

Cisco Content Services Gateway – Second-Generation Release 1

Cisco® announces the availability of the Cisco Content Services Gateway 2 (CSG2). The Cisco CSG2 delivers best-in-class content-aware billing, content filtering, service control, traffic analysis, and data mining in a highly scalable, fault-tolerant package. Its deep packet inspection (DPI) capability allows mobile operators to analyze, optimize, secure, and meter all traffic flows, including content-based services.

The Cisco CSG2 builds on the market-leading Cisco Content Services Gateway technology, which gives operators service-aware and differentiated content-billing capability. This proven technology delivers the flexibility to bill per subscriber and per service, thus enabling cost-effective delivery of revenue-generating services.

Cisco Service Exchange Framework

The Cisco CSG2 is part of the Cisco Service Exchange Framework for Mobile (Mobile SEF), an open platform that can readily interface to all the control elements in a mobile network, including multiple Radio Access Networks (RANs), back-end billing systems, and content-filtering and compression solutions. Mobile operators can install and deploy Cisco Mobile SEF solutions without disrupting any services. The Cisco CSG2 is an application deployed on the Cisco Service and Application Module for IP, which provides high-performance, scalable, distributed service processing for the Cisco 7600 Series Routers.

Cisco has already demonstrated the interoperability of the platform with large-scale RANs; authentication, authorization, and accounting (AAA) systems; and content billing, content filtering, and compression solutions – relieving mobile operators of the need to dedicate resources to ensure a smooth deployment. More than 100 mobile operators worldwide have deployed Cisco Mobile SEF solutions. Cisco continuously applies operator feedback to add valuable new features, maintaining the innovation and cost-effectiveness of the platform.

In addition, Cisco's strong partnerships with top billing, mediation, and filtering vendors provide an end-to-end content billing and filtering solution.

The Cisco CSG2 provides content-aware billing, filtering, and data-mining capabilities integral to mobile operators' commercial deployment of content-based and value-added services. Content and value-added mobile services are important sources of differentiation and are essential to creating brand value and loyalty. Price has traditionally been the main factor in attracting and retaining subscribers, but the creation of innovative mobile services and the ability to bill for them can increase average revenue per user (ARPU) and build consumer loyalty.

When mobile operators offer content-aware billing services, subscribers enjoy an improved experience because they can:

- Access more and better content, because operators can charge for the true value of content, making it possible to provide more content types

- Avoid billing surprises by accepting an Advice of Charge (AoC) when they request an event
- Eliminate double charges when they request a service a second time if it is not delivered satisfactorily the first time
- Filter out objectionable content

Mobile operators benefit from offering content-aware billing because they can:

- Increase revenue potential through more granular billing
- Realize revenue sooner by offering prepaid services
- Differentiate their brands to strengthen customer loyalty
- Offer services as well as access
- Use content filtering to meet corporate and regulatory requirements for security and privacy

The Cisco CSG2 adds business value to mobile operators by enabling:

- Controlled subscriber access to services
- Pricing capabilities that differ per service and per event
- Greater customer loyalty
- Greater revenue generation
- Reduction of capital expenditure and operating expenses
- Protection of users on the mobile Internet
- Compliance with governmental and self regulation for content control
- Corporate services for usage management

The Cisco CSG2 is another powerful example of how Cisco is introducing leading-edge, flexible, and scalable technology that helps mobile operators move toward a comprehensive next-generation IP networking solution – one that addresses their most pressing challenges to improve overall profitability.

Features

The Cisco CSG2 delivers the features and functions requisite for service-aware and differentiated content billing and filtering.

- **Service-aware content measurement:** The Cisco CSG2 meters data traffic and generates accounting records at the content and service level. Unlike traditional billing models that bill for broad classes of traffic, the Cisco CSG2 enables differentiated billing based on the actual object requested. The billing agent uses this information to apply different rates to different services, according to the operator's pricing strategy.
- **Real-time prepaid billing support:** For prepaid billed services, the Cisco CSG2 meters subscriber usage so that the subscriber cannot exceed the balance allocated by the billing system. Each service that a subscriber accesses can have a different balance allocation and can be billed at a different rate, including provisions for free services as well as services that provide a credit. A balance allocation can be a specified number of transactions, a specified number of bytes, or service duration.
- **Specific user-awareness capability:** The Cisco CSG2 identifies users by their IP addresses, and correlates this with a user ID that is obtained from AAA RADIUS flows or from an external database using requests based on the industry-standard Extensible Markup Language (XML). The Cisco CSG2 can record subscriber access and billing-plan

information and provide it to the billing system in conjunction with regular charge reporting, thus allowing charge differentiation based on access, and offloading significant correlation load from the billing system.

