



The New, New Internet

*IPv6: Technology's
Next Big Step*

DRIVERS - INNOVATIONS

RETURN ON INVESTMENT

VISION 2010

December 2006

Latif LADID



Real Smooth Transition

***In 1965, people drove
on the left side in Sweden.
In 1967, on the right side.
How did they manage it?:
City by city.***



The Digital Evolution Homos Digitalis Internetus

In the last 5 years, as much info has been generated as in the entire history of mankind

[//www.conceptualdevices.com/ENG/Human%20World/Internet_Users_Animation.html](http://www.conceptualdevices.com/ENG/Human%20World/Internet_Users_Animation.html)

```
..
.001.^
u$0N=1
z00BAI
I.,=^
;s<'
NRX*=-\
z0c^XX^
^B0s^^
00$H^
n$0=XN; \
iBBB0vU1=^^
`$000cRr`vuI
FAHZuqr-^
;BRHv n$U^-
`ARN1 `0si
`Onv` 01.^
c0qr rs.\
aUU` ul`
`RO- ..
nn^^ =,.*|-^
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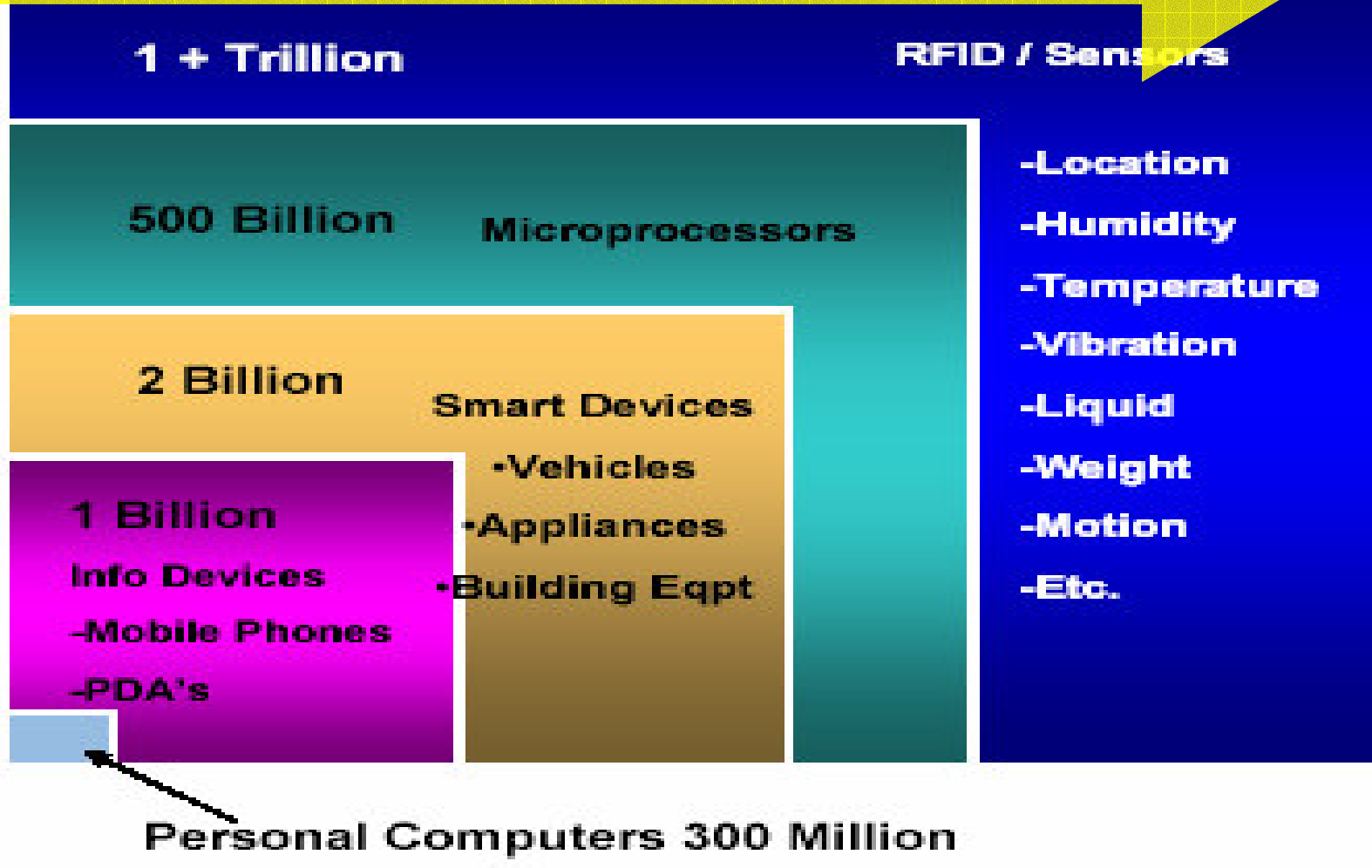
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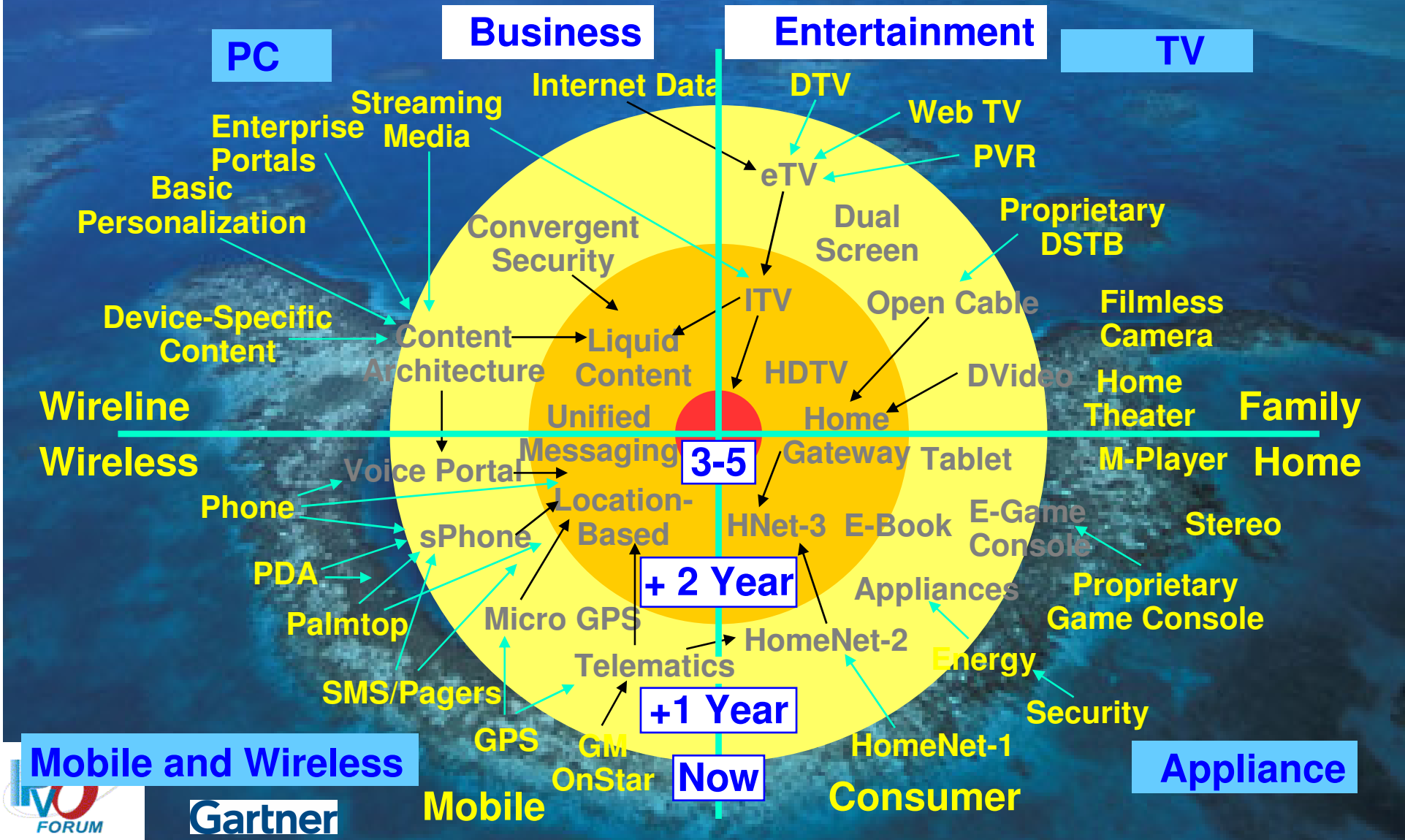
Worldwide Internet Penetration %

2005	1.0	15%
2010	1.6	25%
2015	2.3	35%
2020	3.2	50%

The Next Big Internet



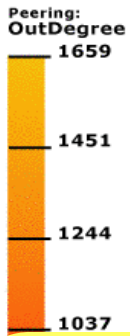
In a Converging Landscape



IPv4 INTERNET TOPOLOGY MAP

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AS-level INTERNET GRAPH

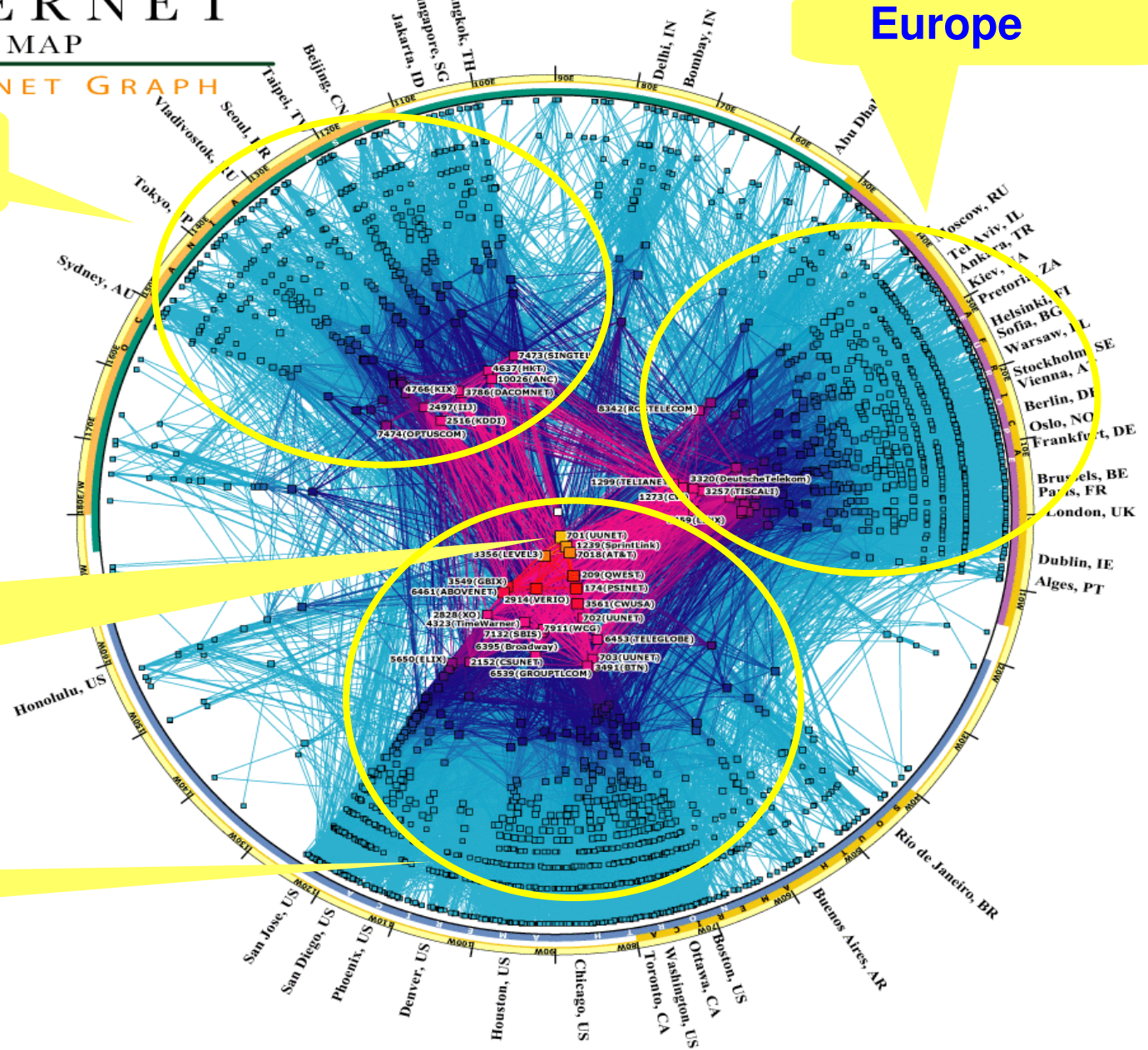


Asia

Europe

MCI/UUNET
Verizon

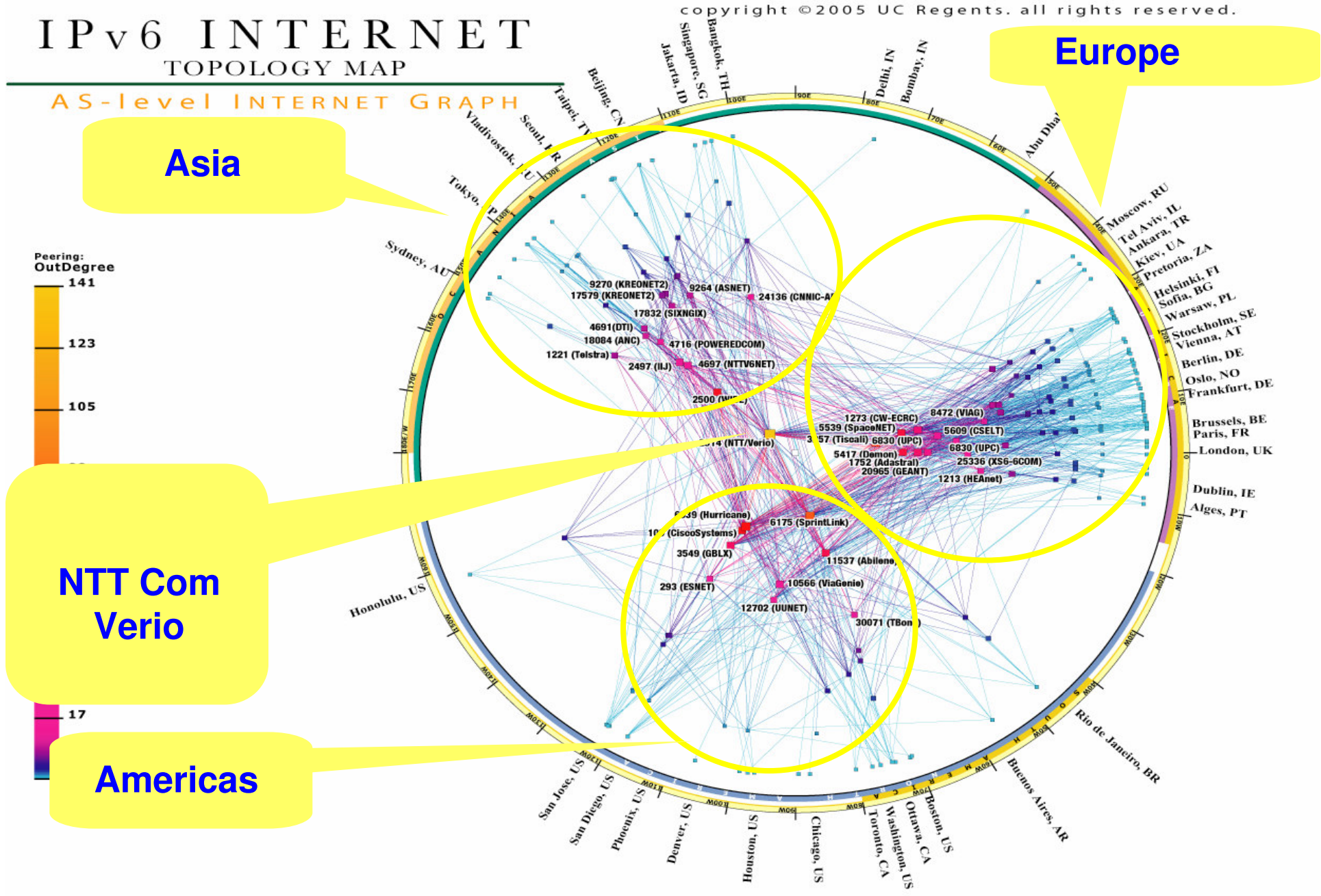
Americas



IPv6 INTERNET TOPOLOGY MAP

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AS-level INTERNET GRAPH

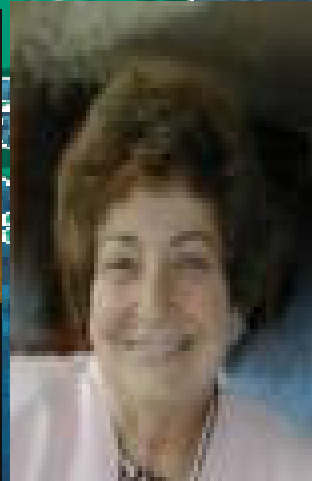


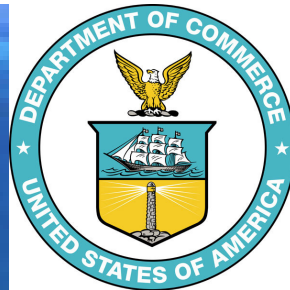
