



5 Marine Drive West
Bognor Regis, West Sussex
PO212QA, UK
Website: www.endurancetech.co.uk



2 Venture Road
Southampton Science Park
Southampton, Hants, SO16 7NP
www.bci.eu.com

Over The Top TV (OTT TV) Delivery Platforms Review

Mark Hooper, Director BCI
Andrew Moyler, Director Endurance
Richard Nicoll, Director Endurance

Copyright ©2010

The copyright in this document is owned by BCI & Endurance Technology Ltd. Any person is hereby authorised to view, copy, print, and distribute this document subject to the following conditions:

1. The document may be used for informational purposes only.
2. The document may only be used for non-commercial purposes.
3. Any copy of this document or portion thereof must include this copyright notice.

Date: 2010-09-27

Contents

Executive Summary	3
Purpose of this paper	3
Who is this paper aimed at	4
What is OTT TV?	4
OTT TV Platforms	4
YouView (formerly Canvas)	4
Freeview HD (MHEG-IC).....	6
SeeSaw - Arqiva	7
HBBTV	7
Google TV.....	8
Sony.....	9
Other offerings	9
Comparison matrix	10
Winners & Losers.....	10
Demonstrations	11
How we can help your business?	11

Executive Summary

Over the Top TV (OTT TV), the delivery of video via the internet directly to user(s) connected devices, allows access to services anywhere, anytime and on any device. Many of the barriers to widespread deployment of OTT TV services are now understood and well on the way to being solved. OTT TV therefore has the potential to transform the face of TV industry by creating new business opportunities for existing stakeholders and facilitating many new entrants.

The purpose of this second White Paper, which is part of a series, is to introduce and describe a number of leading OTT TV platforms and to compare and contrast key aspects for each. In particular we will be reviewing YouView (Canvas), HbbTV, Google TV, SeeSaw and MHEG IC.

Consumers are now gaining access to a plethora of rich on demand content alongside traditional linear content and much of this is freely available. For those who want premium content there will be service providers able to offer them access to films and other content all through the same user interface.

What potential exists by combining push VoD technology into the platform? ISP's will be keen to address the issues of carrying the same content many thousands of times. Push VoD could help address these issues.

Future white papers in this series will explore the specific detail of OTT TV platforms and implementation issues. Our OTT TV demonstrations, designed to promote discussion and evolution of this broad topic, will be available at the forthcoming mashup event in London on 12th October 2010.

This series of papers is likely to be of interest to the senior executives of Operators, CE Vendors and Content Aggregators.

The team at BCI and Endurance has for over 15 years been at the forefront of the Digital Television and Telco TV deployments.

Purpose of this paper

The purpose of this paper is to:-

- Provide an overview of a number of leading OTT TV platforms.
- Compare and contrast the various features and technologies associated with each platform.
- Describe its place in, and effect on, the OTT TV market

The authors acknowledge this is not an exhaustive list of platforms and technologies.

Who is this paper aimed at

This paper addresses a wide range of issues so is likely to be of interest to CEO's, CTO's, COO's and those with an interest in OTT TV design and deployment matters. The paper answers important questions for the following types of business within the Broadcast industry value chain:

- Content producers and aggregators
- CE Vendors (typically Television, STB and handheld devices)
- ISPs and Telco Operators
- Traditional Operators (Cable, Satellite, etc)

This is the second in a series of three papers that will build on the previous paper culminating in a detailed technical analysis of the platform issues associated with a number of the defined problem statements. Each paper is intended to explore a different aspect of this substantial topic and we look forward to hearing back from you in respect of areas that are of particular interest to you at contact@endurancetech.co.uk or info@bci.eu.com

What is OTT TV?

OTT TV is simply the delivery of video and audio, via the internet, directly to user(s) connected devices. It allows access to services anywhere, anytime and on any device. Now that so much video is available online, the industry is asking if future TV programming will be mainly delivered over the Internet, bypassing today's traditional PSB's (Public Service Broadcasters), Cable and Satellite providers.

Connected TV devices such as Blu-ray players, game consoles, smart-phones, and TV sets are swamping the market. The value of hybrid STBs that are immediately put into use will reach \$1.3 billion (€1 billion) worldwide by 2014, according to research firm In-Stat. "TV programmes have come to the Internet. Now, the internet is coming back to TV, and savvy software engineers and smart TV producers are finding ways to create new "hybrid" services that bring it all together," said Gerry Kaufhold, principal analyst for In-Stat, in a statement. "The set top box industry is scrambling to create designs that facilitate all these new features."

Each category of connected device and each geographic region are developing along unique trajectories.

OTT TV Platforms

YouView (formerly Canvas)

Arguably YouView really started life as the 'Kangaroo' service. Kangaroo was cancelled after anti-competition objections. The Kangaroo partners then created YouView with one important difference; it is an open platform/standard and, as such, allows others to add and access content.

