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PROPOSED MODIFICATION TO WTSA-16 RESOLUTION 92 ENHANCING THE STANDARDIZATION ACTIVITIES IN THE ITU TELECOMMUNICATION STANDARDIZATION SECTOR RELATED TO NON-RADIO ASPECTS OF INTERNATIONAL MOBILE TELECOMMUNICATIONS

PROPOSED MODIFICATION TO DRAFT PACP (APT WTSA20-WG3-IM/TMP-03)

1. Abstract

During the 2nd Meeting of the APT Preparatory Group for WTSA-20 (APT WTSA20-2), China and Korea proposed contributions to revise the Resolution 92. Based on the outpout of the joint drafting group, a Candidate draft PACP of Resolution 92 was prepared for inviting the comments. Some changes have been proposed in the candidate for draft PACP in yellow colour which mainly proposes to suggest following changes:

1) To address the standardization work in the aspects beyond IMT-2020 with the proposed term "IMT-2020 and beyond".
2) To describe the standardization progress of ITU-T on IMT-2020 related subjects in this study period.
3) To address the new subjects on IMT-2020 and beyond, which are to be extended and evolved in ITU-T SG13, SG11 and other study groups.
4) To strengthen the role and responsibility of ITU-T SG17 on IMT-2020 security.

2. Introduction

IMT-2020 is the term which includes systems, system components, and related technologies that support to provide far more enhanced capabilities than those described in ITU-R M.1645. IMT-2020 is being utilized widely in the emerging networks, making positive and important contribution to the United Nations Sustainable Development Goals (SDGs) and World Summit on the Information Society (WSIS) action lines. ITU-T has been recognized as an important and valuable role to advance the standardization work on IMT-2020. In 2012, ITU established the project to advance the global research and development on IMT-2020. In 2015, ITU-T SG13 established the Focus Group on IMT-2020 (FG IMT-2020) to study the non-radio aspects of IMT-2020. In 2016, a new Resolution on enhancing the standardization activities related to non-radio aspects of IMT (especially IMT-2020) was approved as Resolution 92 of WTSA-16.

In this study period, ITU-T SG13, SG11, SG17 and other study groups have made great progress on the standardization work related to non-radio aspects of IMT-2020, in the various

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forms of Recommendation, Supplement, Technical Report, Focus Group, Workshop, Joint Coordination Activity, etc.

ITU-T SG13 progressed the study of non-radio aspects of IMT-2020 with the Working Party on IMT-2020 Networks & Systems (WP1/13), which consists of the following Questions: (1) IMT-2020: Network requirements and functional architecture; (2) Network softwarization including software-defined networking, network slicing and orchestration; (3) Upcoming network technologies for IMT-2020 and Future Networks; (4) Fixed-Mobile Convergence including IMT-2020; (5) Quality of service (QoS) aspects including IMT-2020 networks. By March 2020, ITU-T SG13 has approved 35 Recommendations and 5 Supplements on IMT-2020, also has 41 work items under development, and three published flipbooks on IMT-2020. In addition, the Focus Group on Machine Learning for Future Networks including 5G (FG-ML5G) was established to look into the networks self-training and self-organizing as applied to IMT-2020; the Joint Coordination Activity on IMT2020 (JCA-IMT2020) was established to maintain the IMT-2020 roadmap collecting the standardization efforts on IMT-2020 in ITU-T and other standards development organizations (SDOs).

Further, ITU-T SG13 also progressed the study of non-radio aspects of IMT-2020 networks on the issue of end-to-end cloud computing management, cloud security and big data governance performance management with the Working Party (WP2/13), which deals with network function virtualization and QoS and performance management in multiple-cloud scenario.

ITU-T SG11 progressed the study of signalling and protocol aspects of IMT-2020 with the Working Party on Control and management protocols for IMT-2020 (WP2/11), which has conducted studies on signalling requirements and protocols for IMT-2020 network, including network slicing, network capability exposure, fixed-mobile convergence, content discovery, distribution and delivery, edge computing, etc.. By March 2020, ITU-T SG11 has approved 4 Recommendations on IMT-2020, also has 8 work items under development.

ITU-T SG17 progressed the study of security aspects of IMT-2020/5G network and applications. By March 2020, ITU-T SG17 has 5 work items on IMT-2020/5G under development.

In consideration of all the above standardization progress on IMT-2020, it is clear that Resolution 92 has been playing a very instrumental role in the past four years in guiding and facilitating IMT-2020 related study in various study groups of ITU-T. Some of the tasks defined by current Resolution 92 are close to being completed, we believe that ITU-T needs this Resolution after being updated and reinforced in its long-term strategies towards ICT development to provide continuous guidance to standardization work in various study groups and focus groups of ITU-T.

