



Introduction to Computing

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Applications

Business Applications

Modelling and Simulation

Industrial and Control Applications

The Internet

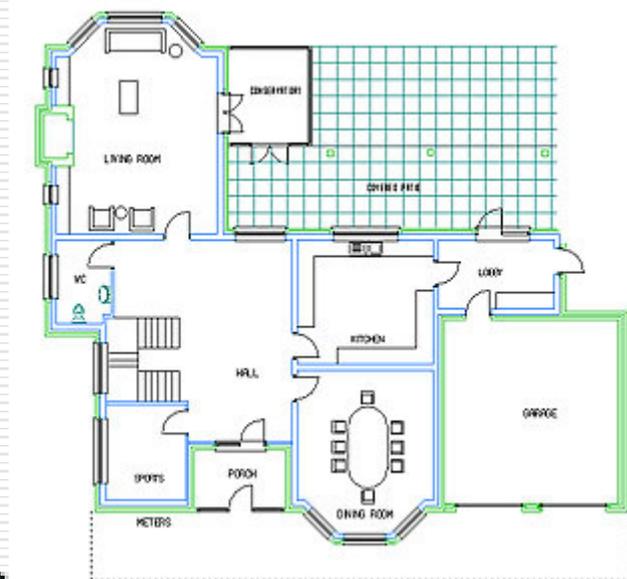
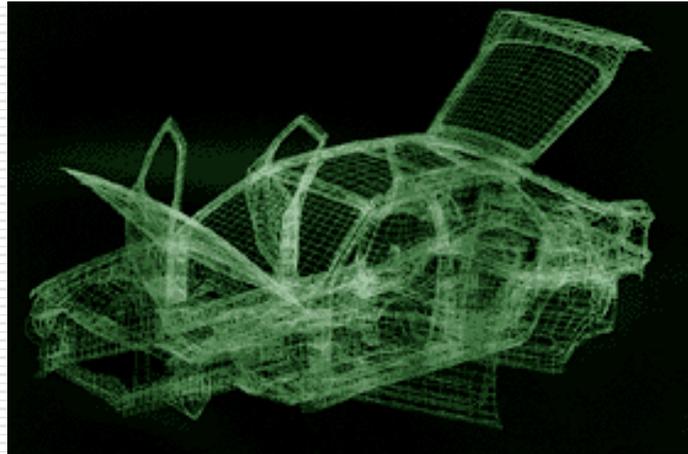


Industrial Applications

- ❑ Computer-Aided Design (CAD)
- ❑ Computer-Aided Manufacture (CAM)
 - Industrial robots
 - Computer numerical control
 - Integrated CAD/CAM
 - Automatic materials handling
 - Flexible manufacturing systems



Computer-Aided Design



Provided by
Creative Design Concepts



Computer-Aided Manufacture

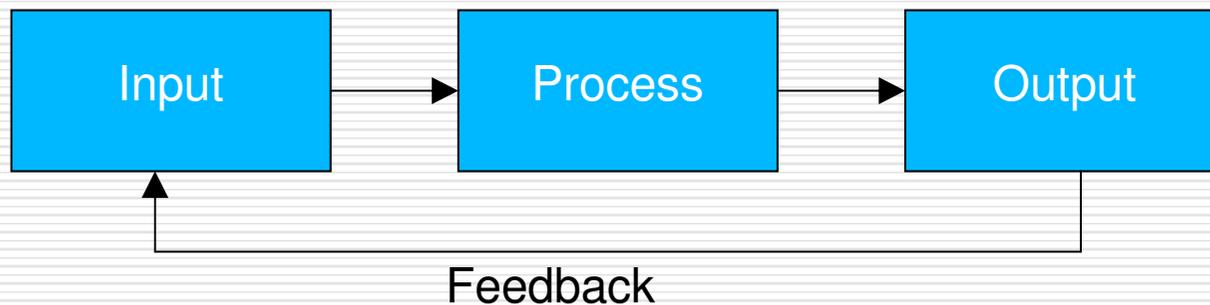
□ Industrial robots





Control Systems

- Used to control the operation of some process
- Examples
 - Air conditioning systems, water heating systems, anti-locking brake system (ABS), cruise control
- Components of a control system



