



CANBERRA 2008

IPv6

The NEXT BIG BAIL-OUT




Vision & Way Forward

Bob Kahn's Conclusions

IPv6 Summit

Washington 2000



Bob Kahn

- *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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Vision & Way Forward

Presented by Dr. Robert E. Kahn, President
Corporation for National Research Initiatives (CNRI)



**”Running out IP
Addresses is like
running out Oil!”**

Vint Cerf 2004

“Now even Money”

No Urgency

Some Urgency

Emergency



Vision & Way Forward

The IPv4 Address Exhausting Debate ☺



Geoff Huston

2030



Tony Hain

2010



CYRIAK



The IPv4 Address Exhausting Debate ☺

Murphy's Law at Work ☺



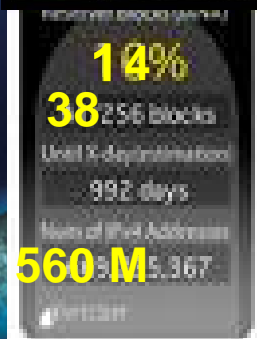
Geoff Huston

2030



Tony Hain

2010



**4-5
Blocks
Are
misused**

**33-34
Blocks
12%
Left**



DNS & IPv6

The Crucial ROLE of ISPs



Suzanne Woolf
@ ISC

Introduction

- Who is ISC?
 - US nonprofit responsible for open source, production-quality implementations of infrastructure protocols
 - DNS: BIND 9
 - DHCP: ISC DHCP 4.0.0
 - DNS services
 - F.root-servers.net
 - Others: TLDs, nonprofits, commercial
- Who is Suzanne Woolf?
 - Joined ISC in 2002
 - Business development
 - Public benefit



The Crucial ROLE

of All Stakeholders



Karine Perset
@ OECD

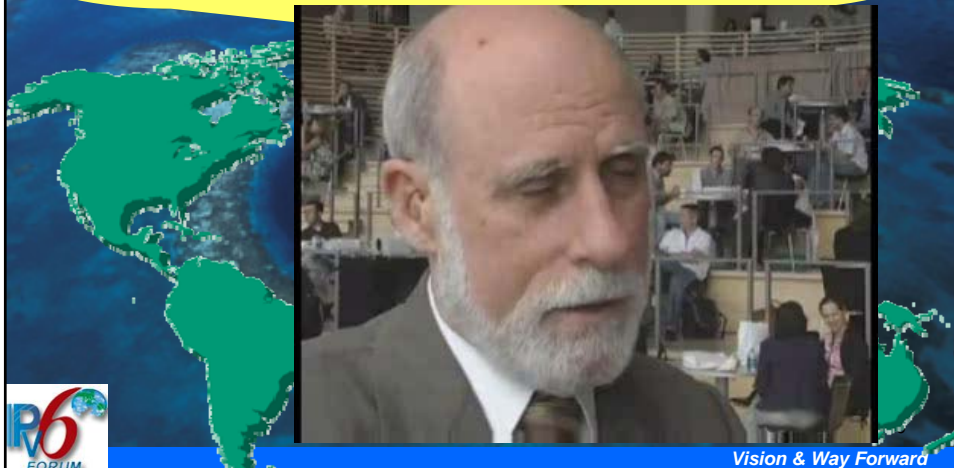


Killer Apps



”The Myth of the IPv6 Killer App”

