Scaling the Root

A study of the impact on the DNS root system
of increasing the size and volatility of the root zone

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Summary of Findings

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Root Scaling Study

- Requested by ICANN Board
- Steering group formed early 2009
  - representatives from SSAC, RSSAC, Staff
- Study team commissioned May 2009
- Announcement and public comments
  - http://www.icann.org/en/public-comment/#root-scaling
- Study team report 7 September 2009
  - http://www.icann.org/en/committees/dns-root/root-scaling-study-report-31aug09-en.pdf

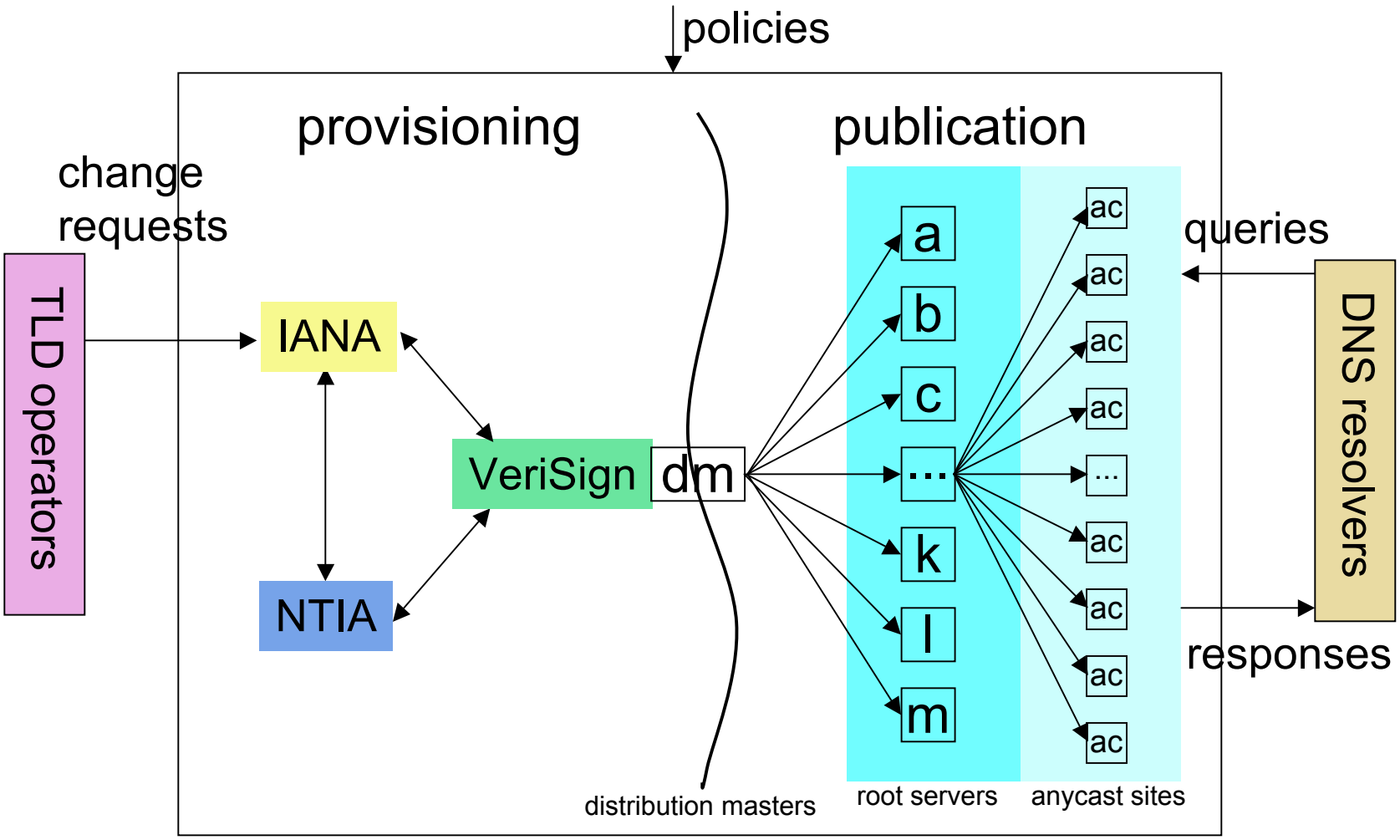
Root Zone Expansion

- New resource records for DNSSEC
- Internationalized top-level domain names
- New address records and glue for IPv6
- New gTLDs

→ Root zone becomes larger (size)

→ Change rate increases (volatility)

