

Email

- SMTP - Simple Mail Transfer Protocol
 - RFC 821
- POP - Post Office Protocol
 - RFC 1939
- Also:
 - RFC 822 *Standard for the Format of ARPA Internet Text Messages*
 - RFCs 1521, 1522 *Mime*

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Terminology

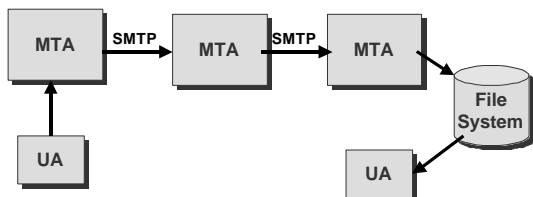
- User Agent: end-user mail program
- Message Transfer Agent: responsible for communicating with remote hosts and transmitting/receiving email (both a client and server).
- Mail Exchanger: host that takes care of email for a domain.

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SMTP

Used to exchange mail messages between mail servers (Message Transfer Agents).



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SMTP Protocol

- SMTP sender is the client
- SMTP receiver is the server.
- Alternating dialogue:
 - client sends command and server responds with command status message.
 - Order of the commands is important!
 - Status messages include ascii encoded numeric status code (like HTTP,FTP) and text string.

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SMTP Commands

- **HELO** - identifies sender
- **MAIL FROM:** - starts a mail transaction and identifies the mail originator
- **RCPT TO:** - identifies individual recipient. There may be multiple **RCPT TO:** commands.
- **DATA** - sender ready to transmit a series of lines of text, each ends with `\r\n`. A line containing only a period `.` indicates the end of the data.

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Data Format

- ASCII only- must convert binary to an ASCII representation to send via email.
- What if we want to send a line containing only a period?
 - Sender prepends a period to any line starting with a period (in the message).
 - Receiver strips the leading period in any line that starts with a period and has more stuff.

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Typical Exchange

```
z3.cs.rpi.edu> telnet mail.cs.rpi.edu 25
Trying 128.213.8.2...
Connected to fred.cs.rpi.edu.
Escape character is '^]'.
220 cs.rpi.edu ESMTP Sendmail 8.9.3/8.9.3; Tue,
    14 Mar 2000 19:41:16 -0500
HELO z3.cs.rpi.edu
250 cs.rpi.edu Hello hollindg@z3.cs.rpi.edu
    [128.213.4.203], pleased to meet you
MAIL FROM: bill@microsoft.com
250 Regis@millionaire.com... Sender ok
RCPT TO: hollindg
250 hollindg... Recipient ok
DATA
354 Enter mail, end with "." on a line by itself
Hi Dave - What is buffer overflow?
.
250 VAA07541 Message accepted for delivery
```

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Leading Period

```
DATA
354 Enter mail, end with "." on a line by itself
Hi dave - this message is a test of SMTP
..
..foo
..
.
250 VAA0771 Message accepted for delivery
Resulting Message:
```

```
Hi dave - this message is a
test of SMTP
.
.foo
.
```

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Other SMTP Commands

VRIFY - confirm that a name is a valid recipient.

EXPN - expand an alias (group email address).

TURN - switch roles (sender <=> receiver).

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more Commands

SOML - Send Or Mail

if recipient is logged in, display message on terminal, otherwise email.

SAML - Send and Mail

NOOP - send back a positive reply code.

RSET - abort current transaction.

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Mail Headers

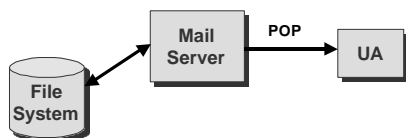
- Email messages contain many headers, some headers are created by the UA, some are automatically added by the MTA.
- Every MTA adds (at least) a "**Received:**" header.
- Some of the headers are read by (parsed) intermediate MTAs, but the content is ignored and passed on transparently.

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POP – *Post Office Protocol*

- Used to transfer mail from a mail server to a UA.



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POP (version 3)

- Similar to SMTP command/reply lockstep protocol.
- Used to retrieve mail for a single user
 - requires authentication
- Commands and replies are ASCII lines.
 - Replies start with "+OK" or "-ERR".
 - Replies may contain multiple lines.

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POP-3 Commands

- **USER** - specify username
- **PASS** - specify password
- **STAT** - get mailbox status
 - number of messages in the mailbox.
- **LIST** - get a list of messages and sizes.
 - One per line, termination line contains '.' only.
- **RETR** - retrieve a message

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More POP-3 Commands

- **DELE** - mark a message for deletion from the mailbox.
- **NOOP** - send back positive reply
- **RSET** - reset. All deletion marks are unmarked.
- **QUIT** - remove marked messages and close the (TCP) connection.

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Optional Commands

- **TOP** - send header lines from messages.
- **APOP** - alternative authentication
 - message digest based on opening greeting sent from POP server.
 - Requires shared secret!
 - No cleartext password on the network.
 - Does not authenticate the server!!!!

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A Pop3 Exchange

```
> telnet monte pop3
Trying 128.213.8.110...
Connected to monte.cs.rpi.edu (128.213.8.110).
Escape character is '^]'.
+OK POP3 monte.cs.rpi.edu v7.59 server ready
user joe
+OK User name accepted, password please
pass joepw
+OK Mailbox open, 1 messages
stat
+OK 1 412
list
+OK Mailbox scan listing follows
1 412
.
```

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Pop3 Example Continued

```
retr 1
+OK 412 octets
Return-Path: <hollingd>
Received: (from hollingd@localhost)
    by monte.cs.rpi.edu (8.9.3/8.9.3) id
    NAA06943
    for joe; Mon, 20 Mar 2000 13:49:54 -0500
Date: Mon, 20 Mar 2000 13:49:54 -0500
From: Dave Hollinger <hollingd@monte.cs.rpi.edu>
Message-Id:
    <200003201849.NAA06943@monte.cs.rpi.edu>
To: joe@monte.cs.rpi.edu
Status: O

blah
.
```

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