

Netnod DNS update

Lars-Johan Liman
Senior Systems Specialist

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Service Overview

► Infrastructure DNS services

- High performance
 - Anycast
- Top availability
 - Anycast
 - Multiple distribution masters
- State-of-the-art feature set
 - TSIG
 - IXFR
 - DNSSEC / NSEC / NSEC₃
 - IPv6
 - IDN

Some Figures

- ▶ 53 TLDs + root
 - 7 DNSSEC / NSEC₃
 - 3 DNSSEC / NSEC
- ▶ 33 reverse zones for /8s
 - (i.e., XX.in-addr.arpa)
- ▶ Various and sundry other zones
 - Total: 717 configured zones
- ▶ Total query load, world wide
 - Avg: 62,700 qps
 - Peak: ~80,000 qps

Anycast Situation

- ▶ Now at 40 sites, world wide
- ▶ Recent additions:
 - Porto Alegre (BR) (South America!! :-)
 - Manama (BH)
 - Yerevan (AM)
- ▶ Deployed collector nodes
 - DNS2DB (in cooperation with .SE)
 - Better “real time” stats, e.g.,
 - Top-10 domain names
 - Top-10 Clients

Customer Portal

... from the zone owners' perspective

- ▶ Query load stats
 - Per zone
 - Per site (incl. clickable map)
 - Per day/week/month/year
- ▶ Active sites
 - By DNSNODE-ID and by city
- ▶ Query load raw data (BIND format)
- ▶ Query delay from probes

