Irish Government launches digital terrestrial television pilot service

BT enables the Irish Government to lay the foundations for Ireland’s first free-to-air digital broadcast network – using less spectrum to facilitate more consumer choice and market opportunity

Executive Summary

Traditional analogue broadcasting uses huge amounts of radio spectrum and offers limited services. Moving to digital broadcasting enables a vastly richer broadcast experience and releases spectrum for new mobile and wireless computing applications. Digital Terrestrial Television (DTT) is currently being rolled out across Europe and is already in extensive use in the UK and the US. The European Commission has proposed a deadline of 2012 to cease analogue broadcast transmission. The Irish Government is responding to this challenge.

Tapping into the expertise and resources of BT, the Department of Communications, Marine and Natural Resources has built a state-of-the-art broadcasting network to pilot Ireland’s first digital free-to-air service. The second phase of the project will involve the distribution of set top boxes that will enable 1,000 trial participants to sample the four main Irish channels – RTÉ One, RTÉ Two, TV3 and TG4 – as well as the national radio channels, RTÉ 1, RTÉ 2fm, RTÉ lyric fm, RTÉ Raidió na Gaeltachta and Today FM.

The implementation of this trailblazing BT managed service – completed on time and within budget in just 16 weeks – will help Government and key stakeholders to decide on the optimum way to achieve national rollout of free-to-air digital terrestrial television. It is also set to play a wider role in terms of shaping and stimulating the digital TV market in Ireland – helping to provide increased choice and opportunity to consumers, broadcasters, programme makers and other content providers.

“Not only will the project create an opportunity to test a digital broadcasting service, but it will also generate awareness and discussion among interested parties in a full rollout of free-to-air digital terrestrial television.”

Noel Dempsey TD
Minister for Communications, Marine and Natural Resources
Irish Government
Marketplace

On behalf of the Government, the Department of Communications, Marine and Natural Resources has responsibility for Ireland’s telecommunications and broadcasting sectors. The Department has a key role in developing a framework for broadcasting in an environment of rapid technological development and convergence.

The Department’s Broadcasting Division aims to develop policies and a legislative framework to facilitate the provision of quality Irish-based broadcasting services. The goal is to optimise the contribution to the development of the Information Society in Ireland of broadcasters, programme makers and content providers as well as infrastructure operators and other participants in broadcasting-related activities.

Business Opportunity

There are two key business drivers for digital broadcasting. The first is the development of a multi-channel, interactive and ultimately High Definition (HD) broadcast industry. The second is the release of valuable radio spectrum for new services such as mobile and Wi-Fi.

To meet these objectives and the European guidelines, the Irish Government started to explore possibilities for the creation of universal free-to-air nationally broadcast programming on digital television platforms in 2004.

To move its vision forward the Department decided to run a trial – the Digital Terrestrial Television (DTT) pilot – to identify the issues associated with a transition from an analogue terrestrial TV platform to a digital one. As well as providing key learning, this strategic initiative plays an important role in developing the TV market in Ireland by making digital service available for the first time from terrestrial transmitter systems.

The Minister for Communications, Marine and Natural Resources, Noel Dempsey TD, commented: “The European Commission has proposed 2012 as the date by which switch-off of analogue TV could be completed across Europe and this pilot plays an important step in informing the development of Ireland’s long-term broadcasting strategy.”

BT solution

A number of elements were required for the pilot including a managed encoding, multiplexing and distribution service. Other key requirements, outside of BT’s scope, included the deployment and operation of two new digital transmitters at Clermont Carn, in the North East of Ireland, and at Three Rock Mountain in South Dublin.

Following an extensive public tender and evaluation exercise, the Department awarded the contract for the digital encoding, multiplexing and distribution to BT. In developing its solution BT was able to combine the global capabilities and technical expertise of BT Media and Broadcast – a specialist unit of BT focused on the needs of the broadcast industry – with the local delivery, transmission and service management expertise of BT Ireland.

Kevin O’Brien, Principal Officer for the Department’s Broadcasting Division says: “BT demonstrated a joined-up approach to working with us. This helped to ensure clear communication, which was particularly important given the complexity and pioneering nature of the project. Knowing that we could call on BT’s pool of resources at any time proved to be a big help.”

Designed to deliver very high availability, the solution uses sophisticated digital content and data management technology to transport and manage video, audio and data. The fact that much of this technology has been developed at BT’s own research and development facilities at Adastral Park (near Ipswich, UK) provides the company with the confidence to meet the extremely tight service and commercial terms associated with broadcasting networks.

Implementation, however, presented many challenges. The first of these was to build an input network to gather uncompressed programme content – via fibre circuits from RTÉ Donnybrook as well as services downlinked directly from satellites – into the BT Multiplexing Centre located in a hosting facility at Citywest in Dublin. BT designed and erected a special steel gantry to support six satellite dishes on the roof of the hosting facility. The project team also had to respond to other unforeseen requirements.

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These included bringing forward another infrastructure project to facilitate the delivery of new equipment racks, in addition to re-locating equipment carrying live broadcast traffic at RTÉ Donnybrook.

