

Featured Article

Overcoming the Challenges of Video-Over-IP Transport

By: Per Lindgren, Net Insight

Video, data and voice services are not created equal and have different requirements for transport. Data can be sent in bursts, while video requires a constant stream. IP technology was developed for data traffic where retransmission addresses data loss. Delay and jitter are non-issues for IP data. The congestion that occurs now and then is a normal state of network operation, and is actually used to control the amount of data users send to avoid severe congestion. Traditionally, IP routers and, more recently, MPLS routers, have handled the transport in the IP architecture. These techniques are based on packet switching, and have excellent characteristics for statistical multiplexing for increasing the network utilization for "bursty," best effort data traffic.

Network engineers have introduced QoS mechanisms to accommodate more demanding services such as video, audio, voice and high bandwidth file transfers, aiming to reduce data loss and jitter characteristics. Early R&D concluded that the only reasonable way to introduce QoS mechanisms in the routers was priority, which led to standards of DiffServ, MPLS priority and IEEE 802.1p Ethernet priority. Priority works well when the relative amount of QoS-demanding traffic is small, but as the amount of QoS-demanding traffic increases, this solution slows down the migration of all services to IP and the introduction of new services.

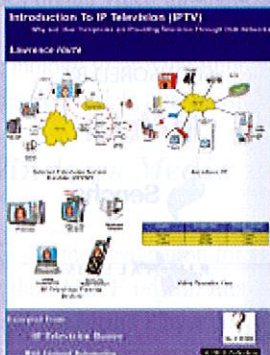
One way of solving this problem has been to heavily overprovision the capacity of the network. However, this solution leads to an explosion in CAPEX and OPEX and is not scalable.

The QoS Impact on Network Utilization

In order to maintain high QoS in IP networks, the load on the network needs to be below 30 percent. However, network load is dependent on the network topology, indicating that the more router hops in the network, the lower the load must be. The number of hops affects this because, in each router or MPLS element, there is cross traffic from other streams that share the same resources in the router. The traffic streams thereby affect each other, making them "burstier" with the result of extensive jitter and packet loss. This problem escalates with increased amounts of traffic.

The Impact of Prioritization on Network Scalability

The introduction of IPTV and legacy migration complicates this even further as high priority traffic increases. With the increased amount of TV services, there is an unfortunate combination of simultaneous requirements for high quality and high bandwidth, which rapidly increases the load of high priority traffic. In addition, lower priority traffic receives significantly worse service in a network with a lot of high priority traffic.



Introduction to IP Television (IPTV)

by: Lawrence Harte

This book explains how and why people and companies are using IP television services and how global television services are already available through broadband data networks. You will learn how IP Television works and the different types of viewing devices that can be used in IPTV systems such as standard televisions with adapters, dedicated IP televisions, multimedia computers and mobile telephones.

ISBN: 1-932813-35-7

Price: \$14.99 print version or \$12.99 eBook !!!

www.AlthosBooks.com/iptv.html

Packets getting dropped at one router/MPLS switch are the result of the traffic becoming burstier in another part of the network; the burstiness increases with each hop, and the final hop results in dropped packets. This makes it more difficult to troubleshoot as the network becomes bigger.

Monitoring in Large Scale IP Media Networks

In large scale IP networks, the introduction of IP multicast and QoS mechanisms increase the complexity of the network with several dimensions, making network monitoring more complex and time consuming. Because QoS engineering in IP networks is about how this traffic should be treated relative to other traffic, the engineering requires a great deal of fine tuning to make the QoS sufficient for the demanding services. Also, as the network changes are built out or new services are introduced, the network operator must redo the engineering and corresponding fine tuning. An operator cannot engineer newly deployed parts of the network independently, as there is interaction between already deployed and new parts of the network. The same situation also occurs for services where new services are affected by those already-deployed and vice versa. This makes rollout of new ser-

vices and migration of legacy services to IP complex and time consuming, making time to market longer than necessary.

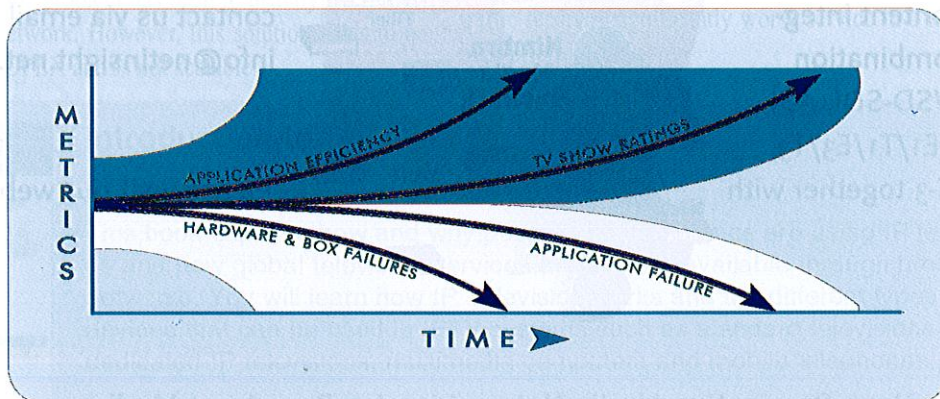
The Importance of Quality of Transport (QoT)

