Need for technical guide for effective participation in developing IMT-2020.

presented at the 6th Africa Regional meeting of Q5/13 ITU-T, 26-27 March 2018, in Cote D'ivore

BY

ENGR CHARLES CHIKE ASADU

ICT/INNOVATION CENTRE, UNIVERSITY OF NIGERIA, NSUKKA

Chike.asadu@unn.edu.ng

chikecasadu@yahoo.com

+234 7061262244

1956 2016
CCITT / ITU-T

ITU

CONTENT

1. INTRODUCTION
2. FG IMT-2020 RECOMMENDATIONS
3. New Structure of Study Group 13
4. Activities of Q20/13
5. Proposal for a Technical Guide to IMT-2020
6. Technical Packages on IMT-2020 by WP1/13

INTRODUCTION

ITU-T Study Group 13 leads ITU's standardization work on next-generation networks and now caters to the evolution of next-generation network (NGN) , while focusing on future networks and network aspects of mobile telecommunications.

NGN refers to the worldwide move from circuit-switched to packet-based network. The migration to NGNs has reduced service providers' CAPEX and OPEX costs and enabled the rollout of a rich variety of services.

Reduced energy consumption was a priority addressed early in the development of NGN standards and in this respect NGNs have proven far superior to traditional networks.

INTRODUCTION

Today, SG13 focuses on future networks (FNs) – networks of the future beyond NGN – expected to enjoy early realization sometime around 2020 in prototyping or phased deployments.

The group is standardizing FNs with the objectives of service, data, environmental and socio-economic awareness. This study resulted in the completion of standardization efforts to support network virtualization, energy saving for FNs, and an identification framework.

 Future plans are to develop different facets of the smart ubiquitous network, requirements of network virtualization for FNs, framework of telecom SDN (software-defined networking) and requirements of formal specification and verification methods for SDN

INTRODUCTION

ITU-T Study Group 13 (SG13) established an ITU-T Focus Group on IMT-2020 (FG IMT-2020) in May 2015 to identify wireline standards gaps to be filled in the development of International Mobile Telecommunications (IMT) for 2020 and beyond – '5G'.

The Focus Group lifetime was extended by one year, until the end of 2016 after their report was received in November 2015

The Focus Group submitted nine deliverables for consideration by the first meeting of ITU-T Study Group 13 in the 2017-2020 study period

INTRODUCTION

Management team of the FM-IMT 2020

FG IMT-2020 RECOMMENDATIONS

The recommendations to SG13 of each of the Deliverables include:

- Draft Terms and definitions for IMT-2020 in ITU-T that describes discussion results on terms and definitions for IMT-2020

- Draft Technical Report on Application of network softwarization to IMT-2020 that describes technological developments related to network softwarization (standardization activities, open source projects, prototyping activities, and work in-progress research projects) and technical aspects (vertical extension of slicing, horizontal extension of slicing, and application scenario of network softwarization).

- Draft Recommendation on Requirements of IMT-2020 from network perspective that specifies the design goals as key principles of IMT-2020 networks and focused on the high level requirements from the view of network operations as well as services for the overall aspects of IMT-2020 networks.

- Draft Recommendation on Framework for IMT-2020 network architecture which defines the framework of IMT-2020 network architecture including related functional entities and reference points.

- Draft Recommendation on Requirements of IMT-2020 fixed mobile convergence which aims to define the requirements on IMT-2020 fixed and mobile convergence over cellular access, fixed access and WLAN access networks. This document will address, but not limited to, consistent users experience, access independence, unified user plane, connection management, interworking, and charging and accounting for fixed and mobile convergence in IMT-2020.

FG IMT-2020 RECOMMENDATIONS

- Draft Technical Report on Unified network integrated cloud for fixed mobile convergence which proposes a technical report on a unified cloud based Fixed and Mobile Convergence architecture in IMT-2020 which includes the motivation of the architecture and the related key technologies.

- Draft Recommendation on IMT-2020 network management requirements that describes network management requirements based on the implementation scenario of IMT-2020. IMT-2020 network management should involve a combination of existing and evolving systems, like LTE-Advanced, Wi-Fi and Fixed Network, coupled with new, revolutionary technologies designed to meet new requirements, such as low latency and massive connectivity.

- Draft Recommendation on Network management framework for IMT-2020 that describes general aspect of Network Management Framework for IMT-2020

- Draft Technical Report on Application of information centric networking to IMT-2020 which document describes the five Proof Of Concept (PoC) performed for the ITU-T Focus Group on IMT-2020 by several of the participating organizations

New Structure of Study Group 13

At the February 2017 meeting, the chairman ITU-T SG 13 announced the New Structure of Study Group 13

New Structure of Study Group 13

WP	Title	Questions
1	IMT-2020 Networks & Systems	Q.6: Quality of service (QoS) aspects including IMT-2020 networks
		Q.20: IMT-2020: Network requirements and functional architecture
		Q.21: Software-defined networking, network slicing and orchestration
		Q.22: Upcoming network technologies for IMT-2020 and future networks
		Q.23: Fixed-mobile convergence including IMT-2020
2	Cloud Computing & Big Data	Q.7: Big data driven networking (bDDN) and deep packet inspection (DPI)
		Q.17: Requirements, ecosystem, and general capabilities for cloud computing and big data
		Q.18: Functional architecture for cloud computing and big data
		Q.19: End-to-end cloud computing management and security
3	Network Evolution & Trust	Q.1: Innovative services scenarios, deployment models and migration issues based on future networks
		Q.2: Next-generation network (NGN) evolution with innovative technologies including software-defined networking (SDN) and network function virtualization (NFV)
		Q.5: Applying networks of future and innovation in developing countries
		Q.16: Knowledge-centric trustworthy networking and services

