

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

**Chişinău, Moldova; 4-6 May 2010**

# **New Technologies and Services: Change and Convergence**

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## **Abstract**

- The way voice services are provided is changing. The role of mobile services vis-à-vis fixed services is changing. The way Internet access is provided is changing. There is tremendous change in the nature of data services, especially those involving smart phones. There is a rapid growth in machine to machine communications. New types of services are envisaged. There has been and there is ongoing tremendous evolution in both access and core infrastructure. The essential common factor is convergence. The changes in services and technologies require corresponding changes in perspectives for all involved.

## Outline

- We've always been working on NGNs
- What's different this time?
- Hyperconnectivity
- Communication Enabled Applications
- True Broadband and the Evolution of Structures and Services

## What's Life Like ....

- **Yesterday and today ...**
  - Most people could not do without their mobile phones
  - Content was on DVDs or magazines or books or a local hard-disk
  - Contact lists are by application, device, and individual situation
- **Tomorrow (already?) ...**
  - Everyone connected, can't do without being on-line
  - The first place many people go for content is on-line
  - Contact lists, etc., starting to be "managed"
- **Future (soon?) ...**
  - Everyone, everything always connected everywhere
  - Only place people go to for content is on-line
  - Email, contact lists, calendars, data starting to be managed w/o geographic or device boundaries

**Today's technology literate young person is tomorrow's key decision maker at home and at work, and your target customer!**

## We were always working on the "next generation" ...

- We began with human operators handling switching and services for "hard-wired" subscribers, ...
- ... "progressed" to analog mechanical circuit switching (SxS), ...



... refined it with stored program control (#5 XBar, SP1), ...

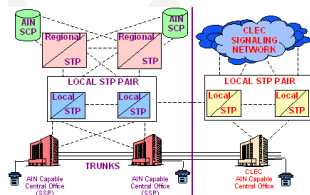


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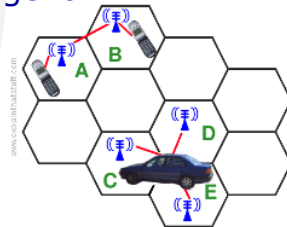
## ... but we were focused on refinements ...

... converted the analog circuits to digital transmission and switching, with replicated islands of intelligence (exchange based service logic and data), ...



... added message based signalling (SS7) and centralized intelligence (Intelligent Networks), ...

... then went from exclusively hard wired access by adding mobility with cellular telephony, ...



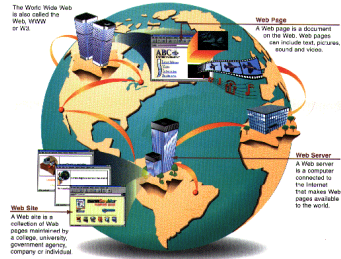
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## ... until some key developments came along ...

... the Internet and global connectivity ...

... coupled with almost unimagined computing technology advances in super computing, servers and personal computing ...

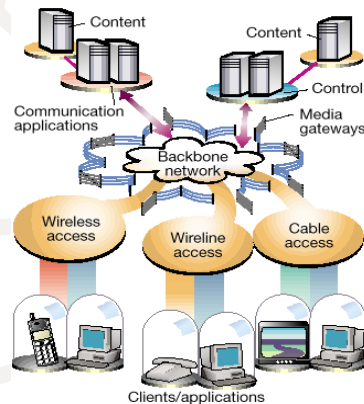
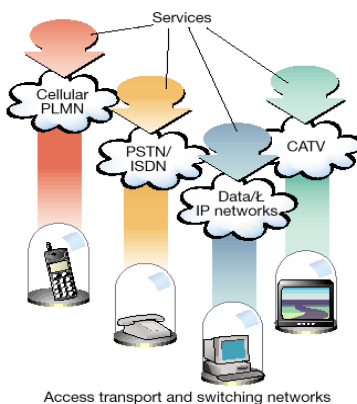


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## ... that *require* a paradigm shift ...

... and these technologies now ~~allow~~ ~~enable~~ *require* us to combine what used to be separate ...

