SMTP extension for internationalized email address
draft-ietf-eai-smtpext-07.txt

Status of this Memo

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Abstract

   This document specifies the use of SMTP extension for
   internationalized email address delivery. Communication with systems
   that do not implement this specification is specified in another
   document.

Table of Contents

1. Introduction

Internationalized email address includes two parts, the local part
and the domain part. The ways email addresses are used by protocols
are different from the ways domain names are used. The most critical
difference is that emails are delivered through a chain of peering
clients and servers while domain names are resolved by name servers
by looking up their own tables. In addition to this, email transport
protocol ESMTP[RFC1869] provide a negotiation mechanism through which
clients can make decisions for further processing; please see more in
[EAI-framework]. Email addresses can exploit the SMTP extension
negotiation mechanism while Internationalized Domain Name(IDN) does
not have such a facility. This is also more desirable
architecturally. This document specifies an SMTP extension to permit
internationalized email addresses in envelopes, and UTF-8 in headers.
The protocol described here is an MTA solution which is feasible,
architecturally elegant, and not difficult to deploy.

1.1. Role of this specification

The framework document [EAI-framework] specifies the requirements
for, and components of, full internationalization of electronic mail.
To understand and implement this specification, understanding the
context presented in [EAI-framework] is necessary.

This document specifies an element of that work, specifically the
definition of an SMTP extension [RFC1869] for the internationalized
email address transport delivery.

1.2. Proposal Context

This specification describes a change to the email transport
mechanism that permits non-ASCII characters in both the envelope and
header fields of messages while the specification in [EAI-utf8header]
specifies the details of how and where non-ASCII characters are
permitted in the header fields of messages. The context for the
change is described in [EAI-framework].

1.3. Terminology

The key words "MUST", "SHALL", "REQUIRED", "SHOULD", "RECOMMENDED",
and "MAY" 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 framework [EAI-framework] or in [RFC2821] and [RFC2822]. The
terms "ASCII address", "internationalized email address", "non-ASCII
address", "i18mail address", "UTF8SMTP", "message" and "mailing list"

are used with the definitions from the [EAI-framework] document.

This document defines only those ABNF [RFC4234] syntax rules that are
different from those of the base email specifications
[RFC2821][RFC2822] and, where the earlier rules are upgraded or
extended, gives them new names. When the new rule is a small upgrade
to the older one, it is typically given a name starting with "u".
Rules that are undefined here may be found in the base email
documents under the same names.

[[anchor4: RFC EDITOR'S NOTE: The following text should be deleted
before publication.]] This document is being discussed on the EAI
mailing list. See https://www1.ietf.org/mailman/listinfo/ima for
information about subscribing. The list's archive is at
http://www1.ietf.org/mail-archive/web/ima/index.html.

2. Mail Transport-level Protocol

2.1. Framework for the Internationalization Extension

The following service extension is defined:

1. The name of the SMTP service extension is "Email Address
    Internationalization";
2. The EHLO keyword value associated with this extension is
    "UTF8SMTP";
3. No parameter values are defined for this EHLO keyword value. In
    order to permit future (although unanticipated) extensions, the
    EHLO response MUST NOT contain any parameters for that keyword.
    Clients MUST ignore any parameters, that is, clients MUST behave
    as if the parameters do not appear. If a server includes
    UTF8SMTP in its EHLO response, it MUST be fully compliant with
    this version of this specification.
4. One optional parameter, ALT-ADDRESS, is added to the SMTP MAIL
    and RCPT commands. ALT-ADDRESS specifies an all-ASCII address
    which can be used as a substitute for the i18mail addresses that
    we call the primary address; you can learn more in
    [EAI-framework] or [EAI-downgrading].
5. One optional parameter "UTF8REPLY" is added to the VRFY and EXPN
    commands. The parameter UTF8REPLY has no value. The parameter
    indicates the SMTP client can accept UTF-8 on replies of the
    VRFY and EXPN commands.
6. No additional SMTP verbs are defined by this extension.
7. Servers offering this extension MUST provide support for, and
    announce, the 8BITMIME extension [RFC1652].