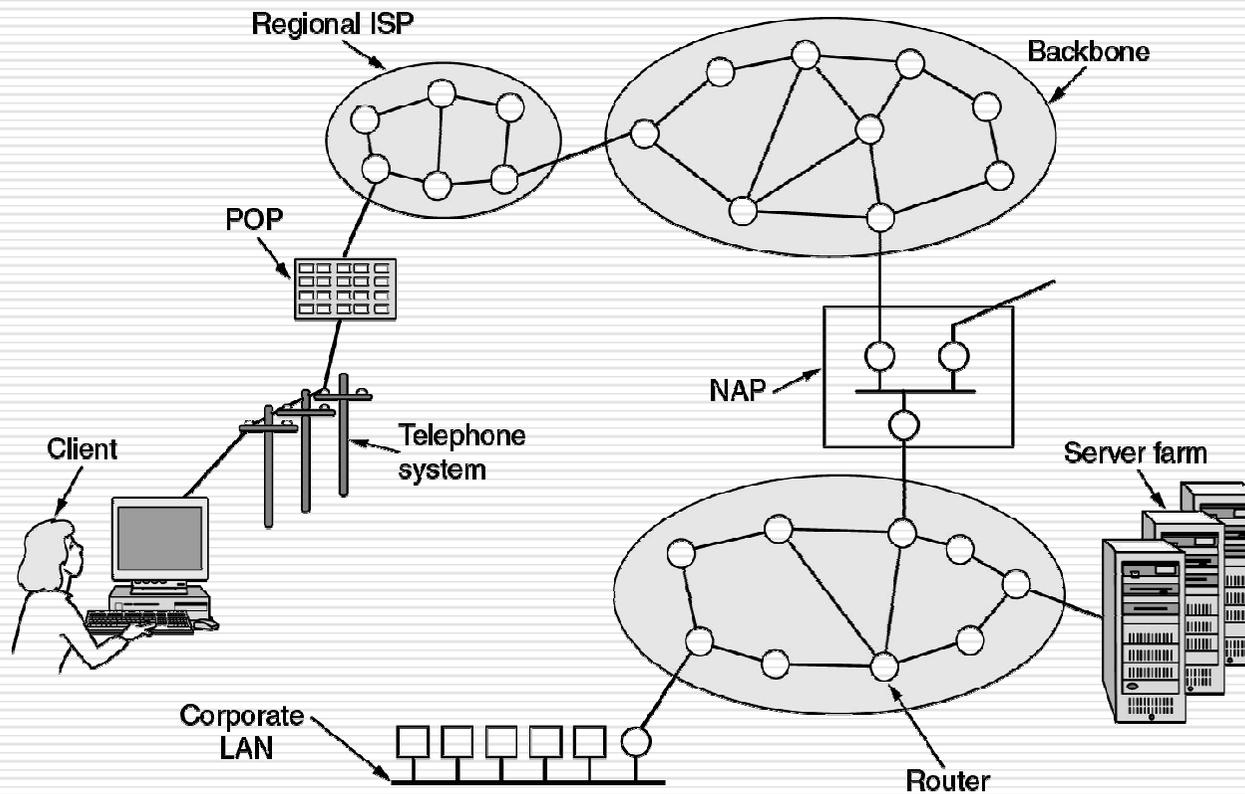


The Internet

- ❑ World Wide Web
- ❑ Email
- ❑ File Transfer Protocol
- ❑ Intranet
- ❑ E-Commerce
- ❑ Internet security



Architecture of the Internet





Internet Connections

- A computer can be connected to the Internet using:
 - Corporate LANs
 - Wireless
 - Dial-up using a telephone line
 - ADSL – Asynchronous Digital Subscriber Line
 - Internet cable networks
 - TV cable networks



