

Advanced Advertising – Migration Paths 2009 SCTE Cable-Tec Expo®

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ABBREVIATIONS AND ACRONYMS

ADS	All digital simulcast
DPI	Digital Program Insertion
DMA	Designated Market Area - A geographic area that makes up an advertising market
DSTB	Digital set-top box
EBIF	Enhanced Television Binary Interchange Format
EISS	ETV Integrated Signaling Stream
ETV	Enhanced Television
PMT	Program Mapping Table
PID	Packet identifier
PID Stream	All the packets with the same PID found within a transport stream.

References

The following standards and specifications apply to this paper.

ANSI/SCTE 30 2009 - Digital Program Insertion Splicing API

ANSI/SCTE 35 2007 - Digital Program Insertion Cueing Message for Cable

ANSI/SCTE 67 2006 - Digital Program Insertion Cueing Message for Cable – Interpretation for SCTE 35

ANSI/SCTE 104 2004 - Automation System to Compression System Communications Applications Program Interface (API)

ANSI/SCTE 130-1 2008 - Digital Program Insertion – Advertising Systems Interfaces Part 1 – Advertising Systems Overview (Informative)

ANSI/SCTE 130-2 2008a - Digital Program Insertion–Advertising Systems Interfaces Part 2 Core Data Elements get the schema here

ANSI/SCTE 130-3 2009 - Digital Program Insertion—Advertising Systems Interfaces Part 3 Ad Management Service (ADM) Interface get the schema here

ANSI/SCTE 130-4 2009 - Digital Program Insertion–Advertising Systems Interfaces Part 4 Content Information Service (CIS) get the schema here

ANSI/SCTE 130-7 2009 - Digital Program Insertion–Advertising Systems Interfaces Part 7 – Message Transport get the schema here

OC-SP-ETV-AM1.0-I04-070921 - OpenCable Specifications ETV Enhanced TV Application Messaging Protocol 1.0

OC-SP-ETV-BIF1.0-I04-070921 - OpenCable™ Specifications ETV Enhanced TV Binary Interchange Format 1.0

SCTE standards available at WWW.SCTE.ORG

CableLabs specifications available at www.cablelabs.com/specifications/ocETV.html.

The cable advertising community has done much to create and further develop a successful core advertising business and it is important to continue building on that success as new advanced advertising products are introduced. The combination of a reliable ad delivery environment, a back office that streamlines many of the complex processes, and an intuitive media buying frontend makes cable advertising products a viable option for media buyers and advertisers today. It is crucial that the industry continues to focus on these attributes while developing the advanced advertising products and supporting systems of tomorrow.

There are many areas of the core advertising system to explore. The focus of this paper is on the evolution of the linear advertising environment and other foundational topics that will impact how we move forward with advanced advertising products.

Ad delivery system - Migration path to Advanced Products

To discuss the transition of the current ad delivery platforms to support advanced advertising products, it is important to first baseline today's advertising environment.

The insertion environment

The current linear ad insertion environment consists of three primary sales/fulfillment tiers:

- Local Zoned
- Interconnect/Regional
- National Footprint

Ad insertion in all three tiers is executed through the use of a single placement schedule representing a 24 hour broadcast day for each network/zone combination. The insertion platform uses the instructions contained in a schedule to identify ad insertion points in a program stream and insert the correct ad into each point. At the end of the broadcast day a verification file containing placement responses for each scheduled insertion is returned by the insertion platform. The verification file is used to validate each ad placement and as proof of performance to validate invoicing.

Local Zoned is a local sales zone covering a specific geographic area of a cable system. This is the lowest level of CATV subscriber granularity that advertising and marketing messages can be delivered to in the current ad insertion environment.

Interconnect/Regional is composed of multiple local sales zones that represent an entire DMA. This frequently includes local sales zones servicing multiple CATV operators and/or other media partners. An Interconnect ad placement request is executed across all participating local sales zones during the same network break and break position. This 1-n scheduling process is managed by replicating the Interconnect zone schedules—containing only the interconnect placement requests— to all participating insertion zones/insertion points. These schedules are merged downstream with local schedules defining ad placement instructions for each applicable local network/zone/insertion point. When the verification file is returned at the end of the broadcast day, the interconnect verifications are separated from the local verifications. The resulting interconnect verification file(s) contains only the interconnect placement responses. These are collected and then weighted by zone level insertion point sub count during an amalgamation process that generates a final verification for that day's collective airing.

