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| **Keywords:** | Signalling; protocols; IMT-2020, conformance; interoperability; testing; counterfeiting; stolen; ICT devices; CASC; |
| **Abstract:** | This report contains the report of the ITU-T SG11 on lead study group activities (January – July 2019). |

1. **Background**

According to Resolution 2 of WTSA-16, ITU-T SG11 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 (January – July 2019)**
	1. **Signalling and protocols, including for IMT-2020 technologies**
		1. **Approved ITU-T Recommendations and agreed Supplements and Corrigendum on signalling aspects**

The following ITU-T Recommendations have been approved since January 2019:

* New ITU-T Q.3054: Signalling architecture for virtualization of control network entities;
* New ITU-T Q.3741: Signalling requirements for SD-WAN services.

The following Supplement and Amendment have been agreed since January 2019:

* Q.Supplement 70: Signalling requirements for IMS and GSM/UMTS network supporting multi-device emergency telecommunications service;
* Amendment 1 to ITU-T Q.850: Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN user part".
	+ 1. **IMT-2020 and SDN protocols**

ITU-T SG11 continues activities which are aimed at developing standards on IMT-2020-related protocols. Following the approval of the first recommendation on intelligent edge computing (ITU-T Q.5001) in March 2018, ITU-T SG11 approved two new signalling requirements for IMT-2020 networks, as follows:

* New ITU-T Q.5020: Protocol requirements and procedures for network slice lifecycle management
* New ITU-T Q.5021: Protocol for managing capability exposure APIs in IMT-2020 network

The subcategory of Q.series – Q.5000-Q.5049: Signalling requirements and protocols for IMT-2020 will be progressively filled in within the new standards which are currently under study in SG11 (6 ongoing work items).

ITU-T SG11 also continues working on SDN activities and achieved progress on two ongoing work items.

ITU-T SG11 is going to develop ICN related protocols. As far as ITU-T SG13 is developing Recommendations and Supplements on use cases, requirements, frameworks, and architectures for ICN, ITU-T SG11 invited ITU-T SG13 experts to join such discussions in future ITU-T SG11 meetings.

* + 1. **SS7 issues**

ITU-T SG11 agreed that it is urgent and necessary to revise ITU-T Q.731.3 to accommodate some Member States' demands dealing with the spoofing of calling party number. The revised ITU‑T Q.731.3 specifies an exceptional procedure for transit exchange connected to CPE (Customer Premises Equipment) in purpose of providing predefined calling party number by the originating operator. The exceptional procedure applies the same principle of providing calling party number as defined in the original texts in subclause 3.5.2.1.1 of ITU-T Q.731.3.

From the ITU-T SG11 perspective, all calling party numbers delivered in the telecommunications network should be generated or verified by an operator.

Some editorial work has also been done on ITU-T Q.731.4, Q.731.5 and Q.731.6 to align them with this series of Recommendations.

All four standards were finally approved by SG11:

* Revised ITU-T Q.731.3: Stage 3. Description for number identification supplementary services using Signalling System no.7 - calling line identification presentation;
* Revised ITU-T Q.731.4: Stage 3. Description for number identification supplementary services using Signalling System no.7 - calling line identification restriction;
* Revised ITU-T Q.731.5: Stage 3. Description for number identification supplementary services using Signalling System no.7 - connected line identification presentation;
* Revised ITU-T Q.731.6: Stage 3. Description for number identification supplementary services using Signalling System no.7 - connected line identification restriction;

WP1/11 decided to start a new technical report for improvement of SS7 security based on the draft technical report presented at the meeting. The goals for this work item are to promote the standardization on security mechanisms for existing (e.g. Legacy, 2G) and future networks, to research on the measures which could reduce the implementation cost of SS7 security in 2G networks, to provide concrete material for education to telecom and financial services regulators on SS7 vulnerabilities and mitigation measures for DFS, and to mitigate the use of the SS7 vulnerabilities for financial fraud.

ITU-T SG11 is organizing a brainstorming session on SS7 security (Workshop) during the next SG11 meeting (22 October 2019). This workshop will therefore be dedicated to brainstorming on the potential way forward to enhance the security mechanisms of SS7 and its adoption rate among telcos in order to defend all stakeholders from related attacks. The key aim of the brainstorming session is to identify the roadmap for fixing these issues.

