Broadcast Infrastructure Operator Reduces Costs of Nationwide Television Network

Abertis Telecom built a hybrid satellite and terrestrial IP distribution system for digital television broadcasting.

EXECUTIVE SUMMARY
ABERTIS TELECOM
• Broadcasting
• Spain
• 1300 Employees
BUSINESS CHALLENGE
• Meet deadline for switchover to digital terrestrial television
• Provide mandated population coverage
• Minimize capital expense and reduce operational expense for satellite and terrestrial networks
NETWORK SOLUTION
• Combined satellite and IP terrestrial networks to distribute content nationwide in the most efficient way
• Upgraded satellite network to use more bandwidth-efficient Digital Video Broadcasting – Satellite Second Generation (DVB-S2) modulation
• Upgraded terrestrial network from ATM to IP
• Received custom project management from SciCare Services.
BUSINESS RESULTS
• Significantly reduced capital expense
• Significantly reduced operational expense
• Lowered customer prices, helping to increase market share by 20 percent

Business Challenge

Abertis Telecom is Spain's leading telecommunications infrastructure and services provider, with 3200 broadcasting and distribution sites serving more than 12 million homes. The company earns a large portion of its revenues from national and regional broadcasting for television and radio and is also expanding into international markets. In 2006, Abertis Telecom acquired a 32 percent stake in Eutelsat, whose fleet of 24 satellites in orbit make it the largest satellite operator in Europe and the third largest in the world.

Spain has mandated that operators convert from analogue to digital broadcasting for terrestrial television by April 2010. To comply, Abertis Telecom needed to provide digital broadcasting to 96 percent of the population for commercial TV and to 98 percent for public TV.

As it prepared for digital switchover, Abertis Telecom also wanted to reduce network costs. The operator distributed most content over its satellite network and also maintained an ATM terrestrial network, used mostly for backup and for regional content. By reducing the capital and operational expense of both networks, Abertis Telecom would be able to charge its customers less for broadcasting time, helping to increase market share. "More advanced satellite and terrestrial broadcast technology would reduce costs and also enable us to offer more and better services in the future," says Sergio Tortola, Technology Director, Abertis Telecom. "Abertis has a history of investing in technology to become more effective and more efficient."

Network Solution

In 2008, Abertis Telecom rolled out a nationwide Digital Video Broadcasting (DVB) transport solution based on Cisco technology and services. "We like to work with vendors that have a global view and the capacity to advance the market," says Tortola. "We have had a very positive experience with Cisco solutions during our long relationship. In addition, we like Cisco's approach and commitment to service. The company is consistent in its flexibility and willingness to evolve its products to meet our needs."

The new architecture combines satellite and terrestrial IP to distribute signals to broadcast transmitter sites and content production centers throughout Spain in the most efficient way. Typically, national broadcasts are delivered over satellite and regional broadcasts over IP. When needed, both networks can provide backup for the other.

Satellite Network

To increase bandwidth efficiency, Abertis Telecom deployed Cisco D9804 Multiple Transport Receivers, which support the DVB-S2 satellite modulation scheme. Previously, with DVB-S, Abertis needed one transponder for every two multiplexes. "With the Cisco DVB-S2 solution, one transponder carries three multiplexes, a 33 percent efficiency gain," Tortola says. "Instead of using three transponders and six reception devices per site, we now need only two transponders and can receive all streams within a single unit. As a result, we need fewer spare parts, have greater redundancy, and can offer better service-level agreements."

> "We have transferred our cost savings to our customers in the form of lower prices, which helped us to increase market share by 20 percent."
>
> — **Sergio Tortola, Technology Director, Abertis Telecom**

Terrestrial Network

Abertis upgraded its terrestrial distribution network from ATM to IP by using Cisco ASI-to-IP (Asynchronous Serial Interface-to-IP) gateways. At the originating site, the gateway encapsulates the MPEG-2 video streams so that they can be carried over the Ethernet network. At the receiving site, another gateway converts them back. "The other solutions we evaluated either had far more capacity than we needed or lacked important features such as stable clock recovery for use in Single Frequency Networks," says Tortola. "Cisco provides a customizable solution that's adapted to the kind of signals we distribute."

Results

Increased Market Share

Lowering capital and operational costs has enabled Abertis Telecom to reduce its prices and gain a competitive advantage. "We have transferred our cost savings to our customers in the form of lower prices, which helped us to increase market share by 20 percent," says Tortola.

Lower Costs

The Cisco solutions have reduced capital as well as operational expense:

- Significantly lower capital expense: Abertis Telecom previously had to purchase and maintain large numbers of receivers, usually one primary and one spare receiver for each multiplex stream. A transmitter site that received six multiplex streams, for example, needed 12 receivers. Now, a single Cisco multiple transport receiver can accept up to six multiplex transmissions.
- Thirty-three percent reduction in transponder needs: Content that previously required three transponders now requires just two.

