

Anycasting of i.root-servers.net

kurtis@netnod.se

Root-nameservers - what are they?

- The entrance to the DNS-systems database
- Root-nameservers can always point further in the system, or tell that something does not exist

Queries for the root...

- A lot of them...
- 8-10% is from net 10.0.0.0/8 (RFC1918) etc.
 - Can not be replied to. Filtered.
- 3,6 % queries **ABOUT** net 10.in-addr.arpa, 168.192.in-addr.arpa.
 - Even though they have been delegated in AS112
- 4% queries on "localhost"
- 3% queries for ".local"
- 2,3% recursive queries

STUPID queries

- Poorly configured

```
_ldap._tcp.Standardname-des-ersten-  
Standorts._sites.gc._msdcs.USD.local
```

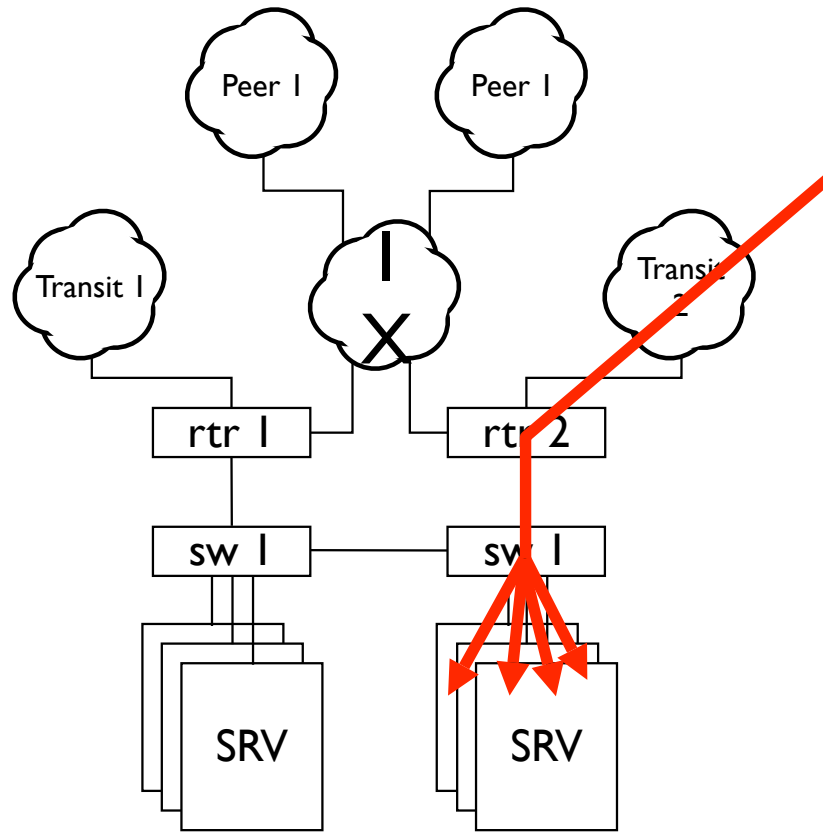
- "The Marjasinproblem"

```
SC1DREV_TByggesagerIgangv\145rende  
\032sagerSag\032011.09\032Ny  
\032receptionsskranke\032afsnit  
\0323981Rekvisition_J\032Pihl.doc
```

Loadbalancing

- Queries are distributed between several servers in the same installation
- Almost all root-servers do this today

Rock Solid Internet Exchange



Loadbalancing

- Good idea
 - Increases query capacity linear
- But ...
- The edge of the network will always be larger than any given server cluster

Anycast

What is anycast?

