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DNS Attrleaf Changes: Fixing Specifications with Underscored Node Name Use
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Abstract

Original uses of an underscore character as a domain node name prefix, which creates a space for constrained interpretation of resource records, were specified without the benefit of an IANA registry. This produced an entirely uncoordinated set of name-creation activities, all drawing from the same namespace. A registry now has been defined. However the existing specifications that use underscore naming need to be modified, to be in line with the new registry. This document specifies those changes. The changes preserve existing software and operational practice, while adapting the specifications for those practices to the newer underscore registry model.

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1. Introduction

Original uses of an underscore character as a domain node name [RFC1035] prefix, which creates a space for constrained interpretation of resource records, were specified without the benefit of an [IANA-reg] registry. This produced an entirely uncoordinated set of name-creation activities, all drawing from the same namespace. A registry has been now defined, and that document discusses the background for underscored domain name use [Attrleaf].

The basic model for underscored name registration, as specified in [Attrleaf], is to have each registry entry be unique in terms of the combination of a resource record type and a 'global' (highest-level) underscored name; that is, the node name beginning with an underscore, which is the closest to the DNS root.

The existing uses of underscored naming have specifications that do not reflect the existence of this integrated registry. For the new reader or the new editor of one of those documents, there is currently nothing signaling that the underscore name(s) defined in the document are now processed through an IANA registry. This document remedies that, by marking such a published document with an update, indicating the nature of the change.

Further, the documents that define the SRV [RFC2782] and URI [RFC7553] DNS resource records provide a meta-template for underscored name assignments, partially based on separate registries [RFC6335]. For the portion that selects the global (highest-level) underscored name, this perpetuates uncoordinated assignment activities by separate technical specifications, out of the same name space. This document remedies that by providing detail for revisions to the SRV and URI specifications, to bring their use in line with the single, integrated global underscore registry.

The result of these changes preserves existing software and operations practices, while adapting the technical specifications to the newer underscore registry model.

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 [RFC2119].

2. Underscored RRset Use in Specifications

The use of underscored node names is specific to each RRTYPE that is being scoped. Each name defines a place, but does not define the rules for what appears underneath that place, either as additional underscored naming or as a leaf node with resource records. Details for those rules are provided by specifications for individual RRTYPEs. The sections below describe the way that existing underscore labels are used with the RRTYPEs that they name.

2.1. TXT RRset Use

This section provides a generic approach for changes to existing specifications that define straightforward use of underscored node names, when scoping the use of a "TXT" RRset. The approach provides the information needed for adapting such specifications to the use of the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf]. Hence the approach is meant both as an update to these existing specifications, and as guidance for changes when those documents are revised.

For any document that specifies the use of a "TXT" RRset under one or more underscored names, that 'global' name is expected to be registered in the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf]. An effort has been made to locate existing drafts that do this, register the global underscored names, and list them in this document.

If a public specification that defines use of a "TXT" calls for the use of an underscore-prefixed domain name, the global underscored name -- the one closest to the root -- MUST be entered into this registry, if it is not already registered.

Here is a template of suggested text for this to appear in the IANA Considerations section of the specification:

> "Per" [Attrleaf] "please add the following entry to the DNS Underscore Global Scoped Entry Registry:"

RR Type	_NODE NAME	REFERENCE
TXT	_{DNS node name}	{citation for the document making the addition.}

Table 1: Underscore Global Registry Entry

2.2. SRV RRset Use

Specification for the SRV [RFC2782] resource record provides a template for use of underscored node names. The global name is characterised as referencing the 'protocol' that is associated with "SRV" RRset usage.

This section provides a generic approach for changes to existing specifications that define the use of an "SRV" RRset. The approach provides the information needed for adapting such specifications to the use of the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf]. Hence the approach is meant both as an update to these existing specifications, and as guidance for changes when those documents are revised.

For any document that specifies the use of an "SRV" RRset, the global ('protocol') underscored name is expected to be registered in the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf]. An effort has been made to locate existing drafts that do this, register the global underscored names, and list them in this document.

If a public specification that defines use of a "SRV" calls for the use of an underscore-prefixed domain name, the global underscored name -- the one closest to the root -- MUST be entered into this registry, if it is not already registered.