- **Open interface with multiple billing agents:** The Cisco CSG2 collects content information and feeds it to a billing agent. The billing agent aggregates all of the information about a data session and formats it to be used by the rating and billing engines. The base protocols used to communicate with the billing mediation or billing devices are standard and open, and provide facilities for reliable transmission and failover in the event that one of the billing systems becomes unavailable. This enables the Cisco CSG2 to interface with whatever billing agent the customer chooses and to provide robust reporting, after this protocol is implemented.
- **Use of content for data mining:** Cisco CSG2 capabilities are not restricted to billing applications. Service providers can gather subscriber network, service, and content usage data across their networks. An operator can apply business intelligence to the collected information to better understand user transaction behaviors and apply that knowledge to marketing and partnership strategies. Traffic patterns can also be analyzed for use in quality-of-service (QoS) plans. Popular sites can be identified and approached with real data to justify opportunities for content-delivery hosting.
- **Content filtering:** In conjunction with Cisco partner technology, the Cisco CSG2 supports dynamic content filtering. Service providers can provide personal filtering based on “blacklists” and “whitelists,” allowing access to content deemed appropriate or on a paid-for basis.

New Features in Cisco CSG2 Release 1

In addition to the Cisco CSG1 Release 7 feature set, the Cisco CSG2 Release 1 supports the following new capabilities:

- Bidirectional peer-to-peer (P2P) traffic charging
- IP fragmentation for all protocols
- Out-of-order TCP segments for all protocols
- TCP reset on no quota
- Configuration of quota reauthorization threshold and timer
- Exclusion of RFC 2822 headers in Simple Mail Transfer Protocol (SMTP) billing records
- Separate queue size tuning for the BMA, the PSD, and quota servers
- Complete online diagnostics at reload
- New Cisco CSG2 MIB: CISCO-CONTENT-SERVICES-MIB
- Simple Network Management Protocol Version 3 (SNMPv3)
- More current values for usage in reports to Quota Server and BMA
 - Sending intermediate transaction call detail records (CDRs)
 - Sending intermediate service-level CDRs
 - Sending reauthorization requests
- Support for PAUSE on interleaved Real Time Streaming Protocol (RTSP) connections
- Support for TCP Selective ACK
- Protocol transparency

- Remote Command and Logging (RCAL) from supervisor engine
- Field-upgradeable ROMmon
- ROMmon recovery
- New command-line interface (CLI) that replaces Cisco CSG1 environmental variables
- Multiple accounting types per service
- Correlation of start and stop for user session
- RTSP stream reporting and reuse enhancements
- Support for “+” operator in maps
- Quota reporting in Service Reauthorization message

Benefits

The Cisco CSG2 provides the following benefits:

- **Management of multiple concurrent services per user-logon session:** The Cisco CSG2 architecture differentiates user service access by providing application-aware inspection of the content of the traffic, allowing the operator to offer multiple, simultaneous services to a user, each charged by a different scheme.
- **Advanced content measurement:** The Cisco CSG2 can be configured to provide application-level billing information. Content matching is deciphered based on the actual object requested. For example, the Cisco CSG2 will record the URL for HTTP, WAP, RTSP, HTTP, and e-mail headers as applicable, rather than just the server IP address. By differentiating the content requests, the Cisco CSG2 allows billing applications to charge for the true value of the content.
- **“Goodput”-based charging (billing only for delivered content):** The Cisco CSG2 has a unique capability to optionally exclude retransmitted TCP packets from volume measurements so that the billing system can eliminate them from the accounting report and in user transaction and event details. The Cisco CSG2 can also provide information indicating the complete status of a transaction or event. For prepaid services, the Cisco CSG2 can be configured to automatically apply the adjustments for retransmissions and failures back to the prepaid billing system, thus simplifying the job of the billing system.
- **Enhanced user identification:** In many environments, the IP address is not sufficient for properly identifying the user. IP addresses can be dynamically assigned, or hidden by proxies and firewalls. In real time, the Cisco CSG2 associates the user ID, as captured by the AAA server, with each transaction that it reports, allowing for user-based charging in a broader set of environments. The ability to reliably associate subscribers with their billing plans enables the real-time control of subscriber service tiers.
- **Price and performance value for data centers and ISPs:** The Cisco CSG2 on the Cisco Service and Application Module for IP features a low connection cost. It slides into a slot in a new or existing Cisco 7600 Series Router and conserves valuable data center space.
- **Ease of configuration:** The Cisco CSG2 uses the same native Cisco IOS® Software interface used to configure the Cisco 7600 Series Routers.

Service Manager Support

The Cisco CSG2 is supported by Cisco CSG Service Manager Release 4.1.2. The Cisco CSG Service Manager is part of the Mobile Wireless Center for the Cisco Mobile SEF suite of solutions,

and complements the CiscoWorks LAN Management Solution (LMS) and Cisco Mobile Wireless Fault Mediator to provide end-to-end management.

