HbbTV TA Phase 2 Explained
Where "Broadcast" Reaches the TV over HDMI from a Set-top Box
Combining HbbTV ADB2 and TA

• HbbTV-TA phase 2 is built out of 2 parts
  1. Application Discovery over Broadband phase 2 (ADB2)
     • Enables basic core HbbTV functionality where linear broadcast TV reaches the TV set over HDMI from a STB
     • Uses ATSC 3.0 watermarks in video & audio to launch HbbTV apps, provide stream events and so on
  2. HbbTV-TA phase 1 enables faster & more precise control of switching broadcast -> ad & back than basic core HbbTV

• Together ADB2+TA enable
  – Launching HbbTV apps in linear broadcast TV reaching the TV via HDMI
  – Apps that have faster & more precise control of switching HDMI -> ad & back than basic core HbbTV
Application Discovery over Broadcast

- Traditionally, HbbTV Terminals “discover” applications using an Application URL carried in an Application Information Table (AIT) received via broadcast.
- Timecode and stream events are found multiplexed into the broadcast stream.
- This is supported in the HbbTV Core Specification (and referenced DVB specs).
• Watermarking extends use cases for Application Discovery over Broadband to include:
  – Service delivery to the HbbTV Terminal via **HDMI and other non-broadcast interfaces**
  – **Timecode**
  – **Stream Events**
1. Broadcaster application launched according to “Application Discovery over Broadband”
2. Broadcaster sends message to app announcing that ‘placement opportunity’ is near
   - Message payload could be included in video watermark
   - Message payload could be fetched via broadband based on signalling in audio watermark
   - Message payload could be the same as HbbTV TA phase 1
3. App confirms that the terminal can safely replace ad
   - App confirms that terminal capabilities are sufficient
   - App confirms that user environment is configured appropriately (e.g. audio routing)
4. App asks ad decision server for an ad that could be played
   - Response could use existing web advertising standards (“VAST”)
5. App preloads ad
   - Preload may be 100% if there's enough RAM / depending on broadcaster / advertiser requirements
     - 100% preload uses Web “Media Source Extensions” API – new to HbbTV in TA phase 1 or HbbTV 2.0.3
6. App tells TV when to switch from HDMI to ad
   - Time based on media timeline reconstructed from audio & video watermarks
   - New “fast media switch API”
7. App manages presentation of ad
   - App monitors watermark presence to detect activity on the STB (e.g. showing EPG) & respond accordingly
8. App reports back on playback of ad
   - Critical otherwise nobody gets paid
9. App switches back from ad to HDMI
   - Also using new “fast media switch API”

Black is TA phase 1, Green is the existing ADB2, Blue is completely new (ADB2+TA)
Some Care Required by Broadcasters

• ADB2+TA is not a perfect solution
  – User experience not as good as TA on the STB would be
  – Broadcasters (or suppliers) will need understanding of the behaviour of the STBs in the markets they address
  – Consumer messaging & communication is important

• Many audio configurations are possible between STB and TV
  – Some will work fine
  – Some won't work with ADB2 at all
  – Broadcasters need to be careful only to substitute ads when it's safe to do so
    • ADB2+TA spec enables apps to query this

• Video watermark may be visible in the top line of broadcast video
  – Important for when user asks for EPG on STB while an ad is being replaced on TV
  – Care required depending on content
  – Could upset viewers & result in complaints
Looking Forwards

• Remember ADB and TA are separate specs
  – Not part of the natural evolution of the core HbbTV spec
  – Dialog required between broadcasters & manufacturers about their implementation
    • Care needed to avoid a "Catch 22"

• Assuming TA phase 1 is a success ….
  – Builds momentum, goodwill & mutual credibility for introducing ADB2+TA
  – Many commercial relationships for TA phase 1 seamlessly move forwards to ADB2+TA
  – Apps & technical infrastructure from TA phase 1 are largely re-usable for ADB2+TA

• Unit tests needed for implementations in TVs
  – 57 unit test descriptions for ADB2+TA
  – 123 unit test descriptions for the ADB2
  – Unit tests now need creating from these descriptions & reviewing

• ADB2+TA is submitted to ETSI for consideration as TS 103 464 V1.3.1
Background Information

• Specifications
  – TA
    • ETSI TS 103 736-1 and ETSI TS 103 736-2
  – ADB+TA
    • Update to ETSI TS 103 464 integrating ETSI TS 103 736

• HbbTV "explainer"
  – These slides mostly from "ADB2+TA Explained"
  – ADB2 has its own explainer here