Political Goodwill

IPv6 Roadmap

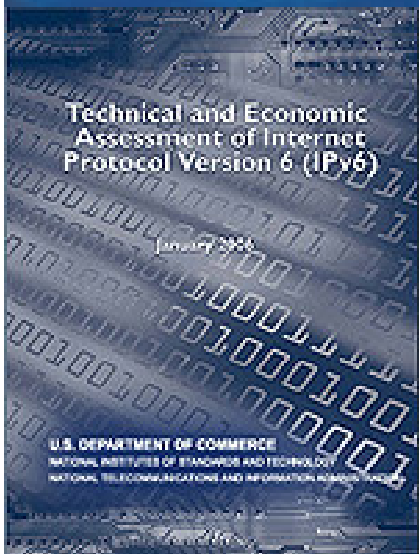


Worldwide Political Goodwill





RTI Report to NTIA/NIST on IPv6



1 B\$ Update Cost

10 B\$ Cost Savings PER YEAR

10:1 Return on Investment

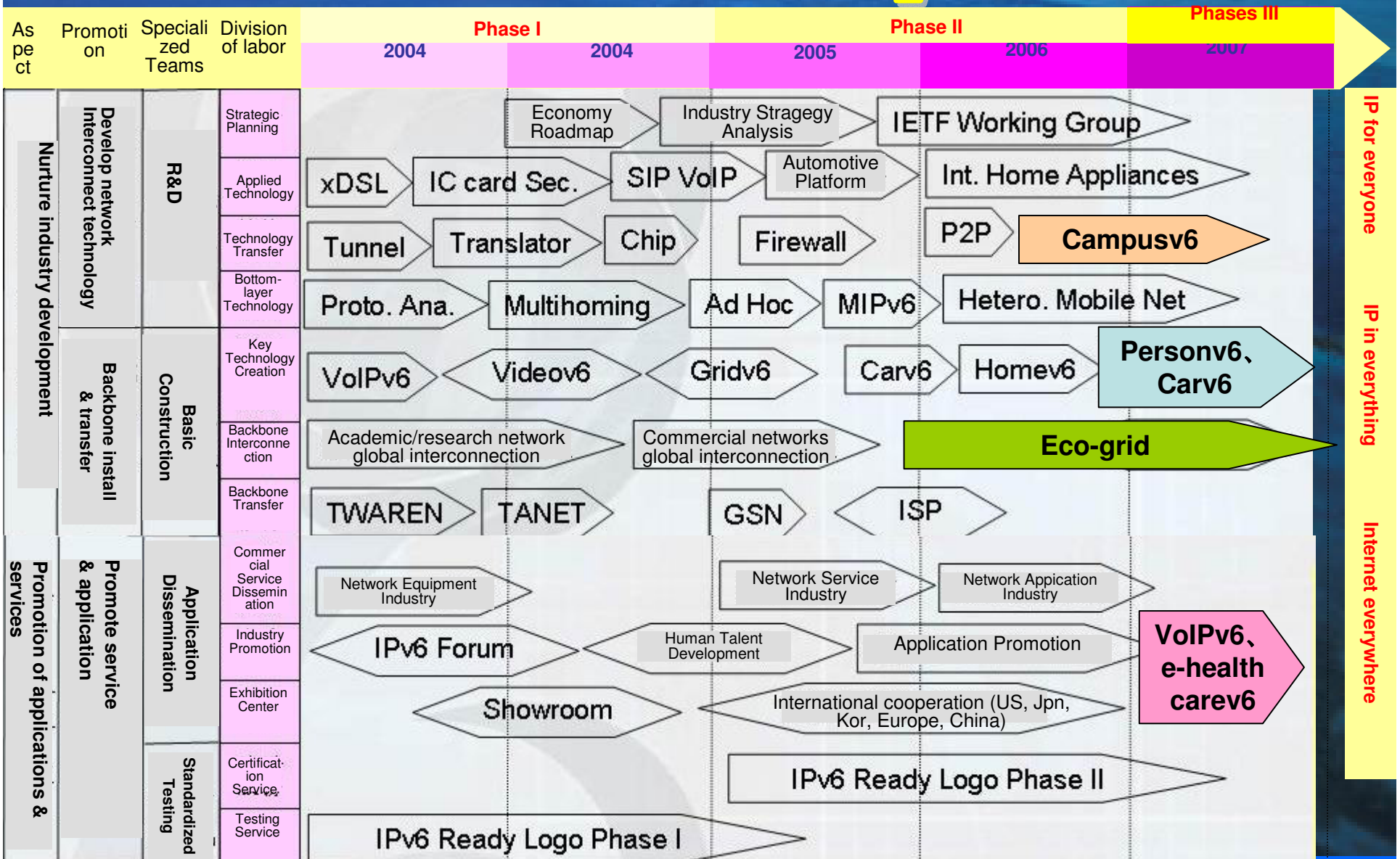


Taiwan v6 Roadmap



Item appearing in all phases

Item not appearing in all phases

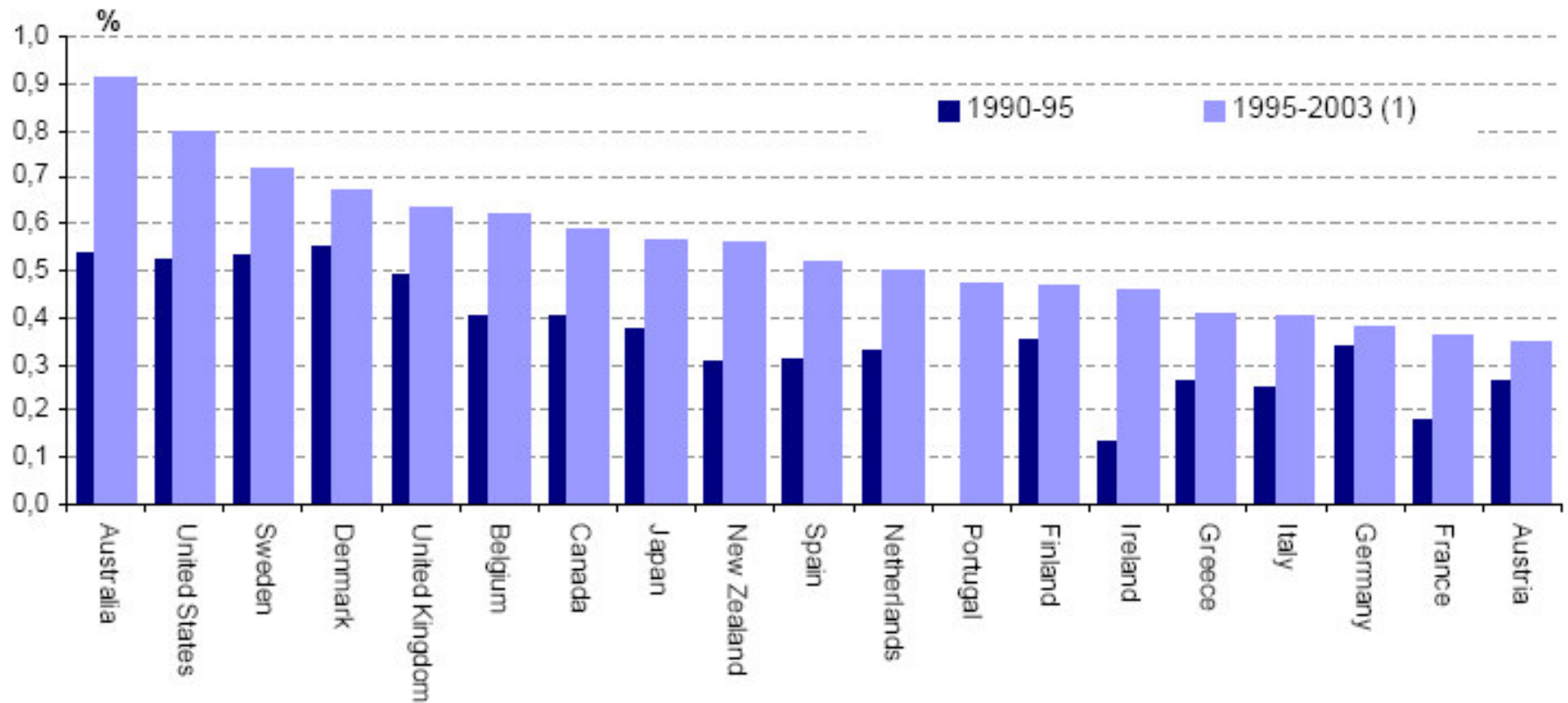


IP for everyone

IP in everything

Internet everywhere

ICT Contribution to the Economic Growth



Source: OECD Productivity Database, September 2005,
[www.oecd.org/statistics/productivity]



Staying with v4-NAT

**Imagine the Internet as a plane!
1 Billion Passengers!**

8 000 Pilots



Running out of kerozene ?!!

Yv4: The Y2K for Apps!



Peer-2-Peer Species work better together!

