

# Hybrid Targeted Advertising White Paper

A Standards Based Approach for Free to Air Broadcast Platforms



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# Document Information

## References

Please see the following documents for more information.

<b>Ref</b>	<b>Document Name</b>	<b>Version</b>	<b>Author</b>
1	<a href="http://www.skymedia.co.uk/sky-adsmart/about-sky-adsmart.aspx">http://www.skymedia.co.uk/sky-adsmart/about-sky-adsmart.aspx</a>		Sky
2	<a href="http://www.decisionmarketing.co.uk/news/sky-hands-data-task-to-experian">http://www.decisionmarketing.co.uk/news/sky-hands-data-task-to-experian</a>		decisionmarketing.co.uk
3	<a href="http://ir.viacom.com/releasedetail.cfm?ReleaseID=909644">http://ir.viacom.com/releasedetail.cfm?ReleaseID=909644</a>		Viacom
4	Notes of guidance on the UK code of broadcast advertising March 2014	1.9	Clearcast

## Definitions

Common terminology definitions:

- TA** : Targeted Advertising refers to the system whereby broadcasters can adjust the advertising received by customers based on particular attributes of the customer (e.g. geographic or socio-economic data). For the sake of brevity Targeting Advertising, or Targeted Advertisement or similar may be abbreviated to TA. The exact phrase meant can be implied by the context.
- HTA** : Hybrid Targeted Advertising refers to the utilization of both the broadcast channel and the Broadband channel to realize a TA system.
- A-Ad** : Addressable Advertising is considered the same as Targeted Advertising. (Perhaps a more common terminology in the US).
- FTV** : Free To View broadcasters such as Freesat and Freeview.
- MHEG** : Multimedia and Hypermedia Expert Group. A group set up to write standards associated with presentation of multimedia data, particularly distribution of interactive multimedia applications in server / client architectures.
- MHEG-5** : Part of a set of standards from the MHEG, it is a client based middle ware under an object orientated architecture that allows the client device (e.g. STB or TV) to present various programming material, enhanced with interactivity, to the end user.
- DSM-CC** : Digital Storage Media - Command and Control. The technology used to access (at the client side) MHEG objects and content data.
- HbbTV** : Hybrid Broadcast Broadband TV. A standard to support the distribution of standard FTV broadcast programming along with content from a broadband connection.
- JIT** : Just in time.
- DRAM** : Dynamic Random Access Memory. Volatile memory that needs constant refresh (hence power requirement). Various variants available such as DDR3, DDR4 etc.

# 1 Executive Summary

A major shift in the way Broadcasters are managing their advertising is occurring. With the advent of fast Internet connections for so many people in the UK, EU and other regions around the world, the possibility now exists for the delivery of content using either broadband, cable, satellite or terrestrial broadcasting with little distinction, from the user's perspective, between the different methods of reception. The presence of broadband as a delivery method also allows for personalised delivery of content and is particularly relevant to advertising. This white paper discusses a possible design strategy for a targeted advertising (TA) system utilizing both broadband and traditional broadcast to achieve a TA solution. Effectively a hybrid TA (HTA) solution.

The current highly successful platforms rely heavily on broadcasters owning the end to end technology. Whereas this is an ideal approach for the likes of Sky in the UK, free to air broadcasters that do not traditionally own or even specify much of the end to end technology, face significant challenges to providing targeted delivery of content of any kind.

This paper looks briefly at the current solutions and outlines a possible approach for the free to view (FTV) broadcasters.

## 2 Current Marketplace

*Showing the right ad, at the right time, to the right person is the simplest explanation of what targeted advertising is.*

### 2.1 Targeted Advertising in the UK

Currently, the most successful is Sky in the UK. They are currently operating both linear broadcast and on-demand targeted advertising platforms.

At the TV Connect show in London at the end of April Jamie West, Deputy MD of Sky Media delivered a talk on Ad insertion strategy.

