Overview of IPTV Forum Japan's Hybridcast Technical Specification

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Abstract

Hybridcast is a hybrid TV system that uses HTML5 as an application service environment. The technical specification of Hybridcast is standardized by IPTV Forum Japan (IPTVFJ) in March 2013. In order to share the understanding of an existing standard for HTML5-based hybrid TV service, this paper describes an overview of the specification.

Overview of Technical Specification

Hybridcast technical standard is defined by the following two documents.

- IPTVFJ STD-0010 "Integrated broadcast-broadband system specifications"
  defines system model, application model, application control signals, transport protocols, VoD, monomedia coding, and receiver functions.
- IPTVFJ STD-0011 "HTML5 Browser specification"
  defines HTML application structure, behavior and syntax of elements, and additional objects and APIs.

Both specifications are publicly available on IPTV Forum Japan web site, at http://www.iptvforum.jp/en/download (Engilish translation will be available soon.) Figure 1 shows the overall architecture of Hybridcast system.

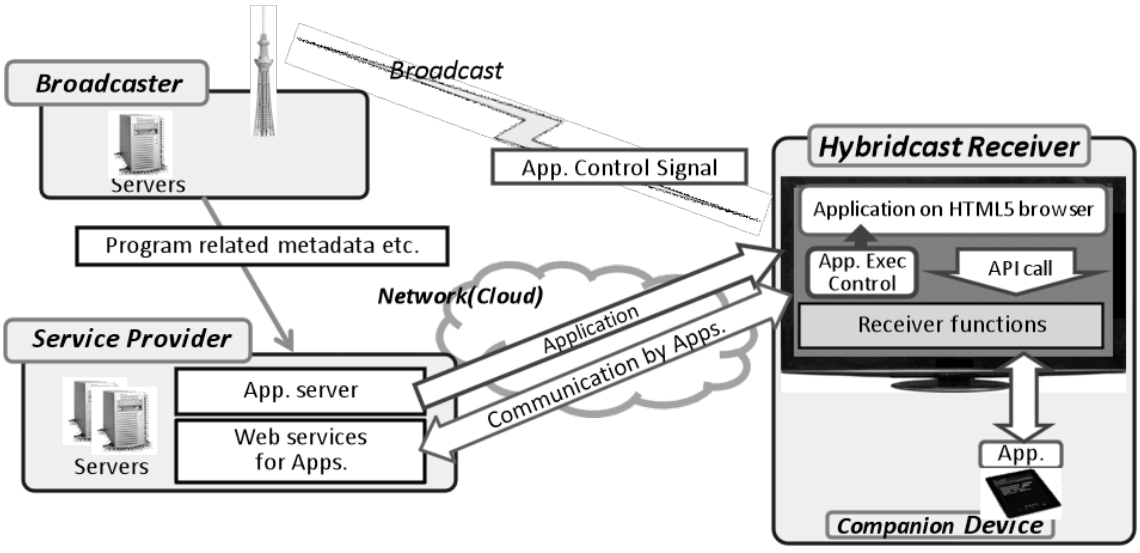

Figure 1. Architecture of Hybridcast system

IPTVFJ STD-0011 defines HTML5 environment with additional APIs for Hybridcast applications. As a base environment, IPTVFJ STD-0011 employs W3C HTML5 and its related specifications such as CSS, DOM and ECMAScript. In addition, using the additional APIs, a Hybridcast application can control the presentation of video and audio, obtain metadata delivered over broadcast channel, and call receiver functions. Table 1 shows major additional objects and elements defined in STD-0011.

Table 1. Major additional objects

Application object	An object which represents an application itself. This object is used to manage execution state of an application and to invoke another application.
ApplicationInfomrationTable object	An object which represents application control signals. An application can obtain boundary and permission information delivered by application control signals by calling this object.
ReceiverDevice object	An object which represents functionalities of a Hybridcast receiver and information managed by a Hybridcast receiver. This object provides functionalities for tuning, access to receiver specific information such as receiver identification and system information, and detection of current broadcasting programme, etc.
EIT[1] related objects	Objects which handle broadcasting program schedule information.
StreamEventTarget object	An object to handle stream events delivered over broadcast channel.
BML[2]CompatObject object	An object to access to a part of functionalities of BML browser such as non-volatile memory.
Companion device collaboration related functions	As a part of ReceiverDevice object, functions to instruct initial URL of an application to run on companion devices and to send/receive messages to/from the devices are defined.
BroadcastVideoObject element	An object element with additional type to represent broadcast video instead of video element in HTML5. This object is defined to satisfy broadcast related requirements such as continuous presentation of broadcast video even

[1] EIT (Event Information Table): A table that contains program schedule information and is delivered over the broadcast channel.
[2] BML (Broadcast Markup Language): An XML based language designed for interactive TV services in 2000. BML is widely used in Japan for data broadcast services.

	during loading HTML document, control of z-order alignment of broadcast video and graphics with alpha blending.

Services of Hybridcast

In September 2013, NHK has launched a service based on the IPTVFJ's Hybridcast technical standards. The service offers HTML5 based applications with graphics of HDTV resolution via the Internet. Viewers with a Hybridcast-enabled TV can initiate the service by pressing the "d"(data) button on the remote while watching a broadcast program. As of January 2014, four manufacturers bring Hybridcast-enabled TVs to the market.

Figure 2 shows an appearance of the home screen of the Hybridcast service. From the home screen, viewers can select a desired application such as news, weather, program guide and HD on-demand video archives. An interactive application that allows viewers to participate in the live quiz show has also been offered. The application used StreamEventTarget API to synchronize its behavior with the broadcast program. Also, some of these applications are being offered with the companion device functions that utilizes a tablet or a smartphone as a second-screen device. Since January in this year, major commercial broadcasters in Japan have also started trial Hybridcast services.

Figure 2. Home screen of NHK's Hybridcast service

Conclusion

This paper summarizes the technical standard of Hybridcast and its current situation. As a member of IPTV Forum Japan, NHK would like to participate in the workshop and discuss a topic on the harmonization between existing standards and HTML5.