NGN Planning and Migration

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OUTLINES

- NGN DEVELOPMENT AND IMPLEMENTATION
- NGN IMPLEMENTATION EXAMPLES
- REGULATORY CHALLENGES
- OPEN QUESTIONS ON NGN REGULATION
- ITU-D GUIDELINES ON NGN FOR DEVELOPING COUNTRIES

NGN DEVELOPMENT AND IMPLEMENTATION

BUILDING ELEMENTS FOR NGN DEVELOPMENT

- **COUNTRY'S POLICY AND STRATEGY FOR BROADBAND**
- **REGULATORY POLICY**
  - MACRO AND MICRO
  - LEGACY REGULATION?
- **OPERATORS BUSINESS MODELES**
  - MIGRATION OF FIXED/MOBILE NETWORKS OR BOTH TOWARDS NGN
  - USER DATA BASE AND USER'S DEMANDS
  - BUSINESS CUSTOMERS
  - INTERNATIONAL TRAFFIC AND VoIP

NGN DEVELOPMENT IN DEVELOPING COUNTRIES

- NGN development is linked to national broadband policy
  - *More broadband, better NGN*
    - *Denmark, N. Korea, Iceland*
- Lacking in many developing countries
  - *Low penetration rates*
  - *Incumbent dominance*
  - *Economy is not ICT based*
- Evolutionary paths different in developing and developed countries:
  - *Affordability and access*
  - *Degree of competition*
  - *Pace and manner of reform*
- Leverage opportunities?
  - *Who will be driver: Policy makers, Regulator, Operators, Customers*

STAKEHOLDERS' EXPECTATIONS

- **OPERATOR AND SERVICE PROVIDERS**
  - Want that:
    - Investment is optimized, OPEX is cut
    - NGN architecture leads to satisfactory QoS across multiple interconnected NGN
    - Continuity of services offered to end-users
    - Improvements in network architectures , easy maintenance.
    - Simplification and harmonization of services through single interface/multiple devices
    - Quick time to market for new service
- **USERS**
  - Will benefit from the ability of network operators and service providers to provide guaranteed QoS of voice services on NGN
  - New services
  - Cost reduction by sourcing voice and data
  - Want to switch between different communication devices
- **MANUFACTURERS**
  - Want to know that currently available terminals are suitable for use with NGN services
  - Confirmation of network architecture suitability will give guidance of the required performance of routers and media gateways.
- **REGULATOR**
  - Want to have a better assurance that users are not adversely affected as PSTN services migrate to NGN
  - Preserve competition

NETWORK OPERATORS/ SERVICE PROVIDERS,

- Where and how to start?-

- PSTN optimization and consolidation?
- From NGNs drivers?
  - CAPEX and OPEX reduction
  - Revenue generation and protection
  - FMC
  - IMS
  - NG Access.
- Following examples from developed countries?
- Have EVOLUTIONARY OR REVOLUTIONARY APROACH?
- Have TOP-DOWN or BOTTOM-UP APPROACH

NETWORK OPERATORS, SERVICE PROVIDERS, CONTENT DEVELOPERS

- **BUSINESS OPPORTUNITIES**
  - NGN remains the only way to preserve gradually declining revenues
  - Foster innovation dynamic
  - New services/substitution and service differentiation
  - Market share protection and possible growth
  - Saving on network maintenance, personnel, IT and power consumption (ITU figures: Network maintenance ~30%, Personnel ~30-40%, IT cost ~40%, Power consumption ~40%)
  - Network consolidation requires less physical assets (e.g. real estate ~40% saving)
  - Economies coming from IP

NETWORK OPERATORS, SERVICE PROVIDERS, CONTENT DEVELOPERS, -Business risk-

- High investment required:
  - core – justified by cost savings and relatively low risk
  - access –big demand uncertainties, major investment before demand are clear, type of regulation
- Simultaneous investment in NGN in fixed and mobile
- Uncertainty about business model
- Entrance of third party may diminish incumbent revenues
- Technical challenges
- New legal environment and return of investment

