          Downgrading mechanism for Email Address Internationalization
                    draft-ietf-eai-downgrade-06.txt

Status of this Memo

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Abstract

   Traditional mail systems handle only ASCII characters in SMTP
   envelope and mail header fields. The Email Address
   Internationalization (UTF8SMTP) extension allows UTF-8 characters in
   SMTP envelope and mail header fields. To avoid bouncing
   internationalized Email messages when a server in the delivery path
   does not support the UTF8SMTP extension, some sort of converting
   mechanism is required. This document describes a downgrading

mechanism for Email Address Internationalization. Note that this is
a way to downgrade, not tunnel. There is no associated up-conversion
mechanism, although internationalized email clients might use
original internationalized addresses or other data when displaying or
replying to downgraded messages.

Table of Contents

1. Introduction

   Traditional mail systems which are defined by [RFC2821] and [RFC2822]
   allow ASCII characters in SMTP envelope and mail header field values.
   The UTF8SMTP extension [RFC4952], [I-D.ietf-eai-utf8headers] and
   [I-D.ietf-eai-smtpext] allows UTF-8 characters in SMTP envelope and
   mail header field values.

   If an envelope address or header field contains non-ASCII characters,
   the message cannot be delivered unless every system in the delivery
   path supports UTF8SMTP. To avoid bouncing such messages when a
   server is encountered which does not support the UTF8SMTP extension,
   this document describes a downgrading mechanism. Downgrading a
   message converts envelope and header fields to an all-ASCII
   representation.

   [I-D.ietf-eai-utf8headers] allows UTF-8 characters to be used in mail
   header fields and MIME header fields. The downgrading mechanism
   specified here converts mail header fields and MIME header fields to
   ASCII.

   This document does not change any protocols except by defining new
   header fields. It describes the conversion method from the
   internationalized email envelopes/messages which are defined in
   [RFC4952] [I-D.ietf-eai-utf8headers] [I-D.ietf-eai-smtpext] to the
   traditional email envelopes/messages which are defined in [RFC2821]
   [RFC2822].

   [I-D.ietf-eai-smtpext] section 2.2 defines when downgrading occurs.
   If the SMTP client has an UTF8SMTP envelope or an internationalized
   message and the SMTP server doesn't support the UTF8SMTP SMTP
   extension, then the SMTP client MUST NOT send a UTF8SMTP envelope or
   an internationalized message to the SMTP server. The section shows 4
   choices. The fourth choice is downgrading, as described here.

   Downgrading may be implemented in MUAs, MSAs, MTAs which act as the
   SMTP client, or in MDAs, POP servers, IMAP servers which store or
   offer UTF8SMTP envelopes or internationalized messages to non-
   UTF8SMTP compliant systems which include message stores.

   This document tries to define the downgrading process clearly and it
   preserves the original information as much as possible.

   Downgrading in UTF8SMTP consists of the following four parts:
   o   New header fields definition
   o   SMTP downgrading

   o Email header fields downgrading
   o MIME header fields downgrading

   In Section 3, many header fields starting with "downgraded" are
   introduced. They preserve the original envelope information and the
   original header fields.

   The SMTP downgrading is described in Section 4. It generates ASCII
   only envelope information from an UTF8SMTP envelope.

   The Email header fields downgrading is described in Section 5. It
   generates ASCII only header fields.

   The MIME header fields are expanded in [I-D.ietf-eai-utf8headers].
   The MIME header fields downgrading is described in Section 6. It
   generates ASCII only MIME header fields.

2. Terminology

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
   document are to be interpreted as described in RFC 2119 [RFC2119].

   All specialized terms used in this specification are defined in the
   EAI overview [RFC4952] or in [RFC2821][RFC2822], MIME documents
   [RFC2045] [RFC2047] [RFC2183] [RFC2231]. The terms "ASCII address",
   "internationalized email address", "non-ASCII address", "i18mail
   address", "UTF8SMTP", "message" and "mailing list" are used with the
   definitions from [RFC4952] document.

   This document depends on [I-D.ietf-eai-smtpext],
   [I-D.ietf-eai-utf8headers], and [I-D.ietf-eai-dsn]. Key words used
   in these document are used in this document, too.

   The term "non-ASCII" is an UTF-8 string which contains at least one
   non-ASCII character.

   An "UTF8SMTP envelope" has Email originator/recipient addresses
   expanded by [I-D.ietf-eai-smtpext] and [I-D.ietf-eai-dsn].

