ITU Initiatives on NGN and Way Forward

“NGN Migration Strategies and Access Modernization”

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Dhaka

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ITU Regional Office for Asia and the Pacific
Agenda

- Why Broadband?
- ITU Standardization work on NGN
- Developmental work on NGN
- ITU Asia Pacific Initiatives on NGN
- Conclusions
Moving Toward the Information Society Responsibly

ICT and climate change

Digital Cities

Smart Grids

Security in Cyberspace

Fully Networked Car

e-commerce

e-health

e-governance

e-education
The ITU Vision on Broadband

Build on broadband and the rest will follow

**Broadband needs to be considered as basic national infrastructure, as it will fundamentally reshape the world in the 21st century and change the way services are delivered – from e-health to e-education to e-commerce to e-government.**
Broadband: National Perspective

- Promoting economic and social development
- Enhancing productivity and competitiveness
- Helping job creation and opportunities
- Raises rural income in developing countries
- Gender equality and empowerment of women
- Bringing economies out of economic crisis
- Creating knowledge based society

Digital Bangladesh : A Step Foreword
Investment in Broadband

Stimulates Economic Development

<table>
<thead>
<tr>
<th>Country of Study</th>
<th>Impact on GDP of an increase of 10 percent in broadband penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various countries</td>
<td>1.20–1.40</td>
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<tr>
<td>United Kingdom</td>
<td>0.60</td>
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<tr>
<td>Australia¹</td>
<td>0.80</td>
</tr>
<tr>
<td>New Zealand</td>
<td>0.90</td>
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<tr>
<td>Malaysia</td>
<td>0.14</td>
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<tr>
<td>Middle Eastern country</td>
<td>0.13–0.25</td>
</tr>
</tbody>
</table>

Average: 0.60–0.70 percent

Source: Qiang and Rossotto, 2009;
Impact of Broadband on Innovation

Innovation efficiency vs. broadband penetration

Broadband facilitates innovation and entrepreneurship
Countries with a higher penetration see greater innovation
Broadband stokes innovation and it does so exponentially

Source: World Economic Forum
## Announced Government Support for ICT Development

<table>
<thead>
<tr>
<th>Country</th>
<th>Vision</th>
<th>Timing and Objective</th>
<th>Government Support (US$ millions)</th>
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</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>First 100% fibered up country in the world</td>
<td>By 2015: 100% homes and businesses passed</td>
<td>670</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Be one of the most technologically advanced countries in Asia</td>
<td>By 2018: 35% Internet penetration</td>
<td>680</td>
</tr>
<tr>
<td>Korea</td>
<td>Have the highest broadband penetration in the world</td>
<td>Already among the highest broadband (94%) and fiber penetrations (34%)</td>
<td>700</td>
</tr>
<tr>
<td>Australia</td>
<td>Fiber up the entire country, even all remote rural areas</td>
<td>By 2014: 98% of homes and businesses passed</td>
<td>3,300</td>
</tr>
<tr>
<td>Italy</td>
<td>Give all Italian citizens access to 20 megabits per second</td>
<td>By 2013: 100% of homes passed with fiber to the home</td>
<td>1,250</td>
</tr>
<tr>
<td>Stockholm</td>
<td>Be one of the first cities entirely covered by fiber</td>
<td>By 2012: 100% homes and businesses passed</td>
<td>300</td>
</tr>
</tbody>
</table>

### Strong Belief that ICT Can Turn Around

Source: World Economic Forum
### Regional and Global IDI Ranking of Bangladesh

#### Table 2.10: IDI – Asia and the Pacific

<table>
<thead>
<tr>
<th></th>
<th></th>
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<td>150</td>
<td>1.06</td>
<td>137</td>
<td>0.99</td>
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</tr>
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</table>

Source: ITU.
WTISD Celebration in Bangladesh

Leading the way towards Digital Bangladesh Vision 2021
Broadband becomes a national policy priority

