Root Server System Scalability

RSSAC Meeting
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RSS Scaling, ToC

- What they asked
- How we answered
- What it means
- Discussion

What They Asked

- Original question:
  - How large can the root zone be or become?
  - How many queries could the RSS handle?
  - How fast could the root zone grow?
  - How long could changes take to propagate?
- Original answer:
  - It depends

How We Answered (1)

- For the cases where the augmentation of the root zone involve the introduction of new capabilities, such as the use of new Resource Records (see for instance the introduction of IPv6 addresses or DNSSEC), which create technical discontinuities, specific studies should be commissioned to examine the impact. These studies will be initiated by RSSAC as it becomes aware of the need, either by direct participation of its members in the standards process, ICANN's processes or any other means that raise RSSAC's awareness of the desired changes.

What It Means (1)

- Protocol changes visible on the wire are more important for the root servers than elsewhere
  - *Everyone* talks to the root servers
- Adding AAAA or RRSIG/DNSKEY or large responses (OPT, fragmentation) deserved study
  - Bad assumptions are not automatically insignificant
- RSS protocol conservatism will continue
  - Propose, discuss, test, rollout with fallback

How We Answered (2)

- In the case of the proposed gradual expansion of no more than 1000 entries per year for the next several years, RSSAC expects the system to remain stable and robust. Further study will be performed by RSSAC in order to model the theoretical capacity of the root name server system including zone propagation and responses and thus discover possible size-related service discontinuities. RSSAC will also monitor the system's performance (again, the important ones being zone latency and response latency/capacity) for trends and thus discover any gradual (continuous) service degradation.

What It Means (2)

- We don't know current full capacity but we know we can do what ICANN proposes (1K/year)
- We'd like a year or so for capacity planning if the proposed rate of change is revised
- We will work to model the full capacity of the current (and then-current) footprint
- **But:** RSS commitment to *sufficient* capacity means ICANN should plan root zone size according to community needs not measured or current or modeled RSS capacity

Longer Term Questions

- “Bring it on” or “crunch all you want we'll make more” are a fine mantra for 1000 TLDs per year
- The community does deserve to know the theoretical maximum capacity of the current RSS design (13 servers, mostly anycasted)
- If this capacity turns out to be inadequate then the community deserves a better design
- RSSAC has accepted these longer term questions as an ongoing work item

Discussion