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| ITU logo | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2017-2020 | | | TSAG-TD846R1 | |
| **TSAG** | |
| **Original: English** | |
| **Question(s):** | | | N/A | E-Meeting, 21-25 September 2020 | |
| **TD** | | | | | |
| **Source:** | | | Rapporteur, TSAG RG-StdsStrat | | |
| **Title:** | | | Hot Topics Repository | | |
| **Purpose:** | | | Information, Discussion | | |
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| **Keywords:** | Standardization strategy; Hot Topics; Status; CTO; |
| **Abstract:** | This TD provides the repository for TSAG Hot Topics including their definition, their metadata, their measurement, scope of usage, etc. as well as any update from various input sources. |

This document acts as the repository for TSAG Hot Topics and is a live document and is an update from [TSAG-TD764](https://www.itu.int/md/T17-TSAG-200210-TD-GEN-0764/en)

# Introduction

This document provides the repository for TSAG Hot Topics including

* agreements for changes and additions,
* an index with all hot topics and sub hot topics
* and a breakdown of hot topics including their metadata and any transaction log input coming from study groups.

This document changes the format from the previous tracking methods which ended with TD734 as agreed in the TSAG meeting of February 2020.

# Definitions and Methodological Aspects

[Editor’s note, this section should be developed based on RG-SS contributions. In particular

* answers to table 1 of [C132](https://www.itu.int/md/T17-TSAG-C-0132/en) as lessons learnt for the future
* [TSAG-RG-StdsStrat-C027](https://extranet.itu.int/sites/itu-t/studygroups/2017-2020/tsag/strategy/_layouts/15/WopiFrame.aspx?sourcedoc=%7B4736167E-28F7-4588-8913-919B73A9F43B%7D&file=C027%20China%20Considerations%20on%20the%20targets%20and%20working%20proceduce%20for%20Hot%20topics-CAICT-R3.docx&action=default&CT=1600677977880&OR=DocLibClassicUI) Considerations on the target and working procedure for hot topics]

# Latest Updates

## Highlights

* The new format was agreed and enforced
* TSB counsellors coordinated and incrementally updated an “FAQ” coming from each Study Group experience (RG-StdsStrat Rapporteur is warmly thanking TSB counsellors)
* 7 out of 11 Study Groups sent LS back to TSAG-LS32 with a priority on “temperature”
* Study Groups took various strategies to answer this LS from prioritising on “temperature” to providing full details justifying their prioritisation on a significant spectrum of aspects (Work Program, Workshops, etc.), improving the metadata of some Hot Topics, etc.
* There are 9 proposed new Hot Topics and Sub-Hot Topics to be agreed
* 13 Hot Topics out of 20 were updated
* 14 Hot Topics temperature was updated out of 20 and with
  + 2 Hot Topics were given divergent views 1.00 and 5.00
* Rapporteur notes that in the details of the feedback, some aspects need to be highlighted, e.g. the notes of SG17 on Smart Cities

## Propositions from study groups

Liaison replies to the original TSAG-LS32 have been received from ITU-T SGs. As of September 21st 2020, the following SGs have provided their responses to the liaison statement:

* SG2([TSAG-TD881](https://www.itu.int/md/T17-TSAG-200921-TD-GEN-0881)), SG3([TSAG-TD894](https://www.itu.int/md/T17-TSAG-200921-TD-GEN-0894)), SG5([TSAG-TD876](https://www.itu.int/md/T17-TSAG-200921-TD-GEN-0876)), SG9([TSAG-TD871](https://www.itu.int/md/T17-TSAG-200921-TD-GEN-0871)), SG11 ([TSAG-TD836](https://www.itu.int/md/T17-TSAG-200921-TD-GEN-0836)) SG15([TSAG-TD844](https://www.itu.int/md/T17-TSAG-200921-TD-GEN-0844)), SG17([TSAG-TD822](https://www.itu.int/md/T17-TSAG-200921-TD-GEN-0822)),

There are two level of changes proposed and considered

* Changes to the list of Hot Topics and sub Hot Topics itself, or their ITU-T point of contacts
  + Those changes are discussed and determined in section 4 of the document
* Changes in the details of each Hot Topics and sub Hot Topics
  + Those changes are discussed and determined in section 5 of the document

## Propositions from CTO and CxO meetings

There were no CTO nor CxO meetings since the last TSAG meeting.

## RG-SS Proposals for TSAG agreements

The following two sections regrouped all the input documents that were used to extract potential Topic and Sub Topic candidates for changes (additions or more).

These candidates are in the first column with their source in the second column

Then RG-SS meeting in TSAG proposed a position in the 3rd column

And the result agreement is in the 4 column

Table 1 – RG-SS proposals for TSAG agreements regarding candidate Hot Topics and Sub Hot Topics and results

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic/Sub Topic** | **Source** | **RG-SS Proposal** | **Allocation / Comment** |
| New sub Hot Topic “Block-chain system management” | SG2 (TD881) | Proposed New | Allocated as 12.04 |
| New Hot Topic “ICT sector impacts on climate and biodiversity” | SG5 (TD876) | Proposed New | Allocated as 21.00 |
| New sub Hot Topic “Smart solutions to improve efficiency” | SG5 (TD876) | Proposed New | Allocated as 21.01 |
| New sub Hot Topic “[Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14084" \o "Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement):   * Reduction of the ICT sector own emissions * The contribution of the ICT sector to other economic sectors from a climate perspective” | SG5 (TD876) | Proposed New | Allocated as 21.02 |
| New sub Hot Topic “ICT in relation to biodiversity” | SG5 (TD876) | Proposed New | Allocated as 21.03 |
| New Hot Topic “Circular Economy concept applied to the ICT sector” | SG5 (TD876) | Proposed New | Allocated as 22.00 |
| New sub Hot Topic “Circular economy definition and application” | SG5 (TD876) | Proposed New | Allocated as 22.01 |
| New sub Hot Topic “E-waste collection and treatment to improve the availability of materials” | SG5 (TD876) | Proposed New | Allocated as 22.02 |
| New sub Hot Topic “Security Standardization Strategy and Security Architecture Development” | SG17 (TD822) | Proposed New | Allocated as 10.15 |
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# Current summary list of Hot Topics with provisional RG-SS proposals

