

ITU Workshop on IPv6

Geneva, Switzerland, 4 – 5 September 2008

IPv6 & Applications Technical & Business Challenges

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Content

- Time scales & role of the European IPv6 Task Force Steering Committee
- IPv6 applications technical & business Challenges study: Objective , Methodology, Approach & Results
- Conclusion & recommendations

Time scales & role of the European IPv6 Task Force Steering Committee

Mission

- Consolidate the IPv6 RoadMap for Europe
- Push IPv6 development in Europe
- Guide the efforts of National IPv6 Task Forces
- Focus on deployment
- Benchmark the IPv6 deployment in Europe
- Establish a clear IPv6 business case
- Promote the adoption of IPv6 by governments

IPv6 Task Force-SC

Market take up

Time

2002-2003

2004

2005

2006/2007/2008/2009 2010

Opportunities and Business development in different Industry Sectors

Mass IPv6 market

Launch of EU National Task Forces

IPv6 Applications
Technical & Business challenges
deliverable

R&D and Awareness

IPv6 workshop on IPv6, Geneva, 4-5 Sept

Technical & Business Challenges: Methodology & Approach

- **Assess/address challenges contributing to slow uptake of IPv6 in Europe by:**
 - Identifying key industry sectors that can benefit from IPv6
 - Gathering emerging industry experience and evaluate from a market and business perspective
 - It's an Application-driven approach
 - We considered **Direct Challenges** ie linked to IPv6 and we rated according to 4 critical scales: **Blocking/High/Medium/Low**

Standardization
Policies & regulations
Equipment development
Market

Operational
Business model
Services

- **Create of "Master Resource" for decision makers**, from a business and technical perspective, highlighting the main trends and the role of Applications as an enabler in the acceleration of IPv6 deployment
- **Highlight main issues and make recommendations** to overcome these challenges

Application Driven Deployment

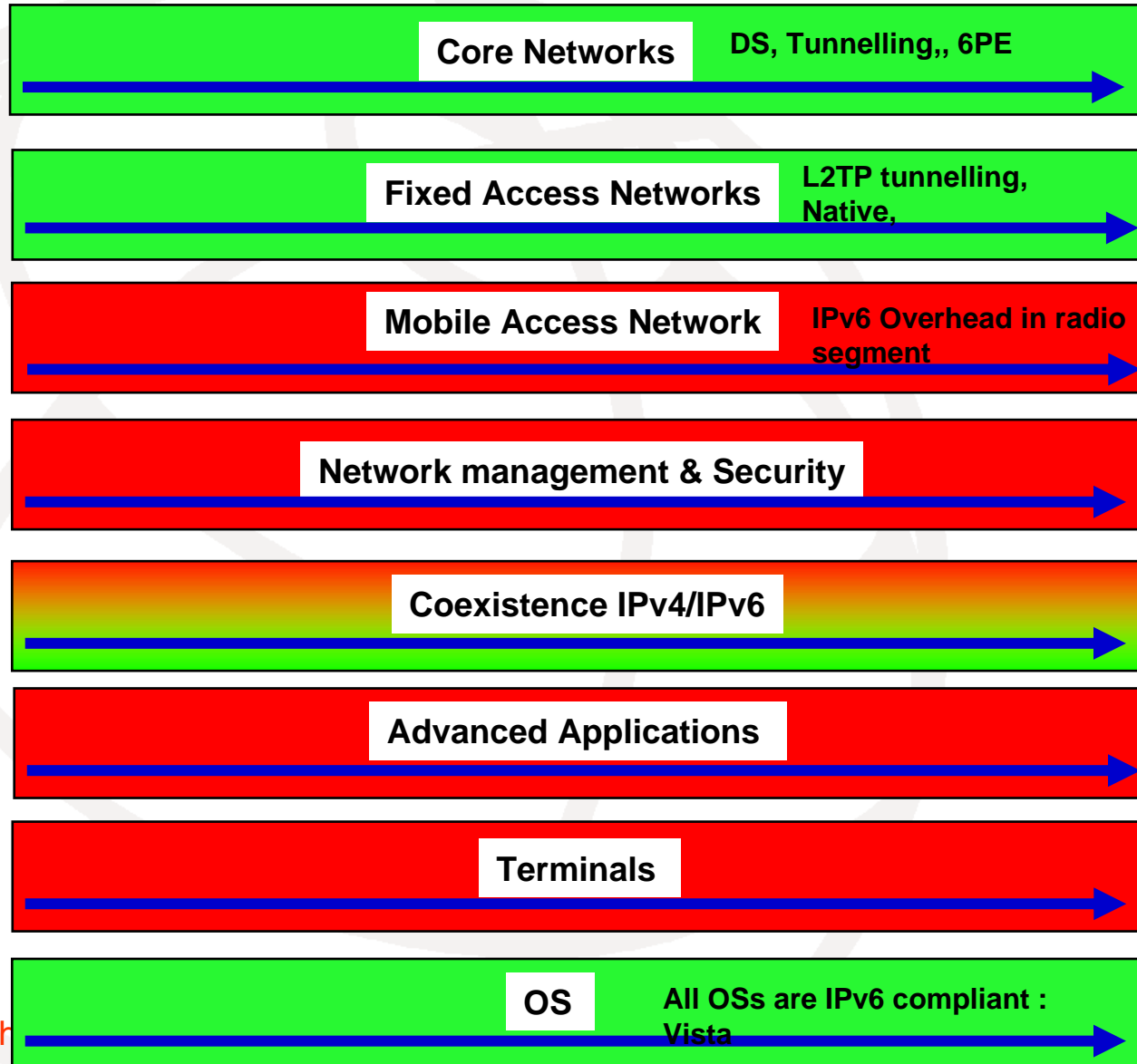
- The chosen approach was to focus on a few relevant applications

