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TD**Source:** Editor H.ILE-Haptic**Title:** H.ILE-Haptic "Media transport protocols, signalling information of haptic transmission for ILE systems" (New): Initial draft (Online, 17-28 January 2022)**Purpose:** Admin

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Keywords: Immersive Live Experience; Haptic; Media transport protocol; Signalling information**Abstract:** This document is the initial draft Recommendation H.ILE-Haptic "Media transport protocols, signalling information of haptic transmission for Immersive Live Experience (ILE) systems" after discussion of SG16-C807 by Q8/16 experts at the SG16 meeting online, 17-28 January 2022.

This document contains the initial text for this new work item, based on the discussions of the following contributions.

Document	Source	Title	Agreements
SG16-C807	NTT (Japan)	New: H.ILE-Haptic: Proposal for establishment new Work Item on Media transport protocols, signalling information of haptic transmission for ILE systems	Agreed to start new WI.

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Draft New Recommendation ITU-T H.ILE-Haptic

Media transport protocols, signalling information of haptic transmission for Immersive Live Experience (ILE) systems

Summary

This draft Recommendation identifies media transport protocol and signalling information of haptic transmission for immersive live experience (ILE) systems, in order to provide ILE services.

Keywords

<Mandatory>

Introduction

<Optional – This clause should appear only if it contains information different from that in Scope and Summary>

1 Scope

ILE systems may handle haptic information, such as vibrotactile and kinaesthetic actions, for increasing more immersiveness in addition to audio and video. Haptic information should be transmitted synchronously with audio, video and lighting information, however ITU-T H.430.4 does not clearly specify the signalling information about haptic transmission.

This Recommendation identifies media transport protocol and signalling information for haptic transmission over immersive live experience (ILE) systems.

The scope of this Recommendation includes:

- Requirements of haptic transmission for ILE systems
- Media transport protocol for haptic transmission
- Signalling information for haptic transmission

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.430.1] | Recommendation ITU-T H.430.1, <i>Requirements for immersive live experience (ILE) services</i> . |
| [ITU-T H.430.4] | Recommendation ITU-T H.430.4, <i>Service configuration, media transport protocols, signalling information of MMT for Immersive Live Experience (ILE) systems</i> . |
| [ISO/IEC 23008-1] | ISO/IEC 23008-1 (2017), <i>Information technology – High efficiency coding and media delivery in heterogeneous environments – Part 1: MPEG Media Transport (MMT)</i> . |
| [ISO 9241-910:2011] | ISO standard 9241-910:2011, <i>Ergonomics of human-system interaction — Part 910: Framework for tactile and haptic interaction, 2011</i> |

3 Definitions

<Check in the ITU-T terms and definitions database at www.itu.int/go/terminology-database whether the term has already been defined in another Recommendation. It would be more consistent to refer to such a definition rather than to redefine the term>

3.1 Terms defined elsewhere

<Normally, terms defined elsewhere will simply refer to the defining document. In certain cases, it may be desirable to quote the definition to allow for a stand-alone document>

This Recommendation uses the following terms defined elsewhere:

3.1.1 Immersive Live Experience (ILE) [ITU-T H.430.1]: A shared viewing experience which stimulates emotions within audiences at both the event site and remote sites, as if the ones at remote sites wandered into substantial event site and watched actual events in front of them, from high-realistic sensations brought by a combination of multimedia technologies such as sensorial information acquisition, media processing, media transport, media synchronization and media presentation.

3.1.2 Haptics [ISO 9241-910:2011]: haptics consists of touch (tactile/cutaneous) and kinaesthesia (kinaesthetic), which are sensory and/or motor activity based in the skin, muscles, joints, and tendons.

3.1.3 Tactile [ISO 9241-910:2011]: tactile appertains to touch.

3.1.4 Kinaesthesia [ISO 9241-910:2011]: kinaesthesia is sense and motor activity based on muscles, joints, and tendons.

3.1.5 Kinaesthetic [ISO 9241-910:2011]: kinaesthetic appertains to kinaesthesia.

3.1.6 Vibrotactile [ISO 9241-910:2011]: vibrotactile is vibration-based stimulation of the skin.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 <Term 3>: <definition>.

4 Abbreviations and acronyms

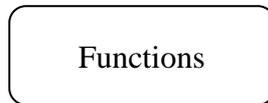
This Recommendation uses the following abbreviations and acronyms:

ILE	Immersive Live Experience
MFU	Media Fragmentation Unit
MMT	MPEG Media Transport
MMTP	MMT protocol
MMT-SI	MMT signalling information

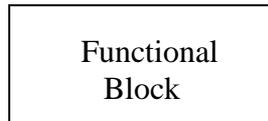
5 Conventions

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 that 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 this Recommendation.
- The keyword "functions" are defined as a collection of functionalities. It is represented by the following symbol in this Recommendation:



- The keyword "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 this Recommendation:



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

Frame borders of "functions" and "functional block", and relational lines among "functions" and "functional block" are drawn with solid lines or dashed lines. The solid lines mean required functionalities or relations. On the other hand, the dashed lines mean optional functionalities or relations.

6 Requirements to haptic transmission for ILE system

Haptic information, including vibrotactile, may increase immersiveness and reality in ILE services. At present, there are several standards such as H.264, H.265, H.266 and MPEG-2 AAC for transmitting video and audio in ITU-T and ISO/IEC JTC1 (MPEG). However, no standards for haptic information transmission were considered yet. ILE services can provide high-realistic sensations at the viewing sites by simultaneously transmission of video, audio, lighting and other information. In addition, simultaneously transmission of haptic information with other information increases more realistic sensation at the viewing sites.

In order to transmit haptic information from event site to viewing sites, media transport protocols and signalling information of haptic transmission for Immersive Live Experience (ILE) systems needs to be clarified. Basically, haptic including vibration information is similar with audio, so this document aims to use existing audio transmission ways such as MMT, MPEG-2 TS and other multiplex formats.

Haptic information, especially vibrotactile signals might be considered as the low frequency audio signals. Audio transport parts of Media transport protocols and signalling information are required to be aligned for haptic transmission.

[Further description will be added]

7 Media transport protocols for haptic transmission

[TBD]

8 Signalling information for haptic transmission

[TBD]

Annex A

<Annex Title>

(This annex forms an integral part of this Recommendation.)

<Body of annex A>

Appendix I

<Appendix Title>

(This appendix does not form an integral part of this Recommendation.)

<Body of appendix I>

Bibliography

[b-ITU-T X.yyy] Recommendation ITU-T X.yyy (date), *Title*.
