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| Title: ITU logo | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2022-2024 | | | | TSAG-TD542 |
| TSAG |
| **Original: English** |
| **Question(s):** | | N/A | | | Geneva, 29 July - 2 August 2024 |
| **TD (Ref.:** [SG20-LS125](http://handle.itu.int/11.1002/ls/sp17-sg20-oLS-00125.docx)**)** | | | | | |
| **Source:** | | ITU-T Study Group 20 | | | |
| **Title:** | | LS/i on ITU-T SG20 Lead Study Group Report [from ITU-T SG20] | | | |
| **LIAISON STATEMENT** | | | | | |
| **For action to:** | | | - | | |
| **For information to:** | | | TSAG | | |
| **Approval:** | | | ITU-T Study Group 20 meeting (Geneva, 12 July 2024) | | |
| **Deadline:** | | | N/A | | |
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A new liaison statement has been received from SG20.

This liaison statement follows and the original file can be downloaded from the ITU ftp server at <http://handle.itu.int/11.1002/ls/sp17-sg20-oLS-00125.docx>.

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|  | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2022-2024 | | | | **SG20-LS125** |
| **STUDY GROUP 20** |
| **Original: English** |
| **Question(s):** | | All/20 | | | Geneva, 1-12 July 2024 |
| **Ref.: SG20-TD1336** | | | | | |
| **Source:** | | ITU-T Study Group 20 | | | |
| **Title:** | | LS on ITU-T SG20 Lead Study Group Report | | | |
| **LIAISON STATEMENT** | | | | | |
| **For action to:** | | | - | | |
| **For information to:** | | | TSAG | | |
| **Approval:** | | | **ITU-T Study Group 20 meeting (Geneva, 12 July 2024)** | | |
| **Deadline:** | | | N/A | | |
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| **Abstract:** | This report contains the report of the ITU-T SG20 on lead study group activities (January – July 2024). |

ITU-T Study Group 20 is actively fulfilling its mandate as the lead study group on: Internet of Things (IoT) and its applications; smart cities and communities, and related digital services; for Internet of Things identification; and digital health related to Internet of Things and smart cities and communities.

For additional information on ITU-T SG20, please see <https://www.itu.int/en/ITU-T/studygroups/2022-2024/20/Pages/mandate.aspx>

# 1 ITU-T SG20 as:

# Lead study group on Internet of Things and its applications

* Lead study group on smart cities and communities, and related digital services
* Lead study group for Internet of Things identification​
* Lead study group on digital health related to Internet of Things, and smart cities and communities​

# Achievements

The list of results pertaining to the ITU-T SGs Recommendations on Internet of Things (IoT), and its applications since July 2024, are provided in Annex 1 (status: 12 July 2024).

# Plan of work for this study period

Draft Recommendations and other texts on Internet of Things (IoT) and Smart Cities and Communities (SC&C) currently under development in ITU-T SG20 are listed in Annex 2.

# Working Party 1/20

# Main achievements

During the last SG20 meeting, WP1/20 approved 42 New Work Items and 19 outgoing Liaison Statements were prepared within WP1/20.

# Ongoing work in Working Party 1/20

# Question 1/20 – Interoperability and interworking of IoT and SC&C applications and services

Q1/20 addresses use cases, requirements, architectures and data sets and format to support interworking and provide interoperability between IoT and SC&C applications and services not only within but also between cities and communities. ​These studies include, but are not limited to: the use cases for interworking between IoT and SC&C applications and services; requirements and architectures to support interworking and provide interoperability of IoT and SC&C applications and services; and data interoperability and semantic interoperability.

Q1/20 is currently working on 8 work items, as detailed in Annex 2.

# Question 2/20 - Requirements, capabilities and architectural frameworks across verticals enhanced by emerging digital technologies

Question 2/20 is responsible for developing Recommendations that address the common and specific requirements, capabilities and architectural frameworks enhanced by emerging technologies across verticals. On the basis of use cases and related ecosystem aspects, the requirements, capabilities and architectural frameworks enhanced by emerging technologies for the support of IoT and SC&C services and applications will be specified from the common (not vertical-dependent) and vertical specific viewpoints.

Question 2/20 is currently working on 33 work items, as detailed in Annex 2.

# Question 3/20 - IoT and SC&C architectures, protocols and QoS/QoE

Question 3/20 is responsible for developing Recommendations that address architectures, including their functionalities, interfaces, protocols, data models, intelligent management mechanisms, control mechanisms, connectivity technologies, APIs, and Quality of Experience/Service (QoE/QoS) of IoT and Smart Sustainable Cities and Communities (SSC&C), which needed to construct architectural frameworks to interact with services and applications, as well as different networks and systems. Question 3/20 is also responsible for developing Recommendations on other aspects based on this architecture, including, but not limited to, protocols, APIs, identification and management mechanisms.

Question 3/20 is currently working on 34 work items, as detailed in Annex 2.

# Question 4/20 - Data analytics, sharing, processing and management, including big data aspects, of IoT and SC&C

Question 4/20 is responsible for developing Recommendations on DPM, data analytics and sharing, including big data aspects for IoT and SC&C.

Question 4/20 is also responsible for developing Recommendations on trusted data and data quality in DPM frameworks, including: digital identification and certification; analysis of existing technologies, platforms, guidelines and standards for DPM; and architectural frameworks for the future of data driven ecosystems and their applications with DPM and big data.

Question 4/20 is currently working on 24 work items, as detailed in Annex 2.

# Working Party 2/20

# Main achievements

During the last SG20 meeting, WP2/20 has also approved 10 New Work Items and 22 outgoing Liaison Statements were prepared.

# 3.2 Ongoing work in Working Party 2/20

# Question 5/20 - Study of emerging digital technologies, terminology and definitions

Question 5/20 is tasked with capturing and developing definitions, and contributing to a common terminology for IoT and SC&C. This Question can also contribute to research solutions for interoperability across different technologies, taking into account end-user, regulatory and market needs. Considering the rapid evolution of the IoT domain, this Question can also contribute to the identification and discussion of relevant research and technological developments in this area, in order to bring the most relevant topics to the attention of ITU-T Study Group 20 (SG20) and/or to the corresponding Questions.

Question 5/20 is currently working on 2 work item, as detailed in Annex 2.

