10-gigabit” speeds. The Cisco SCE 10000 enables Cisco to offer high performance platform in DPI technologies for today's service provider IP NGNs.

A cluster of Cisco SCE 10000s can be configured to support multiple 10-gigabit links and to load-balance IP traffic. The cluster simultaneously helps ensure that each IP session is processed by the same Cisco SCE 10000. 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 10000s 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 10000 fully reconstructs individual traffic flows and the Layer 7 state of each individual application session. By maintaining state information, the Cisco SCE 10000 readily identifies applications that use dynamically assigned port numbers, and it tracks applications that involve multiple inter-related or spawned flows (commonly found in VoIP or multimedia streaming protocols). The Cisco SCE 10000 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 use protocol-specific, state-based traffic flow analysis.

Programmability

The Cisco SCE 10000 is programmable and extensible. Therefore, it can readily adapt to new protocols and IP traffic-management requirements. Standard ML (SML) is a programming language specifically developed for service delivery. It can adapt the Cisco SCE engine to the dynamic requirements of application-level analysis and traffic optimization while allowing the system to identify and manage complex protocols such as HTTPS, Session Initiation Protocol (SIP), Real Time Streaming Protocol (RTSP), and obfuscated P2P protocols.

The programmability of the Cisco SCE 10000 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 10000 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 10000 Service Control Engine integrates with existing network infrastructure, management, provisioning, operation, and support systems using industry-standard APIs.

Powerful management capabilities and infrastructure support command line interface (CLI) and Simple Network Management Protocol (SNMP) for configuration, monitoring, and fault management that facilitate transparent deployment and interoperability. Extensible Markup Language (XML)- and GUI-based interfaces are provided for service management and delivery.

Backward Compatibility

Cisco SCE10000 is backward compatible with all the existing solution components of the service control engine, including Cisco Service Control Collection Manager, Cisco Service Control Subscriber Manager, Cisco Service Control Application for Broadband (SCA-BB), and Cisco Insight. So Cisco SCE10000 does not require re-architect of entire network, and customers can replace the Cisco SCE 8000 Service Control Engine with the Cisco SCE 10000 platform retaining all the existing solution components interfacing with the SCE 8000 platform, which helps reduce operating expenses (OpEx) through faster integration.

Features

The Cisco SCE 10000 manages a wide variety of IP traffic while providing high throughput and supporting a large number of concurrent subscribers. It is also equipped to provide failover protection, helping to ensure that there is no single point of failure for management of application-level traffic. This powerful solution is provided in a 2-rack unit (RU) form factor (Table 1).

Table 1. Cisco SCE 10000 Features

Feature	Benefit
Traffic handling	
Programmable protocol detection	• Support for more than 2200 signatures • Extensible support for emerging protocols • Adaptive peer-to-peer (P2P) recognition • Asymmetric traffic classification support • Heuristic signatures to classify obfuscated protocols

Feature	Benefit
Differentiated class of service (CoS)	Support for: ● Differentiated Services (DiffServ) ● Type-of-service (ToS) byte
Subscriber management	● Classification and control of traffic flows on an individual subscriber basis ● Management and reporting of subscriber usage of network resources for analysis and billing ● Subscriber quotas for prepaid content charging ● Integration in RADIUS environments using RADIUS relay or RADIUS sniffing ● Integration in Dynamic Host Configuration Protocol (DHCP) environments using DHCP lease query or DHCP sniffing ● Direct API for subscriber integration with policy servers ● Integration with Simple Object Access Protocol (SOAP) server to retrieve policy information ● Support for Internet Protocol Detail Record (IPDR) protocol to achieve subscriber awareness and cable modem termination system (CMTS) awareness in cable deployments ● Gx interface support for policy provisioning and quota monitoring ● Gy interface support for online charging ● Integration with multiple third-party policy servers
Management tools	● GUI-driven policy editor ● GUI-driven signature editor ● GUI-driven reporting tool ● GUI-driven subscriber manager ● Network navigator for multidevice management ◦ Batch distribution of policies and rule base ◦ Batch distribution of new signatures and protocols ◦ Logical grouping of devices into sites ◦ Software update wizard
Capacity and Performance[1]	
Maximum throughput	Up to 60 Gbps[2]
Number of concurrent subscribers	Up to 2,000,000
Simultaneous bidirectional flows	Up to 20,000,000
Reliability, Availability, and Serviceability (RAS) and Failover	
High availability	Multi-10-gigabit solution providing N+1 redundancy and load balancing
System bypass for link preservation	Support for in-built optical bypass module within the 10-gigabit interface card
Field-replaceable units	Power supplies, memory, processor, interface cards, rail kit, raid controller, and storage
Internal redundancy	● Redundant power supplies ● Redundant storage ● Redundant fans
Line feeds	AC or DC power supplies with dual feeds
Integration and Management	
Integration	Industry-standard APIs to help ensure easy integration with: ● Provisioning systems ● Operations support systems (OSSs) ● Management systems ● Billing systems
Management	Powerful management capabilities offering: ● GUI-based interfaces for service management ● CLI and SNMP interfaces for configuration, monitoring, and fault management

