

SMTP – Simple Mail Transfer  
Protocol

AND

MIME- Multipurpose Internet Mail  
Extensions

# Overview

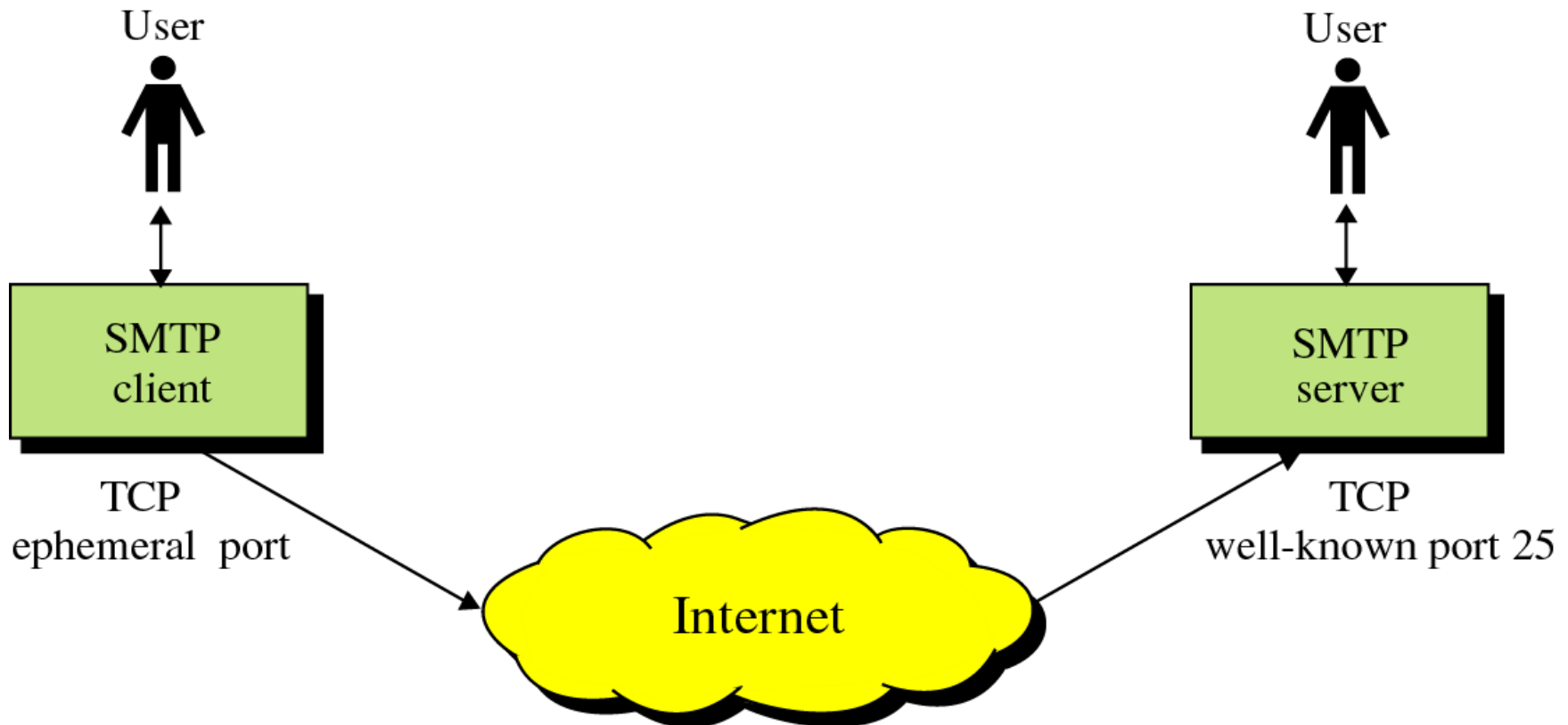
- ◆ Introduction to SMTP and Email
- ◆ Message Breakdown
- ◆ Sample Messages
- ◆ Extensions (MIME)
- ◆ MTA's and Mailbox Protocols

# 1<sup>st</sup> – What is SMTP?

- ◆ The *de facto* standard for e-mail transmissions across the Internet
- ◆ It is defined in RFC 821
- ◆ It is a relatively simple, text-based protocol
- ◆ Not entirely secure thus vulnerable to SPAM

