



IPv6
The Two-Way Internet

Melbourne 2009
Is a "Future Internet"
w/o IPv6
VISION? or
FALLACY?



Vision & Way Forward

Historical Transitions!

Gregorian Calender

Pope Gregory XIII



Adopted Oct 4, 1582

Protestants - GB: 2 Centuries

**Protestants - Russia:
3.5 Centuries later**

Muslim nations: Hegir - dual
China: Its own calendar



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Historical Flag Days Transitions!

US Area Codes

Y2K - Jan 1, 2000

Euro - Feb 2002



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ASCI Table

US ASCII = 7 Bits

International ASCII = 8 Bits

DNS → IDN

<http://ทีเชอชนึค.พาคณึชย์.ไทย>

IR6 FORUM

Courtesy of i-dns.net
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From InterNET to InterNAT

From

Network of Networks

to

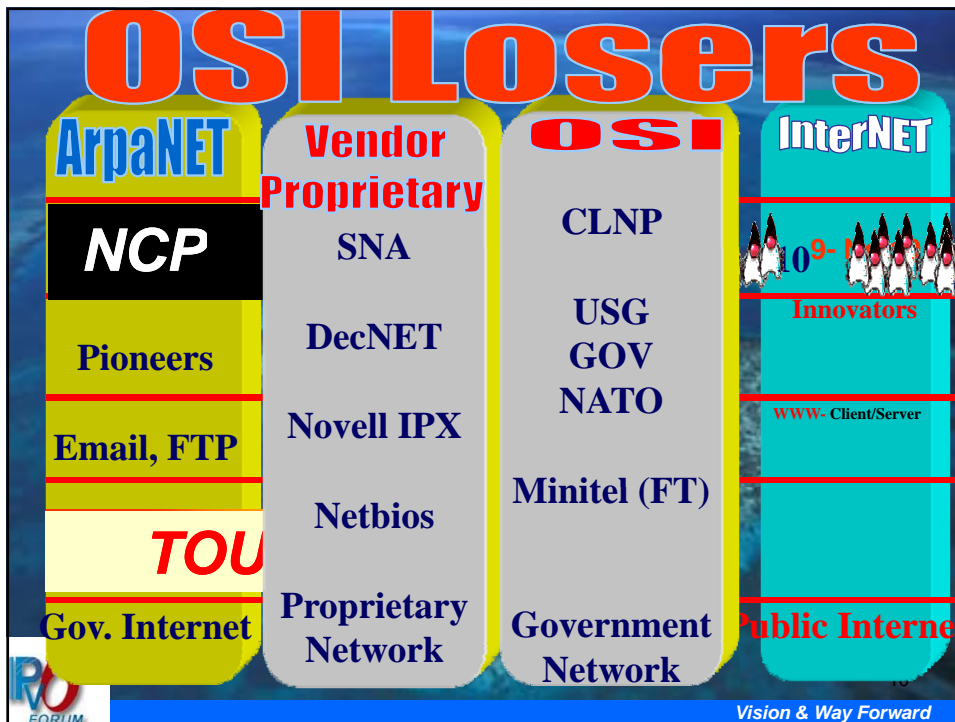
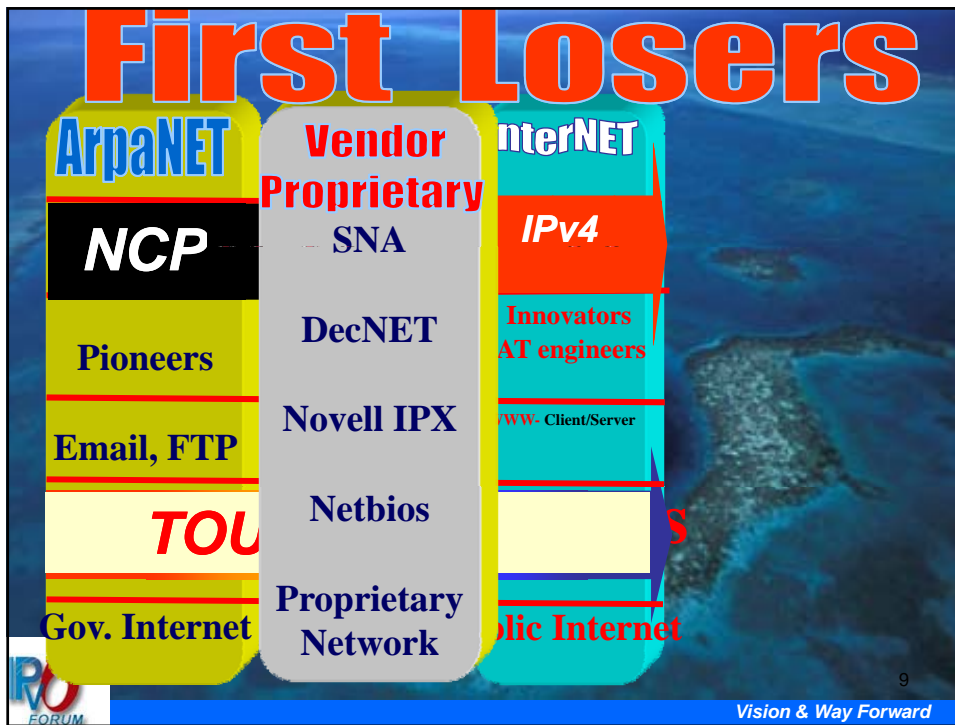
NATwork of NATworks

