

## ITU-T SG16 Sapporo Meeting Report

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### Abstract

The International Telecommunication Union-Telecommunication Standardization Sector Study Group 16 (ITU-T SG16) met from June 30 to July 11, 2014 at the Sapporo Convention Center, Hokkaido, Japan. We report on the results of the SG16 Sapporo meeting and describe some side events held in conjunction with the meeting.

*Keywords: ITU-T meeting, multimedia, IPTV, digital signage, accessibility, audio coding, video coding*

### 1. SG16 meeting results

Study Group 16 (SG16) creates ITU-T (International Telecommunication Union-Telecommunication Standardization Sector) recommendations related to multimedia, which become international standards. It is composed of three Working Parties (WPs), which are further divided into Questions for study according to research themes (**Fig. 1**). The Sapporo meeting was the third meeting in the current study period (2013 to 2016), and was held with 232 participants from 24 countries at the Sapporo Convention Center (**Photo 1**). Great progress was made at the meeting, with 67 draft recommendations consented. We report on the state of deliberation for Questions to which NTT contributed below.

#### 1.1 IPTV

Japan took a lead role in work done on recommendations for the basic Internet protocol television (IPTV) specifications, and this work has already been completed; thus, Question 13 regarding IPTV has recently been studying additional issues including smart TV such as services using multiple screens and multiple devices, and enhanced operation interfaces other than a remote control, for example, speech control, gestures, and touchscreens [1]. At this meeting, NTT also proposed a revised text with illustrations to gain a good understanding of the draft recommendation and a draft appendix explaining the use cases in order to facilitate the study of device discovery typi-

cally used in second-screen services. The technical paper HSTP.IPTV-Gloss [2], which listed terminology for IP-based TV-related multimedia services including smart TV, was also completed at this meeting and approved for publication.

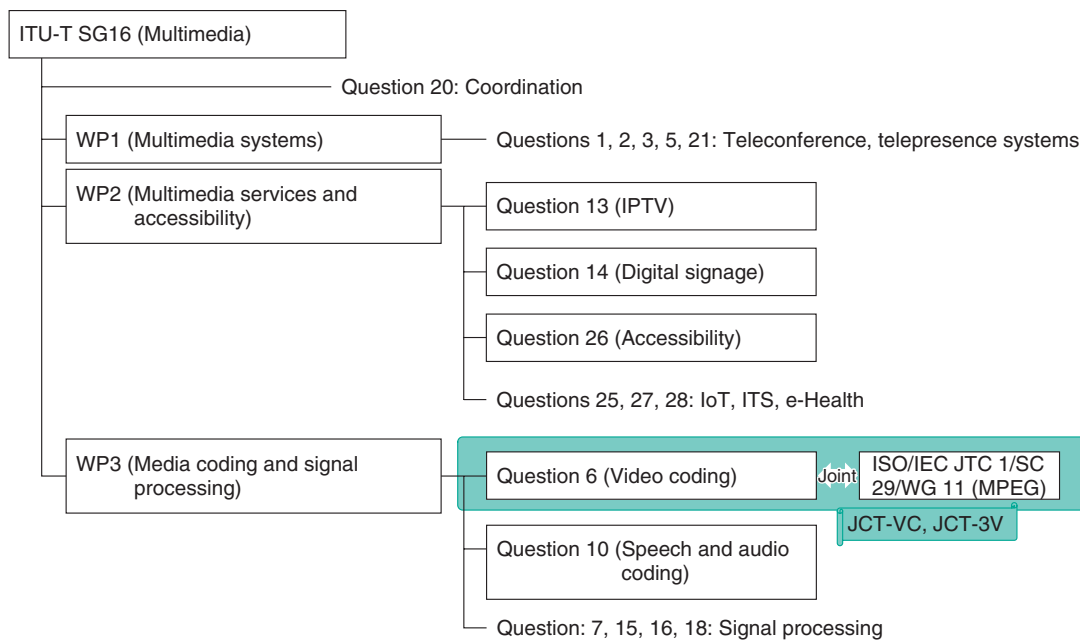
#### 1.2 Digital signage

Digital signage is a new study item in ITU-T, and it was established as the new Question 14 starting with this study period. Recommendation H.780 [3], based on active Japanese contributions, was accepted in the previous study period. It is a basic recommendation for digital signage describing service requirements and IPTV-based architecture, and study on it is now advancing in the area of applied services. At this meeting, the draft recommendation for requirements of disaster information services, which Japanese companies led in proposing work items, was consented as Recommendation H.785.0 [4]. Moreover, approval of the technical paper HSTP.DS-UCIS [5] regarding use cases of interactive services was also achieved.

