Internet Technologies

Chapter 2
Overview at the Internet technologies

Learning Outcomes

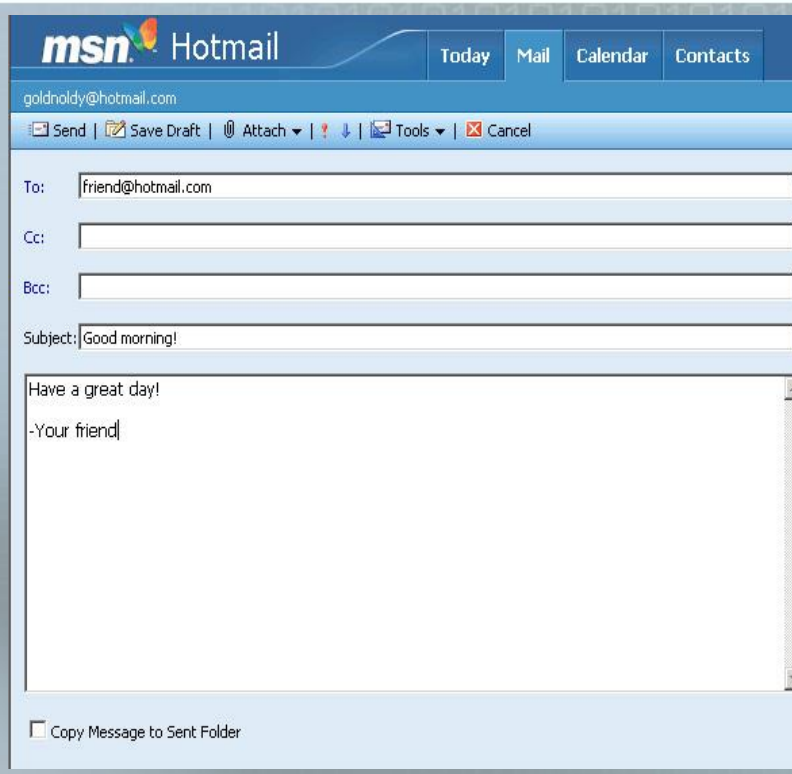
- In this chapter, you will learn about:
  - Basic services of internet
  - Uses of the Internet ?
  - Application Service Provider (ASP)
  - The Next Generation Internet
  - Internet Connections
  - Packet Switching
  - Firewalls

Basic services of internet

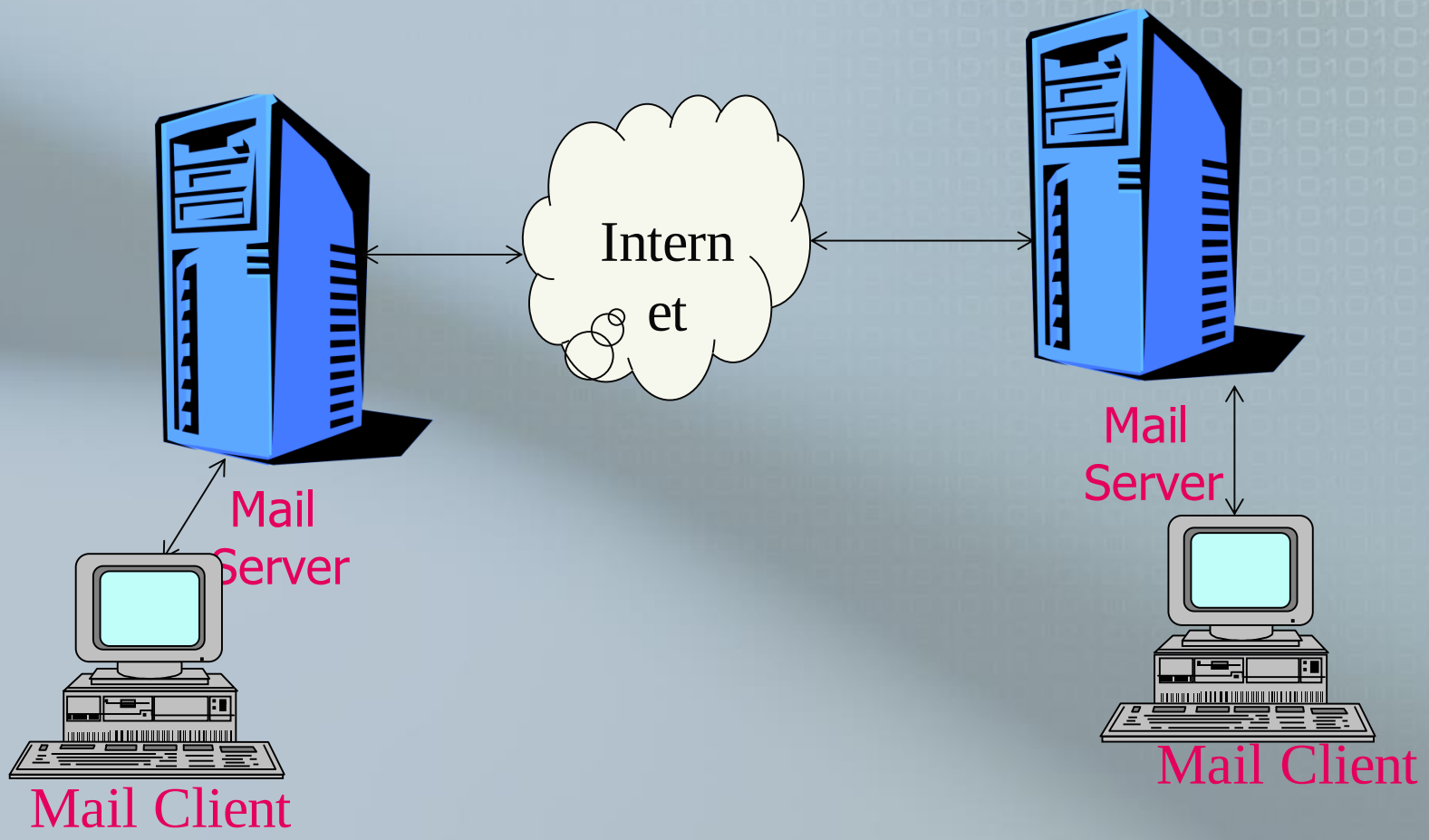
- Electronic mail
- FTP
- Telnet
- Usenet news
- The World Wide Web

