ITU Initiatives on NGN

ITU/MIC Training on Bridging the Standardization Gap
Tokyo, Japan
November 2008

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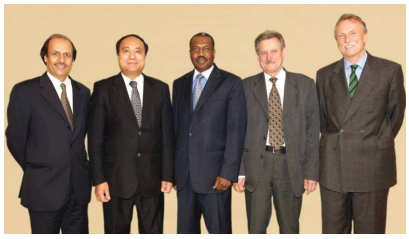
Agenda

- ITU Vision and Strategy and Programs
- ITU Initiatives on NGN
- NGN Applications
- Migration Strategies to NGN
- ITU Initiatives on Bridging the Standardization Gap
- Conclusions

ITU in Brief

- Leading United Nations Agency for ICTs
- 191 Member States, 700 Sector Members
- Three sectors:
  - **Radiocommunication**
  - **Standardization**
  - **Development**
- ITU TELECOM Events



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ITU's Global Presence

5 Regional Offices, 8 Area Offices
HQ in Geneva, Switzerland

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ITU Vision & Strategic Plan 2008 -2011

Vision: By connecting the world and fulfilling everyone's fundamental right to communicate, we strive to make the world a better and safer place.

- Maintain and extend **international, regional, sub-regional cooperation**
- Assist in **bridging the digital divide** and promote global connectivity through implementation of WSIS goals and objectives
- Widen the Union's **membership - especially from the industry**
- Develop tools to **safeguard networks**
- Continue to improve **efficiency and effectiveness**
- Disseminate **information and know-how of ICT**
- Promote the development of an **enabling environment**

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ITU: Development Programs

Six Major Development Programs

Program 1: Regulatory reform

Program 2:Technologies and telecom/ICT network development - Infrastructure

Program 3: E-strategies and ICT applications

Program 4: Economics & finance

Program 5: Human Resource Development

Program 6: Special program for least developed countries (LDC) + SIDCs

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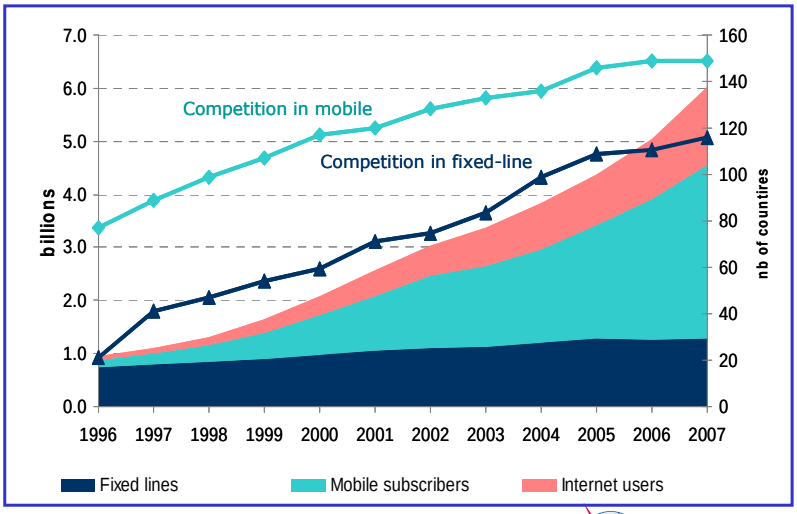
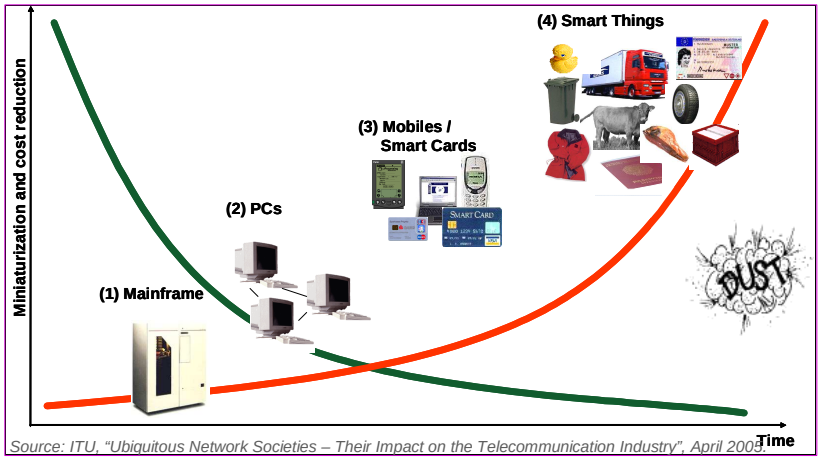
ITU Initiatives on NGN

Telecom Market on the Move



Source: ITU World Telecommunication/ICT Indicators Database and ITU World Telecommunication Regulatory Database

What's Driving the Market?



