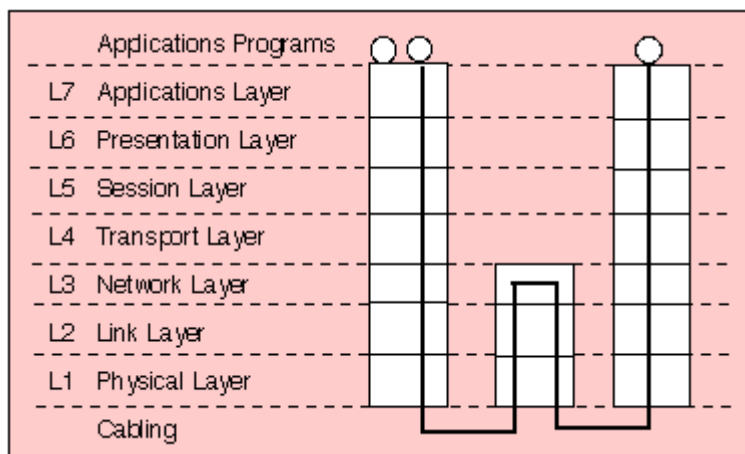




OCEAN BLUE SOFTWARE PRODUCTS IPTV & IP SET TOP BOXES

Introduction.

Tim Berners Lee is acknowledged as starting the revolution via his creation of the World Wide Web (WWW) and responsible for assisting in the seven layer OSI Internet Protocols.



The seven layers of the OSI reference model showing a connection between two end systems communicating.

Internet Protocol Television (IPTV) is another application of the WEB and utilising broadband also called Digital Subscriber Line (DSL) transmission technology to broadcast for example Video-on-demand, Digital Television and Video conferencing.

The DSL standard was designed to offer streaming services, such as Video on Demand films and voice to the consumer. DSL networks are generally multicast systems.

The functions, broadcast applications and software applications as indicated above require an Internet Protocol based set top box. (IP STB). The hardware and software aspects of an IP STB is explained later in section 3.

Triple Play

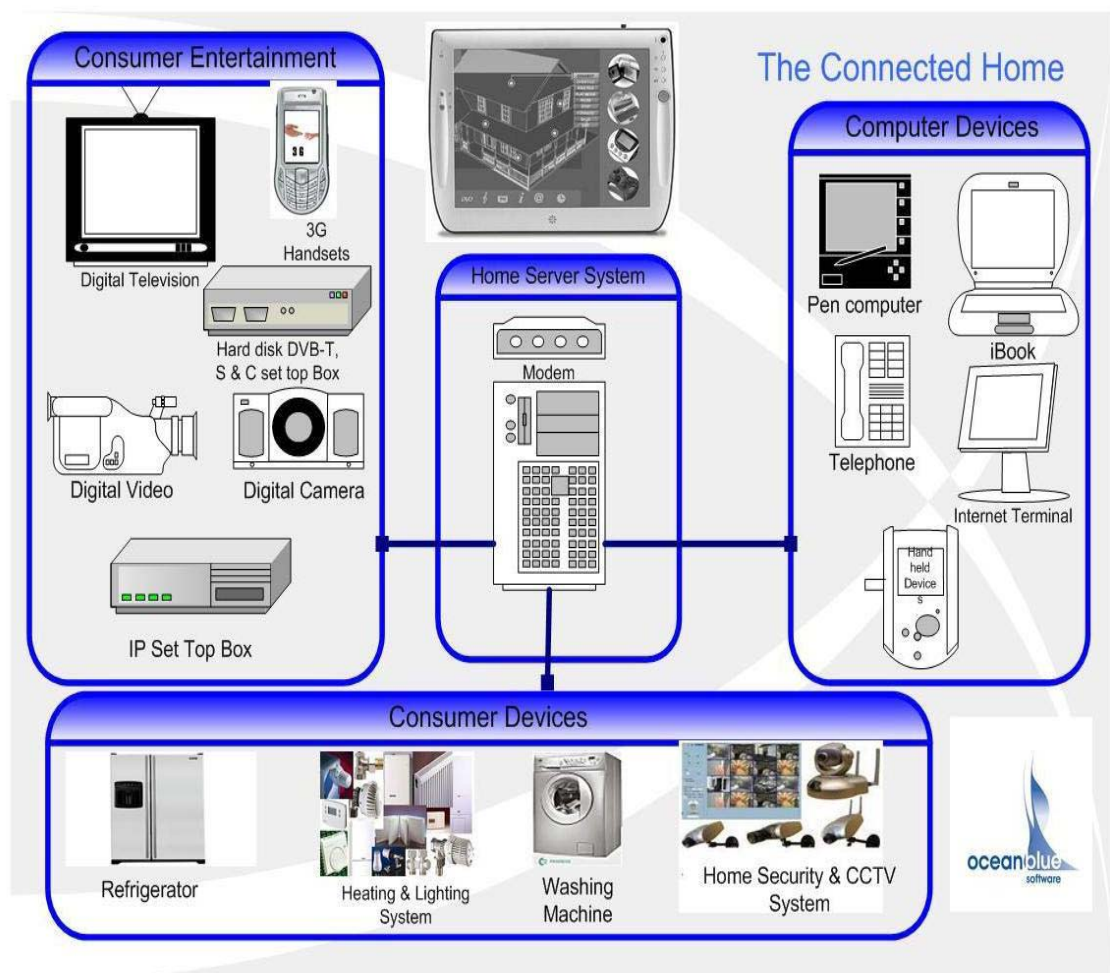
Broadband vendors will generally offer consumers an IP STB, and a Triple play package consisting of phone, internet and television broadcasts for a fixed price per month.

