Cisco Service Control Engine

Today's Environment

Q. What recent trends in the service provider market relate to application and protocol traffic?

A. The emergence of peer-to-peer (P2P) applications has put a different face on the need for, and use of, bandwidth in a broadband environment. Business models and infrastructures designed for low-bandwidth, asymmetrical traffic patterns have been significantly compromised. Over the past few years, this file sharing has developed on two levels – the use of P2P file-sharing applications for the illegal download of digital movies and the use of P2P applications as the basis of legal content downloads and long-distance corporate and educational collaboration. Regardless of the purpose, the average bandwidth consumed has steadily increased, while the average revenue per user (ARPU), because of an increasingly competitive environment, has steadily decreased.

In addition, in an effort to increase ARPU, service providers have begun to create business models and develop infrastructures around latency-sensitive services, such as video, voice, and gaming.

Q. How have these trends affected service providers?

A. These trends have significantly affected service providers in two ways. From a financial perspective, service providers have had to grapple with the constant demand for bandwidth increases. These increases have not had the desired effect on revenue generation, because the new services still contend for network resources, thereby affecting the quality – and adoption – of new services.

From a legal perspective, the Motion Picture Association of America (MPAA) and Recording Industry Association of America (RIAA) have begun to take legal action against those responsible for illegal file sharing. Such activity has a significantly negative effect on the service provider's reputation, and in many cases leads to blacklisting.

Q. What challenges do these trends impose on daily and longer-term service provider operations?

A. Service providers are being pressured not only to curtail the spending on network resources, but also to provide consistent improvements to support new revenue-generating services. This challenge is not limited to one country or region – it is pervasive worldwide.

Q. How do these challenges affect the service providers' subscribers?

A. Because of the changing needs imposed on the service provider network, due to both increases in subscribers and changing application patterns, it is difficult for the service provider to consistently deliver services to each subscriber in a manner that provides equal access to network resources. As a result, a small percentage of the subscribers are able to use a majority of network resources, with the majority of the subscribers facing unpredictable network performance. At the very least, the result is an increase in help desk calls. At worst, this lack of predictable performance leads to subscriber turnover.

Q. How are these challenges manifested with respect to the service provider business model?

A. The effect on the business model is simple to quantify. The cost basis of services delivered continues to increase, with a corresponding decrease in ARPU.

Service Provider Alternatives

Q.   What tool requirements do these challenges impose on the service provider?

A.   In order to control the cost basis of their services, service providers must be able to view traffic streams running on their networks, to control the traffic at wireline speeds, and to rapidly react to the constantly changing application and other protocols appearing on a seemingly daily basis. These control mechanisms must be able to control network usage in a manner that fully uses network resources, provides each subscriber with equal access to network resources, and adapts to changes in network conditions. But, whereas this capability would have sufficed over the past several years, service providers now need tools that deal not only with the cost side of the equation, but with the revenue side as well.

In order to deal with the increasingly competitive broadband market, service providers need the tools that allow them to differentiate services not only by bandwidth tiers, but on application and content bases as well. And because of the increasing diversity of stakeholder needs, such as the use of P2P applications referenced previously, they must be able to differentiate the online experience of individual users – not by IP address alone, but through the identification of individual users by name.

Q.   What tools or mechanisms have traditionally been available to address these challenges?

A.   In recent years, several tools have emerged that address these challenges. There are many traffic-shaping devices that perform deep packet inspection, and a wealth of control mechanisms that attempt to intelligently control application use on the network. However, most of these tools address only the concerns that affect service provider cost, and do not allow for alternative business models.

Q.   How do these tools address the need to deal with an increasingly diverse set of critical, noncritical, and malicious protocols and traffic patterns?

A.   Traditionally, these tools have done an excellent job of managing traffic and changing traffic protocols, particularly for non-latency-sensitive applications such as P2P. However, because most are software-based solutions, essentially residing on PC architectures, they are somewhat less effective in managing latency-sensitive traffic such as voice and video traffic that require much higher performance levels.