Source: ITU, "Ubiquitous Network Societies – Their Impact on the Telecommunication Industry", April 2005

"Miniaturization" of Devices and Prices

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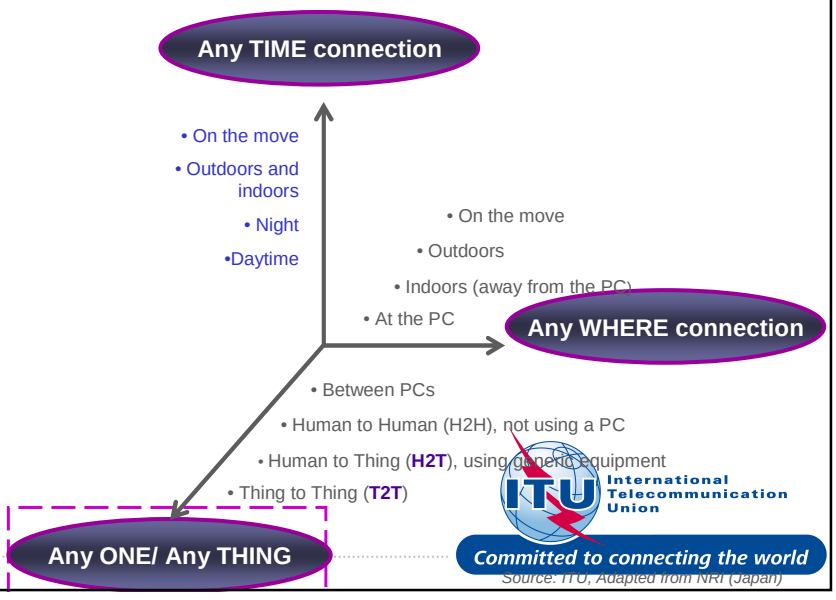
Enabling A New Dimension



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Source: ITU, Adapted from NRI (Japan)

Why NGN?

- The NGN concept takes into consideration new realities in the telecommunication industry characterized by factors such as the need to converge and optimize the operating networks and the extraordinary expansion of digital traffic (i.e. increasing demand for new multimedia services, increasing demand for mobility, etc.)
- NGN also aims to tackle important concerns raised from the use of current IP-based services: (i.e. QoS and Security)
- NGNs are an all-IP environment and can deliver both voice and data to any kind of device

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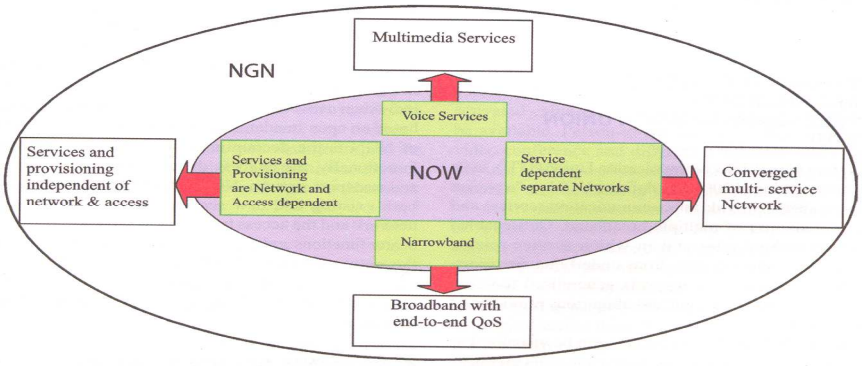
Paradigm Shift!



Changing Telecom Scenario

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Objectives of NGN

- Promote fair competition and encourage private investment
- Reduces cost of infrastructure deployment
- Provide open access to networks
- Single billing contact with the consumer Define a framework for architecture and capabilities to be able to meet various regulatory requirements
- Faster roll-out for new services
- Can enable developing countries to leapfrog and extend broadband connectivity

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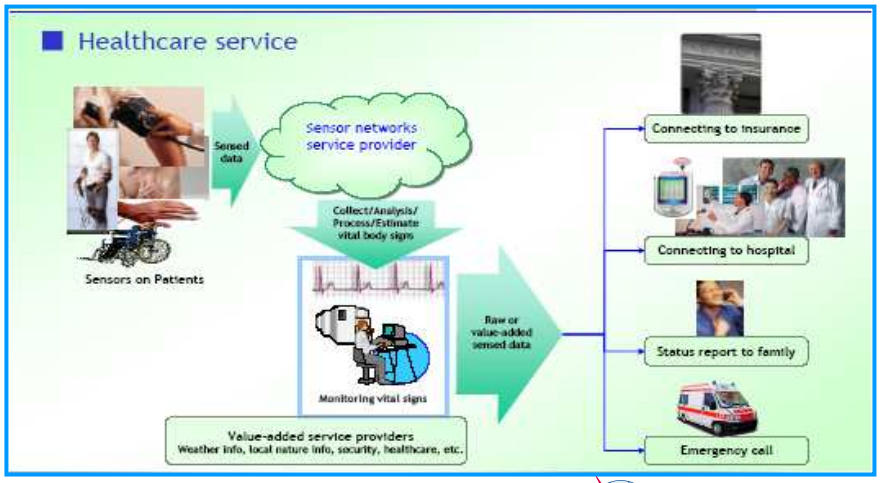
Applications of NGN :Healthcare



