



IPTV

IPTV stands for Internet Protocol Television; this is watching TV via a broadband (internet) connection. This TV technology was developed at the end of the last century and is used in the Netherlands by Tele2 for Tele2 TV and by KPN for offering KPN Interactive TV, among others.

IPTV is suitable for network operators with a broadband IP network such as xDSL or fiber; mobile operators also offer IPTV services. IPTV delivers digital television via IP where MPEG-2, MPEG-4 or VC-1 is often used for video encoding in order to transmit the programs. Cable TV operators only make limited use of IPTV because they use other techniques like DVB-C.

In order to offer IPTV, a platform is needed which can digitize the programs (video content) and distribute them to the end-users. The users can select and watch the program via a Set Top Box, remote control and monitor.

Video on Demand services however, each viewer receives his own specific video IP stream via “unicast” and the amount of traffic increases in proportion to the number of viewers.

Besides sufficient bandwidth, a minimum network quality must also be guaranteed; in case of congestion, very few IP packets may be discarded (packet loss) and there may also only be a slight delay and variation in the network (jitter and delay). This sort of disturbance causes blocks and/or flickering in image and sound which are very annoying to a viewer.

The solution to this is to use special network and modem settings (QoS) for IPTV connections. Specific modem settings with associated connection processes are necessary for each customer. These customer-specific configurations must be kept up to date centrally. This can be done using systems for remote control and configuration of network and customer equipment.

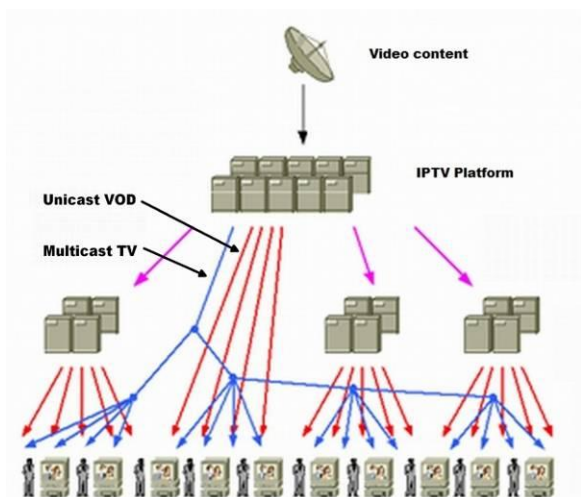


Figure 1 IPTV concept

By using IPTV technology, TV services become network- and apparatus-independent and TV watching is no longer restricted to the TV set. So you can watch programs via a mobile phone, game console, PC or laptop.

A condition for high quality television is that the connection to the customer is dependable and has sufficient bandwidth. Watching TV can cause much more network loading than internet or telephony traffic. The continuous bandwidth usage can vary from two to tens of Mbit/sec for each program watched.

To use bandwidth efficiently, for programs which many people watch simultaneously, the video IP stream is shared via “multicast” technology. For

Service Quality Management

Besides the quality of the connection, the customer experience is also important. The quality of this experience may be deduced from performance indicators such as the image quality, zap time, reaction time via the remote control and the start-up time of the Set Top Box.

Modern Set Top Boxes can measure such indicators and make them available to a Service Management System. A large quantity of quality parameters concerning end-user services then becomes available for each user.

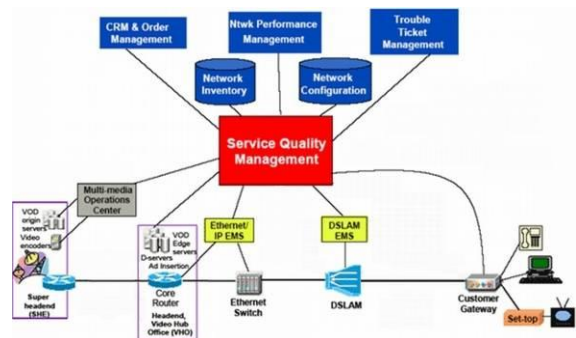


Figure 2 IPTV Network Management System (source: IEC)

With such a system, it is possible to prepare quality reports which can be used to identify and solve potential problems. For customer complaints, a quality measurement may be



started immediately, based on which a support department can conduct further investigation.

