

# Incremental Deployment of a Signed Root

NANOG 47, Dearborn, MI  
October 2009

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# Goals

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- Deploy a signed root zone
  - ▶ Transparent processes
  - ▶ Audited procedures
  - ▶ Trust
  - ▶ DNSSEC deployment
    - validators, registries, registrars, name server operators

# Issues

# DO=1

- A significant proportion of DNS clients send queries with EDNS0 and DO=1
- Some (largely unquantified, but potentially significant) population of such clients are unable to receive large responses
- Serving signed responses might break those clients

# Rollback

- If we sign the root, there will be some early validator deployment
- There is the potential for some clients to break, perhaps badly enough that we need to un-sign the root (e.g., see previous slide)
- Un-signing the root will break the DNS for validators

# Proposal

# Deploy Incrementally

- Serve a signed zone from just L-Root, initially
- Follow up with J-Root
- Then other root servers >A
- Last, A-Root



# Deploy Incrementally

- The goal is to leave the client population with some root servers not offering large responses until the impact of those large responses is better understood
- Relies upon resolvers not always choosing a single server
  - ▶ Note we propose leaving A until last

# DURZ

- “Deliberately Unvalidatable Root Zone”
- Sign RRSets with keys that are not published in the zone
- Publish keys in the zone which are not used, and which additionally contain advice for operators (see next slide)
- Swap in actual signing keys (which enables validation) at the end of the deployment process



# DURZ

- Deploy conservatively
  - ▶ It is the root zone, after all
- Prevent a community of validators from forming
  - ▶ This allows us to un-sign the root zone during the deployment phase if we have to without collateral damage

# Measurement

- For those root servers that are instrumented, full packet captures and subsequent analysis around signing events
- Ongoing dialogue with operator communities to assess real-world impact of changes

# Testing

- A prerequisite for this proposal is a captive test of the deployment
  - ▶ Test widely-deployed resolvers, with validation enabled and disabled, against the DURZ
  - ▶ Test with clients behind broken networks that drop large responses

# Thoughts?

- Feedback on this proposal would be extremely welcome
  - ▶ Here in the room
  - ▶ Email Matt and Joe