- A way to install multiple copies at multiple locations

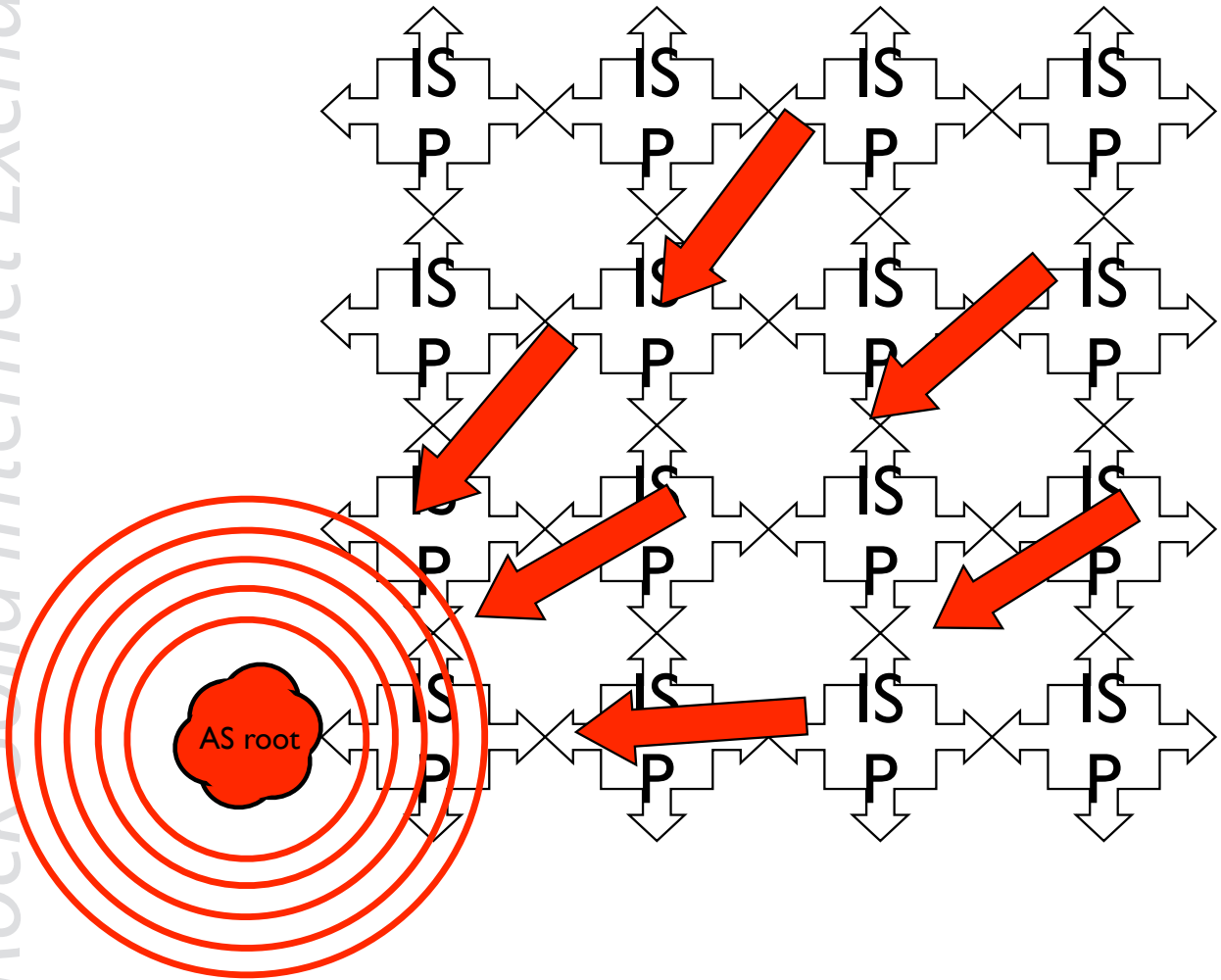
Why anycast?

