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cofinanciado por PROFIT



IPv6 market status

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Why IPv6 ?



Millions of new devices becoming IP aware, not just PCs.

A Need for increased addressing and “plug and play” networking !



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IP Address Allocation History

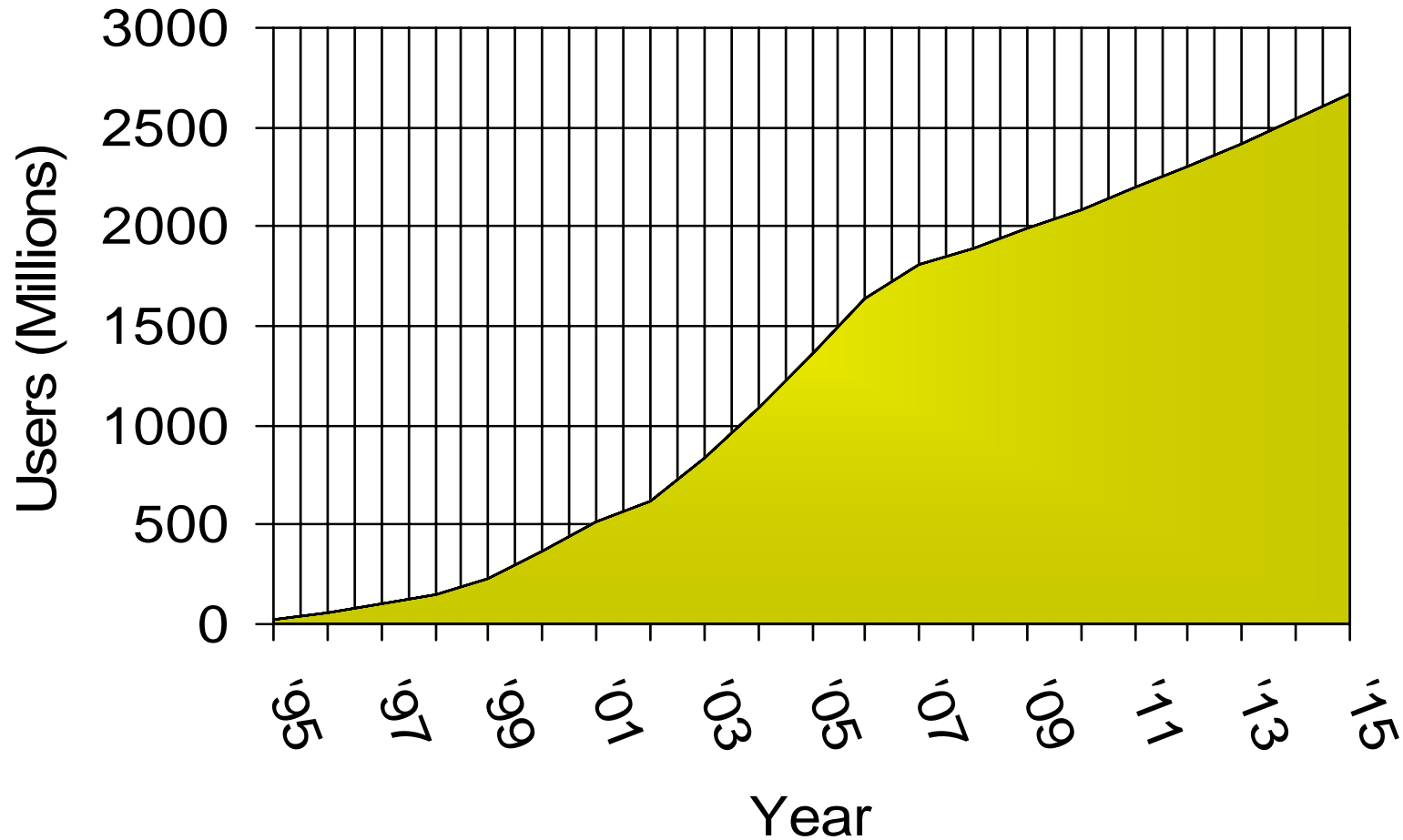
1981 - IPv4 protocol published
1985 ~ 1/16 of total space
1990 ~ 1/8 of total space
1995 ~ 1/4 of total space
2000 ~ 1/2 of total space
2003 ~ 2/3 of total space