To meet the demand for today's media rich content as well as future broadcast content, operators and service providers must be able to design networks capable of delivering quality of transport (QoT); meaning transport without jitter, delay or reduced quality for both broadcast (linear) and on-demand (non-linear) services to a multitude of in-home devices. The industry needs a highly flexible solution that combines the best of multi-circuit switching, as required for transporting large and media rich video signals, with the best of packet-switching, as well as unified monitoring and service provisioning, delivering full-featured and cost efficient multicasting capability. As media and other QoS demanding traffic increases, legacy IP/MPLS solutions do not provide a business viable means for transporting QoS demanding traffic.

Do your TV Services measure up?

Organizations launching IPTV services must monitor their performance.
Peak efficiency leads to maximum revenue and minimum costs.

When tracking Application Performance, Technology Efficiency or TV Audience Ratings – ZapTracking from DigiSoft may be your solution...



... contact **Digisoft.tv** to see how you measure up!

For more info: www.digisoft.tv (303)-926-4921

POWERED BY



THE IPTV METERING SPECIALIST

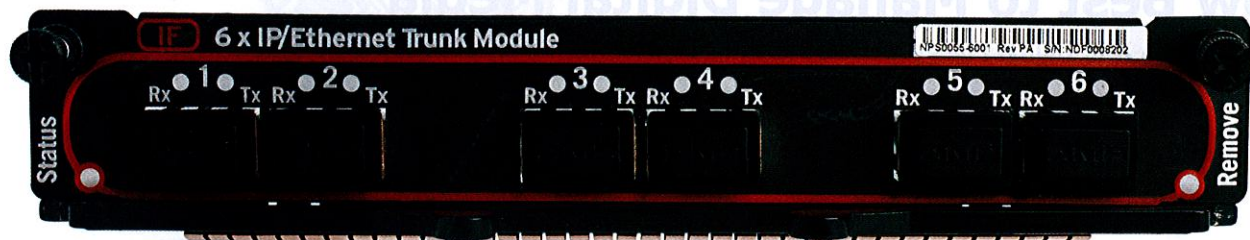


Figure 1, Net Insight Trunk Module. Source Net Insight

Providing Excellence in Media Transport through Channelized IP

Channelized IP is the only IP business model to effectively deliver 100 percent QoS for all media services, 100 percent of the time. By introducing strict resource reservation and separation to IP-networks, QoS bottleneck issues are solved, ensuring a significant, simplified handling and improved infrastructure utilization, lowering CAPEX and OPEX while providing the ability to launch new TV and video related services.

By utilizing channelization with end-to-end provisioning, each type of traffic, including IP, Ethernet, HD/SD SDI and ASI video and AES/EBU audio, can be routed over its own separate channel, which helps minimize jitter, packet loss and traffic delays. Some players rely solely on the MPLS approach for managing the growing amount of rich media traffic over the network. Net Insight offers a channelized approach rather than a priority-based solution to QoS, where management, video, voice, and data are transported on dedicated "channels" of the real-time network, in a media-centric MEF architecture, eliminating any packet loss due to traffic.

Through Channelized IP, Net Insight enables customers to increase revenue by implementing new services and entering new markets. Customers also benefit from increased utilization of the existing network. High utilization means fewer fibers, wavelengths and ports are needed, and therefore less equipment.

Figure 1 is a product photo of the Net Insight Channelized IP Trunk. The solution supports broadcasters, media networks, IPTV/CATV operators, Metro Ethernet and telecom operators, and is aimed at fulfilling the highest capacity and availability demands of these customers, offering twice the access and trunk port count as

other switches on the market, and 97 per cent bandwidth utilization to accommodate services such as compressed and uncompressed HD video, voice and high-speed data. Operators can use this solution to form virtual networks for any application, such as QoS multicast transport of IPTV/CATV traffic, distributed office LAN applications, file transfers or live broadcast video, and combine it with native video, audio and telecom services.

As broadcaster requirements for different media feeds may vary depending on resolution, coding and usage, an operator's ability to deploy an optimal mix of IP capacity and optical links will be key in differentiating service offerings based on QoS aspects.

Net Insight delivers the world's most efficient and scalable transport solution for Broadcast and IP Media, Digital Terrestrial TV, Mobile TV and IPTV/CATV networks. Net Insight products truly deliver 100 percent Quality of Service with three times improvement in utilization of bandwidth for a converged transport infrastructure. Net Insights Nimbra(TM) platform is the industry solution for video, voice and data, reducing operational costs by 50 percent and enhancing competitiveness in delivery of existing and new media services.

For more information go to www.netinsight.net or call +46 8 685 04 00.