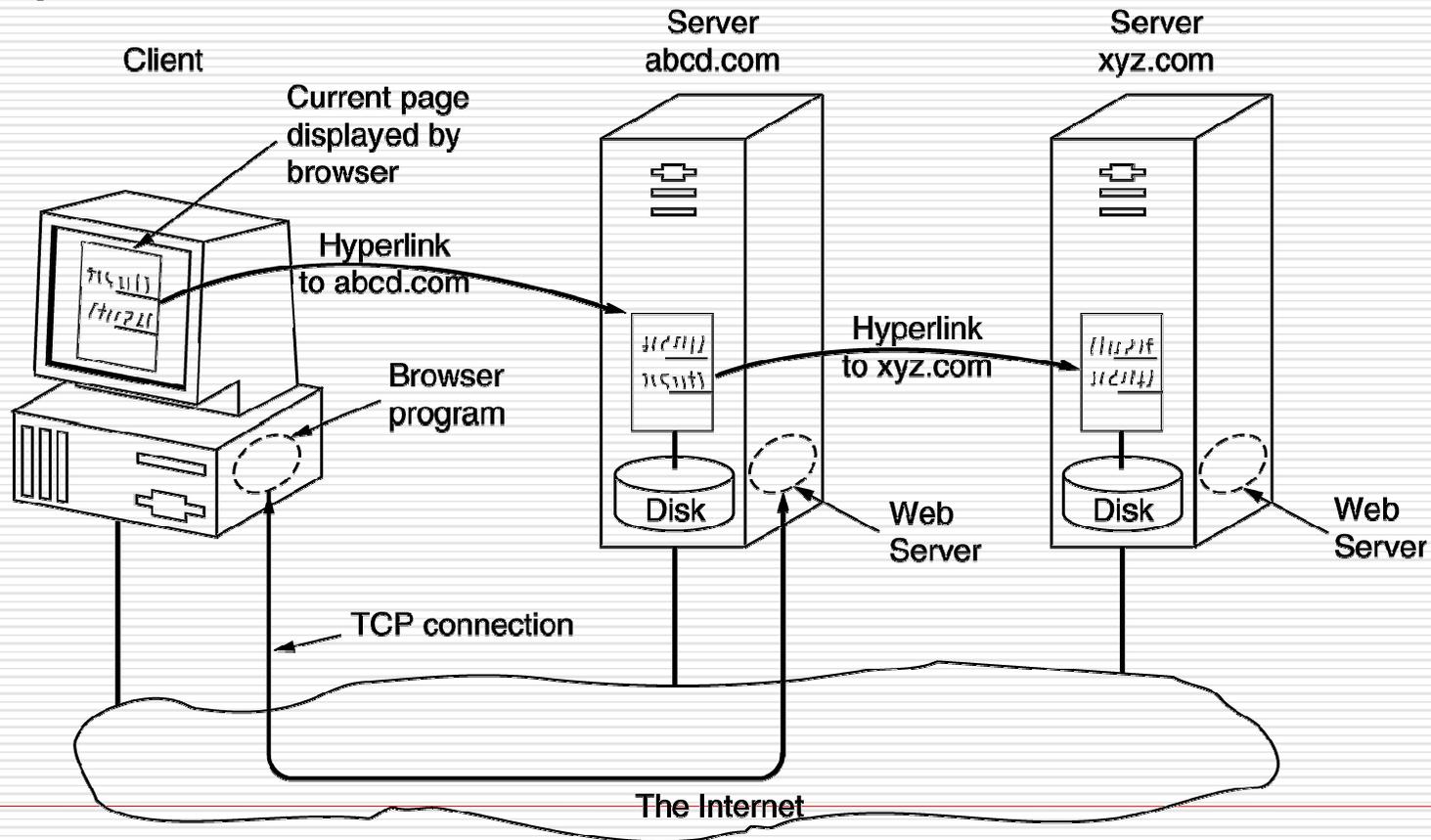
World Wide Web (WWW)

- Was invented in 1989, by Tim Berners-Lee at CERN
- Based on client-server architecture
- Components of the WWW:
 - Hypertext and hypermedia
 - Hypertext Transfer Protocol (HTTP)
 - Hypertext Mark-up Language (HTML)
 - Uniform Resource Locators (URLs)
 - Web browsers
 - Web servers



WWW Architecture Overview

The parts of the Web model.





