

IPv6



THE WAY FORWARD



IPv6 Forum Magyar / Hungarian IPv6 Forum



IPv6 INTERNET



Vision & Way Forward

Internet World Stats

Usage and Population Statistics


[New Facebook Statistics](#)

<u>EUROPE</u>	Population (2011 Est.)	Internet Users, 31-Dec-11	Penetration (% Population)	Users % in Europe	Facebook 31-Mar-12
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Hungary 9,976,062 **6,516,627** 65.3 % 1.3 % 3,751,300

THE BIG SHOW IS IN ASIA

March 31, 2011

World Regions	Population (2011 Est.)	Internet Users Dec. 31, 2000	Internet Users Latest Data	Penetration (% Population)	Growth 2000-2011	Users % of Table
<u>Africa</u>	1,037,524,058	4,514,400	118,609,620	11.4 %	2,527.4 %	5.7 %
<u>Asia</u> 	3,879,740,877	114,304,000	922,329,554	23.8 %	706.9 %	44.0 %
<u>Europe</u>	816,426,346	105,096,093	476,213,935	58.3 %	353.1 %	22.7 %
<u>Middle East</u>	216,258,843	3,284,800	68,553,666	31.7 %	1,987.0 %	3.3 %
<u>North America</u>	347,394,870	108,096,800	272,066,000	78.3 %	151.7 %	13.0 %
<u>Latin America / Carib.</u>	597,283,165	18,068,919	215,939,400	36.2 %	1,037.4 %	10.3 %
<u>Oceania / Australia</u>	35,426,995	7,620,480	21,293,830	60.1 %	179.4 %	1.0 %
WORLD TOTAL	6,930,055,154	360,985,492	2,095,006,005	30.2 %	480.4 %	100.0 %

48

[Hungary](#)

11,833,000

10,020,000

118.3



WIKIPEDIA
The Free Encyclopedia

List of countries by number of mobile phones in use

From Wikipedia, the free encyclopedia

Rank	Country or region	Number of mobile phones	Population	% of population	Last updated
—	World	5,000,000,001	6,901,400,000	72.6	2010 ^[7]
1	China	WOW 853,400,000	1,342,470,000	62.8	Jan 2011 ^{[2] [3] [4] [5]}
2	India	752,190,678	1,194,390,000	63.22	Dec. 2010 ^[6]
3	United States	292,847,098	310,866,000	91.0	June, 2010 ^{[7] [8]}
4	Russia	213,900,000	141,914,509	147.3	Jun 2010 ^{[9] [10]}
5	Brazil	205,100,000	190,732,694	107.53	Jan. 2011 ^[11]
6	Indonesia	168,264,000	237,556,363	73.1	May, 2009 ^[12]
7	Pakistan	101,641,122	171,901,000	60.32	Nov 2010 ^[13]
8	Japan	107,490,000	127,370,000	84.1	Mar. 2009 ^[14]
9	Germany	107,000,000	81,862,342	130.1	2009 ^[15]
10	Mexico	88,797,186	112,322,757	79.8	Sep 2010 ^[16]
11	Italy	88,580,000	60,090,400	147.4	Dec. 2008 ^[17]
12	Philippines	78,000,000	92,226,600	73.6	January 2010 ^[18]
13	Nigeria	76,000,000	158,259,000	50.3	Dec. 2009 ^[19]
14	United Kingdom	75,750,000	61,612,300	122.9	Dec. 2008 ^[20]
15	Turkey	66,000,000	71,517,100	92.2	2009 ^[21]
16	Bangladesh	65,142,000	150,093,000	40.2	Sep. 2010 ^[22]
17	France	58,730,000	65,073,842	90.2	Dec. 2008 ^[23]
18	Thailand	56,170,908	65,001,021	81.0	2009 ^[citation needed]
19	Ukraine	54,377,000	46,143,700	117.9	April, 2009 ^[24]
20	Iran	52,000,000	75,078,000	69.3	2010 ^{[25] [26]}

Mobile Planet!

INTERNET USERS WORLD MAP 2015

The Show is Here!

100 Million People

When Everyone is on the Internet!

INTERNET USERS WORLD MAP 2015

A world map titled "INTERNET USERS WORLD MAP 2015" showing the distribution of internet users by country. The map is color-coded by country, with a circular highlight in a light green color over the Asian continent. The text "The Mobile Internet Show will be Here!" is overlaid in yellow on this highlighted area. The map shows that China and India have the largest number of internet users, followed by the United States and Europe. A legend in the bottom left corner indicates that a square represents 100 million people.

The Mobile Internet Show will be Here!

100 Million People



Top Sites

The top 500 sites on the web.

- 1 Google**
google.com
Enables users to search the world's information, including
★★★★★ Search Analytics ▶ Audience ▶
- 2 Facebook**
facebook.com
A social utility that connects people, to keep up with friends
★★★★★ Search Analytics ▶ Audience ▶
- 3 YouTube - Broadcast yourself**
youtube.com
YouTube is a way to get your videos to the people who matter
★★★★★ Search Analytics ▶ Audience ▶
- 4 Yahoo!**
yahoo.com
A major internet portal and service provider offering search
★★★★★ Search Analytics ▶ Audience ▶
- 5 Baidu.com**
baidu.com
The leading Chinese language search engine, provides "similarity"
★★★★★ Search Analytics ▶ Audience ▶

- 6 Wikipedia**
wikipedia.org
A free encyclopedia built collaboratively using wiki software
★★★★★ Search Analytics ▶ Audience ▶
- 7 Blogger.com**
blogspot.com
Free, automated weblog publishing tool that sends updates
★★★★★ Search Analytics ▶ Audience ▶
- 8 Windows Live**
live.com
Search engine from Microsoft.
★★★★★ Search Analytics ▶ Audience ▶
- 9 Twitter**
twitter.com
Social networking and microblogging service utilising instant
★★★★★ Search Analytics ▶ Audience ▶
- 10 QQ.COM**
qq.com
China's largest and most used Internet service portal owned
★★★★★ Search Analytics ▶ Audience ▶



Top Sites in Hungary

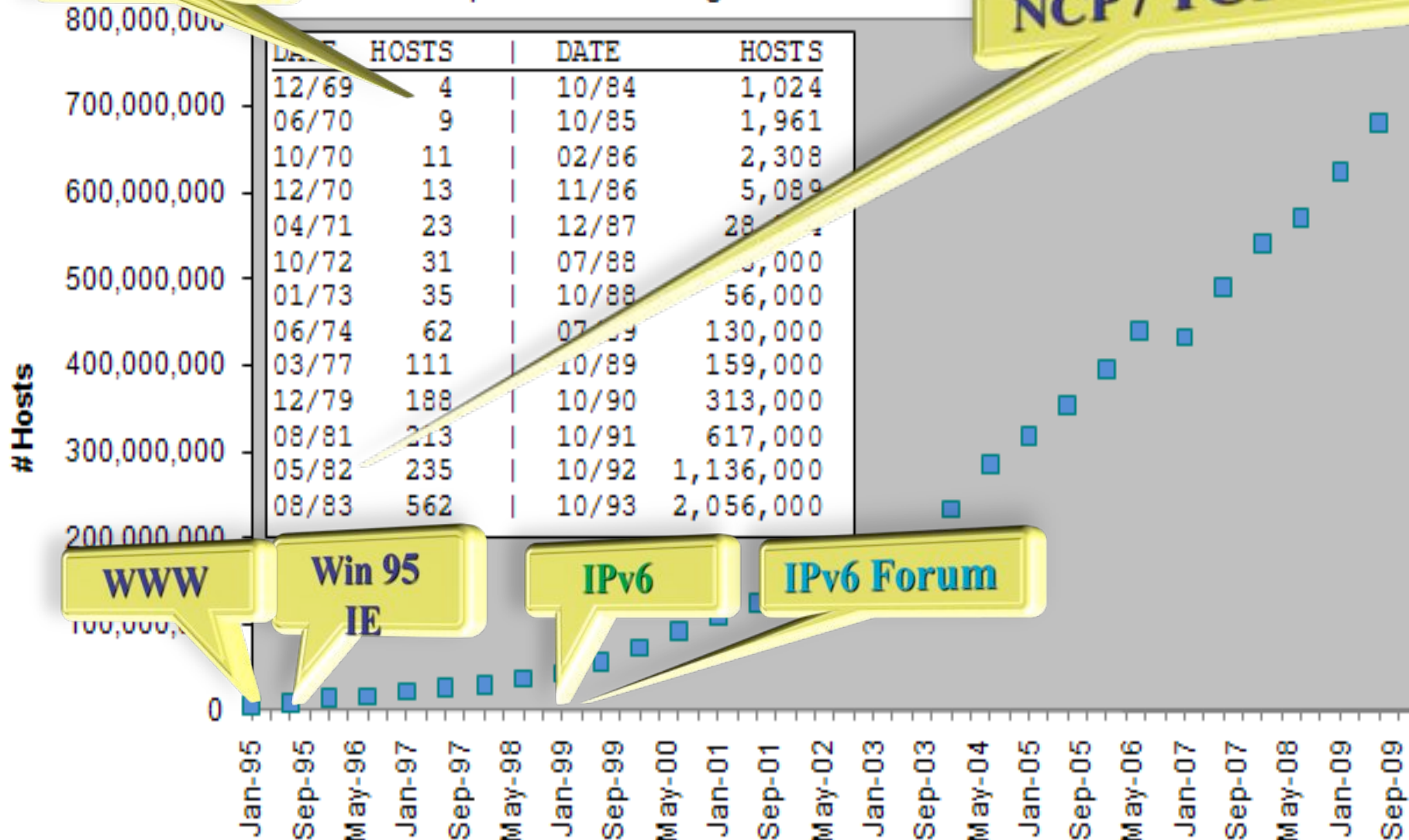
The top 500 sites in Hungary. 

