

## **ITU Cross Regional Seminar on Broadband Access (Fixed, Wireless including Mobile) for CIS, ASP and EUR Regions**

### **Trends on Convergence and Migration Leaps**

**Chisinau (Republic of Moldova)  
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## **Agenda**

- **Convergence**
  - **Convergence related questions**
  - **Dimensions and profiles**
  - **Key factors: Economies of scale**
- **Market and Business trends per category**
- **Technology and Business Leapfrogging**

## Convergence related questions

- Does convergence refer only to Fixed and Mobile?
- Does convergence matter only to developed countries?
- Is convergence more expensive?
- What benefits may be addressed by convergence?
- How convergence may help developing countries?
- Others.....?

## Convergence dimensions

### Convergence is taking place at several domains

- ➔ **At Network domain**
  - One network for all service types: NGN, IMS
- ➔ **At Service domain**
  - Fixed, Nomadic, Mobile, Interactive and Broadcasting, Content, etc.
- ➔ **At radio Access domain**
  - DECT, WiMax, 3G, LTE, etc.
- ➔ **At Operational and Business domain**
  - OSS, Billing, etc, for all customer classes
- ➔ **At Terminal domain**
  - 2G, 3G, PDA, iPhone, iPad, etc.

## Convergence profiles

Convergence Domain	Level of convergence			
	Separated Implementation	Low level convergence	Medium level convergence	Full convergence
Network Core	●			
Operations	●			
Services	●			
Network Access and Edge	●			
Terminals	●			

Traditional Mode of Operation

Initial traditional status: Separated networks, services and operations

## Convergence profiles: trends

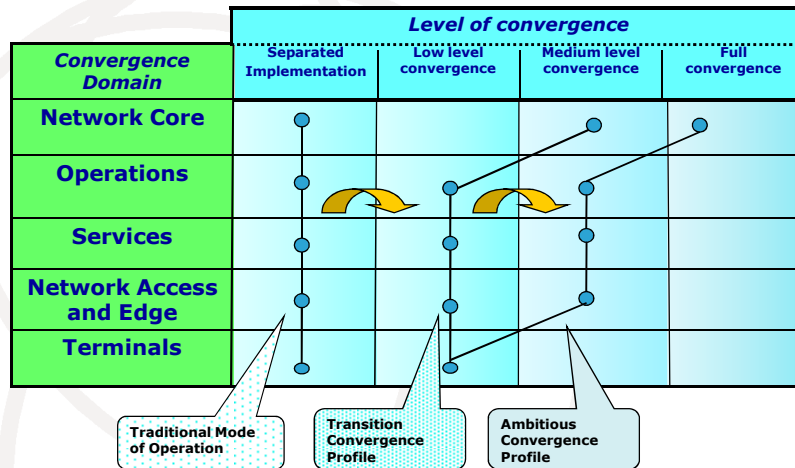
Convergence Domain	Level of convergence			
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Traditional Mode of Operation

Transition Convergence Profile

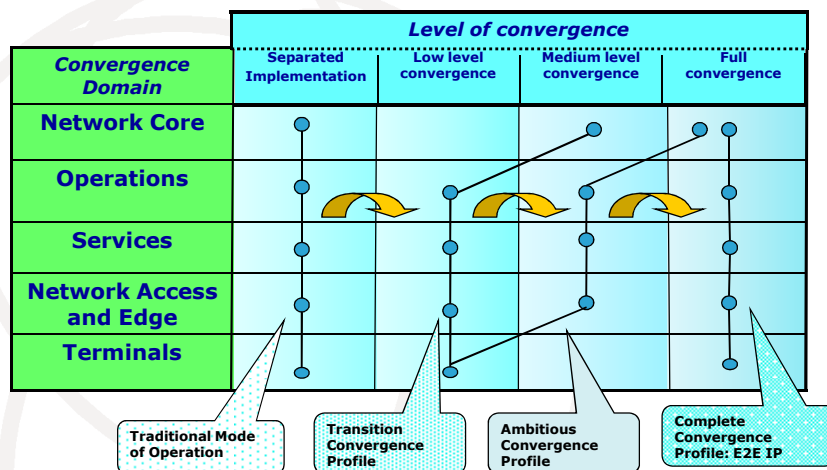
Example of convergence for most operators in developed economies

## Convergence profiles: trends



Example for leading operators on convergence (100% NGN on core and 30 to 70% on edge and access with IMS base)

