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Abstract: This TD contains the initial text of draft new Recommendation ITU-T H.ILE-QM "Quality Measures and Evaluation Method for Immersive Live Experience (ILE)", discussed at Q8/16 sessions of this SG16 meeting, from 10-21 July 2023.

NOTE – Editorial adjustments performed by TSB. Issues needing editor's attention are identified in WinWord comments. Editors are requested to carefully read the Author's Guide for drafting ITU-T Recommendations, https://www.itu.int/oth/T0A0F000004/en.

This document is the initial draft of Recommendation ITU-T H.ILE-QM "Quality Measures and Evaluation Method for Immersive Live Experience (ILE)", resulting from discussion by Q8/16 experts of the following contribution at this SG16 meeting.

Document	Source	Title
SG16-C332-R1	China ICT Group, China Telecom, China Unicom	New: H.ILE-CCM: Proposed new work item on capability classification method for immersive live experience (ILE)

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Draft New Recommendation ITU-T H.ILE-QM

Quality measures and evaluation methods for immersive live experience (ILE)

Summary

This draft Recommendation specifies the quality measures and evaluation methods for immersive live experience (ILE), the related requirements as well as some additional considerations.

Keywords

Immersive Live Experience; Quality Measures; Quality Evaluation Method;

1 Scope

This draft Recommendation specifies the quality measures and evaluation method of Immersive Live Experience (ILE). Quality measurement and evaluation aim to evaluate the immersiveness and expressiveness of ILE services and capability level of ILE systems. The evaluation dimensions include the aspects of quality of immersiveness, processing delays, network performance and expressiveness of atmosphere reconstruction. The scope of the draft Recommendation is:

– Overview of quality measures and evaluation methods for ILE services.

– Quality requirements for ILE services

– Quality measures for ILE services.

– Quality evaluation methods for ILE systems.

– Security considerations.

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 G.1036] ITU-T Recommendation G.1036, Quality of experience (QoE) influencing factors for augmented reality (AR) services, 2022

3 Definitions

3.1 Terms defined elsewhere

3.1.1 immersive live experience (ILE) [b-ITU-T H.430.1]: A shared viewing experience that stimulates emotions within audiences at both the event site and the remote sites, as if the audience at the remote sites had wandered into substantial event venue and had actually watched the events taking place in front of them. This impression is due to high-realistic sensations provided by a combination of multimedia technologies such as sensorial information acquisition, media processing, media transport, media synchronization and media presentation.

TBD

3.2 Terms defined in this Recommendation

TBD

4 Abbreviations

This Recommendation uses the following abbreviations and acronyms:

ILE	Immersive Live Experience

TBD

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 this Recommendation.

6 Overview of quality measures and evaluation methods for ILE services.

Immersive live experience (ILE) enables users to experience a remote event in real time with highly realistic sensations, which provide various benefits such as enhanced enjoyment, reduced cost and time, and increased accessibility. ILE services can also create new opportunities for entertainment, education, tourism, and culture. The standardization of ILE has been conducted in ITU-T and other organizations. The normative works about requirements, architectural framework, service scenarios, use cases and transport protocols of ILE have been accomplished. However, the industry lacks a clear and comprehensive quality measures and evaluation methods for ILE services that can encompass different types, levels, and dimensions of immersion and reconstruction.

A well-defined quality measures and evaluation method for ILE services can contribute to defining the characteristics and quality of such services, as well as promoting interoperability, compatibility, and innovation of ILE technologies and applications. Establishing an evaluation method for assessing the immersiveness and expressiveness of ILE services and capability level of ILE systems, incorporating both subjective and objective evaluations, can assist customers, service providers, and equipment vendors in the industry in achieving a common understanding of the concept of quality in ILE.

In addition, to evaluate ILE quality for each level in a fair and scientific way, we will consider the impact of each dimension holistically, state the definition of dimensions clearly and establish relevant evaluation methods. The evaluation dimensions include the aspects of quality of immersiveness, processing delays, network performance and expressiveness of atmosphere reconstruction.

[Editor's Note: Add relation for G.1036 here]

7 Quality requirements for ILE services

[Editor's Note: This clause specifies the quality requirements for ILE services. Several key dimensions that affect ILE services are considered, including but not limited to the aspects of quality of immersiveness, processing delays, network performance and expressiveness of atmosphere reconstruction.]

7.1 Quality requirements of immersiveness

7.2 Quality requirements of processing delays

7.3 Quality requirements of network performance

7.4 Quality requirements of expressiveness of atmosphere reconstruction

TBD

8 Quality measures for ILE services

[Editor's Note: This clause specifies quality measures and parameters for ILE services. To evaluate ILE quality in a fair and scientific way, we will consider the impact of each dimension holistically, state the definition of dimensions clearly and analyse the relevant parameters of each dimension. The influencing dimensions include but not limited to aspects of quality of immersiveness, processing delays, network performance and expressiveness of atmosphere reconstruction.]

8.1 Quality measures of immersiveness

[Editor's Note: Immersiveness dimension includes visual quality and audio quality. Visual quality is affected by parameters, including depth, geometric resolution, texture resolution. Audio quality is affected by reproduce of sounds direction.]

8.2 Quality measures of processing delays

[Editor's Note: Processing delays dimension includes compression, encoding/decoding. The relevant parameters include geometric accuracy, texture bit rate, frame rate, frame loss, payload size.]

8.3 Quality measures of network performance

[Editor's Note: Network performance dimension includes synchronous transmission of multiple media streams and real-time interactivity. Synchronous transmission is affected by parameters including network latency, the throughput, the payload size, the packet loss probability, round-trip times (RTT), and the network protocol used (i.e. UDP vs TCP). Real-time interactivity is affected by parameters including real-time object extraction, motion and navigation.]

8.4 Quality measures of expressiveness of atmosphere reconstruction

[Editor's Note]: Reconstruction dimension includes reconstruction of stage effects, displaying real-sized objects, spatial environment, augmented information attachment ability, user perception. Reconstruction of stage effects is affected by device, sound effects, lighting, atmosphere parameter. User perception is affected by parameters such as parallax limitations.

TBD

9 Quality evaluation methods for ILE systems

[Editor's Note]: This clause presents evaluation methods for ILE systems.

9.1 Quality evaluation methods of immersiveness

9.2 Quality evaluation methods of processing delays

9.3 Quality evaluation methods of network performance

9.4 Quality evaluation methods of expressiveness of atmosphere reconstruction

9.5 Evaluation methods of quality level for ILE systems

TBD

10 Security considerations

[Editor's Note]: This clause presents the security considerations which include the network security, user privacy and quality evaluation system security.

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*.