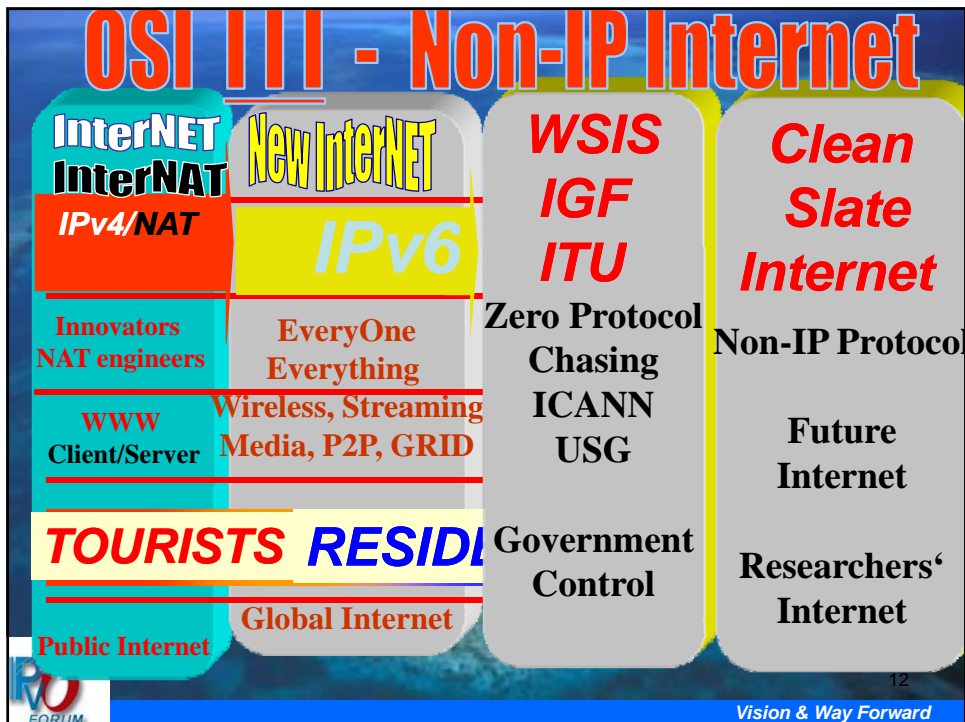
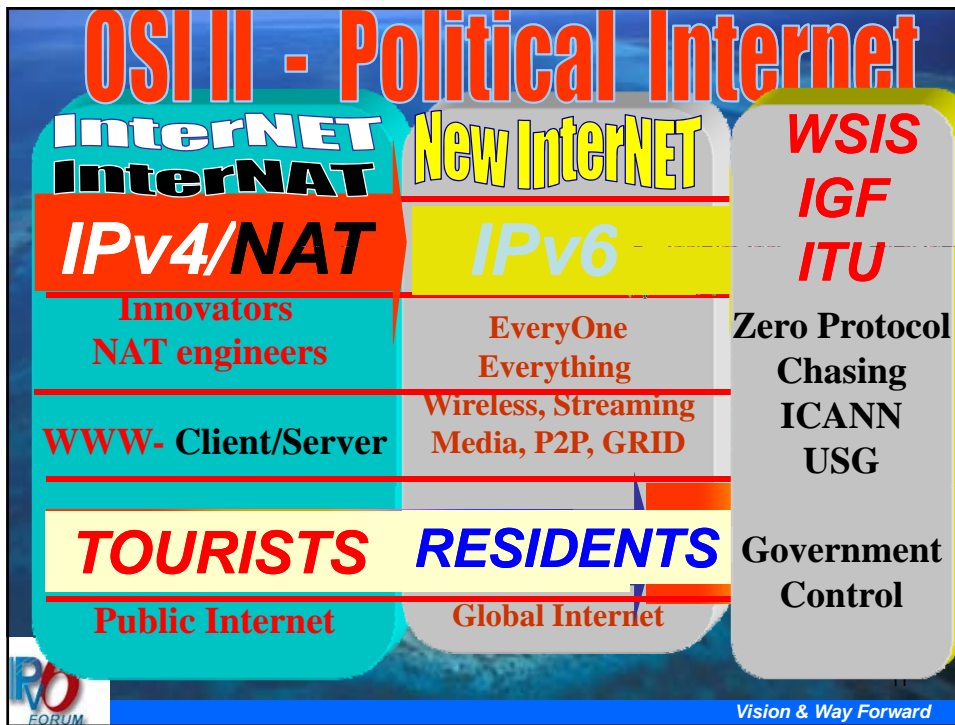


