



NGNs, Hyperconnectivity and the Evolution of Structures and Services

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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



In 2010 ...

- Everyone's connected and can't do without being on-line
- The first place people go for content is on-line
- Informal peer groups and sharing is open and legal



In 2015 ...

- Everyone and everything is connected all the time, everywhere
- The only place people go for content is on-line
- Dynamic communities of interest without any 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), ...

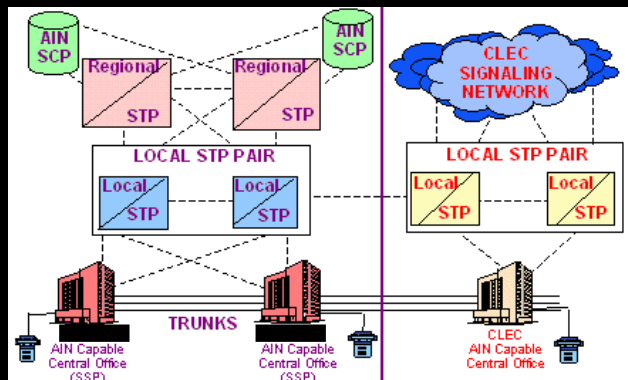


... refined it with stored program control (#5 XBar, SP1), ...



but we were focused on refinements ...

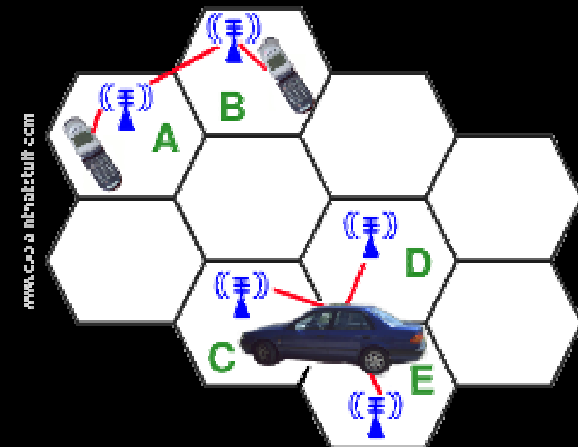
... converted the analog circuits to digital transmission and switching, with replicated islands of intelligence (exchange based service logic and data), ...



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



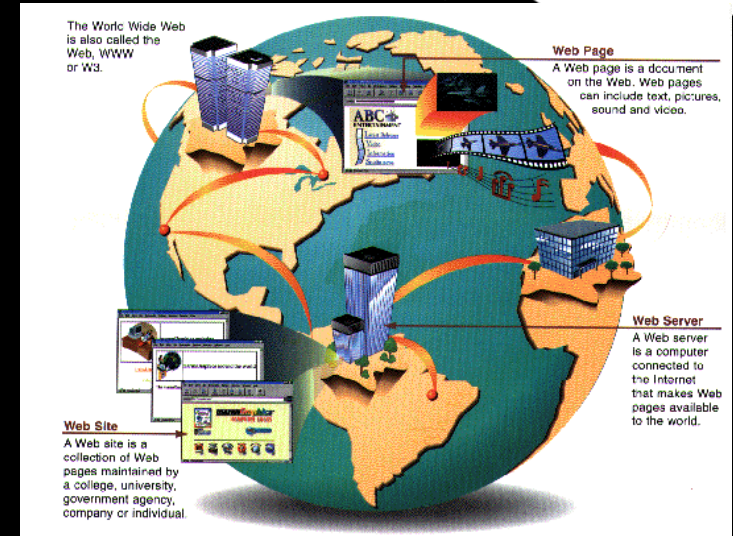
... then went from exclusively hard wired access by adding mobility with cellular telephony, ...



until some key developments ...