## Convergence profiles: trends



Future profile driven by: Initial status, Market development, Economy of scale and Operator Strategy

## Convergence profiles: trends



- **Most leading operators implemented IMS** subsystems since 2007: >20 operational and few hundreds under pilot or planned
- Higher number of IMS started with fixed networks (mainly in EU) **driven by the service convergence**, followed by mobile networks (mainly in APAC)
- Main implemented subsystems are: **CSCF servers, HSS, BGCF, Voice Application Servers and Media Resource Functions** - audio and video announcements, multimedia conferencing, text-to-speech (TTS) conversion, speech recognition, etc. -
- Full functionality of IMS **requires end to end IP** that will enable innovative services and Reach Communication Suite (RCS)
- **LTE with IP terminals will be a key driver of IMS and convergence growth at service level after 2012**

## Key Factors: Economies of scale



Economies of scale (EoS) are an inherent characteristic to the telecom technologies that impact on solutions, efficiency and cost reduction

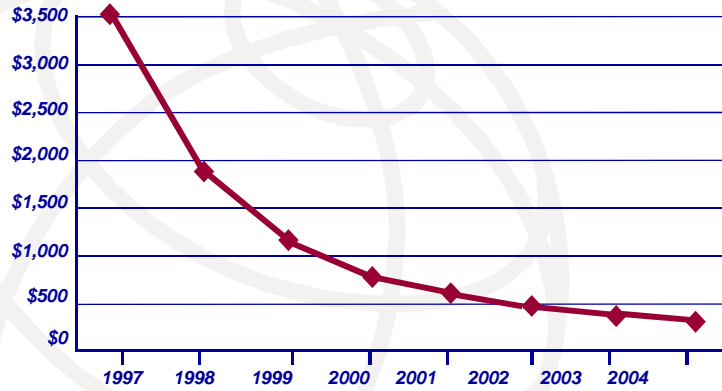
### The five dimensions of the economy of scale:

- By **Size** of the systems
- By **Technology** capabilities
- By **Traffic efficiency** with the occupancy
- By customers **Density**
- By **Volume** of purchasing

### Benefits per dimension

- Cost reduction per unit (i.e.: 10% to 30%)
- New technologies with higher productivity (i.e.: x10)
- Better utilization for a given GoS when larger systems (i.e.: +20%)
- Quadratic decrease with coverage radio increase
- Discount per volume in log scale (i.e.: up to 40%)

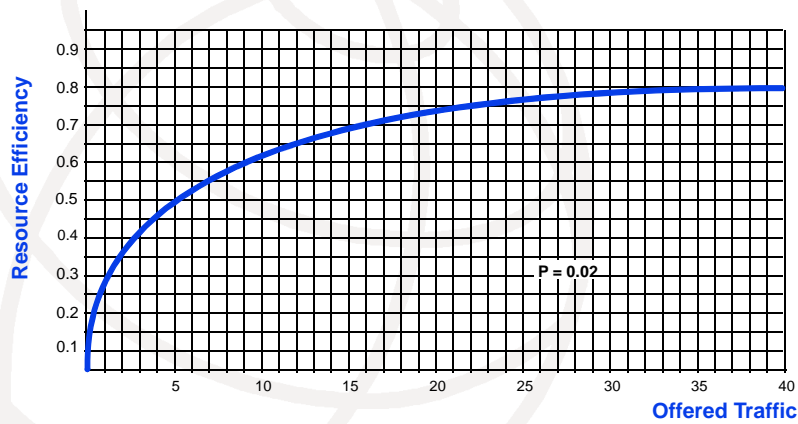
## Cost reduction per technology evolution. Example for Ethernet ports



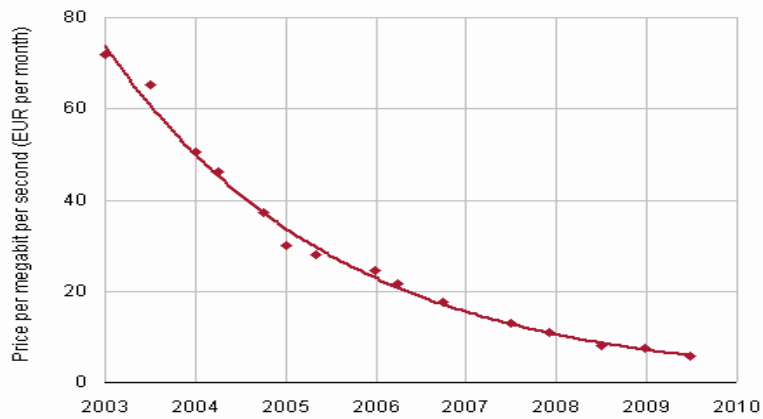
Source: Dell'Oro Group

## Economy of scale per traffic efficiency

Impact on efficiency increase for a given quality with traffic and group size (non-linear effect)



