



Network Evolution to NGN and Convergence

2.1.1: Mobile Network Evolution to NGN

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

Nairobi, Kenya 9-12 May 2005

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>THIS IS **THE WAY**

Mobile Network Evolution to NGN

John Visser, P.Eng.
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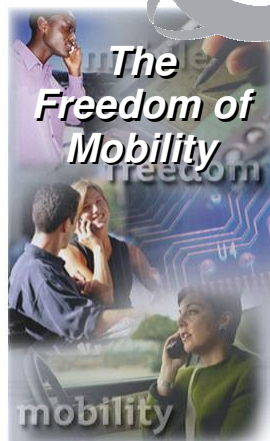
>THIS IS **NORTEL**

Outline

- > What do users value? What is needed to deliver it?
- > Mobility and convergence are key dimensions of the NGN
- > Major shifts occurring
 - Subscriber base (ref. presentation 1.3.1)
 - What the access technologies can deliver
- > Convergence of Telecoms, Data, Broadcasting
 - Wireless access and network transformation
 - Blending user devices
- > Realizing the Vision

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End Users Value ...



**... for enhanced productivity
and user experience**

Eliminate boundaries ...

... to enable ubiquitous and seamless solutions

Transforming the User Experience – Application Convergence

Personal Agent manages your incoming calls

Call Logging

Desktop Video Conferencing

“One-Click” to all contacts

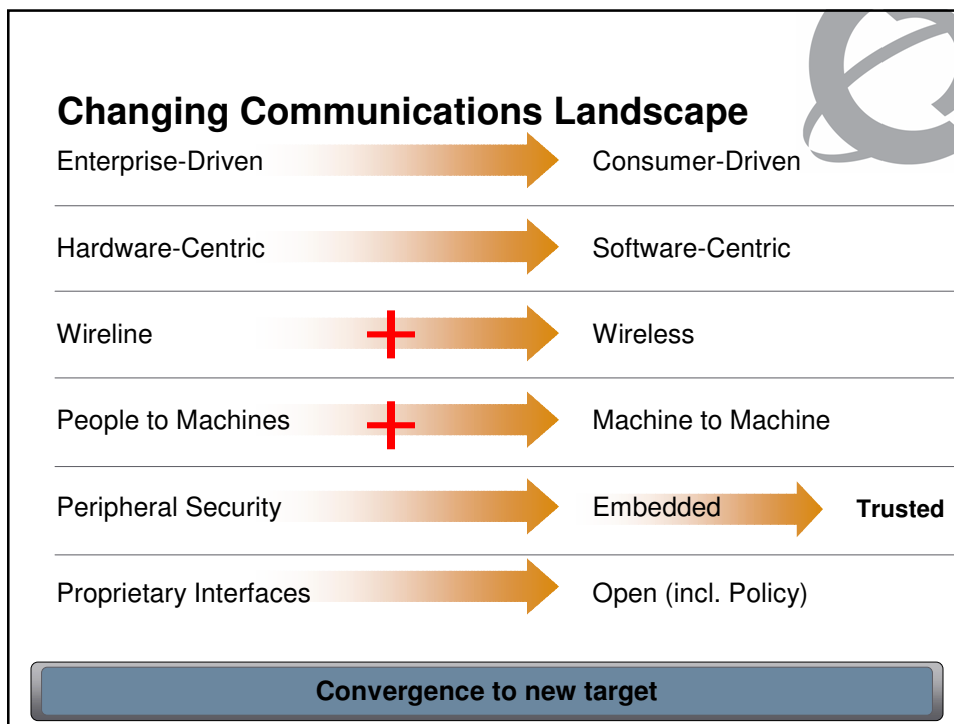
Collaboration Services

Wireless LAN Access

The new enterprise

- Calling Line ID
- Calling Picture Presentation
- Send Call to Voicemail
- Send Call to pre-determined destination
- Reject Call
- Click-to-call on box
- Call Logs
- Address Book

The new home center



Forecasts

> Many available!

