

# Chapter 17

## Networks

### What's Inside? ↘

#### Chapter overview

#### Chapter outline

#### Instructional notes

Key terms

Lecture notes

What is a network?

What are the components of a network?

How do I connect my computer to the Internet?

What's the best Internet connection?

What does the Internet offer?

What is e-commerce?

What are the advantages and disadvantages of networks?

#### Solutions

QuickChecks

## Instructor's Notes

### Chapter overview

In this chapter your students will learn basic network terminology and how to identify network components. They will also learn about the advantages and disadvantages of networks as well as what the Internet has to offer and how to connect to it.

### Chapter outline

FAQ	Page #	Material covered
What is a network?	221	Types of networks and their uses
What are the components of a network?	222	Wireless networks, wired networks, servers, client/server networks, peer-to-peer networks, network peripherals, network communications devices
How do I connect my computer to the Internet?	224	Internet backbone, network service providers, dial-up connections, modulation, demodulation, cable Internet service, personal firewall software, DSL service, ISDN service, T1 service, Direct satellite service, latency
What's the best Internet connection?	227	Bandwidth, broadband, narrowband, various Internet connections
What does the Internet offer?	228	Services available on the Internet
What is e-commerce?	229	Financial transactions on the Internet
What are the advantages and disadvantages of networks?	230	Pros and cons of networks

### Technical notes

Your *Practical Computer Literacy* book includes an action-packed **multimedia Book-on-CD**. Each page of the Book-on-CD looks exactly like its corresponding page in the printed book and contains interactive elements such as pop-up definitions, interactive animations, and interactive end-of-chapter material. The Book-on-CD is easy to use at home, at school, or at work. For more information on the Book-on-CD, please reference the preface of this book.

The following Materials Needed section is the same for each chapter of *The Practical Computer Literacy*. This information is repeated in each chapter for your convenience.



**Materials needed**

**Windows 95, 98, Me, 2000, or XP installed on the lab computers.** *The Practical Computer Literacy* Book-on-CD is optimized for use with Windows 95, Windows 98, Windows Me, Windows 2000, and Windows XP. Note that *The Practical Computer Literacy* Book-on-CD will *not* work acceptably on computers installed with Windows 3.1.

**Tracking Disk.** You can have students create a Tracking Disk, which records their scores on the Skill Sets, so that you can monitor their progress. When you start a Skill Set, the program checks drive A: for a Tracking Disk. If you want to create a Tracking Disk, insert a formatted floppy disk, then click **Create Tracking File A:\TRACKING.TRK**. You'll be prompted to enter your name, student ID, and section number, all of which will be stored on the Tracking Disk. If you don't want to save your results, just click **Continue without a Tracking Disk**. This option allows you to try a Skill Set review without saving your results. For more information on the Tracking Disk, please reference the preface of this book.

**Project Disk.** For many of the projects, your students must create a Project Disk, onto which they copy project files and save their completed work. Students create their own Project Disk by inserting a blank, formatted floppy disk in drive A (or the appropriate drive), clicking Project Disk menu option on the Welcome screen of *The Practical Computer Literacy* CD-ROM, clicking the menu option for the assigned project, and then following the instructions to copy the project file to the blank floppy disk. A second method is to click the Copy It! button on the first page of the project to copy the file for that project to their floppy disk.

You can specify whether students submit the disk for your review, submit their printed completed project, or send you their completed file as an e-mail attachment. For e-mail submission, students will need your e-mail address.

This chapter assumes your students have access to a lab (or home) computer and have previously used a mouse.

**Content and Certification.** With the increasing presence and use of computers in both school curriculum and the workplace- there is a growing need to evaluate and measure computer skills through a set of certification standards. *Practical Computer Literacy* integrates computer concepts, Office applications, and Internet concepts making it the perfect solution for your introductory computer needs.

The content of the text and Book-on-CD maps to the certification standards for IC3 (Internet and Computing Core Certification). This certification is a set of 3 exam modules including: Computing Fundamentals, Key Applications, and Living Online.

Even if you don't use IC3 certification, *Practical Computer Literacy* is a good fit for many other certification standards developed by industry, your state, or your school. For more information on how *Practical Computer Literacy* can work with your course or for more information on certifications such as IC3 and ICDL, contact your Course Technology Sales Representative, or go to [www.course.com](http://www.course.com).

