Enhancing Usage Analysis with Cisco Service Control

Cisco® Service Control technology creates a subscriber-and application-aware service overlay onto existing IP network infrastructure, helping ensure that service providers can gain enhanced visibility into the usage activity of the most complex network environments without reducing reliability or performance. Cisco Service Control takes the guesswork out of capacity planning by detailing subscriber demographics, thereby assisting providers in uncovering revenue opportunities. Enhanced usage analysis empowers providers to create policies, business models, and new applications targeted to meet the individual needs of segmented communities of broadband and mobile network subscribers.

Challenge

Today IP networks are moving from subscriber access and rapid packet transport to premium service delivery, but these networks cannot classify the various applications that are converging on the IP pipeline. To successfully achieve the vision of an all-encompassing IP network, both subscriber and application awareness are essential. The first step toward profitably delivering suites of differentiated IP services is to understand how subscribers are using network resources and develop appropriate policies to better manage traffic as well as pricing models for new business opportunities.

Broadband and mobile service providers must accurately understand their subscribers' usage. However, obtaining meaningful usage data from IP networks is difficult because many network devices are not designed to provide usage information that captures the granular details of transport traffic patterns. This means reduced visibility into network activity, leaving providers to frequently rely upon guesswork or inaccurate sampling techniques to improve their understanding of subscribers' usage. Only a subscriber-and application-aware network can achieve the level of detail required.

As providers move to converged IP networks for "triple-play" service delivery—data, voice, and video—subscriber-and application-aware technologies offer providers the ability to inspect Layers 3–7, providing an unsurpassed level of information to cost-effectively manage their networks and differentiate services. Enhanced analysis allows providers to create business models, network policies, and traffic enforcement techniques that can improve the overall subscriber experience, optimize application-level network traffic, and ensure quality of experience (QoE) for premium or latency-sensitive IP service offerings such as voice over IP (VoIP) and interactive gaming.

Cost-effective management of network resources requires that providers be able to:

- Assess capacity and usage
- Understand usage trends by time of day or other metrics
- Determine peak hours of usage or slack times
- Assess how much traffic is traveling on-net versus off-net
- Identify subscribers infected by malicious traffic such as worms, viruses, or spam zombies that could impact network performance

Optimizing network traffic and load balancing is critical to ensure adequate capacity exists across the network to meet the requirements of different service offerings. The IP service operating environment is becoming increasingly more complex as developers create “broadband¬-aware” applications such as peer-to-peer (P2P) or providers use a converged network for diverse service applications. Multiservice networks carry new content-based services that demand further refinements in usage assessment and analysis, including the ability to:

- Prioritize traffic by application
- Meter usage by application or subscriber
- Classify different types of application usage, for example, VoIP, P2P, gaming, etc.
- Collect demographics to set metrics to assess success or failure of new service deployments

If new services are to succeed, providers need better ways to improve capacity planning to ensure they can manage applications and condition their networks to meet the latency requirements of advanced services such as interactive gaming, video, or VoIP while still being able to develop pricing policies for applications or bundles riding on this all-encompassing IP network. (Refer to: Optimizing Application Traffic with Cisco Service Control Technology at: http://www.cisco.com/go/servicecontrol.)

Solution

The Cisco Service Control platform infuses the network with application- and subscriber-aware traffic classification, offering unrivaled visibility into network activity. Cisco Service Control provides data that service providers can use in service and policy planning. It enables providers to identify subscribers, classify applications, apply application-level traffic optimization, and charge for individual applications. Providers can better manage and control high-volume use and profit by tailoring offerings to meet individual needs.

Cisco Service Control technology comprises 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; it can be configured redundantly to meet high-availability requirements. Using the Layer 7 stateful deep packet inspection capability of the platform, the solution can accurately identify application use by individual subscriber. In order to undertake stateful deep packet inspection at multigigabit speeds, a purpose-built hardware architecture is required that can maintain the state of each network conversation, while executing deep and detailed inspection of each data packet through the application layer or Layer 7 network layer. With this unique set of capabilities, the Cisco solution can detect specific protocol signatures and classify all traffic for any network session.