- Example: Yankee Group, News Release 24 Jun 2003:
 - estimate 18.6% of world's population currently has mobile phones
 - global wireless user base will increase 49% over next 4 years, reach 1.72B by 2007
 - global cellular subscriber revenue will grow from \$387B in 2002 to \$584B in 2007, similar in value to crude oil production
- Reality: Dec 2004*:
 - enormous growth in Russia, India China: China added 9.25M mobile subscribers in Feb 2005!**
 - global wireless user base: 1.5B at end 2004; internet user base: 700M at mid 2004
 - global mobile revenue already \$414B in 2003

* CNN: www.cnn.com Dec 9, 2004, using ITU info

** Shosteck Email Briefing, April 2005; www.shosteck.com

Enhanced 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



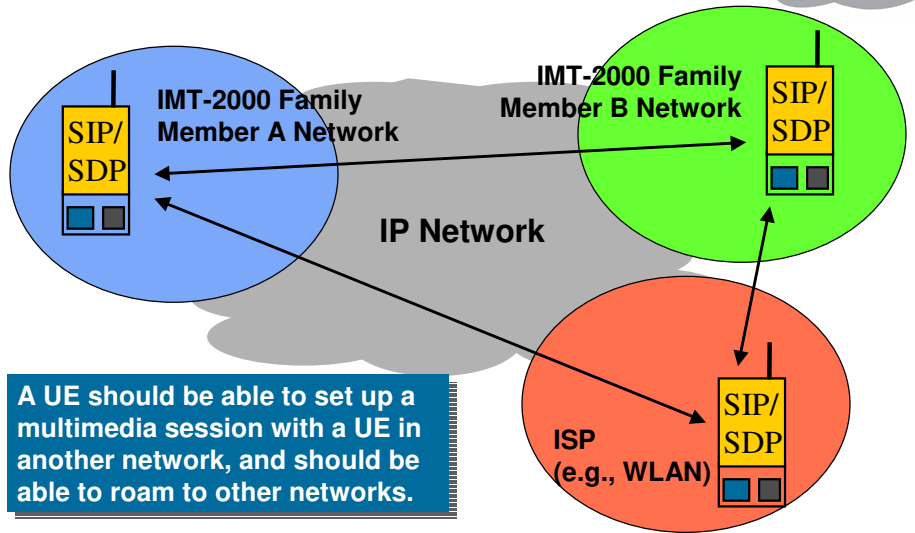
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Seamless Mobility

- > “The ability for a user or machine to access services, while freely moving within and between network types, regardless of client type, domain or service provider without having to re-authenticate or re-logon while maintaining functionality of any application.”

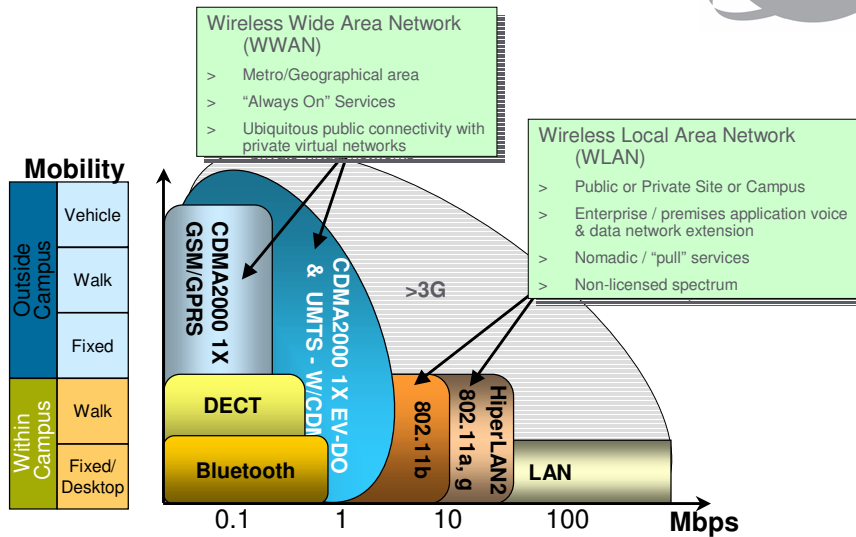
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IMS and Interworking



