IPv6 in Real Life

(Update)

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The objetive?

- Again: If our wives had a computer with only IPv6 connectivity, what would they see?
- N.B.: Our wives are lawyers and they manage to live without computer skills

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Why?

- Everybody says IPv4 address space is depleted (now seems to be serious stuff)
- Everybody says “we have to deploy IPv6”
- But... there is such a thing as real life in IPv6 ?
- Is IPv6 really useful for something more than theoretical discussions or just small talk?

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Investigative method

- No rocket science here
- Just plain lookups in DNS space, some easy-to-do tests
- Plus some web and mail digging
- No traffic analysis here

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Investigative method (2)

- Go get the most visited webs per country
  Source: http://www.alexa.com/
- And then:
  - Ask the DNS of that domain for...
  - an AAAA DNS entry for the web service and the email (MX), a DNS server with an IPv6 address

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Investigative method (3)

- If there is a IPv6 entry in the DNS, verify that it works following three steps:
  - Open the web page with an IPv6 navigator
  - Telnet to port 25 and do some basic SMTP dialog
  - Dig to the IPv6 DNS server

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Investigative method (4)

- Give ipv6 a chance...
- Though you can associate A and AAAA records to **www.example.com**, many domains do it by different ways:
  - **www.ipv6.example.com**
  - **www6.example.com**
  - **ipv6.example.com**

  Periodic scan results are available at:

  http://www.lab.bt.es/ipv6/global_results.html

  http://www.lab.bt.es/ipv6/country_select.html

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Investigative method (5)

- We also do a small check on the DNS hierarchy
  - Root servers with AAAA addressing
  - TLD (gTLD and ccTLD) with AAAA addresing

    (to be automated by some scripts, soon)

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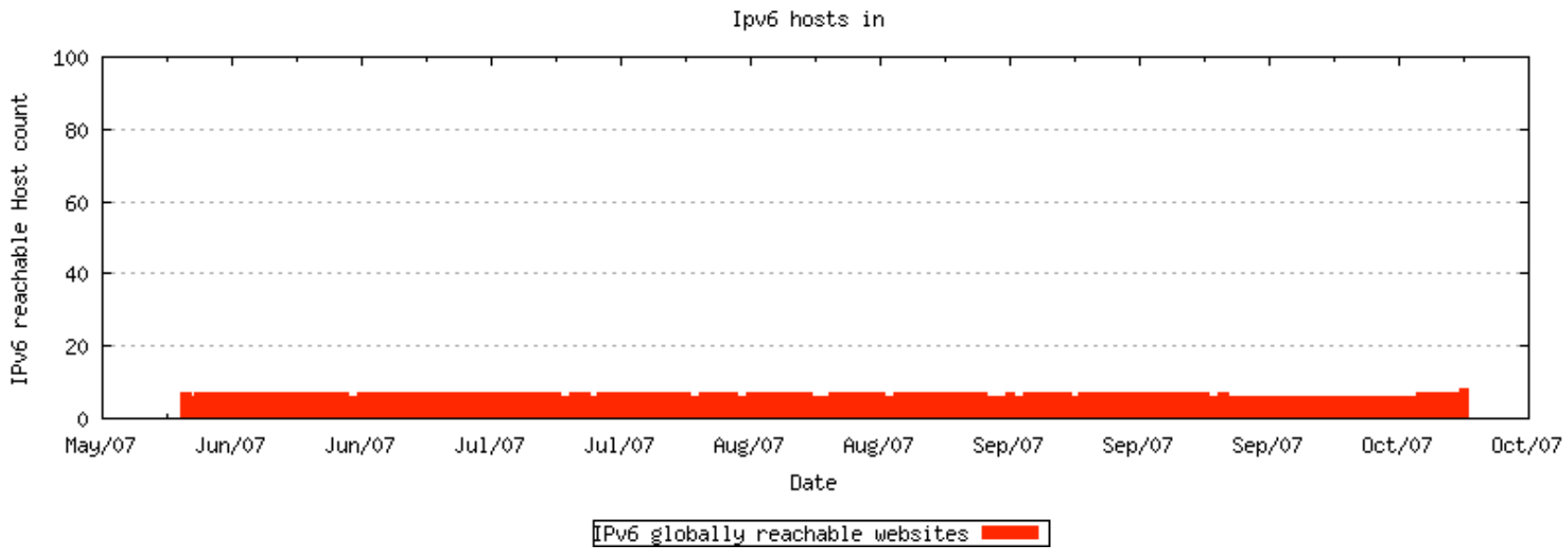
Results



