International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

Y.1991

(03/2010)

SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS

Internet protocol aspects – IPTV over NGN

Terms and definitions for IPTV

Recommendation ITU-T Y.1991

ITU-T Y-SERIES RECOMMENDATIONS

GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS

GLOBAL INFORMATION INFRASTRUCTURE	
General	Y.100–Y.199
Services, applications and middleware	Y.200–Y.299
Network aspects	Y.300–Y.399
Interfaces and protocols	Y.400–Y.499
Numbering, addressing and naming	Y.500–Y.599
Operation, administration and maintenance	Y.600–Y.699
Security	Y.700–Y.799
Performances	Y.800–Y.899
INTERNET PROTOCOL ASPECTS	
General	Y.1000–Y.1099
Services and applications	Y.1100–Y.1199
Architecture, access, network capabilities and resource management	Y.1200–Y.1299
Transport	Y.1300–Y.1399
Interworking	Y.1400–Y.1499
Quality of service and network performance	Y.1500–Y.1599
Signalling	Y.1600–Y.1699
Operation, administration and maintenance	Y.1700–Y.1799
Charging	Y.1800–Y.1899
IPTV over NGN	**Y.1900–Y.1999**
NEXT GENERATION NETWORKS	
Frameworks and functional architecture models	Y.2000–Y.2099
Quality of Service and performance	Y.2100–Y.2199
Service aspects: Service capabilities and service architecture	Y.2200–Y.2249
Service aspects: Interoperability of services and networks in NGN	Y.2250–Y.2299
Numbering, naming and addressing	Y.2300–Y.2399
Network management	Y.2400–Y.2499
Network control architectures and protocols	Y.2500–Y.2599
Future networks	Y.2600–Y.2699
Security	Y.2700–Y.2799
Generalized mobility	Y.2800–Y.2899
Carrier grade open environment	Y.2900–Y.2999

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T Y.1991

Terms and definitions for IPTV

Summary

Recommendation ITU-T Y.1991 contains terms and definitions and a framework relevant to providing a general understanding of IPTV. The primary purpose of this Recommendation is to provide a context for the use of certain terms and definitions to avoid misunderstandings in IPTV and IPTV-related activities.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T Y.1991	2010-03-16	13

Keywords

CDN, DoS, dPVR, ECG, EPG, ePVR, IPTV, metadata, nPVR, PVR, SCP, TD, VoD.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

CONTENTS

Recommendation ITU-T Y.1991

Terms and definitions for IPTV

1 Scope

This Recommendation contains terms and definitions and a framework relevant to providing a general understanding of IPTV. This Recommendation is not simply a compendium of terms and definitions. The primary purpose of this Recommendation is to provide a context for the use of certain terms and definitions to avoid misunderstandings in IPTV and IPTV-related activities. Thus, the definitions are arranged in a specific order and certain necessary relationships are illustrated. This Recommendation uses terms and definitions, which are considered particularly suitable and applicable to IPTV work and that have already been defined in published ITU-T Recommendations.

2 References

None.

3 Terms and definitions

Not applicable.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviation:

IPTV Internet Protocol Television

5 Conventions

There are no specific conventions in this Recommendation.

6 IPTV definition

6.1 IPTV [b-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 QoS/QoE, security, interactivity and reliability.

7 Terms used in Recommendations related to requirements to support IPTV services

7.1 accessibility feature [b-ITU-T Y.1901]: An additional content component that is intended to assist people hindered in their ability to perceive an aspect of the main content. Examples: captions for the hard of hearing, subtitles in various languages, sign-language interpretation video and descriptive audio.

7.2 acquisition [b-ITU-T Y.1901]: The process of obtaining content by the end-user.

NOTE – For content with accessibility features, this means that the content will be available in a form that can be used by the end-user.

7.3 application provider [b-ITU-T Y-Sup.5]: The entity providing IPTV-related user applications.

7.4 aspect ratio [b-ITU-T Y.1901]: The ratio of the width to the height of a rectangular area, such as the defined display area.

7.5 audio description [b-ITU-T Y.1901]: This service provides a commentary describing the visual events pertinent to the content and augments the dialog in the content.

NOTE – Audio description is primarily intended to assist users who are unable to see the video content clearly. The narrative passages fit between the dialogue and other significant audio content so as not to interfere with it. Ideally, the user can control the volume and spatial positioning of the audio or derive it from a separate output.

7.6 broadcast [b-ITU-T M.60]: One-way transmission from one point to two or more other points.

7.7 captions [b-ITU-T Y.1901]: Captions provide a real-time on-screen transcript of the dialogue as well as any sound effects.

NOTE – This service can be provided by means of either textual or graphical supplementary content. The captions and the dialogue are usually in the same language. The service is primarily to assist users having difficulty hearing the sound. Ideally, users may have some control over the position and size of the presentation. Different speakers are distinguished, usually by different colours.

7.8 channel [b-ITU-T Y.1901]: Content formatted as a selectable set of data and transported as part of a data stream.

7.9 channel changing [b-ITU-T Y.1901]: The act of changing from one channel to another.

7.10 client personal video recorder (cPVR) [b-ITU-T Y.1901]: Same as PVR except that the recording device is located at the end-user's premises.

7.11 content aggregator [b-ITU-T Y-Sup.5]: A player in the IPTV service delivery chain whose role is to aggregate content, e.g., forming a TV bouquet composed of several TV channels.

7.12 content segment [b-ITU-T Y.1901]: A continuous portion of a piece of content, for example, a single topic in a news programme.

7.13 delivery network gateway (DNG) [b-ITU-T Y.1901]: A device implementing the DNGF.