82 countries with a national broadband strategy

Digital Bangladesh with Vision 2021 underlines urgency on Broadband

Source: ITU
Broadband and NGN

- Broadband is key driver for social and economic growth
- To establish the knowledge based society requires robust infrastructure and applications
- ITU defined NGN which is a **reliable social infrastructure** to deliver broadband applications
- Efforts of ITU towards NGN:
  - ITU-D: Regulatory reforms/ institutional capacity building/Best Practice Guidelines/Case Studies
  - ITU ASP RO: County Specific assistances/ regional/national training/Forums
ITU-T Standardization on NGN
Objectives of NGN

- Promote fair competition
- Encourage private investment
- Provide open access to networks
- Single billing contact with the consumer
- Faster roll-out for new services
- Reduces cost of infrastructure: Affordability
- Can enable developing countries to leapfrog and extend broadband connectivity

NGN Architecture
General Drivers of Migration

**New services and revenue** increase with multimedia services
- Compensate *voice revenue reduction and increase BB* related business
- Providing Service innovation (e.g. VPN)
- **Decreased time to market**

**Cost reductions** by sharing network infrastructure and systems
- Savings are a function of network scenario, equipment modernization status and customers grow speed
- Evolving legacy networks to NGN: *Reduced OPEX* and *streamline operations*

**Simplification of O&M**
- *Integrated* operation platforms, maintenance and training
- *Centralized* Management and Control

*New Services & NGN Applications*

Source: *Nippon Telegraph and Telephone*
Drivers of Migration: Operators Perspective

- **Business continuity** required to maintain ongoing dominant services and customers that require carrier-grade service
- **Flexibility** to incorporate existing new services and react quickly to the ones that appear on real time (main advantage of IP mode)
- **Profitability** to allow feasible return on investments and in the best practices market values
- **Quality of Service** to guarantee the Service Level Agreements for different traffic mixes, conditions and overload.
- **Interoperability across networks** to allow to carry end to end services for flows in different network domains

Source: ITU Technology Watch, Cisco
ITU-T NGN Milestones

Past

2003
JRG-NGN
Y.2001
Y. 2011
11 draft
Recommendations

~ 2008
NGN-GSI
(1st Phase)
NACF
RACF
QoS/Security
Mobility

2004-2005
FG-NGN
30 Documents
collected in
Proceeding Book

~ 2010
NGN-GSI
(2nd Phase)
NGN Rev.1
IPv6 NGN
IPTV/CD&F
NGUN, N-ID &IdM

Future

~ 2012
NGN-GSI
(2nd Phase ... going)
Future Networks
OSE/SIDE
USN, DSN
Cloud Computing

Present

~ 2008
NGN-GSI
(1st Phase)
NACF
RACF
QoS/Security
Mobility

JRG: Joint Rapporteur Group  GSI: Global Standards Initiative  FG: Focus Group  SG: Study Group
NGN release 2 to support the following functions:
- All functionalities of NGN release 1;
- Delivery functions for streaming content including multicasting such as IPTV services;
- Mobility support functions, e.g. FMC and seamless handover.

Newly developed functions in Rel.2
## Status of ITU-T SG13 NGN Developments

<table>
<thead>
<tr>
<th>Area</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements</td>
<td>NGN (R1, R2), IPTV, Mobility Management, Id/Log separation, FMC(IMS), Multicast, VPN, N-ID, OSE, MDS, IPv6-NGN, Migration-IPv6 NGN, Flow State aware-NGN, Accounting-Charging, AAA, Security</td>
</tr>
<tr>
<td>Architecture and Functions</td>
<td>NGN (FRA R1), RACF, RACF-MPLS (Central, Distributed), NACF, IPTV, Multicast, IdM, IPv6-NGN, Multi-himing-IPv6, PSTN/ISDN-Emulation/Simulation, Loc-MM, HOC, Converged Services, Ethernet-QoS, Admission Control/Storage Restoration Priority Level</td>
</tr>
<tr>
<td>Service</td>
<td>Customized Multimedia Ring, Converged Web Browsing Service</td>
</tr>
</tbody>
</table>
Strategic Direction for NGN Developments

