

Internet Architecture Board
Internet-Draft
Updates: [7322](#) (if approved)
Intended status: Informational
Expires: September 1, 2016

H. Flanagan, Ed.
RFC Editor
February 29, 2016

The Use of Non-ASCII Characters in RFCs
draft-iab-rfc-nonascii-01

Abstract

In order to support the internationalization of protocols and a more diverse Internet community, the RFC Series must evolve to allow for the use of non-ASCII characters in RFCs. While English remains the required language of the Series, the encoding of future RFCs will be in UTF-8, allowing for a broader range of characters than typically used in the English language. This document describes the RFC Editor requirements and guidance regarding the use of non-ASCII characters in RFCs.

This document updates [RFC 7322](#). Please review the PDF version of this draft.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on September 1, 2016.

Copyright Notice

Copyright (c) 2016 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents

(<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

1.	Introduction	2
2.	Basic Requirements	3
3.	Rules for the Use of Non-ASCII Characters	3
3.1.	General Usage Throughout a Document	4
3.2.	Authors, Contributors, and Acknowledgments	4
3.3.	Company Names	5
3.4.	Body of the Document	5
3.5.	Tables	7
3.6.	Code Components	8
3.7.	Bibliographic Text	8
3.8.	Keywords and Citation Tags	9
3.9.	Address Information	9
4.	Normalization Forms	10
5.	XML Markup	10
6.	IANA Considerations	10
7.	Internationalization Considerations	11
8.	Security Considerations	11
9.	Change log - to be removed by the RFC Editor	11
9.1.	draft-iab-rfc-nonascii-00 to -01	11
9.2.	draft-flanagan-nonascii to draft-iab-rfc-nonascii-00	11
9.3.	-04 to -05	11
9.4.	-04 to -05	11
9.5.	-02 to -04	12
10.	References	12
Appendix A.	Acknowledgements	13
	Author's Address	13

[1.](#) Introduction

Please review the PDF version of this draft.

For much of the history of the RFC Series, the character encoding used for RFCs has been ASCII [[ANSI.X3-4.1986](#)]. This was a sensible choice at the time: the language of the Series has always been English, a language that primarily uses ASCII-encoded characters (ignoring for a moment words borrowed from more richly decorated alphabets); and, ASCII is the "lowest common denominator" for character encoding, making cross-platform viewing trivial.

Flanagan

Expires September 1, 2016

[Page 2]

There are limits to ASCII, however, that hinder its continued use as the exclusive character encoding for the Series. The increasing need for easily readable, internationalized content suggests it is time to allow non-ASCII characters in RFCs where necessary. To support this move away from ASCII, RFCs will switch to supporting UTF-8 as the default character encoding and allow support for a broad range of Unicode character support. [[UnicodeCurrent](#)] Note that the RFC Editor may reject any codepoint that does not render adequately in enough formats or on in enough rendering engines using the current tooling.

Given the continuing goal of maximum readability across platforms, the use of non-ASCII characters should be limited in a document to only where necessary within the text. This document describes the rules under which non-ASCII characters may be used in an RFC. These rules will be applied as the necessary changes are made to submission checking and editorial tools.

This document updates the RFC Style Guide [[RFC7322](#)].

The details described in this document are expected to change based on experience gained in implementing the RFC production center's toolset. Revised documents will be published capturing those changes as the toolset is completed. Other implementers must not expect those changes to remain backwards-compatible with the details described this document.

[2.](#) Basic Requirements

Two fundamental requirements inform the guidance and examples provided in this document. They are:

- o Searches against RFC indexes and database tables need to return expected results and support appropriate Unicode string matching behaviors;
- o RFCs must be able to display correctly across a wide range of readers and browsers. People whose system does not have the fonts needed to display a particular RFC need to be able to read the various publication formats and the XML correctly in order to understand and implement the information described in the document.

[3.](#) Rules for the Use of Non-ASCII Characters

This section describes the guidelines for the use of non-ASCII characters in the header, body, and reference sections of an RFC. If the RFC Editor identifies areas where the use of non-ASCII characters

negatively impacts the readability of the text, they will request alternate text.

The RFC Editor may, in cases of entire words represented in non-ASCII characters, ask for a set of reviewers to verify the meaning, spelling, characters, and grammar of the text.

