

# **Regional Development Forum - Africa: "NGN and Broadband, Opportunities and Challenges"**

**Lusaka, Zambia; 18-19 May 2009**

## **Voice Evolution and Fixed- Mobile-Internet 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 has been and there is ongoing tremendous evolution in both access and core infrastructure. The essential common factor is the convergence of all types of traffic, and how this changes the entire game, necessitating a fresh look at the rules applied to the game.

## 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

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## What's Life Like ....

- **Today ...**
  - ◆ Most people can't do without their mobile phones
  - ◆ Content is on DVDs or magazines or books or a local hard-disk
  - ◆ Contact Lists are by application, device, and individual situation
- **In 2010 (already?) ...**
  - ◆ Everyone connected, can't do without being on-line
  - ◆ The first place people go for content is on-line
  - ◆ Informal peer groups and sharing are common
- **In 2015 (sooner in some places) ...**
  - ◆ Everyone, everything always connected everywhere
  - ◆ Only place people go to for content is on-line
  - ◆ Dynamic communities of interest w/o boundaries



Today's technology savvy young person is grown up, a 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), ...



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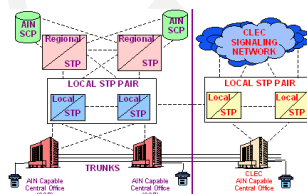
... refined it with stored program control (#5 XBar, SP1), ...



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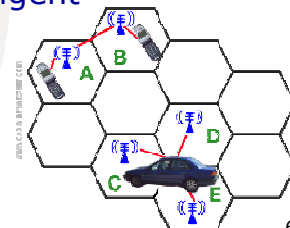
## but we were focused on refinements ...

... 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, ...



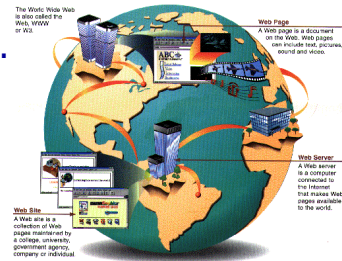
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## ... until some key developments ...

... then along came the Internet ...

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

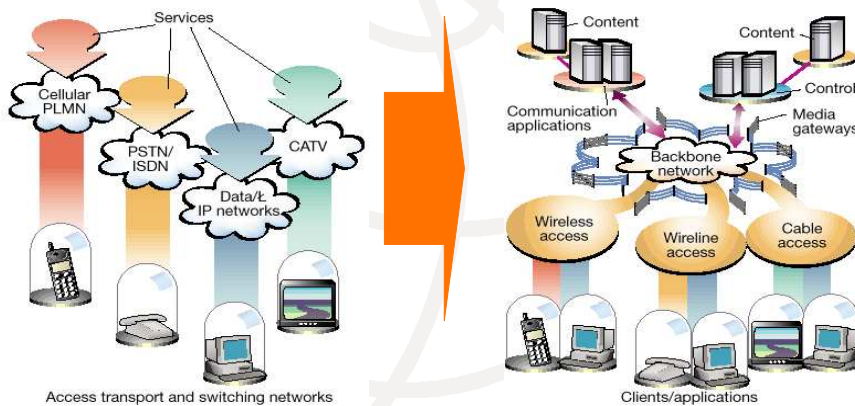


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## ... that *require* a paradigm shift ...

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

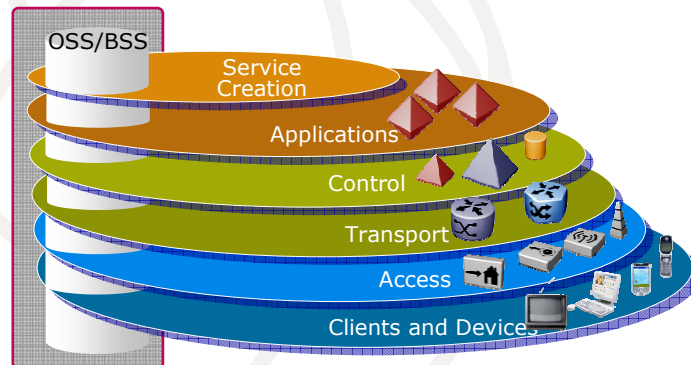


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## ... in how we do next generation telecommunications ...