- Home Networking
- Triple Play
- Peer-to-Peer Applications
- IPv6 VPNs
- Mobile networking
- Social applications
(chat, VoIP, messaging, p2p)
- Digital IP-TV
- SIP-based VoIP
- Online gaming
- E-Health (Home Hospital care)

- Supply chain management
- Ad-hoc networks
- Utility sector applications
- Transport networks
- Environmental monitoring
- Sensor networks
- Public safety and emergency networks

- These applications are projected to be the potential "goldmine" of revenue growth in the coming years for ISPs and associated partners

Global view of IPv6 integration : Status



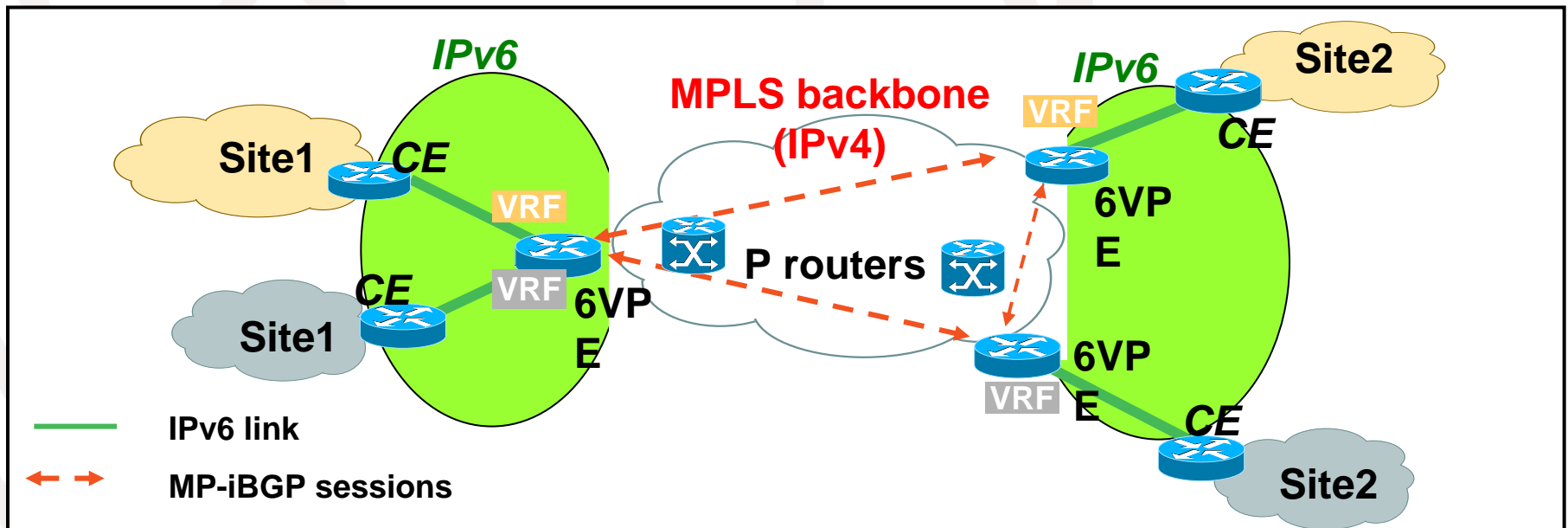
Issues & Challenges

How to overcome these Challenges

IPv6 VPN service for Businesses: Goals & Global architecture

Goals

- Placing IPv6 VPN service at the same level as IPv4 VPN's (same CoSs)
- Convergence between IPv6 and IPv4 on MPLS VPN (RFC 2547bis)
- Resolving technical limitations of IPsec-based solutions
- Based on a proven technology (MPLS), largely implemented in operators' networks
- Permitting an easy and backward compatible IPv6 deployment
- Vendors solutions available (6VPE)



How to deploy IPv6 along with Broadband: Impacts of IPv6 on ADSL chain

- **Broadband penetration perspective:** Some European countries are ranked on the top 10 list. Europe will take a significant position in **FTTX** in the coming years
- This suggests that Europe is in a good position to take advantage of applications & services deployment using IPv6

■ Actors

Electronic appliances vendors
Operating Systems Providers
CPEs vendors
Transmission equipment vendors
IP equipment vendors
Services Platform Vendors
Contents Providers
Incumbent Operators
ISPs
TV Broadcasters
Users

■ Components

Home appliances	High
Home networks	Low
Home Gateway	High
DSLAM	High
if IP-based	
AAA, DHCP, DNS	Low
Access network	Low
Backhaul	No
Core Network	No
Service Platform	Low

Addressing mechanisms for Internet services: Role of the HGW

■ IPv4 addressing vs IPv6 addressing



Allocate a single IP@ to the Home

Allocate a prefix (a block of 65 k IP@): /48 or /56

■ Dual-stack environment

- IPv4 connectivity is totally independent from IPv6 one

■ IPv4 addressing

- Private @ to the Home LAN
- A public IPv4 address to the HGW to allow devices to communicate with Internet

■ IPv6 addressing

- An IPv6 prefix is allocated to the Home
- A global IPv6 address allocated to each Home device by autoconf mechanism

Home Networking applications challenges: From ISPs perspective

- Most ISP's are now **under strong pressure to gain market shares** in the Home Networking
- **Multi-play applications**, along with associated services are at the heart of their broadband strategy.
- **Home gateway** is not only a VoIP, TV over ADSL enabler or internet WiFi router.
- **Home gateway** will be a **new home usage enabler** for services such as **music sharing**, **home automation with remote video monitoring** (security), **gaming**, and others related to alternative home devices apart from PC's, fixed or mobile devices.