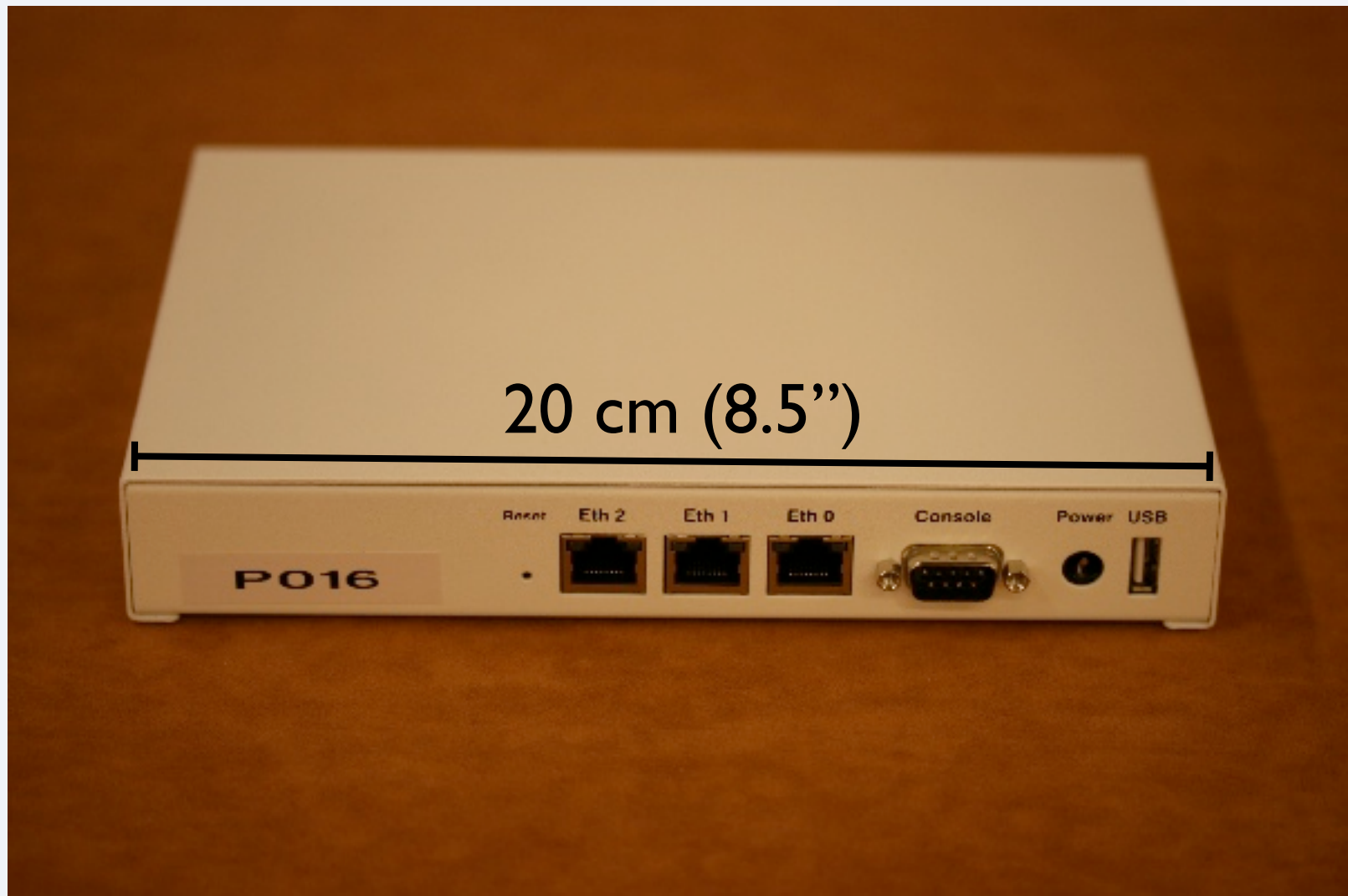
Probes

- ▶ Impossible to monitor an anycast service.
 - Probes monitor the service from different viewpoints.
- ▶ Pocketbook Linux computers
- ▶ Deployed here/there/everywhere
- ▶ Sending a trickle of DNS queries to our servers and report statistics back to us.

Probe



Probe



Customer Portal

... from the probe hosts' perspective

- ▶ DNS query delays
 - Per monitored TLD
 - Per day/week/month/year



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[P022](#) | [Logout](#)

[Enköping](#)

Probes

[P022](#): Location: Enköping

v0.85 — Thu, 16 Sep 2010 — noc@netnod.se



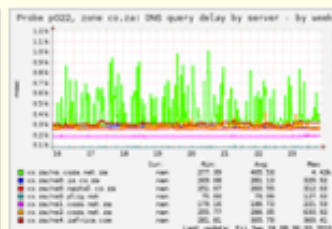
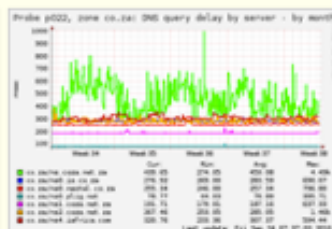
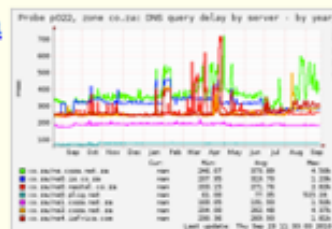
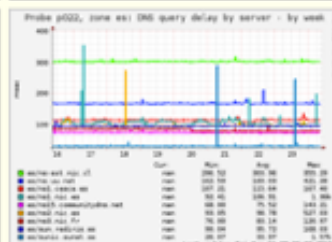
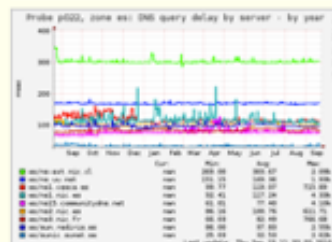
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Enköping

Probe: P022
Serial: 60N00525
Issuer: Håkan Hellström (Netnod Internet Exchange AB)
Inventory: 00506