## Cost reduction per technology evolution. Example for fixed BB residential access in EU



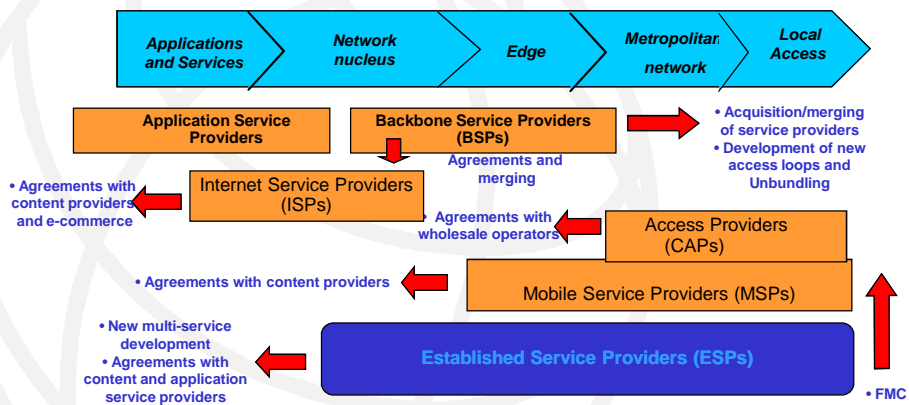
[Source: Analysys Mason, 2010]

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## Business domains and trends

Example of Value Added chain and operators movements to gain economy of scale and market



## Business Planning case

Evaluations to be based on robust techno-economical tools due to high number of alternatives and complexity

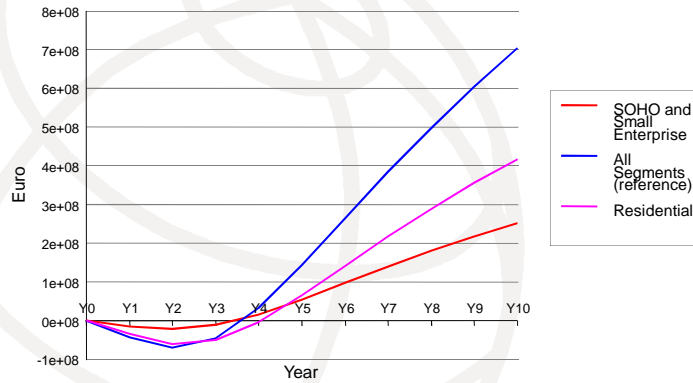
Case study performed for medium size country with mixes of customer classes and services domains:

- Multiservice IP Network with integrated operation available
- Three service categories: Voice, Data/Internet, Video distribution
- Modeling demands, multiservice traffic flows, dimensioning, network resources, CAPEX, OPEX and financial results for different levels of competition
- Evaluate differential future Cash-flows, NPV, IRR, etc. for a 10 years period



## Business Planning case

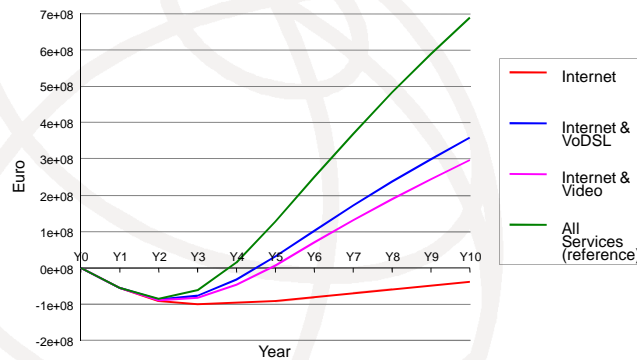
Effects of the mix of customers on Reference Scenario: Low competition level Network NPV



- SME and SOHO with quicker recovery but less NPV and company value at medium term
- "All customer segments" case with much better behavior

