Network Working Group
Internet-Draft
Intended status: Informational
Expires: 24 February 2021

E. Foudil

Y. Shafranovich
Nightwatch Cybersecurity

23 August 2020

# A File Format to Aid in Security Vulnerability Disclosure
## draft-foudil-securitytxt-10

Abstract

When security vulnerabilities are discovered by researchers, proper reporting channels are often lacking. As a result, vulnerabilities may be left unreported. This document defines a format ("security.txt") to help organizations describe their vulnerability disclosure practices to make it easier for researchers to report vulnerabilities.

Table of Contents

## 1. Introduction

### 1.1. Motivation, Prior Work and Scope

Many security researchers encounter situations where they are unable to report security vulnerabilities to organizations because there are no reporting channels to contact the owner of a particular resource and no information available about the vulnerability disclosure practices of such owner.

As per section 4 of [RFC2142], there is an existing convention of using the <SECURITY@domain> email address for communications regarding security vulnerabilities. That convention provides only a single, email-based channel of communication for security vulnerabilities per domain, and does not provide a way for domain owners to publish information about their security disclosure practices.

There are also contact conventions prescribed for Internet Service Providers (ISPs) in section 2 of [RFC3013], for Computer Security Incident Response Teams (CSIRTs) in section 3.2 of [RFC2350] and for site operators in section 5.2 of [RFC2196]. As per [RFC7485], there is also contact information provided by Regional Internet Registries (RIRs) and domain registries for owners of IP addresses, autonomous system numbers (ASNs), and domain names. However, none of these address the issue of how security researchers can locate contact information and vulnerability disclosure practices for organizations in order to report vulnerabilities.

In this document, we define a richer and more extensible way for organizations to communicate information about their security disclosure practices and ways to contact them. Other details of vulnerability disclosure are outside the scope of this document. Readers are encouraged to consult other documents such as [ISO.29147.2018] or [CERT.CVD].

As per [CERT.CVD], "vulnerability response" refers to reports of product vulnerabilities which is related but distinct from reports of network intrusions and compromised websites ("incident response"). The mechanism defined in this document is intended to be used for the former ("vulnerability response"). If implementors want to utilize this mechanism for incident response, they should be aware of additional security considerations discussed in Section 6.1.

The "security.txt" file is intended to be complementary and not as a substitute or replacement for other public resources maintained by organizations regarding their security disclosure practices.

### 1.2. Terminology

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. Note to Readers

> *Note to the RFC Editor:* Please remove this section prior to publication.

Development of this draft takes place on Github at: https://github.com/securitytxt/security-txt

## 3. The Specification

This document defines a text file to be placed in a known location that provides information about the vulnerability disclosure practices of a particular organization. This is intended to help security researchers when disclosing security vulnerabilities.

By convention, the file is named "security.txt".

When made available on HTTP servers, it MUST be placed under the /.well-known/ path (as "/.well-known/security.txt") [RFC8615] of a domain name or IP address. For legacy compatibility, a security.txt file might be placed at the top level path (see Section 4.1). For file systems a "security.txt" file SHOULD be placed in the root directory of the file system.

On HTTP servers, the file MUST be accessed via HTTP 1.0 or a higher version and the "https" scheme (as per [RFC1945] and section 2.7.2 of [RFC7230]). It MUST have a Content-Type of "text/plain" with the default charset parameter set to "utf-8" (as per section 4.1.3 of [RFC2046]).

This text file contains multiple fields with different values. A field contains a "name" which is the first part of a field all the way up to the colon ("Contact:") and follows the syntax defined for "field-name" in section 3.6.8 of [RFC5322]. Field names are case-insensitive (as per section 2.3 of [RFC5234]). The "value" comes after the field name ("https://example.com/security") and follows the syntax defined for "unstructured" in section 3.2.5 of [RFC5322]. The file may also contain blank lines.

A "field" MUST always consist of a name and a value ("Contact: https://example.com/security"). A security.txt file can have an unlimited number of fields. It is important to note that each field MUST appear on its own line. Unless specified otherwise by the field definition, multiple values MUST NOT be chained together for a single field. Unless otherwise indicated in a definition of a particular field, any field MAY appear multiple times.

Implementors should be aware that some of the fields may contain URIs using percent-encoding (as per section 2.1 of [RFC3986]).

### 3.1. Scope of the File

For HTTP servers, a "security.txt" file MUST only apply to the domain or IP address in the URI used to retrieve it, not to any of its subdomains or parent domains.