City: Enköping
Country: SE
Host: Håkan Hellström (None)
Email: hakan@netnod.se

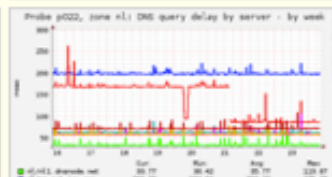
co.za

es

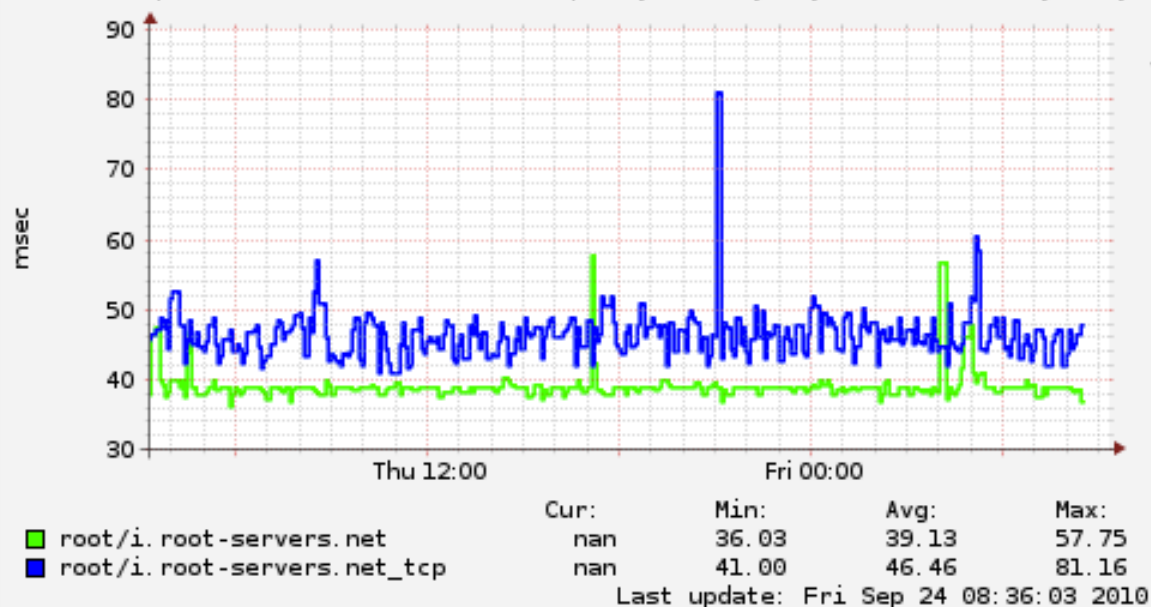
fi



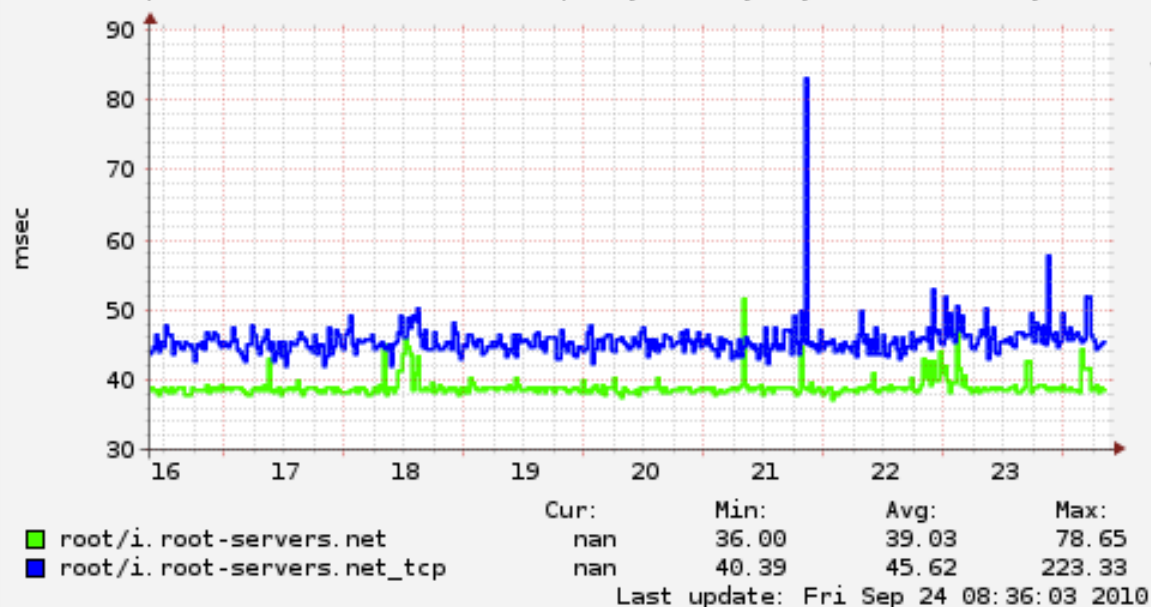
it

nl