NOTE – DNG also is commonly referred to as the residential gateway (RG).

7.14 delivery network gateway functions (DNGF) [b-ITU-T Y.1901]: 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).

7.15 end system [b-ITU-T Y.1901]: A single or set of consumer devices that support IPTV services (e.g., delivery network gateway, display).

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

7.17 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.

7.18 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.

7.19 metadata [b-ITU-T Y.1901]: Structured, encoded data that describe characteristics of information-bearing entities to aid in the identification, discovery, assessment, and management of the described entities.

NOTE – EPG metadata has many applications and may vary in depth from merely identifying the content package title or information to populate an EPG to providing a complete index of different scenes in a movie or providing business rules detailing how the content package may be displayed, copied, or sold.

7.20 middleware [b-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.

7.21 mobility [b-ITU-T Q.1706]: The ability for the user or other mobile entities to communicate and access services irrespective of changes of the location or technical environment.

7.22 multi-channel audio [b-ITU-T Y.1901]: Audio signal with more than two channels.

7.23 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.

7.24 package [b-ITU-T Y.1901]: A collection of content components that in some combination (either all or a subset) together provide an end-user experience and are intended to be used together.

NOTE – A package can be instantiated with or without audiovisual content depending on scenarios, in which audiovisual content and package can be tightly associated or can be loosely coupled enough to be handled (generation, delivery, consumption) independently.

7.25 pay per view (PPV) [b-ITU-T Y.1901]: A TV service where a particular program event (e.g., a hockey match) can be bought separately from any package or subscription. The transmission of the program event is made at the same time to everyone who has ordered it.

7.26 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).

7.27 picture-in-picture [b-ITU-T Y.1901]: One program is displayed on the full-seized IPTV TD screen, one or more other programs are simultaneously displayed in inset windows.

7.28 place shifting [b-ITU-T Y.1901]: A function which allows subscribers to see the content without place limitations.

7.29 push VoD [b-ITU-T Y.1901]: A TV service where multimedia content is packaged and delivered at the discretion of the service provider to the end-user's storage system.

7.30 random access point [b-ITU-T Y.1901]: A point in the content from which playback can begin.

NOTE – For example, in MPEG encoding, this would be an I-frame, as opposed to a P-frame or B-frame.

7.31 re-transmission broadcast service [b-ITU-T Y.1901]: A service in which content is provided from various broadcasting environments including, but not limited to, terrestrial, satellite and cable, and re-transmitted into IP network simultaneously or otherwise.

7.32 service [b-ITU-T Y.1901]: A set of functionalities enabled by a provider for end-users.

NOTE – Example provisioned functionalities include IP connectivity with managed quality of service, video-on-demand.

7.33 service provider [b-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 not be a customer of another service provider.

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

7.34 sign language interpretation [b-ITU-T Y.1901]: A video service showing an interpreter who uses hand gestures and facial expression to convey the main audio content and dialogue to sign language and lip readers.

NOTE – This service comes in the form of supplementary video content, usually smaller in image size to that of the main video content. Ideally, the user can control the position, size and background properties (solid or transparent and the colour, if solid). It is of sufficient temporal and spatial quality to enable sign reading and lip reading.

7.35 skin [b-ITU-T Y.1901]: A customized graphical appearance (the visual aspect of a graphical user interface (GUI)) applied to certain software and websites for aesthetic reasons or ease of use.

7.36 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.

7.37 subscription [b-ITU-T Q.1741.3]: A subscription describes the commercial relationship between the subscriber and the service provider.

7.38 subtitles [b-ITU-T Y.1901]: Subtitles provide a real-time on-screen transcript of dialogue for the purpose of language translation or to clarify speech that is unclear.

NOTE – This service can be provided by means of either textual or graphical supplementary content. The subtitles and the dialogue are usually in different languages. The assumed audience for subtitling is hearing people who do not understand the language of the dialogue.

7.39 supplementary content [b-ITU-T Y.1901]: Video, audio, textual, graphical or other forms of content that can be optionally accessed by the end-user and rendered by the terminal. It has the following features:

– It only works in conjunction with the main content.

– It is synchronous with the main content.

7.40 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.

7.41 terminal device protection [b-ITU-T Y.1901]: Ensuring that a terminal device employed by an end-user in the reception of a service can reliably and securely use content while enforcing the rights of use granted for that content, and while physically and electronically protecting the integrity of the terminal device, and the confidentiality of the content and critical security parameters not otherwise protected by encryption or watermarking.

7.42 third party metadata [b-ITU-T Y.1901]: Metadata provided by an entity (which may be a person) not directly tied to the primary service provider by whom the end-user is being served.

7.43 time shifting [b-ITU-T Y.1901]: A function which allows playback of content after its initial transmission.

7.44 trick mode functionality [b-ITU-T Y.1901]: The ability to pause, rewind or forward stored content.

7.45 TV with trick mode [b-ITU-T Y.1901]: TV service with trick mode functionality.

7.46 universal design [b-ITU-T Y.1901]: It is the design of the products and environments to be useable by all people, to the greatest extent possible by including accessibility features in the original design to prevent the need for adaptation after deployment.

NOTE – The intent of universal design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities.

7.47 usage environment description [b-ITU-T Y.1901]: The usage environment description includes the description of end-user characteristics, terminal capabilities, network characteristics and natural environment characteristics.

NOTE – These various dimensions of the usage environment description, which originate from end-users, can be used for accommodating, for example, the adaptation of contents for transmission, storage and consumption.

7.48 video-on-demand (VoD) [b-ITU-T Y.1901]: 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.

