Deploying Premium Services Using Cisco Service Control Technology

Service providers are seeking to use an all-encompassing IP network for premium services, resulting in the delivery of higher-margin, higher-value service offerings. Cisco® Service Control technology enhances existing network infrastructure with subscriber and application awareness. Cisco Service Control is comprised of a programmable network element that creates a service layer for broadband networks, allowing operators to identify subscribers, classify applications, guarantee service-level performance, and charge for multiple IP services on a single IP network without costly equipment upgrades.

Challenge

The ability to offer voice, video, and data services on an all-encompassing IP network is the ultimate goal for many service providers. Yet "best effort" networks are not good enough to support these demanding service offerings. The first network operators to maximize network efficiencies for IP service delivery using granular analysis and reporting and real-time traffic policies combined with application-level quality of service (QoS) and subscriber-based metering will be well-positioned against the competition. Accompanying such objectives, however, is the need to make only modest incremental infrastructure investments and to control operating costs to secure healthy profits. Both cable and DSL operators are establishing "fat pipes" for delivering advanced IP services into users' homes. However, the existing transport networks are constrained by an inability to easily and cost-effectively identify and meter individual subscriber usage by application. The all-encompassing IP network must be capable of carrying virtually any "triple play" service— voice, video, and data—yet infrastructure continues to fall short of these goals and prevents providers from profitably maximizing network investment, limiting their ability to create new business models or easily customize services to individual subscriber preferences.

Meanwhile, the number of Internet subscribers continues to grow along with the number of intelligent portable devices. The market for both broadband and mobile operators is positioned to accept new premium service offerings such as voice over IP (VoIP), online gaming, music downloads, video on demand (VoD), and streaming television. Such services offer the potential to dramatically increase average revenue per user (ARPU) for service providers, which further increases the overall value of their network assets.

The lack of intelligence in the network's data plane causes significant issues for operators in their attempt to deploy premium services. The network must be intelligent enough to understand "who" is doing "what" during any subscriber session. Subscriber and application awareness must be efficiently integrated into the network to meet the essential needs of profitable premium service delivery.

Subscriber and Application Awareness Facilitates New Service Exchanges

Subscriber acceptance is predicated on perceived value. New business models must be tested as providers seek to develop the right formulas to value various offerings. As more and more digitized content becomes available, a plethora of new business opportunities emerges for content-based services. However, to bring a diversity of content to the subscriber, network providers and third-party content suppliers will need to cooperate with each other to use their value proposition. However, for service providers to pursue partnerships with content suppliers in exchange for access to their pipelines or revenue shares, the network requires service intelligence. Content usage must be tracked by subscriber, protected from piracy, metered, and appropriately valued. Operators have an opportunity to take advantage of QoS and other network capabilities for a share of third-party content revenue. The concept of a "service exchange" can facilitate new IP deliverables based on partnerships between operators and content providers.

Services such as VoIP or VoD have more rigorous performance requirements that allow for zero latency. Those provider networks that are capable of isolating traffic flows and applying application-level QoS to VoIP traffic or VoD will be more attractive to users. A network is needed that can classify applications easily or identify third-party providers of VoIP. Moreover, by identifying services that might be riding an operator's network for free, a provider can truly differentiate its own "branded" VoIP service traffic from best-effort traffic or extend QoS guarantees to that third party for a share of the profits. Such arrangements further demonstrate the opportunity for network "service exchange" agreements.

The Importance of Service Control for Emerging Multimedia Services on Mobile Networks

In the mobile sector, with the introduction of high-speed access and video-capable handsets, multimedia services are rapidly gaining popularity among mobile subscribers. The ability to make video and audio recordings virtually anywhere subscribers go and instantly share them with friends and family is extremely powerful and will drastically influence the way subscribers communicate with each other. With propagation of third-generation (3G) and fourth-generation (4G) networks, mobile providers will face the same usage analysis, traffic optimization, and security issues that confront broadband providers as more advanced applications migrate to mobile from wire-line networks.

Multimedia Message Service (MMS) messaging is the first application to enable a near real-time sharing experience of pictures and short video or audio clips of "captured moments." However, as mobile subscribers master this new technology, the demands of multimedia sharing on the network become enormous and will be followed by powerful real-time multimedia applications such as VoD, video broadcasts, and video phone conversations or even peer-to-peer (P2P) communications. These applications use the powerful Real Time Streaming Protocol (RTSP) to enable multimedia-streaming applications permitting multiple audio and video channels to be simultaneously streamed while delivering a robust multimedia experience to the end user.