Electronic mail

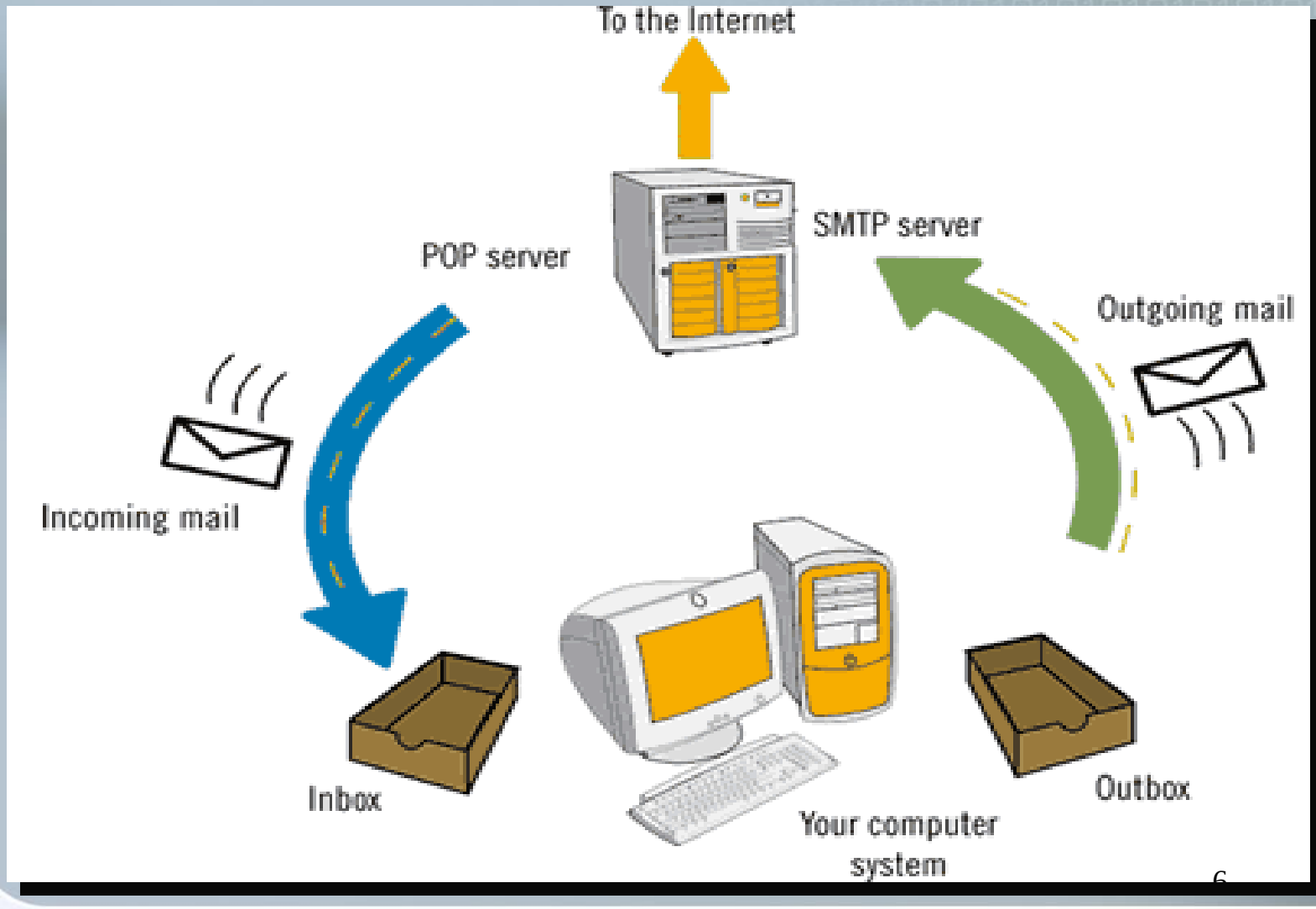
- It is also known as e-mail in short
- It enables to send and receive a mail (message).
- It is Faster than paper mail.
- Images, audio, video can be sent along with text.



