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COMPUTER APPLICATIONS AND CONCEPTS

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5

The Internet and Email

LEARNING OBJECTIVES

1. Understand how the Internet evolved
2. Set up your computer to use the Internet
3. Understand how to search the Internet for information
4. Understand email and other types of messaging
5. Describe common Internet activities

Evolution of the Internet

- Topics covered
  - *From ARPANET to Internet2*
  - *The World Wide Web*
  - *Internet2*
  - *The Internet community today*

- **Internet**: The largest and most well-known computer network, linking billions of computers all over the world

ARPANET

- **ARPANET**: Predecessor of the Internet
  - *Objectives*
    - To create a network permitting communication among researchers located in different places
    - To build a computer network capable of sending or receiving data over multiple paths
- Originally four supercomputers; additional networks were connected over the years
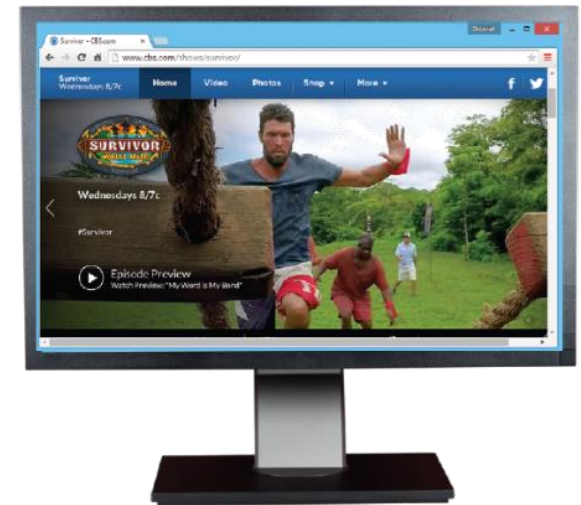- Evolved into the present-day Internet

The World Wide Web

- **World Wide Web (Web)**: The collection of Web pages available through the Internet
- Envisioned by Tim Berners-Lee in 1989 as a way to organize information as linked pages
- Viewed using a Web browser (GUI today)

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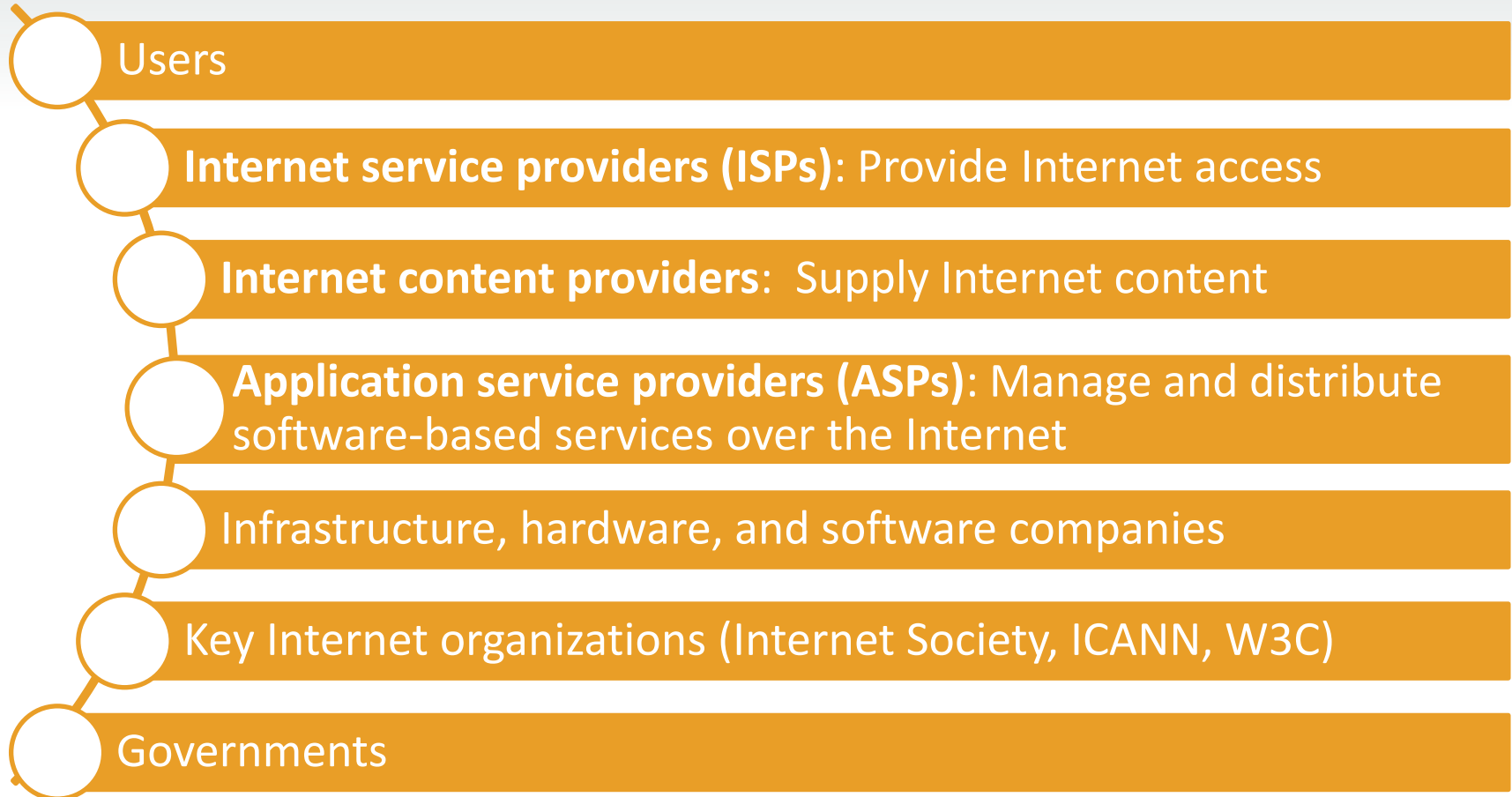
EARLY 1990s

```
ftp>dir
100 port command successful
300 opening ASCII mode data
connection for file list
  2415    readme.txt  Mon Apr 10 19:52:04 1990
  32251   pkzip.exe  Tues Sept 6 03:44:18 1991
  145671  mis.zip  Sun Jan 17 10:33:14 1991
<dir> rfc
420 transfer complete
ftp>cd rfc
200 cwd command successful
ftp>get rfc-contents.txt contents.txt
```