7.49 wireless network characteristics [b-ITU-T Y.1901]: The characteristics of a wireless network expressed in terms of current available bandwidth, packet loss and possibly other wireless network information parameters for a specific wireless link type, e.g., WLAN, cellular, WPAN or WMAN.

8 Terms used in Recommendations related to IPTV architecture

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

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

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

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

8.5 end-user [b-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.

8.6 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.

8.7 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.

8.8 network provider [b-ITU-T Y.1910]: The organization that maintains and operates the network components required for IPTV functionality.

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.

8.9 reference point [b-ITU-T Y.2012]: A conceptual point at the conjunction of two non-overlapping functional entities that can be used to identify the type of information passing between these functional entities.

NOTE – A reference point corresponds to one or more physical interfaces between pieces of equipment.

9 Terms used in Recommendations related to performance, QoE, QoS and traffic management

9.1 channel zapping [b-ITU-T G.1080]: The act of quickly changing from one channel to another.

9.2 clean audio [b-ITU-T G.1080]: Audio track of an IPTV service with background sounds removed.

9.3 group of pictures [b-ITU-T G.1080]: The group of pictures (GOP) is a group of successive pictures within a MPEG-coded film and/or video stream. Each MPEG-coded film and/or video stream consists of successive GOPs. From the MPEG pictures contained in it, the visible frames are generated.

9.4 platform [b-ITU-T G.1081]: A hardware and/or software architecture that serves as a foundation or base for realizing certain functionality.

9.5 quality of experience (QoE) [b-ITU-T P.10 Amd.2]: The overall acceptability of an application or service, as perceived subjectively by the end-user.

NOTE 1 – Quality of Experience includes the complete end-to-end system effects (client, terminal, network, services infrastructure, etc.).

NOTE 2 – Overall acceptability may be influenced by user expectations and context.

9.6 triple play services [b-ITU-T G.1080]: Services that include IPTV, VoIP, and Internet access.

9.7 VoD trick modes [b-ITU-T G.1080]: Download and streaming video on demand (VoD) systems provide the user with a large subset of VCR functionality including pause, fast forward, fast rewind, slow forward, slow rewind, jump to previous/future frame, etc. These functions are usually referred to as "trick modes".

10 Terms used in Recommendations related to metadata, terminal devices and home network

10.1 application environment [b-ITU-T J.200]: The context or software environment in which an application is processed.

10.2 application event [b-ITU-T H.740]: An application event is every user interaction or occurrence related with multimedia contents in IPTV applications. It includes an emergency event from event notification services.

10.3 application programming interface (API) [b-ITU-T J.200]: Consists of software libraries that provide uniform access to system services.

10.4 audience measurement [b-ITU-T H.740]: Measuring how many people are in an audience, usually in relation to television viewership, but also newspaper and magazine readership, and increasingly, usage of websites and IPTV service.

NOTE – Measurement may include demographic (e.g., age, gender) and sometimes psychographic information (e.g., personality, values, attitude, interests, lifestyles), to help broadcasters and advertisers determine who is listening, rather than just how many.

10.5 author [b-ITU-T H.761]: Person who writes NCL documents.

10.6 authoring tool [b-ITU-T H.761]: Tool to help authors to create NCL documents.

10.7 broadcast markup language (BML) [b-ARIB STD B-24]: The XML application language specified in [b-ARIB STD B-24] to be solely responsible for tags and attributes for multimedia representation.

10.8 certificate revocation list (CRL) [b-ITU-T X.509]: A signed list indicating a set of certificates that are no longer considered valid by the certificate issuer. In addition to the generic term CRL, some specific CRL types are defined for CRLs that cover particular scopes.

10.9 character [b-ITU-T J.200]: A specific "letter" or other identifiable symbol, e.g., "A".

10.10 content [b-ITU-T T.174]: Encoded generic value, media or non-media data.

10.11 content delivery network (CDN) [b-ITU-T F.750]: A network optimized for delivering digital content.

10.12 data carousel [b-ITU-T J.200]: A transmission scheme defined in ISO/IEC 13818-6, with which data is transmitted repetitively. It can be used for downloading various data in broadcasting. The scenario of the DSM-CC User-to-Network Download protocol that embodies the cyclic transmission of data.

10.13 declarative application [b-ITU-T J.200]: An application which primarily makes use of declarative information to express its behaviour; an XML document instance is an example of a declarative application.

10.14 declarative application environment [b-ITU-T J.200]: An environment that supports the processing of declarative applications; an XML user agent (browser) is an example of a declarative application environment.

10.15 digital storage media command and control (DSM-CC) [b-ITU-T J.200]: A control method defined in ISO/IEC 13818-6, which provides access to files or streams for digital interactive services.

10.16 distributed PVR (dPVR) [b-ITU-T H.720]: 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.

10.17 ECMAScript [b-ISO/IEC 16262]: The programming language defined by Standard ISO/IEC 16262.

10.18 electronic content guide (ECG) [b-ITU-T H.721]: A service navigation application used especially for streamed and downloaded content. ECG deals with metadata unlike service information used in terrestrial broadcasting.

10.19 electronic program guide (EPG) [b-ITU-T H.721]: A service navigation interface which is used especially for programs.

NOTE – In some traditional broadcast services, EPG is defined as an on-screen guide used to display information on scheduled live broadcast television programs, allowing a viewer to navigate, select, and discover programs by time, title, channel, genre. This traditional definition does not cover "catalogues" for on-demand and download services (sometimes called ECG) and bidirectional interactive service (sometimes called IPG) for end-user interaction with a server or head-end. Some EPGs utilize web-pages, or teletext to realize this function.

10.20 element [b-ITU-T J.200]: A portion of document punctuated by tags.