National Footprint advertising is sometimes done using techniques similar to those used to execute an Interconnect buy. Typically, the method used to accomplish a national footprint ad insertion is to parse out the order to the individual market level Traffic and billing systems for execution, followed by the collection and rollup of the resulting billing affidavits to produce a consolidated invoice. This method of taking a single order, executing it across multiple platforms, and billing through a single invoice is one of the primary drivers for our back office development initiatives and is very important for the future success of any new products.

In addition to the sales/fulfillment tiers, there may be multiple fulfillment participants in a market that run schedules and advertising copy; two common examples of this are Turnkey and Interconnect Partner

A turnkey zone is when one operator is hired to manage the sales and ad insertion activities for another operator's subscribers. Turnkey zones are usually rolled into a much larger insertion/ operating environment.

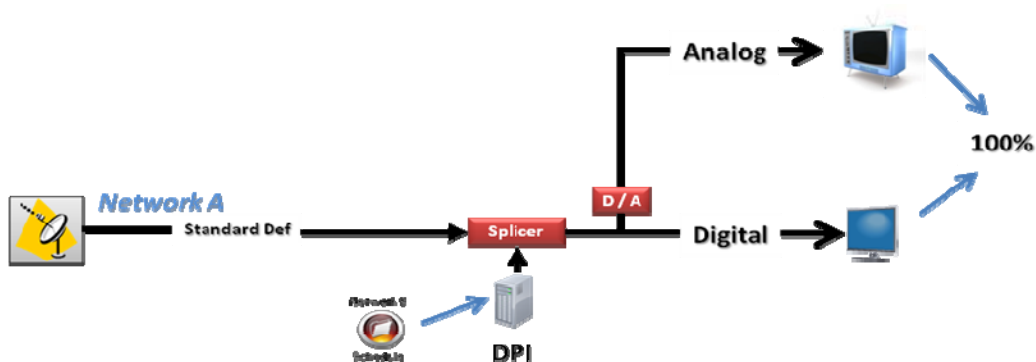
An interconnect partner is an operator that operates its own ad insertion platform while also running interconnect schedules and MPEGs on behalf of the managing partner. Spot IDs and ad copy format management are important factors when supporting interoperability between multiple ad libraries, ad serving platforms and management philosophies.

The ad delivery platform:

Ad delivery platforms and formats are becoming more and more diverse; switching an ad into an analog network feed at the headend is no longer the norm. The transformation of the ad delivery platform was necessitated by the move from analog to digital program streams; not by new advertising products.

All Digital Simulcast

As the name indicates, all digital simulcast (ADS) is the carriage of the same programming in both analog and digital formats. The All Digital Simulcast initiative was the impetus to transitioning the ad insertion business to an all digital insertion environment. A key addition to the ad delivery environment is the digital to analog converter used at the output of the splicer to service the analog subscribers. This allowed the industry to maintain service to 100% of the network/zone viewing audience from a single insertion point, as depicted in the diagram below.

