ITU-D Regional Development Forums 2010 on NGN and Broadband (ARB, EUR & CIS Regions): "NGN and Broadband, Opportunities and Challenges"

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Overview and Progress in Implementing Next Generation Networks

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Abstract

- NGN represents a major transition in the approach to providing both basic voice and enhanced communications services of all types. This presentation will briefly highlight some key NGN concepts and the current ITU work on NGN. But what is the current reality? A series of examples of progress drawn from various parts of the world will be reviewed showing the deployment of the new technologies.

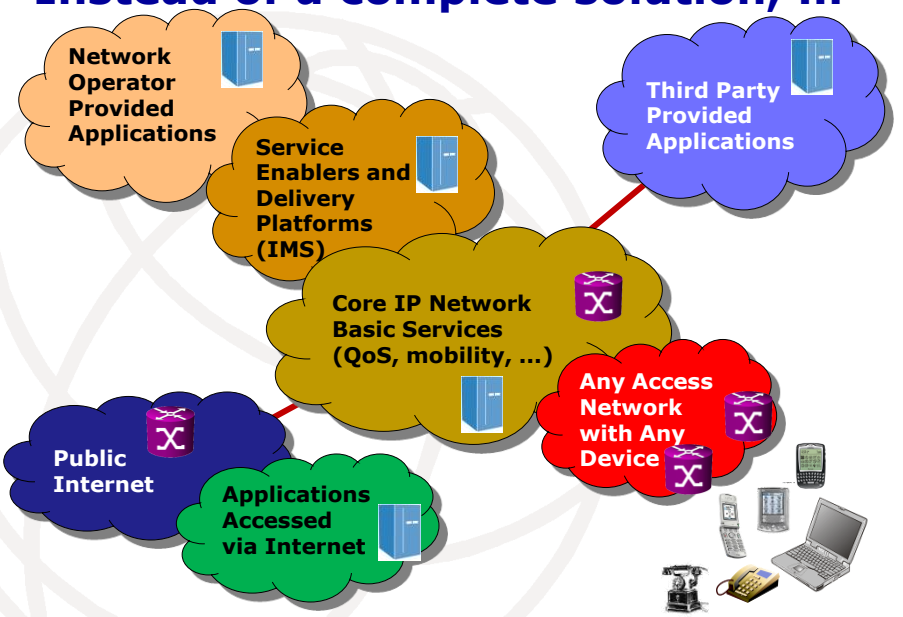
Outline

- Introduction
- Key Definitions
- NGN Characteristics
- Mobility and NGN in ITU-T
- Transition from existing networks
- Early Deployments
- Recent Announcements
- Issues

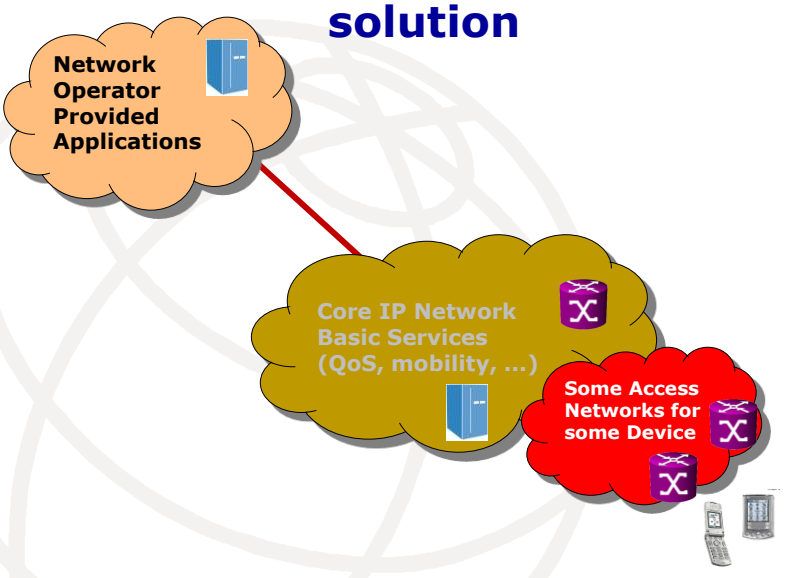
Introduction

- Challenge: business case
  - It is nearly always less costly to deploy a service-specific solution when introducing a new service than to deploy a general purpose solution
  - In the mid-1980s, operators were often reluctant to deploy SS7 because a business case based solely on replacing existing signalling systems wasn't attractive (break even or marginally positive)

Instead of a complete solution, …



… it is tempting to provide a partial solution



Need to look forward!

