

Glue is not Optional!

<https://datatracker.ietf.org/doc/html/draft-ietf-dnsop-glue-is-not-optional-02>

IETF 111 DNS Operations Working Group
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Glue is not optional

- Glue records are address records for nameservers that are contained in the delegated (child) zone.
 - Reference specific RFC1034 text or DNS Terminology RFC?
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- Draft says: “Servers are expected to return available glue records in referrals. If message size constraints prevent the inclusion of glue records in a UDP response, the server **MUST** set the TC flag to inform the client that the response is incomplete, and that the client **SHOULD** use TCP to retrieve the full response.”

Updates since -00

- Point out that the “gov” example is historical (from June 2020).
- Sibling Glue & requirements.
- Cross zone NS records with circular dependencies” (don’t do this).
- Orphaned Glue discussion.

Sibling Glue - definition

Sibling glue are glue records that are not contained in the delegated zone itself, but in another delegated zone from the same parent.

In most cases, these are not strictly required for resolution, since the resolver can make subsequent queries to the same zone to resolve the nameserver addresses after following the referral to the sibling zone. However, most nameserver implementations provide them as an optimization to obviate the need for extra traffic from resolvers.

Sibling Glue - example

In delegating (parent) zone "test":

```
bar.test.           86400    IN NS    ns1.bar.test.  
bar.test.           86400    IN NS    ns2.bar.test.  
ns1.bar.test.       86400    IN A     192.0.1.1  
ns2.bar.test.       86400    IN A     192.0.1.2  
  
foo.test.           86400    IN NS    ns1.bar.test.  
foo.test.           86400    IN NS    ns2.bar.test.
```

A referral for 'foo.test' will contain sibling glue for ns1.bar.test and ns2.bar.test in the additional section.

Sibling Glue - example

Referral response for 'foo.test':

;; QUESTION SECTION:

;www.foo.test. IN A

;; AUTHORITY SECTION:

foo.test. 86400 IN NS ns1.bar.test.

foo.test. 86400 IN NS ns2.bar.test.

;; ADDITIONAL SECTION:

ns1.bar.test. 86400 IN A 192.0.1.1

ns2.bar.test. 86400 IN A 192.0.1.2

Sibling Glue - processing requirements

- Sibling glue is usually provided as an optimization, but there are situations in which it may be required (todo: give an example of the 'required' case).
- **Proposal: Always provide sibling glue in referral responses and state that TC=1 must also be set when sibling glue (not just required glue) cannot fit into the response.**
 - Easier for implementers; don't have to figure out when it is or isn't required.
 - Robustness argument: always provide as complete a set of nameserver info in the response as possible.

Cross zone cyclic address records

Don't do this! Cannot be expected to work reliably:

;; Zone: example.com:

example.com.	86400	IN NS	ns1.example.net.
example.com.	86400	IN NS	ns2.example.net.
ns1.example.com.	86400	IN A	192.0.1.1
ns2.example.com.	86400	IN A	192.0.1.2

;; Zone: example.net:

example.net.	86400	IN NS	ns1.example.com.
example.net.	86400	IN NS	ns2.example.com.
ns1.example.net.	86400	IN A	198.51.100.1
ns2.example.net.	86400	IN A	198.51.100.2

Cross zone circular dependencies on NS addresses

- Cross zone address records with different parents & circular dependence.
- These can't really be called glue.
- This configuration is NOT expected to work.
- One zone could arrange to have the cross zone address records returned gratuitously, but will resolvers actually accept those?

Proposal: Remove this section entirely.

Orphan Glue?

- (Note: not a DNS protocol term. We either have glue or authoritative data.)
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- However, some registry processes result in glue address records being promoted to authoritative data when the containing child zone's NS records are removed.
- Normally, you'd expect such glue records to be expunged from the zone once the delegation for the zone has disappeared.
- What should be said about this practice, if anything? (least contentious path: describe the situation, but make no judgements)

-02: “All” glue records

- In -02, we propose an additional clarification: “all” glue must be included, otherwise TC=1 must be set if it doesn't fit.

Discussion

- github repo for edits/issues etc:
 - <https://github.com/ietf-wg-dnsop/draft-ietf-dnsop-glue-is-not-optional>