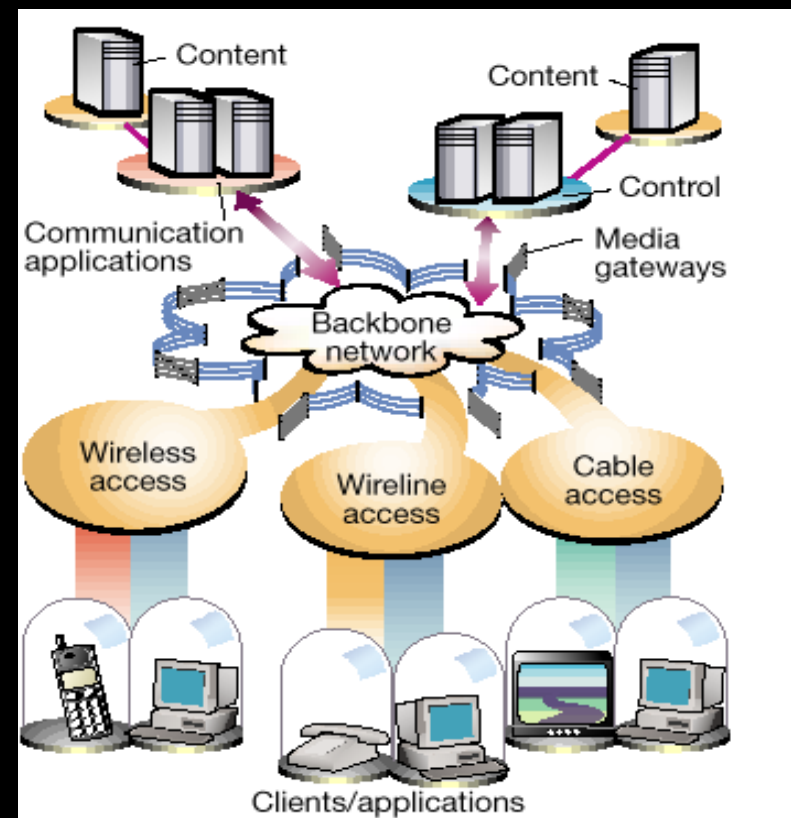
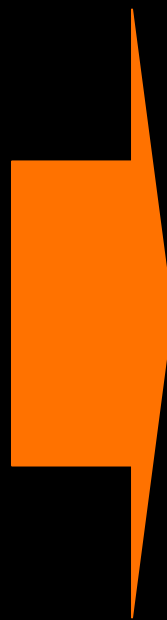
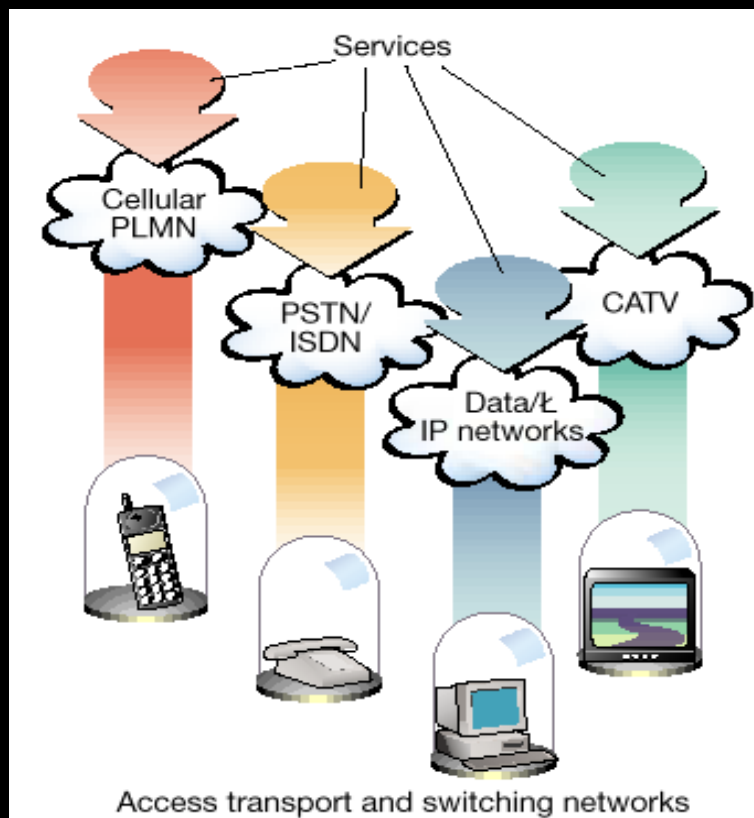
... then along came the Internet ...

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



that *require* a paradigm shift ...

