



Converged Networks
**1.3.1: Shaping the Future:
Converged Networks**



*ITU-BDT Regional Seminar on Fixed Mobile
Convergence and Guidelines on the smooth
transition of existing mobile networks to IMT-2000
for Developing Countries for Africa Region*



Communications
Commission
of Kenya

Nairobi, Kenya 9-12 May 2005

John Visser, P.Eng.
Chairman, ITU-T SSG "IMT-2000 and Beyond"
Phone: +1-613-763-7028
Fax: +1-613-765-6257
Mobile: +1-613-276-6096
Email: jvisser@nortelnetworks.com



>THIS IS THE WAY

Shaping the Future: Converged Networks

John Visser, P.Eng.
Sr. Mgr., International Network Standards
Nairobi, 9-12 May 2005

>THIS IS NORTEL

Objective and Outline

> Objective

- Show network transformation and convergence are essential for enhancing the user experience, and are driven by user demand
- Show mobility must be an integral capability of the Next Generation Network

> Outline

- What do users want and value?
- Value: Services / Service Infrastructure / Network
- Convergence Opportunity
- Requirements and Attributes of a Service Architecture
- Shifting “demographics”
- Realizing the Vision: simplifying the user's life / transforming the network

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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 ...

- Everyone is connected and people 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



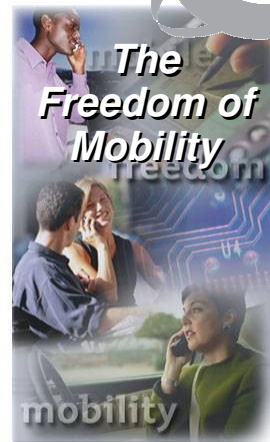
> In 2015 ...

- 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



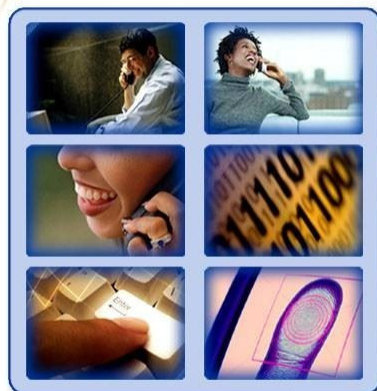
Today's technology savvy teenager (software downloading, IM addicted, camera phone wielding) **is grown up, a key decision maker at home and at work, and your target customer!**

End Users Value ...