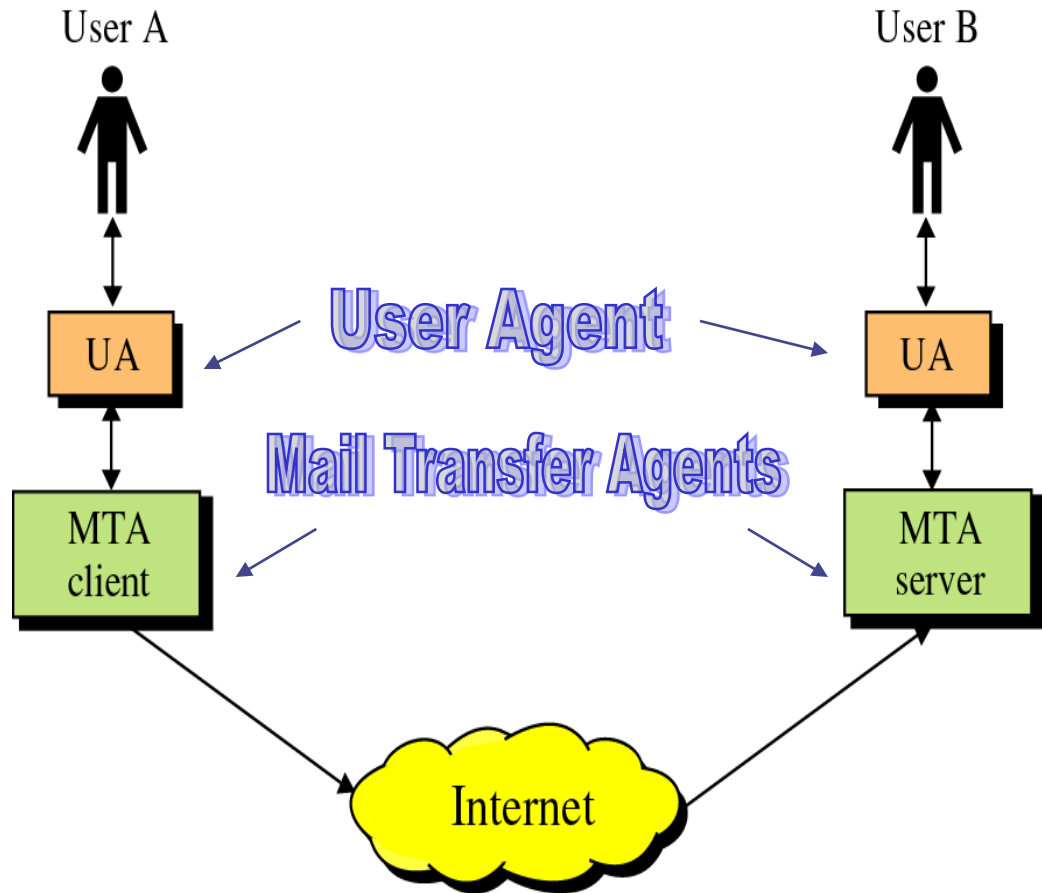
# SMTP

- ◆ Originated in 1982 (rfc0821, Jon Postel)
- ◆ Goal: To transfer mail reliably and efficiently



