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| **Abstract:** | This document contains the Report of the ITU-T SG11 on lead study group activities (October-December 2021). |

1. **Background**

According to Resolution 2 of WTSA-16, ITU-T Study Group 11 is the lead study group on:

* Signalling and protocols, including for IMT-2020 technologies;
* Establishing test specifications, conformance and interoperability testing for all types of networks, technologies and services that are the subject of study and standardization by all ITU‑T study groups;
* Combating counterfeiting of ICT devices;
* Combating the use of stolen ICT devices.

1. **Report of ITU-T SG11 on lead study group activities (October-December 2021)**
   1. **Signalling and protocols, including for IMT-2020 technologies**

ITU-T SG11 is developing signalling requirements and protocols for VoLTE, IMS-based networks, computing power networks, virtual broadband network services, cloud-network-converged networks gateway, Service Function Chain, Quantum key distribution networks, Network intelligence capability enhancement, etc.

In December 2021, SG11 consented the following draft new Recommendations:

* ITU-T Q.3631 “Interworking between ISDN and the IP Multimedia (IM) Core Network (CN) subsystem”;
* ITU-T Q.3061 “Signalling requirements for service function paths load balancing traceroute in service function chaining”.

SG11 started new work item Q.IBN-SA “Signalling architecture of Intent-Based Network for network evolution”.

In total, there are 13 ongoing work items on signalling aspects.

**IMT-2020 and managed P2P communications related issues**

With regard to IMT-2020 related aspects, in December 2021 SG11 consented draft new Recommendations, as follows:

* ITU-T Q.5003 “Signalling requirement and architecture for federated multi-access edge computing”;
* ITU-T Q.5024 “Protocol for providing intelligent analysis services in IMT-2020 network”.

SG11 started two new work items on IMT-2020 aspects, as follows:

* Q.PCNC-FMSC “Protocol for supporting computing and network convergence in fixed, mobile and satellite convergence in IMT-2020 network and beyond”;
* Q.AIS-SRA “Signalling requirements and architecture to support AI based vertical services in future network, IMT2020 and beyond”.

Currently, there are nine ongoing work items on IMT-2020-related issues.

Regarding managed P2P communications, SG11 consented two draft new Recommendations:

* ITU-T Q.4102 “Hybrid peer-to-peer (P2P) communications: Peer protocol”;
* ITU-T Q.4103 “Hybrid peer-to-peer (P2P) communications: Overlay management protocol”.

SG11 continues progressing ongoing work item ITU-T Q.HP2P-dss “Hybrid peer-to-peer (P2P) communications: Data streaming service”.

**Signalling of Computing Power Networks (CPN)**

SG11 has made progress on:

* draft Recommendation ITU-T Q.CPN “Signalling requirements for Computing Power Network”;
* draft Recommendation ITU-T Q.BGN-INC: Requirements and signalling of intelligence control for the border network gateway in computing power network.

**Security issues of SS7 and other protocols**

In December 2021, SG11 agreed a new Technical Report ITU-T QSTR-USSD (ex. TR-USSD) “Low resource requirement, quantum resistant, encryption of USSD messages for use in Financial services”.

Also, SG11 continues improving signalling-based services and protocols to be used for calling party identification presentation/restriction (e.g., basic calls, supplementary services such as CLIP/CLIR, USSD, etc.) for all types of networks. Currently, SG11 develops:

* Draft new Recommendation ITU-T Q.PRO-Trust “Signalling procedures and protocols for enabling interconnection between trustable network entities in support of existing and emerging networks”, which defines the signalling procedures and protocols involved in the application of the signalling requirements and architecture, TSa, Sa and Sc defined in ITU-T Q.3057 for interconnection between trustable network entities in support of existing and emerging networks. It is expected that the work will be completed in July 2022;
* Draft new Recommendation ITU-T Q.CIDA “Signalling procedures of calling line identification authentication”, which will use X.509 digital certificates signed by a TSCA.

Following the progress made so far, SG11 in close collaboration with SG2 and SG17 organized ITU Workshop on “Improving the security of signalling protocols” (virtual, 29 November 2021, [www.itu.int/go/WS-SSP](http://www.itu.int/go/WS-SSP)).

**VoLTE/ViLTE interconnection and VoLTE-related issues**

In December 2021, SG11 consented draft new Recommendation ITU-T Q.3646 “Framework and protocols for signalling network analyses and optimization in VoLTE”.

SG11 has made progress on three ongoing work items.

**QKDN protocols**

SG11 has made progress on Q.QKDN\_profr “Quantum key distribution networks – Protocol framework” and started four new work items on QKDN protocols, as follows:

* Q.QKDN\_Ak “Protocols for Ak interface for QKDN”;
* Q.QKDN\_Kx “Protocols for Kx interface for QKDN”;
* Q.QKDN\_Kq-1 “Protocols for Kq-1 interface for QKDN”;
* Q.QKDN\_Ck “Protocols for Ck interface for QKDN”.

