A case study of

Delivering IPTV with Predictable Quality of Experience

The Issue

The network demand for media-rich content began to grow exponentially from 2007, particularly for video services.

With distribution to 19 member companies, WIN began to receive reports that end users were experiencing tiling and artifacts in video signals distributed by the network. As the provider of IP video infrastructure, the company needed to resolve these problems in order to cope with the growing demands video was having across its network.

Localizing the problem areas were difficult. Network operators could not easily identify where errors were occurring, because of a complicated three-layer puzzle of interlocking content delivery mechanisms: head-end, fiber optic ethernet over SONET (transport) and last mile (usually from the telephone company in the local area).

To try and help WIN resolve the issue, their engineering team introduced video quality probes on each layer to monitor the transport network performance. The objective was to determine specific traffic interruptions and to try and identify approximately where they were likely to happen. After a number of months of monitoring and testing, the only thing clear was that the errors with the signals were sporadic and not confined to any one component or location, making resolving the issue a tall order.

The Solution

One of WIN's member companies had deployed a Net Insight Nimbra solution to help with delivery of data within their territory. Through this limited deployment, engineers at WIN became familiar with the unique strengths of the Net Insight Nimbra platform, especially with regard to Quality of Service for data services.

THE COMPANY

Wisconsin Independent Network (WIN) started in 1999 and is part of Communications Management Group, LLC, a privately-held company based in Eau Claire, Wisconsin, USA. WIN offers state-of-the-art fiber optic net-work and data center services in the states of Wisconsin, Minnesota, Illinois, and beyond.

It is jointly owned by a consortium of 31 independent local telephone companies that serve over 200,000 telephone, internet and video customers. WIN began operations as a small ten-node SONET ring. Over time it has added over 3,000 route-miles of fiber infrastructure, created fifteen SONET rings and added 70 new points of presence.

WIN shared information about the difficulties they were experiencing with their current transport infrastructure with engineers at Net Insight. Based on their experience, they hypothesized the intermittent issues were being caused by non-linear behavior of the existing Ethernet infrastructure. Net Insight suggested the Nimbra's unique strengths with respect to Ethernet QoS and multicast could be brought to bear against WIN's issues, Net Insight advised WIN to implement the Nimbra 680 platform and utilize the Nimbra's Ethernet Transport Service.

WIN decided to perform a pilot test across a 90-mile network segment between the head-end in Westby, Wisconsin and a member in Oxford, Wisconsin. The test was architected alongside the existing solution so parallel comparative data could be gathered on both the Nimbra network and infrastructure that did not run the Nimbra solution. The entire Nimbra solution was implemented in a matter of days riding spare wavelengths on WIN's DWDM systems. The trial network was up and running in less than four days.

netinsight

"The benefits of the Nimbra platform have given us the flexibility, quality and reach that we require."

The Result

After deploying the solution, the test results were immediate and overwhelmingly favorable. Tiling and artifact issues disappeared immediately. Network measurements proved the existing network infrastructure suffered a highly-disruptive 0.5 percent packet loss on content delivery. Once the Nimbra platform was implemented this loss was reduced to zero. Net Insight's efficient multicast capability allowed the reliable delivery of video plus other premium services to share the same infrastructure.

Based on the success of the initial trial and subsequent production deployment, WIN introduced more than twenty new Nimbra nodes across its entire network. The Nimbra platform is capable of 10Gbps trunks but WIN opted for the 4 port 2.5Gbps cards instead. That allowed them to add another 2.5Gbps when needed by simply adding another wavelength on their DWDM system.

"The benefits of the Nimbra platform have given us the flexibility, quality and reach that we require as a Tier I level wholesale bandwidth provider," said Scott Hoffmann, CEO of Wisconsin Independent Network (WIN). "We selected the Nimbra platform given Net Insight's track record as a preferred provider of video delivery product in the broadcast distribution space. We are currently using the new Ethernet Switching Feature as part of our Predictable Ethernet service offering, including IPTV distribution, and like the Nimbra platform for its ability to affordably deliver other Ethernet services on same platform."

The Nimbra platform is a versatile transport solution with several unique features for virtual head-end solutions, including redundant head-end protection switching. IPTV operators deploying virtual head-end services based on the Nimbra platform not only get a network but a multi-service transport infrastructure that opens up new business opportunities, including video-on-demand, games-on-demand, and e-commerce.
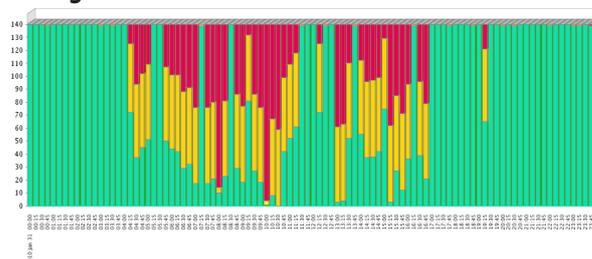
Midwest Video Solutions, in which WIN has ownership, provides digital television services to communications providers. These services enable WIN's members to offer robust IPTV services over their tele-communication networks to their subscribers. Thanks to the implementation of the Nimbra network Midwest Video Solutions delivers trans-pacific virtual head-end services to soldiers stationed in a US military base in Japan.

"The Nimbra platform has significantly reduced bit error rates in our service, allowing us to deliver a pristine IPTV service half way around the world," says Marty Snustead, Executive Director of MVS. "We are currently using Net Insight's solution as part of our statewide Digital TV service for local communications providers in the state of Wisconsin, and for providing services to the US military base in Japan."

Before Migration

After Migration

netinsight