

GARR CONFERENCE 05

Mobile Wired Convergence and IPv6

Jean-Pierre ROMBEAUT
ALCATEL/CTO



PLAN

- Presentation of the context.
- Technologies necessity for FMC.
- Usage of IP, to render the convergence possible.
- Comparison of IPv4 and IPv6 in convergence.
- Solution example, usage of Mipv6 to unify the different worlds.
- Governments or enterprises FMC positioning.

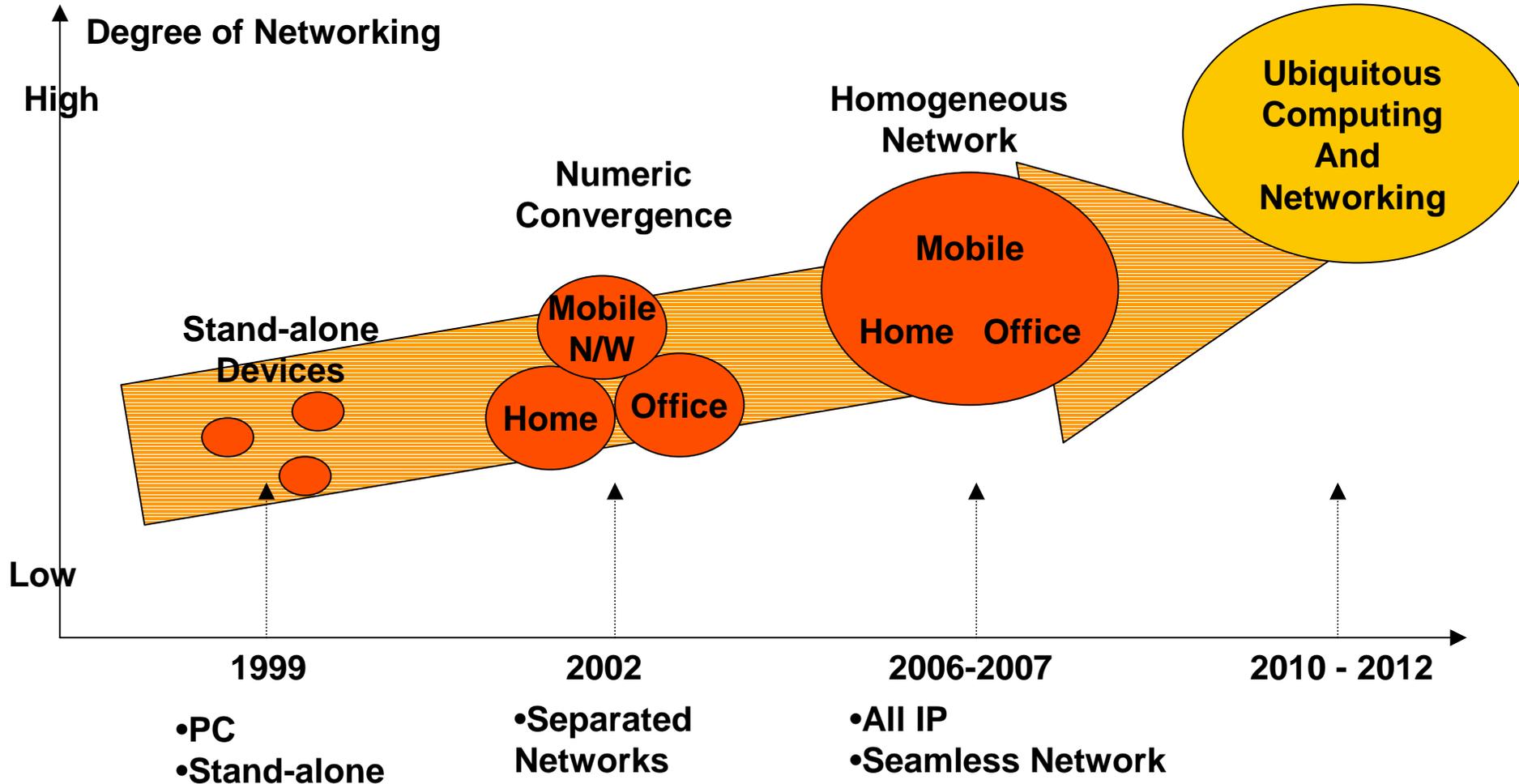
Introduction

- FMC is more and more a needed from costumer, which have a Dect at home and a GSM or DCS1800 for outside.
- Different experiment have proved that it is possible to have the same phone for multiple network access: FIDO in Italia, PHS(Personal Handy System) in Japan
- Today IP is more and more the common protocol used everywhere for any types of applications.

Presentation of the context

- Presentation of the context.
- Technologies necessity for FMC.
- Usage of IP, to render the convergence possible.
- Comparison of IPv4 and IPv6 in convergence.
- Solution example, usage of Mipv6 to unify the different worlds.
- Governments or enterprises FMC positioning.

Presentation of the context



Presentation of the context

The latest Heavy Reading inquire (December 2004), reveals that:

- The 2006-2007 Time Frame will be critical to FMC technology and Services development.
- In the core network, the boundaries between fixed and mobile technologies will be largely dissolved by 2010-2012.
- Access networks are likely to continue to include a wide range of technologies even after the FMC is established in the network core.
- Service providers are taking a fairly optimistic view of FMC, and by and large they believe it is going to bring fundamental changes to the structure of telecom market.

Presentation of the context

- Flexibility will be critical to successful deployment of FMC services and will be required at all levels of implementation.
- Full convergence will occur slowly at the end-user terminal, even through the technology to achieve terminal FMC is likely to develop fairly quickly.

Technologies necessity for FMC

- Presentation of the context.
- Technologies necessity for FMC.
- Usage of IP, to render the convergence possible.
- Comparison of IPv4 and IPv6 in convergence.
- Solution example, usage of Mipv6 to unify the different worlds.
- Governments or enterprises FMC positioning.

Technologies necessity presentation

