





# The IPv4 Address Exhausting Debate

Central IANA Pool Registry Pool

**IPv4 Exhaustion Counter**

▼ Now

Reserver blocks (IANA)

**0%**

Until X-day (estimation)

**2011**

Num of IPv4 Addresses

**0/256**

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**IPv4 Exhaustion Counter**

▼ Present Status (RIR)

X-day and Reserved Blocks (Remaining /8)

AfriNIC	Oct 18, 2020	2.99
APNIC	Apr 15, 2011	0.85
ARIN	Apr 16, 2014	2.24
LACNIC	Aug 06, 2014	1.78
RIPE NCC	Sep 14, 2012	0.98

NetCore via IPv4

**v4 Exhaustion**

**IPv4 & IPv6 Statistics**

**RIR v4 IPs Left**

AfriNIC	62,548,690
APNIC	14,341,285
ARIN	35,946,161
LACNIC	38,449,693
RIPE	14,886,328

**v6 ASNs**  
16% (7,199/44,626)

**v6 Ready TLDs**  
88% (281/317)

**v6 Glues**  
15,282

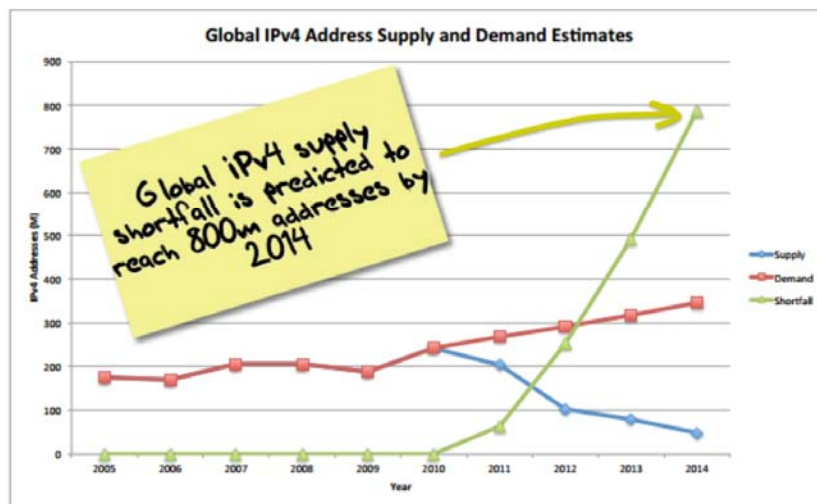
**v6 Domains**  
4,931,943

**0** days remaining  
**IANA exhausted**


HURRICANE ELECTRIC



## Coping with Demand




Source: Geoff Huston, APNIC



**Yv4**

Committed to Connecting the World