   An "UTF8SMTP message" is Email messages expanded by
   [I-D.ietf-eai-utf8headers].

3. New header fields definition

   New header fields starting with "Downgraded-" are defined here to
   preserve those original envelope and header values which contain
   UTF-8 characters. During downgrading, one new "Downgraded-" header
   field is added for each original envelope or header field which
   cannot be passed as-is to a server which does not support UTF8SMTP.
   The original envelope or header field is removed or rewritten. Only
   those envelope and header fields which contain non-ASCII characters
   are affected. The result of this process is a message which is
   compliant with existing email specifications [RFC2821] and [RFC2822].
   The original internationalized information can be retrieved by
   examining the "Downgraded-" header fields which were added. Even
   though the information is not lost, the original message cannot be
   perfectly reconstructed. Hence, downgrading is a one-way process.
   However, an internationalized client might use the information in the
   "Downgraded-" header fields when processing a downgraded message, for
   example, such as displaying or composing a reply.

3.1. Envelope information preservation headers

   Two headers "Downgraded-Mail-From:" and "Downgraded-Rcpt-To:" are
   defined to preserve SMTP envelope downgraded information. SMTP
   envelope downgraded information consists of the original non-ASCII
   address and the downgraded all-ASCII address. The header field
   syntax is specified as follows:

```
fields      =/ downgradedmailfrom / downgradedrcptto
downgradedmailfrom = "Downgraded-Mail-From:" [FWS] "<" uPath ">" 1*[FWS]
                                "<" Mailbox ">" [FWS] CRLF
downgradedrcptto = "Downgraded-Rcpt-To:" [FWS] "<" uPath ">" 1*[FWS]
                                "<" Mailbox ">" [FWS] CRLF
```

   Original non-ASCII address <uPath> is defined in
   [I-D.ietf-eai-smtpext]; it is treated as unstructured in this header
   and it is encoded according to [RFC2047]. <Mailbox> is defined in
   [RFC2821], section 4.1.2.

3.2. Address header field preservation headers

   The address header fields preservation headers are defined to
   preserve the original header field. Their value field holds the
   original header field value. Any original header field value is
   treated as an <unstructured> and it MUST be encoded according to
   [RFC2047] with charset='UTF-8'. The header field syntax is specified
   as follows:

```
   fields      =/ known-downgraded-headers ":" unstructued CRLF
   known-downgraded-headers =  "Downgraded-" original-headers
   original-headers = "From" / "To" / "Cc" / "Bcc" /
                      "Sender" / "Reply-To" /
                      "Resent-From" / "Resent-Sender" /
                      "Resent-To" / "Resent-Cc" / "Return-Path"
```

   Preserving a header field in a downgraded header field is defined as:
   1. Generate new downgraded header field whose value is the original
       header field value.
   2. Encode the generated header according to [RFC2047] with
       charset='UTF-8'.

3.3. Unknown header fields preservation headers

   The unknown header fields preservation headers are defined to
   encapsulate those original header field which contains non-ASCII
   characters and are not otherwise provided for in the this
   specification. The encapsulation header field name is the
   concatenation of "Downgraded-" and the original name. The value
   field holds the original header field value.

   Any original header field value is treated as an unstructured value
   and it MUST be encoded according to [RFC2047] with charset='UTF-8'.
   The header field syntax is specified as follows:

```
   fields      =/ unknown-downgraded-headers ":" unstructued CRLF
   unknown-downgraded-headers =  "Downgraded-" original-header-field-name
   original-header-field-name = field-name

   field-name     =      1*ftext

   ftext          =      %d33-57 /                ; Any character except
                         %d59-126                 ;  controls, SP, and
                                                  ;  ":".
```

   Encapsulating a header field in a "Downgraded-" header field is
   defined as:
   1. Generate new "Downgraded-" header whose value is the original
       header field value.
   2. Encode the generated header field value according to [RFC2047]
       with charset='UTF-8'. To preserve space characters, the whole
       header field value which include space characters SHOULD be
       encoded.

   3. Remove the original header field.

4. **SMTP Downgrading**

   Target of downgrading elements in SMTP envelope are below:

   o MAIL FROM:
   o RCPT TO:
   o ORCPT parameter

   Downgrading the SMTP envelope uses ALT-ADDRESS parameter defined in
   [I-D.ietf-eai-smtpext]. An address is downgradable if the address is
   non-ASCII address and has ASCII address specified by ALT-ADDRESS
   parameter. Since only non-ASCII addresses are downgradable,
   specifying an ALT-ADDRESS value for an all-ASCII address is invalid
   for use with this specification, and no interpretation is assigned to
   it. This restriction allows for future extension of the
   specification even though no such extensions are currently
   anticipated.