- 1 Google**
google.co.hu
A Google kereső magyar nyelvű felülete. Képek, csoportok, cím
More
★★★★★ Search Analytics ▶ Audience ▶
- 2 Facebook**
facebook.com
A social utility that connects people, to keep up with friends, up
★★★★☆ Search Analytics ▶ Audience ▶
- 3 Google**
google.com
Enables users to search the world's information, including we
More
★★★★☆ Search Analytics ▶ Audience ▶
- 4 YouTube**
youtube.com
YouTube is a way to get your videos to the people who matter t
More
★★★★☆ Search Analytics ▶ Audience ▶
- 5 Index.hu**
index.hu
Internetes napilap változatos témákban.
★★★★☆ Search Analytics ▶ Audience ▶

- 6 blog.hu**
blog.hu
★★★★★ Search Analytics ▶ Audience ▶
- 7 ORIGO**
origo.hu
Internetes napilap
★★★★☆ Search Analytics ▶ Audience ▶
- 8 Wikipedia**
wikipedia.org
A free encyclopedia built collaboratively using wiki software. (Cr
★★★★☆ Search Analytics ▶ Audience ▶
- 9 Origo Freemail**
freemail.hu
Ingyenes levelezés, fizetős kiegészítő szolgáltatásokkal.
★★★★☆ Search Analytics ▶ Audience ▶
- 10 Blogspot.com**
blogspot.com
★★★★★ Search Analytics ▶ Audience ▶

The Internet took a long time to make it!

Hobbes' Internet Timeline Copyright ©2010 Robert H Zakon
<http://www.zakon.org/robert/internet/timeline>



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



RFC801 – NCP / TCP Transition Plan

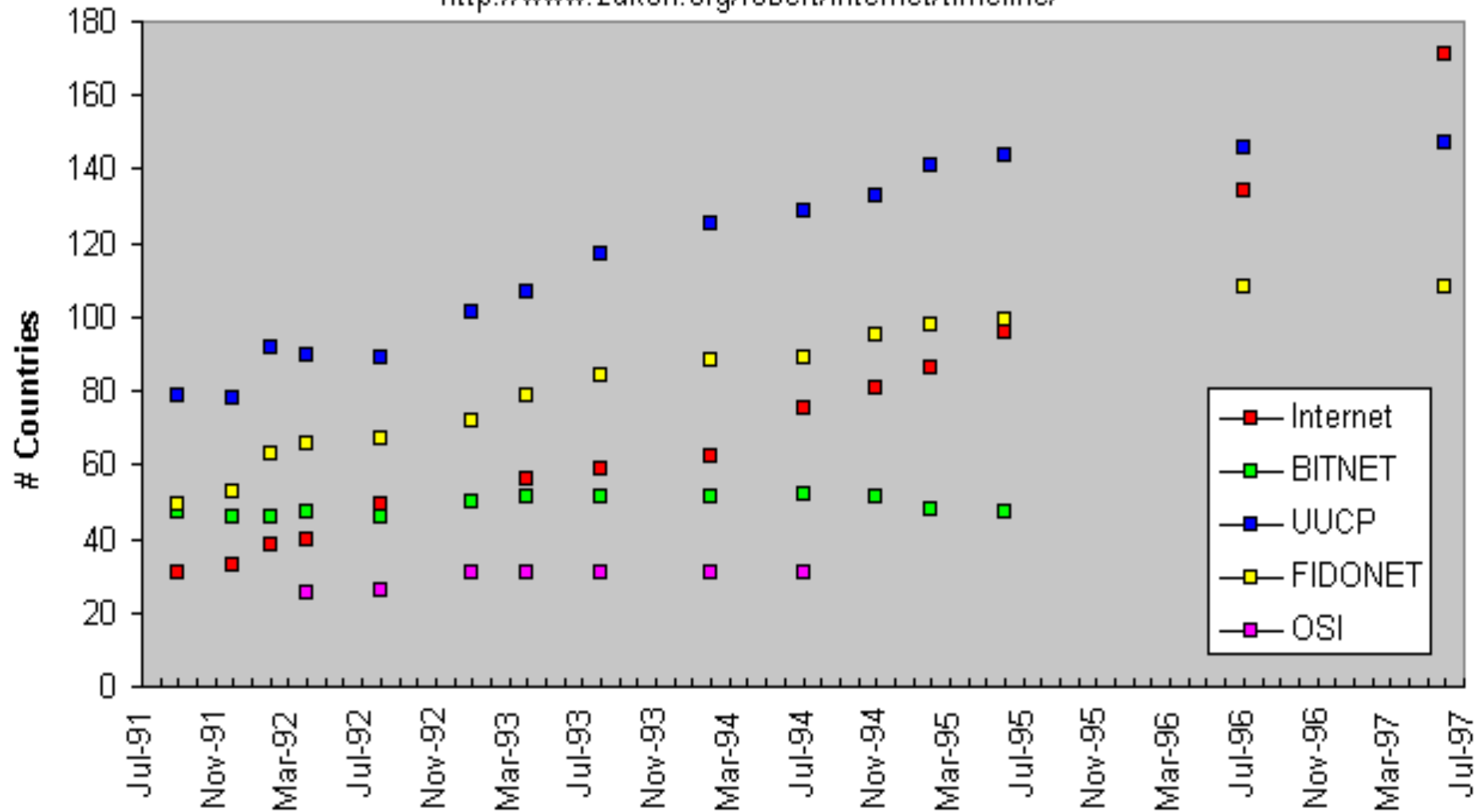
Network Working Group
Request for Comments: 801

J. Postel
ISI
November 1981

Total Hosts	Dual Hosts	NCP Hosts	TCP Hosts	"Load"	Date
200	20	178	2	356	Jan-82
210	40	158	12	1896	Mar-82
220	60	135	25	3375	May-82
225	95	90	40	3600	Jul-82
230	100	85	45	3825	Sep-82
240	125	55	60	3300	Nov-82
245	155	20	70	1400	Dec-82
250	170	0	80	0	31-Dec-82
250	0	0	250	0	1-Jan-83

Internet was Competing against others

Hobbes' Internet Timeline Copyright ©2003 Robert H Zakon
<http://www.zakon.org/robert/internet/timeline/>

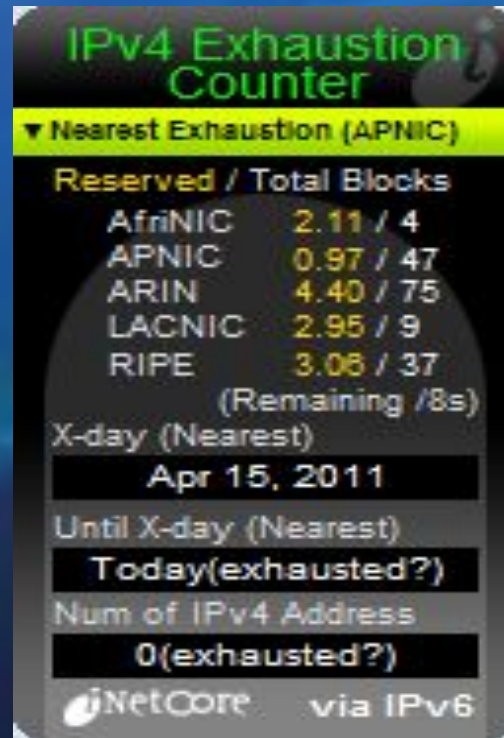


The IPv4 Address Exhausting Debate ☺

Central IANA Pool



Registry Pool



In Blissful Ignorance:
IPv6 Networking is tottaly different
from IPv4 Networking.
It's a whole new world.