#### 1.3 Accessibility

Accessibility<sup>\*1</sup> of multimedia services and systems is examined in Question 26. In this meeting, NTT collaborated in proposing two contributions regarding systems enabling persons with hearing or speech disabilities to make emergency calls.

<sup>\*1</sup> Accessibility: The ability for anyone, including the elderly or disabled, to use a service or system without impediment.



IoT: Internet of things  
 IPTV: Internet protocol television  
 ISO/IEC: International Organization for Standardization/ International Electrotechnical Commission  
 ITS: intelligent transport system  
 JCT: Joint Collaborative Team  
 JTC: Joint Technical Committee  
 MPEG: Moving Picture Experts Group  
 SC: subcommittee  
 VC: video coding  
 WG: Working Group

Fig. 1. SG16 organization.



Photo 1. Venue at Sapporo Convention Center.

These proposals are based on the results of a study of emergency calling systems using mobile phones and smartphones for persons with hearing or speech disabilities done by the Emergency Call Accessibility Working Party (Em-Call WP) of the Telecommunication Technology Committee and lead by Emeritus

Prof. Sadahiko Kano of Waseda University. The WP held discussions with participation from NTT and other telecommunications carriers as well as vendors and service providers related to emergency calling, the Fire and Disaster Management Agency, and organizations for the disabled. The contributions discussed here include specifications for information (data) required at the application layer and proposals for activities necessary to create recommendations.

As a result of discussion in this meeting, it was agreed to proceed with the creation of a new work item (H.ACC-RDE) based on these proposals so that study of detailed specifications can proceed.

#### 1.4 Speech and audio coding

Question 10 involves the study of speech and audio coding. NTT has been working since 2007 on standardizing a 14-kHz bandwidth, super wideband (SWB) extension of the G.711.1 [6], 7-kHz bandwidth, wideband (WB) scalable audio coding, which is in turn, an extension of the 3.4-kHz bandwidth,

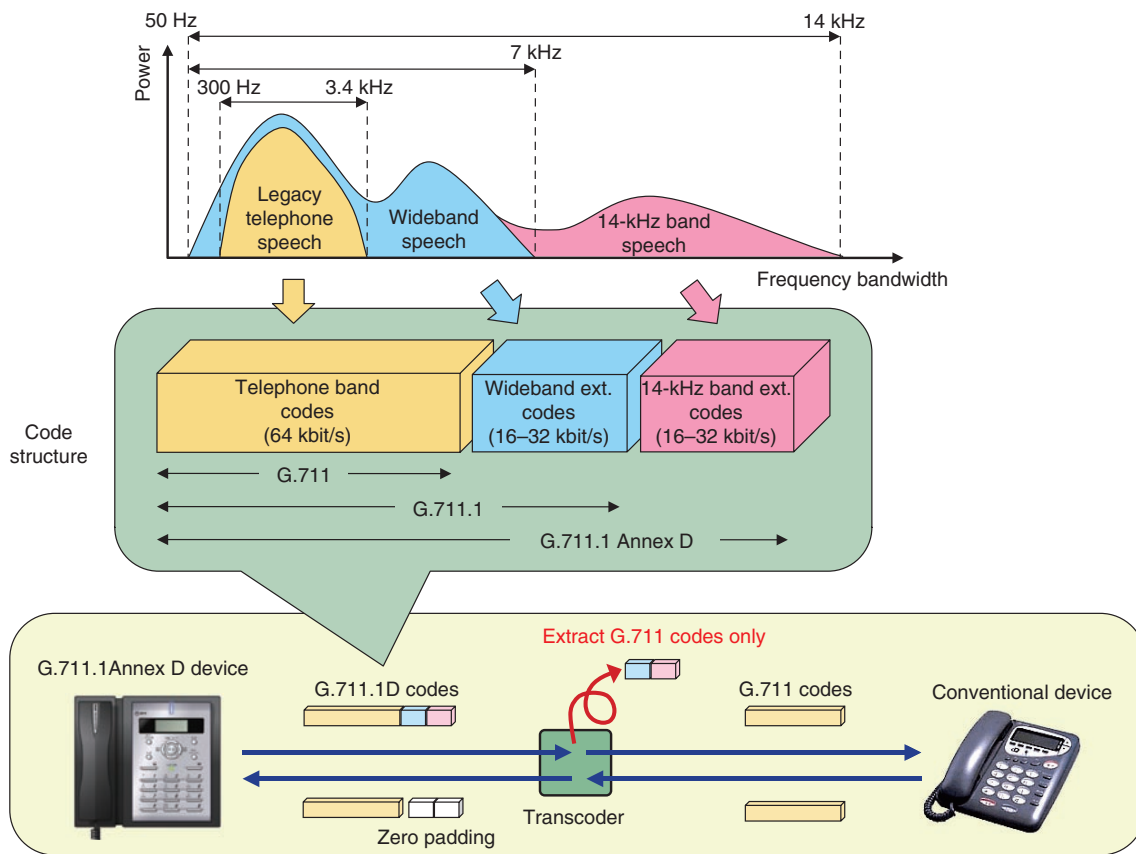


Fig. 2. Scalable bit-stream structure.

