ITU Forum on Conformance and Interoperability
for the Arab and African regions
Tunis, Tunisia, 5-7 November 2012

Organization and Activities of a Test lab

Denis Andreev
Programme coordinator of TSB

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1. The International experience of Test Lab

The purpose of existing international testing centers

- **Verification equipment and services on conformity against internal requirements by operator or ISP (enterprise standards)**
- **Interoperability testing for understanding compatibility equipment that will be installed to ISPs existing network**
- **Preliminarily testing of new technologies and services (try-and-buy). Determination the effective business's and operation's strategy of ISP**

1. The International experience of Test Lab

The type of testing centers and their tasks

- **ISP and vendor private labs** (DT – Systemqualifizierung; BT – 21CN "ON THE NIGHT") (own – operator or vendor)

Purposes: testing on conformity to operator's/vendor's requirements (services, equipment performance, interoperability features)

- **Testing against requirements of the network operator community** (Technische und betriebliche Fragen der Nummerierung und Netzzusammenschaltung) (3-rd party)

Purposes: testing on conformity to requirements of community, interoperability testing

- **Testing against SDOs requirements** (ETSI PLUGTESTS, ITTC end etc.) (3-rd party testing)

Purposes: testing on conformity against international standards and recommendations

1. The International experience of Test Lab

The typical approaches of equipment choice

- **Building the MODEL NETWORK** (architecture, set of services similar to the existing network – but with low performance) **where applicable different opportunity for preparation local standards and testing from conformity/interoperability till testing of new technologies upcoming to the network**
- **Developing Request for Proposal (RFP), which include all requirements: network architecture, equipment functionality, protocol realization including call flow** (the average RFP 300-400 pages)
- **Initiating regulation process like EU via Directive of EC** (in case if a new services are appear which are not standardized by ETSI a ISPs launch the process for standardization thought ETSI the interfaces and services with purpose to reduce costs of equipment for European network operators)
- **Development enterprise's program and test specifications**

1. The International experience of Test Lab

ISP's stages of equipment choice

Stage 1 - Preliminarily selection of equipment on global criteria (type of equipment, performance, scalability, state of distribution, reservation, stability and etc.) and their possible realization on the ISP network

Stage 2 - Preparation of winner's MODEL NETWORK in accordance with requirements of developed RFP (equipment conformity against operator's requirements and compatibility of equipment with the existing operator equipment (Software/Patches)

Stage 3 – Updating the equipment and final testing on ISP's services conformity (service as a product for the customer)

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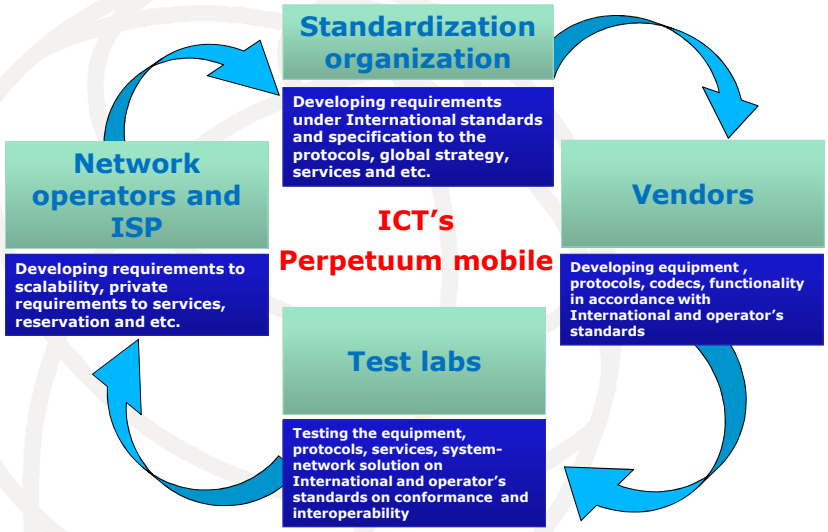
1. The International experience of Test Lab

The common lack of existing conformity assessment methods

- **Costly process and capital investments could not be refunded fully**
- **The unified approach of conformity assessment of network facilities/features is absent (often uses private strategy and private network solutions)**
- **The private conformity assessment procedure could not be distributed for other players and in general it covers just only narrow tasks of present ISP**

