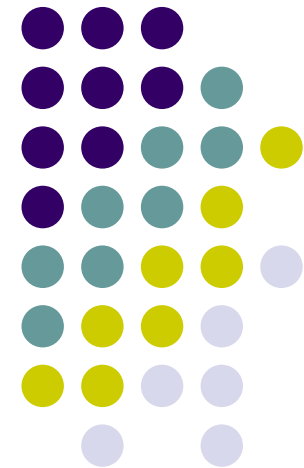


IP Multimedia-Subsystem (IMS) and IPv6

Bosco Eduardo Fernandes
Coordinator IPv6 TF-SC





Overview

- Market trends with Multiple choices of Technologies
- Solution for Converged and future services IP- Multimedia Subsystem
- IPv6 and IMS
- Conclusion

Technology and Choices today



- Range of consumer communications services constantly evolving:

- Increasing choice

- Devices
- Functionality
- Services and applications

- Increasing mobility

- Increasing speed/bandwidth

- Network and access methods

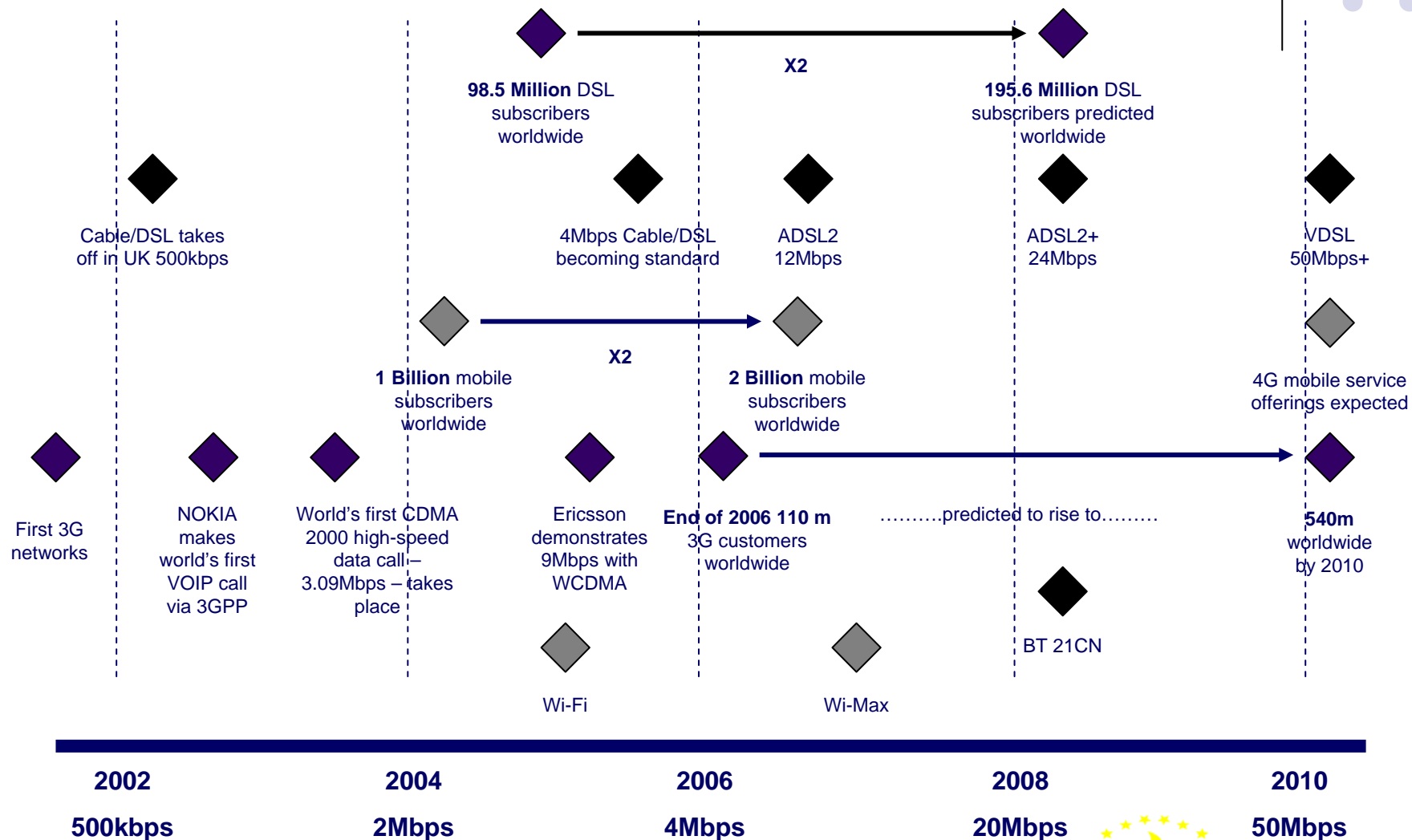
- Increasingly IP based

- Faster and cheaper
- Becoming more reliable

- Increasing globalisation of VoIP and IP networks



New technologies, more users, more bits



New services, new identities

- Services and applications

- Boom in personal communication, social-networking and peer-to-peer file sharing services