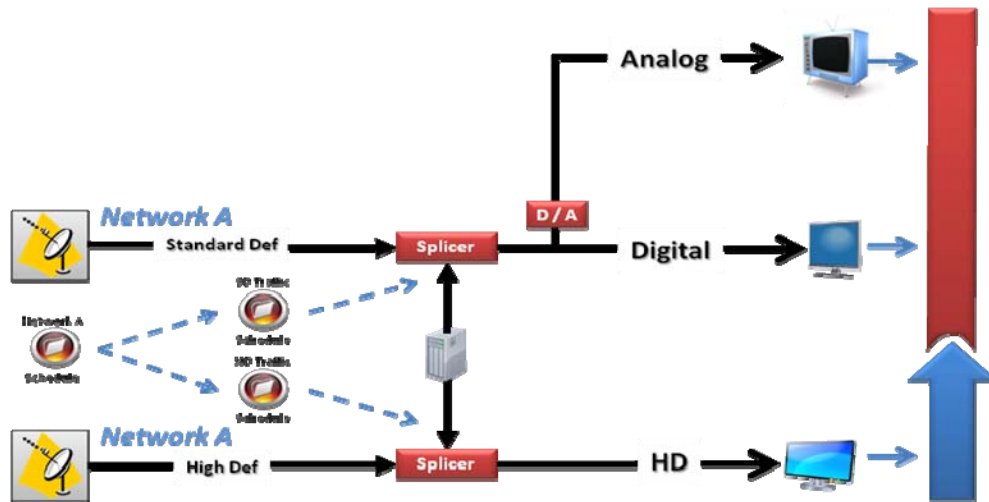


Implementing ADS facilitated several key advances to the ad insertion platform, including:

- Move from ASI to IP video interfaces
- Move from DTMF tones and CCs for cueing to the in-band SCTE-35 messaging
- Audio Level management, move to Dial Norm
- Introduction of the A/D process to service analog viewership
- Audio format –changed from MPEG-1, layer-2 audio to AC3 (both are currently carried in the MPEG to support DPI and legacy.)
- Streaming formats –changed from system stream to transport stream

The introduction of multiple formats and multiple insertion points- HD Simulcast networks

The addition of HD simulcast feeds from networks requires ad insertion on the HD version of a network feed. This creates the situation of not being able to maintain the single insertion point due to the differences in aspect ratio of the programming. This has resulted in the need to now support a 1-n environment for a single insertion event as depicted below.



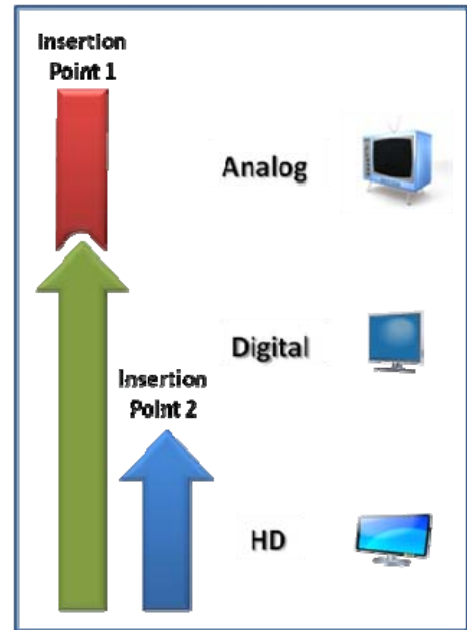
Key HD considerations include:

- Automated SD to HD transcoding process of copy
- The need to begin managing both SD and native HD simultaneously at both the business and operational levels
- Higher Rate shaping costs due to the number of services per mux
- Single network/zone sales target is now represented by two insertion points
- Need to track both HD and SD Sub counts by network/zone

Audience:

AUDIENCE SEGMENTATION MANAGEMENT

With ad targeted programming in the linear environment being simulcast across multiple formats and possibly differing platforms, it has become important to track and weight audiences based on product enabled households. In the case of delivering a straight forward ad insertion on an SD only network in a simulcast environment (Insertion point 1). There is no change in the way we track audience numbers as the insertion point hits all viewing subs in the zone. When we insert on a network that is also simulcast in HD (insertion points 1&2) we now need to subtract the HD households from the SD insertion point and weight each splice point based on their associated subs for verification. This will only get more complex as we expand on the 1-n relationship and n becomes viewers across a broader range of delivery platforms (ex. IP delivered video to personal computers) and other session based delivery environment.



ADVANCED ADVERTISING AUDIENCE

Advanced Advertising products enabled by enhanced television (ETV) and tru2way® require further zone level aggregate subscriber number/ audience segmentation management. For example, when setting up an interactive campaign that is associated with a 30 second spot, you will not only need to identify subs associated with feed/format you will also need to track other enabling or disabling factors such as DSTB types. For instance, in an environment where there are analog only households and households with only DSTBs that do not support interactive TV, you will need to subtract those households from the selling zone when defining the Interactive insertion audience though you would include them when describing the entire insertion audience. Analog TVs and non-interactive DSTBs will show the audio/video but without the enhancement in this example.