TODAY

Internet2

- Internet2: A consortium of researchers, educators, and technology leaders dedicated to the development of revolutionary Internet technologies
- Uses high-performance networks linking over 500 member institutions to deploy and test new network applications
- Much research is based on speed
  - *First 100 Gigabit Ethernet national network*

The Internet Community Today

- Users
- **Internet service providers (ISPs)**: Provide Internet access
- **Internet content providers**: Supply Internet content
- **Application service providers (ASPs)**: Manage and distribute software-based services over the Internet
- Infrastructure, hardware, and software companies
- Key Internet organizations (Internet Society, ICANN, W3C)
- Governments

Net neutrality: The basic concept that all Internet content is equal

Connecting to the Internet

- Topics covered
  - *Selecting the type of device*
  - *Choosing a type of Internet connection*
  - *Selecting an ISP*
  - *Setting up your Internet connection and devices*

Selecting the Type of Device

- Depends on where you need access, the type of content you want, etc.
    - *Personal computer, smartphone, gaming console, smart TV, etc.*

PERSONAL COMPUTER   SMARTPHONE   SMART TV

Choosing a Type of Internet Connection

- **Conventional dial-up Internet access**: Slow, dial-up access via telephone lines

- **Cable Internet access**: Fast, direct access via cable TV lines

- **DSL Internet access**: Fast, direct access via standard telephone lines

- **Satellite Internet access**: Fast, direct access via the airwaves and a satellite dish

- **Fixed wireless Internet access**: Fast, direct access via the airwaves

Choosing a Type of Internet Connection (continued)

- **Broadband over fiber (BoF)** or **fiber-to-the-premises (FTTP) Internet access**: Very fast, direct access via fiber-optic networks

- **Mobile wireless Internet access**: Access via a mobile phone network

  - *Augmented reality (AR) can overlay computer-generated images on top of real-time, real-life images seen through a phone's camera*

- **Wi-Fi hotspot**: A location that provides wireless Internet access to the public

