

Forum Survey Activities by TTC (The Telecommunication Technology Committee) Technology Research Advisory Group

Hideyuki Iwata

Abstract

The Technology Research Advisory Group of The Telecommunication Technology Committee (TTC) of Japan surveys and analyzes trends in the standardization activities of Japanese and world forums in the field of information and communications on a yearly basis. These efforts help to establish direction in TTC standardization activities. The results of this survey and analysis can be accessed on the TTC website. These results provide valuable information for individual companies that wish to grasp the latest trends in standardization and evaluate the need to join a particular forum. This article reports in particular on the activities of forums recently added to the survey and on forums focusing on current technology topics.

Keywords: forum, consortium, standardization

1. Overview of Technology Research Advisory Group

Forum surveys [1] at the Technology Research Advisory Group of The Telecommunication Technology Committee (TTC) commenced in 1994, making the survey scheduled for fiscal year (FY) 2018 the 25th version. The forums targeted by these surveys consist of organizations, voluntary bodies, and groups aiming to promote or promulgate standardization, but exclude de jure standardization bodies such as the International Telecommunication Union (ITU), International Electrotechnical Commission (IEC), International Organization for Standardization (ISO), and the ISO/IEC Joint Technical Committee 1 (JTC1). The names of these bodies commonly include the words *forum*, *consortium*, *alliance*, or *project*. The survey team consists of eight TTC-member operator/vendor companies. Their activities involve (1) determining the latest trends in the information and communications field and narrowing

down the forums to be surveyed, (2) collecting information on the selected forums such as membership fees, target fields, and member makeup from publicly released information on the web, and (3) examining the temporal change in member makeup, the types of activities carried out, and other details from survey data.

2. FY2017 surveyed forums

After the review was completed of the 58 forums targeted in FY2016 version 23 of the forum survey, it was decided to add 13 bodies and to terminate the surveying of 4 bodies whose activities had ended or that had merged with other bodies, or for which information could no longer be obtained.

The following provides a brief introduction to the 13 forums added for FY2017 version 24 of the forum survey.

2.1 5G Automotive Association (5GAA)

The 5GAA was founded in September 2016 to promote the cooperative development of connected car services using fifth-generation mobile communications systems (5G). Although the founding members of 5GAA consist mainly of European companies, today a total of 48 companies from the United States, Japan, China, Korea, and other countries around the world are participating in 5GAA activities. These companies include telecommunications equipment vendors, telecommunications operators, automotive manufacturers, and parts suppliers. The mission of 5GAA is to jointly develop, test, and promote communications solutions, support the standardization of those solutions, and encourage their commercialization and global penetration.

2.2 OpenStack Foundation

The OpenStack Foundation is a non-profit organization established in September 2012. It aims to provide an open and vendor-agnostic cloud-computing environment deployed as an infrastructure as a service (IaaS) and to develop and disseminate open source software (OSS). The foundation consists of individual members and corporate members, the latter of which consist primarily of telecommunications equipment vendors and telecommunications operators.

2.3 OpenAPI Initiative (OAI)

The OAI is a Linux Foundation Project established on November 5, 2015 under the leadership of SmartBear Software as a consortium focused on promoting a standard format for describing RESTful APIs (representational state transfer application programming interfaces). As of August 2017, a total of 28 companies had become OAI members. The Swagger open source API development tool developed by SmartBear and adopted by OAI for describing APIs is already finding widespread use. The initial version of the OpenAPI Version 3.0 Implementer's Draft based on the Swagger Specification was released on March 1, 2017. The OAI has adopted OpenStack as an IaaS platform.

2.4 FIWARE Foundation

Based in Germany, the FIWARE Foundation is a non-profit organization established as a private initiative to promote the FIWARE smart application platform developed by FI-PPP (Future Internet Public-Private Partnership), a project of the European Union's 7th Framework Programme. FIWARE is

attracting attention as a set of APIs that facilitate data usage thanks to its key feature of treating data as context information and its handling of cross-industry data in common. It is taking hold in Europe as a common platform for smart cities. As of September 2017, The FIWARE Foundation had 28 member companies located mainly in Europe, with one Japanese company participating.