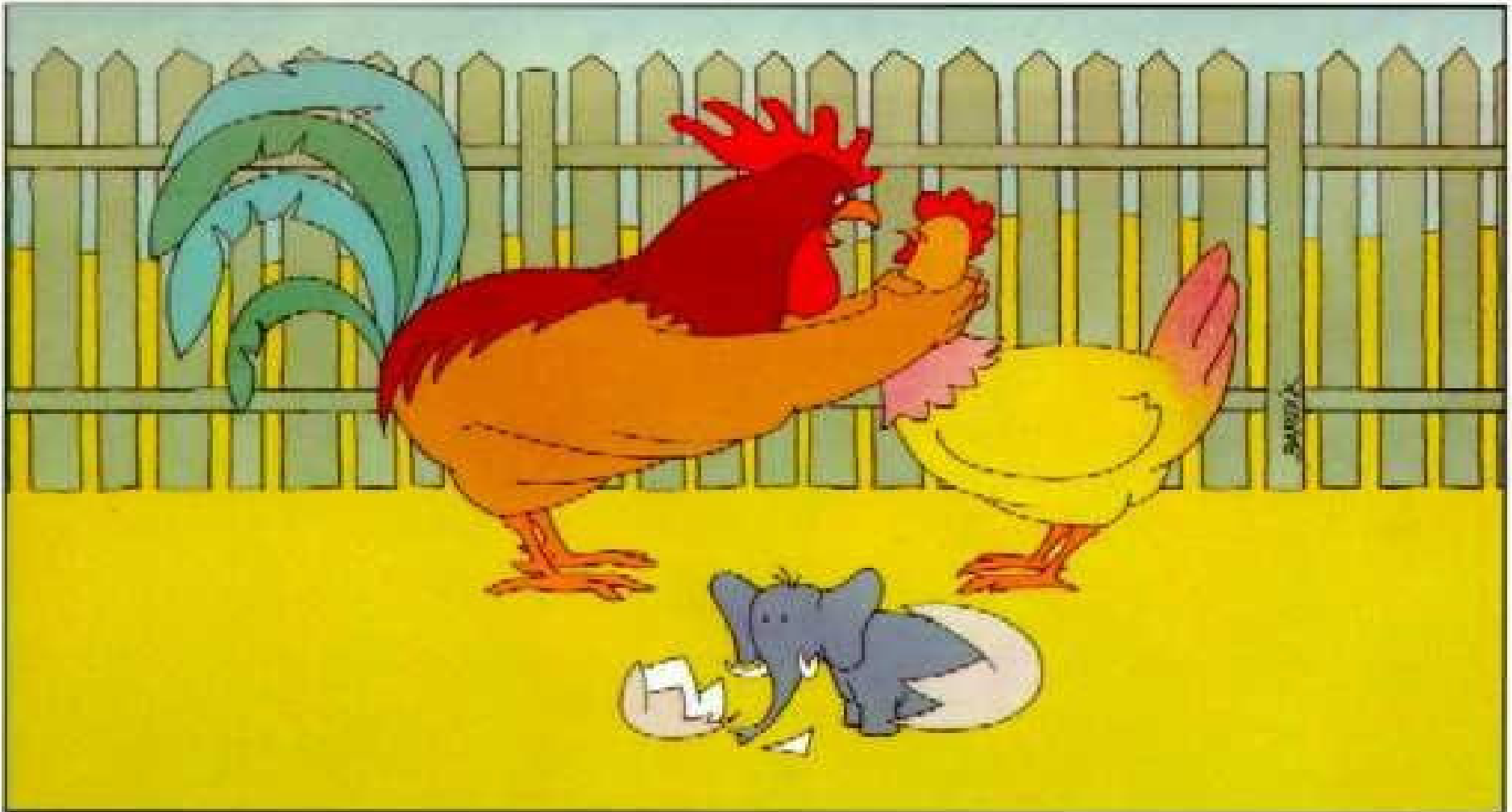


The Internet is losing its original Design



Future of the Internet

Chicken & Egg ?

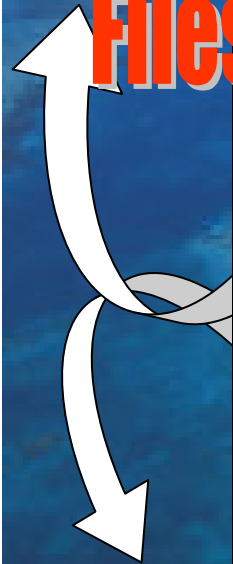


The New Internet The TWO-WAY Internet

End 2 End

Filesharing

Resource Sharing



Instant
Communication

Interactive

Collaborative
Computing

Wide Open Again for INNOVATION



SHORT TERM DRIVERS

VPN



VOIP



3G



GAMING



Broadband



LONG TERM DRIVERS

NGN



Triple Play



Remote Control



Embedded



Wimax



LONG TERM DRIVERS

Home



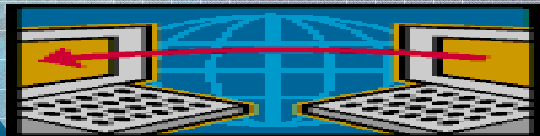
GRID



PLC



IPTV



CAR2CAR



LONG TERM DRIVERS

**Building
Automation**



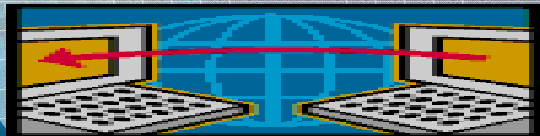
P2P



RFID



Sensors



Emergency



Winning Defence



IPv4 IPv6
Peace Green



moonv6

Germany



Bundeswehr

France



