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| A black and white logo  Description automatically generated with low confidence | INTERNATIONAL TELECOMMUNICATION UNION**TELECOMMUNICATIONSTANDARDIZATION SECTOR**STUDY PERIOD 2022-2024 | TSAG-TD204 |
| TSAG |
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| **TD** |
| **Source:** | Chairman, ITU-T SG13 |
| **Title:** | ITU-T SG13 Lead Study Group Report |
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| **Abstract:** | This document contains the summary status and progress report on lead SG activities of ITU-T SG13 in this study period. It complements the information already delivered to the May 2023 TSAG meeting via liaison statements (TDs [242](https://www.itu.int/md/T22-TSAG-230530-TD-GEN-0242/en), [246](https://www.itu.int/md/T22-TSAG-230530-TD-GEN-0246/en) and [247](https://www.itu.int/md/T22-TSAG-230530-TD-GEN-0247/en)/TSAG). |

**Action**: Review, note this report and note the information in LSs in TSAG-TDs [242](https://www.itu.int/md/T22-TSAG-230530-TD-GEN-0242/en), [246](https://www.itu.int/md/T22-TSAG-230530-TD-GEN-0246/en)

 and [247](https://www.itu.int/md/T22-TSAG-230530-TD-GEN-0247/en).

1. **Meetings and Events**

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| **Meeting/Event** | **No. of** | **Dates** | **Place** |
| SG13 | 3 | 4 – 15 July 2022 | Geneva, Switzerland |
| 14 November 2022 | Geneva, Switzerland |
| 13 – 24 March 2023 | Geneva, Switzerland |
| WPs | 3 | 25 November 2022  | Geneva, Switzerland |
| Co-located Rapporteur Groups | 1 | 14 – 25 November 2022 | Geneva, Switzerland |
| SG13 Regional Group for Africa (SG13RG-AFR) | 1 | 20 October 2022 | Virtual |
| 2 | 12 July and 17 November 2022 | Preparatory e-meetings |
| JCA-IMT2020 and Beyond | 5 | 7 July, 20 September, 21 November 2022, 14 March, 18 April 2023  | Geneva, Switzerland  |
| JCA-ML | 1 | 16 March 2023 | Geneva, Switzerland |
| FG-AN | 5 | 30 March – 1 April, 1 – 3 June, 31 August - 1 September 2022, 1 – 3 February and 19 - 20 April 2023 | Virtual |
| Workshop on Autonomous Networks (by FG-AN) | 1 | 15 November 2022 | Geneva, Switzerland |

Above table doesn’t include the stand-alone interim rapporteur groups meetings as well as the permanent ad-hocs and correspondence group meetings.

1. **Outputs**
	1. WP1 (5 Questions for IMT-2020 and beyond and machine learning)

**2.1.1** Outputs (2022): 22 Recommendations

* Y.3117: Quality of service assurance-related requirements and framework for **smart education** supported by IMT-2020 and beyond
* Y.3118: Requirements and framework for **jitter guarantee** in large scale networks including IMT-2020 and beyond
* Y.3811: Quantum key distribution networks - Functional architecture for quality of service assurance
* Y.3812: Quantum key distribution networks - Requirements for machine learning based quality of service assurance
* Y.3119: Future networks including IMT-2020: capability classification framework for dedicated networks
* Y.3120: Functional Architecture for **latency guarantee** in large scale networks including IMT-2020 and beyond
* Y.3121: QoS requirements and framework for supporting **deterministic communication services** in local area network for IMT-2020
* Y.3181: Architectural framework for **Machine Learning Sandbox** in future networks including IMT-2020
* Y.3182: Machine learning based end-to-end multi-domain network slice management and orchestration
* Y.3158: Local shunting for multi-access edge computing in IMT-2020 networks
* Y.3159: Framework for classifying network slice level in future networks including IMT-2020 (under AAP approval process)
* Y.3079: Information-Centric Networking in networks beyond IMT-2020: Framework of locally enhanced name mapping and resolution
* Y.3080: Information-Centric Networking in networks beyond IMT-2020: Requirements and Mechanisms of Transport Layer
* Y.3081: Self-Controlled Identity based on Blockchain: Requirements and Framework
* Y.3082: **Mobile network sharing** based on distributed ledger technology for networks beyond IMT-2020: Requirements and framework (TAP approved in 03/2023)
* Y.3183: Framework for network slicing management assisted by machine learning leveraging QoE feedback from verticals
* Y.3137: Technical requirements for supporting application addressing in edge computing for future networks including IMT-2020
* Y.3138: **Unified multi-access** edge computing for supporting fixed mobile convergence in IMT-2020 networks
* Y.3139: Fixed mobile convergence enhancements to support IMT-2020 based software-defined wide area networking service
* Y.3140: Service brokering network framework for Trusted Reality (AAP approved in 03/2023)
* Y.3201: Fixed, mobile and satellite convergence – Framework for IMT-2020 networks and beyond
* Y.3325: Framework for high-level AI-based management communicating with external management systems