Exhibit 5-6

Typical Home Internet Connection Options

Type of Internet Connection	Availability	Approximate Maximum Speed*	Approximate Monthly Price
Conventional dial-up	Anywhere there is telephone service	56 Kbps	Free–$30
Cable	Virtually anywhere cable TV service is available	6–200 Mbps	$30–110
DSL	Within three miles of a switching station that supports DSL	3–15 Mbps	$30–40
Satellite	Anywhere there is a clear view of the southern sky and where a satellite dish can be mounted and receive a signal	5–15 Mbps	$40–80
Fixed wireless	Selected areas where service is available	2–12 Mbps	$60–250
Broadband over fiber (BoF)	Anywhere fiber has been installed to the building	5 Mbps–1 Gbps	$30–70
Mobile wireless (4G)	Virtually anywhere cellular phone service	3–100 Mbps	Varies greatly depending on data plan

* Download speed; most connections have slower upload speeds.
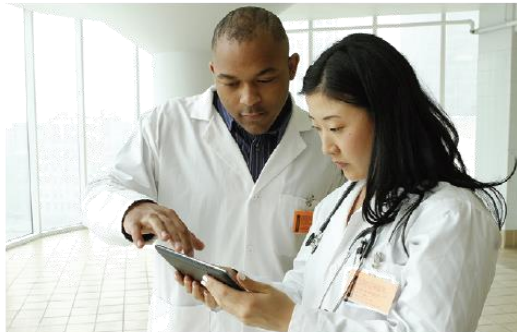
Exhibit 5-8

Wi-Fi Hotspots

COFFEEHOUSES AND OTHER PUBLIC LOCATIONS
Often fee-based, though some are available for free.

HOTELS AND CONFERENCE CENTERS
Often free for guests.

HOSPITALS, BUSINESSES, AND OTHER ORGANIZATIONS
Usually designed for employees but are sometimes also available free to visitors.

COLLEGE CAMPUSES
Usually designed for students and faculty; sometimes used directly in class, as shown here.

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Exhibit 5-9

Questions to Ask Before Choosing an ISP

Area	Questions to Ask
Services	Is the service compatible with my selected device?
	Is there a monthly data cap? If so, do I have a choice of tiers?
	How many email addresses can I have?
	What is the size limit on incoming and outgoing email messages and attachments?
	Do I have a choice between conventional and Web-based email?
	Are there any special member features or benefits?
	Does the service include Web site hosting, Wi-Fi hotspots, or other benefits?
Speed	How fast are the maximum and usual downstream (ISP to my device) speeds?
	How fast are the maximum and usual upstream (my device to ISP) speeds?
	How much does the service slow down under adverse conditions, such as high traffic or poor weather?
Support	Is telephone-based technical support available?
	Is Web-based technical support (such as via email) available?
	Is there ever a charge for technical support?
Cost	What is the monthly cost for the service? Is it lower if I prepay a few months in advance? Are different tiers available?
	Is there a setup fee? If so, can it be waived with a 6-month or 12-month agreement?
	What is the cost of any additional hardware needed, such as modem?
	Are there any other services (telephone service or TV, for instance) available from this provider that can be combined with Internet access for a lower total cost?

Setting up Internet Connection and Devices

- Specific steps depend on the:
    - *Type of device*
    - *Type of connection*
    - *ISP chosen by the user*
- Some connections (i.e. satellite) require professional installation on site
- To share the Internet connection via Wi-Fi, connect the broadband modem to a wireless router if the modem doesn't function as one
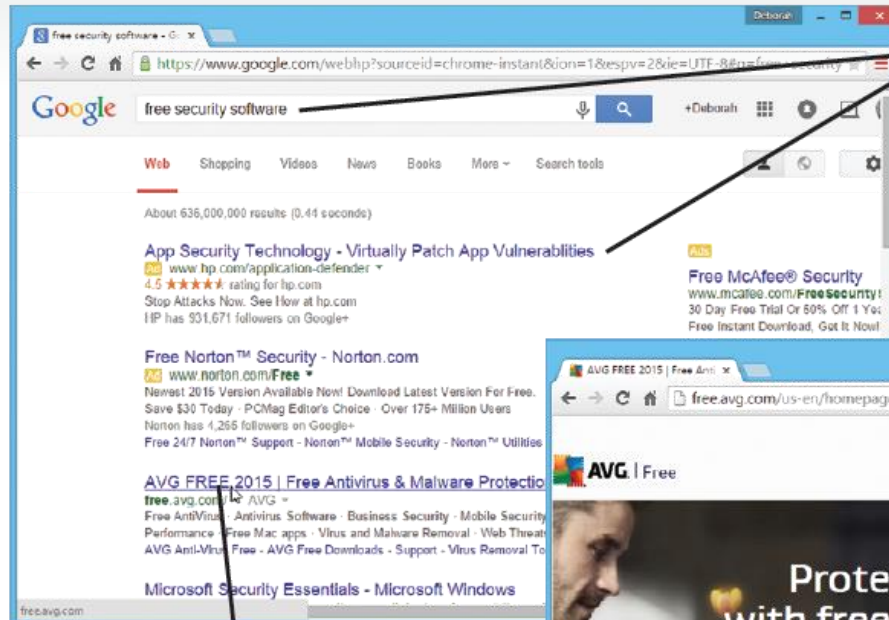
Searching the Internet