**MINISTÈRE
DE LA DÉFENSE**

Korean



MND



Australian Government
Department of Defence

Winning The Safety Sector

Bio-Ecological

Health

Transportation disaster

Risk Profiles

Terrorism

Rescue

Natural disaster

First Responders

Public Information

Crisis Management

Voice

Sensors

Video

Data

Instant Messenger

Directory services

Time Synch

Localization

Management

IPv6 - Common Networking Infrastructure Enabler

- Secure environment
- Bi-directional communications
- IP Mobility
- Ad-Hoc Networks
- Traceability
- Community of Interest

Fixed Network Infrastructures

Broadband

Public

Private

Government



Wireless Network Infrastructures

WiFi

GPRS/3G

Satellite

Radio

DVB-H

WiMax

FORUM



Car-2-Car v6 Roadmap



• Summary

Specification	Mock-up	Validation
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01-03-04

01-03-05

01-03-06



01-03-07

ITS
London

**S.C Chair : RENAULT
Managed by ERTICO**

- 50 Partners
- 22 M€ Budget
- 11 M€ Subvention E.C

7 Subprojects

- OS (Open System)
- SEC (Security)
- S.PAY (Service Payment)
- CERTECS
- EFCD
- RESCUE
- SAFETY CHANNEL

7 Test Sites

- French (FT / RENAULT)
- Aachen (FORD)
- Gothenburg (VOLVO)
- Stuttgart (DAIMLER CHRYSLER)
- Munich (BMW)
- Torino (FIAT)
- London (RESCUE)

FORUM

Winning Microsoft



Jawad Khaki

Microsoft

Windows Vista



Benefits:

- Dramatically improves speed
- Limitless scalability
- Minimum server requirements
- Very cheap

Avalanche



Needs End2end

Saving OPEX

1

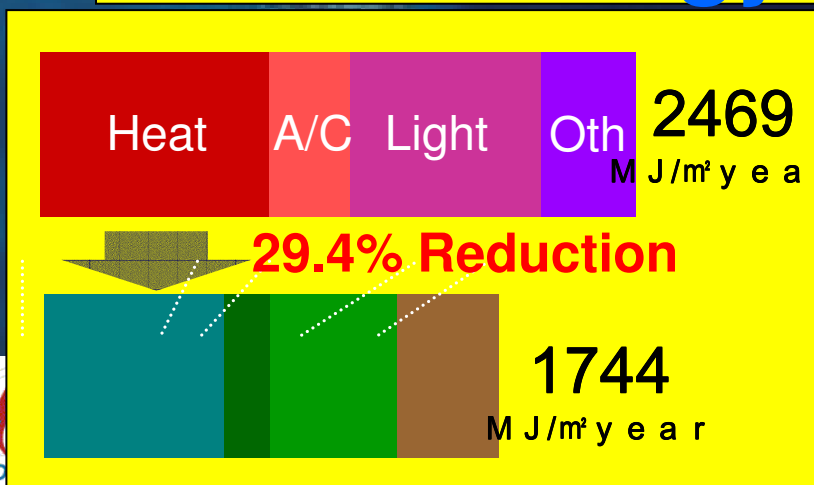
◆ IP-Phone (FreeBit) What was achieved with IPv6?