Table 2 - Current summary list of Hot Topics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Topic/Sub Topic** | **Source** | **ITU-T Topic Point of Contacts** | **Status** | **Temperature** |
| 1.00 | OTT Services and the economic impact, Cross-Industry (TSAG [TD101](https://www.itu.int/md/T17-TSAG-170501-TD-GEN-0101/en)) | CTO | **SG3 SG2 SG9 SG16 SG17** | No Change | Hot (SG3)  Medium (SG9)  Cold (SG17) |
| 1.01 | The interplay of OTT service providers and operators particularly in developing countries |  |  |  | Hot (SG3) Cold (SG17) |
| 1.02 | The economic impact of OTT services and operators |  |  |  | Hot (SG3) Cold (SG17) |
| 1.03 | International standards frameworks, best practices and guidelines on OTT services |  |  |  | Hot (SG3) Cold (SG17) |
| 2.00 | VoLTE/ViLTE interconnection and adoption of ENUM for IMS interconnection (TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en)) | CxO | **SG11** in cooperation with SG2 | Updated | Hot (SG11) |
| 3.00 | Intelligence for network automation, augmentation and amplification (TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en)) | CxO | **SG13 SG9 SG20** | No Change | Hot (SG9) |
| 3.01 | Identify the standardization needs for intelligence in 5G systems and the telecommunications sector |  |  |  | Medium (SG3) |
| 3.03 | Automatic detection and resolution of anomalies and other incidents of inefficiency, as well as predictive maintenance will reduce the operational expenditure of network operators and service providers |  |  |  | Medium (SG5) |
| 3.04 | Address the architecture interfaces, functional entities, service scenarios and protocols required for intelligence retrieval and actuation, and the performance benchmarking and certification of AI techniques |  |  |  |  |
| 3.05 | Usage of AI in security management solutions |  |  |  |  |
| 3.06 | Real-time network monitoring | CxO |  |  | Hot (SG5) |
| 3.07 | Automation informed by machine learning for network operation and maintenance | CxO |  |  | Hot (SG5) |
| 4.00 | Open APIs, enabling third parties to access and build on network capabilities to develop innovative, reusable services (TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en)) | CxO | **SG13** **SG11** (Cooperating SG) **SG20** | Updated |  |
| 5.00 | Realizing 5G/IMT-2020 vision (TSAG [TD101](https://www.itu.int/md/T17-TSAG-170501-TD-GEN-0101/en), [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en), [C27R2](https://www.itu.int/md/T17-TSAG-C-0027/en), [C29](https://www.itu.int/md/T17-TSAG-C-0029/en)) | CTO, CxO, Contributions | **SG13** in cooperation with SG2, 5, 11, 12, **15**, 16, 17, 20 | Updated | Medium (SG3)  Hot (SG5)  Some aspects are Hot (SG17) |
| 5.01 | Unified access-independent network management |  |  |  |  |
| 5.02 | Standardization roadmap on IMT-2020 |  |  |  |  |
| 5.03 | ICN (Information Centric Networks) |  |  |  |  |
| 5.04 | Open-source software and standards for 5G |  |  |  |  |
| 5.05 | Software-based networking functions to optimize a per-session based performance | SG15 | **SG15** | Updated | Hot (SG15) |
| 5.06 | Emerging fronthaul and midhaul technologies to support the 5G deployment | SG15 | **SG15** | Updated | Hot (SG15) |
| 5.07 | Large-bandwidth backhaul and fronthaul solutions |  |  |  |  |
| 5.08 | Concrete strategies for the migration from 4G to 5G systems. |  |  |  |  |
| 5.09 | Service-based network architecture |  |  |  |  |
| 5.10 | Open service management APIs for the Internet of Things |  |  |  |  |
| 5.11 | Electromagnetic field (EMF) studies around 5G beam-forming capabilities |  |  |  |  |
| 5.12 | Interoperability of services supporting public safety |  |  |  | Hot (SG5) |
| 5.13 | Control and management protocols for IMT-2020 |  |  |  |  |
| 5.14 | Virtualized deployment of recommended methods for network performance, quality of service (QoS) and quality of experience assessment |  |  |  |  |
| 5.15 | End-to-end security and trust in 5G | CTO CxO |  |  |  |
| 5.16 | Establish a 5G observatory to gain lessons from various technical developments and implementations of 5G technology, use cases and vertical experiments | CTO |  |  | Hot (SG17) |
| 5.17 | Develop guidance for operators on the business rationale for 5G deployment | CTO |  |  |  |
| 5.18 | Standardization of open, interoperable RAN interfaces and RAN functional architecture” | CxO |  |  |  |
| 6.00 | Gigabit-speed broadband access services and networks (TSAG [TD101](https://www.itu.int/md/T17-TSAG-170501-TD-GEN-0101/en)) | CTO | **SG15** SG9 | Updated | Hot (SG9) |
| 6.01 | Support the delivery of high definition video services |  |  |  |  |
| 6.02 | Broadband access networks; G.fast, G.hn, VDSL2, NG-PON2 | SG15 | **SG15** | Updated |  |
| 6.03 | True fixed-mobile convergence, hybrid fixed wireless |  |  |  |  |
| 7.00 | Data Center Interconnection for OTT and vertical industries (TSAG [C37](https://www.itu.int/md/T17-TSAG-C-0037/en)) | Contribution | **SG15 SG11** (Cooperating SG) SG9 | Updated | Cold (SG9) |
| 7.01 | OTT’s business and services models in relation to telecom services |  |  |  | Hot (SG3) |
| 7.02 | Requirements from OTT for DCI/metro network technologies (such as short distance, large bandwidth, low-cost optical (WDM) technology, fixed network), and standards | SG15 | **SG15** | Updated |  |
| 8.00 | Augmented reality & virtual reality, video services (TSAG [C6](https://www.itu.int/md/T17-TSAG-C-0006/en), [TD101](https://www.itu.int/md/T17-TSAG-170501-TD-GEN-0101/en)) | Contribution, CTO | **SG16 SG12[[1]](#footnote-1) SG11** (Cooperating SG) | No Change |  |
| 8.01 | Applications with high network requirements in throughput and latency |  |  |  |  |
| 8.02 | A range of innovative technologies in transport, IP and access networking, media coding and cloud and edge computing |  |  |  |  |
| 8.03 | NG video codec standardization on 5G and vertical industries |  |  |  |  |
| 8.04 | Future Content Delivery Network (CDN) technologies standards. |  |  |  |  |
| 8.05 | Immersive live experience (ILE) |  |  |  |  |
| 8.06 | Digital signage |  |  |  |  |
| 9.00 | Accessibility by design mainstreaming the consideration of needs of persons with disabilities and other persons with specific needs to build inclusive ICT solutions (TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en)) | CxO | **SG16 SG2 SG20** | No Change |  |
| 10.00 | Security and Trust (TSAG [TD101](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0101/en), [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en)) | CTO, CxO | **SG2 SG17** | Updated | Hot (SG17) |
| 10.01 | Principles of transparency and technological integrity |  |  |  | Cold (SG17) |
| 10.02 | Mitigation of the risks posed by IoT botnets |  |  |  | Cold (SG17) |
| 10.03 | Assessment of the impact of quantum computing |  |  |  | Hot (SG17) |
| 10.04 | Potential of blockchain and its implications for security |  |  |  | Hot (SG17) |
| 10.05 | Data-centric security |  |  |  | Hot (SG17) |
| 10.06 | Security and privacy by design, considering security and privacy from the outset of ICT services’s development through the proactive monitoring and protection of live services |  |  |  | Cold (SG17) |
| 10.07 | Security, privacy and trust in the presence of AI and ML |  |  |  | Hot (SG17) |
| 10.08 | Application security and quantum-safe cryptography through an incubation process |  |  |  | Hot (SG17) |
| 10.09 | Identity and authorization, providing for the reliable identification essential to secure, efficient service provision |  |  |  | Hot (SG17) |
| 10.10 | Security and privacy of human factor (intersection of computer science and the humanities) |  |  |  | Cold (SG17) |
| 10.11 | Security of Robotics/IoT |  |  |  | Cold (SG17) |
| 10.12 | Cybersecurity Services |  |  |  | Hot (SG17) |
| 10.13 | Technical aspects of Cybersecurity Insurance |  |  |  | Medium (SG17) |
| 10.14 | Edge Cloud Security |  |  |  | Medium (SG17) |
| 10.15 | Security Standardization Strategy and Security Architecture Development |  |  | Proposed New | Hot (SG17) |
| 11.00 | Analytics, supporting the development of evidence-based, data driven services (TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en)) | CxO | **SG20 SG17** | Updated | Some aspects are Hot (SG17) |
| 11.01 | Data processing and management for IoT and SC&C |  |  |  |  |
| 11.02 | Common things description methodology |  |  |  |  |
| 11.03 | Interoperability framework and functional architecture for IoT and SC&C |  |  |  |  |
| 11.04 | Industry dependent data models and formats to support development of data driven IoT and SC&C services |  |  |  |  |
| 11.05 | Features, requirements, framework and functional architecture of IoT device, gateway, platform, network |  |  |  |  |
| 11.06 | Edge Computing to support evidence-based, data driven IoT and SC&C services |  |  |  |  |
| 11.07 | Distributed ledger technologies for IoT and SC&C |  |  |  | Medium (SG3) |
| 11.08 | IoT identification to support evidence-based data driven IoT and SC&C services |  |  |  |  |
| 11.09 | AI enabled IoT and SC&C |  |  |  |  |
| 11.10 | Data driven IoT verticals |  |  |  |  |
| 11.11 | Data Security |  |  |  | Hot (SG17) |
| 12.00 | Intelligent network management towards future networks (TSAG [TD344](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0344/en)) | SG2 | **SG2** | Updated | Hot (SG2) |
| 12.01 | Smart operation, management and maintenance. |  |  |  |  |
| 12.02 | Telecom anti-fraud management |  |  |  |  |
| 12.03 | REST-based network management framework |  |  |  |  |
| 12.04 | Block-chain system management |  |  | Proposed New |  |
| 13.00 | Environmental efficiency of emerging technologies (TSAG [TD374](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0374/en)) | SG5 | **SG5** | Updated | Hot (SG5) |
| 13.01 | Assessment of the environmental impacts of deploying and implementing AI, Blockchain, and other emerging technologies |  |  |  |  |
| 14.00 | Digital health (TSAG [TD347](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0347/en)) | SG16 | **SG16 SG20** | No Change |  |
| 15.00 | Quantum based Security[[2]](#footnote-2) (TSAG [TD362](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0362/en)) | SG17 | **SG17 SG13** | No Change | Hot (SG17) |
| 16.00 | Assessment and evaluation of smart city and IoT verticals (e.g. detailed mobility, detailed energy management, detailed water management, etc.) (TSAG [TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | SG20 | **SG20 (cooperating with SG5)** | Updated | Hot (SG5)  (1) |
| 17.00 | Solutions in smart sustainable cities using emerging technologies (e.g. IoT, AI, etc.) (TSAG [TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | SG20 | **SG20 (cooperating with SG5)** | Updated | Hot (SG5)  (1) |
| 18.00 | Smart villages and rural areas (TSAG [TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | SG20 | **SG20 (cooperating with SG5)** | Updated | Hot (SG5)  (1) |
| 19.00 | Identify scenarios and best practices for Network infrastructure sharing (TSAG [TD582](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0582/en), [TD661](https://www.itu.int/md/T17-TSAG-200210-TD-GEN-0661/en)) | CTO, CxO | **SG2, SG3, SG13, SG15 (cooperating with SG5)** | Updated |  |
| 20.00 | Performance, QoS and QoE assessment | CTO | **SG12, SG11, SG16, FG-AI4AD** | No Change |  |
| 20.01 | Real-time monitoring of network performance | CTO | **SG12, SG11, SG16, FG-AI4AD** |  |  |
| 20.02 | Network performance prediction | CTO | **SG12, SG11, SG16, FG-AI4AD** |  |  |
| 20.03 | Compliance, conformance and quality testing for Intelligent Transport Systems | CxO | **SG12, SG11, SG16, FG-AI4AD** |  |  |
| 20.04 | Measurement of user-perceived QoS | CxO | **SG12, SG16, FG-AI4AD** |  |  |
| 21.00 | ICT sector impacts on climate and biodiversity | SG5 | **SG5** | Proposed New |  |
| 21.01 | Smart solutions to improve efficiency | SG5 | **SG5** | Proposed New |  |
| 21.02 | [Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14084" \o "Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement):   * Reduction of the ICT sector own emissions * The contribution of the ICT sector to other economic sectors from a climate perspective | SG5 | **SG5** | Proposed New |  |
| 21.03 | ICT in relation to biodiverstiy | SG5 | **SG5** | Proposed New |  |
| 22.00 | Circular Economy concept applied to the ICT sector | SG5 | **SG5** | Proposed New |  |
| 22.01 | Circular economy definition and application | SG5 | **SG5** | Proposed New |  |
| 22.02 | E-waste collection and treatment to improve the availability of materials | SG5 | **SG5** | Proposed New |  |
|  |  |  |  |  |  |
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Notes

1. SG17 added the first detailed tables for these hot topics with some input. Given the content, it could be considered by RG-StdsStrat as this is a Hot Topic for SG17 which is not listed as Point of Contact

# Hot Topics Detailed Updated List

|  |  |  |  |
| --- | --- | --- | --- |
| **1.00** | **OTT Services and the economic impact, Cross-Industry** | | **SG3 SG2 SG9 SG16 SG17** |
| **Description**  Sub Hot Topics | | | |
| 1.01 | The interplay of OTT service providers and operators particularly in developing countries | | |
| 1.02 | The economic impact of OTT services and operators | | |
| 1.03 | International standards frameworks, best practices and guidelines on OTT services | | |
| **Source Type** | CTO | **Date of Entry** |  |
| **Source References** | TSAG [TD101](https://www.itu.int/md/T17-TSAG-170501-TD-GEN-0101/en) | **Date of Update** |  |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| --- | --- | --- |
| **Transaction Update Table** | | |
| TSAG Meeting Date: December 2018, September 2019 | | |
| SG2 ([TD344](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0344/en)) ([TD515](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0515/en)) | New Work Items | New work items on OTT are under development in SG2  New work item in regards to the use of E.164 Numbers as identification for OTT. SG2 will be working on a technical report to study the current use of telephone numbers, as well as a supplement to provide guidance ([SG2-TD 683-R2](https://www.itu.int/md/T17-SG02-190219-TD-GEN-0683/en) and [SG2-TD 687-R2](https://www.itu.int/md/T17-SG02-190219-TD-GEN-0687)). |
| SG3 ([TD330](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0330/en)) | Work Program | 1. [D7\_R\_OTTBypass](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14531) (Regional Recommendation on OTT bypass including national and regional collaboration between Member States and operators to deal with the OTT bypass issue) 2. [D.50Supp\_OTT](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13500) (OTTs in the context of IIC); 3. [D.ConsumerOTT](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14123) (Customer redress mechanism and consumer protection); 4. [D.262 (ex D.OTT)](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13503) (Collaborative Framework for OTTs); 5. [D.OTTBypass](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13522) (OTT Bypass); 6. [D.OTTMNO](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=13521) (Guidelines on OTT-MNO Partnerships). |
| SG9 ([TD404](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0404/en)) |  | Regarding OTT services, SG9 has started a new work item on draft Recommendation J.cable-ott “System architecture and interfaces between a cable television operator and an OTT service provider”. |
| SG16 ([TD347](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0347/en)) | Work Program | SG16 is working on technical aspects of provisioning of OTT service over IPTV |
| SG17 ([TD362](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0362/en)) ([TD596](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0596/en)) | Work Program | X,1147 (X.srfb), X.1450 (X.hakm), X.sfop |
|  | Correspondence Group | SG17 Correspondence Group on transformation of security studies identified the OTTs as part of the Digital Service Providers (DSPs) ecosystem. |

