

Authoritative Enrollment of DELEG

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Intro to DELEG

- Upcoming alternative to NS records
- DNSSEC-signed in parent zone
- Indirection via DELEGPARAM
 - manageability for DNS providers
- Enable ADoQ signalling
- Extensible

Six Aspects of DELEG

(1)Software support

(2)Configuration knobs

(3)DE bit in queries

(4)DELEG non/existence proofs @referrals

(5)DELEG presence in zone

(6)ADT bit in DNSKEY

(1)Software support in authoritatives

- Bind9 and Knot DNS
 - Probably later in 2026
- Other mainstream implementations
 - Wait for 2027?
- Don't stick with legacy repos

(2) Configuration knob

- Server-wide
- Per-zone
- None at all

(3) DE bit

- Part of message/EDNS
- Similar to DO
- Per-query (and response) indication of DELEG-awareness
- Both on/off served by same server

(4) DELEG non/existence proofs

- Only if DE=1
 - Required if ADT=1
- Only in referral answers
- Similar to DS non/existence proofs
 - And shared sometimes

(6) ADT bit

- Downgrade protection (NS spoofing)
- Part of DNSKEY RR
 - If multiple, any one DNSKEY can
- If ADT, referral response **MUST** either DELEG or NSEC => DELEG-aware auths
- ADT required if DELEG in zone
 - **MUST** in spec, don't forget security

Order of deployment

- First compatible software
 - Incl. all secondaries!
- ADT bit in signer
 - Wait for prop-delay + TTL
- Put DELEGs into zone
- Profit (manageability, security, ADoQ etc.)

Potential negative effects?

- Careful 👍 worried 👎
- Without DELEG and without DE=1
 - None (no changes)
- Without DELEG with DE=1
 - Larger referral responses
- ADT bit in DNSKEY
 - None (surveys exist)

Try out yourself 1/2

- Authoritative zones:
 - d.xdp.cz. with various delegations:
 - ns.d.xdp.cz., ns-ds.d.xdp.cz.
 - deleg.d.xdp.cz., deleg-ds.d.xdp.cz.
 - deleg-ns-ds.d.xdp.cz.
 - deleg.rwdns.de. with subzones:
 - zone1.deleg.rwdns.de. --- zone8...

Try out yourself 2/2

- DELEG-aware resolvers:
 - `kdig +https=/dns-query @cs8.res.rwdns.de`
- All tracked down (Paul Hoffman):

<https://github.com/ietf-wg-deleg/deleg-testing/>

Overview

- Update your servers
- Go ahead to ADT bit
- Be prepared for DELEG

Thank you for attention