- Better service to more users
 - Noone could decide on where to locate new roots. Root-ops do it themselves
- Cancels the effects of the DDoS-attacks

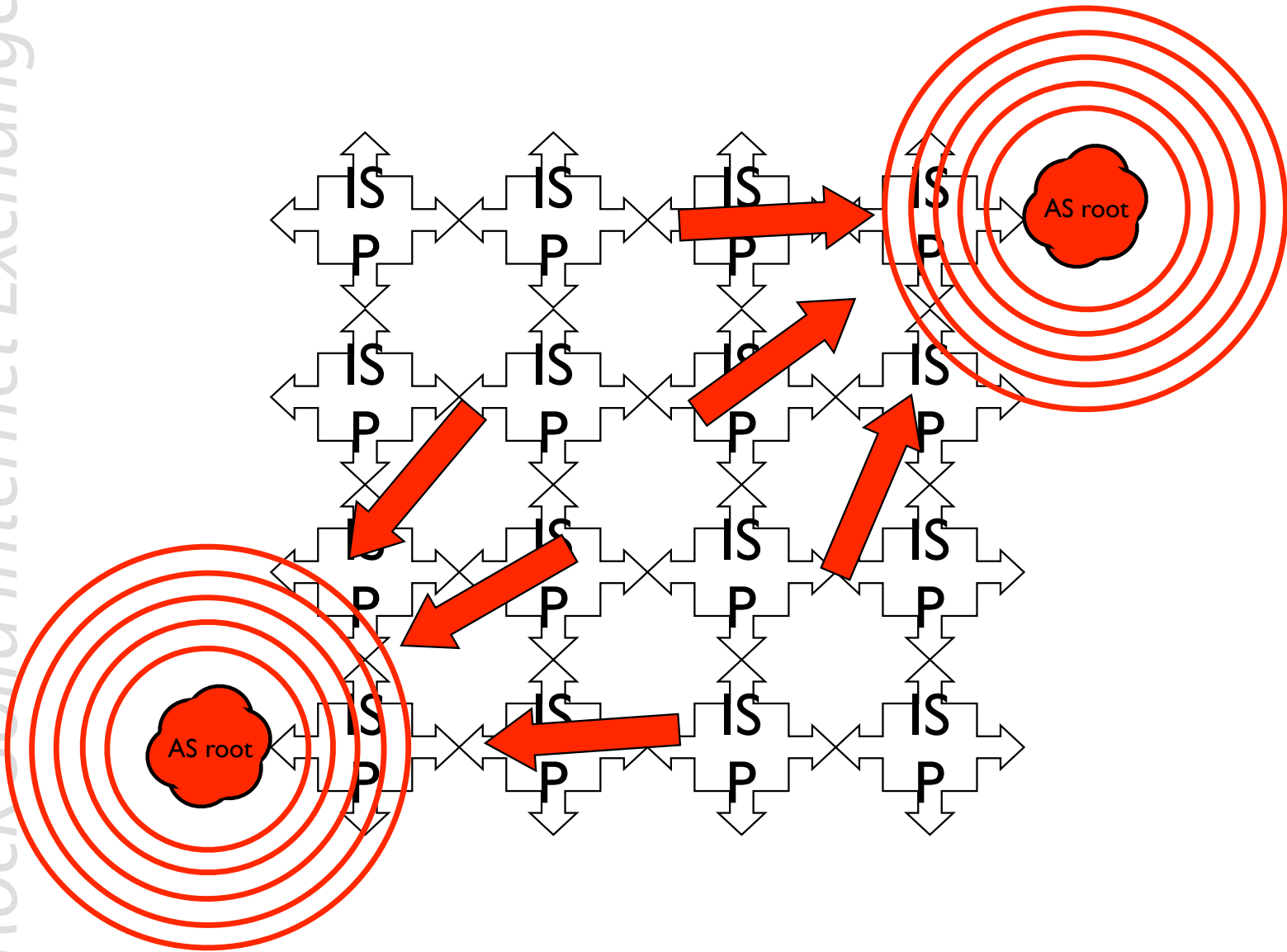
How does anycast work?