In the next study period, the current Questions in ITU-T SG13 and SG11 related to IMT-2020 will extend the Terms of Reference (ToR) by introducing new subjects of IMT-2020 and beyond. The following new subjects of IMT-2020 and beyond have reached consensus in the study group-level discussion of ToR for the next study period.

1) Fixed, mobile and satellite convergence;
2) Network digital transformation;
3) Artificial intelligence (AI) / machine learning (ML) enhanced networks and signalling;

4) Big data enhanced networks and signalling;
5) Distributed ledger technology (DLT) enhanced networks;
6) Quantum information technologies (QIT).

In addition, Industrial Internet Networking and Vehicular Networking are new subjects of IMT-2020 and beyond which have aroused widespread interest in recent years. Standardization activities on these subjects will promote the application and evolution of IMT-2020 networks and network technologies.

With regard to the security aspects, security and trust have become the primary concern in IMT-2020/5G networks today as risks can have high consequences. The 11th annual ITU-T CTO meeting held in Budapest on 8 September 2019 agreed the Communiqué as posted in SG17-TD2714, part of which addressed the IMT-2020/5G era security as follows.

For 5G security, the CTO meeting endorsed the findings of the Ottawa Accord in relation to three security priorities:

- *Global threat exchange: Common understanding of security threats and common terminology to enable the sharing of threat intelligence.*
- *Best practices for operational security: Best practices for 5G security and widespread commitment to infrastructure protection.*
- *Security incentives: Measurement schemes based on agreed metrics could bring attention to prevailing levels of security and create incentives for investment in security.*

CTOs highlighted the alignment of these three priorities with the priorities of the ITU standardization expert group for 'security', ITU-T Study Group 17.

WTSA-16 Resolution 92 clearly instructs ITU-T SG17 "to promote the studies on standardization activities related to IMT network and applications security". There are several SDOs working on 5G security: 3GPP SA 3, GSMA, IEEE, IETF, etc. Especially, 3GPP SA3 is working on release 16 for 5G security.

As the lead study group on security, ITU-T SG17 needs to take follow-up activities to implement the priorities described in this CTO Communiqué, and consider to conduct security coordination activities in ITU-T among relevant SDOs during the development of security standards for IMT-2020/5G and beyond, especially between ITU-T SG17 and 3GPP SA3 in the area of security for IMT-2020/5G and beyond as a long term approach.

With the discussion above, we would like to propose that ITU-T should make the best use of WTSA-20 as an opportunity to review the existing Resolution 92 by adding new instructions and contents to it, including the new subjects addressed above, so that it can be refreshed, enhanced and strengthened in order to be able to guide ITU-T's standardization work in IMT-2020 and beyond related subjects in the next study period. In this way, ITU-T could continue to play a prominent role in facilitating the wide application of IMT-2020 in ICT related industries.

3. Proposal

It is suggested that APT members propose to revise Resolution 92 in following aspects:

1) To address the standardization work in the aspects beyond IMT-2020 with the proposed term "IMT-2020 and beyond".

2) To describe the standardization progress of ITU-T on IMT-2020 related subjects in this study period, including the areas of network, signalling and security, as the foundation of further standardization activities on IMT-2020 and beyond.

3) To address the new subjects on IMT-2020 and beyond, which are to be extended and evolved in ITU-T SG13, SG11 and other study groups in the next study period, including fixed, mobile and satellite convergence, network digital transformation, Industrial Internet Networking, Vehicular Networking, and application of emerging technologies including AI/ML, big data, DLT, QIT, etc.

4) To strengthen the role and responsibility of ITU-T SG17 on IMT-2020 security, and to promote the coordination and cooperation on IMT-2020 security in ITU-T, and among ITU-T and other SDOs.

[Editor's Note] The term "IMT-2020 and beyond" is for further consideration.

[Contributor's Note:

1. The proposed modifications of India supplement the efforts of China and Korea and has been highlighted in yellow background.

2. In the proposed modifications of other Resolutions (viz. WTSA Resolution 60), the term "Future Networks including IMT-2020" has been used in place of the term "IMT-2020 and beyond".][Editor's Note] Whether to specify the detailed subjects and technologies in network aspect and signalling aspect in Resolution 92 is for further consideration.

[Editor's Note] The proposal regarding the new JCA IMT-2020-SEC is for further consideration.