Internet Generations

ArpaNET	InterNET InterNAT	New InterNET
NCP	IPv4/NAT	IPv6
Pioneers	Innovators NAT engineers	EveryOne Everything
Email, FTP	WWW- Client/Server	Wireless, Streaming Media, P2P, GRID
TOURISTS		RESIDENTS
Gov. Internet	Public Internet	Global Internet

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Is this the Fate of the Internet?

The Research Strikes back!



Larry Landweber



Dave Clark



Peter Freeman



National Science Foundation
WHERE DISCOVERIES BEGIN





geni
Exploring Networks of the Future

Is this the Fate of the Internet?

March 8, 2006 @ IPv6-NSF-OECD Workshop

The OECD IPv6 STORY



ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
OECD

Internet workshop OECD Discussion Forum -
- IPv6 Forum Contribution to the OECD
March 2006
Hijacked by Larry Landweber to NSF
NO TO IPv6

Is this the Fate of the Internet?

January 31, 2007 @ NSF-OECD Workshop

The OECD IPv6 STORY

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT 

NSF/OECD Workshop "Social and Economic Factors Shaping the Future of the Internet"
31 January 2007
IPv6 is back thanks to Vint Cerf ONLY!

 OECD Ministerial Meeting on the Future of the Internet Economy
Seoul, Korea, 17-18 June 2008

Is this the Fate of the Internet?

January 31, 2007 @ NSF-OECD Workshop



It is good to do research, but IPv6 is the way forward!

5 minutes ago, I retired, I agree with Vint IPv6 is the way forward!

 **Peter Freeman**

Is this the Fate of the Internet?

June 17-18, 2008 @ OECD @ SEOUL

The OECD IPv6 STORY

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT


 OECD Ministerial Meeting on the Future of the Internet Economy
 Seoul, Korea, 17-18 June 2008

Is this the Fate of the Internet?