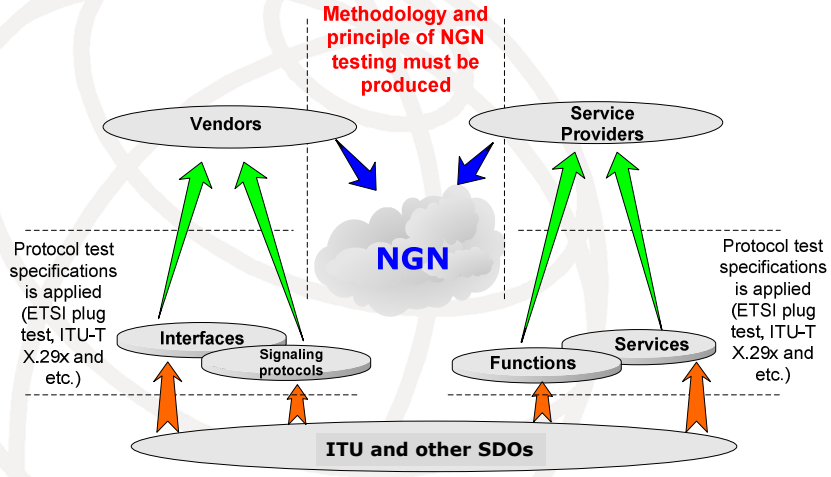
2. The effective strategy of standardization and verification (testing)

The list and tasks of key players of process



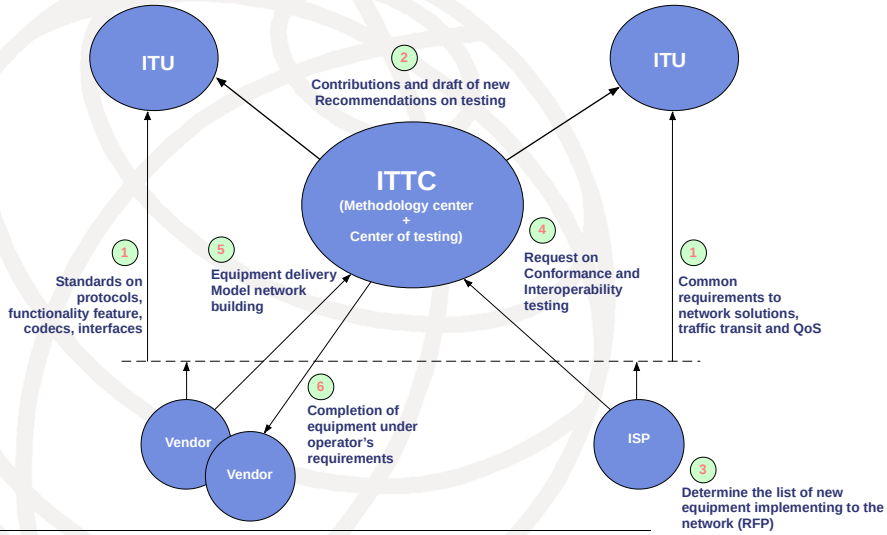
2. The effective strategy of standardization and verification (testing)

The scheme of ICT players interaction



2. The effective strategy of standardization and verification (testing)

The typical process of interaction



3. The role of International telecommunication testing center (ITTC) – Test Lab

The actuality

- **Unified and test network solutions for Region** (equipment requirements, special requirements to services and QoS)
- **Reducing the cost of testing** (sharing the testing fees among Region's ISP)
- **Assessment of equipment's high performance conditions** (benchmarking)

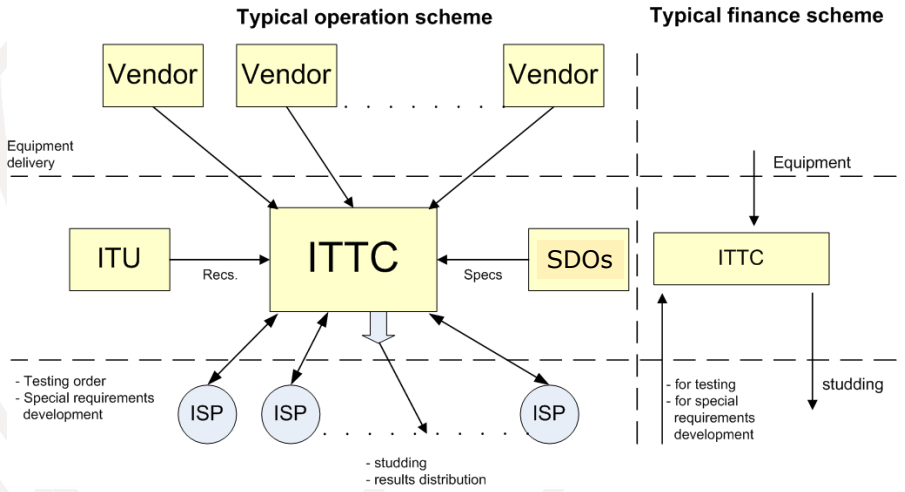
3. The role of International telecommunication testing center (ITTC) – Test Lab