   Note that even if no downgrading is performed on the envelope,
   message header fields and message body MIME header fields that
   contain non-ASCII characters MUST be downgraded. This is described
   in Section 5 and Section 6.

   When downgrading, replace each non-ASCII mail address in the envelope
   with its specified alternative ASCII address and preserve the
   original information using "Downgraded-Mail-From" and "Downgraded-
   Rcpt-To" header fields as defined in Section 3. Before replacing,
   decode the ALT-ADDRESS parameter value because it is encoded as xtest
   [RFC3461].

   To avoid disclosing recipient addresses, the downgrading process MUST
   NOT add "Downgraded-Rcpt-To:" header if the SMTP downgrading targets
   multiple recipients. See Section 7 for more detail.

   The "RCPT TO" command may have an ORCPT parameter when the recipient
   address is downgraded. The ORCPT parameter is used for DSN
   [RFC3461]. If the ORCPT parameter contains an "utf-8" address and
   the address contains non-ASCII characters, the ORCPT parameter MUST
   be converted to utf-8-addr-xtext form or utf-8-addr-unitext form
   which are described in [I-D.ietf-eai-dsn].

   As a result of the recipient address replacement, the domain part of
   the original recipient address may not equal to the domain part of
   the new recipient address. If the result of address resolution for
   the domain part of the new recipient address contains the server at

the connection destination of the SMTP session for the original
recipient address, the SMTP connection is valid for the new recipient
address. Otherwise, the downgrading process MUST NOT send the
downgraded message to the new recipient address via the connection
and MUST try to send the downgraded message to the new recipient
address.

5. Email header fields downgrading

   This section defines the conversion method to ASCII for each header
   field which may contain non-ASCII characters.

   [I-D.ietf-eai-utf8headers] expands Received: header fields, [RFC2822]
   ABNF elements <mailbox>, <word>, <comment>, <unstructured>, [RFC2045]
   ABNF element <value>.

   Header field downgrading is defined below for each ABNF element.
   Downgrading an unknown header field is also defined as ENCAPSULATION
   downgrading. Converting the header field terminates when no non-
   ASCII characters remain in the header field.

   RECEIVED downgrading: If the header field name is "Received:" and
      the FOR clause contains a non-ASCII addresses, remove the FOR
      clause from the header field. The other part does not contain
      non-ASCII values.

   UNSTRUCTURED downgrading: If the header field has an <unstructured>
      field which contains non-ASCII characters, encode the field
      according to [RFC2047] with charset='UTF-8'. To preserve space
      characters, the whole header field value which include space
      characters SHOULD be encoded.

   WORD downgrading: If the header field has any <word> fields which
      contains non-ASCII characters, encode the fields according to
      [RFC2047] with charset='UTF-8'.

   COMMENT downgrading: If the header field has any <comment> fields
      which contains non-ASCII characters, encode the fields according
      to [RFC2047] with charset='UTF-8'.

   MIME-VALUE downgrading: If the header field has any <value>
      elements defined by [RFC2045] and the elements contain non-ASCII
      characters, encode the <value> elements by [RFC2231] with
      charset='UTF-8' and the Language information empty. If the
      <value> element is <quoted-string> and it contains <CFWS> outside
      the DQUOTE, remove the <CFWS> before this conversion.

DISPLAY-NAME downgrading: If the header field has any <mailbox>
   elements and they have <display-name> elements which contain non-
   ASCII characters, encode the <display-name> elements according to
   [RFC2047] with charset='UTF-8'.

MAILBOX downgrading: The <mailbox> elements have no equivalent
   format for non-ASCII addresses. If the header field has any
   <mailbox> elements which contain non-ASCII characters, preserve
   the header field in each Address header field preservation header
   defined in Section 3.2, and rewrite each <mailbox> element to
   ASCII only format. The <mailbox> element which contains non-ASCII
   characters is one of three formats.

   *   [Display-name] "<" Utf8-addr-spec 1*FCS "<" Addr-spec ">>"

       Rewrite it as

       [Display-name] "<" Addr-spec ">"

   *   [Display-name] "<" Utf8-addr-spec ">"
   *   Utf8-addr-spec

       Rewrite both as
       [Display-name] "Internationalized Address " Encoded-word
       " Removed:;"

       where the <Encoded-word> is the original <Utf8-addr-spec>
       encoded according to [RFC2047].