10.21 elementary stream (ES) [b-ITU-T H.222.0]: A generic term for one of the coded video, coded audio or other coded bit streams in PES packets. One elementary stream is carried in a sequence of PES packets with one, and only one, stream id.

10.22 EPG provider [b-ITU-T J.90]: The entity that collects, collates and assembles the elements of information that constitute the EPG database.

10.23 event [b-ITU-T H.761]: Occurrence in time that may be instantaneous or have a measurable duration.

10.24 execution engine [b-ITU-T J.200]: A subsystem in a receiver that evaluates and executes procedural applications consisting of computer language instructions and associated data and media content. An execution engine may be implemented with an operating system, computer language compilers, interpreters, and Application Interfaces (APIs), which a procedural application may use to present audiovisual content, interact with a user, or execute other tasks, which are not evident to the user. A common example of an execution engine is the JavaTV software environment, using the Java programming language and byte code interpreter, JavaTV APIs, and a Java Virtual Machine for program execution.

10.25 forward error correction (FEC) [b-ITU-T H.701]: FEC-based CDER mechanisms generate redundant data to allow the IPTV terminal to correct packet losses. With this redundant information, the receivers can recover from packet losses locally at the IPTV terminal.

10.26 FEC base layer [b-ITU-T H.701]: Most important FEC layer. In the context of this Recommendation, this refers to the base layer in the FEC as specified in ETSI TS 102 034.

10.27 FEC enhancement layers [b-ITU-T H.701]: Subsequent FEC layers. In the context of this Recommendation, this refers to the enhancement layers in the FEC as specified in ETSI TS 102 034.

10.28 FEC layer [b-ITU-T H.701]: One FEC stream of multiple ordered FEC streams where support of this layer means that all FEC streams with more important order are also supported.

10.29 FEC stream [b-ITU-T H.701]: IP packet stream associated with a media stream that contains redundant data to reconstruct a media stream locally at the IPTV terminal.

10.30 home network (HN) [b-ITU-T H.622]: A 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.

10.31 home network (HN) capable IPTV TD [b-ITU-T H.622.1]: An IPTV TD which has HN capability. This is typically a server and/or a client to HN devices.

10.32 home network (HN) capable TD [b-ITU-T H.622.1]: A TD which has HN capability. This is typically a server and/or a client to HN devices.

10.33 hybrid application [b-ITU-T H.761]: Hybrid declarative application or a hybrid imperative application.

10.34 hybrid declarative application [b-ITU-T H.761]: Declarative application that makes use of imperative object content.

NOTE – An NCL document with an embedded Java Xlet is an example of a hybrid declarative application.

10.35 hybrid imperative application [b-ITU-T H.761]: Imperative application that makes use of declarative content.

NOTE – A Java Xlet that creates and causes the display of an NCL document instance is an example of a hybrid imperative application.

10.36 imperative application [b-ITU-T H.761]: Application that is started by, and primarily makes use of, imperative information to express its behaviour.

NOTE – A Java program and a Lua program are examples of imperative applications.

10.37 imperative application environment [b-ITU-T H.761]: Environment that supports the processing of imperative applications.

10.38 imperative object content [b-ITU-T H.761]: Type of content that takes the form of an executable program.

NOTE – A compiled Java Xlet is an example of imperative object content. A Lua script is another example.

10.39 IPTV end system (IES) [b-ITU-T H.720]: A single or set of consumer devices that support IPTV services (i.e., everything from gateway to display).

10.40 IPTV network [b-ITU-T H.720]: An entity encompassing the full group of IPTV architecture functions expected to be within the network provider and service provider functional domains.

10.41 IPTV TD-basic model [b-ITU-T H.721]: IPTV basic model terminal device as defined in [b-ITU-T H.721].

10.42 locator [b-ITU-T H.761]: A link, expressed in the syntax in RFC 2396, which provides a reference to an application or resource.

10.43 markup language [b-ITU-T J.200]: A formalism that describes a document's structure, appearance, or other aspects. An example of a markup language is XHTML.

10.44 media object [b-ITU-T H.761]: Collection of named pieces of data that may represent a media content or a program written in a specific language.

10.45 media player [b-ITU-T H.761]: Identifiable component of an application environment which decodes or executes a specific content type.

10.46 metadata fragments [b-ITU-T H.750]: A metadata fragment is a self-consistent atomic portion of a metadata instance. In this context, self-consistency means that fragments can be obtained in a random order and each fragment can be transmitted and updated independently.

10.47 metadata instance [b-ITU-T H.750]: A metadata instance is the data instance describing the instance of content or user, etc. A metadata instance has its data model defined by corresponding metadata schema.

10.48 metadata schema [b-ITU-T H.750]: A metadata schema is the representation format for specifying data model describing target instance.

10.49 multimedia [b-ITU-T J.148]: The combination of multiple forms of media such as audio, video, text, graphics, fax, and telephony in the communication of information.

10.50 native application [b-ITU-T H.761]: An intrinsic function implemented by a receiver platform.

NOTE – A closed captioning display is an example of a native application.

10.51 NCL content [b-ITU-T H.761]: Set of information that consists of an NCL document and a group of data including objects (media or execution objects) accompanying the NCL document.

10.52 NCL formatter [b-ITU-T H.761]: Software component that is in charge of receiving the specification of an NCL document and controlling its presentation, trying to guarantee that author-specified relationships among media objects are respected.

NOTE – Document renderer, user agent, and player are other names used with the same meaning of document formatter.

10.53 NCL node [b-ITU-T H.761]: Refers to a <media>, <context>, <body>, or <switch> element of NCL.

10.54 NCL user agent [b-ITU-T H.761]: Any program that interprets an NCL document written in the document language according to the terms of this specification.