Sky's delivery solution is known as AdSmart (ref1). The AdSmart system is further split into two delivery platforms, the first for AdSmart Linear delivery over the broadcast stream, the second for delivery over broadband for the on-demand system.

#### 2.1.1 AdSmart Linear

AdSmart Linear delivers different advertisements to different viewers across over 30 channels including Sky owned channels and some channel partners such as Fox and History. The so called 'AdSmartable' programs. The reach is currently an impressive 7m households across the UK. The selection of which ad to target to a particular household is based on over 350 attributes, from the 2 letter post code area to what type of car the household owns, or whatever else may be known about the household. All this due, to a large extent, to Sky's partnership with Experian Marketing Services, the global provider of integrated consumer insight, data quality and cross-channel marketing. (ref2). At a cost of £100m, Sky AdSmart is now starting to pay its way. Sky boasts 450 different advertisers since its launch with 1.9bn ad impressions delivered across 2300 campaigns. 69% of these being new customers to Sky (or to TV in general), of which two thirds of them are returning with repeat business. It now makes good sense that local organizations have their own ads shown in their areas. A good example of this is that there are now 260 different car dealerships active on Sky AdSmart. It's not only the regional targeting and lower advertising costs that are behind this growth, but also the much lower cost of actual ad creation. Clearly some basic standards of quality need to be adhered to, but, as Jamie West pointed out and showed at the TV Connect show, a local Newcastle based taxi firm was able to make a very decent ad for under £10,000 and even under £5,000 is also possible with cartoon style graphics. Furthermore such adverts can be on air within 6 weeks of inception.

Also worth noting; as well as expanding to smaller and regional businesses, larger established brands with niche audiences who previously thought TV too broad are turning to TV with Sky AdSmart i.e. finance/banking brands looking for high net worth individuals.

#### 2.1.2 AdSmart On-Demand

In the first three months of 2015, Sky launched its AdSmart On-Demand platform. This system delivers targeted ads to subscribers of Sky's On-Demand offering. Ads are targeted to subscribers in exactly the same way as the linear system with the same set of attributes. The key difference being that the ads are delivered via the broadband connection in a just in time (JIT) fashion alongside the on-demand content selected by the subscriber.

### 2.1.3 AdSmart Go

Sky's latest addition to the AdSmart family is AdSmart Go, enabling targeted ads to be viewed on streamed programming to mobile devices. As with the AdSmart linear platform, ads are substituted into the streamed service in real time.

## 2.2 Overseas Platforms

In the US, at the end of April, Viacom announced its Viacom Vantage targeted advertising (TA) solution, and describe this as: An innovative, data-driven ad product that enables advertisers to reach their custom targets at the program level across the Viacom Media Networks portfolio (ref 3). As Kern Schireson, Executive Vice President, Data Strategy and Consumer Intelligence at Viacom Media Networks put it: "By effectively merging our expansive data footprint with syndicated research, we can continuously optimize media plans to integrate our advertisers' messaging on the exact right shows at the exact right time."

Note, throughout this paper, the term Targeted Advertising (TA) is assumed to be synonymous with the terminology of Addressable Advertising (A-Ad).

## 3 What Does Targeted Advertising Bring?

The key benefit of TA is the ability to direct messages to those most likely to respond. This has a number of key impacts on the TV advertising market:

1. The current 'currency' model of cost per thousand no longer applies as ads are targeted at an individual household level.
2. Wastage is reduced as ads can be accurately capped at the household level.
3. New entrants to TV advertising can be encouraged by the fact that previously unreachable niches of prospective buyers can be accurately targeted.

All of the above requires the target audience be accurately sized and targeted so as to accurately assist in campaign planning. TA can deliver this.

### 3.1 Profiling the Audience

All of us are defined by our likes and dislikes and now, more than ever our commercial footprint is tracked and available to marketers who wish to offer us tailored products and services most likely to appeal to our lifestyles and day to day requirements.

#### 3.1.1 Reach Calculation

We can all be categorised by key metrics such as age group, salary, marital status whether or not we have children and postcode etc.

