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Voice Evolution and Fixed-Mobile-Internet Convergence

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Abstract

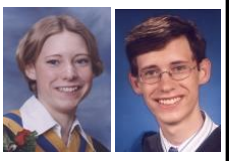
- The way voice services are provided is changing. The role of mobile services vis-à-vis fixed services is changing. The way Internet access is provided is changing. There has been and there is ongoing tremendous evolution in both access and core infrastructure. The essential common factor is the convergence 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

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
- **Tomorrow (already?) …**
  - Everyone connected, can't do without being on-line
  - The first place people go for content is on-line
  - Social networking and informal groups are common



- **Future (soon?) …**
  - 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 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" …

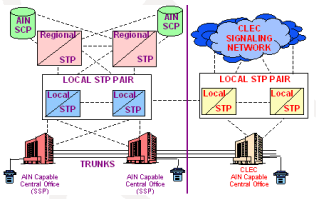
- We began with human operators handling switching and services for "hard-wired" subscribers, …

- … "progressed" to analog mechanical circuit switching (SxS), …

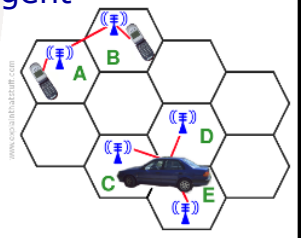
… refined it with stored program control (#5 XBar, SP1), …

… 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), …

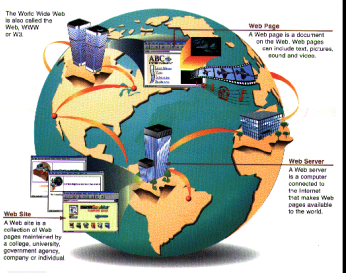


… then went from exclusively hard wired access by adding mobility with cellular telephony, …

… until some key developments came along …

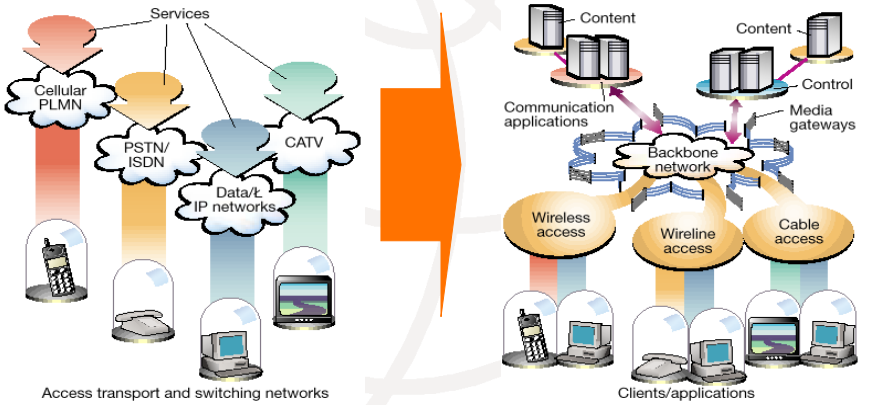
… the Internet and global connectivity …

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



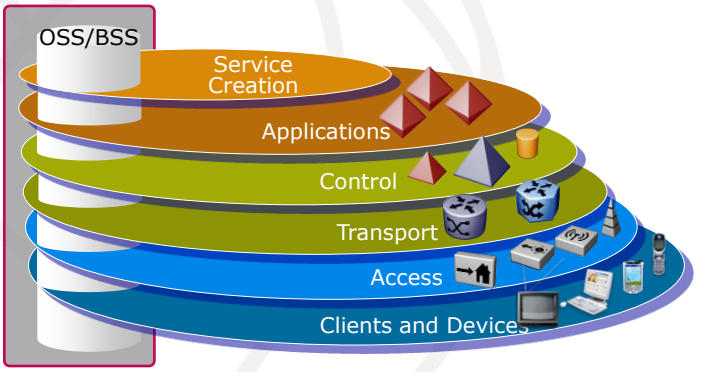
… that *require* a paradigm shift …

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



… 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 …



… always keeping our eyes on the goal: meet user needs!

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!

