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Union



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## Seminar Closing Wrap-up & Next Steps

John Visser, P.Eng.  
Chairman, ITU-T SG 19  
Nortel Networks

29 April – 2 May 2007 ITU-D/ITU-T NGN Seminar for the Arab Region



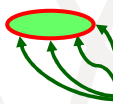
## Introduction



- This presentation, prepared during the seminar to reflect the key points in 36 presentations totalling ~974 slides, aims to provide a summary of the key points of this seminar, and to provide an aid to more in depth review of the material contributed by our volunteer speakers.

- **Quotations**

- “We always over-estimate the change that will occur in the next two years, and underestimate the change that will occur in the next ten years.” \*
- “When you get to a fork in the road, take it!” \*\*
- “Prediction is very difficult, especially about the future.” \*\*\*



\* *Bill Gates, Microsoft Corporation*  
\*\* *Yogi Berra, American baseball player*  
\*\*\* *Neils Bohr, Danish Physicist*

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## Key Overall Messages (1/3)

- **Telecoms is an engine for economic growth**
  - The “Digital Divide” is shrinking!
- **Broadband Wireless Access and NGN are key technologies for bridging the digital divide**
- **There are multiple access solutions**

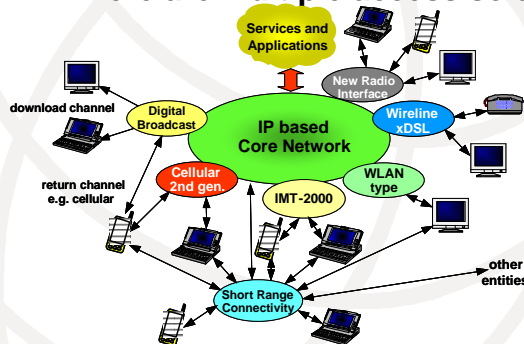


Figure 4/ITU-R Rec. M.1645  
Figure 5.1/ITU-T Supp. 52

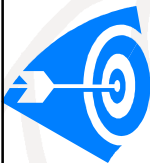
“Future network of systems beyond IMT-2000 including a variety of potential interworking access systems”



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## Key Overall Messages (2/3)

- **How to “hit the target”?**
  - Know your market: customer needs, market potential, deployment challenges, business case, etc.
  - Recognize that technologies are evolving, will continue to do so
  - Ensure well informed on standards
  - Consider what is, will be available, at time you want to deploy
  - Be prepared to adopt multiple complementary approaches
- **Voice and data are important: do both well!**
- **Bit rates up: media/telecom/data convergence, and service/device/network convergence: look forward!**
- **Strong industry alignment of visions, perspectives**
  - Individual technologies have their champions but, overall, there are highly consistent views on future directions



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## Key Overall Messages (3/3)



- **Aim to “delight” your customer!**
  - While managing expectations
  - Users may need some education to get started, but will take services & usage in unexpected directions!
- **One size does not fit all. There is no panacea.**
  - There are no simple answers.
  - You will need to do some work to find the right combination to match your specific needs
  - Expect to constantly tune your next steps
- **Arab region invited to become much more active**
  - Help define requirements, how to meet them (ITU-T)
  - Excellent 3G/3+G and NGN deployment experience to contribute towards Handbooks and Deployment Guides (ITU-D)



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## Opening



- **Call to Order (Kamal Al Bahrani, Batelco)**
  - **Welcome address from Hosting Administration (Peter Kaliaropoulos, CEO, Batelco)**
    - Warm welcome to all
    - Emphasized importance of telecommunications to Bahrain
    - Batelco deploying NGN technologies
  - **Welcome address from ITU-BDT Regional Office (Ebrahim Al-Haddad, ITU Regional Office, Cairo)**
    - Warm welcome on behalf of ITU-D and Regional Office
    - Role of ITU regional office in coordinating support for region
  - **Opening Remarks from ITU-TSB (Paolo Rosa, ITU TSB, on behalf of Malcolm Johnson, TSB Director)**
    - Warm welcome on behalf of ITU TSB
    - Seminars and workshops important means for sharing knowledge



