

# **Lesson 25**

## **Network Fundamentals**

**Computer Literacy  
BASICS: A  
Comprehensive Guide  
to IC<sup>3</sup>, 4<sup>th</sup> Edition**

# Objectives

- Describe a network.
- Identify the benefits of a network.
- Evaluate the risks of network computing.
- Identify client/server networks.
- Identify network types.
- Understand network communications.
- Resolve network security issues.

# Vocabulary

- biometric security measure
- cable modem
- client
- client/server network
- communications channels
- digital subscriber line (DSL)
- extranet
- firewall
- hacker
- hub
- Internet

# Vocabulary (continued)

- intranet
- local area network (LAN)
- modem
- node
- peer-to-peer (P2P) network
- proxy server
- Public Switched Telephone Network (PSTN)
- router
- server
- server operating system

# Vocabulary (continued)

- T-1 line
- wide area network (WAN)
- WiMAX
- wireless Internet service provider (WISP)
- wireless LAN (WLAN)

# Introducing Networks

- A network is simply a group of two or more computers linked together.
- Digital, mobile, and standard telephones are supported through the Public Switched Telephone Network (PSTN).



(a) A home network connects your PCs and other devices so they can communicate



(b) The telephone network functions much like your home network except on a larger scale

# Identifying the Benefits of a Network

- A network like the Internet provides instant communication. Other benefits include:
  - Information sharing
  - Collaborative environment
  - Hardware sharing
  - Software sharing
  - Enhanced communication

# Evaluating the Risks of Networked Computing

- The security of a computer network is challenged every day by equipment malfunctions, system failures, computer hackers, and virus attacks.
- Equipment malfunctions and system failures can be caused by natural disasters such as floods or storms, fires, and electrical disturbances such as brownouts or blackouts.



# Evaluating the Risks of Networked Computing (continued)

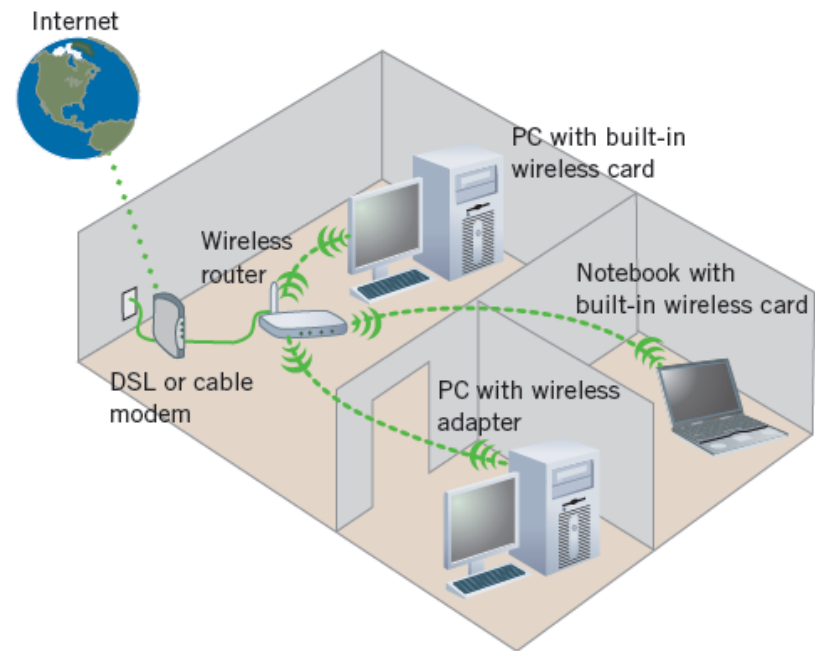
- Other disadvantages of networks include:
  - Individual loss of autonomy
  - Malicious code
  - Network faults
  - Setup and management costs
  - Lack of privacy

# Identifying Client/Server Networks

- The term client/server network describes a network design model.
- In most instances, the client is a software program such as Internet Explorer.
- The server is hardware (a computer) and can be one of many types, such as a mail server, a database server, an FTP server, an application server, or a Web server.
- Server operating systems are high-end programs designed to provide network control and include special functions for connecting computers and other devices into a network.

# Identifying Network Types

- **Local Area Networks:**
- Most LANs connect personal computers, workstations, and other devices such as printers and scanners in a limited geographical area, such as an office building, school, or home.