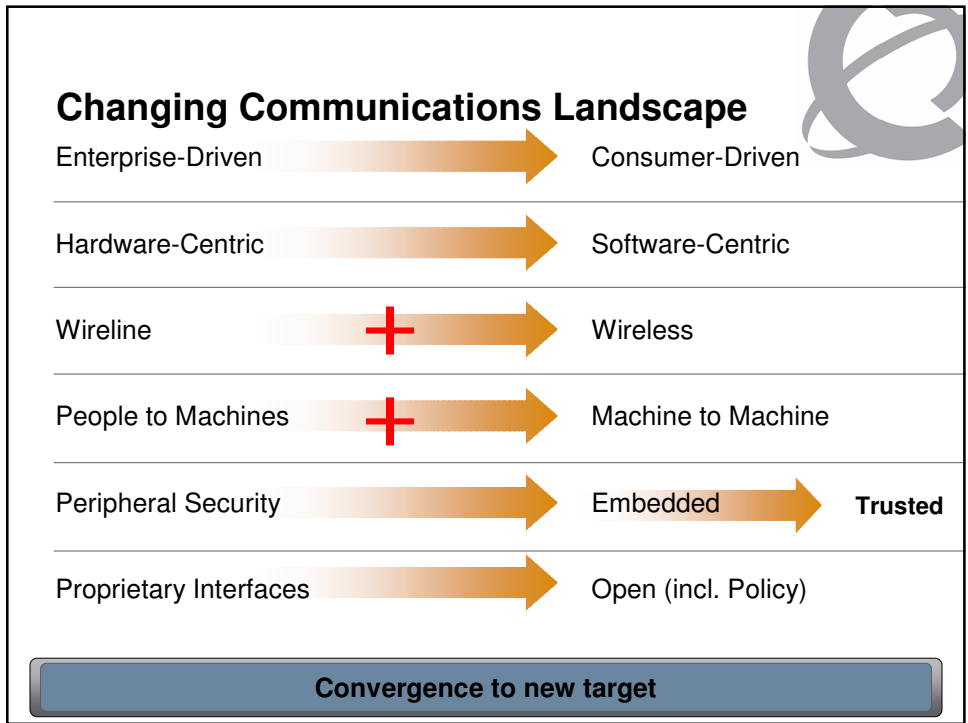
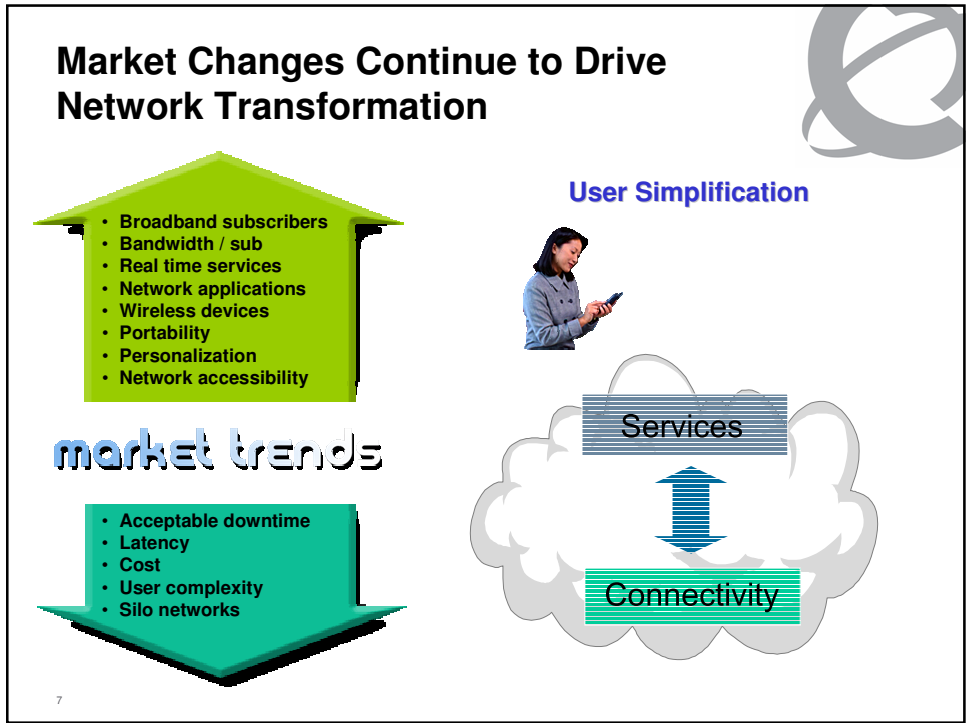


... for enhanced productivity and user experience

Eliminate boundaries ...

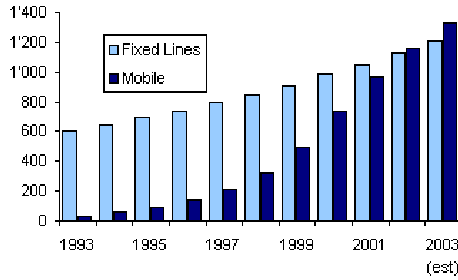


... to enable ubiquitous and seamless solutions



Mobile and Internet Revolution is Underway

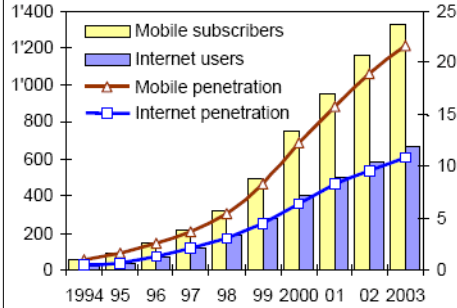
Mobile overtakes fixed: total subscribers, world, millions



From: "ITU and its Activities Related to IP Networks" (Apr 2004)

Data source: ITU World Telecommunication Development Report, 2002.

