Report of the
2nd mini workshop on ILE

Geneva, 19 January, 2017

Summary

This document provides the brief report on the 2nd mini-workshop on Immersive Live Experience services, held on the morning (0930 – 1300 hours) of 19 January 2017.

Keywords

Immersive Live Experience; VR; AR; 360 degree video

Change Log

None

Contents

1 Introduction

The 2nd mini-workshop on Immersive Live Experience (ILE) was held in Geneva. 19 January, 2017 (0930-1300 hours). As the Rapporteur of Q8/16, Mr Hideo Imanaka, NTT, Japan, moderated the workshop and around 30 persons participated. The purpose of this workshop was to exchange information about immersive services within participants for future standardization work in ITU-T. Including non ITU-T member, six speakers presented their latest work on immersive services.

2 Major results of the meeting

The program is shown in Annex A of this document, and also can be found in SG16 web pages: http://itu.int/en/ITU-T/studygroups/2017-2020/16/Pages/ws/201701_ILE.aspx

ITU-T SG16, especially Q8/16, recognized that several kinds of immersive services including immersive telepresence and VR were studied in all over the world, and such immersive services could become one of major ICT services in near future. Since Q8/16 had just started standardization work on immersive live experience, it was needed to gather more information from all over the world. In order to progress this work, it was agreed to have the third workshop on ILE at the next Q8/16 meeting.

3 Summary of presentations

3.1 Opening remarks (TSB director)

Mr Chae-sub Lee, TSB director, addressed opening remarks at the beginning of workshop. He pointed out that immersive services including high-resolution audio and video were hot topics all over the world, and the standardization work was important not only for clarifying technical specification but also for promotion activities to create new market. He concluded this remarks with hoping fruitful exchanging information and success of ILE standardization work.

3.2 Session 1: IMPLEMENTATION OF IMMERSIVE LIVE EXPERIENCES

This session was moderated by Mr Thomas Stockhammer (Qualcomm, Germany), and aimed to explore ILE implementations, including VR and AR, and related technologies, in order to understand what is ILE.

3.2.1 Immersive Telepresence System called "Kirari!", [including demos]: Yoshihide TONOMURA (NTT, Japan)

This presentation introduced NTT's activities related to ILE, which was named "Kirari!." During and after this presentation, toy sized "Kirari!" was demonstrated. "Kirari!" was a research project to realize high-realistic public viewing or live viewing services for big sports games, music concerts and cultural events. Live transmission of Karate Enbu case and Kabuki stage case were shown in videos.

In this presentation, the presenter pointed out that several technologies used by "Kirari!" such as media transmission technologies could be the candidates of standardization topics.

3.2.2 Streaming and rendering of high quality 360° videos, [including videos]: Louay BASSBOUSS (Fraunhofer FOKUS, Germany)

This presentation introduced the work on 360-dgree video in FOKUS. The target services used normal TV set with remote controller, which control viewing angles, without head mount display (HMD). The main research subject was how to control viewing angles. The presentation included second screen solutions which can provide different angle videos simultaneously with main screen. He informed that Fraunhofer planned to have the Media Web Symposium in May 2017.

3.2.3 Immersive Live Experience – KT Use Cases/Services, [including videos]: Hoerim CHOI (KT, Korea)

This presentation introduced current 5G-related work in KT and several immersive services which were planned to provide near future in Korea. KT aimed to provide infrastructure, including 5G network, for several types of immersive services, not only focused on the specific immersive service. Currently, KT considering to provide Sync View, 360-dgree Live VR/TimeSlice, Omni View, Hologram Live and KLive. He showed some video images.

3.3 Session 2: TECHNOLOGIES RELATED TO IMMERSIVE SERVICES AND STANDARDIZATION STATUS

This session was moderated by Mr Yoshihide Tonomura (NTT, Japan), and aimed to introduce the urgent technologies related to immersive services, which may include virtual reality, 360-dgree video, synchronous media transport, surrounding sound, and codecs of spatial and environmental information. The session also reviewed the current status of standardization in several SDOs, in order to clarify standardization gaps.

3.3.1 Emerging 8K services and their applications towards 2020: Shuichi AOKI (NHK, Japan)

This presentation introduced the latest activities on 8K broadcasting and standardization activities in ITU-R. One of hybrid broadcasting solutions provided different angle videos in the second screen simultaneously with main screen. He also introduced Next Generation Contents Distribution Forum (NexCDI-F) in Japan which aimed to develop technical specifications and to promote next generation content including 4K and 8K.

3.3.2 Status of MPEG VR adhoc: Thomas STOCKHAMMER (Qualcomm, Germany)

This presentation introduced the current immersive media standardization activities in MPEG. MPEG had the workshop on MP20 at the day before this workshop. In his presentation, the results of questionnaire on MPEG VR were introduced, and pointed out that VR could be utilized for short content and VR commercial trial was expected in 2016 and 2017. Currently, MPEG-i project that would study immersive media, including three degree of freedom (3DoF), would be established in February 2017. MPEG-i project would be based on Omini-directional Media Format (OMAF) work. He pointed out the future research area included Six degree-of-freedom, point clouds and free navigation.

3.3.3 DVB activities on immersive services: David WOOD (EBU, Switzerland)

This presentation introduced the status of VR standards activities in DVB. DVB mainly focused on delivery function of VR broadcasting service, and already published report on VR. He mentioned there were two main approaches of VR services, Type A: “panoramic/3DoF” and Type B “panoramic/6DoF.” He pointed out there were three key subjects to be solved for providing VR services: technology, sensory sickness and content forms. He also pointed out that the most important subject was “Who pay for the services?” so it was needed to investigate commercial requirements for VR.