Annex

MOD

RESOLUTION 92 (HYDERABAD, 2020)

Enhancing the standardization activities in the ITU Telecommunication Standardization Sector related to non-radio aspects of international mobile telecommunications

(Hammamet, 2016; Hyderabad, 2020)

The World Telecommunication Standardization Assembly (Hyderabad, 2020),

considering

a) that International Mobile Telecommunications (IMT) is the root name that encompasses IMT-2000, IMT-Advanced and IMT-2020, collectively (see Resolution ITU-R 56 (Rev. Geneva, 2015) of the Radiocommunication Assembly);

b) that IMT systems have contributed to global economic and social development, and are intended to provide telecommunication services on a worldwide scale, regardless of location, network or terminal used;

c) that IMT-2020 is being utilized widely to build a user-centred information ecosystem, and it will make a positive and important contribution to the United Nations Sustainable Development Goals (SDGs) and World Summit on the Information Society (WSIS) action lines;

d) that the ITU Telecommunication Standardization Sector (ITU-T) is actively continuing its studies on mobility and overall network aspects of IMT, and in 2015 initiated the study of non-radio aspects of standardization for IMT-2020 and beyond;

e) that the ITU-T study groups and ITU Radiocommunication Sector (ITU-R) Study Group 5 have had, and continue to have, effective informal coordination via liaison activity with respect to the development of Recommendations relating to IMT for both Sectors;

f) that Recommendation 207 (Rev. WRC-19) of the World Radiocommunication Conference, on the future development of IMT for 2020 and beyond, is foreseen to address the need for higher data rates, corresponding to user needs, as appropriate, than those of currently deployed IMT systems;

g) that the development of a roadmap for all standards activities relating to IMT in ITU-R and ITU-T, to independently manage and advance their work on IMT and to coordinate it so as to ensure full alignment and harmonization of the work programmes within a complementary framework, is an efficient means of achieving progress in both Sectors, and that such a roadmap concept facilitates the communication of issues relating to IMT with organizations external to ITU;

h) that Resolution 43 (Rev. Buenos Aires, 2017) of the World Telecommunication Development Conference (WTDC) acknowledged the continuous need to promote IMT throughout the world, and in particular in developing countries[1];

i) that Resolution 130 (Rev. Dubai 2018) of the Plenipotentiary Conference on Strengthening the role of ITU in building confidence and security in the use of information and communication technologies;

j) that the ITU-R Handbook on Global Trends in International Mobile Telecommunications defines IMT and provides general guidance to relevant parties on issues related to the deployment of IMT systems and for the introduction of their IMT-2000, IMT-Advanced and IMT-2020 networks;

k) that Study Group 1 of the ITU Telecommunication Development Sector (ITU-D) is currently involved in activities closely coordinated with ITU-T Study Group 13 and ITU-R Study Group 5 in order to identify the factors influencing the effective development of IMT (especially IMT-2020), for developing countries;

l) that IMT systems are now being evolved to provide diverse usage scenarios and applications such as enhanced mobile broadband, massive machine-type communications and ultra-reliable and low-latency communications, and a substantial number of countries have started implementing these;

m) that ITU-T Study Group 13 progressed the study of non-radio aspects of IMT-2020 through the establishment of the Working Party on IMT-2020 Networks & Systems, which is mandated (1) to develop the network requirements and functional architecture of IMT-2020, (2) to study network softwarization including software-defined networking (SDN) network slicing and orchestration, (3) to study upcoming network technologies including information-centric networking (ICN), (4) to study fixed-mobile convergence (FMC) of IMT-2020, (5) to study quality of service (QoS) of IMT-2020 including end-to-end performance and management of QoS in multi-cloud; through the establishment of the Focus Group on Machine Learning for Future Networks including 5G (FG-ML5G); also through the establishment of Joint Coordination Activity on IMT2020 (JCA-IMT2020);

n) that ITU-T Study Group 11 progressed the study of signalling and protocol aspects of IMT-2020 through the establishment of the Working Party on Control and management protocols for IMT-2020, which is mandated (1) to study control and management technologies for IMT-2020 including network slicing, network capability exposure, virtual resource management and orchestration, (2) to study network attachment including mobility and resource management for IMT-2020, (3) to study distributed content networking and ICN for IMT-2020, including end-to-end multi-party communications;

o) that Industrial Internet Networking and Vehicular Networking related standardization activities are progressed on the basis of IMT-2020 network in various study groups of ITU-T;

p) that ITU-T Study Group 17 is responsible for building confidence and security in the use of ICTs, especially IMT-2020,

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1 These include the least developed countries, small island developing states, landlocked developing countries and countries with economies in transition.

