DVBC ready IPTV Network

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VoIBRENT IPTV SOLUTION

The business opportunity lies around the global trend of moving towards Triple Play IPTV networks (that carry voice, video and data in a converged manner). For reasons unique to them, telephone companies, Multi system operators and State Wide Area networks are all moving towards providing such triple play networks.

Telecom players like MTNL has already launched IPTV services for the subscribers in metropolitan cities. They have the established infrastructure that could be leveraged to provide advanced services like Video on Demand, IPTV, gaming, video conferencing etc. For the same reasons, BSNL has also started activities for rolling out IPTV Network in a franchisee model that is similar to the model currently being followed by MTNL. BSNL is already providing broadband internet services to the mass subscribers.

To provide broadband connections to such huge subscriber base, Telecom players are setting up quality network infrastructure. The same infrastructure could be now utilized to also provide advanced triple play services. These multiple IP services would be provided through a single broadband pipe that would also bring multiple revenue streams to the service provider.
This mechanism allows facilities that were earlier not possible in more conventional mechanisms where voice, data and video were delivered using separate infrastructures. For example one can now get a phone alert while watching TV or order a dress of a particular actor and even go ahead and pay through TV. A major additional benefit is that the carrier providing such services is better able to hold on to its customer base which in case of commodity services keeps switching providers.

IP Television enables the broadcasting and delivery of audio and video over IP network infrastructure. This technique also uses digital modulation at the head end which could be easily compressed, sent over the IP network and decoded only by means of IP set top box placed at the subscribers place.

IP television has interactive nature and has ability to co-exist with other form of data like Internet and voice. On IPTV platform, services like video on demand, internet on TV, Video Conferencing and gaming are easily available. These services would bring multiple revenue stream and would also bring differentiation in the way the services are delivered.

One would actually love to see the movie he wants to at the moment. From the study, it is found that the quality of entertainment experience of the viewer depends upon the content shown and it further improves with the content delivered that is demanded by the viewer. So, the Video on Demand application can greatly improve the viewing experience of the subscriber by showing the movies, music, news and other content demanded.

The web of internet was seen to be netting PCs all around the world decreasing the distance to just one click. A drastic technological improvement with TVs becoming the part of the internet web has taken place. Now, internet could be accessed over the TV also. Although, the experience of surfing internet over TV may not be appreciated but it fulfills the need to access the basic information on internet over TV like train, airways e-ticketing status information and similar information centric services.

How about somebody keeping an eye on your house when you are away. Security is nowadays a topmost priority with the graph of crimes and thefts rising. The service facilitates to monitor the place requiring security against such undesirable activities. The place could be an office, home, server room or any place requiring vigilance.

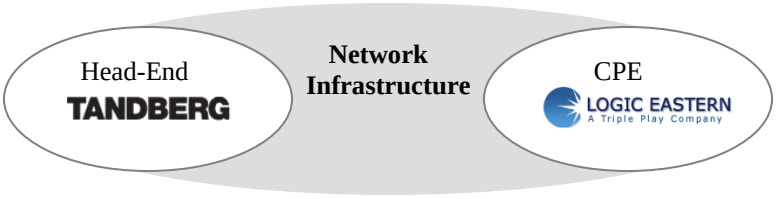
Mass video conferencing has never been possible because of expensive and heavy equipments require for the same at the customer' premises. IPTV enables low cost video conferencing allowing video and audio both on the network using the regular audio and video devices. It enables more than two people to become the part of the audio/video conversation over