The Connected Home

IPTV forms part of the jigsaw for the Connected Digital Home. The Digital Home is essentially consumer electronic devices i.e. a Digital TV set top box or IP STB connected seamlessly to a wireless and connected Home Computer Network.

This allows multi-media content consisting of for example: Music, Video, audio, pictures, text, data, and security checking and control procedures to flow throughout a normal household via the Home Network.

Ocean Blue Vision of the Future Digital Connected Home



IP STB Hardware & Middleware Software

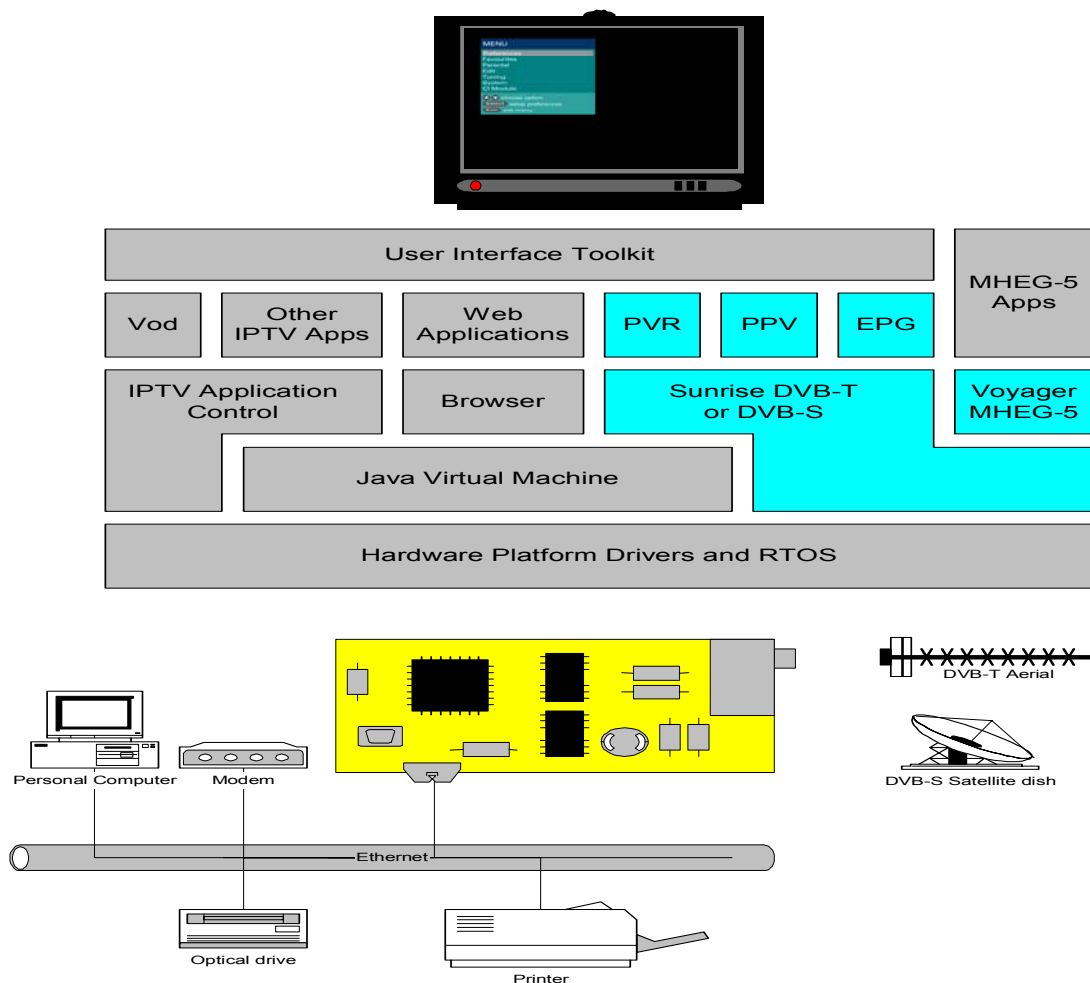
The IPTV hardware device, which for example can consists of: a Hybrid set top box consisting of: a hard disk, RF tuner, pc chipset architecture (i.e. AMD, Intel) a broadband modem, Digital Video Broadcasting (DVB) chipset architecture