The number of identifiers, generally referred to as attributes can be grouped together to provide a detailed profile of any section of the target audience. Marketers and campaign planners have always used such demographic data to segment audiences to target campaigns. This is common in the print media where newspapers and magazines target specific sections of the population with certain traits and advertisers target messages accordingly.

TA now gives advertisers the opportunity to do the same on TV. Households can be grouped according to collections of attributes and the size of any targeted section of the audience can be accurately calculated. This is referred to as the 'reach'.

#### 3.1.2 Benefits of Targeting Advertisements

Ad targeting is all about getting the right ads in front of the right viewers at the right time. This benefits both the target audience and the advertiser.

##### 3.1.2.1 Audience Benefits

- The viewer receives messages that are relevant and potentially more interesting
- Messages are not excessively repeated as the delivery can be better calculated

##### 3.1.2.2 Advertiser Benefits

- Campaigns accurately target with improved audience engagement
- Better determination of campaign success with more accurate determination on return on investment

# 4 The Technology

## 4.1 Break Structure

In a linear broadcast stream there are a number of elements that are scheduled together to complete the stream as viewed by the audience. These consist of the main content (otherwise known as primary assets or, more colloquially, programmes), advertisements, channel identifiers (idents) and sponsorship material.

These last three are generally known as secondary assets and also fall into the classification of short-form assets (i.e. short duration). In a broadcasting headend, these elements are stitched together according to a predefined schedule using an automation system that pulls the assets from digital storage. In the case of a live broadcast, the main content will come in the form of a stream but will still be subject to segmenting as determined by the schedule but now will likely also be subject to last minute schedule changes to respond to events in the live stream. Following stitching by the automation system, the resulting stream is then encoded to the required resolution and bitrate for transmission, combined with other streams that will share the same transport stream and multiplexed with any additional data services and then uplinked.

Construction of the stream, as defined by the scheduling and automation systems includes advertisement assets that are played out at fixed times. In a TA system, these underlying scheduled ads will still be present and form a default ad that will be played out for STBs that are opted-out or unable to play targeted content for other reasons. However, in TA systems, these ads and the break that they inhabit can be replaced, on-the-fly, by the STB which then stitches in replacement ads cached from its own local storage and sourced from a download service over the air or via a broadband connection.

The substitution process can be considered at an entire break level, where a different combination of ads of the same duration can replace the underlying ads, or at ad level where individual ads are replaced. In either case, the broadcast stream needs conditioning to ensure that splicing can take place and to insert signaling into the stream to tell the STB where to make the splices.