* + 1. **VoLTE/ViLTE interconnection**

ITU-T SG11 progressed the ongoing work item Q.DEN-IMS “Signalling architecture of distributed ENUM networking for IMS" and started a new draft Recommendation Q.Protocol\_DES “Protocol at interface between two distributed ENUM servers for IMS".

Also, following the approval of IMS references for release 11 in July 2018, ITU-T SG11 approved new Recommendation ITU-T Q.3642 “IMS references to Release 12 for communication between IMS and NGN Networks to support the end-to-end service interoperability".

Two more VoLTE-related work items are currently under study.

* 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**
		1. **Approved ITU-T Recommendations on conformance and interoperability testing**

The following ITU-T Recommendations, which define test specifications, have been approved since January 2019:

* New ITU-T Q.4061 “Framework of SDN controller testing";
* New ITU-T Q.4014.1 "PSTN/ISDN terminal equipment using IP Multimedia core network subsystem; Conformance testing; Part 1: PICS";
* New ITU-T Q.4014.2 "PSTN/ISDN terminal equipment using IP Multimedia core network subsystem; Conformance testing; Part 2: TSS&TP";
* New ITU-T Q.4043 “Interoperability testing requirements of virtual switch".

Eight related work items, which deal with testing specifications, are currently under study in ITU‑T SG11.

* + 1. **Implementation of ITU C&I Programme**

Following inputs received from different ITU-T SGs, ITU-T SG11 updated the reference table of ITU-T Recommendations suitable for C&I testing ([www.itu.int/go/reference-table](https://www.itu.int/go/reference-table)). The information was updated on the [ITU C&I Portal](https://www.itu.int/en/ITU-T/C-I/Pages/default.aspx) accordingly.

* + 1. **Conformity Assessment Steering Committee (CASC)**

The seventh meeting of the ITU-T Conformity Assessment Steering Committee (CASC) took place during ITU-T SG11 meeting on 8 March 2019.

IECEE TF finalized the Operational Document (OD) “ICT Laboratory Recognition Service on ITU-T Recommendations" and presented it at the ITU-T CASC meeting (8 March 2019). The service is based on IECEE peer assessment processes by using ITU-T Recommendations. This service would be organized and arranged from IECEE side based on IECEE peer assessment program, which would use and facilitate ITU-T technical experts nominated by ITU-T CASC.

Following the approval of OD by IECEE, any Testing Laboratory (TL) (including non-ITU members) may apply for such recognition. The TL should follow the instructions given in IECEE OD. This document will be made available after IECEE CMC approval.

Currently, ITU-T CASC is developing the third Guideline “ITU-T CASC collaboration procedure with IECEE for TL recognition service on ITU-T Recommendations". This document should be finalized and proposed for ITU-T SG11 agreement in October 2019.

In addition, ITU-T CASC received two applications from candidates requesting appointments as ITU-T technical experts, with competence in relevant ITU-T SG2 and ITU-T SG5 Recommendations. In line with the approved guidelines for the appointment of ITU-T CASC Technical Expert, the ITU-T CASC constituted appointment teams to review the applications and provide recommendations to ITU-T CASC.

ITU-T CASC requested all ITU-T SGs to provide focal points to ITU-T CASC. This list of experts will be used by ITU-T CASC as the reference list of experts on particular areas of study of relevant SGs, who could be included in the appointment team (depending on the scope of applications received).

Finally, ITU-T CASC, in collaboration with IECEE will develop a joint ITU/IEC certification scheme and ITU-T CASC requested all ITU-T SGs to provide their proposal regarding potential ITU-T Recommendations, which may become subject for a future ITU/IEC joint certification scheme, taking into consideration market needs.

The next CASC physical meeting will take place in Geneva on 18 October 2019.

