Global Standardization Activities

Recent Trends in IPTV

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Abstract

ITU-T (International Telecommunication Union, Telecommunication Standardization Sector) recently formed the Focus Group for IPTV (FG IPTV), initiating discussions on a global standard for IPTV (Internet protocol television) services. This article describes recent trends in IPTV standardization and the activities of ITU-T FG IPTV.

1. Introduction

With IPTV (Internet protocol television) services that use IP (Internet protocol) to deliver various services, including video, now being deployed, there is growing interest in its specifications. By forming the Focus Group for IPTV (FG IPTV) last year, ITU-T (International Telecommunication Union, Telecommunication Standardization Sector) initiated discussions on a global standard of IPTV. This article overviews recent trends in the standardization of IPTV and, in particular, the activities of ITU-T FG IPTV, which held its first meeting in Geneva in July 2006 [1] and second meeting in Busan, Korea, in October 2006.

2. Trends in IPTV services worldwide

In Europe, commercial IPTV services are already being offered in many countries, such as by Fastweb and Telecom Italia in Italy, by FreeTelecom and France Telecom in France, by Telefonica in Spain, and by BT in the UK. In the USA, Verizon started an IPTV service called "FiOS TV" in September 2005, while the newly renamed AT&T announced its plan to deploy its service U-verse by the end of 2006. In Asia, an IPTV service called "Now Broadband TV"

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introduced by PCCW in Hong Kong in September 2003 had attracted 750,000 subscribers as of November 2005, accounting for 39% of the pay broadcasting service market of Hong Kong. China Telecom started its first IPTV service based on MPEG-4 content in Harbin in 2005, accumulating 40,000 subscribers, and has since been operating IPTV services, including some testbeds, elsewhere. As these figures attest, IPTV has come to be regarded as one of the most promising telecommunications services worldwide [2].

3. Trends in global standardization

Against this backdrop of growing proprietary services, efforts to standardize IPTV services are underway in various places. In the USA, ATIS (Alliance for Telecommunications Industry Solutions) formed the IPTV Interoperability Forum (IIF) in June 2005, initiating discussions on IPTV standardization [3]. Requirements on architecture and rights protection have already been documented.

CEA (Consumer Electronics Association), which is well known for the annual tradeshow CES, formed IPTV-OCC (Oversight and Coordination Committee), initiating discussions on IPTV standards, from the perspective of the consumer electronics industry.

Europe is somewhat more advanced in standards that take into account the possibility of IPTV. DVB (Digital Video Broadcasting) [4] started its IPTV project, called DVB-IPI (IP Infrastructure) in 2003. The

Phase 1 specifications, directed mainly at the unidirectional broadcast model, have been made public. Discussions on Phase 2, which targets more advanced features such as broadband and enhanced interactive services, are currently underway. At ETSI (European Telecommunications Standards Institute), discussions on IPTV standards are conducted in the group TISPAN (Telecommunications and Internet converged Services and Protocols for Advanced Networking) [5], [6].

Even before these efforts, since its establishment in 1999, the TV-Anytime Forum had been defining specifications taking into consideration, in addition to downloaded content, video-on-demand and multicasting based on IPTV. The TV-Anytime specifications have already been incorporated into DVB and ETSI [7].

4. Standardization in ITU-T

4.1 Organization of FG IPTV

These standardization efforts on IPTV specifications in various places and organizations led ITU-T to hold a meeting in Geneva in April 2006 as a preparatory meeting for a new focus group on IPTV (FG IPTV). At this meeting, it was agreed that the main goal of FG IPTV would be, rather than defining its own specifications, to coordinate existing standards of other standardization organizations (SDO) and to harmonize and promote the development of new standards.

Discussions in FG IPTV are conducted in separate working groups. Currently, six working groups have been set up, as shown in **Fig. 1**.

(1) WG 1: Architecture and Requirements defines overall IPTV service, user and architectural requirements, and framework architecture.

(2) WG 2: QoS and Performance Aspects defines the development of global QoS (quality of service), QoE (quality of experience), and performance standards and requirements for IPTV including IPTV traffic management, IPTV application layer reliability, and IPTV performance monitoring.

(3) WG 3: Service Security and Content Protection defines the security architecture and identifies, and if necessary initiates, the development of security mechanisms and interface specifications for IPTV, including the analysis of security threats, security framework, and security function models.

(4) WG 4: IPTV Network Control discusses general requirements for IPTV networks, including control and signaling mechanisms; content distribution and identification; and home, access, and core networks.

(5) WG 5: End Systems and Interoperability Aspects defines the implementation of terminal

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FG Vice-chairs:
   – Mr. Simon Jones (BT, UK)
   – Mr. Chae-Sub Lee (ETRI, Korea)
   – Ms. Duo Liu (China Academy of Telecom. Research, MII, China)

	Title of Working Group	Co-chairs
WG 1	Architecture and Requirements	Junkyun CHOI (ICU, Korea) Christian JACQUENET (France Telecom, France) Julien MAISONNEUVE (Alcatel, France)
WG 2	QoS and Performance Aspects	Paul COVERDALE (Huawei, China) Juergen HEILES (Siemens, Germany)
WG 3	Service Security and Content Protection	Dong WANG (ZTE Corporation, China) Catherine PERGUE (Dell, Switzerland) Glenn ADAMS (Samsung Electronics, Korea)
WG 4	IPTV Network Control	Daegun KIM (KT, Korea) Jifei Song (UTStarcom, China)
WG 5	End Systems and Interoperability Aspects	Gale LIGHTFOOT (Cisco, USA) Yoshinori GOTO (NTT, Japan) Jianting MENG (China Telecom, China)
WG 6	Middleware, Application and Content Platforms	Masahito KAWAMORI (NTT, Japan) Charles SANDBANK (DTI, UK)

Fig. 1.   Organization of ITU-T FG-IPTV.

devices that receive IPTV services, their implementation scenarios, and their remote management, focusing especially on the end-to-end interoperability between terminals. Among the topics for discussion are the relationship between IPTV end systems and home networks, clarification of the sort of services supported by IPTV terminals, and the basic functional architecture of IPTV terminals.

