

UPDATE

on TELECOMMUNICATIONS in the WESTERN REGION

December 2002

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Introduction

The Western Development Commission (WDC) has compiled a bulletin on telecommunications in the Western Region to provide an update on the current situation there, identify the key issues and propose solutions. Case studies are included to highlight the problems encountered in accessing telecommunications services, but also to demonstrate what is being achieved in spite of these.

This summary is intended to provide an overview of the key issues outlined in the bulletin and to help the general public understand the implications of the information and telecommunications revolution for the Western Region. There is a glossary at the end to explain technical terms.

The Importance of Telecommunications

Information and knowledge are key drivers of modern industrial growth. The availability of a modern telecommunications infrastructure in the Western Region is essential to attracting and sustaining investment and maintaining competitiveness. Quality telecommunications infrastructure and services at an affordable price to customers are as crucial to regional development today as rural electrification was in the 1940s and 1950s.

Telecommunications Capacity

Telecommunications refers to the transmission of information electronically by, for example telephone, fax and e-mail. Broadly speaking, telecommunications capacity can be defined as either narrowband or broadband. Narrowband is a low speed telecommunications channel and is the traditional method of telecommunication, but it is unable to carry the large amounts of data that are needed in today's world. The term broadband is used to describe a telecommunications channel which allows for the transmission of data at high speeds.

What is Narrowband?

Narrowband technologies deliver access speeds of less than 2 Megabits per second (2Mbit/s). The telephone network is narrowband and is based on a single copper cable. It is termed the Public Switched Telephone Network. It is a single channel with dial-up connection which can transmit voice and data, but not at the same time. It transmits at speeds of up to 64kbit/s. Most home internet access in Ireland is still accessed through this technology.

ISDN refers to integrated services digital network which is also delivered over copper cable. It is a technology that provides two channels thereby allowing voice and data to be transmitted at the same time. ISDN is dial-up and transmits data at speeds of up to 2Mbit/s.

What is Broadband?

Broadband is a telecommunications channel. It allows for the transmission of large amounts data at 2Mbits/s or higher. Broadband makes possible swift internet access, as well as video on demand, video conferencing and web hosting. The minimum capacity for a broadband connection is 2Mbit/s however, larger businesses can require much greater capacity.

The Broadband Network

The broadband network can be viewed in the same way as the road network. The network is predominantly made up of two types of cable – fibre and copper. The fibre network, like a motorway, can carry large amounts of traffic at high speeds. The copper network is similar to a minor road, carrying relatively less traffic at slower speeds.

The Broadband Network Described

The broadband network has three parts which can be compared to the road network.

1. The **backbone** network (similar to national primary roads) consists of high capacity networks (usually fibre but sometimes copper) connecting cities and towns.

Why are the Backbone Networks Important?

Fibre backbone networks are important because towns on them have the potential to avail of high capacity services. Accessing the fibre backbone via copper, limits the availability of broadband services. Costs for some services can be based on distance from the nearest relevant 'point of presence' (PoP) on the backbone network.

Higher capacity broadband networks are invariably found in cities and larger towns where there are more users with higher capacity requirements. A 'digital divide' or 'broadband gap' is developing due to the restricted access to higher capacity telecommunications services outside of the main urban centres, which are mainly in the east and south of the country.

The Eircom and Esat BT networks are the most widely used by consumers, be they large businesses, small and medium sized enterprises (SMEs), or home users. Within the Western Region, Eircom's network is the most extensive and, in practice, the majority of customers will access this network.

Competition and Choice

In practice, only a few towns in the Western Region have a choice of provider, namely Athlone, Galway, Ennis/Shannon, Sligo, Ballina, Claremorris and Ballinasloe.

Even though there are several towns along the network routes, this does not necessarily mean that businesses in these towns have access in practice. Services will depend on the extent of local demand and the anticipated commercial returns.

Spare Capacity

The backbone networks (both existing and planned) have considerable spare capacity. The reasons offered for this include insufficient demand, and the fact that the price at which it is offered to providers is too high, making the provision of services to customers commercially unviable.

Given that public funding has enabled some of these networks to be built, consideration should be given to making them available at a price which will entice new entrants into the market, particularly outside of the major centres. This would allow for greater use of the current infrastructure and could help reduce costs to the consumer.