Mail Architecture



Mail Architecture



Mail Architecture

- **Simple Mail Transfer Protocol (SMTP) is used to transfer mail between Mail Servers over Internet**
- **Post Office Protocol (PoP) and Interactive Mail Access Protocol (IMAP) is used between Client and Mail Server to retrieve mails**
- **The mail server of a domain is identified by the MX record of that domain**
- **Popular Mail Servers**
  - Sendmail/Postfix
  - Microsoft Exchange Server
  - IBM Lotus

File transfer Protocol (FTP)

- It enables users to move a file from one computer to another computer.
- A file may contain:
  - Text document
  - Image
  - Artwork
  - Movie
  - Sound
  - Software

Telnet

- Telnet service enables users to login to another computer on internet from their local computer for using:
  - Computing power of remote computer
  - Software on remote computer
  - Database of remote computer
- This action is called ‘remote login’.

Usenet News

Usenet news service enables a group of internet users to exchange their views, ideas, information on some common topic of internet.

- A newsgroup is like a large notice board accessible to all members belonging to the group.
- 2 types of newsgroups:
  - Moderated
  - Non-moderated

The World Wide Web

- It is a most popular method of accessing internet.
- It uses a concept called hypertext.
- Hypertext documents on internet are known as web pages.
- Web pages are created by using a special language called Hyper Text Markup Language (html)

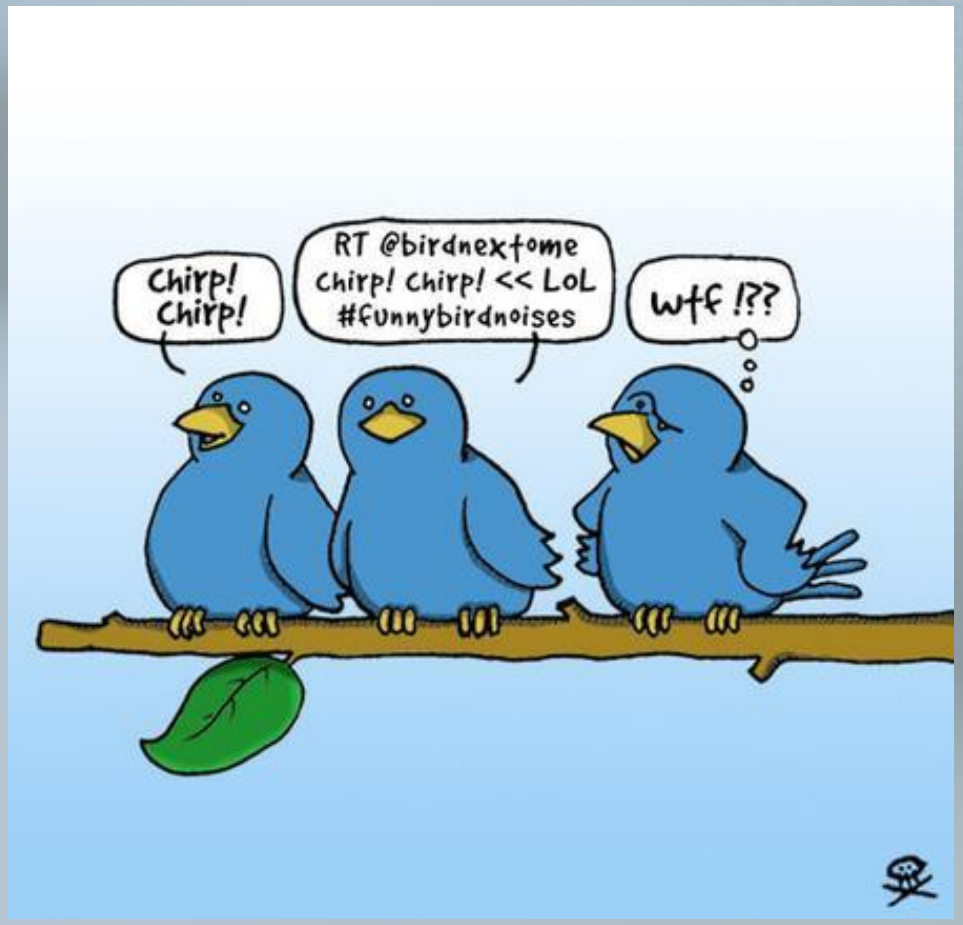
Uses of the Internet ?