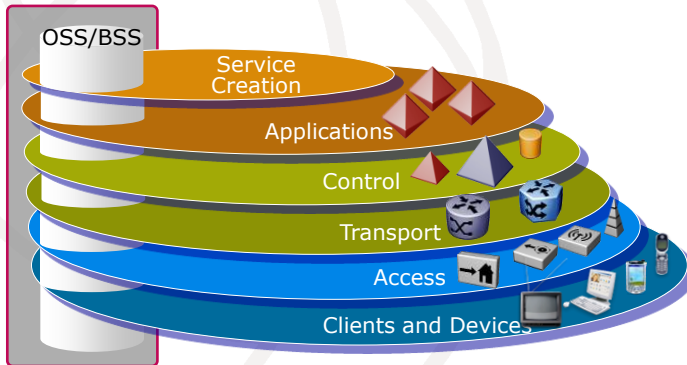


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## ... in how we do next generation telecommunications ...

... and we are taking advantage of all of this to change the entire architectural framework and infrastructure for one that is much more flexible, much more capable and much less expensive ...



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## What Users Demand



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# Telecommunications Industry: Constant Innovation

**VoIP and Converged Communications**

**Wireless to WiMAX/4G/LTE**

**Wireline to Wireless**

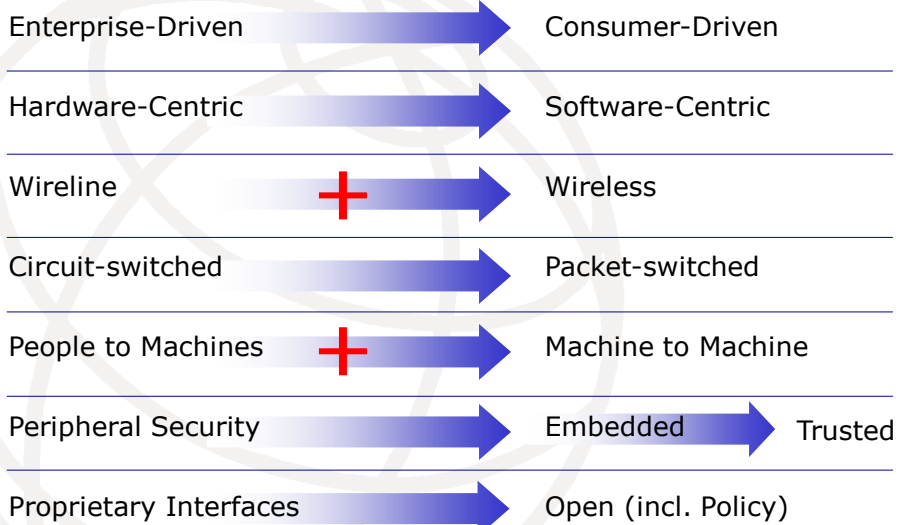
**Copper to Fiber**

**Analog to Digital**

*Change comes from disruption. And we are going through a highly disruptive period!*

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## Landscape is changing



## “Next Generation Networks” – a New Era in Telecommunications

- The communications industry is entering a new era of unprecedented capabilities that promises a rate of technology innovation far surpassing any other era in recent history
  - Catalyst is increasing demand for “Personal Broadband” which delivers high-bandwidth, super-fast, low cost access to any application from any device and any location
- Emerging megatrends require us to re-think how communications technology is developed and what technical challenges need to be overcome to deliver personal, pervasive broadband services unlike anything we have experienced.

## Hyperconnectivity

- Evolution from being fully connected, (meaning everybody is on the network), to being *hyperconnected*, (meaning the range of devices and entities on the network far outpaces the number of people consuming the services offered by those devices).

