DNS/DNSSEC Workshop

Software Overview

UNIVERSITY OF OREGON

NSRC
Network Startup Resource Center

DNS software overview

- Many vendors and software platforms out there
- Commercial and Open Source solutions
- Good overview here

http://en.wikipedia.org/wiki/Comparison_of_DNS_server_software

- ISC's BIND was dominant for many years, but there are also good alternatives

DNS software mini-comparison

Software	Auth	Recursive	DNSSEC	DB / API
ISC BIND9	X	X	X	
PowerDNS	X		X	X
PowerDNS Recursor		X	X	
NSD	X		X	
Unbound		X	X	
Knot DNS	X		X	
Knot Resolver		X	X	

DNS software overview (2)

- BIND9 and Unbound are popular choices for use as a resolver
  - Power DNS Recursor and Knot Resolver are newer
- BIND9 and PowerDNS are possibly more popular than NSD and Knot for use as authoritative
  - Knot is quite new
- We'll focus on 3 implementations
  - BIND 9.18
  - Unbound 1.20.0
  - NSD 4.10.0

DNS software: BIND

- Version 4 released with BSD 4.3 in 1986
- Currently at version 9.18 – May 2024
- BIND 10 was once in development, but has been abandoned
- Most feature rich DNS implementation out there
- Often considered ”the reference”
  - BIND zone format is the de-facto notation
- Used in many commercial products

DNS software: BIND (2)

- Features include
  - ACLs
  - Views
  - DB API
  - Dynamic DNS support
  - DNSSEC signing and validation
  - Many more...

DNS software: NSD

- Developed by NLNetLabs
- Authoritative only
- Developed to mitigate risk of a single bug taking out all BIND implementations
- Several root servers use NSD
- Zones are “compiled” into a precalculated “on the wire” format
  - all possible answers are calculated, then stored into a binary DB, ready to send out
  - very fast

DNS software: Unbound

- Developed by NLNetLabs
- Resolver only
- Developed with performance in mind
- More lightweight that BIND
  - More efficient memory usage
  - More features to control caching
  - Fast...

Knot DNS vs BIND vs Power DNS

Feature	Knot DNS	BIND	PowerDNS
Performance	High performance, optimized for multi-core processors	Solid performance, but may not match Knot DNS in high-demand scenarios	Good performance, varies with backend used
Flexibility	Less flexible, straightforward configuration	Highly configurable, detailed options	Highly flexible, modular architecture, supports various backends
Configuration	Simple configuration syntax	Extensive and detailed configuration files	Configurable with different databases and storage mechanisms
Security	Strong security features, DNSSEC support, mitigations against DNS amplification	Robust security features, regular updates	Strong security, DNSSEC support, flexible architecture for additional measures
Ease of Use	Easy to set up and use, focuses on performance	Comprehensive documentation, can be complex for beginners	Balance between ease of use and flexibility, good documentation
Best For	High-performance needs, large-scale deployments	Advanced DNS features, complex setups	Flexibility and backend integration, various environments
Developer	CZ.NIC	Internet Systems Consortium (ISC)	PowerDNS.com BV

Questions?

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