Table 1. G.711.1 extensions.

Time frame	Name	Coding details
November 2010	Annex D	14-kHz band extension coding (fixed-point implementation)
September 2012	Annex E	Alternative floating-point implementation to Annex D
September 2012	Annex F	14-kHz band stereo extension coding (fixed-point implementation)
Agreements of this meeting	Annex G	Alternative floating-point implementation to Annex F

G.711 codec used for legacy telephone speech signals. Scalable coding is based on transmission formats that add coded data (bandwidth extension codes) to data coded in an earlier format, in order to expand the audio bandwidth. The advantage of this is that it can interoperate with earlier formats without requiring re-encoding (Fig. 2). After the SWB extension was approved as G.711.1 Annex D in November 2010, standardization of a floating-point implementation (Annex E) and a stereo extension (Annex F) advanced (see Table 1). In the previous meeting, a new annex was drafted recommending an alternative

floating-point implementation to Annex F, and in this meeting, NTT and Huawei Technologies contributed a report on results from an objective evaluation of interoperability between it and the fixed-point implementation. This was reviewed, and it was confirmed that there were no issues with interoperability, so it was agreed for consent. This recommendation is scheduled to be published as G.711.1 Annex G.

### 1.5 Video coding

The 18<sup>th</sup> meeting of the Joint Collaborative Team on Video Coding (JCT-VC), formed from the

Question 6 group studying video coding (VCEG) and the ISO/IEC JTC 1/SC 29/WG 11<sup>\*2</sup> (also known as the Moving Picture Experts Group or MPEG) group, was held from June 30 to July 9, 2014. Approximately 140 people participated, and 340 contributions were input. Progress was made in deciding extended specifications for the next-generation High Efficiency Video Coding (HEVC), also called H.265 [7], and specifically, the final specification for SHVC, the scalable HEVC extension, was settled. Together with the RExt range-extension specification settled during the April meeting and the MV-HEVC extension for multi-view video settled during the July meeting, the three extension specifications will proceed to the voting stage as HEVC 2<sup>nd</sup> Edition.

The Screen Content Coding (SCC) extension draft specification for artificial imagery such as PC (personal computer) screen captures was also issued. SCC performance was improved through discussion on refinements of techniques such as efficiently copying block units of images and analyzing color map data and combining colors that appear frequently in order to compress images. Deliberation on SCC will continue at the October meeting and thereafter.

## 2. Invitation to Japan

On November 6, 2013, the Ministry of Internal Affairs and Communications formally invited ITU-T Director Malcolm Johnson to hold the SG16 meeting in Japan, and this was accepted at the SG16 Plenary Session on the 8<sup>th</sup> of the same month. A Japanese host committee was established from the sponsoring companies to run and administer the meeting smoothly. A working group was formed to do preparation work and offer on-site support. The NTT Group, as a platinum sponsor, also participated in these committees and supported the running of the meeting.

## 3. Side events

Various meetings and events were held in conjunction with the SG16 Sapporo meeting. The workshop and exhibition planned by the Japanese host committee are outlined in this section.

### 3.1 Workshop

A workshop on multimedia technologies was held as a local event in conjunction with the SG16 Sapporo meeting in the afternoon of July 1, 2014. This workshop was held in cooperation with the exhibition described below, and was planned by Japanese com-



Photo 2. Mr. Toshiaki Fujita giving the keynote speech at the workshop.

panies hosting the SG16 meeting. The workshop consisted of technical sessions, mainly to introduce technologies shown in the exhibition, and keynote sessions by the platinum sponsors. NTT's contribution included a keynote speech from Toshiaki Fujita, Senior Vice President of the NTT Service Innovation Laboratory Group (**Photo 2**), and a technical session on the roadmap for UHDTV (ultrahigh-definition television) services including 8K and H.265/HEVC encoder technology.

Professor Junichi (Jay) Kishigami from Muroran Institute of Technology, and a senior advisor at NTT, gave an invited speech entitled "Beyond the Content Distribution and Its Technology," in which he discussed the similarities between ITU-T metadata Recommendations F.750 [8] and H.750 [9], the recent importance of metadata, and future directions related to metadata.

Of the 81 participants in the workshop, 56 also participated in the SG16 meeting and the JCT-VC meeting held on the same day.