The key frameworks in both the mobile and fixed network systems are listed below, and should form the basis of convergence.

- Mobility
- Session Control
- QoS
- Security
- Services and Service capabilities

■ Mobility

- Mobility is generally associated with users on the move with wireless access capability.
- It is just as important for people traditionally associated with fixed line network, so that the services can be provided to users at different transport points of attachment.
- A mobility framework encompasses several tasks such as identifying the user requesting a service, location, presence, attributes and preference of a user (user profile), identification of registrar and service node.
- All of these services should be considered in converging the mobility frameworks.
- Possible obstacles could be the authentication mechanisms and algorithms deployed, incompatibility in the data required for registration as well as the choice of protocols.

■ Session Control

- Session control is at the heart of convergence.
- A converged session control should be able to manage session originating and terminating in both the fixed and mobile environments.
- There are several aspects of session control that should be considered for the convergence, such as
 - control over sessions,
 - admission control,
 - charging,
 - transport connectivity management,
 - bearer establishment, naming and addressing schemes,
 - address resolution protocols,
 - services in home and visited networks.

Technologies necessity presentation

■ QoS

■ Converging the QoS framework, consideration must be given to aspects such as:

- QoS classes
- Bearer negotiation and renegotiation procedure,
- Interaction between QoS and Session control,
- Resource reservation,
- Aggregate bearers and any QoS assured pre-conditions.

■ Security

- The security framework of a system is based on the threat analysis and the counter measures for the most important threats. In the case of providing services to authorised users, it is important to authenticate them.
- It is also important to authorise users before providing admission control to avoid unauthorised usage of network resources.
- Procedures adopted to authenticate and authorise a user should be considered when converging to systems.
- Capabilities such as 'Privacy', 'Lawful Interception', 'Topology Hiding' at the interconnection interface, and 'admission control' should also be considered.

