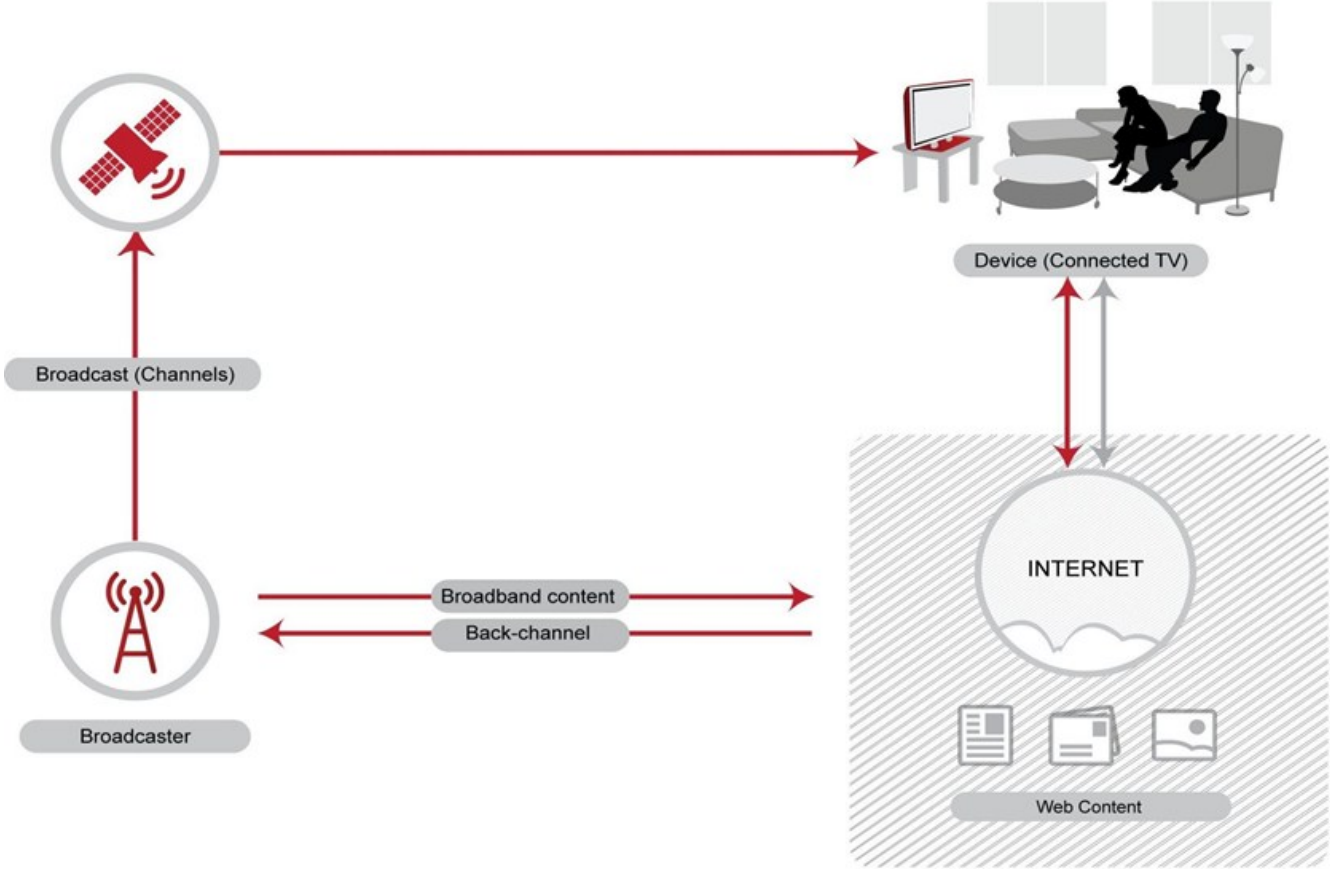




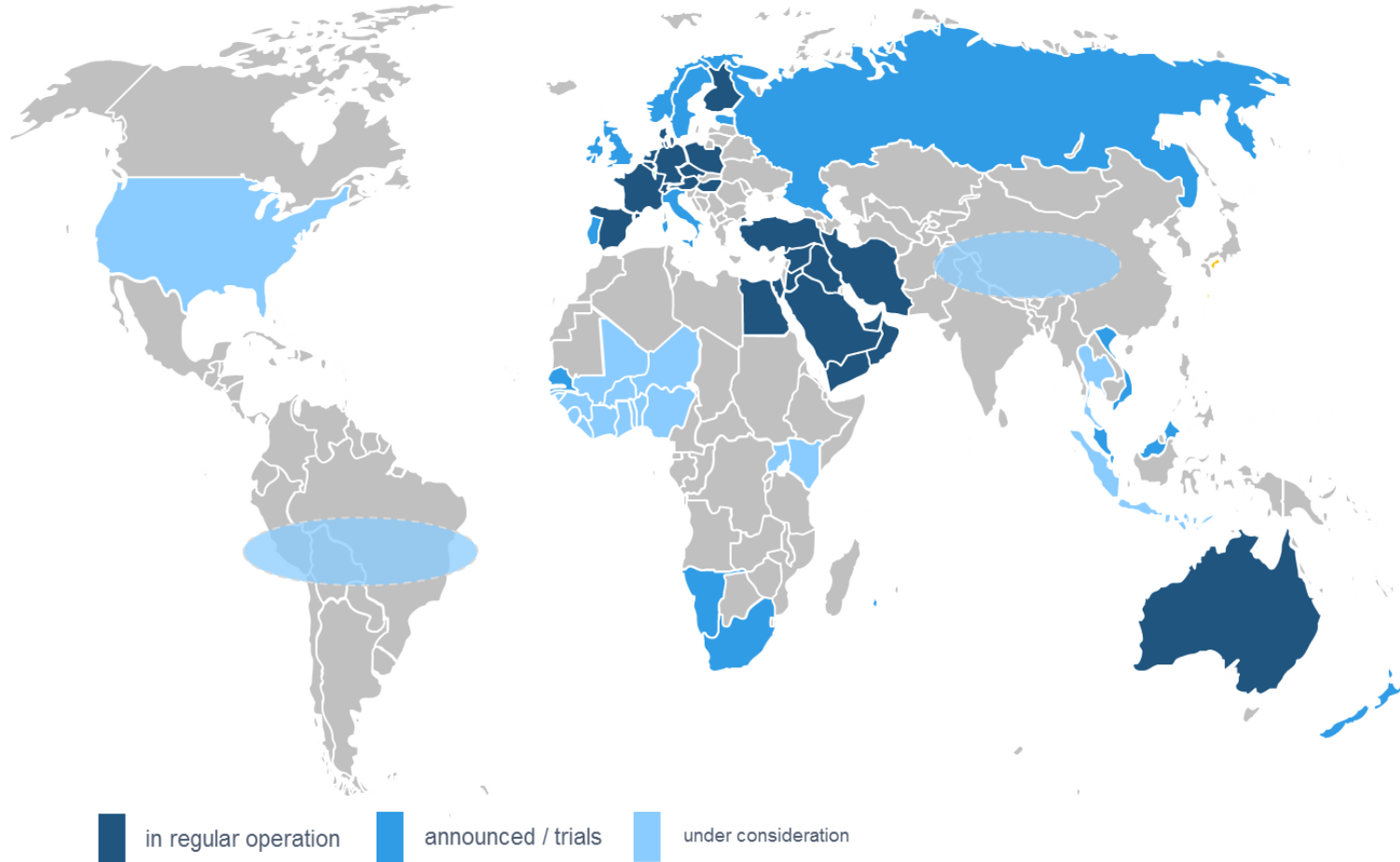
HbbTV Overview

TPAC 2014 – Giuseppe Pascale

HbbTV = Hybrid Broadcast Broadband TV



