Overview of SG11 activities and latest achievements

Andrey KOUCHERYAVY
Chairman of SG11

SG11 in a nutshell

Title: Signalling requirements, protocols, test specifications and combating counterfeit products

SG11 is home to **SS7** and holds expertise in:

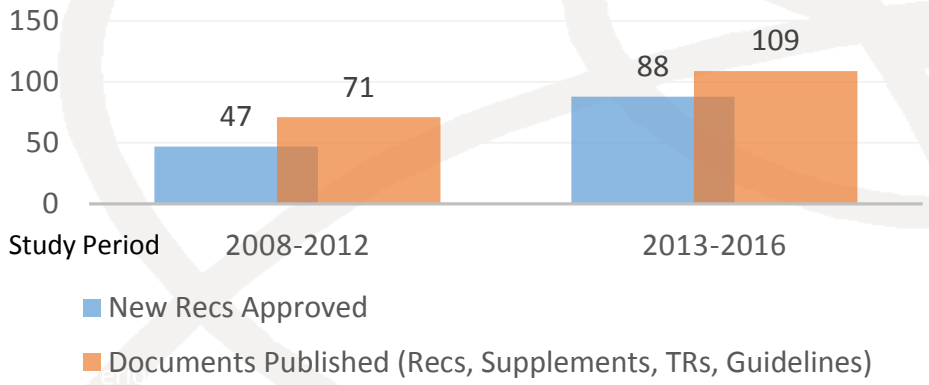
- **Combating counterfeiting and stolen ICT devices**
- **Internet performance measurements**
- **Signalling architectures, requirement and protocols for legacy and future networks**
- **Conformance & Interoperability**
- **Test methodologies and specifications**

Our Mission

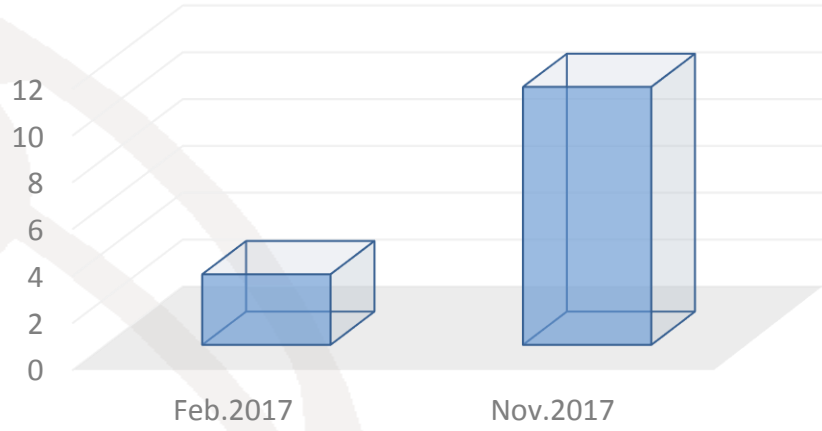
To develop protocols and test specifications to achieve consistent end-to-end interoperability of systems and networks

SG11 in numbers, positive trend

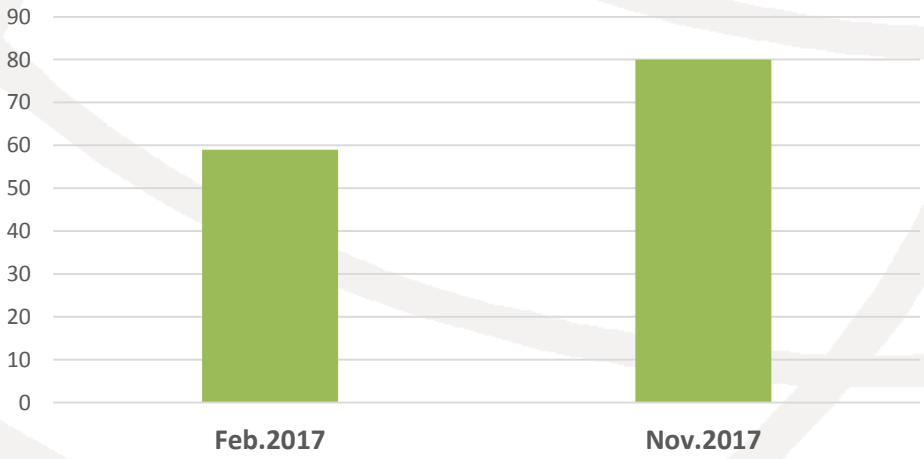
Total publications and new Recs. approved



