

SMTP Service Extension for  
Returning Enhanced Error Codes

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

1. Abstract

This memo defines an extension to the SMTP service [RFC-821, RFC-1869] whereby an SMTP server augments its responses with the enhanced mail system status codes defined in RFC 1893. These codes can then be used to provide more informative explanations of error conditions, especially in the context of the delivery status notifications format defined in RFC 1894.

2. Introduction

Although SMTP is widely and robustly deployed, various extensions have been requested by parts of the Internet community. In particular, in the modern, international, and multilingual Internet a need exists to assign codes to specific error conditions that can be translated into different languages. RFC 1893 defines such a set of status codes and RFC 1894 defines a mechanism to send such coded material to users. However, in many cases the agent creating the RFC 1894 delivery status notification is doing so in response to errors it received from a remote SMTP server.

As such, remote servers need a mechanism for embedding enhanced status codes in their responses as well as a way to indicate to a client when they are in fact doing this. This memo uses the SMTP extension mechanism described in RFC 1869 to define such a mechanism.

### 3. Framework for the Enhanced Error Statuses Extension

The enhanced error statuses transport extension is laid out as follows:

- (1) the name of the SMTP service extension defined here is Enhanced-Status-Codes;
- (2) the EHLO keyword value associated with the extension is ENHANCEDSTATUSCODES;
- (3) no parameter is used with the ENHANCEDSTATUSCODES EHLO keyword;
- (4) the text part of all 2xx, 4xx, and 5xx SMTP responses other than the initial greeting and any response to HELO or EHLO are prefaced with a status code as defined in RFC 1893. This status code is always followed by one or more spaces.
- (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.

### 4. The Enhanced-Status-Codes service extension

Servers supporting the Enhanced-Status-Codes extension must preface the text part of almost all response lines with a status code. As in RFC 1893, the syntax of these status codes is given by the ABNF:

```
status-code ::= class "." subject "." detail
class       ::= "2" / "4" / "5"
subject     ::= 1*3digit
detail      ::= 1*3digit
```

These codes must appear in all 2xx, 4xx, and 5xx response lines other than initial greeting and any response to HELO or EHLO. Note that 3xx responses are NOT included in this list.

All status codes returned by the server must agree with the primary response code, that is, a 2xx response must incorporate a 2.X.X code, a 4xx response must incorporate a 4.X.X code, and a 5xx response must incorporate a 5.X.X code.

When responses are continued across multiple lines the same status code must appear at the beginning of the text in each line of the response.

Servers supporting this extension must attach enhanced status codes to their responses regardless of whether or not EHLO is employed by the client.

## 5. Status Codes and Negotiation

This specification does not provide a means for clients to request that status codes be returned or that they not be returned; a compliant server includes these codes in the responses it sends regardless of whether or not the client expects them. This is somewhat different from most other SMTP extensions, where generally speaking a client must specifically make a request before the extended server behaves any differently than an unextended server. The omission of client negotiation in this case is entirely intentional: Given the generally poor state of SMTP server error code implementation it is felt that any step taken towards more comprehensible error codes is something that all clients, extended or not, should benefit from.

**IMPORTANT NOTE:** The use of this approach in this extension should be seen as a very special case. It **MUST NOT** be taken as a license for future SMTP extensions to dramatically change the nature of SMTP client-server interaction without proper announcement from the server and a corresponding enabling command from the client.