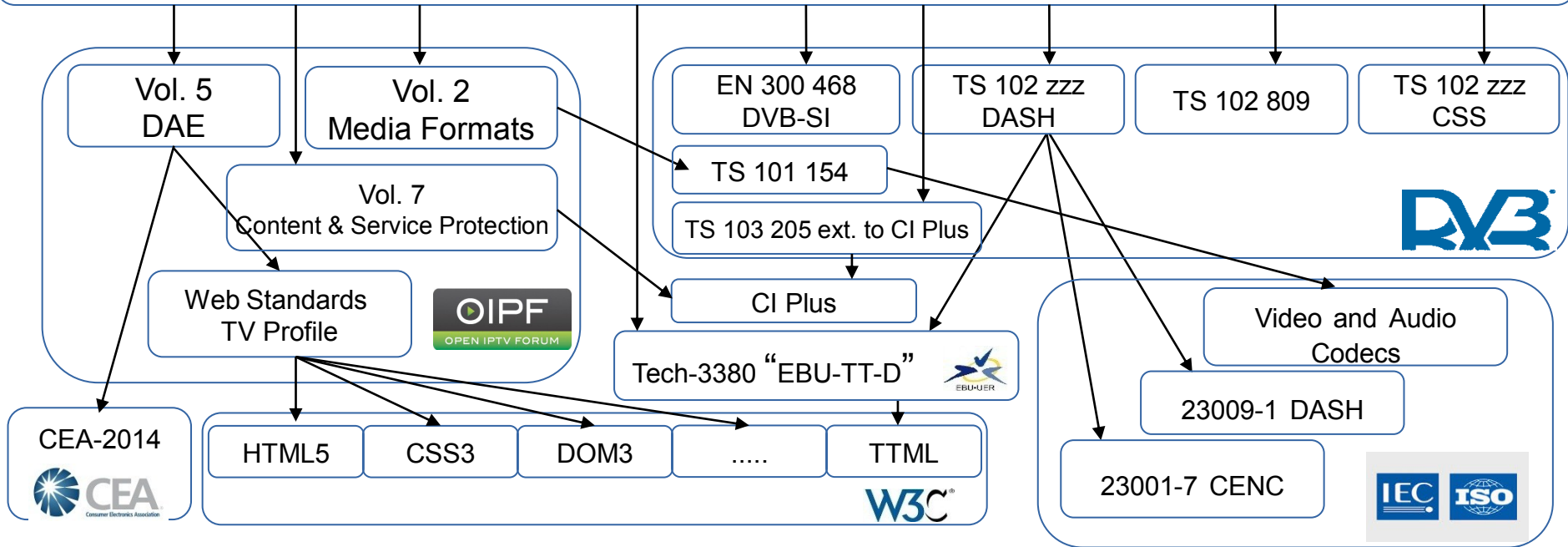
HbbTV gains momentum globally



HbbTV v2 Specification Overview

HbbTV Specification

HbbTV[®]



HbbTV v2 highlights