The major tasks of Regional Test Lab

- ✓ **Conformance and Interoperability testing against International standards and Region's requirements**
- ✓ **Testing on: functionality, special Region's requirements and high performance**
- ✓ **Studding of testing and new technologies implementation**

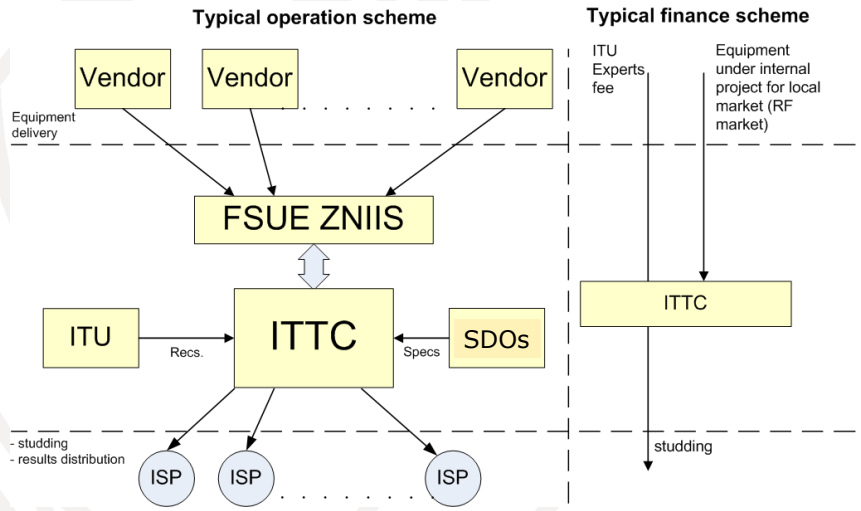
3. The role of International telecommunication testing center (ITTC) – Test Lab

Operation and business model of Regional Test Lab (3-rd party Testing center)



3. The role of International telecommunication testing center (ITTC) – Test Lab

Operation and business model of ITTC Regional center in Moscow



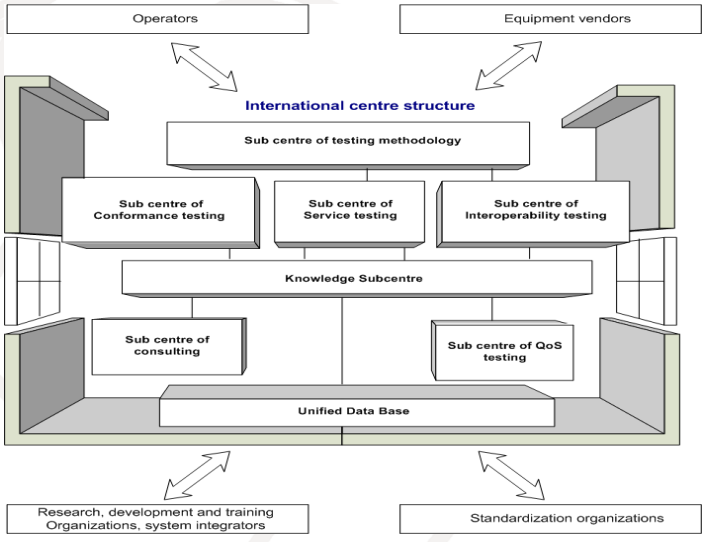
3. The role of International telecommunication testing centers (ITTC) – Test Lab

The common role of center results for Region as a whole

- ✓ **ITTC is used by parties before implementing technologies/equipment on the existing ISPs network (mandatory condition for all ISPs of Region)**
- ✓ **The significance of ITTC requirements/results to the Region ICT community on implementation equipment, network solutions and services on the existing ISP networks of Region**
- ✓ **Establishing and developing different possibility of training including virtual technologies (virtual lab)**

