Downgrading mechanism for Internationalized eMail Address (IMA)
draft-yoneya-ima-downgrade-00.txt

Abstract

Traditional mail systems handle only US-ASCII characters in SMTP envelope and mail headers. The internationalized email address (IMA) is implemented by allowing UTF-8 characters in the SMTP envelope and mail headers. This document describes downgrading from internationalized addressing with the SMTP extension and UTF-8 headers to traditional email formats and characters.
Table of Contents

1. Introduction .................................................. 3
2. Terminology .................................................. 3
3. Downgrade Encoding ............................................ 4
   3.1. Downgrading mail addresses in envelope .................. 4
   3.2. Downgrading mail addresses in mail header ............... 4
   3.3. Downgrading other data .................................. 4
4. Downgrading .................................................. 4
   4.1. Timing and conditions of downgrading .................... 4
   4.2. SMTP Downgrading ....................................... 5
   4.3. Mail Header Downgrading ................................ 5
   4.4. Record of downgrading .................................. 5
5. Implementation consideration ................................. 5
   5.1. MUA .................................................... 5
   5.2. MDA Requirements ....................................... 6
6. Security considerations ........................................ 6
7. IANA Considerations ........................................... 6
8. Acknowledgements .............................................. 6
9. Normative References ......................................... 6
Appendix A. Examples .............................................. 8
Authors’ Addresses ............................................... 9
Intellectual Property and Copyright Statements .................. 10
1. Introduction

Traditional Internet email systems are defined by [RFC2821] and [RFC2822]. They allow US-ASCII characters in the SMTP envelope and mail headers. The IMA proposal [IMA-Framework], [IMA-UTF8], [IMA-SMTPext] allows UTF-8 characters in SMTP envelope and mail headers. Carrying IMA from sender to recipients requires that all components on the mail delivery route be IMA compliant. Otherwise IMA can’t be delivered. To solve the problem, this document describes a downgrade mechanism that enables delivering IMA by converting it to corresponding US-ASCII representation on current mail delivery system. Not only SMTP envelope, but also UTF-8 in mail headers MUST be converted to US-ASCII.

Converting IMA to US-ASCII SHOULD have algorithmic method and 1-to-1 mapping. Requiring users to specify both an IMA and an equivalent US-ASCII form is inconvenient and decreases usefulness of IMA.

2. Terminology

This document assumes a reasonable understanding of the protocols and terminology of the core email standards as documented in [RFC2821] and [RFC2822]. It also assumes familiarity with the other IMA documents described in [IMA-Framework].

Much of the description in this document depends on the abstractions of "Mail Transfer Agent" ("MTA") and "Mail User Agent" ("MUA"). However, it is important to understand that those terms and the underlying concepts postdate the design of the Internet’s email architecture and the "protocols on the wire" principle. That email architecture, as it has evolved, and the "wire" principle have prevented any strong and standardized distinctions about how MTAs and MUAs interact on a given origin or destination host (or even whether they are separate).

The final ("delivery") MTA stores Mail messages in a "message store" or resends messages where the receiver has assigned. In this document, this function is called Mail Delivery Agent (MDA).

In this document, an address is "all-ASCII" if every character in the address is in the ASCII character repertoire [ASCII]; an address is "non-ASCII" if any character is not in the ASCII character repertoire. The term "all-ASCII" is also applied to other protocol elements when the distinction is important, with "non-ASCII" or "internationalized" as its opposite.
The key words "MUST", "SHALL", "REQUIRED", "SHOULD", "RECOMMENDED", and "MAY" in this document are to be interpreted as described in RFC 2119 [RFC2119].

3. Downgrade Encoding

3.1. Downgrading mail addresses in envelope

This section describes how to downgrade mail addresses in SMTP envelope. The encoding described in this section is also used in the mail header.

1. Extract mail addresses from IMA SMTP envelope according to [IMA-SMTPext].
2. Convert mail addresses into ACE (ASCII Compatible Encoding) if it is IMA. ACE format of IMA is below.
   * Domain part (RHS of @) is encoded to Punycode of IDNA [RFC3490].
   * Local part (LHS of @) is encoded to Punycode [RFC3492] as a whole with ACE-Prefix described in Section 7. If local part consists exclusively of US-ASCII characters, do not convert.

3.2. Downgrading mail addresses in mail header

This section describes how to downgrade mail addresses in mail headers.

Extract every addr-spec [RFC2822] of mailboxes from mail headers including UTF-8. For each addr-spec, if it includes UTF-8, convert it into ACE with the same method described in Section 3.1. Original IMA SHOULD remain as a comment encoded by base64 of MIME with UTF-8 tag. Note that specials in addr-spec MUST be escaped. If mailbox elements except for addr-spec include UTF-8, those MUST be encoded by base64 with UTF-8 tag.

3.3. Downgrading other data

This section describes how to downgrade other mail headers.

1. Encode UTF-8 part of headers by base64 of MIME with UTF-8 tag.
2. encoding=UTF-8

4. Downgrading

4.1. Timing and conditions of downgrading

This section describes timing and conditions of downgrading.
Timing: SMTP client detects SMTP server doesn’t support IMA by its absence from the EHLO response.
Conditions: SMTP client detects UTF-8 is included in SMTP envelope or mail headers.