 **2.1.2** Outputs (2023, till 15 May 2023, the day this report was finalized): 6 Recommendations

* Y.3122: QoS assurance requirements and framework for **smart grid**​ supported by IMT-2020 and beyond
* Y.3117 Corr 1: Quality of service assurance-related requirements and framework for smart education supported by IMT-2020 and beyond – Corrigendum 1
* Y.3123: Framework of **edge computing capability exposure** for IMT-2020 networks and beyond
* Y.3160: Architectural framework of end-to-end service level objective guarantee for future networks including IMT-2020
* Y.3202: Fixed, mobile and satellite convergence - **Mobility management** for IMT-2020 networks and beyond
* Y.3203: Fixed, mobile and satellite convergence - **Connection management** for IMT-2020 networks and beyond
	1. WP2 (4 Questions for Cloud Computing and Data Handling)

 **2.2.1** Outputs (2022): 6 Recommendations

* Y.3537: Cloud computing – Functional requirements of cloud service partner for
**multi-cloud**
* Y.3538: Cloud computing - Global management framework of **distributed cloud**
* Y.3539: Cloud computing - Framework of risk management
* Y.3602: Big data - Functional requirements for **data provenance**
* Y.3607: Big data – Functional architecture for data provenance
* Y.3655: Big data driven networking - management and control mechanisms

 **2.2.2.** Outputs (2023, till 15 May 2023): 5 Recommendations

* Y.3656: Big data driven networking - mechanism of network service provisioning (under AAP approval process)
* Y.3184: Mechanism of intelligent awareness for network status (under AAP approval process)
* Y.3532: Cloud computing - Functional requirements of **Platform as a Service** for cloud native applications
* Y.3540: **Edge computing** - Overview and high-level requirements (under AAP approval process)
* Y.3603: Big data - Requirements and conceptual model of **metadata for data catalogue**
	1. WP3 (4 Questions for quantum enhanced networking, trust and innovative service scenarios) **2.3.1** Outputs (2022): 6 Recommendations
* Y.2247: Framework and Requirements of Network-oriented Data Integrity Verification Service based on Blockchain in Future Network
* Y.2248: Service model for Entry-level Smart Farm
* Y.2344: Scenarios and requirements of **Intent-Based Network** for network evolution (under AAP approval process)
* Y.3810: Quantum key distribution network **interworking** - framework
* Y.3813: Quantum key distribution networks interworking – functional requirements
* Y.3814: Quantum key distribution networks - functional requirements and architecture for machine learning enablement

 **2.3.2** Outputs (2023, till 15 May 2023): 2 Recommendations

* Y.2345: Scenarios and requirements of **network resource sharing** based on distributed ledger technology
* Y.2073: Framework of **trusted electricity brokerage** for distributed energy resources (under AAP approval process)

In addition, it was decided at March SG13 meeting to reinitiate the AAP Last Call for

* Y.2086: Framework and Requirements of Decentralized Trustworthy Network Infrastructure (under AAP approval process, LC will be reinitiated)
	1. Supplements
* 5 Supplements
* Sup. 71 (Y.3000-series): Use cases for Autonomous Networks
* Sup. 72 (Y.3000-series): Artificial Intelligence Standardization Roadmap
* Sup. 59 (Y.3100 series): IMT-2020 standardization roadmap
* Sup. 74 (Y.3800-series): Standardization roadmap on Quantum Key Distribution Networks
* Sup. 75 (Y.3000-series): Quantum key distribution networks – Quantum-Enabled Future Networks
1. **Future Meeting Plans**
* Geneva, 26 July 2023, WP1/13, WP2/13, WP3/13
* Geneva, 24 and 25 July 2023 Workshop *on future technical trends for 2030* (Next IMT systems towards 2030 and beyond, web 3.0, quantum networking, deterministic communication services)
* Geneva, 23 October - 3 November 2023, SG13
* Geneva, February, or March 2024, SG13 meeting or SG13RGM (dates and type of meeting TBC according to TSAG and RG-WPR meeting).
1. **Implementation of the WTSA-20 Action Plan**

