

Email Address Internationalization  
(EAI)  
Internet-Draft  
Intended status: Standards Track  
Expires: January 10, 2013

K. Fujiwara  
JPRS  
July 9, 2012

**Post-delivery Message Downgrading for Internationalized Email Messages**  
**draft-ietf-eai-popimap-downgrade-06.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 in traditional message format. In the process, message elements requiring internationalized treatment are recoded or removed and receivers are able to know that they received messages containing such elements even if they cannot treat the internationalized elements.

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 January 10, 2013.

Copyright Notice

Copyright (c) 2012 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

<a href="#">1.</a>	<a href="#">Introduction . . . . .</a>	<a href="#">4</a>
<a href="#">1.1.</a>	<a href="#">Problem statement . . . . .</a>	<a href="#">4</a>
<a href="#">1.2.</a>	<a href="#">Possible solutions . . . . .</a>	<a href="#">4</a>
<a href="#">1.3.</a>	<a href="#">Approach taken in this specification . . . . .</a>	<a href="#">4</a>
<a href="#">2.</a>	<a href="#">Terminology . . . . .</a>	<a href="#">5</a>
<a href="#">3.</a>	<a href="#">New Header Fields Definition . . . . .</a>	<a href="#">6</a>
<a href="#">4.</a>	<a href="#">Email Header Fields Downgrading . . . . .</a>	<a href="#">6</a>
<a href="#">4.1.</a>	<a href="#">Downgrading Method for Each ABNF Element . . . . .</a>	<a href="#">7</a>
<a href="#">4.1.1.</a>	<a href="#">&lt;UNSTRUCTURED&gt; Downgrading . . . . .</a>	<a href="#">7</a>
<a href="#">4.1.2.</a>	<a href="#">&lt;WORD&gt; Downgrading . . . . .</a>	<a href="#">7</a>
<a href="#">4.1.3.</a>	<a href="#">&lt;COMMENT&gt; Downgrading . . . . .</a>	<a href="#">7</a>
<a href="#">4.1.4.</a>	<a href="#">&lt;MIME-VALUE&gt; Downgrading . . . . .</a>	<a href="#">7</a>
<a href="#">4.1.5.</a>	<a href="#">&lt;DISPLAY-NAME&gt; Downgrading . . . . .</a>	<a href="#">7</a>
<a href="#">4.1.6.</a>	<a href="#">&lt;GROUP&gt; Downgrading . . . . .</a>	<a href="#">7</a>
<a href="#">4.1.7.</a>	<a href="#">&lt;MAILBOX&gt; Downgrading . . . . .</a>	<a href="#">8</a>
<a href="#">4.1.8.</a>	<a href="#">ENCAPSULATION Downgrading . . . . .</a>	<a href="#">8</a>
<a href="#">4.1.9.</a>	<a href="#">&lt;TYPED-ADDRESS&gt; Downgrading . . . . .</a>	<a href="#">8</a>
<a href="#">4.2.</a>	<a href="#">Downgrading Method for Each Header Field . . . . .</a>	<a href="#">9</a>
<a href="#">4.2.1.</a>	<a href="#">Address Header Fields That Contain &lt;address&gt;s . . . . .</a>	<a href="#">9</a>
<a href="#">4.2.2.</a>	<a href="#">Address Header Fields with Typed Addresses . . . . .</a>	<a href="#">9</a>
<a href="#">4.2.3.</a>	<a href="#">Downgrading Non-ASCII in Comments . . . . .</a>	<a href="#">10</a>
<a href="#">4.2.4.</a>	<a href="#">Message-ID Header Fields . . . . .</a>	<a href="#">10</a>
<a href="#">4.2.5.</a>	<a href="#">Received Header Field . . . . .</a>	<a href="#">10</a>
<a href="#">4.2.6.</a>	<a href="#">MIME Content Header Fields . . . . .</a>	<a href="#">10</a>
<a href="#">4.2.7.</a>	<a href="#">Non-ASCII in &lt;unstructured&gt; . . . . .</a>	<a href="#">11</a>
<a href="#">4.2.8.</a>	<a href="#">Non-ASCII in &lt;phrase&gt; . . . . .</a>	<a href="#">11</a>
<a href="#">4.2.9.</a>	<a href="#">Other Header Fields . . . . .</a>	<a href="#">11</a>
<a href="#">5.</a>	<a href="#">MIME Body-Part Header Field Downgrading . . . . .</a>	<a href="#">11</a>
<a href="#">6.</a>	<a href="#">Security Considerations . . . . .</a>	<a href="#">12</a>
<a href="#">7.</a>	<a href="#">Implementation Notes . . . . .</a>	<a href="#">13</a>
<a href="#">7.1.</a>	<a href="#">RFC 2047 Encoding . . . . .</a>	<a href="#">13</a>
<a href="#">8.</a>	<a href="#">IANA Considerations . . . . .</a>	<a href="#">13</a>
<a href="#">9.</a>	<a href="#">Acknowledgements . . . . .</a>	<a href="#">14</a>
<a href="#">10.</a>	<a href="#">Change History . . . . .</a>	<a href="#">14</a>
<a href="#">10.1.</a>	<a href="#">Version 00 . . . . .</a>	<a href="#">15</a>
<a href="#">10.2.</a>	<a href="#">Version 01 . . . . .</a>	<a href="#">15</a>
<a href="#">10.3.</a>	<a href="#">Version 02 . . . . .</a>	<a href="#">15</a>