Landscape is changing

Enterprise-Driven	→	Consumer-Driven
Hardware-Centric	→	Software-Centric
Wireline	+ →	Wireless
Circuit-switched	→	Packet-switched
People to Machines	+ →	Machine to Machine
Peripheral Security	→	Embedded → Trusted
Proprietary Interfaces	→	Open (incl. Policy)

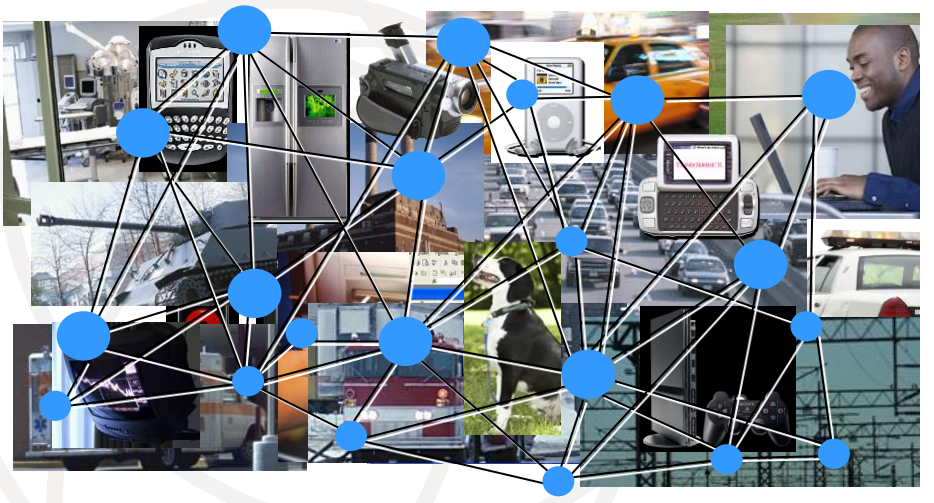
"Next Generation Networks" – a New Era in Telecommunications

- 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

Hyperconnectivity is Real and Happening Now

Person to Person

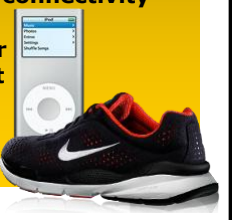
- Europe – mobile phones now outnumber people (>100% penetration)
- Global mobile IM continues to grow at double digit rates
  - One Laptop Per Child

Person to Machine

- By 2010, worldwide:
  - 4-fold growth in Internet Commerce to 100B transactions
  - 1-2 billion GPS-enabled handsets
- 228 million iPods sold (19 Oct 2009)
- iPhone sales: 2008: 11.6M; 2009: >20M; used for >60% of mobile browsing: hyper-connectivity at applications level!

Machine to Machine

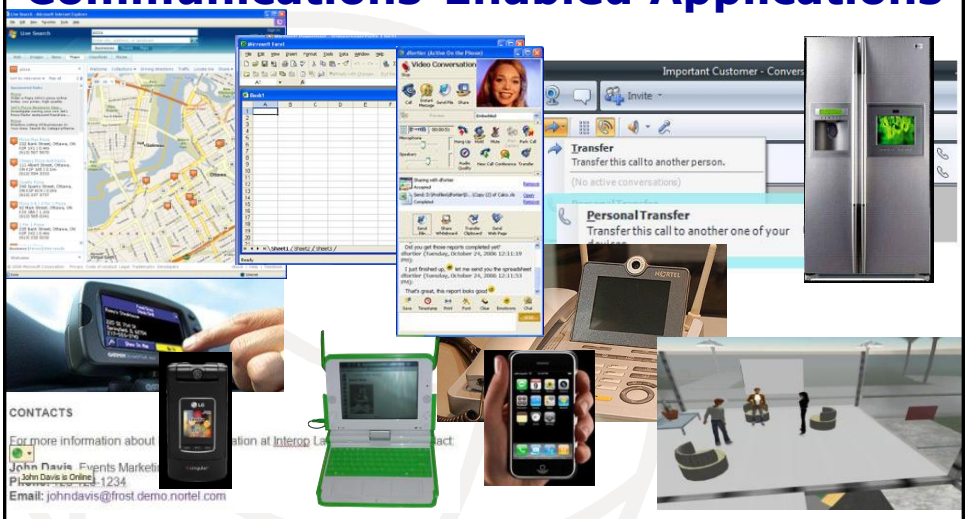
- 98% of all CPUs today are embedded (by 2010 – 14 billion connected, embedded devices)
- >>70% of 2009 cars in U.S. had iPod connectivity
- Sensor pocket in Nike shoes



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).