Users (millions) and penetration per 100 pop.



From ITU Internet Reports 2004: "The Portable Internet"

Data source: ITU World Telecommunication Indicators Database

Jan 2005

• UK: >100%: http://www.telecompaper.com/site/news_TA.asp?type=abstract&id=64718&NR=680

Mar 2005:

• Ireland: 94%: <http://www.rte.ie/business/2005/0318/comreg>

• Singapore: 91%: http://www.w2forum.com/item/singapore_mobile_phone_penetration_past

Mobile Revolution!

> Example: TCA Japan Telecom Data Book 2004

• Ref:

<http://www.tca.or.jp/eng/database/annual/2004/index.html>

Fixed subscriber lines

Mobile subscribers

Paging

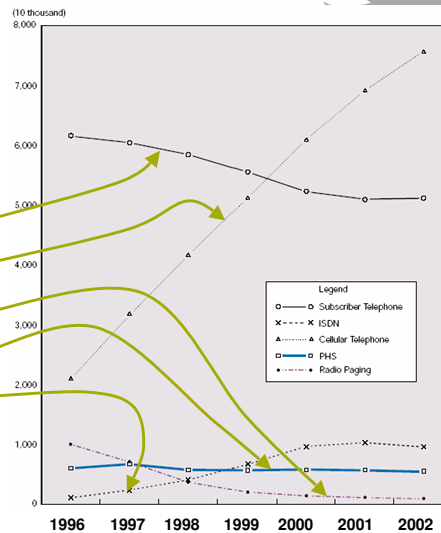
PHS

ISDN

> Continuing strong growth in mobile subscribers

> Stabilizing fixed subscriber base

> ISDN starting to decline!



Mobile and Internet Revolution - Korea

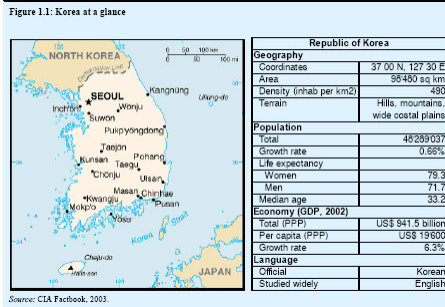
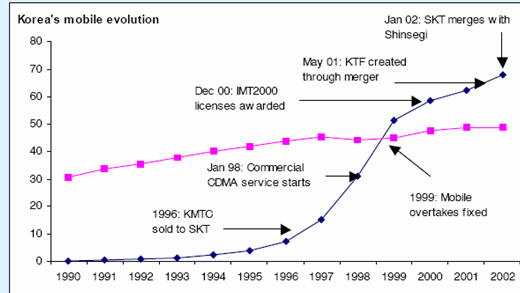


Figure 3.1: Korea's rapid mobile growth



<http://www.itu.int/osq/spu/ni/futuremobile/general/cestudies/koreacase-ry22.doc.pdf> (26 Feb 2004)

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Internet Revolution - Korea

Table 5-1 | Broadband Internet subscribers

Classification	2000	2001	2002	2003	2004. 6
Subscribers	4,017.5	7,805.5	10,405.5	11,178.5	11,617.8
Household rate	27.0	52.6	69.1	73.1	74.8

(unit: 1,000 people, %)

Data : Ministry of Information and Communication, July 2004

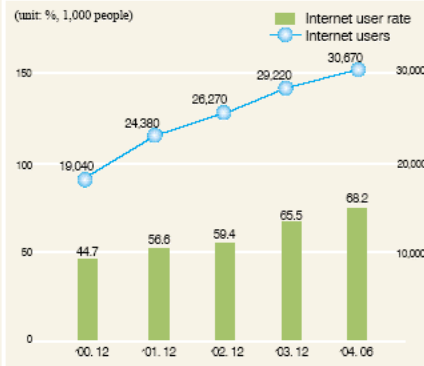
• **Strong correlation between mobility and internet usage**

