Network Working Group
Request for Comments: 1939
STD: 53
Obsoletes: 1725
Category: Standards Track

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May 1996

Post Office Protocol - Version 3

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.

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1. Introduction

On certain types of smaller nodes in the Internet it is often impractical to maintain a message transport system (MTS). For example, a workstation may not have sufficient resources (cycles, disk space) in order to permit a SMTP server [RFC821] and associated local mail delivery system to be kept resident and continuously running. Similarly, it may be expensive (or impossible) to keep a personal computer interconnected to an IP-style network for long amounts of time (the node is lacking the resource known as "connectivity").

Despite this, it is often very useful to be able to manage mail on these smaller nodes, and they often support a user agent (UA) to aid the tasks of mail handling. To solve this problem, a node which can support an MTS entity offers a maildrop service to these less endowed nodes. The Post Office Protocol - Version 3 (POP3) is intended to permit a workstation to dynamically access a maildrop on a server host in a useful fashion. Usually, this means that the POP3 protocol is used to allow a workstation to retrieve mail that the server is holding for it.

POP3 is not intended to provide extensive manipulation operations of mail on the server; normally, mail is downloaded and then deleted. A more advanced (and complex) protocol, IMAP4, is discussed in [RFC1730].

For the remainder of this memo, the term "client host" refers to a host making use of the POP3 service, while the term "server host" refers to a host which offers the POP3 service.

2. A Short Digression

This memo does not specify how a client host enters mail into the transport system, although a method consistent with the philosophy of this memo is presented here:

> When the user agent on a client host wishes to enter a message into the transport system, it establishes an SMTP connection to its relay host and sends all mail to it. This relay host could be, but need not be, the POP3 server host for the client host. Of course, the relay host must accept mail for delivery to arbitrary recipient addresses, that functionality is not required of all SMTP servers.

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3. Basic Operation

Initially, the server host starts the POP3 service by listening on TCP port 110. When a client host wishes to make use of the service, it establishes a TCP connection with the server host. When the connection is established, the POP3 server sends a greeting. The client and POP3 server then exchange commands and responses (respectively) until the connection is closed or aborted.

Commands in the POP3 consist of a case-insensitive keyword, possibly followed by one or more arguments. All commands are terminated by a CRLF pair. Keywords and arguments consist of printable ASCII characters. Keywords and arguments are each separated by a single SPACE character. Keywords are three or four characters long. Each argument may be up to 40 characters long.

Responses in the POP3 consist of a status indicator and a keyword possibly followed by additional information. All responses are terminated by a CRLF pair. Responses may be up to 512 characters long, including the terminating CRLF. There are currently two status indicators: positive ("+OK") and negative ("-ERR"). Servers MUST send the "+OK" and "-ERR" in upper case.

Responses to certain commands are multi-line. In these cases, which are clearly indicated below, after sending the first line of the response and a CRLF, any additional lines are sent, each terminated by a CRLF pair. When all lines of the response have been sent, a final line is sent, consisting of a termination octet (decimal code 046, ".") and a CRLF pair. If any line of the multi-line response begins with the termination octet, the line is "byte-stuffed" by pre-pending the termination octet to that line of the response. Hence a multi-line response is terminated with the five octets "CRLF.CRLF". When examining a multi-line response, the client checks to see if the line begins with the termination octet. If so and if octets other than CRLF follow, the first octet of the line (the termination octet) is stripped away. If so and if CRLF immediately follows the termination character, then the response from the POP server is ended and the line containing ".CRLF" is not considered part of the multi-line response.

A POP3 session progresses through a number of states during its lifetime. Once the TCP connection has been opened and the POP3 server has sent the greeting, the session enters the AUTHORIZATION state. In this state, the client must identify itself to the POP3 server. Once the client has successfully done this, the server acquires resources associated with the client's maildrop, and the session enters the TRANSACTION state. In this state, the client requests actions on the part of the POP3 server. When the client has

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issued the QUIT command, the session enters the UPDATE state. In this state, the POP3 server releases any resources acquired during the TRANSACTION state and says goodbye. The TCP connection is then closed.

A server MUST respond to an unrecognized, unimplemented, or syntactically invalid command by responding with a negative status indicator. A server MUST respond to a command issued when the session is in an incorrect state by responding with a negative status indicator. There is no general method for a client to distinguish between a server which does not implement an optional command and a server which is unwilling or unable to process the command.

A POP3 server MAY have an inactivity autologout timer. Such a timer MUST be of at least 10 minutes' duration. The receipt of any command from the client during that interval should suffice to reset the autologout timer. When the timer expires, the session does NOT enter the UPDATE state--the server should close the TCP connection without removing any messages or sending any response to the client.

4. The AUTHORIZATION State

Once the TCP connection has been opened by a POP3 client, the POP3 server issues a one line greeting. This can be any positive response. An example might be:

```
S:  +OK POP3 server ready
```

The POP3 session is now in the AUTHORIZATION state. The client must now identify and authenticate itself to the POP3 server. Two possible mechanisms for doing this are described in this document, the USER and PASS command combination and the APOP command. Both mechanisms are described later in this document. Additional authentication mechanisms are described in [RFC1734]. While there is no single authentication mechanism that is required of all POP3 servers, a POP3 server must of course support at least one authentication mechanism.

Once the POP3 server has determined through the use of any authentication command that the client should be given access to the appropriate maildrop, the POP3 server then acquires an exclusive-access lock on the maildrop, as necessary to prevent messages from being modified or removed before the session enters the UPDATE state. If the lock is successfully acquired, the POP3 server responds with a positive status indicator. The POP3 session now enters the TRANSACTION state, with no messages marked as deleted. If the maildrop cannot be opened for some reason (for example, a lock can not be acquired, the client is denied access to the appropriate

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maildrop, or the maildrop cannot be parsed), the POP3 server responds with a negative status indicator. (If a lock was acquired but the POP3 server intends to respond with a negative status indicator, the POP3 server must release the lock prior to rejecting the command.) After returning a negative status indicator, the server may close the connection. If the server does not close the connection, the client may either issue a new authentication command and start again, or the client may issue the QUIT command.

After the POP3 server has opened the maildrop, it assigns a message-number to each message, and notes the size of each message in octets. The first message in the maildrop is assigned a message-number of "1", the second is assigned "2", and so on, so that the nth message in a maildrop is assigned a message-number of "n". In POP3 commands and responses, all message-numbers and message sizes are expressed in base-10 (i.e., decimal).

Here is the summary for the QUIT command when used in the AUTHORIZATION state:

```
   QUIT

      Arguments: none

      Restrictions: none

      Possible Responses:
          +OK

      Examples:
          C: QUIT
          S: +OK dewey POP3 server signing off
```

5. The TRANSACTION State

Once the client has successfully identified itself to the POP3 server and the POP3 server has locked and opened the appropriate maildrop, the POP3 session is now in the TRANSACTION state. The client may now issue any of the following POP3 commands repeatedly. After each command, the POP3 server issues a response. Eventually, the client issues the QUIT command and the POP3 session enters the UPDATE state.

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