## Business Planning case

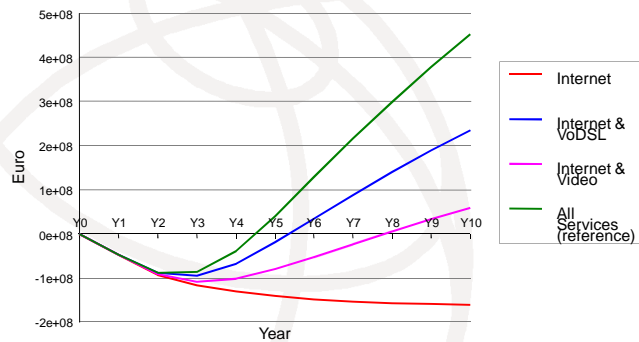
Effects of the mix of services on Reference Scenario: Low competition level Network NPV



- Major impact of service classes on NPV and company survivability
  - Single service classes without future
  - High benefit of "all services" case

## Business Planning case

Effects of the mix of services on typical scenario: Medium competition level Network NPV

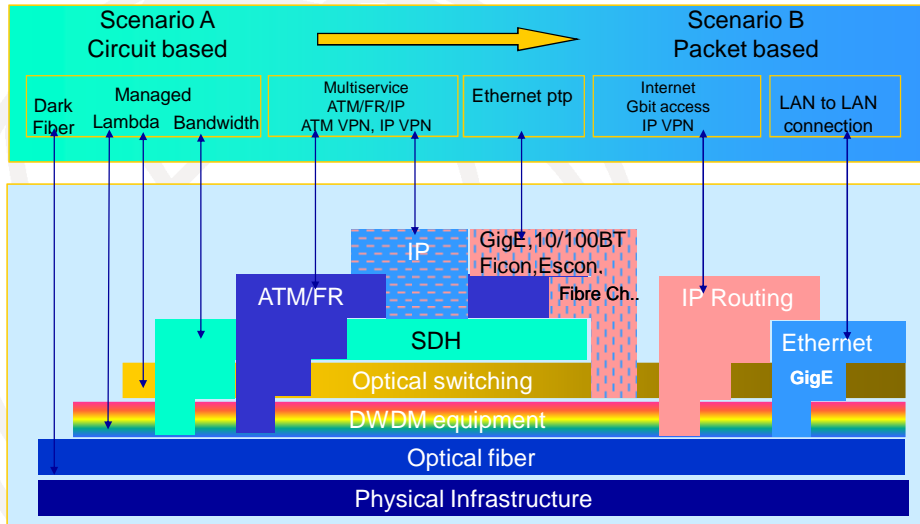


- Increase of competition level amplifies the previous effects on feasibility: big differences between service mixes
- Data only or single service classes without feasibility at medium term
  - Very robust behavior for the "all services" case

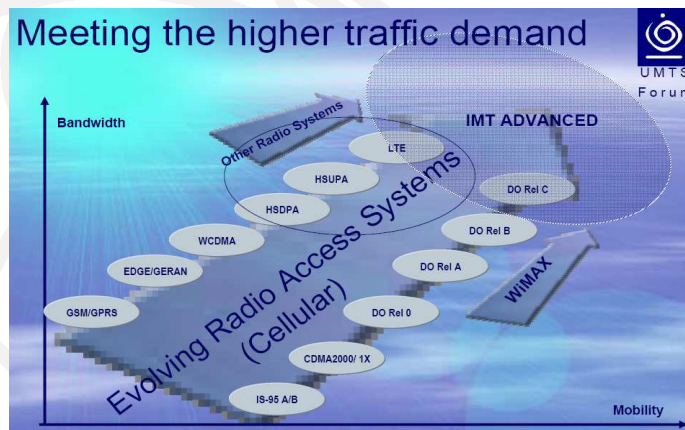
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# Technological alternatives at core