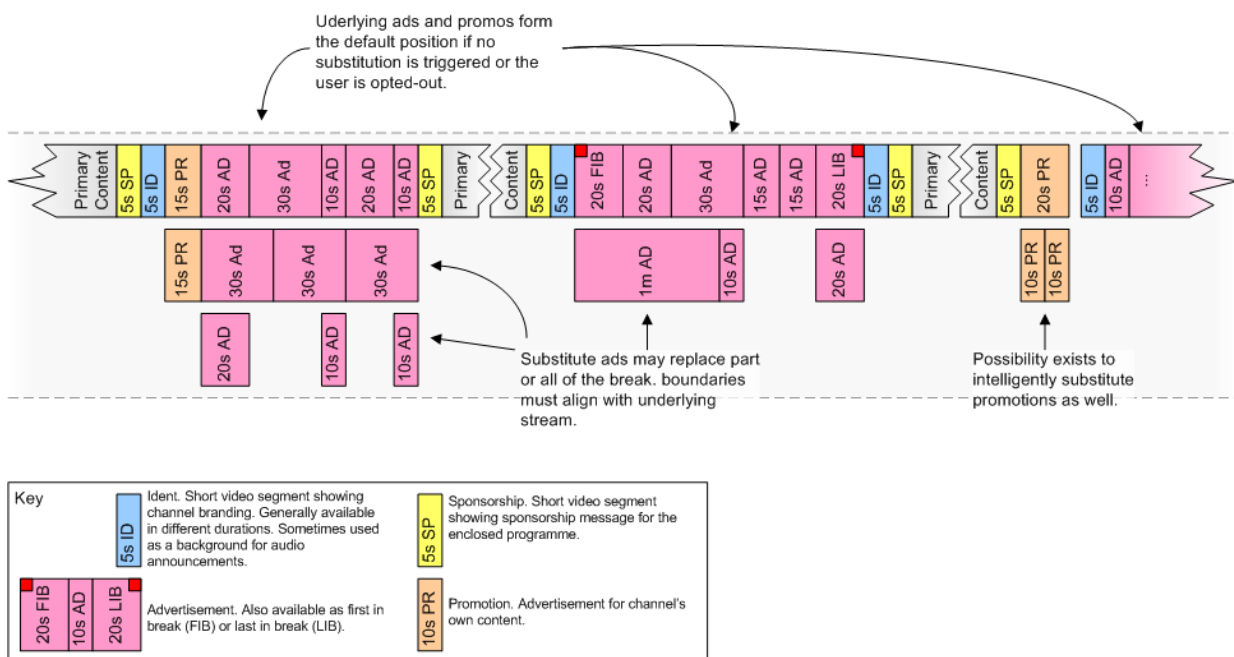


Figure 1 Typical Linear Broadcast Break Structure



As a natural progression to ad substitution, the system could also perform substitution of promotional copy. This might be desirable if details of the customer household demographics where the STB is based, are available and could be used to promote programmes compatible with this profile.

#### **4.1.1 Elements of a Break**

The broadcast stream consists of a number of different types of element that are described in more detail below.

##### **4.1.1.1 Main Content**

This is the primary asset that forms the body of the broadcast. In the case of pre-recorded content, this will be available on digital storage accessible by the automation system. For a live broadcast, this will be a stream subject to last minute scheduling adjustments. On a commercial channel, the main content will typically be broken into segments allowing commercial breaks to be inserted between the gaps. Segments will often be surrounded by sponsorship bumpers where a sponsor has paid for this.

##### **4.1.1.2 Sponsorship**

These are short video segments that show the programme sponsor's branding and generally directly surround the main content segments. Sponsorship will often come in a number of variants allowing for a different message when leading into and out of the main content. Some variations may also have a different message for each mid-roll break. In a TA system, sponsorship would be considered as part of the linear broadcast and would not be subject to substitution.

##### **4.1.1.3 Promos**

These are short-form video segments that advertise forthcoming programmes on this or a related channel. Since these are effectively ads, it would be possible to dynamically substitute promos in the same way as ads although the structure of the break would probably keep the position and location of the promos separate from that of the ads.

##### **4.1.1.4 Idents**

These are short-form video segments that show the channel's branding. These are typically shown between programmes or possibly mid-roll in the case of lengthy assets. Idents, although carrying their own audio are often overlaid with audio announcements and are generally constructed in a number of duration variants or in a form that can be trimmed as necessary. For the purposes of TA, these are considered part of the linear broadcast stream.

##### **4.1.1.5 Ads**

These are the short-form assets that are subject to substitution. Each ad is uniquely identified by a "clock number" which is an ID assigned by the production house (the name arises from the fact that the ID is displayed in the preamble below a countdown clock).

#### 4.1.1.6 First-in-Break, Last-in-Break

The first and last ads in a break are afforded special significance as advertisers will often pay an additional premium to target the first in break, last in break or both as a combined unit. Any ad decisioning system will need to be aware of this and either allow these to be substituted as a unit or allow the underlying ads to remain unsubstituted.

## 4.2 Targeted Advertising Delivery

A number of concepts relate to the mechanisms of ad substitution. These will need to be understood and implemented by the Ad Decisioning software components at both the STB and the central Ad Decisioning Server (ADS).

