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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

IPTV multimedia services and applications for IPTV –
IPTV application event handling

IPTV application event handling: Transport mechanisms for audience measurement

Recommendation ITU-T H.741.4



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Recommendation ITU-T H.741.4

IPTV application event handling: Transport mechanisms for audience measurement

Summary

The ITU-T H.741.x series of Recommendations defines a foundational platform for audience measurement (AM) of IPTV services. They focus on the interface between terminal devices and an audience measurement aggregation function.

The AM platform integrates a method for end users to report personal information, and is designed to easily add time-shifted and interactive services, and non-terminal device measurement points. While the ITU-T H.741.x series allows the implementation of audience measurement for IPTV services, its mechanism may be equally applicable to non-IPTV services.

The design philosophy in the ITU-T H.741.x series is focused on scalability, minimizing the use of resources, security, flexibility to support a variety of service-provider deployments, and rich privacy support to meet emerging regulations and legislation.

Recommendation ITU-T H.741.4 specifies the data elements and structures of the transport delivery-dependent XML and binary headers, used in audience measurement messages. Appendix I provides an analysis of AM to understand its transport protocol requirements.

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T H.741.4	2012-06-29	16

Keywords

Audience measurement, audience rating service, audience viewership, contents rating, data structures, distributed content service, elements, engagement metrics, end-user permission, interactive services, IPTV application event handling, linear TV, metadata, monitoring, personalized service, transport.

FOREWORD

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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.

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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/>.

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Recommendation ITU-T H.741.4

IPTV application event handling: Transport mechanisms for audience measurement

1 Scope

This Recommendation describes transport mechanisms for audience measurement (AM). It specifies how the data structures defined in [ITU-T H.741.2] and [ITU-T H.741.3] are exchanged over different transport protocols. The term 'transport protocol' as used in this Recommendation refers to the protocol in which AM messages are encapsulated for delivery to a remote device.

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.741.0] Recommendation ITU-T H.741.0 (2012), *IPTV application event handling: Overall aspects of audience measurement for IPTV services.*
- [ITU-T H.741.1] Recommendation ITU-T H.741.1 (2012), *IPTV application event handling: Audience measurement operations for IPTV services.*
- [ITU-T H.741.2] Recommendation ITU-T H.741.2 (2012), *IPTV application event handling: Data structures of audience measurement for IPTV services.*
- [ITU-T H.741.3] Recommendation ITU-T H.741.3 (2012), *IPTV application event handling: Audience measurement for IPTV distributed content services.*
- [ITU-T X.1191] Recommendation ITU-T X.1191 (2009), *Functional requirements and architecture for IPTV security aspects.*

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 aggregation functions [ITU-T H.741.0]: The function that configures audience measurement functions (AMFs), then receives processed events, sample values and end-user information from AMFs. It may participate in the communication of end-user permissions.

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

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

3.1.4 audience measurement [ITU-T H.741.0]: The measurement of people's engagement with IPTV services.

3.1.5 audience measurement function (AMF) [ITU-T H.741.0]: The function that, if given permission, measures the end-user behaviour by processing events or samples from IPTV services. AMFs may request and collect end-user information. AMFs transfer processed events, samples and end-user information to aggregation functions.

3.1.6 audience measurement system [ITU-T H.741.0]: The system which, with end-user permission, measures end-user behaviour by detecting application events within the IPTV service and collecting their data within the IPTV service.

3.1.7 configuration package [ITU-T H.741.0]: A configuration package is the data structure which specifies the target services to be measured, content filtering, measurement schedule, events and samples to be measured, and measurement report delivery.

3.1.8 controlled information [ITU-T H.741.0]: A classification of end-user information that can be used alone or easily in combination with other information to uniquely identify, contact, or locate an end user or subscriber. Following [ITU-T X.1191] Annex A.

3.1.9 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.