The Client Side – Web Browsers

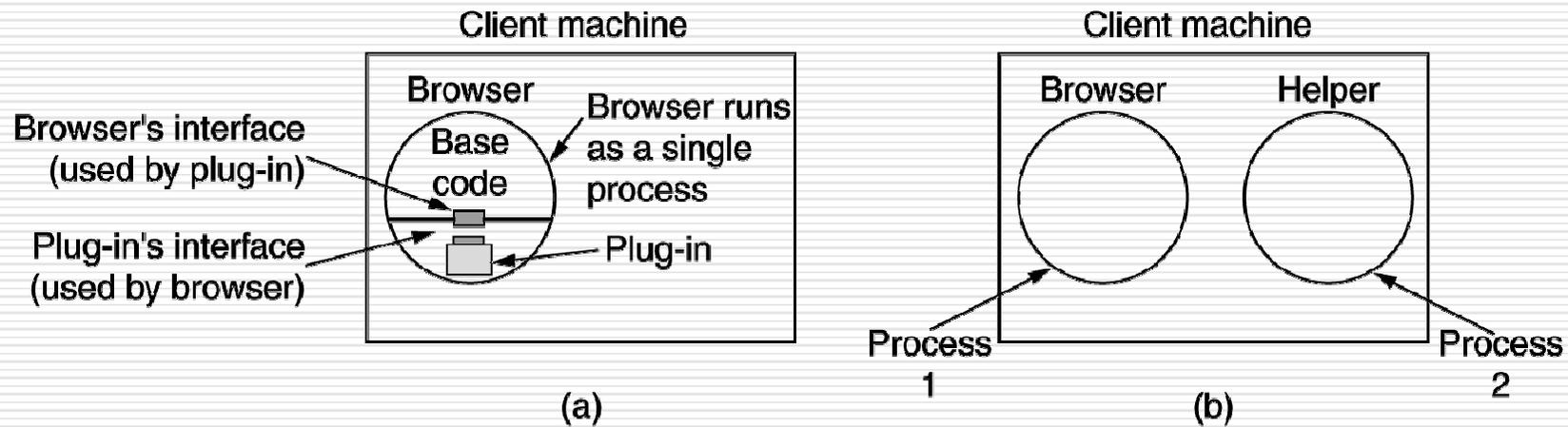
- Steps carried out by the browsers
 1. The browser determines the URL (by seeing what was selected).
 2. The browser asks DNS for the IP address of www.itu.org.
 3. DNS replies with 156.106.192.32.
 4. The browser makes a TCP connection to port 80 on 156.106.192.32.
 5. It then sends over a request asking for file /home/index.html.
 6. The www.itu.org server sends the file /home/index.html.
 7. The TCP connection is released.
 8. The browser displays all the text in /home/index.html.
 9. The browser fetches and displays all images in this file.



The Client Side – Web Browsers (2)

- To display contents other HTML, e.g. PDF file or a movie clip, browsers use plug-ins or helper applications

(a) A browser plug-in. (b) A helper application.





The Server-Side – Web Servers

- Generally, steps that a server performs
 1. Accept a TCP connection from a client (a browser).
 2. Get the name of the file requested.
 3. Get the file (from disk).
 4. Return the file to the client.
 5. Release the TCP connection



HTML

□ The language used for describing hypertext documents

```
<html>
<head><title> AMALGAMATED WIDGET, INC. </title> </head>
<body> <h1> Welcome to AWI's Home Page</h1>
 <br>
We are so happy that you have chosen to visit <b> Amalgamated Widget's </b>
home page. We hope <i> you </i> will find all the information you need here.
<p>Below we have links to information about our many fine products.
You can order electronically (by WWW), by telephone, or by fax. </p>
<hr>
<h2> Product information </h2>
<ul>
<li> <a href="http://widget.com/products/big"> Big widgets</a>
<li> <a href="http://widget.com/products/little"> Little widgets </a>
</ul>
<h2> Telephone numbers</h2>
<ul>
<li> By telephone: 1-800-WIDGETS
<li> By fax: 1-415-765-4321
</ul>
</body>
</html>
```

(a)

Welcome to AWI's Home Page



We are so happy that you have chosen to visit **Amalgamated Widget's** home page. We hope *you* will find all the information you need here.

Below we have links to information about our many fine products. You can order electronically (by WWW), by telephone, or by FAX.

Product Information

- [Big widgets](#)
- [Little widgets](#)

Telephone numbers

- 1-800-WIDGETS
- 1-415-765-4321



Some HTML Common Tags

Tag	Description
<code><html> ... </html></code>	Declares the Web page to be written in HTML
<code><head> ... </head></code>	Delimits the page's head
<code><title> ... </title></code>	Defines the title (not displayed on the page)
<code><body> ... </body></code>	Delimits the page's body
<code><h <i>n</i>> ... </h<i>n</i>></code>	Delimits a level <i>n</i> heading
<code> ... </code>	Set ... in boldface
<code><i> ... </i></code>	Set ... in italics
<code><center> ... </center></code>	Center ... on the page horizontally
<code> ... </code>	Brackets an unordered (bulleted) list
<code> ... </code>	Brackets a numbered list
<code></code>	Starts a list item (there is no <code></code>)
<code>
</code>	Forces a line break here
<code><p></code>	Starts a paragraph
<code><hr></code>	Inserts a Horizontal rule
<code></code>	Displays an image here
<code> ... </code>	Defines a hyperlink



