        **Post-delivery Message Downgrading for Internationalized Email Messages**
                   **draft-ietf-eai-popimap-downgrade-04.txt**

Abstract

   The Email Address Internationalization (SMTPUTF8) extension allows
   UTF-8 characters in mail header fields.  Upgraded POP and IMAP
   servers support internationalized email messages.  If a POP/IMAP
   client does not support Email Address Internationalization, POP/IMAP
   servers cannot send Internationalized Email Headers to the client and
   cannot remove the message.  To avoid the situation, this document
   describes a conversion mechanism for internationalized Email messages
   to be traditional message format.  The purpose of post-delivery
   message downgrading is to enable POP/IMAP servers to deliver
   internationalized messages to traditional POP/IMAP clients.  In the
   process, message elements requiring internationalized treatment can
   be removed or recoded and receivers can know they received messages
   containing such elements even if they cannot receive the elements
   themselves.

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# 1.  Introduction

## 1.1.  Problem statement

Traditional (legacy) mail systems, which are defined by [RFC5322], allow only ASCII characters in mail header field values.  The SMTPUTF8 extension ([RFC6530] and [RFC6532] allows UTF-8 characters in those mail header fields.

If a header field contains non-ASCII characters, POP/IMAP servers cannot send Internationalized Email Headers to legacy clients and, because they have no obvious or standardized way to explain what is going on to those clients, cannot even safely discard the message.

## 1.2.  Possible solutions

Discussions leading to this specification concluded that there are four plausible approaches to the problem, with the preferred one depending on the particular circumstances and relationship among the delivery SMTP server, the mail store, the POP or IMAP server, and the users and their MUA clients:

1.  If the delivery MTA has sufficient knowledge about the POP and/or IMAP servers and clients being used, the message may be rejected as undeliverable.

2.  The message may be downgraded by the POP or IMAP server, in a way that preserves maximum information at the expense of some complexity.

3.  Some intermediate downgrading may be applied that balances more information loss against lower complexity and greater ease of implementation.

4.  The POP or IMAP server may fabricate a message whose intent is to notify the client that an internationalized message is waiting but cannot be delivered until an upgraded client is available.

## 1.3.  Approach taken in this specification

This specification describes the second of those options.  It is worth noticing that, at least in the general case, none of these options preserve sufficient information to guarantee that it is possible to reply to an incoming message without loss of information, so the choice may be considered to be among "least bad" options.

This message downgrading mechanism converts mail header fields to an all-ASCII representation.  The POP/IMAP servers can use the

downgrading mechanism and send the Internationalized Email message as a traditional form.  Receivers can know they received some internationalized messages or some unknown/broken messages.

[RFC6532] allows UTF-8 characters to be used in mail header fields and MIME header fields.  The message downgrading mechanism specified here describes the conversion method from the internationalized email messages that are defined in [RFC6530], and [RFC6532] to the traditional email messages defined in [RFC5322].

There is no good way to convert "From:" and "Sender:" header fields, this document updates [RFC5322] by redefining "From:" and "Sender:" header fields in Section 3.

This document provides a precise definition of the minimum-information-loss message downgrading process.

Downgrading consists of the following three parts:


o  New header field definitions

o  Email header field downgrading

o  MIME header field downgrading

In Section 4 of this document, header fields starting with "Downgraded-" are introduced.  They preserve the information that appeared in the original header fields.

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

MIME header fields are expanded in [RFC6532].  MIME header field downgrading is described in Section 6.  It generates ASCII-only MIME header fields.

Displaying downgraded messages that originally contained internationalized header fields is out of scope of this document.  A POP/IMAP client which does not support UTF8 extension does not know internationalized message format described in [RFC6532].

## 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
Overview and Framework for Internationalized Email [RFC6530], in the
mail message specifications [RFC5322], or in the MIME documents
[RFC2045] [RFC2047] [RFC2183] [RFC2231].  The terms "ASCII address",
"internationalized email address", "non-ASCII address", "i18mail
address", "SMTPUTF8", "message", and "mailing list" are used with the
definitions from [RFC6530].

This document depends on [RFC6532].  Key words used in those
documents are used in this document, too.

The term "non-ASCII" refers to a UTF-8 string that contains at least
one non-ASCII character.

