Over The Top TV (OTT TV) Platform Technologies

Andrew Moyler, Director
Mark Hooper, Director

Date 20th November 2009

Contents

Executive Summary

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 first White Paper, which will be part of a series, is to introduce and describe some of the different stakeholder groups facing both the challenges and opportunities created by OTT TV. From here we proceed to describe a number of general platform and systems integration considerations and then proceed to consider in more detail some fairly common problem statements and solutions which are relevant to these stakeholders.

Future white papers in this series will explore the specific detail of each of these problem statements. Tangible demonstrations to promote discussion and evolution of this broad topic will be available.

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

The team at BCi-Endurance has for over 15 years been at the forefront of the Digital

Television and Telco TV deployments. As such 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

Purpose of this paper and the series

The purpose of this paper is to:-

- Provide an overview of the platform technologies available to new and existing stakeholders

- Describe a set of 'Use Cases' that forms the problem domain that the solution/approach addresses

- Look at the emergence of open standards in this arena including DLNA, DRM and Open Source Media Platforms

- Consider how and what technologies, as defined in the problem statements, are best suited to some typical stakeholder situations and their likely approach towards leveraging the benefits and opportunities created by OTT TV

- Consider how the various technologies might be integrated to produce a platform capable of delivering the business benefits sought by the stakeholder to its end consumer customers

- Describe and show a real world demonstration of an integrated set of leading edge solutions

Who is this paper aimed at

This paper addresses a wide range of technical issues so is likely to be off interest to CEO's, CTO's, COO's and those with and 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 first 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.

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.

The main challenges for OTT TV

This future paradigm faces four main challenges

1. lack of Internet connections to TV sets

2. bandwidth-limited video quality

3. lack of business models

4. the challenge of navigating through millions of video programs and content clips

All of these challenges are well on the way to being solved, but, even so, it will take a few more years before OTT TV can compete effectively with cable or satellite for linear scheduled broadcast content delivery. In the face of surging demand for online video, service providers and hardware developers are jockeying for space in the living room and OTT TV solutions are the latest to the game.

OTT TV importance & implications

We see a number of key reasons as to why OTT will have such a major impact on the whole Media industry:-

- It is a key enabler of 'Personalisation of TV' where relevant content and services can be tailored to consumers

- Users will be able to access services anywhere, anytime and on a variety of devices as content becomes fully personalised and portable

- New players[1] from both inside and outside the industry will challenge the existing operators as subscribers are offered a greater

---

[1] Described in the stakeholder analysis section for this white paper

choice. Content will however remain king

- New service and business models will emerge facilitated by the integration of products and technologies in the area of digital rights management and device interconnection

- Users will have the ability to build a la carte personalised content portals from a variety of different content providers including the main studios, broadcasters, content aggregators and micro broadcasters

- It will Change the basis of competition for consumer spend on content

Barriers to OTT TV

1. OTT TV needs devices supporting new OTT TV standards to become more ubiquitous

2. Current bandwidth and quality of service limitations over many ADSL connections means video quality isn't yet ready for prime time TV

3. Outside of certain niches, the economics still favour traditional delivery, however as the price of delivering an IP stream falls this difference is becoming less apparent.

4. ISP's/Backbone providers (who do not offer OTT TV) already feel marginalised and will want to place restrictions on the carriage of this type of traffic

5. Navigation is still the biggest obstacle. By this we mean both the

navigation and presentation of the vast array of content on offer

Typical stakeholders & business activity

Operator with a premium content play

- Will retain traditional methods of delivery for their pay TV business

- Likely to use OTT TV for delivery of VoD (especially Satellite Operators)

- Will use OTT TV for the delivery of niche content

- Will use OTT TV to enhance existing linear programming

- Will use this to enhance portability of content across devices/multiroom

- See Problem Statement 1 for a description of the problem and a solution

Operator without premium content (e.g. some ISP's, T2, T3 telcos)

- Will form relationships with content aggregators; focus on new and free content

- Will form closer partnerships with CE vendors and attempt to leverage their strategies

- May struggle to negotiate appropriate commercial deals for content

CE vendor without in house premium content

- Establish own content portals and make use of content aggregators

- Strategies based on interconnected devices and content portability

- Services based on users own content such as photos and videos, social networking

- See Problem Statement 2 for a description of the problem and solution

CE vendor with in-house premium content (e.g. Sony[2])

- Bypass traditional operators to deliver content direct

- All of the above stakeholder business models

  - Will be the most formidable in the long run

Super Aggregators (e.g Such as Amazon, Google and Ebay)

These businesses are already vying for our purchases of many goods and services and they are well placed to form themselves into a 'one stop shop' for all of your online entertainment requirements.