Future Internet Research Worldwide

 **European Commission Future Internet Assembly**

3 B€ over the next 5 years

Asia Future Internet Forum *AsiaFI*

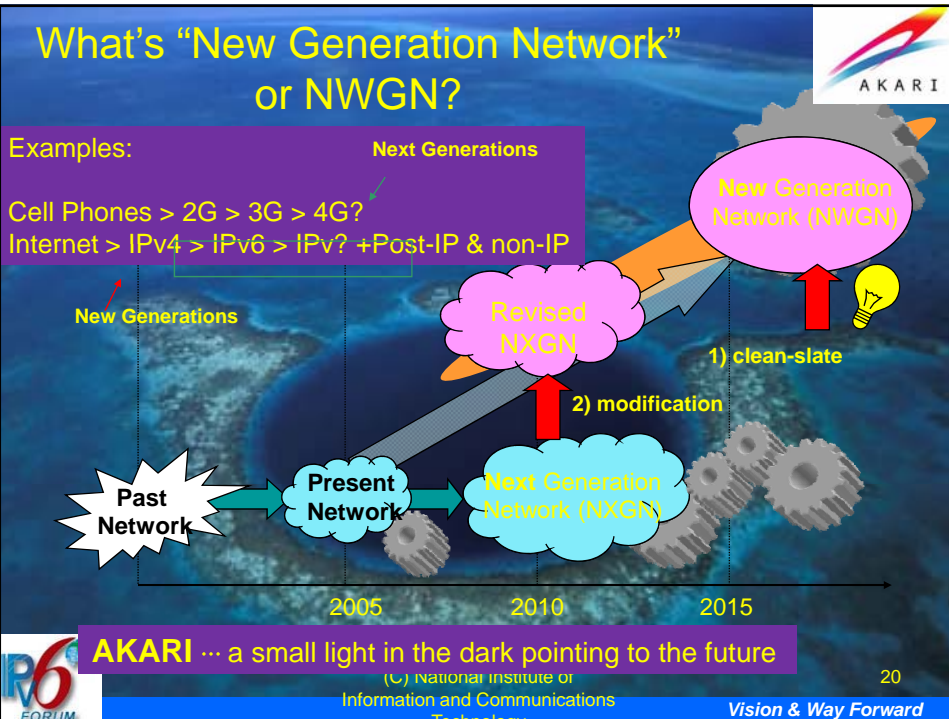
Board
 Daeyoung Kim, Chungnam National University, Korea, 2009-2011, (Vice-chair 2009-2010)
 Francis Lee, Nanyang Technological University, Singapore, 2008-2010
 Jun Murai, Keio University, Japan, 2008-2010, (Chair 2009-2010)
 Kenjiro Cho, IJ Laboratory, 2009-2011
 Lixia Zhang, UCLA, USA, 2008-2010
 Onno Purbo, IDRC, Singapore-Canada-Indonesia, 2008-2010
 Serge Fdida, CNRS, 2009-2011
 Ying Li, Tsinghua University, China, 2009-2011

” IPv6 simply broadens the address space, and we cannot expect the IETF to produce a new network architecture. Our vision is that we must create this new generation network before the Internet reaches its limits.”




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What's "New Generation Network" or NWGN?

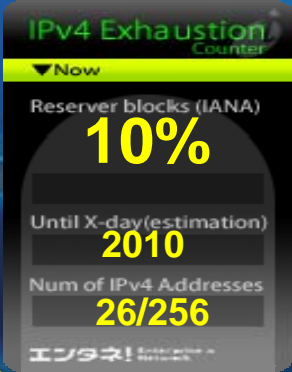


The IPv4 Address Exhausting Debate ☺



2030


Geoff Huston



10%
Reserver blocks (IANA)

2010
Until X-day(estimation)


26/256
Num of IPv4 Addresses



CYRIAK

2010

Tony Hain





**4-5
Blocks
Are
misused**

**20-22
Blocks
8-9%
Left**

The Role of IPv6 in IMS & LTE vodafone

- NAT has become a “religion” in wired networks
- NAT in a wireless / cellular world is costly
 - _ Shortens Battery life time
 - _ Consumes excess Radio capacity
 - _ Responsible for Delays
 - _ Requires effort to minimize security risks
- IPv6 is still not understood
 - _ Administrators love IPv4
 - _ For every IPv4 issue exists a complex solution ;-)
 - _ Myths driven by incompetence and resistance to change



3 Jump starting IPv6
30 May 2008
C1 - Public
Version 1.0




John Curran
Chairman, American Registry
for Internet Numbers (ARIN)

” In the first nine months of 2009, **ARIN** received 300 requests for IPv6.

This compares to 250 received in 2007-8.

We're seeing an uptake in IPv6; it's a very significant growth rate,” “We've seen a slight slowdown in IPv4 requests. It's probably dropped off 10 percent or 20 percent year over year.”