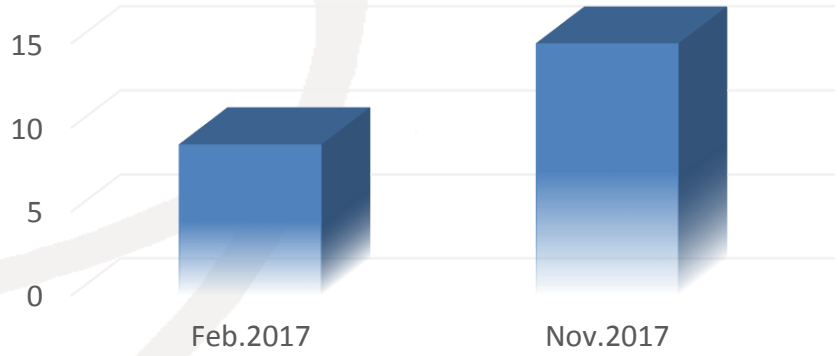
Planned for Consent/approval



Submitted Contributions



PROPOSED NEW WORK ITEMS



Achievements

as of April 2018

SDN-based signalling requirements

- **Supplement 67** (2015/04) to Q-series: **Framework of signalling for SDN**
- **Q.3711** (2016/08): **Signalling requirements for software-defined broadband access network**
- **Q.3712** (2016/08): **Scenarios & signalling requirements of unified intelligent programmable interface for IPv6**
- **Q.3713** (2017/03): **Signalling requirements for broadband network gateway pool**
- **Q.3714** (01/2018): **Signalling requirements of SDN-based access networks with media independent management capabilities**
- **Q.3715** (01/2018): **Signalling requirements for dynamic bandwidth adjustment on demand on broadband network gateway implemented by software-defined networking technologies**
- **Q.3716** (01/2018): **Signalling Requirements for Mapping between Physical and Virtual Networks**
- **Q.3740** (01/2018): **Signalling Requirements for SDN and NFV based Central Office services**

COMPLETED WORK

SIP-IMS signaling requirements

https://www.itu.int/en/ITU-T/C-I/Pages/SIP/IMS.aspx

SG11 finalized the first version of the standardization plan for SIP-IMS. The aims of this activity are to:

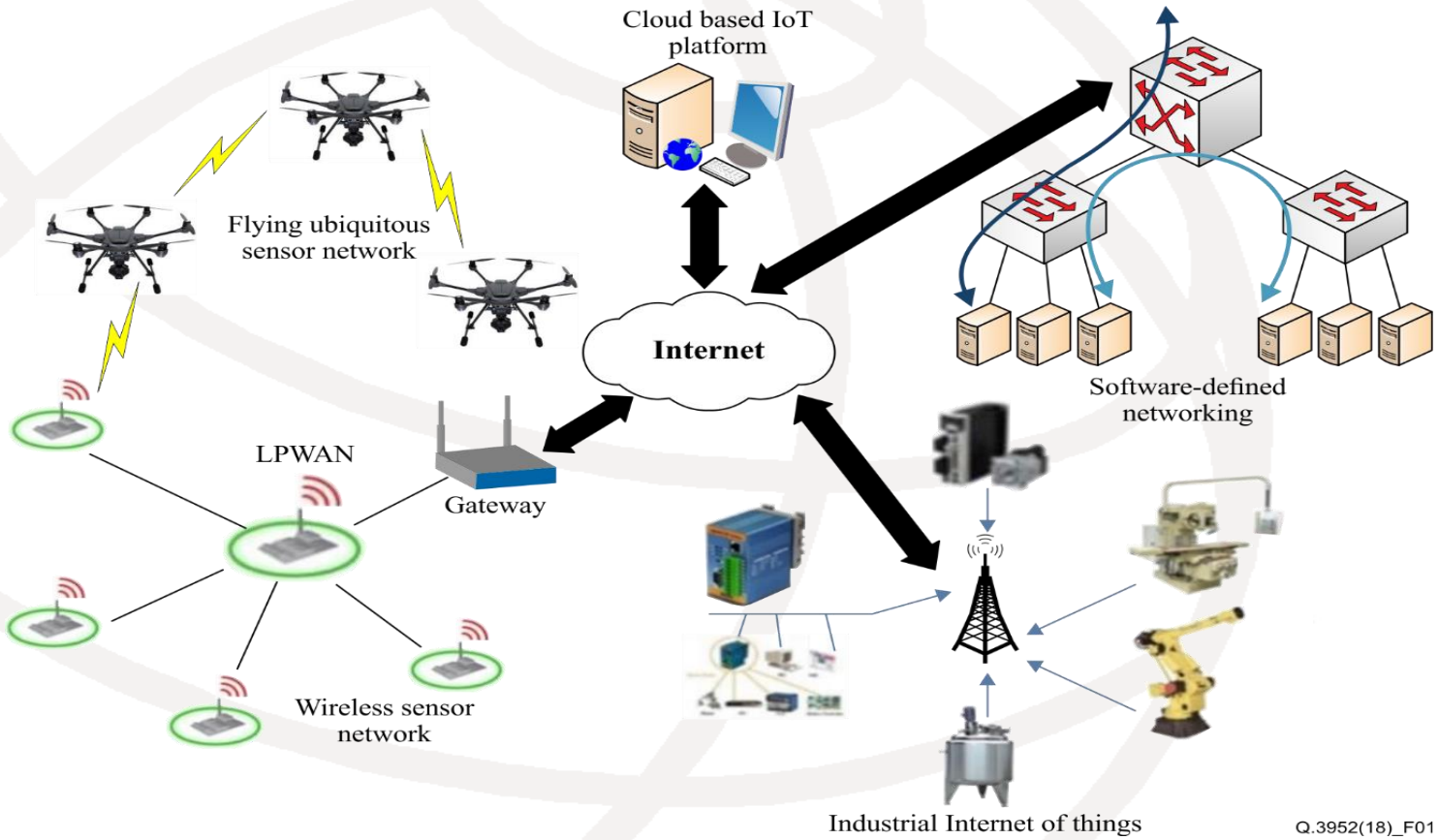
- Collect all standards on SIP-IMS profile in ITU-T and amend it with missing standards (e.g. requirements, test specifications, use cases, etc.)
- Establish a framework for the conformity assessment of SIP-IMS profile which may be used by all fixed telecom operators in the world for testing equipment based on SIP-IMS profile
- Support the conformity assessment of equipment against ITU-T Recommendations on SIP-IMS profile (Testing Laboratory and other interested parties are invited)
- Align and develop ITU-T Recommendations in collaboration with ETSI TC INT

SG11 Approved the revised Recommendation ITU-T Q.1912.5: Interworking between Session Initiation Protocol (SIP) and Bearer Independent Call Control protocol or ISDN User Part

COMPLETED WORK

IoT testing

The structure of the model network to be used for IoT testing (ITU-T Q.3952, approved 01-2018)



Cloud Computing

ITU-T Q.3914

Set of parameters of cloud computing for monitoring

ITU-T Q.4041.1

Cloud computing infrastructure capabilities interoperability testing – part 1: Interoperability testing between CSC and CSP

COMPLETED WORK

VoLTE Interconnection

Current issues of interconnection of VoLTE-based networks:

- Roaming issues and scenarios
- Roaming charges
- Numbering/addressing
- Emergency services

Operators Challenges:

- different VoLTE interconnection/roaming solutions available
- these solutions are not always interoperable
- VoLTE roaming procedures are not agreed and therefore may not be implemented

SG11 Related Achievements:

- **Workshop on Voice and Video Services Interoperability Over Fixed-Mobile Hybrid Environments, Including IMT-Advanced (LTE) (Geneva, 1 December 2015)**
- **Recommendation ITU-T Q.3640: Framework of interconnection of VoLTE/ViLTE-based networks**
- **Recommendation ITU-T Q.3953: VoLTE/ViLTE interconnection testing for interworking and roaming scenarios**

Stakeholders involved: SG11, SG2, ETSI TC INT, GSMA

VoLTE/ViLTE related issues

There are number of ongoing work items related to VoLTE/ViLTE aspects:

- Q.DEN_IMS: **Signalling architecture of distributed ENUM networking for IMS**
- Q.suppl.Multi_Device_ETS: **Signalling requirements for VoLTE-based network and GSM/UMTS network supporting Multi-device emergency telecommunications service**
- Q.VoLTE-SAO-req: **Requirements for signalling network analyses and optimization in VoLTE**
- Q.Suppl.VoLTE_ETS_Interconnection: **Signalling requirements for interconnection between VoLTE-based network and other networks supporting emergency telecommunications service (ETS)**