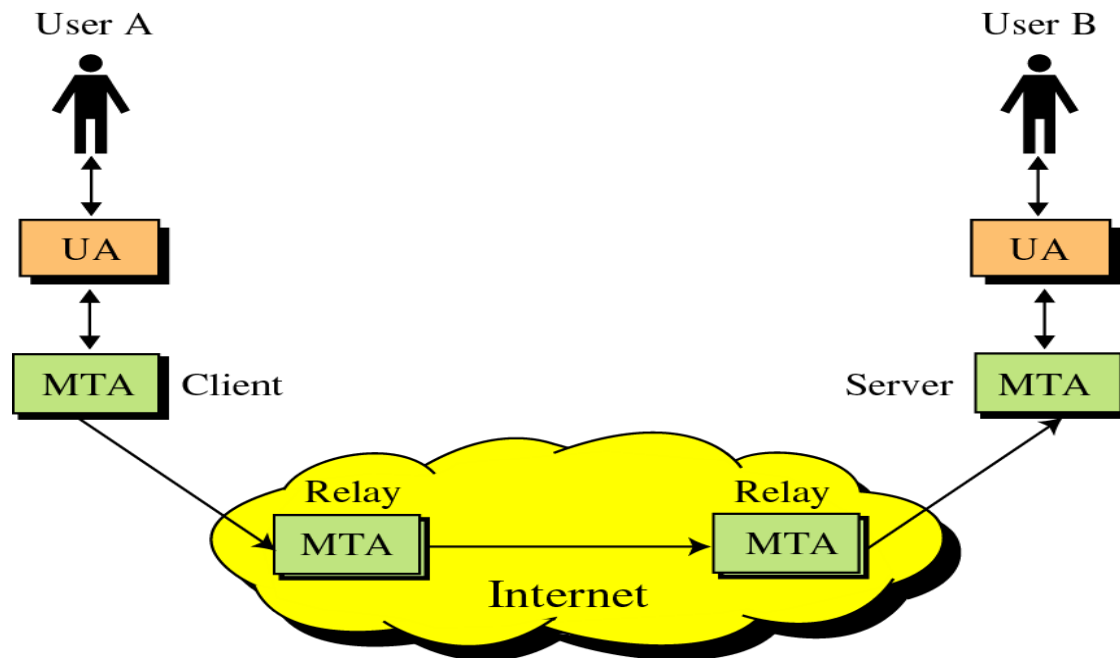
# SMTP

- ◆ SMTP clients and servers have two main components
  - **User Agents** – Prepares the message, encloses it in an envelope. (Eudora for example)
  - **Mail Transfer Agent (MTA)** – Transfers the mail across the internet



# SMTP

- ◆ SMTP also allows the use of Relays allowing other MTAs to relay the mail



# What is Mail?

◆ Mail is a text file

◆ Envelope –

- sender address
- receiver address
- other information

◆ Message –

- Mail Header – defines the sender, the receiver, the subject of the message, and some other information
- Mail Body – Contains the actual information in the message

Behrouz Forouzan  
De Anza College  
Cupertino, CA 96014

Sophia Fegan  
Com-Net  
Cupertino, CA 95014

**Sophia Fegan  
Com-Net  
Cupertino, CA 95014  
Jan. 5, 1998**

**Subject: Network**

Dear Mrs. Fegan:

We want to inform you that  
our network is working properly  
after the last repair.

Yours truly,  
Behrouz Forouzan

Mail From: forouzan@deanza.edu  
RCPT To: fegan@comnet.com

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**From: Behrouz Forouzan  
To: Sophia Fegan  
Date: 1/5/98  
Subject: Network**

---

Dear Mrs. Fegan:  
We want to inform you that  
our network is working properly  
after the last repair.

Yours truly,  
Behrouz Forouzan

Envelope

Header

Body

Message

Post Office  
Mailbox

Post office  
and mail route

Receivers  
Mailbox

**Return-Path:** <Jwatson@cis.udel.edu>

**Delivered-To:** jwatson@cis.udel.edu

Received: by mail.eecis.udel.edu (Postfix, from userid 62)  
id 17FBD328DE; Wed, 5 Nov 2003 11:27:02

Received: from mail.acad.ece.udel.edu  
(devil-rays.acad.ece.udel.edu [128.4.60.10])  
by mail.eecis.udel.edu (Postfix) with ESMTTP id  
5F41832893 for <Jwatson@cis.udel.edu>; Wed, 5 Nov 2003  
11:27:01

Received: by mail.acad.ece.udel.edu (Postfix, from userid  
62)id 47509456C; Wed, 5 Nov 2003 11:27:01

Received: from stimp.eecis.udel.edu(stimp.eecis.udel.edu  
[128.4.40.17])by mail.acad.ece.udel.edu (Postfix) with SMTP  
id 7C2943D79 for <Jwatson@cis.udel.edu>; Wed, 5 Nov 2003  
11:26:34

**Message-Id:**

**<20031105162634.7C2943D79@mail.acad.ece.udel.edu>**

**Date:** Wed, 5 Nov 2003 11:26:34

**From:** Jwatson@cis.udel.edu

**To:** undisclosed-recipients: ;

**MIME-Version:** 1.0

**This is a test.**



# How SMTP works

## ◆ The Essentials

### **Keyword**

### **Arguments**

HELO	Sender's Host Domain Name
MAIL FROM:	Email Address of sender
RCPT TO:	Email of Intended recipient
DATA	Body of the message
QUIT	

## ◆ How about a Demo?

# Status Codes

- ◆ The Server responds with a 3 digit code that may be followed by text info
  - 2## - Success
  - 3## - Command can be accepted with more information
  - 4## - Command was rejected, but error condition is temporary
  - 5## - Command rejected, Bad User!