### 3.2 Exhibition

An exhibition with the theme of showcasing cutting-edge multimedia technologies was held from July 1 to 4 in order to broadly promote technologies both under study and already standardized. NTT provided two demonstration exhibits entitled "Depth-based Free-viewpoint TV" and "Reliable 4K H.265/HEVC

<sup>\*2</sup> ISO: International Organization for Standardization, IEC: International Engineering Consortium, JTC: Joint Technical Committee, SC: Subcommittee, WG: Working Group

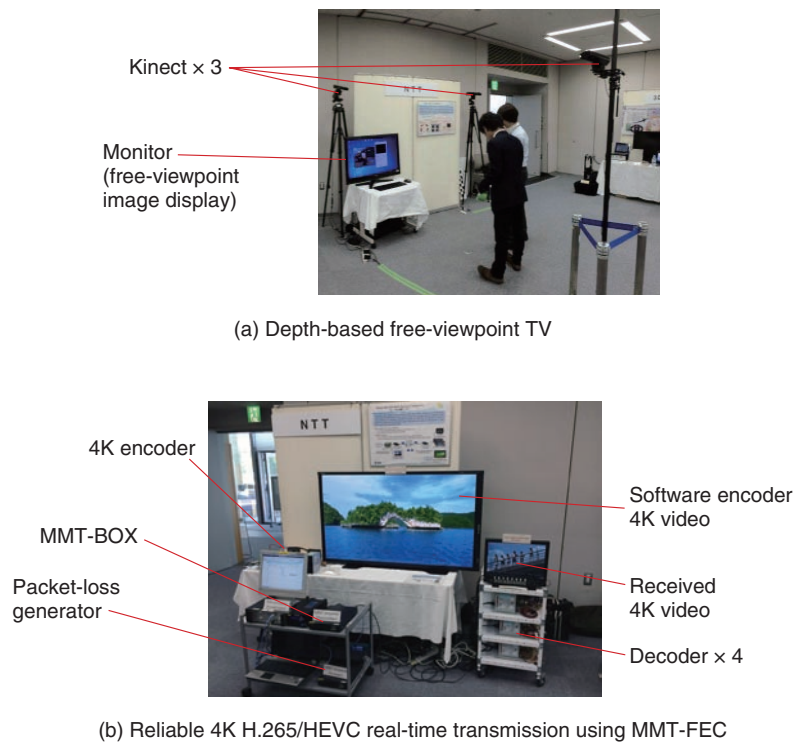


Fig. 3. Exhibits.

Real-time Transmission by Using MMT-FEC (MPEG media transport forward error correction)” (Fig. 3).

The former is a technology for synthesizing free-viewpoint video in real time from multi-point video and a depth map captured using multiple cameras and a depth sensor. Original synthesis technology enables synthesized display of free-viewpoint video from sparse depth data containing sensor noise in real time, without depth defects.

The latter is a robust transmission technology using 4K video HEVC real-time hardware processing technology and MPEG media transport (MMT). 4K video is partitioned into quarters, encoded with four hardware encoders, and transmitted as a highly robust stream using a very robust low-density generator matrix coding provided by NTT.

We received comments from many visitors. Yoko Kamikawa, Vice-Minister of Internal Affairs and Communications (at the time) visited the former exhibit and asked when the technology would be ready for practical use, and noted that it was interesting that the video could be viewed from a position where there was no camera. The latter was recognized for its ability to process 4K video in real time (by the chairman of JCT-VC and other session par-

ticipants), while others expressed their desire for 8K video support. Each day, many domestic and international participants in the sessions, related technologists, and members of government and the press visited the exhibits, making them a phenomenal success.

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He received the B.E., M.E., and Ph.D. in communication engineering from Osaka University in 1992, 1994, and 2005, respectively. He joined NTT in 1994 and since then has been engaged in research on video-on-demand systems and metadata-related interactive video systems and services, especially those related to IPTV systems and services. His current interests include standardization of IPTV, digital signage, and multimedia broadcasting for mobile devices. He joined the standardization efforts of ARIB (Association of Radio Industries and Businesses) STD-B38 (v2.1, 2.2, and 2.3), STD-B45 (v2.0), and TR-B33 as an editor. He has also contributed to ITU-T's international standardization efforts, mainly in ITU-T SG16 and IPTV-GSI. He is a member of the W3C (World Wide Web Consortium) Web and TV Interest Group, the Institute of Electronics, Information and Communication Engineers (IEICE), and the Human Interface Society in Japan.



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He received the B.E. from the Faculty of Science and Engineering and the M.E. from the graduate school of Global Information and Telecommunication Studies from Waseda University, Tokyo, in 2004 and 2006, respectively. He joined NTT in 2006 and engaged in research and development of video coding and its standardization activities. His current research interests include video coding technologies, image processing, and human visual systems. He has received four academic awards so far from IEICE, the Institute of Image Information and Television Engineers (ITE), and the Information Processing Society of Japan. He is a member of IEICE and ITE.



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