3.1. General Usage Throughout a Document

Where the use of non-ASCII characters is purely as part of an example and not otherwise required for correct protocol operation, escaping the non-ASCII character is not required. Note, however, that as the language of the RFC Series is English, the use of non-ASCII characters is based on the spelling of words commonly used in the English language following the guidance in the Merriam-Webster dictionary [[MerrWeb](#)].

The RFC Editor will use the primary spelling listed in that dictionary by default.

Example of non-ASCII characters that do not require escaping [[RFC4475](#)]:

This particular response contains unreserved and non-ascii UTF-8 characters.

This response is well formed. A parser must accept this message.

Message Details : unreason

SIP/2.0 200 = 2**3 * 5**2 но сто девяносто девять - простое

Via: SIP/2.0/UDP 192.0.2.198;branch=z9hG4bK1324923

Call-ID: unreason.1234ksdfak3j2erwedfsASdf

CSeq: 35 INVITE

From: sip:user@example.com;tag=11141343

To: sip:user@example.edu;tag=2229 Content-Length: 154

Content-Type: application/sdp

3.2. Authors, Contributors, and Acknowledgments

Person names may appear in several places within an RFC. In both the front page header and the references section, when a non-Latin script is used, the fullname of the author is required. Initials are supported and encouraged if available. In all cases, valid Unicode is required. For names that include characters outside of the Unicode Latin and Latin Extended script, an author-provided, ASCII-only identifier is required to assist in improving general readability as well as the searchability and indexing of the document.

Example for the header:

Internet Engineering Task Force (IETF)
Request for Comments: 7380
Category: Standards Track
ISSN: 2070-1721

J. Tong
C. Bi, Ed.
China Telecom
רוני אבן (R. Even)
(Q. Wu), Ed.
R. Huang
Huawei
November 2014

Example for the Acknowledgements:

OLD: The following people contributed significant text to early versions of this draft: Patrik Faltstrom, William Chan, and Fred Baker.

PROPOSED/NEW: The following people contributed significant text to early versions of this draft: Patrik Fältström, (William Chan), and Fred Baker.

3.3. Company Names

Company names may appear in several places within an RFC. In all cases, valid Unicode is required. For names that include characters outside of the Unicode Latin and Latin Extended script, an author-provided, ASCII-only identifier is required to assist in search and indexing of the document.

3.4. Body of the Document

When the mention of non-ASCII characters is required for correct protocol operation and understanding, the characters' Unicode character name or code point MUST be included in the text.

- o Non-ASCII characters will require identifying the Unicode code point.
- o Use of the actual UTF-8 character (e.g., Δ) is encouraged so that a reader can more easily see what the character is, if their device can render the text.
- o The use of the Unicode character names like "INCREMENT" in addition to the use of Unicode code points is also encouraged. When used, Unicode character names should be in all capital letters.

Examples:

OLD [[RFC7564](#)]:

However, the problem is made more serious by introducing the full range of Unicode code points into protocol strings. For example, the characters U+13DA U+13A2 U+13B5 U+13AC U+13A2 U+13AC U+13D2 from the Cherokee block look similar to the ASCII characters "STPETER" as they might appear when presented using a "creative" font family.

NEW/ALLOWED:

However, the problem is made more serious by introducing the full range of Unicode code points into protocol strings. For example, the characters U+13DA U+13A2 U+13B5 U+13AC U+13A2 U+13AC U+13D2 () from the Cherokee block look similar to the ASCII characters "STPETER" as they might appear when presented using a "creative" font family.

ALSO ACCEPTABLE:

However, the problem is made more serious by introducing the full range of Unicode code points into protocol strings. For example, the characters " " (U+13DA U+13A2 U+13B5 U+13AC U+13A2 U+13AC U+13D2) from the Cherokee block look similar to the ASCII characters "STPETER" as they might appear when presented using a "creative" font family.

Example of proper identification of Unicode characters in an RFC:

Acceptable:

- o Temperature changes in the Temperature Control Protocol are indicated by the U+2206 character.

Preferred:

1. Temperature changes in the Temperature Control Protocol are indicated by the U+2206 character ("Δ").
2. Temperature changes in the Temperature Control Protocol are indicated by the U+2206 character (INCREMENT).
3. Temperature changes in the Temperature Control Protocol are indicated by the U+2206 character ("Δ", INCREMENT).
4. Temperature changes in the Temperature Control Protocol are indicated by the U+2206 character (INCREMENT, "Δ").