Advanced Data Collection with Prepackaged Reporting

The Cisco Service Control solution takes advantage of advanced data collection and prepackaged reporting provided by its collection manager. Data can be aggregated into reports with a simple-to-use tool performing real-time collection of usage data, which is then exported by the Cisco service control engine generating network analysis, capacity planning, and subscriber demographics data. The Cisco Service Control Collection Manager has a prepackaged reporting tool and 100 report templates to generate a wide range of reports on network activities and application usage. Providers can choose to use the Cisco Collection Manager as an efficient standalone solution or integrate the Cisco service control engine with existing usage management, mediation, and billing solutions.

Cisco Service Control can analyze usage by application and subscriber as well as identify potential sources that threaten network security.

Application Analysis

Cisco Service Control helps providers analyze usage by application type, time of day, or at the aggregate link or subscriber level. Providers can assess any number of application-level parameters, including:

- Separate volume accounting for different applications (for example, providing separate accounting for usage of P2P, HTTP, or Session Initiation Protocol [SIP])
- Providing transaction statistics on individual application flows (for example, VoIP or SIP call duration and destination, Real Time Streaming Protocol [RTSP], or Web browsing)
- Assessing what types of gaming applications are in use
- Such information is essential because service providers must be capable of prioritizing application-level performance.

Subscriber Analysis

Cisco Service Control solutions generate usage statistics on every subscriber. This information can be used to produce reports about:

- Top-volume consumers, identifying high-traffic subscribers such as P2P users
- Subscriber-level usage, which might include the volume of VPN traffic or the number of email sessions per subscriber
- Detailed subscriber usage, outlining how the network was used by a particular subscriber, even to the level of identifying who may be using a free VoIP service on a provider network or running Xbox gaming

Granular analysis offers the provider unsurpassed visibility into network activity and, therefore, insight into which subscribers are abusing the network, what others are doing on it, which traffic to prioritize by subscribers, or what the best control policies are to moderate use or bill accordingly. Assessing trends on existing services or collecting data on trial service offerings is essential to better managing and pricing new content, voice, or video service offerings. All this becomes possible by using the advanced capabilities built into Cisco Service Control solutions.

Security Analysis

The open nature of the Internet increases the potential for service-level security threats that impact network operations resulting in congestion, disruption in service, increased storage requirements, or negative subscriber experience. The advanced usage analysis offered by Cisco Service Control provides a means to assess the potential threat of worms, viruses, or spammers by:

- Offering the ability to identify irregular traffic patterns from individual subscribers
- Identifying origination points for denial-of-service (DoS), spam, or virus attacks and reducing response times to mitigate against such attacks
- Identifying and notifying infected subscribers and directing them to technical support sites

Such capabilities allow providers to proactively respond to attacks and minimize the impact on the network and subscriber base while reducing operational costs or downtime resulting from malicious action. (Refer to: Providing Service-Level Security with Cisco Service Control at: http://www.cisco.com/go/servicecontrol.)

Complementary Technology Offering Advanced Assessment

The Cisco Service Control solution complements the Cisco NetFlow framework for traffic accounting by expanding on the Layer 2–4 statistics generated by NetFlow-enabled routers. Cisco Service Control platforms offer Layer 3–7 analysis and classification that reports on network activity at the "application layer."

- Relying on the hardware-optimized architecture of the Cisco service control engine, the solution performs data collection at multigigabit line rates. Furthermore, because this function is performed on dedicated hardware, it is isolated from routing activities, thereby preserving router resources and increasing overall network performance.
- Cisco Service Control solutions can be used to control traffic. Looking beyond usage analysis and accounting, the Cisco Service Control platform can help enforce traffic control policies such as bandwidth policing, traffic marking, redirection, etc. These control actions are useful for enhanced traffic management, security, service differentiation, network-based billing, and accounting applications.

This configurable platform allows providers to granularly collect data and focus on important information, alleviating common problems associated with privacy concerns or sorting through irrelevant information provided by other reporting solutions.

The stateful deep packet inspection capability can be used to create superior market intelligence to develop a range of new services. Understanding how network resources are being used offers providers the opportunity to create service tiers to meet different needs. Such policy and service options are facilitated by improving the availability of data, enabling providers to make business-planning and policy choices. Granular analysis offers providers a way to test, modify, and improve service applications over time. The Cisco Service Control product line is specifically designed to help providers identify, classify, guarantee performance, and charge for an unlimited number of IP and content-based service offerings running across existing transport.