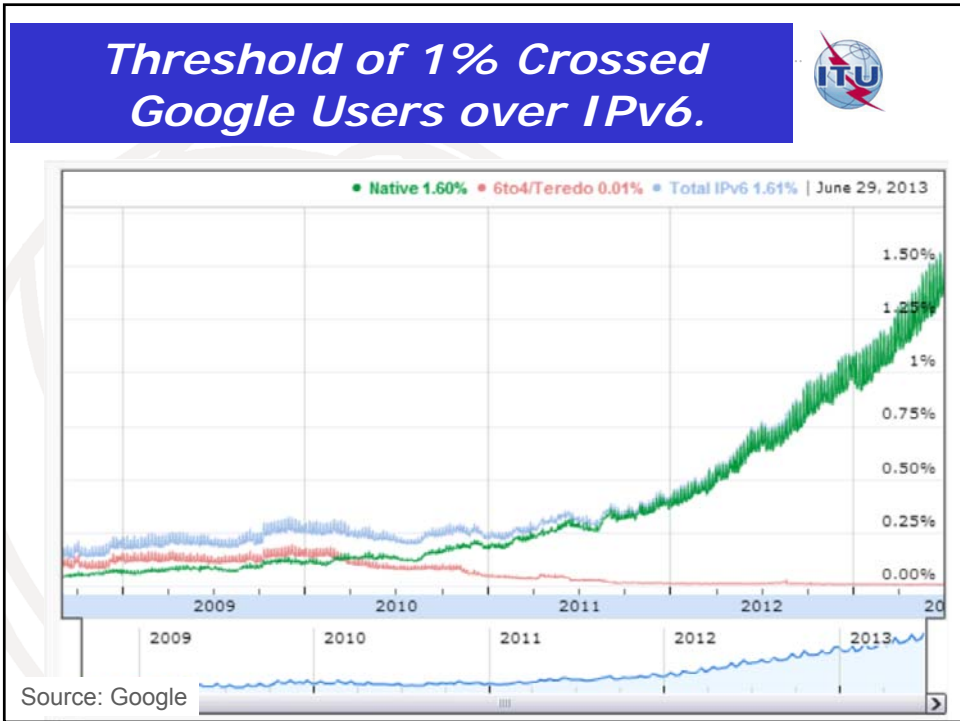


**Yv6**

## WORLD INTERNET STATISTICS

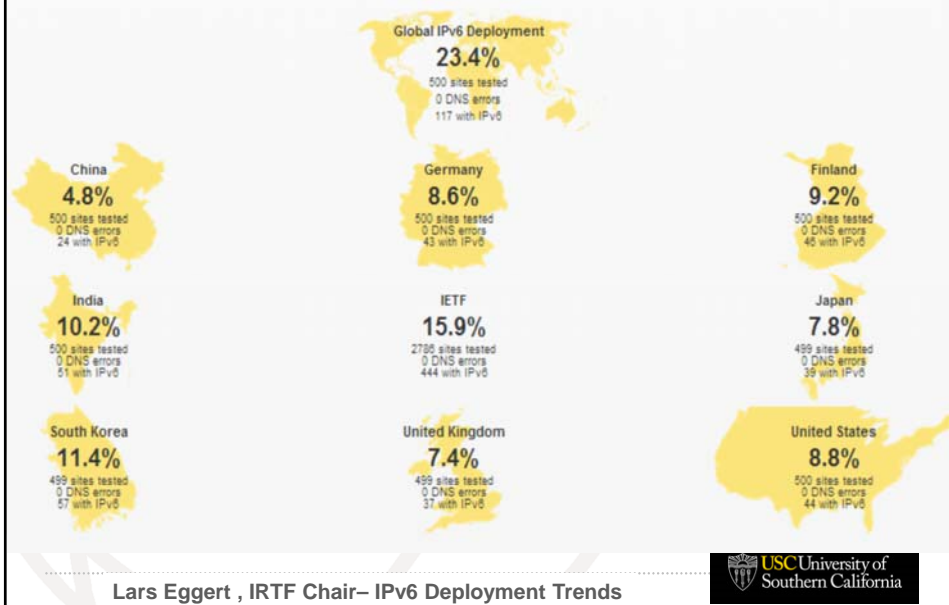
	Individuals using the Internet (in millions)				Per 100 inhabitants			
	2010	2011	2012*	2013*	2010	2011	2012*	2013*
Africa	40	101	120	140	10.1	12.4	14.3	16.3
Arab States	90	123	150	170	29.8	33.7	37.6	
Asia & Pacific	99	1,133	1,269		22.5	28.8	31.9	
CIS	95	100	105	110	40.9	46.4	51.9	
Europe	411	428	443	467	71.2	74.7		
The Americas	458	502	542	582	49.3	57	60.8	

Note: \*Estimates  
Source: ITU World Telecommunication/ICT Indicators database.



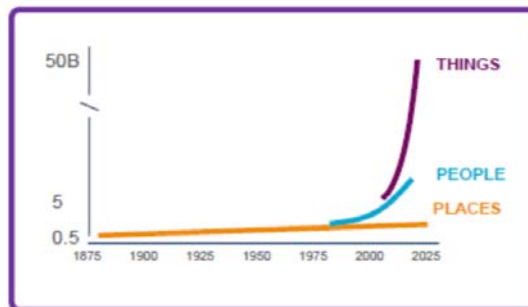
**Key Performance Indicators: 500 Sites Tested**

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**50 BILLION CONNECTED DEVICES**

Committed to Connecting the World



Everything that benefits from being connected will be connected

Source: Ericsson (Hoson AB 2013 | March 2013 | Page 13)

# The Business Case for IPv6

What is the Value at Stake?