- 20/20 Hindsight
  - Today, it is widely recognized that SS7 was a transforming technology that enables many high revenue network wide services, plus it is the nervous system on which mobile systems depend
  - "Prediction is very difficult, especially about the future."
    - Niels Bohr, Danish physicist, won the Nobel Prize in Physics in 1922*

* Aage Niels Bohr, son of Niels Bohr, also won a Nobel Prize in Physics in 1975

Key Definitions (Rec. Y.2001)

- **Next Generation Network (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. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports **generalized mobility** which will allow consistent and ubiquitous provision of services to users.

ITU-T Rec. Y.2001 General overview of NGN
www.itu.int/rec/T-REC-Y/recommendation.asp?lang=en&parent=T-REC-Y.2001

Key Definitions (Rec. Y.2001)

- **Generalized mobility**: The ability for the user or other mobile entities to communicate and access services irrespective of changes of the location or technical environment. The degree of service availability may depend on several factors including the Access Network capabilities, service level agreements between the user's home network and the visited network (if applicable), etc. Mobility includes the ability of telecommunication with or without service continuity.

ITU-T Rec. Y.2001 General overview of NGN
www.itu.int/rec/T-REC-Y/recommendation.asp?lang=en&parent=T-REC-Y.2001

NGN Characteristics I

- Packet-based transfer
- Separation: control/bearer, call/session, application/service
  - Independence of service-related functions from underlying transport technologies
  - Decoupled service provision from transport
- Service building blocks: wide range of services, applications
  - Consistent user perception of services
- Generalized mobility
  - Converged services between fixed/mobile

NGN Characteristics II

- Access independence
  - Made easier with everything on IP
- Support of multiple last mile technologies
  - Broadband capabilities with end-to-end QoS
- Unrestricted user access to different service providers
  - Multiple identification schemes
- Interworking with legacy networks
- Compliant with regulatory requirements
  - emergency communications, security, privacy, lawful interception, etc.

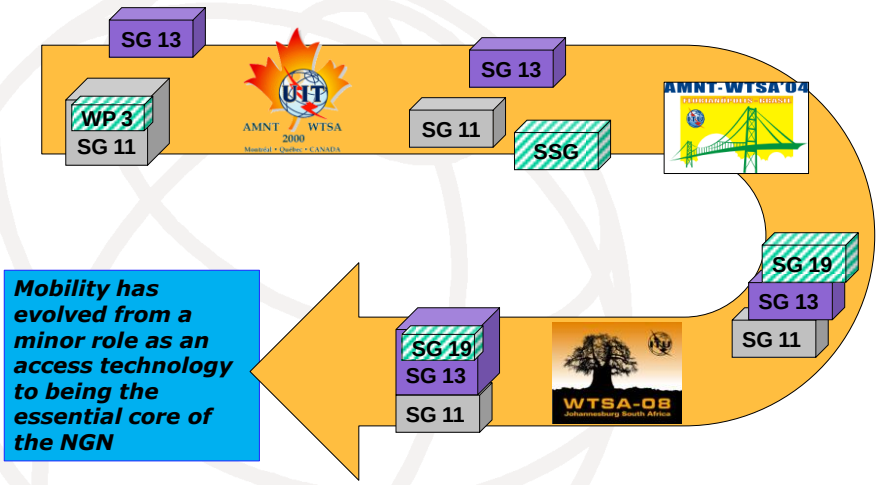
NGN Benefits

- NGN: forward looking technologies, lower costs, greater flexibility
- NGNs will:
  - promote fair competition
  - encourage investment
  - meet regulatory requirements
  - provide open access to networks
- while:
  - ensuring universal access to services
  - promoting equality of opportunity to users
  - promoting cultural and linguistic diversity
  - recognizing need for global cooperation

