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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 (September-December 2020). |

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 (September-December 2020)**
   1. **Signalling and protocols, including for IMT-2020 technologies**
      1. **Approved ITU-T Recommendations and agreed Supplements and Corrigendum on signalling aspects**

Approved ITU-T Q.3058 “Signalling architecture of orchestration in NGNe”. It provides the signalling architecture for orchestration in NGNe. Based on the functional architecture of orchestration in NGNe, it introduces the reference points and specifies the mapping of reference points to interfaces in the signalling architecture of orchestration in NGNe. It also provides the signalling requirements of the interfaces and defines the protocols used for interfaces.

Approved ITU-T Q.3059 “Signalling requirements for service function discovery”. It specifies the signalling requirements for service function discovery based on its functional architecture. The signalling is for service function path controller to discover and select the service function.

Approved ITU-T Q.3720 “Procedures for vBNG acceleration with programmable acceleration card”. It specifies the framework, working modes, and procedures for vBNG acceleration with programmable acceleration card.

SG11 continues progressing 13 ongoing work items on signalling aspects.

* + 1. **IMT-2020 and managed P2P communications related issues**

ITU-T SG11 continues activities which are aimed at developing standards on IMT-2020-related protocols. Currently, there are 11 ongoing work items.

With regards to managed P2P communications, SG11 approved:

* New Recommendation ITU-T X.609.9 “Managed P2P communications: Overlay content management protocol”. It specifies an overlay content management protocol (OCMP) that runs on an interface between an index server and a peer to carry meta-information of overlay content over managed peer-to-peer (MP2P) architecture defined in Rec. ITU-T X.609. The meta-information includes attributes of a content to be distributed and mapping information with an overlay network. This Recommendation provides message formats and protocol operations;
* New Recommendation ITU-T X.609.10 “Managed P2P communications: Signalling requirements for data streaming”. It defines the signalling requirements for data streaming that runs on the reference points among related entities of the managed P2P network communications. This Recommendation also addresses service procedures for providing data streaming services based on managed peer-to-peer networks;
* New Recommendation ITU-T Q.4100 “Hybrid peer-to-peer (P2P) communications: Functional architecture”. The hybrid P2P network can be composed of tree-based overlay network and mesh-based overlay network in order to utilize the advantages of each type of overlay network. The tree-based overlay network will be used for fast distribution of small data, and the mesh-based network will be used for distribution of relatively larger sized data. This Recommendation specifies the functional architecture and the reference points for the hybrid peer-to-peer networking with information flows.

SG11 continues progressing 4 ongoing work items on signaling aspects for P2P communications.

* + 1. **Security issues of SS7 and other protocols**

Following the approval of Recommendation ITU-T Q.3057 “Signalling requirements and architecture for interconnection between trustable network entities”, SG11 continues working on Q.PRO-Trust “Signalling procedures and protocols for enabling interconnection between trustable network entities in support of existing and emerging networks”, which will be based on TCAPSec (3GPP TS 33.204 Release 16) in order for existing STPs to support it without requiring an update. The draft Q.PRO-Trust 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.

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 Q.CIDA “Signalling procedures of calling line identification authentication”, which will use X.509 digital certificates signed by a TSCA.
* draft TR-USSD “Low resource requirement, quantum resistant, encryption of USSD messages for use in Financial services”

SG11 continues progressing 3 ongoing work items on security of signalling protocols.

* + 1. **VoLTE/ViLTE interconnection and VoLTE-related issues**

Following the approval of new Recommendation ITU-T Q.3643 “Signalling architecture of distributed infrastructure ENUM networking for IMS”, SG11 approved new Recommendation ITU-T Q.3645 “Protocol at interface between two distributed ENUM servers for IMS”. It defines protocol at the interface between two Distributed ENUM Servers (DES) of distributed ENUM system in support of IMS interconnection. Based on the functions and signalling requirements defined in ITU T Q.3643, this Recommendation provides the reference model, procedures, protocol, and message specification for the interface between two DES.

Currently, SG11 continues working on Q.VoLTE-SAO-FP “Framework and protocols for signalling network analyses and optimization in VoLTE”.