ENCAPSULATION downgrading: if the header field contains non-ASCII
   characters and for which no rule is given above, encapsulate it in
   a Downgraded header field described in Section 3.3 as a last
   resort.

5.1. Downgrading method for each header field

Header fields are listed in [RFC4021]. This section describes the
downgrading method for each header field.

If the whole mail header field does not contain non-ASCII characters,
email header field downgrading is not required. Each header field's
downgrading method is described below.

o Address header fields which contain <mailbox>s

```
     From:
     Sender:
     Reply-To:
     To:
     Cc:
     Bcc:
     Resent-From:
     Resent-Sender:
     Resent-To:
     Resent-Cc:
     Return-Path:
```

If the header field contains <mailbox> elements which contains non-ASCII addresses, preserve the header field in a downgraded header before the conversion. Then perform COMMENT downgrading, DISPLAY-NAME downgrading and MAILBOX downgrading.

o Downgrading Non-ASCII in comments

```
     Date:
     Message-ID:
     In-Reply-To:
     References:
     Resent-Date:
     Resent-Message-ID:
     MIME-Version:
     Content-ID:
```

These header fields do not contain non-ASCII characters except in comments. If the header contains UTF-8 characters in comments, perform COMMENT downgrading.

o Trace header fields

```
     Received:
```

perform COMMENT downgrading and perform RECEIVED downgrading.

o MIME Content header fields

```
     Content-Type:
     Content-Disposition:
```

Perform MIME-VALUE downgrading.

o Non-ASCII in <unstructured>

         Subject:
         Comments:
         Content-Description:

         Perform UNSTRUCTURED downgrading.

   o Non-ASCII in <unstructured> or <phrase>

         Keywords:

         Perform WORD downgrading.

   o Other header fields

         All other header fields which contains non-ASCII characters are
         user-defined, missing from this draft or future defined header
         fields. Perform ENCAPSULATION downgrading as a last resort.

6. MIME body part headers downgrading

   MIME body part header fields may contain non-ASCII characters
   [I-D.ietf-eai-utf8headers]. This section defines the conversion
   method to ASCII only header fields for each MIME header field which
   contains non-ASCII characters. Parse the message body's MIME
   structure for all levels and check each MIME header field whether it
   contains non-ASCII characters. If the header field contains non-
   ASCII characters in the header value, the header is a target of the
   MIME body part headers downgrading. Each MIME header field's
   downgrading method is described below. COMMENT downgrading, MIME-
   VALUE downgrading, UNSTRUCTURED downgrading are described in
   Section 5.

   Content-ID:
      The Content-ID: header does not contain non-ASCII characters
      except in comments. If the header contains UTF-8 characters in
      comments, perform COMMENT downgrading.

   Content-Type:
   Content-Disposition:
      Perform MIME-VALUE downgrading.

   Content-Description:
      Perform UNSTRUCTURED downgrading.

7. Security considerations

   o A Downgraded message's header fields contain ASCII characters
      only. But they still contain MIME encapsulated header fields
      which contains non-ASCII UTF-8 characters. And more, the body
      part may contain UTF-8 message. The recipients need to accept
      UTF-8 mail body and UTF-8 header fields which is MIME encoded.
   o Rewriting headers increases the opportunities for undetected
      spoofing.

   o Recipients addresses can be undisclosed if those addresses are
      listed on Bcc or group address. Those undisclosed addresses are
      used only in the Envelope. Copying information from the Envelope
      into headers risks inadvertent information disclosure (not just
      about addresses). See Section 4 for instructions on recipient
      address handling.

   o The techniques described here invalidates methods that depend on
      digital signatures over the envelope or any part of the message
      which includes the top-level header or body part headers.
      Depending on the specific message being downgraded, DKIM
      especially, but also possibly S/MIME, PGP, and similar techniques
      are all likely to break.

   o Many gateways and servers on the Internet will discard headers
      with which they are not familiar. To the extent to which the
      downgrade procedures depend on new headers (e.g., "Downgraded") to
      avoid information loss, then the risk of having those headers
      dropped and its implications must be identified. In particular,
      it appears to me that, if the Downgraded headers are dropped,
      there is no possibility of reconstructing the original information
      at any point (before, during, or after delivery).

   See "Security considerations" section in [RFC4952] for more
   discussion.