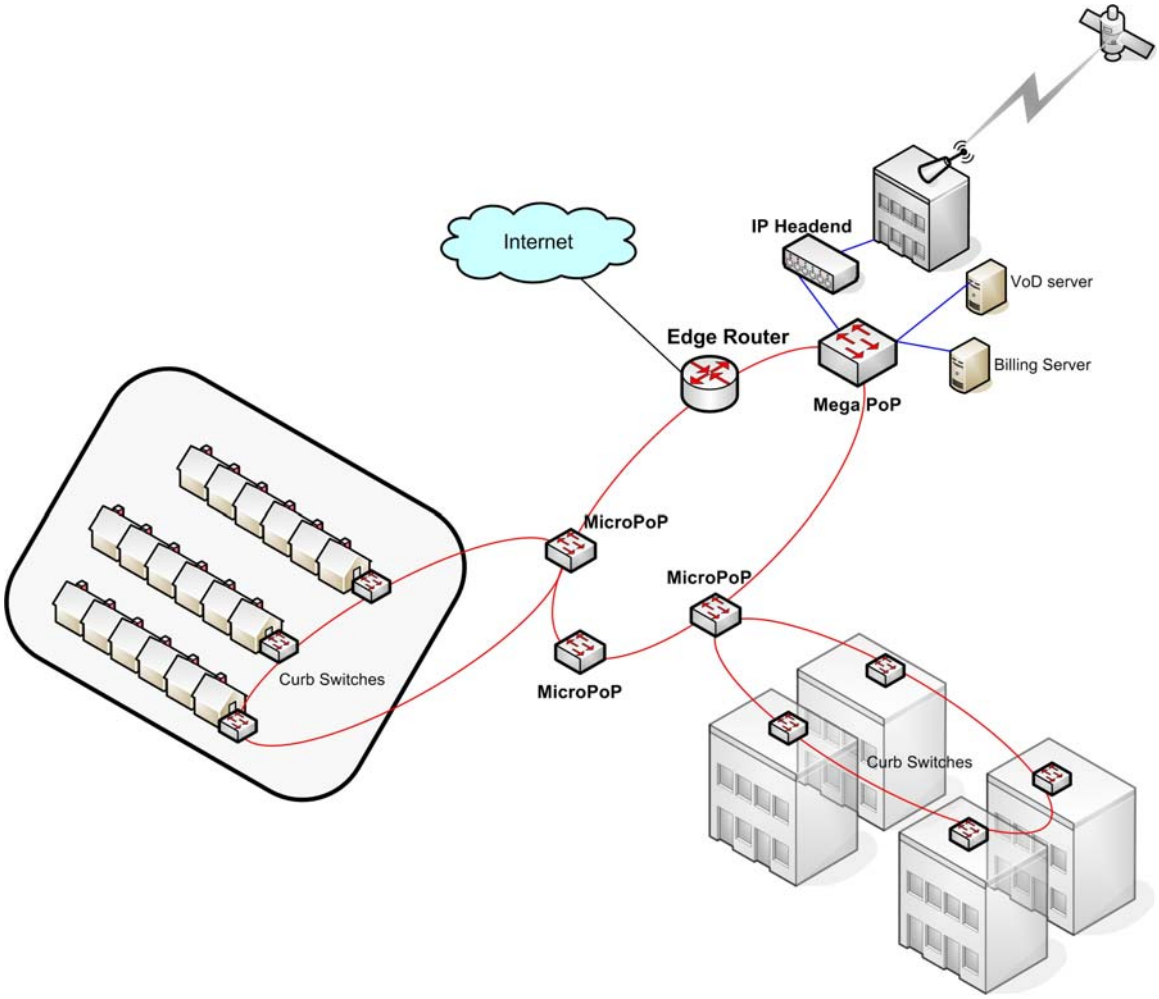
IPTV enable many more services like chat on TV email on TV, T-Commerce, voice over IP, gaming, e-magazines, and billing. Logic Eastern has developed this platform to deliver high quality innovative services.

The following section describes the solution which has various components required.

Key Solution Notes

VoIBRENT solution comprises of the Video Head-end by TANDBERG, Network infrastructure, and the Customer Premise Equipment developed and manufactured by Logic Eastern.