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| **2.00** | **VoLTE/ViLTE interconnection and adoption of ENUM for IMS interconnection** | | **SG11** in cooperation with SG2 |
| **Description** | | | |
| **Source Type** | CxO | **Date of Entry** |  |
| **Source References** | TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en) | **Date of Update** | 21/09/2020 |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| --- | --- | --- |
| **Transaction Update Table** | | |
| TSAG Meeting Date: December 2018 | | |
| SG11 ([TD349](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0349/en)) | Achievements | [Q.3640](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13482): Framework of interconnection of VoLTE/ViLTE-based networks  [Q.3953](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13490): VoLTE/ViLTE interconnection testing for interworking and roaming scenarios  Q.Suppl69: Framework for interconnection between VoLTE-based network and other networks supporting emergency telecommunications service (ETS) |
|  | Work Program | Q.DEN\_IMS: Signalling architecture of distributed ENUM networking for IMS |
|  | Workshop | [ITU Regional Workshop](https://www.itu.int/en/ITU-D/Regional-Presence/CIS/Pages/EVENTS/2018/10_Samarkand/10_Samarkand.aspx) on deployment of VoLTE/ViLTE networks based on IMS. From standardization to implementation (Samarkand, Uzbekistan, 2-3 October 2018) |
|  | Others | [ITU Regional Forum](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20180604/Pages/default.aspx) on “Internet of Things, Telecommunication Networks and Big Data as basic infrastructure for Digital Economy” (St. Petersburg, Russia, 4-6 June 2018) |
| SG17 ([TD362](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0362/en)) | Achievements | Q2/17 developed X.1041 (X.voltesec-1): Security Framework for voice-over-long-term-evolution (VoLTE) Network Operation. |
| TSAG Meeting Date: September 2020 | | |
| SG11 (TD836) | Achievements | [Q.3644](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14143): Requirements for signalling network analyses and optimization in VoLTE |
|  | Work Program | Q.3643 (ex Q.DEN\_IMS): Signalling architecture of distributed ENUM networking for IMS  Q.VoLTE-SAO-FP: Framework and protocols for signalling network analyses and optimization in VoLTE  Q.Pro-DES: Protocol at interface between two distributed ENUM servers for IMS |

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| **3.00** | Intelligence for network automation, augmentation and amplification | | **SG13 SG9 SG20** |
| **Description**  Sub Hot Topics | | | |
| 3.01 | Identify the standardization needs for intelligence in 5G systems and the telecommunications sector | | |
| 3.03 | Automatic detection and resolution of anomalies and other incidents of inefficiency, as well as predictive maintenance will reduce the operational expenditure of network operators and service providers | | |
| 3.04 | Address the architecture interfaces, functional entities, service scenarios and protocols required for intelligence retrieval and actuation, and the performance benchmarking and certification of AI techniques | | |
| 3.05 | Usage of AI in security management solutions | | |
| 3.06 | Real-time network monitoring | | |
| 3.07 | Automation informed by machine learning for network operation and maintenance | | |
| **Source Type** | CxO | **Date of Entry** |  |
| **Source References** | TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en) | **Date of Update** |  |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: December 2018, September 2019 | | |
| SG9 ([TD404](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0404/en)) | New Work Items | Regarding intelligence for network automation, augmentation and amplification, SG9 has started a new work item on draft Recommendation J.pcnp-fmw “Premium Cable network platform with embedded intelligent analyzer and controller for enabling advanced multimedia services”. |
| SG13 ([TD356](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0356/en)) ([TD529](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0529/en)) | Work Program | Y.sfes: Smart Farming Education Service based on u-learning environment  Y.qos-ml-arc: Architecture of machine learning based QoS assurance for IMT-2020 network  Y.MecTA-ML: Mechanism of traffic awareness for application-descriptor-agnostic traffic based on machine learning  Y.MLaaS-reqts: Cloud computing - Functional requirements for machine learning as a service  Y.IMT2020-ML-arc: Architectural framework for machine learning in future networks including IMT-2020 |
| SG17 ([TD362](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0362/en)) | ITU-T Coordination | Network automation, augmentation and amplification with the promise of a “Zero Touch” will include Security at its design level. SG17 identified this gap as well as others and is putting 5G Security at the core of its Q6/17 as lead question  SG17 and SG13 should collaborate here. |
| SG5 ([TD374](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0374/en)) | Work Program | ITU-T SG5 draft L.DCIM “Specifications for datacentre infrastructure management system based on big data and artificial intelligence technology”. |
| TSAG Meeting Date: September 2019 | | |
| SG20 ([TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | Work Program | Y.4116: “Requirements of transportation safety service including use cases and service scenarios”.  Y.IoT-AV-Reqts: “Requirements and capability framework of IoT infrastructure to support network-assisted autonomous vehicles”. |

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| **4.00** | **Open APIs, enabling third parties to access and build on network capabilities to develop innovative, reusable services** | | **SG13** **SG11** (Cooperating SG) **SG20** |
| **Description** | | | |
| **Source Type** | CxO | **Date of Entry** |  |
| **Source References** | TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en) | **Date of Update** | 21/09/2020 |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: December 2018 | | |
| SG13 (TD356) | Work Program | Y.PTDN-T-interface: T interface in Public packet Telecommunication Data Network (PTDN) |
| SG11 (TD349) | Work Program | Work item in Q6/11 - Q.CE-APIMP: Protocol for managing capability exposure APIs in IMT-2020 network |
| SG17 (TD362) | Others | Open APIs cannot be delivered without Security (by design) which is what Q7/17 covers. SG17 and SG13 should collaborate here. |
| TSAG Meeting Date: September 2019 | | |
| SG20 ([TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | Work Program | Y.IoT-NCM-reqts: Requirements and capabilities of network connectivity management in the Internet of things. |
| TSAG Meeting Date: September 2020 | | |
| SG11 (TD836) | Achievements | [Q.5021](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13980): Protocol for managing capability exposure APIs in IMT-2020 network |