A "security.txt" file that is found in a file system MUST only apply to the folder in which it is located and that folder's subfolders. The file does not apply to any of the folder's parent or sibling folders.

A "security.txt" file MAY also apply to products and services provided by the organization publishing the file. Implementors SHOULD use the policy directive (as per Section 3.5.7) to provide additional details regarding scope and details of their vulnerability disclosure process.

Some examples appear below:

```
# The following only applies to example.com.
https://example.com/.well-known/security.txt

# This only applies to subdomain.example.com.
https://subdomain.example.com/.well-known/security.txt

# This security.txt file applies to IPv4 address of 192.0.2.0.
https://192.0.2.0/.well-known/security.txt

# This security.txt file applies to IPv6 address of 2001:db8:8:4::2.
https://[2001:db8:8:4::2]/.well-known/security.txt

# This file applies to the /example/folder1 directory and subfolders.
/example/folder1/security.txt
```

## 3.2. Comments

Any line beginning with the "#" (%x30) symbol MUST be interpreted as a comment. The content of the comment may contain any ASCII or Unicode characters in the %x21-7E and %x80-FFFFF ranges plus the tab (%x09) and space (%x20) characters.

Example:

```
# This is a comment.
```

## 3.3. Line Separator

Every line MUST end either with a carriage return and line feed characters (CRLF / %x0D %x0A) or just a line feed character (LF / %x0A).

## 3.4. Digital signature

It is RECOMMENDED that a security.txt file be digitally signed using an OpenPGP cleartext signature as described in section 7 of [RFC4880]. When digital signatures are used, it is also RECOMMENDED that implementors use the "Canonical" field (as per Section 3.5.2), thus allowing the digital signature to authenticate the location of the file.

When it comes to verifying the key used to generate the signature, it is always the security researcher's responsibility to make sure the key being used is indeed one they trust.

## 3.5. Field Definitions

### 3.5.1. Acknowledgments

This field indicates a link to a page where security researchers are recognized for their reports. The page being referenced should list individuals or organizations that reported security vulnerabilities and collaborated to remediate them. Organizations should be careful to limit the vulnerability information being published in order to prevent future attacks.

If this field indicates a web URL, then it MUST begin with "https://" (as per section 2.7.2 of [RFC7230]).

Example:

Acknowledgments: https://example.com/hall-of-fame.html

Example security acknowledgments page:

We would like to thank the following researchers:

(2017-04-15) Frank Denis - Reflected cross-site scripting
(2017-01-02) Alice Quinn  - SQL injection
(2016-12-24) John Buchner - Stored cross-site scripting
(2016-06-10) Anna Richmond - A server configuration issue

### 3.5.2. Canonical

This field indicates the canonical URIs where the security.txt file is located, which is usually something like "https://example.com/.well-known/security.txt". If this field indicates a web URL, then it MUST begin with "https://" (as per section 2.7.2 of [RFC7230]). The purpose of this field is to allow a digital signature to be applied to the locations of the "security.txt" file.

Canonical: https://www.example.com/.well-known/security.txt
Canonical: https://someserver.example.com/.well-known/security.txt

### 3.5.3. Contact

This field indicates an address that researchers should use for reporting security vulnerabilities such as an email address, a phone number and/or a web page with contact information. The "Contact" field MUST always be present in a security.txt file. If this field indicates a web URL, then it MUST begin with "https://" (as per section 2.7.2 of [RFC7230]). Security email addresses should use the conventions defined in section 4 of [RFC2142].

The value MUST follow the URI syntax described in [RFC3986]. This means that "mailto" and "tel" URI schemes must be used when specifying email addresses and telephone numbers, as defined in [RFC6068] and [RFC3966]. When the value of this field is an email address, it is RECOMMENDED that encryption be used (as per Section 3.5.4).

The precedence SHOULD be in listed order. The first field is the preferred method of contact. In the example below, the email address is the preferred method of contact.

```
Contact: mailto:security@example.com
Contact: mailto:security%2Buri%2Bencoded@example.com
Contact: tel:+1-201-555-0123
Contact: https://example.com/security-contact.html
```

### 3.5.4. Encryption

This field indicates an encryption key that security researchers should use for encrypted communication. Keys MUST NOT appear in this field - instead the value of this field MUST be a URI pointing to a location where the key can be retrieved. If this field indicates a web URL, then it MUST begin with "https://" (as per section 2.7.2 of [RFC7230]).