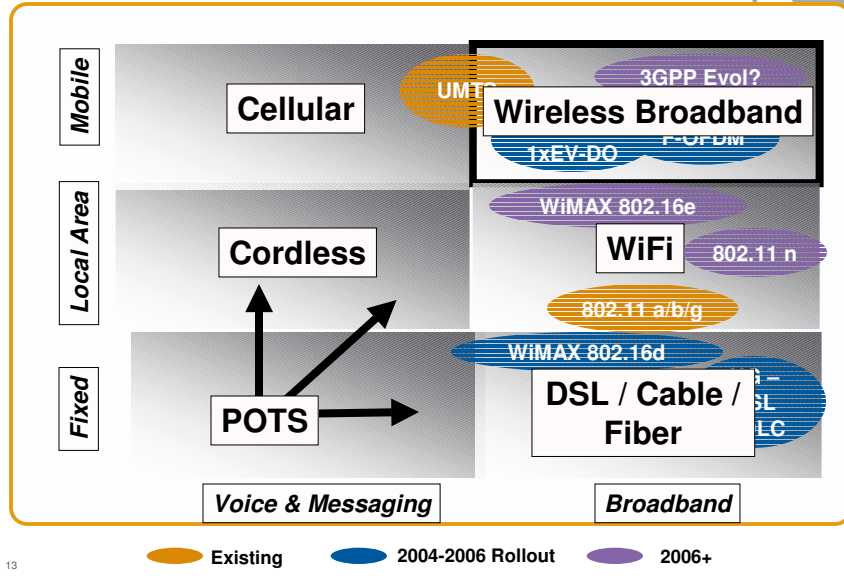
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Wireless Landscape: what the access technologies can deliver



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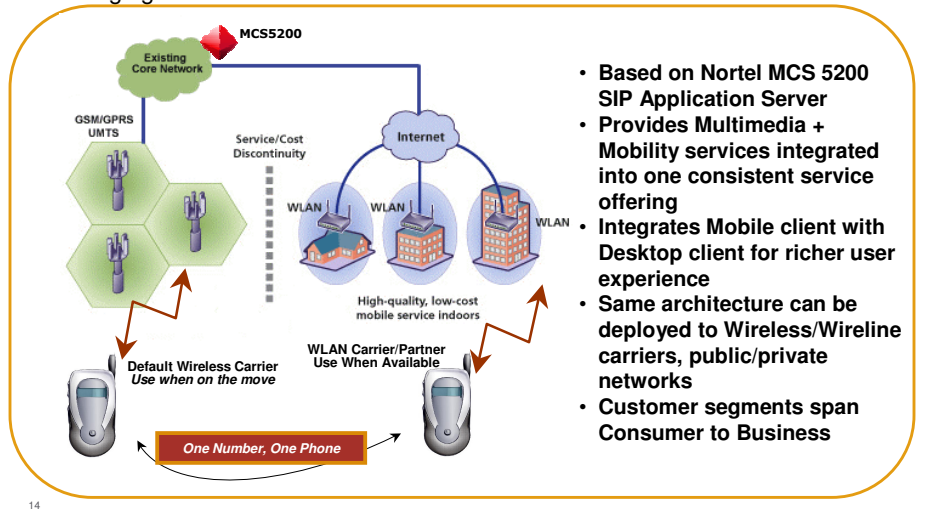
Wireless Broadband – The New Category



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CMS Converged Mobility Solution – Access Virtualization

Leveraging MCS 5200 with Dual-Mode WLAN/Mobile Handsets



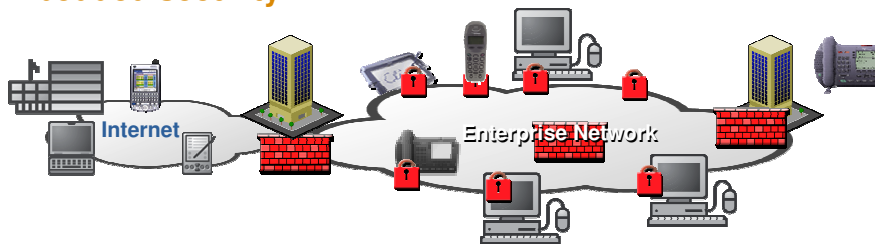
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Challenge: Move from Secure to Trusted Communications

