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.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on May 24, 2019.
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", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP14 [RFC2119] when, and only when, they appear in all capitals, as shown here.

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

NOTE - Documents falling into this category include:
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, the ‘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 the initial set of names added to the registry.

If a public specification defines use of a TXT RRset and calls for the use of an underscore-prefixed domain name, here is a template of suggested text for registering the global underscored name -- the one closest to the root -- through the IANA Considerations section of the specification:

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

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

Table 1: Underscore Global Registry Entry for TXT RR Use

2.2. SRV RRset Use

NOTE - Documents falling into this category include:

[RFC3263], [RFC3529], [RFC3620], [RFC3832], [RFC3887], [RFC3958], [RFC4120], [RFC4227], [RFC4386], [RFC4387], [RFC4976], [RFC5026], [RFC5328], [RFC5389], [RFC5415], [RFC6763], [RFC6120], [RFC5518], [RFC5617], [RFC6376], [RFC7208], and [RFC7489]
Specification of 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 the initial set of names added to the registry.

If a public specification defines use of a SRV RRset and calls for the use of an underscore-prefixed domain name, here is a template of suggested text for registering the global underscored name -- the one closest to the root -- through the IANA Considerations section of the specification:

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

<table>
<thead>
<tr>
<th>RR Type</th>
<th>NODE NAME</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRV</td>
<td>_{DNS 'protocol' node name}</td>
<td>{citation for the document making the addition.}</td>
</tr>
</tbody>
</table>

Table 2: Underscore Global Registry Entry for SRV RR Use

2.3. URI RRset Use

Specification of 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, register the global underscored names, and list them in the initial set of names added to the registry.

If a public specification defines use of a URI RRset and calls for the use of an underscore-prefixed domain name, here is a template of suggested text for registering the global underscored name — the one closest to the root -- through the IANA Considerations section of the specification:

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

<table>
<thead>
<tr>
<th>RR</th>
<th>NODE NAME</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>URI</td>
<td>_{DNS 'protocol' or Enumservice node name}</td>
<td>{citation for the document making the addition.}</td>
</tr>
</tbody>
</table>

Table 3: Underscore Global Registry Entry for URI RR Use

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.

Text of that existing specification is changed as follows:

OLD:
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.

NEW:

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.

Text of that existing specification is changed as follows:

OLD:

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 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").

NEW:

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").

### 3.3. DNSSEC Signaling Specification Changes

"Signaling Trust Anchor Knowledge in DNS Security Extensions (DNSSEC)" [RFC8145] defines a use of DNS node names that effectively consumes all names beginning with the string ".-_ta-", when using the NULL RR in the query.

Text of Section 5.1, "Query Format", of that existing specification, is changed as follows:

OLD:

For example, a validating DNS resolver ...

QNAME=_ta-4444.

NEW:

For example, a validating DNS resolver ... "QNAME=_ta-4444".
Under the NULL RR, an entry is registered in the IANA DNS Underscore Global Scoped Entry Registry [Attrleaf] for all node names beginning with "_ta-".

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]


6.2. References -- Informative

[IANA-reg]


Appendix A. Acknowledgements

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Author’s Address