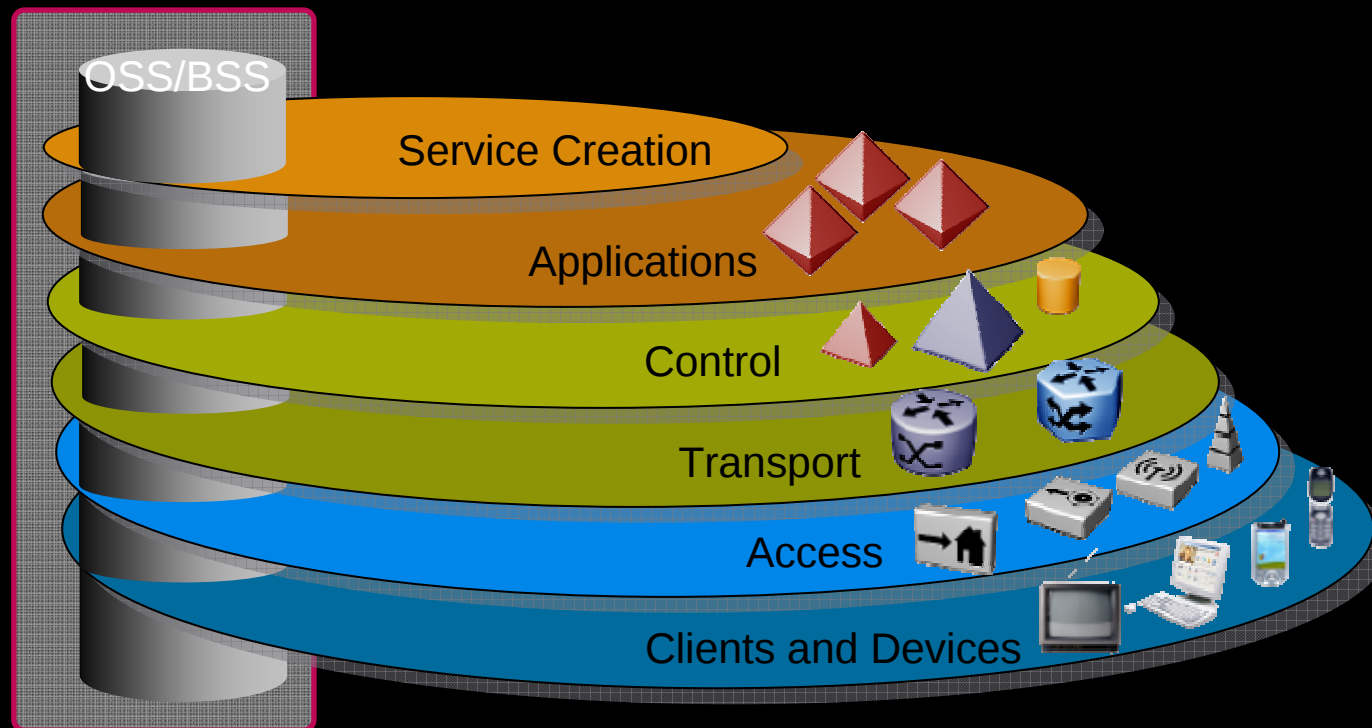
... and these technologies now ~~allow enable~~ *require* us to combine what used to be separate ...



in how we do next generation telecommunications ...



... and we'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 ...



... 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

Telecommunications Industry: Constant Innovation



**VoIP to Unified
Communications**

Wireless to WiMAX/4G/LTE

Wireline to Wireless

Copper to Fiber

Analog to Digital

**Change comes from disruption
coupled with a pioneering spirit.**

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)