## Instructional notes

### Key terms

**Bandwidth** (227): The transmission capacity of a communications channel.

**Bridge** (223): A device that transfers data without regard to its format.

**Broadband** (227): High-bandwidth communications systems.

**Client/server network** (222): A network that contains one or more computers configured with server software, and other computers configured with client software to access the servers.

**Communications protocol** (221): A set of rules for transmitting and receiving voice or digital data.

**Communications software** (221): Software that implements communications protocols.

**Computer network** (221): A network that consists of two or more computers connected in a way that allows information and devices to be shared.

**Demodulation** (224): changing a signal back to its original state.

**E-commerce** (229): Financial transactions conducted electronically over a computer network.

**Ethernet** (221): A popular LAN technology.

**Extranet** (221): A network that uses public telephone and computer networks to share data with external suppliers, vendors, and customers.

**Gateway** (223): Any device or software used to join two dissimilar networks by converting data sent from one network into a format compatible to the receiving network.

**Hotspot** (226): The range of a wireless network's coverage.

**Hub** (223): typically the central connection point in a network that is designed to broadcast data to workstations and peripherals.

**Internet** (221): A collection of local, regional, national, and international computer networks linked together to exchange data and distribute processing tasks.

**Intranet** (221): A type of LAN that uses TCP/IP and is maintained by a private business or organization.

**LAN** (221): Local area network. A network that typically connects personal computers within a very limited geographical area – usually a single building.

**Latency** (226): The delay while your data travels 22,000 miles to a satellite and then back to earth.

**Modem** (224): An electronic device that converts data from the digital format used by your computer to analog signals.

**Modulation** (224): Changing the characteristics of a signal.

■ ■ ■

**Network** (221): Any collection of devices with the ability to communicate with each other.

**Network client** (222): Any device that provides people with access to a computer network.

**Network communications device** (223): An electronic device that broadcasts network data, boosts signals, or routes data to its destination.

**Network peripheral** (223): A device directly connected to a network rather than to a workstation.

**Node** (222): A network connection point.

**Peer-to-peer network** (223): A network that treats every computer as an “equal” so that workstations can store network data and transport it directly to other workstations without passing through a central server.

**Personal firewall software** (225): Software that monitors data as it arrives from a network, filters out suspicious data, and warns of intrusion attempts.

**Router** (223): An electronic device that joins two or more networks.

**Server** (222): A computer configured to provide a network service.

**Transceivers** (222): The devices that send and receive wireless signals.

**WAN** (221): Wide area network. A network that covers a large geographical area and typically consists of several smaller networks.

**Wi-Fi** (222): Short for “wireless fidelity”, one of the most popular wireless networks.

**Wireless network** (222): A network in which signals can travel from one device to another via radio waves or infrared.

**Workstation** (222): A personal computer connected to a network.

## Lecture notes

### What is a network?

Explain that a network is any collection of devices with the ability to communicate with each other and have students suggest examples, such as cell phone networks, LANs, WANs, and intranets. Review the types of networks and situations for which each type is appropriate.

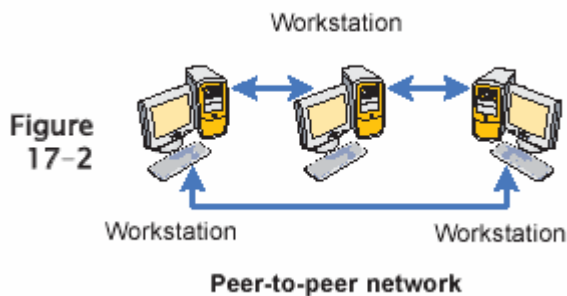
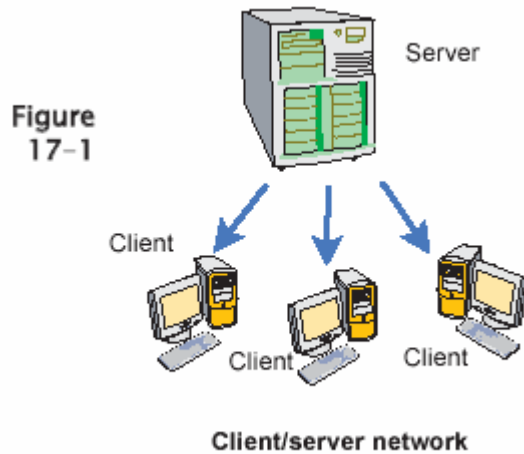
Explain that TCP/IP, which is used by the Internet, is a standard communications protocol that allows diverse computer platforms – including PCs, Macs, and mainframes – to communicate.