- Remaining enhanced network related capabilities
  - Transport control capabilities: Mobility, Multicasting and QoS control over interworking
  - Networking capabilities: Ad-Hoc Networks, DSN, Multi-connection and Ubiquitous Networking
  - Security related: Support of IdM and DPI (Deep Packet Inspection)

- Service related capabilities
  - Service support: SIDE (Service Integration and Delivery Environments)
  - Provider support: OSE (Open Service Environment), Mobile IPTV and Web based IPTV

- Continue to develop Testing Specification:
  - From methodology, testing model, architecture to detailed service testing such as VOIP service.
  - Monitoring parameters set becomes the important part for NGN testing and interoperability.
<table>
<thead>
<tr>
<th>Topic</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next Generation Networks</td>
<td>Y.2000-Y.2999</td>
</tr>
<tr>
<td>Frameworks and functional architecture models</td>
<td>Y.2000-Y.2099</td>
</tr>
<tr>
<td>Quality of Service and performance</td>
<td>Y.2100-Y.2199</td>
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<tr>
<td>Service aspects: Service capabilities and service architecture</td>
<td>Y.2200-Y.2249</td>
</tr>
<tr>
<td>Service aspects: Interoperability of services &amp; networks in NGN</td>
<td>Y.2250-Y.2299</td>
</tr>
<tr>
<td>Numbering, naming and addressing</td>
<td>Y.2300-Y.2399</td>
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<tr>
<td>Network management</td>
<td>Y.2400-Y.2499</td>
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<td>Network control architectures and protocols</td>
<td>Y.2500-Y.2599</td>
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<td>Future networks</td>
<td>Y.2600-Y.2699</td>
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<td>Security</td>
<td>Y.2700-Y.2799</td>
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<tr>
<td>Generalized mobility</td>
<td>Y.2800-Y.2899</td>
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<tr>
<td>Carrier grade open environment</td>
<td>Y.2900-Y.2999</td>
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</table>
ITU-R Initiatives on Broadband
In 2000, work began on “IMT-Advanced”—the global platform on which to build the next generations of fixed and mobile wireless broadband services.

This process, which is now concluding, involved a detailed assessment of market needs up to 2020, identification of suitable spectrum and the detailed specification of the globally agreed radio interfaces.

Selection of radio interfaces decided in October 2010, and the detailed specifications for IMT-Advanced should be finalized in 2011.
Decision

▪ **LTE-Advanced** and **WirelessMAN-Advanced** technologies were each determined to have successfully met all of the criteria established by ITU-R for the first release of IMT-Advanced.

▪ **LTE-Advanced** is developed by 3GPP as LTE Release 10 and Beyond (LTE-Advanced).

▪ **WirelessMAN-Advanced** is developed by IEEE as the WirelessMAN-Advanced specification incorporated in IEEE Std 802.16 beginning with approval of IEEE Std 802.16m.

▪ Full details of the submissions and evaluation process are contained in the recently approved Report ITU-R M.2198

▪ The detailed technical specifications of these radio interfaces will be contained in Recommendation ITU-R M.[RSPEC] to be finalized in early 2012.
Key Features

- High degree of commonality of functionality worldwide while retaining the flexibility to support a wide range of services and applications in a cost efficient manner;
- Compatibility of services within IMT and with fixed networks;
- Capability of interworking with other radio access systems;
- High quality mobile services;
- User equipment suitable for worldwide use;
- User-friendly applications, services and equipment;
- Worldwide roaming capability; and,
- Enhanced peak data rates to support advanced services and applications (100 Mbit/s for high and 1 Gbit/s for low mobility were established as targets for research)*.

