Delivering a Unique Platform for Scalable Video Solutions

The Advantages of SVC-Optimised QoS

What is SVC?

SVC (Scalable Video Coding) is a layered video codec that is an extension of the established H.264 standard. SVC operates by transmitting a base video layer and one or more enhancement layers. Each layer enhances the video quality up through high definition. This layering technique allows for a certain percentage of packet loss, while maintaining the video stream. The artifacts or pixels are all but eliminated with this new technology. Additionally, SVC allows for multiple clients with different capabilities to receive the same video signal without the need for further encoding.

As a result, a single SVC-encoded stream of different end stations and receivers with different capabilities can decode the necessary layers to produce an image from standard definition through high definition. This greatly reduces encoding latency and the overall computing power that is required.

Why Use SVC?

SVC helps solve the issue of poor quality and unusable desktop video conferencing due to packet loss. The long-term goal of this technology is to enable enterprises to deploy desktop video communications on a wide scale.

SVC providers claim that users can experience the same high quality across the Internet without the need to pay private network prices. However, unlike traditional HD video calls, SVC does not experience significant lag; instead the definition of the image on the call constantly varies. This quality can fluctuate between high and standard definition, depending on the congestion on the local loop during the call.

While it is easy to see the benefits of SVC, a mechanism is needed to allow video to be deployed in mass, without inhibiting access to critical business applications as well as best effort and Internet applications. This creates an inverted video QoS paradigm where any sizable desktop video deployment, if implemented over standard WAN services, can and will overwhelm the network and bring other applications to a crawl. So, instead of protecting the video application from other corporate traffic, other corporate applications will need to be protected from this video application.

Example:

- Assume a mid-size deployment of 25 to 30 HD capable SVC desktops where a typical HD desktop video call requires a minimum of 768 kilobits/second
- At any given time, six employees are on a video call, requiring a minimum of 4.6 megabits/second of bandwidth

Depending on the QoS level the company is using for the video traffic, the bandwidth requirement for a handful of video calls could disrupt the performance of mission-critical corporate applications, as well as Internet applications running at this business location.

Current Quality of Service Standards

Most large corporations are migrating to or have migrated to an MPLS network for their intra-company data communications. QoS is a mechanism used within these private networks to mark or prioritise essential business applications, such as voice, video and other applications. Typically, the emphasis has been to prioritise only the critical applications and allow the rest to fall into an unmarked or best effort queue. However, the Internet is becoming an essential business tool and, although the traffic is not marked, companies still rely on consistent access to the public Internet for day-to-day operations.

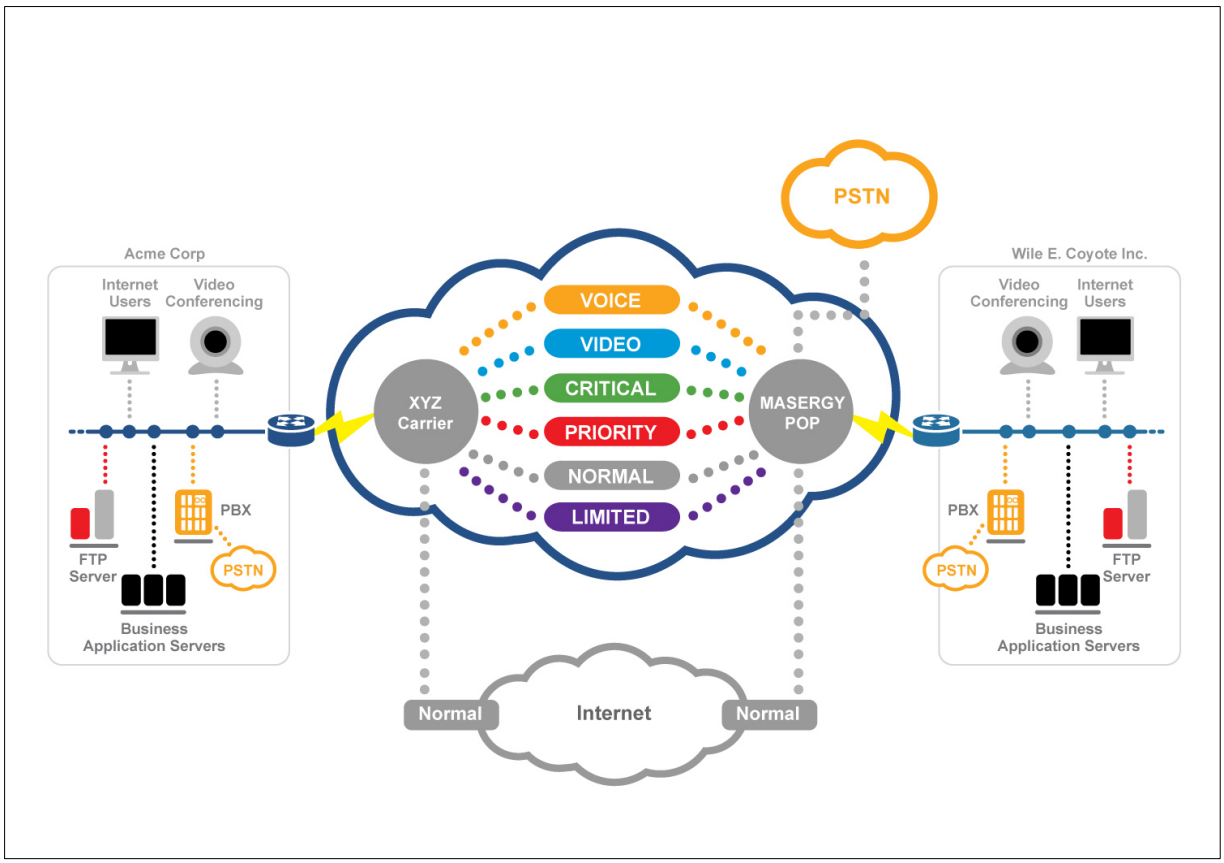
On typical Enterprise WANs the vast majority of traffic is undifferentiated data. Traffic flows of this type are not marked or prioritised. As such, their Type of Service (ToS) precedence value is considered to be “0”; commonly, traffic of this type is referred to as “best effort.” Although not given special treatment over the WAN, best effort traffic is still of tremendous value to the enterprise and often requires a minimally acceptable level of throughput and performance.