■ Services and Service capabilities

3GPP and fixed line standardization organization are moving away from standardizing services. Instead they are standardizing service capabilities, which are the building blocks that can be used to develop standardized or unique services. The convergence process should consider the methodology adopted by the converging architectures, as it will have a major impact in any future service creation and deployment. There is a set of supplementary services that are supported by both the fixed and mobile users. An exhaustive list of services required to be supported by both the networks should be compared and supported so that no services are lost due to convergence.

Usage of IP, to render the convergence possible

- Presentation of the context.
- Technologies necessity for FMC.
- Usage of IP, to render the convergence possible.
- Comparison of IPv4 and IPv6 in convergence.
- Solution example, usage of Mipv6 to unify the different worlds.
- Governments or enterprises FMC positioning.

Usage of IP, to render the convergence possible

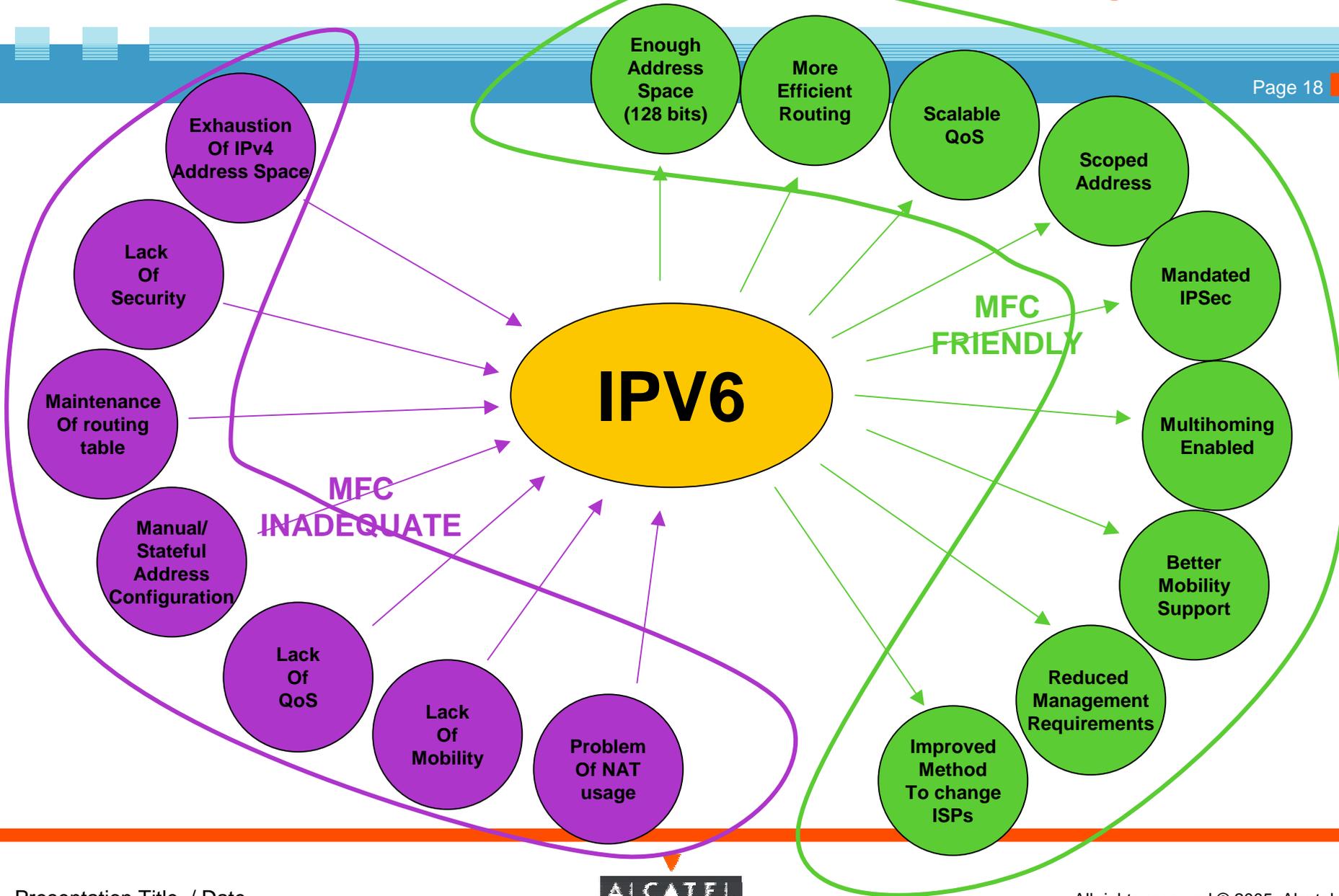
- IMS will be the tomorrow common service architecture for both the fixed and mobile world.
- The different access technologies need to be gathered by a common protocol in order to be unified.
- Quite all applications on mobile or wired networks are using currently IP or will use IP tomorrow (ex: VoIP).

