1st Meeting of the

Welcome
J. Da Silva
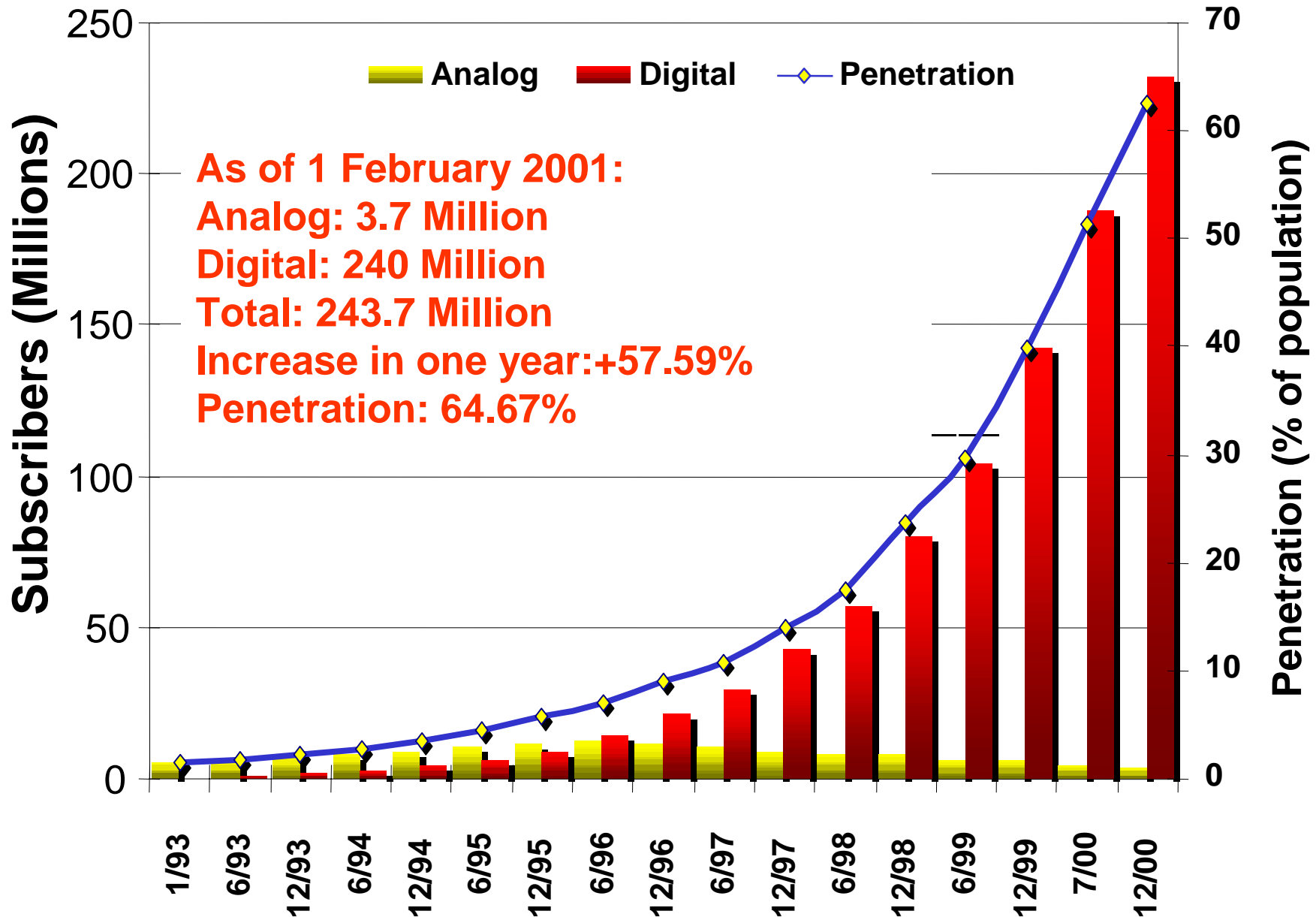