- On-line communication
- Software sharing
- Exchange of views on topics of common intersest
- Posting of information of general interset
- Product promotion
- Feedback about product
- Customer support service
- On-line journals and magazines

On-line communication

Software sharing

Exchange of views on topics of interest



Posting of information

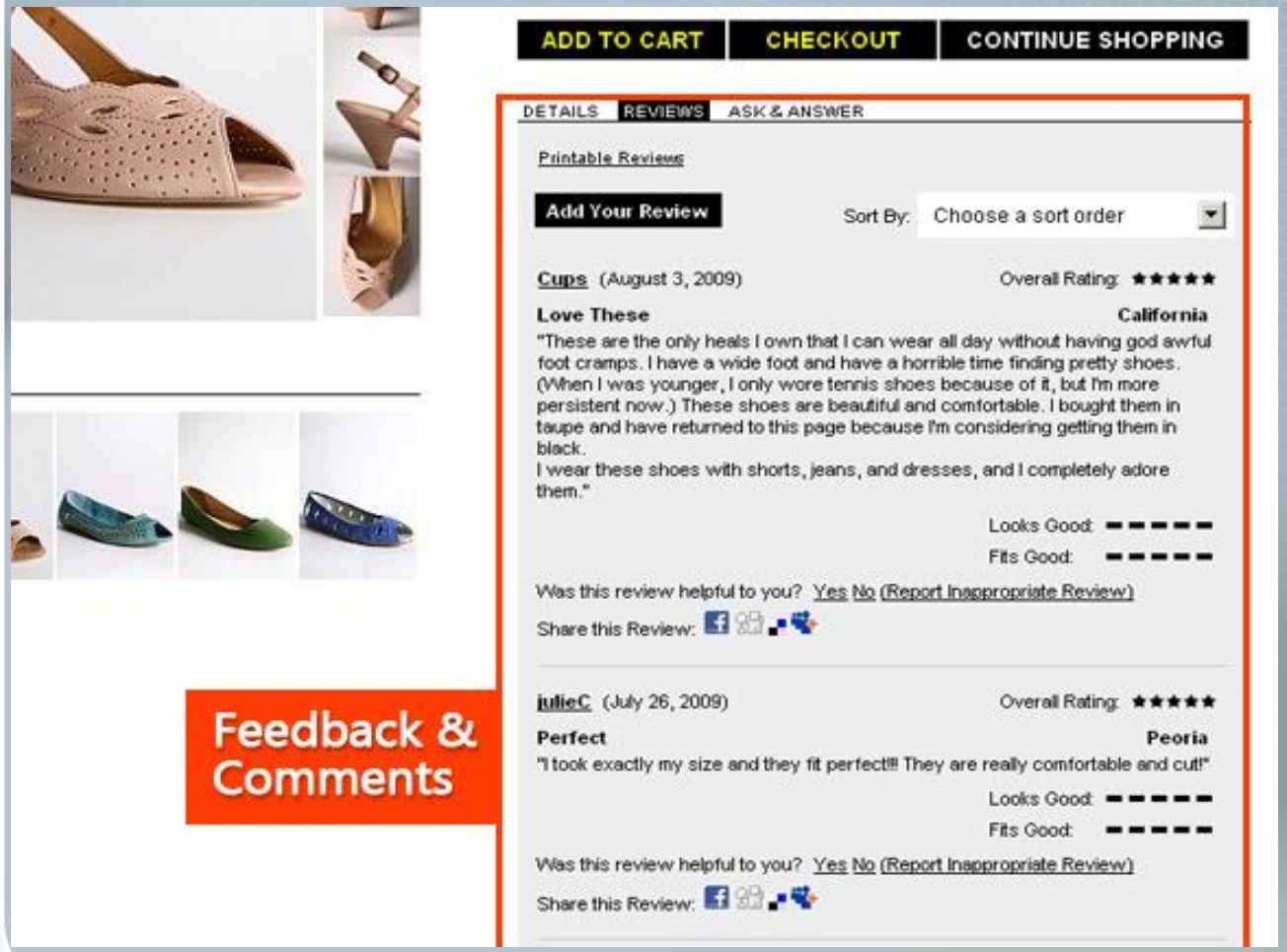
LOST

BLACK LAB

Lost on January 1, 2006. His name is Luca. He was last seen at Dog Avenue and Cat Crossing. He was wearing a red collar with silver tags. White patch of hair on chest. Contact owner at 816-555-5555 or 816-555-5556. Call day or night if you find him. **$50 Reward if found.**

Product promotion

Feedback about products



Customer support services

Online journals and magazines

- ARPANET

Forefather of internet

- INTERNET

Network of computers

- Basic Services

e-mails, FTP, Telnet, Usenet news

- Uses of internet

Communication, sharing, exchanging, informing, feedback and support.

