

Recommendation **ITU-T H.725 (06/2024)**

SERIES H: Audiovisual and multimedia systems

IPTV multimedia services and applications for IPTV – IPTV terminal devices

IPTV terminal device: Virtualized model

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Recommendation ITU-T H.725

IPTV terminal device: Virtualized model

Summary

Recommendation ITU-T H.725 specifies the functionalities of a virtualized IPTV terminal device (IPTV TD). Virtualized IPTV TD divides the IPTV terminal function (ITF) into three parts: physical terminal (PT), function platform (FP) and logical subscriber link (LSL). It identifies key features, functional components, and service procedures of virtualized IPTV TD. Functionality partition of the PT, FP, and LSL are also included in this Recommendation.

With this Recommendation, IPTV service providers are able to deploy new IPTV services with lower costs of IPTV terminals and in a more flexible way by following the architecture of virtualized IPTV TD defined in this Recommendation.

History*

Edition	Recommendation	Approval	Study Group	Unique ID
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IPTV TD, service provider.

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Recommendation ITU-T H.725

IPTV terminal device: Virtualized model

1 Scope

This Recommendation specifies the functionalities of the virtualized Internet protocol television (IPTV) terminal device (IPTV TD), including services and key features, functional requirements, functional architecture, functional components, service procedure, software architecture and reference point.

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 H.622.1] Recommendation ITU-T H.622.1 (2008), *Architecture and functional requirements for home networks supporting IPTV services*.
- [ITU-T H.720] Recommendation ITU-T H.720 (2008), *Overview of IPTV terminal devices and end systems*.
- [ITU-T H.721] Recommendation ITU-T H.721 (V3) (2022), *IPTV terminal devices: Basic model*.
- [ITU-T H.722] Recommendation ITU-T H.722 (2014), *IPTV terminal device: Full-fledged model*.
- [ITU-T H.750] Recommendation ITU-T H.750 (2008), *High-level specification of metadata for IPTV services*.
- [ITU-T H.770] Recommendation ITU-T H.770 (2015), *Mechanisms for service discovery and selection for IPTV services*.
- [ITU-T Y.1901] Recommendation ITU-T Y.1901 (2009), *Requirements for the support of IPTV services*.
- [ITU-T Y.1910] Recommendation ITU-T Y.1910 (2008), *IPTV functional architecture*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 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.

3.1.2 Internet protocol television (IPTV) [ITU-T Y.1901]: Multimedia services such as television/video/audio/text/graphics/data delivered over IP-based networks managed to support the required level of quality of service (QoS) / quality of experience (QoE), security, interactivity and reliability.

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

3.1.4 IPTV terminal function (ITF) [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 teardown, and b) receiving the content of an IP transport from the network and rendering.

3.1.5 linear TV [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.

3.1.6 middleware [ITU-T Y.1901]: A layer of software between applications and resources, which consists of a set of service enablers that allow multiple functionalities running on one or more devices in an IPTV system to interact across a network.

3.1.7 service and content protection (SCP) [ITU-T Y.1901]: A combination of service protection and content protection.

3.1.8 terminal device (TD) [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 audio-visual media player.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 function platform (FP): A distributed system viewed as a logical platform which maintains one or a set of virtualized IPTV terminal functionalities and is typically deployed at the network/service provider premises.

3.2.2 logical subscriber link (LSL): A logical connection between PT and FP which contains both control and content messages.

3.2.3 physical terminal (PT): A physical end user device which maintains the non-virtualized IPTV terminal functionality and is typically located at the residential customer premises.

3.2.4 virtualized IPTV TD (vTD): An architecture of IPTV terminal device that separates the functions of IPTV terminal device [ITU-T H.720] into three partitions: physical terminal (PT), function platform (FP) and logical subscriber link (LSL).

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

CDN	Content Delivery Network
CSS	Cascading Style Sheets
DSLAM	Digital Subscriber Line Access Multiplexer
ECG	Electronic Content Guide
EPG	Electronic Programme Guide
FEC	Forward Error Correction
FP	Function Platform
HLS	HTTP Live Streaming
IPTV	Internet Protocol Television
LAN	Local Area Network
LSL	Logical Subscriber Link

NVRAM	Non-Volatile Random Access Memory
OLT	Optical Line Terminal
PT	Physical Platform
QoE	Quality of Experience
QoS	Quality of Service
RAL	Resource Abstraction Layer
RAM	Random Access Memory
RTMP	Real-Time Messaging Protocol
SADS	Service and Application Discovery and Selection
SCP	Service and Content Protection
SNA	Service Navigation Application
TCP	Transmission Control Protocol
TD	Terminal Device
USB	Universal Serial Bus
VoD	Video on Demand
VxLAN	Virtual Extensible Local Area Network

5 Conventions

In this Recommendation:

- The keywords "**is required to**" indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this Recommendation is to be claimed.
- The keywords "**is recommended**" indicate a requirement which is recommended but which is not absolutely required. Thus, this requirement need not be present to claim conformance.
- The keywords "**can optionally**" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option and the feature can be optionally enabled by the network operator/service provider. Rather, it means the vendor may optionally provide the feature and still claim conformance with the specification.

6 Introduction

An Internet protocol television (IPTV) service provider provides end-to-end solutions for distributing contents to users via terminal devices (TDs). Figure 6-1 depicts the current infrastructure for IPTV service. This model allows operators to provide IPTV video service and some other value-added services. The flourish of video service exerts extra stress on IPTV TD performance. Current service model can lead to a number of problems:

- Excessive IPTV TD cost. The rising demand of home video services calls for higher requirements for IPTV TD.
- New service delivery difficulties. The IPTV TD bears most of the functions of the existing video services and once a new service is to be deployed, the elements in the infrastructure may be upgraded to endorse the service.