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| **Keywords:** | SG; Lead Study Group; IMT-2020; 5G; cloud computing; trust and trusted network infrastructures; roadmap; report; workshop; cooperation; |
| **Abstract:**  | This document intends to report a progress to date on each of the lead study group roles of SG13. It covers the period from end of TSAG meeting 26.2 – 2.3.2018 and addresses some anticipated activities. |

# Assigned lead study group activities

WTSA-16 assigned Study Group 13 to be the lead study group:

* on future networks such as IMT-2020 networks (non-radio related parts)
* on mobility management
* on cloud computing
* on trusted network infrastructures

## Lead study group activities on future networks such as IMT-2020 networks (non-radio related parts)

The studies on IMT-2020 networks are being carried out by Q6/13, Q20/13, Q21/13, Q22/13 and Q23/13 belonging to WP1/13.

***SG13 related studies***

SG13 has continued its active role in IMT2020/5G standardization by approving the following new standards since the last TSAG meeting:

* ITU-T Y.2305: Unified management of Content Delivery Networks
* ITU-T Y.3102: Framework of the IMT-2020 network
* ITU-T Y.3103: Business Role-based Models in IMT2020
* ITU-T Y.3170: Requirements of machine learning based QoS assurance for IMT-2020 network
* ITU-T Supplement 47 to Y.3070-series: Information Centric Networking: Overview, Standardization Gaps and Proof-of- Concept
* ITU-T Supplement 48 to Y.3070-series: Proof-of-Concept for Data Service using Information Centric Networking in IMT-2020

Further recommendations have been consented for last call. AAP will end on 13 December 2018:

* ITU-T Y.2242: Service function chaining in mobile network
* ITU-T Y.3104: Architecture of the IMT2020 network
* ITU-T Y.3105: Requirements of capability exposure in the IMT-2020 network
* ITU-T Y.3112: Framework for the support of Network Slicing in the IMT-2020 network
* ITU-T Y.3324: Requirements and Architectural Framework for Autonomic Management and Control of IMT-2020 Networks

Currently progressing work items include FMC (Y.FMC-arch,-MM,- ReqMo,-EC,-CE, -SS,-SM), Softwarization (Y.IMT2020-ESDP, -CEF, -ADPP,Y.3MO, Y.NetSoft-SSSDN, -SSMO), QoS (Y.IMT2020 QoS-mon, -fa) and ICN (Y.ICN-ReqN, -FnChain, -DS-Frame, -RF, -TL, -Edge). For details see SG13 work program which can be found at SG13 homepage.

Considering the activities related to IMT, the development of Q.174X-series of Recs in collaboration with organizational partners of 3GPP and 3GPP2 (ARIB, ETSI, TIA, ATIS, TTC, TTA, CCSA) is currently on hold due to lack of editors.

***IMT-2020/5G related Correspondence activities with other ITU-T Study Groups***

SG2 and SG13 have established at their meetings in July 2018 a correspondence group to tackle network management issues for IMT2020/5G. This group intends to bundle the expertise of SG2 and SG13 experts on this topic, in particular to mutual review and progress studies related to common scope. A first successful example of this common activity is recommendation ITU-T Y.3324, which is currently in AAP.

A similar co-operation is intended to becoming established between SG13 and SG5. Exchange between experts of SG5 and SG15 related to potential study aspects in common is still ongoing

***JCA IMT-2020***

In order to promote JCA activities JCA IMT2020 has started to meet not only during SG13 meetings but also alongside other Group meetings. In particular, JCA IMT2020 has met in September 2018 alongside Q4/11 in Beijing and during SG15 meeting in Geneva in October 2018.

A number of inputs were agreed for incorporation into the IMT2020 standardization roadmap. JCA IMT2020 has agreed to folder the SDN standards roadmap, which was inherited from JCA-SDN, into the IMT2020 standardization roadmap. The latest revision of roadmap on IMT2020 can be found on <https://www.itu.int/net4/ITU-T/roadmap#?topic=0.130&workgroup=1&searchValue=&page=2&sort=Revelance>

Next meeting of JCA IMT2020 will be alongside SG13 meeting (4-14 March 2019) on 7th March 2019 in Victoria Falls, Zimbabwe.