Business Benefits

Cisco Service Control:

- Enhances a provider's ability to understand usage by subscriber and application
- Helps enable providers to quickly assess the effectiveness of new product introductions, pricing models, or traffic policies
- Enhances business reporting, thereby improving overall business planning for capital expenditures and logistics
- Helps enable providers to customize pricing plans for individual subscribers
- Offers detailed subscriber- and application-level reporting, allowing providers to avoid unnecessary additions to capacity that would otherwise have been required because of incorrect assumptions about demand
- Allows providers to develop traffic-optimization policies for individual or bundled service offerings

Sample of Available Reports

Figure 1. Bandwidth by Application (including control)

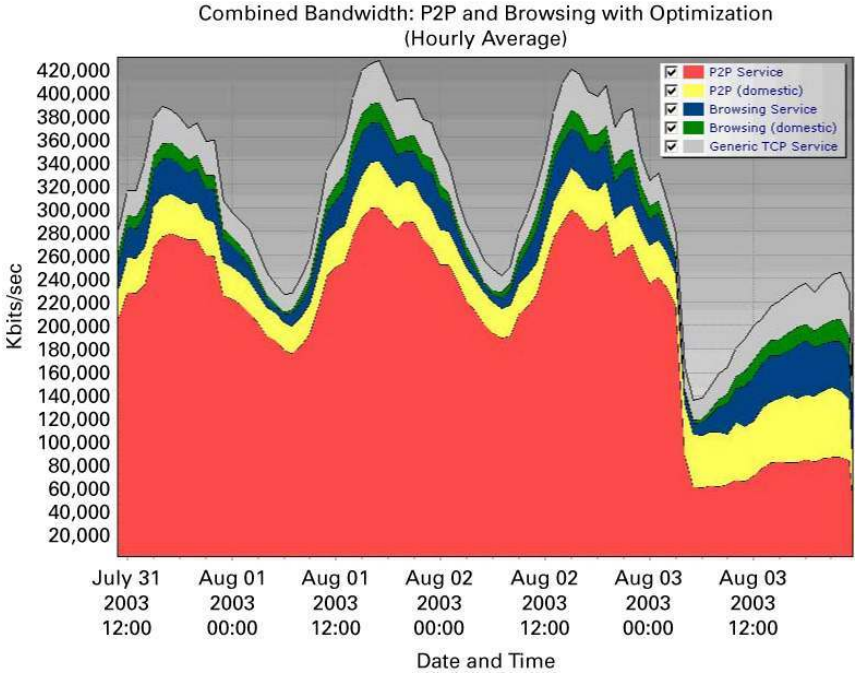


Figure 2. Bandwidth by Application and Destination

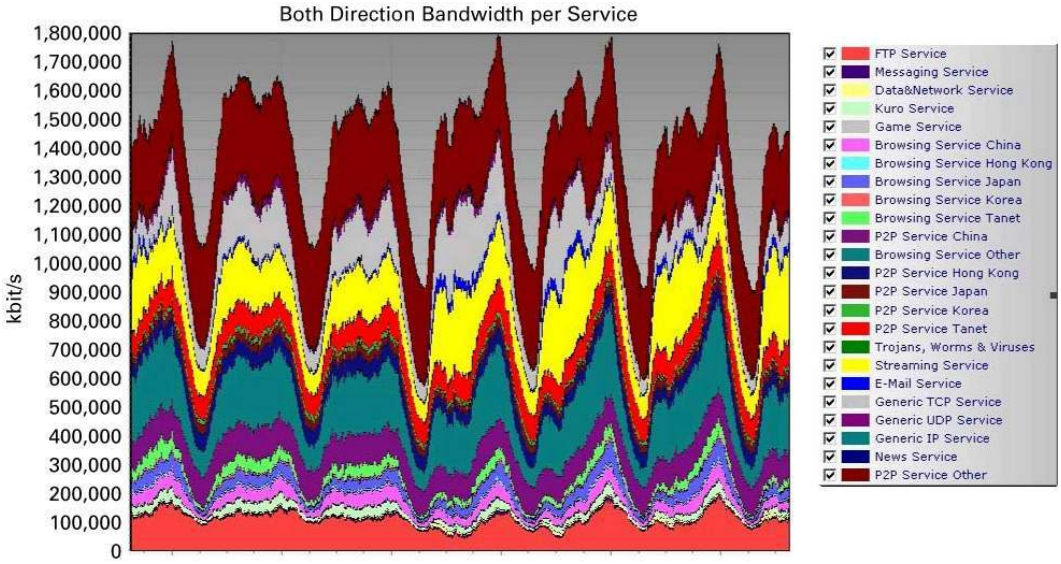


Figure 3. Sessions Over Time per Application

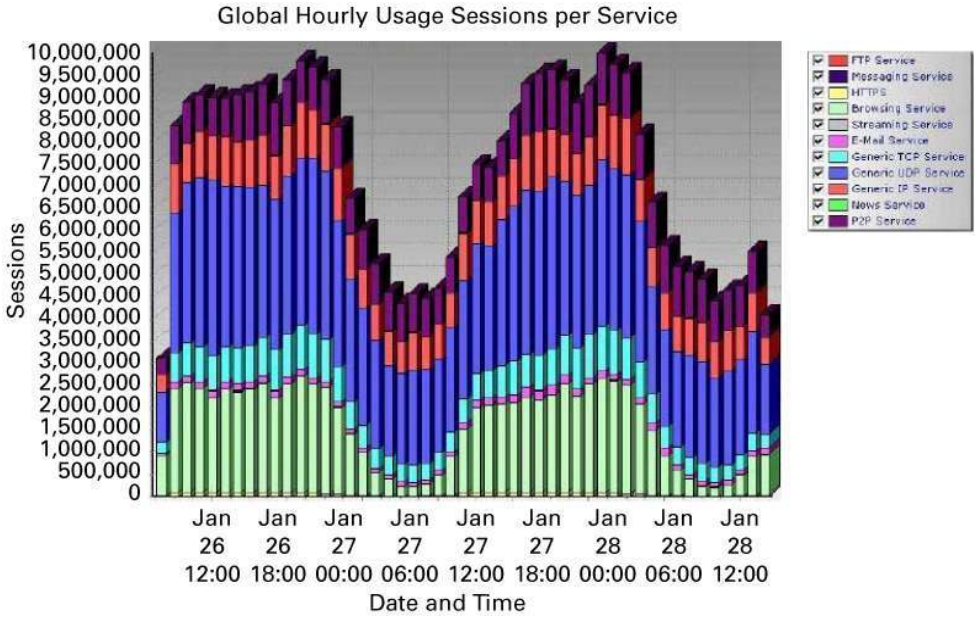


Figure 4. Volume by Application and Destination

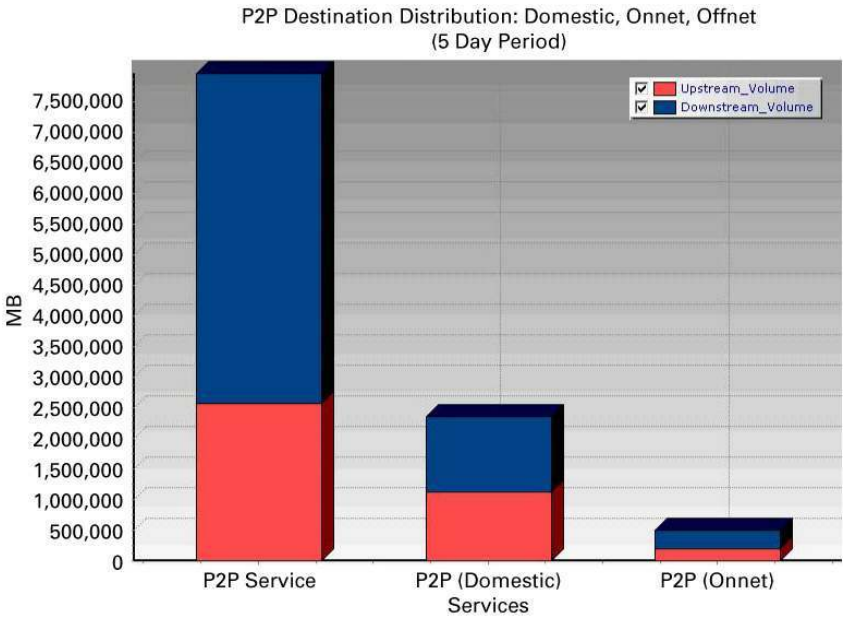
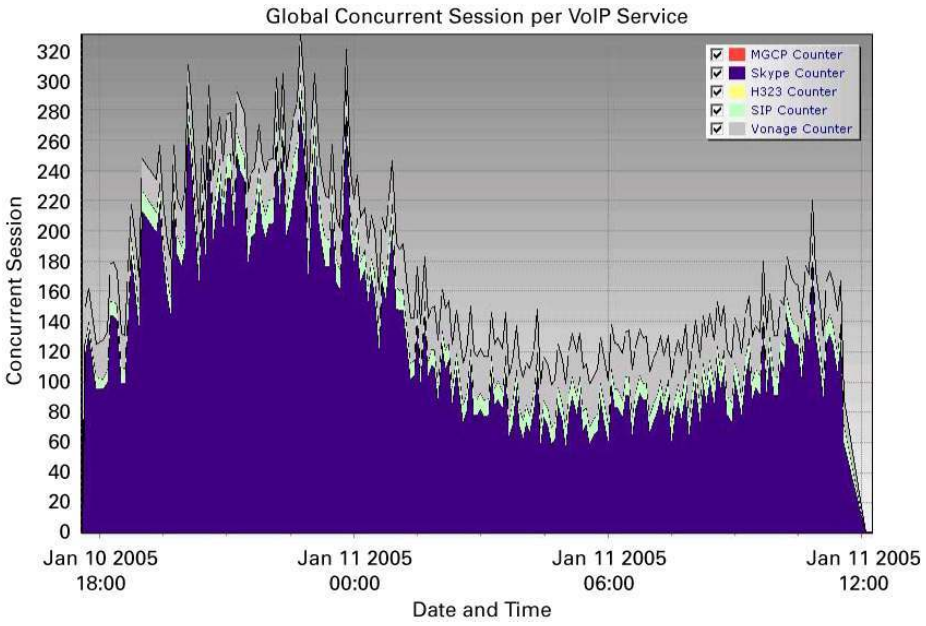
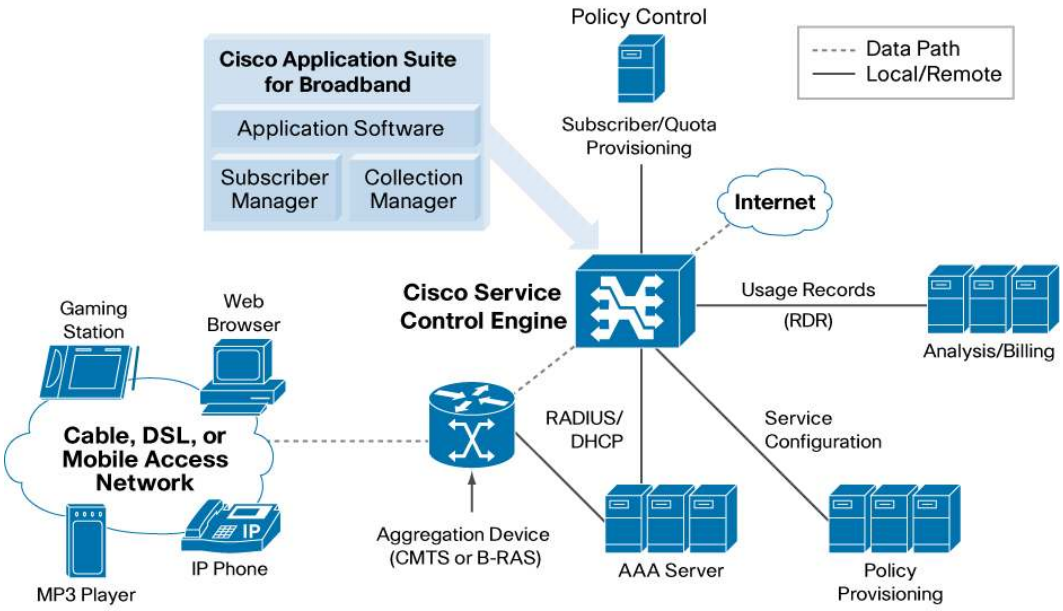


Figure 5. Number of Voice Calls by Service



Architecture

Figure 6. Cisco Service Control in the Network



Products Offerings

Cisco offers the following service control products:

- 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 for Broadband
- Cisco Service Control Collection Manager
- Cisco Service Control Subscriber Manager
- Cisco Service Control Quota Manager

Why Cisco

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

For More Information

For more information about the Cisco Service Control offering, visit: http://www.cisco.com/go/servicecontrol or contact your local Cisco account representative.

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