Convergence

- NGN is not about fixed-mobile convergence *per se*
- NGN is about telephony to internet migration
  - Applies to both fixed and mobile
  - Growth of mobile vs. fixed, changing balance is also a paradigm shift
  - Leads to commonality and hence convergence

Evolution of Mobility and NGN Studies in ITU-T



ITU-T NGN-GSI

- NGN is a major transition in the approach to basic voice and enhanced telecom services: shift to "native IP"
- Mobility has evolved from being merely an access technology to becoming one of the essential capabilities required of NGN
- ITU-T formed the NGN-GSI in the previous study period and it is continuing its work
- More information:
  - www.itu.int/ITU-T/ngn/

Transition from Existing Networks

- Addressed in ITU-T and ITU-D
- ITU-T: Q.14/13: Service scenarios and deployment models of NGN
  - NGN needs simple, clear deployment models: use case service scenarios, user point of view
  - Need scenarios with multiple service providers to realize service convergence
  - Study items include service scenarios and technology-based scenarios
  - www.itu.int/ITU-T/studygroups/com13/sg13-q14

Transition from Existing Networks

- Addressed in ITU-T and ITU-D
- ITU-D: Q.18-1/2 Implementation aspects of IMT-2000 and information-sharing on systems beyond IMT-2000 for developing countries
  - Ways of implementing IMT
  - Key elements to provide efficient and cost effective implementation of IMT
  - www.itu.int/ITU-D/study_groups/SGP_2006-2010/documents/Questions/Q18-1-2.pdf
- More input and effort is needed to progress these areas in both ITU-T and ITU-D

Early Deployments I

- AT&T brings first 'IMS service' to U.S.A. 2006 (ref.)
  - K. Williams, Exec. Director Technology, AT&T Wireless Unit: "... because IMS is an enabler it is difficult to extrapolate a business case based on one service like video share." "... IMS will prove its worth by enabling multiple services."
- Video share service one of the earliest 'IMS services' to come to market.
- AT&T Video Share service enables users to add live video feed while talking on mobile phone
  - Uses circuit switched UMTS network for voice, IP/IMS for video
  - Handset's IMS client uses SIP over IP to communicate with CSCF and HSS servers in core IMS network with no need for an application server
  - Uses IMS to manage the video sessions over the operator's IP network

Early Deployments II

- China Netcom's Beijing Branch (Beijing Netcom) - April 2007 (ref.)
  - First commercial IMS network in China
  - Includes IP-Centrex solution
  - IMS multimedia telephony system provides value-added services; focus on IP-Centrex for enterprise customers
- Beijing Netcom:
  - To provide telecom-quality cost-efficient IP multimedia services addressing the needs of high-end enterprise users in Beijing area now and in the future.
  - Supports introduction of new multimedia services (voice, data, audio, video) to enhance user experience in Beijing area, including visitors and participants in the 2008 Olympic Games

Deployments I

- Telefónica SA, Spain (ref.)
  - "Mobile Attendant" service provides personalised, reliable, easy-to-use advanced communications experience across wireless and wireline networks
  - Integrates voice, video, text and data into one seamless communications environment, part of Telefónica's vision linking fixed and mobile networks together to deliver a converged communications experience
  - PC software manages calls running on GSM or 3G phones via a simple graphical interface
  - Can simultaneously run multimedia sessions from PC including presence and reachability messaging updates
  - Future: add a Personal Assistant with capabilities to enhance productivity for field-based and highly mobile personnel

Deployments II

- KPN - Netherlands, Sep 2006 (ref.)
  - Started IMS-based voice services over BB in 2007, part of €1bn+ spend on all-IP network, completion in 2010
  - Consists of a BB VDSL/FTTH-based network and IP-based platforms to bring IP-based BB services to customers; switch off legacy networks
  - Will save KPN €100M+/year in reduced OPEX costs; will need 1/3 of staff vs. legacy networks
  - IMS is central to plans: start with simple voice services, then VoIP-based IP Centrex, wireless virtual PBX, etc.
  - Issues: regulatory confusion
    - How to classify and charge for VoIP calls? As voice or data?
    - Net neutrality and IP interconnect: who gets paid for what when an incumbent shares its network with 3rd party service providers?