Application Service Provider (ASP)

- Access over the Internet to applications and services that would otherwise have to be located on one's own personal computer
- Email, text editor, financial modeling software, Computer Aided Design (CAD) software, simulation software,…..

Storage Service Provider (SSP)

- Centralized data storage, which will increase efficiency and ease of access to information, as well as synchronization of information among users and machines
- Wherever you are, that is your computer!

The Next Generation Internet

About 120 universities and 25 corporate sponsors are working on better Internet infrastructure "Internet 2"

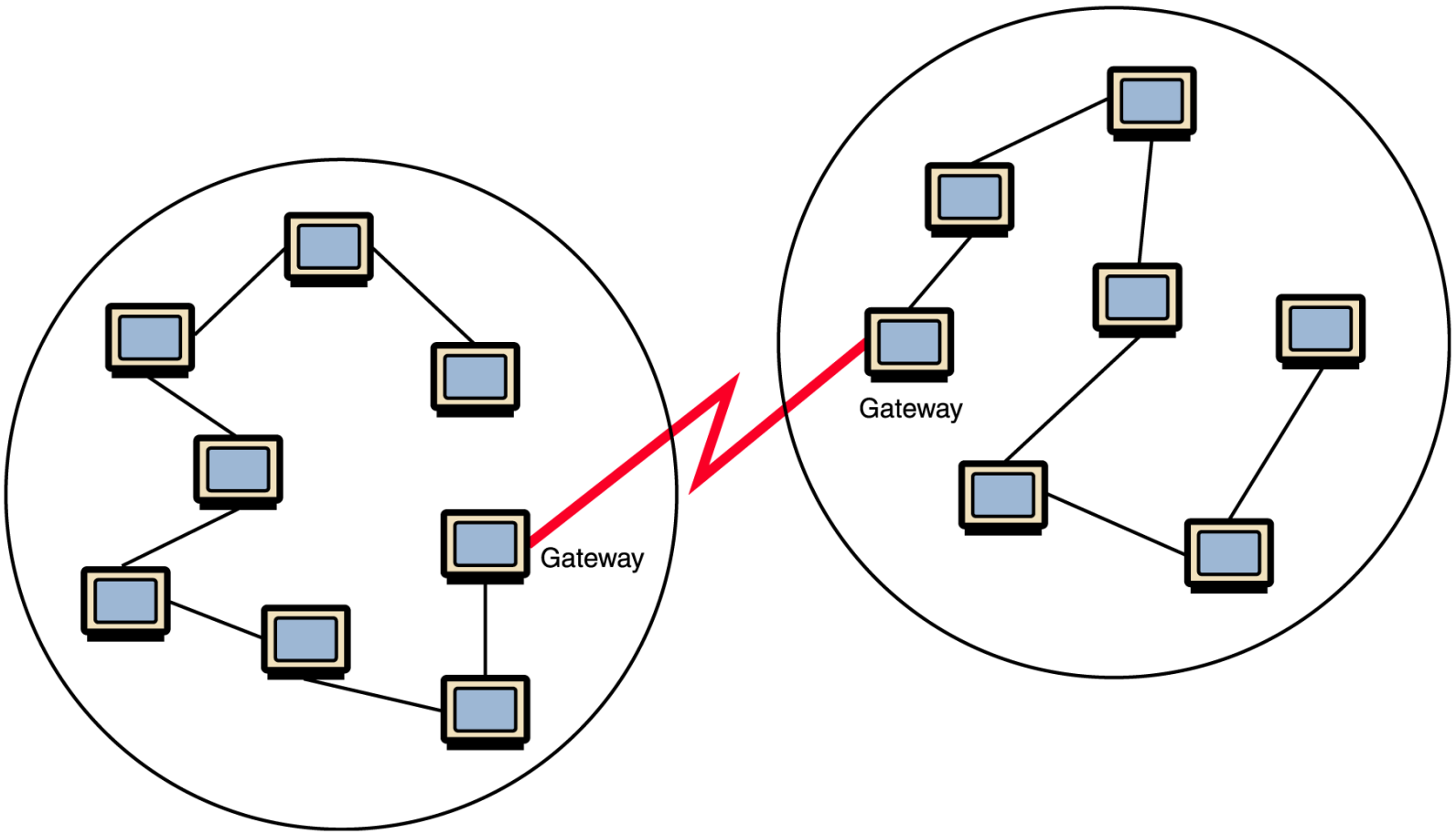
The Next Generation Internet

- Larger bandwidth
- Faster speeds
- Better reliability
- Better security
- Better compression techniques (smaller files to be transmitted)
- Caching – leaving copies around closer to the point of need
- All developments will eventually become part of standard internet

So, who owns the Internet?