Nicolas Fischbach, Director, Network Strategy
and Architecture, Infrastructure Services

Unit COLT



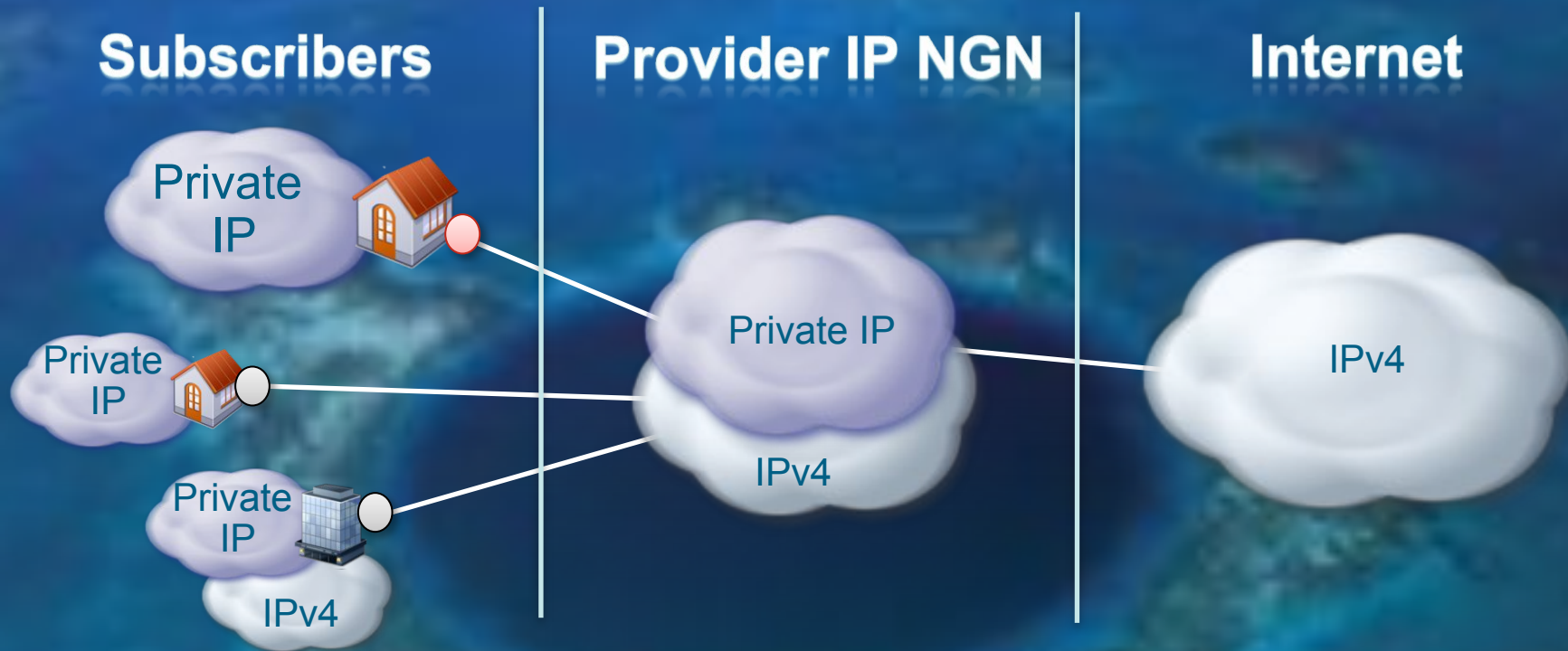
All ISPs will have to take off like this!”