## Selected Governments IPv6 Deployment Roadmaps

Governments	IT Policy -- IPv6 Roadmap -- Adoption Year	Milestones 1	Milestones 2
United States	<ul style="list-style-type: none"> <li>IPv6 Strategy -- Year 2009</li> <li>Refreshed -- Year 2012</li> </ul>	<ul style="list-style-type: none"> <li>Public web sites --2012</li> <li>Result: 35% - May 2013</li> </ul>	<ul style="list-style-type: none"> <li>Complete transition to IPv6 (dual stack) by December 2017</li> </ul>
Australia	<ul style="list-style-type: none"> <li>AGIMO IPv6 Strategy -- Year 2008</li> <li>Stage 1: Preparation (2008-2009)</li> <li>Stage 2: Transition (2010 - 2011)</li> <li>Stage 3: Implementation (2012)</li> </ul>	<ul style="list-style-type: none"> <li>Tasks:                             <ul style="list-style-type: none"> <li>Review Procurement Policy.</li> <li>Stocktake of Equipment.</li> <li>Stocktake of Applications.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Government Transition to IPv6:                             <ul style="list-style-type: none"> <li>Stage 2: Transition: Jan 2010 -- Dec 2011</li> <li>Implementation: Jan 2012 -- Dec 2012</li> </ul> </li> </ul>
Canada	<ul style="list-style-type: none"> <li>IPv6 adoption strategy -- Year 2012</li> </ul>	<ul style="list-style-type: none"> <li>Enabling Phase -- Sep 2013</li> <li>Deployment Phase - 2015</li> </ul>	<ul style="list-style-type: none"> <li>Completion Phase -- 201X?</li> </ul>
India	<ul style="list-style-type: none"> <li>IPv6 Policy -- Year 2010</li> <li>Updated -- Year 2013</li> </ul>	<ul style="list-style-type: none"> <li>Public web sites -- 1.1.2015</li> </ul>	<ul style="list-style-type: none"> <li>Complete transition to IPv6 (dual stack) by December 2017</li> </ul>
China	<ul style="list-style-type: none"> <li>CNGI -- Year 2006</li> <li>NDRC -- Year 2012</li> <li>i2010</li> </ul>	<ul style="list-style-type: none"> <li>8M IPv6 users by 2013</li> </ul>	<ul style="list-style-type: none"> <li>25M IPv6 users by 2014-5</li> </ul>
European Commission	<ul style="list-style-type: none"> <li>EU IPv6 Task Force Year 2001</li> <li>IPv6 Communication 2004</li> <li>2008</li> <li>IPv6 Task Force -- Year 2005</li> <li>Phase 1: 2006 Dissemination, Research</li> </ul>	<ul style="list-style-type: none"> <li>25% IPv6 users by 2010</li> <li>Result: 1%</li> </ul>	<ul style="list-style-type: none"> <li>Phase 3: 2008 - Development of Applications and Transition Process</li> </ul>
Indonesia	<ul style="list-style-type: none"> <li>Phase 1: 2006 Dissemination, Research</li> </ul>	<ul style="list-style-type: none"> <li>Phase 2: 2007 Development of infrastructure and Content</li> </ul>	<ul style="list-style-type: none"> <li>Development of Applications and Transition Process</li> </ul>
Korea (Rep. of)	<ul style="list-style-type: none"> <li>IT839 Strategy-- Year 2004</li> </ul>	<ul style="list-style-type: none"> <li>ISP Readiness</li> </ul>	<ul style="list-style-type: none"> <li>IPv6 service</li> </ul>
Japan	<ul style="list-style-type: none"> <li>U-Japan -- Year 2001</li> </ul>	<ul style="list-style-type: none"> <li>ISP readiness</li> </ul>	<ul style="list-style-type: none"> <li>IPv6 service</li> </ul>