A "SMTPUTF8 message" is an email message expanded by [RFC6532].

## 3.  Updating RFC 5322

"From:" header field or "Sender:" header field may contain non-ASCII
addresses in internationalized Email messages.  These non-ASCII
addresses are not allowed in [RFC5322].  The draft proposes that the
pop/imap downgrading uses <group> syntax and encodes non-ASCII
addresses into <display-name> with empty <group-list> described in
Section 5.

This specification redefines "From:", "Sender:", "Resent-From:" and
"Resent-Sender:" header fields defined in Section 3.6.2 and 3.6.6 of
[RFC5322] to allow <group> in the header fields.


```
from            =   "From:" address-list CRLF
resent-from     =   "Resent-From:" address-list CRLF
sender          =   "Sender:" address CRLF
resent-sender   =   "Resent-Sender:" address CRLF
```


This adds group syntax to "From" and "Sender" that was previously
allowed only in destination fields such as "To" and "cc".  It is
anticipated that when existing implementations encounter a downgraded
field from this set, many will tolerate the appearance of a group,
even though [RFC5322] does not permit it.  Implementations that do
not tolerate it will fail in unpredictable ways, and they might
refuse to process such messages.

[[ Notes in Draft: If this update is rejected, one possible solution
is to rewrite each <addr-spec> element in "From" and "Sender" header
fields as

    ENCODED-WORD "<" NO_EXISTING_ADDRESS ">"


    where the <ENCODED-WORD> is the original <addr-spec> encoded
    according to [RFC2047] and NO_EXISTING_ADDRESS is an ASCII email
    address which does not exist, should, as illustrated in the example
    below, always generate an error and is specified by the administrator
    of the POP3 or IMAP server.

    For example, if the local-part of the "From:" address were the
    Russian (in Cyrillic) equivalent of Ivan, with domain-part
    "foo.example.net" and the IMAP server being used by the recipient was
    "imap.example.com", the encoded word from suggested in this note
    might appear as:


    From: =?UTF-8?Q?=d0=b8=d0=b2=d0=b0=d0=bd@foo.example.net?=
          <invalid-i18n-address@imap.example.com>


    That would lead to immediate rejection if a user attempted to reply
    uncritically to the message.

## 4.  New Header Fields Definition

    New header fields are defined to preserve information that appeared
    in non-ASCII text in header fields of the incoming message.  The
    values of the new fields holds the original header field value in
    encoded form.  The revised header field syntax is specified as
    follows:


    fields                   =/ downgraded

    downgraded =  "Downgraded-Message-Id:"         unstructured CRLF /
                  "Downgraded-Resent-Message-Id:"  unstructured CRLF /
                  "Downgraded-In-Reply-To:"        unstructured CRLF /
                  "Downgraded-References:"          unstructured CRLF /
                  "Downgraded-Original-Recipient:" unstructured CRLF /
                  "Downgraded-Final-Recipient:"    unstructured CRLF


    To preserve a header field in a "Downgraded-" header field:

    1.  Generate a new header field.

        *  The field name is a concatenation of "Downgraded-" and the
           original field name.

   *  The initial new field value is the original header field
      value.

   2.  Treat the initial new header field value as if it were
       unstructured, and then apply [RFC2047] encoding with charset
       UTF-8 as necessary so that the resulting new header field value
       is completely in ASCII.

   3.  Remove the original header field.

## 5.  Email Header Fields Downgrading

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

   [RFC6532] expands "Received:" header fields; [RFC5322] describes ABNF
   elements <mailbox>, <word>, <comment>, <unstructured>; [RFC2045]
   describes ABNF element <value>.

### 5.1.  Downgrading Method for Each ABNF Element

   Header field downgrading is defined below for each ABNF element.
   Converting the header field terminates when no non-ASCII characters
   remain in the header field.

#### 5.1.1.  RECEIVED Downgrading

   If the header field name is "Received:" and the FOR clause contains a
   non-ASCII address, remove the FOR clause from the header field.
   Other parts (not counting <comment>s) should not contain non-ASCII
   values.

#### 5.1.2.  UNSTRUCTURED Downgrading

   If the header field has an <unstructured> field that contains non-
   ASCII characters, apply [RFC2047] encoding with charset UTF-8.