- Will look to become the single portal for all goods, service and content

- Will form relationships with all content producers (large and small)

---

[2] Although there is no evidence to suppose that Sony Pictures would offer any special deal for Sony CE

- Competition based on scale and making a turn on very large numbers of transactions

Small OTT TV Ecosystems

Barriers to entry for the assembly of a complete ecosystem capable of delivering OTT TV have fallen dramatically in recent years. This has been facilitated by the adoption of more open standards and a variety of vendors working together to provide more integrated platforms for the delivery of OTT TV.

As a consequence we see a small, but growing, part of the markets being occupied by groupings of software vendors, content aggregators and CE vendors. These clusters are opportunistically building out solutions which in combination may become a significant market presence. Further we have the possibility that this entrepreneurial hot bed of activity will give rise to a new major player/ business paradigm.

Platform & Systems Integration considerations

Clearly any of the 'stakeholder's contemplating entry into this market will have much to consider. Depending on budget, time, functionality, etc the stakeholder may opt for a pre-integrated solution eliminating much of the integration risk. However even these 'off the shelf' solutions will require a level of integration. Other stakeholders will have the need to create a bespoke solution. The purpose of this paper is not to explain in detail the technology approach (this is the subject of the next paper) however key considerations include:

- Open standards / open source versus proprietary

- Content protection

- Scalability and quality of service

- Portability of content

  - Single v multiple content formats v conversion strategies

- Location of content

  - Content held on a central repository in the WAN

  - Content on a central repository in the LAN i.e. Home Mediaserver

  - Distributed content

- Streaming between devices versus file or device transfer

- Regionalisation of content (like DVD region 1)

- General Architecture – e.g. content management (central, distributed, both?)

- Q.o.S./Q.o.E. – How is this to be managed on an internet backbone service?

- Capacity and Scalability

- Launch strategy – Scale trials, full launch, etc?

Problem Statements (PS)

These problem statements, whilst not an exhaustive list, represent the typical scenarios likely to be encountered by

Operators, Vendors and Content owners/distributors.

PS 1: Transfer of content between two STB's

Problem

A consumer purchases premium content, say a film, from their service provider and watches it on their TV at home. For some reason they have to leave the house and plan to watch the film later. When they get home someone else is watching sport on the main TV and so they are unable to finish the film.
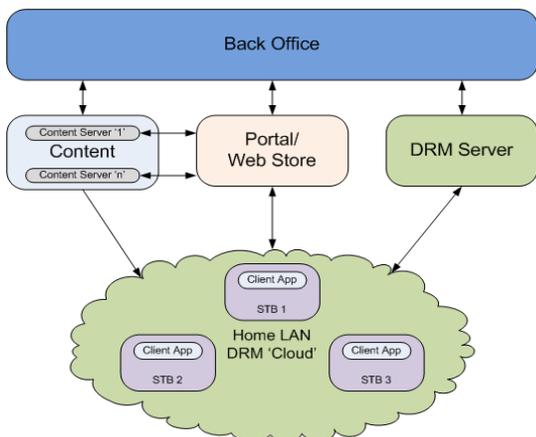
Reason

Service providers such as Cable Operators, Satellite Operators, etc deliver their services directly to a STB connected directly to the TV. This is because of the way the STB connects to the network and because of how the network is designed.

Solution

This solution is specifically designed to address this issue. At the heart of the system is a DRM technology that allows premium content to be shared with other devices. This gives 'permission' for the content to be accessed by 'approved' devices.

Architecture

PS2: Difficulty of Transferring content between other devices

Problem

It is not easy for a consumer to move content between devices around the home. These devices could be PC to TV, TV to games console, etc.
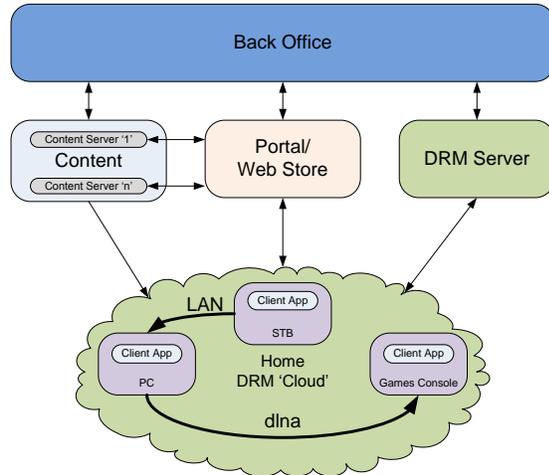
Reason

A lack of common standards and/or consumer knowhow to connect disparate devices.