8.   The reverse-path and forward-path of SMTP MAIL and RCPT commands
      are extended to allow UTF-8 characters in the specified mailbox
      address.

9.   The mail datum is extended in compliance with [EAI-utf8header]

10.   The maximum length of a MAIL and RCPT command lines is increased
      by 460 characters by the possible addition of the ALT-ADDRESS
      keyword and value.

2.2. The UTF8SMTP Extension

An SMTP Server that announces this extension MUST be prepared to
accept a UTF-8 string [RFC3629] in any position in which RFC 2821
specifies that a "mailbox" MAY appear. That string MUST be parsed
only as specified in RFC 2821, i.e., by separating the mailbox into
source route, local part and domain part, using only the characters
colon (U+003A), comma (U+002C), and at-sign (U+0040) as specified
there. Once isolated by this parsing process, the local part MUST be
treated as opaque unless the SMTP Server is the final delivery MTA.
Any domain names that are to be looked up in the DNS MUST first be
processed into the form specified in IDNA [RFC3490] by means of the
ToASCII() operation unless they are already in that form. Any domain
names that are to be compared to local strings SHOULD be checked for
validity and then MUST be compared as specified in section 3.4 of
IDNA.

The UTF8SMTP extension is valid on the submission port [RFC4409].

An SMTP Client that receives the UTF8SMTP extension keyword in
response to the "EHLO" command MAY transmit a mailbox name as an
internationalized string in UTF-8 form and MAY send an UTF-8 header
[EAI-utf8header]. It MAY transmit the domain part of that string in
either the form of ACE labels specified in [RFC3490] or UTF-8 form.
In the domain part of the mailbox string, if any of the labels are
intended to be interpreted as non-ASCII (i.e., are IDNs), then the
Message Submission Server ("MSA") [RFC4409] MUST take responsibility
for ensuring that the labels are valid (whether they appear in native
character or ACE form). The presence of the UTF8SMTP extension does
not change the requirement of RFC 2821 that servers relaying mail
MUST not attempt to parse, evaluate, or transform the local part in
any way.

If the UTF8SMTP SMTP extension is not offered by the Server, the SMTP
client MUST NOT transmit an internationalized address and MUST NOT
transmit a mail message which contains internationalized mail headers
[EAI-utf8header] at any level within its MIME structure. Instead, if
an SMTP client (SMTP sender) attempts to transfer a UTF8SMTP message
and encounters a server that does not support the extension, it MUST
make one of the following four choices:

1. If and only if the SMTP client (sender) is a Message Submission
   Server[RFC4409], it MAY, consistent with the general provisions
   for changes by such servers, rewrite the envelope, headers, or
   message material to make them entirely ASCII and consistent with
   the provisions of RFC 2821 [RFC2821] and RFC 2822 [RFC2822].
2. Reject the message during the SMTP transaction or generate a
   notification of non-deliverability, as specified in RFC 2821
   [RFC2821] and RFC 3464 [RFC3464]. If the message content can be
   returned without alteration, content should be returned as
   specified in 2821 but, if a server is encountered along the
   return path that cannot accept UTF8SMTP traffic, the content
   should simply be abridged or dropped.
3. Find an alternate route to the destination that permits UTF8SMTP.
   That route may be discovered by trying alternate MX hosts (using
   preference rules as specified in RFC 2821) or using other means
   available to the SMTP-sender.
4. If and only if ASCII addresses are available for all addresses
   that appear in the return path and the specific forward paths
   being attempted, downgrade the message to an all-ASCII form as
   specified in [EAI-downgrading]. An ASCII address is considered
   to be "available" for a particular address if the original
   address in the envelope is in ASCII or if an ALT-Address
   parameter is specified for a UTF8SMTP address.

2.3. Extended Mailbox Address Syntax

RFC 2821, section 4.1.2, defines the syntax of a mailbox entirely in
terms of ASCII characters, using the production for "Mailbox" and
those on which it depends.