NGNs: a New Era of Communications

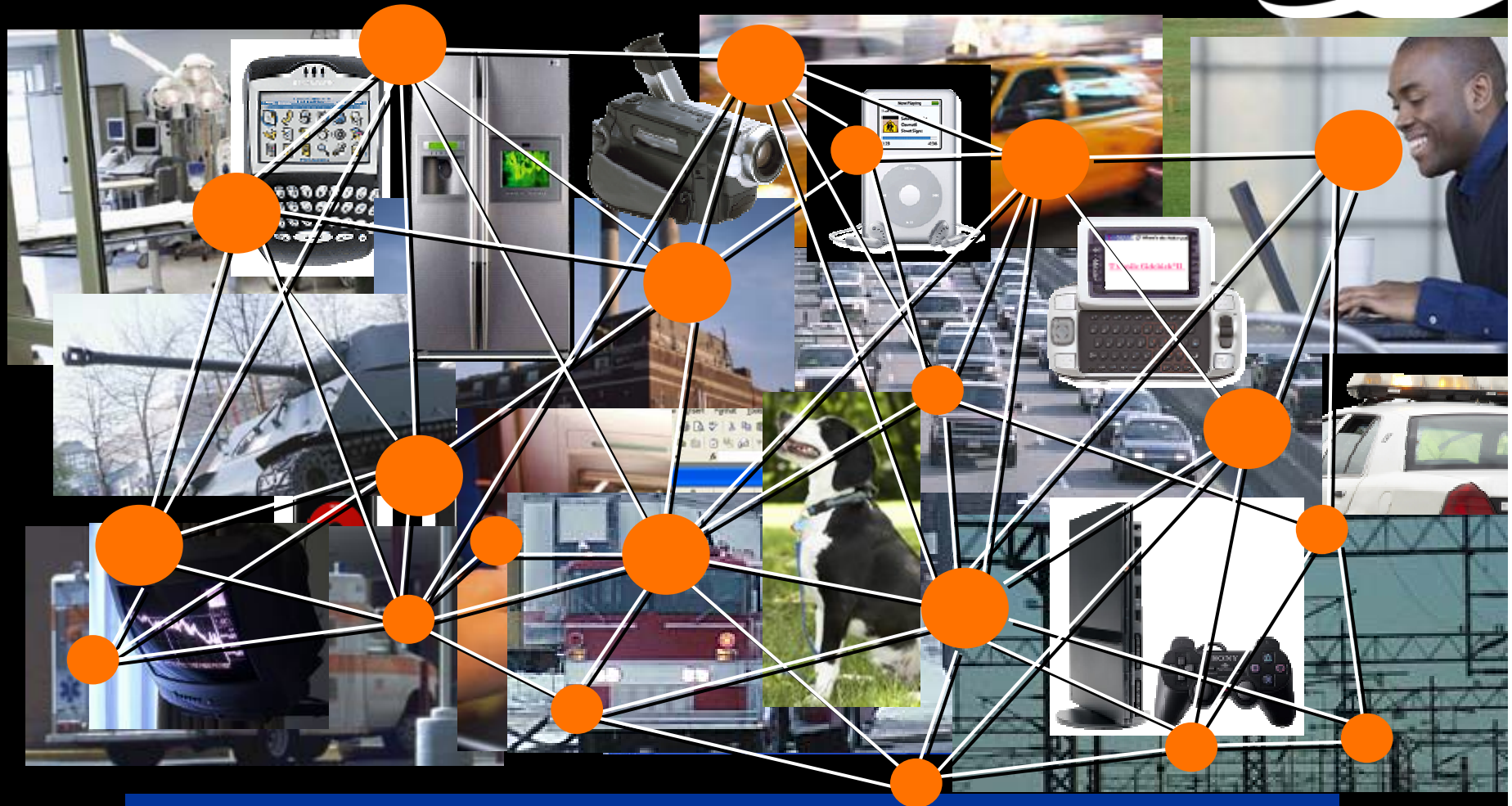
- The communications industry is entering a new era of unprecedented capabilities that promises a rate of technology innovation far surpassing any other era in recent history
 - Catalyst is increasing demand for “Personal Broadband” which ensures high-bandwidth, super-fast, low cost access to any application 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

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; hyper-connectivity at applications level

Machine to Machine



- 98% of all CPUs today are embedded (by 2010 – 14 billion connected, embedded devices)
- 70%+ of all 2007 cars in U.S. had iPod connectivity
- Sensor pocket in Nike shoes