When it comes to verifying the authenticity of the key, it is always the security researcher's responsibility to make sure the key being specified is indeed one they trust. Researchers must not assume that this key is used to generate the digital signature referenced in Section 3.4.

Example of an OpenPGP key available from a web server:

```
Encryption: https://example.com/pgp-key.txt
```

Example of an OpenPGP key available from an OPENPGPKEY DNS record:

```
Encryption: dns:5d2d37ab76d47d36._openpgpkey.example.com?type=OPENPGPKEY
```

Example of an OpenPGP key being referenced by its fingerprint:

Encryption: openpgp4fpr:5f2de5521c63a801ab59ccb603d49de44b29100f

### 3.5.5. Expires

This field indicates the date and time after which the data contained in the "security.txt" file is considered stale and should not be used (as per Section 6.3). The value of this field follows the format defined in section 3.3 of [RFC5322]. It is RECOMMENDED that the value of this field be less than a year into the future to avoid staleness.

This field MUST always be present and MUST NOT appear more than once.

Expires: Thu, 31 Dec 2020 18:37:07 -0800

### 3.5.6. Hiring

The "Hiring" field is used for linking to the vendor's security-related job positions. If this field indicates a web URL, then it MUST begin with "https://" (as per section 2.7.2 of [RFC7230]).

Hiring: https://example.com/jobs.html

### 3.5.7. Policy

This field indicates a link to where the vulnerability disclosure policy is located. This can help security researchers understand the organization's vulnerability reporting practices. If this field indicates a web URL, then it MUST begin with "https://" (as per section 2.7.2 of [RFC7230]).

Example:

Policy: https://example.com/disclosure-policy.html

### 3.5.8. Preferred-Languages

This field can be used to indicate a set of natural languages that are preferred when submitting security reports. This set MAY list multiple values, separated by commas. If this field is included then at least one value MUST be listed. The values within this set are language tags (as defined in [RFC5646]). If this field is absent, security researchers may assume that English is the language to be used (as per section 4.5 of [RFC2277]).

The order in which they appear MUST NOT be interpreted as an indication of priority - rather these MUST be interpreted as all being of equal priority.

This field MUST NOT appear more than once.

Example (English, Spanish and French):

Preferred-Languages: en, es, fr

### 3.6. Example of an unsigned "security.txt" file

```
# Our security address
Contact: mailto:security@example.com

# Our OpenPGP key
Encryption: https://example.com/pgp-key.txt

# Our security policy
Policy: https://example.com/security-policy.html

# Our security acknowledgments page
Acknowledgments: https://example.com/hall-of-fame.html
```

### 3.7. Example of a signed "security.txt" file

```
----BEGIN PGP SIGNED MESSAGE-----
Hash: SHA256

# Canonical URL
Canonical: https://example.com/.well-known/security.txt

# Our security address
Contact: mailto:security@example.com

# Our OpenPGP key
Encryption: https://example.com/pgp-key.txt

# Our security policy
Policy: https://example.com/security-policy.html

# Our security acknowledgments page
Acknowledgments: https://example.com/hall-of-fame.html
-----BEGIN PGP SIGNATURE-----
Version: GnuPG v2.2

[signature]
-----END PGP SIGNATURE-----
```

## 4. Location of the security.txt file

### 4.1. Web-based services

Web-based services MUST place the security.txt file under the "/.well-known/" path; e.g. https://example.com/.well-known/security.txt as per [RFC8615]. For legacy compatibility, a security.txt file might be placed at the top-level path or redirect (as per section 6.4 of [RFC7231]) to the security.txt file under the "/.well-known/" path. If a "security.txt" file is present in both locations, the one in the "/.well-known/" path MUST be used.

Retrieval of "security.txt" files and resources indicated within such files may result in a redirect (as per section 6.4 of [RFC7231]). Researchers should perform additional triage (as per Section 6.2) to make sure these redirects are not malicious or pointing to resources controlled by an attacker.

### 4.2. Filesystems

File systems SHOULD place the "security.txt" file under the root directory; e.g., "/security.txt", "C:\security.txt".

Example file system:

```
/example-directory-1/
/example-directory-2/
/example-directory-3/
/example-file
/security.txt
```

### 4.3. Extensibility

Like many other formats and protocols, this format may need to be extended over time to fit the ever-changing landscape of the Internet. Therefore, extensibility is provided via an IANA registry for fields as defined in Section 7.2. Any fields registered via that process MUST be considered optional. To encourage extensibility and interoperability, implementors MUST ignore any fields they do not explicitly support.