Broadband Technologies

To access the backbone networks, a variety of technologies can be used. The technologies used on the fibre and copper networks, like cars, can be fast or slow, with large or small capacity. The following paragraphs provide a basic summary of what is available.

In the Western Region, the broadband technologies currently available include fibre optics, DSL and satellite. These, along with the other broadband technologies are illustrated in the diagram opposite.

- **Fibre Optics** can provide access speeds of up to 80Gbit/s and is the most future proof of all transmission methods. It is available to larger users such as government, very large business and higher education establishments. Most IDA business parks have fibre installed.
- **DSL** (Digital Subscriber Line) technology allows customers to access the internet and use the telephone at the same time, over existing copper telephone lines. It is always-on (does not require dialling for each use) and access speeds are up to 30 times faster than a standard telephone line. DSL services available in Ireland provide a capacity of up to 2Mbit/s. Users must be within three kilometres of the nearest equipped exchange to avail of these services.

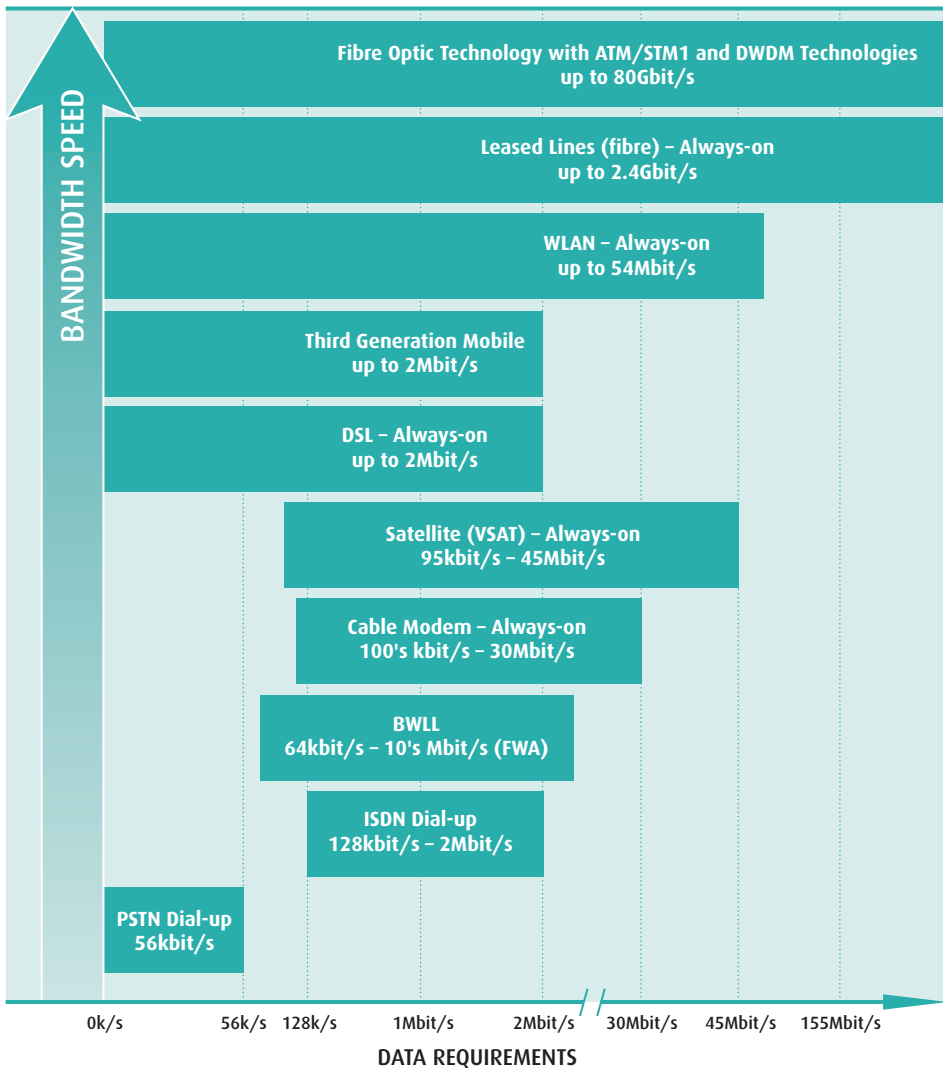
By the end of January 2003, DSL services will be offered in Galway, Athlone, Sligo, Ballina, Ballinasloe and Westport. Providers state that with present technologies, there is no commercial case for rolling out DSL services to smaller centres where it is perceived that there will be fewer users.