# Hyperconnectivity



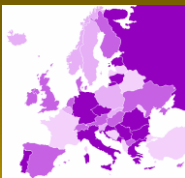
**Anything that *can* be connected and would benefit from being connected *will* be connected**

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## Hyperconnectivity is Real and is Happening Now

### Person - Person



> 130%  
115-130%  
100-115%  
< 100%  
No data

- Europe – mobile phones outnumber people (>100% penetration)
- Global mobile IM continues to grow at double digit rates



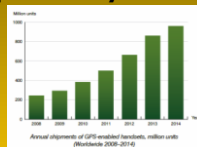
• One Laptop Per Child

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### Person - Machine

• e-Commerce growth continues: >100B transactions, >\$5T

• GPS-enabled handsets to be 60% of shipments by 2014



- >260M iPods sold (Mar 2010)
- iPhone sales
 

2007	3.7M
2008	13.7M
2009	25.7M
2010	36.0M
2011	48.5M

### Machine - Machine



- 98% of all CPUs today are embedded (by 2010 – 14 billion connected, embedded devices)
- Almost all 2010 cars in U.S. have iPod connectivity

- Sensor pocket in Nike shoes



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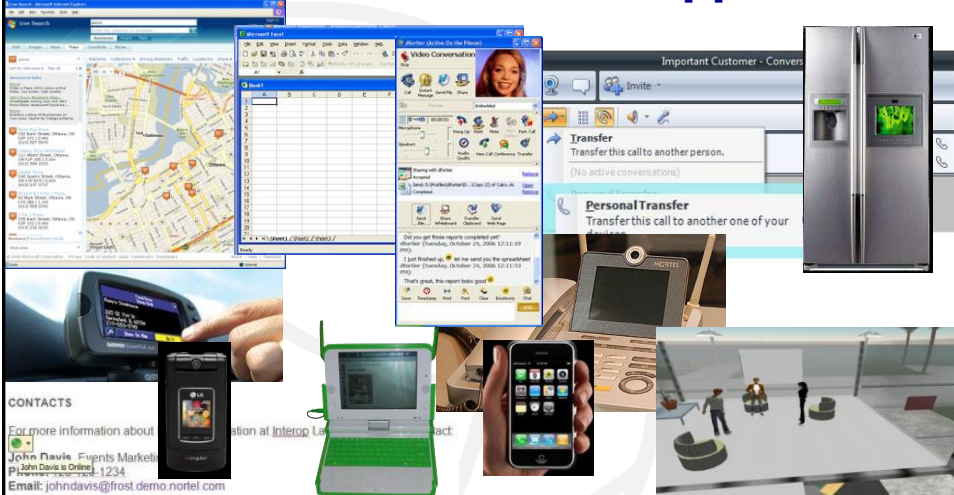
## Communications-Enabled Applications

- **Reinvention** of services and applications to support new levels of **network-aware intelligence** and an intuitive interaction experience through advanced technology frameworks such as IMS and Services Oriented Architecture (SOA).

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## Communications-Enabled Applications



**Every Application will have Built-In Communications Capabilities**

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## Converged Communications Vision

**All Devices, Applications, Interfaces**

**Context**

**Identity**

**Presence Location**

**Policy**

**Services**

**Environment**

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## True Broadband

- The communications experience is **so seamless that users no longer have to consider which technology** – wireline or wireless – is being used to make a connection. **Users simply communicate, anywhere, anytime from whichever device is most convenient.** Most importantly, the broadband experience becomes so economical that the range of uses exceeds any experience of the past.

# Hyperconnectivity: Opportunity & Challenge

## ■ Opportunity

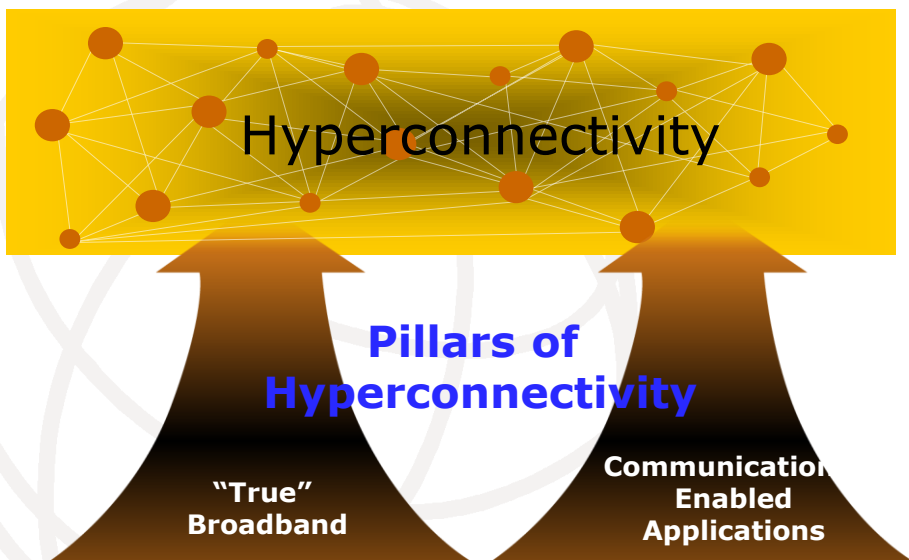
- Increased revenue (carriers)
- Increased productivity (enterprises)
- Better communications experience (end users)
- A more connected world (societal good)