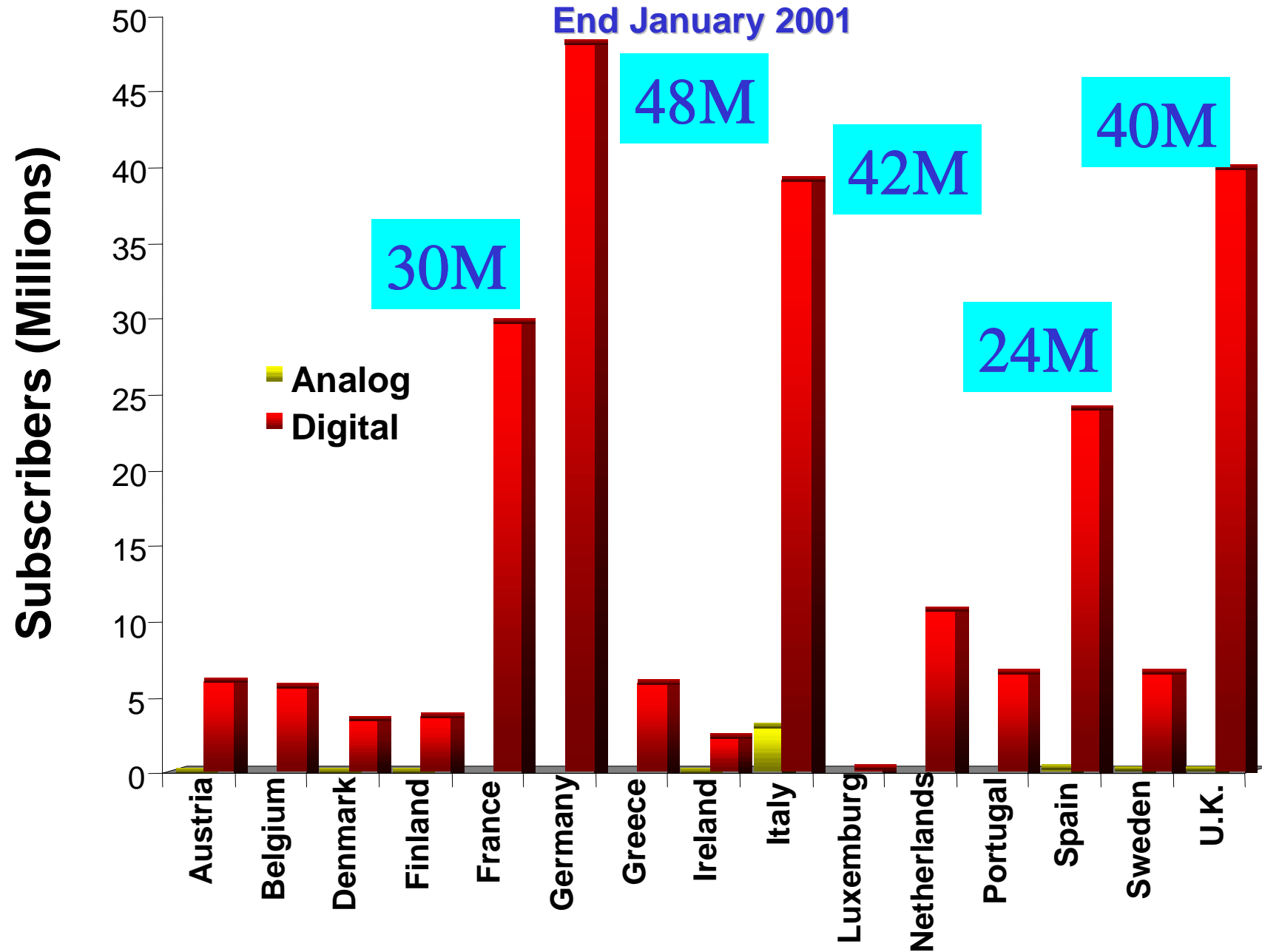
Outline