- Vonage, Tesco Internet phone, Instant Messenger, ICQ
- YouTube, MySpace, “Blogging”
- Kazaa, eDonkey



Communication services and products offering user privacy as key differentiator

- Skype, PGP, Hushmail, findnot.com

- Easy access to many different ‘virtual’ identities

- No link to ‘physical’ identity of user
 - Pre-pay mobile phones, Chat-room nicknames, IM handles
- Many services are free, so don’t require referenceable details



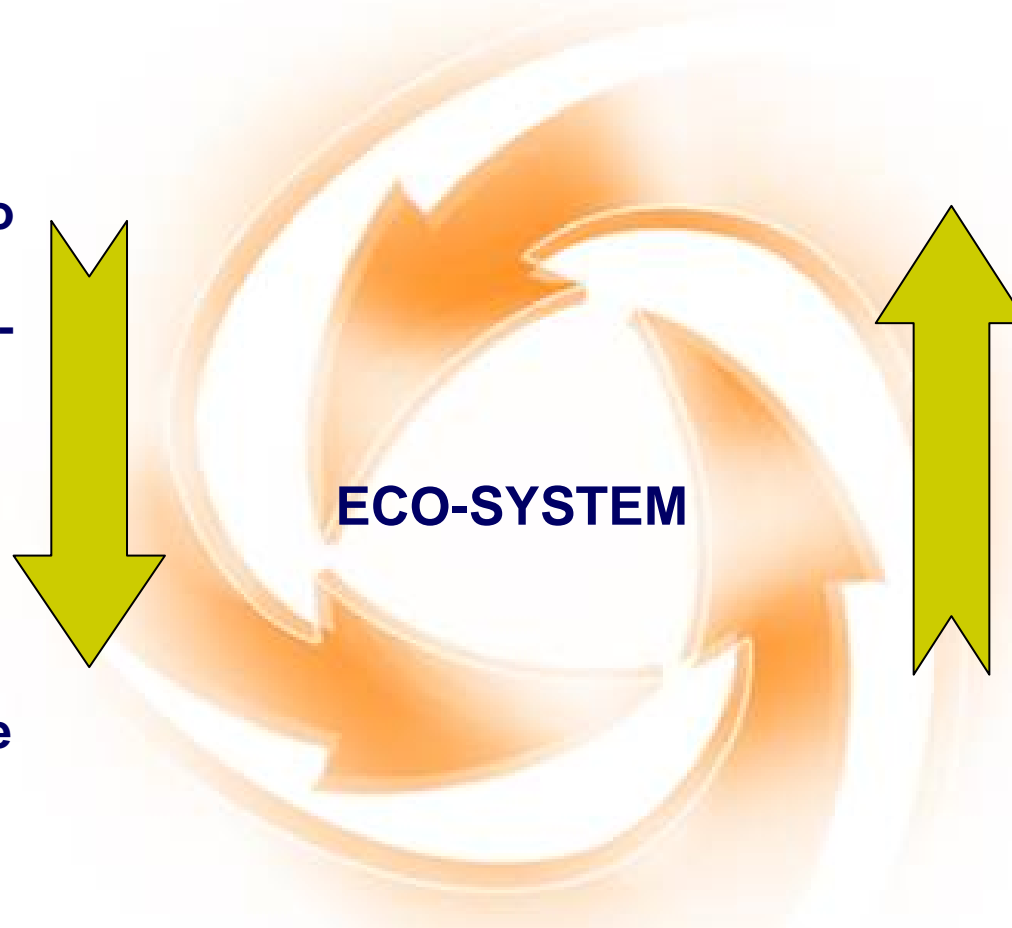
Transforming Today's Market



IP Paradigm-to stimulate the growth



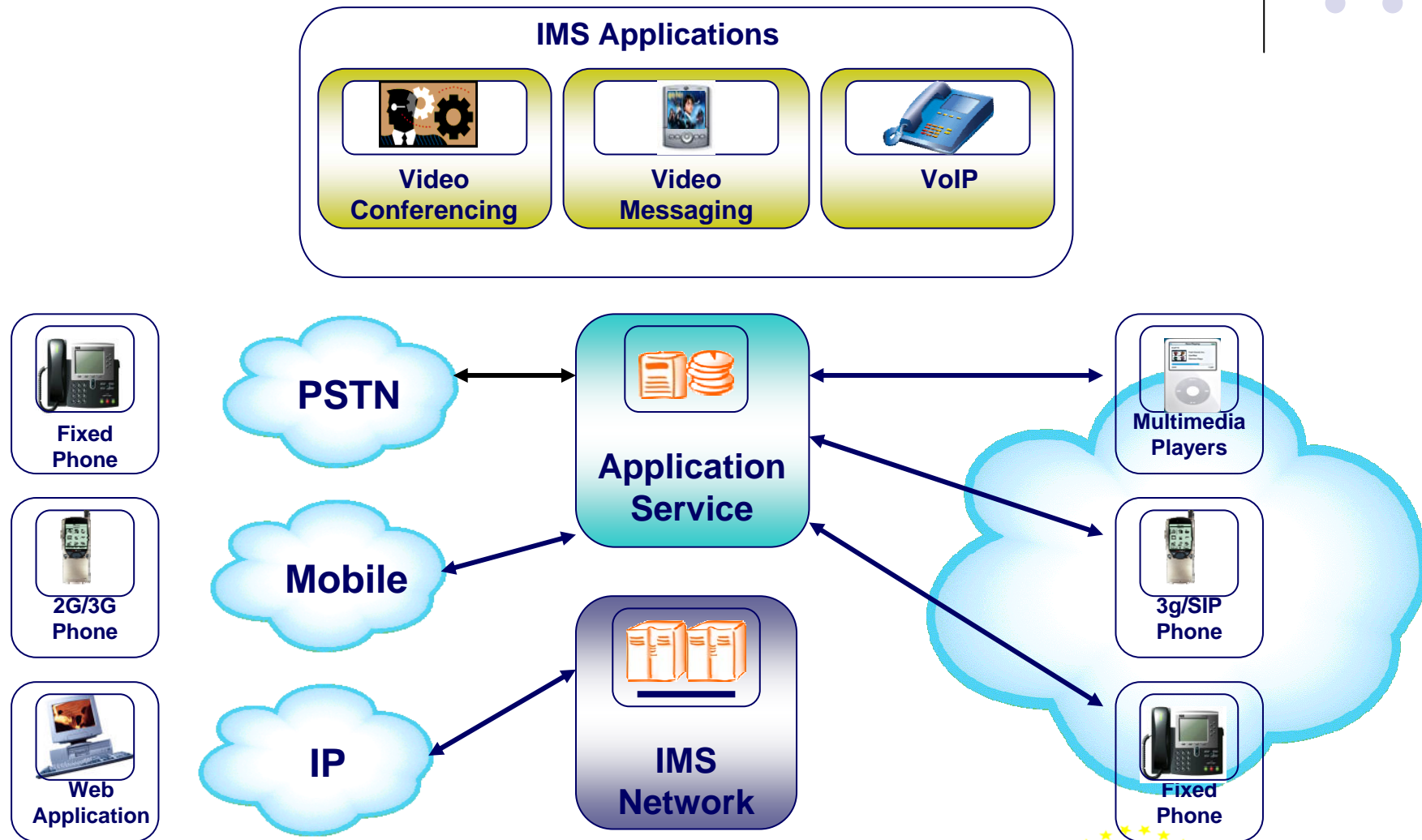
Next Generation Networks aims to enable telcos to compete in an IP-based world-reduce costs, increase operational efficiency and time to market and stimulate the growth of new revenue streams



Next Generation Networks to support vertically-integrated telco business models which are increasingly threatened by new market entrants