- This despite increasingly intense conservation efforts
 - PPP / DHCP address sharing
 - CIDR (classless inter-domain routing)
 - NAT (network address translation)
 - plus some address reclamation
- Theoretical limit of 32-bit space: ~4 billion devices
Practical limit of 32-bit space: ~250 million devices
(see draft-durand-huitema-h-density-ratio –<http://www.faqs.org/rfc/rfc3194.html>)



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Internet User Trends



Source: Nua Internet Surveys + vgc projections



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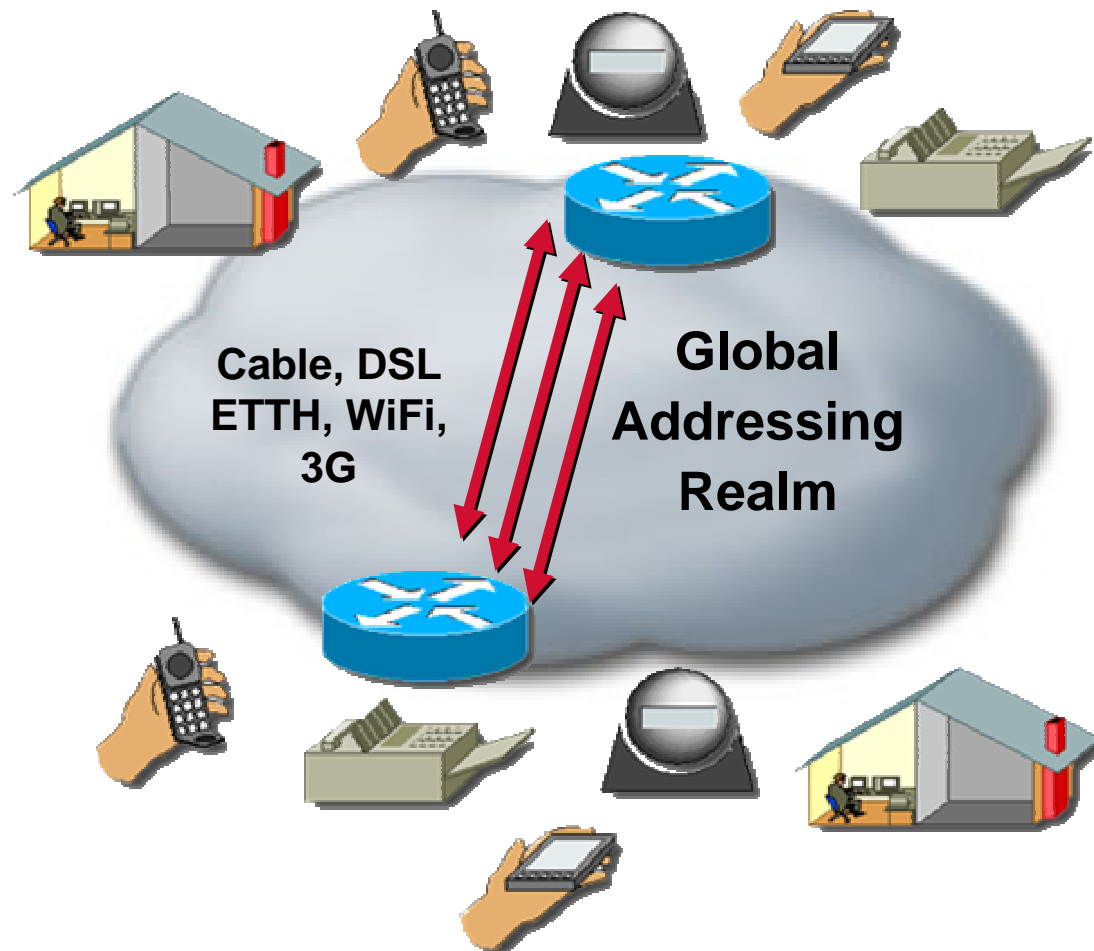
Do We Really Need a Larger Address Space?