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Bob Kahn



Bob Kahn's Conclusions **IPv6 Summit** **Washington 2000**

- **IPv6 is under hyped (for what it really will do)**
- **Industry cannot make it happen**
- **DOD must return to leadership**

IPv6 2000 Internet Protocol version 6

Hosted by:
The IPv6 Forum and the Cross-Industry Working
Team (XIWT)
October 19-20, 2000
Washington, DC



Ronald Reagan Building, International Trade Center

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"The Myth of the IPv6 Killer App"
Vint Cerf 2008

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Yv4 WORLD INTERNET USAGE & POPULATION STATISTICS **Yv6**

World Regions	Population (2008 Est.)	Internet Users Dec/31, 2000	Internet Usage, Latest Data	% Population (Penetration)	Usage % of World	Usage Growth 2000-2008
Africa	955,206,348	4,514,400	51,065,630	5.3 %	3.5 %	1,031.2 %
Asia	3,911,949	114,304,000	579,538,257	15.3 %	39.5 %	406.1 %
Europe	725,095,000	380,000,000	1,000,000,000	48.1 %	26.3 %	266.0 %
Middle East	319,633,400	10,000,000	20,000,000	21.3 %	2.9 %	1,176.8 %
North America	311,167,248	108,096,800	248,247,000	79.8 %	17.0 %	129.6 %
Latin America/Caribbean	511,000,000	10,000,000	109,209,000	2.1 %	1.0 %	49.3 %
Oceania / Australia	35,000,000	10,000,000	10,000,000	28.6 %	0.5 %	35.1 %
WORLD TOTAL	6,676,120,288	360,985,492	1,460,000,000	21.7 %	100.0 %	305.5 %

First IPv6 WOW!

**IPv4 Achieved the Critical 20%
IPv6 Can Drive Growth & Continuity!**

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2nd IPv6 WOW

Vidder.com – the first IPv6 based video service

**Video Conf
For everyone!**

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3rd IPv6 WOW!

Bernard Ourghanlian

**Microsoft
DirectAccess**

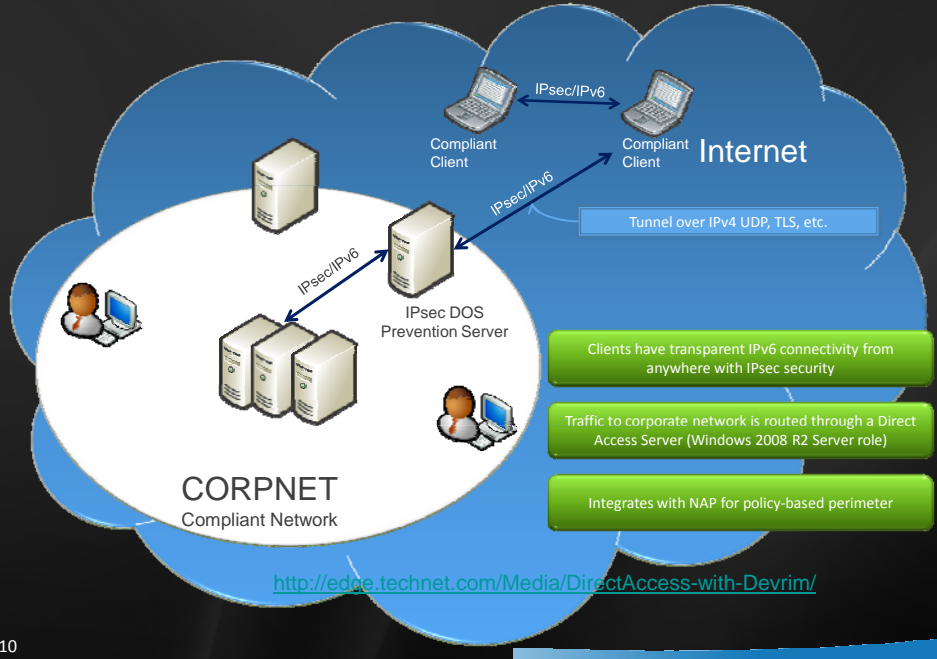
**The IPv6 SECURITY
PARADIGM SHIFT
Security Re-visited**

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The DirectAccess Solution



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4th IPv6 WOW!