In general, implementors should "be conservative in what you do, be liberal in what you accept from others" (as per [RFC0793]).

## 5. File Format Description and ABNF Grammar

The expected file format of the security.txt file is plain text (MIME type "text/plain") as defined in section 4.1.3 of [RFC2046] and is encoded using UTF-8 [RFC3629] in Net-Unicode form [RFC5198].

The following is an ABNF definition of the security.txt format, using the conventions defined in [RFC5234].

```
body             =  signed / unsigned

signed           =  sign-header unsigned sign-footer

sign-header      =  < headers and line from section 7 of [RFC4880] >

sign-footer      =  < OpenPGP signature from section 7 of [RFC4880] >

unsigned         =  *line (contact-field eol)
                    *line (expires-field eol)
                    *line [lang-field eol] *line
                    ; order of fields within the file is not important

line             =  [ (field / comment) ] eol

eol              =  *WSP [CR] LF

field            =  ack-field /
                    can-field /
                    contact-field /
                    encryption-field /
                    hiring-field /
                    policy-field /
                    ext-field

fs               =  ":"

comment          =  "#" *(WSP / VCHAR / %x80-FFFFF)

ack-field        =  "Acknowledgments" fs SP uri

can-field        =  "Canonical" fs SP uri

contact-field    =  "Contact" fs SP uri

expires-field    =  "Expires" fs SP date-time

encryption-field =  "Encryption" fs SP uri
```

```
hiring-field     =  "Hiring" fs SP uri

lang-field       =  "Preferred-Languages" fs SP lang-values

policy-field     =  "Policy" fs SP uri

date-time        =  < imported from section 3.3 of [RFC5322] >

lang-tag         =  < Language-Tag from section 2.1 of [RFC5646] >

lang-values      =  lang-tag *(*WSP "," *WSP lang-tag)

uri              =  < URI as per [RFC3986] >

ext-field        =  field-name fs SP unstructured

field-name       =  < imported from section 3.6.8 of [RFC5322] >

unstructured     =  < imported from section 3.2.5 of [RFC5322] >
```

"ext-field" refers to extension fields, which are discussed in Section 4.3

## 6. Security Considerations

In addition to the security considerations of [RFC8615], the following considerations apply.

### 6.1. Compromised Files and Incident Response

An attacker that has compromised a website is able to compromise the "security.txt" file as well or setup a redirect to their own site. This can result in security reports not being received by the organization or sent to the attacker.

To protect against this, organizations should use the "Canonical" field to indicate the locations of the file (as per Section 3.5.2), digitally sign their "security.txt" files (as per Section 3.4), and regularly monitor the file and the referenced resources to detect tampering.

Security researchers should triage the "security.txt" file including verifying the digital signature and checking any available historical records before using the information contained in the file.  If the "security.txt" file looks suspicious or compromised, it should not be used.

While it is not recommended, implementors may choose to use the information published within a "security.txt" file for incident response. In such cases, extreme caution should be taken before trusting such information, since it may have been compromised by an attacker. Implementors should use additional methods to verify such data including out of band verification of the PGP signature, DNS-based approaches, etc.

### 6.2. Redirects

When retrieving the file and any resources referenced in the file, researchers should record any redirects since they can lead to a different domain or IP address controlled by an attacker. Further inspections of such redirects is recommended before using the information contained within the file.

### 6.3. Incorrect or Stale Information

If information and resources referenced in a "security.txt" file are incorrect or not kept up to date, this can result in security reports not being received by the organization or sent to incorrect contacts, thus exposing possible security issues to third parties. Not having a security.txt file may be preferable to having stale information in this file. Organizations must use the "Expires" field (see Section 3.5.5) to indicate to researchers when the data in the file is no longer valid.

Organizations should ensure that information in this file and any referenced resources such as web pages, email addresses, and telephone numbers are kept current, are accessible, controlled by the organization, and are kept secure.

### 6.4. Intentionally Malformed Files, Resources and Reports

It is possible for compromised or malicious sites to create files that are extraordinarily large or otherwise malformed in an attempt to discover or exploit weaknesses in parsing code. Implementors should make sure that any such code is robust against large or malformed files and fields and may choose not to parse files larger than 32 KBs, having fields longer than 2,048 characters or containing more than 1,000 lines. The ABNF grammar (as defined in Section 5) can also be used as a way to verify these files.