- **Satellite.** VSAT is one form of satellite transmitted internet access. It is always-on and is suitable for voice and data transmission. Transmission requires a line of sight between the user and the satellite. It is particularly suitable for more remote regions, as it does not require expensive cabling. VSAT networks are not widely available in Ireland but some trials have just been concluded. One of these, in Co. Mayo, involved connecting the Mayo Education Centre with fifteen separate schools in counties Mayo and Galway. This provided high-speed internet access to each of the schools at relatively inexpensive rates.

■ Other Broadband Technologies

Other technologies that can be used to deliver broadband services include Cable Modem, Broadband Wireless Local Loop (or Fixed Wireless Access), Wireless Local Area Network (WLAN) technologies and Third Generation mobile (or 3G). However, these have had a limited commercial deployment so far.

Defining Narrowband and Broadband



Telecommunications Services in the Western Region

ISDN

ISDN services are widely available but are increasingly considered inadequate. Users must be within six kilometres of the nearest telephone exchange and are charged on a metered basis (based on the time spent 'on-line') which is costly and discourages more widespread internet usage.

Leased Lines

Leased lines (dedicated lines) are copper or fibre circuits that have been leased for private use. Leased lines are always-on and can provide access speeds of up to 2.5Gbit/s, but usually provide speeds of up to 2Mbit/s over copper. Firms often use leased lines to connect different branches of their business.

Pricing

Leased lines are charged on the basis of distance from the customer to the nearest equipped exchange, and from there to the exchange and user at the final destination. For most companies this will be in Dublin – with an onward connection for international traffic. As a result of this pricing structure, businesses located in the Western Region will generally pay more for leased lines than those located in the East of the country. This is because the circuit (to Dublin) is longer.

Companies with capacity requirements greater than 2Mbit/s may use the ATM network. This requires connection to an ATM node (PoP). Providers routinely charge customers on the basis of their distance from an ATM node. These charges particularly affect customers in Mayo, who are charged for routing to Galway or Sligo (where the nearest ATM node (PoP) is located). In Ireland, ATM network prices are not regulated, and the price structures applied are not published.

DSL Services

Within the Western Region, Eircom plans to have rolled out DSL services to exchanges in Galway, Athlone, Westport and Sligo by the start of 2003. Esat BT is currently operating DSL services in Galway and Ballina and plans to have services available at an additional exchange in Galway, and in Athlone, Sligo, and Ballinasloe by January 2003.

It is likely that a significant proportion of those currently using ISDN would choose a DSL product if available. This demand has not been reflected in take-up to date, partly because DSL services are considered too expensive. Ireland is ranked 18th out of 19 countries in terms of cost for the most basic DSL service^[1].

Telecommunications providers argue that the lower population densities in Ireland relative to other countries drive up costs. If this is so, the cost of rolling out DSL services to smaller centres will probably remain unacceptably high. Consequently, DSL is unlikely to be extended to many other locations within the Western Region in the foreseeable future.

Flat-Rate Internet Access

Flat-rate internet access means that charges are not metered but based on a flat-rate which promotes unlimited access. The Minister for Communications, Marine and Natural Resources has issued a draft policy direction to the new Commission for Communications Regulation to use its powers to facilitate the introduction of flat-rate internet access as a priority. This is a welcome development, as in the absence of a more extensive rollout of DSL services in the Western Region, a flat-rate service is essential.

The widespread delivery of broadband services within the next five years will be of limited attraction to commercial providers. Much of the Western Region is unlikely to see delivery of such services in the absence of additional targeted funding.

Government Telecommunications Policy

The National Development Plan 2000-2006 committed €200 million to telecommunications infrastructure projects of which two-thirds is earmarked for the Border, Midlands and Western Region. It was acknowledged in the NDP that the free market alone could not ensure adequate provision.

¹ The countries include the EU, Canada, Japan, Korea and the USA.

Under the first round of NDP funding in January 2001, nine different projects were awarded grants totalling €55 million.

