RIPE NCC DNS Services

Marco Hogewoning
External Relations Officer

marcoh@ripe.net

We do the numbers, not the names.

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- Reverse DNS

- Operator of k.root-servers.net

- Secondary authoritative DNS for cc-TLDs

- Directly linked to our registry function

- RIPE NCC authoritative for all address ranges in the registry, including legacy space

  - in-addr.arpa

  - ip6.arpa

- Authority delegated to the address holder

  - Controlled via RIPE Database

How Does it Work?

- Every IPv4 and IPv6 address can have a DNS PTR record associated with it
    - This is used in a variety of security applications
    - Often logs show this name rather than the IP address

- Example:
    - 193.0.6.139 -> 139.6.0.193.in-addr.arpa PTR www.ripe.net

- Works similar to IPv4 in reversing the IP address
  - It is reversed on each hexadecimal digit
  - Remember to fully expand the IPv6 address

- Example for www.ripe.net:
  - 2001:67c:2e8:22::c100:68b -> 2001:**0**67c:**0**2e8:**00**22:**0000:0000**:c100:**0**68b
  - b.8.6.0.0.0.1.c.0.0.0.0.0.0.0.0.2.2.0.0.8.e.2.0.c.7.6.0.1.0.0.2.**ip6**.arpa PTR www.ripe.net

- Delegation is made on largest 4 bit boundary:
  - /48 (or bigger) for PI assignments
  - /32 (or bigger) for PA allocations

K-root Server

- There are 13 DNS Root servers with 12 operators
  - Each root server runs multiple instances, using anycast
  - Spread all across the world

A	Verisign - 5 sites		H	US Army - 2 sites
B	ISI - 1 site		I	Netnod - 41 sites
C	Cogent - 8 sites		J	Verisign - 74 sites
D	UMD - 59 sites		K	**RIPE NCC - 17 sites**
E	NASA - 12 sites		L	ICANN - 153 sites
F	ISC - 57 sites		M	WIDE - 7 sites
G	US DOD - 6 sites			

Root Servers Globally

source: http://www.root-servers.org

Myths About Root Servers
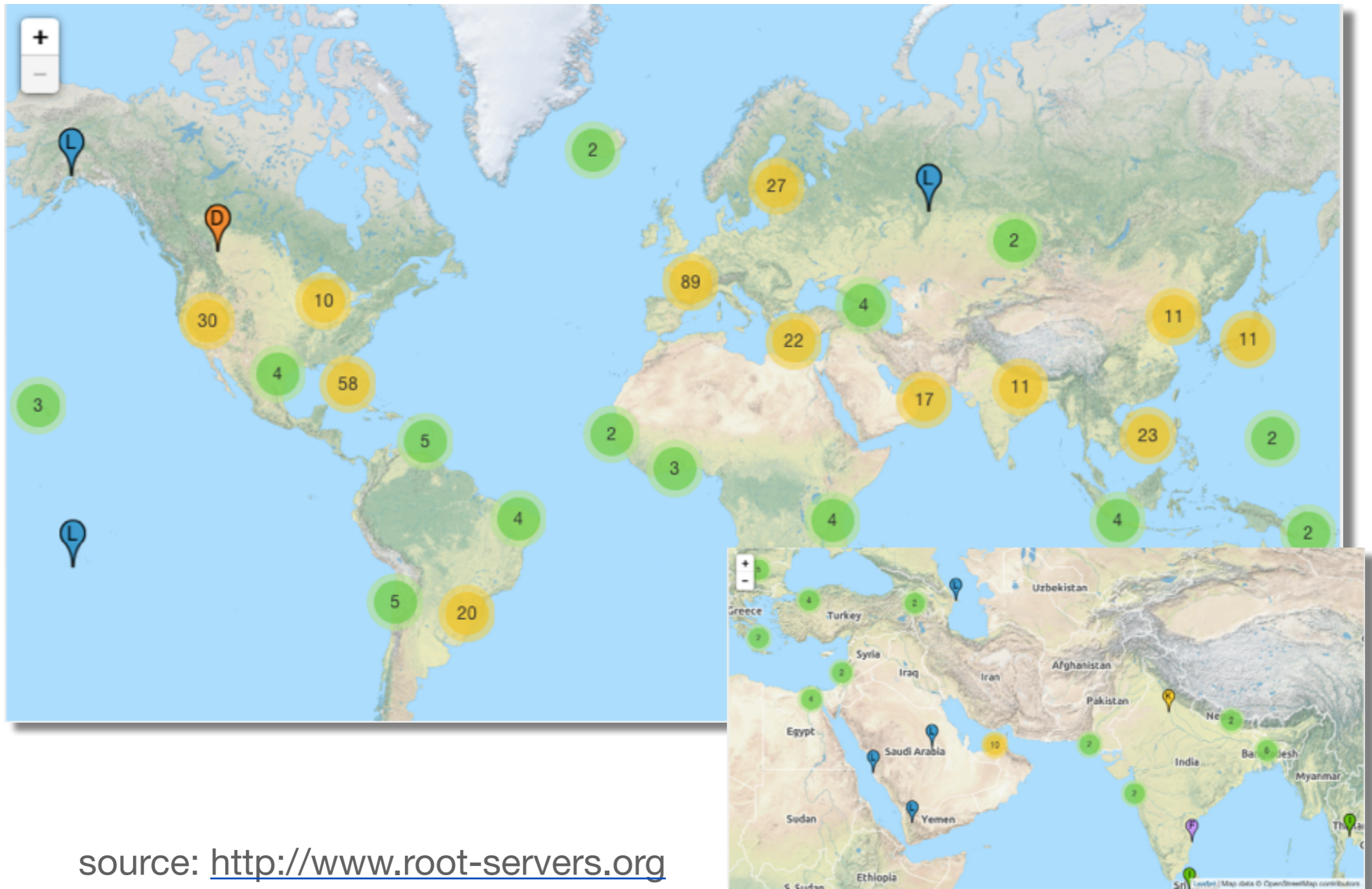
- Not every packet on the Internet is passed through a root server

  - Not every DNS query is handled by a root server

- They have no impact on Internet speed

  - Often the local DNS is a bigger bottle neck

- While they are critical, they are only part of a bigger system

  - Without the second level (ccTLD and gTLD) servers it would still all come apart

  - All answers valid for at least 48 hrs

- Second level of DNS is just as important as the root
  - Root servers only point to ccTLD and gTLD servers
  - Without a second level DNS server it would still break

- Each TLD operator runs its own set of servers
  - Similar to root servers these often use anycast
  - Secondaries sometimes "swapped" or outsourced

- RIPE NCC provides secondary DNS
  - For the benefit of the Internet
  - Stable operation from multiple locations
  - Specifically aimed at developing countries/operators

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