Well, nobody does. No single person or company owns the Internet or even controls it entirely. As a wide-area network, it is made up of many smaller networks. These smaller networks are often owned and managed by a person or organization. The Internet, then, is really defined by how connections can be made between these networks.

So, who owns the Internet?

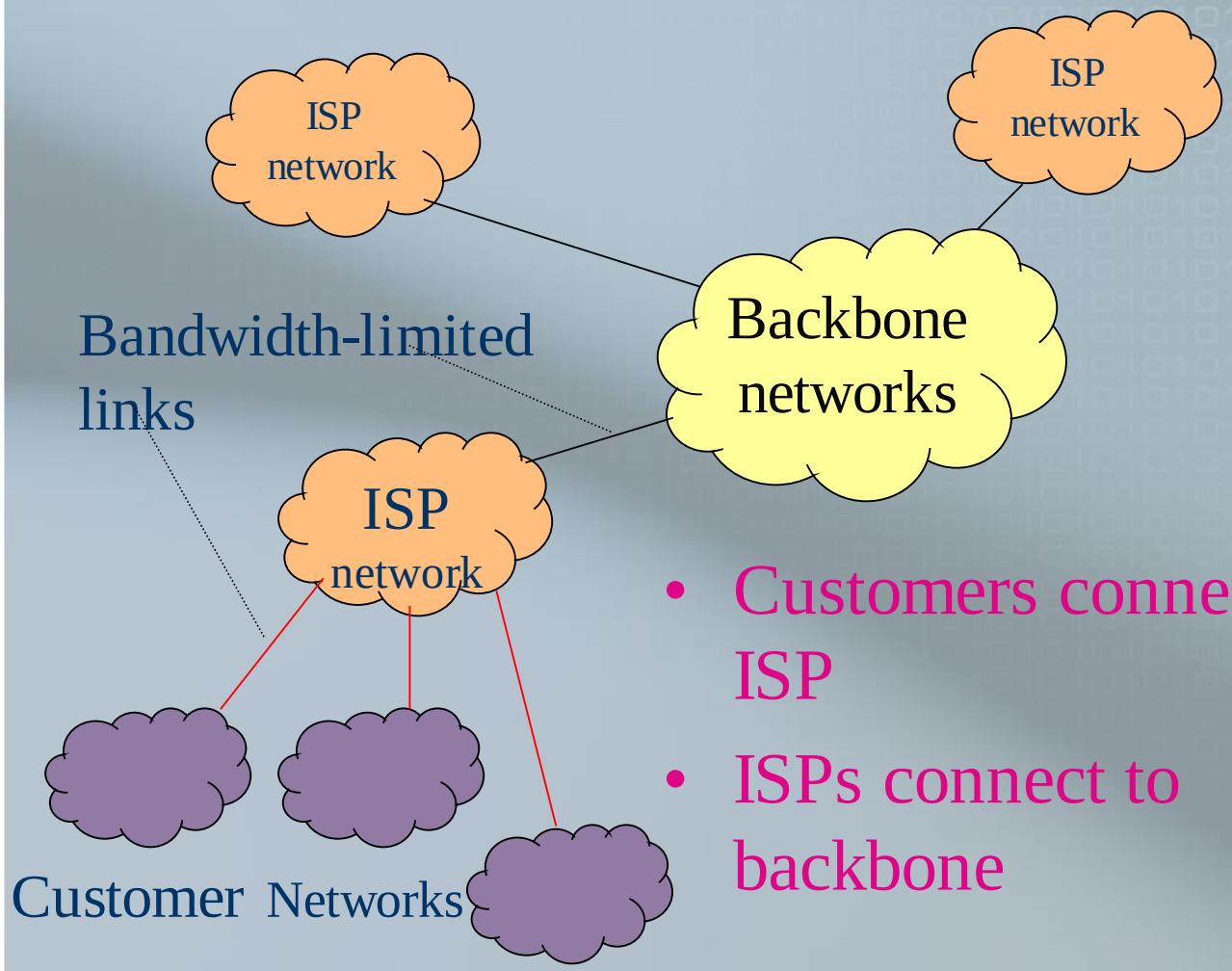


Internet Connections

- **Internet backbone** A set of high-speed networks that carry Internet traffic

  These networks are provided by companies such as AT&T, GTE, and IBM
- **Internet service provider (ISP)** A company that provides other companies or individuals with access to the Internet

Internet Connections



- Customers connect to an ISP
- ISPs connect to backbone

Internet Connections

- There are various technologies available that you can use to connect a home computer to the Internet
  - A **phone modem** converts computer data into an analog audio signal for transfer over a telephone line, and then a modem at the destination converts it back again into data
  - A **digital subscriber line** **(DSL)** uses regular copper phone lines to transfer digital data to and from the phone company's central office
  - A **cable modem** uses the same line that your cable TV signals come in on to transfer the data back and forth

