Connected TV (CTV) Standardisation in the UK

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Introduction

The Digital TV Group (DTG) is the independent industry association for digital television in the UK. Today the Group represents over 150 broadcasters, platforms, manufacturers, technology providers, government departments, regulators, not-for-profit organisations and consumer groups. Since 1995, the DTG has provided a focal point for the digital television industry, bringing together key stakeholders to define detailed broadcast and receiver specifications and to provide regimes to measure conformance against brand requirements.

The Group publishes and maintains the technical specification for the UK's Freeview and Freeview HD platforms (the D-Book) and runs the digital television industry's test centre in the UK: DTG Testing. The DTG has published and maintained the D-Book for over a decade and the specification is updated annually to keep up with the pace of development in UK DTT. At present, interactive TV services are enabled via a profile of the MHEG-5 specification defined by the D-Book, with an HTML-based presentation technology currently being defined.

Connected TV standardisation

The DTG Council, executive and its members are currently developing the technical specification for UK Connected TV which will form part of the 7th edition of the D-Book. D-Book 7 will provide an industry agreed baseline implementation for Connected TV products and services that service providers such as YouView, Fetch TV, Lovefilm, Sky, Virgin Media and others can build on for trademark requirements to support their services.

The DTG has set up 7 Connected TV working groups drawing upon different areas of the specification: architecture, device, delivery, presentation, metadata, security and measurement. D-Book 7 will be published in March 2011, and will be followed by a Connected TV test and conformance regime to ensure market compliance.

Technical specifications

The Connected TV presentation group is focussing on three areas, an HTML-based presentation technology building on the HbbTV specification, a profile of Web standards for improved graphical capabilities (most notably HTML5 and CSS3) , and a framework to enable co-existence of HTML and MHEG-5 with other presentation technologies such as Flash.

In the interests of harmonization with other digital TV specifications, Connected TV is defined using the HbbTV specification as a baseline, with a number of additions to address Connected TV's more advanced requirements. These requirements fall into the following areas:

- Access to additional metadata about programmes, recordings and downloaded media content
- Metadata search
- Security
- Extensions to the application model to support multiple simultaneous applications

- Additional support for DRM and conditional access systems
- Support for linear IP services and adaptive streaming
- Improved graphics and animation capabilities
- User notifications

Many of these requirements are addressed by adding extra elements from the Open IPTV Forum's Declarative Application Environment (DAE) specification to those already selected by HbbTV. Other requirements are met through the inclusion of features from W3C specifications, such as the HTML 5 <video> element for compatibility with existing Web content and a subset of the W3C Web Notifications API. The Connected TV specification also defines additional APIs to address UK-specific requirements for metadata access.

HbbTV's graphical and animation capabilities are extended through the addition of a subset of HTML 5 and CSS 3 technologies. Two device profiles are defined, for basic and advanced devices. The basic profile includes support for 2D functionality that can be implemented on hardware platforms used in today's digital TV receivers. This includes:

- The HTML 5 Canvas element and 2D drawing context
- Elements of the CSS 3 Basic UI, Colour and Backgrounds and Borders modules
- Elements of the CSS 3 2D Transformations module
- Elements of the CSS 3 Transitions module

The advanced profile includes further support for 2D functionality, and includes 3D functionality as an option through the CSS3 3D transformations module. Support for WebGL is still under discussion.

Coexistence of presentation technologies

Deployment of HTML-based presentation engines in the UK market faces a unique challenge, in that coexistence with existing, widely-deployed presentation technologies is vital for the success of this work. Support for MHEG-5 is ubiquitous in UK receivers and MHEG-5 is widely used by broadcasters today. Connected TV defines a framework that enables HTML applications to coexist with applications written in MHEG-5 or other presentation technologies.

This framework not only includes mechanisms for signalling applications of different types, but also includes a definition of how applications share the display and user input (recognising that traditional PC-based approaches to application management are not suitable for the TV). Furthermore, it defines a model where applications may be closely related to a specific broadcast channel or event, or where they may be independent from any broadcast channel. This model includes managing when applications may be overlaid on broadcast video, in order to ensure the needs of broadcasters, device manufacturers, and application providers are all addressed.

Testing and validation

Development of a specification alone is not enough to ensure the success of that specification in a consumer market; testing and validation of implementations play a key part in ensuring consistency across devices and increasing the confidence of both consumers and content developers.

While the DTG is working on the development of test material for the DTV specification, it also recognises that co-operation between standards organisations to develop conformance test regimes is extremely important and is keen to explore the opportunities for standards development organisations to work together in this area. The harmonisation of standards means that elements from one standard may get used in many other places, and co-operation in developing tests ensures a common understanding of the what a "compliant implementation" means for products which may implement some or all of several different (but overlapping) standards.