• but varies by market: must always consider local factors

[http://www.nca.or.kr/homepage/ehome/ehome.nsf/BynewsV/1CACB7630D5C68F2C9256F3300114C44/\\$file/2004eng.pdf](http://www.nca.or.kr/homepage/ehome/ehome.nsf/BynewsV/1CACB7630D5C68F2C9256F3300114C44/$file/2004eng.pdf)

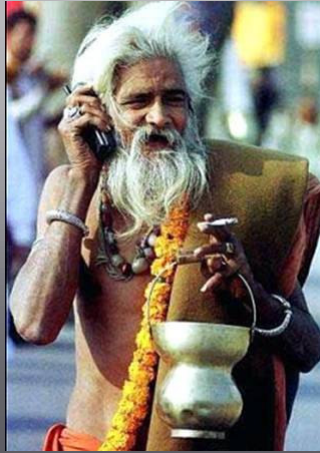
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Figure 5-1 | Trend of Internet Usage Rate and Users



Business in India Country of Contrasts

Embracing Telecom



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Stress All Designs



World Class-Capabilities



The Value Shift Opens up Opportunity & Threat for New Competitive Models

Voice
Networks &
Services

Data Networks &
Services

Internet



Services
(multimedia –
anywhere, anytime,
any device)

Network
(connectivity –
anywhere, anytime)

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The network has value... but the location of the value is shifting



- > Ubiquitous personalized service to the end user
 - Need an open services architecture for service innovation
 - Mobility across networks, ideally without user intervention
 - Quality voice will remain an essential service, key revenue source
 - Users will drive service innovation and quality of experience
- > The network is a platform for services
 - A common core network for wireless and wireline
 - The service edge is the anchor point for services
 - Interface to legacy at the service edge
- > Security across the network, services and information
- > Robust, trusted, always-on (carrier grade)

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Internet and Telecoms Convergence



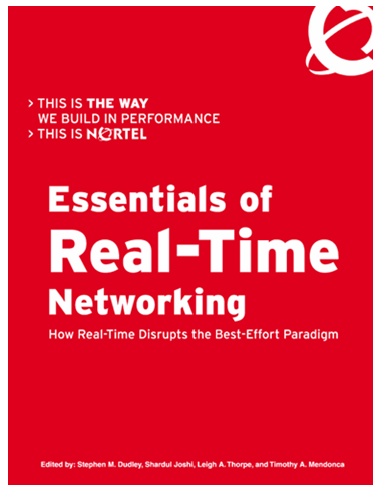
- > PSTN designed for reliable voice
 - Data added by making it behave like voice (modems, ...)
- > ISDN designed for reliable data and reliable voice
 - Voice treated as data using CS paradigm (2B+D, ...)
- > Internet designed for “best effort” data transfer
 - Pretty good, but good enough?
 - Much effort being applied towards QoS, security/fraud/privacy, charging, legacy interworking, ...
- > Major changes in access capabilities
 - xDSL; WWANs (UMTS, CDMA, ...) & WLANs (IEEE 802.11x)

No approach fully satisfactory by itself

- “Next Generation Networks” discussions transitioning from theoretical to practical

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Nortel Wrote the Book on Real-Time Networking (literally!)