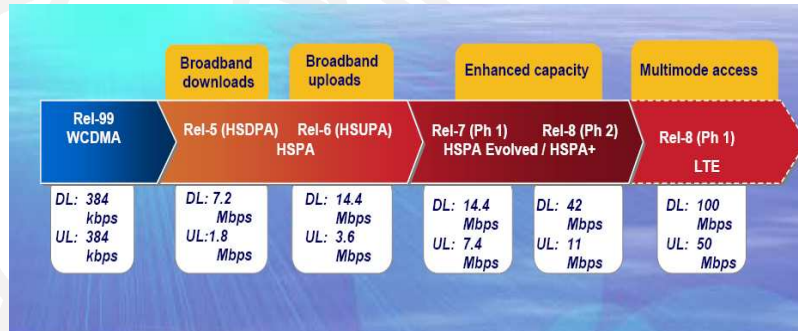


# Network Architecture towards NGN Trends in WLL technologies for Bandwidth and Mobility



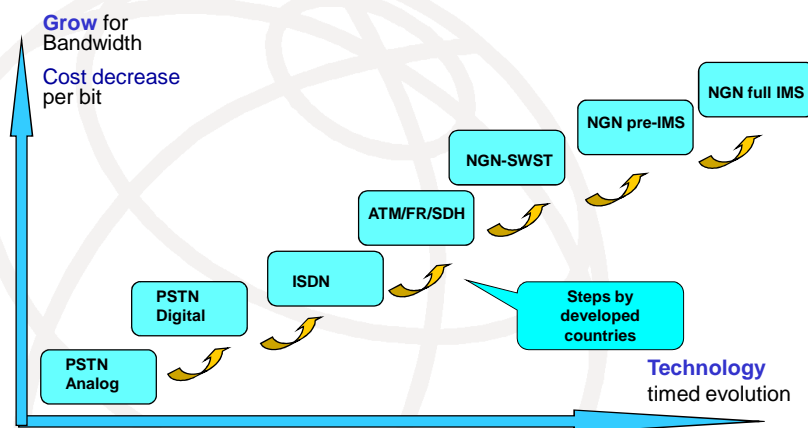
Convergence of different radio systems towards the integration of solutions and services at the IMT advanced

## Network Architecture towards NGN Trends in UMTS solutions for higher capacity and performance

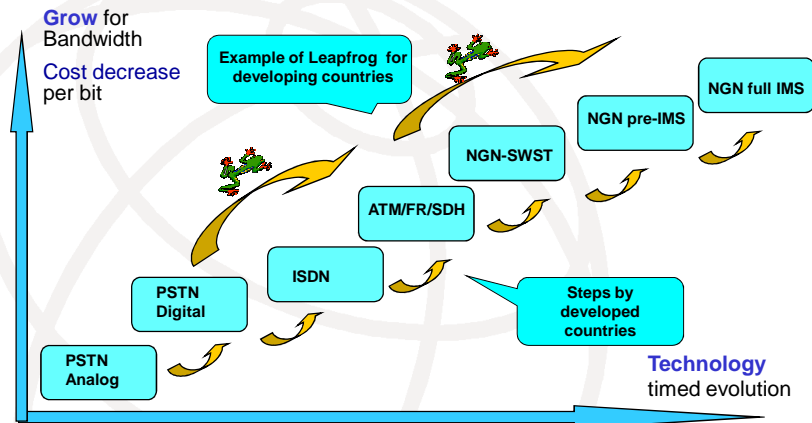


Evolution of the 3G and 3,5G versions towards 4G with increasing speeds and decreasing latency time