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## Keynote Session (1/2)

- **Session Chairman:** Ebrahim Al-Haddad, ITU
  - **Key Feature of ITU-T NGN and future vision** (Chae Sub Lee, ITU-T SG 13)
    - Key features and impacts of ITU-T NGN
    - Ultimate goal of users drives future study directions
  - **ITU introduction: structure, activities, working methods and achievements** (John Visser, ITU)
    - Today's young person, tomorrow's decision maker, wants mobility, seamless applications and ubiquitous broadband access
    - ITU well structured to address radio, telecom and development sector needs
      - Global standards cooperation a hallmark
      - Responsive to changing environment
      - One of the world's most enduring organizations



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## Keynote Session (2/2)

- **ITU-D studies and activities on NGN - Question 19-1/2** (Riccardo Passerini, ITU-D)
  - Q.19-1/2 a key place for development of guidelines for application of NGN in developing country markets
  - Tasks:
    - Trends
    - Examine technologies
    - Planning methodologies
    - Migration
  - Annual reports and draft guidelines leading to a 2009 deliverable



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## Session 1: Regional Office, environment and NGN activities (1/2)

- **Session Chairman:** John Visser, ITU / Nortel



- **ITU Regional Office: Structure, activities, projects and initiatives** (Ebrahim al-Haddad, ITU Regional Office, Cairo)

- Five regional initiatives (2007–2010) aimed at Arab region capacity building, consistent Arabic definitions, Arab community history, local network infrastructure development



- **ITU-T new environment: Ready for the day after** (Paolo Rosa, ITU-T)

- Increased resources, collaboration, partnering with BDT, area offices, regional organizations
- Assist with regional events on all hot topics making use of TSB and experts' expertise



Used without permission (Apologies to Paramount)



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## Session 1: Regional Office, environment and NGN activities (2/2)



- **ITU-T NGN GSI: requirements and main achievements in NGN Release 1 Standardization** (Marco Carugi, Nortel)

- Coordination inside ITU-T, cooperation with other SDOs
  - Leverage of near term detailed and well-focused technical work of relevant SDOs into a consistent global framework
- NGN Release 1 provides:
  - Reduction of installation and operating costs
  - Expansion of service features
  - Creation of new business opportunities
  - Preservation of existing services



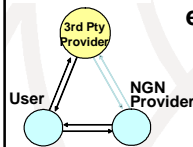
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## Session 2: Services and Applications in NGN (1/2)

- **Session Chairman:** Chae Sub Lee, ITU / ETRI



### – NGN services: new concepts and NGN open service environment (Marco Carugi, Nortel)



- Described progress in developing NGN services standardisation and Open Service Environment specifications
- Selected work items based on Q.2/13 activities
- Future steps in the service area



### – Voice Evolution and Fixed-Mobile-Internet convergence (Jean-Pierre Bienaimé, Chairman, UMTS Forum)



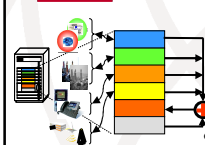
- Forecasts: voice will remain a key service but strong total traffic growth; predict voice will be >50% mobile in 2007
- Benefits: convenience, simplification, <cost, advanced services
- Fixed-mobile convergence and fixed-mobile substitution are both extant: In Europe and elsewhere, FMC/FMS is offered or planned



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## Session 2: Services and Applications in NGN (2/2)

### – Provision of Multimedia Service Mobility within the Next Generation Network (Leo Lehmann, OFCOM, Switzerland)



- ITU-T Standardization - draft Recommendations being developed
  - TP.MMSM (Service Mobility for New Multimedia Service Architecture)
  - Rec. MMF (Framework of Mobility Management for NGN)
  - Rec. LMF (Framework of Location Management for NGN)
  - Rec. HMF (Framework of Handover Management for NGN)
- Q.1706/Y.2801 (Mobility Management Requirements for NGN)
- Closely co-operating Questions (Q.6/13, Q.2/19, Q5/19, Q.29/16)