- Servers located around the world
- **THE SAME** network information
- **THE SAME** data
- **DIFFERENT** servers
- The routing system will decide where the query is sent

Rock Solid Internet Exchange



Rock Solid Internet Exchange



Advantages with anycast

- The service is closer to the users
- Automatic loadbalancing
- Automatic fail-over.
- Localization of attacks

**VERY
IMPORTA
NT**

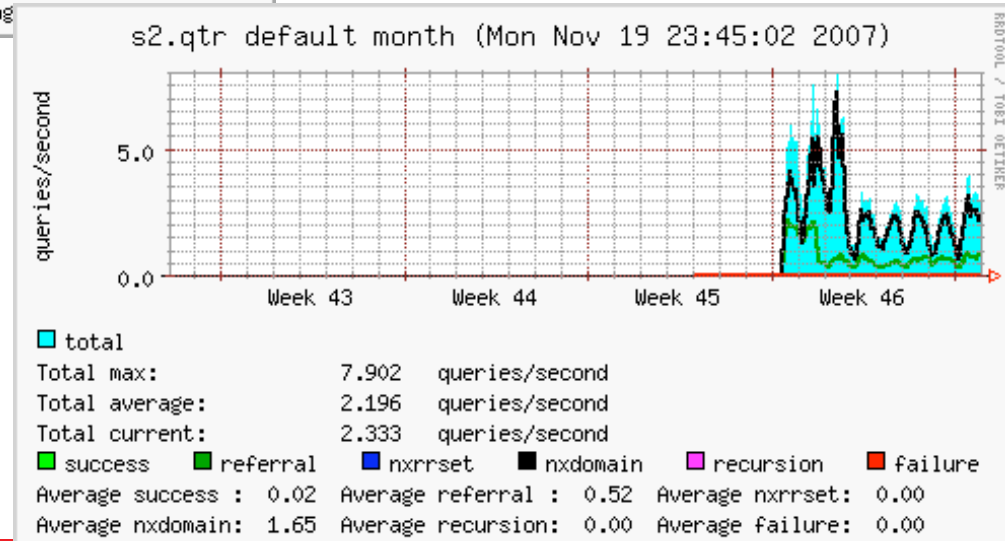
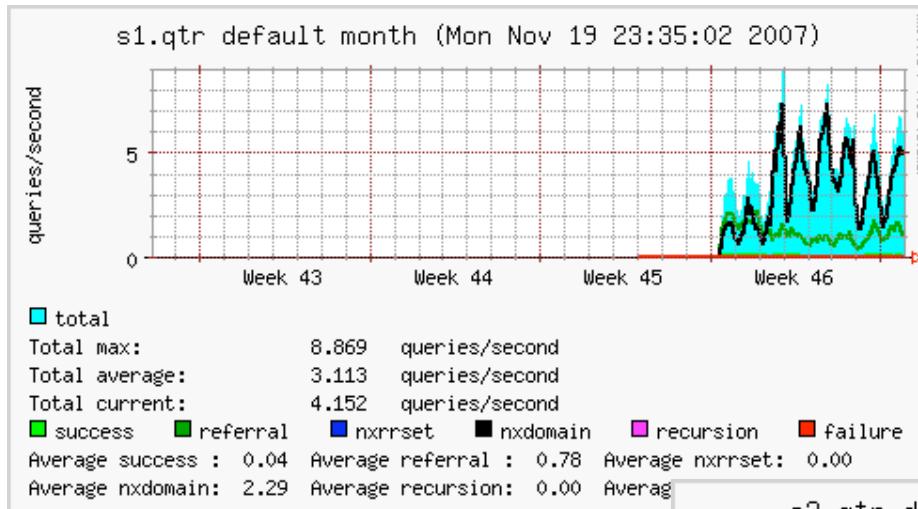
Anycast

- Used by many TLDs and root-server operators
- Also many ISPs use it internally for resolvers and other infrastructure

Anycast in Qatar

- During MENOG I discussions between Qtel and Autonomica
- Plans progressed during the summer
- Installation completed a bit over a week ago
- Installation financed by Qtel
- Operations financed by Autonomica
 - Spare capacity used to Anycast various TLDs
 - This will give additional benefit to the local community e.g in lower RRTs

Initial query load



Questions?