Web Search Engines

- Web search engines are most popular WWW applications
- Used to search for resources available on the WWW
- Famous search engines:
 - Google
 - Yahoo
 - Live Search (Microsoft)



Electronic Mail – Email (or E-mail)

- ❑ Has been around since the early days of Internet
- ❑ Is widely used today
- ❑ Informal form of communication
- ❑ Simple and easy to use



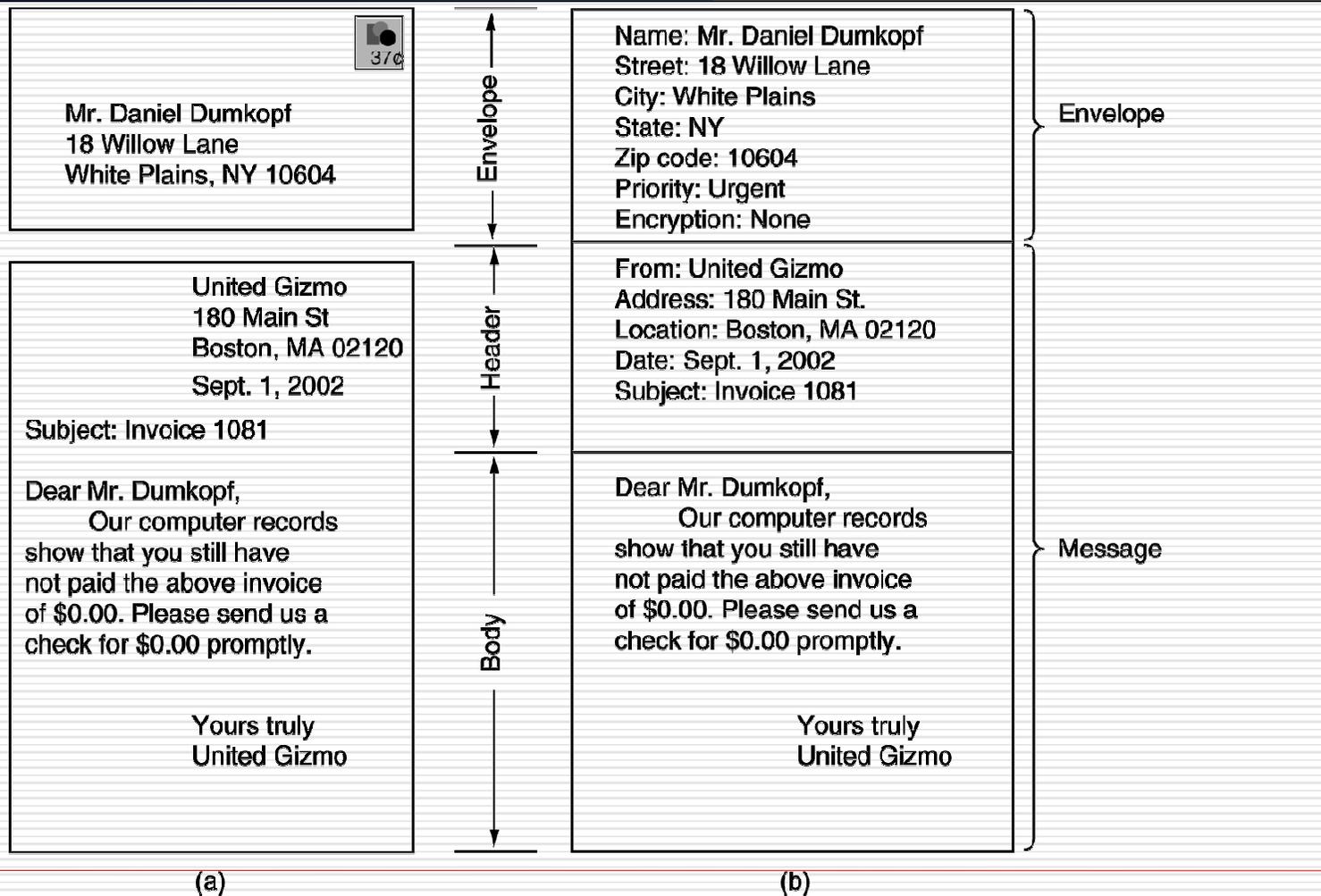
Electronic Mail (2)

Some smileys :-).