(6) WG 6: Middleware, Application and Content Platforms defines the middleware that enables IPTV interactive services, electronic program guides that allow the viewer to select programs, IPTV applications such as browsers, metadata for these applications, and content platforms including various content formats and codecs. At the July meeting, the working group received contributions from China introducing a new codec called AVS, which drew much attention.

4.2 First FG IPTV meeting

The first meeting was held from July 10 through 14, 2006 in Geneva. This meeting drew approximately 250 participants, which is unusual for an FG meeting, attesting the high level of interest in IPTV. Among those participants, about 100 were from China, Japan, and Korea, showing the great interest and expectations this part of the world has toward IPTV. The main activities of this meeting, being the first official meeting of the FG IPTV, were preparatory work such as the appointment and authorization of the chairs, including management, clarification of terminologies, and recognition of mandates. Terms of reference (TORs) were defined to specify the mandates of each working group and clarify requirements. Relevant SDOs were identified and liaison statements were sent to them. Subsequent meetings are expected to produce more substantial documents and to call for specific contributions, where necessary.

4.3 Second FG IPTV meeting

The second meeting, which was held in Busan, Korea, from October 16 to 20, 2006 had around 208 participants, of which more than 150 came from China, Japan, and Korea. The participants included representatives of ATIS, ETSI, and DVB. There were 153 contributions, of which more than 70% were from China and Korea. Many contributions to this meeting proposed the introduction of "profiles" or "phases" to the IPTV standard. Following the contribution from NTT, it was agreed that IPTV consists of three main models: 1) IPTV based on NGN (Next Generation Network) and IMS (IP multimedia subsystem), 2) IPTV based on NGN but without IMS, and 3) IPTV not based on NGN. However, profiles and/or phases were not adopted.

Significant developments were seen in the areas of terminals and metadata. WG5 agreed upon the terminal interfaces and function blocks, though most of them are not mandatory. As for metadata, WG6, after intense discussions, agreed that the metadata should be coded in XML, making it compatible with many other standards.

Efforts to reach agreement on the definition of IPTV involved long and intensive debate, due to the differences among the member countries in terms of their IP infrastructures, the extent of convergence between broadcasting and telecommunications, and the legal systems. The proposed text of the definition of IPTV is "multimedia services such as television/video/audio/text/graphics/data delivered over IP based networks managed to provide the required level of QoS/QoE, security, interactivity and reliability". In addition, support for NGN, bidirectional networks, and realtime as well as non-realtime service delivery are included as key features of IPTV.

There was a lot of debate about IPTV's relationship with NGN and whether an architecture assuming fixed-mobile convergence (FMC) should be accepted or not. This issue, together with other architectural issues, may take some time to resolve.

5. Activities of NTT

NTT (the holding company) has been working with its group companies, TV manufacturers, and other companies to discuss how the standardization of IPTV in Japan will be done. In conjunction with those companies, NTT drafted and contributed documents to the July and October meetings, promoting the activities in Japan. NTT was asked to provide chairpersons for WG5 and WG6 and is playing a leading role in FG IPTV.

6. Future plans

The discussions of FG IPTV are expected to be expedited, with explicit deadlines being specified. The first meeting of 2007, the 3rd FG IPTV meeting, will be held in January at the Microsoft Campus in Mountain View, California, USA. The draft recom-

mendation is expected to be published by the summer of 2007. Since ITU-T SG13 has been designated as the parent Study Group of FG IPTV, the drafts produced by FG IPTV will continue to be discussed within SG13.

Just before the 2nd FG IPTV meeting (October 2006), the ITU-T Technical Workshop on IPTV was held in Seoul, which shows that the Republic of Korea is regarding IPTV as a key industry and is trying to promote its standardization as a nation. China, planning for the Beijing Olympic Games in 2008, is also pushing IPTV services nationwide.

It is fair to say that there is a common understanding among the telecommunication companies in Asia, Europe, and America that IPTV is one of the most important services of next-generation telecommunications. ITU-T FG IPTV will surely play a crucial role in its standardization.

References

[1] http://www.itu.int/ITU-T/IPTV/
[2] K. Kawazoe, S. Hayama, T. Matsuoka, and J. Kishigami, "Next-generation IPTV Service," NTT Technical Review, Vol. 4, No. 10, pp. 38-42, 2006.
[3] http://www.atis.org/iif/
[4] http://portal.etsi.org/tispan
[5] http://www.dvb.org/
[6] A. Kurokawa and I. Higashi, "Standardization Trends of the Next Generation Network in ETSI TISPAN," NTT Technical Review, Vol. 4, No. 6, pp. 53-57, 2006.
[7] M. Kawamori, "Recent Activities of the TV-Anytime Forum," NTT Technical Review, Vol. 4, No. 3, pp. 77-80, 2006.

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