The following is an example of some of the zone level aggregate subscriber numbers needed to support the sales and fulfillment processes:

- Current Linear Products
 - Service Tiers – by network
 - Digital vs. Analog
 - HD viewership used to support HD simulcast networks
- Advanced Advertising product level tracking
 - One way vs. two way subs
 - DSTB types
 - DSTB OS i.e. Tru2way vs. Native
 - VOD enabled homes

AUDIENCE MAPPING

Tracking subscriber numbers used to define these household segments will be virtually impossible without mapping the homes in the billing system to each of the ad zones also known as Syscodes.

Summarizing Where We Are Today

- We operate parallel insertion points for a single zone level execution – added complexity
- Multiple video formats being maintained for a single execution – the need to support HD
- Audience segmentation beyond delivery platforms – Subscriber side devices
- Ad environment / execution crosses MSO boundaries

Looking Forward

When looking at possible migration paths for today's environment to support advanced products, we must also stay focused on today's multibillion dollar linear advertising business. This doesn't mean that we must forever fill avails the same way we do today. The transition of the inventory to an advanced ad delivery model would need to be done at a pace that the advertising community can keep up with. This transition could take many years to complete. Due to this we must make sure we design our systems accordingly and provide support for today's business format while also building for the future.

We have gone through a transition from an analog only environment to ADS with very little impact on our day to day operation. The introduction of HD simulcast has moved us to a 1-N-1 insertion environment at the local zone level, where two insertion points need to be managed for a single execution. This also has been fairly straight forward to manage as the practices implemented here are similar to what is used in the interconnect environment today.

The next anticipated wave to challenge the core linear business is the development and expansion of session based programming delivery platforms i.e. VOD or unicast SDV. The introduction of products utilizing these session based delivery platforms may find their way into the mainstream under titles such as network DVR or Start Over. These uses will most likely have the viewer watching programming that falls under the operator's linear placement obligations in a slightly time shifted environment through platforms that bypass the linear insertion points. Depending on the take rate, products like these could have a real negative impact on the linear business. Without ad insertion coverage on these parallel programming delivery environments, we could begin seeing a decline in ad revenue that that directly the result of these viewership losses. These conditional viewership variances would be difficult to communicate to both agencies and further upstream to their clients therefore resulting in a potential drop in sales activity.

On the other hand, the advancements in this area of session based ad delivery will provide us with the most efficient means for delivering a specific ad to specific homes. Along with the ability to direct an ad to a specific home, it also provides us with the ability to deliver a specific ad to a specific home in an ad zone or syscode. The delivery of specific advertising to the home using this the zone/syscode targeting variable, allows us to maintain the DMA viewership numbers for those placement opportunity in the session based delivery environment that fall within the linear ad placement rules. .

The linear placement rules associated with time shifted content "could" be based on the time of the placement opportunity vs. the initial airing of a program. For instance, any program that is viewed within the same calendar/broadcast day of its original airing would receive its placement instructions from the linear ad decision system and any opportunities presented after this period would be handed off to an ad decision system focused on impressions based ad placement therefore reusing the avail. All of the rules that will drive these decisions will need

to be defined by the cable advertising community with feedback from advertisers and the advertiser's representatives (agencies).

The good news is, most of the standards work required to support this type of ad placement architecture has already been done by the SCTE standards group and can be found on the SCTE.org website in the SCTE-130 standards document. SCTE 130 Part 1 provides a good primer on the collection of standards. Still pending are standards and or specifications work to support the marking of placement opportunities within time-shifted content.

As work is done to define our future ad serving architecture, it is evident that we will need to also orchestrate the execution of an ad placement across multiple delivery platforms for a single buy. The industry's success in the linear space has to do with its ability to take something that is seemingly complicated and position it in a way that it is easy to buy and manage from a buyer's perspective. It is important that we maintain this same philosophy as we move into an advanced advertising environment that is complicated, and make it simple to sell, buy, manage and invoice.

