Network Working Group
Internet-Draft
Intended status: Best Current Practice
Expires: January 9, 2008

D. Crocker
Brandenburg InternetWorking

July 8, 2007

DNS Scoped Data Through Attribute Leaves
draft-crocker-dns-attrleaf-03

Status of this Memo

Copyright Notice

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.

Table of Contents

1. Introduction

Historically, any DNS RR may occur for any domain name. The DNS technical specifications assign 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 reserved DNS node names, beginning with an underscore. The underscore construct is used to define a scope for the occurrence of particular resource records, notably particular uses of those RRs. 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 terms "resolution context" and "scoping rules" have been suggested, in place of "semantic scope". In order to avoid concern for matters of semantics, this specification uses the term "scoping rules", to create a focus on the mechanics being defined, rather than nuances of interpretation for the mechanism.

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

Some resource records are have a generic form, with additional rules of use, internal syntax, or naming node naming conventions to distinguish among particular types. The TXT and SRV records are the notable concern for this. Some of these approaches scale poorly, particularly when the same RR can be present in the same node, but with different uses. An approach with good scaling properties uses underscore-based names can be used to define sections with particular uses for particular RRs.

In the case of TXT records, use for different scoping rules has developed organically and largely without coordination. Underscore-based names therefore provide an administrative way of separating TXT

records that might have different uses, 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 a set of DNS Underscore Name Registries, for DNS node names that begin with the underscore character and have been specified in any published RFC.

The "DNS Underscore SCOPE Registry" creates the top-level of a potentially multi-field sequence of underscore names. Additional registries are defined by the specification that creates a particular underscore name, if it provides for subordinate underscore components.

The purpose of these tables is to define portions of the DNS for which there is a scope of use, with specific meanings for specific resource records, when they occur under the domain name having the underscore name(s). They do not constrain the usage of other resource records that are not specified. The purpose of the registries is to avoid collisions resulting from the use of the same underscore name, for different applications.

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

Name: Specifies a textual name for this scoped portion of the DNS. The name will usually be taken from the specification cited in the "Defined" column and is intended for use in discussions about the entry.

Label: Specifies the underscore name that is being reserved. The name may be specified directly or by citing a table of names, with the implication that a name from the table will be prefaced with an underscore. Referencing a table of names incorporates those names into the table, so as to create a set of additional entries.

Subordinate: Refers to a registry of underscore names that defines the next level of domain name field, below the current one. If this cell contains a reference, the RR cell must be empty.

RR(s): Specifies the Resource Records that are explicitly defined for the scope of this registration. The specification is either by directly listing the RR(s) or by citing a table of RRs. This cell in the table is to be empty, if the Subordinate cell contains a reference.

Defined: Specifies the particular use for specific RR(s), defined for use within the scope of the registered underscore name.

NAME	LABEL	SUBORDINATE	RR(s)	DEFINED
SRV TCP	_tcp	DNS SRV Underscore Name Registry (Table 2)		[RFC3263]
SRV UDP	_udp	DNS Underscore SRV Name Registry (Table 2)		[RFC3263]
SPF	_spf		TXT	[RFC4408]
URI	_e2u	ENUM (Table 3)		(new enumuri draft pending. /d)

Table 1: DNS Underscore SCOPE Name Registry (with initial values)

Initial entries in the registry comprise:

NAME	LABEL	SUBORDINATE	RR(s)	DEFINED

Table 2: DNS Underscore SRV Name Registry (with initial values)

NAME	LABEL	SUBORDINATE	RR(s)	DEFINED
ENUM (or E2U?)	_e2u		IANA Service Table enum-services; or RFC 3968, Section 6.5, <experimental-service>	(new enumuri draft pending. /d)

Table 3: DNS Underscore ENUM Name Registry (with 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-04 (work in progress), October 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

Thanks go to Bill Fenner, Tony Hansen, Peter Koch, Olaf Kolkman, and Andrew Sullivan for diligent review.

Author's Address

Dave Crocker
Brandenburg InternetWorking
675 Spruce Dr.
Sunnyvale, CA 94086
USA

Phone: +1.408.246.8253
Email: dcrocker@bbiw.net
URI: http://bbiw.net/

Full Copyright Statement

Intellectual Property

Acknowledgment

Funding for the RFC Editor function is provided by the IETF Administrative Support Activity (IASA).