The opportunities for advanced IP service delivery on broadband and mobile networks are virtually endless; however, there are gaps that remain in the network infrastructure that must be filled before vision can truly catch up with reality. Cisco Service Control is specifically crafted to fill these infrastructure gaps.

Solution

The Cisco Service Control Platform is comprised of a programmable network element that creates an intelligent overlay, enabling network operators to identify subscribers, classify application-level traffic, guarantee service performance, and charge for content-based services. The solution allows providers to address the gaps in premium service deployment and to customize solutions for individual subscribers while effectively charging for new service offers.

Cisco Service Control technology is comprised of both hardware and software integrated into a state-of-the-art, dedicated network device, providing detection and control capabilities. Typically, the Cisco Service Control Engine resides "in traffic" behind an IP aggregation point and can be configured redundantly to meet high-availability requirements. Using the platform's Layer 7 stateful deep packet-inspection capability, the solution can accurately identify application use by individual subscriber. The Cisco Service Control solution has a set of characteristics and architectural attributes built to perform real-time traffic classification, accounting, and control. To undertake stateful deep packet inspection at multigigabit speeds, a specific hardware architecture is required that is capable of maintaining the state of each network conversation, while implementing deep and detailed inspection of every data packet through the application or Layer 7 network layer. The result is a solution that can detect specific protocol signatures and classify all traffic for a given network session.

Using Cisco Service Control, operators can:

- Granularly analyze how subscribers are using network resources and more effectively assess trends or evaluate the acceptance of new services or business models (refer to Enhancing Usage Analysis Using Cisco Service Control at: http://www.cisco.com/go/servicecontrol).

- Prioritize and guarantee performance for premium services such as VoIP, interactive gaming, or VoD.

- Transparently identify application flows requiring preferential treatment and signal other network elements to set up QoS for packet transport.

- Track service usage to create revenue-sharing opportunities between providers and content partners.

- Mitigate against security threats to the provider network and redirect infected subscribers to technical centers for resolution (refer to Providing Service Security with Cisco Service Control at: http://www.cisco.com/go/servicecontrol).

- Monitor quality and service delivery of premium services such as track voice or streaming traffic's jitter and packet-loss parameters.

- Charge for individual services or suites of services all individually metered and running on common transport network.

- Monitor and control VoIP traffic traversing an IP network, whether originating from the operator's own voice service or that of a nonfacility-based operator. This provides the means to not only track service quality, but also help ensure that adequate resources are available for these services.

- Monitor usage and quality of nonfacility services used by the subscriber base from off-net destinations.

Application-Level QoS: Performance Guarantees

The application-aware and subscriber-aware service overlay created by Cisco Service Control technology provides multigigabit analysis and is powered by Cisco Service Control engines, while the Cisco Service Control Application for Broadband helps ensure that providers can now move beyond best-effort services. Service providers can offer guaranteed performance and QoS for sensitive IP applications such as VoIP and VoD, while taking advantage of existing investments in the common transport network (refer to Using Cisco Service Control for Traffic Optimization at http://www.cisco.com/go/servicecontrol).

This capability helps ensure the appropriate priority is granted to application traffic throughout all network segments, from the first and last mile of the network to the network edge and core. Cisco Service Control adequately monitors network-resource availability so that appropriate actions are taken in the event of oversubscribed network resources. Providers can:

- Detect application usage directly from the data stream, control bandwidth, and mark traffic for preferred treatment as it flows through the network.
- Set up QoS for specific application streams without requiring network integration with application servers. This greatly reduces implementation and operational costs.
- Perform stateful traffic classification to treat multiflow, multimedia application traffic in a single context, helping ensure suitable QoS for the entire application session.
- Go beyond classification and truly understand application semantics to make suitable network resources available for the needs of each application session and take appropriate action if not.

The stateful deep packet-inspection capabilities of Cisco Service Control greatly simplify signaling requirements, and Cisco Service Control engines can simultaneously track hundreds of thousands of flows and maintain an application-layer state for every one.

Accurate Analysis and Control of New Multimedia Traffic

The Cisco Service Control solution is capable of performing application-layer (Layer 7) stateful deep packet inspection of RTSP traffic going over its control channel and associating it with the traffic for all of its audio and video channels. This capability helps enable Cisco service applications to accurately analyze and control multimedia traffic regardless of its network origin and correctly charge for traffic. Mobile service providers who have already deployed the Cisco Service Control solution can deliver and charge for multimedia services without compromising profits.