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- In most countries the same results were obtained
- We'll show a summary and some distinguished cases

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The big numbers on web servers

	RIPE 53	RIPE 54	RIPE 55
Countries	75	102	103
Unique domains	4315	4937	4572
Unique web servers on IPv6	12	10	15

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Incorrect webs servers

- Some servers displayed “test”, “it works”, blah, blah… (4)
- Others simply didn’t answer (9)
  - 2002: … 2
  - 2001: … 7

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SMTP & DNS servers

- **SMTP servers**
  - 14 domains with IPv6 server that answered
  - 2 didn't
- **DNS servers**
  - 68 answered
  - 2 didn't

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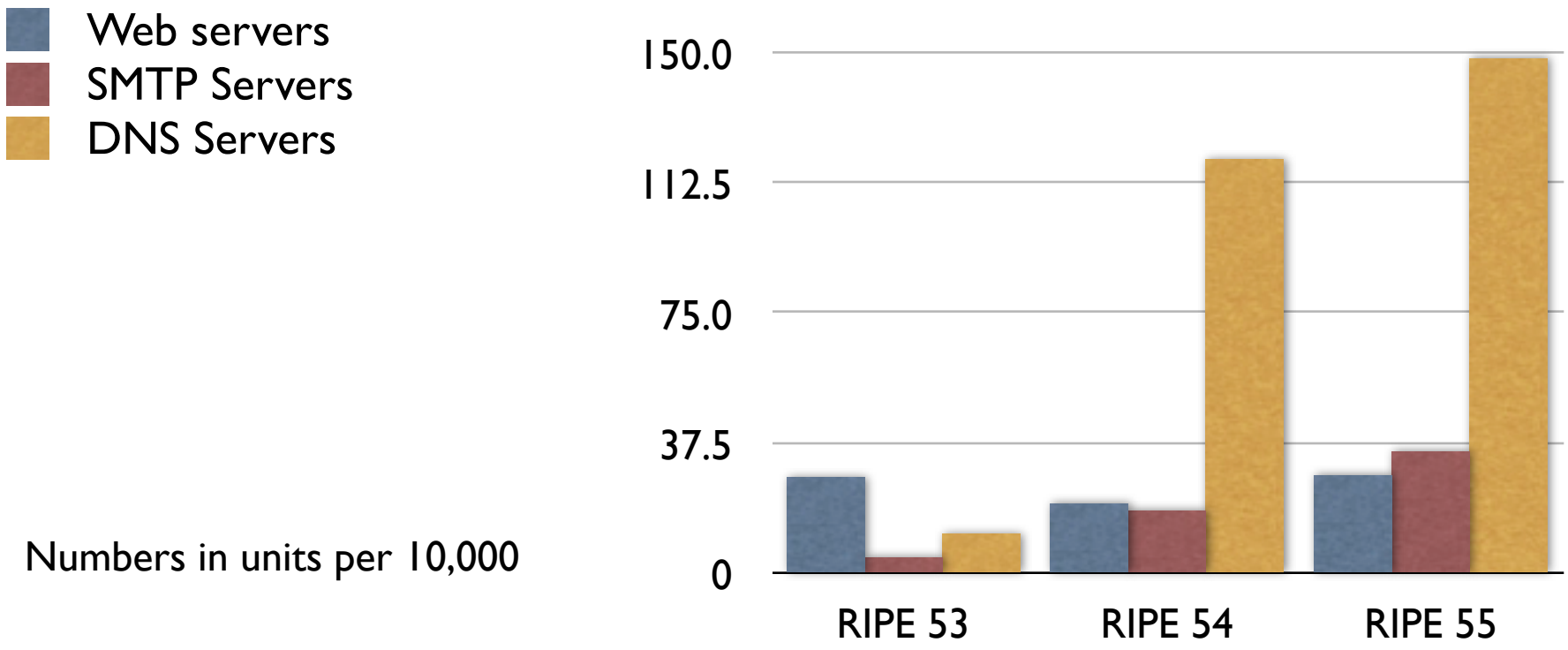
“Growing” rate in IPv6 servers



