Increased QoS over an IP/MPLS network and reduced cost for Embratel

A large scale, national media network based on IP/MPLS

The Issue

Embratel has a unique history of offering media transport services for the major broadcasters and events on national and international level, using their satellites.Most fixed location services have been based on Asynchronous Transfer Mode (ATM), and in the process of changing to a more modern media network, the natural choice of technology has been to consolidate video services on its existing and modern IP/MPLS network.

However shifting to a new technology is not without challenges. The issue was that Embratel's ATM-based network was a separate network and while the vision was to integrate video onto the same network the strict requirements of video with packet loss in the range of 10-9 (maximum one hit per day) and jitter down to 1 microsecond is not what IP/MPLS networks are able to offer, even with the strictest QoS xlasses This however is what broadcasters essentially require.

To offer a more advanced solution to the market providing new opportunities for high quality contribution and remote production, video transport is based on JPEG2000 high-quality, low-latency encoding.

Implementing high quality services on top of an MPLS network is fairly complex and requires a large degree of configuration to ensure that the different types of traffic do not interact with each other. Also, the normal way to configure services is to use a full-mesh topology between the service locations, which means the number of service connections scales with N2 result in a larger number of connections that need to be configured and traffic engineered. The introduction of new sites requires connections to all existing sites. These architectural characteristics drives the operational costs and complexities of the network solution.

Another big challenge is to offer greater flexibility and reduce the operational cost for providing video services. The previous solution was relatively static, however as the bandwidth of the video services, which are not of a permanent nature, increased, a requirement for the new network to use the capacity more efficiently. Also the network should offer services in the way broadcasters are using it with on-demand service provisioning, with the aim to offer customer self-provisioning.

The Company

Embratel is one of the biggest Brazilian companies and leader in the telecommunication sector offering IT and telecom solutions. The company is one of the few operators that have national coverage over the vast country of Brazil. Embratel is also the largest satellite operator in Brazil and Latin America.

Combining these requirements, as well as strict QoS, on-demand and low OPEX operations in one solution remained a big challenge when looking into the different architectural choices.

The Solution

Net Insight's Nimbra media transport platform has been designed with the strictest QoS levels demanded by broadcasters in mind. Also, a very large investment has been made in R&D to automate operations in configuration and service activation. The Nimbra platform offers capabilities to increase the QoS over an IP/MPLS network and to reduce the operational cost of the solution. The provisioning of services has been greatly simplified by separating the services from the transport and incorporating the use of individual connections for each service. This approach offers perfect control, a simple service activation and the possibility to monitor each service individually.

Embratel's EVSOL (Embratel Video Solution) selected the Nimbra 600 series, the multiservice video transport platform that has advanced L2VPN modules for datacom services with guaranteed bandwidth and video modules with built in JPEG2000 encoder/decoders and support for ASI as well as uncompressed video, audio modules for AES and MADI. In addition, special IP transport interfaces with Forward Error Correction (FEC), shaping and guaranteed QoS capabilities. All services including the L2 VPN services can use hitless protection which allows for non-stop operations without

"We offer the best solution to the world's most demanding TV companies""

losing one bit of data, even with network faults. The Nimbra platform is a carrier class, NEBS certified platform for telecom environments.

Furthermore, the Nimbra platform software, NimOS, has an advanced built in control plane with network wide routing, signaling for service set up, plug-and-play auto configuration control located centrally via SNMP for access from Net Insight's network management system Nimbra Vision or third party booking/ provisioning systems. Embratel uses the Nimbra's NimOS functionalities to offer on-demand services to the broadcast market and integrates it with third party management systems. For day-to-day operations Nimbra Vision is used for central control.

In the integration with the Embratel IP/MPLS backbone network, there was also a strong desire to simplify the structure to get a better overview of the network for trouble shooting without requiring a large amount pf work in configuring the core network. Another requirement was that reconfiguration of the IP/MPLS network should not be needed when setting up new services. This was possible by using the Nimbra platform IP trunk functionality, which aggregates media services on a QoS protected, monitored trunk. The IP trunk aggregation capabilities reduces the number of IP/MPLS connections (TE LSPs) from 144 to 14 TE LSPs. Which in turn reduces the configuration time and simplifies BW calculations, monitoring and troubleshooting. For example an expansion at one new site requires 2-3 new TE LSPs rather than, in the full-mesh case, more than 10.

In the Embratel EVSOL, the built-in monitoring system, which is divided into service layer and transport layer performance monitoring with history data, offers a superb tool to verify that Embratel delivers the SLAs agreed with the customer and makes trouble shooting easier in terns on finding and identify problems in the services offered in the customers' service interfaces as well as the IP/MPLS core. This avoids a number of issues and allows Embratel to rapidly resolve potential problems in the services.

The Results

The Embratel EVSOL implementation started during 2014 primarily offering live sport events to the market and during the FIFA 2014 World Cup tournament, it will be used for contribution of football matches to some of the largest national TV companies.

The EVSOL project has been delivered by Net Insight and NEC together as a team, offering global media transport experiences and local advanced telecom support. This strong team together with the experienced Embratel organization has jointly made a swift implementation of this large and complex project.

"We have found the high competence of the Net Insight and NEC team, together with the high-quality Nimbra video transport platform, to be the best choice for our new Embratel Video Solutions. We offer the best solution to the world's most demanding TV companies," says Claudio Zylberman, director at Claro hdtv/Embratel.

Embratel is looking to expand the service offering of the EVSOL to cover other areas such as distribution services, low-bandwidth contribution and media company specific datacom services as the installation grows.

"We see endless possibilities to expand our service offering of EVSOL based on the advanced Nimbra platform. Also, the strong QoS functionalities combined with the advanced monitoring capabilities ensures that we can offer the highest quality services to our customers," says Zylberman.