

ITU's conformance and interoperability Programme (C&I Programme)

C&I basic terms

- **Conformity assessment (CA):** *the process used to demonstrate that a product, service or system conform to specified requirements.* – ISO/IEC 17000
 - 1st party CA – manufactures' self-declaration of conformity
 - 2nd party CA - by user, e.g. purchaser, importer, retailer...
 - 3rd party CA – ISO/IEC 17025, 17065, etc
- **Interoperability:** *the ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged.* - Rec. ITU-T Y.101
- conformance increases the probability of interoperability, but **CAN NOT** guarantee

C&I testing is common telecom/ICT industry practice

- **National regulatory conformity assessment, focusing on:**
 - Safety of life
 - Interference-free
 - Type approval according to national regulation
- **Limited number of bilateral/multilateral Mutual Recognition Agreements(MRA)**
 - APEC TEL MRA 1998
 - US-EU MRA
 - Australia-European MRA
 - Canada-Switzerland MRA
- **Voluntary conformity assessment, by influential SDOs/industry fora**
 - designated testing lab(s), issue product certification against their specific standard(s)
- **Interoperability testing**
 - Organized by a SDO:
 - to verify a standard's specification and its implementation before it's completed
 - To facilitate its members to delivery 'standardized' product to market in synchronization with standard
 - requested by specific customer(s), e.g, decision of telecom operator to procure new devices/systems which must be interoperable with legacy system of either their own or their interconnection partner operator

C&I Issues

Lack of necessary standards and/or standard enforcement leads to:

- **poor interconnection and interoperability**
- **damage reputation of company**
- **damaged reputation of new service/technology**
- **jeopardized competition by dominant market player**
- **vendor locked telecom operators**
- **redundant testing is a burden to both vendors and operators**
- **trade barrier for vendors to access new market**
- **.....**

Why ITU C&I Programme

- **ITU-T's Mission**
 - Develop interoperable, non-discriminatory and demand-driven international standards for International telecommunication
- **Conformity to ITU Recommendations will**
 - Enable telecom operators, vendors, end users, and regulators worldwide to have confidence that products sourced in global market meet international telecommunication requirements
 - Improve interconnection and interoperability
 - Reduce trade barrier and improve transparency to market access
 - increased choice from multiple manufacturers/service providers
 - Help telecom operators to reduce time of new service provision
 - Help vendors to save cost on repetitive testing/certification for same product, thus reduce time to market



ITU Mandate on C&I

- **WTSA Resolution 76:** (WTSA-08, WTSA-12)

“Studies related to conformance and interoperability testing, assistance to developing countries, and a possible future ITU mark programme”

- **WTDC Resolution 47:** (WTDC-10, WTDC-14)

“Enhancement of knowledge and effective application of ITU Recommendations in developing countries, including conformance and interoperability testing of systems manufactured on the basis of ITU Recommendations”

- **PP Resolution 177:** (PP-14) *“Conformance and interoperability”*

- **RA Resolution 62:** (RA 2012)

“Studies related to testing for conformance with ITU-R Recommendations and interoperability of radiocommunication equipment and systems”

- **ITU Council Decisions:** (2009, 2010, 2011, 2012, 2013, 2014)



Overview of ITU C&I Programme



“Pillars”

The Standardization Sector side

- ❖ Pillar 1: Conformity Assessment
- ❖ Pillar 2: Interoperability Events

The Development Sector side

- ❖ Pillar 3: Capacity building
- ❖ Pillar 4: Establishment of test centres and C&I programmes in developing countries

Pillar 1 as defined in ITU PP-14 Resolution 177

- **Res. 177**
 - mentioned a pilot ITU Conformity Database as informative only
 - invited ITU Sector Members to populate the pilot conformity database with details of products tested to applicable ITU-T Recommendations
 - Instructs the Director of TSB to continue to carry out pilot projects for conformity to ITU-T recommendations