Communications-Enabled Applications



Every Application will have Built-In Communications Capabilities

Converged Communications Vision

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.

4G World – Broad View

Connecting everything that should be connected!

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Hyperconnectivity: Opportunity & Challenge

Opportunity

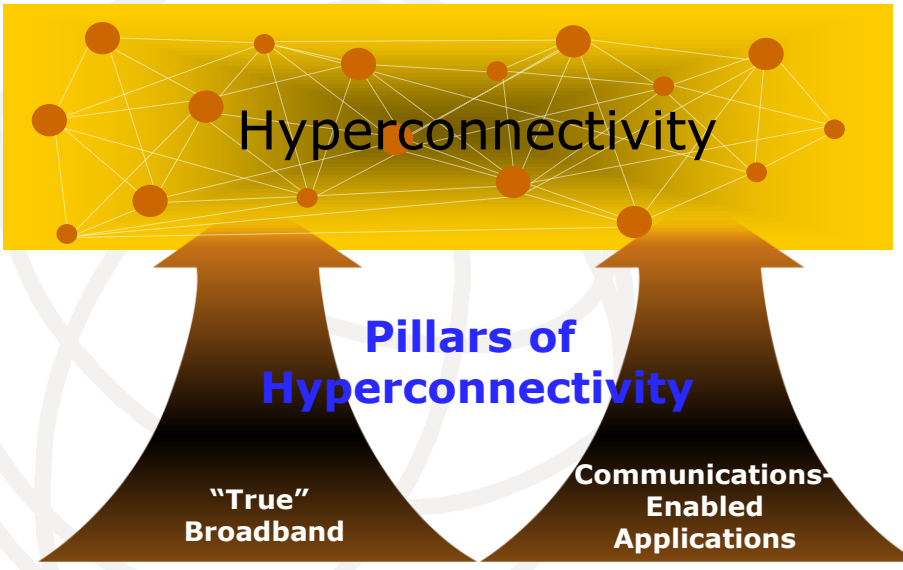
- Increased revenue (carriers)
- Increased productivity (enterprises)
- Better communications experience (end users)
- A more connected world (societal good)

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

Addressing the Challenge and Opportunity of Hyperconnectivity



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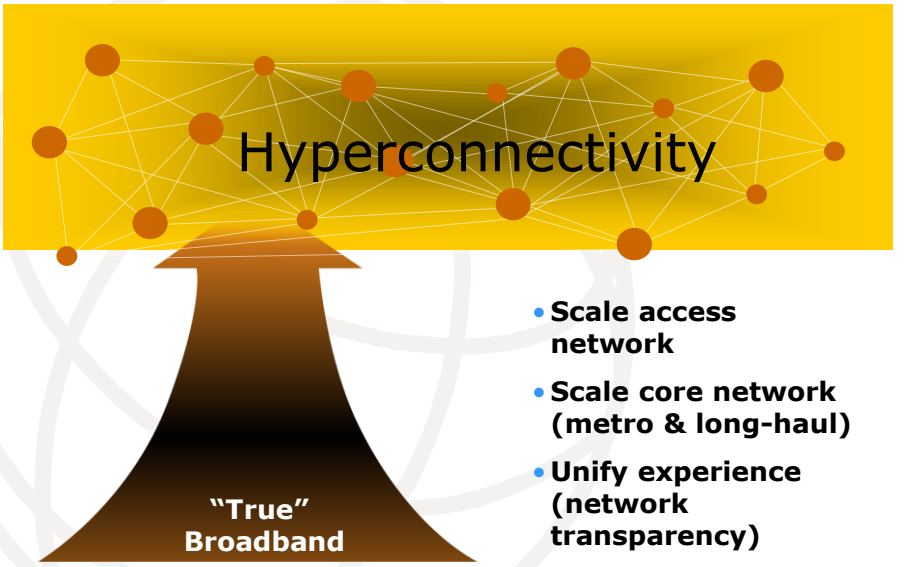

