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| ITU Logo | INTERNATIONAL TELECOMMUNICATION UNION**TELECOMMUNICATIONSTANDARDIZATION SECTOR**STUDY PERIOD 2017-2020 | T17-TSAG-C-0027 |
| **TSAG** |
| **Original: English** |
| **Question(s):** | N/A | Geneva, 26 February - 2 March 2018 |
| **CONTRIBUTION** |
| **Source:** | China Mobile, CAICT |
| **Title:** | Proposal of strengthening cooperation with other international standardization organizations on activities of IMT-2020 |
| **Purpose:** | Proposal |
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| **Keywords:** | IMT-2020; 3GPP; ONAP |
| **Abstract:** | This contribution proposes to strengthen cooperation with other international standardization organizations on activities of IMT-2020, including the introduction of present activities and progresses related to IMT-2020 future networks in ITU-T, the key points of China Mobile’s work regarding 5G networks in 3GPP and suggestions of strengthening cooperation between ITU-T and other SDOs on activities of IMT-2020. |

# 1 Present activities and progresses of IMT-2020 future networks in ITU-T

ITU-T FG IMT-2020 finished the Gap Analysis of 5G standardization work among related SDOs, and also initiated the 5G research and standardization work on non-radio side network technologies. Based on these valuable deliverables, in this new Study Period, SG13 takes the responsibility on standardization activities of IMT-2020 future networks. The management team of SG13 does a good job by programming the plan of standardization work related to 5G with ‘Technical Packages on IMT-2020’, which clearly and perfectly summarizes the finished, on-going and planned specifications related to IMT-2020 in SG13.

Based on the finalized documents after November 2017’s plenary meeting of SG13, the present activities and progresses are as follows:

1. Technical Package – Softwarization

This package focuses on the network softwarization, which includes the basic terms and definitions, requirements, frameworks, management domain architecture and other related technologies. The planned outputs and progresses are in the following table:

**Table 1 Documents and progressed in TP-Softwarization**

| **Area** | **Full title of document** | **Status(Nov.)** | **Approved/Planned** |
| --- | --- | --- | --- |
| Terms & definitions | Y.3100, “Terms and definitions for IMT-2020 network” | Published | 13 September 2017 |
| Management framework | Y.3111, “IMT-2020 Network Management Framework” | Published | 13 September 2017 |
| Management requirements | Y.3110, “IMT-2020 Network Management Requirements” | Published | 13 September 2017 |
| Activity report – NW SWarisation Supplement | Y.3100-series Supplement 44, “Standardization and open source activities related to network softwarization of IMT-2020” | Published | 14 July 2017 |
| Frameworks | Y.IMT2020-frame, “Framework of IMT-2020 network” | Ongoing | Apr-2018 |
| Requirements | Y.3101, “Requirements of IMT-2020 network” | Consented | 17 Nov-2017 |
| Architecture | Y.IMT2020-arch, “Architecture of IMT-2020 network” | Ongoing | Nov-2018 |
| Orchestration for slices | Y.NSOM, “Network slicing orchestration and management:” | Ongoing | Apr-2018 |
| Framework for multiple slice support | Y.IMT2020-MultiSL, “Framework for the support of Multiple Network Slicing” | Ongoing | Jul-2018 |
| Requirements of network capability exposure | Y.IMT2020-CE-Req, “Requirements of network capability exposure in IMT-2020 networks” | Ongoing | Nov-2018 |
| Potential directions | Y.3150, “High level technical characteristic of network softwarization for IMT-2020” | Consented | 17 Nov-2017 |
| Y.AMC, ”Requirements and Architectural Framework for Autonomic Management and Control of IMT-2020 Networks” | Ongoing | Jul-2018 |
| Y.IMT2020-ADDP, “Advanced Data Plane Programmability for IMT-2020” | Ongoing | 2019 |
| Y.IMT2020-CEF, “Network capability exposure function in IMT-2020 networks” | Ongoing | 2019 |
| Y.IMT2020-BM, “Business models of IMT-2020” | Ongoing | Apr-2018 |

*Extracted from* ‘*Technical Packages on IMT-2020 by WP1/13’ (Nov 2017)*

1. Technical Package – Fixed Mobile Convergence (FMC)

This package focuses on the fixed mobile convergence in future networks, which includes requirement, architecture and other related technologies for FMC. The planned outputs and progresses are in the following table:

**Table 2 Documents and progressed in TP-FMC**

| **Area** | **Full title of document** | **Status(Nov.)** | **Approved/Planned** |
| --- | --- | --- | --- |
| Requirements for FMC |  Y.3130, “Requirements of IMT-2020 fixed- mobile convergence” | Consented | 17 Nov-2017 |
| Arch for FMC | Y.FMC-ARCH Functional architecture for supporting fixed mobile convergence in IMT-2020 networks | Ongoing | Nov-2018 |
| Mobility management | Y.MM-RN - Mobility management framework over reconfigurable networks | Ongoing | Nov-2018 |
| Mobility management | Y.FMC-MM - Mobility management for fixed mobile convergence in IMT-2020 networks | New WI | 2019 |
| Requirements on mgm | Y.FMC-MO-req, “IMT-2020 FMC functional requirements for management and orchestration” | New WI | Nov-2018 |
| Service scheduling | Y.FMC-SS, “Service scheduling for supporting FMC in IMT-2020 network” | New WI | 2019 |
| Capability exposure  | Y.FMC-CE, “Capability exposure enhancement for supporting FMC in IMT-2020 network” | New WI | 2019 |