NEW TECHNOLOGY IN HBTV V2

HTML5 and Associated Technologies

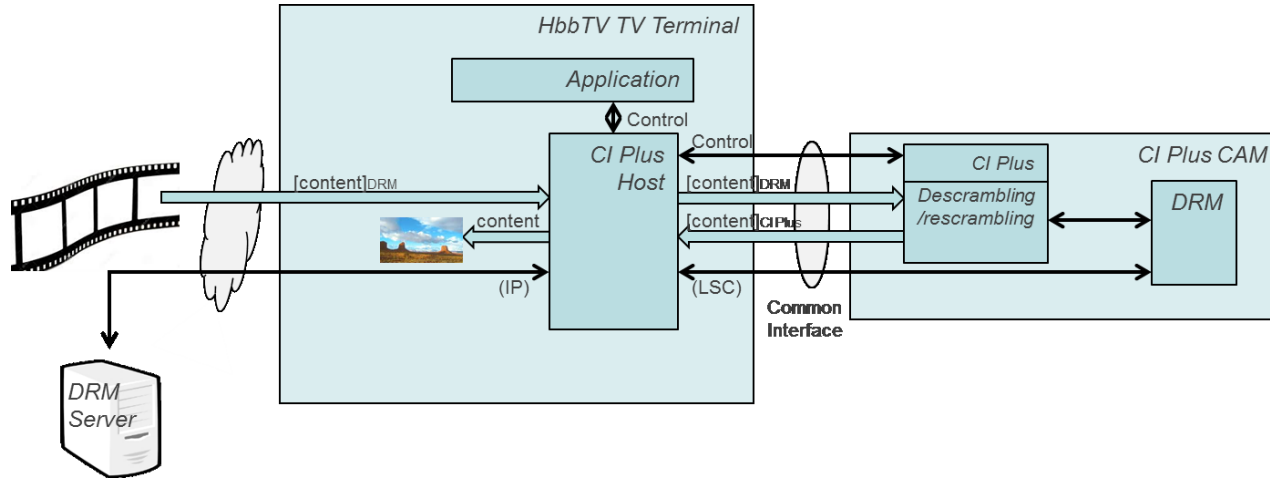
Updated the election of web standards required to be supported by HbbTV devices