Peripheral security

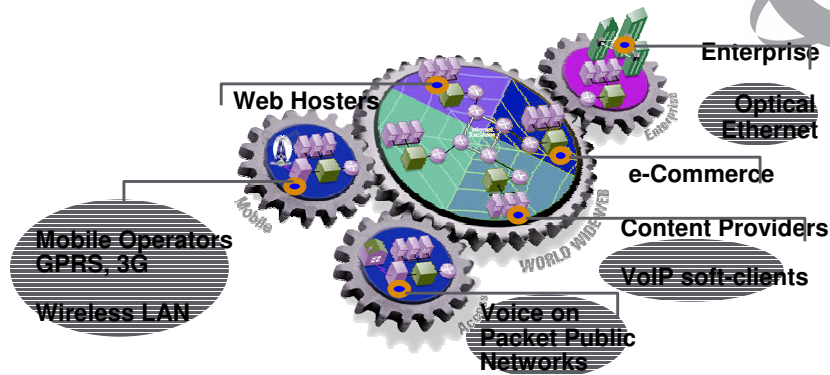


Embedded security



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New Security Challenges....

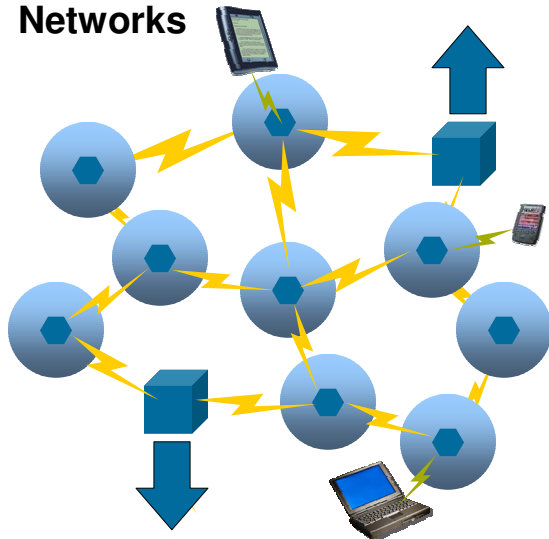


End-to-end NETWORK security focus needed

End-to-end services means piece-meal approach is no longer sufficient!

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New Deployment - Wireless Mesh Networks

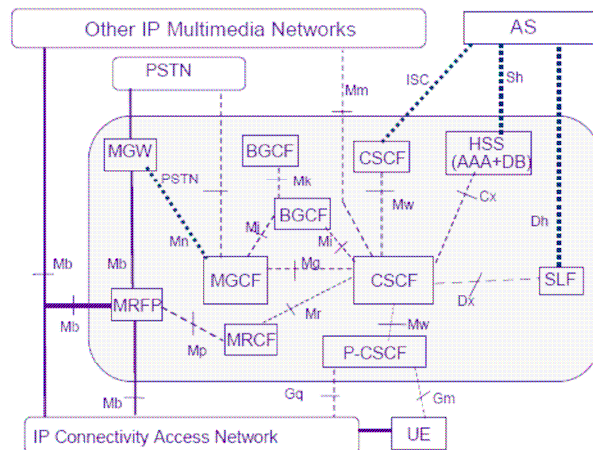


- > Makes WiFi public / city hotspot deployment economic
- > Reduces Operating Costs – Backhaul
- > Commercially Available
- > Taipei, Taiwan Deployment Announced
- > 4 Universities – 2 continents

Can be used to extend WiFi coverage + Use WiMAX 802.16e or HSPA MVNO to provide macrocellular coverage

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Harmonized IMS Functional Architecture



For a tutorial on the IMS, see, e.g., Tom Towle's presentation for the March 2005 NGN Workshop in Jeju, Korea, available at:

<http://www.itu.int/ITU-T/worksem/ngntech/presentations/s1-towle.pdf>

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What is IMS? (1/2)



- > IP Multimedia Subsystem
 - A set of core network functional entities to support access to operator provided SIP based services.
- > Builds on IETF protocols to create a robust and complete multi-media system
 - SIP, SDP, DIAMETER
 - Enhancements, operational profiles provide support for operator control, charging and billing, and security

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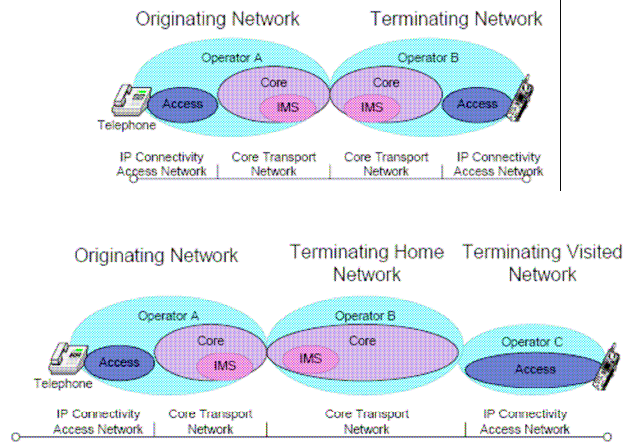
What is IMS? (2/2)