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| **5.00** | **Realizing 5G/IMT-2020 vision** | | **SG13** in cooperation with SG2, 5, 11, 12, **15**, 16, 17, 20 |
| **Description** | | | |
| 5.01 | Unified access-independent network management | | |
| 5.02 | Standardization roadmap on IMT-2020 | | |
| 5.03 | ICN (Information Centric Networks) | | |
| 5.04 | Open-source software and standards for 5G | | |
| 5.05 | Software-based networking functions to optimize a per-session based performance | | |
| 5.06 | Emerging fronthaul and midhaul technologies to support the 5G deployment | | |
| 5.07 | Large-bandwidth backhaul and fronthaul solutions | | |
| 5.08 | Concrete strategies for the migration from 4G to 5G systems. | | |
| 5.09 | Service-based network architecture | | |
| 5.10 | Open service management APIs for the Internet of Things | | |
| 5.11 | Electromagnetic field (EMF) studies around 5G beam-forming capabilities | | |
| 5.12 | Interoperability of services supporting public safety | | |
| 5.13 | Control and management protocols for IMT-2020 | | |
| 5.14 | Virtualized deployment of recommended methods for network performance, quality of service (QoS) and quality of experience assessment | | |
| 5.15 | End-to-end security and trust in 5G | | |
| 5.16 | Establish a 5G observatory to gain lessons from various technical developments and implementations of 5G technology, use cases and vertical experiments | | |
| 5.17 | Develop guidance for operators on the business rationale for 5G deployment | | |
| 5.18 | Standardization of open, interoperable RAN interfaces and RAN functional architecture” | | |
| **Source Type** | CTO, CxO, Contributions | **Date of Entry** | DD/MM/YYYY |
| **Source References** | TSAG [TD101](https://www.itu.int/md/T17-TSAG-170501-TD-GEN-0101/en), [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en), [C27R2](https://www.itu.int/md/T17-TSAG-C-0027/en), [C29](https://www.itu.int/md/T17-TSAG-C-0029/en) | **Date of Update** | 21/09/2020 |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: Devember 2018, September 2019 | | |
| SG5 (TD374) | Work Program | ITU-T SG5 has established the vision on “Setting the Environmental Requirements for 5G”. During its September 2018 meeting, ITU-T SG5 has agreed on the Supplement K.Suppl.16 (ex. K.Supp-5G\_EMF\_Compliance) on Electromagnetic field (EMF) compliance assessments for 5G wireless networks.  Additionally, SG5 is working on the following work items:   * ITU-T L.5g\_powering on “Sustainable power feeding solutions for 5G network” * ITU-T L.EE\_5G on “Energy efficiency Metrics and measurement methodology for 5G solutions” * ITU-T L.ENV-KPI-5G-ARCH on “Environmental KPIs/metrics for 5G architectures” |
| SG13 (TD356) ([TD529](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0529/en)) | Work Program | Y.NGNe-O-arch: Functional architecture of orchestration in NGNe  Y.IMT2020-qos-fa: QoS functional architecture for IMT-2020 networks  [Y.IMT2020-qos-req](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14740); QoS requirements for IMT-2020 network  Y.qos-ml-arc: Architecture of machine learning based QoS assurance for IMT-2020 network  Y.IMT-2020.qos-mon: IMT-2020 network QoS monitoring architectural framework  Y.IMT2020-CEF: Network capability exposure function in IMT-2020 networks  Y.3MO: Requirements and Architectural Framework of Multi-layer, Multi-Domain, Multi-Technology Orchestration  Y.IMT2020-ADPP: Advanced Data Plane Programmability for IMT-2020  Y.NetSoft-SSSDN: High level architectural model of network slice support for IMT-2020 - Part: SDN  Y.NSOM: Network slicing orchestration and management  Y.FMC-ARCH: Functional architecture for supporting fixed mobile convergence in IMT-2020 networks  Y.FMC-CE: Capability exposure enhancement for supporting FMC in IMT-2020 network  Y.FMC-EC: Unified edge computing for supporting fixed mobile convergence in IMT-2020 networksY.FMC-MM: Mobility management for fixed mobile convergence in IMT-2020 networks  Y.FMC-ReqMO: IMT-2020 FMC functional requirements for management and orchestration  Y.FMC-SM: Session management for fixed mobile convergence in IMT-2020 networksY.FMC-SS: Service scheduling for supporting FMC in IMT-2020 network |
| SG11 (TD349) | Achievements | Q.5001: Signalling requirements and architecture of intelligent edge computing |
| SG11 (TD349) | Work Program | Related current work items of Q6/11:   * 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.IMT2020-PFW: Protocol Framework for IMT-2020   Related current work items of Q7/11:  Q.QMP-TCA QoS management protocol for time constraint applications over SDN |
| SG12 (TD337) | Work Program | Draft new Recommendation Y.cvms, “Considerations for Realizing Virtual Measurement Systems”, in Question 8/12 |
| SG17 (TD362) ([TD596](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0596/en)) | Others | SG17 support to this Hot Topic and the update covering the last two SG17 meetings to date consists of  - Q2 and 6/17 have supporting mandates with substantial work programs especially on SDN/NFV and 5G and Q8/17 dealing with Cloud Computing has connected work under development |
|  | Work Program | Since last TSAG meeting SG17 can update this Hot Topic with:  - Approved new draft Recommendations: X.1042 (X.sdnsec-1) and X.1043 (X.sdnsec-3)  - New Work Items established: X.5Gsec-guide, X.sr\_cphr, X.nsom-sec, X.5Gsec-netec  - There are currently a growing number of 9 work items in the work programs of SG17. |
| SG15 (TD385) | Work Program | Work items of ITU-T SG15 in cooperation with SG13   * Transport network to support IMT-2020/5G, * Optical access transport systems to serve the 5G fronthaul application, * incl. Fronthaul, midhaul and backhaul network considerations for IMT-2020/5G. |
| TSAG Meeting Date: September 2019 | | |
| SG20 ([TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | Work Program | Draft new Recommendation ITU-T Y.UAV.arch “Functional architecture for unmanned aerial vehicles and unmanned aerial vehicle controllers using IMT-2020 networks” |
| TSAG Meeting Date: September 2020 | | |
| SG5 (TD374) | Work Program | ITU-T SG5 has established the vision on “Setting the Environmental Requirements for 5G”., ITU-T SG5 has developed the following Recommendations and Supplements:   * ITU-T K.Suppl.4 on "Electromagnetic field considerations in smart sustainable cities" * ITU-T K.Suppl.8 on "Resistibility analysis of 5G systems" * ITU-T K.Suppl.9 on "5G technology and human exposure to RF EMF" * ITU-T K.Suppl.10 on "Analysis of electromagnetic compatibility aspects and definition of requirements for 5G systems" * ITU-T K.Suppl.14 on "The impact of RF-EMF exposure limits stricter than the ICNIRP or IEEE guidelines on 4G and 5G mobile network deployment" * ITU-T K.Suppl.16 on "Electromagnetic field (EMF) compliance assessments for 5G wireless networks " * Recommendation ITU-T L.1210 on "Sustainable power-feeding solutions for 5G networks" * Recommendation ITU-T L.1220 on "Innovative energy storage technology for stationary use - Part 1: Overview of energy storage" * Recommendation ITU-T L.1221 on "Innovative energy storage technology for stationary use - Part 2: Battery" * Recommendation ITU-T L.1222 on "Innovative energy storage technology for stationary use - Part 3: Supercapacitor technology" * Recommendation ITU-T L.1380 on “Smart energy solution for telecom sites" * ITU-T L.Suppl.36 to ITU-T L.1310 on "Study on methods and metrics to evaluate energy efficiency for future 5G systems"   Additionally, SG5 is working on the following work items:   * ITU-T K.5G-Lightning on “Practical guide for lightning protection, earthing and bonding, and safety consideration of 5G radio base station” * ITU-T K.Sup.5G.EMC on “Impacts of Electromagnetic compatibility test methods for 5G AAS” * ITU-T L.5G\_sav on “Energy saving technologies and best practices for 5G RAN equipment” * ITU-T L.EE\_slicing on “Energy efficiency and Slicing of IMT2020/5G” * ITU-T L.EE\_5G on “Energy efficiency Metrics and measurement methodology for 5G solutions” * ITU-T L.ENV-KPI-5G-ARCH on “Environmental KPIs/metrics for 5G architectures” |
| SG11 (TD836) | Achievements | Q.5001: Signalling requirements and architecture of intelligent edge computing  [Q.5020](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13888): Protocol requirements and procedures for network slice lifecycle management  [Q.5021](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13980): Protocol for managing capability exposure APIs in IMT-2020 network |
| SG11 (TD836) | Work Program | Related current work items of Q6/11:   * Q.D2D-EECP: Energy efficient D2D communication protocol for IMT 2020 network * Q.IMT2020-PFW: Protocol Framework for IMT-2020 * Q.IMT2020-PIAS: Protocol for providing intelligent analysis services in IMT-2020 network * Q.INS-PM: Protocol for managing Intelligent Network Slicing with AI-assisted analysis in IMT-2020 network   Related current work items of Q7/11:   * Q.QMP-TCA QoS management protocol for time constraint applications over SDN * Q.WLAN5G-REQ: Signalling requirements of WLAN access network for interworking with 5G network |
| SG17 (TD822) | Work Program | Since last TSAG meeting SG17 can update this Hot Topic with:  - Approved new draft Recommendations: X.1042 (X.sdnsec-1), X.1043 (X.sdnsec-3), X.1044 (X.srnv), X.1045 (X.ssc), and X.1046 (X.SDSec)  - New Work Items established: X.5Gsec-guide, X.sr\_cphr, X.nsom-sec, X.5Gsec-netec, X.5GSec-ecs, X.5Gsec-q and X.5Gsec-t. |
| SG15 (TD844) | Work Program | Work items of ITU-T SG15 WP1 and WP3 in cooperation with SG13   * Transport network to support IMT-2020/5G, * Optical access transport systems to serve the 5G fronthaul application,   incl. Fronthaul, midhaul and backhaul network considerations for IMT-2020/5G. |
|  | Achievements | Transport network to support IMT-2020/5G, - Technical Report GSTR-TN5G: Transport network support of IMT-2020/5G (Rev. October 2018) - G Suppl. 67 (07/2019): Application of optical transport network Recommendations to 5G transport - G.709.4 (03/2020): OTU25 and OTU50 short-reach interfaces - G.8261 (Rev. 08/2019) and Amd.1 (03/2020): Timing and synchronization aspects in packet networks - G.8262.1 (01/2019) and Amd.1 (08/2019): Timing characteristics of an enhanced synchronous equipment slave clock - G.8271.1 (Rev. 03/2020): Network limits for time synchronization in packet networks with full timing support from the network - G.8272.1 (2016) Amd.2 (08/2019): Timing characteristics of enhanced primary reference time clocks - G.8273.2 (Rev. 08/2019) and Amd.1 (03/2020): Timing characteristics of telecom boundary clocks and telecom time slave clocks - G.8273.4 (03/2020): Timing characteristics of telecom boundary clocks and telecom time slave clocks for use with partial timing support from the network - G.8275 (2017) Amd.2 (08/2019): Architecture and requirements for packet-based time and phase distribution - G.8275.1 (Rev. 03/2020): Precision time protocol telecom profile for phase/time synchronization with full timing support from the network  - G.8300 (05/2020): Characteristics of transport networks to support IMT-2020/5G - Technical Report GSTR-GNSS: Considerations on the Use of GNSS as a Primary Time Reference in Telecommunications (January 2020)  Optical access transport systems to serve the 5G fronthaul application - G Suppl. 66 (Rev. 07/2019): 5G wireless fronthaul requirements in a passive optical network context - G.9804.1 (11/2019): Higher speed passive optical networks – Requirements - G.9806 (06/2020): Higher speed bidirectional, single fibre, point-to-point optical access system (HS-PtP) |
|  | New Work Items | Transport network to support IMT-2020/5G, - G.8312: Interfaces for a metro transport network - G.8321: Characteristics of MTN equipment functional blocks - G.8331: Characteristics of linear protection for MTN networks - G.8310: Architecture of MTN - G.8350: Management of MTN - Amendment 2 to G.8261 ( 08/2019): Timing and synchronization aspects in packet networks - Amendment 1 to G.8271.1 (03/2020): Network limits for time synchronization in packet networks with full timing support from the network - Revision of G.8273.2 (08/2019): Timing characteristics of telecom boundary clocks and telecom time slave clocks - Revision of G.8275 (08/2017) Architecture and requirements for packet-based time and phase distribution - Amendment 1 to G.8275.1 (03/2020): Precision time protocol telecom profile for phase/time synchronization with full timing support from the network - Amendment 1 to G.8275.2 (03/2020): Precision time protocol telecom profile for phase/time synchronization with partial timing support from the network  Optical access transport systems to serve the 5G fronthaul application - Revision of G Suppl. 66 (07/2019): 5G wireless fronthaul requirements in a passive optical network context - Amendment 1 to G.9804.1 (11/2019): Higher speed passive optical networks – Requirements - G.9804.2: Higher Speed Passive Optical Networks: Common Transmission Convergence Layer Specification - Amendment 1 to G.9806 (06/2020): Higher speed bidirectional, single fibre, point-to-point optical access system (HS-PtP) - Proposed Recommendation on WDM-PON for 5G applications is in discussion |
|  | Workshop | - ​[Workshop on the evolution of Transport networks to support IMT-2020/5G](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20171016/Pages/default.aspx) - Geneva, 16 October 2017 - [Joint IEEE 802 and ITU-T Study Group 15 workshop “Building Tomorrow’s Networks”](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20180127/Pages/default.aspx) – Geneva, 27 January 2018 - [Joint IEEE 802 and ITU-T Study Group 15 workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/202001/Pages/default.aspx)  - Geneva, 25 January 2020 |