Here is a template of suggested text for this to appear in the IANA Considerations section of the specification:

> "Per" [Attrleaf] "please add the following entry to the DNS Underscore Global Scoped Entry Registry:"

RR Type	_NODE NAME	REFERENCE
SRV	_{DNS 'protocol' node name}	{citation for the document making the addition.}

Table 2: Underscore Global Registry Entry

2.3. URI RRset Use

Specification for the URI [RFC7553] resource record provides a template for use of underscored node names. The global name is characterised as naming the 'protocol' that is associated with "URI" RR usage or by reversing an Enumservice sequence [RFC6117].

This section provides a generic approach for changes to existing specifications that define use of a "URI" RRset. The approach provides the information needed for adapting such specifications to the use of the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf]. Hence the approach is meant both as an update to these existing specifications, and as guidance for changes when those documents are revised.

For any document that specifies the use of a "URI" RRset, the global ('protocol' or highest-level enumservice) underscored name is expected to be registered in the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf]. An effort has been made to locate existing drafts that do this and register the associated 'protocol' names.

If a public specification that defines use of a "URI" calls for the use of an underscore-prefixed domain name, the global underscored name -- the one closest to the root -- MUST be entered into this registry, if it is not already registered.

Here is a template of suggested text for this to appear in the IANA Considerations section of the specification:

"Per" [Attrleaf] "please add the following entry to the DNS Underscore Global Scoped Entry Registry:"

RR Type	_NODE NAME	REFERENCE
URI	_{DNS 'protocol' or Enumservice node name}	{citation for the document making the addition.}

Table 3: Underscore Global Registry Entry

3. Underscored Template Specifications

3.1. SRV Specification Changes

The specification for a domain name under, which an SRV [RFC2782] resource record appears, provides a template for use of underscored node names. The global underscored name, is characterised as indicating the 'protocol' that is associated with "SRV" RR usage.

The text of that existing specification is hereby updated from:

The format of the SRV RR

Here is the format of the SRV RR, whose DNS type code is 33:
_Service._Proto.Name TTL Class SRV Priority Weight Port Target
...
Proto
The symbolic name of the desired protocol, with an underscore (_) prepended to prevent collisions with DNS labels that occur in nature. _TCP and _UDP are at present the most useful values for this field, though any name defined by Assigned Numbers or locally may be used (as for Service). The Proto is case insensitive.

And is to be updated to the new text:

The format of the SRV RR

Here is the format of the SRV RR, whose DNS type code is 33:

"_Service._Proto.Name TTL Class SRV Priority Weight Port Target" _..._

Proto

The symbolic name of the desired protocol, with an underscore (_) prepended to prevent collisions with DNS labels that occur in nature. _TCP and _UDP are at present the most useful values for this field. The Proto is case insensitive.

The SRV RRset protocol (global) underscored name SHOULD be registered in the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf].

3.2. URI Specification Changes

Specification for the domain name under which a URI [RFC7553] resource record occurs is similar to that for the SRV [RFC2782] resource record, although the text refers only to 'service' name, rather than distinguishing 'service' from 'protocol'. Further, the URI RR specification permits alternative underscored naming schemes:

One matches what is used for "SRV", with the global underscored name called "protocol'.

The other is based on a reversing of an Enumservice [RFC6117] sequence.

The text of the existing specification is hereby updated from:

4.1. Owner Name, Class, and Type

The URI owner name is subject to special conventions.

Just like the SRV RR [RFC2782], the URI RR has service information encoded in its owner name. In order to encode the service for a specific owner name, one uses service parameters. Valid service parameters are those registered by IANA in the "Service Name and Transport Protocol Port Number Registry" [RFC6335] or as "Enumservice
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Registrations [RFC6117]. The Enumservice Registration parameters are reversed (i.e., subtype(s) before type), prepended with an underscore (_), and prepended to the owner name in separate labels. The underscore is prepended to the service parameters to avoid collisions with DNS labels that occur in nature, and the order is reversed to make it possible to do delegations, if needed, to different zones (and therefore providers of DNS).