By using an IMS Framework

Overview of IP Multimedia Subsystem



Product Categories with Significant impact on IMS



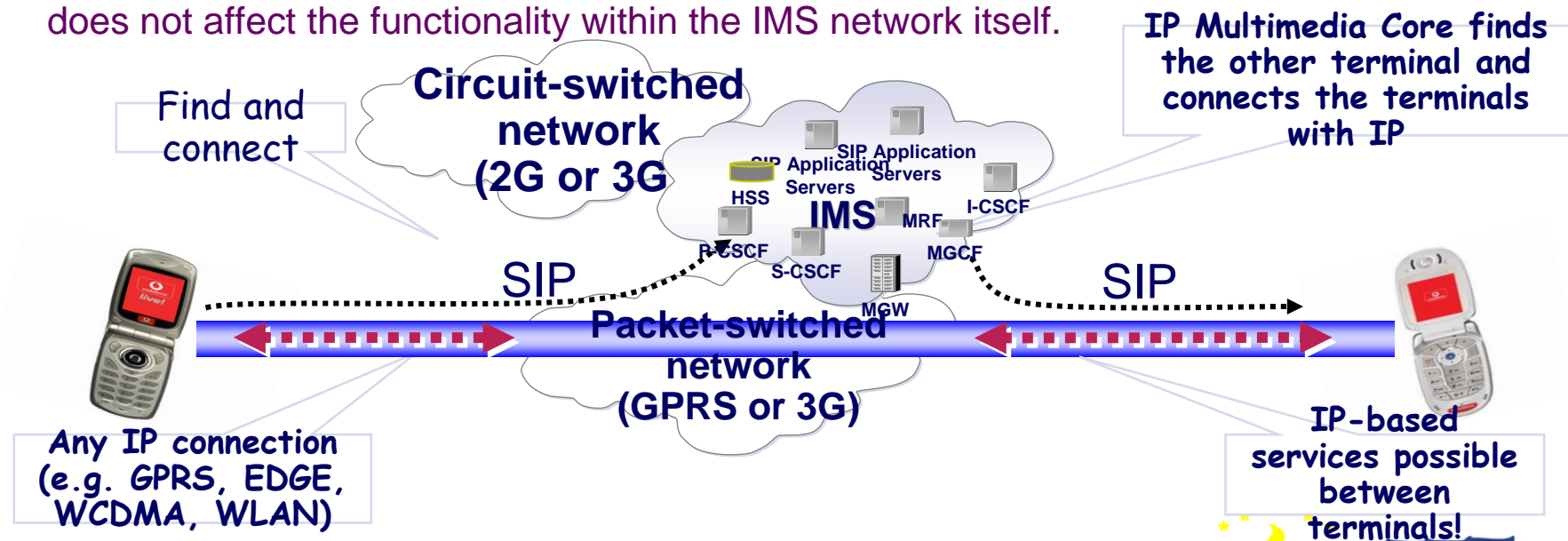
- **Core Infrastructure products:**
 - Application Servers-Stand-alone application and feature servers and application gateway products
 - Home Subscriber Servers-Database products for storing IMS subscriber information; includes hybrid HLR/iHSS products
 - IMS Softswitches-includes new IMS-based CSCFs, MGCF, BGCF components performing gateway control, proxy, and core signaling functions-usually bundled together in one or more physical devices, and stand-alone P-CSCF devices