[1] Capacity and performance of the Cisco SCE 10000

[2] Depends on exact traffic mix

[3] Refers to all the flows the Cisco SCE 10000 starts processing

Product Specifications

Table 2. Product Specifications of Cisco SCE 10000 Service Control Engine

Specification	Description
Model	Cisco SCE 10000 Service Control Engine
Management interfaces	4 x 10/100/1000 Mbps Ethernet RJ-45
Console interface	Cisco Integrated Management Controller
Optical bypass interface	Built into the interface
Interfaces	Four 2 x 10 Gigabit Ethernet with built-in optics supporting the following variations: ● Single-mode fiber long-reach (LR) 1310 nm ● Multimode fiber short reach (SR) 850 nm
Weight	26.5Kg/58.5 lb[4]
Physical dimensions (H x W x D)	2 RU: 3.4 x 18.9 x 31.5 in. (8.9 x 48.1 x 80 cm)
Mounting	2 RU
Temperature: Operating	-5 to 55°C/23 to 131°F
Temperature: Nonoperating	-40 to 70°C/-40 to 158°F
Humidity: Operating	10 to 93%
Humidity: Nonoperating	5 to 93%, noncondensing
Power	Power supply: ● 200 to 240 VAC nominal (Range: 180 to 264 VAC); 50 to 60 Hz nominal (Range: 47 to 63 Hz) ● 930 W -48V DC power supply Power consumption: ● 400W for AC power supply; 500W for DC power supply
Cooling and airflow	Redundant cooling fans
Regulatory compliance	EMC: ● 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 Safety: ● UL 60950, IEC 60950-1, EN 60950-1 ● CAN/CSA-C22.2 No. 60950-1, AS/NZS 60950.1
Safety and environmental standards compliance	Under certification process of GR-63-Core NEBS Level 3 and GR-1089-Core NEBS Level 3 ● 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 5.0.0

[4] Full configuration with two AC supply, two HDDs, four SR cards, and 32 DIMMS.

Ordering Information

View Only License

With a view only license, a customer can use the traffic classification and reporting functions of the system to perform detailed analysis and statistics collection on application activity. This license is used by providers to gain insight into network activity for capacity planning, usage demographics, and market intelligence.

Report and Monitor License

A report and monitor license is applicable when customers want to use traffic classification and reporting to perform detailed analysis and statistics collection on per-subscriber activity. With this license, the system can be integrated with the back-end AAA, DHCP, or policy-server infrastructure for subscriber awareness. This license can only be used only for reporting and monitoring, not for any kind of global or per-subscriber control

Capacity Control License

The capacity control license is applicable when performing global traffic management and using the platform to optimize application traffic. With this license, the platform should not be integrated with the back-end AAA, DHCP, or policy-server infrastructure for per-subscriber traffic monitoring and management. Instead, it is used to apply global or anonymous policies for a group of subscribers. This license is used by providers for advanced network management applications to improve performance and optimize network resources.

Tier Control License

With a tier control license, customers can use the application suite to deliver individualized policies for each subscriber. The system can be provisioned with a control policy for each subscriber and integrated into authentication and registration OSS systems (RADIUS, DHCP, or policy servers) to dynamically bind IP addresses assigned to subscribers' sessions and their control policy. This license is used by providers to create new data services and deliver tiered network experience to their subscribers.

Table 3. Ordering Information for the Cisco SCE 10000 Service Control Engine

Description	Part Number
Cisco SCE 10000 Service Control Engine configuration bundle	SCE10000-CONFIG
Cisco SCE 10000 bundle including chassis, four LR NICs, two DC power supply units and two SSD storage units	SCE10000-LDS-BUN
Cisco SCE 10000 bundle including chassis, four SR NICs, two DC power supply units and two SSD storage units	SCE10000-SDS-BUN
Cisco SCE 10000 bundle including chassis, four LR NICs, two AC power supply units and two HDD storage units	SCE10000-LAH-BUN
Cisco SCE 10000 bundle including chassis, four SR NICs, two AC power supply units and two HDD storage units	SCE10000-SAH-BUN
Cisco SCE 10000 bundle including chassis, four LR NICs, two AC power supply units and two SSD storage units	SCE10000-LAS-BUN
Cisco SCE 10000 bundle including chassis, four SR NICs, two AC power supply units and two SSD storage units	SCE10000-SAS-BUN
Cisco SCE 10000 bundle including chassis, four LR NICs, two DC power supply units and two HDD storage units	SCE10000-LDH-BUN
Cisco SCE 10000 bundle including chassis, four SR NICs, two DC power supply units and two HDD storage units	SCE10000-SDH-BUN
Cisco Service Control Application View Only	L-SCE10000-VO
Cisco Service Control Application Monitor and Report	L-SCE10000-MR
Cisco Service Control Application Capacity Control	L-SCE10000-CC
Cisco Service Control Application Tiered Control	L-SCE10000-TC
Cisco Service Control Application Tiered Control	SCA-BB-TC-XXX-R3*
Cisco Service Control Insight License	L-INSIGHT-SCE10000
Cisco Service Control Subscriber Manager License	L-SCMS-NG-SM

* XXX represents number of subscribers: 250,000, 500,000, 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, promoting high levels of customer satisfaction. Cisco services help you 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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Printed in USA C78-732339-00 09/14