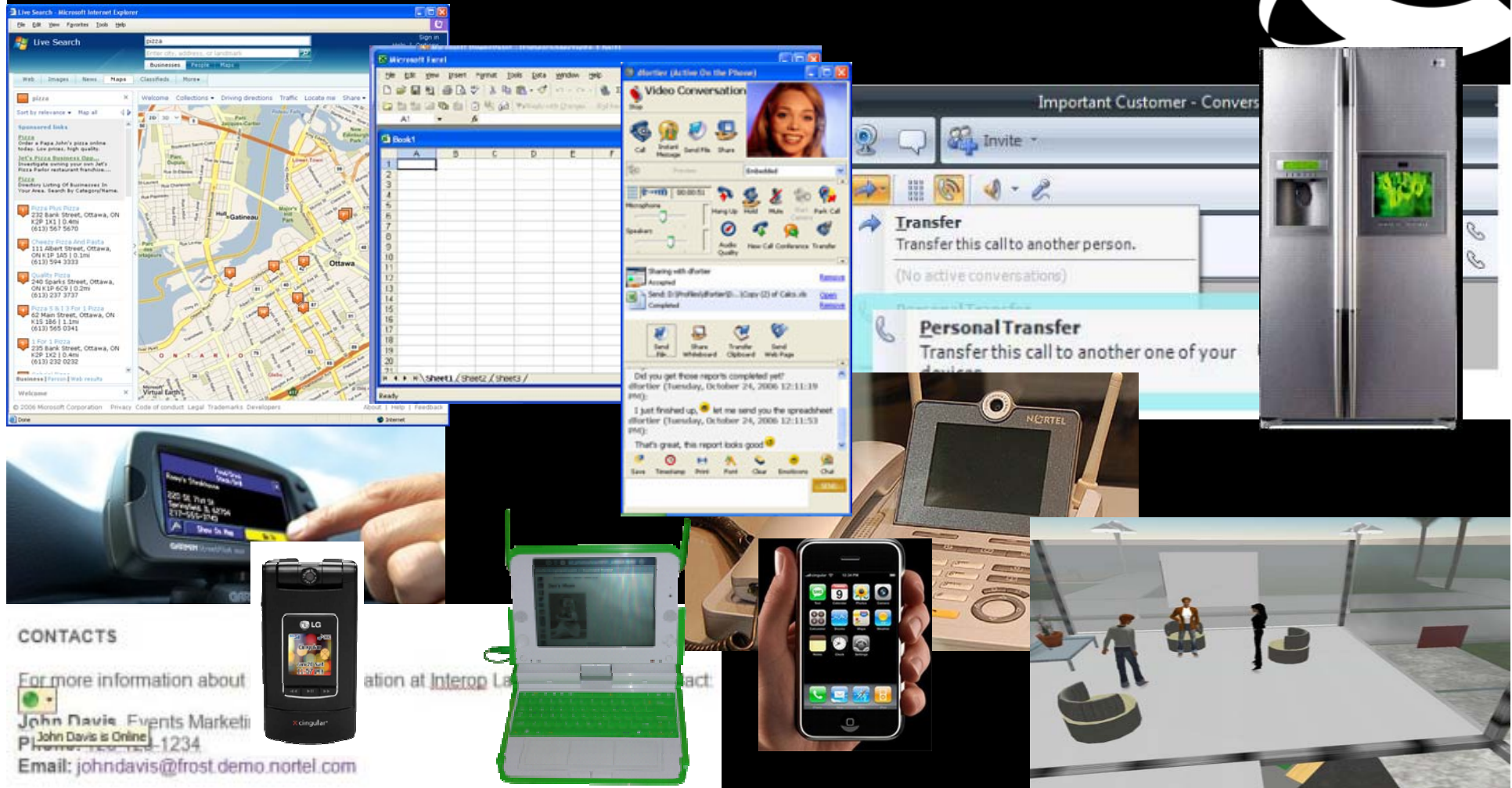


Communications-Enabled Applications



- 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

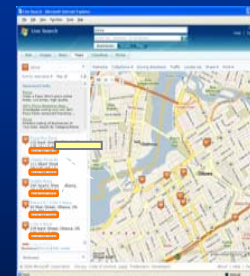
Unified Communications Vision



All Devices, Applications, Interfaces



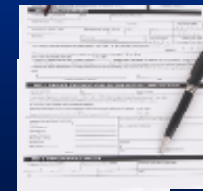