The key changes made by this specification are, informally, to

o Change the definition of "sub-domain" to permit either the
   definition above or a UTF-8 string representing a DNS label that
   is conformant with IDNA [RFC3490].
o Change the definition of "Atom" to permit either the definition
   above or a UTF-8 string. That string MUST NOT contain any of the
   ASCII characters (either graphics or controls) that are not
   permitted in "atext"; it is otherwise unrestricted.

According to the description above, define the syntax of an
internationalized email mailbox with ABNF [RFC4234] as

```
uMailbox = uLocal-part "@" uDomain
        ; Replace Mailbox in RFC 2821, section 4.1.2

uLocal-part = uDot-string / uQuoted-string
        ; MAY be case-sensitive
        ; Replace Local-part in RFC 2821, section 4.1.2

uDot-string = uAtom *("." uAtom)
        ; Replace Dot-string in RFC 2821, section 4.1.2

uAtom = 1*ucharacter
        ; Replace Atom in RFC 2821, section 4.1.2

ucharacter = atext / UTF8-xtra-char
        ; Replace character in RFC 2821, section 4.1.2
        ; atext is defined in RFC 2822

uQuoted-string = DQUOTE *uqcontent DQUOTE
        ; Replace Quoted-string in RFC 2821, section 4.1.2
        ; DQUOTE is Double Quote defined in RFC 4234

uqcontent = qcontent / UTF8-xtra-char
        ; qcontent is defined in RFC 2822, section 3.2.5

uDomain = (sub-udomain 1*("." sub-udomain)) / address-literal
        ; Replace Domain in RFC 2821, section 4.1.2
        ; address-literal is defined in RFC2821 section 4.1.2

sub-udomain = uLet-dig [uLdh-str]
        ; Replace sub-domain in RFC 2821, section 4.1.2

uLet-dig = Let-dig / UTF8-xtra-char
        ; Let-dig is defined in RFC 2821, section 4.1.3

uLdh-str = *( ALPHA / DIGIT / "-" / UTF8-xtra-char) uLet-dig
        ; Replace Ldh-str in RFC 2821, section 4.1.3

UTF8-xtra-char = UTF8-2 / UTF8-3 / UTF8-4
        ; UTF8-2, UTF8-3 and UTF8-4 are defined in RFC 3629
```

The value of "udomain" SHOULD be verified with IDNA [RFC3490]; If failed, the email address with that udomain can not be regarded as the valid email address.

2.4. The ALT-ADDRESS parameter

   If the UTF8SMTP extension is offered, the syntax of the SMTP MAIL and
   RCPT commands is extended to support the optional esmtp-keyword "ALT-
   ADDRESS", which specifies an alternate all-ASCII address which may be
   used when downgrading. If the ALT-ADDRESS esmtp-keyword is used, it
   MUST have an associated esmtp-value (ALT-ADDRESS-esmtp-value which is
   defined below).

   Based on the definition of mail-parameters in [RFC2821], the ALT-
   ADDRESS parameter usage in the commands of "MAIL" and "RCPT" is
   defined below.

        "MAIL FROM:" ("<>" / uReverse-path) [SP Mail-parameters] CRLF
                ; Update mail command in RFC 2821, section 4.1.1.2.
                ; A new parameter defined by the ABNF non-terminal
                ; <ALT-ADDRESS-parameter> is added. It complies
                ; with the syntax specified by <esmtp-param>.

        "RCPT TO:" ("<Postmaster@" domain ">" / "<Postmaster>" /
                 uForward-Path) [SP Rcpt-parameters] CRLF
                ; Update rcpt command in RFC 2821, section 4.1.1.3.
                ; A new parameter defined by the ABNF non-terminal
                ; <ALT-ADDRESS-parameter> is added. It complies
                ; with the syntax specified by <esmtp-param>.

        uReverse-path = uPath
                ; Replace Reverse-path in RFC 2821, section 4.1.2

        uForward-path = uPath
                ; Replace Forward-path in RFC 2821, section 4.1.2

        uPath = "<" [A-d-l ":"] uMailbox ">"
                ; Replace Path in RFC 2821, section 4.1.2
                ; A-d-l is defined in RFC 2821, section 4.1.2
                ; uMailbox is defined in section 2.3 of this document

        ALT-ADDRESS-parameter="ALT-ADDRESS=" ALT-ADDRESS-esmtp-value

        ALT-ADDRESS-esmtp-value=xtext
                ; Mailbox encoded as xtext.
                ; xtext is defined in RFC 3461 [RFC3461], section 4.2

   The ALT-ADDRESS-parameter MUST NOT appear more than once in any MAIL
   or RCPT command. ALT-ADDRESS-esmtp-value MUST be an all-ASCII email

address before xtext encoding.