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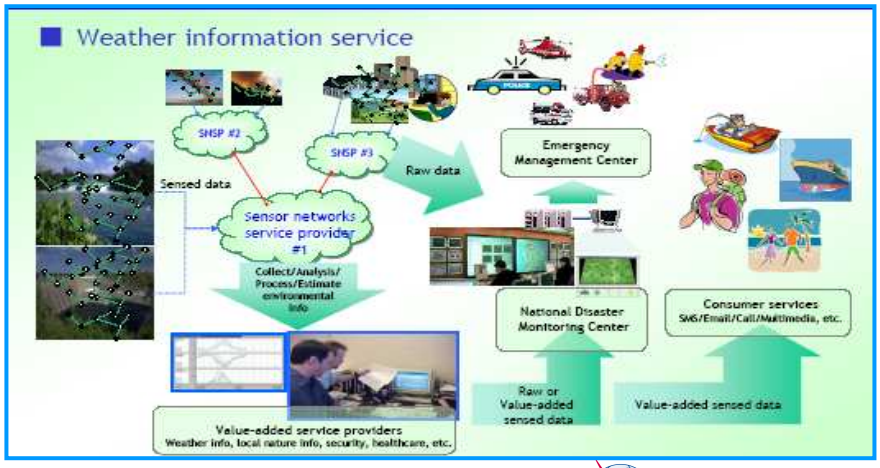
Applications of NGN: Weather Information



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Solution Against Climate Change

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ITU Definition of NGN

- A packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies
- Enables unfettered access for users to networks and to competing service providers and/or services of their choice
- Supports generalized mobility which will allow consistent and ubiquitous provision of services to users

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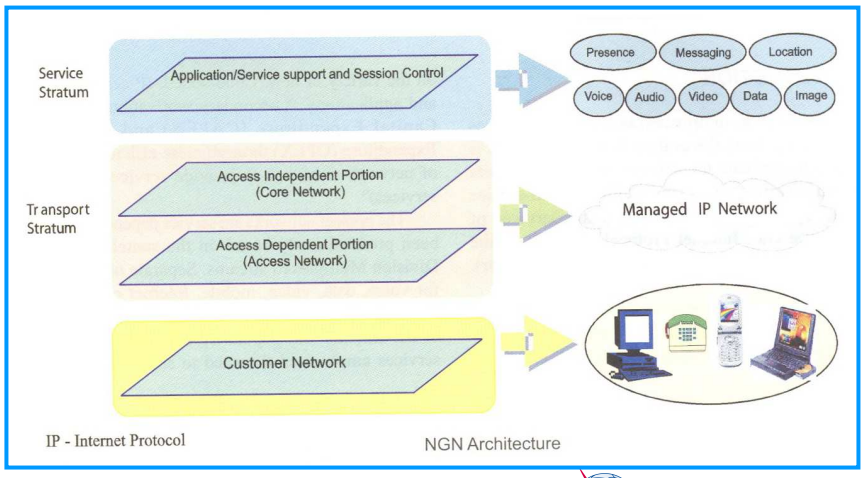
NGN Architecture



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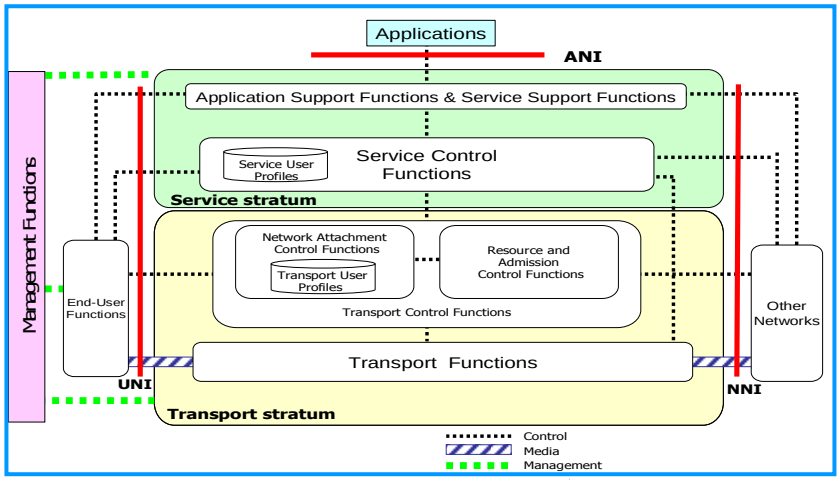
ITU NGN Architecture



NGN Core and Access

- The Next Generation Core
  - The next generation core network is a single converged network, which can carry voice and data
  - The network technology of choice will be IP/MPLS and all traffic is transported as IP
  - This core networks evolves from a complex environment of different boxes in today's core networks to single streamlined delivery network
  - The evolution to a next generation core network promises significant savings in the long run and a stable platform for converged services
- The Next Generation Access
  - This involves deployment of fiber into the local loop, either to the incumbent's street cabinet or to customer premises (FTTx)
  - The next generation access is a large digital bitpipe which is service independent and allows multiple play (TV broadcast, high speed internet access , telephony etc.)
  - There will not be a single platform to deliver next generation access. Platform competition is expected between copper lines, cable, fixed wireless networks as well as satellite and fibre access

NGN Service Control

- The Next Generation Service Control
  - Today's service control is service specific
  - In a next generation network rapid service development and delivery is paramount
  - The next generation service control will provide a toolbox for operators, where converged service can be brought to market flexibly and quickly
  - Certain challenges arise regarding interoperability of services and service components