Anonymous 2010

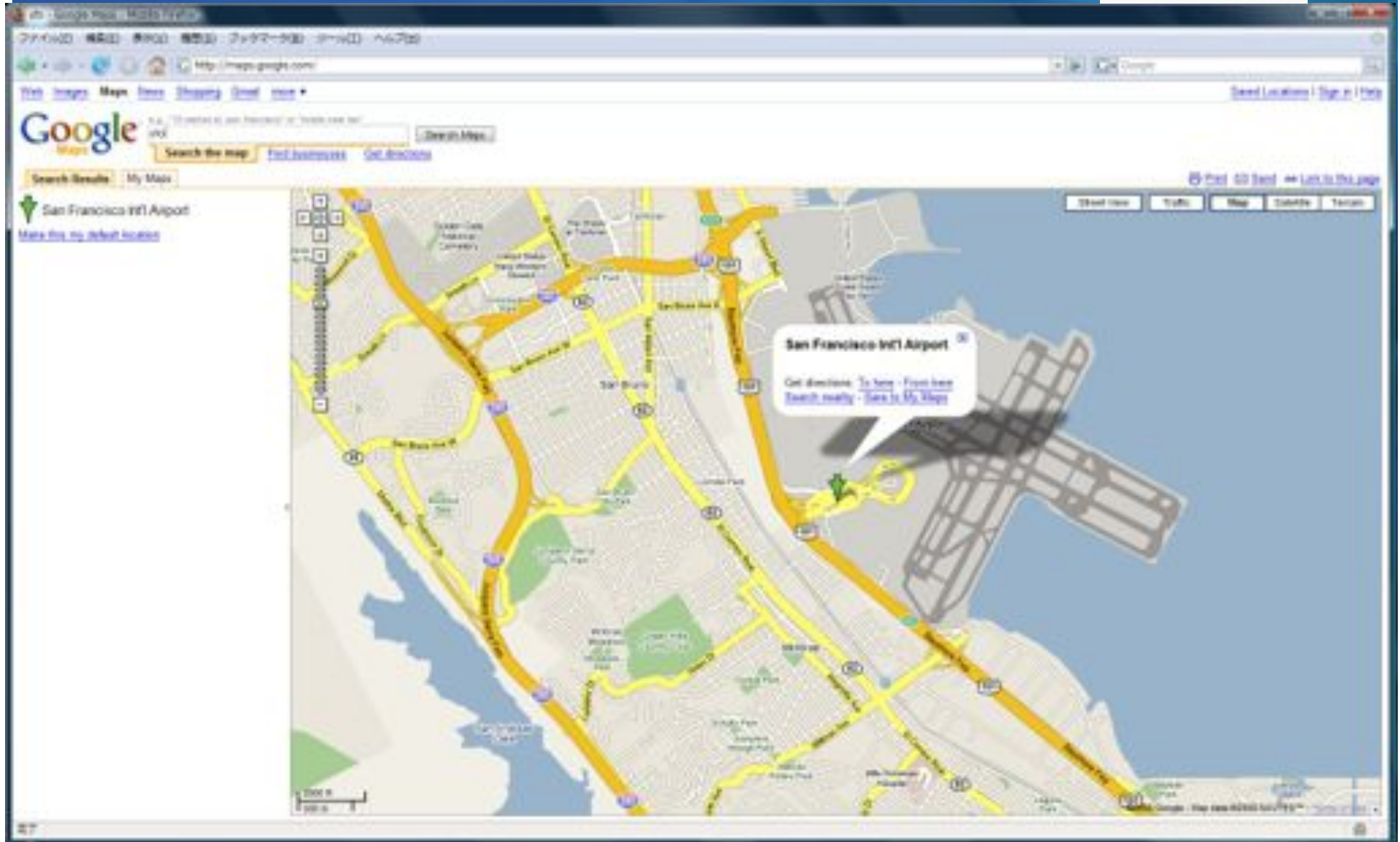


Deal with IPv4 Exhaustion

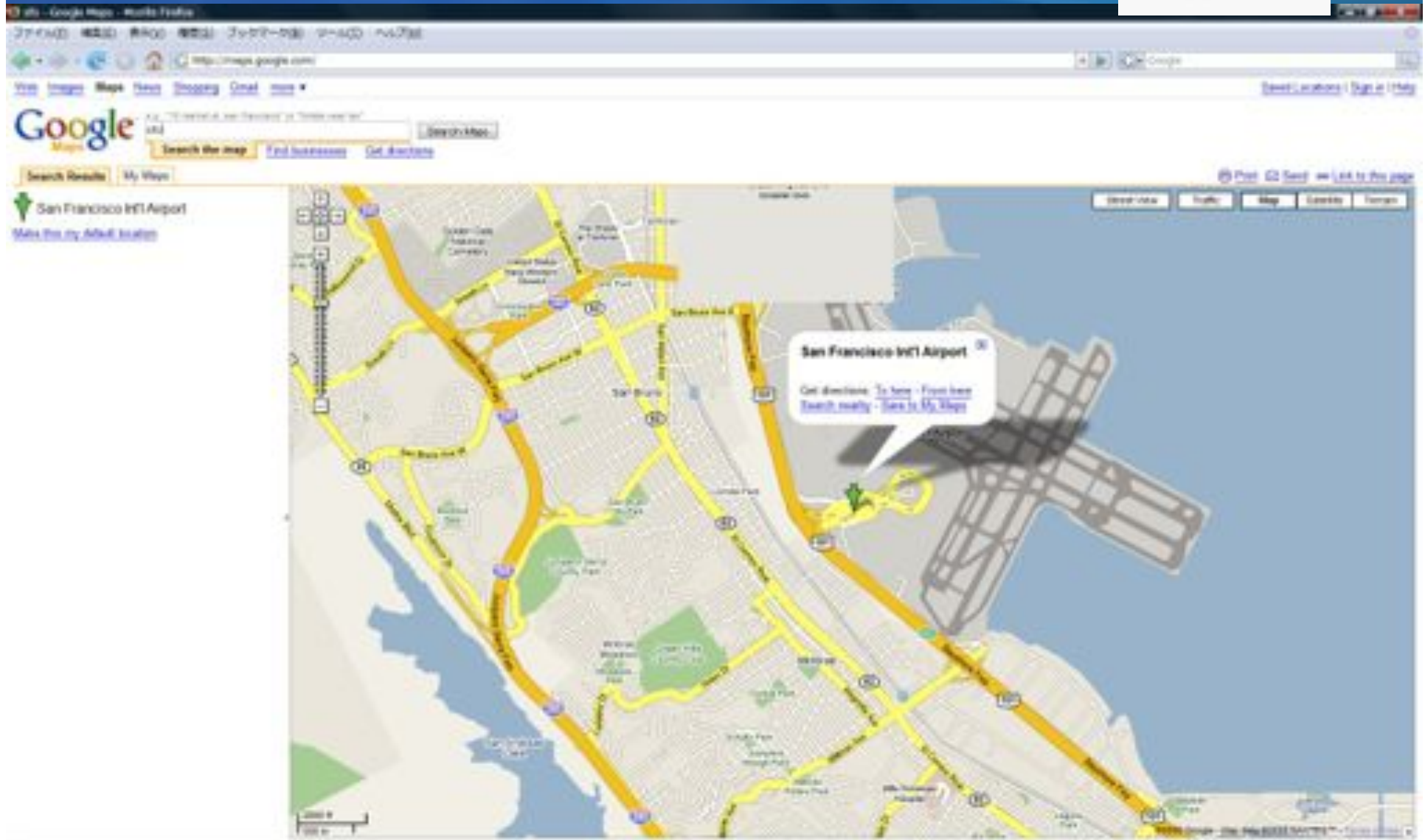
Carrier IPv4 NAT—“NAT444”