... and we're taking advantage of all 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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## ... always keeping our eyes on the goal: meet user needs!

- 
- Always on
  - Anytime, anywhere and in any form
  - Voice and multimedia
  - Self service, intuitive
  - Simple for the end user
  - Secure, trusted and reliable

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# Telecommunications Industry: Constant Innovation

**VoIP and Converged Communications**

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

**Wireline to Wireless**

**Copper to Fiber**

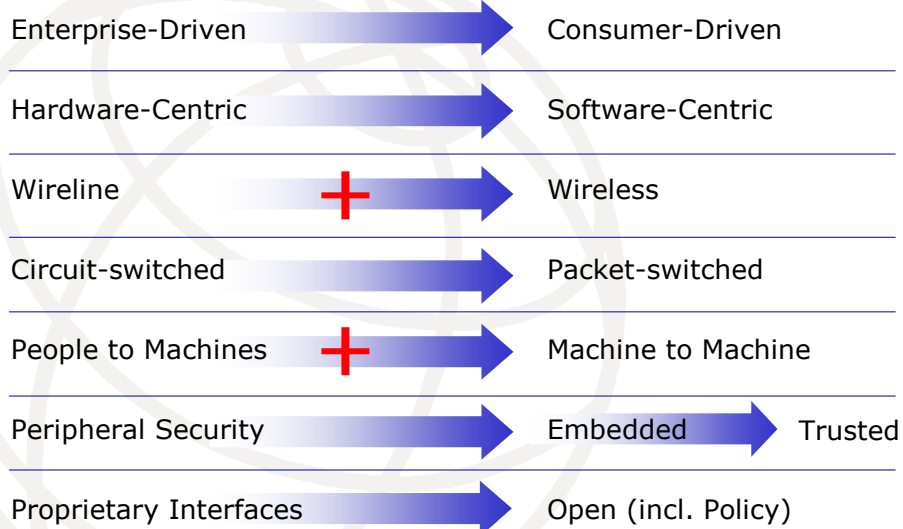
**Analog to Digital**

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

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## Landscape is changing



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## NGNs: a New Era of Communications

- 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 ensures 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 Happening Now

## Person to Person



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



## Person to Machine

- By 2010, worldwide:
  - 4-fold growth in Internet Commerce to 100B transactions
  - 1-2 billion A-GPS-enabled handsets
    - 150 million iPods sold (March 2008)
  - iPhone sales to hit 10M in 2008, may hit 45M in 2009; hyper-connectivity at applications level

## Machine to Machine



- 98% of all CPUs today are embedded (by 2010 – 14 billion connected, embedded devices)
- >>70% of 2009 cars in U.S. had iPod connectivity



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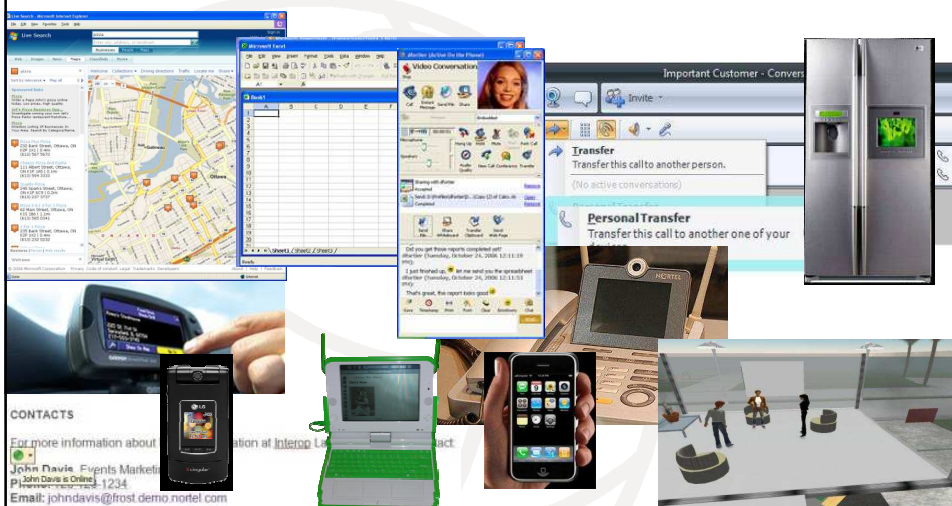
## Communications-Enabled Applications