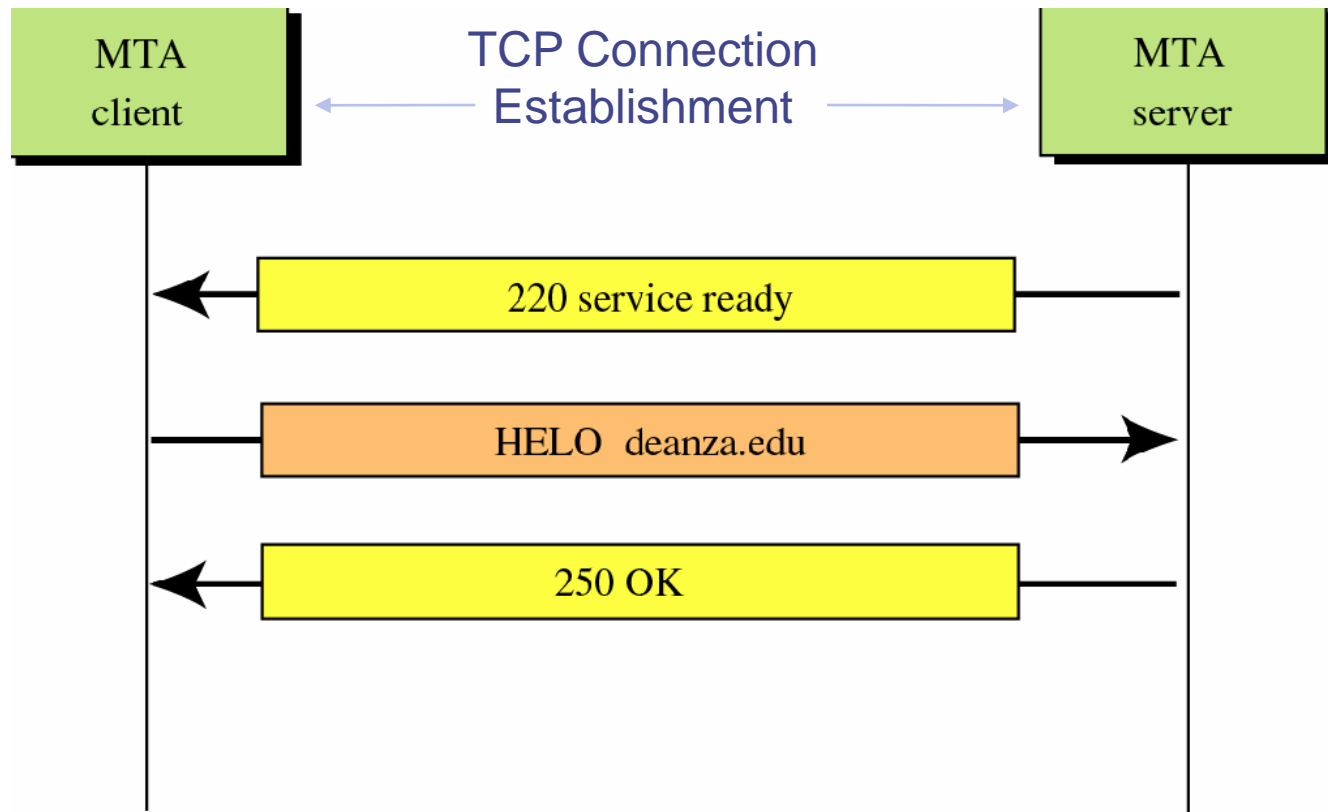
# Status Codes

- ◆ 211 System status, or system help reply .
- ◆ 214 Help message.
- ◆ 220 <domain> Service ready.
- ◆ 221 <domain> Service closing transmission channel.
- ◆ 250 Requested mail action okay, completed.
- ◆ 251 User not local; will forward to <forward-path>.
- ◆ 354 Start mail input; end with <CRLF>.<CRLF>.
- ◆ 421 <domain> Service not available, closing transmission channel.  
[This may be a reply to any command if the service knows it must shut down].
- ◆ 450 Requested mail action not taken: mailbox unavailable.
- ◆ 451 Requested action aborted: local error in processing
- ◆ 452 Requested action not taken: insufficient system storage.