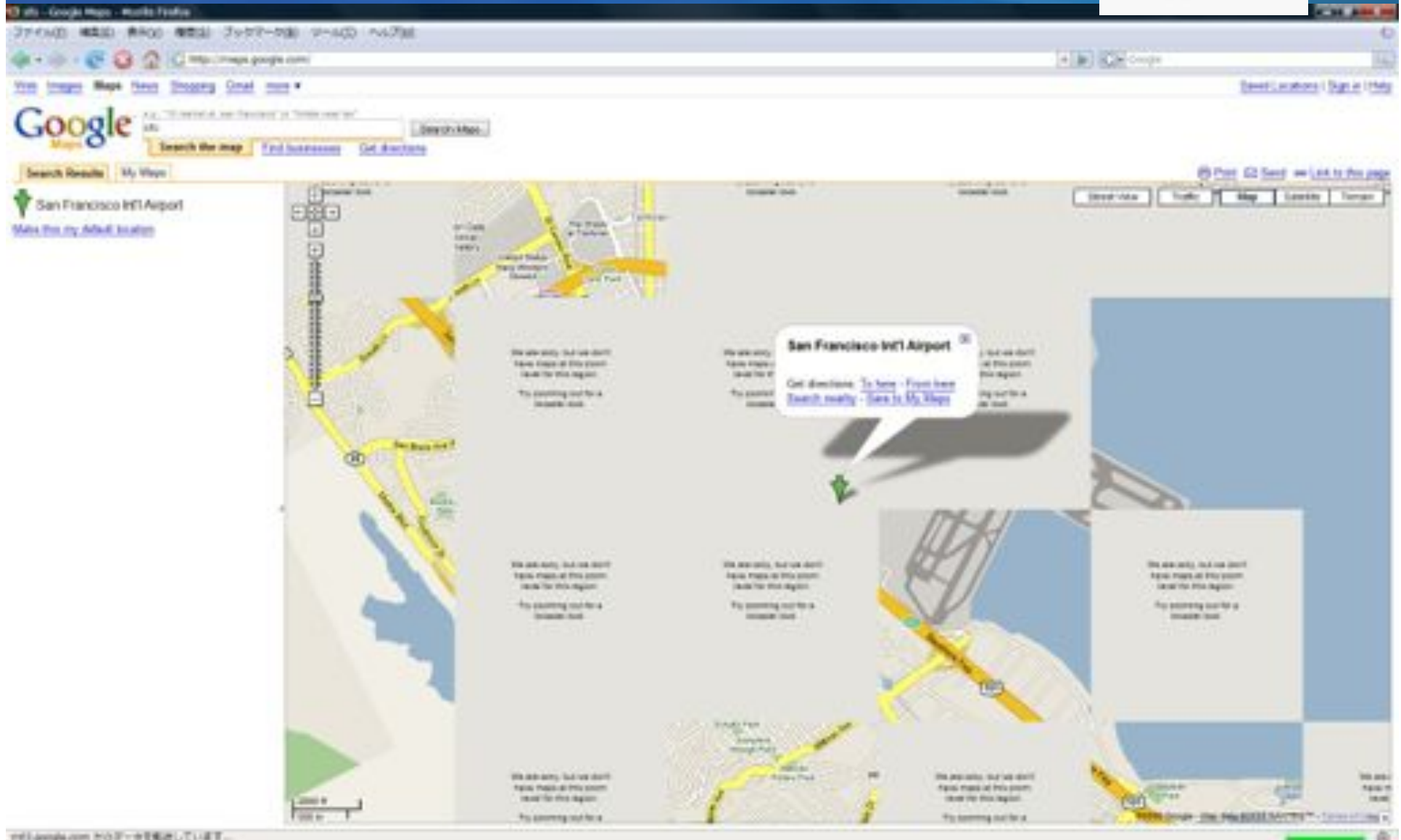
Max 30 Translations



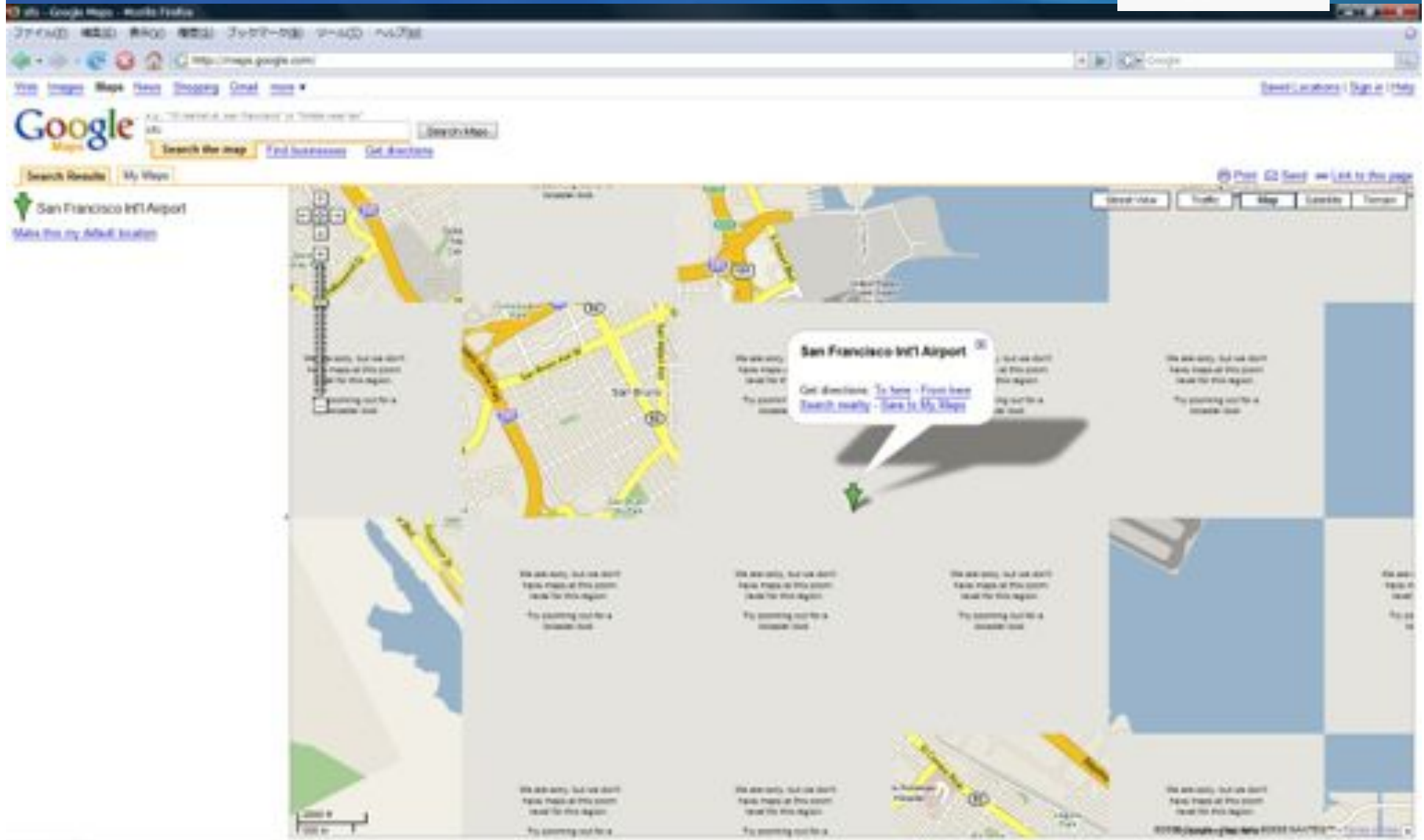
Max 20 Translations



Max 15 Translations



Max 10 Connections



IPv4
500 M



IPv6 Vision
Billions of Nodes

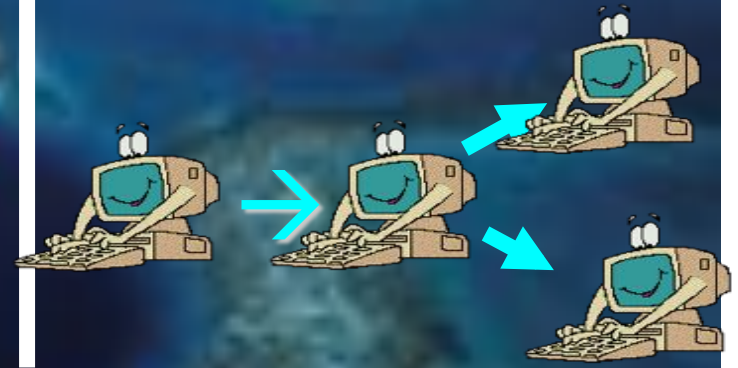
Always-on



Autoconfig



Multicast



IPv6



Always-on
Security
Privacy



Vision & Way Forward

The New Internet The TWO-WAY Internet

End 2 End

Filesharing

Resource Sharing



**Instant
Communication**

Interactive

**Collaborative
Computing**

Wide Open Again for INNOVATION



Vision & Way Forward

Perception: IPv4 is Innovation - IPv6: an Upgrade

Yv4

Yv6

Political Goodwill

Not needed

Needed?



Business Drivers

Innovation

Upgrade



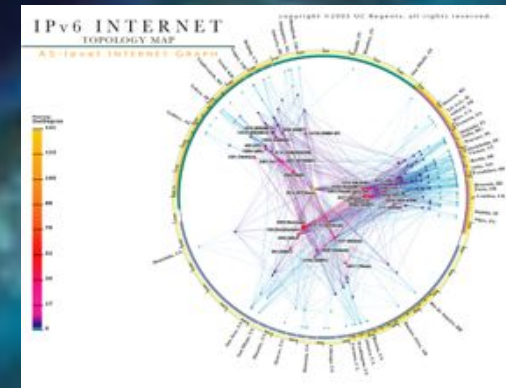
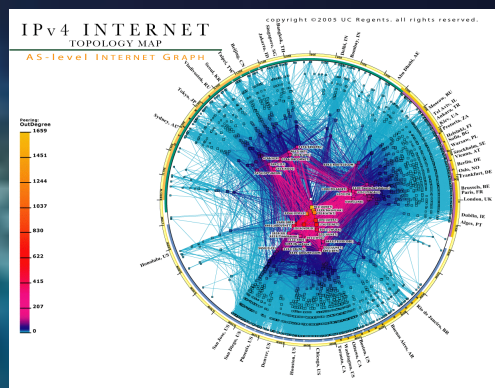
Technology Value

Powerful

Same & More



Infrastructure

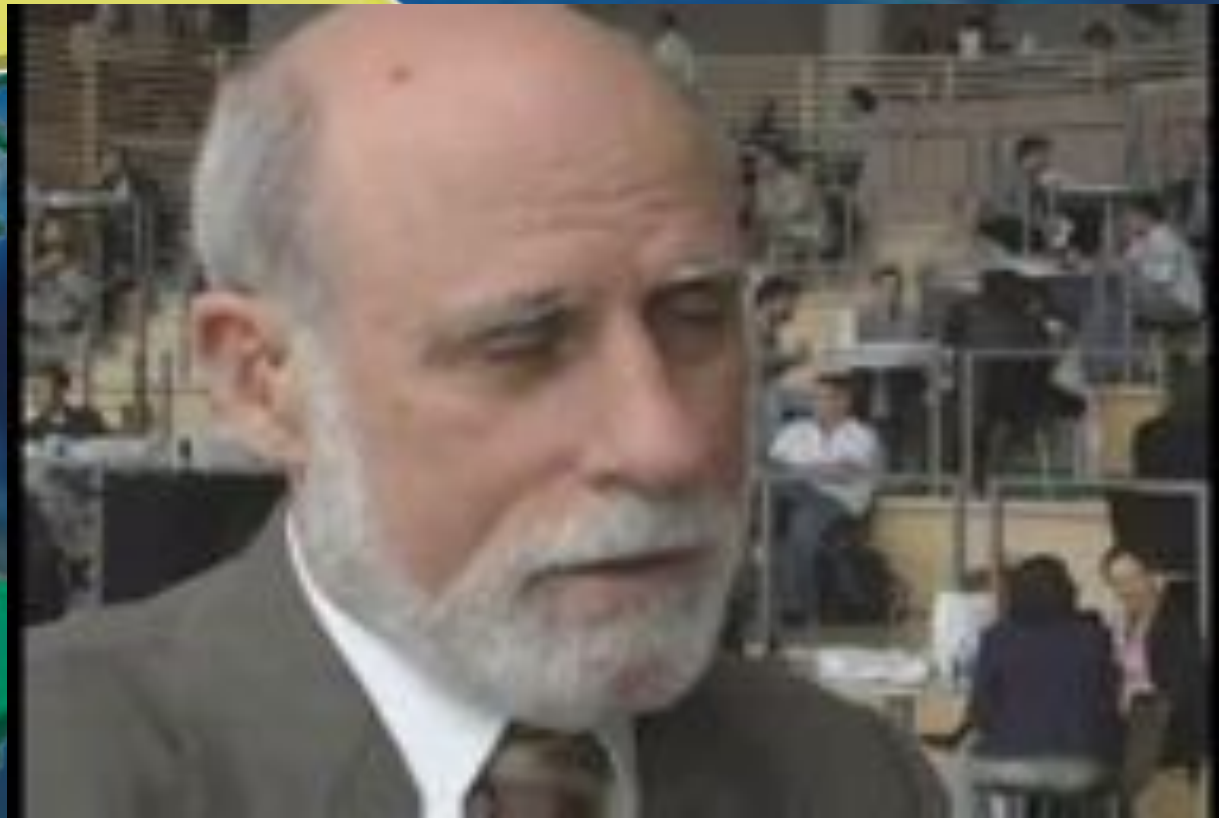


Killer Apps



”The Myth of the IPv6 Killer App”