## ■ Challenge

- Scale is unprecedented
- Today's networks are not designed for Hyperconnectivity
- New technology required to transform much of IT and Telecom

**Embracing innovation and scale  
will capture the opportunity of Hyperconnectivity**

# Addressing the Challenge and Opportunity of Hyperconnectivity



## Addressing the Challenge and Opportunity of Hyperconnectivity

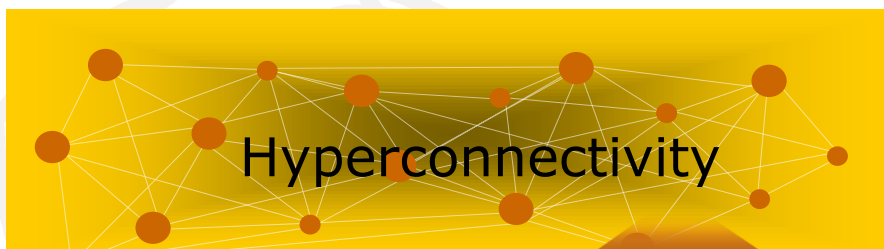


- Scale access network
- Scale core network (metro & long-haul)
- Unify experience (network transparency)

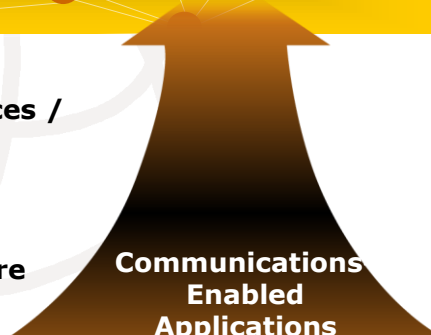
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## Addressing the Challenge and Opportunity of Hyperconnectivity



- SOA / Web Services / IMS
- Network-aware applications
- Applications-aware networks



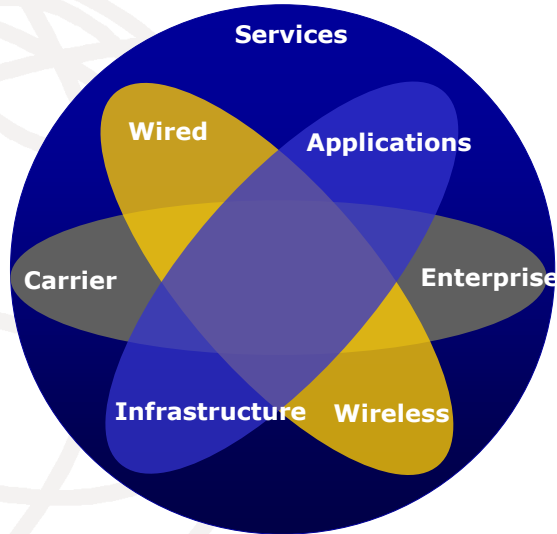
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## Leveraging the Synergy

**Synergy** matters because today's challenges are multi-dimensional

- Multimodal phones
- Fixed-mobile convergence
- Real-time communications handoff
- True Presence
- Extension of Enterprise application to mobile devices
- Carrier-grade enterprise mobility



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## Summary

- We've always worked toward "Next Generation Networks"
  - Expectations of next generation users a key driver
  - Landscape is changing, rate of change is increasing
- What users want:
  - Always on
  - Anytime
  - Anywhere
- Hyperconnectivity is the future
  - Change comes from disruption
  - Enormous growth of mobile plus IP-based infrastructure leading rapidly to convergence
- Opportunity abounds!

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# Thank you!

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