- Scale access network
- Scale core network (metro & long-haul)
- Unify experience (network transparency)

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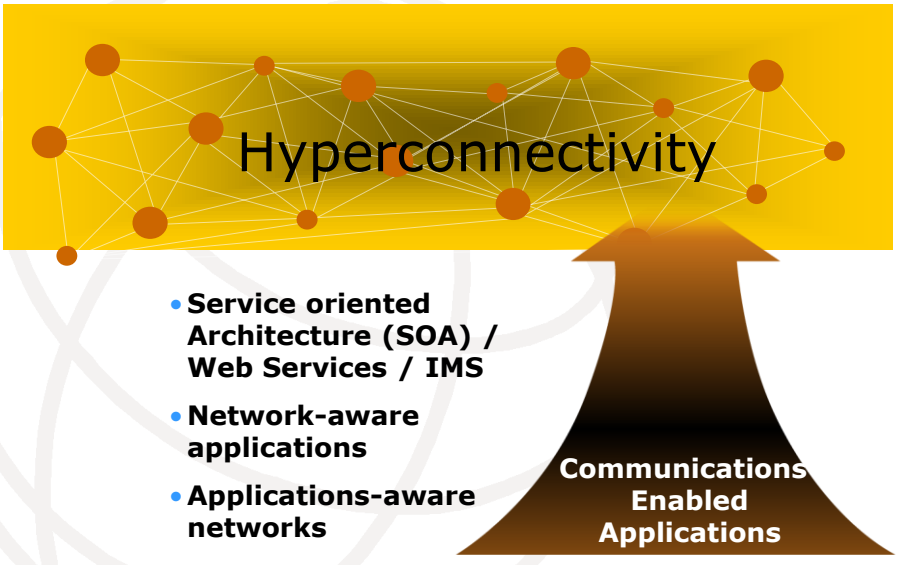
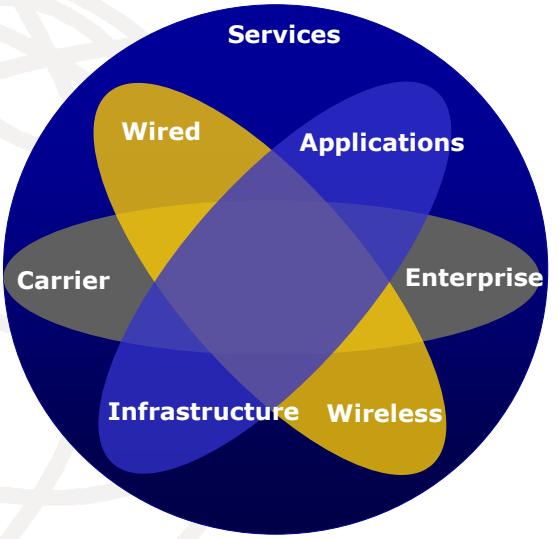


- Service oriented Architecture (SOA) / Web Services / IMS
- Network-aware applications
- Applications-aware networks

Leveraging the Synergy

Synergy matters because today's challenges are multi-dimensional

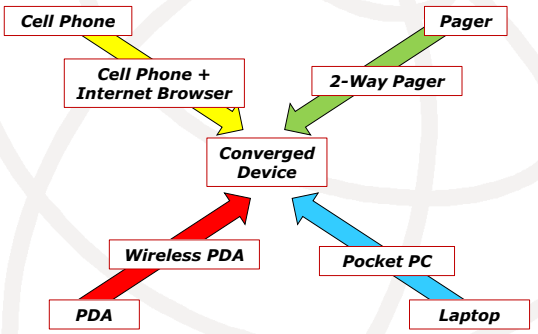
- Multimodal phones
- Fixed-mobile convergence
- Real-time communications handoff
- True Presence
- Extension of Enterprise application to mobile devices
- Carrier-grade enterprise mobility



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!

Thank you!



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