8. Implementation notes

   Downgrading is an alternative to rejection for delivering messages
   which require UTF8SMTP support to a server which does not provide
   this. Implementing the full specification of this document is
   desirable, but a partial implementation is also possible.

   If a partial downgrading implementation confronts an unsupported
   downgrading target, the implementation MUST NOT send the message to
   server which does not support UTF8SMTP. Instead, it MUST reject the

message or generate a notification of non-deliverability.

8.1. Trivial downgrading

A partial downgrading, Trivial downgrading is discussed. It does not
support non-ASCII addresses in SMTP envelope and address header
fields, unknown header fields downgrading, the MIME body part headers
downgrading. It supports
o   some simple header fields downgrading: Subject
o   comments and display name downgrading: From, To, CC
o   trace header field downgrading: Received

Otherwise, the downgrading fails.

Trivial downgrading targets mail messages which are generated by
UTF8SMTP aware MUAs and contain non-ASCII characters in comments,
display names, unstructured parts without using non-ASCII E-mail
addresses. This E-mail message does not contain non-ASCII addresses
in SMTP Envelope and its header fields. But it is not deliverable
via UTF8SMTP un-aware MTA. Implementing full spec downgrading may be
hard, but trivial downgrading saves mail messages without using non-
ASCII addresses.

9. IANA Considerations

IANA is requested to register the following header fields in the
Permanent Message Header Field Repository, in accordance with the
procedures set out in [RFC3864].

Header field name: Downgraded-Mail-From
Applicable protocol: mail
Status: experimental
Author/change controller: IETF
Specification document(s): This document (Section 3)

Header field name: Downgraded-Rcpt-To
Applicable protocol: mail
Status: experimental
Author/change controller: IETF
Specification document(s): This document (Section 3)

Header field name: Downgraded-From
Applicable protocol: mail

      Status: experimental
      Author/change controller: IETF
      Specification document(s): This document ([Section 3](#))

      Header field name: Downgraded-Sender
      Applicable protocol: mail
      Status: experimental
      Author/change controller: IETF
      Specification document(s): This document ([Section 3](#))

      Header field name: Downgraded-To
      Applicable protocol: mail
      Status: experimental
      Author/change controller: IETF
      Specification document(s): This document ([Section 3](#))

      Header field name: Downgraded-Cc
      Applicable protocol: mail
      Status: experimental
      Author/change controller: IETF
      Specification document(s): This document ([Section 3](#))

      Header field name: Downgraded-Reply-To
      Applicable protocol: mail
      Status: experimental
      Author/change controller: IETF
      Specification document(s): This document ([Section 3](#))

      Header field name: Downgraded-Bcc
      Applicable protocol: mail
      Status: experimental
      Author/change controller: IETF
      Specification document(s): This document ([Section 3](#))

      Header field name: Downgraded-Resent-From
      Applicable protocol: mail
      Status: experimental
      Author/change controller: IETF
      Specification document(s): This document ([Section 3](#))

      Header field name: Downgraded-Resent-To
      Applicable protocol: mail
      Status: experimental
      Author/change controller: IETF

Specification document(s): This document ([Section 3](#))

Header field name: Downgraded-Resent-Cc
Applicable protocol: mail
Status: experimental
Author/change controller: IETF
Specification document(s): This document ([Section 3](#))

Header field name: Downgraded-Resent-Sender
Applicable protocol: mail
Status: experimental
Author/change controller: IETF
Specification document(s): This document ([Section 3](#))

Header field name: Downgraded-Return-Path
Applicable protocol: mail
Status: experimental
Author/change controller: IETF
Specification document(s): This document ([Section 3](#))

And more, IANA is requested to reserve all the field names that start
by "Downgraded-" for unknown header fields downgrading described in
[Section 3.3](#), in accordance with the procedures set out in [[RFC3864](#)].

Header field name: Names which starts by "Downgraded-"
Applicable protocol: mail
Status: experimental
Author/change controller: IETF
Specification document(s): This document ([Section 3](#))

[10](#). Acknowledgements

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Marcos Sanz, Alexey Melnikov, Frank Ellermann, Edward Lewis, S.
Moonesamy and JET members.

[11](#). Change History

This section is used for tracking the update of this document. Will
be removed after finalize.

