Chapter 20

SMTP

- User Agent (UA)
- Addressing
- Delayed Delivery
- Aliases
- Mail Transfer Agent (MTA)
- MIME
- POP

Figure 20-1

SMTP concept

User

SMTP client

Internet

TCP ephemeral port

User

SMTP server

TCP well-known port 25
Figure 20-2: UAs and MTAs

User A

UA

MTA client

Internet

User B

UA

MTA server

Figure 20-3: Relay MTAs

User A

UA

MTA

Client

Relay

MTA

Internet

User B

UA

MTA

Server

Relay

MTA
Figure 20-4

**User A**

**UA**

**MTA**

**User B**

**Mail gateway**

**Private network**

**Internet**

**MTA**

**Mail gateway**

Figure 20-5

**Format of an e-mail**

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

**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

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
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**Figure 20-6**

E-mail address

- **Local part**
  - Address of the mailbox on the local site

- **Domain name**
  - The domain name of the destination

**Figure 20-7**

Sender-site delay

1. User A
2. UA
3. Spool
4. MTA
5. Internet
Figure 20-8

Receiver-site delay

User B

UA

Mailboxes

MTA Server

Internet

Figure 20-9

Alias expansion

User A

UA

Spool

MTA Client

Database

Alias exp.

User B

UA

Mailboxes

MTA Server

Database

Alias exp.

Internet
**Figure 20-10**

**One-to-many expansion**

![Diagram showing one-to-many expansion]

- Friends (One name)
- Database
- john@nett.com
- joe@deanza.edu
- janet@mcgraw.com
- (Many recipients)

**Figure 20-11**

**Many-to-one expansion**

![Diagram showing many-to-one expansion]

- John (One recipient)
- Database
- john@nett.com
- acc@nett.com
- sell@nett.com
- (Many addresses)
The entire e-mail system

Figure 20-12

Commands and responses

Figure 20-13
Keyword: argument(s)

MTA client

220 service ready

HELO: deanza.edu

250 OK

MTA server

Connection establishment
Figure 20-16  Message transfer

Figure 20-17  Connection termination
SMTP

MIME

User

Non-ASCII code

7-bit NVT ASCII

Figure 20-18

MIME

User

Non-ASCII code

7-bit NVT ASCII

SMTP

Figure 20-19

E-mail header

MIME-Version: 1.1
Content-Type: type/subtype
Content-Transfer-Encoding: encoding type
Content-Id: message id
Content-Description: textual explanation of nontextual contents

E-mail body
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Figure 20-20

Non-ASCII data

Base 64 converter

11001100 10000001 00111001

ASCII data

0111010 01001001 01000101 00110101

Figure 20-21

Mixed ASCII and non-ASCII data

Quoted-printable

00100110 01001100 10011101 00111001 01000100

Quoted-printable

00100110 01001100 00111101 00111001 01000100 00111010 01001011

ASCII data
Figure 20-22  
POP3 and SMTP

Forouzan Notes  
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