- Topics covered
  - *Using search sites*
  - *Citing Internet resources*

- One of the most important skills an Internet user can acquire is how to successfully search for and locate information on the Internet

Using Search Sites

- **Search site**: Web site designed to help users find information
    - *Search engine: A software program used by a search site to retrieve matching Web pages from a search database*
- **Keyword**: A word typed in a search box on a search site to locate related information
- **Hit**: A link displayed in a search site's results that matches the supplied search criteria
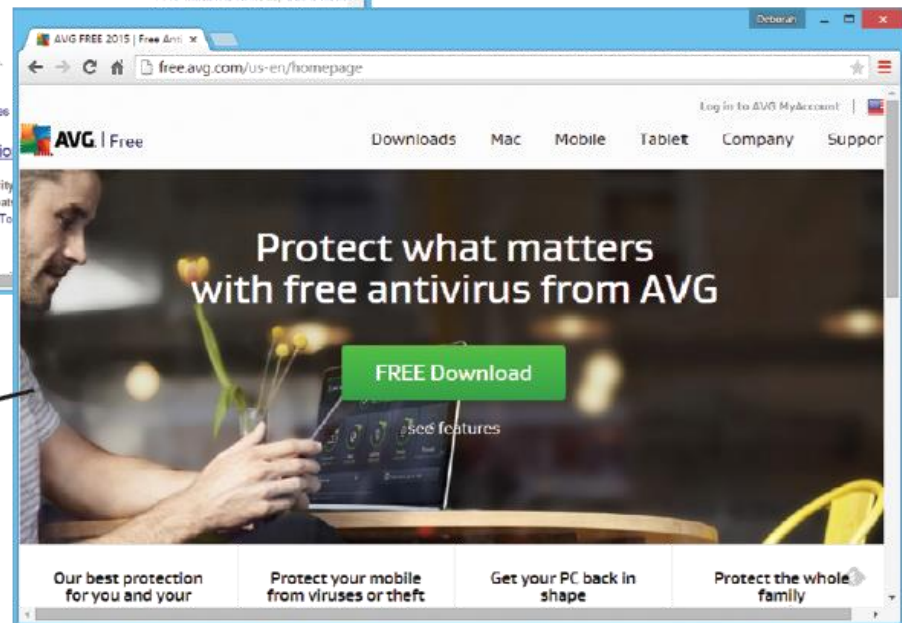- **Search phrase**: A search using multiple keywords

Exhibit 5-10   **Using a Search Site**

Type appropriate keywords in the search box to display the search results.

Click a hyperlink in the search results to display that page.