Pillar 1 Objectives

- 1. Produce interoperable standards - ITU-T SGs are identifying ITU-T Recommendations with demonstrated market need for C&I testing and developing testing specifications if needed, in collaboration with partner SDOs if appropriate**
- 2. Promote conformity assessment on products/services against ITU-T Recommendation(s) - ITU Conformity database**

WTSA-12

WTSA-12 designated the ITU-T Study Group 11 as a lead group on test specifications, conformance and interoperability testing which coordinates ITU-T activities related to the ITU C&I programme across all SGs and review the recommendations in the Conformance and Interoperability Business Plan for the long term implementation of the C&I programme



- **ITU-T to run a pilot of the conformity assessment programme for key technologies**
- **ITU-T study groups to identify further technologies (*ITU-T Recommendations*) for C&I**
- **ITU Secretariat invite labs/forums/consortia/SDOs to join the C&I Programme**
- **ITU Secretariat to consult study groups towards identifying and suggesting topics for future events**
- **ITU-T Study Groups to develop system roadmaps, identify and define the interfaces across which interoperability is needed**
- **ITU-T Study Groups should identify or develop use cases, application profiles and test plans to use for interoperability testing for Recommendations**

The key outcomes related to Pillar 1&2 as of June 2014 (1/2)

- ✓ ITU-T SG11 developed a **living list of key technologies** suitable for C&I (<http://itu.int/go/key-technologies>)
- ✓ ITU-T SG11 launched the **list of pilot projects** of conformity assessment (<http://www.itu.int/go/pilot-projects>)
- ✓ ITU-T SG11 maintains the **C&I reference table of ITU-T Recs.** (<http://itu.int/go/reference-table>)
- ✓ ITU-T SG11 established the new work item **Q.TL-rec-pro “Testing Laboratories recognition procedure”** (Nov. 13)
- ✓ ITU-T SG11 established the **CG on collaboration between ITU and TL** (Nov. 13)
- ✓ ITU secretariat cooperated with the relevant SDOs (ISO, IEC, IEEE, DCMAS, ILAC, IAF, etc.)

The key outcomes related to Pillar 1&2 as of June 2014 (2/2)



- ✓ **ITU conducted test events** (e.g. from 2013 to 2014):
 - ✓ Conformance & Interoperability event of IMS UNI, IPTV (Bangkok, Sept. 13)
 - ✓ Continua Health Alliance Interoperability event on e-health (Geneva, Oct. 13)
 - ✓ Performance assessment of mobile phones in conjunction with HFT in a car against Recs. ITU-T P.1100/P.1110 (May. 14)
 - ✓ Interoperability of IMS-NNI, IoT (Aug. 14) (planned)
- ✓ ITU-T SG11 established the new work item **Q.Int speed test “Unified methodology of Internet speed quality measurement usable by end-users on the fixed and mobile networks”**
- ✓ There are available some new test specifications for **IMS-NNI, benchmarking, NGN-UNI**, etc.
- ✓ JCA-CIT extended the list of conformity assessment approaches



<http://www.itu.int/en/ITU-T/C-I/Pages/default.aspx>

ITU Conformity and Interoperability Portal

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The living list of technologies to be tested on C&I

List of Pilot projects for conformity assessment against ITU-T Recs

The reference table of standards are used for C&I assessment

SG11 Action plan on C&I

ITU-T meeting schedules on C&I activities



ITU C&I Task Force

One of the core objectives of international standardization is to enable the global interoperability of ICT networks and devices. Products developed in accordance with ITU standards (ITU-T Recommendations) should provide the interoperability needed for users of these products to make use of them anywhere in the world, regardless of who has manufactured them and who is offering the service.

ITU created the Conformity and Interoperability (C&I) Programme in response to a request from the ITU membership to ensure the conformance and interoperability of ICT products implemented according to ITU-T Recommendations or part thereof.

The Programme is also aimed at soliciting feedback to improve the quality of ITU-T Recommendations and at reducing the digital divide and the Standardization Gap by providing developing countries with the requisite tools and expertise to establish regional C&I test centres.