What can IPv6 bring to Multi-play applications

Multi-play applications are characterised by very low margins

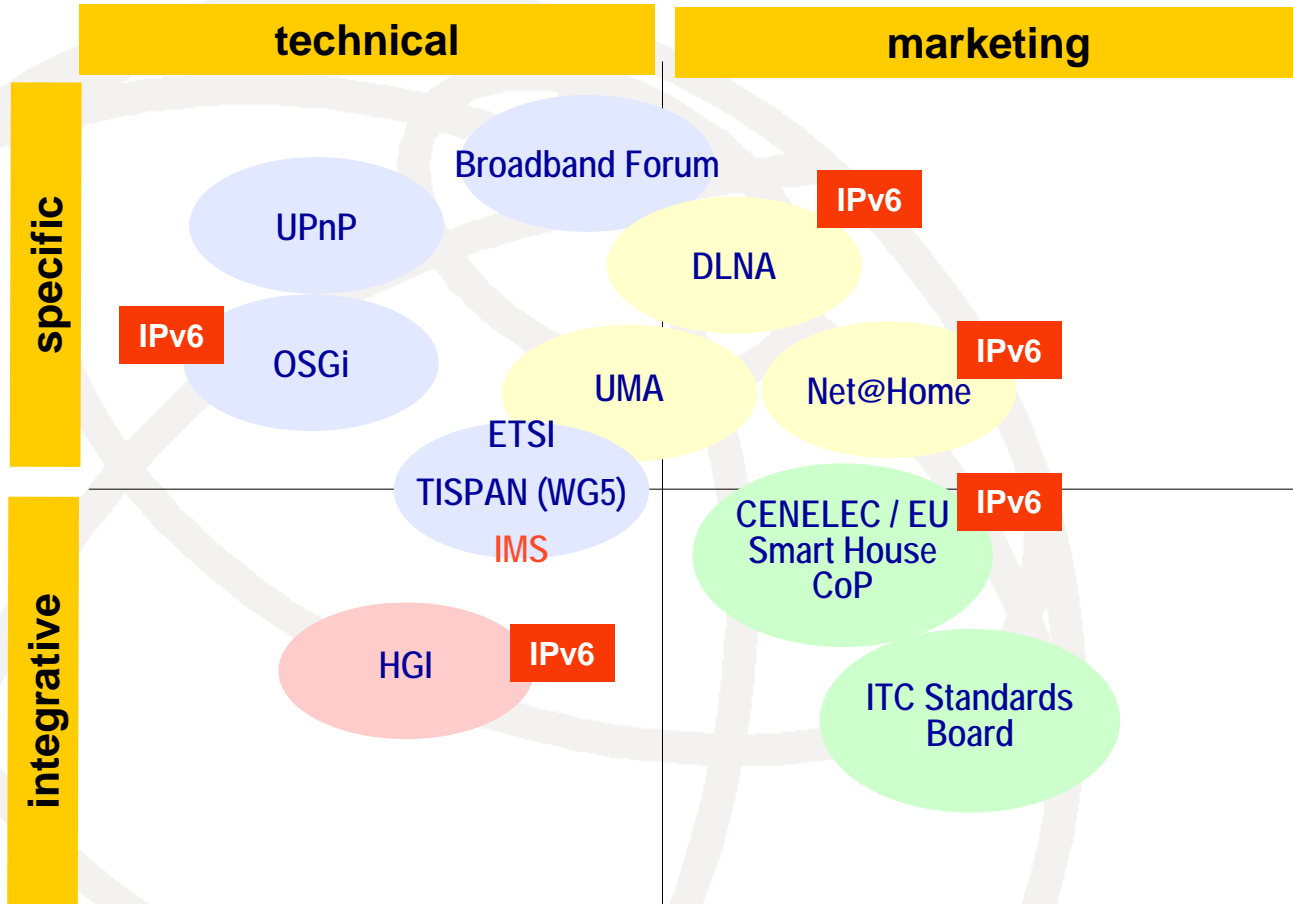
In order to build a viable business model, the solution consists of:

- Implementing all technologies leading to save CAPEX and OPEX;
- Deploying these services on a very large scale (it's a mass market characteristic);
- Bringing innovation to the market by providing new advanced services easy to deploy and ready to use.

IPv6 is the appropriate scenario to achieve this objective

- **Item 1:** IPv6 will lead to the design and implementation of a very simple end-to-end architecture, without NAT boxes, or servers. It is cost effective, with reduced CAPEX, easy to exploit and maintain with a reduced OPEX.
- **Item 2:** The large penetration of the applications or services needs a huge number of IP addresses. IPv6 will easily cater for this.
- **Item 3:** The use of IPv6 addresses provides through automatic configuration mechanisms, giving the flexibility to address this category of customer and also exploit the seamless mobility.

Home Networking ecosystem "standards bodies & industry fora" Role of the IPv6-TF-SC



What the European IPv6 Task Force did?

We looked around, made bridge and set up liaisons with:

