Digital Video Broadcasting - Cable

Technical Solution Paper

LOGIC EASTERN INDIA PVT. LTD.
B-2, Sector-31, Noida, U.P., INDIA.
Ph. No. +0129-2455112/13/14,
info@logiceastern.com
http://www.logiceastern.com

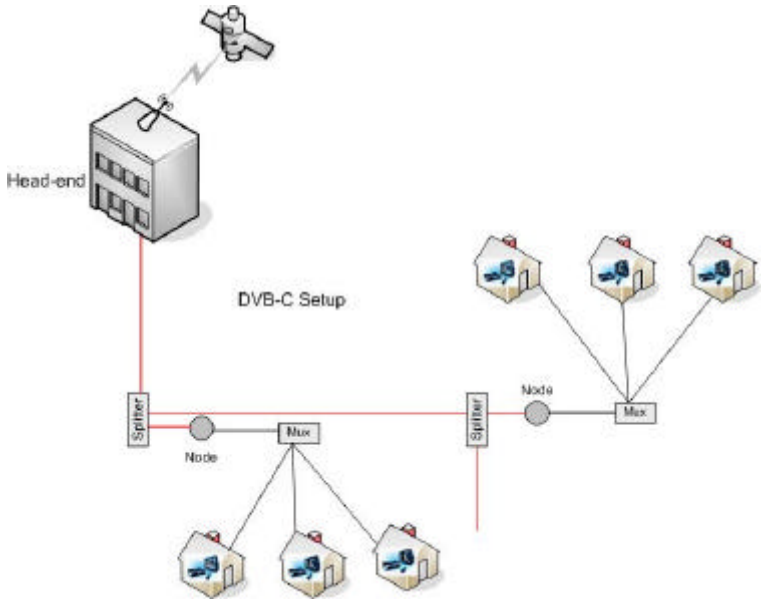
Solution – DVB-C

Digital Television enables the broadcasting and receiving audio and video by means of digital signals. The technique uses digital modulation which could be easily compressed and decoded only by means of set top box.

Digital television has several advantages over traditional TV, the most significant being the use of smaller channel bandwidth. This frees up space for the more digital channel and non-television interactive services like EPG, multicasting. Thus, helps increasing the revenue from multiple innovative services. Digital TV provides better reception, superior image and audio quality.

DVB-C is a digital television technology based on MPEG-2 video compression / transmission scheme. It is however much more than a simple replacement for existing analog television transmission. In the first case, DVB provides superior picture quality with the opportunity to view pictures in standard format or wide screen (16:9) format, along with mono, stereo or surround sound

DVB-C Solution Design



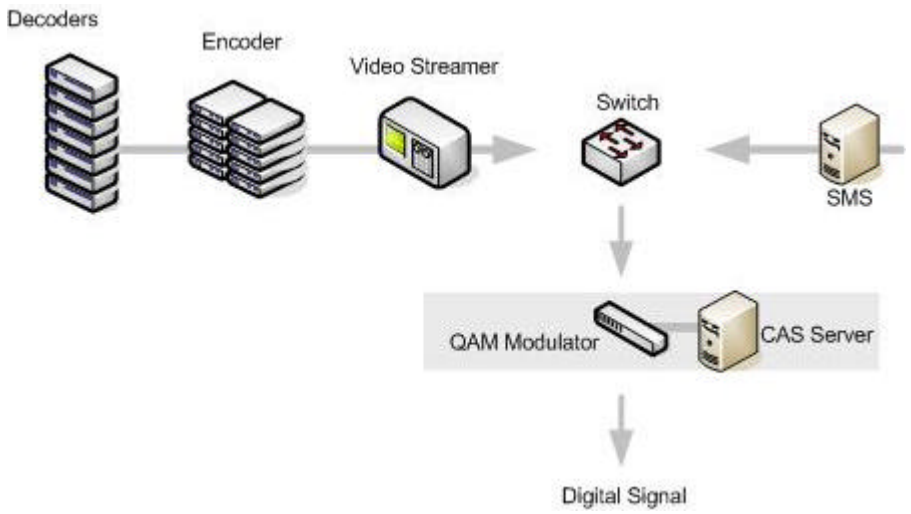
The solution comprises of Digital Head-end by TANDBERG and DVB-C Set Top Boxes manufactured by Logic Eastern. The technical solution paper explains the DVB-C solution in the following topics.

Digital Video Headend

This is the location where Digital Video Headend is set up. This is the area specified at the time of the installation. The Server Farm for IPTV could also be placed here, if the service provider wihe to upgrade the infrastructure to provide IPTV services.