* See Recommendation ITU-R M.1645
IMT Advanced-Satellite

- Satellite radiocommunication systems have great potential to accelerate the availability of broadband, particularly in remote and land-locked areas.
- Studies into providing global access to the Internet at high data rates via satellite have been carried out and are contained in ITU–R standards.
- Work on the satellite component of IMT-Advanced is also underway.
- Process for selecting candidate satellite radio interface(s) of IMT-Advanced is being developed, and a report identifying requirements of the interface(s) is being finalized.
Radiocommunication Study Groups

Res. ITU-R 4-5 of Radiocommunication Assembly 2007:
- 6 ITU-R Study Groups:

SG 1: Spectrum management
SG 3: Radiowave propagation
SG 4: Satellite services
SG 5: Terrestrial services
SG 6: Broadcasting service
SG 7: Science services

In addition:
CCV: Coordination Committee for Vocabulary
CPM: Conference Preparatory Meeting
SC: Special Committee on regulatory and procedural matters

>900 Recommendations
“Standards” in areas of spectrum management and radio technology
Result of consensus from meetings of world-wide experts
Some referred to in RR
Used by spectrum planners and system designers

Supported by Counsellors and Assistants in Study Group Department of BR

See Web page at: http://www.itu.int/ITU-R/go/rsg
Developmental Work on NGN
Changing Institutional Frameworks

Legislations embracing the power of convergence as well as addressing concerns such as Cybersecurity on the rise.

Institutional convergence including Telecom, Broadcasting, IT and in some cases even beyond on ground: e.g., Australia, China, India, Republic of Korea, Malaysia,

Converged policy & regulatory frameworks evolving: e.g., Converged Licensing (Malaysia), Authorization (European Union), Unified Access License (India), Digital Signature, etc.
New Regulatory Paradigm

Pre-NGN

Transport Agnostic

Service-based Pol./Reg.

Voice

Internet

Video

MM

Pol. Reg.

IP (Future Packet ?) Platform

xDSL/Optic based Fixed-Mobile

Resource-based Pol./Reg.

Access Network Provider Domain

ANP 1 (DSL)

ANP 2 (DSL)

ANP 3 (Opt)

ANP N (Cable)

Service/Application Provider Domain

Core Network Provider Domain

SP 1

SP m

CN P 1

CN P 2

CN P 3

Access Agnostic
What Could be the Licensing Models?

Simplification of Licenses

Models for Reduction of Administrative Requirements

Source: Report from ITU-D Study Group 1, Question 10-2/1
### Regulatory Considerations for NGN Migration

<table>
<thead>
<tr>
<th>Licensing</th>
<th>Consider appropriate regime for classes and types of licences and licensing criteria, where licensing is required. There is a shift away from service and technology specific licensing towards horizontal licensing.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbering</td>
<td>To ensure access to numbering resources and ensure that numbering, naming and/or addressing schemes encompass legacy, transitional and NGN services and associated directory services.</td>
</tr>
<tr>
<td>Interconnection</td>
<td>Regulatory considerations include whether new interconnection models may be required; the impact of IP based networks and traffic on current interconnection arrangements; ensuring no discriminatory access behaviour; defining the parameters of interconnection in a multi-service environment and whether there will still be a need for mandated wholesale interconnection regimes, as well as a revision of the charging principles.</td>
</tr>
<tr>
<td>Standards and Interoperability:</td>
<td>Regulatory considerations include mandating standards and interoperability between operators and new entrants to ensure no delays in the introduction of new services and providers in retail markets and to coordinate standardization activity where no specific body has been established.</td>
</tr>
<tr>
<td>Spectrum</td>
<td>The main regulatory consideration is ensuring equitable access to spectrum required by new NGN operators and services and ensuring that competition is not hampered through legacy spectrum assignments to incumbent operators for the provision of fixed, fixed-mobile and mobile services.</td>
</tr>
<tr>
<td>Universal Service</td>
<td>Affordability and accessibility are key policy goals that should not be abandoned or altered in a NGN environment. There is ongoing relevance to the structure of universal service obligations and levies for NGN migration, whilst ensuring that these are not onerous on operators such that they compromise innovation and infrastructure development. Regulatory questions include whether VoIP providers should contribute to a universal service fund; how to structure universal service contributions and to which technology or service these should attach.</td>
</tr>
<tr>
<td>Consumer Protection</td>
<td>Issues that require attention include but are not limited to, quality of service; priority access to emergency services; the provision of location information; rights and presence management, number portability, operators’ liability; privacy and security. Regulators around the world have started industry wide consultations of the consumer aspects of NGN migration to ensure that consumers are in no way adversely affected.</td>
</tr>
<tr>
<td>Spectrum</td>
<td>The main regulatory consideration is ensuring equitable access to spectrum required by new NGN operators and services and ensuring that competition is not hampered through legacy spectrum assignments to incumbent operators for the provision of fixed, fixed-mobile and mobile services.</td>
</tr>
</tbody>
</table>