Fujiwara

Expires January 10, 2013

[Page 2]

<a href="#">10.4.</a>	Version 03 . . . . .	<a href="#">15</a>
<a href="#">10.5.</a>	Version 04 . . . . .	<a href="#">15</a>
<a href="#">10.6.</a>	Version 05 . . . . .	<a href="#">16</a>
<a href="#">10.7.</a>	Version 06 . . . . .	<a href="#">16</a>
<a href="#">11.</a>	References . . . . .	<a href="#">16</a>
<a href="#">11.1.</a>	Normative References . . . . .	<a href="#">16</a>
<a href="#">11.2.</a>	Informative References . . . . .	<a href="#">17</a>
<a href="#">Appendix A.</a>	Examples . . . . .	<a href="#">18</a>
<a href="#">A.1.</a>	Downgrading Example . . . . .	<a href="#">18</a>

## **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](#)]) allow raw UTF-8 in those mail header fields.

If a header field contains non-ASCII strings, 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**

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

Fujiwara

Expires January 10, 2013

[Page 4]

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 messages that are defined in [RFC6530], and [RFC6532] to the traditional email messages defined in [RFC5322].

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 3](#) 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 4](#). It generates ASCII-only header fields.

The definition of MIME header fields in Internationalized Email Messages is described in [RFC6532]. MIME header field downgrading is described in [Section 5](#). 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", "non-ASCII address", "SMTPUTF8", "message", "internationalized





message" are used with the definitions from [\[RFC6530\]](#). The term "non-ASCII string" is used with the definitions from [\[RFC6532\]](#).

### **3. New Header Fields Definition**

New header fields are defined to preserve information that appeared in non-ASCII strings 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.

### **4. Email Header Fields Downgrading**

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

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

Fujiwara

Expires January 10, 2013

[Page 6]

#### **4.1. 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 strings remain in the header field.

##### **4.1.1. <UNSTRUCTURED> Downgrading**

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

##### **4.1.2. <WORD> Downgrading**

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

##### **4.1.3. <COMMENT> Downgrading**

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

##### **4.1.4. <MIME-VALUE> Downgrading**

If the header field has any <value> elements defined by [[RFC2045](#)] and the elements contain non-ASCII strings, 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.

##### **4.1.5. <DISPLAY-NAME> Downgrading**

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

##### **4.1.6. <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 [\[RFC2047\]](#).

#### **[4.1.7.](#) <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 strings in their <addr-spec> element, rewrite each <addr-spec> element to ASCII-only format. The <addr-spec> element that contains non-ASCII strings 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 [\[RFC2047\]](#).

#### **[4.1.8.](#) ENCAPSULATION Downgrading**

Encapsulate the header field in a "Downgraded-" header field as described in [Section 3](#) 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.

#### **[4.1.9.](#) <TYPED-ADDRESS> Downgrading**

If the header field contains <utf-8-type-addr> and the <utf-8-type-addr> contains raw non-ASCII strings, 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 strings, then fall back to using ENCAPSULATION downgrading on the entire header field.



## **[4.2.](#) Downgrading Method for Each Header Field**

[RFC4021] establishes a registry of header fields. This section describes the downgrading method for each header field.

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

### **[4.2.1.](#) 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.

This procedure may generate empty <group> elements in "From:", "Sender:" and "Reply-To:" header fields.

[[I-D.leiba-5322upd-from-group](#)] updates [[RFC5322](#)] to allow (empty) <group> elements in "From:", "Sender:" and "Reply-To:" header fields.

### **[4.2.2.](#) Address Header Fields with Typed Addresses**

Original-Recipient:





Final-Recipient:

If the header field contains non-ASCII strings, perform <TYPED-ADDRESS> downgrading.

#### **4.2.3. 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 strings except in comments. If the header field contains UTF-8 characters in comments, perform <COMMENT> downgrading.

#### **4.2.4. Message-ID Header Fields**

Message-ID:

Resent-Message-ID:

In-Reply-To:

References:

Perform ENCAPSULATION Downgrading.

