*:96 Overheads

Part 4: Message delivery protocols
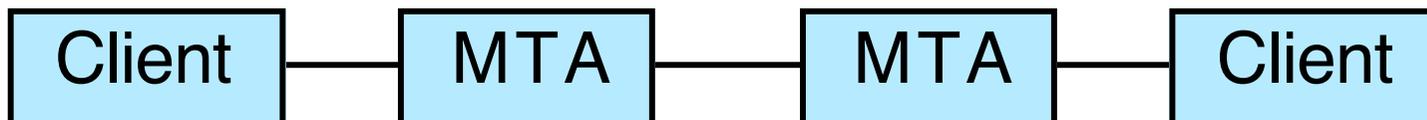(POP and IMAP)
Network News (Usenet News)

More about this course about Internet application protocols can be found at URL:

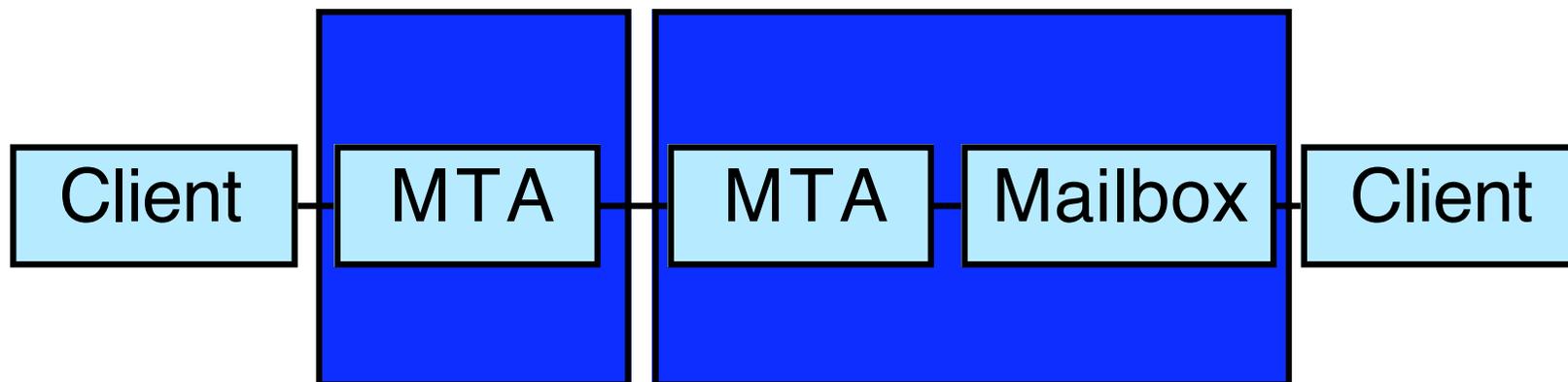`http://www.dsv.su.se/~jpalme/internet-course/Int-app-prot-kurs.html`

Last update: 2005-02-08 18:44

E-mail model: Where is POP and IMAP?

Traditional mail transport model

| Client | — | MTA | — | MTA | — | Client |

Augmented model with mailbox in server

| Client | MTA | MTA | Mailbox | Client |

Client-Server Protocols

- Post Office Protocol (POP), a protocol for fast downloading of mail to client software, where the client stores and handles the mail, corresponding to P3 in X.400.

- Interactive Mail Access Protocol (IMAP), a protocol for cases where the user wants to store his messages in the server, and wants to be able to manipulate this storage from client software on his personal computer. IMAP is a more complex protocol than POP.