Source: GSR 2007 Discussion Paper: NGN Overview
Access Evolution TOT, Thailand

- Network assessment and audit for the status of the existing copper access network infrastructure in Bangkok
- Analyze target models & architecture for OSP network systems & services
- Evaluate dynamic migration models over time towards target solution based on technical dimensioning and business evaluations
- Network modernization for triple play services with at least 8 Mbps
- Guidelines on current access network capability toward NGN including economics of access network upgrading, NGN planning and deployment of ICT-based services over the access network
- To extract generic conclusions and experiences with applicability to other countries of the Region
### Radio Network Planning
- Assessment of the existing technologies in access network;
- Developing broadband IP-based-CDMA wireless access data network;
- Designing EVDO REVA with voice and design network connectivity at protocol level;
- Recommend Tools and instruments for optimization, maintenance, monitoring and QOS related issues for all IP Networking

### Core Network Planning
- Assessment of the existing technologies in core network;
- Preparing detailed design of overall network topology based on all IP CDMA, equipments for pool network, network design for disaster management;
- Design Network connectivity at protocol level;
- Recommend Tools and instruments for optimization, maintenance, monitoring and QOS related issues for all IP Networking
- Design one window customer related management system for customer provisioning, maintenance, billing for post paid and prepaid subscribers;
- SIP based point to point and point to multipoint services for post paid/prepaid;
- Suggest on issues related to WAP server, NMS, MMS, Voice over SMS
NGN Case Study: India, Philippines, Sri Lanka

**WTDC 2006:** A handbook with a number of parts on NGN network planning methodologies: a guideline for selecting NGN network planning software tools; and global network planning initiative.

**Terms of Reference**

- Compile Best Practices
- Prepare a manual consisting of various implementable action points for licensing, regulation, standardization, and deployment for facilitating smooth transition towards NGN;
- Conduct a two days interactive workshop

**Philippines**

Project Document Prepared  
Coordinated by CICT and Ministry, Philippines  
Funds: By DBCDE (  
Dates: 7-18 June  
Expert: Oscar Soto  
Working Group: Formed

**India**

Project Document Prepared  
Coordinated by IAFI, TRAI, DOT  
Funds: RI Funds  
Dates: 11-22 October  
Expert: Oscar Soto  
Working Group: Formed

**Sri Lanka**

Project Document Prepared  
Coordinated by TRCSL  
Funds: RI Funds  
Dates: 25 Oct-5 Nov  
Expert: Oscar Soto  
Working Group: Formed
Asia Pacific: Wireless Broadband Master Plan

1. Survey on the situation of broadband
   - Collect information on the status of Asia and Pacific broadband through a questionnaire in cooperation with the Asia-Pacific Regional Office; and
   - Analyze the collected information.

2. Develop master plan for pilot countries
   Identify the pilot countries (at least 4 countries);
   Clarify the requirements of the 4 pilot countries; and
   Develop and provide a master plan according to each pilot country’s requirements and situation.