KPN, Netherlands

- IMS is central to plans: once in place, will deploy fixed and mobile IP-based services, starting with simple voice services and moving to VoIP-based IP Centrex, wireless virtual PBX and messaging services
- Issues: regulatory confusion
  - How are VoIP calls classified and charged for? Is it voice, or is it data?
  - Net neutrality and IP interconnect: who gets paid for what when an incumbent shares its network with 3rd party service providers?

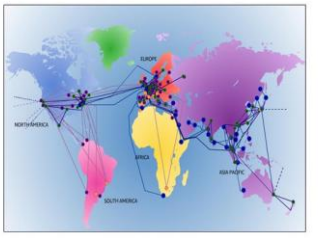
Deployments III

- Bahrain Telecom (Batelco)
  - Investing US$57M in NGN project across the kingdom
  - Started Sep 07; completed Jan 09 (original plan 5 yrs!)
  - Significant simplification of network
  - First country with complete country wide broadband
  - Provides NGN services: triple play (voice, data, video) on 1 line which traditionally only carried voice telephony
  - 176,000 lines migrated to NGN
  - Migration did not disrupt normal service
  - Now customers can connect to Batelco BB internet same day vs. one week
  - NGN delivered on promise to bring affordable BB access to all households making Bahrain among the best connected in the world

Deployments IV

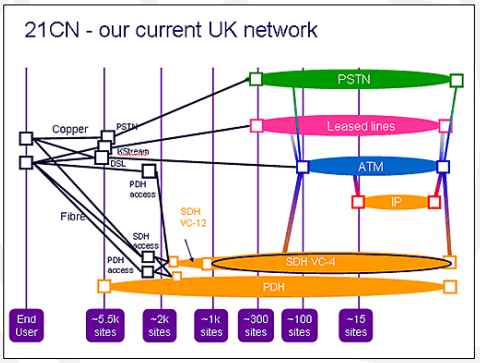
- "Delivering the future - BT's 21st Century Network" (ref.)
  - Software driven network, simpler portfolio of next gen. services
  - Platform for innovation to put flexibility and choice in the hands of customers
  - BT serves markets in 172 countries: maximum global consistency
  - Key technologies:
    - IP is key as common transport protocol
    - SIP allows service provider to control the communications activity to meet a customer's requirements
    - MPLS for efficient routing of BB IP traffic flows
    - IMS to support innovative services
    - Also: SDH, Virtual LAN, WDM

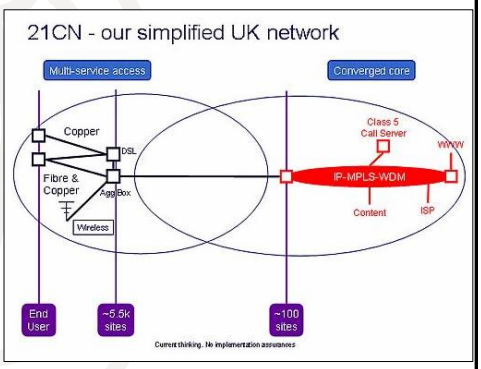
BT's global network



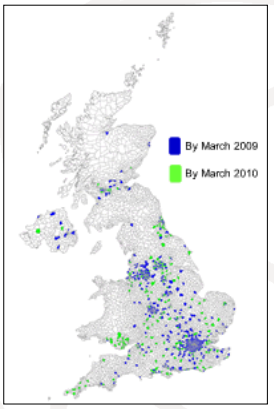
BT's 21CN

- Illustrating the significant simplification of the network
  - Reduced OPEX plus increased reliability