- ➔ CENELEC, Smarthouse Forum, Net-atHome, DLNA

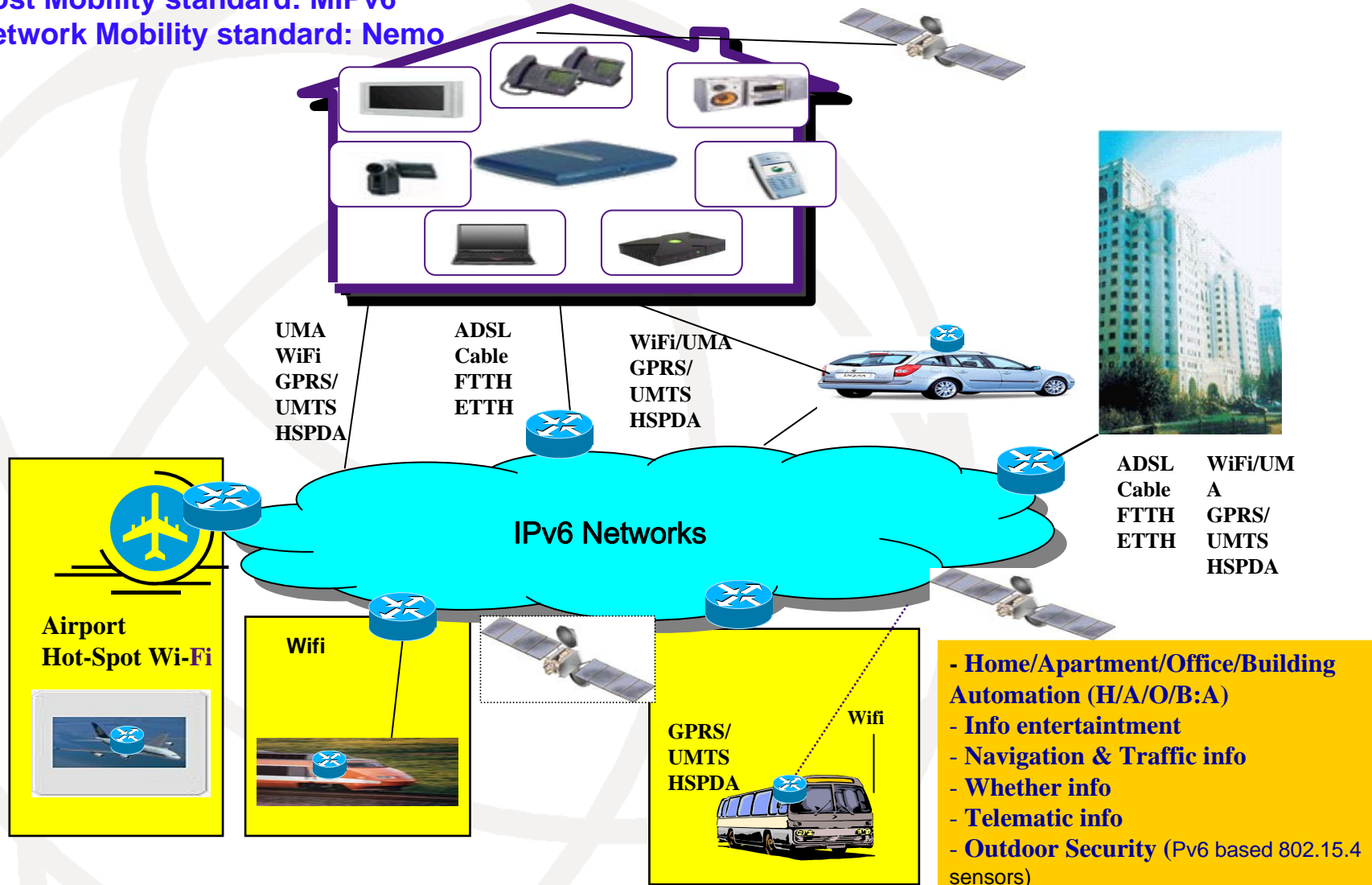
Other liaisons established

- ➔ IPv6 Promotion Council China
- ➔ NAv6 Task Force (US)

Home Networking extension within "Fixed & Mobile" convergence in Host & Network IPv6 mobility environment