3. Training of national experts
   Develop the workshop programmes to deliver a regional workshop on the master plan;
   Identify the host country of the workshop; and
   Conduct the training programmes.
NGN Planning for Access Evolution in BTCL

- To provide and share information on NGN migration strategies, technologies and cases in the APAC region and Worldwide

- To undertake network assessment and audit for the status of the existing copper access network infrastructure in Dhaka

- Evaluate dynamic migration models over time towards target solution based on technical dimensioning and business evaluations

- Recommend network modernization and guidelines to support triple play services with at least 8 Mbps by installing remote Multiservice nodes closer to customer and shortening local loop.
Conclusions

▪ NGN Migration is a complex issue requiring close cooperation amongst regulators, policy makers, and industry stakeholders to promote innovation.

▪ ITU has taken several initiatives to facilitate migration towards NGN:
  - Build on Broadband and Broadband Commission
  - ITU-T and ITU-R Recommendations on NGN
  - Guidelines on Migration Strategies
  - Case Studies, Country Specific Actions

▪ Continued closer collaboration with Bangladesh.
Additional Reference Slides
<table>
<thead>
<tr>
<th>Question #</th>
<th>Question title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/13</td>
<td>Coordination and planning</td>
</tr>
<tr>
<td>2/13</td>
<td>Network terminology</td>
</tr>
<tr>
<td>3/13</td>
<td>Requirements and implementation scenarios for emerging services and capabilities in an evolving NGN</td>
</tr>
<tr>
<td>4/13</td>
<td>Requirements and frameworks for QoS enablement in the NGN</td>
</tr>
<tr>
<td>5/13</td>
<td>Principles and functional architecture for NGN (including ubiquitous networking)</td>
</tr>
<tr>
<td>6/13</td>
<td>Mobile telecom network architecture for NGN</td>
</tr>
<tr>
<td>7/13</td>
<td>Impact of IPv6 to an NGN</td>
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<tr>
<td>8/13</td>
<td>Mobility management</td>
</tr>
<tr>
<td>9/13</td>
<td>MM mechanisms supporting multi-connections for multiple access technologies</td>
</tr>
<tr>
<td>10/13</td>
<td>Identification of evolving IMT-2000 systems and beyond</td>
</tr>
<tr>
<td>11/13</td>
<td>Convergence of existing and evolving IMT and fixed networks</td>
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<tr>
<td>12/13</td>
<td>Evolution towards integrated multi-service networks and interworking</td>
</tr>
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<td>13/13</td>
<td>Step-by-step migration to NGN networks</td>
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<tr>
<td>14/13</td>
<td>Service scenarios and deployment models of NGN</td>
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<tr>
<td>15/13</td>
<td>Applying IMS and IMT in Developing Country mobile telecom networks</td>
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<tr>
<td>16/13</td>
<td>Security and identity management</td>
</tr>
<tr>
<td>17/13</td>
<td>Packet forwarding and deep packet inspection for multiple services in packet-based networks and NGN environment</td>
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<tr>
<td>18/13</td>
<td>Requirements and framework for enabling COTS components in an open environment</td>
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<tr>
<td>19/13</td>
<td>Distributed services networking (DSN)</td>
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<tr>
<td>20/13</td>
<td>Public data networks</td>
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<td>21/13</td>
<td>Future networks</td>
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Regulatory Institutions Playing Key Role

Countries with a separate regulator, 2009

<table>
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<tr>
<th>Region</th>
<th>Count</th>
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<tbody>
<tr>
<td>CIS</td>
<td>39</td>
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<tr>
<td>Arab States</td>
<td>6</td>
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<td>Asia-Pacific</td>
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</tr>
<tr>
<td>Africa</td>
<td>26</td>
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Total: 153

Source: ITU World Telecommunication/ICT Regulatory Database.

Mandate of the regulator, 2009

- Africa
- Americas
- Arab States
- Asia-Pacific
- CIS
- Europe

Source: ITU World Telecommunication/ICT Regulatory Database.

Regulators having enforcement power, world

- 2005: 114 Yes, 77 No
- 2009: 140 Yes, 51 No

Source: ITU World Telecommunication/ICT Regulatory Database.