5. Temperature changes in the Temperature Control Protocol are indicated by the "Delta" character "Δ" (U+2206).
6. Temperature changes in the Temperature Control Protocol are indicated by the character "Δ" (INCREMENT, U+2206).

Which option of (1), (2), (3), (4), (5), or (6) is preferred may depend on context and the specific character(s) in question. All are acceptable within an RFC. [BCP 137](#), "ASCII Escaping of Unicode Character" describes the pros and cons of different options for identifying Unicode characters in an ASCII document [BCP137](#) [[RFC5137](#)].

3.5. Tables

Tables follow the same rules for identifiers and characters as in "[Section 3.4](#). Body of the document". If it is sensible (i.e., more understandable for a reader) for a given document to have two tables -- one including the identifiers and non-ASCII characters and a second with just the non-ASCII characters -- that will be allowed on a case-by-case basis.

Original text from "Preparation, Enforcement, and Comparison of Internationalized Strings Representing Usernames and Passwords" [[RFC7613](#)].

Table 3: A sample of legal passwords

#	Password	Notes
12	<correct horse battery staple>	ASCII space is allowed
13	<Correct Horse Battery Staple>	Different from example 12
14	<απßå>	Non-ASCII letters are OK (e.g., GREEK SMALL LETTER PI, U+03C0)
15	<Jack of ♦s>	Symbols are OK (e.g., BLACK DIAMOND SUIT, U+2666)
16	<foo bar>	OGHAM SPACE MARK, U+1680, is mapped to U+0020 and thus the full string is mapped to <foo bar>

Preferred text:

Table 3: A sample of legal passwords

#	Password	Notes
12	<correct horse battery staple>	ASCII space is allowed
13	<Correct Horse Battery Staple>	Different from example 12
14	<πβ >	Non-ASCII letters are OK (e.g., GREEK SMALL LETTER PI, U+03C0; LATIN SMALL LETTER SHARP S, U+00DF; THAI DIGIT SEVEN, U+0E57)
15	<Jack of ♦s>	Symbols are OK (e.g., BLACK DIAMOND SUIT, U+2666)
16	<foo-bar>	OGHAM SPACE MARK, U+1680, is mapped to U+0020 and thus the full string is mapped to <foo bar>

3.6. Code Components

The RFC Editor encourages the use of the U+ notation except within a code component where you must follow the rules of the programming language in which you are writing the code.

Code components are generally expected to use fixed-width fonts. Where such fonts are not available for a particular script, the best script- appropriate font will be used for that part of the code component.

3.7. Bibliographic Text

The reference entry must be in English; whatever subfields are present must be available in ASCII-encoded characters. For references to RFCs and Internet Drafts, the author's name will be included in the reference as listed on the front header of the RFC or Internet Draft. As long as good sense is used, the reference entry may also include non-ASCII characters at the author's discretion and as provided by the author. The RFC Editor may request a review of any non-ASCII reference entry. This applies to both normative and informative references.

Example:

[GOST3410] "Information technology. Cryptographic data security. Signature and verification processes of [electronic] digital signature.", GOST R 34.10-2001, Gosudarstvennyi Standard of Russian Federation, Government Committee of Russia for Standards, 2001. (In Russian)

Allowable addition to the above citation:

"Информационная технология. Криптографическая защита информации. Процессы формирования и проверки электронной цифровой подписи", GOST R 34.10-2001, Государственный стандарт Российской Федерации, 2001.

3.8. Keywords and Citation Tags

Keywords and citation tags must be ASCII only.

3.9. Address Information

The purpose of providing address information, either postal or e-mail, is to assist readers of an RFC to contact the author or authors. Authors may include the official postal address as recognized by their company or local postal service without additional non-ASCII character escapes. If the email address includes non-ASCII characters and is a valid email address at the time of publication, non-ASCII character escapes are not required.

Example:

Qin Wu (editor)
Huawei
101 Software Avenue, Yuhua District
Nanjing, Jiangsu 210012
China

Alternate contact information:
(editor)

101
210012

Roni Even
Huawei
14 David Hamelech
Tel Aviv 64953
Israel

Alternate contact information:

רוני אבן
וואווי
דוד המלך 14
תל אביב 64953
ישראל

[4.](#) Normalization Forms

Authors should not expect normalization forms to be preserved. If a particular normalization form is expected, note that in the text of the RFC.