11.1. **draft-yoneya-ima-downgrade**: **Version 00**

   o Initial version
   o Followed draft-yeh-ima-utf8headers-00 and draft-yao-smtpext-00

11.2. **draft-yoneya-ima-downgrade**: **Version 01**

   o Document structure was changed
   o Followed draft-yeh-ima-utf8headers-01 and draft-yao-smtpext-02
   o Downgrading requirements were added
   o SMTP DATA encapsulation method was proposed
   o Downgrading examples was provided

11.3. **draft-ietf-eai-downgrade**: **Version 00**

   o Followed draft-yeh-ima-utf8headers-01 and
      draft-ietf-eai-smtpext-00
   o No header downgrading method was proposed
   o Header encapsulation method was proposed

11.4. **draft-ietf-eai-downgrade**: **Version 01**

   o Followed draft-ietf-eai-utf8headers-00
   o Header conversion and encapsulation method was merged
   o Header conversion method was defined in detail

11.5. **draft-ietf-eai-downgrade**: **Version 02**

   o Followed draft-ietf-eai-utf8headers-01 and
      draft-ietf-eai-smtpext-01
   o Specification about algorithmic generated address is removed
   o No header downgrading method was removed
   o SMTP DATA encapsulation method was removed

11.6. **draft-ietf-eai-downgrade**: **Version 03**

   o Followed draft-ietf-eai-utf8headers-03 and
      draft-ietf-eai-smtpext-03
   o Downgraded: and Envelope-Downgraded: headers definition was added
   o Mail header fields downgrading method was refined
   o Examples in Appendix A were refined

11.7. **draft-ietf-eai-downgrade**: **Version 04**

   o Followed draft-ietf-eai-utf8headers-06, draft-ietf-eai-smtpext-07
      and draft-ietf-eai-dsn-02

   o Downgrading requirements and conditions were moved to
      Introduction.
   o Descriptions about upgrading were removed.
   o SPF and DKIM discussion were removed.
   o Added many header fields downgrading.
   o Allow address literal rewriting without alternate ASCII address in
      header fields.
   o Added MIME body part headers downgrading.
   o Added ORCPT downgrading.

11.8. draft-ietf-eai-downgrade: Version 05

   o fixed examples
      * ALT-ADDRESS parameter mistake
      * RFC2047(x) notation was changed to encoded-word format
   o Added implementation consideration section and trivial downgrading
   o Downgraded: and Envelope-Downgraded: headers are separated for
      each original headers.
   o Removed list-* header fields downgrading
   o Changed the way of writing the header field downgrading section

11.9. draft-ietf-eai-downgrade: Version 06

   o Moved decoding downgraded messages as a separate document
   o Added a text to UNSTRUCTURED downgrading
   o Added "replacing SMTP connection" if necessary to SMTP
      downgrading.
   o fixed examples

12. Normative References

   [I-D.ietf-eai-dsn]
              Newman, C. and A. Melnikov, "Internationalized Delivery
              Status and Disposition Notifications",
              draft-ietf-eai-dsn-06 (work in progress), January 2008.

   [I-D.ietf-eai-smtpext]
              Yao, J. and W. MAO, "SMTP extension for internationalized
              email address", draft-ietf-eai-smtpext-11 (work in
              progress), January 2008.

   [I-D.ietf-eai-utf8headers]
              Yeh, J., "Internationalized Email Headers",
              draft-ietf-eai-utf8headers-09 (work in progress),
              February 2008.

   [RFC2045] Freed, N. and N. Borenstein, "Multipurpose Internet Mail

              Extensions (MIME) Part One: Format of Internet Message
              Bodies", RFC 2045, November 1996.

   [RFC2047] Moore, K., "MIME (Multipurpose Internet Mail Extensions)
              Part Three: Message Header Extensions for Non-ASCII Text",
              RFC 2047, November 1996.

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

   [RFC2183] Troost, R., Dorner, S., and K. Moore, "Communicating
              Presentation Information in Internet Messages: The
              Content-Disposition Header Field", RFC 2183, August 1997.

   [RFC2231] Freed, N. and K. Moore, "MIME Parameter Value and Encoded
              Word Extensions:
              Character Sets, Languages, and Continuations", RFC 2231,
              November 1997.

   [RFC2821] Klensin, J., "Simple Mail Transfer Protocol", RFC 2821,
              April 2001.

   [RFC2822] Resnick, P., "Internet Message Format", RFC 2822,
              April 2001.

   [RFC3461] Moore, K., "Simple Mail Transfer Protocol (SMTP) Service
              Extension for Delivery Status Notifications (DSNs)",
              RFC 3461, January 2003.

   [RFC3864] Klyne, G., Nottingham, M., and J. Mogul, "Registration
              Procedures for Message Header Fields", BCP 90, RFC 3864,
              September 2004.