In response to the WTSA-20 Resolution 92 (*Enhancing the standardization activities in the ITU Telecommunication Standardization Sector related to non-radio aspects of international mobile telecommunications*) SG13

* Maintained and continued the operation of *the JCA-IMT2020 and Beyond* until the end of the study period.
* Through the JCA-IMT2020 regularly updates and maintains the online roadmap with IMT-2020 and Beyond standardization efforts taken place around the world.
* Published the Supplement 59 to Y.3100-series of Recommendations “IMT-2020 standardization roadmap” (a snapshot as of November 2022 of the online roadmap mentioned above).

In response to the WTSA-20 Resolution 94 (*Standardization work in the ITU Telecommunication Standardization Sector for cloud-based event data technology*) contributions are invited on the cloud-based event data technology aspects.

In line with instructions found in WTSA-20 Resolution 99 (*Consideration of organizational reform of the ITU Telecommunication Standardization Sector study groups*) SG13 established in November 2022 the ad-hoc on next study period preparations. It progressed the work in two meetings to date (15 May 2023).

1. **Coordination between SGs**

Continuous coordination is going on with SG2 on management aspects, SG5 on energy saving aspects of networks, SG12 on QoS, QoS assurance and deterministic networking topics and with SG17 on security aspects and QKDN.

In addition, SG13 provided its opinion to the SG16 about the metaverse topic study and passed over its accomplished work on *the quantum key distribution networks roadmap* to new JCA-QKDN for maintenance.

1. **Report of lead SG activities**

**WTSA-20 assigned to the SG13 the following lead Study Group roles:**

* 1. **Lead study group on future networks such as IMT-2020 networks and beyond (non-radio related parts)**

SG13 approved/consented 22 new Recommendations and one Supplement, listed above, has 62 work items in progress, continued the JCA-IMT2020 operation (with revised Terms of Reference) until 2024.

Supplement 59 to Y.3100-series (11/2022) is the snapshot of the online database with collection of the IMT-2020 and Beyond related Recommendations, Supplements, technical specifications of other SDOs and various technical reports. Per WTSA-20 Resolution 92 this Supplement will be revised annually. Last version was agreed on 25 November 2022, the next iteration of this publication is anticipated in November 2023.

Next IMT systems towards 2030 and beyond will be one of the topics of the workshop of July 2023 in Geneva.

* 1. SG13 has a **leading role in** **fixed-mobile convergence.**

This study topic and its extension for the fixed, mobile and satellite convergence is well progressing in SG13 with 3 Recommendations approved, two consented as listed above. Work programme counts 24 work items on FMC/FMSC in progress.

* 1. SG13 was entrusted a **leading SG role in** **cloud computing**.

On the above technical topic, 5 Recommendations were developed (3 approved, two consented), including the first Recommendation on edge computing. 18 work items are under study. Furthermore, in July 2022 SG13 set up an ad-hoc “*Future ICT Evolution for emerging Web Era*”**.** By May 2023, the group had two meetings.Web 3.0 will be one of the focuses of the workshop on 24 – 25 July 2023 in Geneva.

* 1. SG13 has a **lead study group responsibility for** **machine learning**.

From this perspective, SG13 approved 5 Recommendations on machine learning.

In July 2022 SG13 initiated the new JCA on ML. First meeting took place on 16 March 2023 in Geneva. Two coordination projects were agreed for start: machine learning standardization roadmap and glossary of terms and definitions for machine learning. In addition, presentations of current standardization efforts in ITU-T Study Groups, other SDOs, and Forums were invited to the second JCA-ML meeting (19 July 2023, Geneva).

Supplement 71 (to Y.3000-series) “Use cases for Autonomous Networks” was approved for publication on 15 July 2022.

Supplement 72 (to Y.3000-series) “Artificial Intelligence Standardization Roadmap” was agreed for publication on 25 November 2022.

There are 12 ongoing work items related to the machine learning and artificial intelligence in the SG13 work programme.

The correspondence group *for datasets applicable for AI/ML in networks,* set up in July 2022, convened three meetings (by 15 May 2023) and started the work on its deliverable - the technical insights and recommendations for a standardization approach for datasets applicable for AI/ML in networks. This group encompasses the participation from external to ITU experts.

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