NOTE – A user agent may display a document, trying to guarantee that author-specified relationships among media objects are respected. It can read it aloud, cause it to be printed, convert it to another format, etc.

10.55 normal play time (NPT) [b-ITU-T J.200]: The absolute temporal coordinates that represent the position in a stream at which an event occurs.

10.56 packet identifier (PID) [b-ITU-T H.222.0]: A unique integer value used to identify elementary streams of a program in a single or multi-program transport stream.

10.57 persistent storage [b-ITU-T J.200]: Memory available that can be read/written to by an application and may outlive the application's own life. Persistent storage can be volatile or non-volatile.

10.58 plug-in [b-ITU-T J.200]: A set of functionalities that may be added to a generic platform in order to provide additional functionality.

10.59 portal [b-ITU-T H.721]: A portal presents information from diverse sources in a unified manner and provides a way to attach the communication services.

10.60 presentation engine [b-ITU-T J.200]: A subsystem in a receiver that evaluates and presents declarative applications consisting of content, such as audio, video, graphics, and text primarily based on presentation rules defined in the presentation engine. A presentation engine also responds to formatting information, or "markup", associated with the content, to user inputs, and to script statements, which control presentation behaviour and initiate other processes in response to user input and other events. A common example of a presentation engine is an HTML browser, capable of displaying text and graphic content formatted in HTML, with interactive behaviour programmed in ECMA script.

10.61 profile [b-ITU-T H.761]: Specification for a class of capabilities providing different levels of functionality in a receiver.

10.62 program specific information (PSI) [b-ITU-T H.222.0]: PSI consists of normative data which is necessary for the demultiplexing of Transport Streams and the successful regeneration of programs and is described in clause 2.4.4 of [b-ITU-T H.222.0].

NOTE – An example of privately defined PSI data is the non-mandatory network information table.

10.63 property element [b-ITU-T H.761]: NCL element that defines a property name and its associated value.

10.64 receiver platform (platform) [b-ITU-T J.200]: The receiver's hardware, operating system and native software libraries of the manufacturer's choice.

10.65 resource [b-ITU-T J.200]: A network data object or a service, which is uniquely identified in a network. An application resource or environment resource.

10.66 retransmission [b-ITU-T H.701]: Retransmission-based CDER mechanisms use feedback messages to recover from packet losses.

10.67 SCP provider [b-ITU-T H.770]: A service provider that offers service and content protection functionalities to the other service providers.

10.68 scripting language [b-ITU-T H.761]: Language used to describe an imperative object content that is embedded in NCL documents and in HTML documents.

10.69 service information (SI) [b-ETSI EN 300 468]: Digital data describing the delivery system, content and scheduling/timing of broadcast data streams, etc.

NOTE – It includes MPEG-2 PSI together with independently defined extensions.

10.70 service navigation [b-ITU-T H.720]: A process of presenting information that allows the end-user to discover, select and consume services.

10.71 service navigation application [b-ITU-T H.721]: A user interface (application) which is intended to provide information on available services, including content, which may be accessed by end-users for service navigation.

10.72 service platform [b-ITU-T H.770]: A set of functions that facilitate telecommunication services provided by service providers.

NOTE – In the context of IPTV services, examples of service platform functions are service authentication, content aggregation and content delivery.

10.73 set-top box (STB) [b-ITU-T H.770]: A device that contains demodulator, de-multiplexer, decoder, other functionalities and interfaces related to signal reception and presentation of the distributed programme at the subscriber's site.

10.74 stream [b-ITU-T J.200]: A unidirectional continuous flow of content.

10.75 telecommunication service [b-ITU-T F.700]: A set of telecommunication capabilities that work in a complementary and cooperative way in order to let users perform applications.

10.76 timestamped transport stream (TTS) [b-ITU-T H.721]: A packet format of the transport stream specified in [b-ARIB STD B-24], section 8.1.8, that adds a 32-bit field containing a counter value of a 27 MHz clock synchronized with the MPEG system clock to control a relative time entered into a decoder.

10.77 transport stream [b-ITU-T H.222.0]: Refers to the MPEG-2 transport stream syntax for the packetization and multiplexing of video, audio, and data signals for digital broadcast systems.

10.78 uniform resource identifier (URI) [b-ITU-T J.200]: An addressing method to access a resource in local storage or on the Internet.

10.79 usage environment [b-ITU-T H.750]: The usage environment is described by user characteristics, terminal capabilities, network characteristics and natural environment characteristics, where the content is being consumed.

10.80 user device [b-ATIS 0800002]: Also known as home network end-device (HNED), home network device (HND), consumer equipment (CE), terminal and physical device. A piece of hardware equipment running its software and attached to a home network and being identified by a GUID, e.g., a MAC address. A single device can be used by one or more users.

10.81 user interface (UI) [b-ITU-T F.902]: Software and hardware components through which a user can interact with a system.

10.82 watermark [b-ITU-T H.720]: 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.

11 Terms used in Recommendations related to secondary distribution

11.1 DOCSIS based CPE [b-ITU-T J.700]: A terminal device that contains an embedded DOCSIS cable modem. Hybrid CPEs and IP-only CPEs may be DOCSIS based.

11.2 enhanced broadcasting [b-ITU-T J.700]: A system that is capable of delivering broadcast programs over existing secondary distribution networks composed of HFC or FTTx with enhancements by applications and/or services transferred over IP-enabled networks.

11.3 hybrid CPE [b-ITU-T J.700]: A terminal device that is capable of receiving content services over MPEG transport streams and IP.