2.5. ALT-ADDRESS parameter usage and response codes

[EAI-utf8header] specifies "UTF8SMTP message" which requires UTF8SMTP
support. Such a message MUST NOT be sent to an SMTP server which
does not support UTF8SMTP. Such a message MAY be rejected due to
lack of the ALT-ADDRESS as discussed in section 2.2 of this document.

When messages are rejected because they require UTF8SMTP, the
response code "550" is used, defined in [RFC2821], meaning "mailbox
unavailable". If enhanced mail system status codes [RFC3463] are
used, the response code should be "5.6.x" [SMTP-codes], meaning that
"The alt-address is required but not specified".

If the response code is issued after the final "." of the DATA
command, the response code "554" is used, defined in [RFC2821],
meaning "Transaction failed". If enhanced mail system status codes
[RFC3463] are used, the response code should be "5.6.z" [SMTP-codes],
meaning that "UTF8SMTP downgrade failed".

[[anchor8: REMOVE THIS: IANA please assign the proper error codes for
"5.6.x" and "5.6.z".]]

2.6. Body Parts and SMTP Extensions

Since there is no ESMTP parameter which tells whether the message is
UTF8SMTP message, SMTP server needs to parse all message header
fields and MIME header fields in the message body to discover which
messages are UTF8SMTP. While this specification requires that
servers support the 8BITMIME extension [RFC1652] to ensure that
servers have adequate handling capability for 8-bit data and to avoid
a number of complex encoding problems, the use of internationalized
addresses obviously does not require non-ASCII body parts in the MIME
message. The UTF8SMTP extension MAY be used with the BODY=8BITMIME
parameter if that is appropriate given the body content or, if the
server advertises it and it is appropriate, with the BODY=BINARYMIME
parameter specified in [RFC3030].

Assuming that the server advertises UTF8SMTP and 8BITMIME, and at
least one non-ASCII address, with or without ALT-ADDRESS, the precise
interpretation of "No 'Body' parameter", "BODY= 8BITMIME", and "BODY=
BINARYMIME" in the MAIL command is:
1. For No "Body" parameter, headers are in UTF-8, body parts are in
    ASCII.
2. For BODY=8BITMIME parameter, headers are in UTF-8, some or all
    body parts contain 8-bit line-oriented data.

3. For BODY=BINARYMIME parameter, headers are in UTF-8, some or all
    body parts contain binary data without restriction as to line
    lengths or delimiters.

2.7. Additional ESMTP Changes and Clarifications

The mail transport process involves addresses ("mailboxes") and
domain names in contexts in addition to the MAIL and RCPT commands
and extended alternatives to them. In general, the rule is that,
when RFC 2821 specifies a mailbox, this document expects UTF-8 to be
used for the entire string; when RFC 2821 specifies a domain name,
the name SHOULD be in the form of ACE labels if its raw form is non-
ASCII.

The following subsections list and discuss all of the relevant cases.

Support and use of this extension requires support for 8BITMIME. It
means that 8BITMIME MUST be advertised by the UTF8SMTP capable SMTP
server.

2.7.1. The Initial SMTP Exchange

When an SMTP or ESMTP connection is opened, the server normally sends
a "greeting" response consisting of the '220' reply code and some
information. The client then sends the EHLO command. Since the
client cannot know whether the server supports UTF8SMTP until after
it receives the response from EHLO, any domain names that appear in
this dialogue, or in responses to EHLO, MUST be in the hostname form,
i.e., internationalized ones MUST be in the form of ACE labels.