Configuration Limits

- 8192 content policy pairs
- 2048 total contents with 2033 available for user configuration
- 1024 services
- 100 MB of map storage, total number of maps and matches vary by configuration
- 8192 policies
- 10 maximum active QS/BMA
- Up to six Cisco CSG2s can be installed in a Cisco 7600 Series chassis

Performance Summary

Connections

- Up to 1,800,000 concurrent sessions
- Up to 500,000 connected subscribers per card
- Up to 5000 data plane transactions per second regardless of protocol mix
- Up to 2500 AoCs per second

Throughput

Throughput performance per Cisco CSG2 is up to 5 Gbps for all protocol and traffic types.

Cisco 7600 Series Platform Requirements

- All Cisco 7600 Series chassis are supported: 7604, 7606, 7609, and 7613, with a minimum software requirement of Cisco IOS Software Release 12.2(33)SRB1.
- Cisco CSG2 features are supported on the Cisco Service and Application Module for IP with a minimum software requirement of Cisco IOS Software Release 12.4(11)MD.
- Supported supervisor engines are: Cisco 7600 Series Supervisor Engine 720-3BXL at first customer shipment (FCS).
- Single or redundant supervisor-engine configurations are permitted.
- There is no restriction on other cards (such as service and network modules) on the Cisco 7600 Series chassis.

Ordering Information

Table 1 lists the product codes for the Cisco CSG2 base software, upgrade licenses, and Cisco Service and Application Module for IP hardware.

The base license provides an unlimited number of subscribers, limited by hardware resource capacity and traffic mix. The Cisco CSG2 license model is three-tiered based on functions used:

- **Basic:** Provides Layer 3 or Layer 4 content inspection and billing. In addition, lab trials or other noncommercial full-function uses are provided by the Basic license.
- **Premium:** Provides Layer 7 content inspection and billing and content filtering. This license does not include use of AoC or RTSP features.

- **Enhanced Premium:** Provides full use of Cisco CSG2 functions, including the AoC and RTSP advanced product features.

Table 1. Cisco CSG2 Ordering Information

Product number	Description
Cisco Service and Application Module for IP	
WS-SVC-SAMI-BB-K9	Service Application Module for IP 6 x PPCs w/ 1GB (Crypto)
WS-SVC-SAMI-BB-K9=	Service Application Module for IP 6 x PPCs w/ 1GB Spare (Crypto)
SC-SBC-NAP-SAMI-1	No Application software load for SAMI
Software Licenses	
SC-SVC-CSG2-B1-K9	CSG2 R1 Basic SW L3/L4 and Noncommercial (Crypto)
SC-SVC-CSG2-B1-K9=	CSG2 R1 Basic SW L3/L4 and Noncommercial Spare (Crypto)
SC-SVC-CSG2-P1-K9	CSG2 R1 Premium SW (B + L7 Billing + Filtering) (Crypto)
SC-SVC-CSG2-P1-K9=	CSG2 R1 Premium SW (B + L7 Billing + Filtering) Spare (Crypto)
SC-SVC-CSG2-E1-K9	CSG2 R1 Enhanced Premium SW (P + AoC/RTSP) (Crypto)
SC-SVC-CSG2-E1-K9=	CSG2 R1 Enhanced Premium SW (P + AoC/RTSP) Spare (Crypto)
Upgrade Licenses	
FL-CSGB7CSG2B1-K9	CSG1R7 Basic to CSG2R1 Basic SW Upg (Crypto)
FL-CSGB7CSG2B1-K9=	CSG1R7 Basic to CSG2R1 Basic SW Upg Spare (Crypto)
FL-CSGP7CSG2P1-K9	CSG1R7 Prem to CSG2R1 Prem SW Upg (Crypto)
FL-CSGP7CSG2P1-K9=	CSG1R7 Prem to CSG2R1 Prem SW Upg Spare (Crypto)
FL-CSGE7CSG2E1-K9	CSG1R7 Enhd to CSG2R1 Enhd SW Upg (Crypto)
FL-CSGE7CSG2E1-K9=	CSG1R7 Enhd to CSG2R1 Enhd SW Upg Spare (Crypto)
FL-CSG2-PEP-K9=	CSG2 SW Upg - Premium to Enhanced Premium
FL-CSG2-BP-K9=	CSG2 SW Upg - Basic to Premium
FL-CSG2-BEP-K9=	CSG2 SW Upg - Basic to Enhanced Premium
Bundles (include Cisco Service and Application Module for IP)	
SAMI-CSG2-EBDL-K9=	CSG2 R1 Enhd SW (Active/Standby) + 2 SAMI Bundle (Crypto)
SAMI-CSG2-PBDL-K9=	CSG2 R1 Prem SW (Active/Standby) + 2 SAMI Bundle (Crypto)

Service ad 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, see Cisco Technical Support Services or Cisco Advanced Services.

Additional Information

For more information about Cisco Service and Application Module for IP, please refer to the product data sheet.

For more information about Cisco mobile wireless products and solutions, visit <http://www.cisco.com/go/mobile>.

For more information about Mobile Wireless Center for Cisco mobile Service Exchange Framework, visit <http://www.cisco.com/en/US/products/ps6401/index.html> or contact your Cisco account manager.

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