11.4 IP-only CPE [b-ITU-T J.700]: A terminal device that is capable of receiving content services over IP only.

11.5 MPEG transport CPE [b-ITU-T J.700]: A terminal device that is capable of receiving content services over MPEG-2 transport streams only.

11.6 provisioning [b-ITU-T M.2301]: The installation, assignment and commissioning (including bringing-into-service testing) of network resources.

11.7 resource abstraction/middleware interface [b-ITU-T J.701]: An interface between the resource abstraction layer and the middleware service which encapsulates OS operations and the resources layer, and provides an abstract view of the resource layer.

11.8 service components [b-ITU-T J.701]: The components that offer functionalities to any upper layers, regardless of the type of software and hardware in the resource layer.

12 Terms used in Recommendations related to IPTV security aspects

12.1 access control [b-ITU-T X.800]: The prevention of unauthorized use of a resource, including the prevention of use of a resource in an unauthorized manner.

12.2 authentication [b-ITU-T X.800]: See data origin authentication and peer-entity authentication.

12.3 authorization [b-ITU-T X.800]: The granting of rights, which includes the granting of access based on access rights.

12.4 availability [b-ITU-T X.800]: The property of being accessible and useable upon demand by an authorized entity.

12.5 confidentiality [b-ITU-T X.800]: The property that information is not made available or disclosed to unauthorized individuals, entities, or processes.

12.6 content export [b-ITU-T X.1191]: Process of exporting securely the IPTV content from the IPTV terminal to another terminal owned by the user entitled to use it.

12.7 content protection [b-ITU-T X.1191]: Ensuring that an end user can only use the content that he/she already acquired in accordance with the rights granted to him/her by the rights holder; content protection involves protecting contents from illegal copying and distribution, interception, tampering, unauthorized use, etc.

12.8 content tracing [b-ITU-T X.1191]: Process that enables the identification of the (arbitrary) origin of content and/or responsible party (e.g., end user) to facilitate the subsequent investigation in case of unauthorized use of content, e.g., content copying or redistribution.

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

12.9 data origin authentication [b-ITU-T X.800]: The corroboration that the source of data received is as claimed.

12.10 denial of service (DoS) [b-ITU-T X.800]: The prevention of authorized access to resources or the delaying of time-critical operations.

12.11 digital signature [b-ITU-T X.800]: Data appended to, or a cryptographic transformation (see cryptography) of a data unit that allows a recipient of the data unit to prove the source and integrity of the data unit and protect against forgery, e.g., by the recipient.

12.12 entitlements [b-ITU-T X.1191]: Referring to the authorization level(s) including conditional access information that can be used by a subscriber to access certain IPTV services in his/her IPTV TD.

12.13 integrity [b-ITU-T X.800]: The property that data has not been altered or destroyed in an unauthorized manner.

12.14 IPTV terminal device (TD) protection [b-ITU-T X.1191]: Ensuring that the TD employed by an end user in the reception of a service can reliably and securely use content, while enforcing the rights of use as granted for such content and in the course of physically and electronically protecting the integrity of TD and confidentiality of the content and critical security parameters (e.g., saved keys) that are not protected.

12.15 key [b-ITU-T X.800]: A sequence of symbols that controls the operations of encipherment and decipherment.

12.16 key management [b-ITU-T X.800]: The generation, storage, distribution, deletion, archiving and application of keys in accordance with a security policy.

12.17 masquerade [b-ITU-T X.800]: The pretence by an entity to be a different entity.

12.18 metadata for watermarking facilitation [b-ITU-T X.1191]: Metadata created to aid subsequent watermarking embedding by downstream devices.

12.19 peer-entity authentication [b-ITU-T X.800]: The corroboration that a peer entity in an association is the one claimed.

12.20 phishing [b-ITU-T X.1191]: Act of acquiring sensitive or personal information such as username, date of birth, or credit card details by masquerading as a trustworthy entity.

12.21 privacy [b-ITU-T X.800]: The right of individuals to control or influence what information related to them may be collected and stored and by whom and to whom that information may be disclosed.

12.22 repudiation [b-ITU-T X.800]: Denial by one of the entities involved in a communication of having participated in all or part of the communication.

12.23 rights [b-ITU-T X.1191]: Referring to the ability to perform a predefined set of utilization functions for a content item; these utilization functions include permissions (e.g., to view/hear, copy, modify, record, excerpt, sample, keep for a certain period, distribute), restrictions (e.g., play/view/hear for multiple number times, play/view/hear for certain number of hours), and obligations (e.g., payment, content tracing) that apply to the content and provide the liberty of use as granted to the end user.

12.24 rights expression [b-ITU-T X.1191]: Syntactic embodiment of rights in concrete, formal form.

12.25 SCP bridging [b-ITU-T X.1191]: Service and content protection operating mode wherein two or more service and content protection systems are operational on a single device acting as a bridge between these service and content protection systems; content acquired via one service and content protection system can be accessed via another service and content protection system on the bridge according to the granted rights.

12.26 SCP end-to-end [b-ITU-T X.1191]: Service and content protection operating mode wherein content is accessed or exchanged by end devices according to the granted rights using a single service and content protection system.

12.27 SCP interchange [b-ITU-T X.1191]: A more general service and content protection operating mode involving two or more devices, with each device having one or more operational service and content protection systems; the content acquired by one device through one of its service and content protection systems can be securely transferred to and accessed on another device through a different service and content protection system according to the granted rights.

12.28 scrambling [b-ITU-T X.1191]: Process designed to protect multimedia content; scrambling usually uses encryption technology to protect content.

12.29 scrambling algorithm [b-ITU-T X.1191]: Algorithm used in a scrambling or a descrambling process.