### 4.2.1 Ad Selection (Client level)

In general, if the decision over which ad to substitute in a particular slot is left to the client device, a number of options are delivered to the device and this is generally termed a 'Hint Message'. The derivation of the hint message will have a number of factors acting upon it; industry and regulatory requirements, such as Clearcast (ref 4), commercial limitations such as competing brands not appearing in the same break. In turn, the client has a degree of autonomy in deciding which advertisements will be substituted in a particular slot. This largely depends upon such factors as whether the client has the media cached locally, capping of delivered ads (number of times an ad is substituted) and the timing of ad repeats (spacing).

### 4.2.2 Ad Selection (Server Level)

If the decision over which ad to serve in a particular slot is not to be made in the client device, the client will submit a request to the ADS for the appropriate copy details. The ADS will make the decision using similar criteria as with the client based approach. In this case, however, the ADS is likely to have details of the delivery rules as used in the derivation of the hint message above in addition to details of the campaign impression targets etc. upon which to base its decision.

ADS systems such as Freewheel, AI Match and others are extensively used in OTT platforms where ads are delivered alongside primary content.

In the linear context, for each forthcoming break, the decisioning server could supply details of the timings of the up-coming break, the slots within it and the underlying ads to be substituted. The advantage of this approach is that there is no need for complex decisioning algorithms to be deployed in any client device making the system open to all devices given that they support the delivery protocols which will be existing standards based.

## 4.3 Reporting

The measure of success of any advertising campaign relies on accurate reporting. Currently, linear broadcast campaigns are reported using panels of client devices which monitor the viewing habits of a selected section of the audience. This service has traditionally been provided by BARB in the UK. This

approach is also true of Sky's AdSmart linear service which uses an internal panel to report on the number of client substitutions against the linear ad or promo.

For server based decisioning, the server relies on statistics to drive the selection of possibilities, it is therefore vital that it receives information on the number of impressions actually delivered. The client will be required to report back periodically with its log of impression counts for ads. Depending on the size of the client population this might be every client or just a proportion of the available clients (a panel). In the latter case, statistics are extrapolated from the returned data. In the former there is a completely accurate picture of impressions for the opted-in boxes (excepting a small percentage of errors). In both cases however, statistics of opted-out clients can only be inferred from other means. Whether or not statistics are collected from the full population of clients will depend on the size of the client population and the capacity of the network and statistics collection servers.

Clients should collect statistics and upload these periodically - perhaps once a day. The time of the upload for each device should be randomised as much as possible in order to spread the load on the server. In addition, the upload should be resilient with the client able to retry later if the upload is not immediately successful.

## 5 The Challenge for Free-to-view Television

### 5.1 The Risk of Doing Nothing

The pay TV operators are the first to provide TA services. For sure they have a very good handle on the economics of running a business and the importance of making profit. How then does this stack up with the free-to-view (FTV) providers? Arguably the FTV providers must maintain a lower cost delivery mechanism at the TV household or individual level. This then gives a hint as to the type of technology more suitable and will be discussed in detail a little later on.

It's no longer a simple matter to look at the digital TV broadcasting landscape as a flat playing field in terms of TA. A few years ago it might have been possible for a FTV broadcaster to simply look at how a TA approach may benefit it in isolation of what other broadcasters may or may not be doing. However with Sky now growing its business at a phenomenal rate this will have impact on the FTV broadcasters and their TA strategies. If your competitor is doing great things in terms of Return on Investment (ROI), and offering its customers a better price and better performance, it will take a bigger market share, it will have more funds to invest to grow its business and the FTV operator may find it difficult to compete even in its core broadcasting business.

Imagine a pay TV operator with significant success using a TA approach, on say two channels, for example a sports channel and a movie channel. They could then consider growing these specific segments to thus attract even more viewers and even more advertising revenue. With more funding available and a good business case they might go for an exclusive strategy. I.e. add top quality exclusive sports or movies to their channels. With no other broadcasters offering the same content, ad agencies may certainly be struggling to find reasons to stick with their traditional strategies. Less funding to the FTV broadcasters could then become a downward spiral.

### 5.2 The Response

Given that the current linear approach to TA is strongly dependent upon owning the end to end broadcast chain how can the FTA providers compete?