Today – Readying our environment for ETV

Many operators are currently focused on getting interactive advertising rolled out across their footprint. Due to this, it would be good to touch on some of the work being done to readying systems for executing campaigns in this space.

There are two primary methods for delivering ETV applications to the DSTB, In-band (bound applications) and out-of-band (un-bound applications). For this discussion, the focusing will be on the in-band method of Delivery.

The In-band delivery of an ETV application is done through two additional PIDs in the PMT, one used for ETV signaling (EISS) and the other containing the EBIF formatted application and data. In-band applications can originate at the networks, packaged into the ads that we insert locally, or streamed and inserted on their own in the headend along with the underlying ad copy.

The process of inserting a streamed ETV application into the PMT at the headend is often referred to as "late binding". When this method is used in combination with ad inserted video content, additional coordination is required between the streamer and the ad server.

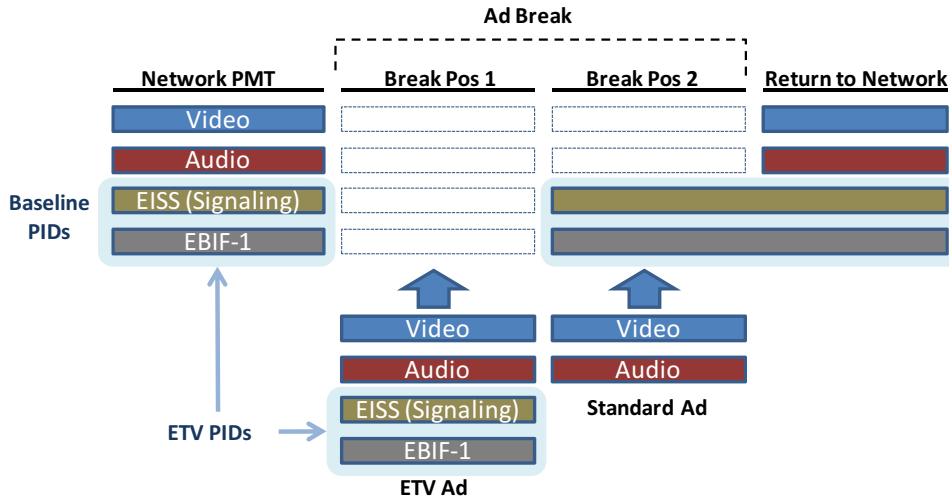
Packaging an application into a stored ad is sometimes referred to as "early binding" (the finished product is sometimes refer to as an ad-bound app). The early binding process requires that all downstream systems used to either process the MPEG file or insert the ads into networks are able to maintain and or pass the additional PIDs. In addition to inserting these ads through the linear environment they are also supported in the VOD space

The following focuses on the In-band/pre-bound method for developing and delivering ETV applications in the current linear environment.

Prepping the insertion environment

Splice point Setup – Many DSTBs only acknowledge the PIDs associated with the network at the time of its initial service acquisition (i.e. at the time of the channel tune). Since the networks are not currently sending ETV PIDs in

