draft-ietf-dnsop-3901bis

Status and Next Steps

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The RFC we're Updating: RFC3901

- DNS IPv6 Transport Operational Guidelines
- Published in 2004
- What it says:
  - All recursive DNS servers SHOULD be IPv4-only or dual-stack
    (IPv4 only allowed, IPv6 not required)
  - All zones SHOULD have at least one IPv4 name server
    (IPv6 implicitly optional)
  - Zone validation SHOULD ensure that there is one IPv4 authoritative server

Why DNS IPv6 Mandate is Needed

- **The Problem: DNS Fragmentation**
  - ∼40% of zones still IPv4-only after 20+ years since RFC 3901
  - IPv6-only resolvers can't reach IPv4-only authoritative servers
  - "Some names work, some don't" for IPv6 resolvers
- **Precedent: RFC 6540 (2012)**
  - RFC 6540: "IPv6 support no longer optional" for IP nodes
  - 3901bis: Same mandate for DNS layer
- **Current Reality**
  - IPv6 now widespread, DNS policy hasn't caught up
  - IANA TLD requirements still IPv4-only

Goal: Prevent DNS fragmentation through dual-stack requirements

Research Shows IPv6 DNS is Ready

- **Key Finding:** Internet ready for more IPv6 in DNS
- **Fragmentation Impact:** Minimal role in IPv6 DNS issues
- **Real Problem:** Misconfigurations, not technical limitations
  - Misconfigured IPv6 DNS causes more timeouts than fragmentation
  - Better guidance on use of IPv6 will help
- IPv4 does not necessarily ‘perform better’ for DNS resolution
- People following RFC9715, doing IPv6 for DNS, and running NS sets on which at least one domain has DNSSEC seem to coincide

Changes to draft since IETF123

changes since draft-ietf-dnsop-3901bis-04

- **Enhanced Fragmentation Avoidance:**
  - Replaced PMTUD requirement with RFC9715 prioritization
  - IPV6_USE_MIN_MTU=1 guidance added
  - TCP MSS recommendations (1220 bytes)
  - Expanded UDP fragmentation guidance with RFC1035 references
- **IPv4-IPv6 Transition Updates:**
  - Relaxed SHOULD→MAY for NAT64/464XLAT address synthesis
  - Relaxed stub resolver IPv6 prioritization from SHOULD to MAY
  - Updated PREF64 references (RFC6146→RFC8781)
- **Reference Framework Updates:**
  - Added 5 new normative RFCs (RFC1035, RFC2460, RFC3542, RFC4821, RFC8899)

Draft Status & Next Steps

- **Community Feedback Incorporated**
  - Technical reviews from Mark Andrews, Philipp Tiesel, Gorry Fairhurst, Stefan Ubbink....
  - DNSOP mailing list discussions addressed
  - Major concerns resolved

Are we ready for Last Call?