*Extracted from* ‘*Technical Packages on IMT-2020 by WP1/13’ (Nov 2017)*

1. Technical Package – Information Centric Networking (ICN)

This package focuses on the Information Centric Networking in future networks, which includes Data aware networking, overview, gap analysis and other related technologies. The planned outputs and progresses are in the following table:

**Table 3 Documents and progressed in TP-ICN**

| **Area** | **Full title of document** | **Status(Nov.)** | **Approved/Planned** |
| --- | --- | --- | --- |
| Data Aware Networking | Y.3071, “Data Aware Networking (Information Centric Networking) - Requirements and Capabilities” | Published | 29 March 2017 |
| ICN | Y.3070-series supplement “Information-Centric Networking - Overview, Standardization Gaps and Proof-of-Concept | Ongoing | Apr-2018 |
| Y.ICN-FnChain "Framework for service function chaining in ICN" | Ongoing | Nov-2018 |
| Y.ICN-ReqN "Requirements of ICN naming and name resolution in IMT- 2020" | Ongoing | Nov-2018 |
| Y.ICN-DS-framework "Framework for Directory Service for Management of a Huge Number of Heterogeneously Named Objects in IMT-2020" | Ongoing | Nov-2018 |
| Y.SuppICN-PoC-DaaS "PoC for IoT Data as a Service using ICN in IMT- 2020" | Ongoing | Apr-2018 |

*Extracted from* ‘*Technical Packages on IMT-2020 by WP1/13’ (Nov 2017)*

1. Technical Package (under consideration) – QoS

This package focuses on the QoS in IMT-2020 networks, and for now there is only one on-going work item of ‘IMT-2020 network QoS monitoring architectural framework’ (planned date: July, 2018), and whether this topic should be attributed to one independent technical package is under consideration.

# 2 Key points of China Mobile’s work related to 5G networks in 3GPP

China mobile has been promoting the progress of 5G standards, including taking the rapporteur responsibility of several key work, such as 3GPP SA1 5G NEO requirement, SA2 5G system architecture and CT 5G work.

China mobile proposes and promotes service-based architecture as 5G system architecture, and contributes many technical solutions and promote some 5G key features especially on session management, network slicing, service framework, PCC, UDR, edge computing, interworking, 5G voice and short message,

Besides operators and vendors, many researchers from the schools and research institutes are active in ITU-T, and many open topics can be studied and explored. Meanwhile, 3GPP more focuses on some urgent features to be standardized. Currently, the technical cooperation between ITU-T and 3GPP is usually using liaisons. Some new approaches on the cooperation are suggested to be figured out, like how to together work out the specification, how to output the research results to 3GPP.

# 3 Key points of China Mobile’s work related to 5G transport networks in ITU-T

Since ITU-T as a leading standard organization on optical transport and access network, China mobile has been promoting SG15 to study the 5G transport requirement and network architecture since the plenary meeting in June 2017. Many contributions had been submitted to the past two plenary meeting and one interim meeting of SG15, to discussing transport requirements and new technical solutions for the next generation of transport network for IMT-2020/5G and DCI.

5G transport and data center interconnection have many new requirements on transport network in many aspects, such as bandwidth, latency, network slicing, management & control, and synchronization. In order to address these requirements and had an good evolution of 4G mobile transport network, a new transport network technology named Slicing Packet Network (SPN) are proposed to be considered and developed in SG15 by many sector members. In last SG15 close plenary meeting in Feb. 9th, 2018, as a result of discussion of contributions of SPN and other technologies, SG15 Q11 established a new recommendation project G.ctn5g for the characteristics of transport networks to support IMT-2020/5G. This is an important milestone. In order to meet the requirement of 5G deployment, based on the new work item, we hope ITU-T can establish SPN standards including OAM, protection, synchronization, management further.

# 4 Proposals on strengthening cooperation between ITU-T and other SDOs on activities of IMT-2020

Based on the above introductions, this contribution proposes to strengthen cooperation with other international standardization organizations on activities of IMT-2020 with positive and double win spirit, to ensure the productive and practical standard solution to the global ICT industry. Specific proposals are provided as follows:

1. A white paper on standard strategy related to “IMT-2020 network” is advised to be drafted, published and updated annually by ITU-T, and this work is suggested to be taken by TSAG Rapporteur Group on Standardization Strategy (RG-StdsStrat);
2. Timely update the progress of standardization outputs in ITU-T SG13 and other related SGs, especially the consented standard recommendations, to inform other SDOs related work and achievements;
3. Related to IMT-2020 network, ITU-T has already published several basic and essential recommendations, such as “Terms and definitions for IMT-2020 network” (Y.3100), “Requirements of IMT-2020 network” (Y.3101) etc., which can be highly recommended as the fundamental documents for other SDOs’ work for reference. In this way, ITU-T can expand influence in the area of IMT-2020.
4. Explore the potential approach to cooperate with other SDOs to work together to output some Standard Recommendations or specifications, especially on terms, requirements and high level architecture.
5. Strengthen the research and accelerate the Recommendations of advanced IMT-2020 network, and strengthen the cooperation with other SDOs (e.g., 3GPP) on the technical areas in Fixed mobile convergence, network slicing, ICN, orchestration.
6. Strengthen the cooperation with other Open Source organizations (e.g., ONAP) on the network slicing and orchestration.
7. Considering open and exploring research work, explore the potential approach to output achievements to other SDOs beyond liaisons.
8. Accelerate the developing of new Recommendations with new technologies on IMT-2020 transport network to meet the requirements from many ITU members. It’s suggested that ITU-T SG15 should be more open to new technologies.

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