The platform is a direct response to the acknowledgement that Freeview and FreeSat would be left behind the planned services from DTTH operators (e.g. Sky, Virgin Media). In line with the Freeview and FreeSat platforms the offer will be free and will require the consumer to purchase a YouView ready TV, STB or other connected device.

YouView describes itself as follows:

“Content

Connected TVs will enable a wide range of content to find its way to the TV set. The YouView venture will not own, aggregate or control content. The availability of content will be dependent on third parties making applications available to the platform.

Linear TV

"YouView compliant" devices will be upgrades of the UK's existing free-to-air platforms (eg. Freeview, Freesat).

Video on demand

The devices will also integrate video on demand services (e.g. iPlayer, ITV Player, 40D) as well. Using catch-up and archive services, consumers will be able to browse back and forth in time to get all available programmes on demand.

Other online content services

While the YouView venture will not own, aggregate or control content, internet-based video services (such as Lovefilm, Hulu, Blinkboxx) can build applications for the platform, as could any content owner or service provider (e.g. flickr, twitter, amazon.com).

Who are the Partners?

The founding members: BBC, ITV, BT

June 2009; Five. December 2009; Channel 4, Talk Talk

YouView also includes other technology partners, key partners include: Cisco, Thomson, Humax.

Recently Arqiva have joined and Orange has expressed the potential of signing up as a partner.

What will YouView offer?

The offering, which is due for launch in 2011, is based around the PSB's (Public Service Broadcasters) linear offering being made available as a 'catch up' service. The important difference is the ability to watch the content direct to TV and not on or via a computer.

Consumers will still be able to watch linear TV but now also have access to online content direct to their TV. They will also be able to access other content and applications including:

- Social apps (Facebook)

- Webmail accounts (Gmail)
- Premium content (Love Film)
- You Tube

Potential Effects of YouView on the Market

There are a growing number of equipment manufacturers announcing support for YouView, however, complaints are mounting with a number of organisations, such as the OSC Open Standards Committee), formally writing to the UK regulator, Ofcom, asking it to investigate the service. The OSC said that YouView will have "adverse consequences for the device and software sector, diminishing consumer choice and causing inevitable consumer harm". This complaint is the latest in a line of attacks against YouView, joining Virgin Media, United for Local Television, IP Vision and Six TV.

The platform is well supported by key partners with the BBC clearly the most influential partner and perhaps rightly so. It will be able to leverage its credentials with the public by doing what it does so well. It will woo the public with a cushion of well produced and palatable information designed to demystify the offer to the same level of acceptance as Freeview. What is still not clear is whether or not Sky will 'play' by making its content (and in particular its premium content) available. Some commentators have speculated that the platform is not viable unless Sky adds its content. YouView should be successful but its chances will be improved with Sky content.

In addition Project YouView has been accused at various times of: a) setting up a parallel activity in the UK to the DTG that isn't as open and published as it claims to be; b) yet another attempt amongst many others (see Competing Platforms) to develop such a standard; c) going far beyond what it needs to define (e.g. control over the UI) in order to create such a platform.

Freeview HD (MHEG-IC)

Recent work by the DTG in the UK has led to the development of the MHEG-5 Interaction Channel (MHEG-IC), which enables an extension of broadcast interactive services and streamed media to be delivered via an IP connection. In order to address the finite capacity of the broadcast network to carry interactive content, set-top boxes, integrated digital TVs (iDTVs) and PVRs conforming to the MHEG-5 IC specification can be connected through the home network to the public internet using a standard home router and ISP connection. Interactive applications and associated content can be accessed either via the broadcast carousel or via the IP connection.

The principles behind the MHEG-IC are to provide a seamless viewer experience of broadcast delivered content augmented with content delivered over IP as an extension of the channel or network. Broadcasters have full editorial control of the user experience. The MHEG-IC gives access to streamed on-demand video content in addition to traditional text and graphics as well as the ability to support secure transactions. Whilst there is strong consumer demand for on-demand services such as catch-up TV, the widespread deployment of the MHEG-IC will be dependent upon the availability of fast, good quality of service and uncapped broadband

connections. Most consumer devices are not professionally installed and the ease of connection to the home network is paramount in the success of any broadband content. For this reason, the MHEG-IC uses the same standard protocols used to deliver web content to PCs: TCP-IP, HTTP and HTTPS. This means that no special configuration of the home network is needed – if it's possible to browse the web from your home PC, then the MHEG-IC will also work when connected to the same network."

SeeSaw - Arqiva

Arqiva bought the Kangaroo platform during July 2009 with the intention of providing an online 'long form' offering with content from broadcasters and independent content providers. In other words it will carry very similar content as YouView and is likely to support the use of similar applications such as Facebook, Gmail, You Tube, etc. What is not so clear is the distribution channel. Will it be STB only offering, resold via 3rd parties, white label or to integrate directly into a CE vendors TV?