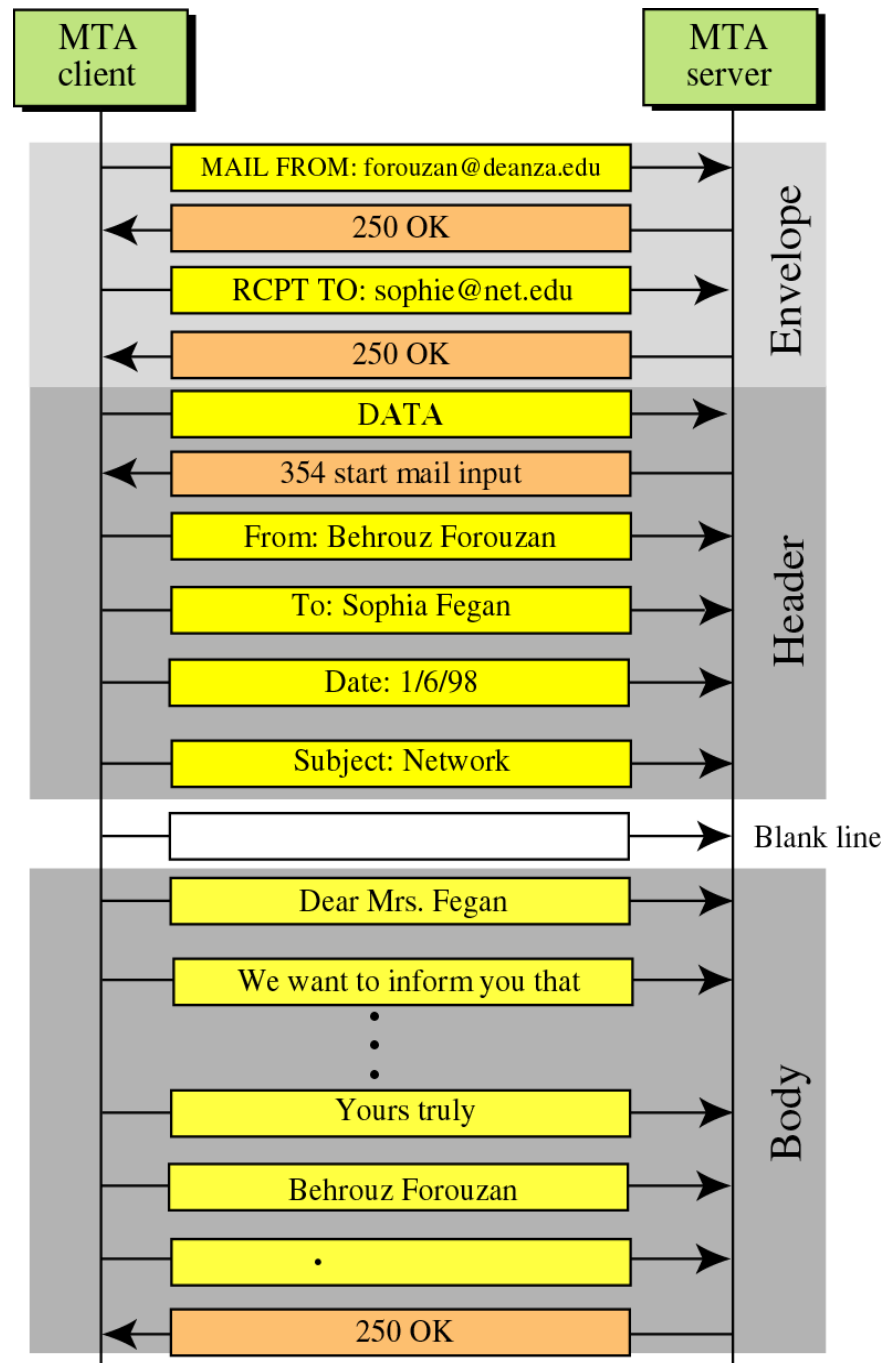
# Status Codes

- ◆ 500 Syntax error, command unrecognized. [This may include errors such as command line too long]
- ◆ 501 Syntax error in parameters or arguments.
- ◆ 502 Command not implemented.
- ◆ 503 Bad sequence of commands.
- ◆ 504 Command parameter not implemented.
- ◆ 550 Requested action not taken: mailbox unavailable.
- ◆ 551 User not local; please try <forward-path>.
- ◆ 552 Requested mail action aborted: exceeded storage allocation.
- ◆ 553 Requested action not taken: mailbox name not allowed.  
[E.g., mailbox syntax incorrect]
- ◆ 554 Transaction failed.