Context



Presence
Location



Identity



Policy

Services



Environment



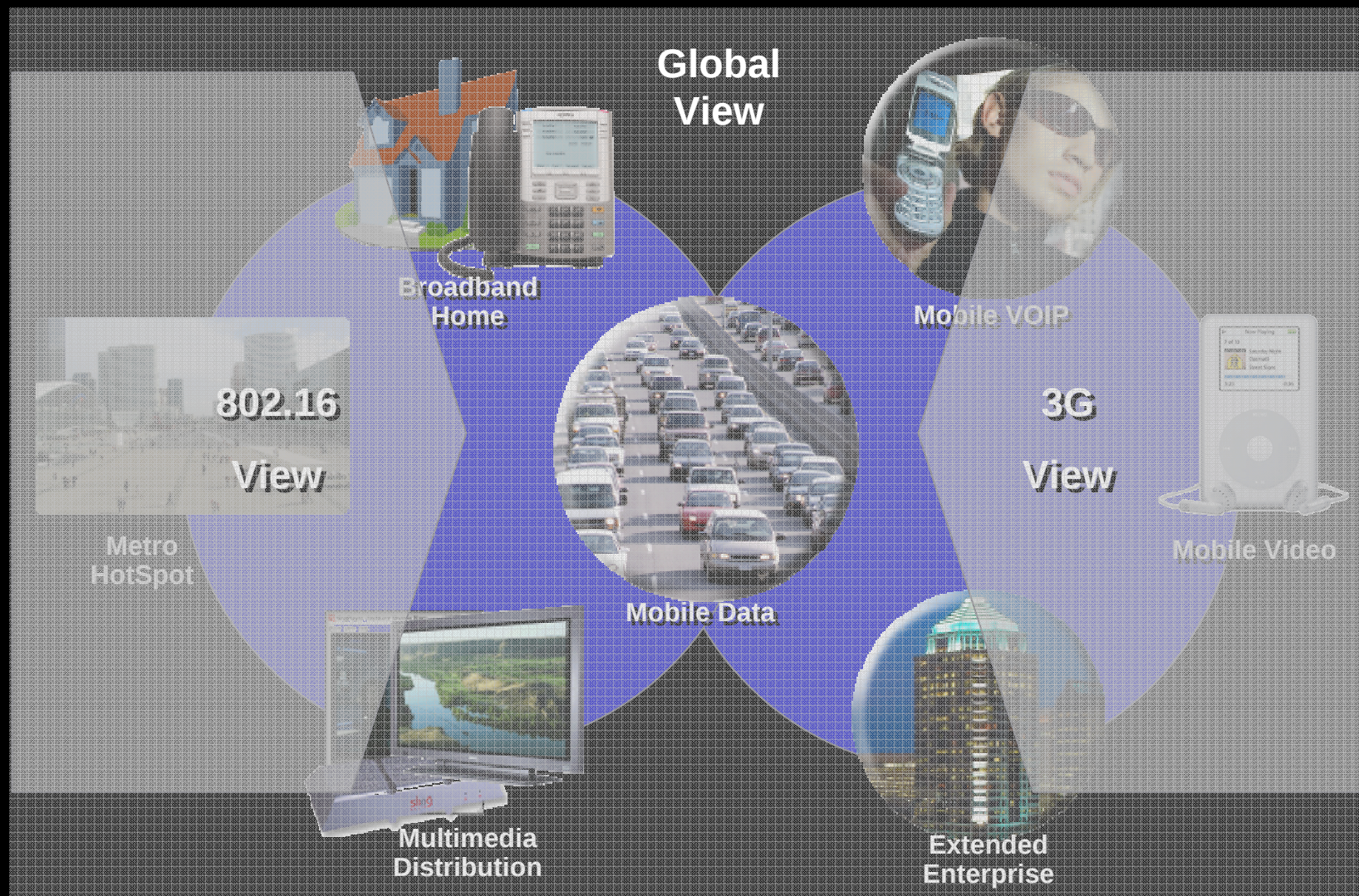


True Broadband

- 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.

4G World – Broad View

Connecting everything that should be connected!