The Solution

Service providers should deliver a class of service (CoS) that is deliberately de-prioritised below best effort, thus providing the customer with a safe place on the network to carry bandwidth hungry desktop video flows without fear of high video volumes overwhelming the network. This CoS should be serviced at a lower priority than Normal Data and is ideal for data back-up or packet-loss-tolerant applications, such as SVC desktop video implementation. Because of its inherent resilience in the presence of packet loss, SVC-based video will be able to cope with the variable network conditions it will encounter on the least effort plane of service.

A new “lower than best effort,” or least effort queue, is required to facilitate corporate-wide SVC deployment on a business network. SVC traffic, being tolerant of packet loss, should be placed in this least effort queue. This allows all critical business applications and best effort applications to operate as expected, while SVC will consume the remaining bandwidth. Without a mechanism like this, any sizeable deployment of SVC in the corporate network will overwhelm all best effort or unmarked traffic. Service providers should implement this kind of queue, based on a weighted mechanism, to service this “least priority” queue at a lower priority than best effort. This queue is to be used by SVC and other applications that are tolerant to packet loss.

With this kind of CoS in place, enterprises can manage and protect the corporate network, while embracing this new technology.



I. **Security and Privacy**

SVC based applications can run across the public Internet. However, this creates security and privacy concerns. With a suitable network in place, enterprises can operate desktop video on the public or private network by running one VLAN on public space and another VLAN on private IP space. This gives key executives or other users with high security needs the option to use a private network to avoid exposing all of the company's video communications to the public Internet or having to encrypt intra-company calls.

II. **Flexibility and Scalability**

Companies that try to solve network congestion simply by adding more bandwidth risk increase the volume and management complexity of network traffic without addressing the causes of congestion. The solution is to allow companies to select users whose SVC-based calls can run on a higher QoS level, while assigning other SVC application users to a lower QoS level for desktop video calls.

Companies that seek additional bandwidth on an access circuit should be able to simply modify their services using QoS-enabled service scalability, available at a moment's notice. Such a quickly deployed network should also dynamically allocate bandwidth between public and private services based on the traffic's QoS tagging.

III. **Performance**

MASERGY's network is purpose-built for the transport of real-time applications over the converged corporate WAN. The company offers six classes of service available on a global basis, including the industry's first SVC-optimised service queue.

Benefits Recap

- **SVC Optimisation –** Engineered to support Scalable Video Coding desktop video applications
- **Security** – Allows applications to run on a private network without coding or encryption
- **Flexibility** – Permits assignment of users to higher service plane for executive or priority calls that must be protected from congestion across the local loop
- **Simplicity –** Supports entire enterprise application deployment on a single corporate network
- **Scalability –** Allows companies to control bandwidth without adding additional circuits or hardware
- **Performance** – Allows companies to prioritise their corporate applications across six unique CoS levels for improved application transport

The advantages of SVC-optimised QoS are clear: flexibility to run on public or private networks on a single circuit; built-in security for private intra-company communications; and the ability to perform without overwhelming the corporate network.

About MASERGY

MASERGY is a global network service provider that has redefined enterprise wide-area networking by consistently offering superior service performance, the most satisfying customer experience and truly innovative solutions, including global Ethernet and embedded services.

Built from the ground up by networking and telecom veterans with a vision and passion for improving enterprise network service and offerings, MASERGY's pure IP/MPLS network delivers the highest-quality experience with unsurpassed performance, reach, flexibility and scalability.

Often recognised as uniquely innovative and best-in-class by the industry's top analysts and observers, MASERGY has pursued and advanced the global networking industry by providing exceptional network performance, reliable attention to enterprise needs and industry-leading customer satisfaction.