CTO CONSULTATION MEETING

16 July 2019, Tokyo, Japan

COMMUNIQUÉ

Chief Technology Officers (CTOs) from China, Japan and Korea met with the senior management of the ITU Telecommunication Standardization Bureau at a CTO consultation meeting in Tokyo, Japan, 16 July 2019, kindly hosted by Japan's Telecommunication Technology Committee. The consultation meeting brought CTOs together to exchange views on industry needs and related standardization priorities.

CTOs discussed the evolution of standardization activities in view of the open-source movement and network 'softwarization', the value of Artificial Intelligence (AI) to the automation of network operation and maintenance, the importance of preparations for the arrival of quantum information technologies, the necessity of investment in all-fibre networks, and the increasing relevance of innovation in support of datacentre interconnection.

Standardization and open innovation

The expansion in the variety of goods and services connected to the network has had significant implications for standardization, said CTOs, particularly in view of the high expectations on IMT-2020/5G, the Internet of Things (IoT) and Artificial Intelligence (AI).

CTOs highlighted the importance of the shift towards software-driven network management and orchestration, in parallel emphasizing the value of the open-source movement to the rapid, flexible allocation of network resources to be required in the 5G era and beyond.

The importance of open innovation to the development of both software and hardware will lead to more diversified standardization activities, said CTOs, activities that must be capable of supporting technological as well as business aspects of open innovation.

CTOs discussed examples of successful ITU interaction with open-source communities, highlighting the value of this interaction to both standardization and open-source projects.

CTOs explored in particular the concept of 'closed-loop' standards, the concept of standardization and open-source projects taking a proactive approach to collaboration adopting well-aligned timelines, iterative interaction and harmonized terminology. Closed-loop standards development, said CTOs, results in working instances of standards and practical feedback to standardization projects, as well as standard-compliant code to open-source projects.

Network slicing and AI

CTOs discussed the value of AI to the automation of network service control. CTOs highlighted the role to be played by AI in the automation of network operation and maintenance, automation that CTOs said will continue to grow in importance as networks gain in complexity. This increasing network

complexity, noted CTOs, results from the need to support the coexistence of a diverse range of ICT services using specialized network slices.

Software-defined networking (SDN) and network function virtualization (NFV) – key enablers of network slicing – will support large-scale networks where network operation and system configuration will require advanced skills in software. This shift, said CTOs, will call for the development of automation technologies for network design, construction, and operation and maintenance.

ITU was encouraged to promote the availability of open data, an effort that CTOs said would require the development of a framework for data sharing as well as methods for the assurance and refinement of data quality. CTOs highlighted the importance of mechanisms to assess end-to-end Quality of Service (QoS) considering the increasing implementation of network slicing and AI. CTOs requested in addition that ITU develop standards promoting interoperable AI techniques with respect to networks, technologies and data.

Quantum information technologies

ITU members are preparing for the arrival of quantum information technologies based on the properties of quantum physics. Quantum information technologies will be capable of solving problems beyond the reach of classical information technologies. And although these quantum information technologies are certain to bolster security defences, CTOs cautioned that they will also bring greater strength to attacks.

CTOs highlighted their support for ITU's ongoing standardization activities on security and network aspects of quantum information technologies.

Quantum information technologies such as Quantum Key Distribution (QKD) or Quantum Random Number Generator (QRNG) are proving themselves to be quantum-safe and their level of technology readiness is high enough for large-scale deployment, said CTOs. They noted that the success of these technologies in securing 5G and IoT networks, for example, will demand standards supporting the efficient, cost-effective deployment of quantum devices and their interoperability.

CTOs expressed their commitment to the expansion of the ecosystem of quantum specialists within ITU. They encouraged ITU to take a forward-looking approach to quantum information technologies so as to anticipate emerging standardization demands. CTOs also called for ITU to take up a leading role in bringing standards bodies together to ensure the effective coordination of quantum-relevant standardization activities.

Fibre future

Fibre-optic networks form the 'backbone' of the Information Society. Investment in fibre continues to rise, with fibre recognized as the key infrastructure underlying today's ultra-broadband Gigabit era. CTOs highlighted that 1-5 Gbit/s access speeds can support Virtual Reality, cloud gaming and smart cities. 5-10 Gbit/s access speeds, said CTOs, could bring us applications such as holographic communications and telemedicine.

Recognizing ITU's leadership in the standardization of fibre-optic networks, technologies and infrastructures, CTOs encouraged ITU to support industry in taking full advantage of ITU-standardized Fibre to the Home (FTTH) technologies.

CTOs thus encouraged ITU to analyze standardization gaps relevant to the relationship between advanced FTTH technologies; high-quality service experience marked by ultra-low latency; all-scenario optical networking including datacentres and home networking; cloud computing and network slicing; and automated network operation and maintenance with AI.

Datacentre interconnection

CTOs highlighted that, according to the Cisco Global Cloud Index for 2016 to 2021, the installed base of servers within datacentres is growing at a compound annual growth rate (CAGR) of 13 per cent and that global datacentre IP traffic is growing at 25 per cent CAGR. The same source forecasts that, by 2021, 71.5 per cent of global datacentre traffic will occur within datacentres, with 13.6 per cent between datacentres and 14.9 per cent between datacentres and users.

These figures motivated CTOs to stress the importance of high-speed data exchange, network slicing and virtualization, and High-Voltage Direct Current (HVDC) power supply. Increasing the speed and capacity of connections between servers, said CTOs, will call for the evolution of cables and connectors, network slicing, and the virtualization of network nodes. CTOs highlighted the potential of HVDC power supply to increase the energy efficiency of datacentre operations.

CTOs encouraged ITU to promote 400 Gbit/s connections between servers as well as the adoption of HVDC power supplies. CTOs in addition requested that ITU investigate datacentre-relevant standardization activities underway across standards bodies with a view to identifying issues to be addressed by ITU standards.

ITU standardization priorities

The senior management of the ITU Telecommunication Standardization Bureau presented an update on ITU standardization activities in view of the World Telecommunication Standardization Assembly 2020 (WTSA-20) to be held in Hyderabad, India, 17-27 November 2020.

Digital transformation – with ICTs impacting all economic sectors – has contributed to a significant upsurge in the membership of ITU's standardization arm (ITU-T). In 2018, ITU-T welcomed 45 new members, including MVNOs and MVNEs, manufacturers of unmanned aerial vehicles, telematics and automotive companies, OTT application providers, fintech companies, energy utilities, and companies specializing in quantum cryptography and quantum communications.

Chaesub Lee, the Director of the ITU Telecommunication Standardization Bureau, highlighted that WTSA-20 presents ITU members with a unique opportunity to ensure that ITU-T's strategy, structure and working methods continue to reflect market realities and industry priorities.

Dr Lee offered the view that ITU's strategy, structure and working methods – the review of which will conclude at WTSA-20 – should strike an appropriate balance between the need to preserve ITU standardization's core competencies and the need for ITU standardization to incorporate the flexibility required to respond to emerging standardization demands.

The participating organizations were:

CAS Quantum Network, China; China Mobile Research Institute, China; Fujitsu, Japan; Huawei Technologies, China; KDDI Corporation, Japan; KT Corporation, Korea; Mitsubishi Electric Corporation, Japan; NEC Corporation, Japan; National Institute of Information and Communications Technology,

Japan; NTT DOCOMO, Japan; QuantumCTek, China; SK Telecom, Korea; Sumitomo Electric Industries, Japan; Telecommunication Technology Committee, Japan; ITU Telecommunication Standardization Bureau, Switzerland.