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| **6.00** | **Gigabit-speed broadband access services and networks** | | **SG15** SG9 |
| **Description** | | | |
| 6.01 | Support the delivery of high definition video services | | |
| 6.02 | Broadband access networks; G.fast, G.hn, VDSL2, NG-PON2 | | |
| 6.03 | True fixed-mobile convergence, hybrid fixed wireless | | |
| **Source Type** | CTO | **Date of Entry** |  |
| **Source References** | TSAG [TD101](https://www.itu.int/md/T17-TSAG-170501-TD-GEN-0101/en) | **Date of Update** | 21/09/2020 |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| TSAG Meeting Date: December 2018, September 2019 | | |
| SG17 (TD362) ([TD596](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0596/en)) | Others | SG17 may support the new FG-NET2030 through Q2/17, Q6/17, Q8/17 , and consider in its current transformation of security studies. |
| SG15 (TD385) | Work Program | Work items of ITU-T SG15 WP1   * Optical systems for fibre access networks: XG(S)-PON, NG-PON2, Higher-Speed PON and MW-PON (Multi-wavelength PON), * Broadband access over metallic conductors: VDSL2, G.fast and G.mgfast (Multi-Gigabit fast), * Broadband in-premises networking: G.hn and G.hn2 (unified high-speed wire-line based home networking transceivers), indoor optical camera communication transceivers (G.occ), and high speed indoor visible light communication transceiver (G.vlc). |
| SG9 (TD404) | New work Items | SG9 started two new work items to standardize the 5th Generation DOCSIS which is capable of gigabit broadband access over cable networks (DOCSIS 3.1 full duplex |
| TSAG Meeting Date: September 2020 | | |
| SG15 (TD844) | Achievements | Optical systems for fibre access networks - G.987 and G.987.x series: 10-Gigabit-capable passive optical networks (XG-PON) - G.9807.x series: 10-Gigabit-capable symmetric passive optical network (XGS-PON) - G.989 and G.989.x series: 40-Gigabit-capable passive optical networks (NG-PON2) - G.9802 (04/2015) and Amd.1 (08/2015): Multiple-wavelength passive optical networks (MW-PONs) - G.9804.1 (11/2019): Higher speed passive optical networks – Requirements - G.9806 (06/2020): Higher speed bidirectional, single fibre, point-to-point optical access system (HS-PtP)  Broadband access over metallic conductors - G.993.2 (Rev. 02/2019) : Very high speed digital subscriber line transceivers 2 (VDSL2) - G.993.5 (Rev. 02/2019) and Cor.1 (03/2020): Self-FEXT cancellation (vectoring) for use with VDSL2 transceivers - G.997.2 (03/2019) , Cor.1 (03/2020) and Amd.1 (05/2020): Physical layer management for G.fast transceivers - G.9700 (Rev. 07/2019): Fast access to subscriber terminals (G.fast) - Power spectral density specification - G.9701 (Rev. 03/2019) and Amd.1 & Cor.1 (11/2019) and Amd.2 & Cor.2 (05/2020): Fast access to subscriber terminals (G.fast) – Physical layer specification - G.9710 (02/2020): Multi-gigabit fast access to subscriber terminals (MGfast) - Power spectral density specification  Broadband in-premises networking - G.996x series: Unified high-speed wireline-based home networking transceivers - G.9991 (03/2019) and Amd.1 (07/2020) : High-speed indoor visible light communication transceiver - System architecture, physical layer and data link layer specification - G.9992 (03/2019): Indoor optical camera communication transceivers – System architecture, physical layer and data link layer specification |
|  | New Work Items | Optical systems for fibre access networks - Amendment 2 to G.987.2 (06/2016): 10-Gigabit-capable passive optical networks (XG-PON): Physical media dependent (PMD) layer specification - Amendment 1 to G.989.2 (02/2019): 40-Gigabit-capable passive optical networks (NG-PON2): Physical media dependent specification - Amendment 2 to G.9807.1 (06/2016): 10-Gigabit-capable symmetric passive optical network (XGS-PON) - Amendment 1 to G.9804.1 (11/2019): Higher speed passive optical networks – Requirements - Amendment 1 to G.9806 (06/2020): Higher speed bidirectional, single fibre, point-to-point optical access system (HS-PtP) - G.9807.3 (ex G.SuperPON): Wavelength multiplexed point-to-multipoint 10-Gigabit-capable passive optical network - G.hsp.50Gpmd: Higher Speed Passive Optical Networks: 50G PMD - G.9804.2 (G.hsp.comTC): Higher Speed Passive Optical Networks: Common Transmission Convergence layer - G.hsp.TWDMpmd: Higher Speed Passive Optical Networks: TWDM PMD  Broadband access over metallic conductors - Amendment 2 to G.997.2 (03/2019): Physical layer management for G.fast transceivers - Amendment 3 to G.9701 (03/2019): Fast access to subscriber terminals (G.fast) – Physical layer specification - G.fastback: Transceiver and system specifications for backhaul applications based on G.fast - G.997.3 (ex G.ploam-MGfast): Physical layer management for MGfast transceivers - G.9711 (ex G.mgfast-PHY): Multi-Gigabit fast access to subscriber terminals (MGfast) – PHY  Broadband in-premises networking - G.hn2: Evolution of unified high-speed wire-line based home networking transceivers - G.uvs: Support UHD video service over G.hn (G.uvs) - G.fin: High speed fibre-based in-premises transceivers - system architecture, physical layer and data link layer specification - Amendment 2 to G.9991 (03/2019): High-speed indoor visible light communication transceiver – System architecture, physical layer and data link layer specification -Technical Paper TP-ARCH-HN: Technical paper on architecture, function, and service of home network - Technical Paper TP-GHN: Overview of the G.hn technology- Technical Paper TP-UC-HN:  - Technical paper on the use of ITU-T G.hn technology for in-home networking - Technical Paper TP-VLC: Technical paper on the use of ITU-T Visible Light Communication technology |
|  | Workshop | - [Joint IEEE 802 and ITU-T Study Group 15 workshop “Building Tomorrow’s Networks”](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20180127/Pages/default.aspx) – Geneva, 27 January 2018 - ​[Joint IEEE 802 and ITU-T Study Group 15 workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/202001/Pages/default.aspx)  - Geneva, 25 January 2020 |

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| **7.0** | **Data Center Interconnection for OTT and vertical industries** | | **SG15 SG11** (Cooperating SG) SG9 |
| **Description** | | | |
| 7.01 | OTT’s business and services models in relation to telecom services | | |
| 7.02 | Requirements from OTT for DCI/metro network technologies (such as short distance, large bandwidth, low-cost optical (WDM) technology, fixed network), and standards | | |
| **Source Type** | Contribution | **Date of Entry** |  |
| **Source References** | TSAG [C37](https://www.itu.int/md/T17-TSAG-C-0037/en) | **Date of Update** | 21/09/2020 |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: December 2018, September 2019 | | |
| SG11 (TD349) | Work Program | Work item in Q4/11  Q.SD-DCI: Signalling requirements and information model of SD-DCI service |
| SG17 (TD362) ([TD596](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0596/en)) | Work Program | work items: Q6/17 and Q7/17 |
|  | Workshops | 5G Security |
|  | Others | The underlying AI/ML topic necessary here is not listed. |
| SG15 (TD385) | Work Program | Work items of ITU-T SG15: ITU-T SG15 provides the network infrastructure for DCI and does not consider the applications using the infrastructure. |
| SG9 (TD404) | New Work Item | Regarding OTT services, SG9 has started a new work item on draft Recommendation J.cable-ott “System architecture and interfaces between a cable television operator and an OTT service provider”. |
| TSAG Meeting Date: September 2020 | | |
| SG15 (TD844) | Work Program | Work items of ITU-T SG15 WP2 and WP3: ITU-T SG15 provides the network infrastructure for DCI and does not consider the applications using the infrastructure.  Nevertheless, several existing ITU-T SG15 Recommendations are particularly of interest for DCI, for example:  - G.654 (Rev. 03/2020): Characteristics of a cut-off shifted single-mode optical fibre and cable - G.694.1 (02/2012): Spectral grids for WDM applications: DWDM frequency grid - G.698.2 (Rev. 11/2018): Amplified multichannel dense wavelength division multiplexing applications with single channel optical interfaces - G.709 (Rev. 06/2020): Interfaces for the optical transport network - G.709.1 (Rev. 06/2018) and Amd.1 (04/2019) & Cor.1 (05/2020): Flexible OTN short-reach interfaces - G.709.2 (07/2018): OTU4 long-reach interface - G.709.3 (06/2018) and Amd.1 (11/2018): Flexible OTN long-reach interfaces - G.798 (12/2017), Cor. 1 (08/2018), Amd.1 (08/2018) and Amd.2 (12/2019): Characteristics of optical transport network hierarchy equipment functional blocks - G.807 (02/2020): Generic functional architecture of the optical media network - G.872 (Rev. 12/2019): Architecture of optical transport networks  Following new work items are also particularly of interest for DCI, for example: - Revision of G.694.1 (02/2012): Spectral grids for WDM applications: DWDM frequency grid - Revision of G.698.2 (11/2018): Amplified multichannel dense wavelength division multiplexing applications with single channel optical interfaces - Amendment 1 to G.709 (06/2020): Interfaces for the optical transport network - Amendment 2 to G.709.1 (06/2018): Flexible OTN short-reach interfaces - Revision of G.709.3 (06/2018): Flexible OTN long-reach interfaces - Amendment 3 to G.798 (12/2017): Characteristics of optical transport network hierarchy equipment functional blocks - Amendment 1 to G.807 (02/2020): Generic functional architecture of the optical media network - Amendment 1 to G.872 (12/2019): Architecture of optical transport networks - Technical Report TR.sdm: Optical fibre and cable for space division multiplexing transmission  Joint IEEE and ITU-T SG15 workshop are also of interest for DCI - [Joint IEEE 802 and ITU-T Study Group 15 workshop “Building Tomorrow’s Networks”](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20180127/Pages/default.aspx) – Geneva, 27 January 2018 - [Joint IEEE 802 and ITU-T Study Group 15 workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/202001/Pages/default.aspx)  - Geneva, 25 January 2020 |