For example, suppose we are looking for the URI for a service with ENUM Service Parameter "A:B:C" for host example.com. Then we would query for (QNAME,QTYPE)=("_C._B._A.example.com","URI").

As another example, suppose we are looking for the URI for a service with Service Name "A" and Transport Protocol "B" for host example.com. Then we would query for (QNAME,QTYPE)=("_A._B.example.com","URI").

And is to be updated to the new text:

> 4.1. Owner Name, Class, and Type
>
> The URI owner name is subject to special conventions.
>
> As for the SRV RRset [RFC2782], the URI RRset global (highest-level) underscored name SHOULD be registered in the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf].
>
> Just like the SRV RRset, the URI RRset has service information encoded in its owner name. In order to encode the service for a specific owner name, one uses service parameters. Valid service parameters are:
>
> + Those registered by IANA in the "Service Name and Transport Protocol Port Number Registry [RFC6335]" The underscore is prepended to the service parameters to avoid collisions with DNS labels that occur in nature, and the order is reversed

to make it possible to do delegations, if needed, to different zones (and therefore providers of DNS).

+ Those listed in "Enumservice Registrations [RFC6117]. The Enumservice Registration parameters are reversed (i.e., subtype(s) before type), prepended with an underscore (_), and prepended to the owner name in separate labels. The highest-level (global) underscored Enumservice name becomes the global Attrleaf name to register.

For example, suppose we are looking for the URI for a service with ENUM Service Parameter "A:B:C" for host example.com. Then we would query for (QNAME,QTYPE)=("_C._B._A.example.com","URI").

As another example, suppose we are looking for the URI for a service with Service Name "A" and Transport Protocol "B" for host example.com. Then we would query for (QNAME,QTYPE)=("_A._B.example.com","URI").

4. IANA Considerations

Although this document makes reference to IANA registries, it introduces no new IANA registries or procedures.

5. Security Considerations

This memo raises no security issues.

6. References

6.1. Normative References

[Attrleaf] Crocker, D., "DNS Scoped Data Through 'Underscore' Naming of Attribute Leaves", I-D draft-ietf-dnsop-attrleaf, 2018.

[RFC6117] Hoeneisen, B., Mayrhofer, A., and J. Livingood, "IANA Registration of Enumservices: Guide, Template, and IANA Considerations", RFC 6117, March 2011.

[RFC6335] Cotton, M., Eggert, L., Tpuch, J., Westerlund, M., and S. Cheshire, "Internet Assigned Numbers Authority (IANA) Procedures for the Management of the Service Name and Transport Protocol Port Number Registry", RFC 6335, Aug 2011.

[RFC7553] Falstrom, P. and O. Kolkman, "The Uniform Resource Identifier (URI) DNS Resource Record", RFC 7553, ISSN 2070-1721, June 2015.

6.2. References -- Informative

[IANA-reg] "Protocol Registries", URL https://www.iana.org/protocols, 2018.

[RFC1035] Mockapetris, P., "Domain names - implementation and specification", STD 13, RFC 1035, November 1987.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[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.

[RFC3404] Mealling, M., "Dynamic Delegation Discovery System (DDDS) Part Four: The Uniform Resource Identifiers (URI) Resolution Application", RFC 3404, October 2002.

[RFC3529] Harold, W., "Using Extensible Markup Language-Remote Procedure Calling (XML-RPC) in Blocks Extensible Exchange Protocol (BEEP)", RFC 3529, April 2003.

[RFC3620] New, D., "The TUNNEL Profile", RFC 3620, October 2003.

[RFC3832] Columbia University, Columbia University, Sun Microsystems, IBM, and IBM, "Remote Service Discovery in the Service Location Protocol (SLP) via DNS SRV", RFC 3832, July 2004.

[RFC3861] Peterson, J., "Address Resolution for Instant Messaging and Presence", RFC 3861, August 2004.

[RFC3887] "Message Tracking Query Protocol", RFC 3887, September 2007.

[RFC3958] Daigle, L. and A. Newton, "Domain-Based Application Service Location Using SRV RRs and the Dynamic Delegation Discovery Service (DDDS)", RFC 3958, January 2005.

[RFC4120] USC-ISI, MIT, MIT, and MIT, "The Kerberos Network Authentication Service (V5)", RFC 4120, July 2005.

