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Revised IANA Considerations for DNSSEC

Abstract

   This document changes the review requirements needed to get DNSSEC
   algorithms and resource records added to IANA registries. It updates
   RFC 6014 to include hash algorithms for Delegation Signer (DS)
   records and NextSECure version 3 (NSEC3) parameters (for Hashed
   Authenticated Denial of Existence). It also updates RFCs 5155 and
   6014, which have requirements for DNSSEC algorithms, and updates RFC
   8624 to clarify the implementation recommendation related to the
   algorithms described in RFCs that are not on the standards track.
   The rationale for these changes is to bring the requirements for DS
   records and hash algorithms used in NSEC3 in line with the
   requirements for all other DNSSEC algorithms.

Table of Contents

1. Introduction

DNSSEC is primarily described in [RFC4033], [RFC4034], and [RFC4035].
DNSSEC commonly uses another resource record beyond those defined in
[RFC4034]: NSEC3 [RFC5155]. DS resource records were originally
defined in [RFC3658], and that definition was obsoleted by [RFC4034].

[RFC6014] updates the requirements for how DNSSEC cryptographic
algorithm identifiers in the IANA registries are assigned, reducing
the requirements from "Standards Action" to "RFC Required". However,
the IANA registry requirements for hash algorithms for DS records
[RFC3658] and for the hash algorithms used in NSEC3 records [RFC5155]
are still "Standards Action". This document updates those IANA
registry requirements. (For a reference on how IANA registries can
be updated in general, see [RFC8126].)

1.1. Requirements Language

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
BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all
capitals, as shown here.

2. Update to RFC 6014

Section 4 updates [RFC6014] to bring the requirements for DS records
and NSEC3 hash algorithms in line with the rest of the DNSSEC
cryptographic algorithms by allowing any DS hash algorithms, NSEC3
hash algorithms, NSEC3 parameters, and NSEC3 flags that are fully
described in an RFC to have identifiers assigned in the IANA
registries. This is an addition to the IANA considerations in
[RFC6014].

3. Update to RFC 8624

This document updates [RFC8624] for all DNSKEY and DS algorithms that
are not on the standards track.

The second paragraph of Section 1.2 of [RFC8624] currently says:

| This document only provides recommendations with respect to
| mandatory-to-implement algorithms or algorithms so weak that they
| cannot be recommended. Any algorithm listed in the [DNSKEY-IANA]
| and [DS-IANA] registries that are not mentioned in this document
| MAY be implemented. For clarification and consistency, an
| algorithm will be specified as MAY in this document only when it
| has been downgraded from a MUST or a RECOMMENDED to a MAY.

That paragraph is now replaced with the following:

| This document provides recommendations with respect to mandatory-
| to-implement algorithms, algorithms so weak that they cannot be
| recommended, and algorithms defined in RFCs that are not on the
| standards track. Any algorithm listed in the [DNSKEY-IANA] and
| [DS-IANA] registries that are not mentioned in this document MAY
| be implemented. For clarification and consistency, an algorithm
| will be specified as MAY in this document only when it has been
| downgraded from a MUST or a RECOMMENDED to a MAY.

This update is also reflected in the IANA considerations in
Section 4.

4. IANA Considerations

In the "Domain Name System Security (DNSSEC) NextSECure3 (NSEC3)
Parameters" registry, the registration procedure for "DNSSEC NSEC3
Flags", "DNSSEC NSEC3 Hash Algorithms", and "DNSSEC NSEC3PARAM Flags"
has been changed from "Standards Action" to "RFC Required", and this
document has been added as a reference.

In the "DNSSEC Delegation Signer (DS) Resource Record (RR) Type

Digest Algorithms" registry, the registration procedure for "Digest
Algorithms" has been changed from "Standards Action" to "RFC
Required", and this document has been added as a reference.

5. Security Considerations

Changing the requirements for adding security algorithms to IANA
registries as described in this document will make it easier to add
both good and bad algorithms to the registries. It is impossible to
weigh the security impact of those two changes.

Administrators of DNSSEC-signed zones and validating resolvers may
have been making security decisions based on the contents of the IANA
registries. This was a bad idea in the past, and now it is an even
worse idea because there will be more algorithms in those registries
that may not have gone through IETF review. Security decisions about
which algorithms are safe and not safe should be made by reading the
security literature, not by looking in IANA registries.

6. References

6.1. Normative References

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   [RFC4034] Arends, R., Austein, R., Larson, M., Massey, D., and S.
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   [RFC5155] Laurie, B., Sisson, G., Arends, R., and D. Blacka, "DNS
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              November 2010, <https://www.rfc-editor.org/info/rfc6014>.

   [RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for
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              May 2017, <https://www.rfc-editor.org/info/rfc8174>.

   [RFC8624] Wouters, P. and O. Sury, "Algorithm Implementation
              Requirements and Usage Guidance for DNSSEC", RFC 8624,
              DOI 10.17487/RFC8624, June 2019,
              <https://www.rfc-editor.org/info/rfc8624>.

6.2. Informative References

   [RFC3658] Gudmundsson, O., "Delegation Signer (DS) Resource Record
              (RR)", RFC 3658, DOI 10.17487/RFC3658, December 2003,
              <https://www.rfc-editor.org/info/rfc3658>.

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