One of the key challenges is to define a solution that is standards based and easily adopted across a wide number of devices from a highly diverse manufacturing base. This paper proposes a high level approach that will address some of the technical issues and potential roadblocks to deploying a TA over a free to air broadcast platform.

## 6 Targeted Advertising on Free-to-view Television

### 6.1 Platforms

The key to providing an effective TA solution is to ensure the reliable delivery of content and triggers to the respective device. As was previously discussed, this is relatively easy when the end to end platform is under the direct control of a single broadcaster, Sky, for example.

The challenge facing FTA platforms is that by their very nature, they do not traditionally specify the client device connected to the network but rather rely on internationally agreed specifications to do the job of ensuring that any device meets the required interface requirements.

Therefore, it follows that any proposed solution should adopt this approach. The proposed solution should ideally work with a range of client devices. As a priority:

- Set Top Boxes
- TVs

Secondary devices could be:

- Gaming Consoles
- Mobile devices, phones, tablets etc.
- Personal Computers

The focus of this discussion will be the priority devices.

### 6.2 Key Requirements

There a number of requirements that any TA solution must fulfil. However, for the purposes of this high level technical discussion, these are reduced to three primary requirements.

These are:

1. The ability to target an ad to a client device based upon known attributes.
2. The ability to accurately report on the success of a substitution.
3. The ability to deliver content to be substituted to the client device prior to the substitution taking place.

The technical discussion in this white paper will focus on the challenges involved in meeting these requirements.

### 6.3 Delivery Options

There are a number of ways in which to design a delivery mechanism for the delivery of targeted ads.

Clearly, in deciding the most suitable mechanism, such factors as legacy systems that may need to be used and what technology is already deployed is worth looking at to see if there is any easy way to re-task to achieve the TA goals.

## 6.3.1 Existing Technology

### 6.3.1.1 MHEG-5

The UK as well as other regions around the world use MHEG-5 as the middleware for free-to-air services. Perhaps most well known in the UK as providing the red button for interactive services, MHEG-5 includes an object carousel for the delivery of program related material.

An interesting extension is Interaction Channel (MHEG-IC), which enables an extension of broadcast interactive services to be delivered via an IP connection. All object carousel messages are transmitted using DSM-CC section format. Effectively the Transport Stream (TS) section data is utilized to transmit these objects. Could this carousel or indeed the TS sections directly be used to transmit the TA? This was certainly not their intention. Without going into the detail there would certainly not be enough bandwidth to effectively transmit high quality advertisements. Maybe hint messages could be transmitted in this way?

### 6.3.1.2 HbbTV

This technology was first introduced as a means to standardise the harmonized delivery of both broadcast and broadband TV content to the end user via a single user interface. Since its inception about 6 or so years ago it's mainly used in central Europe. However there's also some penetration now in Australia, where, in some cases it's replacing MHEG-5.

In the UK, Freeview Play, which was launched in September 2014, incorporates the HbbTV middleware (in line with D-Book8). Freeview Play adds the connectivity to the basic Freeview, thus enabling catch up TV - this via the broadband link. This then could also be used as a mechanism for bringing in TA on a JIT basis.

## 6.4 Proposed Approach - Broadband Hybrid Delivery

### 6.4.1 Overview

Most client devices, including the latest OTT TVs have an IP connection used to retrieve content from various on-demand providers. The proposed approach uses this connection, in addition to the broadcast stream to facilitate the delivery and substitution of targeted ads.

### 6.4.2 Broadcast Platform

In summary, the proposed approach would use the broadcast stream to signal the availability of one or many ad substitution opportunities to the client device a short time ahead of the actual opportunity. (In addition, a message would be sent in the stream a short while before the break to signal the exact position to the client). The client device would then send a request to the Ad Decisioning System (ADS) to get the details of the ad to be substituted. The ADS would return details of the ad which the client would then retrieve if it was not already cached on the client device. This content would then be substituted at the required time by the client device.