#### 5.1.3.  WORD Downgrading

   If the header field has any <word> fields that contain non-ASCII
   characters, apply [RFC2047] encoding with charset UTF-8.

#### 5.1.4.  COMMENT Downgrading

   If the header field has any <comment> fields that contain non-ASCII
   characters, apply [RFC2047] encoding with charset UTF-8.

### [5.1.5](#).  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 according to [[RFC2231](#)] with charset UTF-8 and leave the
language information empty.  If the <value> element is <quoted-
string> and it contains <CFWS> outside the DQUOTE, remove the <CFWS>
before this conversion.

### [5.1.6](#).  DISPLAY-NAME Downgrading

If the header field has any <address> (<mailbox> or <group>) elements
and they have <display-name> elements that contain non-ASCII
characters, encode the <display-name> elements according to [[RFC2047](#)]
with charset UTF-8.  DISPLAY-NAME downgrading is the same algorithm
as WORD downgrading.

### [5.1.7](#).  GROUP Downgrading

<group> is defined in [Section 3.4 of [RFC5322]](#).  The <group> elements
may contain <mailbox>s which contain non-ASCII addresses.

If the header field has any <group> elements that contain <mailbox>
elements, and those <mailbox> elements in turn contain non-ASCII
addresses, rewrite each <group> element as


display-name ENCODED_WORD " :;"


where the <ENCODED_WORD> is the original <group-list> encoded
according to [[RFC2047](#)].

### [5.1.8](#).  MAILBOX Downgrading

The <mailbox> elements have no equivalent format for non-ASCII
addresses.  If the header field has any <mailbox> elements that
contain non-ASCII characters in their <addr-spec> element, rewrite
each <addr-spec> element to ASCII-only format.  The <addr-spec>
element that contains non-ASCII characters may appear in two forms
as:


"<" addr-spec ">"
addr-spec


Rewrite both as:

```
ENCODED-WORD " :;"
```

where the <ENCODED-WORD> is the original <addr-spec> encoded according to [RFC2047].

### 5.1.9.  ENCAPSULATION Downgrading

Encapsulate the header field in a "Downgraded-" header field as described in Section 4 as a last resort.

Applying this procedure to "Received:" header field is prohibited. ENCAPSULATION Downgrading is allowed for "Message-ID", "In-Reply-To:", "References:", "Original-Recipient" and "Final-Recipient" header fields.

### 5.1.10.  TYPED-ADDRESS Downgrading

If the header field contains <utf-8-type-addr> and the <utf-8-type-addr> contains raw non-ASCII characters, it is in utf-8-address form. Convert it to utf-8-addr-xtext form.  Those forms are described in [RFC6533].  COMMENT downgrading is also performed in this case.  If the address type is unrecognized and the header field contains non-ASCII characters, then fall back to using ENCAPSULATION downgrading on the entire header field.

## 5.2.  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.

### 5.2.1.  Address Header Fields That Contain <address>s

```
From:
Sender:
To:
Cc:
Bcc:
Reply-To:
```

      Resent-From:
      Resent-Sender:
      Resent-To:
      Resent-Cc:
      Resent-Bcc:
      Resent-Reply-To:
      Return-Path:
      Disposition-Notification-To:

      If the header field contains <group> elements that contain non-ASCII
      addresses, perform COMMENT downgrading, DISPLAY-NAME downgrading, and
      GROUP downgrading.

      If the header field contains <mailbox> elements that contain non-
      ASCII addresses, perform COMMENT downgrading, DISPLAY-NAME
      downgrading, and MAILBOX downgrading.

### 5.2.2.  Address Header Fields with Typed Addresses


      Original-Recipient:
      Final-Recipient:

      If the header field contains non-ASCII characters, perform TYPED-
      ADDRESS downgrading.

### 5.2.3.  Downgrading Non-ASCII in Comments


      Date:
      Resent-Date:
      MIME-Version:
      Content-ID:
      Content-Transfer-Encoding:
      Content-Language:
      Accept-Language:
      Auto-Submitted:

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

### 5.2.4.  Message-ID Header Fields

      Message-ID:
      Resent-Message-ID:
      In-Reply-To:
      References:

      Perform ENCAPSULATION Downgrading.