* 1. **Combating counterfeiting of ICT devices**

Further to TSB Circular 105 of 5 September 2018, and pursuant to clause 9.5 of Resolution 1 (Rev. Hammamet, 2016), ITU-T SG11, during its meeting in Geneva on 6-15 March 2019, approved new Recommendation ITU-T Q.5050: Framework for solution to combat counterfeit ICT devices. This Recommendation contains the reference framework and requirements to be considered when deploying solutions to combat the circulation and use of counterfeit ICT devices.

Also, following the decision of Council-18 (C18/107, clause 2), ITU, in particular TSB, should be studying the questions raised by members on IMEI security in one of the ITU-T study groups. Council-18 report (C18/107) requested *“ITU-T study groups, in particular Study Group 11, to continue to develop Recommendations, technical reports and guidelines to address the problems posed by counterfeits"*.

In this regard, following the contribution received and the report prepared by TSB, ITU-T SG11 decided to start a new work item TR-RLB-IMEI "Reliability of IMEI identifier". This technical report contains a study about key vulnerabilities on IMEI reprogramming on mobile devices and proposals to improve IMEI reliability.

In addition, following the contribution received, ITU-T SG11 started a new work item “Technical Report TR-CF-QoS: Impact of Counterfeit Mobile devices on Quality of Service" that aims to study the negative effects and impact of counterfeit mobile devices on network's quality of service along with the negative effects and service degradation experienced by the mobile subscribers.

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

ITU-T SG11 continues working on work item Q.FW\_CSM “Framework for Combating the use of Stolen Mobile ICT Devices”.

1. **ITU-T SG11 workshops**
	1. **ITU Workshop on Benchmarking of emerging technologies and applications. Internet related performance measurements**

ITU-T SG11 organized a [Workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/20190311/Pages/default.aspx) on Benchmarking of emerging technologies and applications. Internet related performance measurements in Geneva on 11 March 2019. The event was attended by many ITU-T SG11 delegates and was well received by the audience.

This workshop was dedicated to sharing experiences and highlighting the approaches on benchmarking and Internet related performance measurements of different stakeholders, including telecom operators, regulators, SDOs, customers and any active player.

A successful demo was showcased during the break from Rohde & Schwarz, Germany, following their presentation on *"Why Operations Support Systems (OSS) Are Not the Answer to All? Enhanced Network Performance Evaluation with Mobile Probes"*.

Among the outcomes of the Workshop were:

* Benchmark is *“evaluation of performance value/s of a parameter or set of parameters for the purpose of establishing value/s as the norm against which future performance achievements may be compared or assessed”* (ITU-T E.800);
* Benchmarking is “*performance tests of a system based on a suite of standardized performance tests. The main purpose of a performance benchmark is to produce a metric that can be rated and compared with the metric values produced by other systems using the same benchmark”* (ITU-T Q.3930);
* The benchmarking approach can be used for performance assessment of parameters of different systems, networks, services and applications (e.g. call drops, call set-up delay, CPU load, latency, jitter, download transmission speed, upload transmission speed, etc.);
* The approach highlighted in ITU-T Q.3960 (2016) and the proposed draft ITU-T Q.3961 is compliant with Net Neutrality regulation 2015/2120 from BEREC and OECD 2014 report, underlying that TCP protocol is widely used by customer application.

The detailed outcomes of the workshop are available in [SG11-TD813/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG11-190306-TD-GEN-0813).

1. **SG11 Regional groups**

The [SG11RG-EECAT](https://www.itu.int/en/ITU-T/studygroups/2017-2020/11/sg11eecat/Pages/default.aspx) meeting took place in Saint-Petersburg (Russia) from 21-22 May 2019 back to back with the SG13RG-EECAT, SG3RG-EECAT and [ITU Forum](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/201905/Pages/default.aspx) "Internet of Things: future Applications and Services. Perspective 2030"/ Fourth ITU Workshop on Network 2030.

The [SG11RG-AFR](https://www.itu.int/en/ITU-T/studygroups/2017-2020/11/sg11rgafr/Pages/default.aspx) will take place in Tunis (Tunisia) from 30 September to 2 October 2019. It will be preceded by the third ITU-T Study Group 11 Regional Workshop for Africa on “Counterfeit ICT Devices, Conformance and Interoperability Testing Challenges in Africa” (30 September 2019, Tunis).

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