 Needed of IP to unify the different Access Technologies.

Comparison of IPv4 and IPv6 in convergence

- Presentation of the context.
- Technologies necessity for FMC.
- Usage of IP, to render the convergence possible.
- Comparison of IPv4 and IPv6 in convergence.
- Solution example, usage of Mipv6 to unify the different worlds.
- Governments or enterprises FMC positioning.

Comparison of IPv4 and IPv6 in convergence



Solution example, usage of Mipv6 to unify the different worlds

- Presentation of the context.
 - Technologies necessity for FMC.
 - Usage of IP, to render the convergence possible.
 - Comparison of IPv4 and IPv6 in convergence.
 - Solution example, usage of Mipv6 to unify the different worlds.
- Governments or enterprises FMC positioning.

Mobile IP is an IETF proposed standard solution for mobility at layer 3 IP

- First proposed standard published in Nov. 1996.
- Working group called *mobileip*.
- IP Mobility Support for IPv4: **RFC 3344**
- Mobility Support in IPv6: **RFC 3775**
- The Definitions of Managed Objects for IP Mobility Support using SMIv2: **draft-ietf-mobileip-rfc2006bis-01**
- Hierarchical Mobile IPv6 mobility management : **draft-ietf-mipshop-hmipv6-03.txt**

Mobile Node (MN)

- An IP node which maintains network connectivity regardless of which subnet it is connected to.
- Owns one permanent IP address called *home address*.
- Owns many transient IP addresses called *Care-of-Addresses (CoA)*

Home Agent (HA)

- Maintains an association between the MN's home address and its CoA on the foreign network.
- Redirects and tunnels packets to the CoA on the foreign network.

Correspondent Node (CN)

- Host in session with the MN.

MIPv6 Overview

MIPv6 or HMIPv6 could be a solution for the Macro mobility in WLAN(managed by a MAP) and inter-working, managed by a HA or of course for FMC.