Post Office Protocol (POP) *(RFC 1939)*

USER   Client identifies mailbox to be downloaded

PASS   Password

STAT   Get number of messages and size of mailbox

LIST N   Return size of message N

LAST   Get highest message number accessed

RETR N   Retrieve a full message

TOP N M   Retrieve only headers and first M lines of message N

DELE N   Delete message

QUIT   Release service

NOOP   See if POP server is functioning

RPOP   Insecure authentication

Example of a POP session

```
S: <waiting for connection on TCP port 109>
C: <open connection to server>
S: +OK POP server ready
C: User larse
S: +OK password required
C: PASS **********
S: +OK mailbox contains 4 messages (4567 octets)
C: STAT
S: +OK 4 4567
C: LIST
S: +OK
S: 1 333
S: 2 906
S: 3 999
S: 4 1111
S: .
```

```
C: TOP 1 1
S: +OK
S: Return-Path: <jpalme@ester.dsv.su.se>
S: Date: Sun, 26 Sep 1995 18:49:01 +0100 (MET)
S: From: Jacob Palme DSV <jpalme@dsv.su.se>
S: Subject: =?iso-8859-1?Q?R=E4ksm=F6rg=E5s?=
S: To: Lars Enderin <larse@dialog.se>
S: Message-Id: <3.85.93.A27024-0200000@ester>
S: Mime-Version: 1.0
S: Content-Type: MULTIPART/MIXED; BOUNDARY="1430317162"
S: --1430317162
S: Content-Type: TEXT/PLAIN; CHARSET=ISO 8859-1
S: Content-Transfer-Encoding: QUOTED-PRINTABLE
S:
S: R=E4ksm=F6rg=E5s
S: .
C: QUIT
S: +OK POP server quitting
C: <close connection>
S: <close connection>
```

Interactive Mail Access Protocol (IMAP), *(RFC 1203)*

- Server can send unsolicited messages to the client.

- More than one transaction can be waiting, identified by transaction ID, asynchronous operation of client and server.

- Each message has a set of properties, which can be retrieved one or more than one at a time. Examples of properties: seen flag, deleted flag.

- To delete a message, set its deleted flag to 1 and perform the expunge command.

- A SEARCH command.

- Bulletin-board facility (shared mailboxes)

IMAP properties:

- More the processing in the server
- Not so much wait for downloading
- More oriented toward keeping the session open
- More flexible than POP

Differences between POP and IMAP

POP	IMAP	Function
Yes	Yes	Download of new mail
Yes	Yes	List of stored messages
Yes	Yes	Peeking at messages
No	Yes	Sort messages into folders on server
No	Yes	Search for messages in the server using different search criteria
No	Yes	Sending operations asynchornously in both directions, with tags to indicate what is answer to what
No	Yes	Run in the background all the time, advice when new messages arrive

Network News Transfer Protocol (NNTP)

RFC 977: Network News Transfer Protocol, February 1986.

RFC 1036: Standard for interchange of USENET messages, January 1987.

