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Infrastructure of audiovisual services – Communication procedures

HSTP.IPTV-Gloss
Glossary and terminology of IP-based TV-related multimedia services

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Summary

This technical paper specifies terminology related to IP-based TV multimedia services.

Keywords

IPTV, Terminology

Change Log

This document contains Version 1 of the ITU-T Technical Paper on "*Glossary and terminology of IP-based TV-related multimedia services*" approved at the ITU-T Study Group 16 meeting held in Sapporo, Japan, 30 June – 11 July 2014.

Editors:

Myung-Eun Kim
ETRI
Republic of Korea
Tel: +82-42-860-5303
Fax: +82-42-860-6202
Email: mekim@etri.re.kr

Muzaffar Djalalov
Communication and Information Agency
Uzbekistan (Republic of)
Tel: +998-71-235-7907
Fax: +998-71-235-7907
Email: djalalov@unicon.uz

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ITU-T Technical Paper
Glossary and terminology of IP-based TV-related multimedia services

Summary

This technical paper specifies terminology related to IP-based TV multimedia services.

1 Scope

This technical paper specifies terminology related to IP-based TV multimedia services.

It contains the features of IP-based TV-related multimedia services including hybrid TV, connected TV, smart TV, internet TV, web TV, etc. leading to clarifying their own distinct characteristics compared with the multimedia services by the hybrid IPTV terminal device.

2 References

[ITU-T Y.1910] Recommendation ITU-T Y.1910 (2008), *IPTV functional architecture*.

[ITU-T H.720] Recommendation ITU-T H.720 (2008), *Overview of IPTV terminal devices and end systems*.

[ITU-T H.761] Recommendation ITU-T H.761 (2011), Nested Context Language (NCL) and Ginga-NCL.

[ITU-T H.762] Recommendation ITU-T H.762 (2011), Lightweight interactive multimedia environment (LIME) for IPTV services

[ITU-T J.205] Recommendation ITU-T J.205 (2012), *Requirements for an application control framework using integrated broadcast and broadband digital television.*

[ITU-T J.206] Recommendation ITU-T J.206 (2013), *Architecture for an application control framework using integrated broadcast and broadband digital television*.

[ITU-R BT.2267] Report ITU-R BT.2267 (2013), *Integrated broadcast-broadband systems.*

[ETSI TS 102 796] ETSI TS 102 796 V1.1.1 (2010), *Hybrid Broadcast Broadband TV*.

3 Definitions

3.1 Terms defined elsewhere

This Technical Paper uses the following terms defined elsewhere:

3.1.1 hybrid terminal device [ITU-T H.720]: An IPTV terminal device that can also receive content from different types of transmission systems (e.g. terrestrial, satellite).

3.1.2 IBB application [ITU-T J.205]: An application that is meant to be handled and executed within an integrated broadcast and broadband (IBB) application control framework. Such applications can have their application contents delivered using different application component delivery mechanism.

3.1.3 IBB DTV receiver [ITU-T J.205]: A device capable of receiving and displaying DTV Services as well as integrated broadcast and broadband (IBB) DTV services.

3.1.4 service associated IBB application [ITU-T J.205]: An application that is part of the integrated broadcast and broadband(IBB) DTV service tuned by the user at a given time.

3.1.5 stand-alone IBB application [ITU-T J.205]: Resident or downloaded integrated broadcast and broadband (IBB) installable application that is not part of an IBB DTV service. Such an application can be created by an authorized IBB application provider, and typically delivered through the application repository.

4 Abbreviations and acronyms

This Technical Paper uses the following abbreviations and acronyms:

DVB	Digital Video Broadcasting
EAN	Emergency Alert Notification
EPG	Electronic Program Guide
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
HTTPS	Secure HyperText Transfer Protocol
IBB	Integrated Broadcast and Broadband
IGMP	Internet Group Management Protocol
IPTV	Internet Protocol Television
JPEG	Joint Photographic Experts Group
LIME	Lightweight Interactive Multimedia Environment
MPEG	Moving Picture Experts Group
NDK	Native Development Kit
NCL	Nested context language
OTT	Over-The-Top
P2P	Peer-to-Peer
PIP	Picture-In-Picture
RTP	Real-time Transfer Protocol
RTSP	Real Time Streaming Protocol
SDK	Software Development Kit
UDP	User Datagram Protocol
VCR	Video Cassette Recording
VoD	Video On Demand

5 Conventions

None.

6 Introduction

Various types of new multimedia terminal devices have been poured out these days with similar services providing multimedia contents from both current terrestrial broadcast network and Internet. Furthermore terms indicating these multimedia terminal devices are seemed to be used with no distinction. However, they have apparent differences in terms of service domains, service providers, functionalities, and transmission networks, etc. It is needed to discriminate among those devices offering comparable IP-based TV-related multimedia services and clarify the concept of each terminal device.