- 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



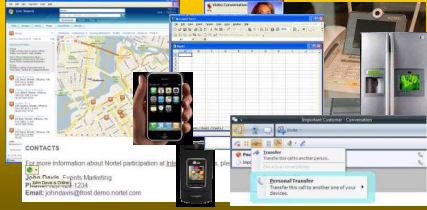
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**Every Application will have Built-In Communications Capabilities**

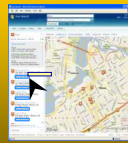
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## Converged Communications Vision

### All Devices, Applications, Interfaces



### Context



Presence  
Location

### Identity



Policy

### Services



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### Environment



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## True Broadband

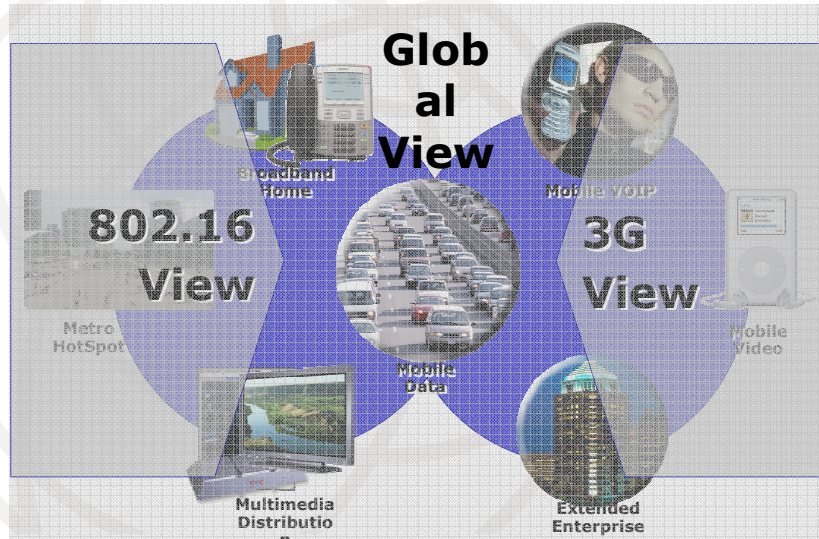
- The communications experience is so seamless that users no longer have to consider which technology – wireline or wireless – is being used to make a connection. They simply communicate, anywhere, anytime from whichever device is most convenient. Most importantly, the broadband experience becomes so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

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## 4G World – Broad View

Connecting everything that should be connected!



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## Hyperconnectivity: Opportunity & Challenge

### ■ Opportunity

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

### ■ Challenge

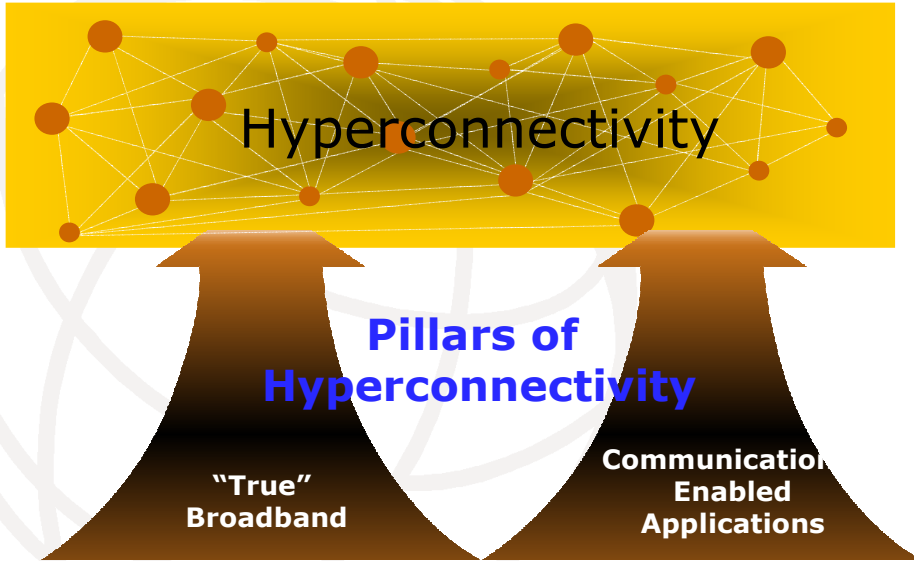
- Scale is unprecedented
- Today's networks are not designed for Hyperconnectivity
- New technology required to transform much of IT and Telecom