News

Databases

Baseline Documents

Press Release: Test event finds mobile phones have poor hands-free performance

12-16 May: Leading car makers to test hands-free systems to ITU standards

ITU hosts testing event for hands-free in car systems

Call for Expression of Interest

Milestones reached in ITU Conformity and Interoperability programme

More >
Archives >

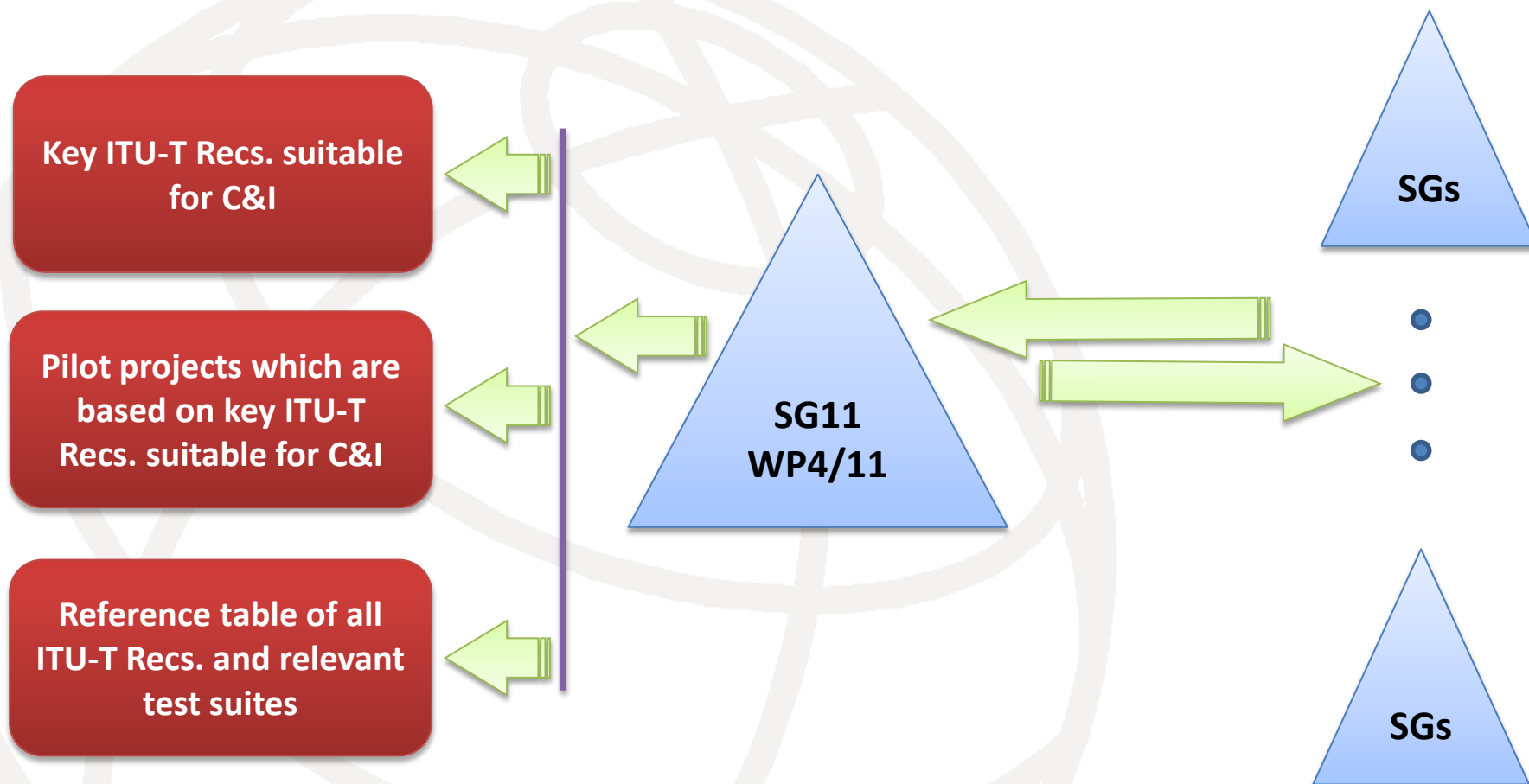


QUICK LINKS

- ▶ C&I Portal home page
- ▶ JCA-CIT
- ▶ ITU-T SG11 (lead group on testing)
- ▶ BDT C&I Activities
- ▶ ITU Conformity Database (application form)
- ▶ ITU Promotional materials
- ▶ ITU Pilot Conformity Database (TSB Circular 98)