7 Terms related to IP-based TV-related multimedia services

7.1 IPTV

According to ITU-T definition [ITU-T Y.1910], **IPTV** is defined as multimedia services such as television/video/audio/text/graphics/data delivered over IP based networks managed to provide the required level of quality of service and experience, security, interactivity and reliability.

IPTV services are provided by telecommunication companies or network providers having IPTV service infrastructure, managed IP networks, unlike traditional broadcast services using terrestrial network and satellite.

The **basic services** for IPTV are live television services, video on-demand services, interactive services, and public interest services. The **live television services** are the same as the classic form of television services that are provided by terrestrial, cable and direct-to-the-home satellite broadcasting operators. The **video on-demand (VoD) services** enable an end-user to select, acquire and consume from a library of content stored on a remote or local server. **Interactive services** are bi-directional services involving information services, learning services and entertainment services with the ability to communicate with a remote interactive content server via means such as HTTP or HTTPS. **Public interest services** notify the user of an incoming emergency alert notification (EAN) message both visually and audibly, or according to the user's preferences and capabilities, if specified.

Advanced services for IPTV are Live TV services with trick mode, personal video record services, advertising services, audience measurement services, interactive services with high security and personal IPTV broadcast services.

IPTV provides subscribers multimedia services through various types of **IPTV terminal devices** involving a set-top box, TV set, and mobile device. In terms of a set-top box and TV set support advanced services as well as basic services depending on their capabilities, but a mobile IPTV device has software and hardware constraints specific to mobile device.

IPTV supports several types of **compression methods** such as MPEG-2 and MPEG-4 when delivering video contents in an MPEG transport stream via IP multicast or IP unicast. When it comes to live television services, it uses IGMP for connecting a multicast stream (TV channel) and changing from one multicast stream to another. It also uses UDP or RTP protocol for VoD stream services and controls it using RTSP.

IPTV enables users to access IPTV services and contents by navigating a graphical user interface with a remote controller, but some IPTV terminal devices use smartphone apps for remote control instead of a remote controller for better user experience.

IPTV allows service providers to support various Internet-based applications on top of multimedia content services including Live TV service and VoD service. These applications are stored in an IPTV application server and managed by a service provider.

7.2 Smart TV

Smart TV, which is also sometimes referred to as "**Connected TV**", is a terminal device reflecting the current trend of applying Internet and web technologies to television sets and set-top boxes. It provides Internet-based services involving social networking, games, interactive advertising, and IPTV as well as traditional broadcast TV channels.

Smart TV can be considered as an information appliance or the computer system integrated within a TV set or set-top box, as smart TV often allows the user to install and run more advanced applications or plugins/add-ons based on a specific platform. All of the smart TVs have a homepage that lets users access the different functions, and from there are also links to individual app stores. It has its own complete operating system or mobile operating system allowing the user to install and execute various types of applications from application stores like for smartphones. It usually provides a public software development kit (SDK) and/or native development kit (NDK) for third-party developers.

Smart TV attempts to replace traditional remote control with an alternative control system such as voice control, gesture control, and touchpad control to provide new user experiences. It enables users to navigate web pages and to utilize in-depth search engine effectively with a full feature HTML5 enabled browser. Smart TV allows users to search and find videos, movies, photos and other content on the web, on a local TV channel, on a satellite TV channel, or on a local storage drive.

7.3 Hybrid TV

Hybrid TV is a device or service that uses two channels (broadcast and broadband) for data and application delivery. Typical hybrid devices are Internet-connected TV sets and set-top boxes, PCs with broadcast tuner and mobile phones with broadcast receivers.

Hybrid TV delivers linear broadcast DTV services through broadcast channel and broadband channel as well as non-linear (on-demand) content through broadband channel.

In the case of integrated broadcast-broadband DTV services, IBB TV [ITU-T J.206], some DTV service components can be delivered through the broadcast channel and some other components can be delivered through the broadband channel. Hybrid TV also supports audio-visual interactive contents or applications intended for the user to interact with them using the broadband technology. [ITU-T J.205]

DTV service providers broadcast the DTV Service, in which integrated broadcast-broadband application components can be multiplexed for one or more integrated broadcast-broadband applications. At the same time, DTV service providers can make available the same or different sets of integrated broadcast-broadband application components in a server or integrated broadcast-broadband application repository reachable through the Internet. In the same way, third party entities can make available integrated broadcast-broadband application components as well as integrated broadcast-broadband repositories. [ITU-T J.206]

Hybrid TV has capabilities to decode the DTV service and supports integrated broadcast-broadband application control framework collecting integrated broadcast-broadband application components from several sources and executing them. [ITU-T J.206]

There are various types of hybrid TV terminals supporting both broadcast network and broadband network.

Hybrid Broadcast Broadband TV [ETSI TS 102 796] defines a platform for signalling, transport, and presentation of enhanced and interactive applications designed for running on hybrid terminals

that include both a DVB compliant broadcast connection and a broadband connection to the Internet.