4.2. SMTP Downgrading

Target of downgrading elements in SMTP envelope are below:
1. MAIL FROM:
2. RCPT TO:

Downgrading MUST be performed in each SMTP session.

4.3. Mail Header Downgrading

Target of downgrading elements in mail headers (SMTP data) are below:
Originator address(es): IMA in From, Reply-To and Sender and their Resent- headers MUST be converted into ACE form.
Destination address(es): IMA in To and Cc and their Recent- headers MUST be converted into ACE form.
IDs: IDs such as Message-ID, In-Reply-To and Reference MUST NOT be the target of downgrading, i.e., these headers MUST NOT be downgraded.
Other headers: UTF-8 in other headers such as Subject and Received MUST be converted into base64 of MIME with UTF-8 tag.

Note that the MTA which performs downgrading MUST be responsible for base64 encoding of preceding Received headers.

4.4. Record of downgrading

MTA which performs downgrading MUST add downgrading header to record which headers are downgraded. Downgrading header is specified as "X-IMA-Downgraded", and elements of the header is list of downgraded header names separated by white space characters.

SMTP envelope downgrading is recorded as Envelope-To and Envelope-From.

X-IMA-Downgraded: Envelope-From Envelope-To From To CC

5. Implementation consideration

5.1. MUA

An IMA compliant MUA MUST implement downgrade mechanism for sending.
The MUA MAY encode UTF-8 in Subject header with the same encoding of body part while downgrading.

IMA compliant MUA MUST decode downgraded mail headers and MUST show IMA on display. MUA MAY use X-IMA-Downgraded header to determine which headers were downgraded.

5.2. MDA Requirements

This section describes downgrading in MDA.
1. MDA MUST NOT convert downgraded header to UTF-8.
2. Record Return-Path header in ACE form.
3. Perform downgrading for each Storage/Back-end-Process. If and only if MDA knows MUA is IMA compliant, then no downgrading is performed.
4. If MDA detects downgraded IMA in SMTP envelope, then MDA MUST decode IMA and perform the same processing as if it were IMA. MDA MAY normalize or canonicalize local-part before processing it.

6. Security considerations

See the extended security considerations discussion in [IMA-Framework]

7. IANA Considerations

To distinguish downgraded IMA in ACE form, it MUST have ACE-Prefix. The ACE-Prefix MUST be differ from IDNA ACE-Prefix to avoid possible confusion. IANA will assign IMA ACE-Prefix when RFC is published.

IANA should register the new header [X-]IMA-Downgraded in the registry of email header types.

8. Acknowledgements

...To be supplied ...

9. Normative References


ANSI X3.4-1968 has been replaced by newer versions with
slight modifications, but the 1968 version remains definitive for the Internet.

[Hoffman-IMAA]
Hoffman, P. and A. Costello, "Internationalizing Mail Addresses in Applications (IMAA)", draft-hoffman-imaa-03 (work in progress), October 2003.

[IMA-Framework]

[IMA-SMTPext]
Yao, J., Ed., "SMTP Extension for Internationalized Email Address", draft-yao-smtpext-00 (work in progress), September 2005.

[IMA-UTF8]
Yeh, J., "Transmission of Email Headers in UTF-8 Encoding", draft-yeh-ima-utf8headers-00 (work in progress), October 2005.

[JET-IMA]
Yao, J. and J. Yeh, "Internationalized eMail Address (IMA)", draft-lee-jet-ima-00 (work in progress), June 2005.

[Klensin-emailaddr]
Klensin, J., "Internationalization of Email Addresses", draft-klensin-emailaddr-i18n-03 (work in progress), July 2005.

[RFC1123]

[RFC1651]

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

[RFC2821]

[RFC2822]

[RFC3490]
Faltstrom, P., Hoffman, P., and A. Costello,
"Internationalizing Domain Names in Applications (IDNA)", RFC 3490, March 2003.


Appendix A. Examples

...to be supplied...
Authors’ Addresses

Yoshiro YONEYA (editor)
JPRS
Chiyoda First Bldg. East 13F, 3-8-1 Nishi-Kanda
Chiyoda-ku, Tokyo 101-0065
Japan

Phone: +81 3 5215 8451
Email: yone@jprs.co.jp

Kazunori Fujiwara (editor)
JPRS
Chiyoda First Bldg. East 13F, 3-8-1 Nishi-Kanda
Chiyoda-ku, Tokyo 101-0065
Japan

Phone: +81 3 5215 8451
Email: fujiwara@jprs.co.jp
Intellectual Property Statement

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be found in BCP 78 and BCP 79.

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at http://www.ietf.org/ipr.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

Disclaimer of Validity

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Copyright Statement

Copyright (C) The Internet Society (2005). This document is subject to the rights, licenses and restrictions contained in BCP 78, and except as set forth therein, the authors retain all their rights.

Acknowledgment

Funding for the RFC Editor function is currently provided by the Internet Society.