IMPLEMENTATION EXAMPLES

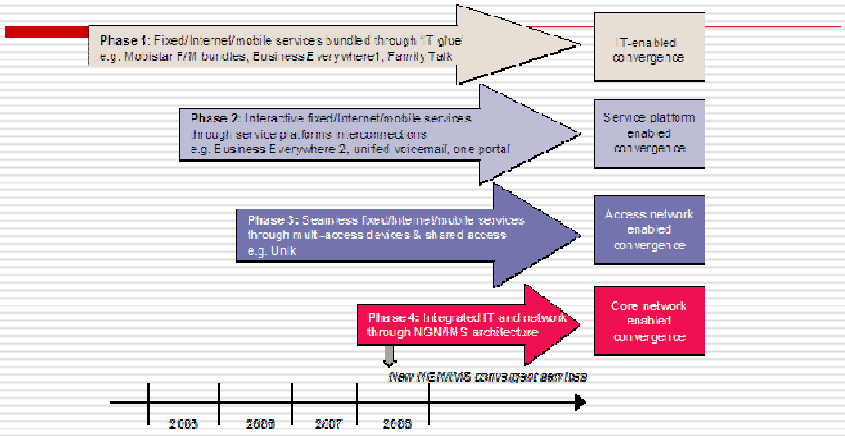
Example of NGN progress

Operator	Start	Plans
BT	• 2004 vision • 2007 migration of customers to NGN in trail areas Wales	• Full migration in 2011
France Telecom	2005, NGN plans in France Telecom strategy	• France Telecom aims to have fully integrated its IT and networks into an NGN/IMS architecture by 2008 • To begin offering new NGN/IMS convergent services from 2008 onwards.
KPN	March 2005 NGN Strategy	KPN hopes to complete its NGN backbone and the majority of its access network by 2010
SA Telecom	• NGN strategy in 2006. • From 2008, Telkom SA begins selective PSTN migrations and increase core bandwidth to 10Gbps	• Anticipates full migration beyond 2011.

Examples

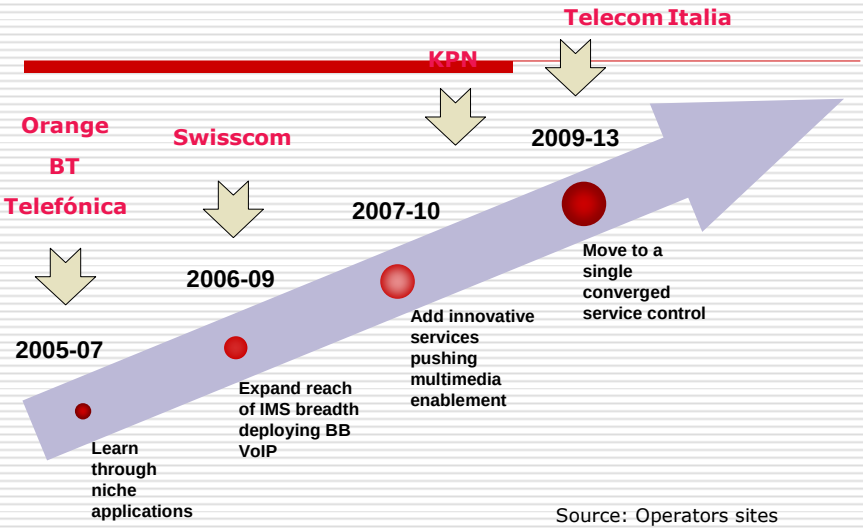
- **BT**
  - "With the migration of its network to NGN (21 Century Network), BT expects savings in operating expenses of £1bn (about 1.5bn €) starting 2008/09. The expected investment amounts to £10bn (about 15bn €) "(**KIRSCH, HIRSCHHAUSEN, 2008)**.
- **KPN**
  - "expects a reduction in operating costs of €850 million up to 2009 while the total capital expenses for the migration are estimated to be €0.9 billion. The extension of fiber to the street cabinets renders the MDFs obsolete. About 200 of the 1,391 MDF locations will remain in operation as interconnection points to the backbone (HENDRIKS, 2007, OPTA, 2006b). KPN expects an additional revenue of €1 billion from sales of the MDF real estate " (**KIRSCH, HIRSCHHAUSEN, 2008)**.
- **Schenzhen Telekom**
  - **"Improved network operation quality:** Operation records from the four NGN end offices of Shenzhen Telecom are convincing proof of an improved network operation quality. For instance, the 33,000-line Huangmugang office (the NGN end office with the largest capacity) serves as a good example. The operation indices from the NGN end office are much better than those of the original office, and the call completion rate showed an increase of 12%. Even with an increase in traffic, the softswitch system continued to run stably and the indices were much improved.
  - **Lower maintenance cost:** After the original end office was converted into an NGN end office, indices like integrity, occupied space, and power consumption of the NGN equipment proved to be superior to those of the original TDM switch. After rebuilding, the occupied space was reduced by 40%, and power consumption by 63%. Hence, in a large-scale NGN, the maintenance cost will obviously be much lower. With its innate advantages in services like, IP Centrex and video services, NGN will quickly become the first choice in the rebuilding of the TDM network." (**Huawei Service, Multimedia library, Issue 20, 2005).**