Source: © Google Inc.; AVG Technologies

Citing Internet Resources

- To avoid plagiarizing Web page content, you must credit Internet sources you use
- Citing Web sources is similar to offline sources but include a "Retrieved" statement
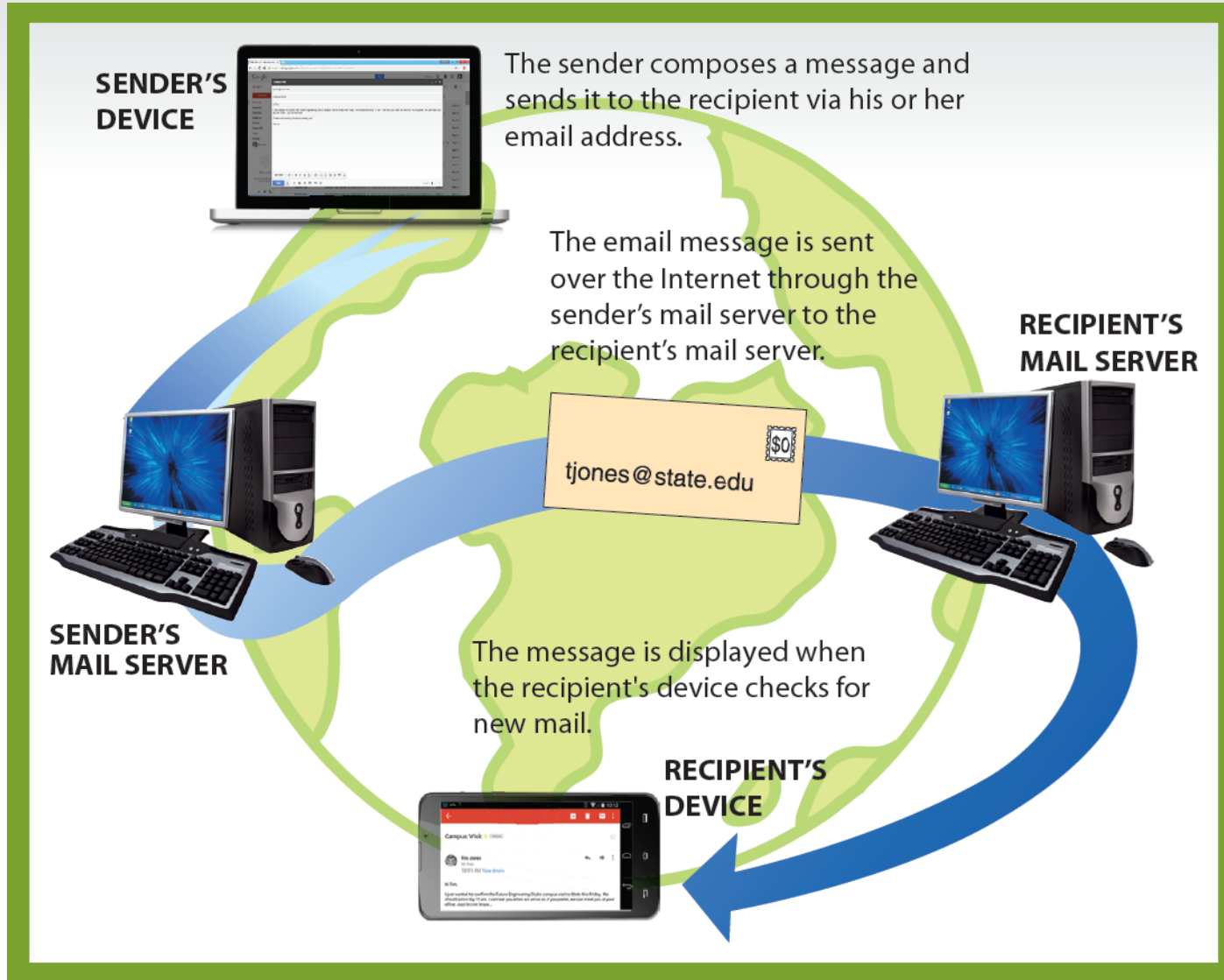- Various style formats to choose from (APA, MLA, Chicago, etc.)

Style Format	Citation Example
MLA	Kedmey, Dan. "Why Thieves Love the Apple Watch." *Time.* Time, 14 May 2015. Web. 30 March 2016. <http://time.com/3858762/apple-watch-theft/>.
APA	Kedmey, D. (2015, May 14). Why Thieves Love the Apple Watch. Retrieved June 30, 2015, from http://time.com/3858762/apple-watch-theft/

Email and Messaging

- Topics covered
  - *How email works*
  - *Other types of messaging*

- Email: The process of exchanging electronic messages (emails) over a network, typically the Internet

Exhibit 5-12   How Email Works

SENDER'S DEVICE

The sender composes a message and sends it to the recipient via his or her email address.

The email message is sent over the Internet through the sender's mail server to the recipient's mail server.

RECIPIENT'S MAIL SERVER

tjones@state.edu

$0

SENDER'S MAIL SERVER

The message is displayed when the recipient's device checks for new mail.

