An Approach for Increasing Root And TLD DNS Servers
draft-yasuhiro-dnsop-increasing-dns-server-01.txt

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dnsop wg
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Concepts of the draft

• This draft proposes increasing IP addresses of DNS servers without IP anycast, DNS protocol extensions

• Reducing DNS packet size by using “multiple-addresses per host”
  – authority section of DNS response packet
  – This does not violate the DNS protocol

• Zone administrator can add IPv6 addresses without (or minimum) reducing of IPv4 address
“single-address per host”

- Example: single address per host

  net. IN NS a.gtld-servers.net.
  IN NS b.gtld-servers.net.
  ...
  IN NS m.gtld-servers.net.
  a.gtld-servers.net. IN A 192.5.6.30
  b.gtld-servers.net. IN A 192.33.14.30
  ...
  m.gtld-servers.net. IN A 192.55.83.30
“multiple-addresses per host”

- Example: multiple addresses per host

```
net. IN NS x.gtld-servers.net.
IN NS y.gtld-servers.net.
IN NS z.gtld-servers.net.

x.gtld-servers.net. IN A aaa.aaa.aaa.aaa
IN A bbb.bbb.bbb.bbb
IN A ccc.ccc.ccc.ccc

y.gtld-servers.net. IN A ddd.ddd.ddd.ddd
IN A eee.eee.eee.eee
IN A fff.ffh.ffh.ffh
```

...
Changes from -00

• Added 3 issues
  – “Number of Addresses per Server” issue
  – “Server Selection” issue
  – “Registration” issue

• Added the test result on appendix A
  – Some various cases of combinations
    • Number of DNS servers
    • IPv4 addresses per name
    • IPv6 addresses per name
“Number of Addresses per Server” issue

• DNS treats all the resource records (RRs) per ‘RRSet’ basis
  – This makes direct influence on additional section in a DNS packet. Because, if it is occurred at NS query, whole of glue A records may be cancelled
  – This is harmful for name resolution and this must be avoided

• We did the test some various cases of combinations “the number of DNS servers” and “IPv4 and IPv6 addresses per name”, the result of the test on appendix A of the draft
“Server Selection” Issue

• If some trouble is occurred at one of the host of ‘DNS server set’, it may be harmful for whole of ‘server set’
  – For example, one bad server may block access to other good servers

• It may effect server selection algorithm of DNS cache servers (not yet issued by draft)
  – On many implementations, multiple A returns ‘round-robin’ basis, it may effects DNS server selection algorithm
“Registration” Issue

• Some registries and/or registrars (especially root = IANA), this “multiple IP addresses registration” for DNS server host may not be allowed
  – I am not sure IANA allows this or not

• In this case, users can not register this

• .jp registry allows the multiple IP addresses
ToDo

• Needs more tests and experiences
  – Testing the behavior of existing DNS server implementations (especially, DNS cache servers)
    • Treats of multiple address per name as glue A
    • Server selection algorithm
    • ‘Round-robin’ issue
  – Testing for searching most suitable pattern of number of NSes, IPv4 addresses and IPv6 addresses per name
Thank you

• Please give us comments
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