After the successful substitution, the client would send a report to the ADS system for accounting and campaign fulfilment recording.

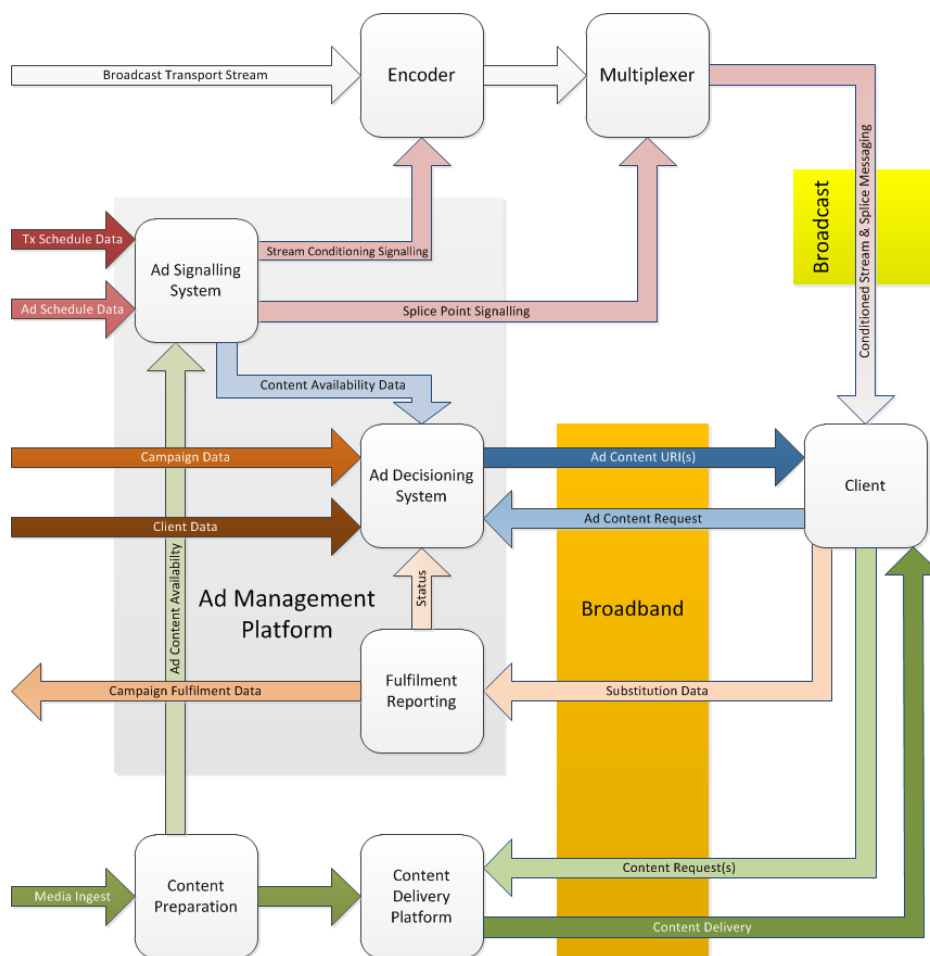


Figure 2 Proposed High Level Architecture

Figure 2 gives a high level detail of a proposed solution. Details of the messaging and caching processes are beyond the scope of this white paper.

### 6.4.3 Client Platforms

Whereas the headend components will need to be integrated into an existing broadcast platform the principal complexity will be agreeing a standards-based approach for the client such that it can be deployed on STBs, TVs and other mobile devices.