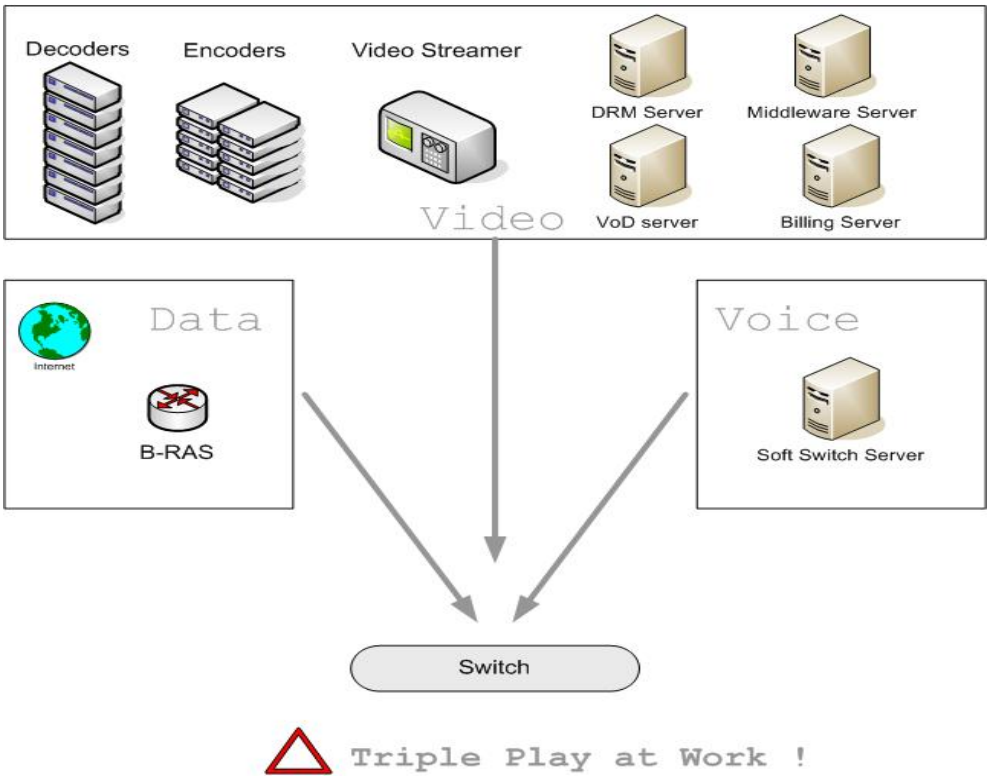


The Solution enables both Triple Play (IPTV) and DVB-C services on the same infrastructure.

Video Headend

The Video Headend equipment and the IT Server farm would feed the entire IP network on a redundant and highly available fiber optic backbone. This location would be highly secured where only senior or technically trained personnel would have access.

DVBC ready IPTV HEADEND



Components in Video Play

Antenna Farm
It captures all the Free to air and scrambled signals being beamed in the skies. The signals are then sent to the Video head-end.

IRD decoders
Decode the streams being received preferably in ASI format or otherwise through component video. Many of these decoders might be already in place and unless specifically asked by the video Head-end vendor, need not be purchased again. Many decoders are provided directly by the broadcaster.

TANDBERG iPLEX
iPlex is the equipment that takes the feed from the decoders, processes, multiplexes and give IP Output which could be sent over the network.

MPEG-2 Encoders
Encode the decoded programs into low bandwidth MPEG-4 format or cost effective MPEG-2 format that could be sent over fiber network to provide feed to the subscriber base. Encoders are required for pay channels that are decoded at the subscribers premise using a Set Top Box.

ASI Cards
ASI output from the decoders would be sent to the ASI Cards in the iPlex. These ASI streams are then processed and send further to Transrater to transrate them.

Multiplexers and streamers
Scramble and multiplex Single Program Transport Streams ideal for Digital transmission

DRM Server
These are servers provided by Digital Rights Management technology vendors that work with the Multiplexers and streamers to scramble the signal to avoid content pilferage. This is optional.