Based on received iLS ([SG11-TD1777/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG11-211201-TD-GEN-1777)), with a view to ensure a smooth and efficient transfer of its deliverables to the Study Groups, FG-QIT4N organized information session during SG11 and SG13 meetings in December 2021. The objective of the session was to present FG-QIT4N deliverables and suggestions for the way forward for QIT-related standardization. The session was held fully virtual on 6 December 2021 (0800-0930 hours, Geneva time). The presentations are available in [SG11-TD1818/GEN](https://www.itu.int/md/T17-SG11-211201-TD-GEN-1818/en).

* 1. **Establishing test specifications, conformance and interoperability testing for all types of networks, technologies and services that are the subject of study and standardization by all ITU‑T study groups**

**ITU-T Recommendations on conformance and interoperability testing**

SG11 started two new work items on testing and monitoring aspects, as follows:

* Q.TSRT\_IoT “Test specifications for remote testing of Internet of Things using the probes”;
* Q.PIS “Monitoring Parameters for Intelligent Speech Service in Future Networks”.

In total, there are eight ongoing work items on testing aspects.

**Implementation of ITU C&I Programme**

ITU-T SG11 maintains the reference table of ITU-T Recommendations suitable for C&I testing and list of pilot projects for conformity assessment against ITU-T Recommendations ([www.itu.int/go/reference-table](https://www.itu.int/go/reference-table), [www.itu.int/go/pilot-projects](http://www.itu.int/go/pilot-projects)). Following the received updates from different SGs, SG11 updated both lists. The outputs are available in [SG11-TD1817/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG11-211201-TD-GEN-1817) and [SG11-TD1816/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG11-211201-TD-GEN-1816) respectively. Both lists are updated on the [ITU C&I Portal](https://www.itu.int/en/ITU-T/C-I/Pages/default.aspx).

**Conformity Assessment Steering Committee (CASC)**

The thirteenth meeting of the ITU-T Conformity Assessment Steering Committee (CASC) was held virtually on 3 December 2021 during the ITU-T SG11 virtual meeting.

Due to lack of proposals on joint certification schemes taking into consideration the financial implications presented by IECEE, CASC decided to discontinue collaboration with IECEE on the TL recognition procedure and on joint certification scheme for the time being.

Following request of previous CASC meeting, TSB presented a new ITU Testing Laboratory Database. The application needs to be submitted through [online form](https://www.itu.int/net/itu-t/cdb/secured/reg-tldb.aspx) which is available on ITU C&I Portal ([www.itu.int/go/citest](http://www.itu.int/go/citest)). The recognized testing laboratory will be listed in the ITU Testing Laboratory Database accordingly.

Any TL including non-ITU members, which expresses its interest to be accredited against ITU-T Recommendations to be further recognized by ITU, needs to approach Accreditation Body (AB) that is a signatory to the ILAC MRA. The list of ABs is available at: <https://ilac.org/signatory-search/>. Afterwards, once the accreditation is given to the TL and relevant application form submitted to ITU by TL, the TL can be recognized by ITU accordingly.

All ICT products tested against ITU-T Recommendation by TLs recognized by ITU may be registered in the [ITU Product Conformity Database](https://www.itu.int/net/itu-t/cdb/ConformityDB.aspx), based on the request. The relevant requests need to be submitted via [online form](https://www.itu.int/net/itu-t/cdb/secured/Register16.aspx) accordingly.

More details are available in the [ITU-T CASC Report](https://www.itu.int/md/T17-SG11-211201-TD-GEN-1736/en).

The next CASC meeting is planned for 8 July 2022 (TBC). It will be held during next SG11 meeting (6-15 July 2022, TBA). More information is available on the [CASC webpage](https://www.itu.int/en/ITU-T/studygroups/2017-2020/11/Pages/CASC.aspx).

* 1. **Combating counterfeiting and the use of stolen ICT devices**

In December 2021, SG11 agreed a new ITU-T Q Supplement 75 “Use Cases on the Combat of Counterfeit ICT and Stolen Mobile Devices”.

SG11 continues progressing four ongoing work items on this subject matter.

1. **ITU-T SG11 Workshops**

Since October 2021, the following Workshop and Forum were organized:

* **ITU Workshop on “Improving the security of signalling protocols”** (virtual, 29 November 2021, [www.itu.int/go/WS-SSP](http://www.itu.int/go/WS-SSP)).

The event focused on measures on how to cope with different types of attacks (e.g., spoofing number, telephone spam, etc.) from signalling perspective.

SG11 revised Q.731.3-series, developed [ITU-T Q.3057](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14242) and continues developing a set of standards (e.g., [Q.Pro-trust](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=16748), [Q.CIDA](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=16501)) that allows to tackle such issues by inserting digital signatures into signalling exchange, which will be further validated by the Trusted Signalling Certification Authority (TSCA). This approach may significantly decrease the number of such attacks giving customer the trust of connected applications and services.