 - Media Resources Functions Products-Media server products which support MRFP IMS functions and can be controlled by and /or H248 signaling.
- **Gateways (Media and Signaling)-Network devices that translate bearer traffic and signaling formats and can be controlled via SIP and/or H.248**
- **IMS Terminal stacks-IMS client and Software stacks used in end-user devices**
- **Infrastructure Enabling Technologies-include stacks, SDKs, and development tools used to help infrastructure vendors develop products**
- **IPv4/IPv6 Transport Products.**

The transition from CS to PS

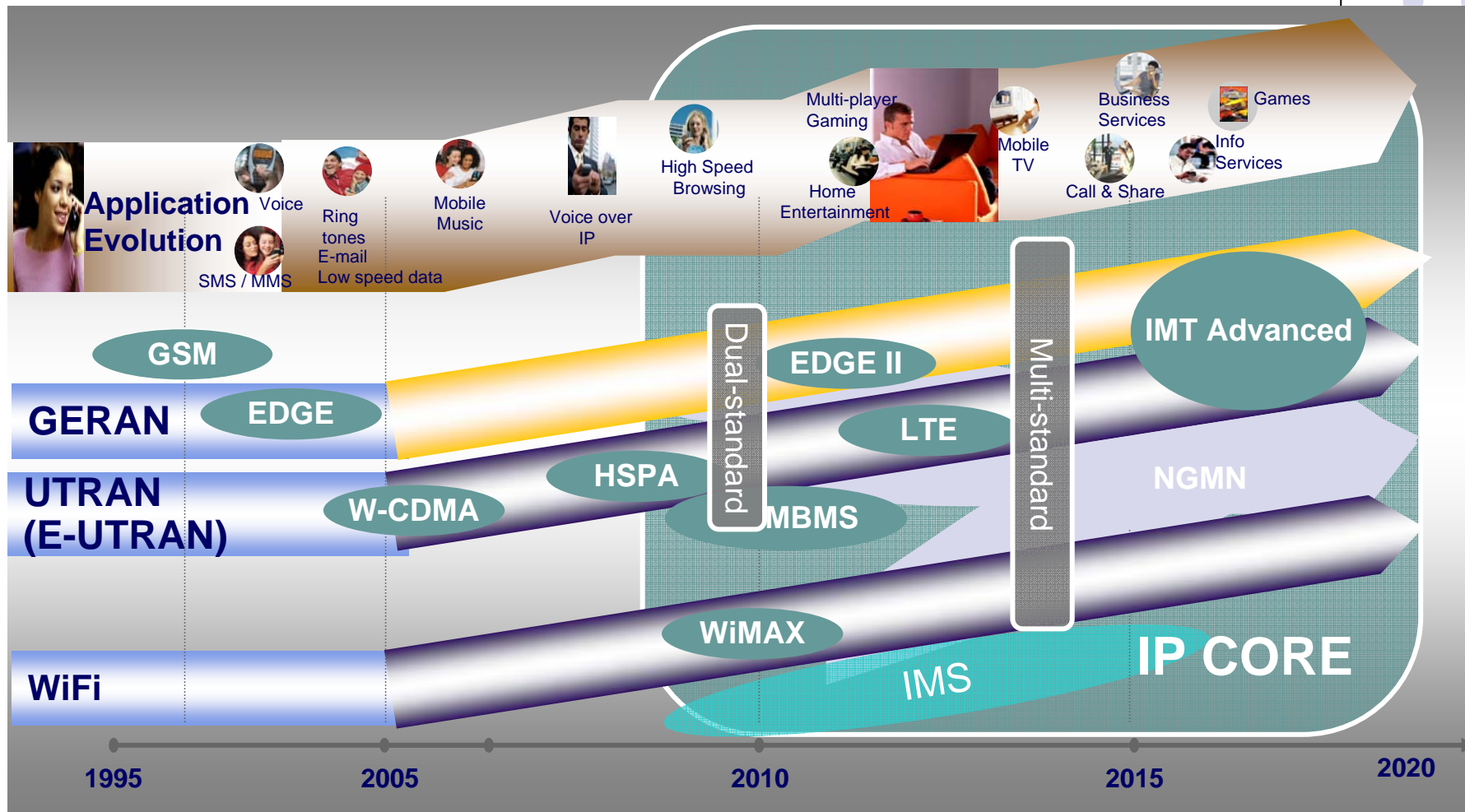
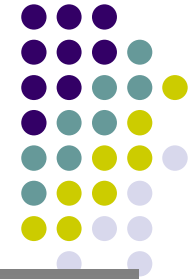