Internet Connections

- **Broadband** A connection in which transfer speeds are faster than 128 bits per second
  - DSL connections and cable modems are broadband connections
  - The speed for **downloads** (getting data from the Internet to your home computer) may not be the same as **uploads** (sending data from your home computer to the Internet)

Packet Switching

- To improve the efficiency of transferring information over a shared communication line, messages are divided into fixed-sized, numbered **packets**
- Network devices called routers are used to direct packets between networks

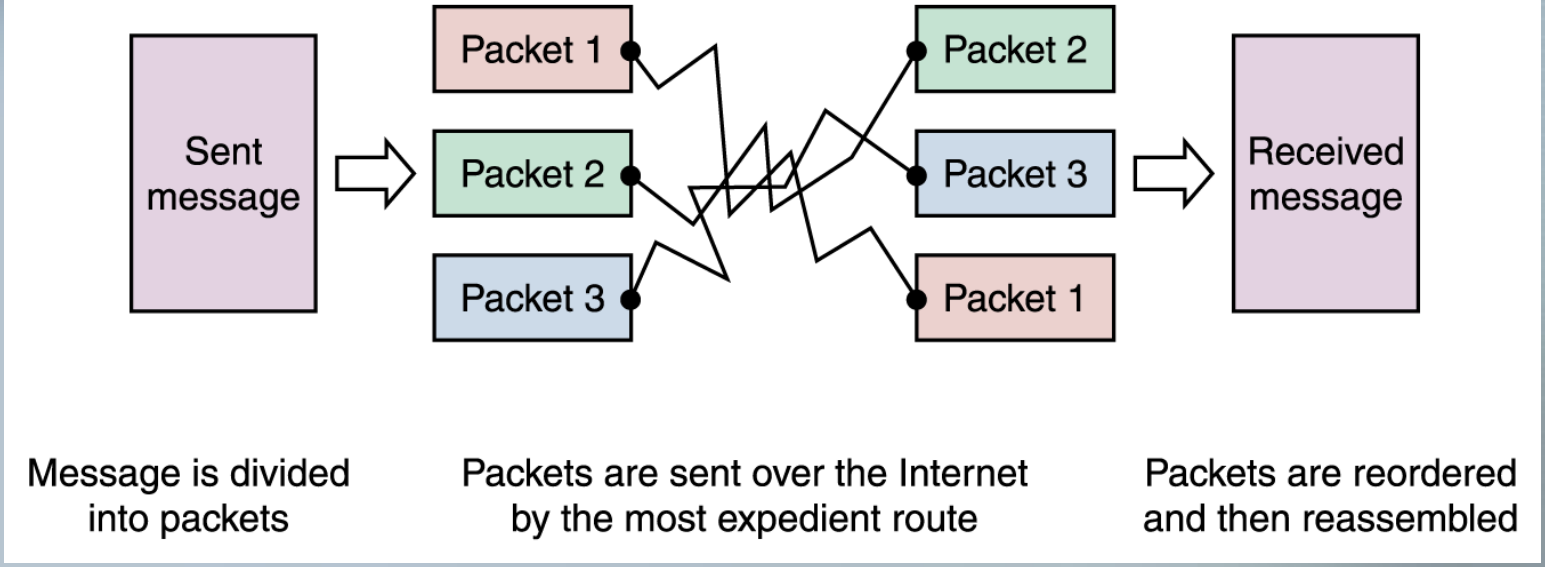
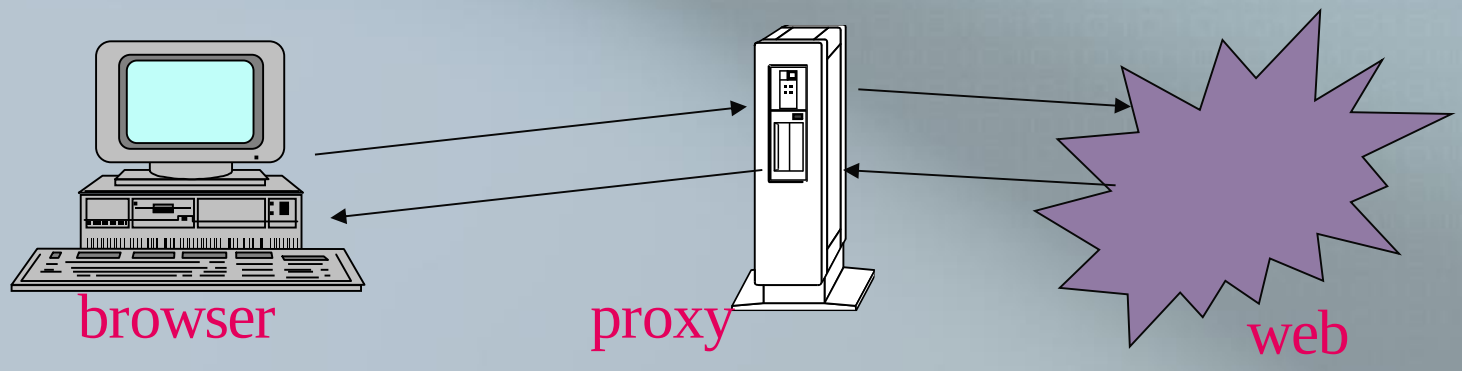


Figure Messages sent by packet switching

What is a Web Proxy?

