

VIDEOCONFERENCING

The Promise of Videoconferencing

Time is money, and time spent traveling can mean missed opportunities and undue wear and tear on the employee. Fortunately, dramatic improvements in videoconferencing—including the speed, capacity, and reliability of the underlying communications technologies (such as H.323)—has made it a viable business tool. However, videoconferencing over the Internet is a bandwidth-reliant, real-time application requiring a guaranteed delivery mechanism that meets the most stringent Quality of Service standards. The key to ensuring high-quality videoconferencing without compromising the performance of other applications sharing the network is to deploy Sitara QoS solutions capable of controlling all traffic types—from bandwidth-hungry bulk transfers to the most latency-sensitive real-time applications.

Benefits and Challenges

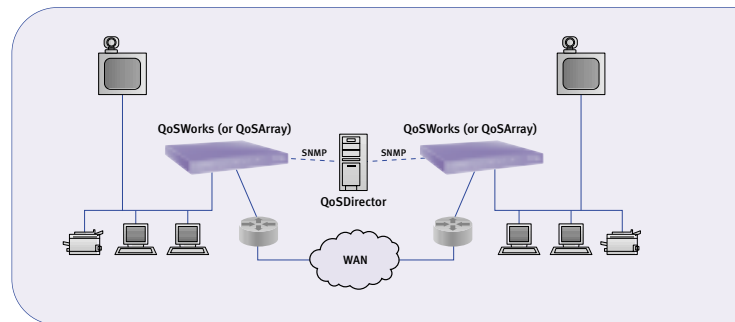
Videoconferencing allows face-to-face meetings without the time, cost, and inconvenience of travel. However, video over IP can use more bandwidth than traditional applications: a typical high-quality videoconference requires 480Kbps of bandwidth, and can starve applications sharing the network of the bandwidth they need to function optimally. Furthermore, videoconferencing requires strict limits on latency (delay) and jitter (variability of delay), both of which can lead to packet loss and severe degradation in voice and video quality and usability. Therefore, to ensure that all of their applications perform optimally, many network managers deploy videoconferencing over a dedicated ISDN line—an arrangement that undermines some of the key cost advantages of deploying videoconferencing in the first place.

BENEFITS

- Optimal voice and video quality for every call
- No need to deploy expensive private ISDN lines exclusively for videoconferencing
- Improved conference completion ratio
- Foundation for implementing strategic converged applications, such as distributed conferencing

PLUS...

- Monitors and controls all traffic—including voice and video
- Eliminates the need to over-provision bandwidth
- Optimizes router performance by offloading QoS functions



The Sitara Quality of Service (QoS) solution enables network managers to deploy videoconferencing over existing networks, while ensuring that all applications on the network perform at their best. The key is to deploy the Sitara QoS solution as an integral part of each videoconferencing deployment, on both ends of links carrying voice and video traffic. The Sitara solution enables the network manager to:

- Pinpoint voice/video bandwidth requirements
- Set policies to protect voice/video traffic
- Monitor the effectiveness of these policies

Only Sitara provides all of the tools required to deliver optimal voice and video quality in one easy-to-manage, flexible, scalable solution. UDP traffic must be managed in a dual-ended fashion therefore Sitara's solution for quality videoconferencing consists of QoSWorks on both ends of the link carrying voice/video traffic. QoSArray should be deployed where a high-availability solution is required. QoSDirector, Sitara's central policy management software, can be used for management of large deployments, advanced monitoring and reporting, and integration with 3rd-party systems, such as OSS and billing systems.

Real-time monitoring

Sitara's monitoring function provides a real-time window into all of the voice/video and data traffic traversing the network. User-friendly charts and reports make it easy to see how much bandwidth each user/application is consuming, and how well network resources are serving them. This gives administrators clear direction on setting up policies to protect voice/video traffic and feedback on how policies are performing once they are in place.

Advanced jitter control

- *Class-based queuing (CBQ)*: provides bandwidth sharing and traffic priority control for RTP and TCP (signaling) traffic.
- *Packet-size optimization*: reduces TCP packet sizes at the source to any specified size (from 1,514 bytes to 1024 bytes). Helps reduce queuing delay for smaller voice/video packets by ensuring that they are not queued behind large data packets.
- *Caching of HTTP traffic*: stores frequently accessed Web pages in a local cache to reduce unnecessary traffic over the WAN and free up more network resources.

Control over packet loss

- *TCP rate shaping*: controls TCP/IP flows by throttling down (or up) the size of the transmission window.
- *Minimum bandwidth guarantee*: ensures minimum bandwidth for all traffic types, including voice/video.
- *CBQ*: provides prioritization and rate control for voice and video traffic.

Control over delay

- *Maximum queue delay*: enables network managers to adjust QoSWorks/QoSArray queue depth in order to achieve the optimal balance of latency and packet loss.
- *Low overhead*: the Sitara solution adds only a negligible amount of additional delay to the network, with no impact on voice and video quality.

Sitara's Scalable, Flexible Architecture

Application-specific QoS

Sitara's QoS solution features an architecture that provides true application-specific QoS by going beyond mere classification. Using a technique called transparent proxy, application traffic is transparently identified, intercepted and redirected to specialized proxies.

Standards-based platform

Sitara's solutions are based on industry-standard hardware and software, which facilitates the rapid development of new, robust features. Investment protection is provided through user-installable feature and performance upgrades. Using standards such as SNMP, Sitara's solutions interoperate with OSS and other networks management systems.

CASE STUDY

A multinational corporation wanted to deploy videoconferencing between headquarters in Singapore and a branch office in London. Voice and video traffic were to share a 512Kbps link with e-mail and other traffic. QoSWorks worked seamlessly with the company's existing bandwidth on the same network to ensure optimal voice and video quality.

Step 1: Pinpoint voice and video bandwidth requirements

Prior to deploying videoconferencing, the customer used QoSWorks to take a baseline reading of bandwidth usage by existing applications, particularly over WAN links. The bandwidth needs of mission-critical applications were accounted for first, before allocating bandwidth for the less-critical applications such as Internet access.

Step 2: Set policies to protect voice and video traffic

The company needed to allocate 480Kbps of bandwidth to videoconferencing (384K with 25% overhead). They also set the maximum queuing delay in the QoSWorks box for voice packets to 150 ms. They then divided the remaining 32Kbps of bandwidth between the data traffic, prioritizing latency-sensitive TN3270 over e-mail. They set the maximum transmission unit for TCP traffic to 1024 bytes, to minimize queuing delays experienced by video conferencing packets.

Step 3: Monitor policy effectiveness

Monitoring versus policies allowed the company to tailor policies as they added more users and application types to the network.

Results:

Optimal voice and video quality was achieved without compromising the performance of the other applications sharing the network.



Sitara Networks Corporate Headquarters

52 Second Avenue
Suite 200
Waltham, MA 02451
Phone: +1 781 487 5900
Fax: +1 781 684 8291
Email: inquiries@sitaranetworks.com

Sitara Networks EMEA

Phone: +44 8823 9421
Fax: +44 8823 9430
Email: emea-inquiries@sitaranetworks.com

Sitara Networks Asia Pte Ltd

Phone: +852-2251-1961
Fax: +852-2251-1707
Email: asia-inquiries@sitaranetworks.com

www.sitaranetworks.com

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