5G control plane and other protocols

- Q.NS-LCMP: **Protocol for network slice lifecycle management**
- 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**
- Q.SDN-CT: **Framework of SDN controller testing**
- Draft ITU-T Q.3405: **IPv6 protocol procedures for broadband services**
- Q.ETN-DS: **Signalling architecture of the fast deployment emergency telecommunication network to be used in a natural disaster**

ON-GOING WORK

SS7 security

- Due to number of complaints on identification of calling party number coming from different network subscribers, SG11 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. SG11 started a new work item **Q.SR-Trust: Signalling requirements and architecture for interconnection between trustable network entities**
- SG11 started revising Q.731.3: **Stage 3 description for number identification supplementary services using Signalling System No. 7 : Calling line identification presentation (CLIP)**

Internet related performance measurements

ON-GOING WORK

Vision: Unified methodology of Internet speed measurement usable by end-users on the fixed and mobile networks

Two types of measurements:

- Network Internet access speed
- Internet resources access speed

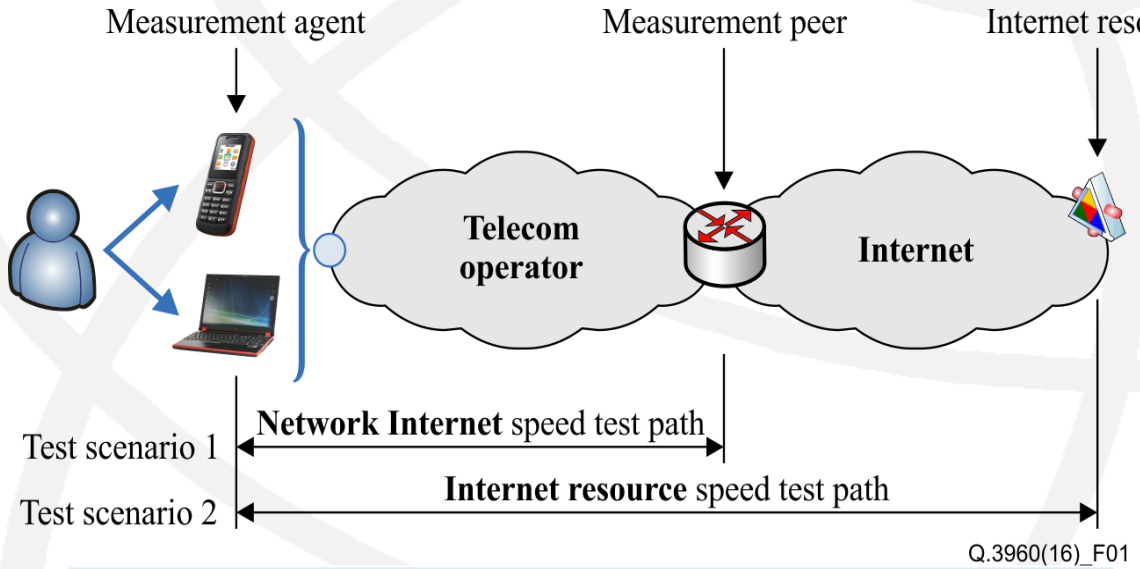


Fig.1 - Global scenario and test definition [REF. ITU-T Q.3960]

Approved

ITU-T Q.3960

Framework of Internet related performance measurements

Ongoing work:

Draft Q.3961

Testing methodologies of Internet related performance measurements including e2e bit rate within the fixed and mobile operator's networks

http://itu.int/en/ITU-T/C-I/Pages/IM/Internet-speed.aspx

ON-GOING WORK

Signalling requirements for remote testing

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**

Conformance & Interoperability

Conformity Assessment Steering Committee (CASC)

- Working on a test laboratory recognition procedure in ITU-T
- Collaboration with IECEE (TF “ITU Requirements”)
- Two guidelines approved
- Two guidelines ongoing

Recommendations

- SIP-IMS conformity assessment work plan (**57** new Recs)
- Benchmarking of IMS platform work plan (**10** new Recs)
- Conformance test plan for Number Portability requirements in Q Sup.4 (Q.3905)
- Cloud computing test specifications (Q.4040, Q-Sup.65)
- Model network for IoT testing

Tools

- Living list of key technologies suitable for C&I testing
- Reference table of ITU-T Recs and test specifications
- Pilot projects among SGs

www.itu.int/go/citest

Combating Counterfeiting ICT Equipment

The Problem

PP-14 Resolution 188 *(BUSAN, 2014)*
"Combating counterfeit telecommunication/information and communication technology devices"