## Network Architecture towards NGN Fixed network steps/leapfrogging

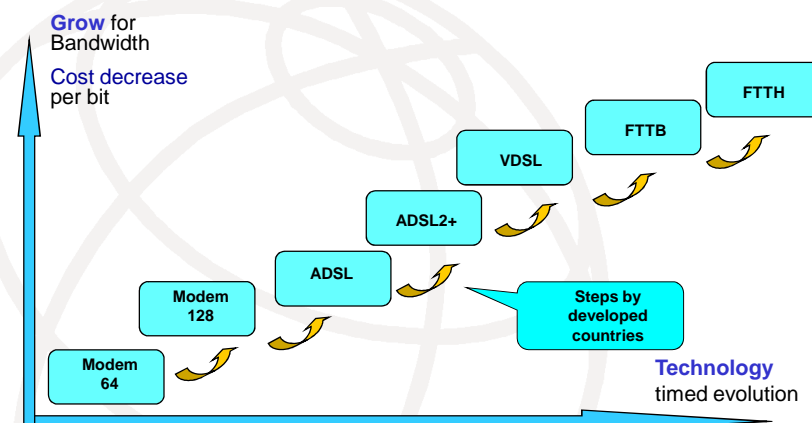


## Network Architecture towards NGN Fixed network steps/leapfrogging



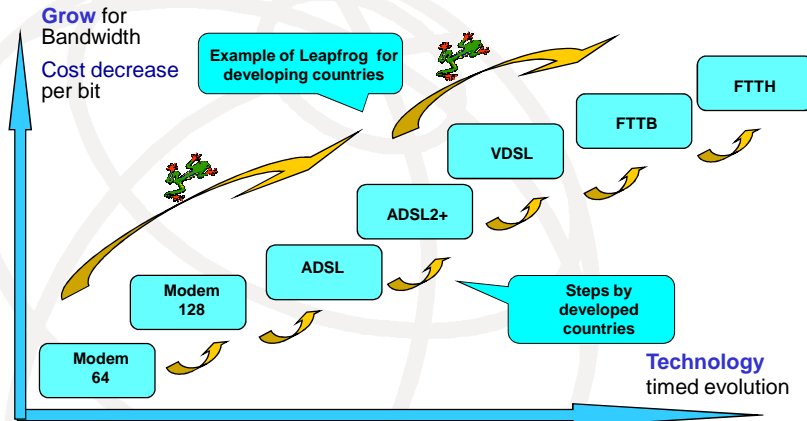
Migration strategy is strongly dependent on **country opportunity, infrastructure and service maturity**

## Network Architecture towards NGN Fixed Access network steps/leapfrogging



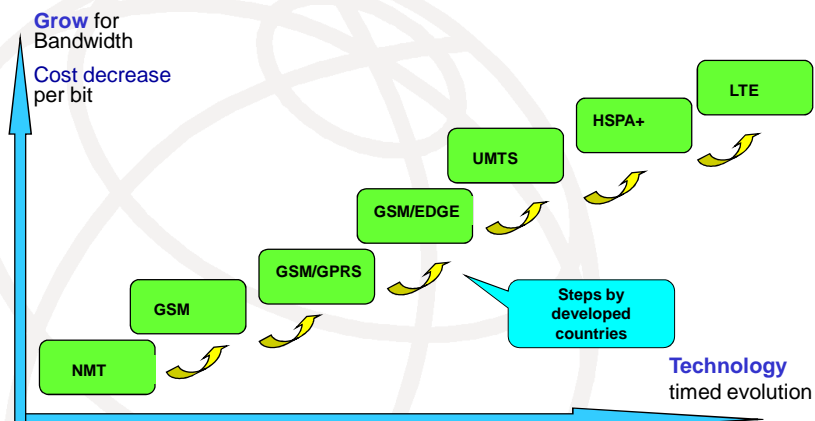
Historical migration steps for internet access operators with early development and services deployment

## Network Architecture towards NGN Fixed Access network steps/leapfrogging



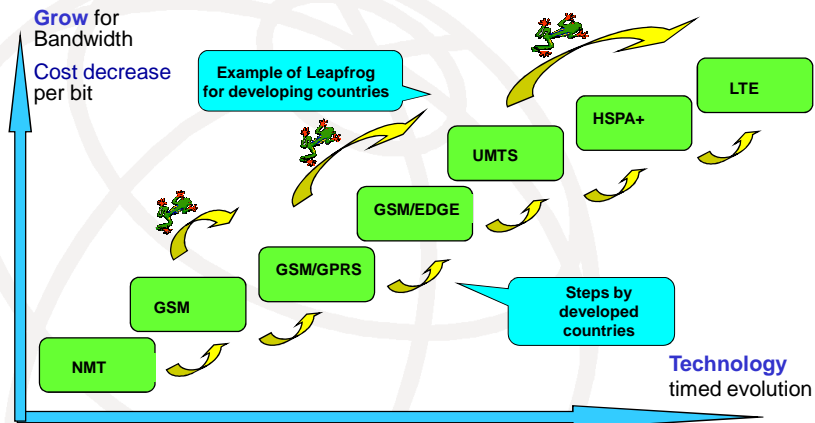
Migration strategy is strongly dependent on **country opportunity, infrastructure and service maturity**

## Network Architecture towards NGN Mobile network steps/leapfrogging



Historical migration steps for mobile operators with early development and services deployment

