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Interoperability issues. Global approach of NGN testing

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Reasons of necessity of NGN testing

- **Growth of the manufactured equipment nomenclature and software** which realizes NGN functionality and appear a lot of unify equipment (router with gateway functionality and etc.)
- **Appear of new set of services** which is realized without changes of network and independent of technologies
- **Absence of guarantee quality** of network performance in comparison with existent TDM networks

Purpose of NGN testing

NGN technologies harmonization **is the global principle on implementation and operation of NGN networks development and usages**

Current situation in testing standardization area in ITU-T

- **Present time**

Conformance testing which includes protocols and interfaces testing ***(TTCN 1 (X.292-1995), TTCN 2 (X.292-1998), TTCN 3 (Z.140-2003)***

TSS&TP, PICS/PIXIT proformas for different protocols testing)

- **Future**

NGN based on the functional entity which interworks using some protocols

Interoperability testing

(Q.3901 for NGN, Draft Q.3904 for IMS)

ITU-T purposes in testing standardization area

WTSA-08 Resolution 76
Global Interoperability

- Interoperability of technical means (TM) which realize the basic NGN functionality (Y.2012, Y.2010)
- NGN Services Interoperability
- QoS Interoperability

The approach of NGN testing

- **Functional Interop. testing** – verification the functionality on TM (EUT) and system-network solutions (NUT) different vendors for compatibility in accordance with basic ITU-T Recs.
- **Service testing** – testing the services on "end-to-end" scenarios including call flow testing and testing with existent provider's operation systems (Billing, OSS/BSS and etc.)
- **QoS testing** – testing the QoS parameters and RACF functionality

History of testing research area in ITU-T

- **WTSA-04 (Brasilia, Oct. 2004)**

Creation of Q.8/11 "NGN test specification"

- **WTSA-08 (RSA, Dec.08)**

Creation **WP4/11** "Test specifications"

Continuation of **Q.8/11** "Protocol Test Specifications for NGN"

Creation of new questions

Q.9/11 "Monitoring parameters for NGN protocols"

Q.10/11 "Service test specification for NGN"

Q.11/11 "QoS tests specification for NGN"

Q.12/11 "NID and USN test specification"

The SG11 achievements under responsibility of testing

- ✓ Q.3900 Methods of testing and model network architecture for NGN technical means testing as applied to public telecommunication networks (approved 09/06)
- ✓ Q.3901 Integral testing. Tests and services' distribution for NGN technical means testing in the model and operator networks (approved 01/08)
- ✓ Q.3902 Parameters to be monitored in the process of operation when introducing NGN in PSTN (approved 01/08)
- ✓ Q.3903 Formalized presentation of testing results (approved 09/08)
- ✓ Q.3904 The scenarios, list and types of tests for TM local and NUT testing for IMS on the Model networks (on development)

Plans of WP4/11 ITU-T

- ✓ **IMS TM and NUT testing**
- ✓ **IMS/PES benchmarking**
- ✓ **NIT between NGN and TDM protocols**
- ✓ **NGN services testing (TIP/TIR, OIP/OIR, HOLD etc)**
- ✓ **IPTV testing**
- ✓ **NACF and RACF testing**
- ✓ **Broadband Access testing (fixed and wireless)**
- ✓ **"end-to-end" NGN testing (TS1, TS2)**
- ✓ **QoS testing**

ITU-T Rec. Q.3900 as a global approach of testing

Purpose – determination of the Model network as a basic solution for NGN testing

Model network – a network which simulates the capabilities similar to those available in present telecommunication networks, has a similar architecture and functionality and uses the same telecommunication equipment

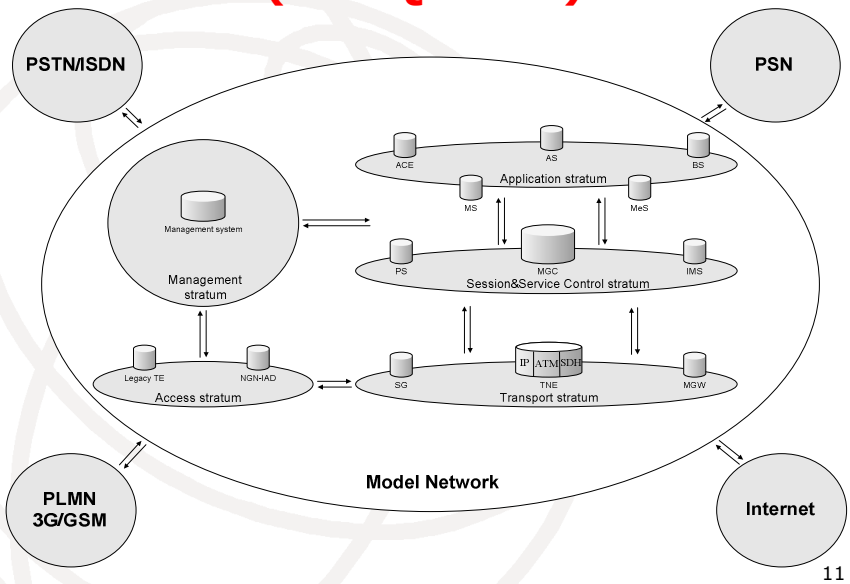
Contents of Q.3900

✓Classification of NGN TM regarding the NGN functionality (Y.2012)

