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| ITU logo | INTERNATIONAL TELECOMMUNICATION UNION**TELECOMMUNICATIONSTANDARDIZATION SECTOR**STUDY PERIOD 2017-2020 | TD 151  |
| **TSAG** |
| **Original: English** |
| **Question(s):** | N/A | Geneva, 26 February – 2 March 2018 |
| **TD** |
| **Source:** | Chairman, ITU-T SG11 |
| **Title:** | ITU-T SG11 Lead Study Group Report |
| **Purpose:** | Information |
| **Contact:** | Andrey KUCHERYAVYRussia | Tel: +7 921 3140320E-mail: akouch@mail.ru |

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| **Keywords:** | Signalling; protocols; IMT-2020, conformance; interoperability; testing; counterfeiting; stolen; ICT devices. |
| **Abstract:** | This report contains the report of the ITU-T SG11 on lead study group activities (May 2017-February 2018). |

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 (May 2017-February 2018)**
	1. **Signalling and protocols, including for IMT-2020 technologies**

The following ITU-T Recommendations have been approved since May 2017:

* New ITU-T X.609.3: Managed P2P communications: Multimedia streaming signalling requirements;
* New ITU-T X.609.4: Managed P2P communications: Multimedia streaming peer protocol;
* New ITU-T X.609.5: Managed P2P communications: Multimedia streaming overlay management protocol;
* New ITU-T Q.3640: Framework of interconnection of VoLTE/ViLTE-based networks;
* New ITU-T Q.3740: Signalling Requirements for SDN and NFV based Central Office services;
* New ITU-T Q.3716: Signalling Requirements for Mapping between Physical and Virtual Networks;
* New ITU-T Q.3715: Signalling requirements for dynamic bandwidth adjustment on demand on broadband network gateway implemented by software defined networking technologies;
* New ITU-T Q.3714: Signalling requirements of SDN-based access networks with media independent management capabilities;
* Revised Q.1912.5 (revised): Interworking between Session Initiation Protocol (SIP) and Bearer Independent Call Control protocol or ISDN User Part.

Since February 2017, SG11 advanced the ongoing work item Q.NS-LCMP “Protocol for network slice lifecycle management” and agreed to start several new work items on IMT-2020, as follows:

* 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.QMP-TCA: QoS management protocol for time constraint applications over SDN.

SG11 continues working on some aspects related to signalling procedures for remote testing and monitoring. In this regard, SG11 started two new work items:

* Q.SP-RT-NP: Signalling procedures of the probes to be used for remote testing of network parameters;
* Q.SQM: Signalling requirements and architecture for the Internet service quality monitoring system.

SG11 also agreed to start a new work item Q.ETN-DS *“Signalling architecture of the fast deployment emergency telecommunication network to be used in a natural disaster”* which aims to describe the functional elements, services and signalling architecture of emergency telecommunication network which can be rapidly deployed in a country affected by a natural disaster.

The SG11 meeting discussed a number of contributions addressed to SS7 issues. Amongst them were proposals to revise ITU-T Q.731.3 and create new signalling procedures to be applied on SS7 stack.

Following the discussion of the proposed new work items, the meeting agreed that verification of the identification of network entities (also the calling party number) is a very important method to achieve greater safety and security for network. At the current stage, study on the requirements and architecture for interconnection between trustable network entities is needed. In this regard, it was agreed to start a new work item Q.SR-Trust *“Signalling requirements and architecture for interconnection between trustable network entities”*.

Following the consented new Recommendation ITU-T Q.3640 *“Framework of interconnection of VoLTE/ViLTE-based networks”*, SG11 agreed to start a new work item Q.DEN\_IMS *“Signalling architecture of distributed ENUM networking for IMS”* which will define the signalling architecture of distributed ENUM networking in support of IMS interconnection.

SG11 also made progress on ongoing work item Q.Suppl.VoLTE\_ETS\_Interconnection “Signalling requirements for interconnection between VoLTE-based network and other networks supporting emergency telecommunications service (ETS)” and agreed to start several new work items on VoLTE/ViLTE matters, as follows:

* Q.VoLTE-SAO-req: Requirements for signalling network analyses and optimization in VoLTE;
* Q.suppl.Multi\_Device\_ETS “Signalling requirements for VoLTE-based network and GSM/UMTS network supporting Multi-device emergency telecommunications service”.
	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**

According to received inputs from different ITU-T SGs, ITU-T SG11 updated the reference table of ITU-T Recommendations suitable for C&I testing and list of pilot projects on conformance testing against ITU-T Recommendations. The information was updated on the [ITU C&I Portal](https://www.itu.int/en/ITU-T/C-I/Pages/default.aspx) accordingly and it is available at:

* [www.itu.int/go/pilot-projects](https://www.itu.int/go/pilot-projects);
* [www.itu.int/go/reference-table](https://www.itu.int/go/reference-table).

In November 2017, SG11 approved the revised Terms of Reference (ToR) of CASC, which were aligned with WTSA-16 Resolution 2 and Resolution 76 referring to joint ITU/IEC certification scheme. The revised ToR for CASC are available in [SG11-TD314/GEN](https://www.itu.int/md/T17-SG11-171108-TD-GEN-0314/en).