RECIPIENT'S DEVICE

© andersphoto/Shutterstock.com; © 300dpi/Shutterstock.com; © Roman Samokhin/Shutterstock.com; Google Inc.

Other Types of Messaging

- **Instant messaging (IM)** or **chat**: Exchanging real-time typed messages with others
  - *Can be sent via computers and smartphones*
  - *Included in some social networks (i.e. Facebook)*
  - *Can supports group messaging and voice and video calls*
- **Text messaging**: Exchanging real-time typed messages with others via a cellular network and cell phones
  - *Includes Short Message Service (SMS) and Multimedia Message Service (MMS)*

Beyond Browsing and Email

- Topics covered
  - *Other types of online communications*
  - *Online education*
  - *Social media*
  - *Online entertainment*
  - *E-commerce*
  - *Product, corporate, government, and other information*
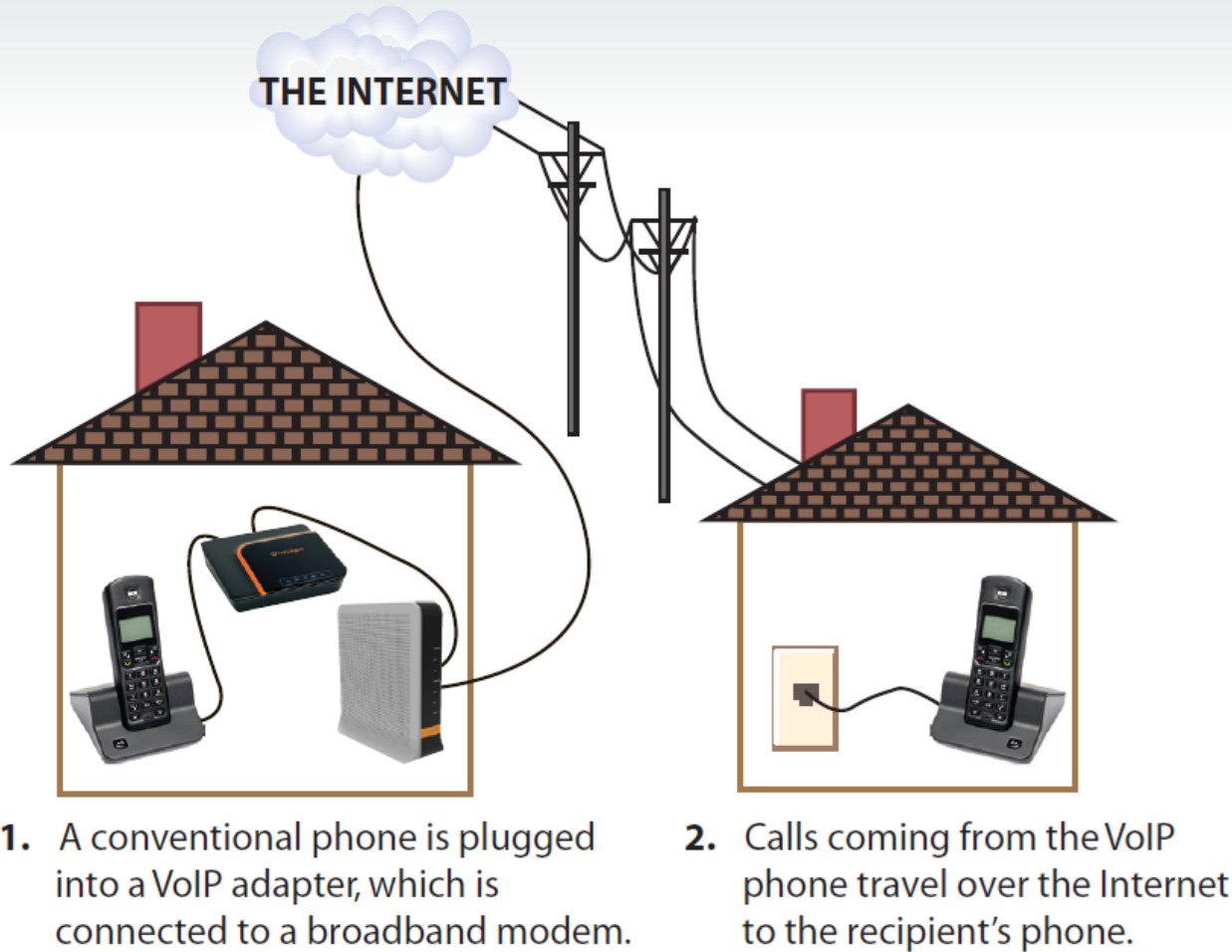
Other Types of Online Communication