- This allows IMS to be applied to any form of Access technology that is capable of transporting SIP control messages to the P-CSCF
 - WLAN, DSL, Cable Modem, FTTx, Satellite, Broadband Wireless all become irrelevant – all that matters is SIP presentation to the P-CSCF.
 - Only expectation is Access that is relevant is User Equipment capability and QoS.
- **'Access Independent'**

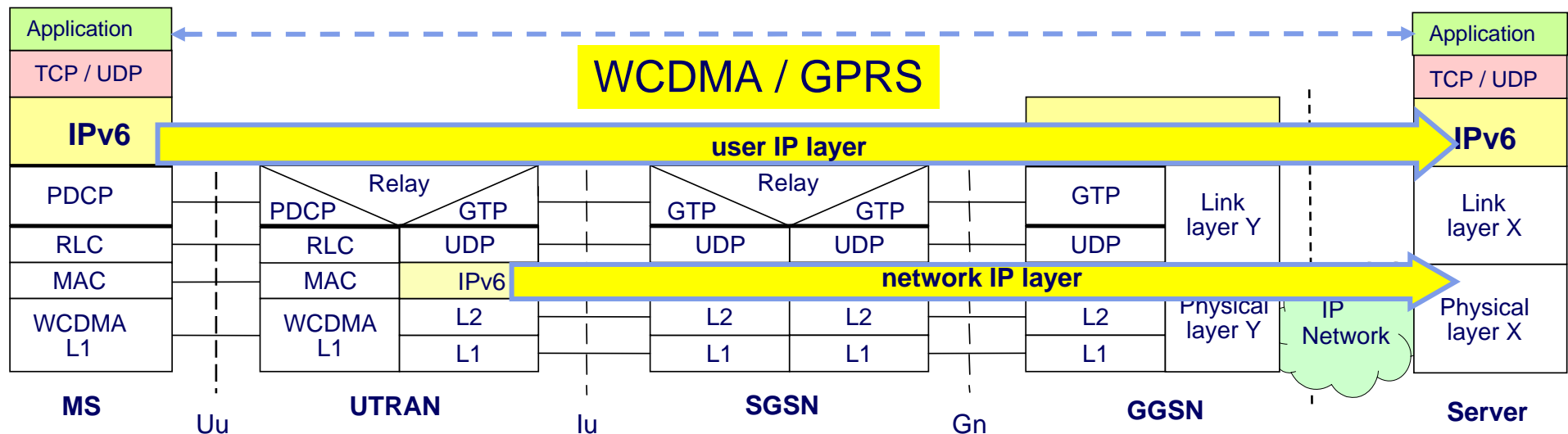
the technology used to transport SIP messages to the edge of the IMS network does not affect the functionality within the IMS network itself.



IP centric and multiple access evolution



Protocol Stack in Access Network



The Access network can already support IPv6 this valid for the whole 3G family

- WCDMA
- HSDPA, HSDPA+
- HSUPA,
- LTE



IPv6 the best of all worlds

- Related to end-to-end security and reachability, QoS and overall cost-effectiveness.

Frame Relay	Leased line replacement
Multiservice	ATM too broad and complex
MPLS	(Too) complex
IPv6	Will be great once it is deployed

- With growing needs for IP multimedia messaging, video streaming and VoIP, IPv6 will support 3G VoIP as well as 3G hotspot services (including VoWi-Fi).