France Telecom Evolutionary Strategy



Source: France Telecom

Approach to IMS implementation



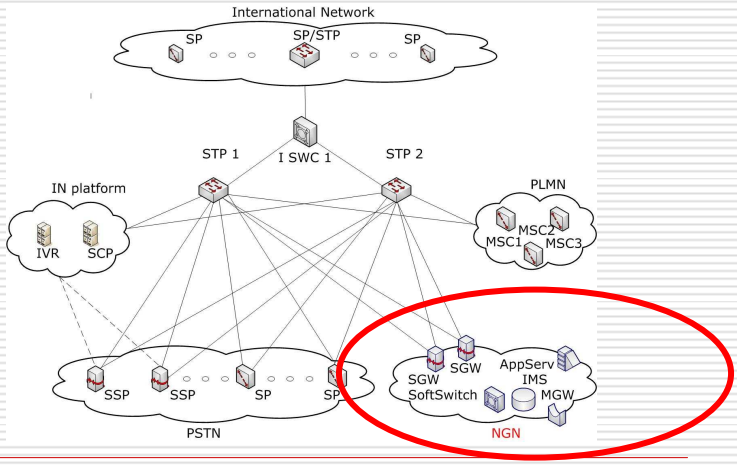
Source: Operators sites

Example: Small operator from developing country

-Telekom Srpske, B&H-

- New services are based on the NGN and IMS architecture.
- Strategy
  - parallel existance of TDM and NGN network till full migration to NGN (Year 2012.)
  - 75.000 PSTN users are migrated to Softswitch using MSAN platform - preserving all PSTN services (the end of the 2008).
  - Solutions consisting of IMS Core elements and Softswitch
- NGN Techno-Economic Aspects
  - Investment protection
  - Costs reduction (capital and operational)
  - Carrier grade reliability
  - Scalability
  - Improved product selection
  - Increase usage of the existing network infrastructure
  - Speed of innovation and introduction of services

Telekom Srpske First step towards NGN



Telecom Srpske: Next Steps in migration to NGN

- Full migration of PSTN users from TDM to NGN using MSAN and Softswitch platform (2012.)
- Offering new services: Video Call, Video Conference, Unified Messaging, Presence and Instant Messaging etc.
- Interconnection with the international VoIP networks
- FMC - Fixed Mobile Convergence

REGULATION CHALLENGES IN NGN ERA

REGULATOR'S OBJECTIVES

- PROMOTE COMPETITION
- FOSTERING INVESTMENT
  - Network modernization
  - Roll-out
  - Most of investment are done by incumbents
- INNOVATION
  - Infrastructure
  - services
- BALANCE between ex-ante regulation and ex-post remedies
- PUBLIC NEEDS
  - Universal service
  - Consumer protection
- SOCIO-ECONOMIC ASPECT
  - Investment in NGNs should lead to major economic gains

NGN AND REGULATIONS

- The emergence of Next Generation Networks (NGNs) raises profound challenges for regulators everywhere
- Different regulatory authorities have approached these problems in strikingly different ways depending:
  - In part on the overall regulatory policy,
  - In part on the nature of the NGN migration envisioned by major market players.
    - NGN core network raises significantly different issues from those of the NGN access network.
  - In part on the nature of market power

REGULATORY CHALLENGES

- Macro and Micro
  - Macro- policy and structural issues
    - Legacy regulatory questions FROM VERTICAL TO HORIZONTAL; Regulatory lag and capacity; Affordability; Access regimes; Fostering competition and investment; Regulatory transparency
  - Micro-implementation:
    - competition, licensing, spectrum assignment, numbering, interconnection, consumer protection, universal services and access, standards and interoperability

NGA REGULATION - STATE OF ART-

- Many national regulators are at an early stage for this regulation
- NGA is economic bottleneck and needs a regulation, but from another side NGA operators need regulatory freedom to meet end user needs
- Survey on a number of OECD countries (DSL networks in all these countries except the USA, are subject to ACCESS REGULATION) shows that the regulatory discussion centers on three regulatory models for high-speed networks:
  - (1) access holidays or deregulation, e.g., in the USA and Germany,
  - (2) access regulation, e.g., in the Netherlands, the Republic of Korea, Japan, Belgium, and
  - (3) structural separation, e.g., in the UK, Australia.