A review of Government Policy took place in 2001/2002. It was concluded that the key broadband infrastructure deficit was in local access networks. The Government Action Plan *New Connections* commits the Government to securing the widespread availability of open-access, affordable, always-on broadband infrastructure and services for businesses and citizens throughout the State within three years.

This has been given effect in a three-phase programme to provide fibre rings in 123 towns with populations in excess of 1,500.

Phase One of this Metropolitan Area Network (MAN) programme, is underway. It provides funding to twenty-seven centres^[2] for the construction of fibre networks, including ten in the Western Region. These networks will be run by a Managed Services Entity structured as a Public Private Partnership. Its functions will include day to day management of the MANs and selling broadband capacity to providers on an open access basis. The deployment of Phases Two and Three will depend on the success of Phase One.

Status of Local Authority Metropolitan Area Networks

	Estimated Completion Date	Project Led By	Indicative Costs €M
Towns in Western Region			
Belmullet*	3/2003	U na G	0.12
Ballina	6/2003	CC	2.50
Carrick-on-Shannon	6/2003	CC	1.60
Dungloe*	3/2003	U na G	0.07
Gweedore	3/2003	U na G	2.50
Galway City	10/2003	CC	8.00
Kiltimagh (m)	6/2003	CC	0.47
Letterkenny	2/2003	CC	4.00
Manorhamilton	6/2003	CC	0.86
Roscommon	6/2003	CC	2.00
Total Indicative Cost			22.12
CC denotes County/City Council; U na G denotes Údarás na Gaeltachta; 'm' denotes the 8 minor centres designated. * denotes those funded under CLÁR.			

Source: Regional Broadband Programme Department of Communications, Marine and Natural Resources. October 2002.

² Two projects in the Western Region are being co-funded by the CLÁR programme.

Other Government Initiatives

Other government initiatives include a VSAT Satellite trial and a programme of funding for community applications of information technology (CAIT). Both of these are scheduled to end in 2002. Five publicly funded trials of wireless technology will shortly get underway. The Border, Midlands and West Regional Assembly has also secured EU funding to pilot wireless technologies.

Summary of WDC Recommendations

1. Broadband in the Western Region

Many parts of the Western Region do not have access to broadband services. In a knowledge-based economy, quality broadband infrastructure is a necessity, and without it growth and competitiveness will be constrained.

Telecommunications infrastructure policy for the Western Region should be based on an acceptance that infrastructure there must be at least on a par with other regions.

2. Metropolitan Area Networks Phase One

Phase One and subsequent phases of the Metropolitan Area Networks (MANs) programme should be delivered as quickly as possible. Any readjustment of public finances should not result in the delay or postponement of the commitment to deliver open access, affordable, always-on broadband infrastructure within three years.

3. Metropolitan Area Networks Phase Two

It is important that towns in the seven western counties are well represented in Phase Two of the MAN programme. Local authorities and other public agencies should be proactive on this issue.

4. Managed Services Entity

Establishment of the Managed Services Entity (MSE) should be expedited. It should be given a clear operational mandate that includes maximising competition among providers, both in operating services and in deploying various technologies. The MSE should have responsibility to ensure that services are available at a competitive price to users in the MAN towns.

Summary of WDC Recommendations (continued)

5. Funding of Other Technologies

In areas with dispersed population, such as the Western Region, it is important to maximise the rollout of services based on wireless and satellite technologies. Public investment is essential to offset market failure.

The provision of €300,000 funding for trials of new technology in the current round of NDP expenditure is insufficient. Funding should be increased significantly and every effort made to secure the involvement of commercial providers.

6. Higher Costs in the Western Region

In the Western Region, the higher cost of broadband connectivity is a major issue and a disincentive to investment.

The pricing structure for leased lines should be reviewed by the Commission for Communications Regulation (ComReg). Consideration should be given to cost oriented or capacity based pricing.

7. ATM Network Pricing

The Commission for Communications Regulation should re-examine the providers' pricing structure for ATM services in the light of current circumstances, and make mandatory the publication of ATM prices.

8. ATM PoPs

As long as the current pricing system prevails and users of ATM services are charged on the basis of their distance from an ATM node (PoP), there is a case for the installation of an additional ATM PoP in Co. Mayo. Consideration should be given as to who should provide such a facility and whether it should be publicly funded.