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| **8.00** | **Augmented reality & virtual reality, video services** | | **SG16 SG12[[3]](#footnote-3) SG11** (Cooperating SG) |
| **Description** | | | |
| 8.01 | Applications with high network requirements in throughput and latency | | |
| 8.02 | A range of innovative technologies in transport, IP and access networking, media coding and cloud and edge computing | | |
| 8.03 | NG video codec standardization on 5G and vertical industries | | |
| 8.04 | Future Content Delivery Network (CDN) technologies standards. | | |
| 8.05 | Immersive live experience (ILE) | | |
| 8.06 | Digital signage | | |
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| **Source Type** | Contribution, CTO | **Date of Entry** |  |
| **Source References** | TSAG [C6](https://www.itu.int/md/T17-TSAG-C-0006/en), [TD101](https://www.itu.int/md/T17-TSAG-170501-TD-GEN-0101/en) | **Date of Update** | 21/09/2020 |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: December 2018 | | |
| SG16 (TD347) | Work Program | 1. New Recs. H.430-series on immersive live experience 2. Activities: Three Mini-workshops on ILE were held on Sep 2016 and Jan, Oct 2017. 3. Related SDOs: MPEG, DVB, EBU, 3GPP, VRIF 4. H.780 “Digital signage: Service requirements and IPTV-based architecture” 5. H.DS-FIS “Digital signage: Framework for interactive services” |
| SG11 (TD349) | Work Program | Work items in Q8/11   1. [X.609.3 (ex X.mp2p-mssr)](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13345) Managed P2P communications: Multimedia streaming signalling requirements 2. [X.609.4 (ex X.mp2p-mspp)](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13493) Managed P2P communications: Multimedia streaming peer protocol 3. [X.609.5 (ex X.mp2p-msomp)](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13494) Managed P2P communications: Multimedia streaming overlay management protocol 4. X.mp2p-cdsr: Managed P2P communications: Content distribution signalling requirements 5. X.mp2p-cdpp: Managed P2P communications: Content distribution peer protocol |
| SG9 (TD404) | Work Program | Regarding augmented reality & virtual reality, video services, SG9 consented J.302amd-1 “System specifications of augmented reality smart television service Amd #1”, and has started to develop a new technical paper TP.b-catv “Broadband CATV system using server-side reception and processing” for enabling advanced video services (e.g. 360 degree video) through existing broadband CATV system. |
| TSAG Meeting Date: September 2019 | | |
| SG20 ([TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | Work Program | Y.IoT-AR: Framework for AR and VR based control in IoT: Q4/20  Y.Supp.42: Use cases of user-centric work space service: Q2/20  Y.UCS-Reqts: Requirements and capabilities of user-centric work space service: Q2/20 |
| TSAG Meeting Date: September 2020 | | |
| SG11 (TD349) | Achievements | X[.609.3](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13345): Managed P2P communications: Multimedia streaming signalling requirements  [X.609.4](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13493): Managed P2P communications: Multimedia streaming peer protocol  [X.609.5](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13494) : Managed P2P communications: Multimedia streaming overlay management protocol  [X.609.6:](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13801) Managed P2P communications: Content distribution signalling requirements  [X.609.7](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=13802): Managed P2P communications: Content distribution peer protocol |

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| **9.00** | **Accessibility by design mainstreaming the consideration of needs of persons with disabilities and other persons with specific needs to build inclusive ICT solutions** | | **SG20** |
| **Description** | | | |
| **Source Type** | CxO | **Date of Entry** |  |
| **Source References** | TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en) | **Date of Update** |  |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| TSAG Meeting Date: December 2018, September 2019 | | |
| SG2 (TD344) ([TD515](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0515/en)) | Others | a global resource for services to promote accessibility. |
|  | New Work Item | New work item was created for a recommendation that specifies a country code that is available for use by entities who wish to offer international telecommunication services for persons with disabilities and persons with specific needs (ITU-T E.disab, [SG2-C140](https://www.itu.int/md/T17-SG02-C-0140/en)). |
| SG16 (TD347) | Achievements | H.702 "Accessibility profiles for IPTV systems"  F.791 "Accessibility terms and definitions"  F.921 "Audio-based indoor and outdoor network navigation system for persons with vision impairment"  F.930 "Multimedia telecommunication relay services". |
| TSAG Meeting Date: September 2019 | | |
| SG20 ([TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | Achievements | Y.4204 “Accessibility requirements for the Internet of things applications and services”: Q2/20 |
|  | Work Program | Y.ACC-PTS “Accessibility requirements for smart public transportation services”: Q2/20 |

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| **10.00** | **Security and Trust** | | **SG2 SG17** |
| **Description** | | | |
| 10.01 | Principles of transparency and technological integrity | | |
| 10.02 | Mitigation of the risks posed by IoT botnets | | |
| 10.03 | Assessment of the impact of quantum computing | | |
| 10.04 | Potential of blockchain and its implications for security | | |
| 10.05 | Data-centric security | | |
| 10.06 | Security and privacy by design, considering security and privacy from the outset of ICT services’s development through the proactive monitoring and protection of live services | | |
| 10.07 | Security, privacy and trust in the presence of AI and ML | | |
| 10.08 | Application security and quantum-safe cryptography through an incubation process | | |
| 10.09 | Identity and authorization, providing for the reliable identification essential to secure, efficient service provision | | |
| 10.10 | Security and privacy of human factor (intersection of computer science and the humanities) | | |
| 10.11 | Security of Robotics/IoT | | |
| 10.12 | Cybersecurity Services | | |
| 10.13 | Technical aspects of Cybersecurity Insurance | | |
| 10.14 | Edge Cloud Security | | |
| 10.15 | Security Standardization Strategy and Security Architecture Development | | |
| **Source Type** | CTO, CxO | **Date of Entry** |  |
| **Source References** | TSAG [TD101](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0101/en), [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en) | **Date of Update** |  |
| **Status** | Active | **Global Measurement** |  |
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| **Transaction Update Table** | | |
| TSAG Meeting Date: December 2018, September 2019 | | |
| SG2 (TD?) | New Work Item | New work item on "spoofing" in regards to E.156 and E.157. Unwanted calling appears to be on the rise around the world. The unwanted calls often use non-existent telephone numbers, or use a number that is not the number of the originator. This work will provide information on nuisance calling, spoofing, etc. and initiatives to address those concerns. ( [SG2-TD 665](https://www.itu.int/md/T17-SG02-190219-TD-GEN-0665/en)). |
| SG17 (TD362) ([TD596](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0596/en)) | Others | For what concerns the list of sub Hot Topics:   * Workshops: Workshop on AI/ML and Security * AI/ML is now part of question text of Q2, 4, 5 and 6/17 * New Work Items: TR.cs-ml on AI/ML   Regarding more generally this hot topic   * Emerging new topics are establishing and develop and through the incubation mechanism pilot in particular about Quantum based security (see Hot Topic 15), but as well several new aspects of Security Architecture (Schemas for Integrated Cyber Defence, etc.) * Through these observations, SG17 would like TSAG to consider potential changes on Hot Topic 10 sub items as Security Architecture topics emerged in Q2 and 4/17 (X.arch-design, TP.sec-arch, TP.ics-schemas, X.rf-csap, X.tf-mpc) but as well a significant development **security for verticals with not only increase of activity for ITS with Q13/17 but the qualification** of its usage by industry. As well finance work items in Q7/17 considerations of Question text changes and in relation to the Workshop listed above   We observe too a densification of work in the area of Managed Security Services and Cyber Defence Centres X.fram-cdc; DLT; Cloud Computing with the key containerisation X.sgcc and various deployment scenarios X.sgdc, etc.;  Cybersecurity Insurance aspects initiated with X.ciag   * existing partnership with ISO/IEC JTC1/SC27/WG1 on this topic with 27102 “Guidelines for Cyber Insurance” which was published in 2019. |
|  | Workshops | ITU Workshop on Fintech Security  Mini-workshop on Cybersecurity Challenges in Automated Driving |
| TSAG Meeting Date: September 2020 | | |
| SG17 (TD822) | Others | SG17 saw again a densification of its work over the past 2 SG17 meetings and despite the complications inherent to the COVID19 crisis.  On top of SG17 standard work, SG17 agreed to report the below as relevant to current or proposed new hot topics that could be of relevance for other SGs, FGs and ITU-T  The intense preparations for WTSA-20 allowed to propose a number of changes in the structure and exhibited a number of Hot Topics   * In addition to Quantum based security, other emerging topics keep flowing and develop   + The incubation mechanism was adopted in production (from pilot stage) and is documented as per [TD3353](https://www.itu.int/md/T17-SG17-200824-TD-PLEN-3353/en) and is proposed to TSAG as a base for a new A series Recommendation should other SGs leverage it.   + The incubation is identifying increased needs and call for contributions for Technical Papers, Technical Reports and Strategy documents as beneficial both for SG17 and outside of SG17 to understand better some topics as well as to help the contributors and editors to have a much deeper preparation in a safe zone to then develop their Recommendations. * Q1 will be transformed from a ‘project office’ to a ‘strategy office’ and will likely carry the work developed by correspondence groups   + The correspondence group on transformation of security studies finished successfully all its 3 years long mandate with more than 115 participants allowing a number of short, mid and long term critical results including the below correspondence group (CG-SECAD). A Technical Report was agreed [TD3355R1](https://www.itu.int/md/T17-SG17-200824-TD-PLEN-3355/en)   + A correspondence group for security architecture development (CG-SECAD) studied the feasibility for SG17 to improve quality, harmonization and composition of its work through security architecture. See report TD3353   + It delivered significant outcome that might be of interest for other Study Groups and it created informal new relationships with IEC leaders, ISO/IEC JTC 1/AG 8 on Meta References Architectures and Trustworthiness asked its experts to join them, SG17 learnt key specific solution ideas from SG15 whom we warmly thank looking towards keeping both sides informed on progress and development   + It observes that at least ISO and IEC are seeing similar problems as SG17 but in a bigger scale * SG17 recognized too a number of gaps with other SGs and in particular the need to establish an ITU-T level Smart City strategy * A strategy work item for ‘as a Service’ Recommendations was accepted in Q8/17 to better organize the strategy with SG13 |