**TIP:** Explain the type of network your school uses and demonstrate it for students, if possible.

### What are the components of a network?

Physically, a network consists of computers and other devices connected wirelessly or with cables. Explain how signals travel from one device to another via radio waves or infrared in a wireless network and through standard telephone cables in a wired network.

Review with students that a network node is a network connection point that typically contains a workstation, server, network peripheral, or network communication device. Explain the differences between a client/server network, shown in Figure 17-1 below, and a peer-to-peer network, shown in Figure 17-2 below.



Explain the difference between network peripherals and local peripherals and point out which type your classroom has available.

Review network communications devices, which are electronic devices that broadcast network data, boost signals, or route data to its destination. Explain that the central connection point in a network is not necessarily a server and that more typically it is a hub, which is designed to broadcast data to workstations and peripherals. Explain that a repeater can boost the strength of the signal that carries data and is necessary when the distance between two nodes exceeds the carrying capacity of their connecting links. Also review bridges, gateways, and routers.

### **How do I connect my computer to the Internet?**

Explain that the Internet backbone is maintained by network service providers (NSPs), such as AT&T, MCI, Qwest, Sprint, and UUNET. Explain that NSPs are different from ISPs (Internet Service Providers), which sell access to the Internet and connects to an NSP to access the Internet backbone.

Review the different types of Internet connections, as listed below:

- Dial up, which uses standard telephone service and is the slowest and least expensive type.

■ ■ ■

- Cable, which offers high-speed data transport and is more expensive than dial-up.
- DSL, which requires a DSL modem that connects to standard telephone lines, but transmits data at a much higher speed than a dial-up modem.
- ISDN, which uses two telephone lines and is not as fast as DSL or cable, but is faster than dial-up.
- T1, which is one of the fastest but most expensive types.
- Direct satellite, which providers say offers data transport speeds similar to cable Internet service.
- Wi-Fi, which is a wireless LAN that provides open Internet access to the public.

**TIP:** Explain which type of Internet access the classroom uses.

### **What's the best Internet connection?**

The “best” connection depends on the users’ needs. Availability, speed, cost, reliability, and security are all factors that will affect which Internet connection is best for each situation.

Bandwidth is the transmission capacity of a communications channel and greatly affects the speed of a connection. High-bandwidth communications systems, such as cable TV and DSL, are sometimes referred to as broadband, whereas systems with less capacity, such as the telephone system, are referred to as narrowband. Broadband services offer fast Internet connections.

Refer students to the table in Figure 17-6 on page 227 of the text to compare speed and other factors for various Internet connections.

### **What does the Internet offer?**

Perhaps the better question is what doesn't the Internet offer. Many people have a hard time imagining life without the Internet. The Internet can be used for communication, shopping, paying bills, checking the weather, reading the news, and completing schoolwork, among many other activities.

**TIP:** Have students share with the class the types of activities they most frequently use the Internet for.

### **What is e-commerce?**

Although not everyone agrees on a definition for e-commerce, it typically describes financial transactions conducted electronically over the Internet. Almost any type of good or service can be purchased on the Internet. E-commerce offers some unique advantages over brick-and-mortar stores and mail-order catalogs.

**TIP:** Have students list popular e-commerce sites, such as Amazon.com.

### **What are the advantages and disadvantages of networks?**

While the Internet is the most visible network, there are many networks operating “behind the scenes” facilitating all kinds of tasks. In fact, industry and commerce as we know it depends heavily upon those networks. Some of the advantages of networks are:

- Sharing networked hardware can reduce costs.
- Sharing networked hardware can provide access to a wide range of services and specialized peripheral devices.
- Sharing networked software can reduce costs.
- Sharing data on a network is easy.
- Networks enable people to work together regardless of time and place.

The primary disadvantage of networks is their vulnerability to unauthorized access.

## **Solutions to QuickChecks**

### **Solutions to QuickCheck** **A**

1. protocol
2. hub
3. backbone
4. firewall
5. bandwidth

### **Solutions to QuickCheck** **B**

1. F
2. B
3. A (D, E)
4. A
5. C