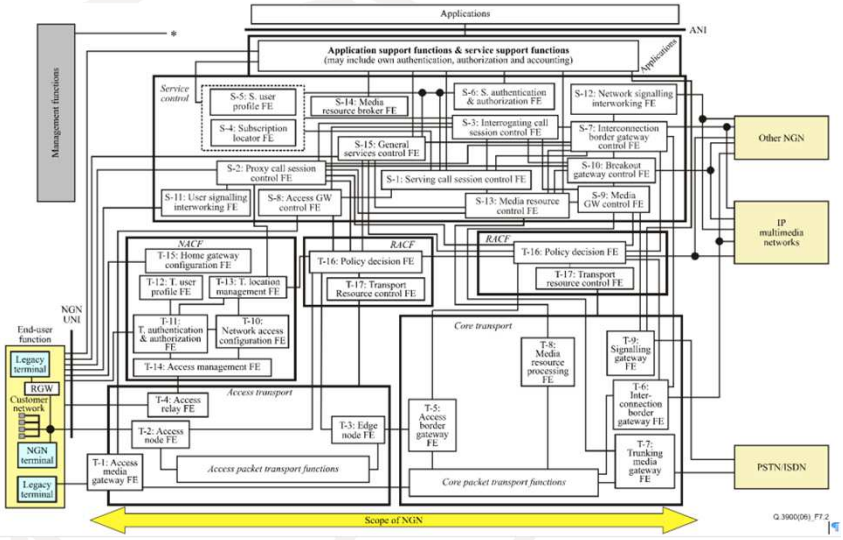
4. ITTC tasks

The structure of ITTC (based on ZNIIS experience)



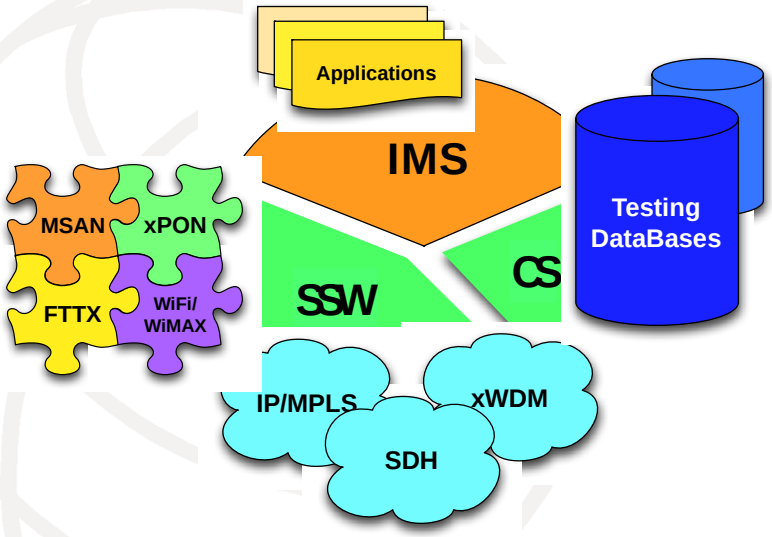
4. ITTC tasks

The basic structure of Model network (Y.2012/Q.3900)



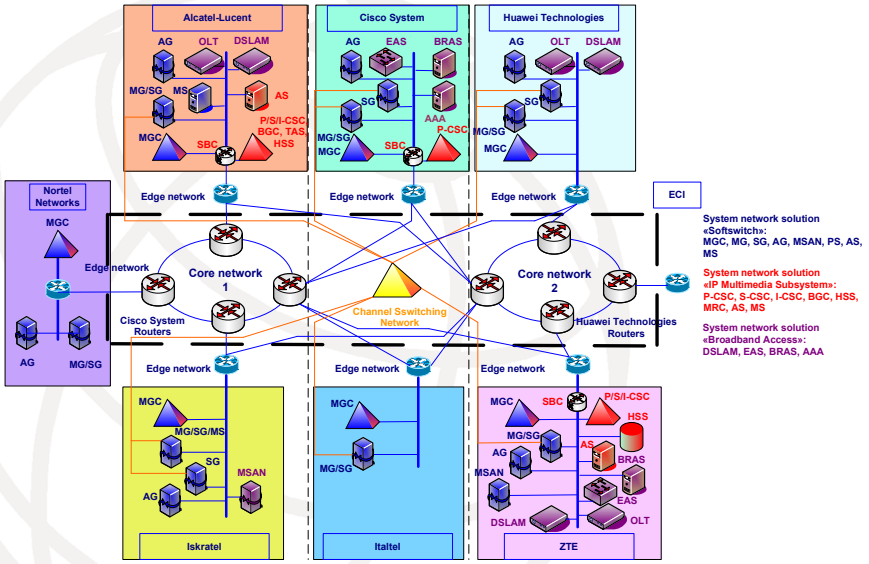
4. ITTC tasks

Market driven architecture of Model network (ZNIIS experience)