Status of IPv6 Deployment



- IPv6 has started in the data switching/ routing networks and ...
.... extends its reach now to servers, clients and devices.
- The Mobile IPv6 value proposition
- A trinity of Mobilities.



IPv6 Business case



- Most Operators have trialled IPv6 in their networks and are developing a technology implementation strategy for IPv6.
- Despite:
 - IPv6 knowledge within engineering, operating and support is still not quite there.
 - Although most operating systems have implemented IPv6, they still lack in support e.g. manual installations, no GUI-based configuration tools
 - Only a limited set of applications (the IETF still provides RFC without IPv6 support)
 - Most of the home network equipment only support IPv6 rudimentary.
- The mass market is on its way....Over 20 Million Notebooks/ PC's have been sold today and growing every day- all equipped with VISTA and IPv6 enabled.
 - As a result one gets automatically a TCP/IPv6 download.

This is the beginning not the end of IPv6

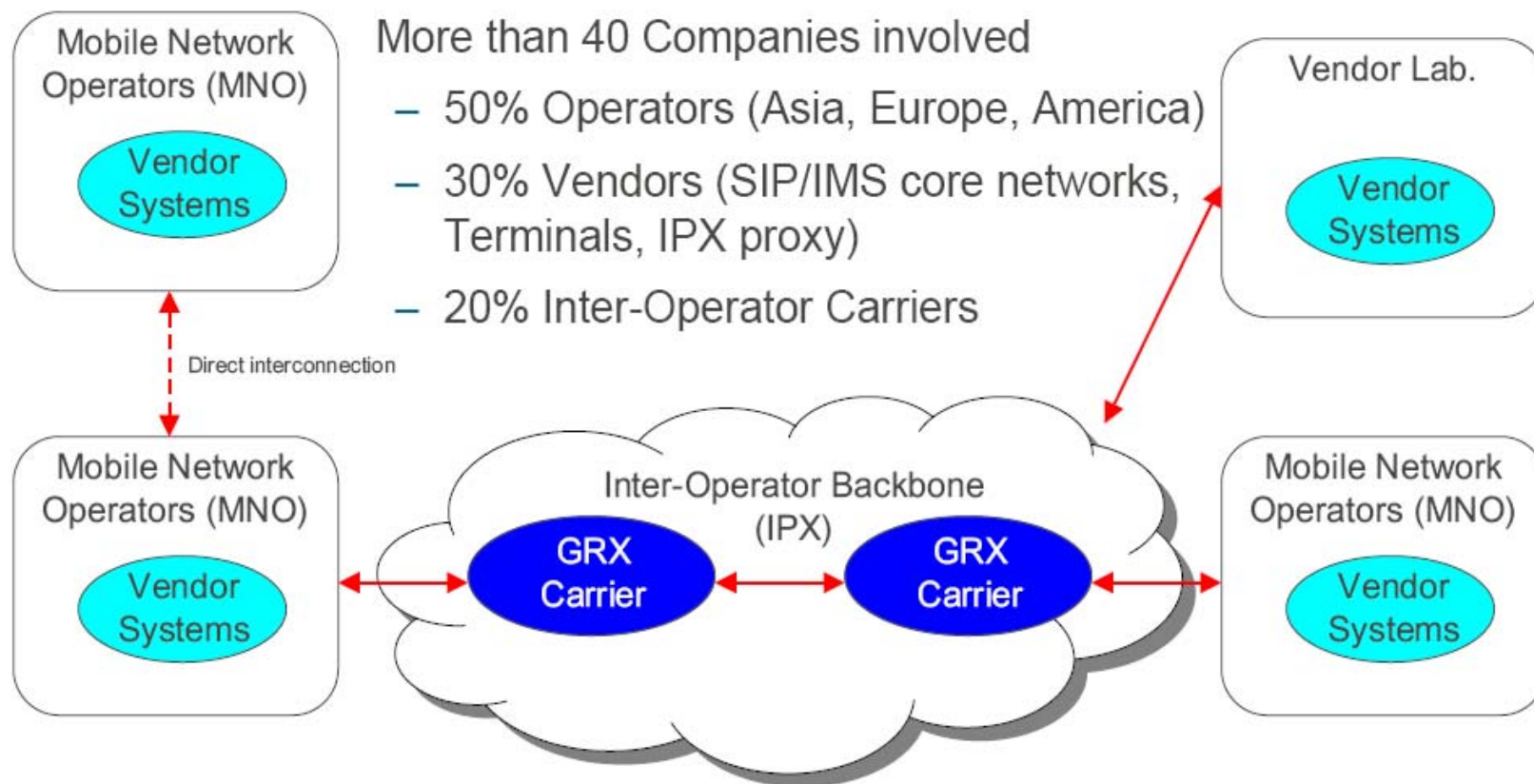
Programming with IPv6



- Most applications will require minimal changes to support IPv6
 - Change the socket, name-service, and UI
 - This is true for C programs since the Java API is already IP version agnostic
- Network-intensive applications will require a bit more
 - IDS, firewall, network/security analysis tools
 - Security tools that use addresses in protocol