- > For mission-critical applications, “best-effort” of data world is not acceptable
- > Not all networks can support real-time applications
- > Expert network planning and design is required
- > “The Book” – 800+ pages; technology/standards focused
- > Available on-line:
- > Certification program: Nortel Certified Technology Specialist – Real-Time Networking

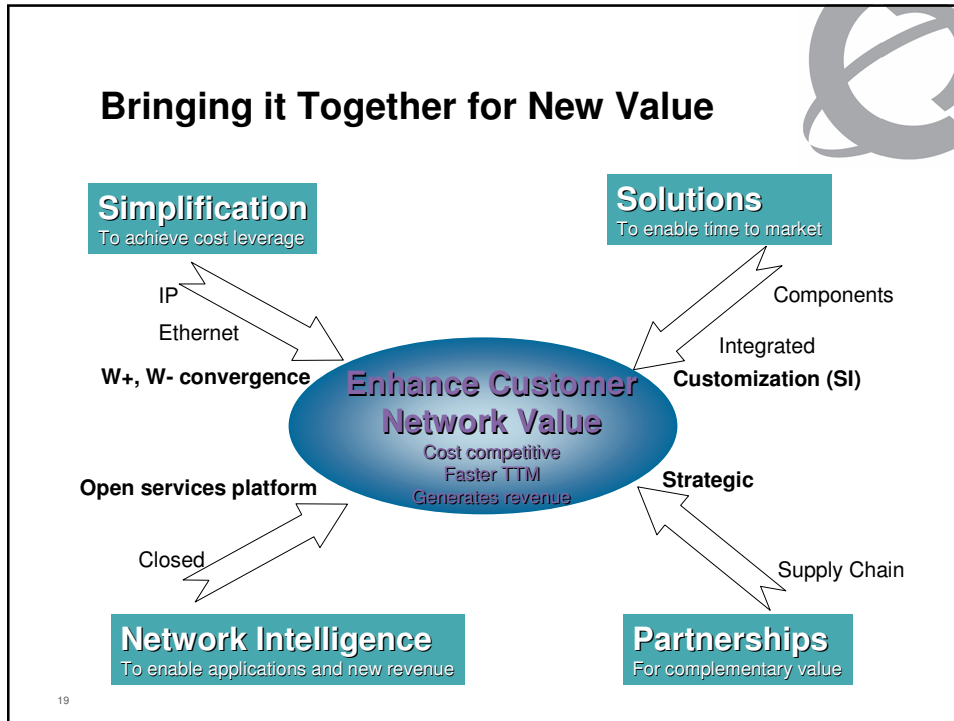
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No one knows “real-time” networking better than Nortel

Convergence Opportunity

- > Emerging industry-aligned vision
- > Avoid unnecessary complexity: align requirements for fixed and mobile/wireless
- > Motivation: retain customers; utilize infrastructure capacity to better serve customers
- > Capital constraints require innovation
- > IP technology maturity lags revenue generating service needs
- > Need for coherent management across a converging environment

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- ### Requirements of a Service Architecture
- > **For Users:**
 - Services available everywhere, and from multiple sources
 - Performance guarantees / simplicity in support, activation, billing
 - > **For Service Providers:**
 - Open service creation on one service infrastructure
 - “Stickiness” with Users
 - > **For Service Developers:**
 - A convenient level of abstraction
 - > **For Service Transporters:**
 - A slice of revenue: no free lunch!
 - > **For everyone:**
 - Security from malicious attack
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Key Attributes of a Service Architecture



- > Supports dynamic and static services
- > Enables access-independent service delivery
- > Provides seamless service execution across enterprise and carrier domains
- > Enables a dynamic communications services value chain
- > Ensures services are billable
 - revenue essential for the bottom line!
- > Supports digital rights management
- > Simplifies the end-to-end user experience

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Enhancing End User Experience: Blending User Devices

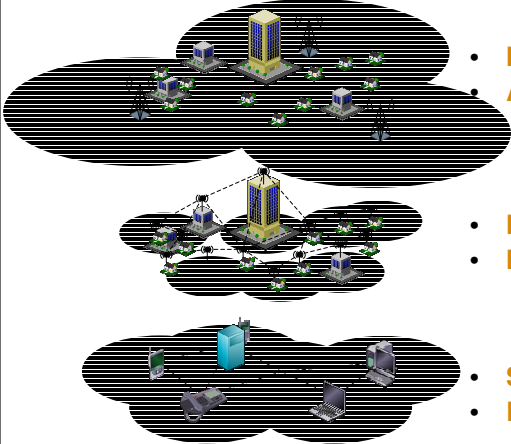


- > PC, phone(s) and PDA: different user interfaces to the same network-based application
- > Common, network-based directory for:
 - Phone numbers
 - Buddies & presence
 - Email address book
 - All applications
- > Just one address to reach the user
- > Unified, network-based, user profile applying to all terminals
 - E.g., set presence location, call routing preferences, etc., on any terminal and it applies to all