Middleware Servers
These are servers that provide the billing, customer services, CPE management, content management features to the network.

Video on Demand Server
These are high throughput servers designed for providing unicast VoD streams for VoD services. Normally the VoD server feeds a tree of smaller VoD servers deployed at Major PoP locations that cache the VoD content. These are optional for the first phase.

Billing Server
The billing software manages the billing transaction for the subscribers for the consumed services. The subscribers can even see the billing details of the services consumed on the TV itself.

Components in Data Play

Broadband Remote Access Server
The point in the network where subscribe identity is terminated and services are generated.
Provides functions like rate control, Network address translation, Routing, PPPoE termination etc.

Components in Voice Play

Soft Switch Server

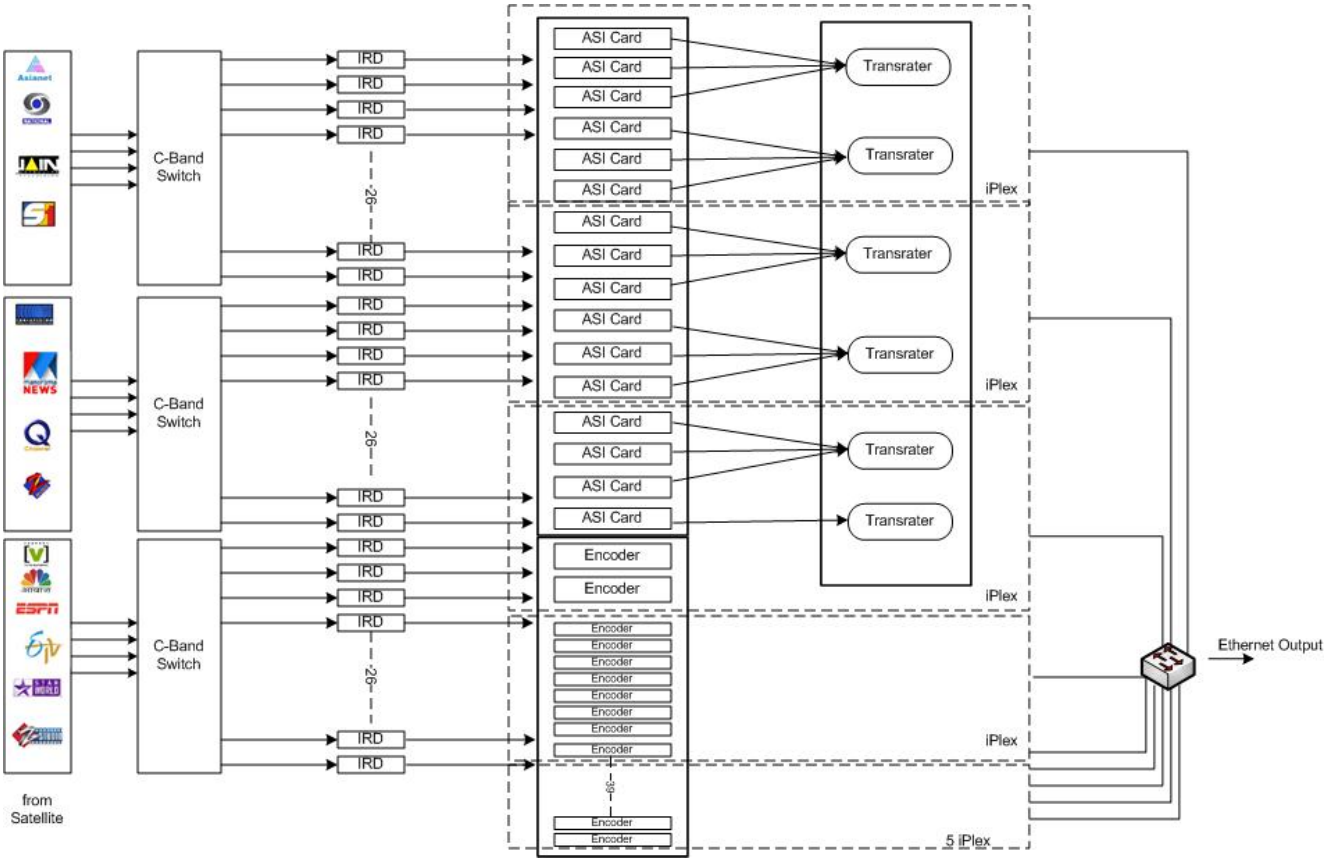
The device enables the VoIP calls over the IP infratructure. The Server manages the access number of the Phone and subscriber information. An ATA device is required for the subscriber to make calls using a regular PSTN telephone equipment.