9. Third Generation Mobile Services

Only one of the three Third Generation (3G) licensees is required to provide services outside of the five major cities. In the absence of competition, 3G services in the Western Region are likely to be more expensive. This situation should be monitored closely by the Commission for Communications Regulation to ensure that consumers in the West are not at a cost disadvantage.

10. Decentralisation and eGovernment

Decentralisation and the deployment of the eGovernment strategy, which involves networking all public bodies, should be considered as a key enabler for the promotion of ICT use across the spectrum of users.

11. Articulating Demand

The provision of telecommunications services is demand-driven to a very significant extent. Much can be done at local level to articulate the needs of SMEs and domestic users.

Local authorities, the social partners, LEADER Groups and Partnerships and other community sector organisations could form an effective collective voice in demanding services from the providers and in seeking continued proactive intervention by the State and the Commission for Communications Regulation.

12. Updated Information

The Department of Communications, Marine and Natural Resources should be mandated and resourced to produce accurate information in the form of up to date maps of fibre and other broadband networks.

13. Flat-Rate Internet Access

It is vitally important that flat-rate internet access be introduced as soon as possible.

14. Universal Service Obligation

In the context of the Government's commitment to the widespread availability of broadband services, consideration should be given to extending the minimum requirement of the Universal Service Obligation to include basic broadband. This would necessitate an examination of the economic implications of such a requirement.

15. Customer Service

Inadequate service from the telecommunication providers is an issue for many businesses.

The scope of the Commission for Communications Regulation should include a clear customer focus, including a facility for receiving and processing customers' complaints and ensuring providers' compliance with agreed standards of service.

16. Spare Capacity

There is considerable spare capacity in the backbone networks and this will be augmented when the new networks are completed. Public money has financed some of these networks so it is desirable that they should be made available at a price which will entice new entrants into the market particularly outside of the major centres.

Consideration should be given to extending the remit of the Managed Services Entity (MSE) referred to above to include managing open access to the fibre networks currently owned by state bodies such as ESB and CIE, and any other relevant spare capacity in the broadband system.

Summary Table of Currently Available Narrowband and Broadband Technologies^[3]

TECHNOLOGY	TYPICAL SPEED	COST	AVAILABILITY
Copper / PSTN	56kbit/s (Dial-up)	Monthly rental charge €15-€16. Metered charges vary by provider	Widespread
ISDN	ISDN Basic 2 x 64kbit/s (Dial-up)	Installation - €244.99 + modem - €121+ monthly rental fee ranging from €20.00-€37.50. (Esat - Eircom)	Widespread within 6km of nearest exchange
	ISDN Primary 30 x 64kbit/s (Dial-up)	Installation - €3,958 incl vat, + monthly rental fee €70-€264.11 (Esat - Eircom)	
Leased Line Copper	Up to 2Mbit/s (Always-on)	2Mbit/s (2km circuit). National average = €651 per month ^[4] 2Mbit/s (5 km circuit). National average = €1,461 per month	Widespread
Leased Line - Fibre Optic Cable	Up to 80Gbit/s (Always-on)	Price varies depending upon capacity. Ireland positioned 7th out of OECD countries for national leased line costs	Limited to large data users
DSL Basic	DSL 128kbit/s upstream & 512kbit/s downstream. (Always-on)	€125-€165 installation + modem €145 + rental €89 per month for 3Gbit quota. (UK €46.80)	Designed for SMEs/ home. Limited by approx. 3 km from exchange
DSL 2Mbit/s	DSL 512kbit/s upstream & 2Mbit/s downstream. (Always-on)	€1500 installation + rental €400 per month.	Designed for SMEs. Limited by approx. 3 km from exchange
Cable Modem	128kbit/s - 1Mbit/s (Always-on)	€100 installation + rental, 128kbit/s €30 per month, 512kbit/s €40 per month	Not widely deployed but trials under way
Satellite VSAT	95kbit/s - 45Mbit/s (Always-on)	€1,500 installation, 128kbit/s upstream & 400kbit/s downstream = €100-€170 per month	Not widely deployed but trials under way
Wireless LAN	256kbit/s - 54Mbit/s (Always-on)	256kbit/s upstream & 512kbit/s downstream. Business users - €100 per month + installation €1,500. Home users - €30-€50 per month	Limited by up to 10km
BWLL or FWA	64kbit/s - 10's Mbit/s	Broadband services not widely deployed	Limited by distance 1-35km

³ The prices quoted are approximate and are those prevailing in November 2002.