- Reusing the a profile made by the Open IPTV Forum
- HTML5, WOFF, Canvas 2D, XHR, Web Messaging, Web Socket, Web Workers, Server-Sent Events, Web Storage, Media Fragment URI
- CSS 2.1 plus a selection of CSS3 modules
 - Basic UI, Color, Images, Backgrounds and Borders, Selectors, Media Queries, Multi-column Layout, Flexible Box Layout, Fonts, Transforms, Transitions, Animations

HTML5 <video> element Included in the spec for IP delivered video

- Allow to target TVs, tablets, phones and PCs with the same HTML app
- Old API based on the <object> element is still included both for IP delivered video and broadcast video
 - Apps can choose which to use

DVB CI Plus 1.4



“DRM in a CAM” feature references CI+ 1.4 “Host Player Mode”

- For content delivered over broadband using MPEG DASH, or downloaded (incl. from broadcast)

2 other features use the CI+ 1.4 “Auxiliary File System”

- Launch apps where whole app comes from the CAM
- Access to data from the CAM by conventional broadcast or broadband apps

Other New Technology

HEVC video via broadband

- Covers both UHD and HD use-cases
 - UHD particularly where it's not available in the broadcast
 - HD for the same quality as AVC at a lower bitrate or higher quality than AVC at the same bitrate
- HEVC via broadcast is left to national specs

Subtitles via broadband

- Uses W3C TTML as profiled by the EBU (“EBU-TT-D”)

Privacy

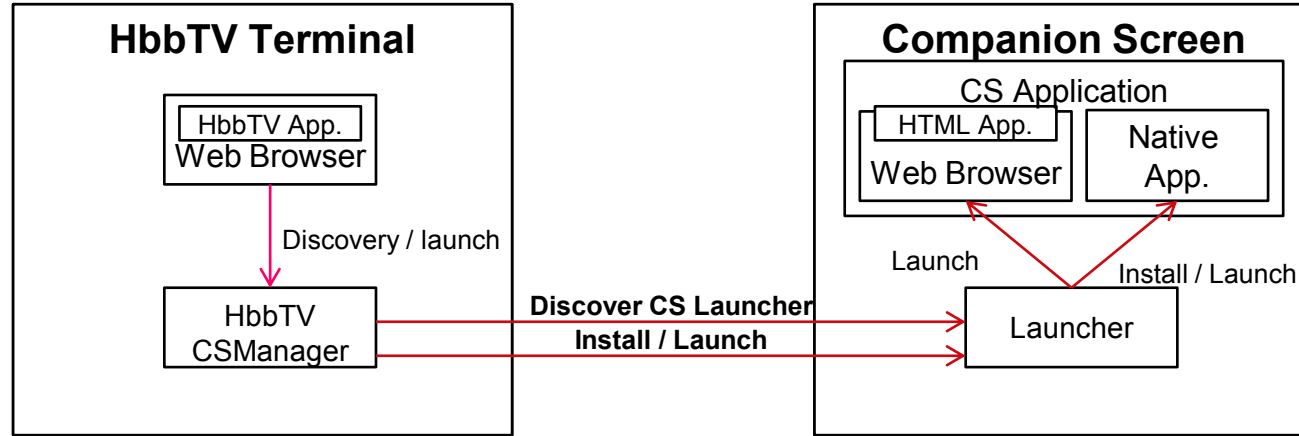
- Uses the W3C ‘do not track’ specification
- Possibility of blocking third party cookies commonly used in tracking
- Possibility of blocking tracking web sites
- Recommendations to app developers on respecting privacy

