Internet Engineering Task Force (IETF)
Request for Comments: 6152
STD: 71
Obsoletes: 1652
Category: Standards Track
ISSN: 2070-1721

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March 2011

SMTP Service Extension for 8-bit MIME Transport

Abstract

This memo defines an extension to the SMTP service whereby an SMTP content body consisting of text containing octets outside of the US-ASCII octet range (hex 00-7F) may be relayed using SMTP.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 5741.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at http://www.rfc-editor.org/info/rfc6152.

1. Introduction

Although SMTP is widely and robustly deployed, various extensions have been requested by parts of the Internet community. In particular, a significant portion of the Internet community wishes to exchange messages in which the content body consists of a MIME message [RFC2045][RFC2046][RFC5322] containing arbitrary octet-aligned material. This memo uses the mechanism described in the SMTP specification [RFC5321] to define an extension to the SMTP service whereby such contents may be exchanged. Note that this extension does NOT eliminate the possibility of an SMTP server limiting line length; servers are free to implement this extension but nevertheless set a line length limit no lower than 1000 octets. Given that this restriction still applies, this extension does NOT provide a means for transferring unencoded binary via SMTP.

2. Framework for the 8-bit MIME Transport Extension

The 8-bit MIME transport extension is laid out as follows:

1. the name of the SMTP service extension defined here is 8bit-MIMEtransport;

2. the EHLO keyword value associated with the extension is 8BITMIME;

3. no parameter is used with the 8BITMIME EHLO keyword;

4. one optional parameter using the keyword BODY is added to the MAIL command. The value associated with this parameter is a keyword indicating whether a 7-bit message (in strict compliance with [RFC5321]) or a MIME message (in strict compliance with [RFC2046] and [RFC2045]) with arbitrary octet content is being sent. The syntax of the value is as follows, using the ABNF notation of [RFC5234]:

   body-value = "7BIT" / "8BITMIME"

5. no additional SMTP verbs are defined by this extension; and

6. the next section specifies how support for the extension affects the behavior of a server and client SMTP.

3. The 8bit-MIMEtransport Service Extension

When a client SMTP wishes to submit (using the MAIL command) a content body consisting of a MIME message containing arbitrary lines of octet-aligned material, it first issues the EHLO command to the server SMTP. If the server SMTP responds with code 250 to the EHLO

command, and the response includes the EHLO keyword value 8BITMIME, then the server SMTP is indicating that it supports the extended MAIL command and will accept MIME messages containing arbitrary octet-aligned material.

The extended MAIL command is issued by a client SMTP when it wishes to transmit a content body consisting of a MIME message containing arbitrary lines of octet-aligned material. The syntax for this command is identical to the MAIL command in RFC 5321, except that a BODY parameter must appear after the address. Only one BODY parameter may be used in a single MAIL command.

The complete syntax of this extended command is defined in RFC 5321. The esmtp-keyword is BODY, and the syntax for esmtp-value is given by the syntax for body-value shown above.

The value associated with the BODY parameter indicates whether the content body that will be passed using the DATA command consists of a MIME message containing some arbitrary octet-aligned material ("8BITMIME") or is encoded entirely in accordance with RFC 5321 ("7BIT").

A server that supports the 8-bit MIME transport service extension shall preserve all bits in each octet passed using the DATA command. Naturally, the usual SMTP data-stuffing algorithm applies, so that a content that contains the five-character sequence of
<CR> <LF> <DOT> <CR> <LF>
or a content that begins with the three-character sequence of
<DOT> <CR> <LF>
does not prematurely terminate the transfer of the content. Further, it should be noted that the CR-LF pair immediately preceding the final dot is considered part of the content. Finally, although the content body contains arbitrary lines of octet-aligned material, the length of each line (number of octets between two CR-LF pairs) is still subject to SMTP server line length restrictions (which can allow as few as 1000 octets, inclusive of the CR-LF pair, on a single line). This restriction means that this extension provides the necessary facilities for transferring a MIME object with the 8BIT content-transfer-encoding, it DOES NOT provide a means of transferring an object with the BINARY content-transfer-encoding.