10

1956 2016
CCITT / ITU-T

Activities of Q20/13

At the February 2017 meeting, the following Output documents were proposed:

- New draft Rec. Y.IMT2020-terms - Terms and Definitions for IMT-2020
- New draft Rec. Y.IMT2020-reqts - requirements for IMT-2020
- New draft Rec. Y.IMT2020-frame – framework for IMT-2020
- New draft Rec. Y.IMT2020-arch - functional architecture
- New draft Rec. Y.IMT2020-CE-Req - Requirements of Capability Exposure for IMT-2020
- New draft Rec. Y.IMT2020-CEF - Capability Exposure Function in IMT-2020 networks

Activities of Q20/13

At the July 2017 meeting, Q20 also had a joint session with Q.2, Q21, and Q23 to discuss IMT-2020 orchestration and management issues. The agenda for the joint session is available as 14819-TD-12.

Output documents of this meeting include:
- TD XX (WP1/13): Draft Rec. Y.IMT2020-terms
- TD XX (WP1/13): Draft Rec. Y.IMT2020-reqts
- TD XX (WP1/13): Draft Rec. Y.IMT2020-frame
- TD XX (WP1/13): Draft Rec. Y.IMT2020-CE-Req
- TD XX (WP1/13): Draft Rec. Y.IMT2020-CEF
- TD XX (WP1/13): Draft Rec. Y.IMT2020-BM

Activities of Q20/13

Recall that at the Egypt meeting – may 2017, university of Nigeria proposed in their contribution is to underline the need for relevant groups to provide adequate identification, proper definition and detailed description, together with precise specification for the purposes of increasing the level of awareness and understanding of African administrators in other that they may be able to critically review existing requirements and technologies inherent in IMT–2000 and hence be able to make realistic contributions.

Furthermore, in order to make inputs into the documents of Q20/13, it is imperative that considerations should be given to the provisions of IMT–2020 in terms of access in rural areas and in developing countries, with low cost networks, deployment and capabilities; requirement in terms of architecture and software application development for the networks. These are all necessary in addition to identifying the relevant use cases which bear on the involvement in various potential business roles and the migration of the existing networks to IMT–2020 in a step-wise fashion, with the satellite component.

It has to be noted that still with this request, there are very little or no contributions from Africa

Activities of Q5/13

- In line with the desire that Africa participates actively in the development of IMT-2020, a proposal was made to Q5/13 on the development of a handbook to aid developing countries to follow-up activities of SG13 on IMT-2020 ISSUES.

- This proposal was however stepped down in favour of a technical guide that will be useful to all and not restricted to Africa or developing countries.

Proposal for a Technical Guide to IMT-2020

- A Technical Guide is hereby proposed for Q5/13

- The document to this effect is SG13-C.n for adoption and further correction as discussed in the SG 13 November 2017 meeting

Proposal for a Technical Guide to IMT-2020

The chapters as highlighted in the document will include :–

- basic Concepts and history of mobile communication, IoT, role of internet in modern communications, internet protocols, smart cities, Robots
- radio standard organisations
  - history of standardisation in radio operation
  - radio standard organisations
  - Basic issues on IMT-2020 Network requirements and Architecture
  - Thematic areas of interest in IMT-2020 network for developing countries
  - relevant use cases, focused on the involvement of the various potential business roles, migration from existing networks to IMT-2020
  - 3GPP standards work organization.
  - New Radio Related developments:
  - Services Related issue:

Proposal for a Technical Guide to IMT-2020

- Deployments ISSUES
- Review of activities of SG 13 on:
    - FG-SDN
    - SG 13 QUESTION ON – DATA, TRUST, ETC
- Synopses from:
    - workshops of FG IMT-2020
    - workshops of SG 13 ITU-T FEB, JULY, NOVEMBER 2017 meetings amongst others
    - workshops of AFR REG of ITU-T SG 13Q5 – Ghana 2016, Egypt 2017, Cote I'vore 2018 etc
    - REPORTS AND ACTIVITIES OF FGML5G, AND OTHER FGs.

Proposal for a Technical Guide to IMT-2020

It is therefore recommended that Q5/13:

- Accepts to support the proposal for production of technical guide to IMT-2020

- Adopts the attached document with the view to improving it

- Generate rapporteurs for the document

Technical Packages on IMT-2020 by WP1/13

Technology Package: 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

Technical Packages on IMT-2020 by WP1/13

Technology Package: FMC

Area	Full title of document	Status (July 17)	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

Technical Packages on IMT-2020 by WP1/13

Technology Package: FMC

Area	Full title of document	Status (July 17)	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

Technical Packages on IMT-2020 by WP1/13

Technology Package: ICN

Area	Full title of document	Status (Nov'17)	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

THANKS FOR YOUR KIND ATTENTION

ENGR CHARLES CHIKE ASADU

ICT/INNOVATION CENTRE, UNIVERSITY OF NIGERIA, NSUKKA

Chike.asadu@unn.edu.ng

chikecasadu@yahoo.com

+234 7061262244