The Digital Video Headend equipment would feed the entire cable 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 HEADEND



We would have the following major components at the location:

Antenna Farm

It captures all the Free to air and scrambled signals being beamed on 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 composite video. These decoders are responsible for receiving the signals from the antennae farm and decoding the received signals. Many of these decoders might be already in place, in case the service provider is already operating analog head-end, and unless specifically asked by the video Head-end vendor, need not be purchased again. Many decoders are provided directly by the broadcaster.

MPEG-2 / MPEG-4 Encoders

Encode the decoded programs into low bandwidth MPEG-4 format or cost effective MPEG-2 format that we could use for IPTV transmission.

Multiplexers and streamers

Scramble and multiplex Single Program Transport Streams.

CAS Server

These are servers provided for Conditional Access System technology that work with the multiplexers and streamers to scramble the signal to avoid content pilferage.

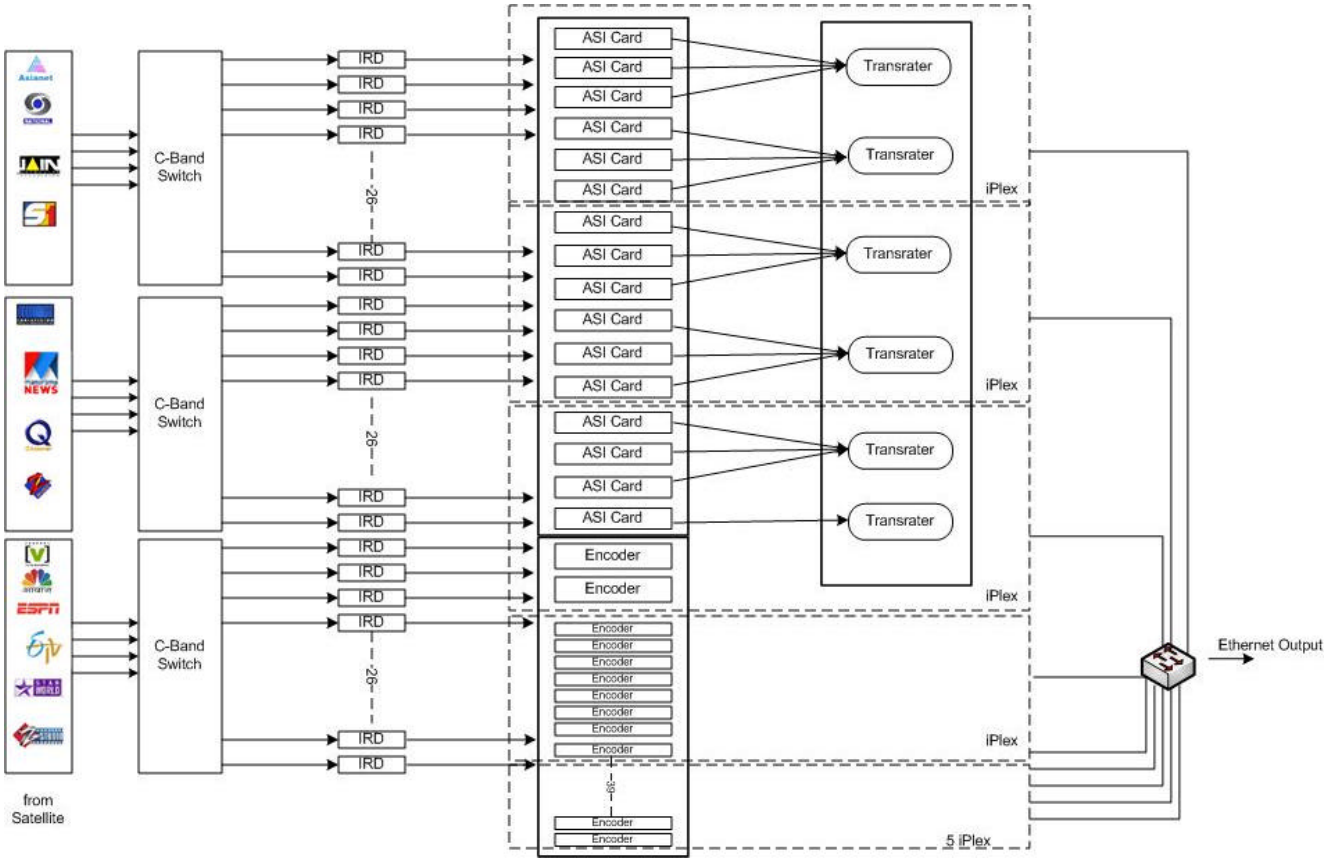
Switch

High performance Ethernet switch that would provide Gigabit ports. Switch would aggregate the video stream received from the encoders and generate a single output that could be given to the modulator.