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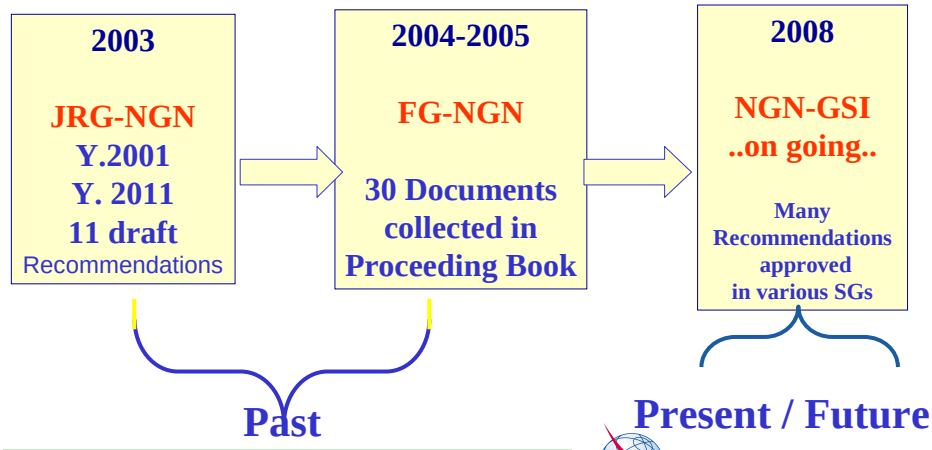
ITU-T NGN Milestones



JRG: Joint Rapporteur Group GSI: Global Standards Initiative
FG: Focus Group SG: Study Group

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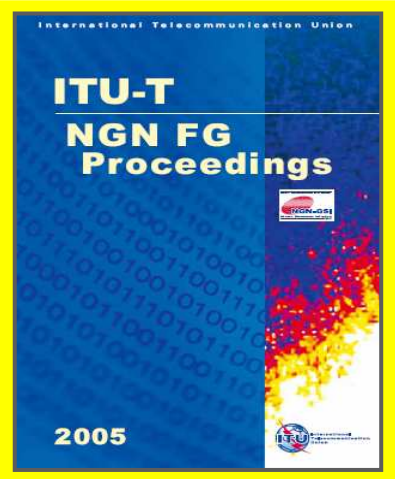
NGN-FG Deliverables

- NGN-FG final output was a total of **30 documents** collected in the **NGN FG Proceeding book**
- It is freely available at: www.itu.int/ITU-T/ngn/release1.html
- The deliverables cover the seven working areas previously described, and has been transferred to the relevant Study Groups for their further consideration.
- Deliverables are classified by **Release concept**



FG: Focus Group
GSI: Global Standards Initiative

ITU NGN GSI

- Results of FGNGN (Release 1) provided the building blocks on which the world's systems vendors and service providers can start to make the shift to NGN
- Since the creation of FGNGN there has been an intensive schedule of meetings, about every two months (www.itu.int/ITU-T/uni/kaleidoscope/index.html)
- There has been growing momentum in the work, and growth in participation and the number of contributions
- Now this work is carried forward by ITU-T's NGN-Global Standards Initiative (NGN-GSI), which encompasses all NGN work across ITU-T Study Groups
- Implemented by co-located meetings of concerned Study Groups and Rapporteur Groups from the various study groups to jointly progress the work under the auspices NGN-GSI

ITU NGN GSI (2)

- NGN-GSI Objectives and Goals:
  - To address the market needs for NGN standards
  - To produce global standards for NGN
  - To further strengthen the ITU-T's leading role amongst the groups in NGN standard work
  - To keep visibility of the work spread between different technical groups in ITU-T

Migration Strategies to NGN

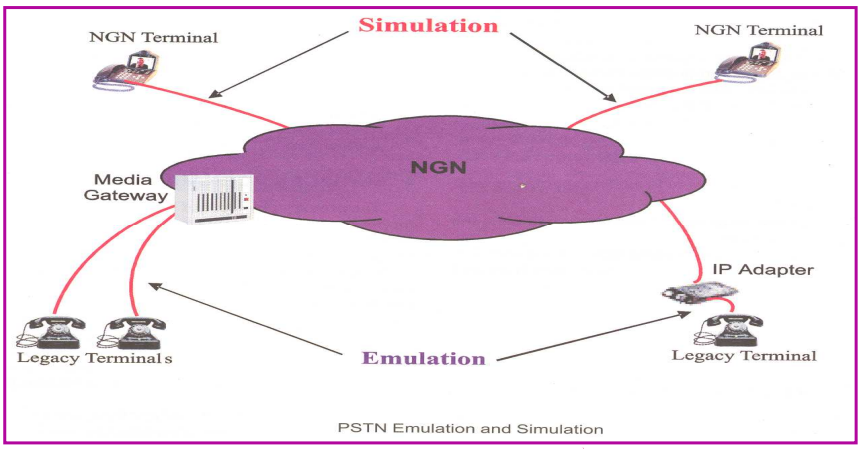
Evolution of PSTN/ISDN to NGN

- NGN is believed to provide new opportunities for and capabilities to the network and service providers. Considering that existing networks have different life span and vast amount of capital has been spent on them, complete replacement of their components is not considered to be either advisable or possible. So, a phased approach should be considered for evolution of existing networks to NGN
- PSTN/ISDN (Public Switched Telephone Network/Integrated Services Digital Network) being one of the first networks, is considered to be prime candidate for evolution. For PSTN/ISDN evolution to NGN a phased approach is considered
- Different evolutionary Scenarios with PSTN/ISDN emulation (adaptation to IP infrastructure) and with PSDN/ISDN simulation (session control over IP interfaces and infrastructure) are presently under consideration in ITU in order to provide reference for the evolution to NGN