- **The 2G Success Story**
- **Evolution to 3G and Beyond**
- **The Challenges Beyond 3G**
- **IP addresses a Key Resource Issue**
- **e-Europe 2002 and 3G Communication**
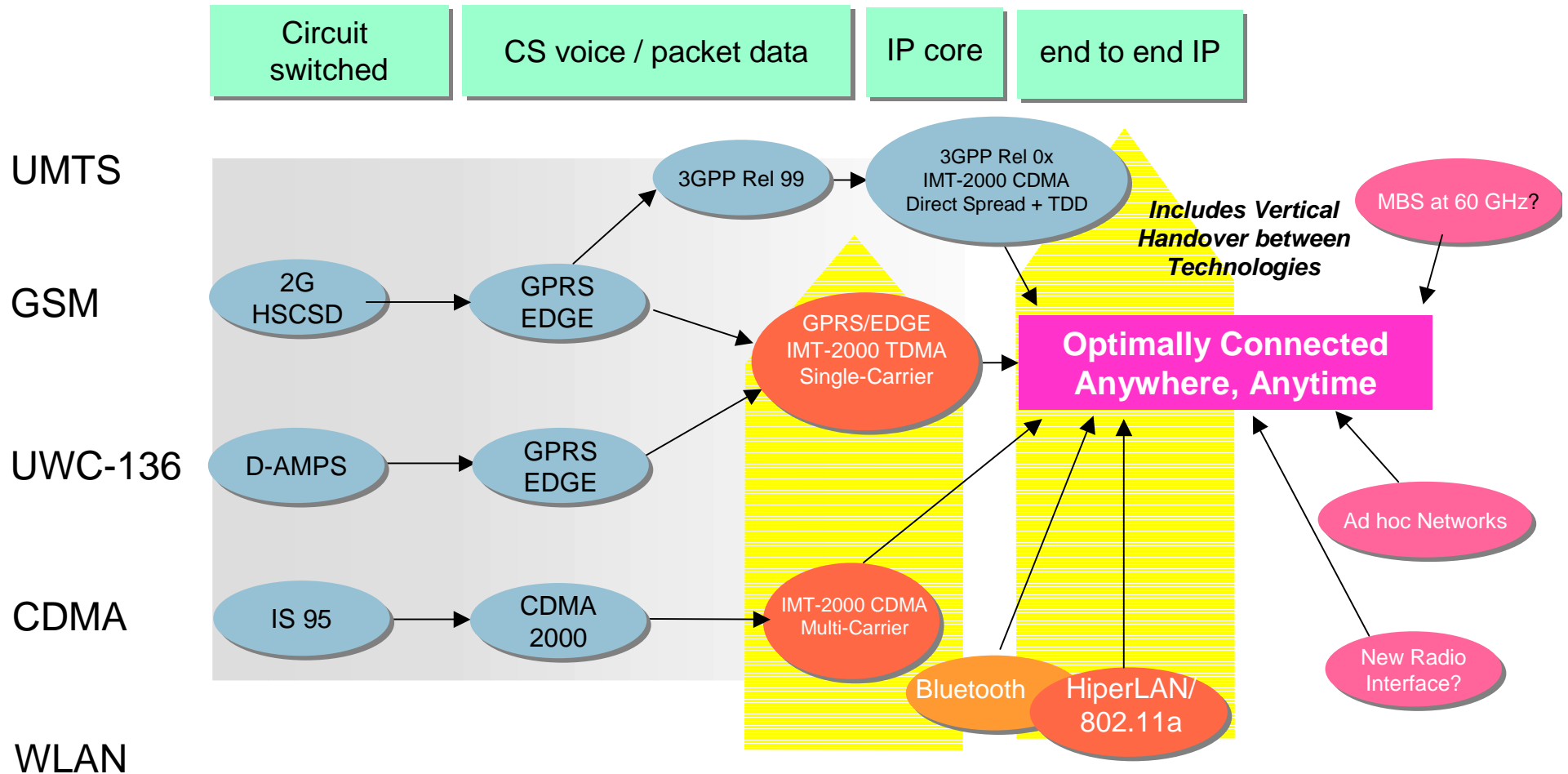- **The IPv6 Task Force: Terms of Reference**