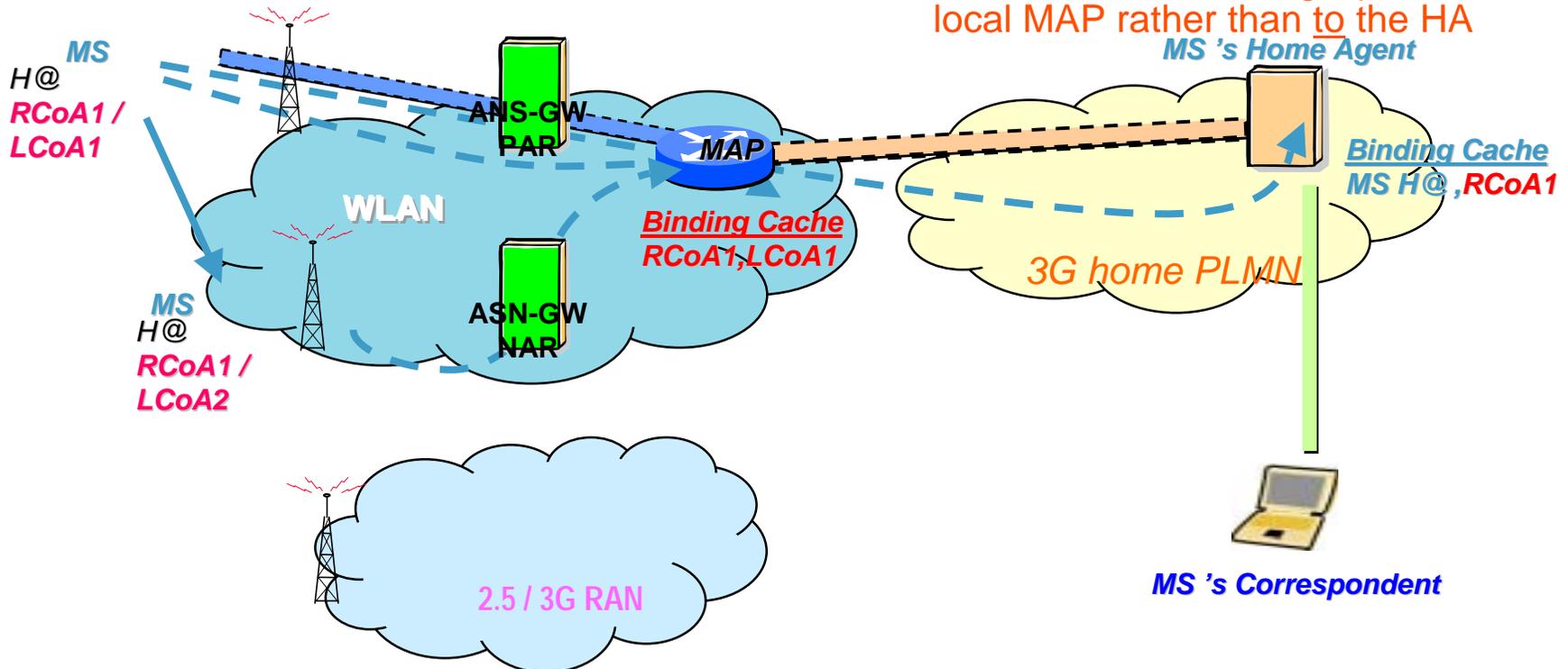
MIPv6 Overview, interworking example between WLAN and 3GPP.

MS has 2 CoAs:

- RCoA is permanent in the WiMAX RAN
- LCoA changes at each new ASN-GW

Macro-Mobility:

- MS generates a new Local CoA IP address
- The MS sends Binding Updates to the local MAP rather than to the HA