Trends in mechanisms used to solve disputes once negotiations among parties failed, world

- 2005
- 2009

Source: ITU World Telecommunication/ICT Regulatory Database.
An enabling regulatory regime can foster innovation, investment and affordable access to NGNs and facilitate migration to NGNs.”

- Establish forward-looking regulatory regimes
- Recognizing the need for regulatory flexibility and technology neutrality
- Removing undue regulatory barriers to competition and innovation
- Establish investment-friendly regulation while maintaining a level playing field and protecting consumer interests

The best practice guidelines cover as well authorization, access, interconnection, numbering and NGN identification systems, universal access, quality of service, consumer awareness, security and protection.

GSR 2007 Best Practice Guidelines for Next-Generation Networks Migration
The purpose of this module is to develop an intellectual framework and innovative content exploring issues related to new technologies and regulation policies. The module is organized in three main parts:

- **Technological trends.** This part examines the main technological trends and their impacts on regulation.

- **Market and regulation.** The analysis of the technology implications on the current regulation and market structure in this part is focusing on traditional regulatory areas, like Interconnection, price regulation, etc. and market structure aspects, like horizontal and vertical integration.

- **New regulatory paradigm.** Based on the technology trends and regulatory implications a new regulatory paradigm and its constituent elements are discussed in this part.

### New Technologies and Impacts on Regulation

QUESTION 12-2/1: Tariff policies, tariff models and methods of determining the costs of services on national telecommunication networks, including NGN

This report provides a link between economic and tariff policies based on conventional networks, and those set to lead to the effective establishment of next generation networks in different countries.

- Economic aspects of NGN investment projects

Type of cost model used by administrations for NGN – 2009

Cost models used in setting tariffs for new services carried by NGN

Type of cost model used by administrations for NGN

<table>
<thead>
<tr>
<th>Type of Cost Model</th>
<th>Percentage</th>
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<tr>
<td>Fully distributed historical costs</td>
<td>0.30</td>
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<tr>
<td>Long-run incremental costs</td>
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<tr>
<td>Other model</td>
<td>0.20</td>
</tr>
<tr>
<td>None</td>
<td>0.15</td>
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</table>

Cost models used in setting tariffs for new services carried by NGN - 2008

<table>
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<tr>
<th>Model Type</th>
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<tbody>
<tr>
<td>Former cost-based tariff model</td>
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<tr>
<td>Model under development</td>
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<tr>
<td>Other</td>
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</table>
ITU-D Study Group Questions (2011-2014)

**Study Group-1**

- Question 7-3/1 – Implementation of universal access to broadband services
- Question 12-3/1 – Tariff policies, tariff models and methods of determining the costs of services on national telecommunication networks, including next-generation networks
- Question 18-2/1 – Enforcing national policies and regulations on consumer protection notably in a converging environment
- Question 19-2/1 – Implementation of IP telecommunication services in developing countries

**Study Group 2**

- Question 25/2 – Access technology for broadband telecommunications including IMT, for developing countries
- Question 26/2 – Migration from existing networks to next-generation networks for developing countries: technical, regulatory and policy aspects

Contributions, participation, response to survey questions from stakeholders are encouraged.
Conformity & Interoperability

**WTSA-08 Resolution 76** Studies related to conformance and interoperability testing, assistance to developing countries, and a possible future ITU mark program

- **Conformity** ITU is developing a pilot conformity database which lists and gives visibility to products tested for conformity against ITU-T Recommendations. The database available for ITU members;

- **Interoperability** ITU is organizing a series of interop events, some in partnership with relevant standards development organisations, forums and consortia. Future interop events may include: Home Networking; VDSL2; GPON

- **Capacity Building** ITU-T and ITU-D Secretariats preparing a programme of capacity building events on conformity and interoperability testing.

- **Test Centers** ITU is providing assistance in establishment of testing facilities with other international organizations and private entities. A pilot project has been initiated in Tanzania in cooperation with Sintesio

- **Regional ITU Consultation** on Conformance Assessment and Interoperability for the Asia-Pacific Region: Sydney, Australia, 16 - 17 September 2010