## 6. Usage Example

The following dialogue illustrates the use of enhanced status codes by a server:

```
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 ENHANCEDSTATUSCODES
C: MAIL FROM:<ned@ymir.claremont.edu>
S: 250 2.1.0 Originator <ned@ymir.claremont.edu> ok
C: RCPT TO:<mrose@dbc.mtview.ca.us>
S: 250 2.1.5 Recipient <mrose@dbc.mtview.ca.us> ok
C: RCPT TO:<nosuchuser@dbc.mtview.ca.us>
S: 550 5.1.1 Mailbox "nosuchuser" does not exist
C: RCPT TO:<remoteuser@isi.edu>
S: 551-5.7.1 Forwarding to remote hosts disabled
```

```
S: 551 5.7.1 Select another host to act as your forwarder
C: DATA
S: 354 Send message, ending in CRLF.CRLF.
...
C: .
S: 250 2.6.0 Message accepted
C: QUIT
S: 221 2.0.0 Goodbye
```

The client that receives these responses might then send a nondelivery notification of the general form:

```
Date: Mon, 11 Mar 1996 09:21:47 -0400
From: Mail Delivery Subsystem <mailer-daemon@ymir.claremont.edu>
Subject: Returned mail
To: <ned@ymir.claremont.edu>
MIME-Version: 1.0
Content-Type: multipart/report; report-type=delivery-status;
        boundary="JAA13167.773673707/YMIR.CLAREMONT.EDU"
```

```
--JAA13167.773673707/YMIR.CLAREMONT.EDU
content-type: text/plain; charset=us-ascii
```

```
----- Mail was successfully relayed to
         the following addresses -----
```

```
<mrose@dbc.mtview.ca.us>
```

```
----- The following addresses had delivery problems -----
<nosuchuser@dbc.mtview.ca.us>
  (Mailbox "nosuchuser" does not exist)
<remoteuser@isi.edu>
  (Forwarding to remote hosts disabled)
```

```
--JAA13167.773673707/YMIR.CLAREMONT.EDU
content-type: message/delivery-status
```

```
Reporting-MTA: dns; ymir.claremont.edu
```

```
Original-Recipient: rfc822;mrose@dbc.mtview.ca.us
Final-Recipient: rfc822;mrose@dbc.mtview.ca.us
Action: relayed
Status: 2.1.5 (Destination address valid)
Diagnostic-Code: smtp;
  250 Recipient <mrose@dbc.mtview.ca.us> ok
Remote-MTA: dns; dbc.mtview.ca.us
```

```
Original-Recipient: rfc822:nosuchuser@dbc.mtview.ca.us
Final-Recipient: rfc822:nosuchuser@dbc.mtview.ca.us
Action: failed
Status: 5.1.1 (Bad destination mailbox address)
Diagnostic-Code: smtp;
    550 Mailbox "nosuchuser" does not exist
Remote-MTA: dns; dbc.mtview.ca.us
```

```
Original-Recipient: rfc822:remoteuser@isi.edu
Final-Recipient: rfc822:remoteuser@isi.edu
Action: failed
Status: 5.7.1 (Delivery not authorized, message refused)
Diagnostic-Code: smtp;
    551 Forwarding to remote hosts disabled
    Select another host to act as your forwarder
Remote-MTA: dns; dbc.mtview.ca.us
```

```
--JAA13167.773673707/YMIR.CLAREMONT.EDU
content-type: message/rfc822
```

```
[original message goes here]
--JAA13167.773673707/YMIR.CLAREMONT.EDU--
```

Note that in order to reduce clutter the reporting MTA has omitted enhanced status code information from the diagnostic-code fields it has generated.

## 7. Security Considerations

Additional detail in server responses axiomatically provides additional information about the server. It is conceivable that additional information of this sort may be of assistance in circumventing server security. The advantages of provides additional information must always be weighed against the security implications of doing so.

## 8. References

[RFC-821]

Postel, J., "Simple Mail Transfer Protocol", RFC 821, August, 1982. (August, 1982).

[RFC-1869]

Rose, M., Stefferud, E., Crocker, C., Klensin, J., Freed, N., "SMTP Service Extensions", RFC 1869, November, 1995.

[RFC-1893]

Vaudreuil, G., "Enhanced Mail System Status Codes", RFC 1893, January, 1996.

[RFC-1894]

Moore, K., Vaudreuil, G., "An Extensible Message Format for Delivery Status Notifications", RFC 1894, January, 1996.

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