- **Blog**: A Web page that contains short, frequently updated entries in chronological order, typically by just one individual

- **Wiki**: A collaborative Web page that is edited and republished by a variety of individuals

- **Forum**: A Web page where individuals can post messages on specific subjects to initiate a discussion with a large group of individuals

  - *Messages typically organized by topics (threads)*

Other Types of Online Communication (continued)

- **Podcast**: A recorded audio or video file that can be played or downloaded via the Web
  - *Typically uploaded on a regular basis*
- **Voice over Internet Protocol (VoIP)**: Placing telephone calls via the Internet
  - *Can be via a messaging program or smartphone app (Skype, FaceTime, etc.) or a permanent setup*
- **Web conference**: A face-to-face meeting that takes place via the Web
- **Webinar**: A seminar presented via the Web

Exhibit 5-15   How VoIP Works

THE INTERNET

1. A conventional phone is plugged into a VoIP adapter, which is connected to a broadband modem.

2. Calls coming from the VoIP phone travel over the Internet to the recipient's phone.

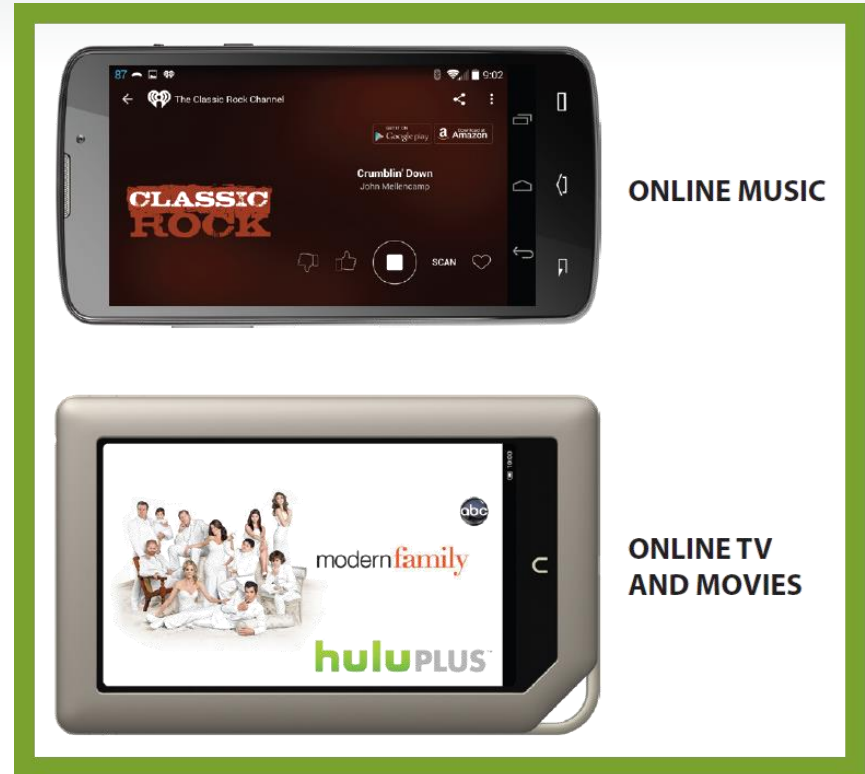© S. Bonaime/Shutterstock.com; Vonage; Ubee Interactive

Online Education

- **Web-based training (WBT)**: Instruction delivered on an individual basis via the Web
- **Distance learning**: When the student is physically located away from the instructor and other students
- Advantages
  - *The learner can learn at his/her own pace*
  - *Content can be updated as needed*
- Disadvantages
  - *Technological problems and security issues*
  - *Lack of face-to-face contact*