- International trade in counterfeit: hundreds of billion USD
- Growing problem particularly in developing countries
- Economic impacts on manufacturers and Governments
- Affects operators networks
- Dangers to the health

Past Events

- Workshop on Combating counterfeit and substandard ICT devices ***(November 2014)***
- DEMO — Demo on a solution to combat Counterfeiting of ICT products based on the Digital Object Architecture ***(April 2015)***
- Workshop on Combating counterfeit using conformance and interoperability solutions ***(June 2016)***

COMPLETED WORK

Technical Report on "Counterfeit ICT Equipment" *(2014, rev. 2015)*

QTR-CICT
Survey report on counterfeit ICT devices in Africa region *(02-2017)*

ON-GOING WORK

Draft Rec. Q.FW_CCF "Framework for solution to combat counterfeit ICT Device"

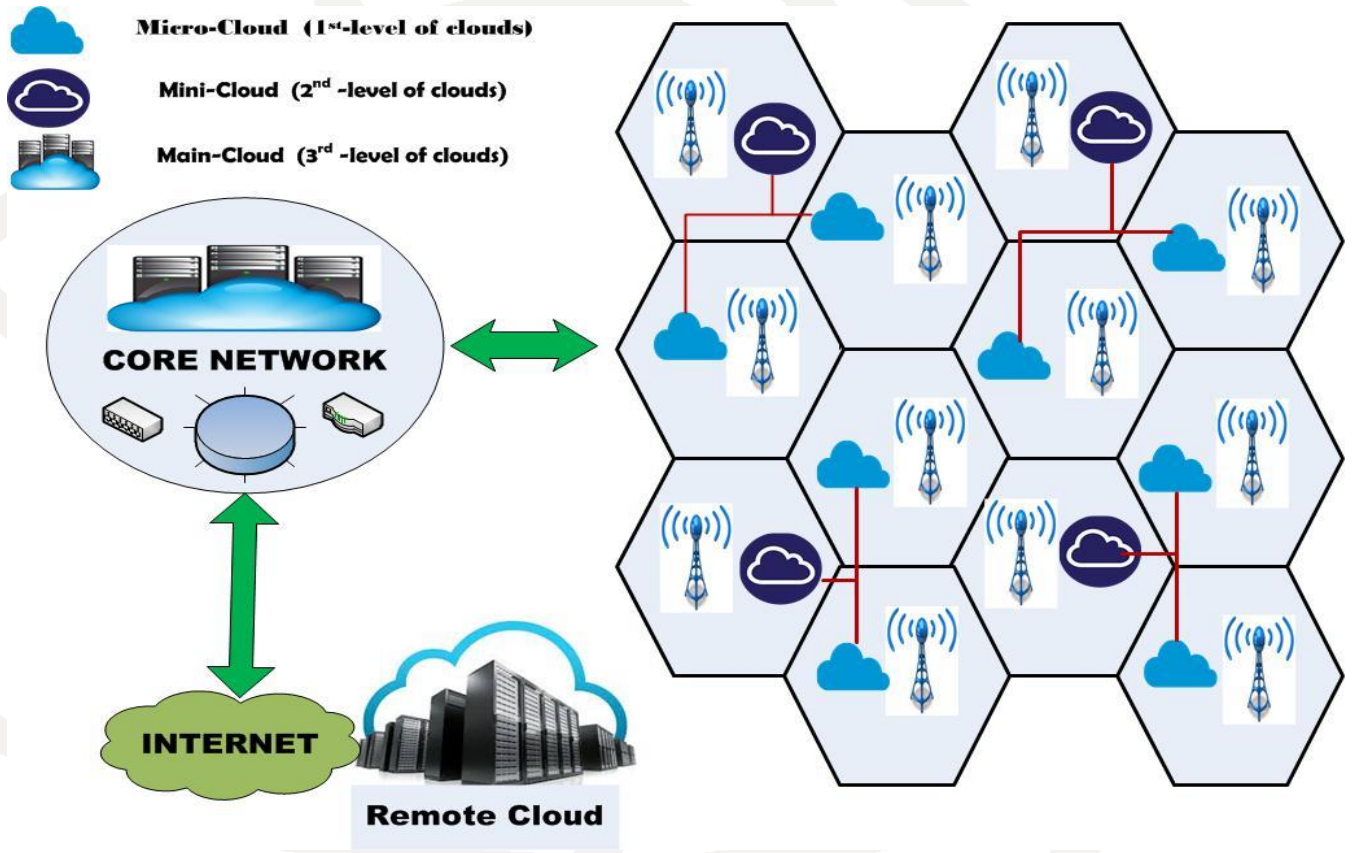
Two technical reports ongoing

Combating the use of stolen ICT devices

- WTSA-16 Resolution 97: Combating mobile telecommunication device theft
- SG11 is developing Q.FW_CSM: Framework for Combating the use of Stolen Mobile ICT Devices (updated in April 2018)
- Action plan for Implementation of WTSA-16 Resolution 97 (SG11-TD115R2/GEN)
- ITU Workshop on Global approaches on combating counterfeiting and stolen ICT devices, 23 July 2018 (during next ITU-T SG11 meeting)

New potential areas of study (1/3)

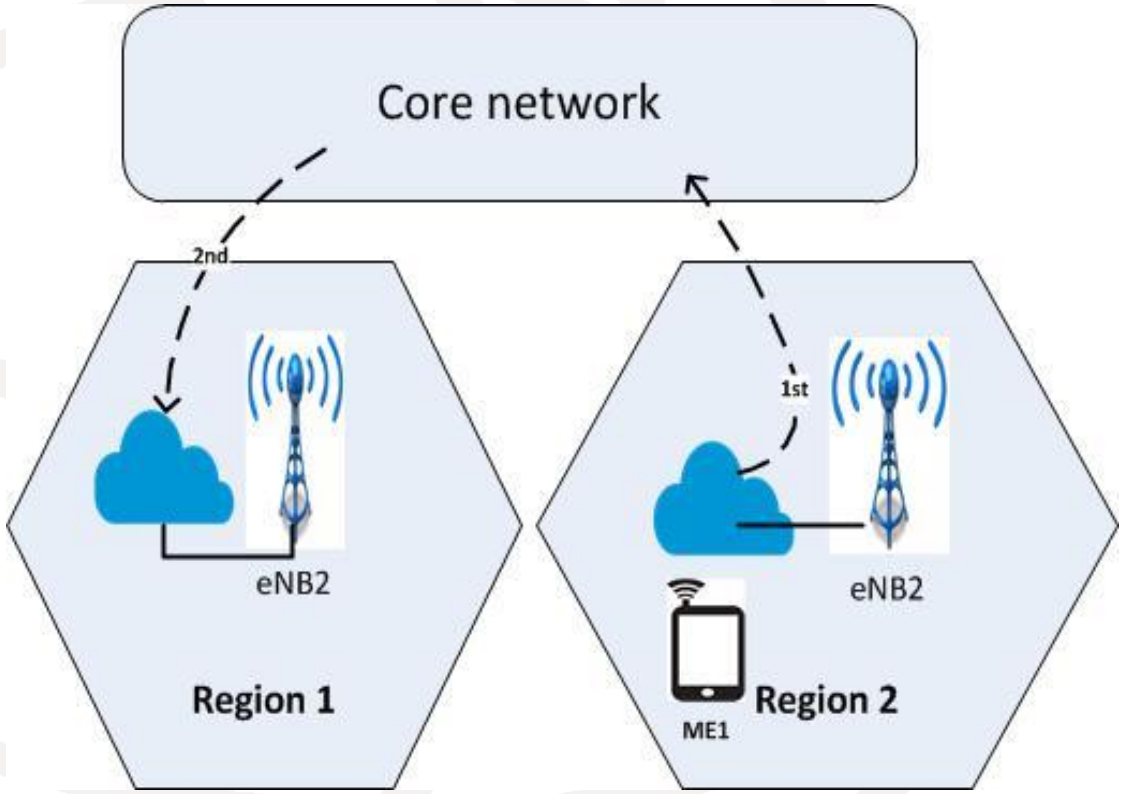
Multilevel cloud based Tactile Internet system



A.Koucheryavy and all. Multilevel Cloud based Tactile Internet System. ICACT'2017.