There is another interesting possibility with SeeSaw. Arqiva has the potential to support push VoD, as it already supports the Top Up TV service. Customers are managed and billed by Top Up TV but the service is delivered over the Freeview infrastructure. What if the benefits of a Push VoD platform are added to the benefits of the YouView platform?

This presents an even more compelling offering for consumers (as they will have immediate access to popular content and at high resolutions potentially). The ISP's support such a move as it means they do not have to carry a popular soap opera or similar, across their network 1000's of times. Surely it makes more sense to push this content quietly to the STB. Less network traffic for the ISP's and better service to the consumer.

HBBTV

This can be thought of as a pan-European version of YouView. Unlike YouView it is being positioned as a service as opposed to a platform but from a consumer standpoint the experience is likely to be similar. In essence it will be a hybrid DVB and IPTV service accessed via an enabled TV or STB.

HbbTV is an open specification (published by ETSI) which defines, through reference to numerous other open specifications, a platform supporting interactive content ranging from simple "Red button" content similar to the way MHEG is used in UK Freeview, right through to entire set-top box user interfaces. The user interface is presented through variants of HTML and CSS and implemented in JavaScript. Any particular self-contained package of HTML, CSS and JavaScript on this platform is referred to as an application.

The broadcast connection transmits the main TV and radio services, as well as some data services. Applications can be transmitted entirely within data services, or URIs can be transmitted which allow applications to be fetched over a broadband connection. Applications can be independent of the currently decoding broadcast service or can be tied to it (red button interactive content etc.) with control over application lifecycle (e.g. a particular 'red button' broadcast-related application may be transmitted for the duration of a single advertisement only).

The broadband connection is used for on-demand video and radio content, for transmission of broadcast-related applications if desired, for discovery (e.g. some kind of application/games portal) and fetching of applications which are not related to particular broadcasts, and for exchange of information between applications and remote servers - the connection is used in a two-way fashion, though there is an implication that download/pull/fetch data speed is typically expected to be high (to support on-demand video, for example) while the upload/push/send data speed does not need to be anywhere near as fast. This is important given the upload/download speed asymmetry of many broadband services.

Since all (or "enough") of the HbbTV collection of standards are open, in the sense that they can be accessed and read free of charge by any individual or organisation, then any HbbTV compliant set-top box is capable in theory of running any HbbTV compliant application. A particular vendor's set-top box is not constrained to run a particular vendor's applications, or vice versa. However, a particular deployed HbbTV *service* may be tied to an STB due to content protection, branding requirements, assumptions about head-end content services or similar; the HbbTV specification does not attempt to define the specific kinds of applications or services that a manufacturer or software author may produce, it merely defines the way in which these things are produced and the constraints under which they operate.

Google TV

Google have launched a platform called "Google TV" based on top of its Android system. This is another attempt to integrate the web directly with TV but unlike offerings like YouView which come from the broadcast market Google TV is coming at a solution from the web market using its YouTube/Google Video offerings to provide access to some online content.

Unlike the other offerings it also has to be driven primarily using keyboard and pointing device which are quite alien to the traditional 10 foot lean back TV viewing experience. Given that studies have shown that if you remove the batteries from a TV remote control that >70% of subjects won't get up to change the channel even when its showing something they don't want to watch, Google may not be going in the right direction with their interface. Google have recently announced that they are negotiating with the major studios to offer premium content on the You Tube platform. Apple is also understood to be looking to re-launch a more video centric version of the iTunes platform in competition. According to Google there are 300 million visitors a day, 2 billion view per day, 160 mobile views and 24 hours of video uploaded every minute. There are 2 billion monetised views a week; the number of advertisers was up 50% from last year.

Google TV will be introduced in the US before the end of the year, but the service will not hit Europe until 2011. Goggle has announced that Google TV in the US will include a Google TV Marketplace. As reported by Broadband TV News, Sony will be the official launch partner for Google TV. The company was showing the first Google TV sets in Berlin. Google TV will launch in the US with three products; a full HDTV set from Sony, a Sony Blu-ray player and a set top box from Logitech. Android-powered smartphones and the Apple iPhone can be used

as remote control devices for GoogleTV, and also a remote with Voicesearch is in the planning. Other territories will roll out later, but there is not yet a definite schedule.

Sony

Sony will add 100 “channels” from the German online video portal sevenload to all its Bravia TV sets, as well as other connected devices such as Blu-ray players and home cinema sets. The official launch of the new service took place at this year’s IFA consumer electronics show in Berlin.

Viewers will have direct access to over 3,000 videos on the sevenload portal including content from major broadcasters such as BBC, MTV, Discovery Channel’s DMAX, National Geographic, Nickelodeon, as well as from local German channels and producers including Stern TV, Giga TV, Focus, Deutsche Welle and many others such as Big Brother.