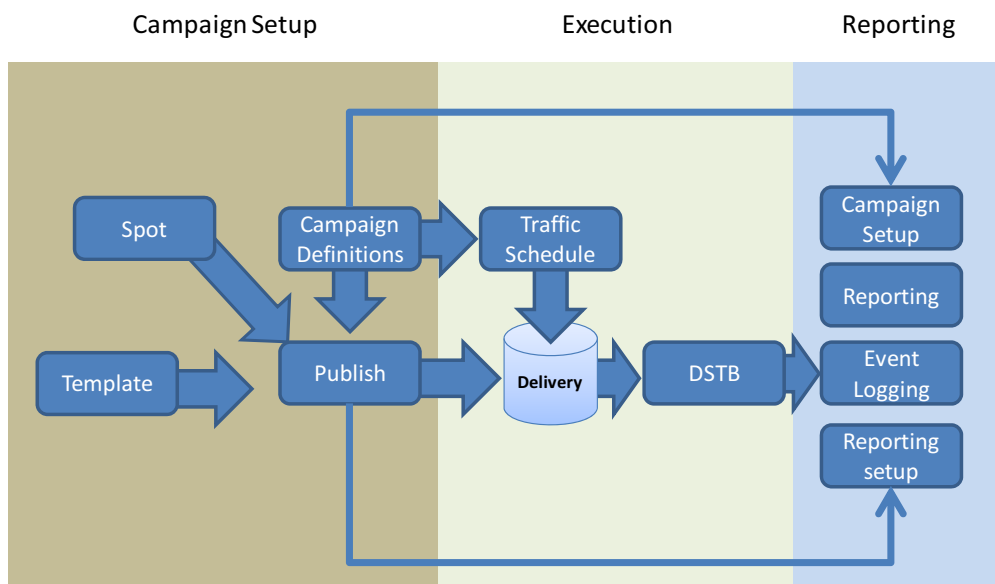
their PMTs, any application contained in an interactive ad, delivered after the initial channel tune would most likely not be seen by the DSTB. The solution is to create and maintain a constant set of ETV PIDs with fixed descriptors in the PMT that can be acknowledged by the DSTB and referenced during the splicing process. Many of the splicer vendors have already built this functionality into their products so please check with your splicer vendor(s) to make sure you are on a version that supports the provisioning of these baseline PIDs.



Ad Insertion – The insertion platform will need to be at a version that will support splicing setup for the ETV PIDs.

HD Support – HD transcode software may require an upgrade to pass the ETV PIDs while also up converting the Video to the appropriate HD format.

The fulfillment cycle



Campaign Setup

CAMPAIGN DEFINITIONS

Campaign definitions consist of placement and provisioning/production instructions used to setup the campaign in traffic and guide the interactive ad creation process and setup the reporting service. The placement instructions are contained in the linear insertion order, ingested by the traffic system and used to schedule the spot.

Supplemental information specifically relating to copy instructions is also coordinated between the Campaign planning tools and traffic. Provisioning/production instructions contain information related to specific copy instructions used in the production phase of the ad along with any other fulfillment instructions.

KEY LINKING INFORMATION:

Spot ID – 11 character Alpha numeric ID that is used in the traffic schedules to identify a specific spot in the insertion environment for airing – also included in billing verifications

Ad Package ID 16 character ID included in the DSTB logging post – this establishes the Spot ID for Interactive app cross reference that is used to support the linking of the backend reporting information to the campaign

CAMPAIGN SETUP – REPORTING:

Since the reporting service interface needs to be aware of the campaign prior to airing campaign setup information is moved to the reporting service during the setup process

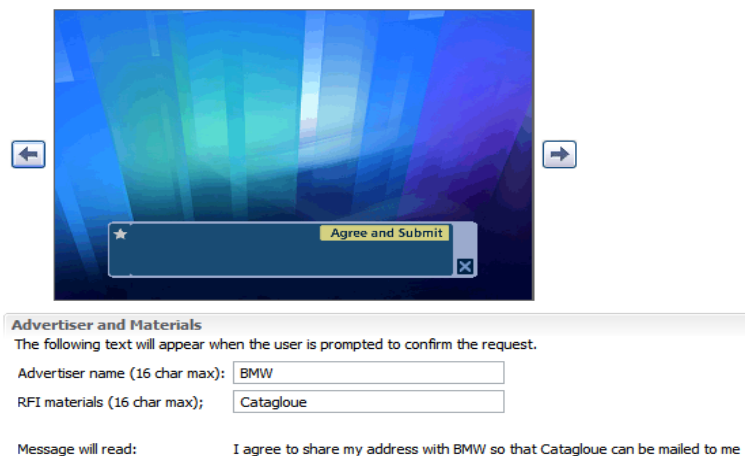
TEMPLATES

Applications used in the ad environment are first developed through what we refer to as the authoring process.

This is the process in where the overall functionality is defined and tested along with the variables that will be used during the actual ad development/publishing phase. The resulting application produced in this phase is referred to as a template.

COPY CREATION – PUBLISHING TOOLS

When creating an interactive ad, editable variables defined in the application template are used to tailor the application for each ad instance. These variables are exposed through a publishing interface like the one depicted below.