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| **11.00** | **Analytics, supporting the development of evidence-based, data driven services** | | **SG20 SG17** |
| **Description** | | | |
| 11.01 | Data processing and management for IoT and SC&C | | |
| 11.02 | Common things description methodology | | |
| 11.03 | Interoperability framework and functional architecture for IoT and SC&C | | |
| 11.04 | Industry dependent data models and formats to support development of data driven IoT and SC&C services | | |
| 11.05 | Features, requirements, framework and functional architecture of IoT device, gateway, platform, network | | |
| 11.06 | Edge Computing to support evidence-based, data driven IoT and SC&C services | | |
| 11.07 | Distributed ledger technologies for IoT and SC&C | | |
| 11.08 | IoT identification to support evidence-based data driven IoT and SC&C services | | |
| 11.09 | AI enabled IoT and SC&C | | |
| 11.10 | Data driven IoT verticals | | |
| 11.11 | Data Security | | |
| **Source Type** | CxO, | **Date of Entry** |  |
| **Source References** | TSAG [TD160](https://www.itu.int/md/T17-TSAG-180226-TD-GEN-0160/en) | **Date of Update** | 21/09/2020 |
| **Status** | Active | **Global Measurement** |  |
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| SG17 (TD362) ([TD596](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0596/en)) | Others | Questions: Q7/17, Q8/17, Q13/17  WTSA-16 Res.94 |
|  | Work Program | work items: X.srfb |
| SG20 (TD339) ([TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | Work Program | Y.SC-OpenData (Framework of Open Data in Smart Cities): Q1/20  [Y.IoT-BPM-reqts-caps](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=14497) (Specific Requirements and Capabilities of the Internet of Things): Q2/20  [Y.4203](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=13687)  (Requirements of things description in the Internet of Things): Q2/20  Y.IoT-EC-reqts (IoT requirements for edge computing): Q2/20  Y.4116 (Requirements of transportation safety service including use cases and service scenarios): Q2/20  Y.4555 (Service functionalities of self-quantification over Internet of things): Q4/20  Y.4457 (Architectural framework for transportation safety services): Q4/20  Y.smart-evacuation (Framework of Smart Evacuation during emergencies in Smart Cities and Communities): Q4/20  Y.disaster-notification (Framework of the disaster notification of the population in Smart Cities and Communities): Q4/20  Y.dev-IoT-arch (Architectural reference models of devices for IoT applications): Q3/20  Y.SCCE-arch (Reference architecture of spare computational capability exposure of IoT devices for smart home): Q3/20  Y.cnce-IoT-arch (Functional architecture of cellular-radio network capability exposure for smart hospital based on Internet of things):Q3/20  Y.dec-IoT-arch (Decentralized IoT communication architecture based on information centric networking and blockchain): Q3/20  Y.AERS-msd (Minimum set of data structure for automotive emergency response system): Q3/20  Y.AERS-mtp (Minimum set of data structure for automotive emergency response system): Q3/20  Y.IoT-rf-dlt (OID-based Resolution framework for transaction of distributed ledger assigned to IoT resources): Q3/20  Y.IoT-ics (Requirements and functional architecture of open IoT identity correlation service): Q3/20  Y.UIIS (Unified identity/identifier/locator split (UIIS) services and architecture in IoT environment): Q3/20  Y.NDA-arch (Functional architecture of network-based driving assistance for autonomous vehicles): Q3/20  Y.SSC-AISE-arc (Reference architecture of artificial intelligence service exposure for smart sustainable cities): Q3/20  Y.smoke-detection (Requirements and Functional Architecture of Smart Fire Smoke Detection Service): Q4/20  Y.STD (Functional Architecture for Management to Smart Tourist Destinations): Q4/20  Y.STIS-fm (Function and metadata of Spatiotemporal Information Service for SSC): Q4/20 |
| FG-DPM | FG Activities | Technical Specification D3.2: SensorThings API – Sensing;  Technical Specification D3.3: Framework to support data interoperability in IoT environments;  Technical Report D3.5: Overview of blockchain for supporting IoT and SC&C in DPM aspects;  Technical Specification D3.7: Blockchain-based data management for supporting IoT and SC&C. |
| TSAG Meeting Date: September 2020 | | |
| SG17 (TD822) | Others | Regarding 11.11  SG17 agrees to use the term operational and technical aspects of Data Protection  SG17 agrees to improve Q7/17 question text regarding data protection and security for AI |

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| **12.00** | **Intelligent network management towards future networks** | | **SG2** |
| **Description** | | | |
| 12.01 | Smart operation, management and maintenance. | | |
| 12.02 | Telecom anti-fraud management | | |
| 12.03 | REST-based network management framework | | |
| 12.04 | Blockchain system management | | |
| **Source Type** | SG2 | **Date of Entry** |  |
| **Source References** | TSAG [TD344](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0344/en) | **Date of Update** | 21/09/2020 |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| TSAG Meeting Date: December 2018, September 2019 | | |
| SG2 (TD344) ([TD515](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0515/en)) | Work Program | M.somm: Framework of smart operation, management and maintenance.  M.tsm: Principles for telecommunications smart maintenance.  M.rtsmf: Requirements for telecommunications smart maintenance management functions  M.tsm-gim: Generic information model for telecommunications smart maintenance  M.rdm: Requirements for Data Management in the TMN  M.rtafm: Requirements for Telecom anti-Fraud Management in the TMN.  X.rest : Guidelines for the definition of REST-based managed objects and management interface  Q.rest: REST-based management services  M.rcsnsm: A new work item was created for a Recommendation that specifies the requirements for cloud and SDN-based network synergy management ([SG2-TD-673-R1](https://www.itu.int/md/T17-SG02-190219-TD-GEN-0673)). |
| TSAG Meeting Date: September 2020 | | |
| SG2 (TD881) | Work Program | M.3041 (ex. M.somm): Framework of smart operation, management and maintenance.  M.3040 (ex. M.tsm): Principles for telecommunications smart maintenance.  M.3364 (ex. M.rtsmf): Requirements for telecommunications smart maintenance management functions  M.3164 (ex. M.tsm-gim): Generic information model for telecommunications smart maintenance  M. M.rdm: Requirements for Data Management in the TMN  M.3362 (M.rtafm): Requirements for Telecom anti-Fraud Management in the TMN.  X.785 (ex. X.rest): Guidelines for the definition of REST-based managed objects and management interface  Q.rest: REST-based management services  M.rcsnsm: Requirements for synergy management of cloud and SDN-based networks ([SG2-TD-673-R1](https://www.itu.int/md/T17-SG02-190219-TD-GEN-0673)).  [M.rrsp](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16433" \o "See more details): Requirements for robot-based on-site smart patrol of telecommunication network  [M.AI-TOM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16432" \o "See more details): Framework of AI enhanced Telecom Operation and Management (AITOM)  [M.resm-AI](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16435" \o "See more details): Requirements for energy saving management of 5G RAN system with AI  M.rwop-AI: Requirements for work orders processing in Telecom Management with AI  X.rest-ics: Guidelines for implementation conformance statement proformas associated with REST-based management systems  [M.rmbs](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16434" \o "See more details): Requirements for management of blockchain system  [M.immbs](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16442" \o "See more details): Information model for management of blockchain system |

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| **13.00** | **Environmental efficiency of emerging technologies** | | **SG5** |
| **Description**  The ITU-T Focus Group on “Environmental Efficiency for AI and other Emerging Technologies” (FG-AI4EE) is identifying the standardization gaps related to the environmental performance of AI and other emerging technologies including automation, augmented reality, virtual reality, extended reality, smart manufacturing, industry 5.0, cloud/edge computing, nanotechnology, 5G, among others. The focus group develops technical reports and technical specifications to address the environmental efficiency, as well as water and energy consumption of emerging technologies. | | | |
| 13.01 | Assessment of the environmental impacts of deploying and implementing AI, Blockchain, and other emerging technologies | | |
| **Source Type** | SG5 | **Date of Entry** |  |
| **Source References** | TSAG [TD374](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0374/en) | **Date of Update** |  |
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| TSAG Meeting Date: December 2018 | | |
| SG5 (TD374) | FG Activities | **A proposal for a new Focus Group on Environmental Efficiency for Artificial Intelligence and other emerging technologies** has been presented during the SG5 meeting that took place from 11-21 September 2018. The Final approval of this FG will be decided during the next SG5 meeting planned in May 2019. |
| TSAG Meeting Date: September 2020 | | |
| SG5 (TD876) | FG Activities | **The Focus Group on Environmental Efficiency for Artificial Intelligence and other emerging technologies** (FG-AI4EE) was established in May 2019. The first meeting of the FG-AI4EE was held on 12 December 2019 in Vienna, Austria. The meeting was preceded by a Forum on Environmental Efficiency for AI and other Emerging Technologies. The work of the FG-AI4EE will be carried out within three working groups:   * WG1: Requirements of AI and other Emerging Technologies to Ensure Environmental Efficiency * WG2: Assessment and Measurement of the Environmental Efficiency of AI and Emerging Technologies * WG3: Implementation Guidelines of AI and Emerging Technologies for Environmental Efficiency |
| SG5 (TD876) | Work programme | Within ITU-T SG5 the following Recommendation has been approved:   * Recommendation ITU-T L.1305 “Data centre infrastructure management system based on big data and artificial intelligence technology” * Active WI L.Energy\_Crypto\_Currency “Energy consumption of crypto currency” |

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| **14.00** | **Digital health** | | **SG16 SG20** |
| **Description** | | | |
| **Source Type** | SG16 | **Date of Entry** |  |
| **Source References** | TSAG [TD347](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0347/en) | **Date of Update** |  |
| **Status** | Active | **Global Measurement** |  |
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| TSAG Meeting Date: December 2018, September 2019 | | |
| SG16 (TD347) ([TD524](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0524/en)) | Achievements | H.870 (ex F.SLD) on safe listening systems  H.810-series on personal connected health  H.860-series on multimedia brain information platform |
|  | Focus Group | Q28/16 and FG AI4H with AI with its applications in certain medical and health domains. |
| TSAG Meeting Date: September 2019 | | |
| SG20 ([TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | Work Program | Y.IoT-EH-PFE (Performance evaluation frameworks of e-health systems in the IoT): Q7/20 |

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| **15.00** | **Quantum based Security** | | **SG17 SG13** |
| **Description**  Quantum cryptography and key distributions are essential to the long term resistance of any digital life. It is a major problem to address within a 10 years horizon, yet facing challenges of the high incentives of the Quantum Computing ‘attack’ weaponry to succeed sooner.  The impending arrival of quantum computing poses significant risks to security. Quantum-safe cryptography is essential to preparations for that arrival. Public key cryptography is a cornerstone of authentication over public networks. Quantum computing is quick to solve integer-factoring and discrete-logarithm problems, problems relied on by almost all public key cryptography. Recognizing the increasing importance of quantum-safe public key cryptography, SG17 identified the need for ITU standards to provide for interoperable quantum-safe communications, in particular the secure distribution of symmetric encryption keys. | | | |
| **Source Type** | SG17 | **Date of Entry** |  |
| **Source References** | TSAG [TD362](https://www.itu.int/md/T17-TSAG-181210-TD-GEN-0362/en) | **Date of Update** |  |
| **Status** | Active | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: December 2018 | | |
| SG13 (TD?) | Work Program | Y.QKDN\_FR Framework for Networks to supporting Quantum Key Distribution  Experts participated in the ITU Workshop on Quantum in Shanghai |
| TSAG Meeting Date: September 2019 | | |
| SG17 ([TD596](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0596/en)) | Workshops | Organized a Mini workshop on Secure Quantum Communications |
|  | Others | Temporarily agrees to refer to this field as to “Quantum based security” subject to change in future meetings |
|  | New Work Items | X.sec\_QKDN-km, X.sec-QKDN-ov, X.sec-QKDN-tn |
|  | ITU-T Collaboration | Experts contribute to SG13 work in Q16/13 and in particular to Y.3800 |







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| **16.00** | **Assessment and evaluation of smart city and IoT verticals (e.g. detailed mobility, detailed energy management, detailed water management, etc.)** | | **SG20** |
| **Description** | | | |
| **Source Type** | SG20 | **Date of Entry** | 14/02/2020 |
| **Source References** | TSAG [TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en) | **Date of Update** | 21/09/2020 |
| **Status** | New | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: September 2020 | | |
| SG17 (TD822) | Others | SG17 agrees to request an ITU-T Strategy regarding Smart Cities as a whole first. See LS/o SG17 TD3391 |

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| **17.00** | **Solutions in smart sustainable cities using emerging technologies (e.g. IoT, AI, etc.)** | | **SG20** |
| **Description** | | | |
| **Source Type** | SG20 | **Date of Entry** | 14/02/2020 |
| **Source References** | TSAG [TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en) | **Date of Update** | 21/09/2020 |
| **Status** | New | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: September 2020 | | |
| SG17 (TD822) | Others | SG17 agrees to request an ITU-T Strategy regarding Smart Cities as a whole first. See LS/o SG17 TD3391 |