Regulatory approach to enable competition

- Depend on country regulatory policy
  - General principles: light touch, targeted, proportional
- Introduction of mandatory reporting of QoS figures
  - already started in some EU countries, must be improved to be meaningful for users
- Regulate for market abuse/ dominance, concentration
- Distinguish between core NGN (effectively competitive) and NG Access –NGA
- Define the types of investment that regulator may give regulatory "holidays" (e.g. high speed access)
- Dominance should not be exempted as a result of NGN investment
- Despite NGN has the potential to increase competition, certain conditions of significant market power may still resist or some new troublesome forms might emerge.

Promote effective competition ***and not existing competitors***

OPEN QUESTIONS

- **Creation of new markets**
- **Market power and "Network effects"**
  - Implication for existing and future customer access
  - Any-to-any connectivity
- **Support for legacy wholesale products**
- **Interconnection**
  - Transport and service functional separation
  - Charging model for multiple providers in E2E services
  - Confrontation of two existing models (Internet model versus circuit-switched model)"
  - "Service aware" or "service agnostic" aproach

- **Pricing**
  - Will it be possible to separate connectivity and services (Operators aim for NGN to be no more then a complete re-building of PSTN on top of a new IP structure. Will NGN be more?)
  - Business models may not be change
  - Revision of international settlement system
- **Standards**
  - Technical

Country' studies into NGN issues

New Zealand Commerce Commission

- Involving engagement with **all stakeholders**, into NGN issues for defined time period
- **Scope of study**:
  - opportunities for innovative services to be delivered to end users;
  - opportunities for achieving greater efficiencies and cost savings
  - significant technical and operational design, and implementation, issues;
  - uncertainty for business plans and business models, including sustainable models for competitive entry;
  - uncertainty for investors;
  - regulatory and competition issues.
  - concern for continuity of service for end users
- **Aims od Study:**
  - Provide a roadmap for industry and the market so that there is a common understanding of the issues
  - Develop a robust analytical framework for assessing the impact of NGN on competition issues
  - Provide a strategic assessment of the likely impact of technological change on market structure and competition;
  - Give increased certainty to end users and stakeholders by providing guidance as to likely regulatory responses to market developments – for example, to identify likely triggers for regulatory forebearance or intervention;
  - Explore any joint industry processes which could provide ongoing transparency on NGN issues;

Country' studies into NGN issues

- Hungary: Project: Study on "The Regulation of Next Generation Networks" for the NHH
  - General developments in the communications sector
  - Technological basis of NGN
  - Regulatory tasks and instruments
  - Possible regulatory alternatives
  - NGN issues from a Hungarian perspective

NGN AND DEVELOPING COUNTRIES

ITU-D Guidelines for Migration of Existing Networks to NGN for Developing Countries-

- A vast majority of developing countries are aware of NGN migration and the challenge it raises;
- Many countries already introduced some components of NGN architecture within their networks like VoIP with softswitches or the introduction of national IP backbones; some have even migrated a significant part of their legacy voice architecture to NGN;
- Still, what characterizes many developing countries is the lack of Broadband access – especially in its wireline form (DSL, Fiber,…) – with respect to developed countries;
- Lack of Broadband access results in marginal if inexistent use of new NGN services – like IPTV and multimedia communication – in many developing countries;
- Many developing countries also view the new NGN architecture as being complex with competing standard bodies (3GPP, TISPAN, ITU,…) and fear that this standards are mature.

Role of developing countries

- Developing countries should be encourage to take a part in international effort to develop best migration path to NGN.
- Mr. **Roberto Viola,** *General Director of the Italian Regulator (AGCOM)*
  - "*If we wait for private capital to flow in the direction of NGN we might wait in certain parts of Europe for decades. The question that rises is whether you should wait for the car makers to build the highways. Telecom operators might for example leverage from regional governments and municipalities investing in optical fibers and other basic infrastructures".* *(EETT NEWSLETTER, ISSUE N° 17 \ JULY 2008)*

CONCLUSION

- NGN is a concept, not just a technology
- There are fundamental differences between NGNs and the traditional PSTN/ISDN.
- NGN is an attempt by operator to provide a single technology platform into the future to support converged services
- NGN is a global initiative, coordinated by ITU
- Robust and open standards are essential to the long term success of IMS and NGN
- Regulators will have an interesting time trying to manage what is likely to become standard/systems battle between various players

THANK YOU FOR YOUR ATTENTION!

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