

The Zone Status (ZS) DNS Resource Record
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Abstract

A Domain Name System (DNS) resource record which provides status information about a zone is described in this document.

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1. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#), [RFC2119](#) [7].

2. Introduction

The DNS protocol is defined in [RFC1034](#)[1], [RFC1035](#)[2] and clarified in [RFC2181](#)[3]. The DNS does not currently provide a well defined mechanism for obtaining information about the status of a zone: what it is being used for, the significance of the zone's contents, when the zone was last updated and so on. This means a variety of ad-hoc techniques are deployed whenever zone administrators choose to make this information available. Typical strategies include descriptive TXT records in the zone or embedding meta-information in the values of existing RRtypes or subtypes such as the SOA record's serial number and RNAME. These are confusing and impractical since an arbitrary DNS client needs a priori knowledge of which of these schemes, if any, has been used by a zone administrator.

This document advocates the introduction of a new resource record specifically to provide this type of information.

3. Rationale

Common examples where indicating the status of a zone would be useful include: whenever the domain is in the process of a substantial update; a domain undergoing a long-term migration; and changes to the authoritative name servers for a zone. eg "Use of example.net was deprecated on April 1st. Please visit example.com instead." It would be convenient to store this type of meta information within the zone in a way that makes it easily retrieved. This kind of status information would be particularly helpful for systems such as ENUM [8] which can be used for publishing real-time contact data for zone owners.

These sorts of details are generally associated with the administration of the zone rather than being tied to the rest of the zone content. Clarifying this separation between information that reflects the status of a zone from any text that a domain holder may choose to publish via DNS is useful. It also avoids the current subtyping issues that would affect processing of a TXT RRset if the status information was embedded there. TXT records are too general and would require imprecise RDATA parsing in order to extract any relevant items of interest to a particular client.

The proposed RRtype will be of particular use for zones where contact data are published in the DNS as NAPTR records [4]. For instance a set of tel: and sip: URIs [5]. could be associated with the proposed zone status RRtype. That could indicate these URIs are the ones published by the zone owner when they are at work, or while travelling or when at home. Client software could lookup the zone's ZS records and display a meaningful message to the end user about the NAPTR records that had been retrieved from an earlier lookup. A description of which contact data the zone owner has published would offer additional information to what might be inferred from the actual NAPTR RRset or other zone data itself. The ZS RRtype could express concepts like "the zone owner is asleep, so don't bother trying voice-based communication" or "the zone owner is at work but in a meeting".

Publishing and obtaining this information will become more significant because of emerging applications and services which make innovative use of the DNS such as the real-time manipulation of zone content data. For example, updating NAPTR records (ie the zone owner's contact data) whenever the zone owner switches between the NAPTR RRset they publish while at work, at home, commuting or while sleeping.

4. Justification For New RRtype

TXT records are unsuitable for providing this sort of zone status information because the semantics of TXT record RDATA are unstructured. TXT records can and are used for all sorts of purposes: version control strings, comments or reminders to zone administrators, anti-spam information, references to ticketing systems, contact details of the zone administrator and so on. It would be impractical for an application to interpret the contents of a response to a TXT query and guess which, if any, of the returned TXT records contained meaningful data about the status of the zone.

One approach would be to adopt a convention that a "magic string" in the RDATA for some TXT record identified zone status information. This is not viable for two reasons. First, it may break backwards compatibility with the installed base which might already be using this "magic string" in TXT records. The second reason is this proposal would introduce yet another example of subtyping which is generally accepted as poor protocol design.

Likewise, it is not sensible to insert TXT records in some part of the name space to be dedicated for this specific purpose. That would be another instance of bad protocol design because a fundamental but unstated principle of the Domain Name System is any RRtype can be used in any zone irrespective of the name of the zone.

5. ZS Resource Record

Apart from its type code, the wire and text formats for the proposed ZS RRtype are identical to the definitions of the TXT record given in [RFC1035](#):

ZS RDATA format

```
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
/                               ZS-DATA                               /
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
```

where: ZS-DATA One or more character-strings.

The ZS RRtype will hold descriptive text intended to contain information reflecting the status of the zone in which it is held.

6. End User Considerations

Users publishing ZS records SHOULD pay attention to the needs of potential readers of these resource records, especially with respect to character sets and language. Although arbitrary text can be used in character-strings, publishers of ZS records should realise that clients looking up these records may not be able to display them if they are presented in unusual character sets. For example, a mobile phone or other hand-held device may not have the font information or rendering capabilities to display (say) Chinese or Arabic characters. Similarly, publishers of ZS records should try to avoid displaying information in multiple languages or assume that all readers of these records understand the same language they have chosen to use.

7. Security Considerations

Although this document does not appear to introduce any extra security issues beyond those listed in the thorough analysis of the threats to DNS in [RFC3833](#) [9], there are some additional considerations. These are described below.

It is unrealistic to assume that zone owners who publish ZS records can be relied upon to ensure any ZS records contain accurate, timely information. Similarly it cannot be assumed that ZS records contain text that will be understandable by an arbitrary reader that looks them up in the DNS. Therefore any data contained in a ZS record is solely for informational purposes. The information contained in a ZS record **MUST NOT** be relied upon for any location-based services. In particular, emergency services **MUST NOT** treat the contents of a ZS record as definitive information about the location or disposition of the domain name owner.

8. IANA Considerations

IANA is requested to issue a new type code and mnemonic for the proposed resource record. No other IANA services are required by this document.

9. Acknowledgements

The author would like to thank Ben Timms, John Cundall, John Tidmuss and Lawrence Conroy for their constructive suggestions to this document and for helping to identify potential uses for the proposed record type.

10. References

10.1. Normative References

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