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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

IPTV multimedia services and applications for IPTV –
IPTV terminal devices

Overview of IPTV terminal devices and end systems

Recommendation ITU-T H.720

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Recommendation ITU-T H.720

Overview of IPTV terminal devices and end systems

Summary

Recommendation ITU-T H.720 gives an overview of the architecture and functional components of an Internet Protocol television (IPTV) terminal device and provides a high-level description of the functionality necessary to support IPTV services. This Recommendation provides the definitions of terminal device and end system, the location of terminal devices and end systems within the overall architecture of IPTV, examples of IPTV services, an abstract description of the terminal device architecture, and descriptions of other Recommendations that discuss IPTV terminal devices.

Source

Recommendation ITU-T H.720 was approved on 14 October 2008 by ITU-T Study Group 16 (2005-2008) under Recommendation ITU-T A.8 procedure.

FOREWORD

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Recommendation ITU-T H.720

Overview of IPTV terminal devices and end systems

1 Scope

This Recommendation gives an overview of Internet Protocol television (IPTV) terminal devices and end systems. It also describes the general architecture and functional components of an IPTV terminal device, providing a high-level description of functionality of terminal devices for IPTV services. It provides the definitions of terminal device and end system, the location of terminal devices and end systems within the overall architecture of IPTV, examples of IPTV services, an abstract description of the terminal device architecture, and descriptions of other Recommendations that discuss IPTV terminal devices.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T F.703] Recommendation ITU-T F.703 (2000), *Multimedia conversational services*.
<<http://www.itu.int/rec/T-REC-F.703>>
- [ITU-T F.790] Recommendation ITU-T F.790 (2007), *Telecommunications accessibility guidelines for older persons and persons with disabilities*.
<<http://www.itu.int/rec/T-REC-F.790>>
- [ITU-T F.902] Recommendation ITU-T F.902 (1995), *Interactive services design guidelines*.
<<http://www.itu.int/rec/T-REC-F.902>>
- [ITU-T G.1080] Recommendation ITU-T G.1080 (2008), *Quality of experience requirements for IPTV services*.
<<http://www.itu.int/rec/T-REC-G.1080>>
- [ITU-T G.1081] Recommendation ITU-T G.1081 (2008), *Performance monitoring points for IPTV*.
<<http://www.itu.int/rec/T-REC-G.1081>>
- [ITU-T H.622.1] Recommendation ITU-T H.622.1 (2008), *Architecture and functional requirements for home networks supporting IPTV services*.
<<http://www.itu.int/rec/T-REC-H.622.1>>
- [ITU-T H.750] Recommendation ITU-T H.750 (2008), *High-level specification of metadata for IPTV services*.
<<http://www.itu.int/rec/T-REC-H.750>>
- [ITU-T J.702] Recommendation ITU-T J.702 (2008), *Enablement of current terminal devices for the support of IPTV services*.
<<http://www.itu.int/rec/T-REC-J.702>>
- [ITU-T M.1400] Recommendation ITU-T M.1400 (2006), *Designations for interconnections among operators' networks*.
<<http://www.itu.int/rec/T-REC-M.1400>>

- [ITU-T Q.1290] Recommendation ITU-T Q.1290 (1998), *Glossary of terms used in the definition of intelligent networks*.
<http://www.itu.int/rec/T-REC-Q.1290>
- [ITU-T Y.1910] Recommendation ITU-T Y.1910 (2008), *IPTV functional architecture*.
<http://www.itu.int/rec/T-REC-Y.1910>
- [ITU-T Y.2014] Recommendation ITU-T Y.2014 (2008), *Network attachment control functions in next generation networks*.
<http://www.itu.int/rec/T-REC-Y.2014>
- [ITU-R BT.2052] Report ITU-R BT.2052 (2005), *Protection of end-users' privacy in interactive broadcasting systems*.
<http://www.itu.int/publ/R-REP-BT.2052>
- [ETSI TS 102 822-1] ETSI TS 102 822-1 V1.3.1 (2006), *Broadcast and On-line Services: Search, select, and rightful use of content on personal storage systems ("TV-Anytime"); Part 1: Benchmark Features*.
<http://pda.etsi.org/pda/queryform.asp>
- [ETSI TS 102 822-2] ETSI TS 102 822-2 V1.4.1 (2007), *Broadcast and On-line Services: Search, select and rightful use of content on personal storage systems ("TV-Anytime"); Part 2: Phase 1 – System description*.
<http://pda.etsi.org/pda/queryform.asp>
- [ETSI TS 102 822-9] ETSI TS 102 822-9 V1.2.1 (2007), *Broadcast and On-line Services: Search, select and rightful use of content on personal storage systems ("TV-Anytime"); Part 9: Phase 2 – Remote Programming*.
<http://pda.etsi.org/pda/queryform.asp>
- [ATIS-0800002] ATIS standard ATIS-0800002 (2006), *IPTV Architecture Requirements*.
<http://www.atis.org/docstore/product.aspx?id=21213>

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 application [b-ITU-T Y.101]: A structured set of capabilities, which provide value-added functionality supported by one or more services.

3.1.2 content provider [ITU-T Y.1910]: The entity that owns or is licensed to sell content or content assets.

3.1.3 content tracing [b-ITU-T Y.1901]: A process to enable the identification of the (arbitrary) origin of content, and/or the responsible party (e.g., the end-user), to facilitate subsequent investigation in the event of unauthorized content copying or distribution.

NOTE – Content tracing information may be attached to content either as metadata, or as a forensic watermark.

3.1.4 delivery [ITU-T Y.1910]: In context of IPTV architecture, "delivery" is defined as sending contents to the end-user.