Note also UUCP: Alternative to both NNTP and SMTP for communication between servers via asynchronous lines.
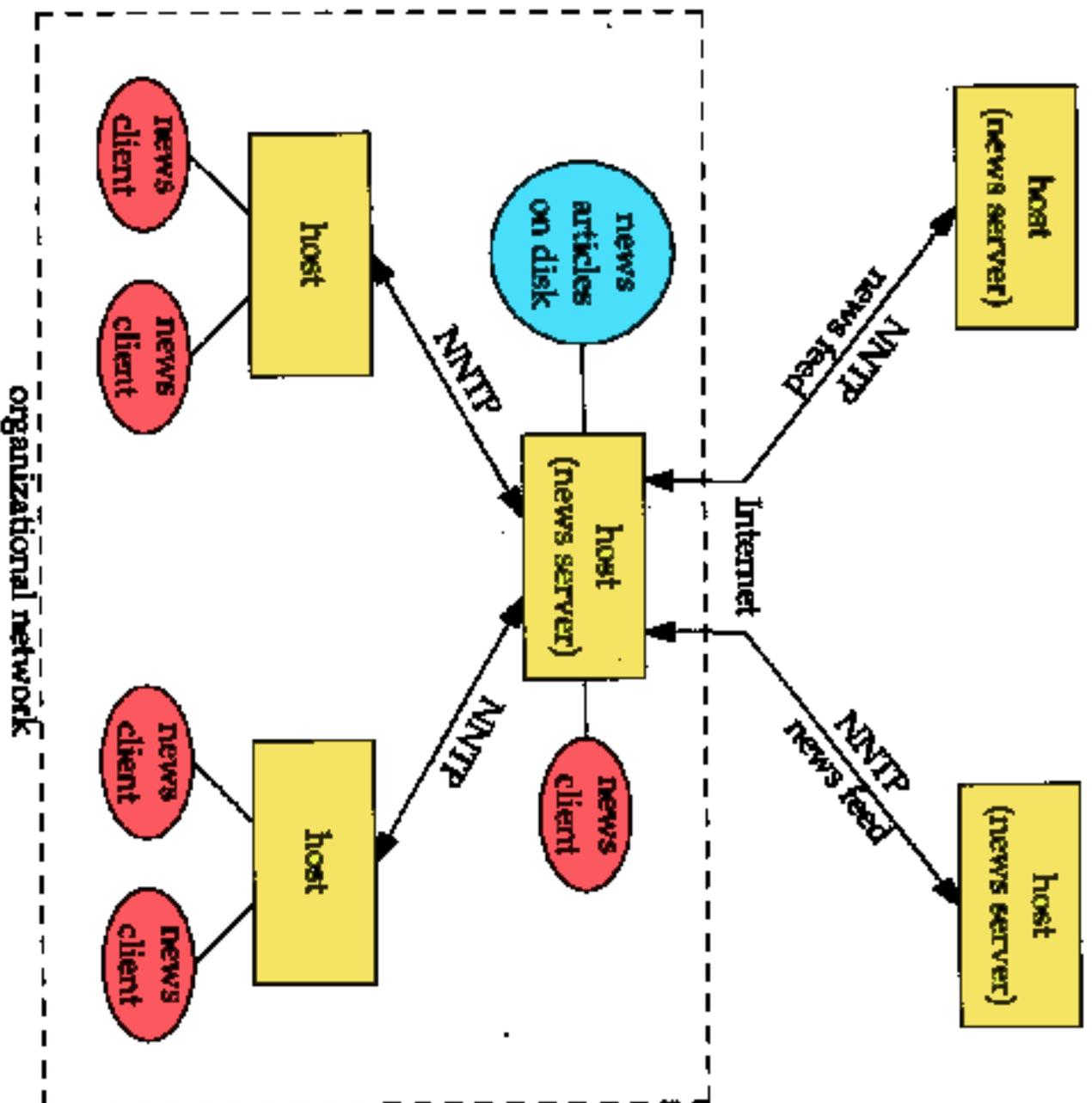
NNTP architecture

Figure 15.1 Typical news setup.

Picture from Stevens: TCP/IP Illustrated, Volume 3, page 208

Example of an NNTP interaction

```
C:<open connection to news.su.se on port 119>
S:200 news.datakom.su.se InterNetNews NNRP server INN
  1.4unoff3 17-Oct-95 ready (posting ok).
C:group swnet.test                  Go to newsgroup swnet.test
S:211 410 4211 4622 swnet.test      Status info about this meeting
C:head 4622                         Get head of message 4622
S:221 4622 <199607282133.OAA17435@infinity.c2.org> head
  Path:news.datakom.su.se!newsfeed.sunet.se!mail2news
  Date: Sun, 28 Jul 1996 14:33:18 -0700 (PDT)
  Message-ID: <199607282133.OAA17435@infinity.c2.org>
  From: jamosen@alpha.c2.org (James Olafsen)
  Subject: **** IPS!*****
  Newsgroups: swnet.test
  Lines: 2
  .
```

Submit an article

```
C: POST
S: 340 Ok
C: From: jpalme@dsv.su.se
   Newsgroups: swnet.test
   Subject: Testing NNTP
   Date: 07 Aug 1996 02:16:40 +0200
   Sender: jpalme@dsv.su.se
   Message-ID: <1-test*jpalme@dsv.su.se>

   This is a test message
   This is the last line of the test message
   .
S: 240 Article posted
C: quit
S: 205
S:  <closes the connection>
```