Subscribers (EU) - December 2000

As of 1 February 2001:
Analog: 3.7 Million
Digital: 240 Million
Total: 243.7 Million
Increase in one year:+57.59%
Penetration: 64.67%

Legend: Analog, Digital, Penetration

Y-axis (left): Subscribers (Millions) — 0, 50, 100, 150, 200, 250
Y-axis (right): Penetration (% of population) — 0, 10, 20, 30, 40, 50, 60, 70
X-axis: 1/93, 6/93, 12/93, 6/94, 12/94, 6/95, 12/95, 6/96, 12/96, 6/97, 12/97, 6/98, 12/98, 6/99, 12/99, 7/00, 12/00

Total Subscribers per Country

End January 2001

Chart: Subscribers (Millions) per country, showing Analog and Digital subscribers.

- 30M (France)
- 48M (Germany)
- 42M (Italy)
- 24M (Spain)
- 40M (U.K.)

Legend:
- Analog
- Digital

Countries (x-axis): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal, Spain, Sweden, U.K.

Evolution from 2G to 3G and Beyond

Circuit switched | **CS voice / packet data** | **IP core** | **end to end IP**

UMTS
GSM
UWC-136
CDMA
WLAN

3GPP Rel 99

3GPP Rel 0x
IMT-2000 CDMA
Direct Spread + TDD

2G
HSCSD

GPRS
EDGE

GPRS/EDGE
IMT-2000 TDMA
Single-Carrier

Includes Vertical Handover between Technologies

MBS at 60 GHz?

Optimally Connected Anywhere, Anytime

D-AMPS

GPRS
EDGE

IS 95

CDMA
2000

IMT-2000 CDMA
Multi-Carrier

Bluetooth

HiperLAN/
802.11a

Ad hoc Networks

New Radio
Interface?

2G	**evolved 2G**	**3G**	**and**	**beyond**
9.6-14.4 kbps	64-144 kbps	384 kbps-2 Mbps	384 kbps-20 Mbps	100 Mbps?