PSTN/ISDN Emulation & Simulation

- It is expected that while evolving to NGN, all or most of the features of existing PSTN shall continue to be provided
- PSTN/ISDN emulation is used for PSTN replacement scenario for providing PSTN/ISDN services capabilities and interfaces to an IP infrastructure
- While using intelligent terminals, most of the PSTN/ISDN services are also expected to be provided besides new NG services. This is done through PSTN/ISDN simulation in NGN using PSTN simulation subsystem using session control over IP interfaces and infrastructure

PSTN/ISDN Emulation & Simulation (2)



PSTN Emulation and Simulation

General Framework for Migrating Telephony Networks Towards NGN

- In markets with a high growth in traditional voice services substantial extensions will be required to the existing telephony network to cover the huge need for new lines
- Established Service Providers will have to decide on how to extend their networks: using more traditional circuit-switched solutions or implementing a distributed network architecture, with a common, packet-based transport layer for voice and data
- NGN creating opportunities for delivering new (broadband) services in developing countries

ITU-T Recommendation Y.2261 PSTN/ISDN Evolution to NGN

- This draft describes possible ways of evolving PSTN/ISDN to NGN
- Both IP multi-media sub-system (IMS-based) and call server (CS-based) are described
- It describes aspects, which need to be considered including evolution of transport, management, signalling and control parts of PSTN/ISDN to NGN
- Evolution scenarios are also provided in this document

Core Network Evolution to NGN

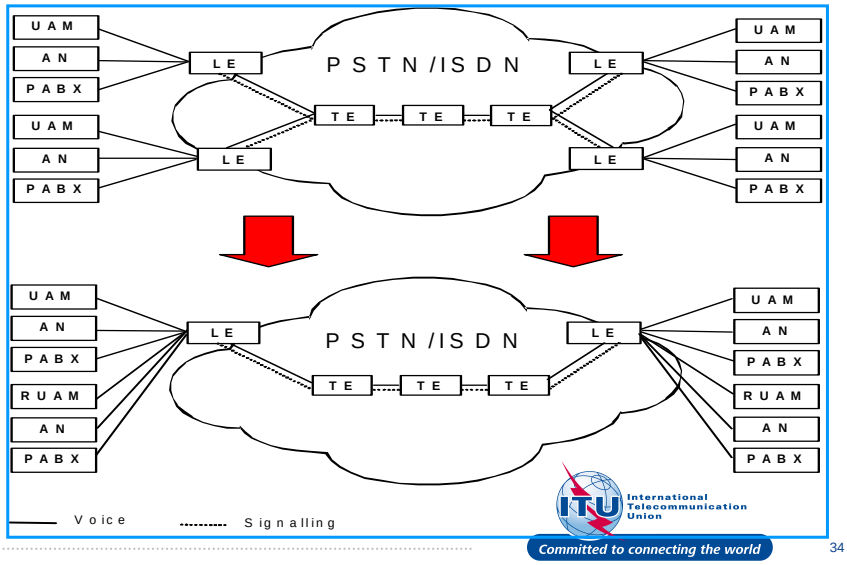
A) CS-based evolution to NGN

- Call server is the core element for PSTN/ISDN emulation
  - Responsible for call control, gateway control, media resource control, routing, user profile and subscriber authentication, authorization and accounting
- Call Server may provide PSTN/ISDN basic service and supplementary services, and may provide value added services through service interaction with an external service control point (SCP) and/or application server (AS) in the service/application layer
- A fully compliant Call Server implementation need only implement some of the components identified here, although it is possible to combine multiple functions in a single entity

Consolidation of Local Exchanges and Remotes for Evolution to NGN

- In order to prepare the circuit switched PSTN/ISDN for the evolution to a IP based Packet Switched Network and as an initial step some of the local exchanges are removed and all their functionalities such as control, accounting, etc. are transferred to those remaining LEs
- Affected User Access Module PABX, and Access Network are connected to the remaining LEs.
- Further consolidation occurs when User Access Modules become Remote User Access Modules which, are connected to the remaining LEs