# Question 6/20 - Security, privacy, trust and identification for IoT and SC&C

Question 6/20 is developing Recommendations, Supplements, Guidelines and Technical Reports on topics such as: authenticity, confidentiality, integrity, non‑repudiation and availability of IoT devices, systems, applications, protocols, platforms, and services; security and trust provisioning in IoT at the ICT infrastructure and future heterogeneous converged-service environments; security and trust provisioning in IoT services and applications for converged environments among stakeholders of different industries; requirements to mitigate the risks and threats identified in IoT and SC&C systems and services; utilizing security constructs in IoT systems to protect identity, privacy, and security of the system; technical measures to prevent compromise, and protect the integrity and privacy of IoT systems, applications, platforms, and services; technical measures needed to support the protection of privacy in SC&C applications, services, and platforms; identifying the potential risks associated with the different management, administration, maintenance, and service provisioning in SC&C; how to mitigate risks associated with the different management, administration, maintenance, and service provisioning in SC&C; supporting availability and portability of the data in IoT and SC&C platforms, systems, and services; the use of naming, addressing, and identification in IoT and SC&C deployments; and identity discovery and identity management in IoT and SC&C.

Question 6/20 is currently working on 11 work items, as detailed in Annex 2.

1. **Question 7/20 - Evaluation and assessment of Smart Sustainable Cities and Communities**

Question 7/20 is developing Recommendations, Supplements and Technical Reports on topics such as: methodologies for assessment of city SDGs, considering general principles, criteria for evaluating ICT impact; collecting and calculating reliable data to feed into the assessment model; developing methodologies for measuring and evaluating a city's specific performance and e/smart services with respect to defined sector indicators; and reporting a city's performance to help cities to reach SDGs.

Question 7/20 is currently working on 14 work items, as detailed in Annex 2.

# Collaboration with other SGs and external organizations

ITU-T SG20 received and responded to many Liaison Statements including those from: TSAG, ITU-T SG2, ITU-T SG3, ITU-T SG5, ITU-T SG9, ITU-T SG11, ITU-T SG12, ITU-T SG13, ITU-T SG15, ITU-T SG16, ITU-T SG17, ITU-D, FG-DPM, FG-DLT, FG-VM, Standardization Committee for Vocabulary (SCV), JCA-IMT2020, JCA-AHF, CITS, ITU-R, ITU-D, IEC SyC Smart Cities, ISO/IEC JTC1, ISO TC 204, ISO TC 184, IEC TC 65, Internet Engineering Task Force (IETF), OMA, ETSI ISG CDP, ISCG, ICAO, LoRa Alliance, IEEE, TM Forum, W3C and oneM2M, among others.

In addition, JCA-IoT/SC&C seeks coordination with other SDOs and other forums.

## 4.1 Collaboration with TM Forum

In the last study period, according to [TD1755](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG20-200706-TD-GEN-1755) - LS/i on Technical specifications on TMF 908 IoT agent and device management API specification and IoT service management API specification from TM Forum, TM Forum invited ITU-T SG20 to consider transposing the following Technical Specifications on TMF 908 IoT Agent and Device Management API Specification and IoT Service Management API Specification into ITU-T Recommendations using Recommendation ITU-T A.25.

During the ITU-T SG20 plenary (July 2020), two new work items were approved, which were contained respectively in [TD1783-R3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG20-200706-TD-GEN-1783) and [TD1782-R3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG20-200706-TD-GEN-1782) .

* Draft Recommendation ITU-T Y.TM.DM-API “IoT Device Management API REST Specification”.
* Draft Recommendation ITU-T Y.TM.SM-API “IoT Service Management API REST Specification”.

​Working Party 1 of ITU-T SG20 reviewed the two Technical Specifications during the Q3/20 Rapporteur Group Meeting held virtually on 2–5 November 2020, and during the Working Party 1/20 meeting that took place on 6 November 2020. The meeting received a list of comments and questions. Accordingly, Working Party 1 of ITU-T SG20 sent out an LS to TM Forum, which included the comments and questions received from the meeting, as contained in [TD1961](https://www.itu.int/md/T17-SG20-201106-TD-GEN-1961/en).

During the ITU-T SG20 plenary that took place on 18–28 July 2022, in Geneva, Switzerland, the editors proposed a revised baseline text to add editorial improvements on draft new Recommendation ITU-T Y.TM.DM-API *“IoT Device Management API REST Specification”* and draft new Recommendation ITU-T Y.TM.SM-API “*IoT Service Management API REST Specification”.* The proposed baseline texts have been reviewed and agreed, as contained [TD218](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0218) and [TD219](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0219).

During the ITU-T SG20 plenary (January 2023) in Geneva, Switzerland, it was agreed to submit the two work items (ITU-T Y.TM.SM-API and ITU-T TM.DM-API) for consent. However, issues were raised concerning IPR matters and consequently, while these two documents had been considered mature for consent from a technical perspective, it was agreed to postpone its consent until further clarification is provided on the IPR matters. The output documents of these two draft Recommendations are: [TD565-R2](https://www.itu.int/md/T22-SG20-230130-TD-GEN-0565/en) and [TD564-R2](https://www.itu.int/md/T22-SG20-230130-TD-GEN-0564/en).

During the ITU-T SG20 plenary (September 2023) in Arusha, Tanzania, the two work items (ITU-T Y.TM.SM-API and ITU-T TM.DM-API) were consented.

* Draft Recommendation ITU-T Y.4703 (ex Y.TM.SM-API) “Internet of Things Service Management Applications Programmer Interface Representational State Transfer Specification”.
* Draft Recommendation ITU-T Y.4704 (ex Y.TM.DM-API) “Internet of Things device management application programming interface Representational State Transfer specification”.

The following work items have been approved:

* [Recommendation ITU-T Y.4703](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=15692) “Internet of things service management application programming interface Representational State Transfer specification”
* [Recommendation ITU-T Y.4704](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=15693) “Internet of things device management application programming interface Representational State Transfer specification”

## 4.2 Collaboration with oneM2M

ITU has excellent cooperation with oneM2M and is exploring the possibility of furthering its synergies with oneM2M. ​

During the ITU-T SG20 meeting, the following document has been considered:

* [TD551](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0551) - Follow-up on TSDSI’s policy documents for ITU-T A.5 qualification

[TD551](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0551) was presented by TSB at the SG20 Opening Plenary.

At the SG20 closing plenary held in July 2022, SG20 approved the A.5 qualification for TSDSI, and by extension, SG20 also approved the A.5 qualification for oneM2M by applying section 7.3 of ITU-T A.5, as all oneM2M partners became A.5 qualified.

As of this decision of qualification, two TSDSI’s policy documents (the TSDSI Software Copyright Policy and the TSDSI Trademark Usage Guidelines) were still to be approved by TSDSI. A request was made to review the status of those documents at the meeting of WP2/TSAG in December 2022 ([TSAG-TD011R1](https://www.itu.int/md/T22-TSAG-221212-TD-GEN-0011/en)), and this request was deferred to SG20 for a follow up.