noting

a) Resolution 18 (Rev. Hammamet, 2016) of this assembly, on principles and procedures for the allocation of work to, and coordination between, ITU-R and ITU-T;

b) Resolution 59 (Rev. Buenos Aires, 2017) of WTDC, on strengthening coordination and cooperation among the three ITU Sectors on matters of mutual interest;

c) Recommendation ITU-T A.4, on the communication process between ITU-T and forums and consortia;

d) Recommendation ITU-T A.5, on generic procedures for including references to documents of other organizations in ITU-T Recommendations;

e) Recommendation ITU-T A.6, on cooperation and exchange of information between ITU-T and national and regional standards development organizations;

f) Recommendation ITU-T A.7, on the establishment and working procedures of focus groups, and Amendment 1: Appendix I Guidelines for the efficient transfer of focus group deliverables to its parent group;

g) CTO meeting Communique (8 September 2019, Budapest, Hungary), highlighting the alignment of these three priorities on IMT-2020 security with the priorities of the ITU standardization expert group for 'security', ITU-T Study Group 17,

resolves to invite the Telecommunication Standardization Advisory Group

1 to facilitate coordination of the standardization activities related to the non-radio side of IMT (especially IMT-2020 and beyond) among all relevant study groups, focus groups, joint coordination activities, etc.;

2 to encourage, in cooperation with Study Group 13 and other relevant study groups, collaboration with other standards development organizations (SDOs) on a wide range of issues associated with the non-radio aspects of IMT-2020 and beyond,

instructs study groups of the *ITU Telecommunication Standardization Sector*

1 to strengthen the cooperation and coordination on IMT (especially IMT-2020 and beyond) standardization activities with a positive and double-win spirit, in order to ensure a productive and practical standard solution for the global ICT industry;

2 to promote efficiently the standardization research work on the non-radio side network technologies of IMT;

3 to be responsible for the research and annual reporting of ITU-T's standards strategy on IMT,

instructs Study Group 11

1 to promote the studies on signalling requirements and protocols for IMT-2020 and beyond, including management and control for network slicing, network capability exposure, fixed-mobile convergence, content discovery, distribution and delivery, edge computing, Industrial Internet Networking, Vehicular Networking, and application of emerging technologies including artificial intelligence (AI) / machine learning (ML), big data, quantum information technologies (QIT), etc. in signalling and protocol aspects;

2 to promote the studies on testing frameworks, specifications, methodologies, capabilities and interoperability for IMT-2020 and beyond,

instructs ITU-T Study Group 12

to promote the studies on standardization activities related to the non-radio aspects of IMT (especially IMT-2020 and beyond) service, QoS and quality of experience (QoE),

instructs Study Group 13

1 to maintain the roadmap of IMT standardization activities in ITU-T, which should include work items to progress standardization work related to the non-radio side of IMT, and share this with relevant groups of ITU-R and ITU-D as the mission of the lead group for IMT (especially IMT-2020 and beyond);

2 to promote the studies on network requirements and architecture, network softwarization, gap analysis of existing network functions and of future requirements, defining new network functions to meet future requirements, enabling more elastic and resilient network function infrastructure for ensuring stateless network functions, virtualisation of all network functions (network function virtualization), network slicing, network capability exposure, network management and orchestration, fixed, mobile and satellite convergence, network digital transformation, network aspects of QoS including performance and management of QoS in multi-cloud, Industrial Internet Networking, Vehicular Networking, and application of emerging technologies including ICN, AI/ML, big data, distributed ledger technology (DLT), QIT, etc. in network aspects, for IMT-2020 and beyond and standardization thereof;

3 to promote JCA IMT-2020 and coordinate the standardization activities of IMT (especially IMT-2020 and beyond) among all relevant study groups, focus groups and other SDOs,

instructs Study Group 15

to promote the studies on IMT's fronthaul and backhaul network standardization activities, including transport network requirements, architecture, characteristics, technologies, management and control, synchronization, etc., especially for IMT-2020 and beyond,

instructs Study Group 17

1 to promote the studies on standardization activities related to IMT (especially IMT-2020 and beyond) network and applications security;

2 to develop the standardization roadmap dedicated to IMT-2020 security;

3 to explore coordination or collaboration actions with other SDOs such as 3GPP SA3 in the course of development of 3GPP Specifications or ITU-T Recommendations;

4 to establish the Joint Coordination Activity for IMT-2020 Security (JCA IMT-2020-SEC) dedicated to IMT-2020 security among all relevant study groups, focus groups and other SDOs in collaboration with JCA-IMT2020 on general issues,

instructs the Director of the Telecommunication Standardization Bureau

1 to bring this resolution to the attention of the Directors of the Radiocommunication Bureau and the Telecommunication Development Bureau;

2 to conduct seminars and workshops on the standard strategic, technical solutions and network applications for IMT (especially IMT-2020 and beyond), taking into account specific national and regional requirements,

encourages the Directors of the three Bureaux

to investigate new ways to improve the efficiency of ITU work on IMT,

invites Member States, Sector Members, Associates and academia

1 to participate actively in the standardization activities of ITU-T on developing Recommendations on non-radio aspects of IMT;

2 to share standard strategy, network evolution experience and application cases of IMT in relevant seminars and workshop events.