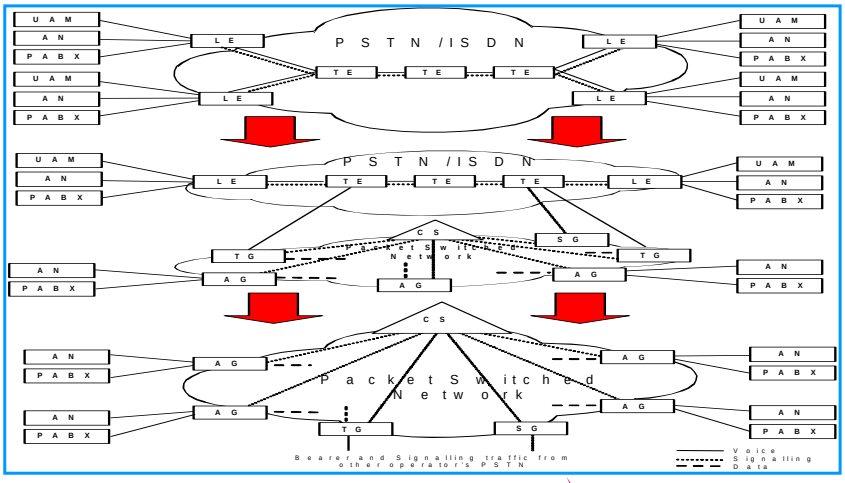
Preparation for Evolution to NGN



Scenario 1 – PSTN/ISDN and PSN Co-Exist Initially

- The most likely initial approach for evolution of PSTN/ISDN to PSN will involve a path that requires the PSTN/ISDN to co-exist with PSN during a transition period
- This scenario follows that approach
- There are two steps in this scenario as explained in next slide

Realisation of Scenario 1



Scenario 2 – Use of SGs and TGs as an Initial Approach

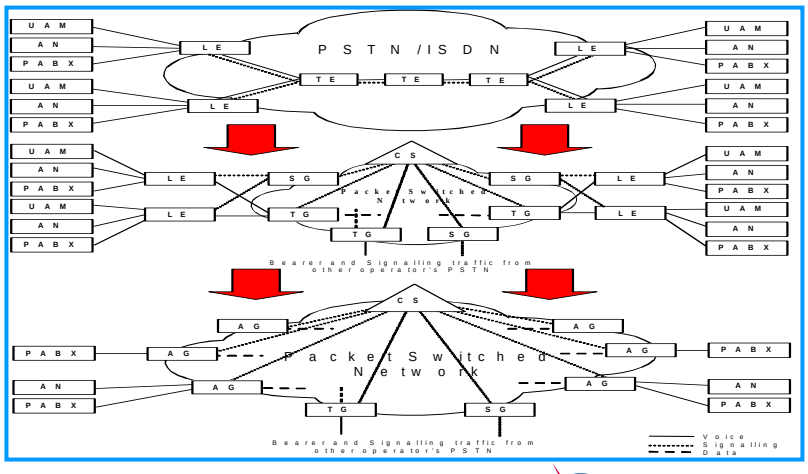
Step 1 :

- PSTN/ISDN is replaced by PSN and the TE functions are performed by the TGs and the SGs under the control of the call Server
- Local exchanges are connected to PSN via transit gateways and Signalling Gateways
- Transit and Signalling Gateways are also deployed for interconnection between PSN and other operators' PSTNs/ISDNs

Step 2

- Local exchanges and some of the access elements such as user access modules and remote user access modules are removed and their functions are provided by the access gateways and call server
- The private automatic branch exchanges are directly connected to access gateways
- Access Networks are either replaced by the Access Gateways or are connected to the Access Gateways
- Transit and Signalling Gateways are deployed for interconnection between PSN and other operators' PSTNs/ISDNs
- Access and the Transit are all controlled by call server

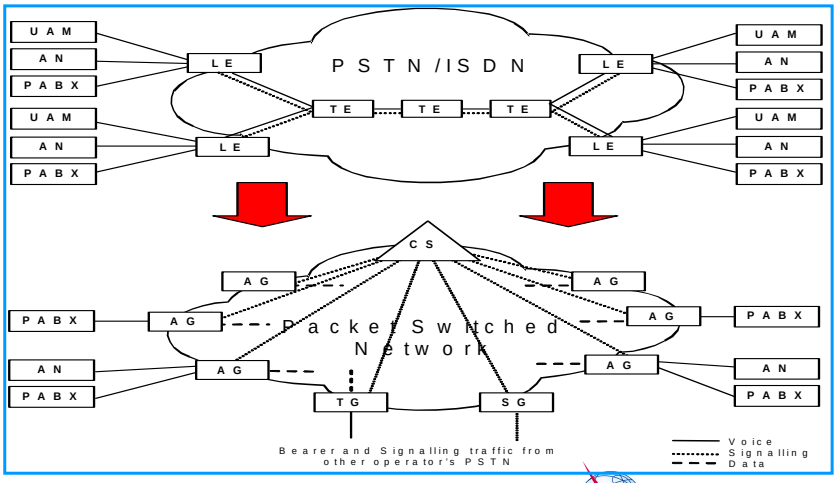
Realisation of Scenario 2



Scenario 3 – One-Step Approach

- In this scenario the PSTN/ISDN is replaced with packet switched network (PSN) in only one step
- Local Exchanges (LEs) are replaced by the access gateways (AGs) and their functions are divided between the AGs and the call server (CS)
- Specifically the call control and accounting functions are all transferred to the call server (CS)
- All access elements such as user access modules (UAMs), remote user access modules (RUAMs), and private automatic branch exchanges (PABXs) are connected to access gateways (AGs)
- Access networks (ANs) are either replaced by the access gateways (AGs) or are connected to packet based network (PBN) through the AGs
- Transit Gateways (TGs) under the control of the call server (CS), and the signalling gateways (SGs), are deployed to replace the TE functions and provide interconnection between PSTN and other operators' PSTNs/ISDNs