- > Vertical interfaces to transport level provide:
 - Coordinated assured QoS (session layer negotiation matches resources at transport layer)
 - Media gating under operator control
 - Correlated accounting among service, session and transport layers
- > Coordinated network interfaces provide:
 - Better user service experience:
 - QoS, accounting, single sign-on, better security, etc.
 - Common Application Server interfaces for:
 - Accounting/charging, security, subscriber data
 - Service building blocks (e.g., for Presence, Location)

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Some sample IMS in NGN scenarios



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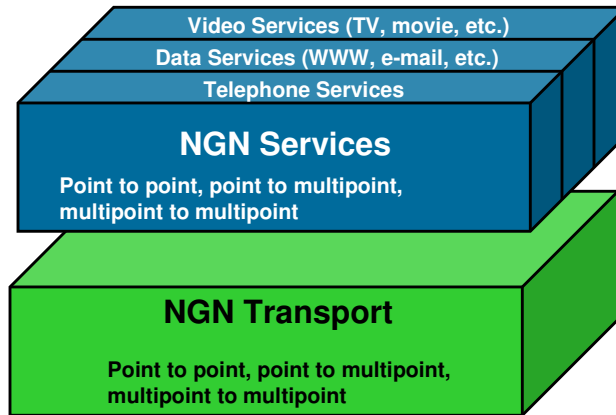
What does this mean for the Core Network?

- > Common, access independent NGN Core Network solution: IP-based using IETF protocols
- > Basic mobile telecommunications paradigm includes integration of IMT-2000 (3G) and Wireless LANs
- > Common issues dealt with in a common way:
 - QoS
 - Fraud/Privacy
 - CS (legacy) interworking
 - Charging
 - ...