With Cisco Service Control technology, premium IP services can be managed, controlled, and delivered on a converged IP network capable of meeting the needs of individual service providers to astutely analyze usage by subscriber, classify and guarantee application-level performance, and meter and charge for any number of IP applications. The resulting profitability closes the gap between vision and reality.

Business Benefits

Cisco Service Control technology allows operators to:

- Increase ARPU by customizing services to meet individual subscriber needs
- Effectively converge network deployments and operations

- Make a small incremental investment for existing networks and use overall network investment for new premium service delivery
- Reduce operating costs and capital investment by using a single network for multiple IP services
- Test and trial new offerings without additional investment, to better amortize infrastructure costs across a multitude of service offerings
- Meet the demands of latency- and jitter-sensitive applications such as VoIP and VoD
- Increase overall customer satisfaction and reduce turnover by offering truly differentiated or customized service offerings

Architecture

Figure 1 indicates where Cisco Service Control resides in the network and how it effectively uses existing infrastructure investment.

Figure 1. Cisco Service Control in the Network
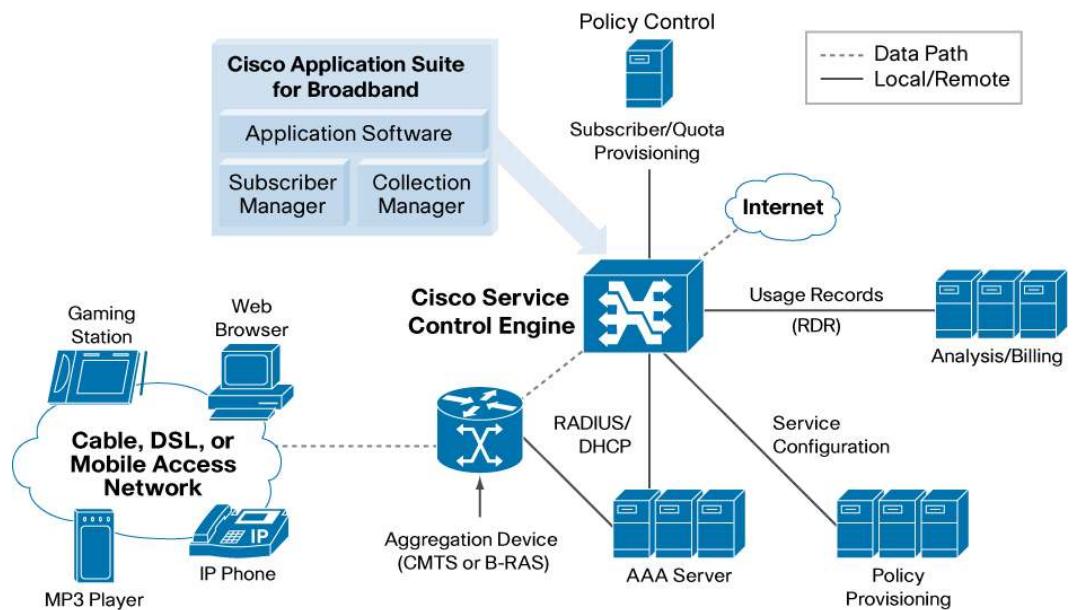
Product Offering

- Cisco SCE 1000 Series Service Control Engine
- Cisco SCE 2000 Series Service Control Engine
- Cisco SCE 8000 Series Service Control Engine
- Cisco Service Control Application Suite for Broadband
- Cisco Service Control Collection Manager
- Cisco Service Control Subscriber Manager

Why Cisco

Cisco offers industry-leading service control solutions, delivering multigigabit performance and stateful deep packet inspection as well as worldwide technical assistance and support. Cisco is speeding the evolution of networks from generic transport to platforms offering higher-value, higher-margin services. Programmable, scalable, and designed for the communications sector, Cisco Service Control technology accelerates network delivery of advanced IP services. The Cisco Service Control platform adds intelligence, stateful deep packet inspection, and multigigabit analysis to existing network infrastructure, so carriers can identify and charge for dissimilar content applications while simultaneously managing different applications' performance requirements. The Cisco Service Control solution is deployed in more than 450 companies worldwide.

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