New potential areas of study (2/3)

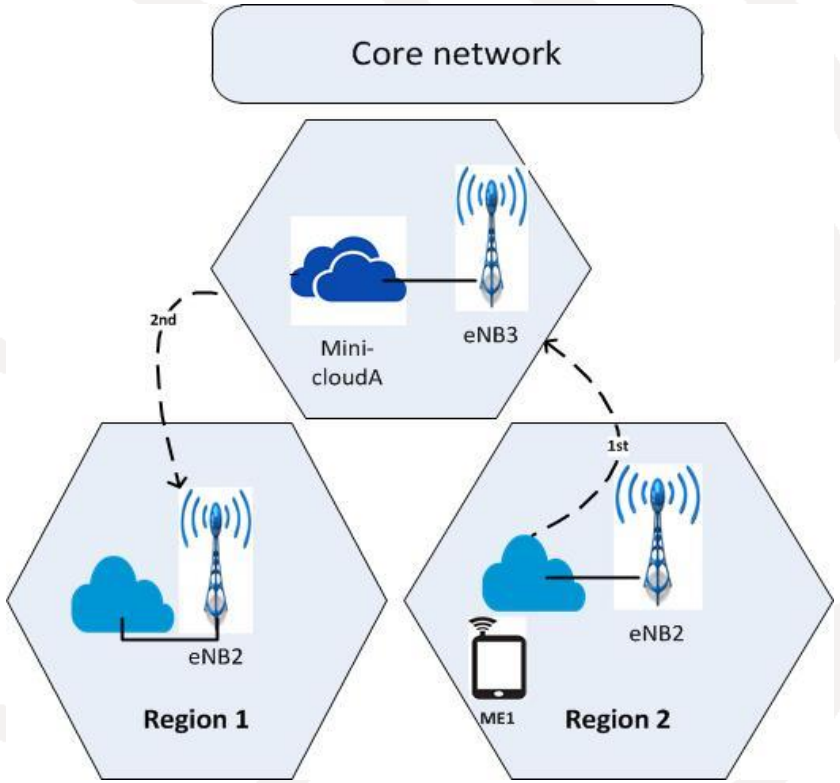
Roaming from eNB2 to eNB1 through the core network



A.Koucheryavy and all. Multilevel Cloud Based Tactile Internet System. ICACT'2017.

New potential areas of study (3/3)

Roaming from eNB2 to eNB1 through the mini-cloud A



A.Koucheryavy and all. Multilevel Cloud based Tactile Internet System. ICACT'2017.

Mandate and structure of the SG11, Study Period (2017-2020)

ITU-T SG11 Management

CHAIRMAN: Andrey KUCHERYAVY (Russia)

VICE-CHAIRMAN:

- Isaac BOATENG (Ghana)
- Mr JOSE HIRSCHSON ALVAREZ PRADO (Argentina)
- Shin-Gak KANG (Korea (Rep. of)
- Karim LOUKIL (Tunisia)
- Awad Ahmed Ali Hmed MULAH (Sudan)
- Khoa NGUYEN VAN (Viet Nam)
- João Alexandre Moncaio ZANON (Brazil)
- Xiaojie ZHU (China)

SECRETARIAT
(Telecommunication Standardization Bureau – TSB)

- **ADVISOR:** Denis ANDREEV
- **ADMINISTRATIVE ASSISTANT:** Emma NORTON VIARD

Resolution 2 of WTSA-16

"ITU Telecommunication Standardization Sector study group responsibility and mandates"

ITU-T SG11 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**

AREAS OF STUDY OF ITU-T SG11

- **network signalling and control architectures** in emerging telecommunication environments *(e.g. SDN, NFV, FN, cloud computing, VoLTE/ViLTE, IMT-2020 technologies, etc.)*
- **services and application control** and signalling requirements and protocols
- **session control** and signalling requirements and protocols
- **resource control** and signalling requirements and protocols
- **signalling and control requirements and protocols** to support attachment in emerging
- telecommunication environments
- signalling and control requirements and protocols to support **broadband network gateways**
- signalling and control requirements and protocols to support **emerging multimedia services**
- signalling and control requirements and protocols to support emergency telecommunication services (**ETS**)
- signalling requirements for establishing the **interconnection of packet-based networks**, including VoLTE/ViLTE-based networks, IMT-2020 and beyond
- **test methodologies** and test suites as well as monitoring of parameters set for emerging network technologies and their applications, including cloud computing, SDN, NFV, IoT, VoLTE/ViLTE, IMT-2020 technologies, etc., to enhance interoperability
- **conformance, interoperability testing** and network/system/service testing, including **benchmark testing**, a testing methodology and testing specification of standardized network parameters in relation to the framework for **Internet-related performance measurement**, etc.
- **combating counterfeiting** of ICT devices

