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DNS Scoped Data Through Attribute Leaves
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Abstract

Historically, any DNS RR may occur for any domain name. Recent additions have defined DNS leaf nodes that contain a reserved node name, beginning with an underscore. The underscore construct is used to define a semantic scope for the associated, parent domain name, within which the use of some RRs is constrained. Hence the underscore construct defines a basic paradigm modification to the DNS. This note explores the nature of this DNS usage and defines the

procedures for registering "underscore names" with IANA.

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1. Introduction

Historically, any DNS RR may occur for any domain name. The DNS technical specification assigns no semantics to domain names and no constraints upon which resource records may be associated with a particular name. Over time, some leaf node names, such as "www" and "ftp" have come to imply support for particular services, but this is a matter of operational convention, rather than defined semantics. This freedom in the basic technology has permitted a wide range of administrative and semantic policies to be used -- in parallel -- with the DNS. In the DNS, data semantics have been limited to the specifications of particular resource records, on the expectation that new ones would be added as needed. Although there remains the view that this method of enhancement is preferred, alternative approaches have been explored and gained widespread deployment.

Recent additions have defined DNS leaves that contain a reserved leaf node name, beginning with an underscore. The underscore construct is used to define a semantic scope for for the associated, parent domain name, within which the use of some RRs is constrained. Hence the underscore construct defines a basic paradigm modification to the DNS. Within the scope of a defined underscore leaf, the uses of specific resource records can be formally defined and constrained. An established example is the SRV record [[RFC2782](#)] which generalizes concepts long-used for email routing in the MX record.[\[RFC0974\]](#)[\[RFC2821\]](#) The use of special DNS names has significant benefits and detriments. Some of these are explored in [[I-D.iab-dns-choices](#)].

[Comment]: The term "resolution context" has been suggested, in place of "semantic scope". It is not yet clear what resolution is being given particular context by this proposal, whereas the intent behind the phrase "semantic scope" is to note that the interpretation -- ie, semantics -- of particular RRs is constrained. [/Dave]

One use that has perhaps not been noticed is that the underscore construct substantially changes possible concerns for scaling effects. For example, different uses for the same RR, such as the free-form TXT record, become manageable when those are defined to be within different, scoped leaf nodes.

This note discusses this enhancement, provides an explicit definition of it, and establishes an IANA registry for the reserved names beginning with underscore.

1.1. Disclaimer

This document does not seek to recommend or debate the merits of using sub-domain names that begin with underscore. The practise already exists, for multiple services. The sole goal for this document is to specify a registry for the underscore-based names that get used.

1.2. Procedural Model

NOTE: This procedure is modeled after that specified in [[RFC2489](#)].

"The author of a new DHCP option will follow these steps to obtain approval for the option and publication of the specification of the option as an RFC:

1. The author devises the new option.
2. The author documents the new option as an Internet Draft, choosing a node name that has not yet been registered.
3. The author submits the Internet Draft for publication as an RFC, either as an independent submission or as an IETF-approved document.
4. The specification of the new option is reviewed for publication by the appropriate bodies.
5. At the time of publication as an RFC, IANA formally lists the node name."

1.3. Discussion Venue

Discussion about this draft is directed to the `dnsop@lists.uoregon.edu` [[1](#)]mailing list of the IETF DNSOP Working Group [[2](#)].

2. Scaling Benefits and TXT and SRV Resource Records

It is intended that additional semantics, associated with a domain name, be provided by the definition and deployment of new resource records, the use of underscore-based naming is sometimes used to distinguish among different semantics for the same RR. The primary examples of this are TXT and SRV records.

In the case of TXT records, use for different semantics has developed organically and largely without coordination. Underscore-based names

therefore provide an administrative way of separating TXT records that might have different semantics, but otherwise would have no syntactic markers for distinguishing among them.

In the case of the SRV RR this method of distinguishing among uses was part of the design. [[RFC2782](#)] In reality, the SRV specification defines an RR that may only be used for specific applications when there is an additional specification. So the SRV specification is best thought of as a template for future specifications. The template definition includes reference to tables of names from which underscore-names should be drawn. So, the set of <service> names is defined in terms of other IANA tables, namely any table with symbolic names. The other SRV naming field is <proto>, although its pool of names is not explicitly defined.

3. IANA Considerations

IANA is requested to establish the DNS Underscore Name Registry, for DNS node names that begin with the underscore character and have been specified in any published RFC.

These documents provide specific meanings for specific resource records. They do not constrain the usage of resource records that are not specified. The purpose of this registry is to avoid collisions resulting from the use of the same underscore name, for different applications.

A request to register an entry in the DNS Underscore Name Registry MUST contain:

Name: Specifies the underscore name that is being reserved. The name may be multi-part. That is, it may cover more than one domain name field, such as "_sip._tcp".

RR(s) Specifies the Resource Records that are explicitly defined for the scope of this registration.

RFC(s) These specify the semantics for the RRs defined for use within the scope of the registered underscore name.

Initial entries in the registry comprise:

NAME	RR(s)	RFC
_sip._tcp	SRV	[RFC3263]
_sip._udp	SRV	[RFC3263]
_spf	TXT	[RFC4408]

Table 1: DNS Underscore Name Registry Initial Values

4. Security Considerations

This memo raises no security issues

5. References

5.1. References -- Normative

- [RFC2782] Gulbrandsen, A., Vixie, P., and L. Esibov, "A DNS RR for specifying the location of services (DNS SRV)", [RFC 2782](#), February 2000.
- [RFC3263] Rosenberg, J. and H. Schulzrinne, "Session Initiation Protocol (SIP): Locating SIP Servers", [RFC 3263](#), June 2002.
- [RFC4408] Wong, M. and W. Schlitt, "Sender Policy Framework (SPF) for Authorizing Use of Domains in E-Mail, Version 1", [RFC 4408](#), April 2006.

5.2. References -- Informative

- [I-D.iab-dns-choices] Faltstrom, P., "Design Choices When Expanding DNS", [draft-iab-dns-choices-03](#) (work in progress), April 2006.
- [RFC0974] Partridge, C., "Mail routing and the domain system", [RFC 974](#), January 1986.
- [RFC2489] Droms, R., "Procedure for Defining New DHCP Options", [BCP 29](#), [RFC 2489](#), January 1999.
- [RFC2821] Klensin, J., "Simple Mail Transfer Protocol", [RFC 2821](#), April 2001.

URIs

- [1] <mailto:dnsop@lists.uoregon.edu>
- [2] <<http://ietf.org/html.charters/dnsop-charter.html>>

Appendix A. Acknowledgements

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