SG11 Action plan

Principles of SG11 cooperation among other SGs





The living list of Recommendations and related specifications within key technologies suitable for C&I testing

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ITU-T SG11 output document:

TD 371 (GEN/11) (9-16 July 2014)

#	Title	Focal Point	Other SDOs	ITU-T SGs	References to SDOs docs	References to ITU-T Recs.
1	NGN Functionality	Martin Brand Vice-chairman of SG11 (Austria) martin.brand@A1telekom.at	ETSI	SG11	ETSI (Requirements)	ITU (Requirements)
		-			Y.2201	
		-			Y.2012	
		Andrey Koucheryavy (Russia) akouch@mail.ru			ETSI (Test suites)	ITU (Test suites)
					-	Q.3900
					-	Q.3901
2	Functions of broadband network as a part of NGN	Dmitry Tarasov (Russia) tarasov@zniis.ru	-	SG11	-	ITU (Requirements)
		Dmitry Tarasov (Russia) tarasov@zniis.ru				Y.2012
3	IMS architecture, signalling protocols, interfaces	Martin Brand Vice-chairman of SG11 (Austria) martin.brand@A1telekom.at	ETSI/3GPP	SG11	ETSI (Requirements)	ITU (Requirements)
					TS 124 228	-
					TS 124 229	-
					TS 124 238	-
					TS 124 428	-
					ITU (Test suites)	Q.3906.1



Network and equipment performance (benchmarking) – Req: Draft Q.39zz-1; TS:Q.3930, Q.3931.1-4, Q.3932.1-4,

QoS/QOE/NP – Req: Q.3925, Y.1541, Y.1542, Y.1543, draft Q.MSPQuality, Q.NP-req; TS:Q.QMS, Q.3930, Q.3931.1, Q.3931.2

NGN Functionality – Req: Y.2201, Y.2012; TS: Q.3909; TS: Q.3900; Q.3901

Functions of broadband network as a part of NGN – Req: Y.2012; TS: Q.3906.1

IMS architecture, signaling protocols, interfaces – Req: Y.2012; TS: Q.3904

IMS basic call – Protocol conformance testing – Req: Draft Q.39xx-1; TS: Q.3904

IMS supplementary services. Protocol specifications – Req: -; TS: Q.3943.1/2/4, Q.3942.1

IMS interconnection – Re: Q.3401; TS: -

Interoperability testing – Req: - ; TS: Q.3940, Q.3941.1-4

NGN monitoring system – Req: Q.3902, Q.3910, Q.3911, Q.3912; TS: -

Interworking of signaling protocols of NGN – Req: Q.1912.5, Q.3401, Q.3402; TS: Q.1912.5 B-F

RFID – Req: - ; TS: Q.3950

Internet speed access – Req: - ; TS: Q.InSpMs

Internet Access as perceived by user – Req: G.1000; TS: -

The pilot projects of conformance testing against ITU-T Recommendations (1/2)

<http://itu.int/go/pilot-projects>

Title of planned/on going Pilot Project under C&I Programme	ITU-T Recs.	SGs focal point	Interested companies	Motivations	Short-term strategy
The title of planned or on-going Pilot Project which SG is going to start and maintain		The contact of responsible person/expert (rapporteur, editor, etc)	The companies are going or have already involved to the project	The reason and expecting results under ITU C&I Programme	The short-term strategy (one year) for achieving the goals of the Pilot Project

The pilot projects of conformance testing against ITU-T Recommendations (2/2)



<http://itu.int/go/pilot-projects>

First ITU-T Pilot project

Testing scope: conformance testing of the Multi-technology network interface in accordance with series of Recs. ITU-T M.3170.x

Involved companies: China Telecom, FiberHome, ZTE, CTTL, BUPT, etc.