Source: Ken Renard, WareOnEarth Communications

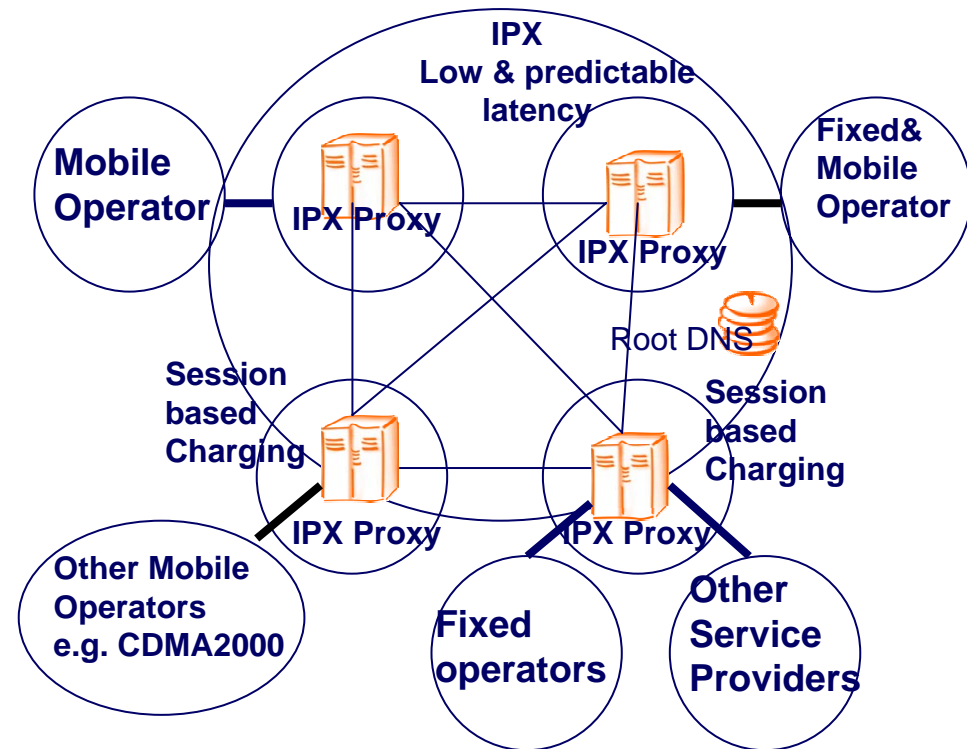
INTEROPERABILITY TEST



Scope of Interoperability Test



- Connection between IPx's Proxies
- IPv6/IPv4/6 Conversion
- Accounting data collection done by IPx proxy
- Basic Performance related measurements





Results accomplished

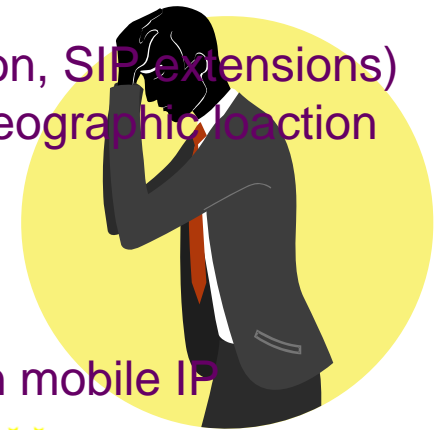
- Successful service inter-working through two IPX proxies
- End-to-end IPv6 and IPv6/IPv4 in IPX Proxy proved successful
- Four IPX Proxies tested
 - Three IPX Proxies IPv6 enabled
- IPX Proxies able to produce accounting information from the session data
- New information about the performance of a real-time peer-to-peer application in an inter-working environment collected
- Real terminals from Nokia employed for all tests
- No issues raised with the standards
- More practical experience from the deployment of SIP based services across network and platform boundaries gained