The same concerns apply to any other resources referenced within security.txt files, as well as any security reports received as a result of publishing this file. Such resources and reports may be hostile, malformed or malicious.

### 6.5. No Implied Permission for Testing

The presence of a security.txt file might be interpreted by researchers as providing permission to do security testing against that asset. This might result in increased testing against an organization by researchers. On the other hand, a decision not to publish a security.txt file might be interpreted by the organization operating that website to be a way to signal to researchers that permission to test that particular site or project is denied. This might result in pushback against researchers reporting security issues to that organization.

Therefore, implementors shouldn't assume that presence or absence of a "security.txt" file grants or denies permission for security testing. Any such permission may be indicated in the company's vulnerability disclosure policy (as per Section 3.5.7) or a new field (as per Section 4.3).

### 6.6. Multi-user Environments

In multi-user / multi-tenant environments, it may possible for a user to take over the location of the "security.txt" file. Organizations should reserve the "security.txt" namespace at the root to ensure no third-party can create a page with the "security.txt" AND "/.well-known/security.txt" names.

### 6.7. Protecting Data in Transit

To protect a "security.txt" file from being tampered with in transit, implementors should use HTTPS (as per [RFC2818]) when serving the file itself and for retrieval of any web URLs referenced in it (except when otherwise noted in this specification). As part of the TLS handshake, implementors should validate the provided X.509 certificate in accordance with [RFC6125] and the following considerations:

* Matching is performed only against the DNS-ID identifiers.

* DNS domain names in server certificates MAY contain the wildcard character '*' as the complete left-most label within the identifier.

The certificate may also be checked for revocation via the Online Certificate Status Protocol (OCSP) [RFC6960], certificate revocation lists (CRLs), or similar mechanisms.

In cases where the "security.txt" file cannot be served via HTTPS (such as a filesystem or localhost) or is being served with an invalid certificate, additional human triage is recommended since the contents may have been modified while in transit.

As an additional layer of protection, it is also recommended that organizations digitally sign their "security.txt" file with OpenPGP (as per Section 3.4). Also, to protect security reports from being tampered with or observed while in transit, organizations should specify encryption keys (as per Section 3.5.4) unless HTTPS is being used for report submission.

However, the determination of validity of such keys is out of scope for this specification. Security researchers need to establish other secure means to verify them.

### 6.8. Spam and Spurious Reports

Similar to concerns in [RFC2142], denial of service attacks via spam reports would become easier once a "security.txt" file is published by an organization. In addition, there is an increased likelihood of reports being sent in an automated fashion and/or as result of automated scans without human triage. Attackers can also use this file as a way to spam unrelated third parties by listing their resources and/or contact information.

Organizations need to weigh the advantages of publishing this file versus the possible disadvantages and increased resources required to triage security reports.

Security researchers should review all information within the "security.txt" file before submitting reports in an automated fashion or as resulting from automated scans.

## 7. IANA Considerations

example.com is used in this document following the uses indicated in [RFC2606].

192.0.2.0 and 2001:db8:8:4::2 are used in this document following the uses indicated in [RFC6890].

Implementors should be aware that any resources referenced within a security.txt file MUST NOT point to the Well-Known URIs namespace unless they are registered with IANA (as per [RFC8615]).

### 7.1. Well-Known URIs registry

The "Well-Known URIs" registry should be updated with the following additional values (using the template from [RFC8615]):

URI suffix: security.txt

Change controller: IETF

Specification document(s): this document

Status: permanent

### 7.2. Registry for security.txt Fields

IANA is requested to create the "security.txt Fields" registry in accordance with [RFC8126]. This registry will contain fields for use in security.txt files, defined by this specification.

New registrations or updates MUST be published in accordance with the "Expert Review" guidelines as described in sections 4.5 and 5 of [RFC8126]. Any new field thus registered is considered optional by this specification unless a new version of this specification is published.

Designated Experts are expected to check whether a proposed registration or update makes sense in the context of industry accepted vulnerability disclosure processes such as [ISO.29147.2018] and [CERT.CVD], and provides value to organizations and researchers using this format.