Once a server SMTP supporting the 8bit-MIMEtransport service extension accepts a content body containing octets with the high-order (8th) bit set, the server SMTP must deliver or relay the content in such a way as to preserve all bits in each octet.

If a server SMTP does not support the 8-bit MIME transport extension (either by not responding with code 250 to the EHLO command, or by not including the EHLO keyword value 8BITMIME in its response), then the client SMTP must not, under any circumstances, attempt to transfer a content that contains characters outside of the US-ASCII octet range (hex 00-7F).

A client SMTP has two options in this case: first, it may implement a gateway transformation to convert the message into valid 7-bit MIME, or second, it may treat the barrier to 8-bit as a permanent error and handle it in the usual manner for delivery failures. The specifics of the transformation from 8-bit MIME to 7-bit MIME are not described by this RFC; the conversion is nevertheless constrained in the following ways:

1. it must cause no loss of information; MIME transport encodings must be employed as needed to insure this is the case, and

2. the resulting message must be valid 7-bit MIME.

4. Usage Example

The following dialogue illustrates the use of the 8bit-MIMEtransport service extension:

```
S: <wait for connection on TCP port 25>
C: <open connection to server>
S: 220 dbc.mtview.ca.us SMTP service ready
C: EHLO ymir.claremont.edu
S: 250-dbc.mtview.ca.us says hello
S: 250 8BITMIME
C: MAIL FROM:<ned@ymir.claremont.edu> BODY=8BITMIME
S: 250 <ned@ymir.claremont.edu>... Sender and 8BITMIME ok
C: RCPT TO:<mrose@dbc.mtview.ca.us>
S: 250 <mrose@dbc.mtview.ca.us>... Recipient ok
C: DATA
S: 354 Send 8BITMIME message, ending in CRLF.CRLF.
 ...
C: .
S: 250 OK
C: QUIT
S: 250 Goodbye
```

5. Security Considerations

This RFC does not discuss security issues and is not believed to raise any security issues not already endemic in electronic mail and present in fully conforming implementations of RFC 5321, including attacks facilitated by the presence of an option negotiation mechanism. Since MIME semantics are transport-neutral, the 8BITMIME option provides no more added capability to disseminate malware than is provided by unextended 7-bit SMTP.

6. IANA Considerations

6.1. SMTP Service Extension Registration

This document defines an SMTP and Submit service extension. IANA has updated the 8BITMIME entry in the SMTP Service Extensions registry, as follows:

Keyword: 8BITMIME

Description: SMTP and Submit transport of 8-bit MIME content

Reference: [RFC6152]

Parameters: See Section 2 in this specification.

7. Acknowledgements

E. Stefferud was an original author. This version of the specification was produced by the YAM working group.

Original acknowledgements: This document represents a synthesis of the ideas of many people and reactions to the ideas and proposals of others. Randall Atkinson, Craig Everhart, Risto Kankkunen, and Greg Vaudreuil contributed ideas and text sufficient to be considered co-authors. Other important suggestions, text, or encouragement came from Harald Alvestrand, Jim Conklin, Mark Crispin, Frank da Cruz, Olafur Gudmundsson, Per Hedeland, Christian Huitma, Neil Katin, Eliot Lear, Harold A. Miller, Keith Moore, Dan Oscarsson, Julian Onions, Neil Rickert, John Wagner, Rayan Zachariassen, and the contributions of the entire IETF SMTP Working Group. Of course, none of the individuals are necessarily responsible for the combination of ideas represented here. Indeed, in some cases, the response to a particular criticism was to accept the problem identification but to include an entirely different solution from the one originally proposed.

8. Normative References

[RFC2045] Freed, N. and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies", RFC 2045, November 1996.

[RFC2046] Freed, N. and N. Borenstein, "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", RFC 2046, November 1996.

[RFC5234] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, January 2008.

[RFC5321] Klensin, J., "Simple Mail Transfer Protocol", RFC 5321, October 2008.

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

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