Solution

The demonstration shows how content can easily transfer from one device to another. This can be achieved a number of ways including dlna, wi-fi, USB drive or even using a SD card.

Architecture

PS3: Difficulty of transferring content 'off-net'

Problem

A variety of content types (music, photo, video) resides on a PC in the home office and the consumer wants to access the

content remotely using a handheld device, say a PSP but is not able to.

Reason

Only very 'network savvy' consumers can resolve all of the traditionally complicated requirements to complete such a task. These 2 devices were not made to 'talk' to each other.

Solution

A dlna enabled PC. As the devices would also be part of the DRM approved 'cloud' the PC could act as a proxy server allowing the PSP to connect to PPV, VoD, IPTV, and other content anywhere it has an internet connection. The solution also supports movement of protected content on SD card or USB drives.

Architecture
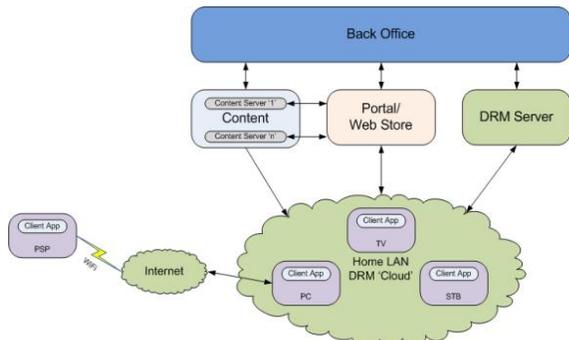
Quality of Service and Experience

A number of vendors are producing a server-side suite of tools for monitoring the performance of a video system delivered to customers over an IP network, partly by installing some client software in all of the devices which can monitor the user experience. Such products use protocols such as TR69[3].

---

[3] TR-069 (short for Technical Report 069) is a DSL Forum (which was later renamed as Broadband Forum) technical specification entitled CPE WAN Management Protocol (CWMP). It defines an application layer

There are also products which act as a platform for delivery of OTT content, specifically to take Internet content and bring it to the end user's TV. Examples of OTT content might be: news, weather, sport, horoscopes, email, chat, VoIP etc.

The purpose of these platforms is to repurpose the Internet content into a TV-friendly format, both in terms of navigation and display. This can include restructuring the content so that the simplified browsers found in consumer premises equipment (CPE) can render it. There are also aspects of these systems which can instrument the web services to monitor (at the server side) the delivery platform performance - gathering information about response times, numbers of users, who's looking at what, etc.

Thinking about how this applies to some of our use cases, there are some things to consider:

Is the content held at the server end (in the cloud) or in the end user's home?

Having content stored in the cloud offers more control for the service provider and makes it easier to monitor (and correct) issues surrounding quality of service. This will of course depend upon who provides the pipe into the home. If it is an ISP providing the service then monitoring the QoS is in their interest, however if the pipe and OTT TV content is from different vendors then there is likely to be some issues

However, from a CPE manufacturer's point of view, keeping content in the device is

---

protocol for remote management of end-user devices

seen as added value. This is also a better thing for the user, especially those who like to own their content rather than rent it.

OTT TV demonstration

BCi-Endurance is in the process of setting up an OTT TV demonstration within our Southampton lab facility which will comprise the following key elements:-

- Flexible DRM that supports content portability

- DLNA and DRM enabled devices to enable the streaming of content between such clients

  - Content portability scenarios will in include LAN to LAN and LAN to WAN

Conclusions

- OTT TV very important as it has the potential to change the basis of competition and facilitate new business models
- Barriers to widespread deployment are rapidly being fixed and consequently no business can afford to not understand how to both develop the opportunities and manage the threats in this "any content to any device" paradigm shift
- OTT TV is a very broad subject and the various stakeholders in the industry will focus on different aspects from a design and deployment perspective

How we can help your business?

BCi-Endurance in this first paper has highlighted some of the general platform considerations. Based on our considerable

experience of working with vendors and technology we are well placed to help stakeholders develop new and existing platforms.

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

BCi Ltd : www.bci.eu.com

Endurance Technology Ltd: www.endurancetechnology.co.uk

In future papers BCi-End will concentrate on working through some of the detail related to the problem statements identified in this 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 BCi Ltd and/or Endurance Technology Ltd and are not licensed hereunder.