3.3.4 Discussions

After all presentation, the standardization gaps of immersive services were discussed. As the results of discussion, all participants recognized the followings as the standardization gaps:

- Metrics for quality of immersiveness
- Mitigation method of sensory sickness
- Encryption of content delivered

Some parts of these gaps were already started consideration in several groups, such as VR quality work in ITU-T SG12 and video and audio quality work in ITU-R WP6C. In addition, it was recognized that the biggest issue was how to monetize immersive services.

3.4 Wrap-up

The moderator of this workshop, Mr Imanaka, concluded that all information, including use cases and standardization status, provided in this workshop was very helpful for studying standards on immersive live experience. He proposed to have the third workshop on ILE for further information exchange and discussion about ILE standardization activities at the next Q8/16 meeting. This is because it was recognized that many kinds of immersive services were existed and it expected that other SDOs might have activities with regard to immersive services. All participants and speakers were agreed his proposals.

3.5 Closing remarks (the Chairman of SG16)

The Chairman of SG16, Mr Noah Luo, gave closing remarks. He mentioned that immersive multimedia was the challenging subject in SG16, and it might bring new business although the business potential was unclear so far. The relation with CDN and edge computing were requested to consider in Q8/16. He encouraged participating the third workshop on ILE for all participants.

4 Conclusion

In this mini-workshop, participants learned several kinds of immersive services and its technologies. Since Q8/16 work was in initial stage, it should need to gather more information about immersive services including its standardization activities. Holding the third workshop on ILE was agreed, and contributions were invited.

Acknowledgements:

The moderator of this workshop thanked all presenters for providing useful information about immersive services all over the world, and participants for their active discussion, and also thanked to TSB, Mr Simão Campos.

ANNEX A:
Programme of the 2nd mini-workshop on Immersive Live Experience

2nd ITU-T Mini-Workshop on Immersive Live Experience

Geneva, Switzerland

ITU Headquarters

19 January 2017, 0930-1300 hours

Scope and Background of this workshop

Recently, some of huge sport events and music concerts are not only broadcasted, but also considered to be delivered remote sites for public viewing or live viewing in order to share emotion by audiences in remote sites as if they were in main event venues. On the current public viewing or live viewing services, however, realistic experience caused by flat displays has limitations. In order to provide high-realistic sensations to audiences at remote sites in anywhere of the world at the same time of events, it needs to implement Immersive Live Experience (ILE), which can reconstruct event sites virtually with presenting real-sized objects, sound direction and lighting by transmitting environmental information together with audio and video streams.

ITU-T SG16 has established new Question for Immersive Live Experience (ILE), called Q8/16, at the last SG16 meeting in May/June 2016. On September 2016, the first Question meeting discussed about definition of ILE, as follows:

Immersive Live Experience (ILE): the 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

There are several kind of immersive services and technologies such as virtual reality (VR), augmented reality (AR), 360-dgree view cameras/displays, 3D projection mapping, 4K/8K displays, and so on. Some of them are already standardized or currently underway on standardization work, thus, ITU-T has to identify standardization gaps for future standardization work in ITU-T SG16. In September 2016, ITU-T held the 1st workshop on ILE to clarify the ILE services and technologies as the first step.

The main objective of the 2nd workshop is to exchange information related to immersive services and technologies between several organizations, and to identify standardization gaps. In order to achieve this objective, this workshop covered the introduction of immersive services from several companies and standardization organizations, and discuss the possibility of future collaborative work.

DRAFT PROGRAMME

09:30-09:40	**Opening Session** • ***Moderator: Hideo IMANAKA (Q8/16 Rapporteur)*** • ***Opening remarks: Chae-Sub Lee (ITU-T TSB Director)***
SESSION 1 **IMPLEMENTATION OF IMMERSIVE LIVE EXPERIENCES** *The session explored ILE implementations, including VR and AR, and related technologies, in order to understand what is ILE.*	
09:40-11:00	***Moderator: Thomas STOCKHAMMER (Qualcomm)*** **Presenters** • *ILE implementation called "Kirari", [including demos]: Yoshihide TONOMURA (NTT)* • *Streaming and Rendering of High Quality 360° Videos: Louay BASSBOUSS (Fraunhofer FOKUS)* • *Immersive Live Experience – KT Use Cases/Services: Hoerim CHOI(KT)*
11:00-11:20	***Coffee break***
SESSION 2 **TECHNOLOGIES RELATED TO IMMERSIVE SERVICES AND STANDARDIZATION STATUS** *This session introduced the urgent technologies related to immersive services, which may include VR, 360-dgree video, synchronous media transport, surrounding sound, and codecs of spatial and environmental information. The session also reviewed the current status of standardization in several SDOs, in order to clarify standardization gaps.*	
11:20-12:50	***Moderator: Yoshihide TONOMURA (NTT)*** **Presenters** • *Emerging 8K services and their applications towards 2020: Shuichi AOKI (NHK)* • *Status of MPEG VR adhoc: Thomas STOCKHAMMER(Qualcomm)* • *DVB activities on immersive services: David WOOD(EDU)* • **Discussions**
12:50-13:00	**Closing Session** • ***Wrap up: Hideo IMANAKA (Q8/16 Rapporteur)*** • ***Closing remarks: Noah Luo (Chairman of SG16)***