Vint Cerf 2008



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
<u>Africa</u>	955,206,348	4,514,400	51,065,630	5.3 %	3.5 %	1,031.2 %
<u>Asia</u>	3,949,000,000	114,304,000	578,538,257	15.3 %	39.5 %	406.1 %
<u>Europe</u>	740,000,000	209,000,000	209,000,000	48.1 %	26.3 %	266.0 %
<u>Middle East</u>	319,000,000	84,800,000	84,800,000	21.3 %	2.9 %	1,176.8 %
<u>North America</u>	316,724,800	108,096,800	248,241,969	78.4 %	31.1 %	129.6 %
<u>Latin America/Caribbean</u>	519,000,000	3,919,000	3,919,000	0.8 %	0.1 %	669.3 %
<u>Oceania / Australia</u>	37,620,000	7,620,000	7,620,000	20.3 %	1.1 %	165.1 %
WORLD TOTAL	6,676,120,288	360,985,492	1,111,111,111	16.6 %	100.0 %	305.5 %

First IPv6 Killer App!

IPv4 Achieved the Critical Mass
 IPv6 Can Drive Growth & Continuity!

IPv4: Fragmented Economy & Society



IPv4

Information Society

Some Competitiveness

Some e-Government

transportation

Society

Commerce

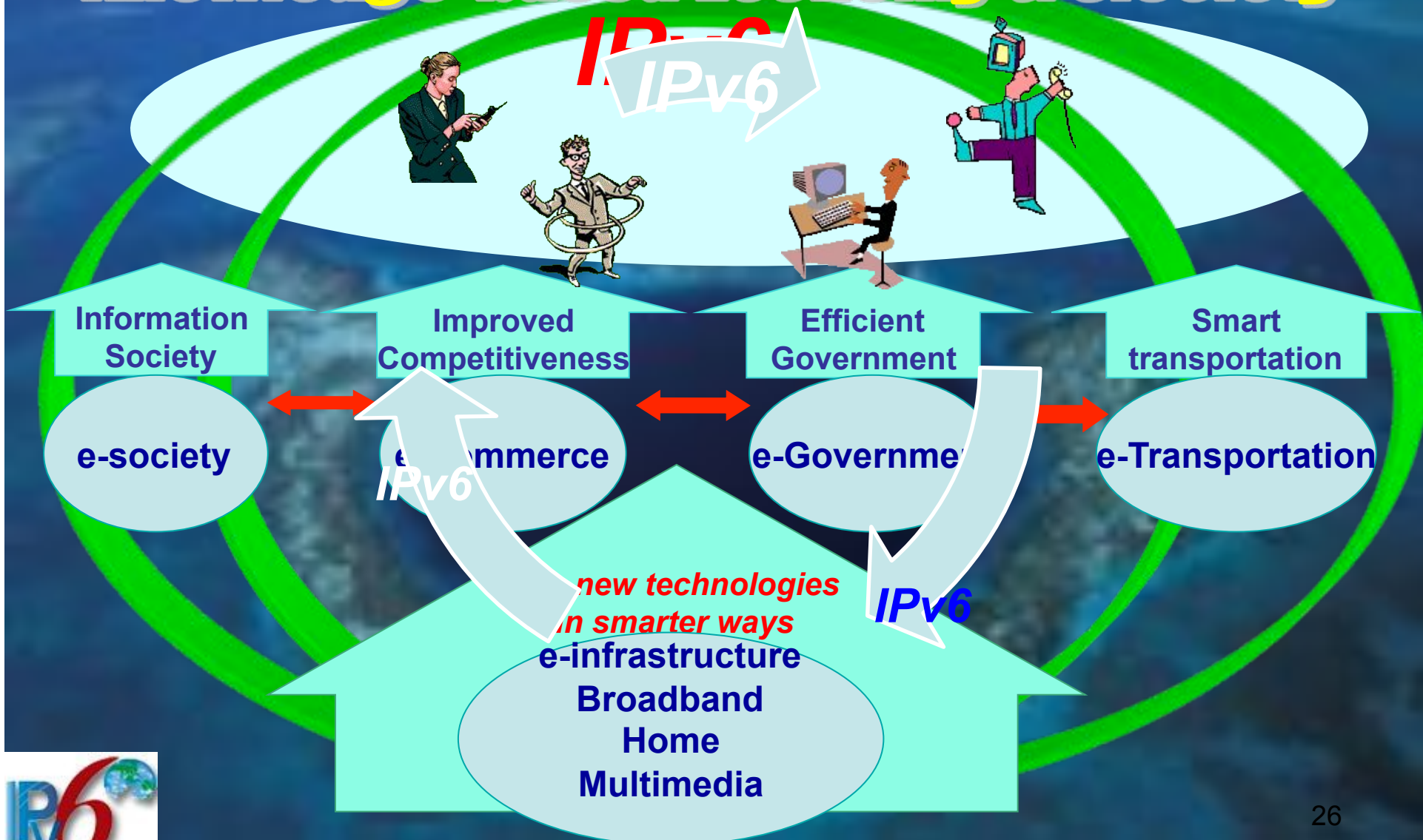
Government

Transportation

*Legacy Technologies
Not agile for many ways*

Infrastructure
Narrowband
Dial-up Home
Poor Media

IPv6: For Most Advanced Knowledge-based Economy & Society



The Next Big Internet

Smart GRID

Internet of Things

Billions of
Smart Devices
- Vehicles
- Buildings

Trillions of
- RFIDs
- Sensors

5 Billions
- Mobile Phones
- PDAs

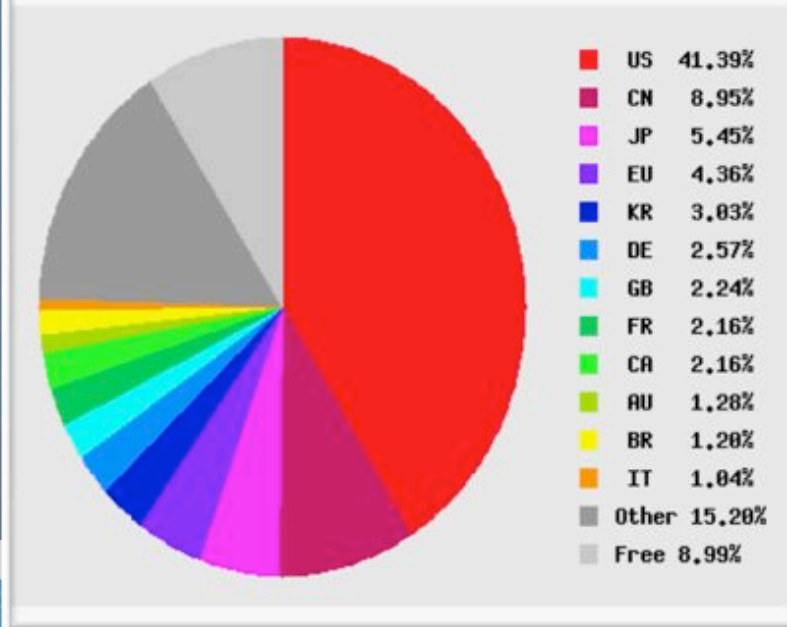
650 M
Nodes

Cloud Computing

China has 332 M IPv4 addresses, with 0.26 IP addresses per citizen

Total number of IPv4 addresses:

2 ³² :	4294967296	4294.97 million
Class D+E:	536870912 -	536.87 million -
Nets 0 and 127:	33554432 -	33.55 million -
RFC 1918:	17891328 -	17.89 million -
	-----	-----
Usable:	3706650624	3706.65 million























IPv4 addresses per country:

Country	Country code	Addresses	Per capita
United States	US	1534.03 million	5.51
China	CN	331.63 million	0.26
Japan	JP	202.08 million	1.59
Europe, country unspecified	EU	161.49 million	
South Korea	KR	112.21 million	2.40
Germany	DE	95.34 million	1.16
United Kingdom	GB	82.90 million	1.39
France	FR	80.09 million	1.35
Canada	CA	79.97 million	2.57
Australia	AU	47.55 million	2.52
Brazil	BR	44.43 million	0.26
Italy	IT	38.38 million	0.67
Russian Federation	RU	36.03 million	0.25
Taiwan	TW	35.38 million	1.59
India	IN	34.65 million	0.03
Spain	ES	25.26 million	0.64
Netherlands	NL	24.98 million	1.57
Mexico	MX	23.46 million	0.24
Sweden	SE	22.90 million	2.58
South Africa	ZA	20.31 million	0.50
Poland	PL	17.72 million	0.46
Indonesia	ID	17.32 million	0.08
Vietnam	VN	15.51 million	0.19
Turkey	TR	13.07 million	0.20
Argentina	AR	12.30 million	0.33
Denmark	DK	11.23 million	2.11
Switzerland	CH	10.75 million	1.50
Norway	NO	10.34 million	2.31

World of IPv6 Prefixes

IPv6 DFP's per country

Total number of countries: 175

Pos	Flag	Country	V	A	VP
1		United States	1001	2442	8.76%
2		Brazil	140	757	1.22%
3		Germany	399	634	3.49%
4		United Kingdom (Great Britain)	250	512	2.19%
5		Australia	134	472	1.17%
6		Russia	201	409	1.76%
7		Netherlands, The	239	401	2.09%
8		Japan	165	350	1.44%
9		France	157	296	1.37%
10		Sweden	136	237	1.19%
11		Canada	112	232	0.98%
12		Switzerland	131	210	1.15%
13		Italy	91	189	0.80%
14		Indonesia	72	184	0.63%
15		China	30	180	0.26%
16		Poland	116	180	1.01%
17		Czech Republic	129	179	1.13%
18		Austria	118	165	1.03%
19		India	28	158	0.24%
20		New Zealand	44	147	0.38%

5026 visible
from 11432 (43.96%)

Prefix Length distribution

The following prefixlengths are delegated by the above RIR's.

























- 1x /13
- 2x /19
- 7x /20
- 4x /21
- 8x /22
- 3x /23
- 12x /24, 13x returned, 45x reclaimed
- 4x /25
- 10x /26
- 14x /27
- 29x /28, 14x returned, 42x reclaimed
- 20x /29, 1x returned
- 26x /30, 2x returned
- 31x /31, 1x returned
- 7526x /32, 185x returned, 22x reclaimed

USG



/26 German Gov

European IPv6 Prefixes

Pos	Flag	Country	V	A	VP
1		Germany	399	627	8.08%
2		United Kingdom (Great Britain)	250	505	5.06%
3		Russia	201	408	4.07%
4		Netherlands, The	239	393	4.84%
5		France	157	291	3.18%
6		Sweden	136	234	2.75%
7		Switzerland	131	204	2.65%
8		Italy	91	182	1.84%
9		Czech Republic	129	179	2.61%
10		Poland	116	174	2.35%
11		Austria	118	164	2.39%
12		Spain	58	144	1.17%
13		Norway	96	139	1.94%
14		Denmark	63	102	1.28%
15		Ukraine	56	97	1.13%
16		Belgium	45	86	0.91%
17		Finland	53	84	1.07%
18		Slovenia	47	70	0.95%
19		Ireland	40	62	0.81%
20		Romania	25	53	0.51%
21		Iran	16	51	0.32%
22		Turkey	17	50	0.34%
23		Hungary	22	46	0.45%
24		Slovakia	24	45	0.49%



Hungarian IPv6 Prefixes

22 visible
from 46

tld	NetName	Owner
🇭🇺	srinet6	Synergon System Integrato...
🇭🇺	HU-HUNGARNET-2001071...	HungarNet
🇭🇺	BIX-20050905	Council of Hungarian Inte...
🇭🇺	HU-JASMIN-20080926	Jasmin Media Group zRt.
🇭🇺	HU-PANTEL-20040317	PanTel Telecommunications...
🇭🇺	HU-HTC-20050420	Hungarian Telecom MATAV
🇭🇺	HU-IPPARK-20090707	IP-Park Kft.
🇭🇺	HU-DATANET-20090709	GTS - DataNet Telecommuni...
🇭🇺	HU-WESTEL900-2009071...	T-Mobile Hungary Telecomm...
🇭🇺	HU-BUSINESSTEL-20091...	Business Telecom Kft.
🇭🇺	HU-AZONNAL-20091105	Azonnal Kft.
🇭🇺	HU-SZABINET-20091130	UPC Magyarország Kft.
🇭🇺	HU-PANNON-20091215	Pannon GSM Telecommunicat...

🇭🇺	HU-SZNET-20110221	Szervernet Ltd
🇭🇺	HU-COVYSOFT-20060927	CovySoft Networks Co.
🇭🇺	HU-ATW-20061219	ATW Internet Kft.
🇭🇺	HU-HDSNET-20070518	Egyesult Magyar Kabeltele...
🇭🇺	HU-TARR-20071108	Tarr Kft.
🇭🇺	HU-NETFONEKFT-201106...	Netfone Kft
🇭🇺	HU-ZALASZAM-20110302	Zalaszam informatika Ltd
🇭🇺	HU-QUERTYNET-2011062...	QwertyNet
🇭🇺	Hu-FIBERNET-20110201	FiberNet Communication Co...
🇭🇺	HU-SATELIT-20110629	Satelit Hivadastechnikai ...
🇭🇺	HU-DRAVANET-PECS-201...	Dravanet Co Ltd.
🇭🇺	HU-EXTERNET-20080626	Externet Kft.
🇭🇺	HU-DENINET-20080901	Deninet KFT
🇭🇺	HU-INTERWARE-2008090...	InterWare Ltd.
🇭🇺	HU-HOFF-20080910	HostOffice Informatikai S...
🇭🇺	HU-PRTELECOM-2008121...	PR-TELECOM Rt.
🇭🇺	HU-AHOL-20090217	HunNet Kft
🇭🇺	HU-INFOTECHNA-201011...	Infotechna Ltd.
🇭🇺	HU-UUNET-20101024	Verizon Hungary, Internet...
🇭🇺	HU-HPC-MVM-20110824	Hungarian Power Companies...
🇭🇺	HU-IRISZ-20110411	-ANTENNA HUNGARIA- Magyar...



Top Level Domains (TLDs): 310

TLDs with IPv6 nameservers: 263
Percentage of TLDs with IPv6 nameservers: 84.8%

Registered domains with AAAA records

TLD	domains	A	AAAA
com	97380383	87121458	833633
net	14157721	12127192	177930
de	13155766	10957508	2094271
org	9457050	8302025	110558
info	8134949	6770069	111948
biz	2134827	1802618	37274
us	1690338	1471543	5053

total	150303486	131635093	3402387
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2.5%

Source: Hurricane Electric



Networks Running IPv6

- [IPv4 ASes: 39079](#)
- [IPv6 ASes: 4684](#)
- [ASes using only IPv4: 34497](#)
- [ASes using only IPv6: 102](#)
- [ASes using IPv4 and IPv6: 4582](#)
- [ASes using IPv4 or IPv6: 39181](#)
- Percentage of ASes (IPv4 or IPv6) running IPv6: 12.0%

IPv6 Performance

Actually, the reason we looked at IPv6 reverse DNS servers was to get some hosts on both IPv6 and IPv4 s

- [IPv6 rDNS Nameservers where IPv6 is faster than IPv4 \(by more than 1ms\): 1099](#)
- [IPv6 rDNS Nameservers where IPv4 and IPv6 are the same speed \(within 1ms\): 233](#)
- [IPv6 rDNS Nameservers where IPv4 is faster than IPv6 \(by more than 1ms\): 467](#)
- [IPv6 rDNS nameservers where IPv6 is as fast or faster than IPv4 \(within 1ms\): 1332](#)
- Percentage of IPv6 rDNS Nameservers where IPv6 is as fast or faster than IPv4 (within 1ms): 74.0%

There is now a flurry of IPv6 SIGNALS and Initiatives !