3.1.10 Internet Protocol Television (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.

3.1.11 measurement report [ITU-T H.741.0]: The data that the audience measurement function (AMF) generates from an end-user behaviour event or sample.

3.1.12 multicast sub-addressing [ITU-T H.741.1]: The use of elements in a multicast message to determine if the message is intended for the receiving TD-AMF.

3.1.13 service [b-ITU-T Y.101]: A structure set of capabilities intended to support applications.

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

3.1.15 service provider [b-ITU-T M.1400]: A general reference to an operator that provides telecommunication services to customers and other end 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.

3.1.16 set-top box (STB) [b-ITU-T J.183]: A hardware box that contains digital signal demodulator, de-multiplexer, MPEG-2 decoder, and other functionalities and interfaces related to digital signal reception and presentation of the distributed programme at the subscriber's site.

3.1.17 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 audio-visual media player.

3.2 Terms defined in this Recommendation

This Recommendation does not define any particular term.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AM	Audience Measurement
AMF	Audience Measurement Function
BiM	Binary MPEG format for XML

EXI	Efficient XML Interchange
GZIP	GNU Zip
ID	Identifier
MPEG	Moving Picture Experts Group
PC	Personal Computer
SP	Service Provider
STB	Set-Top Box
TD-AMF	Terminal Device Audience Measurement Function
TV	Television
UTC	Coordinated Universal Time
XML	Extensible Markup Language
ZLIB	Z LIBrary – A data compression library

5 Conventions

In this Recommendation, the following conventions apply.

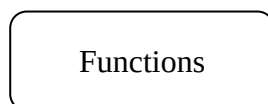
The keywords "is required to" indicate a requirement which must be strictly followed and from which no deviation is permitted if conformance to this Recommendation is to be claimed.

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.

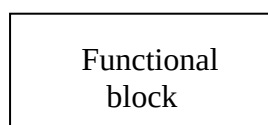
The keyword "is not recommended" indicate a requirement which is not recommended but which is not specifically prohibited. Thus, conformance with this specification can still be claimed even if this requirement is present.

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 that the vendor may optionally provide the feature and still claim conformance with the specification.

The keyword "functions" is defined as a collection of functionalities. It is represented by the following symbol in the context of IPTV architecture:



The keywords "functional block" is defined as a group of functionalities that has not been further subdivided at the level of detail described in this Recommendation. It is represented by the following symbol in the context of IPTV architecture:



NOTE – In the future, other groups or other Recommendations may possibly further subdivide these functional blocks.

In order to facilitate the specification of the corresponding schema, the notation used in tables defining elements and data structures is:

- *Support*: 1 = mandatory (one instance), 0-1 = optional (maximum one instance), 0-* = (optional and multiple instances possible), 1-* = mandatory and multiple instances possible).
- *Type*: string, integer, float, etc.
- *Container* elements are defined to group associated elements.

Following tables containing data structures, an alternative representation may be shown which illustrates the data structure. In the event of discrepancy between an alternative representation and the table, the correct information is to be found in the table.

6 Messages for data structure delivery

The data structures defined in [ITU-T H.741.2] may be delivered by one of multiple transport protocols; they may all be delivered by unicast, and some may be delivered by multicast, as indicated in Table 1.

Each of the three messages may be either unicast or multicast:

- configuration request response message
- configuration message
- measurement report request message.

When the message name is to be distinguished, the word unicast or multicast is prefixed to the above message names, e.g., multicast configuration message.

Table 1 – Delivery mechanisms for each data structure

Data structure	Unicast	Multicast
Configuration package request	X	
Configuration package request response	X	X
Configuration package	X	X
Measurement report request	X	X
AM report package	X	
Ack	X	
Error	X	

This clause focuses on the differences between unicast and multicast for delivery over transport protocols that can carry only XML. It distinguishes between elements to be used for delivery over transport protocols which can carry only XML and those which can carry binary.

All unicast and multicast messages have delivery elements which may be included in XML or a binary header, as depicted in Figure 1.