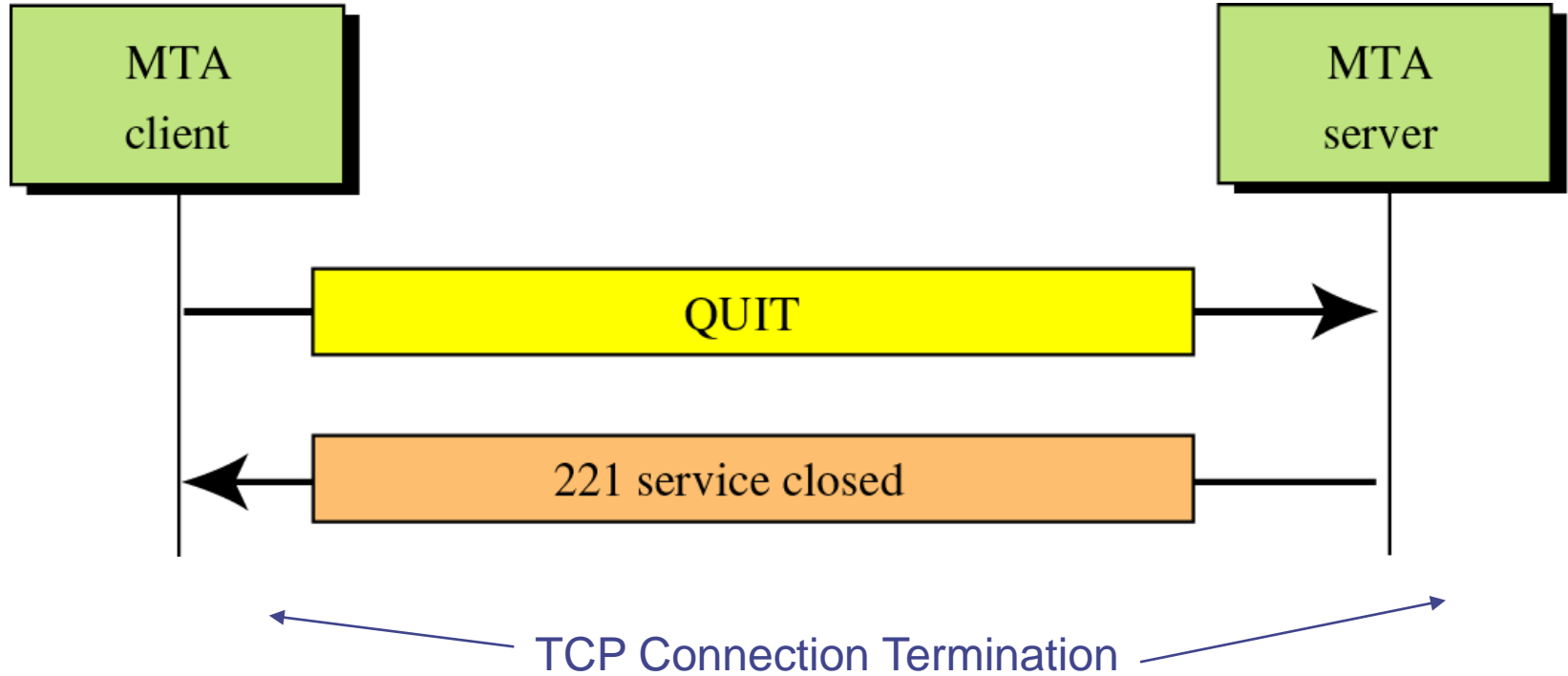
# Connection Establishment



# Message Progress



# Connection Termination



# Problems with SMTP

- ◆ No inherent security
  - Authentication
  - Encryption
- ◆ Only uses NVT (**Network Virtual Terminal**) 7-bit ASCII format



# E-mails can be forged.....

HELO mail.rose.edu

MAIL FROM: carberry@rose.edu

RCPT TO: wrichards@rose.edu

DATA

From: Dr. Art Zenner

To: Professor Richards

Subject: CIT 2243

Professor Richards,

By department decree all students in your "Introduction to Unix" class are hereby to be granted automatic A's.