Q.   What applications and services must these tools address?

A.   In general, broadband subscribers expect access to browsing and e-mail, and, especially for many specific demographic clusters, access to P2P downloads as well. Initially, most of these needs were satisfied using a simple Web browser; over the past several years, many additional application categories have emerged – such as P2P file sharing – that add significant complexity to the task of traffic management. In addition to P2P file-sharing applications and protocols, broadband voice, broadband video, and online gaming have all shown rapid growth worldwide:

- *Broadband Voice* – Voice over IP (VoIP) has emerged as a predominant online application. Most service providers now offer a VoIP service to complement their Internet access services, and Skype, a popular online voice application, boasts 54 million members in 225 territories. More than 150,000 people download this application every day. Many educational institutions are now either implementing, or are in the process of implementing, broadband voice services as an inexpensive solution requiring low IT administration.

- *Broadband Video* – From the service provider's perspective, one of the most compelling revenue-generation services is video on demand delivered over a broadband network. Such services are extremely latency sensitive, and must be delivered with a level of quality that competes with other video alternatives (rentals, etc.).

- *Online Gaming* – Online gaming is rapidly growing in demand, particularly in higher-education institutions and in the home. The increasing sophistication of game consoles provides the capability for online gaming with multiple players over the Internet. Many students are involved in online gaming in student residences, contributing to the US$600 million gaming market.

Solution

Q.   What problems does the Cisco® Service Control solution solve?

A.   The unique capabilities of the Cisco Service Control solution provide the traditional traffic management capabilities of existing traffic management solutions, but provide the capability of solving problems, or capitalizing on opportunities, that will present themselves over the coming years. As well as providing granular control over application use in the network, the solution provides the capability of assigning online rights to individual users if required. Subscribers would have access to those applications necessary to support their specific traffic patterns, contributing to the control of subscriber turnover.

As well as solving problems – specifically reducing cost and ensuring fair access to network resources – the solution is a potential revenue source as well. Online quotas can be assigned to subscribers, services such as music downloads can be effectively managed and financially reconciled, and latency-sensitive services such as online gaming can be enhanced, for a fee, by assigning a high priority for identified users of this service.

Q.   Does the solution assist the service provider in controlling network costs?

A.   Yes. Not only does the Cisco Service Control solution include the standard features provided in today's traffic management solutions, but it expands these capabilities to include per-user network control. These capabilities help ensure full use of network resources without compromising the online experience of any member of the subscriber group.

Q.   How does the solution assist in generating incremental per-subscriber revenue?

A.   Today, most broadband service providers compete on the basis of bandwidth tiers, and few services are available to generate incremental revenue. Revenue is subjected to continuous downward pressure by competitive market forces, making the formation of a viable business model difficult – if not impossible. The Cisco Service Control Engine combines deep packet inspection with specific subscriber identification, allowing the service provider to properly segment its customer base and provide individualized services to differing demographic "clusters." As a result, the service provider competes on factors other than price, and can generate incremental revenue from application-based services rendered.

Q.   Why would a service provider want to purchase a Cisco Service Control solution?

A.   The Cisco Service Control solution adds financial value by controlling the cost basis of services delivered and creating the foundation for delivery of a series of application- and content-based services. This scenario, in turn, increases the intimacy between the service provider and its subscriber base, and offers the opportunity for significant expansion of the customer base.

Q.   What advantages does the solution offer over competitive solutions?

A.   The solution offers three major advantages over competitive solutions. First, as a hardware-accelerated device, the solution offers significantly better performance than traditional software-based solutions. This capability is most noticeable in solutions that are most affected by latency, such as video or voice. Second, the ability to identify traffic streams of individual users, and control application and network use differentially based on assigned "online" rights, ensures protection of critical applications, network fairness, and an online experience tailored for each student and that student's chosen courses. Finally, it is supported by a company that already supplies a significant range of products for this market, understands the market, and is committed to future product development of user-specific traffic analysis and control solutions.

Q.   Which service providers have currently purchased and implemented the Cisco Service Control solution?

A.   More than 120 providers worldwide have purchased the solution to date. Because many Cisco Systems® customers are using the solution for P2P control, they are reluctant to publicly announce implementation of the system because of the adverse effects such an announcement may have on their subscriber bases.

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