Host Mobility standard: MIPv6

Network Mobility standard: Nemo



IPv6 applications in Emergency & crisis context

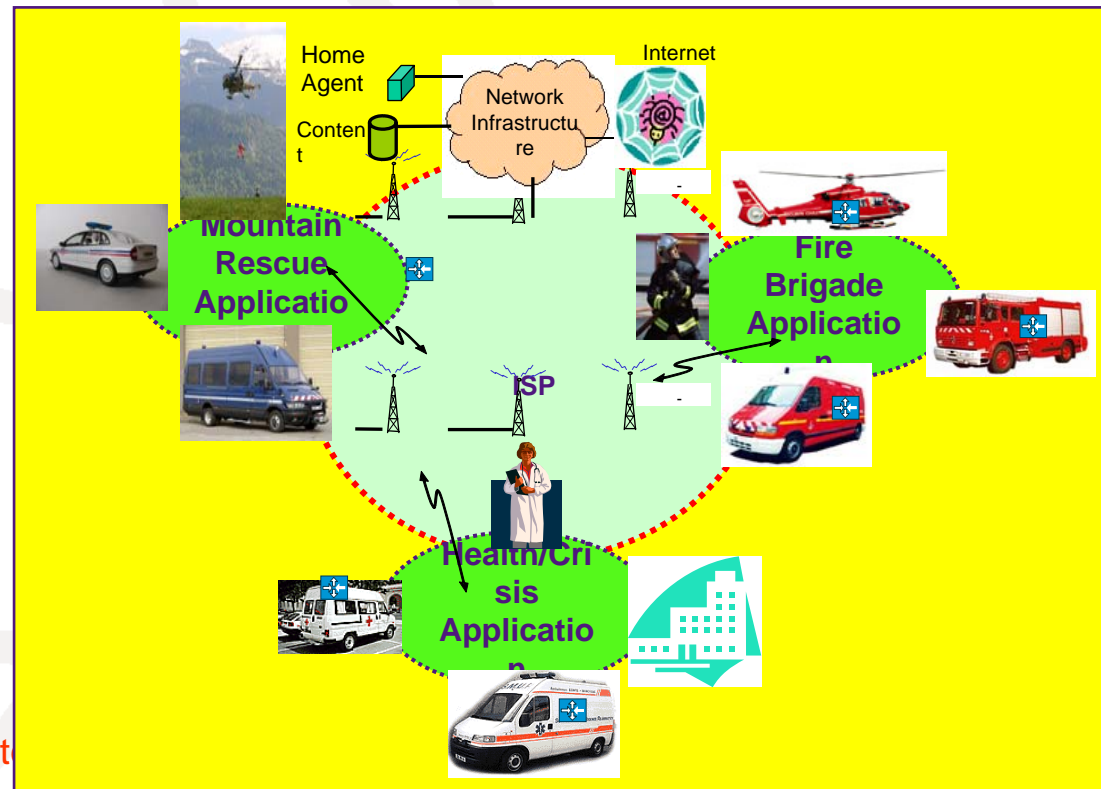
u-2010 IST project (FP6-2005-IST-5) Ubiquitous IP-centric Government & Enterprise Next Generation Networks (Vision 2010)

- Recent catastrophes and crises like the Tsunami at the end of 2004 and the Katrina hurricane September 2005 dramatically showed the importance of communication to prevent the death of thousands of people.
- High availability and flexible communication would help rescue teams coming from all over the world to support each other more effectively.
- In the context of this project, the 3 following applications/scenarios are considered:

- Mountain Rescues scenario**
UK:Lancaster

- Fire brigade (Fire in Tunnel) scenario**
Luxembourg

- Monitoring system of radioactivity and chemical dangerous substances scenario**
Slovakia



IPv6 applications in Emergency & crisis context : the main initiatives (Wireless IPv6 sensor Networks)

■ European projects

- **U-2010** project: IPv6 applications in Emergency & Crisis context
- **PSC Forum Europe (Public Safety Communications)** (IP Working group)

■ USA

- **MetroNet6 Project: similar to the European IST u-2010 project**
<http://www.cav6tf.org/>

■ Japan

- **LiveE!** Project: "Sensors networks for Earth" (Installation of weather sensor units)

■ Korea

- MIC will expand the broadband convergence network (BcN) and actively distribute **RFID/USN (Ubiquitous Sensors Networks)** and IPv6