2.5 Hypercat Alliance

The Hypercat Alliance is an organization established in September 2014 by 42 British companies and municipalities using funds from the IoT Demonstrator Phase I Clusters of Innovate UK, an organization under the Department for Business, Innovation and Skills. Hypercat is a technology that is released in the form of an online catalog that tags the specifications needed to design Internet of Things (IoT) devices with metadata and that enables automatic interconnectivity between devices. Its purpose is to achieve high functionality, high-speed operation, and interoperability in IoT devices by combining necessary objects and functions in the catalog to generate and share IoT devices. The Hypercat Alliance had 70 members as of September 2017, including one Japanese company.

2.6 OpenID Foundation (OIDF)

OIDF is a non-profit organization established in June 2007 in Oregon, USA. In addition to formulating digital identifier (ID) standards, OIDF promotes inter-site ID linking, access to web services via smartphone applications and API linking by using OpenID Connect and other ID-authentication technologies and is engaged in the dissemination, protection, and training of OpenID technologies. As of September 2017, 40 companies were OIDF members, with some of the major members including OTT (over-the-top) telecommunications operators.

2.7 Spring Framework Project

The Spring Framework is an open-source application framework targeting Java platforms. It addresses various problems common to conventional web application frameworks such as weakness with respect to specifications changes, difficulty of performing tests in program units, and difficulty of maintenance and reuse. The Spring Framework can interact with existing protocols and products such as HTTP (Hypertext Transfer Protocol), SOAP (Simple Object Access Protocol), and Enterprise JavaBeans. While there are only six main developers, the

development is open, and anyone can participate. The Japan Spring Framework User Group is a Spring Framework community with a presence on social networking services.

2.8 Trusted Computing Group (TCG)

TCG is an industry organization established in April 2003 with headquarters in Oregon, USA, with the aim of formulating standard technologies to improve reliability and safety in the use of personal computers. It formulated the specifications for the Trusted Platform Module (TPM) security chip equipped with a hardware-based encryption function. The most recent version of this specification is version 2.0 released in 2014. Almost all personal computers manufactured today are equipped with a TPM chip to safely store and manage personal authentication information and encryption keys. The application of this technology to IoT devices has come into view with the aim of enhancing terminal security.

2.9 Zero Outage Industry Standard Association

The Zero Outage Industry Standard Association was established in November 2016 with the aim of maximizing customer satisfaction and value by offering best practices and a standard framework to provide secure, high-reliability, and high-availability information technology services and solutions. It had 12 member companies as of September 2017.

2.10 Wi-Fi Alliance

The Wi-Fi Alliance is an industry organization founded in 2000 with the aim of promoting the spread of wireless local area network products. It formulates interconnectivity test methods, certifies products, and engages in promotional activities toward the widespread use of the Wi-Fi brand. It had a total of 790 member companies as of August 2017. Although the main Wi-Fi standard is 802.11ac at present, the Wi-Fi Alliance plans to provide products based on new standards such as 802.11ad, 802.11ax, and 802.11ah and on the Wi-Fi Agile Multiband that enables instantaneous access to the most optimal wireless environment.

2.11 Z-Wave Alliance

The Z-Wave Alliance was established to ensure interoperability between devices and equipment equipped with the Z-Wave wireless communications protocol for smart homes. It had a total of 365 member companies as of August 2017. Z-Wave is a low-power technology for smart homes centered on the

technology developed by the Danish company Zensys (acquired by the US company Sigma Designs in 2009). It operates in the sub-gigahertz band. Devices equipped with Z-Wave have found widespread use in Europe and other regions around the world.

2.12 EnOcean Alliance

EnOcean and other corporate groups established the EnOcean Alliance in April 2008 to promote the spread of EnOcean technology and ensure interoperability between EnOcean products. EnOcean is an energy harvesting technology developed by EnOcean GmbH in Germany. It converts weak forms of energy such as light, heat, and vibration into electric power to perform low-power wireless communications. EnOcean switches and sensor modules are being used in offices, factories, and industrial equipment throughout the world. It adopts the lower three layers specified in ISO/IEC 14543-3-10 as wireless specifications and prescribes an application protocol called EEP (EnOcean Equipment Profiles). As of August 2017, 430 companies had joined the EnOcean Alliance, and more than 1200 products had been certified.