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NGN - Convergence Model

> What's new: horizontally integrated network

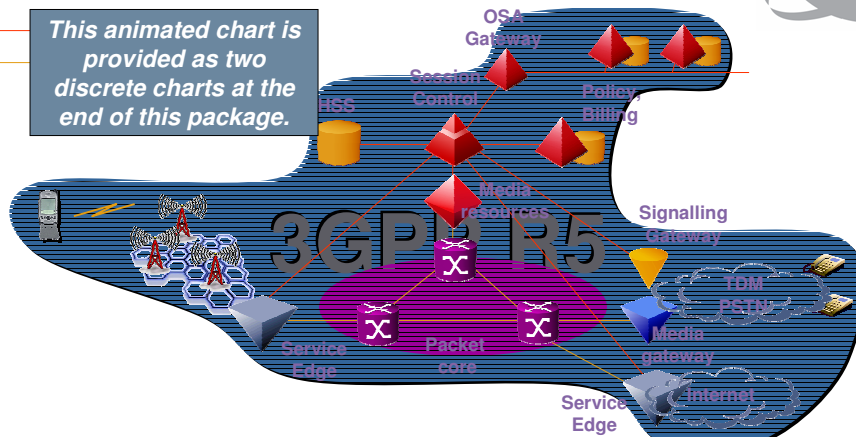


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ITU-T Recommendation Y.2011

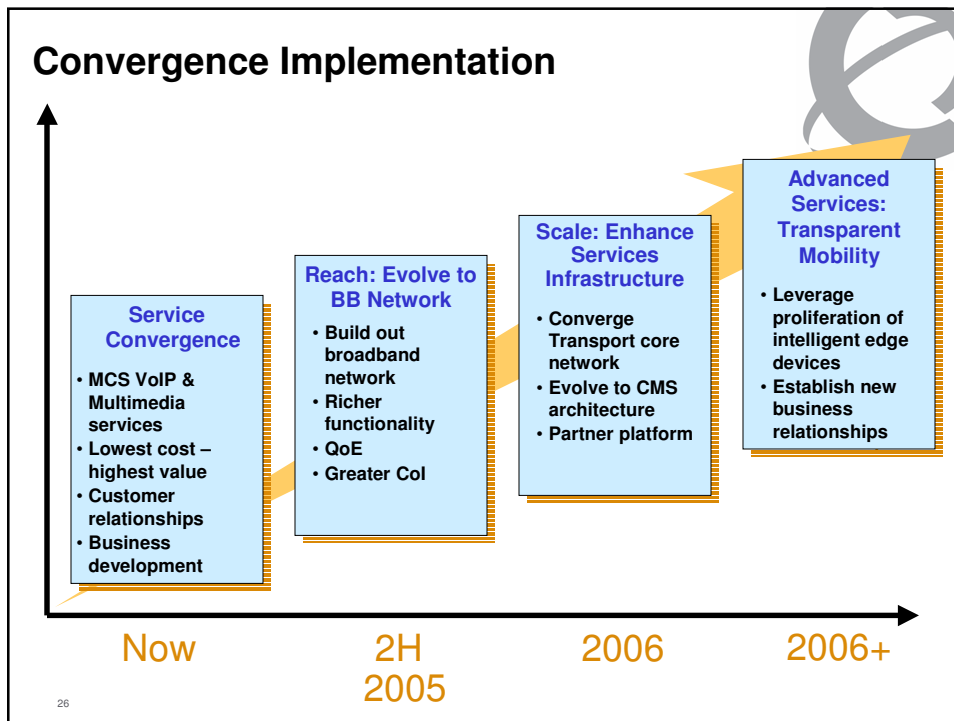
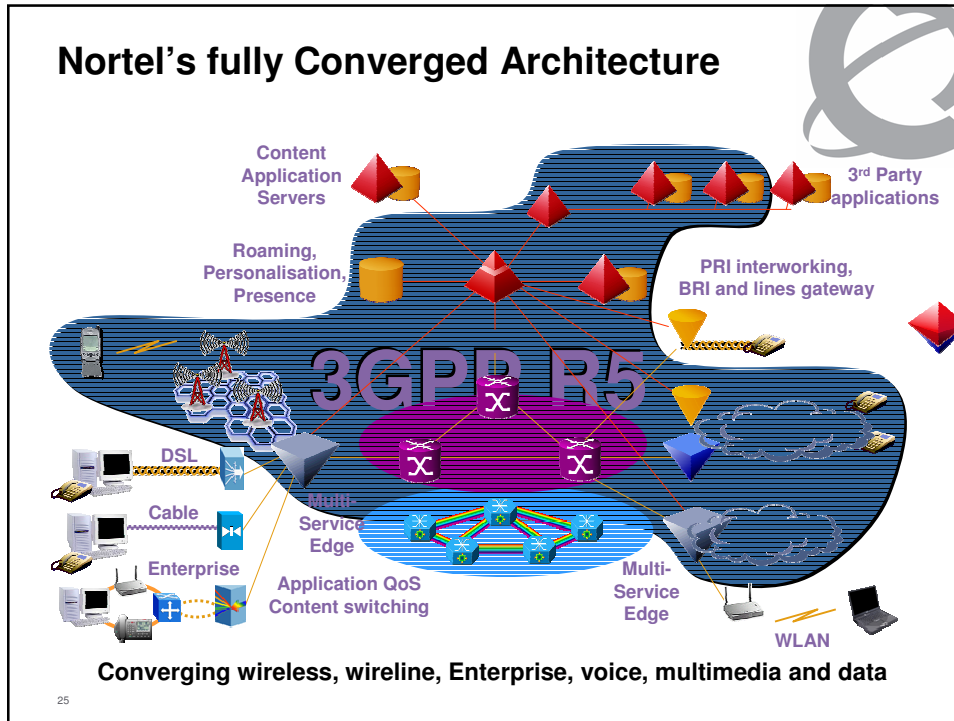
3GPP R5 network architecture

This animated chart is provided as two discrete charts at the end of this package.