## 5.2.5.  Received Header Field

      Received:

      Perform COMMENT downgrading and RECEIVED downgrading.

## 5.2.6.  MIME Content Header Fields


      Content-Type:
      Content-Disposition:

      Perform MIME-VALUE downgrading and COMMENT downgrading.

## 5.2.7.  Non-ASCII in <unstructured>


      Subject:
      Comments:
      Content-Description:

      Perform UNSTRUCTURED downgrading.

## 5.2.8.  Non-ASCII in <phrase>

      Keywords:

      Perform WORD downgrading.

## 5.2.9.  Other Header Fields

   There are other header fields that contain non-ASCII characters.
   They are user-defined and missing from this document, or future
   defined header fields.  They are treated as "Optional Fields" and
   their field value are treated as unstructured described in Section
   3.6.8 of [RFC5322].

   Perform UNSTRUCTURED downgrading.

   If the software understands the header field's structure and a
   downgrading algorithm other than UNSTRUCTURED is applicable, that

software SHOULD use that algorithm; UNSTRUCTURED downgrading is used
as a last resort.

Mailing list header fields (those that start in "List-") are part of
this category.

## 6.  MIME Body-Part Header Field Downgrading

MIME body-part header fields may contain non-ASCII characters
[RFC6532].  This section defines the conversion method to ASCII-only
header fields for each MIME header field that contains non-ASCII
characters.  Parse the message body's MIME structure at all levels
and check each MIME header field to see whether it contains non-ASCII
characters.  If the header field contains non-ASCII characters in the
header field value, the header field is a target of the MIME body-
part header field's downgrading.  Each MIME header field's
downgrading method is described below.  COMMENT downgrading, MIME-
VALUE downgrading, and UNSTRUCTURED downgrading are described in
Section 5.

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

Content-Type:

Content-Disposition:
   Perform MIME-VALUE downgrading and COMMENT downgrading.

Content-Description:  Perform UNSTRUCTURED downgrading.

## 7.  Security Considerations

The purpose of post-delivery message downgrading is to allow POP/IMAP
servers to deliver internationalized messages to traditional POP/IMAP
clients and permit them to work with those messages.  Users who
receive such messages can know that they were internationalized.  It
does not permit receivers to read the messages in their original form
and, in general, will not permit generating replies, at least without
significant user intervention.

This specification is designed so that MUAs that receive converted
messages may be traditional and SMTPUTF8-unaware.  The specification
assumes that such MUAs have no special provisions for either
"Downgraded-" header fields or the new syntax of From and Sender
header fields described in Section 3.

A downgraded message's header fields contain ASCII characters only.
But they still contain MIME-encapsulated header fields that contain
non-ASCII UTF-8 characters.  Furthermore, the body part may contain
UTF-8 characters.  Implementations parsing Internet messages need to
accept UTF-8 body parts and UTF-8 header fields that are MIME-
encoded.  Thus, this document inherits the security considerations of
MIME-encoded header fields ([RFC2047] and [RFC3629]).

Rewriting header fields increases the opportunities for undetected
spoofing by malicious senders.  However, the rewritten header field
values are preserved in equivalent MIME form or in newly defined
header fields which traditional MUAs do not care.

The techniques described here invalidate methods that depend on
digital signatures over any part of the message, which includes the
top-level header fields and body-part header fields.  Depending on
the specific message being downgraded, at least the following
techniques are likely to break: DomainKeys Identified Mail (DKIM),
and possibly S/MIME and Pretty Good Privacy (PGP).  Receivers may
know they need to update their MUAs, or they don't care.

While information in any email header field should usually be treated
with some suspicion, current email systems commonly employ various
mechanisms and protocols to make the information more trustworthy.
Information in the new Downgraded-* header fields is not inspected by
MUAs, and may be even less trustworthy than the traditional header
fields.  Note that the Downgraded-* header fields could have been
inserted with malicious intent (and with content unrelated to the
traditional header fields), however traditional MUAs do not parse
Downgraded-* header fields.

In addition, if an Authentication-Results header field [RFC5451] is
present, traditional MUAs may treat that the digital signatures are
valid.