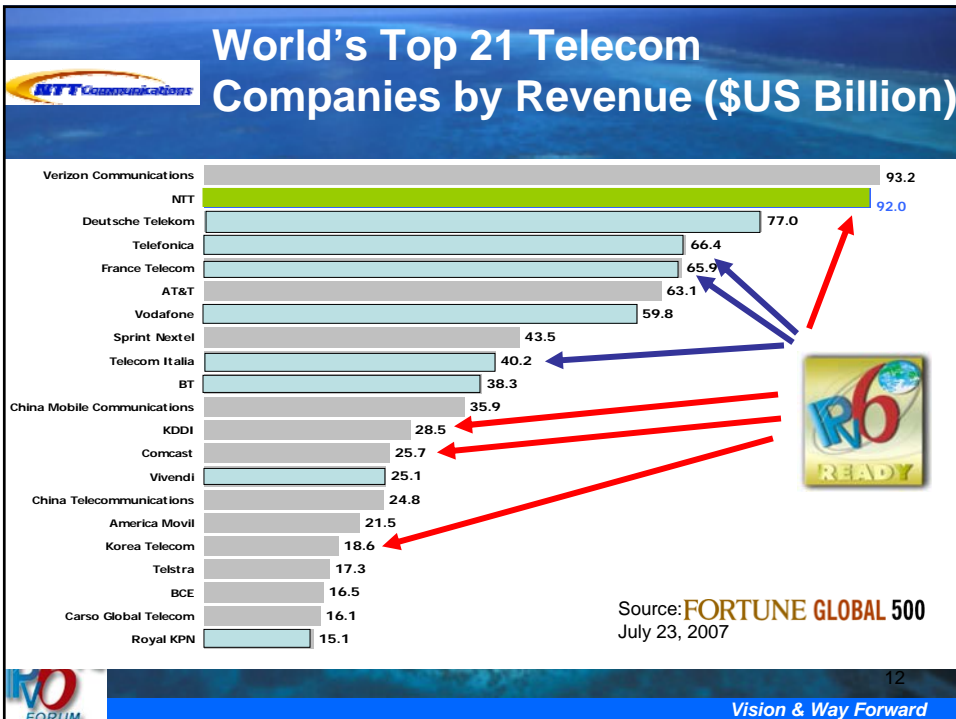
Vint Cerf 2008



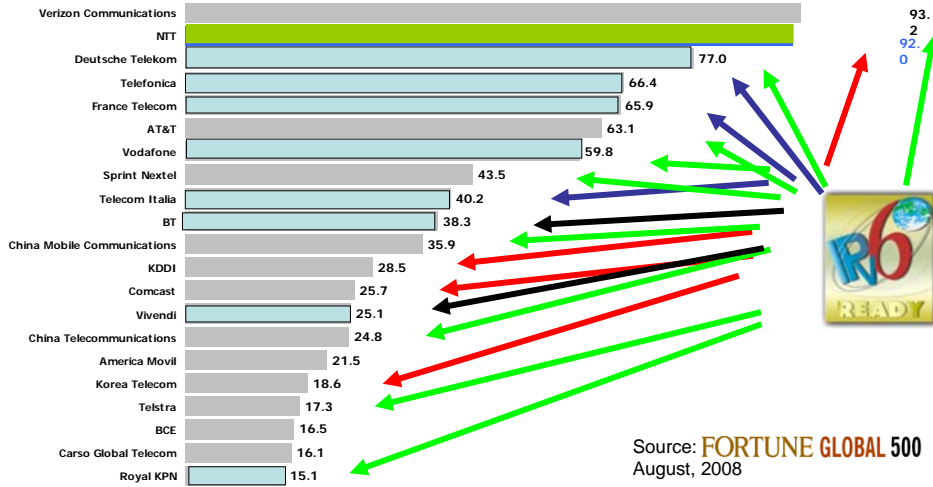
Vision & Way Forward



Bob Hinden – Co-Chair IETF IPv6 Task Force



World's Top 21 Telecom Companies by Revenue (\$US Billion)



Source: FORTUNE GLOBAL 500 August, 2008



NTT Business Case

NTT's History and IPv6

NTT Communications IPv6 Service History

1986 NTT Labs defines one of the world's largest IPv6 research networks	1992 NTT begins IPv6 activities in U.S.	1996 NTT begins IPv6 activities in Japan	1998 NTT begins IPv6 activities in U.S. & Europe	2000 NTT begins IPv6 activities in U.S. & Europe	2001 NTT begins IPv6 activities in U.S. & Europe	2002 NTT begins IPv6 activities in U.S. & Europe	2003 NTT begins IPv6 activities in U.S. & Europe
2004 NTT Communications launches IPv6 services in U.S. & Europe	2005 NTT Communications launches IPv6 services in U.S. & Europe	2006 NTT Communications launches IPv6 services in U.S. & Europe	2007 NTT Communications launches IPv6 services in U.S. & Europe	2008 NTT Communications launches IPv6 services in U.S. & Europe	2009 NTT Communications launches IPv6 services in U.S. & Europe	2010 NTT Communications launches IPv6 services in U.S. & Europe	2011 NTT Communications launches IPv6 services in U.S. & Europe