[TD551](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0551) confirms that those documents were approved by TSDSI in August 2022, and can be considered as being consistent with ITU’s relevant guidelines.

SG20 noted [TD551](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0551) and continues to collaborate with TSDSI and oneM2M as A5 qualified organizations.

## 4.3 Joint IEC-ISO-ITU Smart Cities Task Force (J-SCTF)

The 10th J-SCTF meeting (Virtual, 2–3 November 2023) was chaired by ITU Co-Chair, Mr Hyoung Jun Kim (Chair, ITU-T SG20).

The 11th J-SCTF meeting (Virtual, 26–27 February 2024) was chaired by IEC Co-Chair Mr Bernard Gindroz (Chair, ISO/TC 268).

The 12th J-SCTF meeting (Virtual, 17–18 June 2024) was chaired by IEC Co-Chair Mr Michael Mulquin (Chair, IEC SyC Smart Cities).

The 13th J-SCTF meeting (Virtual, 19 July 2024) was chaired by ITU Co-Chair Mr Hyoung Jun Kim (Chair, ITU-T SG20).

## 4.4 Collaboration with IEEE

During the ITU-T SG20 opening plenary that took place on 17 May 2021, the collaboration between ITU and IEEE was introduced. Mr Gyu Myoung Lee, Q4/20 Rapporteur, was designated as ITU-T SG20 focal point. After that, there were several e-meetings on the Global observatory for urban intelligence (GOUI).

During the 26th JCA-IoT and SC&C meeting that took place on 19 July 2022, Mr Gyu Myoung Lee, ITU Focal Point, gave a verbal presentation on the collaboration activities with IEEE. Mr Lee highlighted that there was good collaboration with IEEE on the global observatory for urban intelligence.

Based on recent discussions with IEEE, it was tentatively agreed to prepare a couple of Technical Reports, especially one on Smart City Ontology, to expand on the SSC semantics.

On IEEE’s side, IEEE has identified some key experts to work on this topic. Mr Lee will consult with TSB to identify experts on the ITU-T side, including those working on the data project within the [AI for Data Commons](https://www.itu.int/en/ITU-T/extcoop/ai-data-commons/Pages/default.aspx#:~:text=The%20Global%20Initiative%20on%20AI,Nations%20Sustainable%20Development%20Goals%20(SDGs)).

The verbal presentation and discussion were noted with appreciation.

## 4.5 Collaboration with IEC SyC Smart Cities

*IEC SyC Smart Cities – Working Group 3 “Reference Architecture”*

ITU-T SG20 received the following Liaison Statements:

* [TD104](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0104) on “LS/i on proposal for joint work on Smart Cities Reference Architecture (SCRA)”
* [TD181](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0181) on “LS/i on proposal for joint work on Smart Cities Reference Architecture (SCRA)”

An outgoing Liaison Statement (See [TD327-R2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0327)) has been sent to IEC SyC Smart Cities.

*IEC SyC Smart Cities – Joint Working Group on City Information Modelling and Urban Digital Twins*

During the SG20 Plenary, the following incoming liaison statement has been discussed:

* [TD1296](https://www.itu.int/md/T22-SG20-240701-TD-GEN-1296/en) on “LS/i on Collaborative Team Invitation from City Information Modelling and Urban Digital Twins JWG [from CIM & UDT JWG]”

**4.6 Collaboration with LoRa Alliance**

During the JCA IoT and SC&C meeting that took place on 31 January 2023, in Geneva, Switzerland, LoRa Alliance provided an update on their activities and shared information on their approval process.

LoRa Alliance experts attended the Q3/20 sessions and contributed to the discussions surrounding the revision of Recommendation ITU-T Y.4480.

**4.7 Collaboration with ASTM**

[TD550](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0550) on “Analysis for qualification of ASTM according to ITU-T A.4, A.5 and A.6” was presented by TSB at the SG20 Opening Plenary, as requested by SG20 (see [SG20-R1](https://www.itu.int/md/T22-SG20-R-0001/en), July 2022). The analysis in the TD focused on whether the ASTM characteristics meet the A.5 and A.6 qualification criteria, as ASTM is a regional/national standards development organization. Provisions related to general licensing commitments for declared standard essential patents are not covered in the ASTM’s organization-wide IPR policies, but are included in each of its committee’s policies, and those provisions are not identical. The secretariat considers that the absence of such provisions in the organization-wide IPR policy is a point of discrepancy with the Common Patent Policy for ITU-T/ ITU-R/ISO/IEC and the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC. ITU-T SG20 decided to defer its decision on qualification until further action has been taken by ASTM with regard to their IPR policies.

**4.8 Collaboration with AIOTI**

[TD553](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0553) on “Analysis for qualification of AIOTI according to ITU-T A.4, A.5 and A.6” was presented by TSB at the SG20 closing plenary as per request by SG20 (see [SG20-R1](https://www.itu.int/md/T22-SG20-R-0001/en), July 2022). AIOTI clarified that they do not develop any standards, nor are they a regional/national SDO; hence, the TD focused on whether the AIOTI characteristics meet the A.4 qualification criteria.

Taking into consideration information provided by [TD553](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0553), SG20 approved the A.4 qualification for AIOTI, noting that AIOTI does not develop any standards.

**4.9 Digital Transformation Resource Hub**

The newly created Digital Transformation Resource Hub provides a wide range of quality publications on digital transformation topics, including smart sustainable cities, cities' actions to tackle COVID-19, artificial intelligence, Internet of Things, blockchain, digital twin, metaverse and digital transformation trends. All resources are freely available to everyone. It can be found at: <https://www.itu.int/cities/dt-resource-hub/>.

# Correspondence group for Artificial intelligence of Things (CG-AIoT)

During the ITU-T Study Group 20 meeting, a CG-AIoT session took place on 13 September 2023, 16:00-17:30 hours, Arusha time. The agenda can be found in [TD900](https://www.itu.int/md/T22-SG20-230913-TD-GEN-0900/en).

During the SG20 plenary and Liaison Statement session held on 20 September 2023, the meeting report ([TD1066](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230913-TD-GEN-1066)) was approved.

CG-AIoT concluded its activities and the following [Technical Paper on “Challenges of and Guidelines to Standardization on Artificial Intelligence of Things”](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=18471) was agreed.