2.7.2. Mail eXchangers

Commonly, organizations authorize multiple servers to accept mail
addressed to them. For example, the organization may itself operate
more than one server, and may also or instead have an agreement with
other organizations to accept mail as a backup. Authorized servers
are generally listed in MX records [RFC2821]. When more than one
server accepts mail for the domain-part of a Mailbox, it is strongly
advised that either all or none of them support the UTF8SMTP
extension. Otherwise, surprising downgrades can happen during
temporary failures, which is not a good thing.

2.7.3. Trace Information

When an SMTP server receives a message for delivery or further
processing, it MUST insert trace ("time stamp" or "Received")
information at the beginning of the message content. Time stamp
appears in the form of "Received: lines". The most important use of

Received: lines is for debugging mail faults. When the delivery SMTP
server makes the "final delivery" of a message, it inserts a return-
path line at the beginning of the mail data. The primary purpose of
the Return-path is to designate the address to which messages
indicating non-delivery or other mail system failures are to be sent.
For the trace information, we update the time stamp line and the
return path line [RFC2821] formally defined as follows:

uReturn-path-line = "Return-Path:" FWS uReverse-path <CRLF>
        ; Replaces Return-path-line in the section 4.4 of [RFC2821]
        ; uReverse-path is defined in Section 2.3

uTime-stamp-line = "Received:" FWS uStamp <CRLF>
        ; Replaces Time-stamp-line in the section 4.4 of [RFC2821]

uStamp = From-domain By-domain uOpt-info ";" FWS date-time
        ; Replaces Stamp in the section 4.4 of [RFC2821]

uOpt-info = [Via] [With] [ID] [uFor]
        ; Replaces Opt-info in the section 4.4 of [RFC2821]
        ; [With]'s protocol value will allow UTF8SMTP value

uFor = "FOR" 1*(FWS (uPath / uMailbox)) CFWS
        ; Replaces For in the section 4.4 of [RFC2821]
        ; uPath is defined in section 2.4 of this document
        ; uMailbox is defined in section 2.3 of this document

[[anchor12: Note: Whether the FOR parameter is permitted to accept
more than one address is now under discussion as part of the
rfc2821bis effort. The multiple-address construction was introduced
with RFC 2821; it is not clear that it has been widely implemented or
that it is wise. Whatever decision is reached about RFC2821bis will
be reflected in the syntax of a future version of this document.]]
Except in the 'uFor' and 'uReverse-path' line where non-ASCII domain
name may be used, internationalized domain names in Received fields
MUST be transmitted in the form of ACE labels. The protocol value of
the WITH clause is UTF8SMTP when this extension is used. More
information is in the "IANA Considerations" section of this document.

2.7.4. UTF-8 Reply

If the client issues the RCPT command which contains non-ASCII
characters, the SMTP server is permitted to use UTF-8 characters in
the email address within 251 and 551 response codes.

If an SMTP client follows this specification and sends any RCPT

commands containing non-ASCII addresses, it MUST be able to accept
and process 251 or 551 replies containing UTF-8 email addresses. If
a given RCPT command does not include non-ASCII envelope addresses,
the server MUST not return a 251 or 551 response containing a non-
ASCII mailbox. Instead, it MUST transform such responses into 250 or
550 responses that do not contain addresses.

If the VRFY and EXPN commands have the optional parameter
"UTF8REPLY", it indicates the client can accept UTF-8 on replies of
the VRFY and EXPN commands. Specially this allows to use UTF-8 on
mailboxes and full names which occur on replies. The SMTP client
following this specification MUST accept UTF-8 on replies of the VRFY
and EXPN commands. However the SMTP server MUST not use UTF-8 on
replies, if the SMTP client does not ask UTF-8 replies. Some replies
include the mailbox, but usually most of replies do not require that
the mailbox is included in it and therefore UTF-8 is not needed. The
UTF8REPLY parameter on the VRFY and EXPN commands tells the SMTP
server that the client is prepared for UTF-8 on SMTP replies.