2.13 Digital Stationery Consortium (DSC)

DSC was established in October 2016 in Delaware, USA, to promote the use of digital ink and achieve mutual compatibility between digital ink products. It already provides SDKs (software development kits) to partner companies for the WILL (Wacom Ink Layer Language), which is a technology that can share digital writing tools such as pen tablets in a cloud environment and ensure mutual compatibility. DSC seeks to achieve even closer collaborations going forward. It has nine participating members from Japan, Korea, China, and Europe including Montblanc, a manufacturer of stationery goods, plus equipment vendors and telecommunications operators.

3. Forums related to current technology topics

The following highlights forums classified by technology topics that have been attracting interest in recent years, namely, software-defined networking (SDN)/network functions virtualization (NFV), big data/IoT/machine to machine (M2M), smart cities, 5G, and intelligent transportation system (ITS)/connected cars. Note that a few of these forums were introduced in section 2.

3.1 SDN/NFV

- Open Networking Foundation (ONF) (established 2011): ONF released the second version of Atrium, an SDN software distribution, in February 2016. ONF has made improvements to version 1 of the Open Network Operating System (ONOS) and developed extensions to OpenDaylight platform. ONF merged with Open Networking Lab (ONOS/CORD (Central Office Re-architected as a Datacenter)) in October 2017 and added a use-case discussion forum.
- Broadband Forum (BBF) (established 1994): As of December 2017, BBF had taken up a variety of virtualization themes such as SDN access node architecture, a Yet Another Next Generation (YANG) model for passive optical networks, and a YANG model for access nodes.
- OpenDaylight Project (established 2013): This group develops SDN controller software to achieve SDN/NFV, providing it as OSS. It released Carbon as the sixth version of its SDN platform in June 2017 and is developing extensions for IoT applications.
- Open Platform for NFV (OPNFV) (established 2014): OPNFV released Danube 1.0 as its fourth OSS release in April 2017 and released Danube 2.0 and Danube 3.0 in May and July, respectively, of the same year. OPNFV Summit 2017 was held in June 2017.
- TM Forum (established 1988): The ZOOM (Zero-touch Orchestration, Operations and Management) project team is collaborating with the NFV Industry Specification Group of the European Telecommunications Standards Institute (ETSI) to develop an NFV management and implementation model.

3.2 Big data/IoT/M2M

- Object Management Group (OMG) (established 1989): OMG announced a supplementary provision to the Industrial Internet Connectivity Framework standard of IIoT (Industrial Internet of Things) for application to the energy field at the Work in Oil and Gas event in September 2017. OMG has held two webinars (web-based seminars).
- Industrial Internet Consortium (IIC) (established 2014): IIC has been quite active in testbed development with 25 testbeds in total as of September 2017. It holds many events and issues many types of documents including white papers.
- Open Connectivity Foundation (OCF) (estab-

lished 2016): The parent organization of OCF is the Open Interconnect Consortium, which previously merged with the Universal Plug and Play Forum. In October 2016, OCF and the AllSeen Alliance merged under the OCF name, and it was decided to make IoTivity and Alljoyn frameworks compatible. In June 2017, OCF announced that six of its IoT specifications were put to a vote at ISO/IEC JTC1.

- THREAD Group (established 2014): Since the release of the Thread Wireless Networking Protocol version 1.1 in the summer of 2016, The THREAD Group has been active in equipment certification and interconnectivity testing. Seamless connectivity was exhibited by 17 companies at CES (Consumer Electronics Show) 2017, and the group completed its first certification of version 1.1 products.
- OpenFog Consortium (established 2015): The OpenFog Consortium collaborates with the IoT Acceleration Consortium in Japan to develop technologies and testbeds and promote standardization. On September 25, 2017, it announced that it had concluded a memorandum of understanding with ETSI to cooperate in the development of fog and edge applications.
- Hypercat Alliance (established 2014): The Hypercat Alliance has presented use cases in 14 fields including smart buildings and smart energy. It released “PAS 212:2016 Automatic resource discovery for the Internet of Things - Specification” as a British standard in August 2016.