- **Internet Population**
 - ~600M users in Q4 CY2002, ~945M by end CY 2004 only 10-15%
 - How to address the future Worldwide population? (~9B in CY 2050)
 - Emerging Internet countries need address space, eg: China uses nearly 2 class A (11/2002), ~20 class A needed if every student (320M) has to get an IP address, Africa
- **Mobile Internet introduces new generation of Internet devices**
 - PDA (~20M in 2004), Mobile Phones (~1.5B in 2003), Tablet PC
 - Enable through several technologies, eg: 3G, 802.11,...
- **Transportation – Mobile Networks**
 - 1B automobiles forecast for 2008 – Begin now on vertical markets
 - Internet access on planes, eg. Lufthansa – train, eg. Narita express
- **Consumer, Home and Industrial Appliances**

IPv6 Drivers—Network Architecture

“Always-on” technologies enable new application environments

- Today, Network Address Translation (NAT) and application-layer gateways connect disparate networks
 - Internet started with end-to-end connectivity for any application
- Peer-to-peer or server-to-client applications mean global addresses
 - IP telephony, fax, video
 - Mobility
 - Distributed gaming
 - Remote monitoring
 - Instant messaging

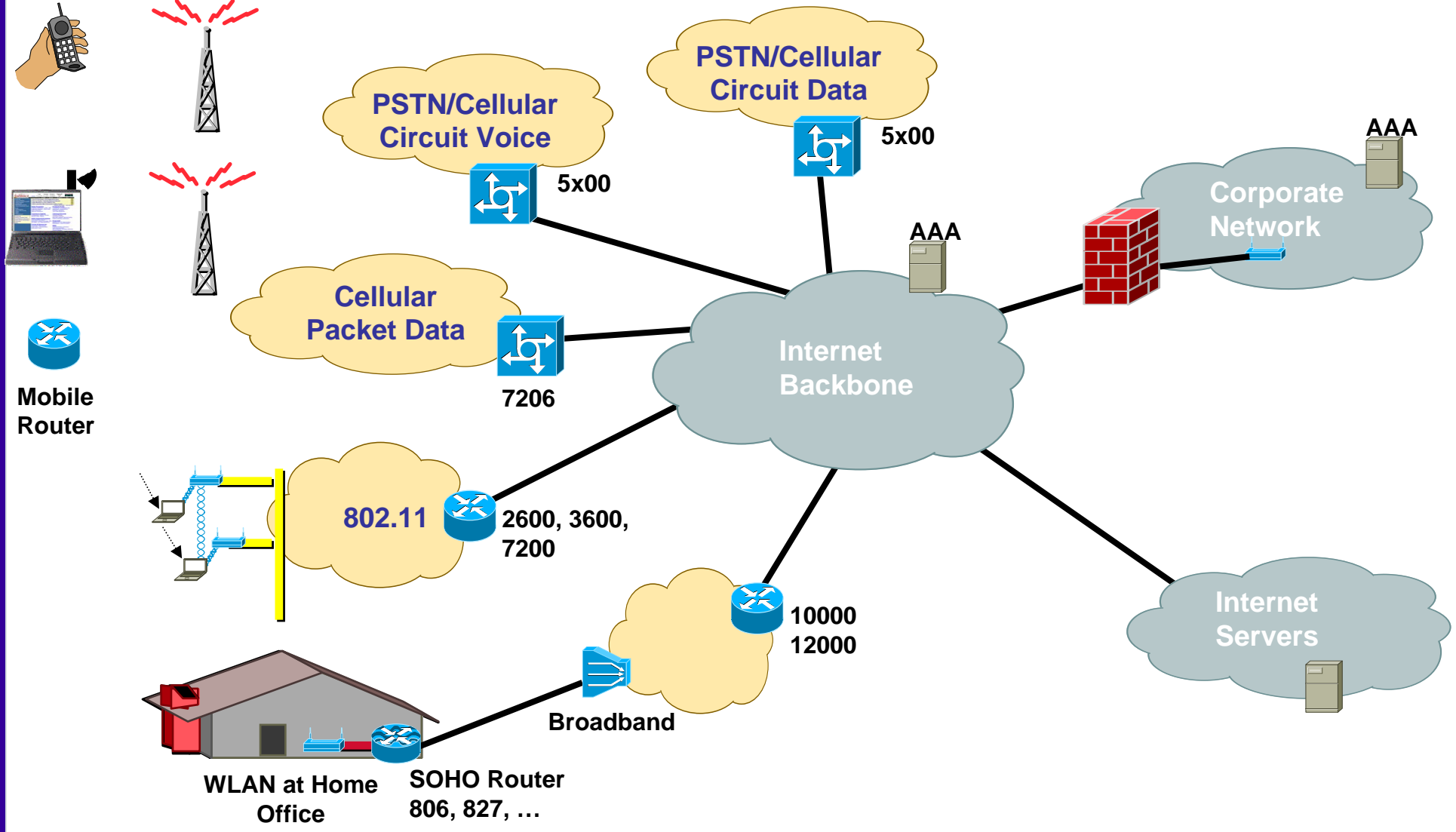


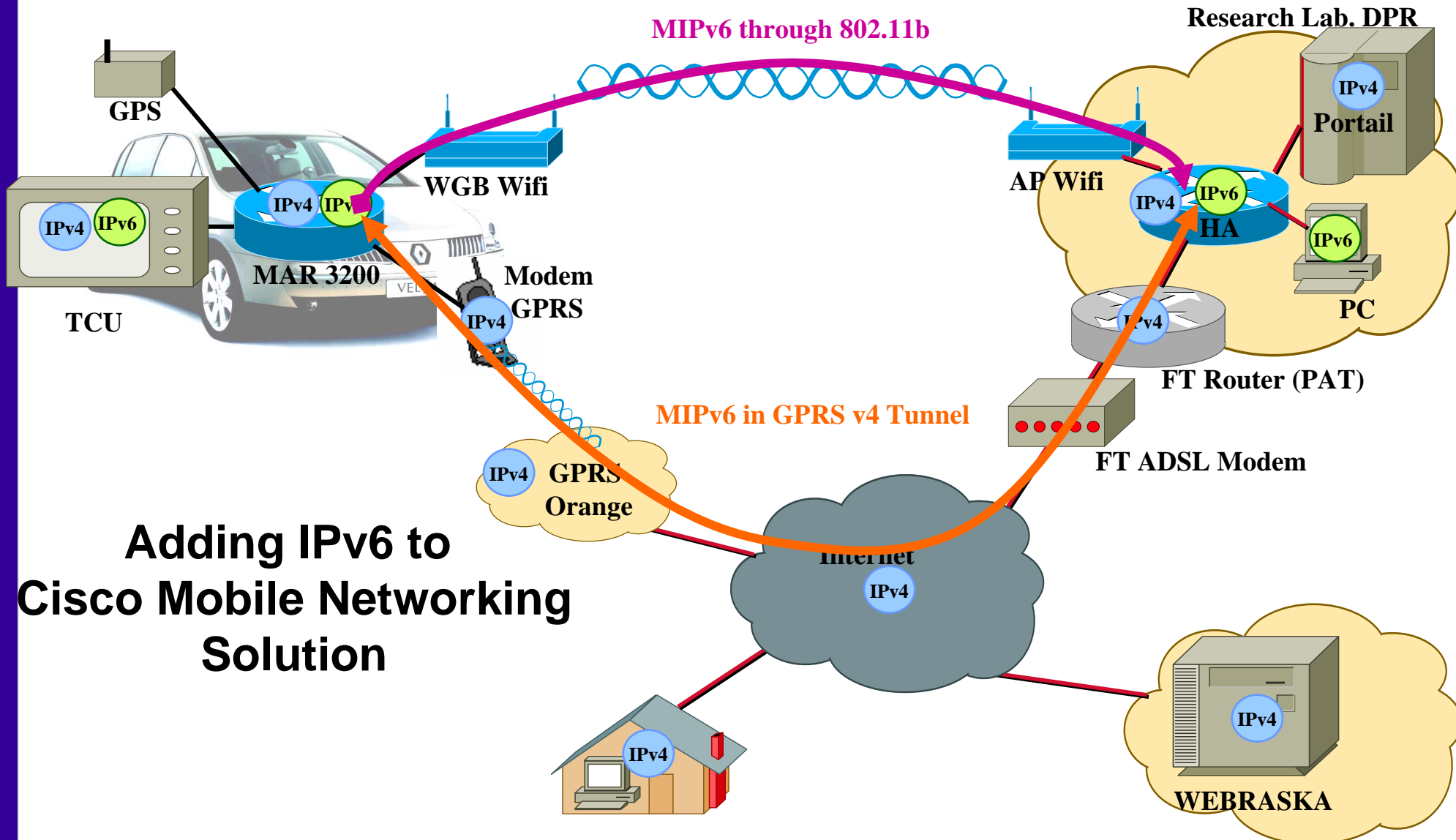


IPv6 Drivers—Mobility

Mobility Across Multiple Access Networks

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**Adding IPv6 to
Cisco Mobile Networking
Solution**



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IPv6 O.S. & Applications support

- All software vendors officially support IPv6 in their latest O.S. releases
 - Apple MAC OS X, HP (HP-UX, Tru64 & OpenVMS), IBM zSeries & AIX, Microsoft Windows XP, CE .NET; Sun Solaris,...
 - *BSD, Linux,...
- 2004 and beyond: *Call for Applications*
 - Applications must be agnostic regarding IPv4 or IPv6.
 - Successful deployment is driven by Applications
- For latest update see [playground.sun.com/pub/ipng/html/ipng-
implementations.html](http://playground.sun.com/pub/ipng/html/ipng-implementations.html) and www.hs247.com



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Who is Deploying IPv6 Today?

- Several segments/countries now mandate IPv6 for any product they buy – even if not in use yet

Japan – eJapan directives : most of the data communications must be done over IPv6 in CY05 – helped by tax incentives

DoD Memo on 6/9/03 : Any procurement after 10/1/03 has to be IPv6 Capable

- **Service Providers**
 - Carriers – Transit services
 - Internet Exchange Point – ISP & NRN peering
 - Regional ISP – IPv6 services to end-users on ADSL & ETTH
 - Mobile SP – R&D for future services
- **Enterprises – vertical market segments**
 - NRN & connected downstream sites (Universities & R&D labs)
 - Federal Systems (Military, Govt. agencies)
 - Vendors for their internal engineering communities, ie: Cisco IT



