Nominet's Response to IANA's Request For Comments on DNS Root Zone Glue Policy

31 January 2007

Preface

Nominet welcomes the opportunity to respond to IANA's request for comments, *Comment Sought on DNS Root Zone Glue Policy*, dated 5 December 2006:

http://www.icann.org/announcements/announcement-3-05dec06.htm

We are pleased to see IANA continuing to take steps to be proactive in addressing the needs of TLD operators and in inviting stakeholder comments on IANA policies and procedures prior to enacting changes to them.

This response uses the terms "wide glue" or "narrow glue" in the sense of their definition in `draft-koch-glue-clarifications-02.txt`; for convenience, these definitions are provided below.

Eliminate Shared Glue

We recommend that IANA implement a policy of "no shared glue": in other words, no two TLDs would have a name server with the same DNS name. This does not preclude the use of the same name server by multiple TLDs; they would only have to use distinct names to refer to the same IP address. Several TLDs already do this.

A policy of "no shared glue" could be implemented incrementally: the new names could be added only when changes to existing shared glue are required. Alternatively, there could be a fixed period in which all TLDs using shared glue would need to provide new name server names.

Investigate Narrow Glue

Currently IANA maintains a policy of wide glue for the root zone. We strongly suggest that IANA investigate the possibility of a transition to a policy of narrow glue. The use of narrow glue would remove significant issues associated with changes to shared glue the root zone.

In theory, the removal of non-narrow glue should have a negligible impact on the behaviour and performance of the DNS. However, IANA would have to carry out a programme of thorough testing to determine whether any unexpected behaviour might occur. In particular, DNS implementations may exist that have latent flaws that will be triggered by the removal of non-narrow glue from the root zone.

The following will need to be studied to determine the full effect of the removal of non-narrow glue:

- The impact of removal on general resolver behaviour
- The impact of removal on specific, widely-deployed resolver implementations
- The impact of removal on traffic patterns at the root servers

- Suitable checks to identify cases where some non-narrow glue will be required or desired, e.g. for total or partial circular references.

Suggested Best Practice

Finally, we believe that the best practice for naming authoritative name servers for a TLD is to use name server names:

1. which are immediate descendents of the TLD[1],
2. for which the TLD zone is authoritative
3. which have the shortest possible least-significant (left-most) labels

Example:

```
EXAMPLE.     SOA   ...
EXAMPLE.     NS    A.EXAMPLE.
EXAMPLE.     NS    B.EXAMPLE.
EXAMPLE.     NS    C.EXAMPLE.
A.EXAMPLE.   A     192.0.2.1   ; Anycasted hosts or
B.EXAMPLE.   A     192.0.2.66  ; hosts in distinct
C.EXAMPLE.   A     192.0.2.130 ; autonomous systems.
```

If all TLDs voluntarily implemented this practice, there would no longer be non-narrow glue in the root, and the problem of shared glue would vanish. We recommend that IANA investigate the possibility of having TLD operators agree to this scheme, but stop short of suggesting that it should be imposed on TLDs.

Glossary

Wide Glue	Glue resource records are registered if and only if the name server resides below the delegating (parent) zone. There is no need to register glue RRs if the name server's name belongs in the parent zone.
Narrow Glue	Glue resource records are registered if and only if the name server resides within or below the delegated (child) zone (that is, within the delegated domain).

[1] Name server names that are in a sub-delegation of the TLD, e.g. `A.NIC.EXAMPLE.`, introduce a possible additional point of failure. Also, glue with more than two labels in the TLD zone may be vulnerable to some countermeasures that were employed by implementations as against the use of wildcard RRs in TLDs, e.g. those described in `http://www.nanog.org/mtg-0310/pdf/woolf.pdf`