Social Media

- **Social networking site**: A site that enables individuals to connect and interact with other individuals
  - *Most often used to communicate with existing friends but also used for business purposes*
- **Social media**: The collection of social networking sites and other online platforms used to transmit or share information with a broad audience
  - *Media sharing (i.e. YouTube), microblogging (i.e. Twitter, social curation (i.e. Pinterest)*
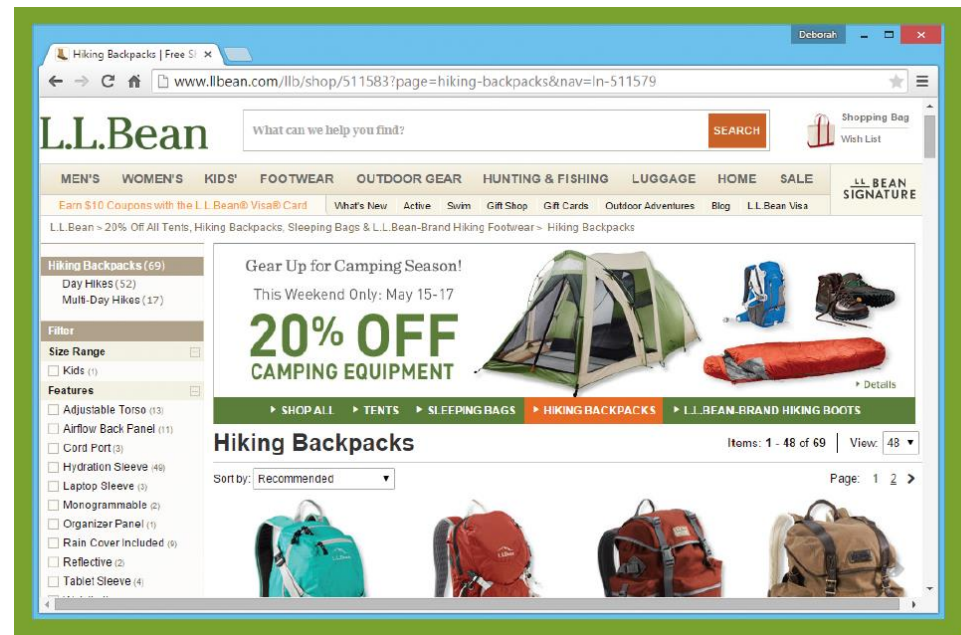
Online Entertainment

- Streaming or downloading online music, videos, TV shows, and movies

- Playing online games

- Reading or downloading online books and magazine

ONLINE MUSIC

ONLINE TV AND MOVIES

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E-Commerce

- **E-commerce**: The act of performing financial transactions online
  - *Includes online shopping, auctions, banking, and investment activities*
- Perform only via secure Web pages
- Use credit cards
- Use strong passwords

Source: L.L.Bean® is a registered trademark of L.L.Bean Inc.

Product, Corporate, Government, and Other Information

Manufacturer and retailer Web sites

- Provide product information and specifications

Consumer review sites

- Help evaluate options before purchase

Corporate information sites

- Used by corporate investors and consumers

Government sites

- Contain government publications and forms, and provide the facility to download and file tax returns online

KEY TERMS

- Internet
- ARPANET
- World Wide Web (Web)
- Internet service provider (ISP)
- Internet content provider
- Application service provider (ASP)
- Net neutrality
- Conventional dial-up Internet access
- Cable Internet access
- DSL (Digital Subscriber Line) Internet access
- Satellite Internet access
- Fixed wireless Internet access

- Broadband over fiber (BoF) or fiber-to-the premises (FTTP)
- Augmented reality
- Mobile wireless Internet access
- Wi-Fi hotspot
- Search site
- Search engine
- Keyword
- Hit
- Search phrase
- Email
- Instant messaging (IM) or chat
- Text messaging
- Blog

KEY TERMS

- Wiki

- Forum

- Podcast

- Voice over Internet Protocol (VoIP)

- Web conference

- Webinar

- Web-based training (WBT)

- Distance learning

- Social networking sites

- Social media

- E-commerce

SUMMARY

- The Internet evolved from ARPANET and now contains the World Wide Web

- To set up a device to use the Internet, determine type of device and connection to be used, and then select an ISP

- Search engines are used to find specific information on the Internet

- Email and other types of messaging are used to communicate with others

SUMMARY

- The Internet is also used for other types of online communications (i.e. blogs and VoIP), online education, social media, online entertainment, e-commerce, and to obtain product, corporate, and other information