## National Regulators IPv6 Deployment Roadmaps

Regulator	IT Policy -- IPv6 Roadmap -- Adoption Year	Milestones	Results
India TRAI	<ul style="list-style-type: none"> <li>IPv6 Recommendation -- Year 2005</li> </ul>	<ul style="list-style-type: none"> <li>DOT – TEC to take over 1.1.2006</li> </ul>	<ul style="list-style-type: none"> <li>IPv6 Strategy &amp; Roadmap published in 2010 and 2013</li> </ul>
Europe	<ul style="list-style-type: none"> <li>Finnish Ficora – Year 2001</li> <li>Austrian RIR Year 2006</li> <li>French ARCEP Year 2002</li> <li>European BEREC</li> </ul>	<ul style="list-style-type: none"> <li>Recommendations In the BEREC board of Regulators 2013 Workprogramme dated December 12, 2012, the board in § 6.5 outlines an action item for IPv6 in relation to Machine to machine ( M2M)</li> </ul>	
Saudi Arabia CICT	<ul style="list-style-type: none"> <li>IPv6 Strategy -- Year 2008</li> <li>3 Studies: IPv6 Readiness Assessment</li> <li>IPv6 Countries Benchmark</li> <li>IPv6 International bodies &amp; Organisations</li> </ul>	<ul style="list-style-type: none"> <li>Infrastructure Track</li> <li>Awareness Track</li> </ul>	<ul style="list-style-type: none"> <li>14 ASNs support IPv6</li> <li>3 ASNs have IPv6 traffic Transition Process</li> </ul>
Oman TRA	<ul style="list-style-type: none"> <li>Oman IPv6 Strategy-- Year 2010</li> </ul>	<ul style="list-style-type: none"> <li>IPv6.om Web Site</li> </ul>	<ul style="list-style-type: none"> <li>OmanTel Testing IPv6</li> </ul>
Morocco ANRT	<ul style="list-style-type: none"> <li>IPv6 Study -- Year 2012</li> </ul>	<ul style="list-style-type: none"> <li>ISP Readiness work</li> </ul>	<ul style="list-style-type: none"> <li>Strategy published in 2013</li> </ul>



## Core IPv6 Policy Recommendations

Recommendations	IT Policy	Objectives	Impact
Top down	<ul style="list-style-type: none"> <li>CEO Round Table</li> </ul>	<ul style="list-style-type: none"> <li>Decision-making on investment</li> </ul>	<ul style="list-style-type: none"> <li>Priority setting for budget</li> </ul>
IPv6 Service	<ul style="list-style-type: none"> <li>Broadband (Fixed &amp; Mobile)</li> </ul>	<ul style="list-style-type: none"> <li>Integrate IPv6 in new broadband infrastructure investment right from the beginning</li> <li>Future proofing investment</li> </ul>	<ul style="list-style-type: none"> <li>IPv6 Service readiness for broadband apps for public services</li> <li>e-Gov; e-Learning; e-Health</li> </ul>
Capacity Building	<ul style="list-style-type: none"> <li>Launch IPv6 Competence Centres, Educational Programs and Test Labs</li> </ul>	<ul style="list-style-type: none"> <li>Build Skills &amp; Expertise</li> <li>IPv6 Skills Contest (see Singapore iDA Program)</li> </ul>	<ul style="list-style-type: none"> <li>High level LOCAL Skills is the cheapest transition tool as 80% of the transition cost is labour.</li> </ul>
National Research	<ul style="list-style-type: none"> <li>Fund IPv6 Research projects</li> </ul>	<ul style="list-style-type: none"> <li>Gain higher level Skills</li> <li>Add IPv6 in Higher education Curriculum</li> </ul>	<ul style="list-style-type: none"> <li>Gain skills parity with international links</li> </ul>
National IPv6 Task Force	<ul style="list-style-type: none"> <li>Bottom-up stakeholder Forum to define a national IPv6 Roadmap</li> </ul>	<ul style="list-style-type: none"> <li>Consensus building PPP-based Objectives</li> <li>See example of Saudi Arabia IPv6 Task Force)</li> </ul>	<ul style="list-style-type: none"> <li>National IPv6 Strategy with key-players involvement</li> <li>Promote DNSSEC</li> </ul>