

# EDNS0 Deployment

Shane Kerr <[shane@ca.afilias.info](mailto:shane@ca.afilias.info)>

Joe Abley <[jabley@ca.afilias.info](mailto:jabley@ca.afilias.info)>

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# EDNS0

- Specified in RFC 2671, published in August 1999
- Provides an extension mechanism for DNS
- Widely deployed thanks to implementation in software such as BIND9, NSD
- Notably not supported in DJBDNS, PowerDNS

# Deployment

- DNS operations folklore suggests that EDNS0 deployment is far from complete, and that serious proposals relating to the DNS cannot rely on its existence
- We decided to look at a sample of authority-only servers and see what we could see
- ***Work in Progress! Interim Results!  
Many Improvements Possible!***

# More Details

- draft-kerr-dnsop-edns0-penetration-00
- ***Work in Progress! Interim Results!  
Many Improvements Possible!***

# Methodology

- Take a number of TLD and TLD-ish zones, and harvest nameservers from the NS RRsets contained within
  - list of zones in draft, includes some large gTLDs and a small collection of ccTLDs
- 13 million delegations, around 4000 unique servers

# Methodology

- Send a query with EDNS0 to each server
- Look for an OPT record in the additional section of the response
  - if present, “EDNS0-capable”
  - if absent, “EDNS0-incapable”
  - if no reply, “unresponsive”

# Methodology

- For those servers which we classified as “EDNS0-incapable”:
  - test to see whether a query with TCP transport succeeds

# Methodology

- For those servers which were classified as “unresponsive”:
  - test UDP with no EDNS0
  - test TCP with no EDNS0

# Interim Observations

- Of 407,011 nameservers tested
  - 332,992 (82%) were EDNS0-capable
  - 19,030 (4.7%) were EDNS0-incapable
  - 64,989 (16%) were unresponsive

# Interim Observations

- Of the 19,030 servers which were EDNS0-incapable
- 14,991 (79%) provided answers to queries sent over TCP
- 4,039 (21%) did not respond to a query over TCP

# Interim Observations

- Of the 64,989 unresponsive servers:
  - 807 (1.2%) responded to UDP queries without EDNS0, but not TCP
  - 919 (1.4%) responded to TCP queries without EDNS0, but not UDP
  - 5,326 (8.2%) respond over both UDP and TCP queries without EDNS0

# Tentative Conclusion

- Of servers that are sufficiently non-broken that they will provide some kind of answer to some kind of client (332,992 + 19,030 + 807 + 919 + 5,326 = 359,074)
  - *332,992 (92.7%) support UDP/EDNS0*
  - 4,039 (1.1%) don't support UDP/EDNS0, but support TCP without EDNS0
  - 22,043 (6.1%) support neither UDP/EDNS0 nor TCP

# Further Work

- We can see many areas where the methodology here can be improved
- Several areas in which we think we can improve are shown in the draft
- Offers of additional source data, ideas, coffee, beer, most welcome