Numbers in units per 10,000

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Funs and Facts

(Not too much changes from previous edition)

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facts from top 500/100 lists

- (ipv6)Microsoft present (and unreachable) everywere.
- (ipv6)hp.com still there (and unreachable), but in much less countries.
- Less (overall) ipv6 www sites found at this round:
  - of **103** countries, **69** have the same number of sites (most of them compatible with 0), **21** have less, and **13** more than in previous edition.
- Some "real" sites disappeared, some new came out, and also some "incorrect" sites went out.
- The general balance is slightly positive (+0.001% ipv6 to ipv4 ratio :-S) for the real sites.

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facts from top 500/100 lists (ii)

- Countries that have less ipv6-reachable web sites:
  - **1 site less**: bolivia, brunei, ecuador, germany, malta, romania, srilanka, switzerland, taiwan, thailand, uruguay, venezuela, vietnam
  - **2 sites less**: indonesia, kuwait, mexico, pakistan, panama, tunisia, united kingdom, united states
- Countries that have more ipv6-reachable web sites:
  - egypt, jordan, libya, oman, palestinian territory, sudan, syrian arab republic, yemen
    (the same web site (www.paran.com) at ~ the same time: 2nd week of october)
  - bulgaria, greece, jamaica, moldova, nicaragua

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Servers that really works!

(and fit on a slide...)

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- www.ipv6.elmundo.es

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- www.ipv6.elmundo.es
- www.sch.gr, www.ntua.gr

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- ipv6.paran.com
- www6.detik.com (6 servers)

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- www.ipv6.ku.ac.th

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Usual suspects

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Usual suspects

	Web	MX	NS
ripe.net	yes	no	yes
arin.net	yes	no	yes
apnic.net	yes	no	yes
lacnic.net	yes	yes	yes
afrinic.net	no	no	yes

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more usual suspects

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more usual suspects

	Web	MX	NS
iana.org	no	no	yes
icann.org	no	no	yes
ietf.org	yes	yes	yes

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DNS Hierarchy

Root servers

- 5 root servers operating in IPv6 (No change since RIPE-53) *(according to www.root-servers.org)*
- But they STILL don't appear in **`/domain/named.root`**, so are nearly invisible

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TLD DNS servers

	RIPE 53	RIPE 54	RIPE 55
with 5 IPv6 DNS servers	-	-	2
with 4 IPv6 DNS servers	17	16	16
with 3 IPv6 DNS servers	27	31	30
with 2 IPv6 DNS servers	51	51	55
with 1 IPv6 DNS server	72	75	69
without IPv6 DNS servers	97	96	109
TOTALS	**264**	**267**	**281**

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TLD DNS Servers (2)

gTLD	RIPE-53	RIPE-54	RIPE-55
.int	2	2	2
.biz	2	2	2
.com	2	2	2
.info	2	2	2
.mobi	2	2	2
.org	3	3	5
.museum	-	1	0

gTLD	RIPE-53	RIPE-54	RIPE-55
.aero	1	1	1
.edu	0	0	0
.gov	0	0	0
.mil	0	0	0
.cat	-	2	2
.tel	-	2	2
.travel	-	2	2

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more numb3rs

- For the **281** TLDs, **353** DNS with ipv6 address were found:
  - **322** IPv6 DNS servers answered (315 authorizative, 7 not)
  - **21** never answered

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Popular DNS servers

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- 36 domains served by 2001:6b0:7::2 (sunic.sunet.se)

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- 13 domains served by 2001:dc0:1:0:4777::140 (sec3.apnic.net)

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- 13 domains served by 2001:dc0:1:0:4777::140 (sec3.apnic.net)
- 13 domains served by 2001:502:d399::1 (tld1.ultradns.net)
- 8 domains served by 2001:4200:1010::1 (hippo.ru.ac.za)

RIPE support of DNS

- Many TLD use RIPE IPv6 DNS servers as secondary
  - 5(4) TLD have two RIPE IPv6 DNS servers as secondaries
  - 61(65) TLD have one

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Questions?

Suggestions & Corrections are welcome

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