See the "Security Considerations" section in [RFC6530] for more
discussion.

## 8.  Implementation Notes

### 8.1.  RFC 2047 Encoding

While [RFC2047] has a specific algorithm to deal with whitespace in
adjacent encoded words, there are a number of deployed
implementations that fail to implement the algorithm correctly.  As a
result, whitespace behavior is somewhat unpredictable in practice
when multiple encoded words are used.  While RFC 5322 states that
implementations SHOULD limit lines to not more than 78 characters,

implementations MAY choose to allow overly long encoded words in
order to work around faulty [RFC2047] implementations.
Implementations that choose to do so SHOULD have an optional
mechanism to limit line length to 78 characters.

## 9.  IANA Considerations

[[RFC Editor: Please change "should now be" and "should be" to "have
been" when the IANA actions are complete.]]

[[ Notes in draft: this section is not finished, to be reviewed with
IANA. ]]

[RFC5504] registered many "Downgraded-" header fields and requested
that 'IANA will refuse registration of all field names that start
with "Downgraded-", to avoid possible conflict with the procedure for
unknown header fields' preservation described in Section 3.3 of
[RFC5504].'  However [RFC6530] obsoleted [RFC5504] and this document
does not use all "Downgraded-" header fields registered by [RFC5504].

The following header fields should be registered in the Permanent
Message Header Field registry, in accordance with the procedures set
out in [RFC3864].

Header field name:  Downgraded-Message-Id
Applicable protocol:  mail
Status:  standard
Author/change controller:  IETF
Specification document(s):  This document (Section 4)

Header field name:  Downgraded-In-Reply-To
Applicable protocol:  mail
Status:  standard
Author/change controller:  IETF
Specification document(s):  This document (Section 4)

Header field name:  Downgraded-References
Applicable protocol:  mail
Status:  standard
Author/change controller:  IETF
Specification document(s):  This document (Section 4)

Header field name:  Downgraded-Original-Recipient
Applicable protocol:  mail

Status:  standard
Author/change controller:  IETF
Specification document(s):  This document ([Section 4](#))

Header field name:  Downgraded-Final-Recipient
Applicable protocol:  mail
Status:  standard
Author/change controller:  IETF
Specification document(s):  This document ([Section 4](#))

## [10](#).  Acknowledgements

This document draws heavily from the experimental in-transit message downgrading procedure described in [RFC 5504](#) [[RFC5504](#)].  The contribution of the co-author of that earlier document, Y. Yoneya, are gratefully acknowledged.  Significant comments and suggestions were received from John Klensin, Barry Leiba, Randall Gellens, Pete Resnick, and other WG participants.

## [11](#).  Change History

[[RFC Editor: Please remove this section prior to publication.]]

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

### [11.1](#).  Version 00

o  Initial version

o  Imported header field downgrading from [RFC 5504](#)

### [11.2](#).  Version 01

o  same as Version 00

### [11.3](#).  Version 02

o  Added updating [RFC 5322](#) to allow <group> syntax in From: and Sender

o  Added GROUP Downgrading

### [11.4](#).  Version 03

o  Replaced <utf8-addr-spec> with <addr-spec>

o  Added updating RFC 5322 to allow <group> syntax in From: and
   Sender

o  Added one sentence in Security considerations

o  Updated IANA considerations

## 11.5.  Version 04

o  Removed "Internationalized Address removed" from GROUP and MAILBOX
   downgrading

o  Updated "Updating RFC 5322"

o  Compacted new header field definition

o  Compacted security considerations

o  Updated IANA considerations to remove obsoleting header fields
   that are registered by RFC 5504

o  Added a discussion of alternate downgrading models for the POP and
   IMAP cases.

o  Incorporated a large number of editorial changes to improve
   clarity.

## 12.  References

### 12.1.  Normative References

[RFC6530]  Klensin, J. and Y. Ko, "Overview and Framework for
           Internationalized Email", RFC 6530, February 2012.

[RFC6532]  Yang, A., Steele, S., and N. Freed, "Internationalized
           Email Headers", RFC 6532, February 2012.

[RFC6533]  Hansen, T., Newman, C., and A. Melnikov,
           "Internationalized Delivery Status and Disposition
           Notifications", RFC 6533, February 2012.