   [RFC4021] Klyne, G. and J. Palme, "Registration of Mail and MIME
              Header Fields", RFC 4021, March 2005.

   [RFC4952] Klensin, J. and Y. Ko, "Overview and Framework for
              Internationalized Email", RFC 4952, July 2007.

Appendix A. Examples

A.1. Downgrading example 1

   This section shows an SMTP Downgrading example. Consider a mail
   message.

   o The sender address is "NON-ASCII-local@example.com" which is non-
      ASCII address. Its ASCII alternative is "ASCII-local@example.com"
      and its display-name is "DISPLAY-local".
   o The "To" address is "NON-ASCII-remote1@example.net" which is non-
      ASCII address. Its ASCII alternative is
      "ASCII-remote1@example.net" and its display-name is "DISPLAY-
      remote1".
   o The "CC" address is non-ASCII address
      "NON-ASCII-remote2@example.org" without alternative ASCII address.
      Its display-name is "DISPLAY-remote2".
   o Three display-names contains non-ASCII characters.
   o The Subject header is "NON-ASCII-SUBJECT" which contains non-ASCII
      characters.
   o assume To: recipient's MTA (example.net) does not support
      UTF8SMTP.
   o assume Cc: recipient's MTA (example.org) supports UTF8SMTP.
   The example SMTP envelope/message is showin in Figure 4. In this
   example, the To: recipient's session is fucused.

   MAIL FROM: <NON-ASCII-local@example.com>
              ALT-ADDRESS=ASCII-local@example.com
   RCPT TO: <NON-ASCII-remote1@example.net>
            ALT-ADDRESS=ASCII-remote1@example.net
   RCPT TO: <NON-ASCII-remote2@example.org>

   Message-Id: MESSAGE_ID
   Mime-Version: 1.0
   Content-Type: text/plain; charset="UTF-8"
   Content-Transfer-Encoding: 8bit
   Subject: NON-ASCII-SUBJECT
   From: DISPLAY-local <NON-ASCII-local@example.com
    <ASCII-local@example.com>>
   To: DISPLAY-remote1 <NON-ASCII-remote1@example.net
    <ASCII-remote1@example.net>>
   CC: DISPLAY-remote2 <NON-ASCII-remote2@example.org>
   Date: DATE

   MAIL_BODY

            Figure 4: Original envelope/message (example 1)

   In this example, there are two SMTP recipients, one is To:, the other
   is CC:. The SMTP downgrading treats To: session downgrading.
   Figure 5 shows SMTP downgraded example.

```
   MAIL FROM: <ASCII-local@example.com>
   RCPT TO: <ASCII-remote1@example.net>
   -------------------------------------------------------------
   Downgraded-Mail-From: =?UTF-8?Q?<NON-ASCII-local@example.com>_?=
    =?UTF-8?Q?<ASCII-local@example.com>?=
   Downgraded-Rcpt-To: =?UTF-8?Q?<NON-ASCII-remote1@example.net>_?=
    =?UTF-8?Q?<ASCII-remote1@example.net>?=
   Message-Id: MESSAGE_ID
   Mime-Version: 1.0
   Content-Type: text/plain; charset="UTF-8"
   Content-Transfer-Encoding: 8bit
   Subject: NON-ASCII-SUBJECT
   From: DISPLAY-local <NON-ASCII-local@example.com
    <ASCII-local@example.com>>
   To: DISPLAY-remote1 <NON-ASCII-remote1@example.net
    <ASCII-remote1@example.net>>
   CC: DISPLAY-remote2 <NON-ASCII-remote2@example.org>
   Date: DATE

   MAIL_BODY
```

           Figure 5: SMTP Downgraded envelope/message (example 1)