HybridCast is a platform for building systems that make the most of the characteristics of broadcasting (simultaneous delivery, high quality, and high reliability) and those of communications (the ability to respond to the individual needs and requests of users). It is a hybrid system that uses communications to enhance broadcasting services. [ITU-R BT.2267].

Ginga-NCL [ITU-T H.761] is a multimedia presentation environment. The characteristics of its declarative programming language (Nested context language, NCL) make it an advanced solution for IBB services (see [ITU-R BT.2267] Annex 4). Since its first standardized version in 2007, Ginga-NCL provides support to converged services by making use of broadcast and IP distribution paths.

Lightweight Interactive Multimedia Environment (LIME) [ITU-T H.762], LIME is based on simple profiles of common Web-technologies like HTML, CSS and Javascript (= ECMAScript). It supports interactivity on TV terminals, and is capable of being carried over broadcast signal to provide integrated multimedia content on a TV set from IP-based content and broadcast content.

7.4 Connected TV

See "Smart TV".

7.5 Internet TV

Internet TV, which is also referred to as "Catch-up TV" or "Online TV", is a general term that designate services that deliver television shows and other video contents services over Internet, typically by major traditional television broadcasters.

Internet TV provides users an archive of content or a channel directory and users can watch a video content or a television show from streaming it directly to a media player or downloading it to the user's computer. It usually limits its support to one type of media player, but some Internet TV services are available through other platforms such as game consoles, smartphone, and tablet PC. Internet TV offered users streaming services using peer-to-peer (P2P) technologies, VoD systems, and live streaming.

Internet TV allows users to view the catalogue of multimedia contents from broadcasters with a remote control. Furthermore, some Internet TV terminals support smartphone apps for the remote control of user interface.

7.6 Catch-up TV

Catch-up TV is a term used to describe VoD in which TV shows are available for a certain period of time (e.g. days) after the original broadcast by major broadcaster.

See "Internet TV".

7.7 Online TV

See "Internet TV".

7.8 web TV

web TV is the name of both a thin client which uses a television for display rather than a computer monitor and the online service that supports it. The web TV product is an adapter that allows a television set to be connected to the Internet, primarily for web browsing and e-mail. While web TV

does not allow as much functionality as a computer-based web browser, it is a low-cost alternative to a traditional computer connection to the Internet.

The first model of web TV set-top box was a dedicated web browser appliance that did not need to be based on a standard operating system, and the web browser was compatible with the current several web browsers.

The second model featured a tuner to allow watching television in a picture-in-picture (PIP) window while waiting for pages to arrive, allowed one to capture video stills from video camera, VCR or broadcast television as a JPEG image, and included a video tuner that allowed one to schedule a VCR.

The latest model adopted a standard PC architecture and communicated with PCs on a home network to play multimedia contents within it. It was an Internet and media player that requires no software to buy or install. It consists of an Internet media player, a wireless keyboard, a wireless remote.

7.9 OTT

OTT (over-the-top) is online content delivery service without the intervention of an Internet service provider in the control or distribution of the content. OTT particularly refers to content services provided by a third party. OTT may support video distribution service. Users can access OTT video contents through Internet-connected devices such as PCs, laptops, tablets, smartphones, set-top boxes, etc. and furthermore, users can share contents among multiple Internet connected devices by means of multi-screen technologies.

With the OTT market gaining momentum, some broadcasters launch OTT services for their subscribers and deliver their contents over Internet to expand the market share.

Appendix I

Comparison table of IP-based TV-related multimedia services

Table I.1 summarizes the main features of the IP-based TV-related multimedia services.

Table I.1 – Comparison of IP-based TV-related multimedia services

	Service Provider	Network	Terminal type	User interface	Application store
IPTV	Telecommunication provider, network provider	Managed IP network	STB,TV set, mobile	remote control (wireless remote/mobile app)	No
Smart TV	Content holder, manufacturer	Broadcast and IP network (managed or unmanaged)	STB, TV set	remote control, voice control, gesture control (wireless remote/mobile app)	Yes
Hybrid TV	Broadcaster, telecommunication provider	Broadcast and IP network (managed or unmanaged)	STB, TV set, PC, mobile	remote control (wireless remote)	No
Connected TV	Content holder, manufacturer	Broadcast and IP network (managed or unmanaged)	TV set	remote control, voice control, gesture control (wireless remote/mobile app)	Yes
Internet TV	Broadcaster, content holder, manufacturer	IP network (primarily unmanaged)	Game console, STB, TV set, PC, mobile, tablet PC	remote control (wireless remote/mobile app)	No
Catch-up TV	Broadcaster	IP network (primarily unmanaged)	PC, tablet PC	keyboard, mouse	No
Online TV	Broadcaster, content holder	IP network (primarily unmanaged)	PC, tablet PC	keyboard, mouse	No
web TV	Content holder	Internet (with web protocols)	PC, STB	remote control (wireless remote/ wireless keyboard)	No
OTT	Content holder, broadcaster	Internet	STB, TV set, PC, laptop, tablet PC, mobile, game console	remote control (wireless remote)	No