SG 11 Structure

Andrey Kucheryavy (Russia)
SG11 Chairman

SG11

Conformity Assessment Steering Committee

CASC

CASC Chairman:
Isaac Boateng (NCA)
Vice-chair: Khoa Nguyen Van (NTA, MIC)
Vice-chair: Karim Loukil (CERT)

Regional Group for Africa

SG11RG-AFR

RG-AFR Chairman:
Isaac Boateng (NCA)
RG-AFR Vice-Chair:
Karim Loukil (CERT)

Regional Group for EECAT

SG11RG-EECAT

RG-RCC Chairman:
Alexey Borodin (Rostelecom)

Signalling requirements and protocols for emerging telecommunications networks

WP1

WP 1 Chairman: Xiaojie Zhu (China Telecom)

Q1/11, Q2/11, Q3/11, Q4/11, Q5/11

Control and management protocols for IMT-2020

WP2

WP 2 Chairman: Shin-Gak Kang (ETRI)

Q6/11, Q7/11, Q8/11

Conformance and interoperability testing, combating counterfeit ICT and mobile device theft

WP3

WP 3 Chairman: Kaoru Kenyoshi (NEC)
WP 3 Vice-chair: Awad Ahmed Ali Hmed Mulah (NTC)
WP 3 Vice-chair: João Alexandre Moncaio Zanon (NTA)

Q9/11, Q10/11, Q11/11, Q12/11, Q13/11, Q14/11, Q15/11

List of questions of SG11

Question number	Title
Q1/11	Signalling and protocol architectures in emerging telecommunication environments and guidelines for implementations
Q2/11	Signalling requirements and protocols for services and applications in emerging telecommunication environments
Q3/11	Signalling requirements and protocols for emergency telecommunications
Q4/11	Protocols for control, management and orchestration of network resources
Q5/11	Protocols and procedures supporting services provided by broadband network gateways
Q6/11	Protocols supporting control and management technologies for IMT-2020
Q7/11	Signalling requirements and protocols for network attachment including mobility and resource management for future networks and IMT-2020
Q8/11	Protocols supporting distributed content networking and information centric network (ICN) for future networks and IMT-2020, including end-to-end multi-party communications
Q9/11	Service and networks benchmark testing, remote testing including Internet related performance measurements
Q10/11	Testing of emerging IMT-2020 technologies
Q11/11	Protocols and networks test specifications; frameworks and methodologies
Q12/11	Testing of internet of things, its applications and identification systems
Q13/11	Monitoring parameters for protocols used in emerging networks, including cloud computing and software-defined networking/network function virtualization (SDN/NFV)
Q14/11	Cloud interoperability testing
Q15/11	Combating counterfeit and stolen ICT equipment

STRATEGIC GOALS OF SG11, STUDY PERIOD (2017-2020)

- **Signalling requirements for existing and emerging technologies/services**
  (Tactile Internet (TI), Augmented Reality (AR) and Flying Ad Hoc Networks)
- **SS7 security** (e.g. new authorizations procedures are needed, SS7 firewall/router, etc.)
  Note: see the summary of the ITU Workshop "SS7 Security"
- **5G/IMT-2020 control plane and signaling requirements for 5G's services**
- **Interconnection of 4G (VoLTE/ViLTE) and 5G/IMT-2020 networks**
- **Implementation of C&I Programme**
  - Testing specifications for all types of technologies, networks and services, including testing of Internet technologies/services/apps (e.g. IoT, Tactile Internet, Augmented Reality, Flying Ad Hoc Networks, robotics network etc.)
  - Recognition procedure of testing laboratories and joint ITU/IEC certification schemes (through ITU-T CASC)
- **Combating counterfeit and mobile devices theft**

Source: presentation of SG11 Chairman, TD56 (GEN/11)

Conclusion

- SG11 is the lead SG on **signalling requirement and protocols (including IMT-2020), test specifications** and **conformance & interoperability testing**
- SG11 will study protocols and test specifications for new service and new network e.g. **NGN enhance, Cloud computing, SDN, IPv6** etc.
- SG11 would take **the lead coordinating role in the harmonization of various protocol standards** based on the concept of consistent end-to-end interoperability
- SG11, as a lead group, will study ways to combat **counterfeiting** and the use of **stolen ICT devices**
- SG11 will study testing methodologies related to **Internet performance measurements**
- SG11 study a way to implement a **testing laboratory recognition procedure** (CASC)

SG11 contacts

www.itu.int/itu-t/go/sg11

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