12.30 secure transcodable scheme [b-ITU-T X.1191]: A kind of a security scheme that enables the intermediate network node to perform transcoding without decryption while preserving end-to-end security; this scheme can be executed by combining scalable coding, progressive encryption, and packetizing. The secure transcodable scheme can provide both the confidentiality and message integrity/authentication.

12.31 security label [b-ITU-T X.800]: The marking bound to a resource (which may be a data unit) that names or designates the security attributes of that resource.

NOTE – The marking and/or binding may be explicit or implicit.

12.32 security policy [b-ITU-T X.800]: The set of criteria for the provision of security services.

12.33 service and content protection (SCP) [b-ITU-T X.1191]: A combination of service protection and content protection or the system or implementation thereof.

12.34 service protection [b-ITU-T X.1191]: Ensuring that an end user can only acquire a service and the content hosted therein by extension as what he/she is entitled to receive; service protection includes protecting service from unauthorized access as IPTV contents traverse through the IPTV service connections.

12.35 spoofing [b-ITU-T X.1191]: An activity wherein a forged (spoofed) source (e.g., a person or a computer program) successfully masquerades as a legitimate source by falsifying data and for the purpose of obtaining information and/or obscuring the true source so that the forged source can carry out unauthorized activities such as spreading computer malware (e.g., virus), etc.

12.36 tamper-resistant [b-ITU-T X.1191]: Resistance to tampering by either the personal users/attackers of a product, package, or system with physical/software access to it.

12.37 threat [b-ITU-T X.800]: A potential violation of security.

12.38 transcoding [b-ITU-T X.1191]: Process of transforming multimedia content such as images, text, audio, and video from original format to a different format or quality.

12.39 user privacy protection [b-ITU-T X.1191]: Ensuring that information considered to be private (or confidential) by an end user is kept confidential while remaining subject to mandatory disclosure due to legal processes.

12.40 video signature [b-ITU-T X.1191]: Metadata (or visual feature) for identifying a video content; unlike watermark embedded by manipulating original video contents, video signature is extracted from a video content itself without the risk of quality deterioration.

Bibliography

[b-ITU-T F.700] Recommendation ITU-T F.700 (2000), *Framework Recommendation for multimedia services*.

[b-ITU-T F.750] Recommendation ITU-T F.750 (2005), *Metadata framework*.

[b-ITU-T F.902] Recommendation ITU-T F.902 (1995), *Interactive services design guidelines*.

[b-ITU-T G.1080] Recommendation ITU-T G.1080 (2008), *Quality of experience requirements for IPTV services*.

[b-ITU-T G.1081] Recommendation ITU-T G.1081 (2008), *Performance monitoring points for IPTV*.

[b-ITU-T H.222.0] Recommendation ITU-T H.222.0 (2006) | ISO/IEC 13818-1:2007, *Information technology – Generic coding of moving pictures and associated audio information: Systems*.

[b-ITU-T H.622] Recommendation ITU-T H.622 (2008), *A generic home network architecture with support for multimedia services*.

[b-ITU-T H.622.1] Recommendation ITU-T H.622.1 (2008), *Architecture and functional requirements for home networks supporting IPTV services*.

[b-ITU-T H.701] Recommendation ITU-T H.701 (2009), *Content delivery error recovery for IPTV services*.

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

[b-ITU-T H.721] Recommendation ITU-T H.721 (2009), *IPTV terminal devices: Basic model*.

[b-ITU-T H.740] Recommendation ITU-T H.740 (2010), *Application event handling for IPTV services*.

[b-ITU-T H.750] Recommendation ITU-T H.750 (2008), *High-level specification of metadata for IPTV services*.

[b-ITU-T H.761] Recommendation ITU-T H.761 (2009), *Nested context language (NCL) and Ginga-NCL for IPTV services*.

[b-ITU-T H.762] Recommendation ITU-T H.762 (2009), *Lightweight interactive multimedia framework (LIME) for IPTV services*.

[b-ITU-T H.770] Recommendation ITU-T H.770 (2009), *Mechanisms for service discovery and selection for IPTV services*.

[b-ITU-T J.90] Recommendation ITU-T J.90 (2000), *Electronic programme guides for delivery by digital cable television and similar methods – Reference operating scenario and requirements*.

[b-ITU-T J.148] Recommendation ITU-T J.148 (2003), *Requirements for an objective perceptual multimedia quality model*.

[b-ITU-T J.183] Recommendation ITU-T J.183 (2001), *Time-division multiplexing of multiple MPEG-2 transport streams over cable television systems*.

[b-ITU-T J.200] Recommendation ITU-T J.200 (2001), *Worldwide common core – Application environment for digital interactive television services*.

[b-ITU-T J.700] Recommendation ITU-T J.700 (2009), *IPTV service requirements and framework for secondary distribution*.

[b-ITU-T J.701] Recommendation ITU-T J.701 (2008), *Broadcast-centric IPTV terminal middleware*.

[b-ITU-T J.702] Recommendation ITU-T J.702 (2008), *Enablement of current terminal devices for the support of IPTV services*.

[b-ITU-T M.60] Recommendation ITU-T M.60 (1993), *Maintenance terminology and definitions*.

[b-ITU-T M.1400] Recommendation ITU-T M.1400 (2006), *Designations for interconnections among operators' networks*.

[b-ITU-T M.2301] Recommendation ITU-T M.2301 (2002), *Performance objectives and procedures for provisioning and maintenance of IP-based networks*.

[b-ITU-T M.3050.1] Recommendation ITU-T M.3050.1 (2007), *Enhanced Telecom Operations Map (eTOM) – The business process framework*.