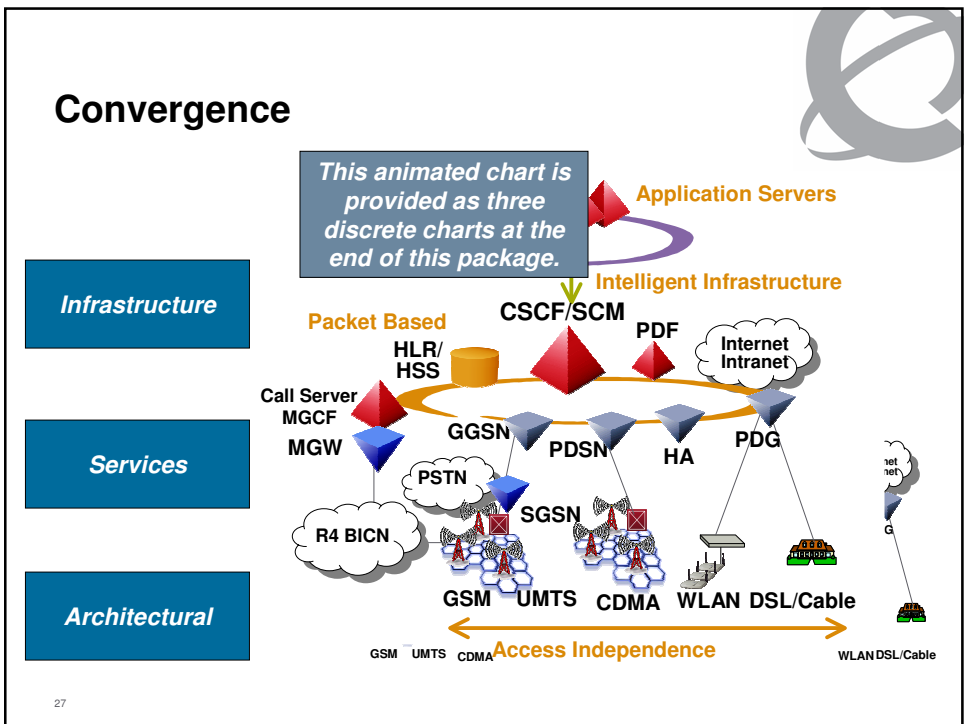


- 3GPP R5 IM Subsystem provides a SIP and H248 framework for the applications and control environment of converged wireless networks
- Applications creation environment permits extending applications to users independently of their means and point of access

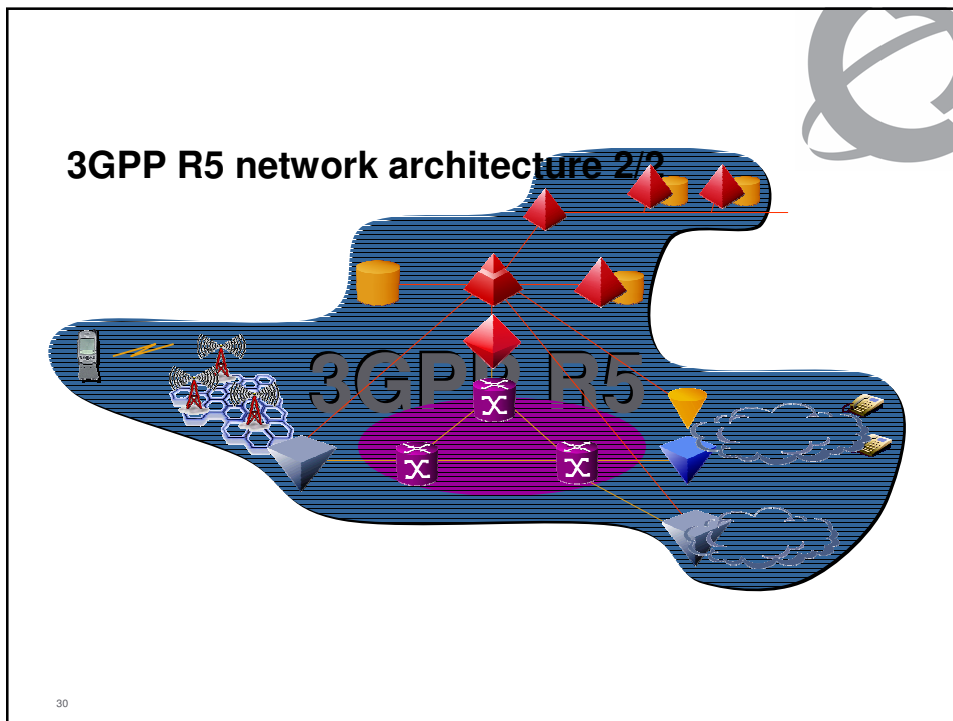
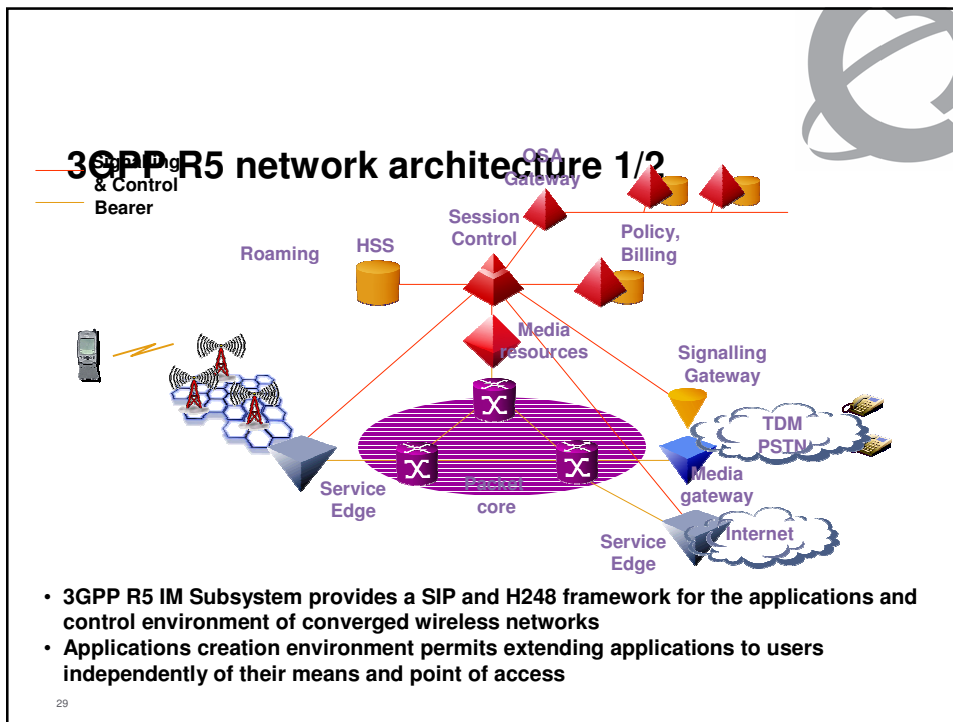
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Convergence