IPTV services

IPTV is often used to offer public television programs. A typical characteristic of IPTV is however the user interaction. Where traditional digital TV offers one-way services to a large public, IPTV enables new services for individual users. Examples are Video on Demand, Tele Voting, Online Gaming and Home Shopping, which are possible via the so-called "Red Button Functions". By this means, the viewer can select a program, film or extra service via the remote control. He can also order something or vote for a favorite artist.

Current platforms can offer theme channels for specific target groups. It is possible for a user to compose his own program supply and obtain advice about future programs based on previous viewing behavior and preferences. Services which are already available via the internet such as the sharing of videos and photos become available on the TV; phoning or a baby-intercom with image also becomes possible.

Development and standardization

IPTV offers possibilities to develop new program material tailored to each target group. IPTV can also provide detailed information to program makers about a program's viewing density and the use of services.

This information may be used to invoice the users, and may be very valuable to determine when an advertising message may best be shown. It is quite conceivable to show specific commercials to each target group.

Different standards are in development for IPTV. ITU-T recently described architecture in which network and user functions are defined.

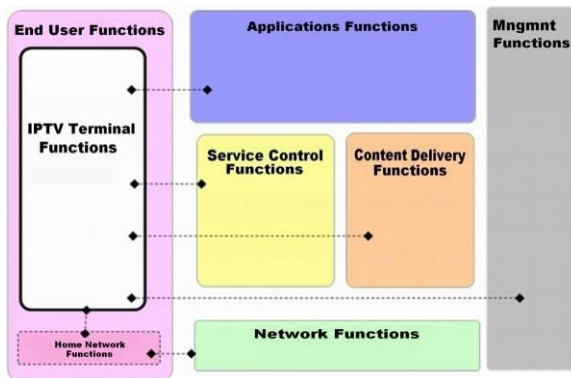


Figure 3 ITU-T IPTV architecture

The architecture describes IPTV in functional blocks necessary to offer, manage and invoice services. An important functional block is the service control function; access to and protection of services is arranged with this function. There is control over the storage and copying of content by use of encryption. Besides this, the provider can determine for each user whether and how often he can make use of a service; this information is stored for each customer.

IPTV and IMS

An architecture known as "IMS based IPTV", which supports IPTV within the IP Multimedia Subsystem (IMS), is being developed by the standardization body 3GPP. Both ITU-T and ETSI are involved with this standard (ETSI TS 182 027). TV and voice services can be delivered from one central network core using IMS.

Suppliers

There are many providers of IPTV platforms, the associated middleware and particularly also Set Top Boxes. These last are becoming more often suitable for IP networks besides the well-known satellite, cable and aerial broadcast versions. Besides this, the success of devices like the iPod has contributed to it no longer being strange to watch films on a mobile phone or PDA.

For the implementation of IPTV, a careful choice from the networks and peripherals on offer is essential. Good integration and end-to-end test are important success factors, because the customer experiences the quality of every link in the IPTV chain, including the weakest.

Advantages

- IPTV is a new technology allowing ISPs and broadband parties to offer multimedia services along with internet and telephony.
- No antenna or coaxial cabling is needed in households; TV can be offered via an existing network.
- The services are innovative, interactive and make optimal use of broadband technology.
- Besides this, much information becomes available about service usage which can promote interaction with the end-user.



Disadvantages

- The technology is still developing rapidly; so there is not yet a worldwide standard giving a plug-and-play solution.
- The provider must make choices in the services offered, the activation and installation process, the type of protection, the manner of billing and the storage of information.
- There is a large range of providers of Set Top Boxes, software and network systems from which parts must be selected and then integrated.
- High demands are imposed on the quality and protection of the network of the provider and certainly also on the network at the customer. This demands a complete, integrated chain approach.

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VDVL

Setting up an IPTV service has proved more complex than launching a service on the internet. As soon as you have made a choice of services offered, it is important that the content protection is in order to prevent misuse. Besides this, interoperability tests, usage tariffs, end-to-end quality and connection to BSS/OSS must be taken care of. VDVL has experience in all these matters and can help you.



Figure 4 VDVL core competencies

Additional Information

Additional information about our references and fields of expertise may be found on our website www.vdl.nl.

References, white papers and our employees' CVs will also be made available on request.

For more information, please contact

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