Planning Guide/Roadmap Toward IPv6 Adoption within the U.S. Government

Version 2.0
March 2012

In collaboration with the



Vision & Way Forward

There is now a flurry of IPv6 SIGNALS and Initiatives !



Oct 7, 2011: Organisations must prepare for switch to IPv6, warns Ovum



The Society of Cable Telecommunications Engineers (SCTE) this week formed the IPv6 Deployment Working Group



Starts IPv6 Service in April after upgrading over 100,000 servers in 78 countries

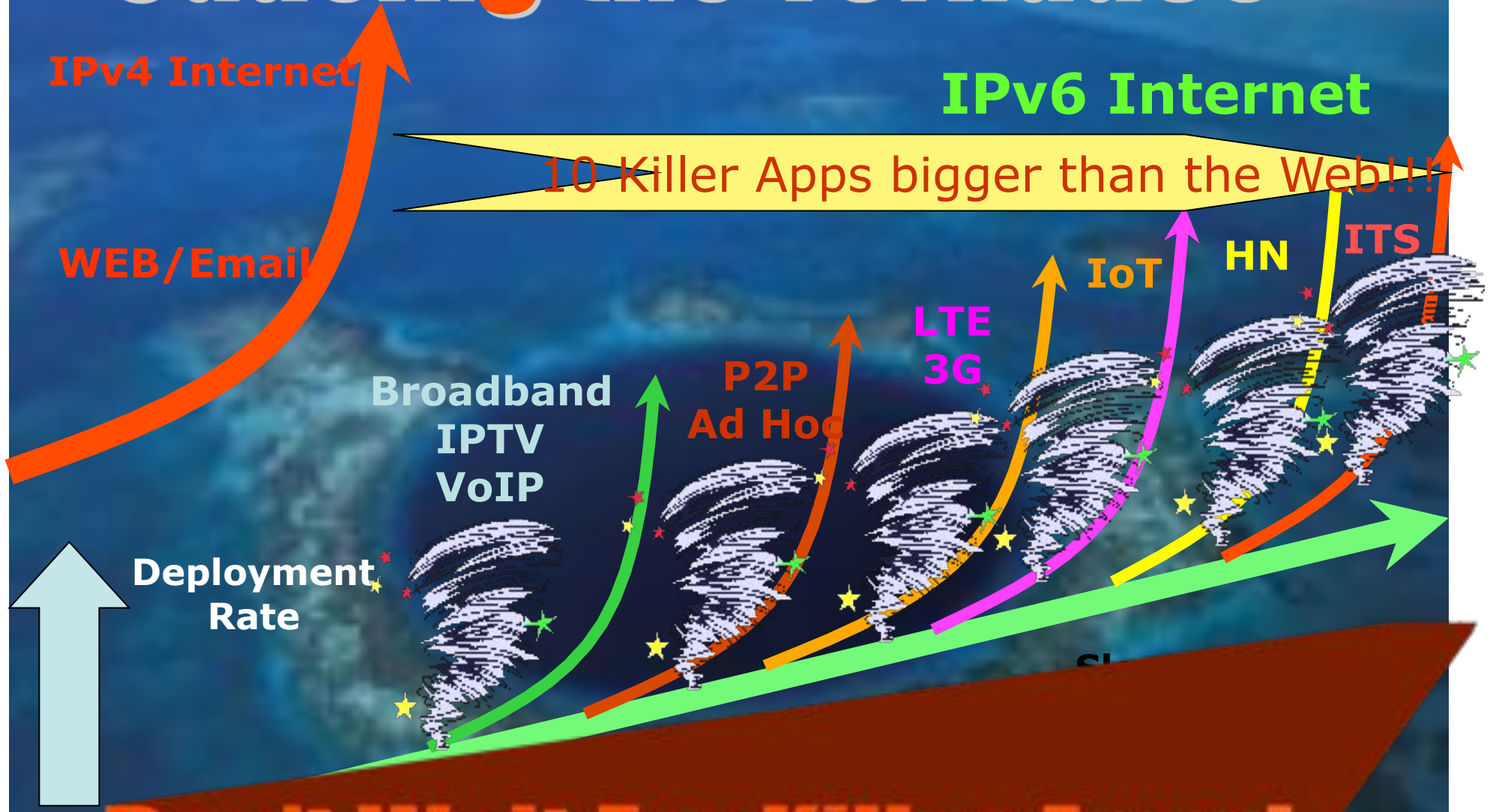




**NAT
SHACKS**

The New Internet Tornadoes

Causing the Tornadoes



**Don't Wait For Killer Apps!
Cause Them To Happen!**

Political Goodwill

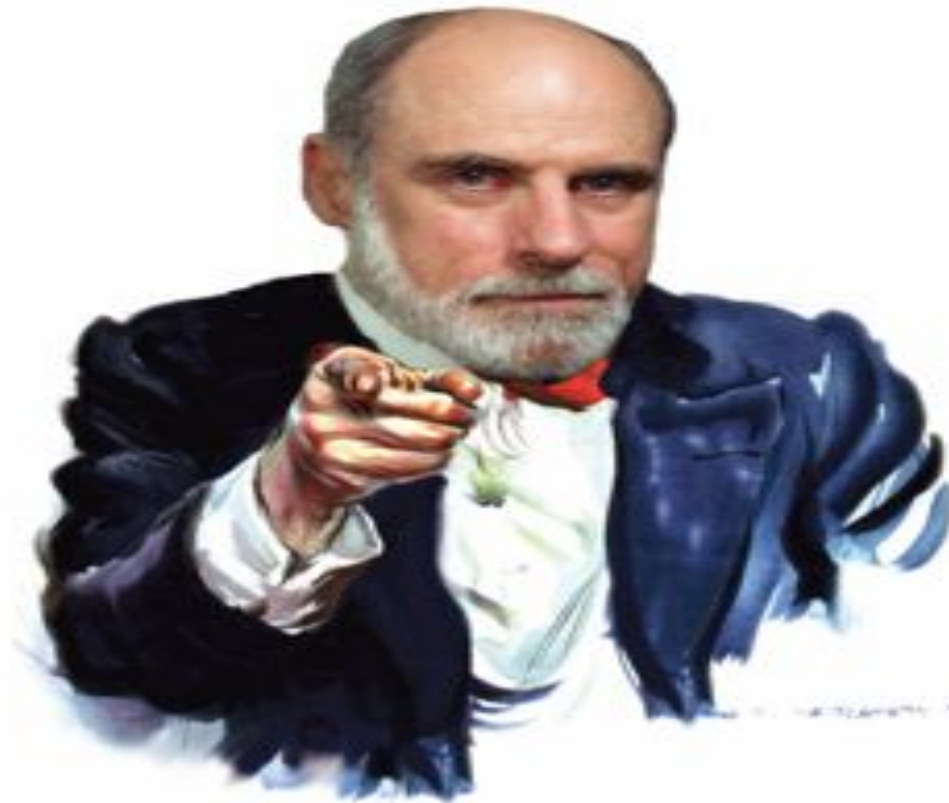


Imre S
Andor
IPv6 Forum
Hungary



February 2012





**I WANT YOU
TO USE IPv6**

— VINT CERF

It's about Job and Wealth Creation!

You **Tube**

<http://www.youtube.com/watch?v=jbkSRLYSojo>

Hans Rosling's 200 Countries, 200 Years, 4 Minutes - The Joy of Stat

BBC

9,776 videos

Subscribe

BBC FOUR

LUXEMBOURG

75 years

50 years

25 years

2009

income

\$400

\$4 000

\$40 000

3:29 / 4:48

360p

FORUM

<http://www.youtube.com/watch?v=jbkSRLYSojo>

Vision & Way Forward