QAM Modulator

The device would modulate the video data signals from the switch to the QAM modulated digital signal with content security which could then be transported over the existing cable infrastructure.

The Detailed connectivity of the headend is shown in the following illustration :



1. The feed from the broadcaster is received by the satellite antennae and would be 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.

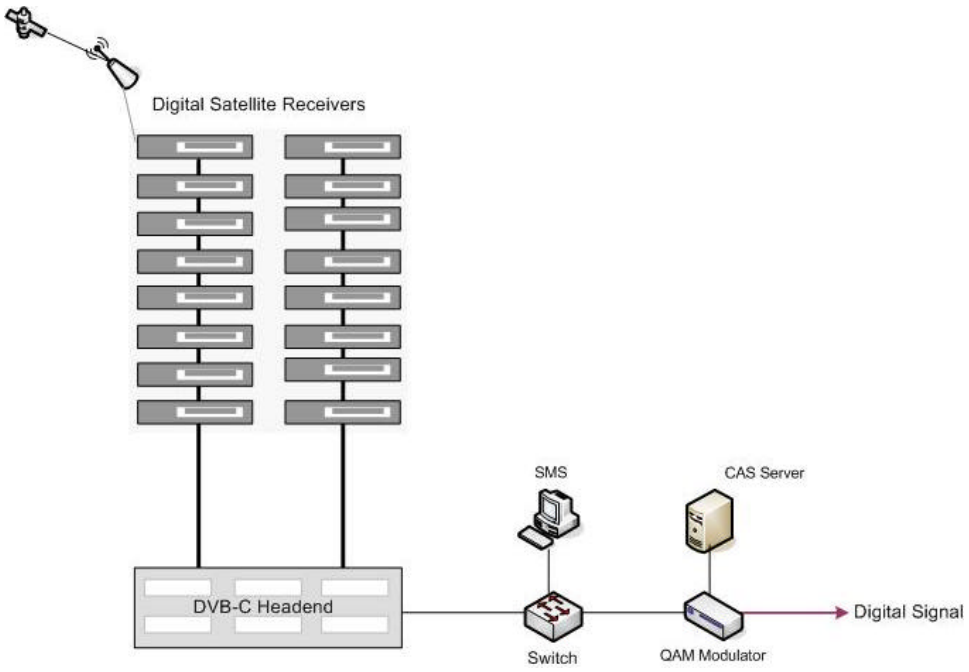
5. The composite stream would be the input to Encoder. The encoder supports MPEG-2 compression and encoding scheme.

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 Iplex processes both the ASI and the encoded stream and generates 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.



Moving further, the above figure shows the complete setup to be put at the NOC to provide DVB-C services to the subscribers. The Signals from the satellite would be catched by the satellite antennae feeding it to the Digital Satellite receivers . These receivers are connected to the DVB-C Headend which gives an ethernet output. The output of the ethernet switch would be fed to the QAM modulator (BQ6800). QAMModulator enables to provide Broadcast cable TV to the subscribers on the co-axial network. The device would convert the video IP signals to the Digital signal which could then be transported over cable with content security fuctionality. From the NOC premises DVB-C signals would run over fibre cable to the optical node to convert the media to coaxial cable. This coaxial cable would provide the last mile connectivity to the subscribers.

CPE

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. DVBC 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.

Network Operation Centre

The NOC would have a Subscriber Management System Server which enables the operator to manage the subscriber services.

Subscriber Management System Software

The management, billing and reporting of the subscriber information would be possible using the SMS server. This would help to keep the detailed record of information of each subscriber making their addressability unique and identified. The channels being watched by the subscriber would be accounted.

Conclusion and Summary

The technology not only increases the number of channels but also delivers them with digital DVD quality. The MSOs would now have control on the subscriber's viewership numbers and this information can be used to more accurately negotiate with the content owners/ broadcasters. The MSOs would now have a Digital Headend that would implement CAS and subscribers would pay for the channels they choose to watch. The DVB-C signal from the headend would be taken from the MSOs to LCOs over optical fiber cable. The LCOs would utilize the existing coaxial cable connectivity to the subscribers' home that would provide last mile connectivity. To utilize the existing local coaxial cable network of the LCO, the fiber would be split as required. The media would be converted from fiber to coaxial cable using an optical node as shown in the diagram. The Digital video can only provide one way communication which limits the subscribers to watch what is shown on the TV.

Logic Eastern enables the service providers to deliver DVB-C services on their existing coaxial network. The same solution could be upgraded to provide additional advanced IPTV services which were never possible before at a minimum expense.