The progress report of CG-AIoT is contained in [TD1066](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230913-TD-GEN-1066).​​

# ITU-T Focus Group on “Artificial Intelligence (AI) and Internet of Things (IoT) for Digital Agriculture” (FG-AI4A)

During the SG20 meeting that took place from 1-12 July 2024, FG-AI4A Advisor, Ms Mythili Menon presented the FG-AI4A Progress Report (from September 2023 to June 2024), as contained in [TD1299](https://www.itu.int/md/T22-SG20-240701-TD-GEN-1299/en). The Progress Report provided information on the outcomes of the eighth, ninth and tenth meetings of FG-AI4A, including the updated FG-AI4A structure, completed list of deliverables, Management Team, and workshops and webinars. The final report was approved.

During the SG20 plenary, FG-AI4A submitted its completed deliverables:

* [TD1230](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-240701-TD-GEN-1230) - FG-AI4A Deliverable: Technical Report - Ethical Legal, and regulatory Considerations relating to the use of AI for agriculture: A European Perspective
* [TD1231](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-240701-TD-GEN-1231) - FG-AI4A Deliverable: Technical Report - Standardization gaps and roadmap for AI and IoT in digital agriculture
* [TD1232](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-240701-TD-GEN-1232) - FG-AI4A Deliverable: Technical Report - Use Cases for AI and IoT for Digital Agriculture
* [TD1233](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-240701-TD-GEN-1233) - FG-AI4A Deliverable: Technical Report - Data Modelling for digital agriculture

FG-AI4A Concluded its work on 19 June 2024.

# ITU-T Study Group 20 Meetings

ITU-T SG20 held a meeting from 1-12 July 2024, in Geneva, Switzerland. See Report 20 for additional details on the last SG20 meeting.

# JCA IoT and Smart Cities & Communities

The scope of the [JCA-IoT and SC&C](https://www.itu.int/en/ITU-T/jca/iot/Pages/default.aspx) is to coordinate the ITU-T work on the “Internet of Things and Smart Cities and Communities” and provide a visible contact point for IoT and its applications, including smart cities and communities (SC&C) activities within ITU-T. This would also help to coordinate with external bodies working in IoT and SC&C, and enable effective, two‑way communication with these bodies. External bodies include representatives from relevant SDOs such as IEC, ISO, relevant academia, consortia and fora.

The JCA-IoT and SC&C maintains an IoT and SC&C standards roadmap, which documents complete and also ongoing work on IoT and SC&C carried out by ITU-T, as well as by other SDOs and Forums. The IoT and SC&C standards roadmap is available [online](https://www.itu.int/itu-t/landscape/?topic=t&group=g&search_text=) and as [Supplement ITU-T Y.Suppl.58](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14176) “Internet of Things and smart cities and communities standards roadmap”.

Since September 2023, the JCA IoT and SC&C has held the following meeting:

* Twenty ninth meeting, Geneva, 2 July 2024.

The next meeting of the JCA IoT and SC&C will be held in conjunction with the next ITU-T SG20 meeting.

# ITU-T Study Group 20 Regional Groups

The following are the updates from the ITU-T SG20 Regional Groups since the last SG20 meeting:

* [SG20 Regional Group for the Africa Region](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rgafr/Pages/default.aspx) – none.
* [SG20 Regional Group for the Arab Region](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rgarb/Pages/default.aspx) – none.
* [SG20 Regional Group for the Latin America Region](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rglatam/Pages/default.aspx) – none.
* [SG20 Regional Group for Eastern Europe, Central Asia and Transcaucasia](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rgeecat/Pages/default.aspx) – none.
* [SG20 Regional Group for Asia and the Pacific](https://www.itu.int/en/ITU-T/regionalgroups/sg20-ap/Pages/default.aspx)

## The previous meeting of ITU-T SG20 Regional Group for Asia Pacific (SG20RG-AP) took place virtually from 23-24 April 2024. The SG20RG-AP meeting report is contained in [TD1204](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-240701-TD-GEN-1204).

# Future events and dates of next ITU-T Study Group 20 meeting and Regional Group meetings

* A series of e-meetings and forums will take place in 2024 and 2025;
* The [Digital Transformation Dialogues (DTD)](https://www.itu.int/cities/digitaltransformationdialogues/) are taking place throughout 2024;
* The next meeting of ITU-T SG20 will take place from 15-24 January 2025 in Geneva Switzerland.

# Other activities

Please see below the upcoming events:

* [Digital Transformation Dialogues](https://www.itu.int/cities/standards4dt/) (All year always online)​​

The following events have been held in 2024:

**Fireside Chats:**

* [Ethical Horizons: Navigating Responsible AI in the Digital Landscape](https://www.itu.int/cities/digitaltransformationdialogues/responsible-ai/) (16 April 2024)
* [Beyond Boundaries: Revolutionizing Banking through Digital Transformation](https://www.itu.int/cities/digitaltransformationdialogues/banking/) (14 March 2024)
* [Prospects for Surgical Advances](https://www.itu.int/cities/digitaltransformationdialogues/20240118-2/) (18 January 2024）

**Ask the Expert Sessions**

* [Assessing the circularity of ICT goods](https://www.itu.int/cities/digitaltransformationdialogues/circularity/) (22 May 2024)
* [Breaking barriers in the metaverse: Improving accessibility](https://www.itu.int/cities/digitaltransformationdialogues/accessibility-metaverse/) (25 April 2024)
* [Guardians of Authenticity: Battling Counterfeiting](https://www.itu.int/cities/digitaltransformationdialogues/counterfeiting/) (28 March 2024)
* [Urban Intelligence Unveiled: AI Principles for Smart Cities](https://www.itu.int/cities/digitaltransformationdialogues/ai-principles-cities/) (21 February 2024)
* [Digital twin for smart cities](https://www.itu.int/cities/digitaltransformationdialogues/20240130-2/) (30 January 2024）
* [Ask the Expert Session - Rester connecté: Explorer l’itinérance mobile internationale](https://www.itu.int/cities/digitaltransformationdialogues/mobile-roaming/) (27 June 2024)
* [Ask the Expert Session - Exploring DLT Beyond Cryptocurrency: Applications and Opportunities](https://www.itu.int/cities/distributed-ledger-technology/) (23 July 2024)