VERIFY (VRFY) and EXPAND (EXPN)command syntaxes are changed to:

       "VRFY" SP (uLocal-part / uMailbox) [SP "UTF8REPLY"] CRLF;
              ;uLocal-part is defined in section 2.3 of this document
              ;uMailbox is defined in section 2.3 of this document

       "EXPN" SP (uLocal-part / uMailbox) [SP "UTF8REPLY"] CRLF;
              ;uLocal-part is defined in section 2.3 of this document
              ;uMailbox is defined in section 2.3 of this document

This parameter "UTF8REPLY" does not have value. If SMTP reply
requires UTF-8, but SMTP client does not use "UTF8REPLY" parameter in
the VERIFY (VRFY) and EXPAND (EXPN) commands, the response code 252
is used, defined in [RFC2821], meaning "Cannot VRFY user, but will
accept the message and attempt the delivery". Also response code 550
may be used, meaning "Requested action not taken: mailbox
unavailable". If enhanced mail system status code [RFC3463] is used,
response codes given on below is used. "UTF8REPLY" on the VERIFY
(VRFY) or EXPAND (EXPN) commands enables UTF-8 for that command only.

If a normal (i.e., 250) response is returned, the response MAY
include the full name of the user and MUST include the mailbox of the
user. It MUST be in either of the following forms:

       User Name <uMailbox>
              ; uMailbox is defined in section 2.3 of this document
              ; User Name allows the non-ASCII character.

       uMailbox

                    ; uMailbox is defined in section 2.3 of this document

   If the SMTP reply requires UTF-8, but UTF-8 is not allowed on reply,
   and enhanced mail system status code [RFC3463] is used, the response
   code should be "5.6.y" or "2.6.y" [SMTP-codes], meaning that "The
   UTF-8 reply required, but not allowed.". [[anchor13: REMOVE THIS:
   IANA please assign the proper error codes for "5.6.y" and "2.6.y".]]

   If the SMTP Client lack of the UTF8SMTP support receives the UTF-8
   message on reply, it may crash. UTF-8 messages on reply are only
   allowed in the commands under the situations described above. Under
   any other circumstances, UTF-8 messages on the reply MUST NOT be
   used.

   Although UTF-8 is needed to represent email addresses in responses
   under the rules specified in this section, this extension does not
   permit the use of UTF-8 for any other purposes. SMTP servers MUST
   NOT include non-ASCII characters except in the limited cases
   specifically permitted in this section.

3. Issues with Other Parts of the Email System

3.1. LMTP

   LMTP [RFC2033] may be used as the final delivery agent. In such
   cases, LMTP may be arranged to deliver the mail to the mail store.
   The mail store may not have UTF8SMTP capability. LMTP need to be
   updated to deal with these situations.

3.2. SMTP Service Extension for DSNs

   The existing draft standard Delivery status notifications
   (DSNs)[RFC3461] is presently limited to US-ASCII text in the machine
   readable portions of the protocol. "International Delivery and
   Disposition Notifications" [EAI-dsn] adds a new address type for
   international email addresses so an original recipient address with
   non-US-ASCII characters can be correctly preserved even after
   downgrading. If an SMTP server advertises both the UTF8SMTP and the
   DSN extension, that server MUST implement EAI-dsn [EAI-dsn] including
   support for the ORCPT parameter.

3.3. POP and IMAP

   The [EAI-framework] has introduced two documents [EAI-pop] and
   [EAI-imap] to how to use internationalized user names based on UTF-8
   characters for the retrieval of messages from a mail server.

4. Potential problems

4.1. Impact many email related RFC

   Internationalized email has implications for all processes and
   protocols which examine, handle, generate, or otherwise deal with
   mail. In particular, address parsing or validity checks, message
   parsing or handling, etc.

5. Implementation Advice

   In the absence of this extension, SMTP clients and servers are
   constrained to using only those addresses permitted by RFC 2821. The
   local parts of those addresses MAY be made up of any ASCII
   characters, although some of them MUST be quoted as specified there.
   It is notable in an internationalization context that there is a long
   history on some systems of using overstruck ASCII characters (a
   character, a backspace, and another character) within a quoted string
   to approximate non-ASCII characters. This form of
   internationalization SHOULD be phased out as this extension becomes
   widely deployed but backward-compatibility considerations require
   that it continue to be supported.