⁴ These costs represent the national average and there are significant price variations, in part depending upon the distance of the user from the local exchange. In more rural areas the distance to the exchange is likely to be greater than in urban areas. Source: Total Research - Teligen. Cited in Forfás, 2002, p.30.

Glossary of Telecommunications Terms

Always-On	Always-on means that users can connect to e-mail/internet at any time, as opposed to 'dial-up' where users must dial-up each time to connect to the internet or e-mail.
ATM	Provides for access speeds of between 34 and 155Mbit/s. Asynchronous Transfer Mode – a fast switching and multiplexing technique that allows voice, data, audio and video to be carried on the same network.
ATM node (ATM PoP)	An ATM node (PoP) is a Point of Presence on the ATM network. Access to this node enables transmission on the ATM network.
Bandwidth	Bandwidth is a measurement of the speed at which data is sent. Bandwidth is measured by the rate of transmission in bits per second.
Bit	A 'bit' is a unit of information, and 'bits' per second is the standard measure of data transmission speeds. 1 kbit/s is one thousand bits per second. 1 Mbit/s is one million bits per second.
Broadband	Broadband is a high-speed telecommunications channel. The minimum capacity for a broadband channel is generally considered to be 2 Mbit/s. This is in contrast to narrowband, which typically supports traditional telephone lines and much slower internet access.
BWLL	Broadband Wireless Local Loop. This technology allows companies to beam high-speed internet services to buildings via radio waves rather than using wires. This allows the service to become operational faster than traditional broadband connections, which have to be installed by digging up roads and laying cable.
Cable Modem	A device enabling connection from a TV or PC to a cable TV line to send and receive data at high speeds and internet access.
ComReg	The Commission for Communications Regulation. This Commission will assume the functions of the ODTR in December 2002.
Dial-Up	Dial-up refers to when users must dial-up each time to connect to the internet or e-mail. It is in contrast to always-on which means that users can connect to e-mail/internet at any time.
DSL	Dedicated Subscriber Line technologies that allow high-speed broadband communications over existing copper wires. Can enable the provision of high speed internet and multimedia services. (Up to thirty times faster than traditional modem services).
FRIACO	Flat-Rate Internet Access is charged at a flat-rate, in contrast to a metered rate where charges are applied based on the time spent accessing the internet.
Gigabit	1 Gigabit/s = 1,000 Mbit/s.
ISDN	Integrated Services Digital Network. Offered in two forms – Basic ISDN (2 x 64kbit/s channels) and the faster Primary ISDN (30 x 64kbit/s channels). ISDN is dial-up and can provide data transfer of up to 2Mbit/s however customers must be within six kilometres from the nearest exchange.
Leased lines	A leased line is a telephone line that has been leased for private use. Businesses lease lines from telecommunications companies, to provide them with bandwidth capacity and dedicated connection between different sites or branches. There are approximately 31,500 leased line circuits in use in Ireland of which 95 per cent are under 2Mbit/s.
LLU	Local Loop Unbundling. Allowing other telecommunication companies and service provider's access to the incumbent's local network to provide services directly to the customer.
Narrowband	Narrowband technologies deliver access speeds of less than 2Mbit/s.
PoP	Point of Presence. A PoP or point of presence is an access point to the internet.
PSDN	Public Switched Telephone Network refers to the general fixed line telephone system throughout the country and is based on copper cables. Transmission via copper generally provides a capacity of up to 2Mbit/s, but can be extended to 8 Mbit/s.
Spare Capacity	When fibre networks are not being used at all or underused, they are referred to as unlit or dark fibre. Fibre that is in use is sometimes referred to as lit fibre.
USO	Universal Service Obligation. This is a mechanism with legal force which compels operators to provide a minimum level of service.
VSAT	Very Small Aperture Terminals. Suitable for applications such as transmission of voice and data from head office to branch office. Typically access speeds are between 100kbit/s and 350kbit/s upstream and between 100kbit/s and 2Mbit/s downstream, but faster access speeds can be achieved.
WLAN	Wireless Local Area Network. A high-speed communications system designed to link computers and other data processing devices within a small area.
3G	The third generation of mobile phone technology which is designed to be a broadband digital system.

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