**Webinars**

* [Greening the Future: Navigating Digital Transformation for Land Restoration](https://www.itu.int/cities/digitaltransformationdialogues/digital-land-restoration/) (5 June 2024)
* [Connected Communities: Harnessing the Power of Digital Public Infrastructure](https://www.itu.int/cities/digitaltransformationdialogues/digital-public-infrastructure/) (21 May 2024)
* [UN 2.0 Week Side event on Harnessing the metaverse and virtual worlds for global impact](https://www.itu.int/cities/digitaltransformationdialogues/virtual-worlds-for-global-impact/) (26 April 2024)
* [Metaverso 360°: Explorando la Accesibilidad, la Inclusión y los Derechos Humanos en Dominicana Innova](https://www.itu.int/cities/digitaltransformationdialogues/metaverse-360/) (22 April 2024)
* [Immersive Inclusivity: Enhancing Virtual Worlds with Accessibility](https://www.itu.int/cities/digitaltransformationdialogues/inclusivity/) (2 April 2024)
* [Unleashing the Power of Digital Water Solutions: Exploring the flow of emerging technologies](https://www.itu.int/cities/digitaltransformationdialogues/digital-water/) (22 March 2024)
* [Future of real-love in the virtual world: The Perfect Date](https://www.itu.int/cities/digitaltransformationdialogues/love-metaverse/) (14 February 2024）

**Please see below upcoming event:**

* [Webinar - City Horizons: Celebrating World Cities Day and Shaping Urban Futures](https://www.itu.int/cities/digitaltransformationdialogues/world-cities-day/) (31 October 2024)

**United for Smart Sustainable Cities (U4SSC) initiative**

The [United for Smart Sustainable Cities (U4SSC) initiative](https://u4ssc.itu.int/) is a United Nations initiative coordinated by the International Telecommunication Union (ITU), the United Nations Economic Commission for Europe (UNECE) and the United Nations Human Settlements Programme (UN-Habitat) and supported by 19 United Nations Agencies and Programmes (CBD, ECLAC, FAO, UNDESA, UNESCO, UNDP, UNECA, UN-Women, UNEP, UNEP-FI, UNFCCC, UNIDO, UNOP, UNU EGOV, UNWTO and WMO).

The Eight Meeting of the United for Smart Sustainable Cities (U4SSC) Initiative will take place on 19 September 2024 in Madrid, Spain.

The U4SSC Thematic Groups and their Working Groups are continuously advancing their deliverables through regular e-meetings.

The [Seventh Meeting of the United for Smart Sustainable Cities (U4SSC) Initiative](https://u4ssc.itu.int/latest-meetings/7th-meeting/) took place on 20 June 2023. The outcome document of the meeting is available [here](http://u4ssc.itu.int/wp-content/uploads/2023/07/2023-06-20-U4SSC-Outcome-Document.pdf).

During the meeting, it was agreed to appoint Mr Okan Geray (Digital Dubai) as the new U4SSC Chair. To further support the activities of U4SSC and provide guidance, the following representatives were appointed as new U4SSC Vice-Chairs:

* Mr Ramy Ahmed Fathy (Egypt):
* Ms Wendy Goico Campagna (Dominican Republic)
* Ms Emily Royall (Office of Innovation for the City of San Antonio)

U4SSC is currently working on the following Thematic Groups:

* City platforms
  + Working Group 5: Reference framework for an integrated management of a smart sustainable city
  + Working Group 6: Data and APIs in Smart City Platforms
* Lessons Learned from Building Urban Economic Resilience at City Level During and After COVID-19​
* Guiding principles for Artificial Intelligence in cities
  + Working Group 2: Autonomous Cities
* Procurement guidelines for Smart Cities and Communities
  + Working Group 2: Methodology to support cities to implement the procurement guidelines​
* Enabling People-Centred Cities through Digital Transformation
  + Working Group 1: Setting the Context: Digital Transformation for People-oriented Cities
  + Working Group 2: Policy Benchmarks for Digital Transformation for People-oriented Cities
  + Working Group 3: Digital Transformation Assessment for People-oriented Cities
  + Working Group 4: Guidelines for Unlocking Net Zero in Cities Through Sustainable Digital Transformation
* Digital Wellbeing

Since September 2023, the following deliverable was published:

* [​Guiding principles for artificial intelligence in cities](https://www.itu.int/en/publications/Documents/tsb/2024-U4SSC-Guiding-principles-artificial-intelligence-in-cities/index.html#p=1)

The U4SSC Deliverable on Guiding principles for artificial intelligence in cities is complemented by the following case studies:

* Case study – Hong Kong, China [[Read online](https://www.itu.int/en/publications/Documents/tsb/2024-U4SSC-Case-study-Hong-Kong-China/index.html#p=1)]
* Case study – Dubai, United Arab Emirates [[Read online](https://www.itu.int/en/publications/Documents/tsb/2024-U4SSC-Case-study-Dubai-United-Arab-Emirates/index.html#p=1)]
* Case study – Buenos Aires, Argentina [[Read online](https://www.itu.int/en/publications/Documents/tsb/2024-U4SSC-Case-study-Buenos-Aires-Argentina/index.html#p=1)]
* Case study – Singapore, Singapore [[Read online](https://www.itu.int/en/publications/Documents/tsb/2024-U4SSC-Case-study-Singapore/index.html#p=1)]
* Case study – Copenhagen, Denmark [[Read online](https://www.itu.int/en/publications/Documents/tsb/2024-U4SSC-Case-study-Copenhagen-Denmark/index.html#p=1)]

**Key performance indicators for smart sustainable cities project**

The U4SSC developed a set of international key performance indicators (KPIs) for Smart Sustainable Cities (SSC) to establish the criteria to evaluate ICT´s contributions in making cities smarter and more sustainable, and to provide cities with the means for self-assessments in order to achieve the sustainable development goals (SDGs). These KPIs for SSC are based on an international standard – [Recommendation ITU-T Y.4903 on Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals](https://www.itu.int/ITU-T/recommendations/rec.aspx?id=12884&lang=en) – and were developed within the framework of the United for Smart Sustainable Cities initiative. More than 200 cities worldwide are already implementing these KPIs.

The list of all the KPIs for SSC along with its collection methodology are contained in the:

* [Flipbook on “Collection Methodology for Key Performance Indicators for Smart Sustainable Cities”.](https://www.itu.int/en/publications/Documents/tsb/2017-U4SSC-Collection-Methodology/index.html)

As part of the work on the implementation of the U4SSC KPIs for smart sustainable cities, the following Snapshots, Verification Reports and Case studies were launched:

City Snapshots:

* [Canton of Geneva, Switzerland](https://www.itu.int/en/publications/Documents/tsb/2022-U4SSC-State-Snapshot-Canton-of-Geneva-Switzerland/index.html#p=1)
* [Anyang, Korea (Republic of)](https://www.itu.int/en/publications/Documents/tsb/2023-U4SSC-City-Snapshot-Anyang-Republic-of-Korea/index.html#p=1)

Verification Reports:

* [Canton of Geneva, Switzerland](https://www.itu.int/en/publications/Documents/tsb/2022-U4SSC-Verification-Report-Canton-of-Geneva-Switzerland/index.html#p=1)
* [Anyang, Korea (Republic of)](https://www.itu.int/en/publications/Documents/tsb/2023-U4SSC-Verification-Report-Anyang-Republic-of-Korea/index.html#p=1)