✓Determination of testing procedures

✓Requirements to the Model network

Architecture of Model Network (Rec.Q.3900)



Classification of NGN TM (Rec. Q.3900)

Call Session Control System	
Media Gateway Controller (MGC)	S3, S7, S9, S10, S12 T10, T11, T12, T13
Proxy Server SIP (PS)	S2, S3, S7, S11, S12 T10, T11, T12, T13
IP Multimedia Subsystem (IMS)	S1, S3, S6, S7, S8, S10, S12, S13 T10, T11, T12, T13, T14, T15, T16, T17
Voice and signaling transmit system	
Media Gateway (GW)	T7, T8
Signaling Gateway (SG)	T8, T9
Transport Network Environment (TNE)	T5, T6, T8
Application servers	
Application Server (AS)	S4, S5, S6, S14, S15
Media server (MS)	S4, S5, S6, S14, S15
Messaging Server (MeS)	S4, S5, S6, S14, S15

Joint ITU-D-ZNIIS Project (ITTC)

Purpose – to create an International Telecommunication Testing Centre (ITTC) for testing of new technologies, including NGN and to train telecom specialists from developing countries

First results

1. Training on system and network solutions testing was carried out for telecom specialists from 10 countries

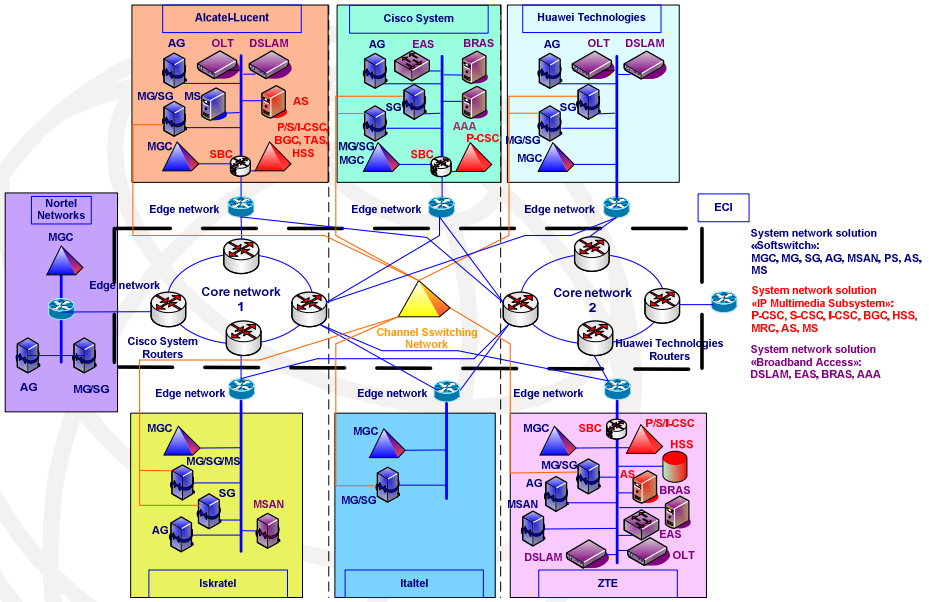
2. Testing the NGN system and network solutions on interoperability in accordance with ITU-T Rec. Q.3901:

- ✓**IMS and Softswitch**
- ✓**Broadband Access**

ITTC tasks

- ✓**To find and remove problems and difficulties in TM before implementing it on the "live" network**
- ✓**To solve the interoperability TM different vendors**
- ✓**To accumulate and save experience for it implementation on the activity of different telecom players**
- ✓**To verify NGN services and prepare the recommendations for implementing it on the existent networks**

ITTC practical Model network



Global problems on Interoperability which were determined (ITTC)

- ✓ Tariffication data lost in emergency situation in case of geographic redundancy
- ✓ Absence of statistical data about IP characteristics sessions in detailed records
- ✓ Absence the QoS parameters and total layer for session and subscriber in tariffication data
- ✓ Absence of "Ring-back tone"
- ✓ Absence the possibility of T.38 FAX realization
- ✓ Problems with modem connection
- ✓ Different header fields in SIP for IMS solutions
- ✓ Different syntax of parameters which are used in SIP IMS messages, etc.

Knowledge Database as a global instrument for experience exchange (ITTC)

- **Virtual methodic constructor**
- **Virtual labs**
- **Part of science research networks**
- **Accumulate and share testing results world wide**
- **Virtual studying on implementation, testing and operation of NGN**

Consequence of Global interoperability

- **Global approach of fixed network** operators **interworking**
- Appear transparent mechanisms for **roaming and nomadism** in the fixed networks
- **Absence the association** of services **with physical network** infrastructure
- **Subscriber freedom** and possibility to satisfy a lot of information dreams

Thank you for attention

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