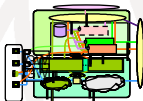


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## Session 3: Architectural views of NGN (1/2)

- **Session Chairman:** Marco Carugi, ITU / Nortel

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- **Architectural Overview of NGN** (Chae Sub Lee (ITU-T SG13))

- Provided definition for and principles for NGN and IPTV on NGN
- Covered NGN architecture overview and details of NGN Release 1 architecture: transport and access agnostic
- Resource and Network Access Control Functions RACF and NACF are key components, work areas

- **Mobility Management Requirements of NGN** (John Visser, ITU-T SG 19)

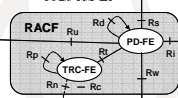
- Technology savvy young person is tomorrow's decision maker
- Convergence is happening and is unstoppable
- NGN architecture based on key mobile concepts, architectures
- Mobility is a complex area with too much variation
- Mobility Management, Fixed-Mobile Convergence in NGN-GSI



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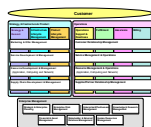
## Session 3: Architectural views of NGN (2/2)

- **Resources and Admission Control for NGN** (Tina Tsou, Huawei Technologies Co. Ltd.)



- Description of RACF requirements, role and functions
- RACF bridges service control and transport for application-driven real-time resource management and end-to-end performance
- Use cases: BW & Admission Control Manager; Packet Interconnect

- **NGN OSS Transformation** (A. Jalil Abdulla, Batelco)



- OSS challenges and drivers: being a "lean" operator is essential
- Evolving from islands of services to a converged network
  - Brings challenges in provisioning, fulfillment, assurance, billing, etc., issues which must be addressed
- Best way: follow industry standard approaches (TMF eTOM, etc.)
- Frost & Sullivan quote clearly validates Batelco approach:
  - "... in our research we find that operators that best understand the strategic importance of OSS/BSS are best positioned to compete."



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## Session 4: Standards for NGN Migration (1/2)

- **Session Chairman:** Chae Sub Lee, ITU / ETRI



- **Key Features of QoS study in NGN** (Tina Tsou (Huawei Technologies Co. Ltd.))

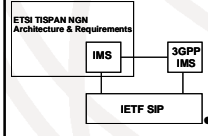


- Why do we need QoS in NGN? Satisfy the customer!
  - Interactive / Responsive / Timely / Non-critical
- Rec. Y.1541 Network QoS Classes: classes 0 through 7
  - Challenge: multiple networks, plus originating, terminating accesses
- Rec. Y.1542 “Framework for achieving end-to-end IP performance objectives” discusses approaches to problem



- **NGN Protocol Specifications** (Keith Mainwaring, Cisco)

- Protocols required for Call/Session Control, Resource and Admission Control, Data Path & IP infrastructure control
  - IP, TCP, UDP, SIP UNI & NNI, HTTP, RTP, BGP, OSPF, ENUM, DNS, MPLS, Diffserv, RSVP, Radius, Diameter, ...)
  - Produced by: ITU-T, ETSI, 3GPP, IETF



- 2 “R” protocols specified but most in approvals

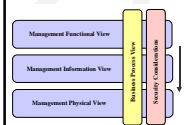


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## Session 4: Standards for NGN Migration (2/2)



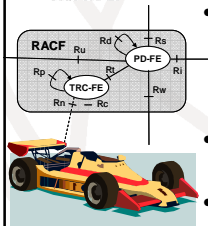
- **ITU-T Overview of NGN Management** (Dave Sidor, Nortel)



- ITU-T NGNMFG general goal: provide management interface capabilities to support ITU-T NGN Release 1
- NGN Management Specification Roadmap summarized
- Outstanding example of collaborate among ITU-T and major SDOs, forums, and consortia for mutual benefit



- **NGN Signalling requirement to support QoS** (Tina Tsou, Huawei Technologies Co. Ltd.)