[5.](#) XML Markup

As described above, use of non-ASCII characters in areas such as email, company name, addresses, and name is allowed. In order to make it easier for code to identify the appropriate ASCII alternatives, authors must include an "ascii" attribute to their XML markup when an ASCII alternative is required. See [[I-D.iab-xml2rfc](#)] for more detail on how to tag ASCII alternatives.

[6.](#) IANA Considerations

This document makes no request of IANA.

Note to RFC Editor: this section may be removed on publication as an RFC.

7. Internationalization Considerations

The ability to use non-ASCII characters in RFCs in a clear and consistent manner will improve the ability to describe internationalized protocols and will recognize the diversity of authors. However, the goal of readability will override the use of non-ASCII characters within the text.

8. Security Considerations

Valid Unicode that matches the expected text must be verified in order to preserve expected behavior and protocol information.

9. Change log - to be removed by the RFC Editor

9.1. [draft-iab-rfc-nonascii-00](#) to -01

Code Components: added fixed-width font clarification

Authors, Bibliographic info: Clarified requirements for full name, how name will be displayed

9.2. [draft-flanagan-nonascii](#) to [draft-iab-rfc-nonascii-00](#)

Changed requirement for all nonASCII names (including company names) to require an ASCII equivalent to requiring it only for non-Latin characters. Extended Latin is also acceptable without an ASCII equivalent.

9.3. -04 to -05

Keywords: expanded section to include citation tags.

Internationalization considerations: reiterated that the use of non-ASCII characters is not automatically guaranteed.

9.4. -04 to -05

Introduction: added statement regarding document subject to change.

Tables: added example.

Code: removed placeholder for example.

9.5. -02 to -04

Introduction and Abstract: change to be clearer about what/why non-ASCII characters are being allowed.

XML Markup: section added.

10. References

[ANSI.X3-4.1986]

American National Standards Institute, "Coded Character Set - 7-bit American Standard Code for Information Interchange", ANSI X3.4, 1986.

[I-D.iab-xml2rfc]

Hoffman, P., "The "xml2rfc" version 3 Vocabulary", [draft-iab-xml2rfc-03](#) (work in progress), February 2016.

[MerrWeb] Merriam-Webster, Inc., "Merriam-Webster's Collegiate Dictionary, 11th Edition", 2009.

[RFC3550] Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications", STD 64, [RFC 3550](#), DOI 10.17487/RFC3550, July 2003, <<http://www.rfc-editor.org/info/rfc3550>>.

[RFC4475] Sparks, R., Ed., Hawrylyshen, A., Johnston, A., Rosenberg, J., and H. Schulzrinne, "Session Initiation Protocol (SIP) Torture Test Messages", [RFC 4475](#), DOI 10.17487/RFC4475, May 2006, <<http://www.rfc-editor.org/info/rfc4475>>.

[RFC5137] Klensin, J., "ASCII Escaping of Unicode Characters", [BCP 137](#), [RFC 5137](#), DOI 10.17487/RFC5137, February 2008, <<http://www.rfc-editor.org/info/rfc5137>>.

[RFC6949] Flanagan, H. and N. Brownlee, "RFC Series Format Requirements and Future Development", [RFC 6949](#), DOI 10.17487/RFC6949, May 2013, <<http://www.rfc-editor.org/info/rfc6949>>.

[RFC7322] Flanagan, H. and S. Ginoza, "RFC Style Guide", [RFC 7322](#), DOI 10.17487/RFC7322, September 2014, <<http://www.rfc-editor.org/info/rfc7322>>.

- [RFC7564] Saint-Andre, P. and M. Blanchet, "PRECIS Framework: Preparation, Enforcement, and Comparison of Internationalized Strings in Application Protocols", [RFC 7564](#), DOI 10.17487/RFC7564, May 2015, <<http://www.rfc-editor.org/info/rfc7564>>.
- [RFC7613] Saint-Andre, P. and A. Melnikov, "Preparation, Enforcement, and Comparison of Internationalized Strings Representing Usernames and Passwords", [RFC 7613](#), DOI 10.17487/RFC7613, August 2015, <<http://www.rfc-editor.org/info/rfc7613>>.
- [UnicodeCurrent]
The Unicode Consortium, "The Unicode Standard",
2014-present, <<http://www.unicode.org/versions/latest/>>.

Appendix A. Acknowledgements

With many thanks to the members of the IAB i18n program and the RFC Format Design Team.

Author's Address

Heather Flanagan (editor)
RFC Editor

Email: rse@rfc-editor.org
URI: <http://orcid.org/0000-0002-2647-2220>