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The Un-Wiring of the Future



- **Mobility / WWAN**
• **A Million nodes @ \$50k**
- **Nomadic / Mesh / WLAN**
• **Millions of Nodes @ \$100**
- **Sensor / Ad-hoc / WPAN**
• **Billions of Nodes @ \$1**

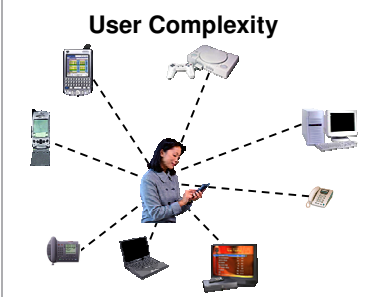
... connected through the Wireless Packet Network

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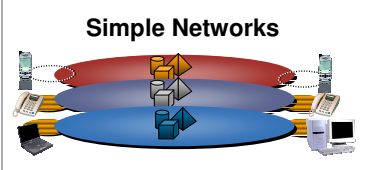
Convergence Value more than just VoIP Paradigm shift to multimedia “sessions”


Today

User Complexity




Simple Networks



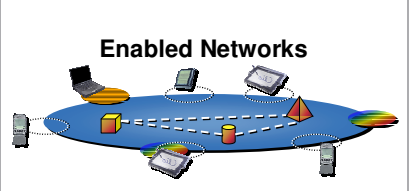


Tomorrow

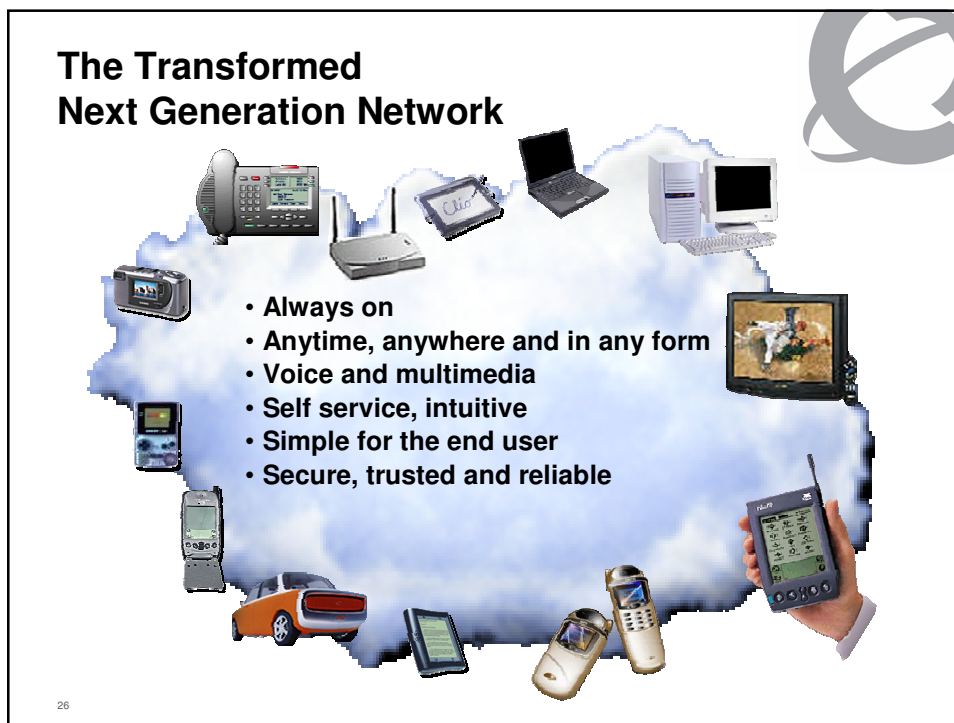
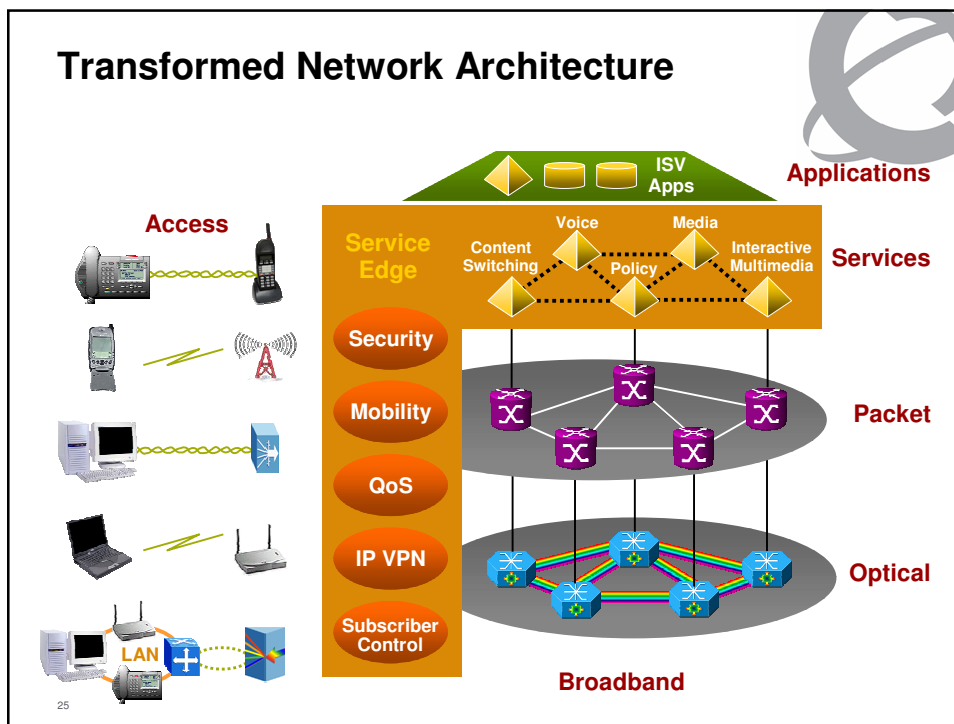
User Simplification



Enabled Networks



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Thank you!

Selected Acronyms



3G	Third Generation	MGCF	Media Gateway Control Function
3GPP(2)	Third Generation Partnership Project (2)	MGW	Media Gateway
BICN	Bearer Independent Core Network	NGN	Next Generation Network
CDMA	Code Division multiple Access	PC	Personal Computer
CSCF	Call State Control Function	PDA	Personal Digital Assistant
DECT	?? Digital Electronic Cordless Telephony	PDF	Packet Data Function
FA	Foreign Agent	PDG	Packet Data Gateway
GGSN	Gateway GPRS Support Node	PDSN	Packet Data Serving Node
GII	Global Information Infrastructure	POTS	Plain Old Telephone Service
GPRS	General Packet Radio Service	PSTN	Public Switched Telephone Network
GSM	Global System for Mobility	QoS	Quality of Service
HA	Home Agent	SCM	Session Control Manager
HLR	Home Location Register	SGSN	Serving GPRS Support Node
HSS	Home Subscriber Server	SIP	Session Initiation Protocol
IMS	IP Multimedia Subsystem	SLA	Service Level Agreement
IP	Internet Protocol	UMTS	Universal Mobile Terrestrial Access
ISDN	Integrated Services Digital Network	WLAN	Wireless Local Area Network
LAN	Local Area Network	WWAN	Wireless Wide Area Network

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