[b-ITU-T P.10 Amd.2] Recommendation ITU-T P.10/G.100 (2006) Amendment 2 (2008), *Vocabulary for performance and quality of service*, plus Amd.2: *New definitions for inclusion in Recommendation ITU-T P.10/G.100*.

[b-ITU-T Q.1706] Recommendation ITU-T Q.1706/Y.2801 (2006), *Mobility management requirements for NGN*.

[b-ITU-T Q.1741.3] Recommendation ITU-T Q.1741.3 (2003), *IMT-2000 references to release 5 of GSM evolved UMTS core network*.

[b-ITU-T T.174] Recommendation ITU-T T.174 (1996), *Application programming interface (API) for MHEG-1*.

[b-ITU-T X.509] Recommendation ITU-T X.509 (2005) | ISO/IEC 9594-8:2005, *Information technology – Open Systems Interconnection – The Directory: Public-key and attribute certificate frameworks*.

[b-ITU-T X.800] Recommendation ITU-T X.800 (1991) | ISO/IEC 7498-2:1989, *Security architecture for Open Systems Interconnection for CCITT applications*.

[b-ITU-T X.1191] Recommendation ITU-T X.1191 (2009), *Functional requirements and architecture for IPTV security aspects*.

[b-ITU-T Y.101] Recommendation ITU-T Y.101 (2000), *Global Information Infrastructure terminology: Terms and definitions*.

[b-ITU-T Y.1901] Recommendation ITU-T Y.1901 (2009), *Requirements for the support of IPTV services*.

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

[b-ITU-T Y.2012] Recommendation ITU-T Y.2012 (2006), *Functional requirements and architecture of next generation networks*.

[b-ITU-T Y-Sup.5] ITU-T Y-series Recommendations – Supplement 5 (2008), *ITU-T Y.1900-series – Supplement on IPTV service use cases*.

[b-ARIB STD B-24] ARIB Standard STD B-24 Version 5.2 (2008), *Data Coding and Transmission Specification for Digital Broadcasting*.

[b-ATIS-0800002] ATIS 0800002 (2006), *IPTV Architecture Requirements*.

[b-ETSI EN 300 468] ETSI EN 300 468 V1.11.1 (2010), *Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems*.

[b-ISO/IEC 16262] ISO/IEC 16262:2002, *Information technology – ECMA Script language specification*.

Alphabetical index

Definition	Clause
hybrid CPE	11.3
imperative application	10.36
imperative application environment	10.37
imperative object content	10.38
integrity	12.13
IP-only CPE	11.4
IPTV end system (IES)	10.39
IPTV network	10.40
IPTV TD-basic model	10.41
IPTV terminal device	7.16
IPTV terminal device (TD) protection	12.14
IPTV terminal function (ITF)	7.17
key	12.15
key management	12.16
linear TV	7.18
locator	10.42
markup language	10.43
masquerade	12.17
media object	10.44
media player	10.45
metadata	7.19
metadata for watermarking facilitation	12.18
metadata fragments	10.46
metadata instance	10.47
metadata schema	10.48
middleware	7.20
mobility	7.21
MPEG transport CPE	11.5
multi-channel audio	7.22
multimedia	10.49
native application	10.50
NCL content	10.51
NCL formatter	10.52
NCL node	10.53
NCL user agent	10.54
network personal video recorder (nPVR)	7.23
network provider	8.8
normal play time (NPT)	10.55
package	7.24
packet identifier (PID)	10.56
pay per view (PPV)	7.25

Definition	Clause
peer-entity authentication	12.19
persistent storage	10.57
personal video recorder (PVR)	7.26
phishing	12.20
picture-in-picture	7.27
place shifting	7.28
platform	9.4
plug-in	10.58
portal	10.59
presentation engine	10.60
privacy	12.21
profile	10.61
program specific information (PSI)	10.62
property element	10.63
provisioning	11.6
push VoD	7.29
quality of experience (QoE)	9.5
random access point	7.30
receiver platform (platform)	10.64
reference point	8.9
repudiation	12.22
resource	10.65
resource abstraction/middleware interface	11.7
retransmission	10.66
re-transmission broadcast service	7.31
rights	12.23
rights expression	12.24
SCP bridging	12.25
SCP end-to-end	12.26
SCP interchange	12.27
SCP provider	10.67
scrambling	12.28
scrambling algorithm	12.29
scripting language	10.68
secure transcodable scheme	12.30
security label	12.31
security policy	12.32
service	7.32
service and content protection (SCP)	12.33
service components	11.8

Definition	Clause
service information (SI)	10.69
service navigation	10.70
service navigation application	10.71
service platform	10.72
service protection	12.34
service provider	7.33
set-top-box	10.73
sign language interpretation	7.34
skin	7.35
spoofing	12.35
stream	10.74
subscriber	7.36
subscription	7.37
subtitles	7.38
supplementary content	7.39
tamper-resistant	12.36
telecommunication service	10.75
terminal device (TD)	7.40
terminal device protection	7.41
third party metadata	7.42
threat	12.37
time shifting	7.43
timestamped transport stream (TTS)	10.76
transcoding	12.38
transport stream	10.77
trick mode functionality	7.44
triple play services	9.6
TV with trick mode	7.45
uniform resource identifier (URI)	10.78
universal design	7.46
usage environment	10.79
usage environment description	7.47
user device	10.80
user interface (UI)	10.81
user privacy protection	12.39
video-on-demand (VoD)	7.48
video signature	12.40
VoD trick modes	9.7
watermark	10.82
wireless network characteristics	7.49

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Terminals and subjective and objective assessment methods
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	**Global information infrastructure, Internet protocol aspects and next-generation networks**
Series Z	Languages and general software aspects for telecommunication systems

Printed in Switzerland
Geneva, 2010