# Annex 1

**Achievements of ITU-T Study Group 20 on Internet of Things (IoT) and Smart Cities and Communities (SC&C)  
(status 12 July 2024)**

1. **Recommendations approved**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| SG20 | Y.4607 | Requirements for the interworking of autonomous urban delivery robots |
| SG20 | Y.4225 | Requirements and capability framework of digital twin for intelligent transport system |
| SG20 | Y.4221 | Requirements of IoT-based electric power infrastructure monitoring system |
| SG20 | Y.4497 | Requirements and functional architecture of smart sharing bicycle service |
| SG20 | Y.4487 | A functional architecture of roadside multi-sensor data fusion systems for autonomous vehicles |
| SG20 | Y.4498 | Framework for city-level energy data sharing and analytics among buildings |
| SG20 | Y.4488 | Requirements and functional architecture of data services provided via IoT-based technologies for the safety of manufacturing-related working environments |

1. **Implementer's guide approved**

**None.**

1. **Deleted Recommendations**

**None.**

1. **Agreed informative texts**

|  |  |  |
| --- | --- | --- |
| **SG** | **No** | **Title** |
| SG20 | YSTR.DataModelling-Agri | Data processing, management and analytics with AI for digital agriculture |
| SG20 | Y.Suppl.82 | Standardization gaps and roadmap for AI and IoT in digital agriculture |
| SG20 | Y.Suppl.83 | Optimizing Digital Agriculture with Best Practices for Integrating AI and IoT |
| SG20 | YSTR.P2P-CC | Current state of P2P crowd charging platforms and corresponding market needs |
| SG20 | YSTR-IADIoT | Intelligent Anomaly Detection System for IoT |

# Annex 2

**Current work programme of ITU-T Study Group 20 on Internet of Things (IoT) and Smart Cities and Communities (SC&C)   
(status 12 July 2024)**

**Working Party 1/20**

1. **Q1/20 - Interoperability and interworking of IoT and SC&C applications and services**

|  |  |  |
| --- | --- | --- |
| **SG** | **No/ Provisional name** | **Title** |
| SG20 | [Y.4226 (ex Y.isms)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17882) | Functional framework and requirements for disaster monitoring system |
| SG20 | [Y.4505 (ex Y.MIM)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18458) | Minimal Interoperability Mechanisms for smart and sustainable cities and communities |
| SG20 | [Y.4506 (ex Y.DRI-arch)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19056) | Reference architecture for the interworking of autonomous urban delivery robots |
| SG20 | [Y.4705 (ex Y.nmm-isms)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17883) | Metadata model of sensing capability for disaster monitoring system |
| SG20 | [Y.dtmv-if](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19592) | Interface model and its requirements of integrating virtual and physical worlds through digital twins for the metaverse |
| SG20 | [Y.dtmv-ref](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19591) | Reference model of integrating virtual and physical worlds through digital twins for the metaverse |
| SG20 | [Y.dtmv-reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19590) | Requirements of integrating virtual and physical worlds through digital twins for the metaverse |
| SG20 | [YSTR.ACC-SCC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18454) | Guidelines on developing ICT services for accessible smart cities |

**b) Q2/20 - Requirements, capabilities and architectural frameworks across verticals enhanced by emerging digital technologies**

| **SG** | **No/ Provisional name** | **Title** |
| --- | --- | --- |
| SG20 | [Y.4222 (ex Y.smart-evacuation)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17886) | Framework of smart evacuation in a disaster or emergency in smart cities and communities |
| SG20 | [Y.4227 (ex Y.IoT-BC-reqts-cap)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17932) | IoT requirements and capabilities for support of blockchain |
| SG20 | [Y.4228 (ex Y.IIoT-infra-SM-fr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17949) | Requirements and framework of Industrial IoT (IIoT) infrastructure for smart manufacturing |
| SG20 | [Y.4229 (ex Y.IoT-SFFS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17955) | Requirements and reference functional model of IoT-based smart forest firefighting system |
| SG20 | [Y.4230 (ex Y.EV-charging)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17954) | Requirements and capability framework of public smart charging service for electric vehicles |
| SG20 | [Y.4231 (ex Y.IoT-Vreqs)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17953) | Requirements and capability framework of the internet of things for vision |
| SG20 | [Y.4232 (ex Y.IoT-RTPS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18461) | Requirements, capabilities and use cases of Internet of Things infrastructures in roadside traffic perception system |
| SG20 | [Y.4233 (ex Y.FSPH)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18460) | Framework for smart public health emergency management in smart and sustainable cities |
| SG20 | [Y.4234 (ex Y.RemoteEd)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18751) | Requirements, capabilities and deployment models for e-learning in remote classrooms |
| SG20 | [Y.4420-rev](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19606) | Framework of Internet of things based monitoring and management for Lift |
| SG20 | [Y.ACC-ASM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19057) | Requirements and capabilities of accessible service management using user accessibility preference profile for IoT services |
| SG20 | [Y.ACC-IoTMV](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19599) | Accessibility requirements for metaverse services supporting IoT |
| SG20 | [Y.DEMC-fra](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19607) | Requirements and framework of IoT-based distributed energy resources management and control services |
| SG20 | Y.[dt-PAF](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19600) | Requirements and capabilities of a digital twin for pedestrian accessibility facilities for persons with disabilities |
| SG20 | [Y.dt-IWCS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18459) | Requirements and capability framework of digital twin for intelligent water conservancy system |
| SG20 | [Y.dt-SComCam](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18750) | Common requirements and capability framework of digital twin for smart complex and campus |
| SG20 | [Y.EMM-Reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17952) | Requirements for Real-Time Event Monitoring and Integrated Management in Smart City Platforms |
| SG20 | [Y.energy-storage](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18749) | Requirements and capability framework of energy storage service for residential community in smart city |
| SG20 | [Y.EV-PUD](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19062) | Requirements of electric vehicle power usage data acquisition and management for smart city |
| SG20 | [Y.IoT-APS-Reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19605) | Requirements and capability framework of Internet of Things for support of application-aware service |
| SG20 | [Y.IoT-PDP](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19061) | Requirements of electric power data perception based on the Internet of Things |
| SG20 | [Y.IoT-smartschool](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19059) | Requirements of IoT-based smart school management system |
| SG20 | [Y.IoT-soil](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19058) | Requirements of IoT-based soil environmental protection and remediation |
| SG20 | [Y.LASS-fra](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19601) | Requirements and capability framework of IoT-based low-altitude sensing system |
| SG20 | [Y.PGComNet-Reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18748) | Requirements of IoT-based power grid communication network |
| SG20 | [Y.SCCNS-Reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19603) | Requirements of smart city communication network system |
| SG20 | [Y.SCGMS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19602) | Requirements and capabilities of IoT-based smart crop growth monitoring system |
| SG20 | [Y.Sup.EdgeIoT-usecases](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19063) | Supplement to ITU-T Y.4208 - Use cases of edge computing based Internet of Things |
| SG20 | [Y.Sup.SmartAqua-usecases](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18753) | ITU-T Y.4000-series - Use cases of IoT-based smart aquaculture |
| SG20 | [Y.Sup-datainterop-usecases](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19608) | Supplement to ITU-T Y.4563 - Use cases of data interoperability in Internet of things |
| SG20 | [Y.Sup-IoT-BC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19060) | Applicability cases of blockchain in the IoT |
| SG20 | [Y.Sup-SCC-AI](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19604) | Supplement to ITU-T Y.4223 - Use cases of smart cities and communities supported by AI |
| SG20 | [YSTR.Ambient IoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18752) | Analysis on requirements and use cases of ambient power-enabled IoT |