4. ITTC tasks

The instance of technical infrastructure of ITTC (ITTC of Moscow)



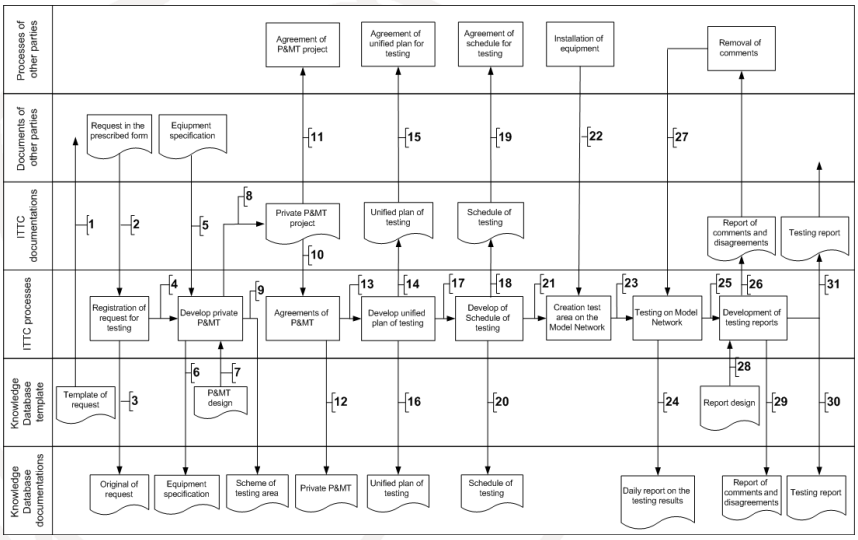
4. ITTC tasks

The common set of tests conducting on the Model networks

- ✓ **Testing on conformance and interoperability against international specification (ITU and other SDOs)**
- ✓ **Testing against ISP requirements (safety, services, security and etc.)**
- ✓ **Testing of performance equipment and network solutions (benchmarking)**
- ✓ **Testing of market driven services (services observation)**
- ✓ **Testing abnormal behavior of equipment&network solutions (under pick load)**
- ✓ **Testing of protocols and interfaces**
- ✓ **Testing management systems and OSS/BSS process**
- ✓ **QoS/QoE assessment and NP testing**
- ✓ **Metrology**

4. ITTC tasks

The typical operation scheme of testing procedure in ITTC



4. ITTC tasks

The unified testing DataBase of ITTC

- **Support of all documents on equipment and software which is testing on the Model network include storage of etalon software**
- **Registration results of testing and all additional documents (daily reports, history of detected errors correction and etc.)**
- **Support of equipment, services and technology testing Regestry**
- **Storage and analyze results of testing (filter, content searcher and etc.)**
- **Electronic portal for preview testing procedure**
- **Remote access to the DataBase**

4. ITTC tasks

The ITTC's set of measurement equipment

- **The automatic test system based on TTCN-3 scripts and realized test specifications (ATS) for conformance testing**
- **The generator of invariant payload (public telephone network, public packet network and services)**
- **The network architecture emulation system (virtual equipment) for emulation packet switching traffic transit**
- **The QoS and monitoring/control test system include possibility different class of traffic generation**
- **The system of transfer incorrect messages and parameters**

4. ITTC tasks

ITTC training tasks

- **Confront training** (testing approaches, implementation of NGN equipment, principle of compare equipment, implementation QoS parameters on the network and etc.)
- **Virtual training**