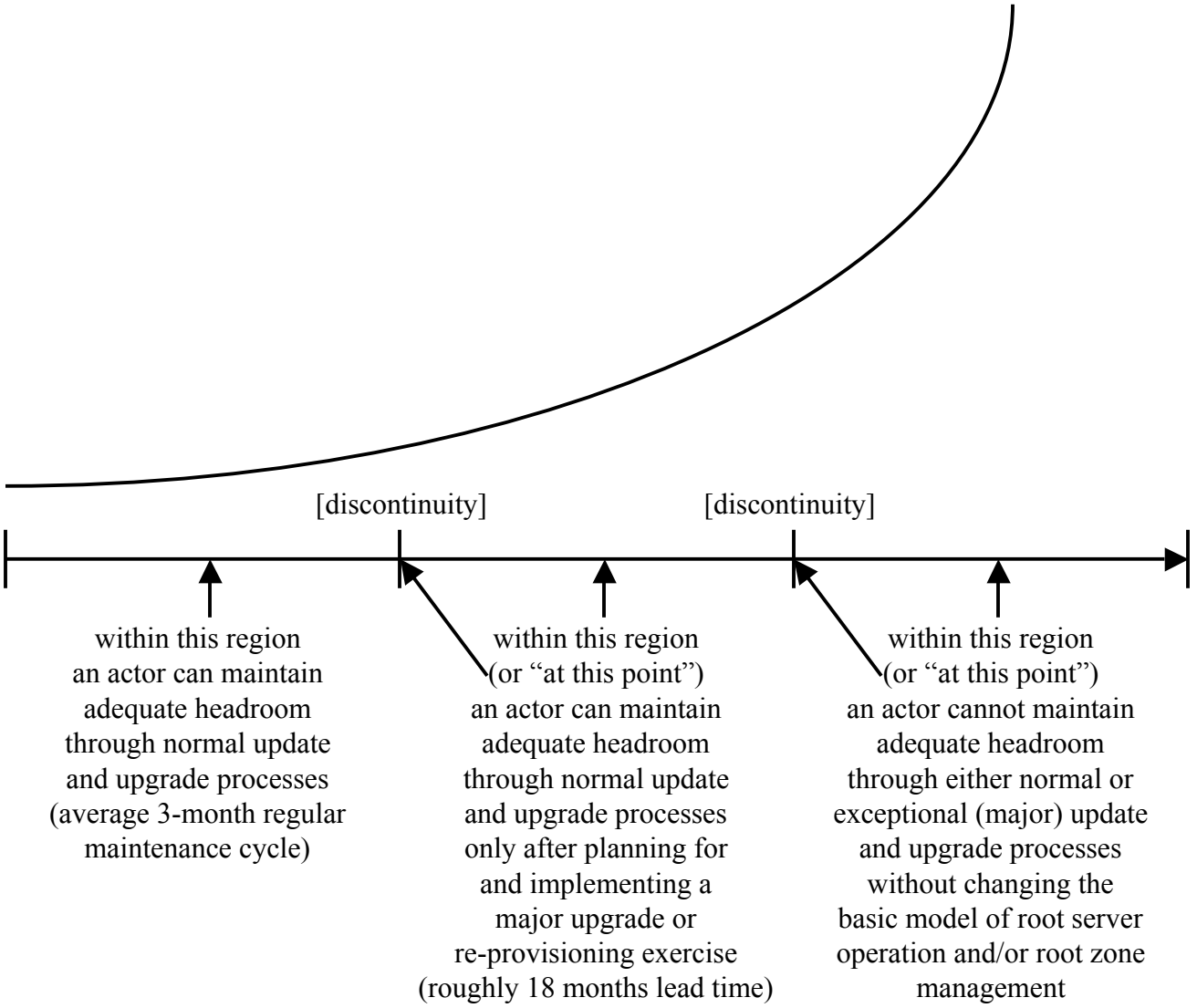
Root System Model



Findings

- The root is a highly decentralized dynamic system.
- Any increase in the size or volatility of the root zone involves risk.
- Root system oversight should focus on “early warning” rather than threshold prediction.
- In order for “early warning” to be effective, changes to the root must be made gradually.

Dynamic Operating Regions



Findings

- On the provisioning side, the ability to scale the root is completely dominated by the steps that involve human intervention.
- On the publication side, scaling the root primarily affects poorly-connected Internet locations.
- The risks associated with an annual increase in the size of the root zone on the order of hundreds of new entries can be managed without changing any actor's current arrangements.
- The risks associated with an annual increase in the size of the root zone on the order of thousands of new entries can be managed only with changes to the current arrangements of one or more actors.

Next Steps

- RIPE DNS WG
  - Thursday afternoon (8 October)
- ICANN Seoul
  - Wednesday afternoon (28 October)
- Public comments
  - http://www.icann.org/en/public-comment/public-comment-200911.html#rsst-report
- Further study
  - Quantitative model
  - Early warning system