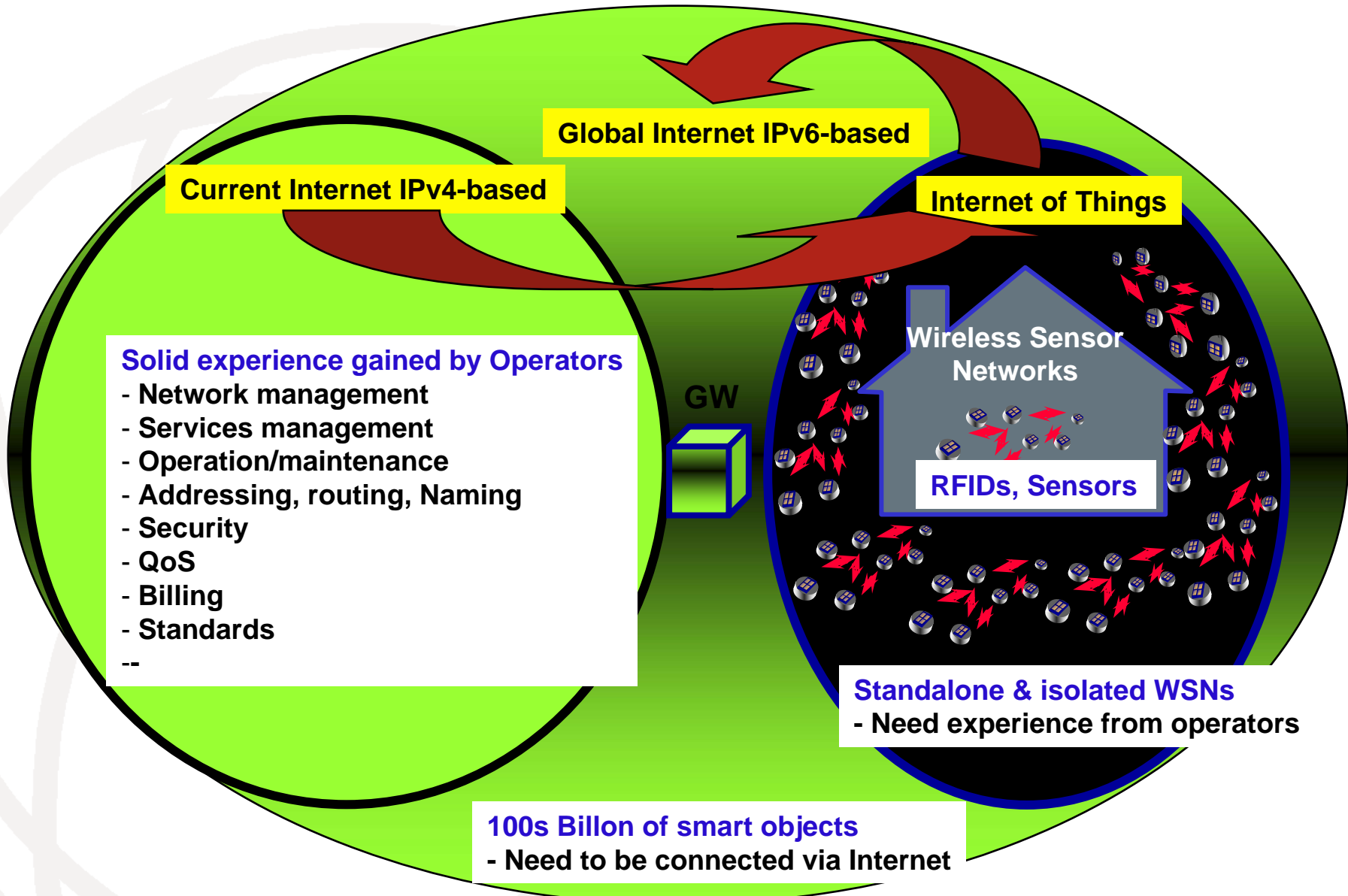
■ China

- Environment monitoring trials, Olympic surveillance "Remote video sensor network"

■ Taiwan

- RFID Centre and IPv6 Grid project

Internet of Things & IPv6: How to pave the way



Conclusion

- IPv6 should be deployed along with Broadband (xDSL, FTTX, WiMAX, 3G, HSDPA, 4G/LTE, IMS....) for Internet Access Services services
- IPv6 should be a key driver of applications requiring a huge IP @ consumption in the context of IPv4 @ exhaustion (mass market)
- Internet of "Things" through IPv6 WSNs (Wireless Sensor Networks) is a driver of new markets
- Huge number of applications and use cases in Home environment at large (Habitat, Home Hospital care), Supply chain, Environment monitoring, Car Industry, Transportation..) based on WSNv6 will open a new market and lowers the CAPEX & OPEX



Thank you