**Internet
Of Things**



**The New Stuff that you can do
with IPv6 only**

IoT PARADIGM SHIFT



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AUTONOMICITY REVISITED AUTONOMIC NERVOUS SYSTEM

AUTONOMIC NERVOUS SYSTEM
Sympathetic - Yellow Parasympathetic - Blue

For simplicity, this chart does not reflect all the paths of nerve transmission. Ask your instructor if you have any questions or visit www.khanacademy.org.

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IT Complexity & Cost

IT Budgets

Microsoft
Your potential. Our passion.

70% Maintenance

30% New

2008

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Security & Defence Industry



Jim Bound
CTO IPv6 Forum
Chair NAV6TF



Oct 2002

Oct 2002






Richard Clarke Howard Schmidt John Osterholz Marilyn Kraus

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Obama Administration



Pete Tseronis
US IPv6 Task Force



June 2009

Broadband Policy (4 B\$)



Aneesh Chopra

eGov + IPv6 (5 B\$)



Vivek Kundra

SmartGRID (74 B\$)



Dr. Chu

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Political Goodwill



Chair EUv6TF



The way forward!
Do it now!

May 2008



Viviane Reding



Mario Campalargo



Per Blixt



Jacques Babot




i2010

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The European IPv6 Day

European Commission Call to Action on IPv6



The way forward!
Do it now!

25%
by 2010


European Commission Call to Action on IPv6 orchestrated by Jacques Babot

[European Commission communication on IPv6 dated 27 May 2008](#)

[IPv6 Video Clip](#)

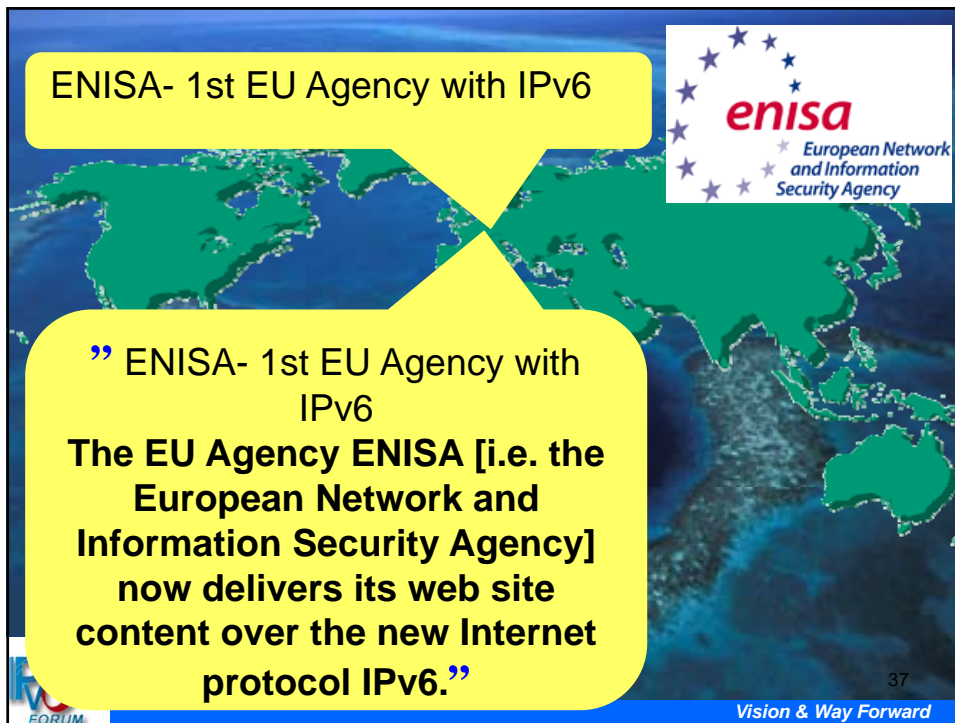
[European IPv6 Day - Brussels 30 May 2008](#)

[IPv6 Research projects, from action to R&D](#)



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ENISA- 1st EU Agency with IPv6