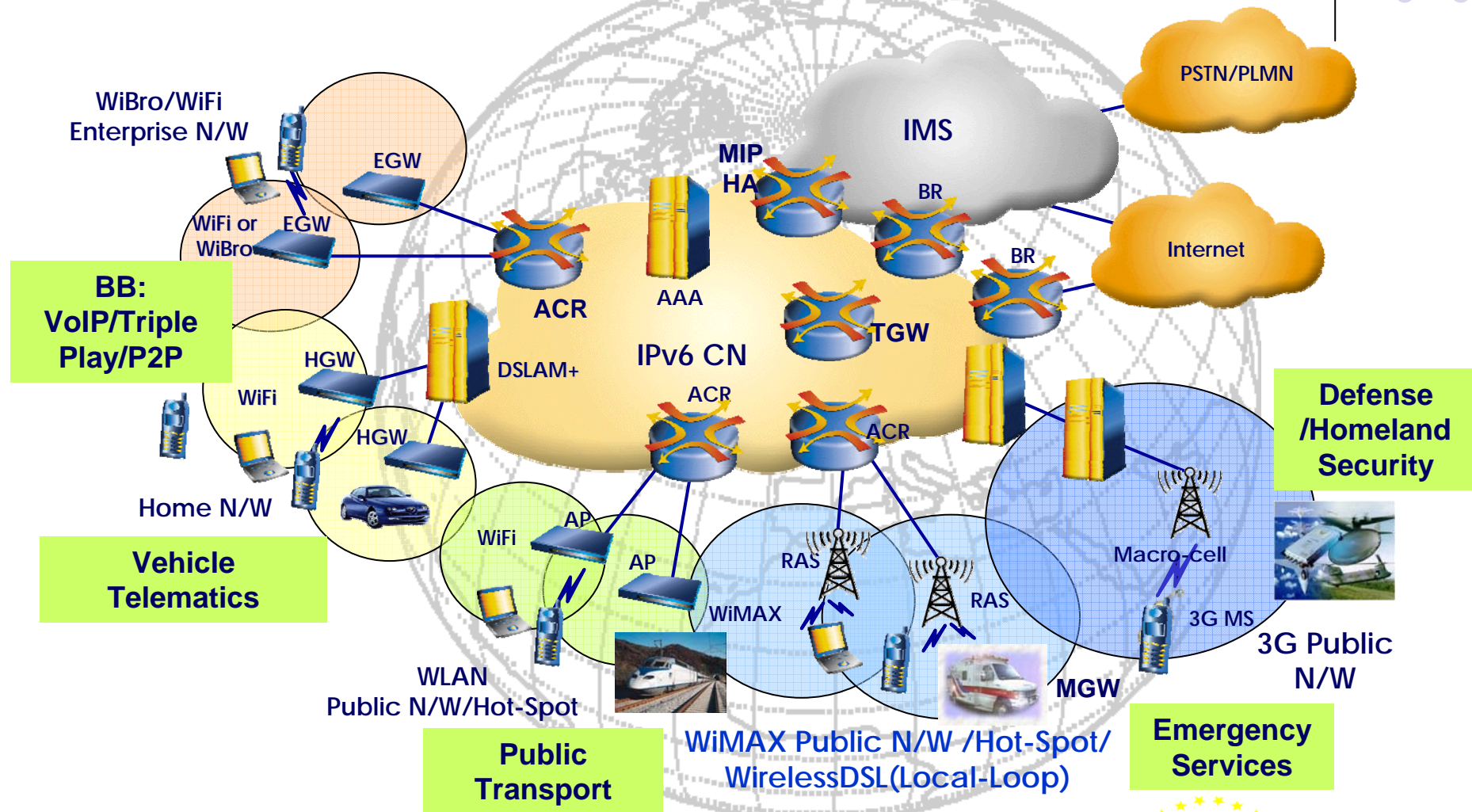
Key Challenges yet to be overcome



- **Interoperability**
 - Codec interworking (Voice calls using different vocoders, Interworking between vocoders, Multimedia sessions using different vocoders)
 - End-to-end QoS management (consistent use of diffserv)
- **Charging**
 - Common data items collected. Common protocols to offline billing systems
- **Roaming**
 - Security relationship (Network to terminal, Terminal to terminal)
 - Mutual authentication (Network to network, Terminal to home network, terminal to visited network)
 - Common SIP model (Use identical models, SIP compression, SIP extensions)
 - Consistent support for :Local services, Emergency calls, Geographic location services Dual Tone Multi Frequency (DTMF support)
- **WiMAX**
 - Still early stages of mobile WiMAX (802.16e)
 - Lack of demonstrated business model of services based on mobile IP
 - Standardization of FMIPv6 & common v4/v6 MIP



IP always-On Mobility Services



Summary



- IMS can be deployed with existing technologies today
- Two matured technologies currently being implemented in a productive environment are SIP and IPv6.
- 3GPP Release 6 has relaxed “mandatory IPv6 requirement”, and supplement Releases will hold and evolve.
- Slow understanding of difference in SIP and IP by Fixed and Cellular Operators, hence
 - adoption will be service requirement led.
- Operators will demand SIP/combinational services that IPv4 can not support today.
- Enhanced SIP services with IPv6 support needs to be accelerated.

It's inevitable: SIP and IPv6 are the future of Communications



Thank you for your attention

Visit our Portal @
<http://www.ipv6.eu>