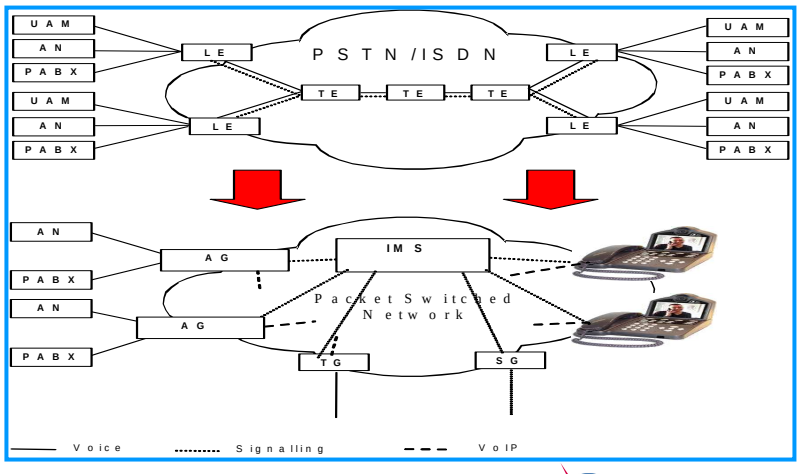
Realisation of Scenario 3



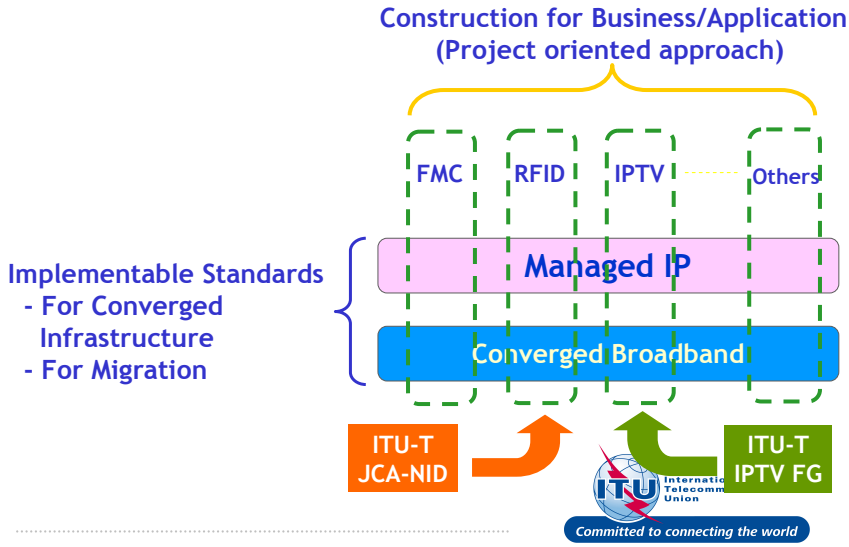
(B) IMS-based Evolution to NGN

- In this case, PSTN/ISDN evolves directly to a PSN based on the IMS core network architecture
- The end-users access the network using NGN user equipment or legacy user equipment connected via an AG
- Transit and signalling gateways are deployed for interconnection between the NGN and other operators' PSTNs/ISDNs
- Concurrent CS-based and IMS-based evolution to NGN implementations can occur when an existing operator deploys a separate IMS-based network for new services and supports the remainder of the services using a CS-based approach
- These two types of network implementations need to interoperate

IMS-based PSTN/ISDN Evolution to NGN



Next Direction of NGN Standardization



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SG2 Question Q.19-1/2 : Migration to NGN

- Trends of telecommunication networks migration towards NGN
- Examination of NGN technologies
  - Network management
  - Transport networks
  - Access networks
  - Interworking with existing networks
- Methodologies for planning, with taking into account the behaviour of different existing networks
- Migration solution to NGN

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Expected Outputs for Q.19-1/2

- Yearly progress report on NGN development
- A report of methodologies for planning NGN (multidimension planning process, service demand, forecasting methods, traffic forecasting models, and structure and dimensioning optimization methods
- A set of guidelines for migration from existing network to NGN

Rapporteur's Group Meetings

- **Rapporteur's Group Meeting: Geneva 18-19 February 2008**
- **Draft "Guidelines for developing countries on migration towards NGN"**
- **http://web/dms_ties/itu-d/md/06/rgq19.1.2/c/D06-RGQ19.1.2-C-0011!R1!MSW-E.doc**
- **Last Rapporteur's Group Meeting: During SG2 Meeting, Geneva 15-19 September 2008**

ITU Asia-Pacific Regional Initiatives

RI 1: Telecommunication/ICT policy and regulatory cooperation in the Asia-Pacific region	CHINA, AUSTRALIA, SINGAPORE, EUROPEAN COMMISSION, THAILAND, MALAYSIA ETC.
RI 2: Rural Communications – Infrastructure development	ADB, UPU, JAPAN INDUSTRY, ETC.
RI 3: Next Generation Networks (NGN) Planning	APT, PITA, PIFS, ESCAP, INDUSTRY ETC.
RI 4: The unique telecommunication/ICT needs of Pacific islands and small island developing states (SIDS) in the Asia-Pacific region	AUSTRALIA, EUROPEAN COMMISSION, PITA, APT, ESCAP, WORLD BANK ETC.
RI 5: Strengthening the collaboration between ITU-T and ITU-D	APT, ESCAP, INDUSTRY