#### **4.2.5. Received Header Field**

Received:

If the FOR clause contains a non-ASCII address, remove the FOR clause from the header field. Comments may contain non-ASCII strings, Perform <COMMENT> downgrading. Other parts should not contain non-ASCII strings.

#### **4.2.6. MIME Content Header Fields**



Content-Type:  
Content-Disposition:

Perform <MIME-VALUE> downgrading and <COMMENT> downgrading.

#### **4.2.7. Non-ASCII in <unstructured>**

Subject:  
Comments:  
Content-Description:

Perform <UNSTRUCTURED> downgrading.

#### **4.2.8. Non-ASCII in <phrase>**

Keywords:

Perform <WORD> downgrading.

#### **4.2.9. Other Header Fields**

There are other header fields that contain non-ASCII strings. They are user-defined and missing from this document, or future defined header fields. They are treated as "Optional Fields" and their field values 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.

### **5. MIME Body-Part Header Field Downgrading**

MIME body-part header fields may contain non-ASCII strings [\[RFC6532\]](#). This section defines the conversion method to ASCII-only header fields for each MIME header field that contains non-ASCII strings. Parse the message body's MIME structure at all levels and check each MIME header field to see whether it contains non-ASCII strings. If the header field contains non-ASCII strings 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 4](#).

**Content-ID:**

The "Content-ID:" header field does not contain non-ASCII strings 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.

## **6. 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 the clients to display 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.

A downgraded message's header fields contain ASCII characters only. But they still contain MIME-encapsulated header fields that contain non-ASCII strings. 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 [[I-D.leiba-5322upd-from-group](#)] and [[RFC6530](#)] for more discussion.

## **7. Implementation Notes**

### **7.1. [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.

## **8. IANA Considerations**

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

[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 3](#))

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

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

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

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

## **[9.](#) 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, Martin J. Durst, and other WG participants.

## **[10.](#) 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.



**10.1. Version 00**

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

**10.2. Version 01**

- o same as Version 00

**10.3. Version 02**

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

**10.4. 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

**10.5. 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.



### **10.6. Version 05**

- o Some text corrections
- o Terminology change: only to use non-ASCII address, non-ASCII message, non-ASCII string and imported them from [RFC 6530](#) and [RFC 6532](#)
- o Replace "non-ASCII character" with "non-ASCII string"
- o Removed 5.1.1. RECEIVED Downgrading: It's

### **10.7. Version 06**

- o Removed "Updating [RFC 5322](#)"
- o Added reference to [draft-leiba-5322upd-from-group](#)

## **11. References**

### **11.1. Normative References**

- |           |  |
|-----------|--|
| [RFC2045] | Freed, N. and N. Borenstein,<br>"Multipurpose Internet Mail<br>Extensions (MIME) Part One: Format of<br>Internet Message Bodies", <a href="#">RFC 2045</a> ,<br>November 1996.                 |
| [RFC2047] | Moore, K., "MIME (Multipurpose<br>Internet Mail Extensions) Part Three:<br>Message Header Extensions for Non-<br>ASCII Text", <a href="#">RFC 2047</a> , November 1996.                        |
| [RFC2119] | Bradner, S., "Key words for use in<br>RFCs to Indicate Requirement Levels",<br><a href="#">BCP 14</a> , <a href="#">RFC 2119</a> , March 1997.   |
| [RFC2183] | Troost, R., Dorner, S., and K. Moore,<br>"Communicating Presentation<br>Information in Internet Messages: The<br>Content-Disposition Header Field",<br><a href="#">RFC 2183</a> , August 1997. |
| [RFC2231] | Freed, N. and K. Moore, "MIME<br>Parameter Value and Encoded Word<br>Extensions: Character Sets, Languages<br>, and Continuations", <a href="#">RFC 2231</a> ,<br>November 1997.               |



- [RFC3629] Yergeau, F., "UTF-8, a transformation format of ISO 10646", STD 63, [RFC 3629](#), November 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.
- [RFC5322] Resnick, P., Ed., "Internet Message Format", [RFC 5322](#), October 2008.
- [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.
- [I-D.leiba-5322upd-from-group] Leiba, B., "Update to Internet Message Format to Allow Group Syntax in the 'From:' Header Field", [draft-leiba-5322upd-from-group-01](#) (work in progress), July 2012.

## **11.2. 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 strings.
- o The "Message-Id:" header field contains "NON-ASCII-MESSAGE\_ID", which contains non-ASCII strings.
- o There is an unknown header field "X-Unknown-Header" which contains non-ASCII strings.



```
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

Kazunori Fujiwara  
Japan Registry Services Co., Ltd.  
Chiyoda First Bldg. East 13F, 3-8-1 Nishi-Kanda  
Chiyoda-ku, Tokyo 101-0065  
Japan

Phone: +81 3 5215 8451

EMail: fujiwara@wide.ad.jp, fujiwara@jprs.co.jp