- ✓ installed 20,000 terminals to a dormitory operator to manage distributed facilities
- ✓ Simplifies Network design / re-design
- ✓ Reduces the required human-resources and its costs

20,000

2

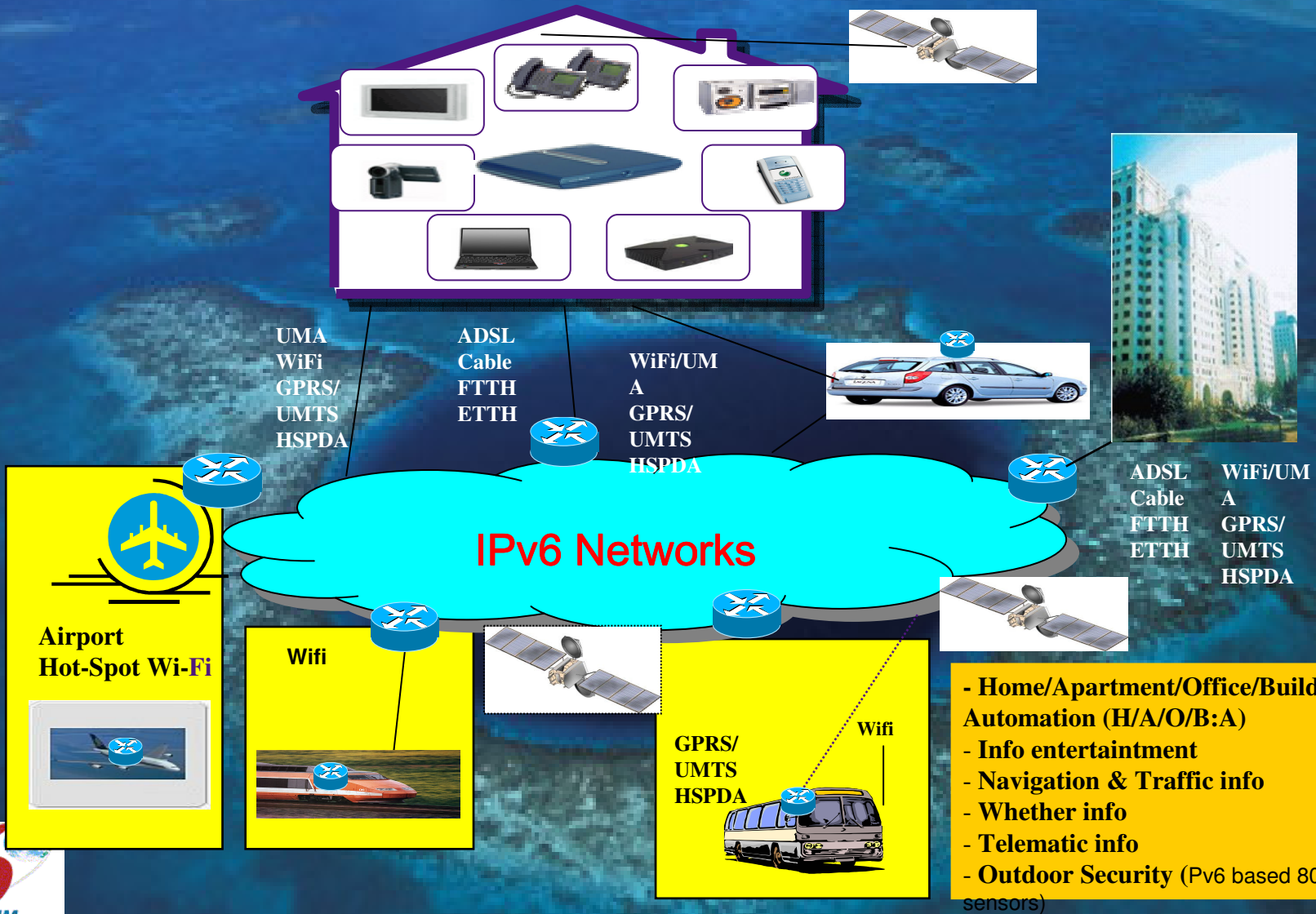
How to use sensor networks to save energy in building system



Hiroshi ESAKI, Ph.D

vision & Way Forward

Home Innovations



Smartcard: a first-class networked citizen ?