Triple Play Convergence

Switch
High performance Ethernet switch that would provide 1Gbps to each Major PoP location to start with. It would be possible to upgrade these links to 10 Gbps at a later date. This switch could also provide the Peering functionality required to peer with our uplink ISP. Alternatively peering functionality could be provided using another smaller router.

QAM Modulator
The device would convert the IPTV signal to the Digital signal (QAM Output) which could then be transported over the existing cable infrastructure providing CAS fuctionality. This is required for providing DVBC services from the same headend.

The Detailed connectivity of the Broadcast Video headend for both DVB-C and IPTV services is shown in the following illustration :



1. The feed from the broadcaster is catched by the satellite antennae and would be the input to the Digital Satellite Receiver for decoding the signal.

2. The output of the Digital Satellite receiver could be either ASI or composite signals depending on the nature of the channel i.e. Free To Air or Pay Channel.

3. All the Free To Air channels would be ASI streams whereas Pay channels would be composite or A/V stream.

4. The ASI stream would be the input to the ASI card supporting dual inputs. So, two ASI streams would be the input to the ASI card.

5. The composite stream would be the input to Encoder . The encoder supports MPEG-2 compression and encoding scheme.

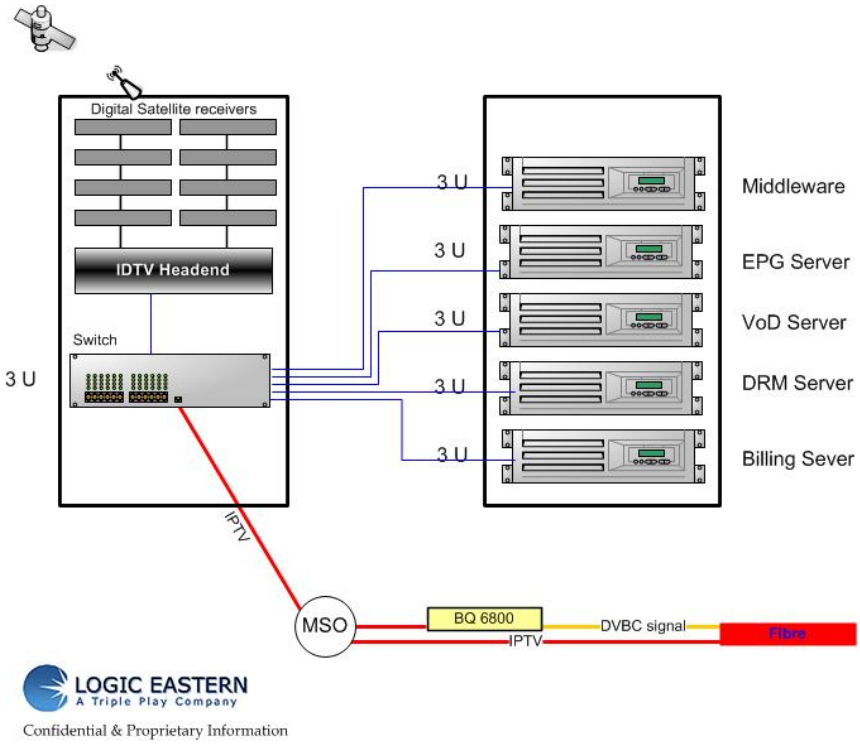
6. ASI cards and Encoder cards are put in iPlex chassis. Each iPlex chassis supports 8 such cards.