CASC discussed the collaboration approach with IECEE TF in order to establish a joint certification scheme. It was noted that IECEE already has a program with their experts to accredit the laboratories worldwide under Certification Body (CB) scheme for Safety standards. It was proposed that the same can be extended for Telecom / RF standards accredited through IECEE for laboratories testing Telecom/RF products in their scope, in particular ITU-T Recommendations.

*Note: the IEC CMC Task Force “ITU Requirements” (IECEE TF) is established by IECEE (*[*IEC web site*](http://www.iecee.org/dyn/www/f?p=106:46:16334084323690::::FSP_ORG_ID:19407)*).*

The following ITU-T Recommendations, which define test specifications, have been approved since May 2017:

* New ITU-T Q.3953: VoLTE/ViLTE interconnection testing for interworking and roaming scenarios;
* New ITU-T Q.3952: The architecture and facilities of Model network for IoT testing;
* New ITU-T Q.3914: Set of parameters of cloud computing for monitoring;
* New ITU-T Q.4041.1: Cloud computing infrastructure capabilities interoperability testing – part 1: Interoperability testing between CSC and CSP;
* Revised ITU-T Q.4016: Testing specification of call establishment procedures based on SIP/SDP and ITU-T H.248 for a real-time fax over IP service;
* Revised ITU-T Q.3940: NGN/IMS interconnection tests between network operators at the IMS 'Ic' interface and NGN NNI / SIP-I.

SG11 continues collaborating with ETSI TC INT through current joint activities:

* Interconnection of VoLTE/ViLTE networks;
* Testing specifications;
* Internet related performance measurements.

The next joint meeting of [Q9/11, Q11/11 and ETSI TC INT](http://www.itu.int/net/itu-t/lists/rgmdetails.aspx?id=9121&Group=11) is scheduled to take place in Prague (hosted by University of Prague) on 20 March 2018.

In addition, in November 2017, SG11 decided to start work on the following new work items:

* Q.SDN-CT: Framework of SDN controller testing;
* Q.TI-TEST: Framework of model network for Tactile Internet testing;
* Q.BNGP: Set of parameters of vBNG for monitoring.
	1. **Combating counterfeiting of ICT devices**

SG11 continues working on the issues related to combat counterfeiting. In November 2017, SG11 made progress on ongoing work items:

* Draft Recommendation Q.FW\_CCF “Framework for solution to combat counterfeit ICT Devices”;
* Draft Technical Report TR-BP\_CF “Technical Report - Guidelines on Best Practice and Solutions for Combating Counterfeit ICT Devices”.
	1. **Combating the use of stolen ICT devices**

In November 2017, SG11 made progress on ongoing work item Q.FW\_CSM “Framework for Combating the use of Stolen Mobile ICT Devices”.

1. **ITU-T SG11 workshops**

In June 2017, ITU organized Regional [Workshop](https://www.itu.int/en/ITU-D/Regional-Presence/CIS/Pages/EVENTS/2017/06_Saint_Petersburg/06_Saint_Petersburg.aspx) for CIS on *“Internet of Things (IoT) and Future Networks”* which highlighted key standardizations areas of SG11 on signalling issues. The Workshop focused on International standardization of the Internet of Things (IoT), International standardization of the technologies of the future networks and its applications, perspectives of implementing IoT technologies in telecom networks in CIS region and future telecom networks development in the CIS region. The event was followed by the SG11 Regional Group for EECAT ([SG11RG-EECAT](https://www.itu.int/en/ITU-T/studygroups/2017-2020/11/sg11eecat/Pages/default.aspx)) which took place back-to-back with SG20 Regional Group for EECAT ([SG20RG-EECAT](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rgeecat/Pages/default.aspx)), held in Saint Petersburg (Russia) on 19-20 June 2017.

In November 2017, SG11 organized a [Workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/201711/Pages/default.aspx) on “*Control plane of IMT-2020 and emerging networks. Current issues and the way forward”*. The goal of the workshop was to identify current issues on signalling protocols for emerging networks, including interconnection, worldwide practices and perspectives on the implementation of 5G/IMT-2020/emerging networks and potential new areas for standardization on control plane of the 5G/IMT-2020/emerging networks.

Among the results of the workshop were some suggestions to SG11 as a lead group on signalling and protocols:

* Establish collaboration with open source communities to speed up the de facto standards;
* Continue to coordinate with the related SDOs (3GPP, ETSI, MEF, etc.) to develop the specs and promote the testing in 5G, network slicing, hybrid network, QoE, QoS;
* Encourage members who have gained fruitful experiences through emerging network practice to submit contributions to promote the SDN/NFV-related testing standardization work in SG11;
* Encourage members to initiate possible work items, which are related to new emerging technologies, such as IoT IMS signalling, Fog/Edge Computing.
1. **SG11 Regional groups**

In November 2017, SG11 approved the revised Terms of References of [SG11RG-AFR](https://www.itu.int/en/ITU-T/studygroups/2017-2020/11/sg11rgafr/Pages/default.aspx) and [SG11RG-EECAT](https://www.itu.int/en/ITU-T/studygroups/2017-2020/11/sg11eecat/Pages/default.aspx). The revised ToR are available in [SG11-TD312/GEN](https://www.itu.int/md/T17-SG11-171108-TD-GEN-0312/en) and [SG11-TD313/GEN](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG11-171108-TD-GEN-0313) accordingly.
*Note: the title of the SG11RG-RCC was changed to ITU-T SG11 Regional Group for Eastern Europe, Central Asia and Transcaucasia (SG11RG-EECAT).*

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