A Galaxy of heterogeneous networks
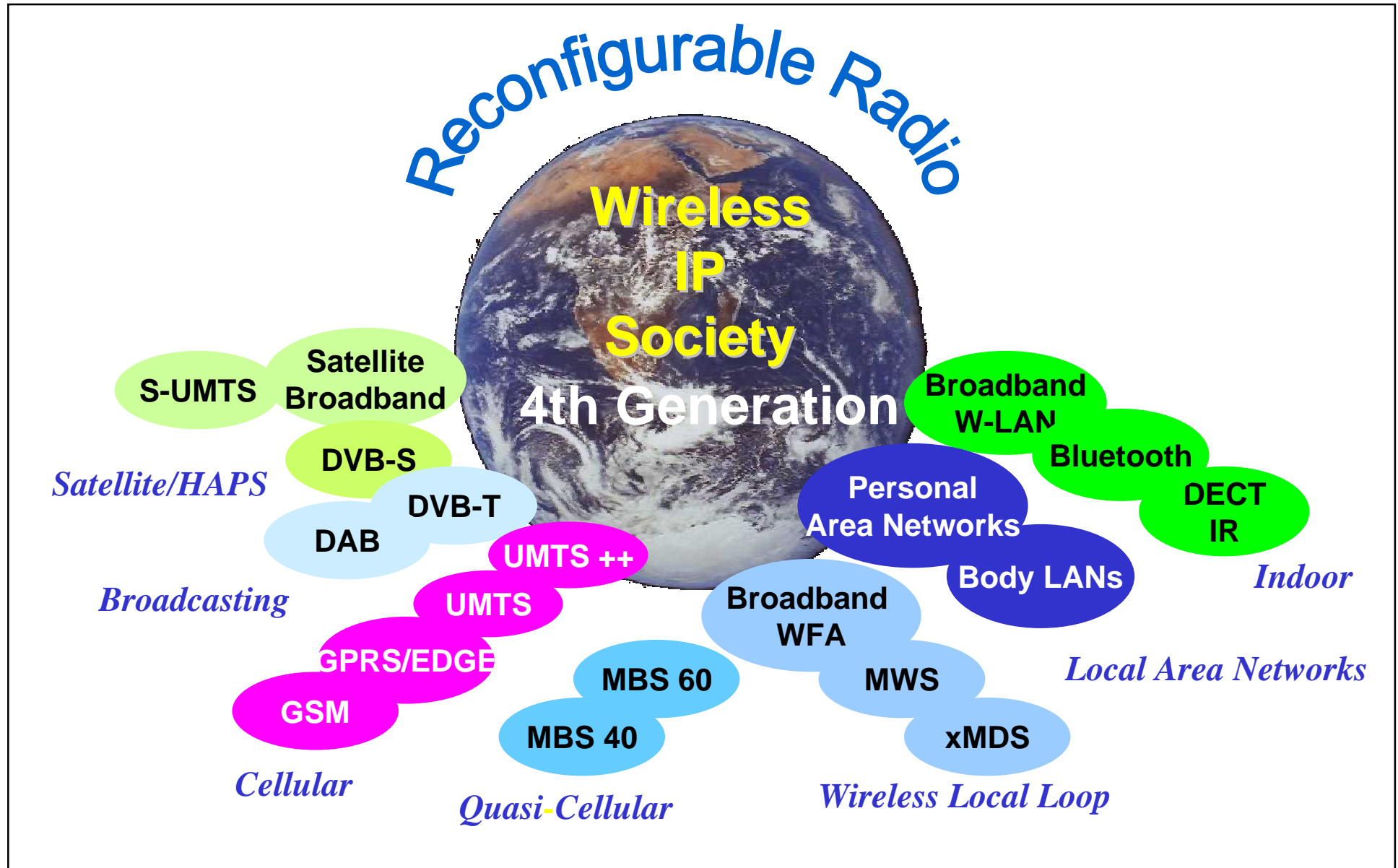
The Future Wireless Generation beyond 3G

- **User as the focus (User no longer "owned" by anyone)**
  - the users, or their smart agents, will select at each instant the best system meeting the required the service and privacy performance,
  - user support in a mobile aware context with the provision of advanced VAS services, across all user environments
- **"Integration" of cellular, broadcasting and WLAN systems**
  - from heterogeneous, competing but complementary, broadband networks (public and private, operator driven or ad-hoc, broadcasting)
  - to personal area and ad hoc networks
- **Spectrum efficiency**
  - More intensive use of unlicensed bands, fully asymmetrical traffic
- **Unlimited address space**

Networks of "WEB present" wireless devices

**Ad hoc networks of a myriad of smart devices,
wireless sensors and actuators embedded in numerous
distributed devices, appliances, artefacts as well as in living beings,
capable of monitoring and interacting with the physical world**

Why a larger IP address space is needed

- **Overall Internet traffic is still growing at 400%/year worldwide**

  - **~320 million users in 2000, ~550 million by 2005**

- **Emerging population/geopolitical & Address space**

  - **China, India, Japan, Korea needs global IP addresses**

  - **How to move to e-Economy without Global Internet access?**

- **650 million mobile phone users in 2000, over 1 billion by 2003**

  - **UMTS Release 5 is Internet Mobility, 1/3 of 1B should get connected**

- **~1 Billion cars in 2010, 15% should get GPS and Yellow Page services**

- **Billion of new Internet appliances for Home users**

IPv4 - The current Internet

- Address space with IPv4 is being rapidly depleted
- Stanford or MIT have more addresses than China
- The requirements of the wireless world are huge
  - 1billion cellular terminals in 2002-2003
  - 1billion cars in 2010
  - Billions Internet appliances in future
  - Home networks
- China, Japan and Korea have taken the decision to go IPv6
- Japan has set a target date of 2005 when all services should be IPv6 enabled
- All major software firms have announced IPv6 products
- All major manufacturers are gearing up to be IPv6 ready