- Focuses on RACF and signalling interfaces
  - Scalability
  - Domain independence
  - Consistent functional architecture for all physical mappings
- Protocol specifications are needed when interacting functional entities are mapped to different physical platforms
- Summarized functions for each RACF interface
  - With associated information elements

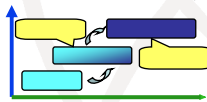


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## Session 5: NGN Migration Scenarios and Strategies (1/4)

- **Session Chairman:** John Visser, ITU / Nortel
  - **Network Architecture in the evolution towards NGN and IMS** (Oscar González Soto, ITU)



- First 100% NGN deployment will be in a Developing Country!
- Motivations: >revenue, <cost, >OPE, QoS for SLA, interoperability:
  - Plan phased migration based on business evaluation per scenario type
  - Implement pilot cases to ensure able to handle technical issues
  - First: IMS services with optimum benefit from flexibility, time to market



- **NGN Business Models** (Michael Stichel, BT)

- Need to decide on type of world you want to be in: fragmented or smart, network-enabled world
  - Not risk-free, but opportunity-rich
- It's not just the network: meet human challenge for tech. success
- Collaboration key in transforming from a capacity provider to a capability provider



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## Session 5: NGN Migration Scenarios and Strategies (2/4)

- **Fixed Mobile Convergence – FMC/IMS in Batelco** (Yacoub Sabt, Batelco)



- Convergence is happening everywhere
- Future is mobile and broadband, IMS a key convergence element
  - Market participants will no longer be possible as “pure” segment players
- Transforming business needs into network requirements: use IMS to transform from a silo-based services infrastructure to a coherent and consistent access independent approach

- **Migration to NGN** (Chae Sub Lee, ITU-T SG 13)





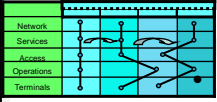



- Huge logistic and technical challenges with significant benefits through great reduction in number of infrastructure sites
- Full NGN capabilities not possible on day 1
- Timely key standards a critical issue for alignment among strategic suppliers, working with other operators
- Key inputs to ITU-T, ETSI and ATIS standards



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## Session 5: NGN Migration Scenarios and Strategies (3/4)

- **3G/UMTS Evolution: towards a new generation of broadband mobile** (Jean-Pierre Bienaimé, Chairman, UMTS Forum)
  - Statistics on UMTS/W-CDMA/EDGE: increasing uptake driven by terminal availability, coverage; incentives
  - Multiplicity of complementary technologies for optimal connectivity, service support: coverage everywhere
- **Convergence Strategy and Trends** (Oscar González Soto)
  - Domains: Network, Service, Access, Operational, Terminal
  - Migration options can vary by domain, how aggressive
    - Good modeling essential for business evaluation of alternatives
    - Focus on extended services for multiple customer types, multiple services domains: focus on one is least viable option


Convergence will be driven by market, economies of scale and competition

Will add Somalia to next version


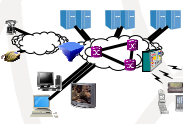



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## Session 5: NGN Migration Scenarios and Strategies (4/4)

- **PSTN/ISDN evolution to NGN** (Riccardo Passerini, ITU)
  - Key evolution principles:
    - Separation of transport, control, management and service functions.
    - Optimum use of new technologies, maximum reuse of existing resources
    - Comparable QoS to existing network
    - Enable full utilisation of applications and network resources
    - Ensure security provided at suitable levels: enough but not excessive
  - ITU-T Rec. Y.2261 - PSTN/ISDN evolution to NGN: scenarios and considerations

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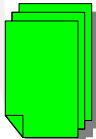


## Session 6: NGN Policy and Regulatory (1/2)

- **Session Chairman:** Ebrahim Al-Haddad (ITU)



### – Regulation for Next Generation Networks (Fabrizio Savi (Telecom Italia))



- Investment in access must be higher, is less flexible than in core
  - Operators need clear, stable regulation to enable appropriate decisions
- Need to avoid unfair advantage for incumbents
- How best to regulate in a rapidly changing environment?