   After SMTP downgrading, header fields downgrading is performed.
   Final downgraded message is shown in Figure 6. Return-Path header
   will be added by the final destination MTA.

```
Return-Path: <ASCII-local@example.com>
Downgraded-Mail-From: =?UTF-8?Q?<NON-ASCII-local@example.com>_?=
 =?UTF-8?Q?<ASCII-local@example.com>?=
Downgraded-Rcpt-To: =?UTF-8?Q?<NON-ASCII-remote1@example.net>_?=
 =?UTF-8?Q?<ASCII-remote1@example.net>?=
Message-Id: MESSAGE_ID
Mime-Version: 1.0
Content-Type: text/plain; charset="UTF-8"
Content-Transfer-Encoding: 8bit
Subject: =?UTF-8?Q?NON-ASCII-SUBJECT?=
From: =?UTF-8?Q?DISPLAY-local?= <ASCII-local@example.com>
Downgraded-From: =?UTF-8?Q?DISPLAY-local_<NON-ASCII-local@example.com_?=
 =?UTF-8?Q?<ASCII-local@example.com>>?=
To: =?UTF-8?Q?DISPLAY-remote1?= <ASCII-remote1@example.net>
Downgraded-To: =?UTF-8?Q?DISPLAY-remote1_?=
 =?UTF-8?Q?<NON-ASCII-remote1@example.net_<ASCII-remote1@example.net>>?=
CC: =?UTF-8?Q?DISPLAY-remote2?= Internationalized address
 =?UTF-8?Q?NON-ASCII-remote2@example.org?= removed:;
Downgraded-CC: =?UTF-8?Q?DISPLAY-remote2_?=
 =?UTF-8?Q?<NON-ASCII-remote2@example.org>?=
Date: DATE

MAIL_BODY
```


                     Figure 6: Downgraded message (example 1)

[A.2](). **Downgrading example 2**

   In many cases, the sender wants to use non-ASCII address, the
   recipient does not support UTF8SMTP and does not have non-ASCII
   address.
   o The sender address is "NON-ASCII-local@example.com" which is non-
      ASCII address. Its ASCII alternative is
      "ASCII-local@example.com". It has a display-name "DISPLAY-local"
      which contains non-ASCII characters.
   o The "To" address is "ASCII-remote1@example.net" which is ASCII
      only. It has a display-name "DISPLAY-remote1" which contains non-
      ASCII characters.
   o The Subject header is "NON-ASCII-SUBJECT" which contains non-ASCII
      characters.
   The second example envelope/message is shown in Figure 7.

```
   MAIL From: <NON-ASCII-local@example.com>
             ALT-ADDRESS=ASCII-local@example.com
   RCPT TO: <ASCII-remote1@example.net>
   ----------------------------------------------------------------
   Message-Id: MESSAGE_ID
   Mime-Version: 1.0
   Content-Type: text/plain; charset="UTF-8"
   Content-Transfer-Encoding: 8bit
   Subject: NON-ASCII-SUBJECT
   From: DISPLAY-local <NON-ASCII-local@example.com
    <ASCII-local@example.com>>
   To: DISPLAY-remote1 <ASCII-remote1@example.net>
   Date: DATE

   MAIL_BODY
```

               Figure 7: Original message (example 2)

   In this example, SMTP session is downgradable. Figure 8 shows SMTP
   downgraded envelope/message.

```
   MAIL From: <ASCII-local@example.com>
   RCPT TO: <ASCII-remote1@example.net>
   ----------------------------------------------------------------
   Downgraded-Mail-From: =?UTF-8?Q?<NON-ASCII-local@example.com>_?=
    ?=UTF8?Q?<ASCII-local@example.com>?=
   Message-Id: MESSAGE_ID
   Mime-Version: 1.0
   Content-Type: text/plain; charset="UTF-8"
   Content-Transfer-Encoding: 8bit
   Subject: NON-ASCII-SUBJECT
   From: DISPLAY-local <NON-ASCII-local@example.com
    <ASCII-local@example.com>>
   To: DISPLAY-remote1 <ASCII-remote1@example.net>
   Date: DATE

   MAIL_BODY
```

        Figure 8: SMTP Downgraded envelope/message (example 2)

   After SMTP downgrading, header fields downgrading is performed. The
   downgraded example is shown in Figure 9.

```
Return-Path: <ASCII-local@example.com>
Downgraded-Mail-From: =?UTF-8?Q?<NON-ASCII-local@example.com>_?=
 =?UTF8?Q?<ASCII-local@example.com>?=
Message-Id: MESSAGE_ID
Mime-Version: 1.0
Content-Type: text/plain; charset="UTF-8"
Content-Transfer-Encoding: 8bit
Subject: =?UTF-8?Q?NON-ASCII-SUBJECT?=
Downgraded-From: =?UTF-8?Q?DISPLAY-local_<NON-ASCII-local@example.com_?=
 =?UTF-8?Q?<ASCII-local@example.com>>?=
From: =?UTF-8?Q?DISPLAY-local?= <ASCII-local@example.com>
To: =?UTF-8?Q?DISPLAY-remote1?= <ASCII-remote1@example.net>
Date: DATE

MAIL_BODY
```


                   Figure 9: Downgraded message (example 2)

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