IPv6 The solution

- **Enough Addresses**
  - **340,282,366,920,938,463,463,374,607,431,768,211,456**
    - This means **six hundred thousand billion billion of IP addresses per square metre** of the planet surface!
  - **Billions of IP-addressable wireless handsets**
- **Mandated Security, Address Autoconfiguration**
- **Route Optimization**
  - **Most Internet devices will be mobile**
  - **Can reduce network load up to 50%**
  - **Route Optimization could double Internet-wide performance!**

IPv6 in 3G/UMTS

- **The early introduction of 3G mobile communications and the integration of these systems with Internet access, calls for an European strategic initiative now because several benefits can be realised:**

  - **"Always-on" wireless access to the Internet**

  - **Integration of Internet-based systems into transportation means and associated infrastructures for e-Mobility and e-Commerce**

  - **In IPv6, each person could dispose of his/her part of the address space. This will greatly contribute to competition – equivalently to "number-portability" in telephony; and it may even come to be seen as a basic "human right".**

e-Europe 2002 and 3G Communication

Member States should make a commitment to progressively introduce IPv6 in their publicly owned networks, e.g. those for research and administrations.

The Commission will increase support for testbeds through its research, TEN Telecom and IDA programmes.

The Commission will invite Member States to work together with industry in an ad-hoc group which, should provide proposals by the end of 2001 in order to accelerate the introduction of IPv6.

IPv6 Task Force: Terms of Reference

You are invited to develop a comprehensive action plan **by end 2001**, aiming at ensuring the timely availability of IPv6. Conclusions and recommendations of the Task Force will be submitted to the Spring European Council of 2002, under the Spanish Presidency.

The following key specific targets are to be considered by the IPv6 Task Force:

•*With a view to implement IP Multimedia under Release 5 in 2003, industry will be requested to submit contributions to 3GPP to accelerate the pace of development of specifications work on IPv6 for 3G mobile communication systems (UMTS);*

•*3G operators to establish mechanisms for exchanging information on the use of IPv6 with a view to develop guidelines and best practises on the transition to IPv6;*

IPv6 Task Force: Terms of Reference

•*Operators and service providers, to consider on a priority basis how best to evolve towards IPv6 and to take early steps to obtain adequate IPv6 address allocations, while ensuring the users rights are safeguarded;*

•*Service providers (providing access through, telephony links, xDSL, Cable, fixed wireless to Internet services) to offer IPv6 capable services, by end 2003,*

•*Telecommunications operators to complete conversion of all "legacy" systems to IPv6 capability by end 2005;*

•*Conversion to IPv6 of Europe's Research and Education Networks (comprising the National Research and Education Networks and the European backbone GEANT), by 2003-2004 .*

•*Introduction of IPv6-based systems in cars, aircraft and freight-transport vehicles and infrastructures by end 2004;*

IPv6 Task Force: Terms of Reference

- *IPv6 connectivity in all new consumer-electronic devices by 2005;*
- *Enabling IPv6-based m-commerce by 2005;*
- *Increase and re-focus of the EU support to RTD and Trans-European Networks to accelerate and facilitate the coherent transition to IPv6 in the period from 2002-2004.*
- *Strengthening of IPv6 R&D activities within the IST Programme (and proposal of measures for FP6) notably on those aspects relating to inter-working and interoperability between systems and networks, to the development of innovative IPv6 based services and applications, and to middle-ware and management tools, by end 2001.*

In conclusion ...

The European Commission wishes to thank you for having accepted to join the IPv6 Task Force

The ambition is for the Task Force to deliver its conclusions by end of 2001 in time for concrete actions to be taken by the Spring European Council of 2002

While the effort may appear to be European driven, the European Commission seeks to internationalise its impact

All sectors of activity most likely to be impacted by the shortcomings of IPv4 are represented in the Task Force

Work will be carried out by correspondence and physical meetings will be limited to the strict minimum

WEB site: http://www.ipv6tf.org

Let me now leave you in the very able hands of Mr. Latif Ladid, who will guide the activities of the Task Force