3.3 Smart cities

- Japan Smart Community Alliance (JSCA) (established 2010): JSCA held the Smart Community Summit in June 2017 and conducted active discussions on issues surrounding the dissemination of solar power generation and entry into emerging energy markets.
- Smart Grid Interoperability Panel (SGIP) (established 2009): SGIP is an organization that supports the National Institute of Standards and Technology in the development of smart grid standards. SGIP merged with SEPA (Smart Electric Power Alliance) in April 2017, becoming part of its organization.
- ECHONET Consortium (established 1997): As of January 2018, the ECHONET Consortium had certified 530 devices under the ECHONET Lite specification, 296 devices under the AIF

(application communication interface) specification, and 19 devices under the ECHONET specification. It held the 1st Plugfest event in July 2018.

- OpenADR Alliance (established 2010): This organization released the OpenADR 2.0 Program Guide for the OpenADR smart grid standard in February 2016. As of May 2017, it had certified 120 devices.
- FIWARE Foundation (established 2011): The FIWARE Foundation has released OSS and APIs as a common platform for smart cities. It has also released DSEs (Domain-Specific Enablers) as field-specific sets of resources.

3.4 5G

- NGMN (Next Generation Mobile Networks) Alliance (established 2006): This group began by conducting studies of Super 3G and Long-Term Evolution (LTE) in 2006 but is presently focused on 5G. It published the NGMN 5G White Paper in March 2015. The NGMN Alliance has published 12 technical documents to date.
- 5G Automotive Association (5GAA) (established 2016): 5GAA has published a variety of white papers including “Edge computing for advanced automotive communications” and “An assessment of LTE-V2X (PC5) and 802.11p direct communications technologies for improved road safety in the EU” in December 2017.

3.5 ITS/connected cars

- ITS Forum (established 1991): ITS Forum has published many technical guidelines such as “700 MHz Band Intelligent Transport Systems - Experimental Guideline for Roadside-to-roadside Communications Ver. 1.1,” “700 MHz Band Intelligent Transport Systems - Experimental Guideline for Inter-vehicle Communication Messages Ver. 1.1,” and “700 MHz Band Intelligent Transport Systems - Test Items and Conditions For Mobile Station Interoperability Verifi-

cation Guideline Ver. 1.2” in October 2017.

- ITS America (established 1991): ITS America published a white paper titled “The Impact of a Vehicle-to-Vehicle Communications Rulemaking on Growth in the DSRC Automotive Aftermarket” in October 2016.

4. Trends in number of members

Twelve forums showed an increase in members from FY2016 to FY2017. A case in point is the LoRa Alliance, which has already expanded its membership to more than 400 member companies despite being established less than three years ago. Its membership increased in FY2017 by more than 70% over the previous year, reflecting a growth trend. In addition, Hyperleger, which promotes standardization in blockchain technology, also experienced a jump in membership of more than 70% over the previous year. In terms of medium-term trends, 10 forums showed an increase in members for two consecutive years from 2015, and 6 forums—OPEN Alliance SIG, Wi-SUN Alliance, The Open Group, IIC, OpenADR Alliance, and ECHONET Consortium—showed an increase in members for three or more consecutive years. These forums tend to be in fields such as smart cities, IoT, cloud computing, and connected cars, reflecting heightened interest in those technologies.

5. Future plans

The release of version 25 of the forum survey report is planned for the end of FY2018.

Reference

- [1] Forum Survey Report (Japanese version only), <http://www.ttc.or.jp/e/inv/>

Trademark notes

All brand names, product names, and company/organization names that appear in this article are trademarks or registered trademarks of their respective owners.

**Hideyuki Iwata**

Senior Research Engineer, Supervisor, Research and Development Planning Department, NTT.

He received a Ph.D. in electrical engineering from Yamagata University in 2011. From 1993 to 2000, he conducted research on high-density and aerial optical fiber cables at NTT Access Network Service Systems Laboratories. Since 2000, he has been responsible for standardization strategy planning for NTT research and development. He has been a delegate of IEC Subcommittee 86A (optical fiber and cable) since 1998 and of the ITU-T (Telecommunication Standardization Sector) Telecommunication Standardization Advisory Group since 2003. He is a vice-chair of the Expert Group on Bridging the Standardization Gap in the Asia-Pacific Telecommunity Standardization Program Forum. In 2004, he received an award from the IEC Activities Promotion Committee of Japan for his contributions to standardization work in IEC.