Smiley	Meaning	Smiley	Meaning	Smiley	Meaning
: -)	I'm happy	= :-)	Abe Lincoln	:+)	Big nose
:-(I'm sad/angry	=):-)	Uncle Sam	: -))	Double chin
: -	I'm apathetic	*<:-)	Santa Claus	: -{)	Mustache
; -)	I'm winking	<:- (Dunce	#:-)	Matted hair
: -(O)	I'm yelling	(-:	Australian	8-)	Wears glasses
: -(*)	I'm vomiting	: -)X	Man with bowtie	C:-)	Large brain



Email Message Structure



Envelopes and messages. (a) Paper mail. (b) Electronic mail.

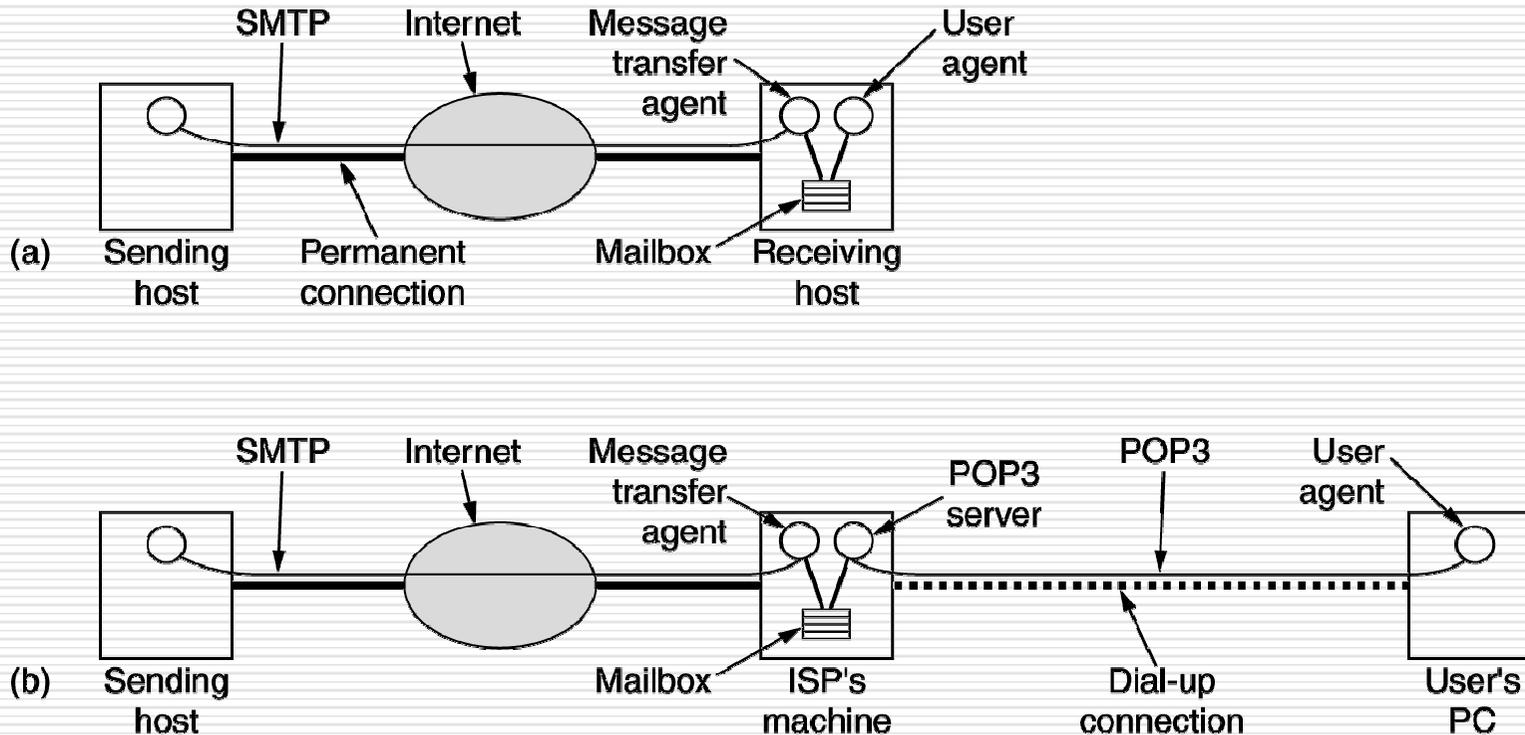


Email Systems

- Has two basic parts:
 - User agent: a program that accepts a variety of commands for composing, receiving, and replying to messages, as well as for manipulating mailboxes
 - Message transfer agents: relaying messages from the originator to the recipient