- Thirty percent lower operational expense for the satellite network: One reason is that DVB-S2 optimizes satellite bandwidth. Another is that in-band control reduces the number of times that Abertis Telecom's technicians need to travel to distribution sites to change device configurations.
- Additional operational cost savings: "Using the same manufacturer's technology platform for our satellite and terrestrial networks simplifies procurement and support," says Tortola. "It also reduces training costs because our people can learn one technology instead of two."

Increased Service Level Agreements

In the first six months of operation, availability for the satellite network has been "incredible," according to Tortola, who is continuing to monitor availability. "So far, our global service-level agreements are better than they were before," he says. The network has had no major events in any of its more than 300 IP transmitter sites.

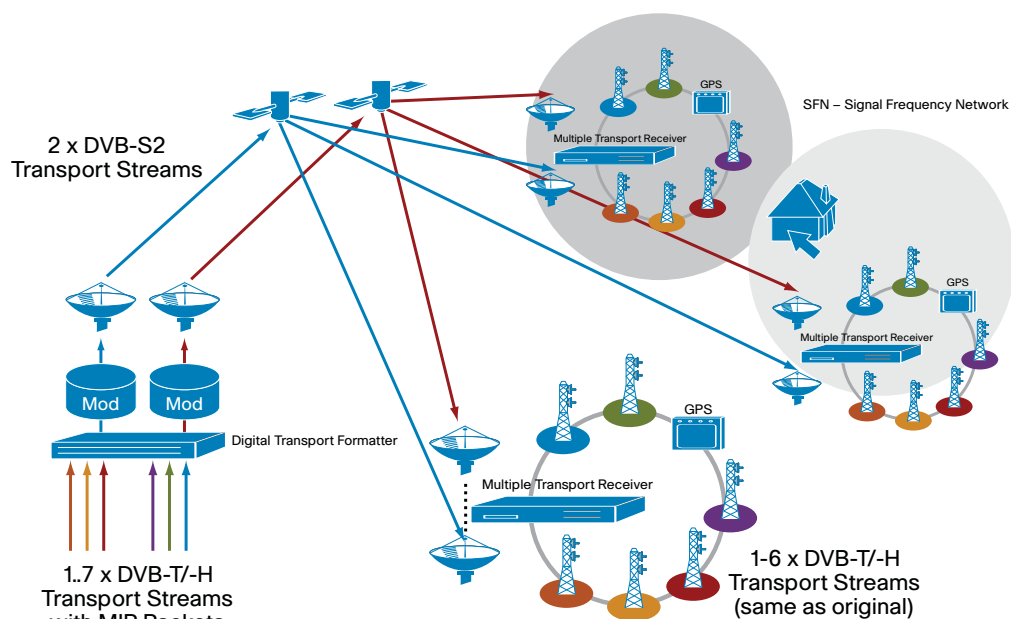| PRODUCT LIST |
| --- |
| **Product List** |
| • Cisco D9804 Multiple Transport Receiver for satellite delivery |
| • Cisco D9435 ASI-to-IP Gateway for terrestrial delivery |
| • Cisco D9402 IP-to-ASI Gateway for terrestrial delivery |
| • Cisco ME 3400 Ethernet Access Switch |
| • Cisco D9900 DCM Digital Content Manager with Digital Transport Formatter (DTF) option |
| • Cisco In-Band Control Computer |
| **Service List** |
| • SciCare Project Management Services |
| • SciCare Architectural Design Services |
| • SciCare Project Integration Services |
| • SciCare Third Party Product & Integration Services |
| • SciCare Technical Support Services |

Next Steps

Abertis Telecom is currently developing new services to be delivered over the Cisco network. Tortola concludes, "We are helping Cisco evolve its broadcast solutions, and we are the first to benefit. Being early to market with new solutions gives us a competitive advantage. A high degree of collaboration with Cisco has helped make this project a success."

Solution Implementation

As shown in Figure 1, Abertis Telecom's satellite solution combines multiple DVB-T carriers; secures them using the Basic Interoperable Scrambling System (BISS); modulates them with DVB-S2; and transmits them over the satellite link to multiple receiver sites. The receivers at each remote site demodulate, decrypt, and route up to six individual DVB-T carriers to the respective transmitter for re-broadcast without altering the Single-Frequency Network (SFN) criteria. The architecture is capable of providing over-the-air control of each individual receiver and can be delivered as a turn-key solution by SciCare™

Figure 1.   Distribution of Multiple Transport Streams Over Satellite

2 x DVB-S2
Transport Streams

SFN – Signal Frequency Network

GPS

Multiple Transport Receiver

GPS

Multiple Transport Receiver

Mod   Mod

Digital Transport Formatter

GPS

Multiple Transport Receiver

1..7 x DVB-T/-H
Transport Streams
with MIP Packets

1-6 x DVB-T/-H
Transport Streams
(same as original)