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Regional Initiative on NGN

- Adopted at World Telecommunication Development Conference 2006), the Doha Action Plan include five regional initiatives for Asia-Pacific region
- This project seeks for ITU assistance to developing countries in smooth migration from existing networks into the NGN by
  - Studying specific questions as requested by Member States in order to develop Handbook/Guidelines on applying NGN network planning methodologies,
  - Software tools and technologies and migration strategies for NGN.In addition,
  - the project also seeks to launch global network planning initiative to assist migrate,
  - Establish and develop NGN applications for benefit of end users utilizing the NGN infrastructure
- The outcome of the project has two components:
  - Component A: Seeks to develop 'Handbook, Guidelines and Case Studies on NGN Migration Strategies and Planning Methodologies using advanced models and software Tools' ;and
  - Component B: 'To develop Pilot Projects on NGN applications and service deployment under global network planning initiative'

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ITU Initiatives on Bridging the Standardization Gap

Regional Initiative 5

- WTDC-06 called upon BDT to implement regionally approved initiatives at the national, regional, interregional and global levels
- Regional Initiatives in the Asia Pacific region on "Strengthening the collaboration between ITU T and ITU D" aims at
  - Assisting, through ITU-D, the developing countries that lack the necessary human resources to understand ITU T Recommendations
  - Enhance the application of ITU T Recommendations for telecommunication/ICT services and equipments
- The expected outcomes :
  - Close coordination mechanism between ITU T and ITU D at the regional level through the ITU Regional Office for Asia and the Pacific;
  - Guidelines for developing countries to understand and apply ITU T Recommendations for those having policy and regulatory implications;
  - Creating a virtual forum to discuss related topics on ITU-T standards and national standards
  - Online and face to face capacity building programs.

ITU / MIC Regional Training on Bridging the Standardization Gap

- ITU and Ministry of Internal Affairs and Communications Japan (MIC) jointly organized the "Training on Bridging the Standardization Gap" during 18-22 June 2007 in Tokyo, Japan
- Training benefited 26 participants from 21 countries in enhancing their knowledge on Standardization including NGN
- Presentations by speakers and country delegates as well as group discussion reports can be found at http://www.itu.int/ITU-D/tech/network-infrastructure/index.html.

Asia-Pacific Forum on NGN Planning

- ITU and the Asia Pacific Telecommunity (APT) jointly organised a Workshop on NGN Planning from 16-17 March 2007 in Bangkok, Thailand
- It provided platform for interaction, information sharing and discussion amongst 180 experts from 24 countries representing APT and ITU Members, international organizations, and private industry
- Presentations by a range of World-wide experts and outcomes/recommendations from the Forum can be found at http://www.itu.int/ITU-D/tech/network-infrastructure/index.html.

Regional Workshop on Frameworks for Cybersecurity and Critical Information Infrastructure Protection

- Regional Workshop was held on 28-31 Aug 2007 in Hanoi, Vietnam
- The workshop identified the main challenges faced by countries in the Asia Pacific region in developing frameworks for Cybersecurity and CIIP, considered best practices, shared information on technical standards and development activities being undertaken by ITU as well as other organizations, and reviewed the role of various actors in promoting a culture of Cybersecurity
- It was a joint collaboration between ITU-D and ITU-T and was hosted by the Government of Vietnam with support from the Government of Australia.
- About 100 delegates from the Asia Pacific and other regions participated in the workshop
- This Action was linked to the DAP Regional Initiatives for Asia Pacific region on "Strengthening the collaboration between ITU-T and ITU-D" (http://www.itu.int/ITU-D/cyb/events/2007/hanoi/index.html).

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Regional Development Forum, VietNam (15-17 September 2008)

- Bridging the ICT standardization gap in developing countries
- Aimed at
  - Encouraging greater understanding of, and participation in, the work of ITU-T
  - Explain status of current hot topics under discussion in ITU-T
  - How to become involved in ITU-T activities in order to champion the interests of each region in the development of international ICT standards
- Attended by over 100 participants (excluding those not registered from Vietnam) from 27 countries
- Regional Reflector with agreement from 25 participants for exchange of information on bridgingictstandardizationgap@itu.int has been created
- Next Regional Development Forum to be held in Indonesia (28-30 July, 2009)

ITU Asia-Pacific Region: PLANNED MEETINGS FOR 2009

Action No.	Month	Meeting Title	Potential Countries*
TSB	April 6-10	NGN-related workshop (e.g., ITU Marks)	Sri Lanka
10703	June	Regional Workshop on NGN Planning: Technology and Strategy	Iran
967	July 28-30	Regional Development Forum	Indonesia

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Conclusions

- NGN Initiative with involvement of relevant stakeholders
- Develop "*Guidelines on NGN Planning"* and "Step by Step Migration to NGN" and develop applications
- Draw a roadmap with time lines for NGN Migration
- Active participation and collaboration on
  - ITU ASP Regional Initiative 3 on NGN Planning
  - ITU ASP Regional Initiative 5 on Bridging the Standardization Gap

THANK YOU

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