New registrations and updates MUST contain the following information:

1. Name of the field being registered or updated

2. Short description of the field

3. Whether the field can appear more than once

4. The document in which the specification of the field is published (if available)

5. New or updated status, which MUST be one of:

    * current: The field is in current use

    * deprecated: The field is in current use, but its use is discouraged

* historic: The field is no longer in current use

6. Change controller

An update may make a notation on an existing registration indicating that a registered field is historical or deprecated if appropriate.

The initial registry contains these values:

Field Name: Acknowledgments
Description: link to page where security researchers are recognized
Multiple Appearances: Yes
Published in: this document
Status: current
Change controller: IESG

Field Name: Canonical
Description: canonical URL for this file
Multiple Appearances: No
Published in: this document
Status: current
Change controller: IESG

Field Name: Contact
Description: contact information to use for reporting vulnerabilities
Multiple Appearances: Yes
Published in: this document
Status: current
Change controller: IESG

Field Name: Expires
Description: date and time after which this file is considered stale
Multiple Appearances: No
Published in: this document
Status: current
Change controller: IESG

Field Name: Encryption
Description: link to a key to be used for encrypted communication
Multiple Appearances: Yes
Published in: this document
Status: current
Change controller: IESG

Field Name: Hiring
Description: link to the vendor's security-related job positions
Multiple Appearances: Yes
Published in: this document

Status: current
Change controller: IESG

Field Name: Policy
Description: link to security policy page
Multiple Appearances: Yes
Published in: this document
Status: current
Change controller: IESG

Field Name: Preferred-Languages
Description: list of preferred languages for security reports
Multiple Appearances: No
Published in: this document
Status: current
Change controller: IESG

## 8. Contributors

The authors would like to acknowledge the help provided during the development of this document by Tom Hudson, Jobert Abma, Gerben Janssen van Doorn, Austin Heap, Stephane Bortzmeyer, Max Smith, Eduardo Vela, and Krzysztof Kotowicz.

The authors would also like to acknowledge the feedback provided by multiple members of IETF's LAST CALL, SAAG, and SECDISPATCH lists.

Yakov would like to also thank L.T.S. (for everything).

## 9. References

### 9.1. Normative References

[RFC1945] Berners-Lee, T., Fielding, R., and H. Frystyk, "Hypertext Transfer Protocol -- HTTP/1.0", RFC 1945, DOI 10.17487/RFC1945, May 1996, <https://www.rfc-editor.org/info/rfc1945>.

[RFC2046] Freed, N. and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", RFC 2046, DOI 10.17487/RFC2046, November 1996, <https://www.rfc-editor.org/info/rfc2046>.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <https://www.rfc-editor.org/info/rfc2119>.

[RFC2142] Crocker, D., "Mailbox Names for Common Services, Roles and Functions", RFC 2142, DOI 10.17487/RFC2142, May 1997, <https://www.rfc-editor.org/info/rfc2142>.

[RFC2277] Alvestrand, H., "IETF Policy on Character Sets and Languages", BCP 18, RFC 2277, DOI 10.17487/RFC2277, January 1998, <https://www.rfc-editor.org/info/rfc2277>.

[RFC2818] Rescorla, E., "HTTP Over TLS", RFC 2818, DOI 10.17487/RFC2818, May 2000, <https://www.rfc-editor.org/info/rfc2818>.

[RFC3629] Yergeau, F., "UTF-8, a transformation format of ISO 10646", STD 63, RFC 3629, DOI 10.17487/RFC3629, November 2003, <https://www.rfc-editor.org/info/rfc3629>.

[RFC3966] Schulzrinne, H., "The tel URI for Telephone Numbers", RFC 3966, DOI 10.17487/RFC3966, December 2004, <https://www.rfc-editor.org/info/rfc3966>.

[RFC3986] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, DOI 10.17487/RFC3986, January 2005, <https://www.rfc-editor.org/info/rfc3986>.

[RFC4880] Callas, J., Donnerhacke, L., Finney, H., Shaw, D., and R. Thayer, "OpenPGP Message Format", RFC 4880, DOI 10.17487/RFC4880, November 2007, <https://www.rfc-editor.org/info/rfc4880>.

[RFC5198] Klensin, J. and M. Padlipsky, "Unicode Format for Network Interchange", RFC 5198, DOI 10.17487/RFC5198, March 2008, <https://www.rfc-editor.org/info/rfc5198>.

[RFC5234] Crocker, D., Ed. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, DOI 10.17487/RFC5234, January 2008, <https://www.rfc-editor.org/info/rfc5234>.

