

# **IPTV: What is it?**

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IPTV or IP Television is a process, a method of preparing and distributing Television signals over an IP based data network. Content streams are acquired, demodulated and decrypted if necessary, then re-encoded digitally for IP transport possibly, with additional compression and new encryption. IPTV signals, or streams, are distributed on an IP based network and viewed on a IPTV capable viewing device, usually a Set Top Box normally abbreviated as an STB.

## **The key components of an IPTV system**

- Programming – This is the content; some person or some entity, in this industry called “The Programmer”, owns it and the IPTV Service Provider (IPTVSP) has to acquire the right to collect and redistribute this material.
- Headend – The physical facility where you collect the media streams and de-code/re-code as IP for distribution.
- IPTV Distribution Network – The distribution network obviously needs to be some kind of wide area network, as it needs to deliver IPTV services to the customer’s homes. This network needs to have adequate bandwidth to the end users to deliver IPTV content, but these requirements can be attained with the mixing and matching of many current technologies.
- IPTV Viewing Device – This is generally considered to be the Set Top Box, not too different in appearance from the STB provided by the cable company for their digital service tier or the STB, which is also a satellite receiver, included with a home satellite package.

## **Overview of key Components**

### **Programming**

All programming or content is owned by some person or some entity. In this industry the entity that owns the rights to the content is called “The Programmer” and the IPTV Service Provider (IPTVSP) has to acquire the right to collect and redistribute this material.

This usually is a transaction that is based on some agreed upon compensation to the programmer. This compensation, to purchase of Distribution Rights can be obtained either direct or through an aggregator.

The negotiated cost for the content takes into consideration the number of viewers that the IPTVSP is distributing to and the perceived value of the content. At the high end of this are the premium movie and sports networks, these typically have the highest price tag. Somewhere in the middle of the revenue ladder are advertising supported networks, and there are just too many of these to mention.

There are many television based shopping channels and religious supported programming which will pay the IPTVSP to carry their content. Although each of these genres have different motivations, all consider it their mission to reach as broad a viewer base as possible.

Also, as any CATV company would be remiss not carrying the locally available off-air networks, an IPTVSP will have to receive, encode, and re-broadcast these cornerstones of the television society to stay competitive. Of course re-broadcast agreements must be emplaced.

## Headend

As we stated above, the Headend is the physical facility where you collect the media streams and de-code/re-code as IP for distribution. This is the core of the IPTVSP's world. This facility is no different in principal from a traditional Community Access TV (CATV) or Cable Television headend. As most of the commercial television content is available via multiple satellites this facility will be lined with rack after rack of commercial satellite receivers and collocated with a large multi-focal point c-band dish, or a field of fixed single focal point dishes. This field is occasional referred to as a "dish farm".

The IPTV headend facility will differ from a traditional CATV headend in that once demodulated and decrypted IPTV will be Multicast encoded. That means the content stream will be digitally generated and ejected from its encoding equipment on a Multicast IP address. This step is analogous to that in a CATV headend of re-modulating streams for injection into a Broadband Distribution Network, the network of broadband distribution amplifiers and the co-axial cable.

The IPTV headend facility is typically also the home of a collection of important servers. These servers perform the various duties that make IPTV an enjoyable and usable experience to the end user and palatable to the Programmer. Some but not all of these items are; Middleware server(s), Digital Rights Management [DRM] Server(s), Video On Demand [VOD] server(s), Storage Arrays, DHCP servers, STB image/boot server(s), Emergency Alert System(s), and any number of other servers or appliances which are necessary for the network operations of a high up-time, high bandwidth, robust network

## IPTV Distribution Network

The IPTV distribution network needs to have adequate bandwidth to the end users to deliver your content, and it needs to be capable of transporting IP Multicast based communications.

An IP based data network that most people are familiar with is the Internet. Other examples of IP networks may be your office LAN, your home LAN or a Private WAN. These networks may connect to and give users access to the internet, but in practice are not “the Internet”. This is an important distinction that we will address later in this series.

Building an IPTV Distribution Network can be attained with the mixing and matching of many current technologies. As emerging technologies become available to deliver more bandwidth to the home, these new technologies will certainly be incorporated and used as the IPTVSP’s network engineers develop ways to use these new technologies most efficiently.

The most prevalent types of networks for IPTV distribution are Fiber To The Home (FTTH/FTTx), Ethernet Passive Optical Networks(PONs), or a Hybrid network using fiber optic distribution throughout a metro area coupled with a Digital Subscriber Line (DSL) technology for the “last mile” transport. The typical DSL types used for IPTV are VDSL or ADSL2+. These families of DSL are selected for their high bandwidth capabilities.

## IPTV Viewing Device

The Viewing Device or Set Top Box is the adapter, which connects to the users’ television. It is similar in appearance to the STB provided by the cable or satellite company for their digital services.

The STB is the hardware item that the user associates with the IPTVSP, but it is useless without a middleware solution. Set Top boxes need also be affordable and disposable as one or more will deploy to each subscribing home and some will be lost as well or receive wear and tear beyond where the IPTVSP can reasonably re-deploy it to a new customer. As the industry as a whole is immature STBs are still maturing. Once stable standard platforms are achieved it will become a war of price attrition and the STB will become a commodity.

IPTV signals can also be viewed on a PC; many software media players can play Multicast streaming content. But, to be a legitimate IPTV client a media player would have to interact with the Digital Rights Management package. There is nothing the programmers fear more than for all their intellectual property dumped out onto the internet for a file-sharing frenzy to make the RIAA’s troubles look like one overdue library book.

Link to original web document:

<http://www.worleyconsulting.com/publications/2007/IPTVwhat.html>