Other offerings

There are several other services being promoted that aggregate internet content (you tube, etc) and present it alongside the linear Freeview content via an STB. Whilst these services bring additional choice to the market they will essentially only act as stopgap for many until OTT TV platforms, such as described, above become available.

Comparison matrix

The following table provides a comparison of a number of key platform attributes:

ATTRIBUTE	PLATFORM					Comments
	Canvas	SeeSaw	HbbTV	Google TV	MHEG & MHEG IC	
Hybrid Platform	Y	N	Y	Y	Y	Will the platform/end device provide linear & OTT services?
Deployment cost	M	M	M	M	L	Metric considers: 1. Estimated platform cost 2. Does the Operator have to supply the end device (STB, TV, etc) 3. Estimated ongoing costs (licence fees, high maint, etc)
Standards Based	Y	N	Y	N	Y	Whats standards are they based on? Adoption of standards will lower entry barriers, reduce TTM and improve acceptance.
Deployment locations	UK	UK	EU	US	UK, Aus, NZ, HK, Ire	Countries of current and planned deployments
End devices	IDTV/STB	PC or Widget	IDTV/STB	IDTV/STB/ Blueray/ Playstation	IDTV/STB	Actual and planned devices.
DRM/CA provider	Marlin	None	Flexible	Marlin with Sony	TBD	

Key	Y	Yes
	N	No
	H	High
	M	Medium
	L	Low

Winners & Losers

Operators

Operators, such as Sky and Virgin Media will see these OTT TV platforms as a competitive threat in the short term. However there are obvious benefits to them by allowing their content to be sold via the OTT TV platforms. There could be a 'Virgin Media' or 'Sky' tab on the EPG allowing consumers' access to much of the unique content found only on these Operators packages.

Arguably the Operators currently rely on the fact that they have exclusive rights premium content. Consumers pay for access to this content but show little loyalty to the service provider and are likely to leave if that compelling content (say football rights) ceases. These 'Operator agnostic' consumers would generally prefer to take a core 'free' platform service (YouView) and pay for the niche premium content ad-hoc. If it comes to a 'carrot and stick' offering consumers will punish the Operator who emphasises use of the 'stick'

The model

It seems clear that most people are crying out for information as this is moving very quickly and there's still a lack of consolidated models out there. One preferred approach is based on the 'iTunes' model where a marketplace exists for many types of content and it remains open to new content sources. The recent internet TV offerings have been a closed system where the CE vendor is controlling what applications and content will be available to the customer. This may be a short term approach and will result in slow growth as customers will recognise the limitations of this approach.

Monetising

There's a couple of ways to make money; sell kit or sell content. However there's a way to learn something from the iTunes model here too. Why not sell the 'app' that gives access to content and make the content free or cheap? This may be particularly relevant at the thin end of the long tail.

ISP's/Bandwidth

ISP's are feeling increasingly marginalised and will not continue to allow themselves to become a free/cheap carrier of everyone's content. An assumption here is that they will be adapting their own pricing models to ensure they can recover investment they have made in the infrastructure. Unless people start asking 'what's in it for the Network Operator' we are all going to find restrictions over the use of the pipe.

Demonstrations

The Endurance demonstration shows multiple devices (iPad, Laptop, Google phone, iPhone) interacting with information on a main TV screen. Each of the satellite devices/screens has knowledge of the content on the main TV screen. The objective of the demonstration is to show how related OTT content can be used to create value for consumers, vendors and service providers.

How we can help your business?

BCi & Endurance in this second paper has described some of the platforms/solutions available to operators and CE manufacturers. We are involved with integration and deployment issues of new and emergent platform technologies relevant to both Operators and Equipment Vendors. Based on our considerable experience of working with vendors and technology we are well placed to help stakeholders develop new and existing platforms.

BCi & Endurance offer a broad range of IPTV and VoD related professional services. For more information please see us at:

BCi Limited: www.bci.eu.com, Endurance Technology Ltd: www.endurancetechnology.co.uk

In future papers we will concentrate on working through some of the detail related to the problem statements identified in our first paper. We welcome hearing from interested parties who wish to participate more fully in the development of additional problem statements and solutions.

Warranty

Note that any product, process or technology described in the document may be the subject of other Intellectual Property rights reserved by or Endurance Technology Ltd and are not licensed hereunder.

THIS PUBLICATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. THIS PUBLICATION COULD INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS. CHANGES ARE PERIODICALLY ADDED TO THE INFORMATION HEREIN; THESE CHANGES WILL BE INCORPORATED IN NEW EDITIONS OF THE PUBLICATION. BCI LTD MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) AND/OR THE PROGRAM(S) DESCRIBED IN THIS PUBLICATION AT ANY TIME.