(i.e. Philips & ST), physical memory , flash memory Broadband (DSL) high speed telephone transmission (1MB – 8MB line speed) deliver a new experience to consumers and with two way communication capability for fast rapid interactivity via the Internet.

A number of Consumer Electronics companies will also offer an IP STB with a single chip solution; it remains to be seen if this will provide enough horsepower to drive both the DVB and IP software application and systems software.

Software inside an IP STB will consist of both IP and DVB software layers, as per diagram below:

Ocean Blue's DVB software & Example IP software stack combined in an IP Set Top Box.



DVB & IP Middleware software is essential for the Digital Home and any form of Digital TV Broadcasting or streaming of content. The value of middleware software is to allow operators the flexibility to scale, adopt new application and help generate new business opportunities and revenue streams.

IP STB and Broadband communication will allow a natural telephone return path, opening up numerous business opportunities for interactive services and applications. Examples will be listed later in this report.

Interactivity & UK Digital Terrestrial Television.

The UK based DVB-T Interactive two way experience is currently limited on conventional Digital Terrestrial television due to the lack of support for a telephone return channel both inside a Freeview set top box and within the MHEG specification at this time.

For further details on MHEG please see Ocean Blue paper on Digital TV software standards available free of charge from <http://www.oceanbluesoftware.co.uk/publications.html>

Current Digital TV broadcasting platforms include: cable, terrestrial and Satellite.

Examples applications of IP STB are as follows:

- Video on Demand (VoD) in near real time, consumers will be able choose, which TV programmes to watch, when and on a 24/7 basis.
- Consumers will be able to catch up and view favourite TV programmes missed.
- Full access to all the World Wide Web for example: Download and store web based information on set top box.
- Connect Digital cameras & devices to upload and store data, information, audio, music, image and pictures on the hard disk embedded in the set top box.
- Voice Over Internet protocol telephony(VOIP)
- Video Conferencing.
- Interacting with Digital TV broadcast via the WEB
i.e. Big Brother voting
- Home Shopping
- Downloadable games and quizzes

Video Compression Systems

Compression technologies play an important part in the viability of TV over DSL networks. There are a number of compression offerings in the market, for example:

- Microsoft TV's VC-1
- MPEG 4 AVC
- D9154 MPEG 4 advanced compression platform
- MPEG 2

Ocean Blue Software Products

Ocean Blue offers a complete and comprehensive range of DVB software products, such as DVB-T, DVB-S and MHEG-5, which consists of features and functions for example:

- Channel tuning
- User Interface tools
- Channel changing
- EBU/DVB subtitles
- EPG support
- Conditional Access support
- Common Interface support
- Digital Rights Management support
- Multi-lingual On Screen display support
- Favourite list
- Timers
- Serial port loader
- Surfsoft Personal Video Recorder software
- EBU Teletext
- MHEG-5 Middleware

For further information or to arrange a meeting please contact Ken Helps at ken.helps@oceanbluesoftware.co.uk or call (44) 0870 24 25 546