The main objective of this workshop was to exchange views on different measures to cope with the vulnerabilities of existing networks, services and protocols. Among other issues, the brainstorming session discussed the need to standardize the identity verification process of a party requesting a certificate, its issuance process and the distribution of the issued certificate to the operators. The representatives of the SG2, SG11 and SG17 gave an overview of their related activities.

According to the key takeaways of the Workshop, there is a need to build a hierarchy of trust, country/regional first, then global where each local regulator will have to determine how to implement the certification depending on their local forms of identification and rules. It was noted that the digital certificates must be interoperable across domains (SIP, SS7, etc.). Finally, it was highlighted that the trust anchor needs to be a globally trusted SDO, preferably one already in charge of numbering and this anchor must interoperate with existing repositories. Therefore, it was pointed out that there is a need to formulate a way to standardize these local/regional certification processes in order to keep the bad actors out. This standardization process should involve as many countries as possible in order to improve its applicability on the global scale.

The key takeaways of the Workshop are available at: [www.itu.int/go/WS-SSP](http://www.itu.int/go/WS-SSP), posted as [SG11-TD1874/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG11-211201-TD-GEN-1874).

* **ITU Forum on Future Networks and C&I** (St. Petersburg, Russia, 19-22 October 2021).

ITU held a series of side events during the Forum, including presentation of the ITU project “ITU International research and development testing centre for equipment, new technologies and services” (IRDTC) and information session “ITU activities in the field of Artificial Intelligence”.

The Forum was collocated with the meeting of the ITU-T Study Group 11 Regional Group for Eastern Europe, Central Asia and Transcaucasia (SG11RG-EECAT).

The presentations are available at: <https://www.itu.int/en/ITU-D/Regional-Presence/CIS/Pages/Events/2021/SPB-Oct.aspx>.

1. **ITU-T Focus Group on Testbeds Federations for IMT-2020 and beyond (FG-TBFxG)**

ITU-T Focus Group on Testbeds Federations for IMT-2020 and beyond (FG-TBFxG) was established by ITU-T Study Group 11 on its virtual plenary on 10 December 2021. The agreed ToR of the FG-TBFxG are available in [SG11-TD1804-R1/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG11-211201-TD-GEN-1804).

The Focus Group will serve as a platform to harmonize testbeds specifications across SDOs/Fora. The FG-TBFxG will develop the required application program interfaces (APIs) aligned with the Testbeds Federations Reference Model defined in Recommendation ITU-T Q.4068, developed in collaboration with ETSI TC INT, and define a set of use cases for Federated Testbeds and APIs.

The Focus Group will play a role in providing a platform to share views, to develop a series of deliverables and it will also offer a platform to different stakeholders to share their initiatives and projects aligned with the outlined vision and the desired Ecosystem on Testbeds Federations. The Focus Group will develop technical specifications that may become a basis for further standardization in the area of Testbeds Federations.

The first meeting is scheduled to be held fully virtually from 4 to 7 April 2022 (TBA).

The FG-TBFxG encourages collaboration with SDOs/Fora, Research Communities, Researchers on IMT-2020 and beyond, Industry Users of Testbeds, Testbeds Suppliers for IMT-2020 Testbeds and other Testbeds, CSPs (Communications Service Providers), Network Operators, Infrastructure Vendors/Suppliers for ICT and Verticals, Open Source & Open Hardware Projects, Regulators.

All interested parties are encouraged to subscribe to the Focus Group mailing list ([fgtbf@itu.int](mailto:fgtbf@itu.int)) [here](https://www.itu.int/myworkspace#/Mailing) (see instructions [here](https://www.itu.int/en/ITU-T/focusgroups/tbfxg/Documents/Quick_steps-subscribe_to_fgtbf_mailing_list.pdf)).

More details are available on the Focus Group webpage at: [www.itu.int/go/fgtbf](http://www.itu.int/go/fgtbf).

1. **SG11 Regional Groups**

The [SG11RG-EECAT](https://www.itu.int/en/ITU-T/studygroups/2017-2020/11/sg11eecat/Pages/default.aspx) meeting was held fully virtually on 20 October 2021 collocated with the [ITU Forum](https://www.itu.int/en/ITU-D/Regional-Presence/CIS/Pages/Events/2021/SPB-Oct.aspx) on Future Networks and C&I (19-22 October 2021). Following discussion at the Regional Group meeting, four contributions were submitted to SG11 meeting held in December 2021.

The Report of the SG11RG-EECAT meeting is available in [SG11RG-EECAT–R4](https://www.itu.int/md/T17-SG11RG.EECAT-R-0004/en).

There were no meetings of SG11RG-AFR since last SG11 meeting (March 2021).

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