Some NNTP commands

`article [<Message-ID> | <Number>]`	Return text of designated article. If no parameter is given, the next article is returned. The current article pointer is put at the fetched article.
`body [<Message-ID>|<Number>]`	As `article`, but only returns body
`group <newsgroup>`	Go to the designated newsgroup
`head [<Message-ID> | <Number>]`	As `article`, but only returns head
`help`	Lists available commands
`ihave <messageID>`	Informs the server of an available article. The server can then ask for the article or refuse it.
`last`	Sets current article pointer to last message available, returnle number and Message-ID.
`list [active|newsgroups|distributions|schema]`	Returns a list of valid newsgroups in the format: *group last first*

`newgroups <yymmdd hhmmss> ["GMT"] [<distributions>]`	List newgroups created since a certain datetime. "distributions" can be e.g. *alt* to only get newsgroups in the *alt* category.
`newnews <newsgroups> <yymmdd hhmmss> ["GMT"] [<distributions>]`	List Message-ID of articles posted to one or more newsgroups after a specific time. *newsgroups* can be. e.g. `net.*.unix` to match more than one newsgroups. *distributions* checks for articles which also has this other newsgroup as recipient.
`next`	Current article pointer is advanced. Returns number and Message-ID of current article.
`post`	Submit a new article from a client.
`slave`	Tells the server that this is not a user client, it is a slave server. (May give priority treatment.)
`stat [<Message-ID> | <Number>]`	As `article`, but only returns Message-ID. Used to set the current article pointer.

Network News versus e-mail header formats

The format for Network News headers is based on RFC 822. But there are some differences.

Header	Description
Newsgroups:	Comma-separated list of newsgroups to which this article belongs. Example of newsgroup format: alt.sex.fetisches.feet. *Should never occur in e-mail.* Use "Posted-To:" instead!
Subject:	Add four characters "Re. " for replies. Do not change subject in replies.
Message-ID:	Mandatory in Network News, and must be globally unique.
Path:	Path to reach the current system, e.g. abc.foo.net!xyz!localhost. E-mail path format also permitted. Compare to Received: and Return-Path in e-mail.
Reply-To:	In news: Where replies to the author should be sent. In e-mail: Ambiguous.
Followup-To:	Where replies to newsgroup(s) should be sent.

Expires: Suggested expiration date.

References: Message-ID-s of previous areticles in the same thread. Should
                   always contain first and last article in thread. Compare to e-
                   mail: Usually only immediately preceeding messages..

Control: Not used in e-mail. Communication with servers. Body or
                   subject contains command. Subject begins with "cmsg".

          cancel   Delete physically a previously sent article.

          ihave   Host telling another host of available new
                            articles.

          sendme   Host asking for articles from another host.

          newgroup   Name of new group, plus optional word
                            moderated.

          rmgroup   Remove a newsgroup. Requires approved.

          sendsys   Send the sys file, listing neighbours and
                            newsgroups to be sent to each neighbour.

          version   Version of software wanted in reply.

`checkgroups`   List of newsgroups and descriptions, used to check if list is correct.

`Distribution:` Not used in e-mail. Limits distribution to certain geographical/organizational area. Example: Distribution: se, no.

`Organization:` Of sender.

`Keywords:` For filtering.

`Summary:` Brief summary.

`Approved:` Required for message to moderated group. Added by the moderator, contains his e-mail address. Also required for certain control messages.

`Lines:` Count of lines of the message body.

`Xref:` Numbers of this message in other newsgroups. Only for local usage in one server. Example: Xref: swnet.risk:456 swnet.sunet:897

MIME versus UUENCODING in e-mail and Network News

MIME is not yet much used in Network News, but is coming slowly.

UUENCODE is an older alternative to Base64 for encoding of binary data, still much used in Usenet News. Base64 is more secure.

Message size restrictions means that large binary files are often split into several articles, intelligent News clients can automatically find and combine them. (The MIME protocol for partitioning of large files is not much used yet in Usenet News.)