### – Enabling NGN Regulatory Ecosystem for a Developing Country (Satya Gupta, BT Global Services)



- Statistics, licensing and promoting competition in India
  - Technology neutrality; need for NGN awareness and training
- Driving forces for and regulatory issues for NGN for developing countries
- Unified licensing scheme and considerations



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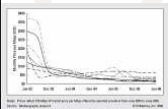
## Session 6: NGN Policy and Regulatory (2/2)



### – Telecommunications Policy and Next Generation Networks: (Keith Mainwaring, Cisco)



- Changing nature of regulation
  - Tension among regulation, “natural monopolies”, competition
- Competition ideals vs. realities
- ITRs and shift of voice traffic from CS to VoIP technologies
- Issues from traffic asymmetry. from declining cost of distance, from increased bandwidth demand
  - Tariffs tending towards actual costs
- Regulatory traditions challenged by blurring of voice, video, data



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# Session 7: NGN Testing (1/2)



**Session Chair: Riccardo Passerini (ITU)**

– **Methodology for NGN Technical Means Testing** (Denis Andreev, ZNIIS, Russian Federation)

- NGN testing: why, principles, approach, methodology, standards
  - Process: conformance, compatibility, interoperability testing
- ITU-T work in Q.8/11: Protocol Test Specifications for NGN
  - Model network as NGN prototype, use for QoS security, interworking
  - Centers for implementation and testing of new technologies could be base for public network modernization to NGN



– **The experience of NGN technical means testing at the model networks** (Dmitry Tarasov, ZNIIS, Russian Federation)

- Description of TechnoPark model network
- Main project: “Testing of SoftSwitch technology”, phased approach
- TechnoPark experience drives content of new Recommendations



– [http://www.itu.int/ITU-T/workprog/wp\\_search.aspx?an\\_sq=1&sn\\_sq=86](http://www.itu.int/ITU-T/workprog/wp_search.aspx?an_sq=1&sn_sq=86) and click on Q.8/11 deliverables at left to see details at right

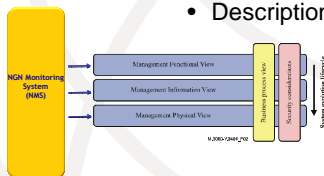
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# Session 7: NGN Testing (2/2)



– **General principles of NGN monitoring systems** (Denis Andreev, ZNIIS, Russian Federation)

- Tasks of NGN Monitoring System (NMS):
  - Control and monitor stand alone elements of NGN
  - Control and monitor elements implementing NGN under load
  - Control and monitor end-to-end call scenarios QoS parameters
- Description of NMS requirements, architecture



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## Session 8: NGN Technology and Systems - Industry Perspectives (1/3)

- **Session Chair:** John Visser (ITU / Nortel)



- **Next Generation Mobility: the WiMAX opportunity** (Turhan Muluk, Intel Corporation)

- WiMAX and 3G are complementary
- WiMAX on next-generation all-IP core network: technology of choice to meet future demand for personal mobile broadband services
  - Open standards, vendor interoperability, favourable IPR; products now
  - Technology neutrality regulation will provide equal opportunity
  - WiMAX needs support for inclusion in IMT-2000 Family at next ITU-R WP 8F meeting, 23-31 May 2007



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## Session 8: NGN Technology and Systems - Industry Perspectives (2/3)



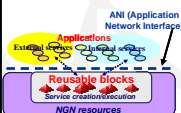
- **NGN Technology and Systems Development Trends** (Keith Mainwaring, Cisco)

- Convergence is a major theme; new: terminal device “blurring”
- “End-to-end” argument but some functions better centralized
- Don’t push infrastructure convergence too far (users can still choose), but device convergence expected to be reality
- Various starting points: inappropriate to assume fixed copper loop