Multi-stream synchronisation

- E.g. sync audio delivered via broadband with broadcast video
- Builds extensively on synchronising applications and content across devices (see later slides)

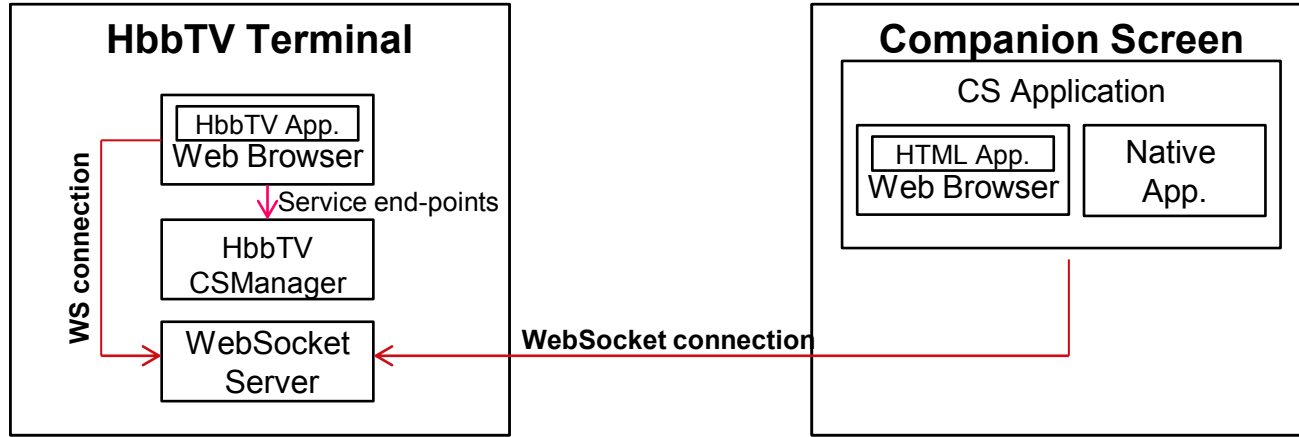
COMPANION SCREENS

Launching CS App. From the TV



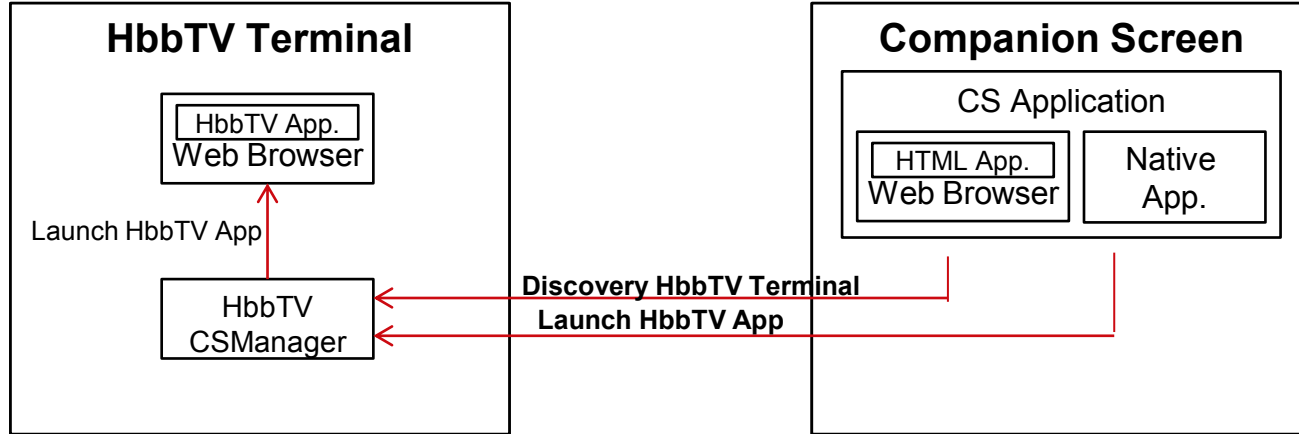
- User starts “Launcher” app on companion screen
 - Launcher app typically comes from TV manufacturer
 - Protocol between terminal and launcher is proprietary but payload for describing what app to launch (from what app store) is specified
- App asks HbbTVCSManager for list of currently running launchers
- App asks chooses a device with a running launcher
- App asks launcher to (install and) launch app