7. For each pay channel, one Encoder card is required. And for 2 ASI channels one ASI card is required.

8. The Skystream Iplex processes both the ASI and the encoded stream and gives an ethernet output.

9. The ethernet output from each iPlex would be connected to a switch so that the output from all the iPlex is sent on a single media.

10. This output could then be used for providing DVB-C and IPTV services on the fiber network for the subscribers.



For DVB-C, the output of the switch would be the input to the QAM modulator (BQ6800) that produces digital signals (QAM signals). These signals would be put on the fiber to provide Digital TV (DVB-C) to the subscribers as shown above in the figure.

For IPTV, all the required servers for respective services like video on demand, voice over IP, gaming etc. could be connected to the same switch to which the output of all the iPlex chassis is given. The figure shows the connectivity of all the servers viz. DRM, Billing, VoD, EPG, middleware to the switch. The output of the Headend is also put in the same switch.

From the Central NOC switch, the fiber would carry IPTV services for IPTV network and Digital Tv Services for Digital TV Network as shown in the above figure. The IPTV Network would be the HFC switched network whereas Digital TV Network would be fiber + coaxial network.

Network Infrastructure

For DVB-C, the infrastructure would already be in place so this section could be ignored. To mention, the digital signals from the QAM modulator would be put over co-axial cable using optical node with fiber input.

For IPTV, Micro Pop and Access switches are required to establish the infrastructure for IPTV network as discussed below.

Micro PoP

Micro PoPs help us to reduce the amount of fiber (compared to an ideal FTTH architecture) that would need to be deployed in connecting a large number of subscribers and hence brings scalability in the network scheme. The micro PoP switches are fed with 1Gbps links from the Major PoP that brings to this point the multicast traffic carrying video signals as well as voice and data traffic. The Micro PoPs also are responsible for respecting the traffic tagged by the BRAS. These Micro PoPs would take very little space. The only criterion to house them is secure, cool, dry space. Spaces under stair cases in professionally maintained buildings provide excellent location for Micro PoPs. Micro PoP should be carefully selected since it should have continuous power available. Alternatively the Power can be brought from Mega PoP or a nearby location but that is an expensive proposition. Micro PoP houses the switch with 1G Uplinks and 100 Mbps optical downlinks that feeds the Curb Switches on 100 Mbps links.

Access Switch

Access switch is the point nearest to the subscriber where the optical fiber ends and CAT-5 starts. Switch assembly houses the following:

One 100 Mbps optical uplink with copper downlinks
Provides fiber uplink, downlink and copper ports for connecting four or eight homes. The copper ports can carry Ethernet for up to a distance of 100 Mts.

CAT-5 Cable
Connects the MxU switch to the IP STB and other CPE equipment at home.

Customer Premise Equipment

Customer Premises is the subscriber home, corporate office or other location.

Set Top Box

Both DVB-C and IPTV Set top Box are provided by Logic Eastern. The Set top Box are manufactured, designed and developed at LOGIC EASTERN. DVB-C STB implements CAS functionality and can be used in locations where basic video broadcast TV services are to be delivered. Whereas IPTV STB enables the subscriber to enjoy all innovative IP enabled services. Either of STBs would be placed at the subscribers premises. The IPTV STBs would enable Video on demand, Video conferencing (with an externally attached camera), Voice over IP, Gaming, Personal Viewing and Recording / Time shifting (TIVO like) at the customers side.

Analog Telephony Adapter (ATA) *

A device used for Voice over IP (VoIP) delivery that enables the coding and decoding of voice information in the network. It allows the PSTN telephone instrument to be “upgraded” to be a part of an IP network and thus making and receiving voice calls possible.