[RFC4227] O'Tuathail, E. and M. Rose, "Using the Simple Object Access Protocol (SOAP) in Blocks Extensible Exchange Protocol (BEEP)", RFC 4227, January 2006.

[RFC4386] Boeyen, S. and P. Hallam-Baker, "Internet X.509 Public Key Infrastructure: Repository Locator Service", RFC 4386, February 2006.

[RFC4387] Gutmann, P., Ed., "Internet X.509 Public Key Infrastructure Operational Protocols: Certificate Store Access via HTTP", RFC 4387, February 2006.

[RFC4976] Jennings, C., Mahy, R., and Roach, "Relay Extensions for the Message Session Relay Protocol (MSRP)", RFC 4976, September 2007.

[RFC5026] Giaretta, G., Ed., Kempf, J., and V. Devarapalli, Ed., "Mobile IPv6 Bootstrapping in Split Scenario", RFC 5026, October 2007.

[RFC5328] Adolf, A. and P. MacAvock, "A Uniform Resource Name (URN) Namespace for the Digital Video Broadcasting Project (DVB)", RFC 5328, September 2008.

[RFC5389] Rosenberg, Mahy, Matthews, and Wing, "Session Traversal Utilities for NAT (STUN)", RFC 5389, October 2008.

[RFC5415] Calhoun, P., Ed., Montemurro, M., Ed., and D. Stanley, Ed., "Control And Provisioning of Wireless Access Points (CAPWAP) Protocol Specification", RFC 5415, March 2009.

[RFC5518] Hoffman, P., Levine, J., and A. Hathcock, "Vouch By Reference", RFC 5518, April 2009.

[RFC5555] Soliman, H., Ed., "Mobile IPv6 Support for Dual Stack Hosts and Routers", RFC 5555, June 2009.

[RFC5617] Sendmail, Inc., Cisco Systems, Inc., Yahoo! Inc., and Taughannock Networks, "DomainKeys Identified Mail (DKIM) Author Domain Signing Practices (ADSP)", RFC 5617, August 2009.

[RFC5679] Bajko, G., "Locating IEEE 802.21 Mobility Services Using DNS", RFC 5679, December 2009.

[RFC5766] Mahy, R., Matthews, P., and J. Rosenberg, "Traversal Using Relays around NAT (TURN): Relay Extensions to Session Traversal Utilities for NAT (STUN)", RFC 5766, April 2010.

[RFC5780] MacDonald, D. and B. Lowekamp, "NAT Behavior Discovery Using Session Traversal Utilities for NAT (STUN)", RFC 5780, May 2010.

[RFC5804] Melnikov, A., Ed. and T. Martin, "A Protocol for Remotely Managing Sieve Scripts", RFC 5804, July 2010.

[RFC5864] Allbery, R., "NS SRV Resource Records for AFS", RFC 5864, April 2010.

[RFC5928] Petit-Huguenin, M., "Traversal Using Relays around NAT (TURN) Resolution Mechanism", RFC 5928, August 2010.

[RFC6011] Lawrence, S., Ed. and J. Elwell, "Session Initiation Protocol (SIP) User Agent Configuration", RFC 6011, October 2010.

[RFC6120] Saint-Andre, P., "Extensible Messaging and Presence Protocol (XMPP): Core", RFC 6120, March 2011.

[RFC6186] Daboo, C., "Use of SRV Records for Locating Email Submission/Access Services", RFC 6186, March 2011.

[RFC6376] Crocker, D., Hansen, T., and M. Kucherawy, "DomainKeys Identified Mail (DKIM) Signatures", RFC 6376, Sept 2011.

[RFC6733] Fajardo, V., Arkko, J., Loughney, J., and G. Zorn, "Diameter Base Protocol", RFC 6733, October 2012.

[RFC7208] Kitterman, S., "Sender Policy Framework (SPF) for Authorizing Use of Domains in E-Mail, Version 1", RFC 7208, April 2014.

[RFC7489] Kucherawy, M., Ed. and E. Zwicky, Ed., "Domain-based Message Authentication, Reporting, and Conformance (DMARC)", RFC 7489, March 2015.

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