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

**Companies that embrace innovation and scale
will capture the opportunity of Hyperconnectivity**

Addressing the Challenge and Opportunity of Hyperconnectivity



Pillars of
Hyperconnectivity

“True”
Broadband

Communications-
Enabled
Applications

Addressing the Challenge and Opportunity of Hyperconnectivity



**“True”
Broadband**

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

Addressing the Challenge and Opportunity of Hyperconnectivity



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

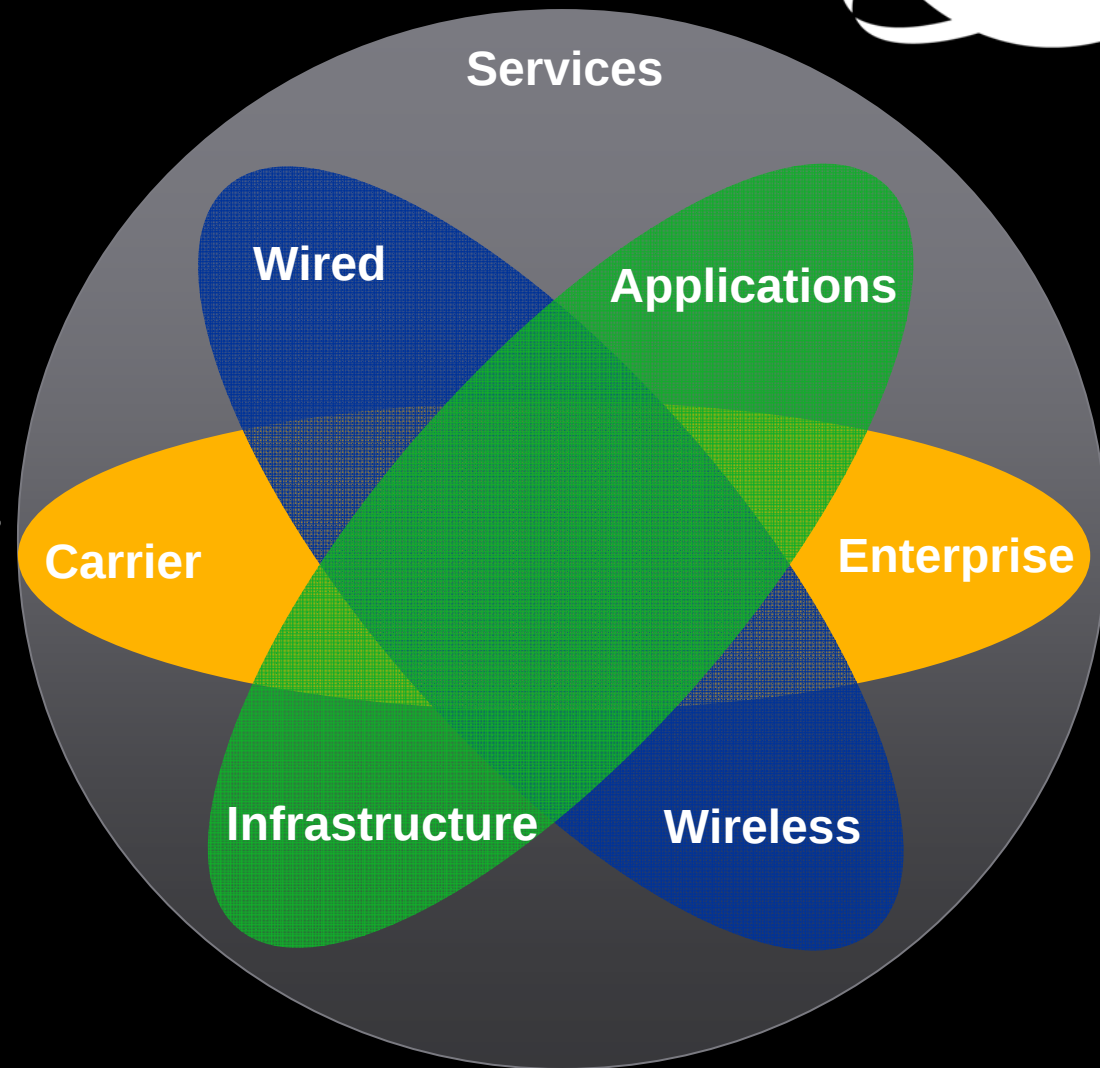
Communications-
Enabled
Applications

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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