Email Delivery



(a) Sending and reading mail when the receiver has a permanent Internet connection and the user agent runs on the same machine as the message transfer agent. (b) Reading e-mail when the receiver has a dial-up connection to an ISP.

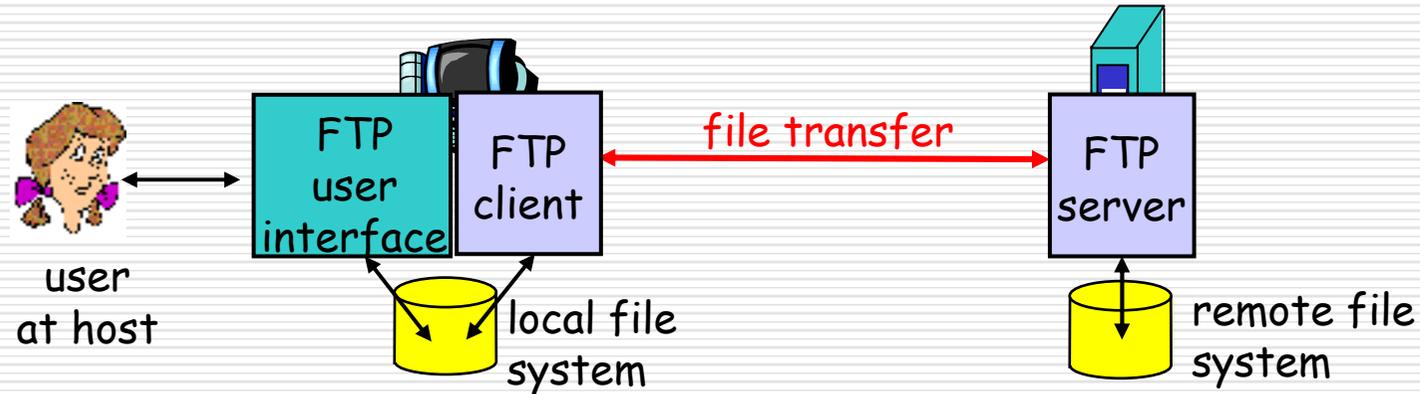


Email Delivery (2)

- Emails are transferred from a mail server to another mail server using Simple Mail Transfer Protocol (SMTP)
- Emails are transferred from a mail server to a user machine using:
 - POP3
 - IMAP
 - Web client (e.g. Gmail, Yahoo Mail)



FTP - File Transfer Protocol



- transfer file to/from remote host
- client/server model
 - *client*: side that initiates transfer (either to/from remote)
 - *server*: remote host
- ftp server: port 21



Intranets

- ❑ A private network using Internet software and TCP/IP protocol
- ❑ E.g. a university intranet, a company intranet
- ❑ Intranets are usually connected to the Internet
- ❑ Some resources an intranet are not accessible from the Internet



E-Commerce

- *“Conducting business transactions over electronic networks” (from textbook)*
 - Types of e-Commerce
 - Business to Business
 - E.g. Suppliers to retailers
 - Business to Customer
 - E.g. retailers to customers (www.amazon.com)
 - Customer to Customer
 - E.g. Ebay (ebay.com)
-



Benefits of e-Commerce

- Reducing costs
 - Labour costs, staff reduction, etc.
 - Improving efficiency
 - Direct sale to customers
 - Shortening supply chains
 - Increasing market size
 - Higher customer satisfaction and better relationships
-



Internet Security Threats

- ❑ Viruses and hostile Web applications (e.g. Java Applets or ActiveX controls)
 - ❑ Trojan horses
 - ❑ Adware and spyware
 - ❑ Spam emails
 - ❑ Identity theft and spoofing
 - ❑ Social engineering
-



Internet Security Measures

- ❑ Firewall
- ❑ Antivirus software
- ❑ Email encryption
- ❑ Encryption and authentication
- ❑ Frequent updates of software
- ❑ Always beware of incoming threads