* + 1. **Emergency telecommunications**

SG11 approved new Recommendation ITU-T Q.3060 “Signalling architecture of the fast deployment emergency telecommunication network to be used in a natural disaster”. It describes general framework of the fast deployment emergency telecommunication network to be used in a natural disaster.

Currently, SG11 continues working on Q.Sig\_Req\_ETS\_IMS\_roaming “Signalling requirements for emergency telecommunication service in IMS roaming environment”, which defines the signalling architecture, interfaces, functional description, signalling requirements, signalling procedures and security consideration of Emergency Telecommunication Service (ETS) in IMS roaming architecture over LTE.

* 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**

SG11 approved the following new Recommendations:

* ITU-T Q.4066 “Testing procedures of Augmented Reality applications”. It describes the procedure for testing augmented reality (AR) applications. In particular, it contains: classification of AR applications, general architecture of the AR application testing model and test specifications for testing various AR applications;
* ITU-T Q.4062 “Framework for IoT Testing”. It specifies the testing framework for IoT to accommodate the tests for such integrated domains with multiple access technologies;
* ITU-T Q.4063 “The framework of testing of identification systems used in IoT”. It provides approaches of identification of devices used in Internet of Things (IoT). There are a lot of applications of IoT, the testing of their identity might be considered as it allows customer to ensure the authenticity of the IoT. The classification of IoT, in terms of testing of their identification procedures and the relevant testing procedures are also subjects of this Recommendation;
* ITU-T Q.3915 “Set of parameters of vBNG for monitoring”. It describes the monitoring architecture and requirements of virtual Broadband Network Gateway(vBNG), and specifies a set of parameters which will be monitored during the lifecycle of a vBNG instance;
* ITU-T Q.3961 “Parameters for evaluating bottleneck of web-browsing service”. It defines parameters for evaluating bottleneck of web-browsing service, including parameters in the network layer, in the transportation layer and in the application layer, and the characteristic parameters. The relationship between these parameters is also introduced;
* ITU-T Q.4064 “Interoperability testing requirements of virtual Broadband Network Gateway”. It aims to specify virtual BNG (vBNG) interoperability testing requirements.

SG11 continues progressing 7 ongoing work items on testing aspects.

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

ITU-T SG11 maintains 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 is made available on the [ITU C&I Portal](https://www.itu.int/en/ITU-T/C-I/Pages/default.aspx).

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

There were no meetings of CASC from September to December 2020. The next meeting is scheduled for 19 March 2021. It will be held during next SG11 meeting (17-26 March 2021). More information is available on the [CASC web page](https://www.itu.int/en/ITU-T/studygroups/2017-2020/11/Pages/CASC.aspx).

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

SG11 approved new Recommendation ITU-T Q.5052 “Addressing mobile devices with duplicate unique identifiers”. It identifies challenges and proposes mechanisms to enable the detection of mobile devices with duplicate identifiers present on operator networks as well as recommending mechanisms for validating the legitimacy of such devices.

In December 2020, WP3/11 consented draft new Recommendation ITU-T Q.5053 (ex. Q-BL-Audit) “Mobile device access list audit interface”. It defines different types of methodologies and interfaces to check and reconcile the Mobile device access list used by the Mobile Network Operators to comply with the regulations with the Mobile device access list Audit System (MDALAS).

SG11 continues progressing 7 ongoing work items on this subject matter.

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

SG11 continues developing:

* Q.Sup.CFS-Use-Cases “Use cases on the combat of counterfeit ICT and stolen mobile devices”;
* Q.Sup.CFS-Rdm “Roadmap for the Q.5050-series - Combat of Counterfeit ICT and Stolen Mobile Devices”;
* Q.Sup.CFS-AFR “Guidelines on combating counterfeit and stolen mobile devices in African region”.

1. **ITU-T SG11 workshops**

SG11 mostly focused on preparation for WTSA-20 and therefore, there were no time for organizing workshops this year. In this regard, it was decided that all future SG11 related workshops are postponed to 2021.

1. **SG11 Regional groups**

There were no SG11 Regional Groups meetings since September 2020.

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