[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.

   [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.

   [RFC5322]  Resnick, P., Ed., "Internet Message Format", RFC 5322,
              October 2008.

   [RFC3629]  Yergeau, F., "UTF-8, a transformation format of ISO
              10646", STD 63, RFC 3629, November 2003.

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

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

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

## 12.2.  Informative References

   [RFC5451]  Kucherawy, M., "Message Header Field for Indicating
              Message Authentication Status", RFC 5451, April 2009.

   [RFC5504]  Fujiwara, K. and Y. Yoneya, "Downgrading Mechanism for
              Email Address Internationalization", RFC 5504, March 2009.

## Appendix A.  Examples

## A.1.  Downgrading Example

   This appendix shows an message downgrading example.  Consider a
   received mail message where:

   o  The sender address is a non-ASCII address,
      "NON-ASCII-local@example.com".  Its display-name is "DISPLAY-
      local".

   o  The "To:" header field contains two non-ASCII addresses,
      "NON-ASCII-remote1@example.net" and
      "NON-ASCII-remote2@example.com" Its display-names are "DISPLAY-
      remote1" and "DISPLAY-remote2".

   o  The "Cc:" header field contains a non-ASCII address,
      "NON-ASCII-remote3@example.org".  Its display-name is "DISPLAY-
      remote3".

   o  Four display names contain non-ASCII characters.

   o  The Subject header field is "NON-ASCII-SUBJECT", which contains
      non-ASCII characters.

   o  The "Message-Id:" header field contains "NON-ASCII-MESSAGE_ID",
      which contains non-ASCII characters.

   o  There is an unknown header field "X-Unknown-Header" which contains
      non-ASCII characters.



   Return-Path: <NON-ASCII-local@example.com>
   Received: from ... by ... for <NON-ASCII-remote1@example.net>
   Received: from ... by ... for <NON-ASCII-remote1@example.net>
   From: DISPLAY-local <NON-ASCII-local@example.com>
   To: DISPLAY-remote1 <NON-ASCII-remote1@example.net>,
       DISPLAY-remote2 <NON-ASCII-remote2@example.com>
   Cc: DISPLAY-remote3 <NON-ASCII-remote3@example.org>
   Subject: NON-ASCII-SUBJECT
   Date: DATE
   Message-Id: NON-ASCII-MESSAGE_ID
   Mime-Version: 1.0
   Content-Type: text/plain; charset="UTF-8"
   Content-Transfer-Encoding: 8bit
   X-Unknown-Header: NON-ASCII-CHARACTERS

   MAIL_BODY


                 Figure 1: Received message in a mail drop

   The downgraded message is shown in Figure 2.  "Return-Path:",
   "From:", "To:" and "Cc:" header fields are rewritten.  "Subject:" and
   "X-Unknown-Header:" header fields are encoded using [RFC2047].
   "Message-Id:" header field is encapsulated as
   "Downgraded-Message-Id:" header field.

```
   Return-Path: =?UTF-8?Q?NON-ASCII-local@example.com?= :;
   Received: from ... by ...
   Received: from ... by ...
   From: =?UTF-8?Q?DISPLAY-local?=
         =?UTF-8?Q?NON-ASCII-local@example.com?= :;
   To:   =?UTF-8?Q?DISPLAY-remote1?=
         =?UTF-8?Q?NON-ASCII-remote1@example.net?= :;,
         =?UTF-8?Q?DISPLAY-remote2?=
         =?UTF-8?Q?NON-ASCII-remote2@example.com?= :;,
   Cc:   =?UTF-8?Q?DISPLAY-remote3?=
         =?UTF-8?Q?NON-ASCII-remote3@example.org?= :;
   Subject: =?UTF-8?Q?NON-ASCII-SUBJECT?=
   Date: DATE
   Downgraded-Message-Id: =?UTF-8?Q?MESSAGE_ID?=
   Mime-Version: 1.0
   Content-Type: text/plain; charset="UTF-8"
   Content-Transfer-Encoding: 8bit
   X-Unknown-Header: =?UTF-8?Q?NON-ASCII-CHARACTERS?=

   MAIL_BODY
```


                        Figure 2: Downgraded message

Author's Address

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