Probe p022, zone root: DNS query delay by server - by day



Probe p022, zone root: DNS query delay by server - by week



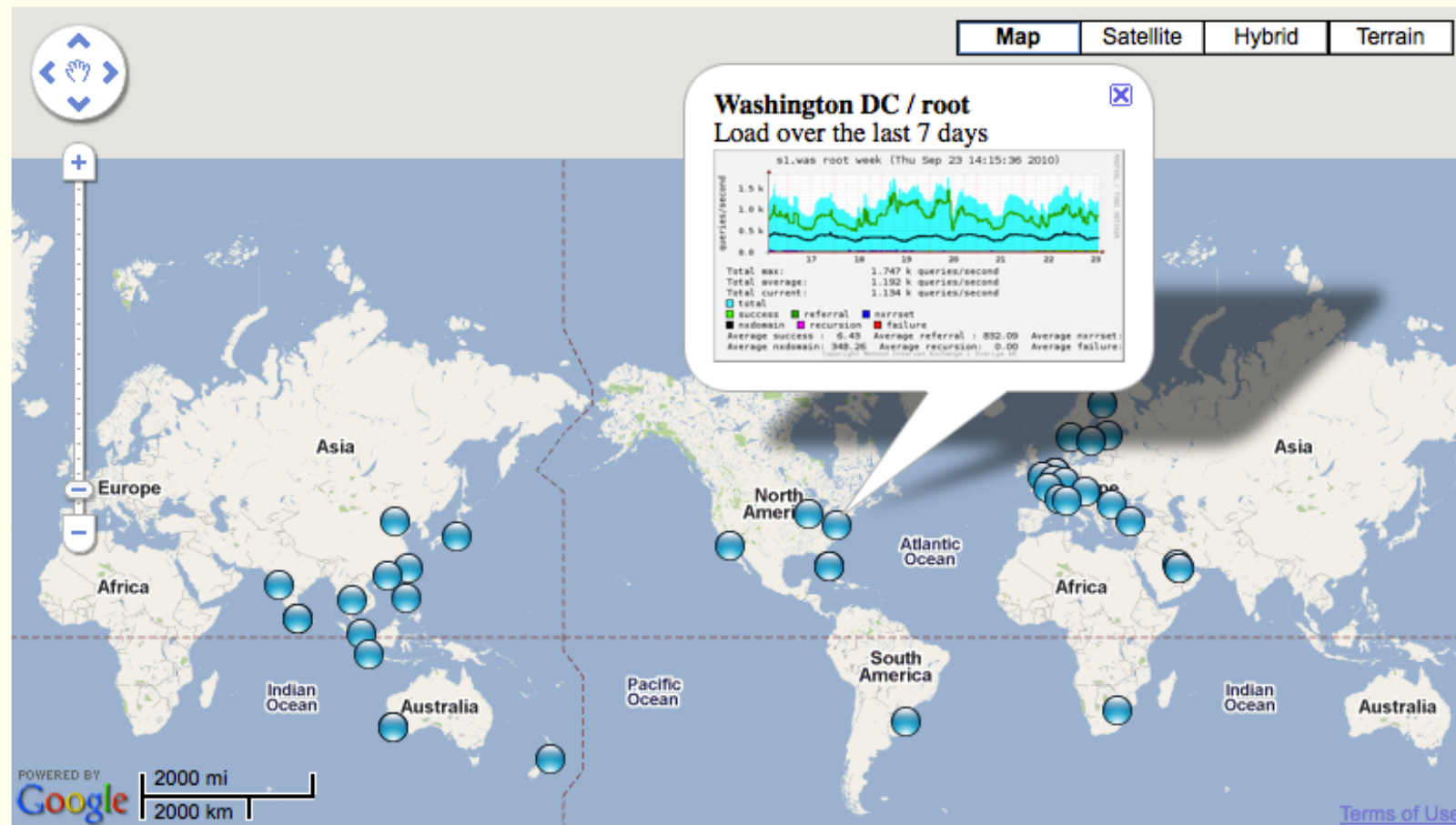


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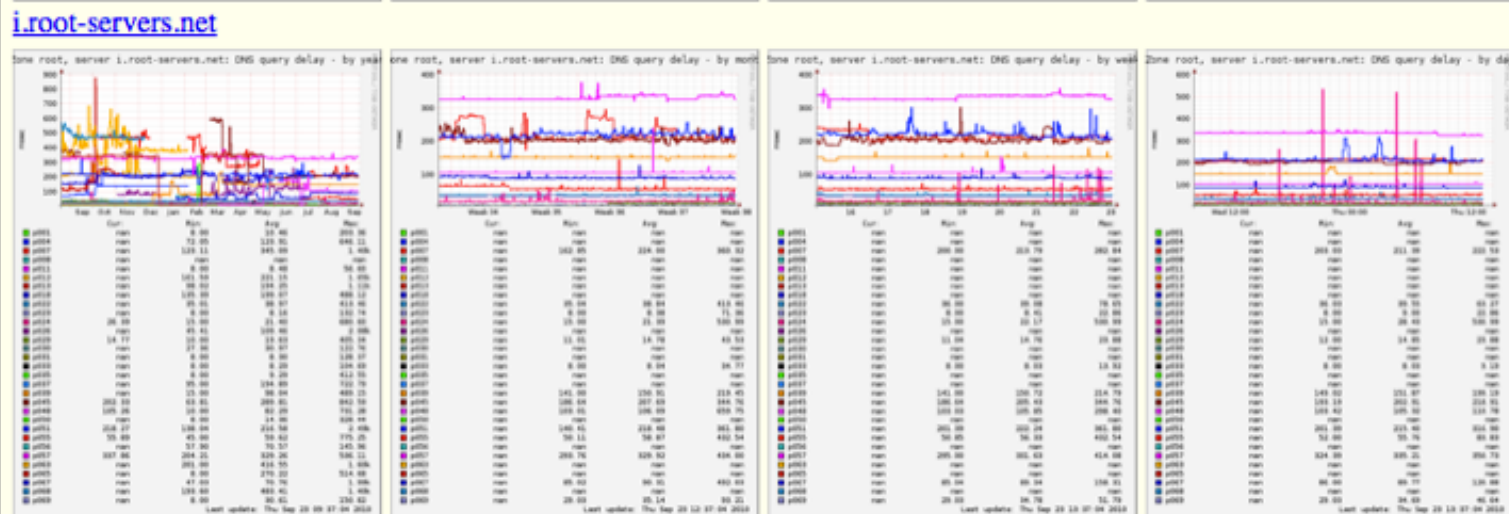
rootdemo | Logout