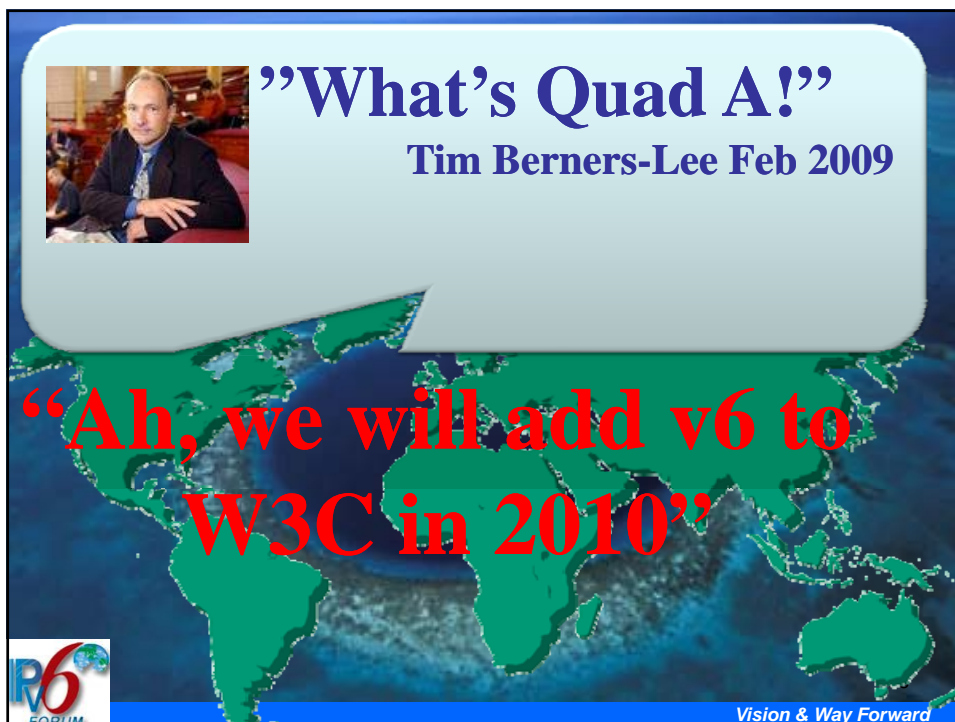
enisa
European Network
and Information
Security Agency

” ENISA- 1st EU Agency with IPv6
The EU Agency ENISA [i.e. the European Network and Information Security Agency] now delivers its web site content over the new Internet protocol IPv6.”

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”What’s Quad A!”
Tim Berners-Lee Feb 2009

“Ah, we will add v6 to W3C in 2010”

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IPv6 Enabled Program

New Certification for IPv6 Services

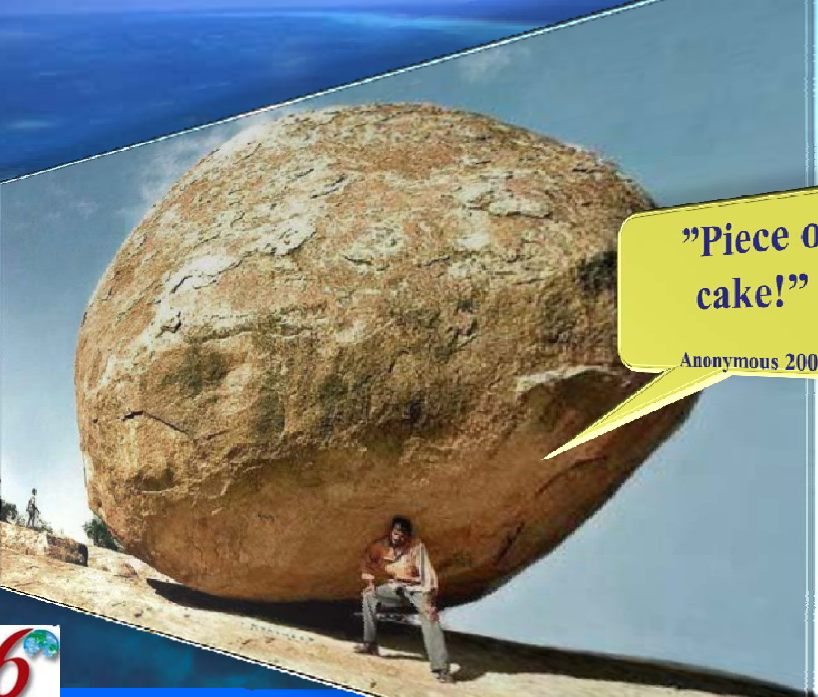


IPv6 Ready Logo Program





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"Piece of cake!"

Anonymous 2008



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forward