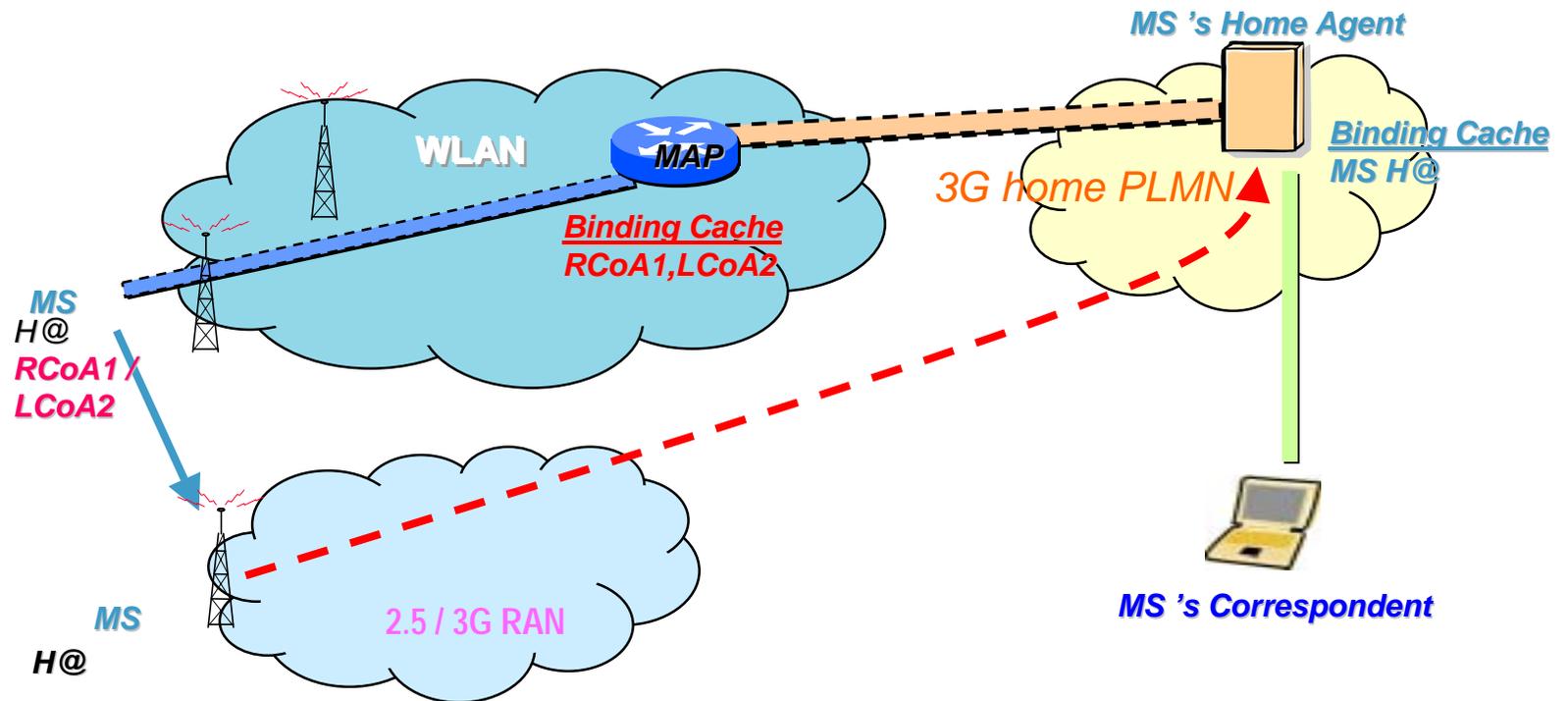


Hierarchical Mobile IPv6 mobility management (HMIPv6) : draft-ietf-mipshop-hmipv6-04.txt

MIPv6 Overview

Interworking:

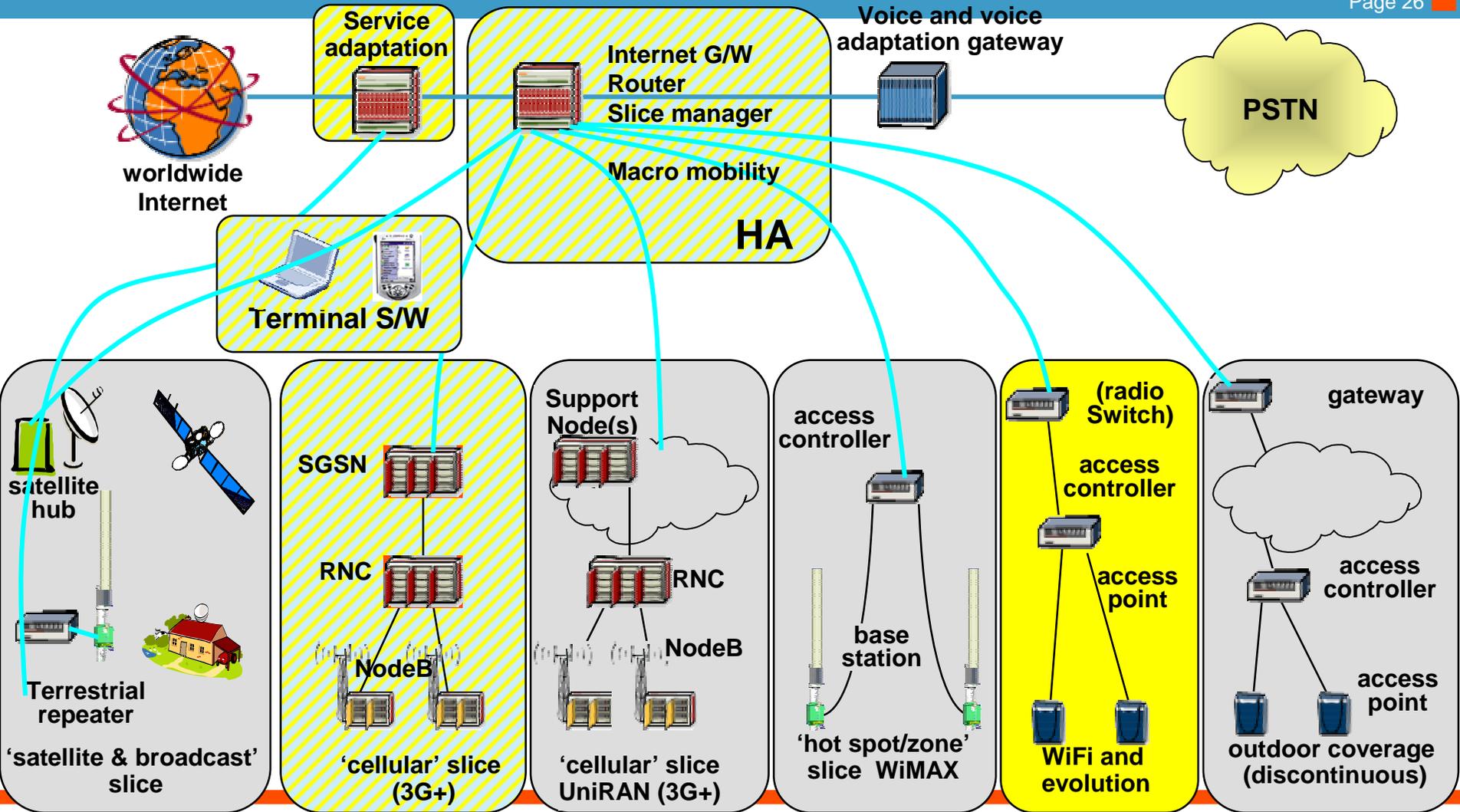
- MS uses its home @ in RAN



MIPv6 Advantages:

- Security(IPSec) is involved in MIPv6.
- Handover could be faster due to dynamical address assignment by using IPv6 Auto-Conf.
- MIP has been natively enclosed in IPv6 specification.
- MIPv6 Client is natively deliver in IPv6 Stacks.

FMC architecture example



Governments or enterprises FMC positioning

- Presentation of the context.
- Technologies necessity for FMC.
- Usage IP, to render the convergence possible.
- Comparison of IPv4 and IPv6 in convergence.
- Solution example, usage of MIPv6 to unify the different worlds.
- Governments or enterprises FMC positioning.

Governments or enterprises FMC positioning

Current and Near-Term Convergent Services, Selected Worldwide Examples

Page 28

Company	Service	DESCRIPTION
BT	Bluephone	Launch planned for spring 2005. Will use a single bluetooth/cellular converged phone; uses BT networks, in wide area, using Vodafone. Seamless handoff in-call; speeds up to 700 kbit/s possible with bluetooth; range 25m. Will move to Wifi in late 2005 or 2006.
France Telecom	Business Everywhere	Targets business customers. Using a software interface, subscribers can connect remotely to their corporate VPN via GPRS, Wifi,DSL, or circuit-switched lines. 3G services, which are being rolled out in France, will soon become an additional platform.
iPass	iPass	Aimed at Bluetooth remote access via laptop or PC. Support almost 14000 Wifi access points, as well as PHS, GSM, and wired services. Consistent user interface, customized security settings; one invoice.
Swisscom	Mobile Unlimited	PC card that can connect to a UMTS, GPRS, or wireless LAN network. The card automatically finds and connects to the fastest networks available.
Korea Telecom	MU One Phone	Bluetooth/cellular mobile phone and service, using CTP Bluetooth standard at home, and KTF cellular network outside it. Data throughput said to be ten times faster in home zone. Dedicated clamshell style phone by samsung. Launched mid 2004.

Questions



B R O A D E N Y O U R L I F E

www.alcatel.com