

BANDWIDTH MANAGEMENT

OPTIMIZING THE USER EXPERIENCE

VERSION 0.8

INTRODUCTION

In the current Internet data center (IDC) shema, there are lots of CPUs, applications and organizations vying for few connections to the outside world. Bandwidth management and traffic control by category have become increasingly more important in current market conditions burdened by low operating margins. Hosting Service Providers (HSPs) will ways to execute customer Service Level Agreements (SLAs) without committing excessive resources. Web site operators will need to better regulate their network resources and avoid paying overuse penalties. While recognizing a need for change, many Hosting Service Providers find the tools to monitor and control traffic at the volume and granularity levels to be unavailable or expensive.

Bandwidth management or Quality of Service (QoS) solutions often found in routers and traditional switches are usually too coarse and lack the necessary flexibility to manage the diverse variety of services found in the Internet Data Center. As these services are often virtualized, QoS is impossible to implement unless the device works on the application level, understands application protocol and can apply bandwidth policy based on application attributes. Specialized bandwidth management appliances are quite expensive and have difficulties keeping pace with growing traffic demands.

The xLswitch integrated high-performance bandwidth management service is designed to maximize bandwidth utilization control . Complete with server load balancing and content management capabilities, xLswitch is a flexible traffic and content switching platform. For companies that can afford to allocate extra resources to business-critical applications, bandwidth management offers greater security monitoring and control.

BANDWIDTH MANAGEMENT IN DETAIL

WHAT IS BANDWIDTH MANAGEMENT

Bandwidth management simulates multiple “virtual pipes” within one or more physical interfaces (ports). xLswitch can support 256 such virtual pipes and 256 traffic classes attached to these pipes.

Each traffic class can be characterized by a broad range of policies, including: IP address, service, application protocol, URL, HTTP cookies and other conditional filters. Administrators can also define the order of operation when handling packets that fit the criteria for multiple virtual pipes. For each virtual pipe, the administrator must allocate an appropriate amount of bandwidth..

Availability of unbounded and isolated pipes allow xSPs and IT administrators to better regulate traffic flow at a more desirable target rate without leaving any wasting any uncommitted resources.

HOW IT WORKS

Bandwidth Management is best described as multiple virtual pipes attached to a physical interface, splitting bandwidth into smaller channels. For each virtual pipe, the switch simulates a physical link by deliberately pacing information transmission at a simulated through-rate.

Transmission for each query is regulated individually; that is, until global congestion occurs and simulated rates are reduced on each query, according to the bandwidth policy. This scheduling scheme effectively allows each virtual pipe to borrow available bandwidth and avoid congestion.

Traffic is directed toward this interface based on application (Level-7) or transport (Level-4) protocol attributes. The technology is able to define separate pipes for different traffic types, such as *.gif files, SSL, for an office network traffic, and users having specific set of cookies. For example, users that are going to buy something at an eCommerce site with a non-empty shopping basket could immediately be switched to a dedicated virtual pipe, avoiding traffic congestion and increasing the likeliness for return.

Traffic can also be assigned a priority within a virtual pipe, which can be useful for interactive protocols like telnet or to keep packet delays for mission-critical applications to a minimum.

MONITORING AND MANAGING TRAFFIC

Monitoring bandwidth management allows administrators to identify when and how much bandwidth each virtual pipe has borrowed, which is crucial for billing and reporting purposes. Critical information such as query depth, bytes sent and number of bytes dropped per virtual pipe is sampled every second.

BANDWIDTH MANAGEMENT WILL BECOME THE NEW STANDARD

Traditional QoS models in packet networks provide minimal bandwidth control. This idea can be seen in the Committed Access Rate metric, available on many router platforms. traffic that exceeds the committed data rate is forwarded at a lower priority or discarded and the routers do nothing to regulate traffic flow.

QoS is also complex and composed of different components. With the xLswitch bandwidth management solution, service providers and application hosters more easily communicate in link rates, set directly in KBps. Using the traditional method, applying traffic shaping algorithms like Random Early Discard or Weighted Fair Queueing does not go far enough to avoid congestion. The xLswitch solution eliminates ambiguity and confusion based on class-based queuing algorithms.

PRACTICAL APPLICATIONS OF BANDWIDTH MANAGEMENT IN E-BUSINESS

QoS technologies previously held real promise for managing traffic growth, but, until now, complexity and compatibility issues have slowed their broad adoption. With the simplicity and power of bandwidth management, many critical e-business problems can now be solved.

THE SLASHDOT EFFECT

Large hosting providers increasingly rely on service virtualization, where a single physical system is used to service many simultaneous users. Smaller providers often rely on a single Internet connection shared by all customers. Obviously, traffic to the Website could experience high bursts, affecting other customers sharing the connection, otherwise known as the “Slashdot effect.” Slashdot is an online publication which receives hundreds of hits daily and any link published on the first page will probably receive millions of hits, potentially affecting others who share the same Internet connection. Using the old model, customers are charged a hefty premium for excessive bandwidth useage, angering customers who are forced to buy extra and unnecessary bandwidth. Even without spikes in traffic, bandwidth is not shared fairly. With the bandwidth monitoring and management capabilities of xLswitch, each virtual server is granted its own virtual pipe of required capacity and one site “being slashdotted” will not affect the others.

INCREASING SECURITY

Protection against Denial Of Service (DOS) attacks is of the utmost importance for Hosting Service Providers. xLswitch can be used to limit the bandwidth for unwanted traffic such as ICMP traffic, SYN packets, directed broadcasts, etc.

Monitoring this traffic could also allow system administrators to create an early warning system, sending notifications when any suspicious traffic rises above pre-set limits.

IMPROVING THE USER EXPERIENCE

xLswitch can also recognize many attributes of application protocols and find available bandwidth or packet priority accordingly to pre-set rules. The technology allows clients to experience a higher quality of service for the recognized returning customers of online shops or visitors to some specific area of the web site.

C O N C L U S I O N

The xLswitch bandwidth management solution solves real problems for e-business in a simple, powerful way. Intelligently managing mission critical operations, xLSwitch maximizes all resources and the increases the revenue potential of the corporate enterprise. SHOULD SAY MORE – JT?)