Goal: improvement of an interconnection between EMS, NMS, and OSS for the MTNM interface

Short-term strategy:

- ✓ harmonize requirements based on the inputs provided by vendors, labs, operators
- ✓ select an appropriate TL that has a competence to perform the relevant tests
- ✓ perform testing at the appointed TL
- ✓ populate ITU product conformity DB

The reference table of ITU-T Recommendations and relevant Test Specifications which are used for C&I testing

<http://itu.int/go/reference-table>

Reference Table is a list of ITU-T Recs and applicable test suites (ITU/other SDOs) which indicate relevant parameters to be tested for conformity/interoperability

The key outputs of JCA-CIT meeting

on 25 April 2013



JCA-CIT decided to extend the list of conformity assessment approaches to:

- **Conformity assessment of ICT's equipment (signalling protocols, interfaces, codecs, etc.) against International standards**
Benefit: the possibility to reduce the repetition of testing (tested once - accepted everywhere)
- **Conformity assessment of Telecommunication Services against International standards**
Benefit: increasing type of interconnection among operator's networks (interconnection on the service level), to facilitate the distribution of nomadic services provided on the fixed and mobile networks
- **Conformity assessment of system/network/equipment performance based on International standards (benchmarking)**
Benefit: to reduce the operator's risk of the purchasing equipment with unexpected performance
- **Conformity assessment of QoS/QoE/NP against requirements of International standards**
Benefit: to increase the level of customer loyalty for services provided by operators

[Report of JCA-CIT \(25 April 2013\)](#)

New ITU-T activities on QoS/QoE assessment and benchmarking

ITU-T SG11

- [Q.3930](#) – Performance testing of distributed systems – Concepts and Terminology (in force)
- [Q.3931.x series](#) – Performance benchmark for the PSTN/ISDN emulation subsystem of an IP multimedia system (in force)
- [Q.3932.x series](#) – IMS/NGN performance benchmark (under study)
- [Q.NP-req](#) - Requirements to network probes for network performance and Quality of service testing (under study)
- [Q.Int speed test](#) - Unified methodology of Internet speed quality measurement usable by end-users on the fixed and mobile networks (under study)

ITU-T SG12

- [G.VoLTE](#) - End-to-end performance for managed voice over LTE networks (under study)

Pillar 2



Interoperability Events



ITU Interop events

- **cross-connect various manufacturers**
- **evaluate of interoperability of all participants on a peer basis**
- **check end to end performance at common “interfaces”**
- **to validate different implementations of standard, and feedback to standard-making**



- ✓ IPTV Interop and showcasing events on ITU-T H.760
- ✓ NGN Interop and showcasing events
- ✓ Continua Health Alliance Interoperability event on e-health (Geneva, Oct. 13)
- ✓ Performance assessment of mobile phones in conjunction with HFT in a car against Recs. ITU-T P.1100/P.1110 (May. 14)
- ✓ Interoperability of IMS-NNI, IoT (Bangkok, Aug. 14)

Future events planned:

- ✓ Continua Health Alliance Interoperability event on e-health (Geneva, 1st Quarter 2015)



Pillar 3

Capacity Building

Workshops and Training Courses



- Provide the necessary tools for participants to replicate knowledge in their country, taking into consideration national specificities
- Promote experience-sharing on testing, certification and accreditation among participants from different countries
- Present a practical learning on standards, regulations, real Lab experience and accreditation procedures
- Contribute to increased awareness and improved knowledge

2014 events

- Training workshop and courses
 - ARB region: Tunis, 17-21 March 2014
 - AMS region (Spanish): Campinas, 5-9 May 2014
 - AFR region: Tunis, July 2014
 - AMS region (English): Campinas, August 2014
 - CIS region (Russian): Moscow, November 2014
- ITU Regional Offices to play an active role to identify regional partners and to support organization



Pillar 4

Establishment of test centres in developing countries



Partnership and Collaboration

The ITU Secretariat signed MoUs with:

- CERT (Research and Studies Telecommunication Center, Tunisia)
- CPqD (Brazil)
- Sintesio (Slovenia)
- Tilab (Telecom Italia)
- ZNIIS (Russia)
- International Accreditation Forum (IAF)
- International Laboratory Accreditation Cooperation (ILAC)
- International Standardization Organization (ISO)
- UNIDO



C&I Guidelines

- **Guidelines for developing countries on Establishing Conformity assessment Test Labs in Different Regions (2012)**
- **Guidelines for the development, implementation and management of MRAs on conformity assessment of Telecom Equipment (2013)**
- **Feasibility Study for a Conformance Testing Centre (2013)**
- **Guidelines for Establishing Conformance & Interoperability Regimes for Developing Countries (2014)**

Assessment Studies

ITU is carrying out activities (e.g. for SADC) to:

- **assess C&I infrastructure in regions/sub-regions/countries**
- **conduct analysis of the status in the regions**
- **promote regional agreements about possible locations for testing capabilities**
- **collaborate with regional experts in capacity building for accreditation and type approval testing**
- **move forward to establishing regional test centres**



Who is invited to join the ITU C&I Programme (1/2)

- ITU-T SG11 invites TLs/SDOs/Consortia to launch the pilot projects on the conformity testing against ITU-T Recs. TSB can help to conduct these events
- TSB invites ICT Companies (e.g. vendors, operators, etc.) to launch the interoperability events based on the ITU-T Recs.
- ITU-T SG11 invites companies to develop Test specifications against ITU-T Recs. Other contributions and proposals which are relevant to C&I issues are highly appreciated

Who is invited to join the ITU C&I Programme (2/2)

- ITU-T SG11 invites TLs and all interested parties to participate in SG11 (Q11/11) for discussing the ITU TL's recognition procedure
- TSB invites Vendors and TL to populate the ITU Product Conformity Database

Conclusions

ITU committed to:

- **Develop interoperable international telecommunication/ICT standards**
- **Promote conformity to telecommunication/ICT standards**
- **Improve international interconnection and interoperability**
- **Reduce global trade barrier, promote market transparency and competition**
- **Facilitate capacity building in developing countries covering most of the key technologies**



**International
Telecommunication
Union**



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Interoperability: interop@itu.int

JCA-CIT: tsbjcacit@itu.int



Background slides

ITU web sources related to C&I Programme

ITU C&I resources

C&I Portal - <http://www.itu.int/en/ITU-T/C-I/Pages/default.aspx>

JCA-CIT - <http://www.itu.int/en/ITU-T/jca/cit/Pages/default.aspx>

SG11 (lead group on testing) - <http://www.itu.int/en/ITU-T/studygroups/2013-2016/11/Pages/default.aspx>



<http://itu.int/go/key-technologies>

The living list of Recommendations and related specifications within key technologies suitable for C&I testing

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ITU-T SGs outputs:

Living List of key technologies to be tested on C&I (SG11 output, 25 February - 1 March 2013)

JCA-CIT updates (25 April 2013)

#	Title	Focal Point	Other SDOs	ITU-T SGs	References to SDOs docs	References to ITU-T Recs.
1	Network and equipment performance (Benchmarking)	Martin Brand Vice-chairman of SG11 (Austria) martin.brand@A1telekom.at Michael Mild Rapporteur of Q10/11 (Sweden) michael.mild@softwell.se	ETSI (INT; STQ; MTS)	SG11	ETSI (Requirements) DTR/STQ-207 (draft) ETSI (Test suites) ETSI TR 101 577 TS 186 025-1 TS 186 025-2 TS 186 025-3 TS 186 025-4 TS 186 008-1 TS 186 008-2 TS 186 008-3 TS 186 008-4	ITU (Requirements) Draft Q.39zz-1 ITU (Test suites) Q.3930 Q.3931.1 Q.3931.2 Q.3931.3 (draft) Q.3931.4 (draft) Q.3932.1 (draft) Q.3932.2 (draft) Q.3932.3 (draft) Q.3932.4 (draft)
2	QoS/QoE and NP	Martin Brand Vice-chairman of SG11 (Austria) martin.brand@A1telekom.at Eva Ibarrola (Spain) eva.ibarrola@ehu.es Minrui Shi (China)	ETSI	SG12 SG11	ETSI (Requirements) - - - TR 102 775 TS 101 563 TS 102 928 (draft) - -	ITU (Requirements) Q.3925 Y.1542 Y.1543 Y.1541 Y.1541 - Q.MSPQuality Q.NP-req



