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TECHNICAL REPORT

colour inside

Cable networks for television signals, sound signals and interactive services – Part 201: A study of IPTV systems with examples and applications for optical broadcast services



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Cable networks for television signals, sound signals and interactive services – Part 201: A study of IPTV systems with examples and applications for optical broadcast services

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CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

Part 201: A study of IPTV systems with examples and applications for optical broadcast services

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IEC TR 60728-201 has been prepared by technical area 5: Cable networks for television signals, sound signals and interactive services, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
100/4073/DTR	100/4103/RVDTR

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60728 series, published under the general title *Cable networks for television signals, sound signals and interactive services*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
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CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

Part 201: A study of IPTV systems with examples and applications for optical broadcast services

1 Scope

This part of IEC 60728 describes the technical background of IPTV systems and commercially available products related to audio, video and multimedia systems and equipment to enable cable operators and customers to understand current IPTV systems that include application, middleware, network, equipment and terminal devices. This document is to encourage all TA5 experts to develop new IS related to IPTV system over optical broadcast network. This Technical Report examines the mechanisms of IPTV systems developed by major standards development organizations (SDOs) and known national regulations. This document concludes with observations and recommendations for the potential future technical standards development activities especially for TA5 under the scope of TC 100.

The purpose of this TR is to give cable operators an appropriate way how to adopt IPTV services with current FTTH system recognizing that optical system is the best solution for the effective transmission of 4K and 8K video signals. This TR gives an overall but essential information on current IPTV systems to cable operators; however, too much detailed information is omitted due to the limitation of document size. The author of this document recommends the cable operator who plans to develop IPTV services to study the original international standards shown in this document. It also describes a migration from the HFC to FTTH system for effective introduction to IPTV services.

DOCSIS 4.0 can be considered on HFC as an alternative way to provide 10Gbps service. If bandwidth and other constraints (without Amp, etc.) are cleared, the IPTV service described in this document can of course be provided.

In addition to present international standards and recommendations, this document describes some major technology supporting IPTV services such as unicast, multicast, ABR (Adapting Bit Rate) and MPEG-DASH. The experiment of 4K and 8K video transmission over IP, virtual STB are also described.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1.1
multicast
transmission of the same message to a group of receivers, identified by their group address

Note 1 to entry: The term "multicast" is used even if the group includes all receivers.

[SOURCE: IEC 61375-1:2012, 3.1.34]

3.1.2
unicast
transmission of message to a receiver

Note 1 to entry: The term "unicast" is used in IPTV like broadcast

3.1.3
forward error correction
FEC
addition of redundant information (parity bits) to the data at the transmitter side so that the receiver side then uses the redundant information to detect and correct errors

3.1.4
adaptive bit rate
ABR
technology that automatically switches the bit rate value according to the communication quality and device resolution in streaming distribution using the Internet

3.1.5
error correction
error control with a view to correcting some types of messages recognized as erroneous

Note 1 to entry: Error correction makes use of either an error correcting code or an error detecting code or a loop checking with, in the last two cases, automatic repetition of the signals recognized as being erroneous.

[SOURCE: IEC 60050-702:2017, 702-07-42]

3.1.6
api
API
specification or interface to use OS functions from a software application's program interface

3.1.7
bit error ratio
BER
error ratio for a binary signal

[SOURCE: IEC 60050-704:1993, 704-18-04]

3.1.8
service provider
SP
organization that provides services to users and other providers

Note 1 to entry: The services may be, for instance, those of an Internet access provider, of a content provider or information provider, of a forum server, or of a server of a private message handling system, or content hosting.

3.1.9
cloud service
one or more capabilities offered via cloud computing invoked using a defined interface

[SOURCE: ISO/IEC 20924:2021, 3.1.8]

3.1.10
application
software designed to fulfil a particular purpose

[SOURCE: ISO/IEC 20924:2021, 3.1.2]

3.1.11
optical fibre
waveguide shaped as a filament, made of dielectric materials for guiding optical waves

[SOURCE: IEC 60050-151:2019, 151-12-35]

3.1.12
quality of service
collective effect of service performances which determine the degree of satisfaction of a user of the service

Note 1 to entry: These characteristic performances can, for example, relate to: transmission quality, dial-tone delay, failures, fault frequency and duration.

[SOURCE: IEC 60050-715:1996, 715-07-14]

3.1.13
media presentation description
MPD
provides sufficient information for a DASH client for adaptive streaming of the content by downloading the media segments from a HTTP server

Note 1 to entry: Content described in layer basis in MPD.

3.1.14
digital rights management
DRM
generic term to protect content right of digital data by controlling and limiting its usage or copying

Note 1 to entry: A watermark is a kind of DRM in a broad sense.

3.1.15
content delivery network
CDN
network for delivering web content efficiently over internet

3.1.16
watermark
WM
embedding technology of related information into video or audio data that cannot be detected by humans

Note 1 to entry: Embedded information can be detected by exclusive software.

3.2 Abbreviated terms

ABR	adaptive bit rate	AEA	advanced emergency information
AES	advanced encryption standard	API	application programming interface
ARQ	automatic repeat request	BMFF	baseline media file format
BNG	broadband network gateway	CENC	common encryption scheme
CAS	conditional access system	CDN	content distribution network
CM	cable modem	CMAF	common media application format