- A proxy is a host which relays web access requests from clients
  - Used when clients do not access the web directly
  - Used for security, logging, accounting and performance



Firewalls

- **Firewall** A machine and its software that serve as a special gateway to a network, protecting it from inappropriate access
  - Filters the network traffic that comes in, checking the validity of the messages as much as possible and perhaps denying some messages altogether
  - Enforces an organization's **access control policy**

Firewalls

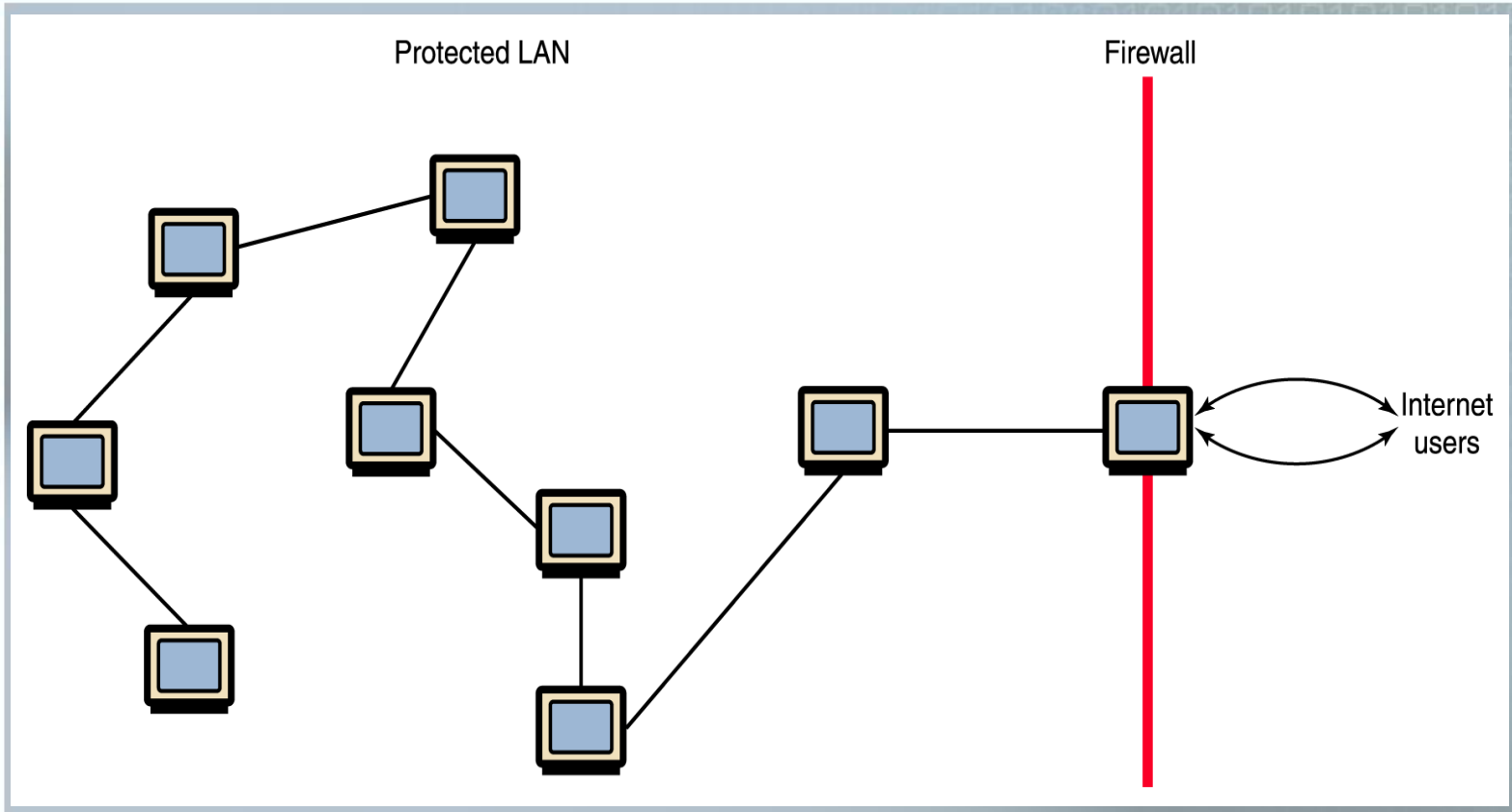


Figure 15.8 **A firewall protecting a LAN**