Arsat - A nationwide ISDB-T distribution network

A nationwide ISDB-T distribution network with SFN and MFN

The Company

Arsat is a government-owned corporation in Argentina which began operating in 2006. Arsat holds rights over the engineering and development of national satellites to be manufactured within the scope of the Communications' Argentine Geostationary Satellite Project. Arsat covers the southern area of Latin America, delivering satellite bandwidth for services including: voice, data, audio and video.

The Issue

After adopting the international Japanese digital TV standard, ISDB-Tb, in late 2009, the Argentine government decided to implement a common nationwide network as a coordinated effort for a rapid roll out of state owned channels. Arsat, the government controlled satellite company, is responsible for implementing the project.

Arsat identified the following key requirements for implementing distribution of TV signals to transmitter towers of ISDBTb signals.

The network:

1) should be rapid to deploy and still maintain the highest level of quality

2) should be expandable without risking the quality to the existing transmitters

3) should support both Single Frequency Network (SFN) and Multi Frequency Network (MFN) distribution as the dense region of Buenos Aires will have SFN and the rest of the country will be MFN

4) had to be implemented using a mix of telecom leased capacity, radio links and fiber as well as satellite

5) should be centrally managed from Arsat´s Network Operations Center

The implementation of the Argentine analogue network has, as in most countries, been implemented gradually over some 50 years. The goal for the new digital network was to have the first Buenos Aires city coverage before the FIFA World Cup 2010, less than 6 month after the ISDB-T decision had been made. The pressure to deliver a friction free and reliable deployment of the infrastructure was significant.

The Solution

After a thorough technical evaluation and by examining references, in conjunction with some of the largest operators in Argentina, Arsat came to the conclusion that Net Insight's Nimbra solution was perfectly suited for its ISDB-Tb distribution network. Net Insight's Nimbra 300 series were selected because of their rich features, compact footprint and easy configuration.

The Arsat network is made up of two parts that use different distribution strategies. One part is for distribution within one SFN area around Buenos Aires, covering the area from Mar del Plata, in the South, to Rosario, in the North West. This constitutes a 700 km long area with continuous TV coverage, offering the highly populated coastal areas such benefits as mobile TV coverage for commuters.

The SFN distribution network uses capacity of the telecom operators' network, mainly STM-1 capacity. For a fully redun

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“The Nimbra platform gives us the capability to continue expanding at a rapid pace”

dant and reliable transport, each site is reached by at least two paths and at each site the Nimbra equipment is duplicated. Due to the traffic engineering capabilities of the Nimbra platform such a redundant configuration is very easy to set up with complete control in planning the distribution.

In the region of Buenos Aires, the Nimbra network handles the distribution of the four Broadcast Transport Streams (BTSes) together with its unique way of transporting time signals from a Rubidium Clock (1 PPS and 10 MHz) to the transmitters operating in SFN mode.

The second part of the network uses fiber distribution with satellite as back-up, due to the long distances. Here the feeds are executed with to the main cities. In each region local insertion is possible and ISDB-T multiplexers are created locally. If an SFN is needed it is possible to create separate SFN areas with local Nimbra distribution.

The Nimbra equipment, with its plug and play functions, such as management and service connection settings, is centrally pre-configured in Buenos Aires before being transported to different sites. At each site the equipment is simply connected and powered up and automatically connected to the other nodes in the network. As Argentina is a large country this saves a lot of work and there is no need to send qualified personnel to each site. The remotely located equipment is centrally managed from Arsat´s Network Operations Center, located in Benavidez, Province of Buenos Aires.

The Results

The first transmission started in Buenos Aires city before the FIFA World Cup in 2010, after a record-fast implementation. Twenty-five transmitter stations were put in place and the area of greater Buenos Aires and other cities had digital TV by the end of 2010, making it the fastest and most reliable installation of digital TV in Latin America. The next goal was to cover a large part of Argentina before the end of 2011, which was achieved. The network continues to grow in preparation for the FIFA World Cup in 2014.

The success of the first implementation phase demonstrated the ease of operation and reliability of the Nimbra platform. In addition, telecom operators involved in the project appreciated the functionality and reliability of the Nimbra platform and are now able to offer other video services, such as contribution service, using Net Insight’s solution. “The reliability and plug-and-play functionality has helped us to implement our digital TV faster and with less trouble than expected”, says Martin Fabris, Operation Manager at Arsat.

In the area of Buenos Aires ten transmitter stations are operating in SFN mode making the Argentine ISDB-Tb installation currently the biggest ISDB-Tb SFN installation in the world.

Net Insight AB (publ)
Phone +46 (0)8 685 04 00, info@netinsight.net, www.netinsight.net
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