App2App Communication



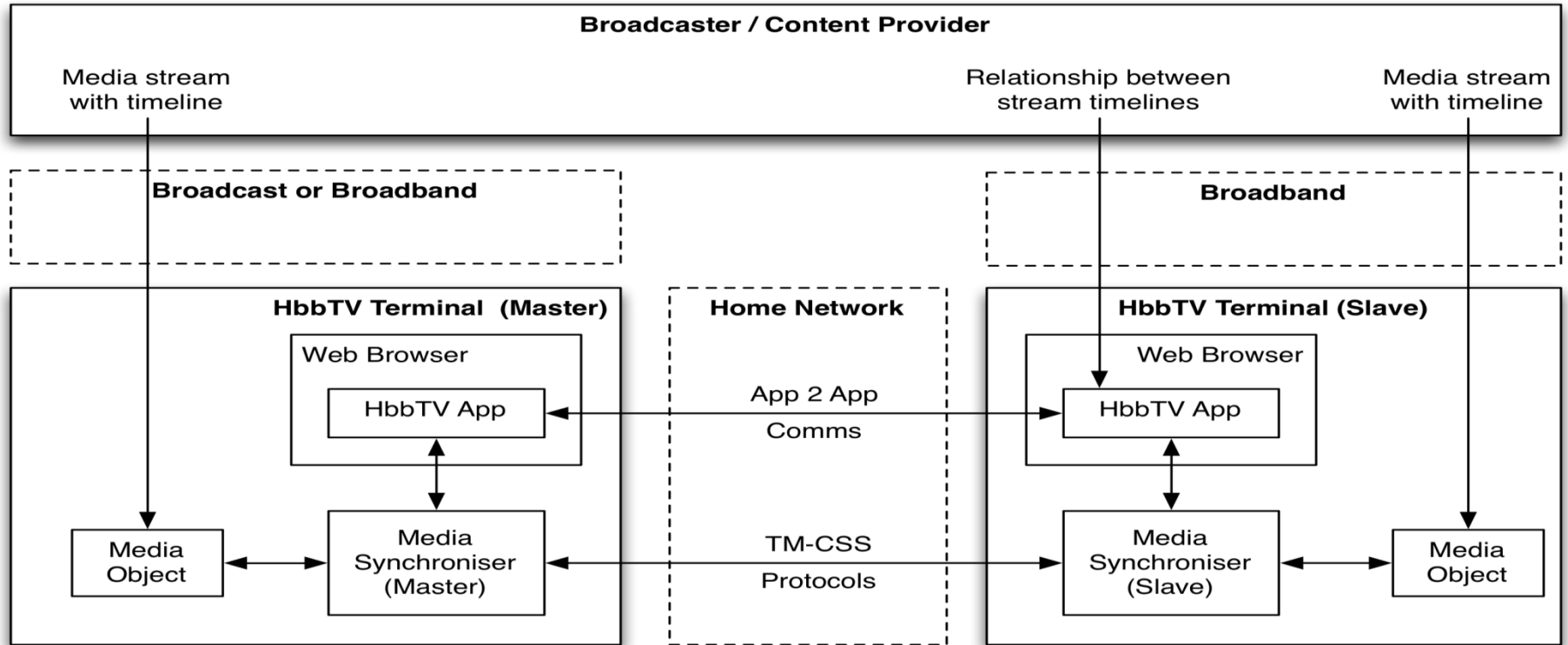
- TV runs websocket server
- App asks HbbTVCSManager for local end point of websocket server
- App makes websocket connection to local end point
- Companion screen app obtains remote end point of websocket server
- Companion screen app makes websocket connection to remote end point
- Websocket server pairs local and remote connections

Remotely Launching HbbTV App.