6. IANA Considerations

   IANA is requested to add "UTF8SMTP" to the SMTP extensions registry
   with the entry pointing to this specification for its definition.

   IANA is requested to assign the proper error codes "5.6.x", "5.6.z",
   "5.6.y" and "2.6.y" for this specification based on [SMTP-codes].

   The "Mail Transmission Types" registry is requested to be updated to
   include the following new entries:

```
  WITH protocol types  Description                        Reference
  -------------------  ---------------------------        ---------
  UTF8SMTP             UTF8SMTP with Service Extensions   [RFCxxxx]
  UTF8SMTPA            UTF8SMTP with SMTP AUTH            [RFC2554bis]
                                                          [RFCxxxx]
  UTF8SMTPS            UTF8SMTP with STARTTLS             [RFC3207]
                                                          [RFCxxxx]
  UTF8SMTPSA           UTF8SMTP with both STARTTLS and    [RFC3207]
                       SMTP AUTH                          [RFC2554bis]
                                                          [RFCxxxx]
```

[[anchor22: REMOVE THIS: where RFCxxxx represents the future RFC N0.
of this document. When this document is published as RFC and
assigned with a RFC No., "xxxx" should be replaced with 4-digits No..
"RFC2554bis" should be replaced with the new RFC No. when the
"RFC2554bis" document is assigned with the new RFC No.]]

7. Security considerations

See the extended security considerations discussion in
[EAI-framework]

8. Acknowledgements

Much of the text in the initial version of this document was derived
or copied from [Klensin-emailaddr] with the permission of the author.
Significant comments and suggestions were received from Xiaodong LEE,
Nai-Wen Hsu, Yangwoo KO, Yoshiro YONEYA, and other members of the JET
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Chung, Tony Finch, Kari Hurtta, Randall Gellens, Frank Ellermann,
Alexey Melnikov. Of course, none of the individuals are necessarily
responsible for the combination of ideas represented here.

9. Change History

[[anchor25: REMOVE THIS: This section is used for tracking the update
of this document. It may be useful to retain parts of it to
facilitate establishing dates and documents for the history of this
work.]]

9.1. draft-ietf-eai-smtpext: Version 00

This version supercedes draft-yao-ima-smtpext-03.txt. It refines the
ABNF definition of the internationalized email address. It
represents as the EAI working group document.

9.2. draft-ietf-eai-smtpext: Version 01

o Upgraded to reflect discussions during IETF 66.
o Remove the atomic parameter.
o Add the new section of "the Suggestion of the value of the ALT-
   ADDRESS parameter".

9.3. **draft-ietf-eai-smtpext**: **Version 02**

   o Upgraded to reflect the recent discussion of the ima@ietf.org
      mailing list.
   o Add the section of "Body Parts and SMTP Extensions".
   o Add the new section of "Change History".
   o Add the subsection about SMTP extensions for DSN.

9.4. **draft-ietf-eai-smtpext**: **Version 03**

   o Update the syntax related to mailbox.
   o Update the trace field section.
   o Add the new section about message retry.
   o Update the subsection about SMTP extensions for DSN.

9.5. **draft-ietf-eai-smtpext**: **Version 04**

   o Refine some syntax.
   o Delete "Message Header Label" section.
   o Change "bounce" to "reject".

9.6. **draft-ietf-eai-smtpext**: **Version 05**

   o Refine the abstract.
   o Delete "The Suggestion of the Value of the ALT-ADDRESS parameter"
      section.
   o Move original section 2.7.4 and 2.7.5 to section 3 with the name
      "Issues with other parts of the email system".
   o Add the new section "LMTP".
   o Refine some text according to suggestions from the EAI mailing
      list discussion
   o Remove the section "Mailing List Question"

9.7. **draft-ietf-eai-smtpext**: **Version 06**

   o Delete the section about message retry.
   o Add the new subsection about Mail eXchangers
   o Add the new section about "UTF-8 Reply"
   o Refine some response code for the section "Using the ALT-ADDRESS
      parameter"

9.8. **draft-ietf-eai-smtpext**: **Version 07**

   o Rename the section 2.5
   o Refine sthe section 2.7

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