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| **18.00** | **Smart villages and rural areas** | | **SG20** |
| **Description** | | | |
| **Source Type** | SG20 | **Date of Entry** | 14/02/2020 |
| **Source References** | (TSAG [TD533](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0533/en)) | **Date of Update** | 21/09/2020 |
| **Status** | New, Active, Deprecated, Archived, Removed | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: September 2020 | | |
| SG17 (TD822) | Others | SG17 agrees to request an ITU-T Strategy regarding Smart Cities as a whole first. See LS/o SG17 TD3391 |

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| **19.00** | **Identify scenarios and best practices for Network infrastructure sharing** | | **SG2, SG3, SG13, SG15** |
| **Description** | | | |
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| **Source Type** | CTO, CxO | **Date of Entry** | 14/02/2020 |
| **Source References** | [TD582](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0582/en), [TD661](https://www.itu.int/md/T17-TSAG-200210-TD-GEN-0661/en) | **Date of Update** | 21/09/2020 |
| **Status** | New | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: September 2020 | | |
| SG5 (TD876) | Work Program | Network facilities infrastructure sharing:  Recommendation ITU-T L.1210: [Sustainable power-feeding solutions for 5G networks](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14079" \o "Sustainable power-feeding solutions for 5G networks)  Draft Recommendation ITU-T L.1382 (ex.L.SE\_TR): Smart energy solution for telecommunication rooms  Both Recommendations consider the sharing of the facilities between different operators. |
| SG15 (TD844) | Work Program | Work items of ITU-T SG15 WP2  Following existing ITU-T SG15 Recommendations are related to network infrastructure sharing with multiple operators: - L.108 (03/2018): Optical fibre cable elements for microduct blowing-installation application - L.156 (03/2018): Air-assisted installation of optical fibre cables - L.160 (07/2010) and Amd.1 (12/2014): Optical cabling shared with multiple operators in buildings - L.162 (11/2016): Microduct technology and its applications - L.206 (08/2017): Requirements for passive optical nodes – Outdoor optical cross-connect cabinet - L.207 (03/2018): Passive node elements with automated ID tag detection - L.208 (08/2019): Requirements for passive optical nodes – Fibre distribution box |

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| **20.00** | **Performance, QoS and QoE** | | **SG12, SG16, FG-AI4AD** |
| **Description** | | | |
| 20.01 | Real-time monitoring of network performance | | |
| 20.02 | Network performance prediction | | |
| 20.03 | Compliance, conformance and quality testing for Intelligent Transport Systems | | |
| 20.04 | Measurement of user-perceived QoS | | |
| **Source Type** | CTO | **Date of Entry** | 14/02/2020 |
| **Source References** | [TD582](https://www.itu.int/md/T17-TSAG-190923-TD-GEN-0582/en) | **Date of Update** |  |
| **Status** | New | **Global Measurement** |  |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: DD/MM/YYYY | | |
| SGxx (TDxxxx) | Work Program |  |
| SGxx (TDxxxx) | New Work Items |  |
| SGxx (TDxxxx) | FG Activities |  |
| SGxx (TDxxxx) | Workshop |  |
| SGxx (TDxxxx) | Coordination in ITU-T |  |
| SGxx (TDxxxx) | Coordination outside of ITU-T |  |
| SGxx (TDxxxx) | Other activities |  |

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| **21.00** | **ICT sector impacts on climate and biodiversity** | | **SG5** |
| **Description**  Reduction of the ICT sector GHG emissions to comply with the Paris Agreement, towards NetZero emissions and following a 1.5 C trajectory and its contribution to a sustainable development of other sectors regarding climate and biodiversity | | | |
| **21.01** | Smart solutions to improve efficiency | | |
| **21.02** | [Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14084" \o "Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement):   * Reduction of the ICT sector own emissions * The contribution of the ICT sector to other economic sectors from a climate perspective | | |
| **21.03** | ICT in relation to biodiversity | | |
| **Source Type** | SG | **Date of Entry** | 21/09/2020 |
| **Source References** | TD876 | **Date of Update** |  |
| **Status** | New | **Global Measurement** | Hot |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: September 2020 | | |
| SG5 (TD876) | Work Program | Recommendation ITU-T L.1410 on Methodology for environmental life cycle assessments of information and communication technology goods, networks and services  Recommendation ITU-T L.1420 on Methodology for energy consumption and greenhouse gas emissions impact assessment of information and communication technologies in organizations  Recommendation ITU-T L.1430 on Methodology for assessment of the environmental impact of information and communication technology greenhouse gas and energy projects  Recommendation ITU-T L.1450 on Methodologies for the assessment of the environmental impact of the information and communication technology sector  Recommendation ITU-T L.1451 on Methodology for assessing the aggregated positive sector-level impacts of ICT in other sectors  Recommendation ITU-T L.1460 on Connect 2020 greenhouse gases emissions - Guidelines  Recommendation ITU-T L.1470 on Greenhouse gas emissions trajectories for the information and communication technology sector compatible with the UNFCCC Paris Agreement  Recommendation ITU-T L.1380 on Smart energy solution for telecom sites  Draft Recommendation ITU-T L.1381 (ex.L.SE\_DC) on Smart energy solution for data centre  Draft Recommendation ITU-T L.1382 (ex.L.SE\_TR) on Smart energy solution for telecommunication rooms  Supplement ITU-T L.Suppl.37 to Recommendation ITU-T L.1470 (ex. L.Sup.Orgtrajectories) on Guidance to operators of mobile networks, fixed networks and data-centres on setting 1.5°C aligned targets compliant with Recommendation ITU-T L.1470  Draft Recommendation ITU-T L.SM\_EN on Smart energy for cities and home applications |
| SG5 (TD876) | New Work Items | Draft Recommendation ITU-T [L.methodology\_arch](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14539" \o "See more details) on Methodology to assess the environmental impact of the different proposed architectures  Draft Recommendation ITU-T [L.SEEQ](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14538" \o "See more details) on Effect for global ICT of the potential of selling services instead of equipment on the waste creation and environmental impacts |
| SG5 (TD876) | Coordination outside of ITU-T | Collaboration with GeSi, IEA, GSMA SBTi, UNFCCC, ETSI TC EE |

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| **22.00** | **Circular Economy concept applied to the ICT sector** | | **SG5** |
| **Description**  The transition to Circular economy is becoming one of the important topics for all activities in order to move into a direction of a sustainable development and to increase the environmental efficiency of the ICT sector.  A series of Recommendations and activities were developed and are under development to create an environment in which the ICT sector can adopt the requirements for Circular Economy. | | | |
| 22.01 | Circular economy definition and application | | |
| 22.02 | E-waste collection and treatment to improve the availability of materials | | |
| **Source Type** | SG | **Date of Entry** | 21/09/2020 |
| **Source References** | TD876 | **Date of Update** |  |
| **Status** | New, Active, Deprecated, Archived, Removed | **Global Measurement** | Hot |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: September 2020 | | |
| SG5 (TD876) | Work Program | Recommendation ITU-T L.1020 on Circular economy: Guide for operators and suppliers on approaches to migrate towards circular ICT goods and networks  Recommendation ITU-T L.1021 on Extended producer responsibility - Guidelines for sustainable e-waste management  Recommendation ITU-T l.1022 on Circular economy: Definitions and concepts for material efficiency for information and communication technology  Recommendation ITU-T L.1030 on E-waste management framework for countries  Recommendation ITU-T L.1031 on Guideline on implementing the e-waste reduction target of the Connect 2020 Agenda  Recommendation ITU-T L.1032 on Guidelines and certification schemes for e-waste recyclers  Recommendation ITU-T L.1101 on Measurement methods to characterize rare metals in information and communication technology goods  Recommendation ITU-T L.1102 on Use of printed labels for communicating information on rare metals in information and communication technology goods  Recommendation ITU-T L.1400 on Overview and general principles of methodologies for assessing the environmental impact of information and communication technologies  Draft Recommendation ITU-T L.1023 (ITU-T L.CE\_2) on Assessment method for Circular Scoring |
| SG5 (TD876) | New Work Items | Draft Recommendation ITU-T L.E-waste-collection on Guidelines on the collection, pre-treatment, dismantling, valorization and final disposal of WEEE  Draft Recommendation ITU-T [L.ARCH\_EoL\_CE](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14540" \o "See more details) on Environmental Impact of architecture solutions with regards to End of Life and Circular Economy (CE)  Draft Recommendation ITU-T [L.CE\_Industry 4.0](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14878" \o "See more details) on Circular Economy and Industry 4.0  Draft Recommendation ITU-T [L.ICT\_CE](https://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14876" \o "See more details) on ICT response to circular economy |
| SG5 (TD876) | Coordination outside of ITU-T | ITU-D, Collaboration with WEF, GESI, PACE, Green Council, WBCSD, Step, Circular Electronic Partnership, ISO TC 323 and IEC TC 111, CEN-CENELEC TC10, CEN-CENELEC-Eco-CG, ETSI TC EE.. |

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Annex – Template Tables for Detailed Hot Topics Description and Transactions

This section provides the templates tables for detailed hot topics descriptions and transactions

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| **<xx.xx>** | **Name** | | **ITU-T Topic Point of Contacts** |
| **Description** | | | |
| Sub Hot Topic | Name | | |
| Sub Hot Topic | Name | | |
| **Source Type** | CTO, CxO, SF, FG, Contribution | **Date of Entry** | DD/MM/YYYY |
| **Source References** | TDxxxx, Cxxxx | **Date of Update** | DD/MM/YYYY |
| **Status** | New, Active, Deprecated, Archived, Removed | **Global Measurement** | Hot, Medium, Cold, Dormant, To be purged |
| **Comments** | | | |

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| **Transaction Update Table** | | |
| TSAG Meeting Date: DD/MM/YYYY | | |
| SGxx (TDxxxx) | Work Program |  |
| SGxx (TDxxxx) | New Work Items |  |
| SGxx (TDxxxx) | FG Activities |  |
| SGxx (TDxxxx) | Workshop |  |
| SGxx (TDxxxx) | Coordination in ITU-T |  |
| SGxx (TDxxxx) | Coordination outside of ITU-T |  |
| SGxx (TDxxxx) | Other activities |  |
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1. It is necessary to include SG12 as a cooperating group for AR/VR and Video topic [↑](#footnote-ref-1)
2. The long text in the initial TD606R1 is pushed in the detailed description of this Hot Topics [↑](#footnote-ref-2)
3. It is necessary to include SG12 as a cooperating group for AR/VR and Video topic [↑](#footnote-ref-3)