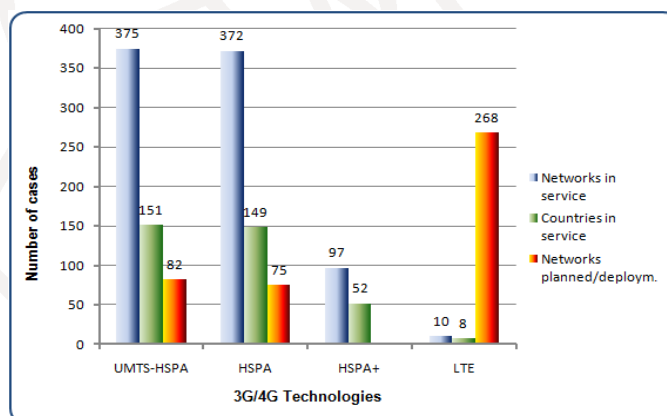
## Network Architecture towards NGN Mobile network steps/leapfrogging



Migration strategy is strongly dependent on **country opportunity, infrastructure and service maturity**

## Network Architecture towards NGN Mobile network steps/leapfrogging

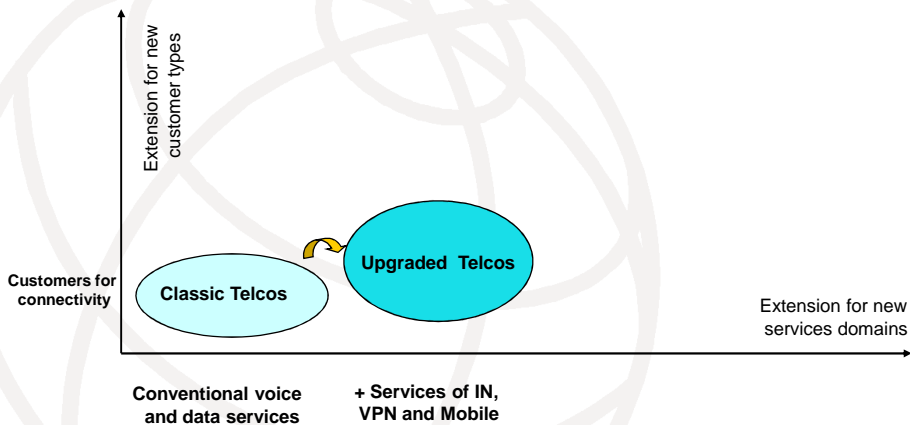
Current status for deployment of 3G networks and beyond as reported by 4G Americas organization (November 2010)



# Business Migration Leaps



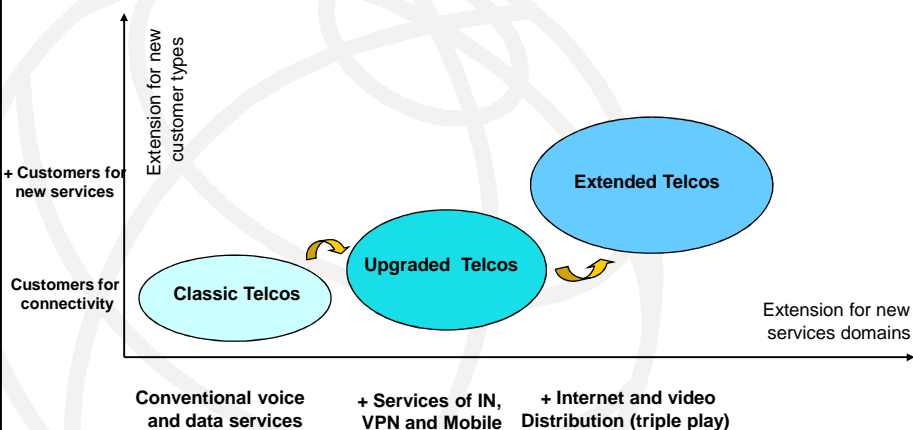
"staircase" for leading growing alternatives