**c) Q3/20 - IoT and SC&C architectures, protocols and QoS/QoE**

| **SG** | **No/ Provisional name** | **Title** |
| --- | --- | --- |
| SG20 | [Y.4417-Rev](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19610) | Framework of self-organization networking in Internet of things environments |
| SG20 | [Y.4477-Rev](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19064) | Framework for service interworking with device discovery and management in heterogeneous Internet of things environments |
| SG20 | [Y.4480Rev](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18747) | Low power protocol for wide area wireless networks |
| SG20 | [Y.4496 (ex Y.RA-PHE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17921) | Requirements and reference architecture of smart service for public health emergency |
| SG20 | [Y.4501 (ex Y.RA-SDL)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17926) | Functional architecture for smart door lock service framework |
| SG20 | [Y.4502 (ex Y.IoT-SQMS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17937) | Requirements and functional architecture of IoT sensing quality management service |
| SG20 | [Y.4507 (ex Y.arc-psfws)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18746) | A functional architecture of power supply facilities warning system |
| SG20 | [Y. EPWS-fc](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19613) | Functional capabilities to support IoT-based electric power work site operation services |
| SG20 | [Y.AI-DECCS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17929) | Functional architecture of AI enabled device-edge-cloud collaborative services for IoT and smart city |
| SG20 | [Y.cnce-IoT-arch](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17894) | Functional architecture of network capability exposure for smart hospital based on Internet of things |
| SG20 | [Y.DT-CS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19611) | Requirements and functional architecture for blockchain-based sustainable and cooperative digital-twin creation system |
| SG20 | [Y.DTS-arch](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19612) | Architecture of the digital twin system in power grid |
| SG20 | [Y.Fram-ssdp](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19614) | Requirements and framework of metaverse simulation service for disaster prevention in electric power facilities |
| SG20 | [Y.IoT-BoT-peer](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17936) | Capability and functional architecture of blockchain of things peers |
| SG20 | [Y.IoT-CMP-VR](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19615) | Functional framework and capabilities of coordination management platform for IoT based vehicle-road |
| SG20 | [Y.IoT-CONV-fr](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17958) | Convergence framework for enhancement of service intelligence based on Internet of Things |
| SG20 | [Y.IoT-DPE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18745) | Management framework for IoT-based distributed power equipment |
| SG20 | [Y.IoT-ESSB](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19616) | Functional architecture of IoT-based energy-saving service for smart buildings |
| SG20 | [Y.IoT-ISP](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19065) | Reference framework for the smart industry service platform based blockchain and IoT |
| SG20 | [Y.IoT-MVarch](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19620) | Functional architecture of the IoT-based machine vision system |
| SG20 | [Y.IoT-NCM-arch](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18462) | Functional architecture of network connectivity management in the Internet of things |
| SG20 | [Y.IoT-SAS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19617) | Functional architecture of IoT-enabled smart accessibility service in smart communities |
| SG20 | [Y.IoT-SPA](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19067) | Functional architecture of smart park based on Internet of Things |
| SG20 | [Y.NCE.arch.EIoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17934) | Functional architecture enhancement with network capability exposure to support flexible QoS/QoE requirements from enterprise IoT services and applications |
| SG20 | [Y.RA-FML](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17924) | Requirements and reference architecture of IoT and smart city & community service based on federated machine learning |
| SG20 | [Y.SA-DSC-SSC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19618) | System architecture of digital supply chain for smart sustainable cities |
| SG20 | [Y.SC-DESMS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19609) | Functional architecture of IoT-based distributed energy storage management system in smart cities |
| SG20 | [Y.SFPP](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19066) | Reference framework for the smart farmland production platform |
| SG20 | [Y.smart-PBRS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17925) | Functional Architecture of Smart Power Bank Rental Service Framework |
| SG20 | [Y.Sup.IoT-CONV (ex YSTR.IoT-CONV)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17959) | Overview of IoT Convergence |
| SG20 | [Y.Sup.IoT-SEDR](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19069) | Functional framework and capability for digital resources in smart education based on IoT |
| SG20 | [Y.Sup.VFS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19070) | Functional architecture of connected vehicle formation supporting based on edge computing |
| SG20 | [Y.Sup\_SUPS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19619) | ITU-T Y.4456 - Functional architecture of IoT based smart underground parking services |
| SG20 | [YSTR.SemComm.IoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17960) | Architectural Framework for Semantic Communication Services for IoT and Smart City & Community |