4. ITTC tasks

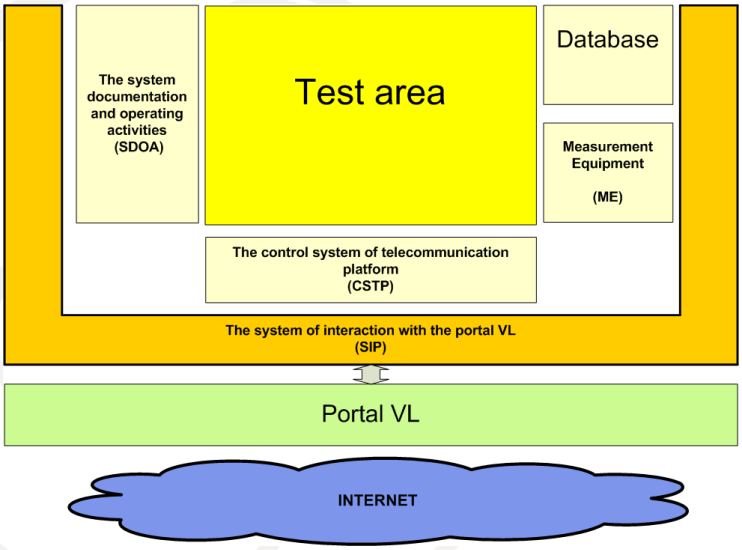
The virtual training

WTDC-10
RCC initiative was supported.

"Creation virtual laboratories for remote equipment, technologies and services testing under Resolution 76 WTDC-08, ITU database filling and providing remote experts of development countries training"

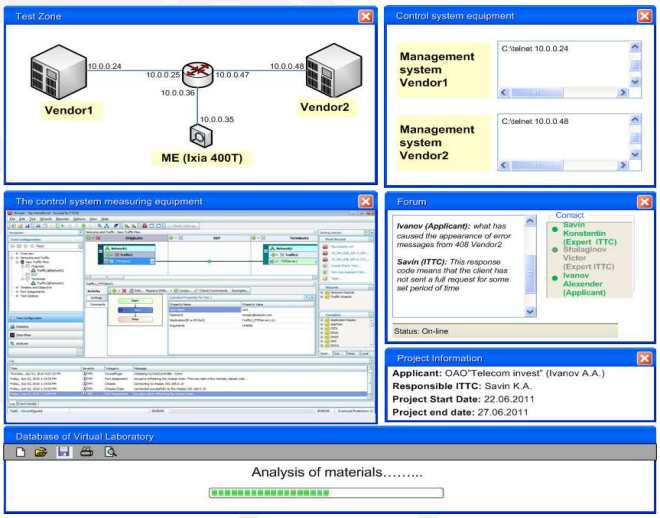
4. ITTC tasks

The organization scheme of Virtual lab



4. ITTC tasks

The instance of Virtual Lab Portal



5. The typical work plan for building ITTC

- **Conception of creating ITTC taking into account Region specific development (tasks, requirements for test zone, "live" functionality procedure and etc.)**
- **Work project of ITTC building development (testing scheme, set of telecom equipment, set of measurement equipment, requirements to the premises)**
- **Normative-technical documentation development (testing procedure, training procedure and etc.)**
- **Testing scheme creation (delivery telecom and measurement equipment, preparation cable infrastructure and etc.)**
- **Testing program creation for Region (specific test specification for Region's ISP)**
- **Data base and unified Internet portal development**
- **Training courses development and providing training event**

6. The ZNIIS experience in ITTC activities

- The Model network is developed (Rec. ITU-T Q.3900). Testing Database was developed (Rec. ITU-T Q.3903)
- More than 100 vendors/network solutions were tested for request of national ISP
- More than 50 test specification for NGN and traditional networks (TDM) were developed
- The ITTC under joint project ITU-ZNIIS was built (5 training event were provided, 3 test events were done)
- The automatic scripts (ATS) for testing based on TTCN-3 is under construction
- The Virtual lab is a new project ITU-ZNIIS for development for next 4 years

Conclusion

- ITTC could be used as a major part of developing strategy of a Region and as a part of ITU C&I Programme which will help to world ICT community resolving the C&I issues
- WTO members have the opportunity to make the local regulations (in accordance with TBT agreement) based on ITU Recommendations that will be used for C&I testing under ITTC activities
- Test Lab like ITTC will raise quality and speed of implementation equipment and services on the Region's ISP networks
- ITTC could become the unique center for a Region within the framework testing and training
- ITTC can help in reducing of digital gap in developing countries

International Telecommunication Union

Thank you for your attention !!!

Denis Andreev
Programme coordinator of TSB

Ph: +41-22-730-5780
E-mail: denis.andreev@itu.int