<http://www.itu.int/go/pilot-projects>

List of Pilot projects for conformity assessment against ITU-T Recs

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#	Title	ITU-T Recs.	Focal Point	Interested Companies	Motivations	Short-term strategy
1	Conformance testing pilot project on "Network management interface related Recommendations (ITU-T M.3170 series)"	Recs. ITU-T M.3170 series (M.3170.0, M.3170.1, M.3170.2, M.3170.3)	WANG Zhili (WP2/2 chair)	<p>Network Operators</p> <ul style="list-style-type: none"> China Telecom Co., Ltd. China Southern Power Grid (China) <p>Vendors</p> <ul style="list-style-type: none"> FiberHome (China) ZTE (China) <p>Integrators</p> <ul style="list-style-type: none"> Beijing Metarnet Technologies Co., Ltd. (China) <p>Testing Labs</p> <ul style="list-style-type: none"> Beijing Infotel Network Testing Laboratory (China) China Telecommunication Technology Labs (CTTL) <p>University</p> <ul style="list-style-type: none"> Beijing University of Posts and Telecommunications (BUPT, China) 	<p>Taking into account of the wide adoption and influence in industrial of this series of Recommendations, this Conformance testing project will promote products which are compliant to this series of Recommendations, help operators, vendors, and integrators to implement this series of ITU-T Recommendations and better facilitate the interconnection between EMS, NMS, and OSS for the MTNM interface.</p>	<p>First — gather interested vendors, operators, integrators and others who implement Recs. ITU-T M.3170 series to identify and harmonize their testing requirements.</p> <p>Second — select appropriate testing organization(s) that are competent to perform the conformance testing for the Recs. ITU-T M.3170 series against these testing requirements using agreed test suites.</p> <p>Third — testing organization(s) to test the products which are based on the Recs. ITU-T M.3170 series by agreed test suites (see 1st above).</p> <p>Fourth — populate the ITU-T product conformance database with testing results generated by selected testing organizations which performed testing, and produced conformance testing report in agreed format.</p>



<http://itu.int/go/reference-table>

The reference table of standards are used for C&I assessment

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Resolution 76 of WTSA-12 resolves that "conformance and interoperability testing requirements shall provide for verification of the parameters defined in the current and future ITU-T Recommendations as determined by the Study Groups developing the Recommendations, and for interoperability testing to ensure interoperability taking into account user needs and in consideration of the market demand, as appropriate".

The C&I Action Plan agreed by Council-12 requests "ITU-T study groups to identify further technologies for which there is a market demand for a conformity assessment programme and to identify whether test specifications are available and if not, to explore the provision of test specifications. If test specifications are available, they may be turned into e.g. ITU-T Recommendations or supplements".

Following the WTSA-12 and Council-12 decisions, SG11 established the SG11 Action plan for implementation of C&I Programme which will help to achieve the goals of Resolution 76 (WTSA-12) and will assist ITU-T SGs in their work concerning the development of ITU C&I Programme within their responsibilities. The Action plan also is aimed at helping developing countries in the implementation of their C&I plans in the regions.

The one of the most important part of the SG11 Action plan is a Reference Table showing list of ITU-T Recs and relevant parameters to be tested for conformity/interoperability and references to the applicable test suites (ITU/other SDOs). These information will be used for filling out the ITU conformity Database by results of conformity assessment against ITU Recs.

The Reference Table is maintained by TSB in accordance with information provided by all ITU-T SGs and JCA-CIT on the SG11 requests with the template is provided in Annex B of SG11 Action plan.

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