# Business Migration Leaps



"staircase" for leading growing alternatives

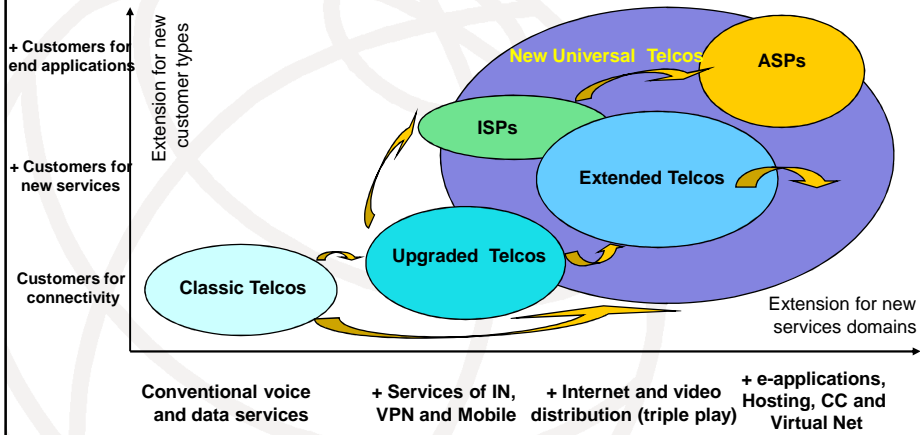




# Business Migration Leaps



## "staircase" for New Universal Telcos



Specific migration and timeframe to be optimized for the country context and regulatory conditions

Chisinau, Moldova, October 2011

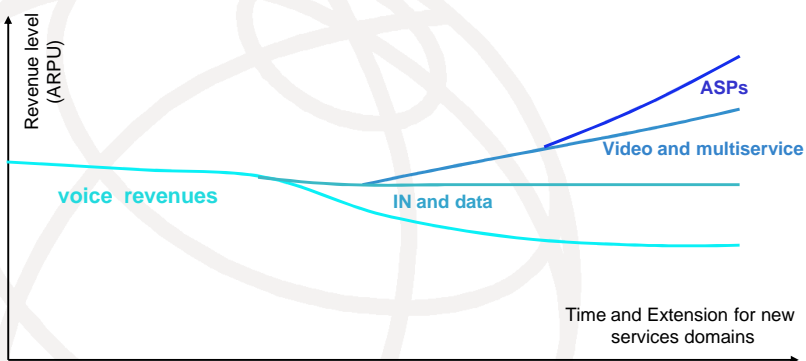
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# Business Migration Leaps



## Evolution of revenues with service domains



Conventional voice and data services    + Services of IN, VPN and Mobile    + Internet and video distribution (triple play)    + e-applications, Hosting, CC and Virtual Net

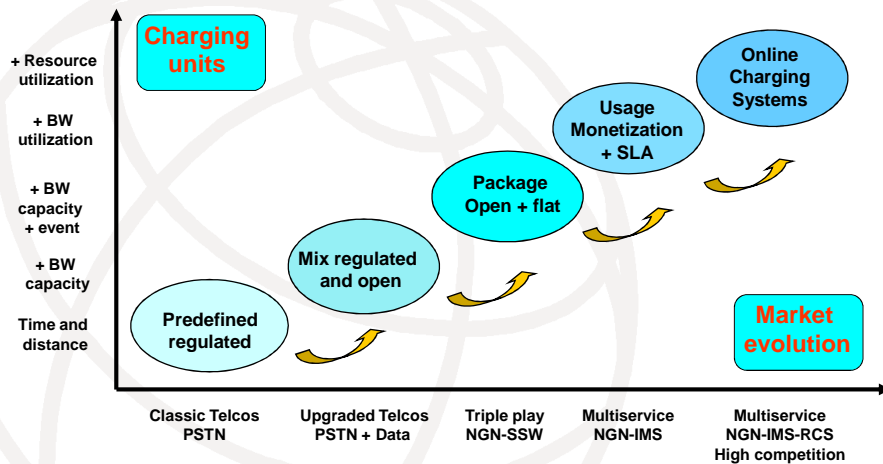
Convergence strategy is fundamental to grow in a competitive environment

Chisinau, Moldova, October 2011

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## Charging migration based on utilization Units and Market evolution



Two dimensional view for charging systems by Units & Market  
Intelligence: Avoid the “bandwidth crunch”

## Conclusions

- Recent higher capacity technologies take benefit of economies of scale and are cheaper per communication unit
- Skipping intermediate development steps will reduce transition and operational costs
- Selection of Leaps per country is a function of initial maturity stage and demand growing rate
- Developing countries may benefit from a business staircase strategy based on the experiences at developed ones

## Recommendations

- Take benefit of experiences, benchmarking and proper **modeling of key techno-economical factors**
- Focus on **consolidated/proven migration steps** and technologies with multiple services domains
- Take benefit of **all economies of scale**