- » Based on Netflix/Youtube DIAL protocol
- » App on companion screen discovers HbbTV terminal & makes HTTP POST request to the end point to launch an app
- » App launching can be refused for various possible reasons listed in the spec

Synchronising Applications & Content Across Devices



FEATURE IMPROVEMENTS

Main Improvements

MPEG DASH

- Refers to the new DVB profile of MPEG DASH
 - Also supports existing HbbTV MPEG DASH
- Will be suitable for live TV and not just on-demand

Advert insertion into VoD content

- Uses two HTML5 media elements with additional requirements for a clean transition between them

Push VoD

- Aka “Non-realtime content delivery via broadcast”
- Combines existing API with a file transport protocol optimised for small numbers of (very) large files

Other Improvements

Support for mouse and keyboard devices

- Trivial extension to existing APIs

Application and content synchronisation

- Minor enhancements to existing specs

Reconciling key request conflicts

- Better sharing of user input between HbbTV environment and other TV set features based on existing web APIs

Caching of object carousels

- Based on solution used for MHEG-5 in Australia

Testing

For HbbTV v1/1.5, test suite development was largely based on voluntary effort and was painfully slow

The link between the spec and individual tests is something called “assertions”

- Getting volunteers to write and review assertions is really difficult
- For v2, the specification will not be published until there are reviewed assertions for everything that needs them

HbbTV will commission tests based on the reviewed assertions

- RfI for possible test case suppliers has just been issued
- RfP for test cases suppliers to be written based on RfI responses
 - Reviewed assertions are needed before we can issue the RfP

HbbTV wants to reduce the wait for the v2 test suite compared to the v1 / v1.5 test suite

Specification Status Today

Stable draft of the specification shared with partner organisations at the end of July

- Currently processing and solving comments from review of this draft

Test assertions exist for all features

- Currently being reviewed
- Some iteration required where solutions to review comments will impact assertions

Publication of the v2 spec depends on HbbTV member contributions to review assertions

BEYOND HBBTV V2

IPTV

Work on HbbTV and IPTV started during the discussions about transferring activities from OIPF to HbbTV

- Also inspired by some of the German activities around video via multicast

3 scenarios for HbbTV and IPTV

- IPTV is the “Broadcast” in HbbTV – no conventional DVB-C/S/T
 - All TV channels / services come via IPTV
- IPTV is “Broadcast” alongside conventional DVB-C/S/T
 - TV channels / services come via either/both IPTV and DVB-C/S/T
- Multicast video presented by an HbbTV app

HbbTV is not going to do an “HbbTV IPTV profile”

- People have done those before and they haven’t been used (or at least not admitted to)

First step will be to document how various IPTV technologies can be used with HbbTV

- E.g. DVB SD&S, DVB OSDT, multicast video, RTSP, ...

Basic IPTV technology choices (e.g. FCC, RET/FEC) will be left to those closer to deployments

Independent Application Signalling

Heard many times yesterday about network operators that don't carry the HbbTV signalling provided by the broadcasters

- Prevents consumers accessing HbbTV services using the HbbTV TV they've paid for

HbbTV will be investigating other ways for the information needed to run an app to reach consumer's TVs

No agreed solutions yet but ..

- In the USA, ATSC are working on watermarking for this and other use-cases
 - Call for proposals issued in January 2014
 - <http://www.atsc.org/cms/index.php/standards/other-technical-documents/333-call-for-proposals-for-atsc-30-automatic-content-recognition-watermarking-solutions>
- HbbTV 1/1.5 include mechanisms for running HbbTV apps with analogue TV (where there's no signalling)
 - Based on sending a channel identifier to a secure web server and getting HbbTV signalling information back as the response

More?

HbbTV works on requirements proposed by its members and reviewed in the Requirements Working Group

- Things only happen because members contribute time and energy to making them happen

If you think something belongs in a future HbbTV spec

- If you're an HbbTV member, come along to the Requirements Group and start a discussion
- If you're not an HbbTV member, how about joining?