Evolution of a name server

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Overview

• General ideas
• Main features of NSD Versions
  – Version numbering 1.2.3
• NSD 4 design
• Vaporware example
NSD Characteristics

• Authoritative only
  – Geared towards root servers and TLDs

• Just enough Documentation
  – Users technical competent

• Simplicity
  – No creeping features
  – Only Class IN

• Resilience against high load
Characteristics (2)

• Build from Scratch
  – Independent code

• Resilience against high loads
  – Compiled answers
  – Static data to serve
  – Memory for Speed
NSD 1.0

• Just a server
  – Answers in pre-recompiled database
  – Server Ignorant about the servings
• Spartan User Interface
  – No configuration
• Little to no XFR support
• RFC 103[345], 2181, 2308
NSD 2.0

- DNSSEC ready
  - RFC 403[345]
  - Internal database structure changed
    - Less compilation possible, less ignorant
- NSD AXFR module
- Configuration file
**NSD 2.0 ++**

- More dynamic behaviour
  - AXFR (in & out), TSIG
- NSD Control
  - Less spartan UI required
  - More complexity internal
- Still a memory hog
NSD 3.0

- AXFR & IXFR (in) support
  - Notify
  - Use timers in SOA
- Full DNSSEC
  - NSEC3
- More DNS meta support
  - RFC 4635 (HMAC SHA TSIG)
  - DNAME
NSD 3.0++

• Internal complexity++
  – For XFR processes
  – IPC Introduced

• Still the same serving Speed
  – No internal (static) database change
• Vaporware logo!
• Lots of zones (x00K)
• Zone Configuration templates
• Internal database change
  – Speed-up server
• More preprocessing
  – NSEC3 hashes stored
• Internal complexity grows
  – Complexity moves to compiler subsystem
• NSD control (via port [TBD])
  – hides complexity
• More dynamic behavior
  – Reconfiguration
  – Reloading zones
  – (Slow) dynamic update
• Improved TCP support
• Added features should not hamper original target audience
• NSD 3.0 might need longer support
• Non vaporware: end 2011
• Wishes: speak to me
Speed tests

• Part of new memory layout put in NSD 3.2.7

• Three scenarios
  – L0: root: 1 zone, 500 delegations
  – L1: TLD: 1 zone, 1M delegations
  – L2: SLD: 100K zones, 10 delegations/zone
Test Setup

- Use one core of 4x3.2Gz, 12Gb, 1Gbit intel Debian
- 1M queries, randomized.
- 100,000 qps is 64 mbit query stream
- Assumptions
  - Domains called example123.tld
  - No nxdomain
  - No dnssec
L2-SLD

% of queries answered

Queries per second

echo
nsd-4-imp-1
nsd-3.2.7
bind-9.7.2-P3
95% returns
Question time

- I'll be around to talk to

???

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