gemalto

IPv6 embedded stack



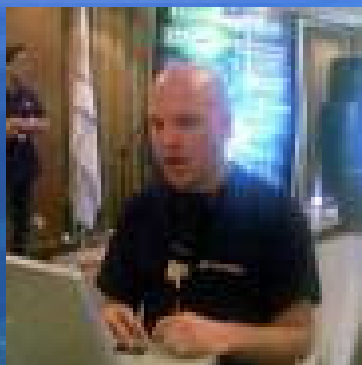
✦ ETSI/SCP (Smart Card Platform)

- Internet connectivity workgroup
- included in Release 7

✦ Java Card Forum

- Next-generation Java Card specifications under progress
- specifications expected during the course of 2007





Famous Hacker Van Hauser Recommends IPv6

the hacker's choice

Conclusion Internet Security with IPv6

So far no known new risks with IPv6, but some security improvements against IPv4:

- Alive-Scanning and TCP/IP Worming very hard
- IP Record Route Option removed, no uptime check
- Easier network filtering and attack tracing

Introduction of IPSEC will not make IPv6 secure, but will make attack tracing easy, and sniffing + Man-in-the-Middle very difficult

Some implications unclear yet, research needed



<http://video.google.com/videoplay?docId=1997928877828616417&q=ipv6&hl=en>

Battery Savings
Battery life of mobile phones
can be severely reduced
by NAT by up to 50%!



Moving from NAT to NAP

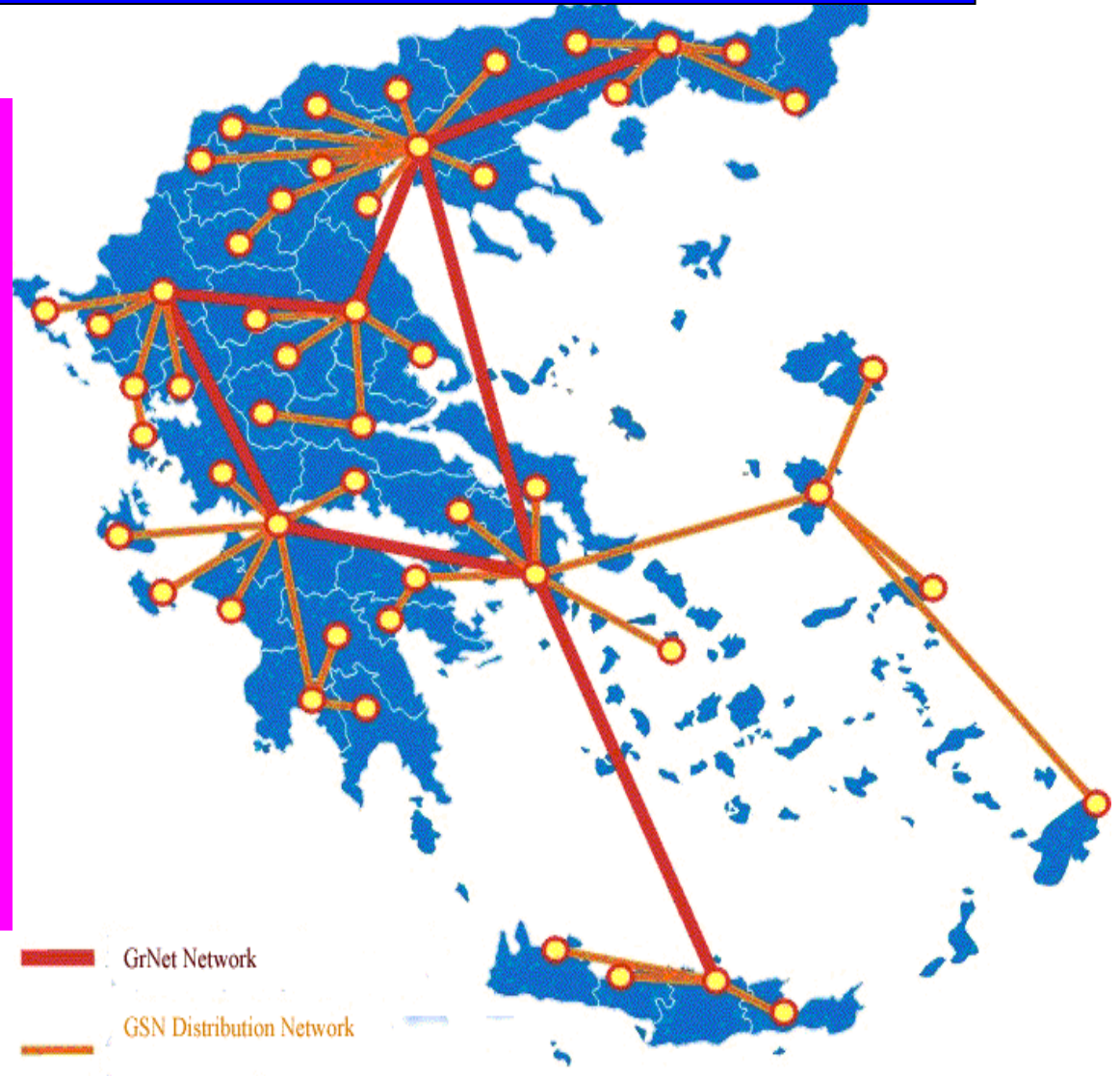
***NAT Engineers will
far better appreciate
and endorse IPv6 !***



Education Example

Greek Public School Network

- Built off Greek NREN (GRNET):
 - 7 GRNET nodes
 - 82 GSN distribution routers
 - ~10,000 schools
- Each school today has two IPv4 /30 subnets
 - Access network
 - Loopback
 - NAT interior



The New Internet

Roadmap

1 billion +
Connected Devices



Worldwide Wireless

Putting The Internet Back Together!



INVENTING THE FUTURE