DNS nodes for zone: root



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i.root-servers.net





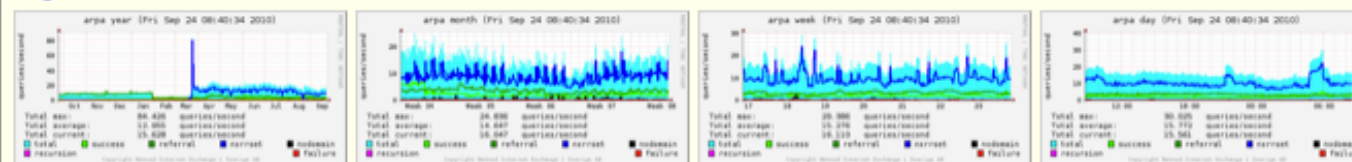
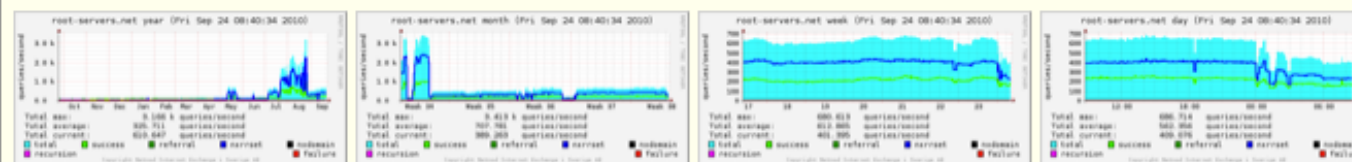
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Query Load

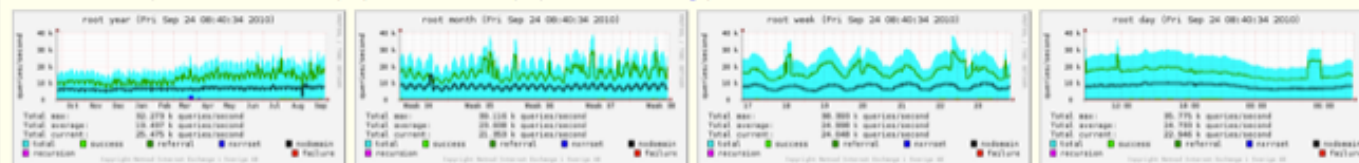
[root](#)[arpa](#)[root-servers.net](#)v0.85 — Thu, 16 Sep 2010 — noc@netnod.se

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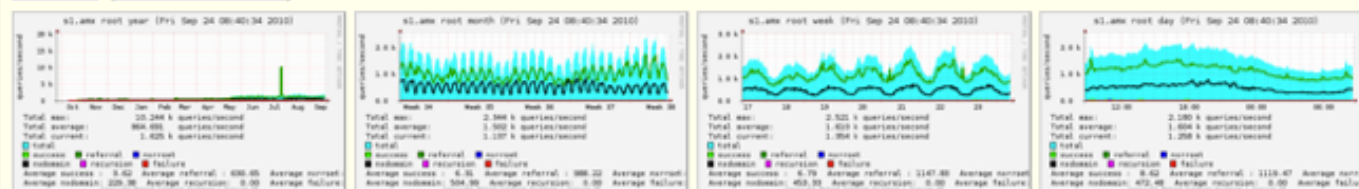
Zone Query Load