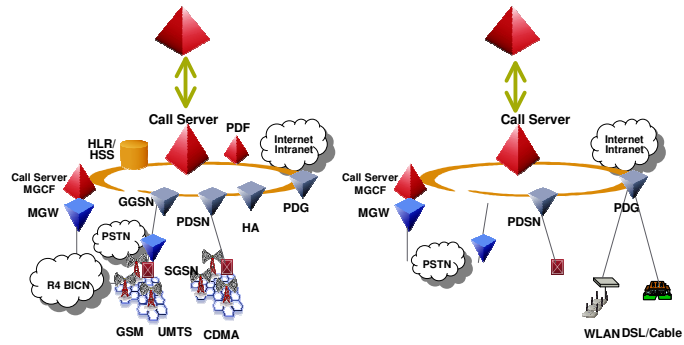


Thank you!



Convergence - Non-animated - Step 1

Architectural

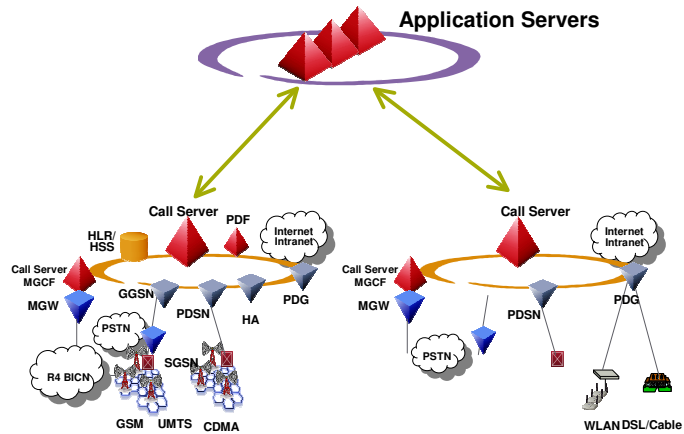


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Convergence - Non-animated - Step 2

Services

Architectural



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Convergence - Non-animated - Step 3

Infrastructure

Services

Architectural