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SURFnet

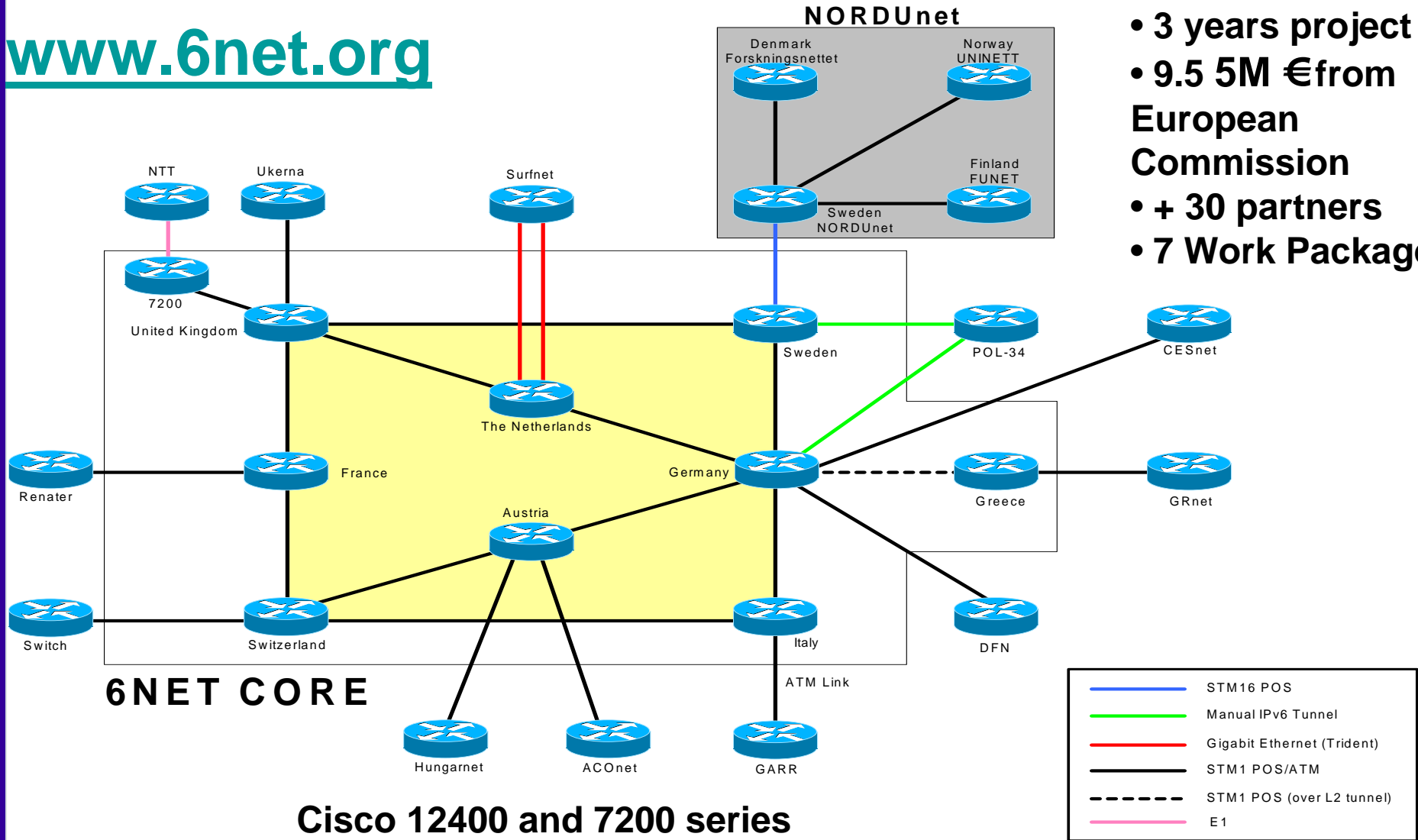


- Dutch NRN, see <http://www.surfnet.nl>
- Currently 5th network generation
- STM-64c/OC-192c core with mostly 12416 routers
- SURFnet-4 and SURFnet-5 ran in parallel for a year, which created a big opportunity to test new services
- Dual-stack IPv4/IPv6
- IPv6 service offering via tunnel, dedicated link, dual-stack

6NET Project

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- 3 years project
- 9.5 5M € from European Commission
- + 30 partners
- 7 Work Packages