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Vision & Way Forward

Obstacles Facing MNO Deployment



- 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



Vodafone Group R&D.de Current State of IPv6



- Primary Motivation is to enable ALL-IP Mobile Networks





Address Space

- ▶ Make basic services accessible for every internet user.
- ▶ Increase the number of available addresses.
- ▶ Roll it out! (critical mass)



Security

- ▶ Infrastructure security is relevant for IPv6 (routing & name-resolution).
- ▶ Other security aspects should be handled on application layer.
- ▶ Again: Roll them out!



Quality of Service

- ▶ For the vast majority of applications simple overprovisioning or multi-homing is enough.
- ▶ Postpone investments!



Direct Connectivity

- ▶ IPv4 address space work-arounds often not perceived as limiting because they offer a degree of security as well.
- ▶ Leverage the Internet of Things as key driver!



Address Space

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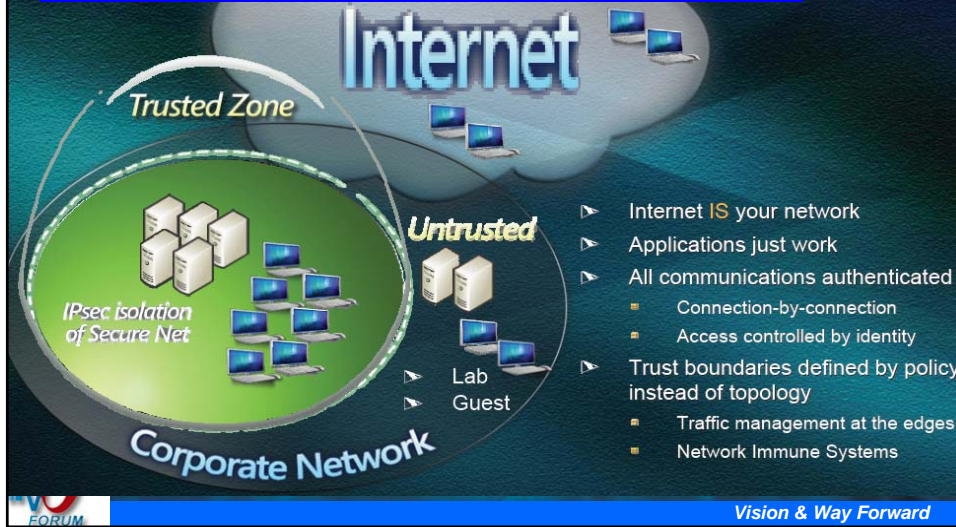


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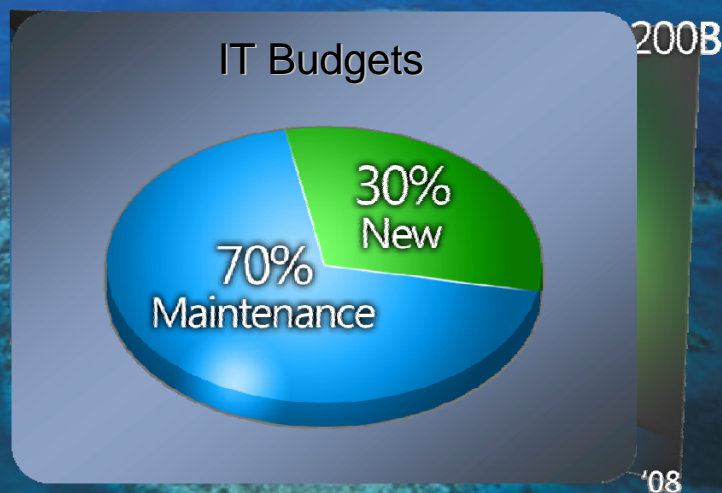
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AUTONOMY NETWORKING



IT Complexity & Cost





"The Roll-Out Plan Fred Baker quoting John Curran"

Fred Baker Sep 2008



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



The Internet Bail-Out