Thank you,

Dr. Art Zenner

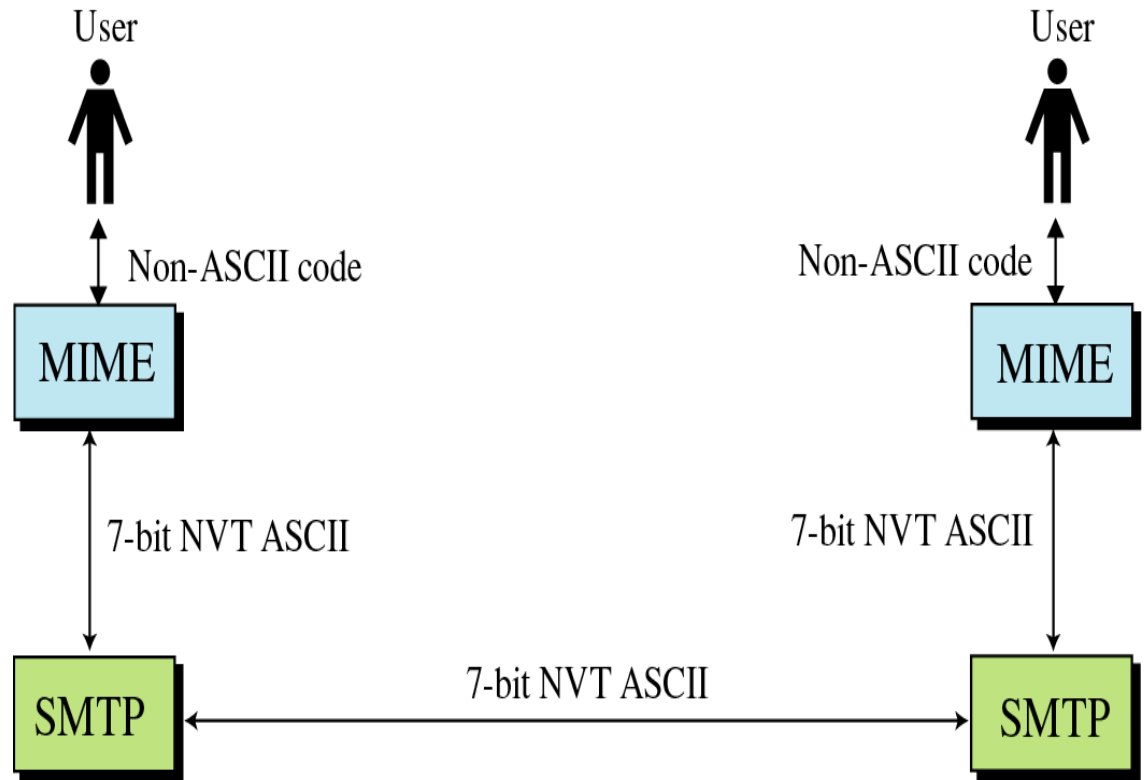
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QUIT

# Extensions to SMTP

## ◆ MIME – Multipurpose Internet Mail Extensions

- Transforms non-ASCII data to NVT (Network Virtual Terminal) ASCII data
  - ◆ Text
  - ◆ Application
  - ◆ Image
  - ◆ Audio
  - ◆ Video



# Mail Transfer Agents (MTA)

- ◆ MTAs do the actual mail transfers
- ◆ MTAs are not meant to be directly accessed by users.
- ◆ Other MTA's are:
  - Postfix
  - Qmail
  - MS Exchange
  - CC:Mail
  - Lotus Notes
  - ....etc.

# Problems with simple SMTP

- ◆ The first one relates to **message length**. Some older implementations cannot handle messages exceeding 64KB.
- ◆ Another problem relates to **timeouts**. If the Client and server have different timeouts, one of them may give up while the other is still busy, unexpectedly terminating the connection.