# Identifying Network Types (continued)

- **Wide Area Networks (WAN):**
- A WAN covers a large geographical area and can contain communication links across metropolitan, regional, or national boundaries.
- **Other Types of Networks**
  - Client/server network
  - Peer-to-peer network
  - Intranet
  - Extranet
  - Internet

# Understanding Network Communications

- **Communication Hardware:**

- Modem
- Cable modem
- Digital subscriber line
- T-1 line
- Wireless



# Resolving Network Security Issues

- The most common form of restricting access to data is the use of passwords, which are similar to combinations you need to remove a lock.

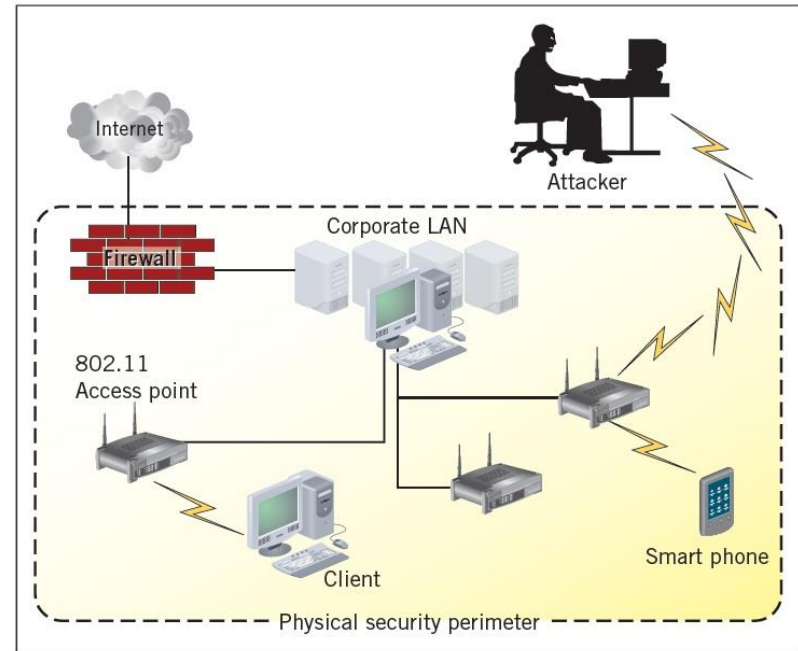


# Resolving Network Security Issues (continued)

- Other security measures include:
  - Electronic identification cards
  - Firewalls
  - Antivirus software
  - Proxy server
- **Planning for Security:**
- Guidelines include:
  - Selective hiring process
  - Regular data backup
  - Biometric security measures

# Resolving Network Security Issues (continued)

- **Wireless Security:**
- Wireless networking has many security issues and hackers have found it easy to access wireless networks.





# Summary

In this lesson, you learned:

- A network is a group of two or more computers linked together.
- A telephone network is similar in makeup to a computer network. The Public Switched Telephone Network (PSTN) supports telephone service, and it is the world's largest collection of interconnected commercial and government-owned voice-oriented systems.

# Summary (continued)

- You can use a network for information sharing, hardware sharing, software sharing, and as a collaborative environment.
- Networks are categorized according to size as local area networks (LANs) and wide area networks (WANs).
- LANs connect personal computers, workstations, and other devices such as printers and scanners in a limited geographical area, such as an office building, a school, or a home.

# Summary (continued)

- A WAN is made up of several connected local area networks.
- In a client/server network, one or more computers on the network acts as a server. The server manages network resources. In a peer-to-peer (P2P) network, all of the computers are equal. No computer is designated as the server. People on the network each determine what files on their computer they share with others on the network.

# Summary (continued)

- Data insecurity is a risk with many networks. Some risks to computers are natural causes, some are accidents, and others are intentional.
- The best way to protect data is to effectively control the access to it. Generally, this protection is the responsibility of the network administrators and security personnel. If unauthorized persons gain access to data, they may obtain valuable information or trade secrets. Hackers are people who break into computer systems to steal services and information.

# Summary (continued)

- Transmission media can be either physical or wireless.
- A modem is a type of communications device. A hub is a device that controls the incoming and forwarding of data. A router directs traffic on the Internet or on multiple connected networks.