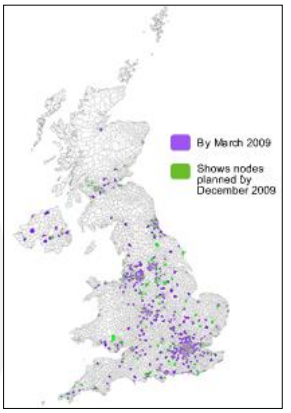




BT's Progress



Next generation broadband enablement – to March 2010



Ethernet node deployment – to December 2009

Deployments V: Telecom Italia

- Coverage in selected cities using large scale FTTH/FTTB to provide ultra BB via overlay
  - Fibre to exchange : 35% @ 20M bps
  - Fibre to cabinet: 50% @ 50M bps
  - Fibre to building/home: 15% @ 100M bps/1G bps
- Milan to have 100% coverage by 2011
  - Rome 70%, Turin 55%, Naples 50%, 16 other centres 30%
- Services: high speed internet, voice, video, gaming, community, HDTV, security & comfort, e-learning, Tele-Assistance, music
  - Home: IPTV, Web 2.0, Connected Home, Tele-Surveillance
  - Business: flexibility, videoconferencing/collaboration, virtual office, digital shop, surveillance
- www.slideshare.net/ceobroadband/ftth-conference-2009-telecom-italia-domestic-ngn2

Deployments VI

- TeleNor VIPNet: enterprise IP communication services
- Slovak Telecom: PSTN replacement enabling new services
- BellSouth
- Telecom Egypt
- Telkom Indonesia
- Verizon
- NTT Japan
- Telecom New Zealand
- Kazakhstan: Kazakhtelecom has completed the installation of NGN in Petropavlovsk, invested ~US10M in Petropavlovsk by end 2009
- India: NGN being deployed by major carriers including BSNL, MTNL, Tata Teleservices, and Aircel
- Etc., etc., etc.

Deployments V

- Limited infrastructure in developing countries (notably Africa) poses a challenge
  - Good news: many initiatives: BB, rolling out IP networks, new fibre optic links
  - But still large unsatisfied demand for basic voice: VoIP a primary application
  - Steady improvement in Internet bandwidth, regulatory environment, growing number of VoIP service providers entering the market

NGN, IMS and the EUR and CIS Region

- Good news:
  - Broadband access is moving ahead
    - e.g., DSL, fibre optics, WiMAX being deployed or planned in Moldova
  - Multiple softswitch installations in EUR and CIS region making networks more data oriented
    - add capacity, flexibility, new services
  - Upgrading infrastructure is fundamental to economic development
    - need to be able to handle many types of traffic
    - include support for internet access for remote areas

NGN and Basic Voice

- Technologies used for NGN (IP, SIP, etc., - see BT 21CN charts) apply to both modernizing existing networks and to installing new networks:
  - Lower costs to install
  - Reduced OPEX
  - Services flexibility
  - Scalability
- Plus additional alphabets and languages coming on stream enable internet services with local, and locally developed content
  - e.g., http://blogs.zdnet.com/BTL/?p=14051

One Size Does Not Fit All

- "One size fits all" sounds great but is rarely the case
- Who knows your operator and market situation best? You do!
  - Apply what you learn from the experience of others ...
  - ... but adjust it to fit your reality

Verne Troyer (0.81m) and Yao Ming (2.29m) in Apple TV ad
www.youtube.com/watch?v=Xvbuwfawqcc

NGN Key Points

- NGN is a major transition in the technology for both basic voice and enhanced telecom services
- NGN is based on IP packet transport with separation of control/bearer, call/session, application/service
- NGN transition from legacy networks and interworking with other networks are key parts of ITU-T NGN-GSI program and ITU-D's support work

Summary

- This presentation has highlighted deployments in a range of markets from highly advanced to developing
  - Clear indication of viability of NGNs and IMS
- But one solution will not fit everyone
  - Each market needs to tailor its approach to its own situation
- The technology is changing: also need "Next Generation Regulation" for Next Generation Networks

Thank you!

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