**d) Q4/20 - Data analytics, sharing, processing and management, including big data aspects, of IoT and SC&C**

| **SG** | **No/ Provisional name** | **Title** |
| --- | --- | --- |
| SG20 | [Y.4463-rev](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19073) | Framework of delegation service for Internet of things devices |
| SG20 | [Y.4499 (ex Y.UIM-cs-framework)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17944) | Framework of urban infrastructure monitoring based on crowdsourcing |
| SG20 | [Y.4503 (ex Y.IoT-CRE-fr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18466) | Framework of common rule enablement for intelligent IoT services in heterogeneous IoT platform environments |
| SG20 | [Y.4504 (ex Y.SF-prediction)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18465) | Service framework of prediction for intelligent IoT |
| SG20 | [Y.4508 (ex Y.DPM-alm-fra)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18467) | Functional requirements and architecture of blockchain-based activity logs management for IoT data processing and management |
| SG20 | [Y.4706 (ex Y.dem-IoT)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18743) | Data exchange model for IoT devices in power transmission and transformation equipment |
| SG20 | [Y.AIoT-dfs-arc](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19626) | Reference architecture of data fusion service in artificial intelligence of things |
| SG20 | [Y.AIoT-dpsm](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19627) | Requirements and framework of data processing for smart manufacturing with Artificial Intelligence of Things |
| SG20 | [Y.AIoT-fr](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19624) | Framework of Artificial Intelligence of Things |
| SG20 | [Y.AIoT-FRA](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19625) | Functional requirements and architecture for Artificial Intelligence of Things |
| SG20 | [Y.cii (ex Y.rrm-data)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17900) | Requirements and reference model of data collected from city infrastructure |
| SG20 | [Y.CL-EDM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18463) | Energy data model for city-level energy management platform |
| SG20 | [Y.CSDL](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18744) | Requirements and framework for crowdsourced system based on distributed learning |
| SG20 | [Y.DM-SLF](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18470) | Conceptual data model of smart livestock farming service |
| SG20 | [Y.DSE-LISF](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19630) | Reference architecture of data sharing and exchange based on lightweight intelligent software framework for Internet of things devices |
| SG20 | [Y.EDSS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19632) | Framework and requirements of electricity data sharing system |
| SG20 | [Y.Interop-DPM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19633) | Integrated Interoperability framework for Data Processing and Management |
| SG20 | [Y.IoT-3DMS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19072) | Requirements and functional capabilities for three-dimensional model based monitoring service |
| SG20 | [Y.IoT-IIEC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19628) | Framework of the integrated intelligent IoT service based on multi edge computing |
| SG20 | [Y.IoT-IWAT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19629) | Framework of interworking with agent-based transportation for intelligent IoT services |
| SG20 | [Y.KCI-IM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19631) | Requirements of knowledge construction and implementation for IoT management |
| SG20 | [Y.metadata-EPI (ex Y.Sup.metadata-EPI)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19074) | Metadata for IoT-based electric power infrastructure monitoring system |
| SG20 | [Y.MIMbased-arch](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19634) | MIM-based Architectural framework for interoperability in support of data sharing ecosystems |
| SG20 | [Y.SmartBuilding-Integration](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19071) | Framework for Smart Building Integration into Smart Cities |
| SG20 | [Y.SPDM-reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19636) | Requirements and a reference model of data for Smart Pest and Disease Management (SPDM) service |
| SG20 | [YSTR.dscm](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18468) | Analysis of data sharing control models |
| SG20 | [YSTR.GenAI-Sem-Interop](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19635) | Implications of Generative Artificial Intelligence on Semantic Interoperability for Data Use |

**Working Party 2/20**

**a) Q5/20 - Study of emerging digital technologies, terminology and definitions**

| **SG** | **No/ Provisional name** | **Title** |
| --- | --- | --- |
| SG20 | [Y.CIP](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19637) | Requirements of metaverse-based emergency response in chemical industrial parks |
| SG20 | [YSTR.DIC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19638) | Reference framework for distributed intelligent computing based on IoT |

**b) Q6/20 - Security, privacy, trust and identification for IoT and SC&C**

| **SG** | **No/ Provisional name** | **Title** |
| --- | --- | --- |
| SG20 | [Y.bsis-sec](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19640) | Security requirements and capabilities of base station inspection services using unmanned aerial vehicles |
| SG20 | [Y.iepi-dm-sa](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19081) | Framework of security assessment for data management for IoT-based electric power infrastructure |
| SG20 | [Y.IoT-acs-fra](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18740) | Functional requirements and architecture of access control service of IoT platform enabled by zero trust technology in decentralized environments |
| SG20 | [Y.IoT-IADS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19643) | Intelligent anomaly detection system for Internet of things |
| SG20 | [Y.IoT-Smartcity-Risk](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17916) | Reference framework of cybersecurity risk management of IoT ecosystems on smart cities |
| SG20 | [Y.Sec-outdoor-EPI](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19075) | Security requirements and capability of IoT Management platform for outdoor electric power infrastructure |
| SG20 | [Y.sup.access-sec](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19641) | Supplement to ITU-T Y.4221 - Use cases and security requirements for sensing devices to access IoT-based electric power infrastructure monitoring system |
| SG20 | [Y.Sup.SRS-SR](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19642) | Supplement to ITU-T Y.4120 - Security threats and requirements of IoT applications for smart retail stores |
| SG20 | [Y.Supp-Imp-CSIADE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19639) | Supplement to ITU-T Y.4811 - Implementation of converged service for identification and authentication for IoT devices in decentralized environment |
| SG20 | [Y.uas-dc-fr](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19083) | Framework of unified authentication service for data collaboration in IoT-based electric power infrastructure |
| SG20 | [YSTR.IoT-IMS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18473) | Identification management service of IoT device |

**c) Q7/20 - Evaluation and assessment of Smart Sustainable Cities and Communities**

| **SG** | **No/ Provisional name** | **Title** |
| --- | --- | --- |
| SG20 | [Y.DT-SSC-CVP](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19645) | Classification of visualization precision levels for digital twin systems in smart sustainable cities |
| SG20 | [Y.Evaluation-dfp](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19644) | Quality evaluation framework of data as a factor of production for smart sustainable cities |
| SG20 | [Y.Evaluation-SE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19086) | Evaluation of capabilities for IoT-enabled frameworks of smart education |
| SG20 | [Y.Highway-KPI](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18476) | Key performance indicators of ICT based highway traffic safety assessment |
| SG20 | [Y.IoT-BEMS-af](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19088) | Assessment framework of IoT infrastructure in building energy management system |
| SG20 | [Y.KHI-PE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18742) | Key health indicators and evaluation model for power equipment in Smart Sustainable Cities |
| SG20 | [Y.KPEM-SM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18474) | Key performance evaluation models of smart manufacturing |
| SG20 | [Y.KPI-Flood](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17963) | Key Performance Indicators of ICT based Urban Flood Disaster Prevention and Mitigation Capability |
| SG20 | [Y.QE-DMI-SSC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18475) | Quality evaluation of digital models in industry for smart sustainable cities |
| SG20 | [Y.SNPG-ref](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19646) | Reliability evaluation frameworks of sensing network in power grid |
| SG20 | [Y.SSC-NGUM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17914) | A Methodology for Next Generation Urban Measurements |
| SG20 | [Y.Sup.MM-EDMC-SSC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18741) | Maturity model of digital management capability of industrial equipment used in smart sustainable cities |
| SG20 | [Y.Sup-NGUM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17915) | Use Cases for Next Generation Urban Measurements |
| SG20 | [Y.Sup-Proc-SSC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19089) | Procurement guidelines for smart sustainable cities |

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