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

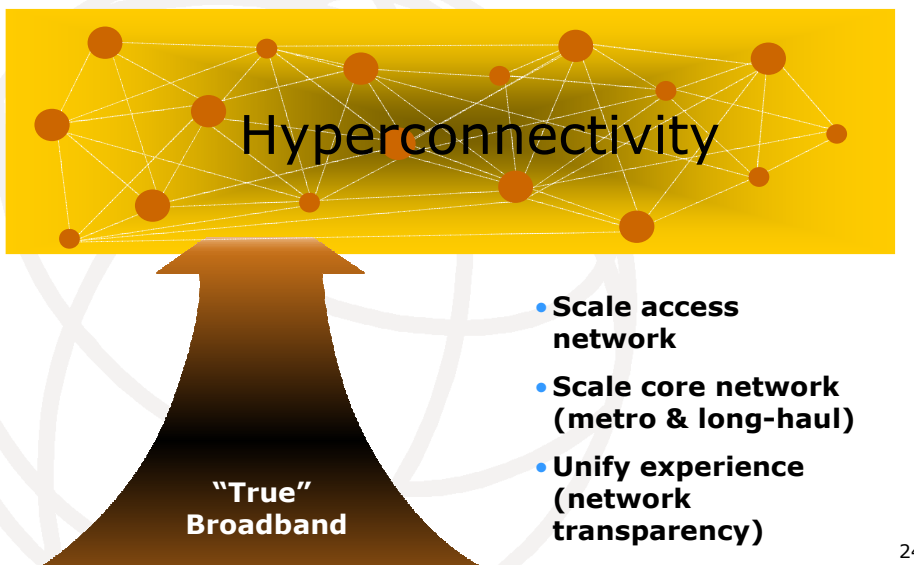
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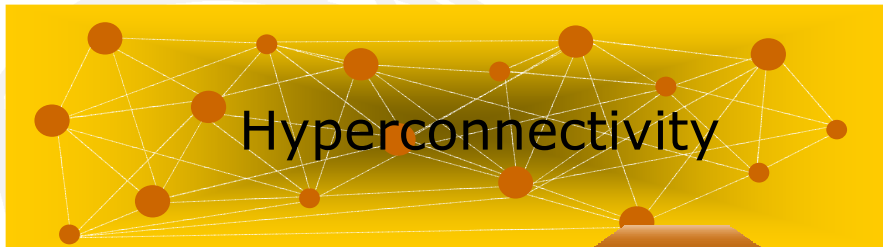
## Addressing the Challenge and Opportunity of Hyperconnectivity



## Addressing the Challenge and Opportunity of Hyperconnectivity



## Addressing the Challenge and Opportunity of Hyperconnectivity



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

Communication Enabled Applications

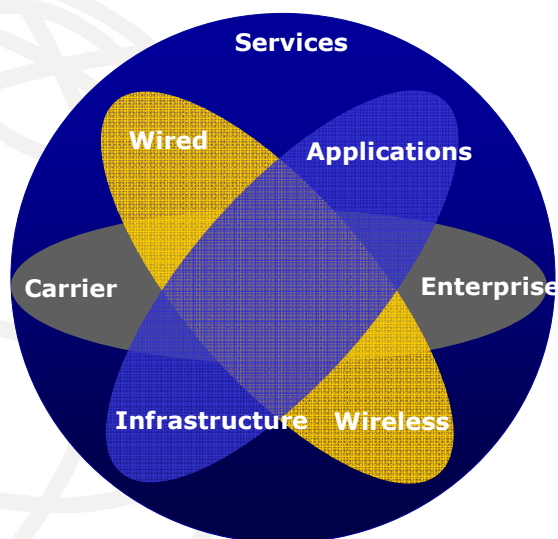
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## Leveraging the Synergy

**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"**
  - Pace 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!**