[RFC5322] Resnick, P., Ed., "Internet Message Format", RFC 5322, DOI 10.17487/RFC5322, October 2008, <https://www.rfc-editor.org/info/rfc5322>.

[RFC5646] Phillips, A., Ed. and M. Davis, Ed., "Tags for Identifying Languages", BCP 47, RFC 5646, DOI 10.17487/RFC5646, September 2009, <https://www.rfc-editor.org/info/rfc5646>.

[RFC6068] Duerst, M., Masinter, L., and J. Zawinski, "The 'mailto' URI Scheme", RFC 6068, DOI 10.17487/RFC6068, October 2010, <https://www.rfc-editor.org/info/rfc6068>.

[RFC6125] Saint-Andre, P. and J. Hodges, "Representation and Verification of Domain-Based Application Service Identity within Internet Public Key Infrastructure Using X.509 (PKIX) Certificates in the Context of Transport Layer Security (TLS)", RFC 6125, DOI 10.17487/RFC6125, March 2011, <https://www.rfc-editor.org/info/rfc6125>.

[RFC6960] Santesson, S., Myers, M., Ankney, R., Malpani, A., Galperin, S., and C. Adams, "X.509 Internet Public Key Infrastructure Online Certificate Status Protocol - OCSP", RFC 6960, DOI 10.17487/RFC6960, June 2013, <https://www.rfc-editor.org/info/rfc6960>.

[RFC7230] Fielding, R., Ed. and J. Reschke, Ed., "Hypertext Transfer Protocol (HTTP/1.1): Message Syntax and Routing", RFC 7230, DOI 10.17487/RFC7230, June 2014, <https://www.rfc-editor.org/info/rfc7230>.

[RFC7231] Fielding, R., Ed. and J. Reschke, Ed., "Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content", RFC 7231, DOI 10.17487/RFC7231, June 2014, <https://www.rfc-editor.org/info/rfc7231>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <https://www.rfc-editor.org/info/rfc8174>.

[RFC8615] Nottingham, M., "Well-Known Uniform Resource Identifiers (URIs)", RFC 8615, DOI 10.17487/RFC8615, May 2019, <https://www.rfc-editor.org/info/rfc8615>.

## 9.2. Informative References

[CERT.CVD] Software Engineering Institute, Carnegie Mellon University, "The CERT Guide to Coordinated Vulnerability Disclosure (CMU/SEI-2017-SR-022)", 2017.

[ISO.29147.2018] International Organization for Standardization (ISO), "ISO/IEC 29147:2018, Information technology -- Security techniques -- Vulnerability disclosure", 2018.

[RFC0793] Postel, J., "Transmission Control Protocol", STD 7, RFC 793, DOI 10.17487/RFC0793, September 1981, <https://www.rfc-editor.org/info/rfc793>.

[RFC2196] Fraser, B., "Site Security Handbook", FYI 8, RFC 2196, DOI 10.17487/RFC2196, September 1997, <https://www.rfc-editor.org/info/rfc2196>.

[RFC2350] Brownlee, N. and E. Guttman, "Expectations for Computer Security Incident Response", BCP 21, RFC 2350, DOI 10.17487/RFC2350, June 1998, <https://www.rfc-editor.org/info/rfc2350>.

[RFC2606] Eastlake 3rd, D. and A. Panitz, "Reserved Top Level DNS Names", BCP 32, RFC 2606, DOI 10.17487/RFC2606, June 1999, <https://www.rfc-editor.org/info/rfc2606>.

[RFC3013] Killalea, T., "Recommended Internet Service Provider Security Services and Procedures", BCP 46, RFC 3013, DOI 10.17487/RFC3013, November 2000, <https://www.rfc-editor.org/info/rfc3013>.

[RFC6890] Cotton, M., Vegoda, L., Bonica, R., Ed., and B. Haberman, "Special-Purpose IP Address Registries", BCP 153, RFC 6890, DOI 10.17487/RFC6890, April 2013, <https://www.rfc-editor.org/info/rfc6890>.

[RFC7485] Zhou, L., Kong, N., Shen, S., Sheng, S., and A. Servin, "Inventory and Analysis of WHOIS Registration Objects", RFC 7485, DOI 10.17487/RFC7485, March 2015, <https://www.rfc-editor.org/info/rfc7485>.

[RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <https://www.rfc-editor.org/info/rfc8126>.