So what additional work needs to be done at the client where the splicing is actually done at the client, on top of the normal linear broadcast processing functions? These can be summarized as:

1. The timely ingest of the ads needs to be made via broadband and saved to local cache memory, along with some metadata about the ads such as their lengths for example.
2. Data regarding splice in and splice out points of new ad content needs to be transmitted. Note that this data would ideally be encrypted prior to transmission to the client to prevent smart ad-blocking technologies which may otherwise be implemented later on. (Such an encryption can be a relatively simple private solution). This data would be transmitted in the Transport Stream (TS) on its own PID (Packet ID) or PIDs. The PID(s) used being identified in the PMT (Program Map Table) in the normal way. The splice information tables would then be built up in advance, in a similar way as the program guide is.
3. The actual splicing needs to be performed. This then is the crucial, low level and highly time critical part. Care should be taken to handle video and audio such that lip-sync issues don't become a problem. However, on initial investigations, most dedicated video processing chip sets should be able to manage this as purely a software task.
4. Feedback to the broadcaster as to successful ad play outs within certain media slots

#### 6.4.3.1 Set Top Box

Such architecture would not pose too big a problem for the STB main processing chip, nor the client design itself provided specifications and requirements are well documented up-front. In order for the client to be uniquely identified the chip-set used would need to have some type of unique identification number (UID) associated with it. This is certainly nothing new in the CPU world.

There are a number of memory options to consider. For a JIT and low cost STB architecture we can quickly rule out a Hard Disk Drive (HDD). Other options are Dynamic Random Access Memory (DRAM) and FLASH.

#### 6.4.3.2 TV

Integrating a TA system into the TV set has its own challenges and is a totally different proposition to that of the STB. There are many STB manufacturers and technologies to choose from. The STB is a much cheaper consumer item and has a shorter life cycle than a TV. Clearly the deployment of a TA solution onto a TV is limited by the media the TV normally connects to.

OFCOM figures show that in 2013 28% of all TV's in the UK were smart (Internet Connected) TVs. Furthermore the growth is in the region of 40% year on year. So the broadband connectivity is not going to be a limiting factor, however clearly the connectivity will be predominantly for off air signals, although some TV manufacturers do have models incorporating satellite receivers.

The large TV manufacturers are predominantly based in Japan and Korea and think very carefully indeed before changing their TV set designs. Typically they will only want to have one basic TV architecture for the whole of the European market to streamline their manufacturing processes. For more memory to be added to the TV hardware, and to ensure the low level and time critical ad splice capabilities are included the basic TV hardware platform would certainly need some re-design.



This imposes a big cost, not only in the re-design but also in the testing and quality control aspects. The key in achieving the TV set re-design will undoubtedly be a good commercial proposition of some sort to the first TV manufacturer(s) incorporating this technology, resulting in either increased sales to the TV manufacturer due to market demand, or possibly some key advantage to the end consumer thus buoying sales. Alternatively a business model could be considered whereby for every TA enabled TV there is a payback to the TV manufacturer based on each targeted ad actually played out.

Timing could also be an important factor. TV manufactures will go through certain re-design cycles as a matter of course to keep up with the technology they must incorporate to meet market demands. There may therefore be an opportunity to include the TA technology, for example when the TV is upgraded from 4k to 8k capable.

### **6.4.3.3 Other Devices**

Given the number of mobile devices such as tablets and mobile phones used to receive live TV programming, it is important to consider these devices when proposing a solution. However, the great advantage of these devices is the superior processing power, on-board memory and ease of developing bespoke software.

Therefore the TA approach for these devices would be to embed the functionality into the player software for any particular service.

## 7 Conclusion

It is without doubt that TA works and for those broadcasters not yet adopting it, it will become a very important future revenue stream. Not only that, but for those that don't have a plan for its implementation they could see their place in the overall broadcast advertising market lose ground to competitors who do.

As previously mentioned, there are advantages for both the advertiser and the viewers being targeted. For the advertiser, TA offers a far more scientific approach to advertising whereby campaigns can be properly measured and results obtained. With an accurate ROI calculation available, selling the advertising slots should become a far easier endeavor.

We have demonstrated in this brief white paper our understanding of some of the challenges and hurdles to overcome in implementing a system and a possible approach to enable a cost effective solution.

BCi are the principal Systems Integrators for the Sky On-Demand and AdSmart platforms. As such we have a great deal of insight into the challenges associated with the technology and are actively developing solutions to make the technology available to other operators and platforms.

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