3.1.5 delivery network gateway (DNG) [ATIS-0800002]: A device implementing the DNGF.

3.1.6 delivery network gateway functions (DNGF) [ITU-T H.622.1]: Set of functions that mediate between the network and service provider domains and the IPTV terminal function (ITF).

NOTE – A device implementing the DNGF is commonly referred to as the residential gateway (RG) or delivery network gateway (DNG).

3.1.7 distribution [ITU-T Y.1910]: In context of IPTV architecture, "distribution" is defined as sending the content to appropriate intermediate locations to enable subsequent delivery.

3.1.8 end-user [ITU-T Y.1910]: The actual user of the products or services.

NOTE – The end-user consumes the product or service. An end-user can optionally be a subscriber.

3.1.9 functional architecture [b-ITU-T Y.2012]: A set of functional entities and the reference points between them used to describe the structure of an NGN. These functional entities are separated by reference points, and thus, they define the distribution of functions.

NOTE 1 – The functional entities can be used to describe a set of reference configurations. These reference configurations identify which reference points are visible at the boundaries of equipment implementations and between administrative domains.

NOTE 2 – This definition is taken from [b-ITU-T Y.2012] and therefore relates to NGN. However, it is also valid for other networks, e.g., networks supporting IPTV terminal devices.

3.1.10 functional entity [b-ITU-T Y.2012]: An entity that comprises an indivisible set of specific functions. Functional entities are logical concepts, while groupings of functional entities are used to describe practical, physical implementations.

3.1.11 home network (HN) [ITU-T H.622]: Home network is the collection of elements that process, manage, transport, and store information, thus enabling the connection and integration of multiple computing, control, monitoring, communication and entertainment devices in the home.

3.1.12 hybrid terminal device [b-ITU-T Y.1901]: An IPTV terminal device that can also receive content from different types of transmission systems (e.g., terrestrial, satellite).

3.1.13 IPTV terminal device [b-ITU-T Y.1901]: A terminal device which has ITF functionality, e.g., STB.

3.1.14 IPTV terminal function (ITF) [b-ITU-T Y.1901]: The end-user function(s) associated with a) receiving and responding to network control channel messages regarding session set-up, maintenance, and tear-down, and b) receiving the content of an IP transport from the network and rendering.

3.1.15 linear TV [b-ITU-T Y.1901]: A television service in which a continuous stream flows in real time from the service provider to the terminal device and where the user cannot control the temporal order in which contents are viewed.

3.1.16 network personal video recorder (nPVR) [b-ITU-T Y.1901]: Same as PVR except that the recording device is located at the service provider premises.

3.1.17 personal video recorder (PVR) [b-ITU-T Y.1901]: An end-user controlled device that records, stores and plays back multimedia content. PVR is also known as personal digital recorder (PDR).

3.1.18 service provider [ITU-T M.1400]: A general reference to an operator that provides telecommunication services to customers and other users either on a tariff or contract basis. A service provider may or may not operate a network. A service provider may or may be a customer of another service provider.

NOTE – Typically, the service provider acquires or licenses content from content providers, and packages them into a service that is consumed by the end-user.

3.1.19 subscriber [b-ITU-T M.3050.1]: The subscriber is responsible for concluding contracts for the services subscribed to and for paying for these services.

3.1.20 terminal device (TD) [b-ITU-T Y.1901]: An end-user device which typically presents and/or processes the content, such as a personal computer, a computer peripheral, a mobile device, a TV set, a monitor, a VoIP terminal or an audiovisual media player.

3.1.21 video on demand [ITU-T Y.1910]: A service in which the end-user can, on demand, select and view a video content and where the end-user can control the temporal order in which the video content is viewed (e.g., the ability to start the viewing, pause, fast forward, rewind, etc.).

NOTE – The viewing may occur some time after the selection of the video content.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 client PVR (cPVR): An instance of PVR where the end-user terminal device contains the recording capability that can be solicited and operated by end-users to record and store video, audio and other associated data locally for subsequent playback.

3.2.2 distributed PVR (dPVR): Multiple instances of PVR, where a combination of cPVRs and nPVRs can be used to record and store video, audio and other associated data for subsequent playback. For example, this usually occurs within a home network containing multiple cPVRs in order to distribute storage of video, audio and other data.

3.2.3 home network capable IPTV TD: An IPTV TD which has HN capability. This is typically a server and/or a client to HN devices.

3.2.4 home network capable TD: A TD which has HN capability. This is typically a server and/or a client to HN devices.

3.2.5 IPTV end system (IES): A single or set of consumer devices that support IPTV services (i.e., everything from gateway to display).

3.2.6 IPTV network: An entity encompassing the full group of IPTV architecture functions expected to be within the network provider and service provider functional domains.

3.2.7 network provider: The organization that maintains and operates the network components required for IPTV functionality (this definition is based on the definition of network provider in [ITU-T Q.1290]).

NOTE 1 – A network provider can optionally also act as service provider.

NOTE 2 – Although considered as two separate entities, the service provider and the network provider can optionally be one organizational entity.

3.2.8 service navigation: A process of presenting information that allows the end-user to discover, select and consume services

3.2.9 watermark: Machine readable data in the form of a signal embedded in a digital media stream so as to be imperceptible to the consumer, but persistent through faithful transformations of the content. Note that this definition pertains to watermarks in the context of IPTV service and is not a universal definition of a watermark. In the IPTV context, watermarks are used to facilitate rights management and media piracy investigation.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

API	Application Programming Interface
BC	BroadCast
DNG	Delivery Network Gateway
DNGF	Delivery Network Gateway Function
EAN	Emergency Alert Notification
EAS	Emergency Alert System