***IMT2020/5G related activities by other ITU-T study groups***

There are also recommendations and work ongoing in other ITU-T Study Groups, which is related directly or indirectly to IMT2020/5G. Such activities include

* SG2:
M.somm (Framework of smart operation, management and maintenance);
* SG5:
L.5G powering: Sustainable power feeding solutions for 5G network, L.EE\_5G: Energy efficiency Metrics and measurement methodology for 5G base station; L.EE\_slicing: Energy efficiency and Slicing of IMT2020/5G, L.ENV-KPI-5G-ARCH: Environmental KPIs/metrics for 5G architectures, L.1310: Energy efficiency metrics and measurement methods for telecommunication equipment, K.Supp-5G\_EMF\_Compliance: Electromagnetic field (EMF) compliance assessments for 5G wireless networks;
recommendations K.112 , K,116 and K.78 also related to 5G, even the term 5G is not explicitly mentioned in the title;
* SG11:
Q.IMT2020-PFW: Protocol Framework for IMT-2020; Q.NS-LCMP: Protocol for network slice lifecycle management; Q.CE-APIMP: Protocol for managing capability exposure APIs in IMT-2020 network; Q.D2D-EECP: Energy efficient D2D communication protocol for IMT 2020 network; Q.SDN-CT: Framework of SDN controller testing;
* SG12:
G.IMT2020: QoS framework for IMT-2020; G.QoE-5G: QoE factors for new services in 5G networks;
* SG15:
G Suppl.66 on 5G wireless fronthaul requirements in a PON context,
G Suppl.55: Radio-over-fibre (RoF) technologies and their applications, G.9803: Radio over Fiber systems; G.fastback: Transceiver and system specifications for backhaul applications based on G.fast, G.ctn5g: Characteristics of transport networks to support IMT-2020/5G, G.Sup.5gotn: Application of OTN to 5G Transport, G Suppl.56: OTN transport of CPRI signals, GSTR-TN5G: Transport network support of IMT-2020/5G;
* SG17:
x.5Gsec-q: Security guidelines for applying quantum-safe algorithms in 5G systems; X.5Gsec-t: Security framework based on trust relationship in 5G ecosystem
* SG20
Y.IoT-EC-reqts:IoT requirements for edge computing, Y.IoT-EC-GW: Capabilities and framework of edge computing-enabled gateway in the IoT

For further work and more detail, it is referred to the work program of the corresponding group.

## Lead study group activities on mobility management

The studies on mobility management are being carried out by Q.23/13.

SG13 has approved the following new standards since the last TSAG meeting:

* ITU-T Y.2814: Mobility Management framework over reconfigurable networks
* ITU-T Y.2815: Mobility supporting architecture for mobile Peer to Peer service in heterogeneous wireless networks

Q.23/13 progresses work on Y.Suppl.MM-SDN (Supplement on use cases of mobility management over SDN).

## Lead study group activities on cloud computing

The studies on Cloud Computing are being carried out by Q17/13, Q18/13 and Q19/13 belonging to WP2/13.

***SG13 related studies***

SG13 has continued its active role in cloud computing standardization by approving the following new standards since the last TSAG meeting:

* ITU-T Y.3506: Cloud Computing-Functional requirements for cloud service brokerage
* ITU-T Y.3516: Cloud Computing-Overview and functional requirements for data storage federation
* ITU-T Supplement 50 to Y.3650-series: Use case and application scenario of big data driven networking

Further recommendations have been consented for last call. AAP will end on 13 December 2018:

* ITU-T Y.3507: Cloud Computing-Functional requirements of physical machine
* ITU-T Y.3514: cloud Computing-Trusted inter-cloud computing framework and requirements; Corrigendum 1
* ITU-T Y.3517: cloud Computing-Overview of inter cloud trust management
* ITU-T Y.2518: Cloud Computing-Functional requirements of inter-cloud data management
* ITU-T Y.3519: Cloud Computing- Functional architecture of Big Data as a Service
* ITU-T Y.3602: Big Data-Functional requirements for data provenance
* ITU-T Y.3651: Big data driven networking-mobile network traffic management and planning

The Cloud Computing Standard Roadmap is continuously updated. The latest roadmap can be found on the web site (<https://extranet.itu.int/sites/itu-t/Roadmaps/SitePages/JCA-Cloud-Standard.aspx>).

Currently progressing work items include studies on BigData (Y.BDDP-reqts, Y.BD-arch, Y.bDDN-FunArch, Y.bdi-reqts, Y.bdm-sch, Y.sup.bdsr2), on Cloud Computing (Y.cslm-metadata, Y.ccm-reqts, Y.cccsdaom-req, Y.e2efapm, Y.dsf-arch, Y.cccm-reqts, Y.ccdc-reqts, Y.BaaS-reqts, Y.MLaaS-reqts) and on DPI (Y.DpiArchFn, Y.bDPI-Mec, Y.bDDN-req, Y.MecTA-ML). For details see SG13 work program which can be found at SG13 homepage.