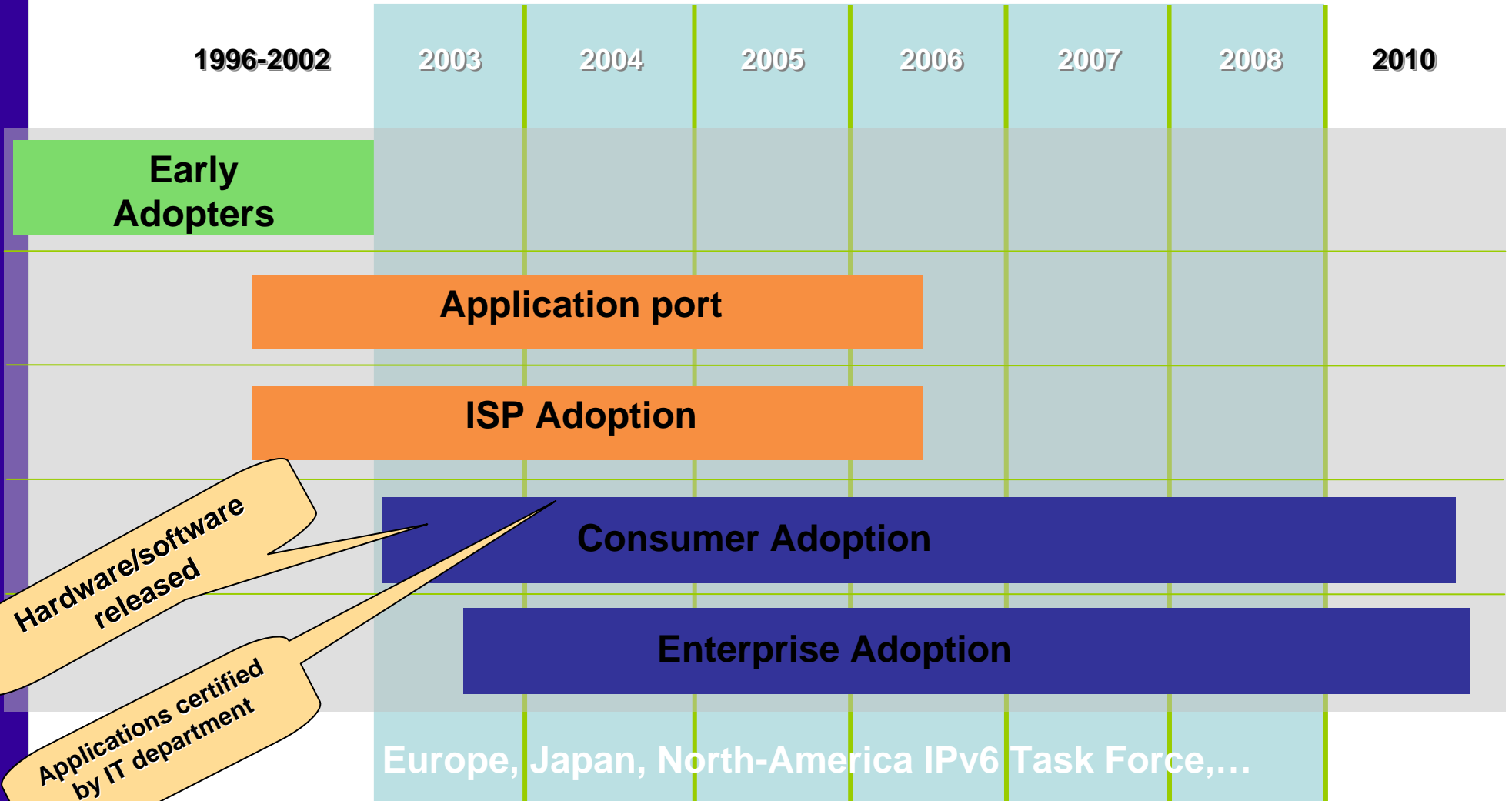


Cisco 12400 and 7200 series



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IPv6 – Looking at the Crystal Ball



Hardware/software released

Applications certified by IT department



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IPv6 – for an Ubiquitous Internet

- **Connect Everything to the Internet**
 - *Simply (Plug & Play) and Safety*
- **Enjoy the Internet Everywhere & Anywhere**
 - *Broadband, wireless,...*
 - *China, India, Africa,...*
- **Play, Learn, and Live on the Internet for Everybody**
 - *Peer to Peer & Client/Servers applications*
 - *Global reachability as well as community of interest*
 - *Home Information Services*
- **We need One Internet**
 - *Global communications enhances business, trade, research*