The image shows a screenshot of a user interface for creating an interactive ad. At the top, there is a blue-themed dialog box with a star icon on the left and a close button on the right. The dialog box contains a yellow button labeled "Agree and Submit". Below the dialog box, there is a section titled "Advertiser and Materials" with a subtitle "The following text will appear when the user is prompted to confirm the request." This section contains two input fields: "Advertiser name (16 char max):" with the value "BMW" and "RFI materials (16 char max):" with the value "Catagloue". Below these fields, there is a "Message will read:" label followed by the text "I agree to share my address with BMW so that Catagloue can be mailed to me".

The production process includes the following steps:

- Select the appropriate template for the campaign
- Define the overall look and feel of the overlays through the available presets
- Enter expiration date
- Enter the messaging that is to be displayed
- Define what functions will be enabled
- Identify any association i.e VOD content and or programs
- Identify the Underlying Video – in this case the spot
- Identify both the ad package ID the at the application will be used for logging and the spot ID for the final packaged interactive spot
- Run the final work through simulations
- Fine tune as required
- Package the final version for airing
- Run the final asset through QC simulation
- Upload the asset to the insertion and or VOD platforms

REPORTING SETUP

In some enhanced advertising environments, an xml is sent to the reporting service for each published instance of an application. This xml identifies the specific events contained in the resulting DSTB logging message, which is identified though the ad package ID. In a pure template based environment the information is uploaded for each template and in this case the definitions are identified by the application ID

Execution

TRAFFIC

The traffic schedule PROVIDES instruction to the insertion environment; execution is keyed on the spot ID of the final packaged asset.

INSERTION

The insertion platform receives the packaged ads that are uploaded from the publishing process and schedules calling out their placement are received from the traffic system.

HD coverage is provided for by creating both a 720p and 1080i version of the spot maintaining the 3x4 aspect ratio of the image while also passing through the application PIDs. Natively encoded HD spots would be required to go through their own packaging process and at some point may require overlay specifically formatted for the 16x9 aspect ratio.

Crossing lines – Interactive ad campaigns that go beyond the host’s subscriber footprint:

DSTB Mac address to service address references have to be made in order to complete certain Interactive transactions. For example, an ad containing a “Request For Information - by mail” kicks off a lead generation process when a viewer selects request and then agrees with the terms. The request is sent back to a logging sever though all that is known at this time is that the request came from a specific MAC address. The request is matched with a MAC address in the associated billing system in order to obtain the address information needed to support

the fulfillment process is then transferred to the host. Due to the fact that it may take some time to work through all of the requirements for interfacing multiple operators in a market. We must ensure that applications being managed by the host are not seen on DSTBs outside of their operating environment. Initially many of the participating zones outside of the host service area may naturally be excluded, due to the absence of an EBIF client on the DSTBs or by not setting up their splicers for EBIF splicing. Because this will be a short lived as more and more systems are enabled for EBIF, stripping of the EBIF PIDs during copy handoff or filtering at the splice point may end up being the appropriate solution in a multi operator ad-bound environment.

REPORTING

Reporting is an information aggregation point used support transactions, analytics, campaign monitoring, and billing. If reporting and/or logging is centrally aggregated it is important that the Ad package IDs used to identify a specific ad be unique for all ads logging back to the reporting service. To support this it is important that these IDs be managed and issued from this point.

Key Campaign Data Sources used in reporting:

ID	Camp Setup	Traffic	Insertion	Application	Logging
Spot ID	X	X	X	X	
Ad Package ID	X			X	X
Application ID				X	X
Channel ID		X	X		X
STB ID					X
Zone ID		X	X		
Time aired			X		
Time viewed					X

Logging and monitoring: Applications can be setup to log activities such as application received, overlay displayed, channel, viewer interactions and even error codes. These data points are invaluable when it comes to monitoring the campaign fulfillment process.

Through readying our platforms for delivering ETV enabled advertising, I have found that the Standards and specifications work that is so foundational to our success is proving itself out. The platforms that we have in place today will support the delivery of ETV enabled spots while also providing the data that is required to support campaigns.