Zone root ([zone server list](#)) ([zone site list](#)) ([zone site map](#))

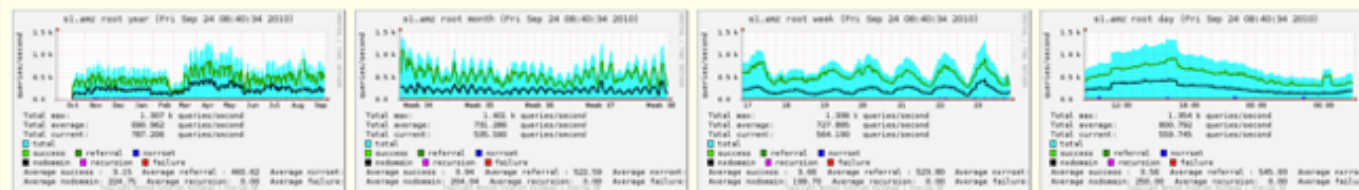


Servers

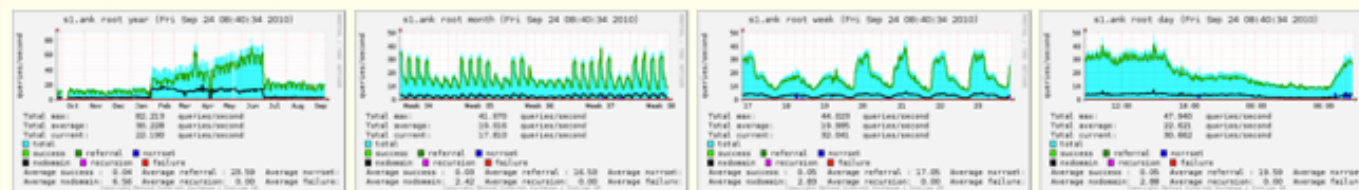
[s1.amx \(raw stats data\)](#)



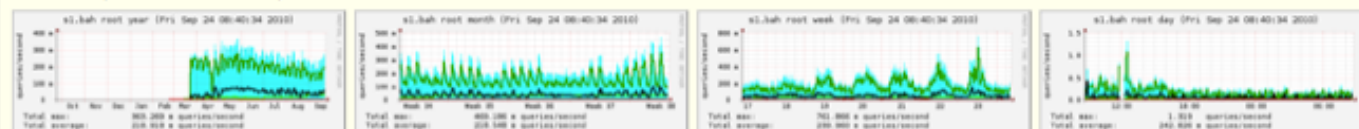
[s1.amz \(raw stats data\)](#)



[s1.ank \(raw stats data\)](#)



[s1.bah \(raw stats data\)](#)



THE ROOT IS SIGNED!

- ▶ ... in case you missed it. :-)
- ▶ Deployed on July 15, 2010
- ▶ NSEC records (no need for NSEC₃)
- ▶ Key Signing Key:
 - 2048 bit RSA/SHA-256
 - <http://data.iana.org/root-anchors/>
- ▶ Zone Signing Key:
 - 1024 bit RSA/SHA-256

Shared Responsibilities

▶ IANA

- Generates and maintains the key signing keys.
- Signs the zone signing keys.

▶ Verisign, Inc.

- Generates and maintains the zone signing keys.
- Signs the root zone.

Root Key Generation

- ▶ Two secure facilities
- ▶ Procedure
- ▶ Key holders
- ▶ Backup key holders
- ▶ Emergency recovery tokens
- ▶ Trusted Community Representatives

DNSSEC Parameters

- ▶ High data churn
 - Signatures expire and need to be replaced
 - Keys are replaced, so signatures need to be replaced.
 - IXFR is sometimes not beneficial!
 - Influences zone distribution.
 - Needs careful planning.
- ▶ Netnod white paper on the subject.

Name Server Control Protocol

- ▶ Zone transfers are well (hmm!) defined, but only relate to *content*!
- ▶ No standardised way to control the operations of the server daemon.
 - Add/delete zones
 - Collect statistics
 - Modify access lists
 - Manage TSIG keys
 - etc ...

Name Server Control Protocol

- ▶ Will use data modeling language “YANG” to build a model for an XML based protocol.
- ▶ “Requirements document” done.
- ▶ Unofficial get-together at IETF.
- ▶ Applied for BoF session at coming IETF.
- ▶ Push-back from IESG.
 - Says: should be handled in DNSOP WG

Questions?