## Appendix A. Note to Readers

*Note to the RFC Editor:* Please remove this section prior to publication.

Development of this draft takes place on Github at https://github.com/securitytxt/security-txt

## Appendix B. Document History

*Note to the RFC Editor:* Please remove this section prior to publication.

### B.1. Since draft-foudil-securitytxt-00

* Moved to use IETF's markdown tools for draft updates
* Added table of contents and a fuller list of references
* Moved file to .well-known URI and added IANA registration (#3)
* Added extensibility with an IANA registry for fields (#34)
* Added text explaining relationship to RFC 2142 / security@ email address (#25)
* Scope expanded to include internal hosts, domains, IP addresses and file systems
* Support for digital signatures added (#19)

The full list of changes can be viewed via the IETF document tracker: https://tools.ietf.org/html/draft-foudil-securitytxt-01

### B.2. Since draft-foudil-securitytxt-01

* Added appendix with pointer to Github and document history
* Added external signature file to the well known URI registry (#59)
* Added policy field (#53)
* Added diagram explaining the location of the file on public vs. internal systems
* Added recommendation that external signature files should use HTTPS (#55)
* Added recommendation that organizations should monitor their security.txt files (#14)

The full list of changes can be viewed via the IETF document tracker: https://tools.ietf.org/html/draft-foudil-securitytxt-02

### B.3. Since draft-foudil-securitytxt-02

* Use "mailto" and "tel" (#62)

* Fix typo in the "Example" section (#64)
* Clarified that the root directory is a fallback option (#72)
* Defined content-type for the response (#68)
* Clarify the scope of the security.txt file (#69)
* Cleaning up text based on the NITS tools suggestions (#82)
* Added clarification for newline values
* Clarified the encryption field language, added examples of DNS-stored encryption keys (#28 and #94)
* Added "Hiring" field

### B.4. Since draft-foudil-securitytxt-03

* Added "Hiring" field to the registry section
* Added an encryption example using a PGP fingerprint (#107)
* Added reference to the mailing list (#111)
* Added a section referencing related work (#113)
* Fixes for idnits (#82)
* Changing some references to informative instead of normative
* Adding "Permission" field (#30)
* Fixing remaining ABNF issues (#83)
* Additional editorial changes and edits

### B.5. Since draft-foudil-securitytxt-04

* Addressing IETF feedback (#118)
* Case sensitivity clarification (#127)
* Syntax fixes (#133, #135 and #136)
* Removed permission field (#30)

* Removed signature field and switched to inline signatures (#93 and #128)

* Adding canonical field (#100)

* Text and ABNF grammar improvements plus ABNF changes for comments (#123)

* Changed ".security.txt" to "security.txt" to be consistent

### B.6. Since draft-foudil-securitytxt-05

* Changing HTTPS to MUST (#55)

* Adding language recommending encryption for email reports (#134)

* Added language handling redirects (#143)

* Expanded security considerations section and fixed typos (#30, #73, #103, #112)

### B.7. Since draft-foudil-securitytxt-06

* Fixed ABNF grammar for non-chainable fields (#150)

* Clarified ABNF grammar (#152)

* Clarified redirect logic (#143)

* Clarified comments (#158)

* Updated references and template for well-known URI to RFC 8615

* Fixed nits from the IETF validator

### B.8. Since draft-foudil-securitytxt-07

* Addressing AD feedback (#165)

* Fix for ABNF grammar in lang-values (#164)

* Fixing idnits warnings

* Adding guidance for designated experts

### B.9. Since draft-foudil-securitytxt-08

* Added language and example regarding URI encoding (#176)
* Add "Expires" field (#181)
* Changed language from "directive" to "field" (#182)
* Addressing last call feedback (#179, #180 and #183)
* Clarifying order of fields (#174)
* Revert comment/field association (#158)

### B.10. Since draft-foudil-securitytxt-09

* Adjust ABNF to allow blank lines between directives (#191)
* Make "Expires" field required (#190)
* Adding a warning about the well-known URI namespace (#188)
* Adding scope language around products/services (#185)
* Addressing last call feedback (#189)

Full list of changes can be viewed via the IETF document tracker:
https://tools.ietf.org/html/draft-foudil-securitytxt

## Authors' Addresses

Edwin Foudil

Email: contact@edoverflow.com

Yakov Shafranovich
Nightwatch Cybersecurity

Email: yakov+ietf@nightwatchcybersecurity.com