Next, BT had to create the distribution network that will carry the compressed signal from the Multiplexing Centre to the transmitters at Clermont Carn and Three Rock Mountain. To overcome the harsh terrain and remote locations of these sites, BT used a mixture of fibre and microwave radio links in order to establish fully diverse paths.

Finally, a dedicated state-of-the-art monitoring system and network management suite had to be integrated at BT’s Network Management Centre in Dundrum. This facility enables BT engineers to continuously monitor sound and picture quality. The solution incorporates Transport Integrity Monitoring Systems (TIMS) placed at critical points throughout the network. These units provide the intelligence to track and immediately identify potential problems, using logic tables to prioritise the most urgent from the less urgent alarms.

Behind the scenes, specially developed Asynchronous Serial Interface (ASI) slipless switches are used which automatically analyse the video streams. Accomplished in real time, this analysis determines which of the two redundant streams to use and to switch from one to the other in such a way as to help ensure an undisturbed experience to the viewer or listener.

Results

The first phase of the pilot went live on August 11th 2006 – delivered on time in just 16 weeks – and comprises a soft trial to test the stability of the network, new functionality and quality of content. Susan Fleming, the Departments’ DTT Project Manager, says: “BT has done an excellent job to get the pilot up and running. We set an aggressive schedule but it was delivered professionally, on time, on budget and with regular updates.”

The second phase of the project will involve the distribution of set top boxes to 1,000 trial participants. Multiplex 1 will carry the four main Irish channels – RTÉ One, RTÉ Two, TV3 and TG4 – as well as the national radio channels, RTÉ 1, RTÉ 2fm, RTÉ lyric fm, RTÉ Raidió na Gaeltachta and Today FM. Multiplex 2 and Multiplex 3 will carry additional content and will be made available to interested parties. BT has also made available an option for a fourth multiplex, which could be used in the future to trial new technologies such as HDTV, IPTV, interactive TV and data services.

During this two-year period, the Department intends to conduct research to determine how users rate the digital TV service and experience. Susan Fleming provides further insight: “This key learning will help Government and key stakeholders to decide on the optimum way to achieve national rollout. It will enable us to test the impact for users of moving from four-channel terrestrial TV to multi-channel digital TV.”

Importantly, the trial is set to play a wider role in terms of shaping and stimulating the digital TV market in Ireland. The intention is that it will provide consumers with more choice in a similar way to how Freeview provides an alternative to pay-per-view cable or satellite TV services in the UK. Early signs are that the trial will also help to make the market more attractive to content providers. Nine applications have already been received for Multiplex Programme Content Managers.

Noel Dempsey TD summarises: “Not only will the project create an opportunity to test a digital broadcasting service, but it will also generate awareness and discussion among interested parties in a full rollout of free-to-air digital terrestrial television.”

Why BT?

- BT combined international media and broadcast industry and technical expertise with local network delivery and service management excellence
- BT was able to build a turnkey broadcasting solution supported by local network services and field engineering teams
- BT developed a sound understanding of the Government’s requirements and provided a joined up approach
- The Government had trust in BT’s ability to deliver and the depth and breadth of BT resources
Technology blueprint

The BT multiplexing and network solution takes advantage of locally based network infrastructure, data centre facilities, network management systems, and engineering and operations staff. Designed with complete end-to-end diversity to provide maximum reliability, it couples resilient network components with a fault tolerant multiplexing technology platform.

For Multiplex 1 BT will collect and deliver source signals in uncompressed format from RTÉ Donnybrook to the BT Multiplexing Centre in Citywest. BT will also collect or ingest source signals that will be made available from alternative sources; the primary feeds for Multiplex 2 and Multiplex 3 being from dedicated and redundant satellite receive antennae at the Multiplexing Centre.

Employing carefully chosen encoding and multiplexing technology, BT processes the source signals and injects the appropriate audio, subtitle, teletext and service information into the Digital Video Broadcast (DVB) stream. BT then distributes the aggregate multiplexed signal over fibre and radio links – using IP networking technology – to transmitters on Three Rock Mountain and Clermont Carn, handing the data stream over to the transmitter operator for onward broadcast.

BT’s state-of-the-art high performance Intelligent Video Network Platform (IVNP) provides the adaptation and transport of multiple digital video streams over IP. Offering four or eight fully independent 270Mbps SDI (Serial Digital Interface) or ASI (Asynchronous Serial Interface) inputs, it provides all layers of IP encapsulation in hardware, with no processor involvement, as well as stream analysis, bit rate policing and separate network address assignments. Ethernet switching capability is included to police the management of IP traffic flow in-band.

The BT TIMS solution provides high-density video and audio monitoring throughout the network and management data is relayed back to BT’s Network Management Centre in Dundrum. Service management is achieved using HP OpenView and SNMP (Simple Network Management Protocol) alarm interfacing. BT operations people liaise with the transmitter operator and ultimately the set-top box vendors to sustain end-to-end ongoing service integrity.

Main BT products and services

- Resilient, fully auto-redundant transmission network
- Intelligent Video Network Platform (IVNP)
- Multiplexing and network services including Transport Integrity Monitoring Systems (TIMS) and Asynchronous Serial Interface (ASI) slipless switches
- BT service management and network monitoring