- **Service Oriented Architecture for ICT** (Marco Carugi, Nortel)

- SOA enables new business revenues for the ICT ecosystem
- SOA brings new challenges to standards development – the intersection of IT and C in ICT
- A SOA framework for NGN an open service environment
- Align & harmonize across many SDOs, Fora, and Consortia
  - Example: dynamic computation at the right time and place: dynamic migration, unbeknownst to applications and clients



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## Session 8: NGN Technology and Systems - Industry Perspectives (3/3)



### – Batelco Experience in Deploying the NGN (Dr. Abdulla Khalifa Al Thawadi, Batelco)

- Aim: create a packet-based network to support voice, data, mobile
  - Converge islands of capability via a common approach
  - Focus investment in new technology rather than extend aging systems
- MPLS-based core, 1 for voice to meet “5 9s”, 1 for data
  - Entire Bahrain PSTN transitioned to a SoftSwitch (1:1 redundancy)
  - Mobile: MSCs to SoftSwitch, BSCs connected to media gateways
  - Next step: converge voice and data to a common MPLS core
  - Internet also migrated to MPLS core, 2 int'l gateways, 2 data centers
- Challenges:
  - converging service provisioning, fulfilment; integrating management
  - HR challenges: training and orientation of staff
- Key message: change is not overnight; careful planning essential



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## Session 9: NGN Network Planning (1/2)

### • Session Chair: Riccardo Passerini (ITU)

#### – Planning and design requirements for NGN (Oscar González Soto)

- Key requirements (IP traffic is stochastic, but different models apply)
  - Multiservice flows: new requirements on NGN and 3G models and tools
  - Interoperability, interconnection: special effort to ensure performance
  - Many new technologies, capabilities: need country-specific solutions
  - Convergence complexity requires use of high quality support tools

#### – Use and Applications of NGN Network Planning Tools (Ignat Stanev, International Teletraffic Congress, Bulgaria)

- ITU-D: long history of involvement in the development, application of network planning tools
- Overview of the many tools available for transport, optical network, radio access, etc., planning; e.g. a WiMAX study

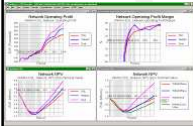


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## Session 9: NGN Network Planning (2/2)



### – Business cases for NGN and WiMAX based on STEM (Oscar González Soto)



- Business modelling tools must be quick and flexible
  - Case study: xDSL vs. WiMAX: WiMAX optimal for low density limited video areas, dual strategy best for common hybrid scenarios
- Technologies available require analysis of wide range of scenarios
- Large differences in migration to NGN scenarios require powerful and high quality tools to support the planning process



### – Planning of Broadband Wireless Access for Rural and Remote Areas (Ignat Stanev, International Teletraffic Congress, Bulgaria)



- Business case for rural markets “less interesting”
  - BB access depends on IT penetration, influences rural BB access
- Case studies: Oman, Papua New Guinea, Mali (Bamako)
  - Market forecasts needed for optimization analyses, add BB wireless terrain analysis in application of planning tools

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## Panel Discussion: Fostering the Development of NGN in the Region

- **Moderator**                      **John Visser, ITU / Nortel**
- **Participants**
  - **Yacoob Sabt**                      **Batelco**
  - **Satya Gupta**                      **BT Global**
  - **Riccardo Passerini**              **ITU-T**
  - **Fabrizio Savi**                      **Telecom Italia**
  - **Denis Andreev**                      **ZNIIS, Russian Fed.**
  - **John Visser**                      **Nortel**
  - **Chae Sub Lee**                      **ETRI**
  - **Tina Tsou**                      **Huawei Technologies**
  - **Oscar González Soto**              **Spain**
  - **Marco Carugi**                      **Nortel**

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# Thank you!

John Visser, P.Eng.

- ITU: Chairman, ITU-T SG 19 Mobile Telecommunication Networks
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