***Cloud Computing related activities by other ITU-T study groups***

There are also recommendations and work ongoing in other ITU-T Study Groups, which is related directly or indirectly to Cloud Computing. Such activities include

* SG5:
L.DCIM: Specifications of data centre infrastructure management (DCIM) system based on Big Data and AI technology, L.Proc DC: Procurement Criteria for Sustainable Data Centres, L.SE DC: Smart energy solution for data centre and telecom centre,
Suppl.GreenICT SLQ: Green ICT standards landscape questionnaires, L.AI-Env effects: AI environmental effect on Networks goods and services
* SG9:
TP.b-catv: Broadband CATV system using server-side reception and processing
* SG11:
Q.4042.1: Cloud interoperability testing about web application – part 1: Interoperability testing between CSC and CSP.
* SG12:
Y.cvms: Considerations for realizing virtual measurement systems
* SG16:
F.CCVSReqs: Requirements for cloud computing in visual surveillance, H.VSCC: Architecture for cloud computing in visual surveillance

For further work and more detail, it is referred to the work program of the corresponding group.

**Lead study group activities on trusted network infrastructures**

The studies on trusted network infrastructures are being carried out by Q16/13 belonging to WP3/13.

***SG13 related studies***

SG13 has continued its active role in trusted network infrastructures standardization by approving the following new standards since the last TSAG meeting:

* ITU-T Y.3054: Framework of Trust-based Media Services

One further recommendation has been consented for last call. AAP will end on 13 December 2018:

* ITU-T Y.3053 Amendment 1: Trustworthy networking deployment architecture and procedures

Currently progressing work items include studies on Y.trust-index, Y.trust-arch, Y.QKDN\_FR, Y.SNS-trust, Y.trust-pdm. For details see SG13 work program which can be found at SG13 homepage. It is noted that Y.QKDN\_FR (Framework for Networks to supporting Quantum Key Distribution) is progressed in closed co-operation with SG17.

***Trusted network infrastructures related activities by other ITU-T study groups***

There are also recommendations and work ongoing in other ITU-T Study Groups, which is related directly or indirectly to trusted network infrastructures. Such activities include

* SG11:
Q.SR-Trust: Signalling requirements and architecture for interconnection between trustable network entities.
* SG20:
Y.IoT-IoD-PT: Identity of IoT devices based on secure procedures and ensures privacy and trust of IoT systems

For further work and more detail, it is referred to the work program of the corresponding group.

**Other important activities of SG13 related to its Lead Study Group mandate**

***New Focus Group***

SG13 agreed at its meeting in July 2018 to establish a new Focus Group on Technologies for Network 2030 (FG-NET-2030) with the goal to investigating the future network architecture, requirements, use cases and capabilities of the networks for the year 2030 and beyond (non radio parts). The Focus Group is convened by Dr. Richard Li, Huawei/ China. Further details including ToR can be found at <https://www.itu.int/en/ITU-T/focusgroups/net2030/Pages/default.aspx>.

## *Workshops related to SG13 lead activities*

The 6th meeting of the SG13 regional group for Africa was be preceded by a two-day Workshop from 26 -27 March 2018, entitled Sixth SG13 Regional Workshop for Africa on “Standardization of future networks: What opportunities for Africa?”. The program includes several presentations related to SG13 lead activities IMT2020, Cloud Computing and trusted network infrastructures. Further details can be found at https://www.itu.int/en/ITU-T/Workshops-and-Seminars/standardization/20180326/Pages/Programme.aspx.

The Third annual ITU IMT-2020/5G Workshop and Demo Day was held on 18 July 2018 in Geneva. Presentations related to this workshop can be found at https://www.itu.int/en/ITU-T/Workshops-and-Seminars/201807/Pages/Programme.aspx.

The new Focus Group FG-NET-2030 held the “First ITU Workshop on Network 2030” on 2 October 2018 in New York/ US, preceding the inaugural FG meeting form 3-4 October 2018 (see also <https://www.itu.int/en/ITU-T/Workshops-and-Seminars/201810/Pages/Programme.aspx> ), The second work shop of this series is confirmed for 18 December 2018 in Hong Kong/ China, preceding the 2nd meeting of FG-NET-2030 19-20 December 2018 (<https://www.itu.int/en/ITU-T/focusgroups/net2030/Pages/default.aspx> ). Further workshops are planned for Week of 18 February 2019 (London, United Kingdom, TBC), Week of 20 May 2019 (St Petersburg, Russia) and October 2019 (Geneva, Switzerland).

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