

TRUYỀN THÔNG VÀ MẠNG

CT200

Nền tảng CNTT



Communications

- Computer **communications** describes a process in which two or more computers or devices transfer data, instructions, and information



Communications

**communications
system**



Uses of Computer Communications

Blogs

Chat rooms

E-mail

Fax

FTP

Instant
messaging

Internet

Newsgroups

RSS

Video
conferencing

VoIP

Web

Uses of Computer Communications

- **Wireless Internet access points** allow people to *connect wirelessly to the Internet* from home, work, school, and in many public locations.
- In order to connect to Internet, computer hardware should have a **wireless network adapter**.

Uses of Computer Communications

- Types of **wireless network adapter** for computer:



PCI Wireless Adapter



miniPCI Wireless Adapter



PCMCIA Wireless Card



USB Wireless Adapter

Uses of Computer Communications

- A **cybercafé** is a coffeehouse, restaurant, or other location that provides personal computers with Internet access to its customers



Uses of Computer Communications

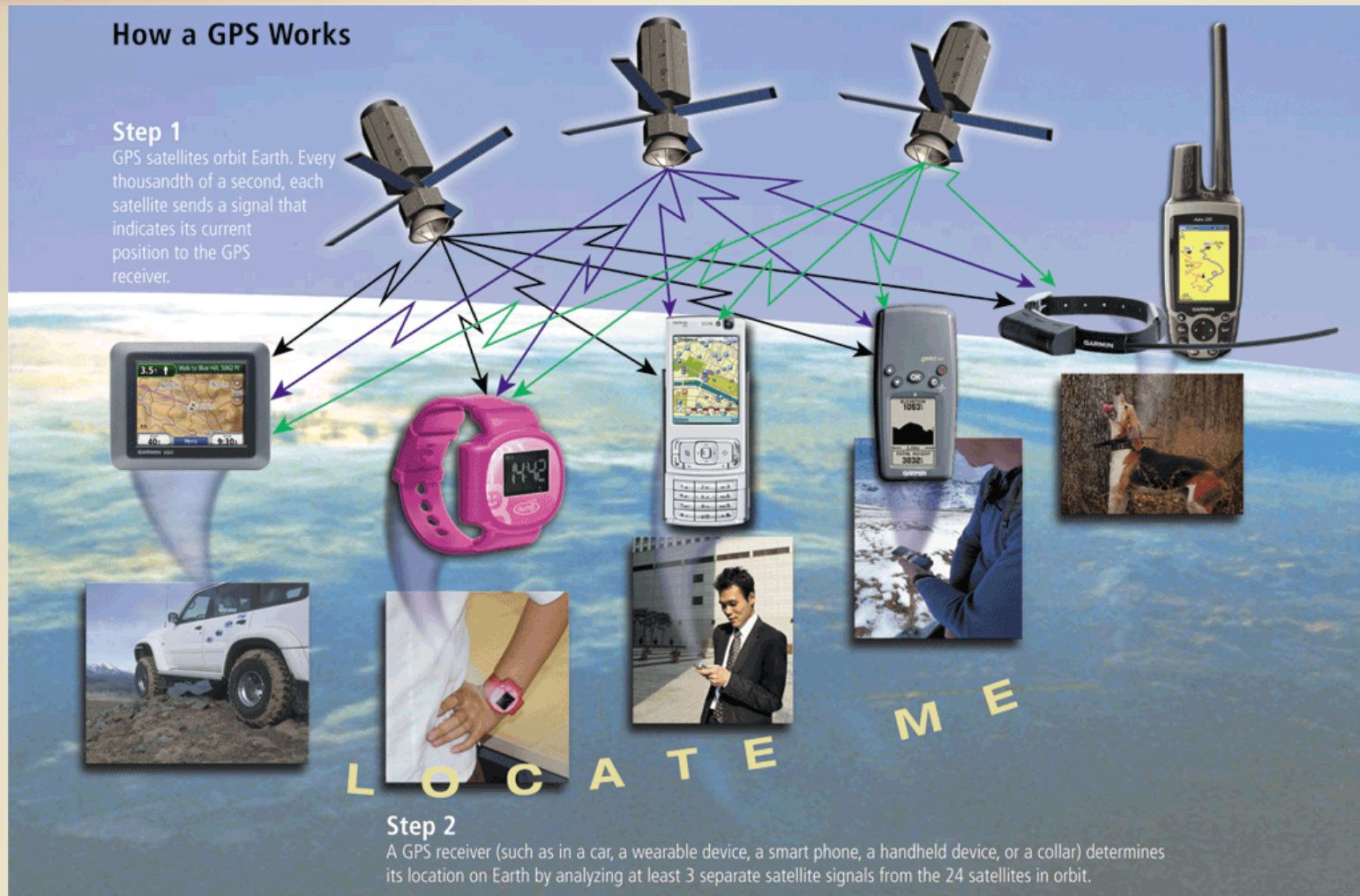
- A **global positioning system (GPS)** is a navigation system that consists of one or more earth-based receivers that accept and analyze signals sent by satellites in order to determine the GPS receiver's geographic location
- GPS receivers are:

Built into
many mobile
devices

Available as a
handheld
device

Available with
new vehicles

Uses of Computer Communications



Uses of Computer Communications

- **Voice mail** allows someone to leave a voice message for one or more people.
- Computer *converts an analog voice into digital* form.
- A voice mailbox is a storage location on a hard disk in the voice mail system.
- With **visual voice mail**, users can view the *length of calls, read message contents* instead of listening to them.

Uses of Computer Communications

- Many programs provide a means to **collaborate**, or work online, with other users connected to a server
- **Collaboration software** includes tools that enable users to share documents via online meetings and communicate with other connected users

Web
conferences/
online meeting

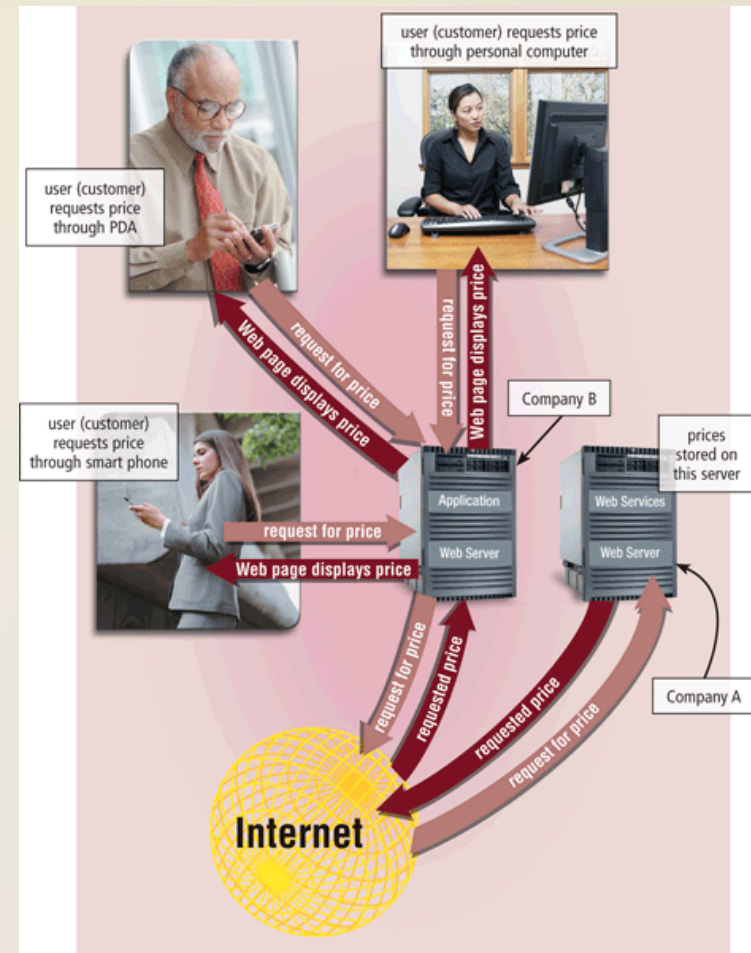
Document
management
systems

Uses of Computer Communications



Uses of Computer Communications

- **Web services** enable programmers to create applications that *communicate with other remote computers* over a network.
- A **mashup web application** *combines services* from two or more sources



Networks

- A **network** is a collection of computers and devices connected together via communications devices and transmission media
- Advantages of a network include:

Facilitating
communications

Sharing
hardware

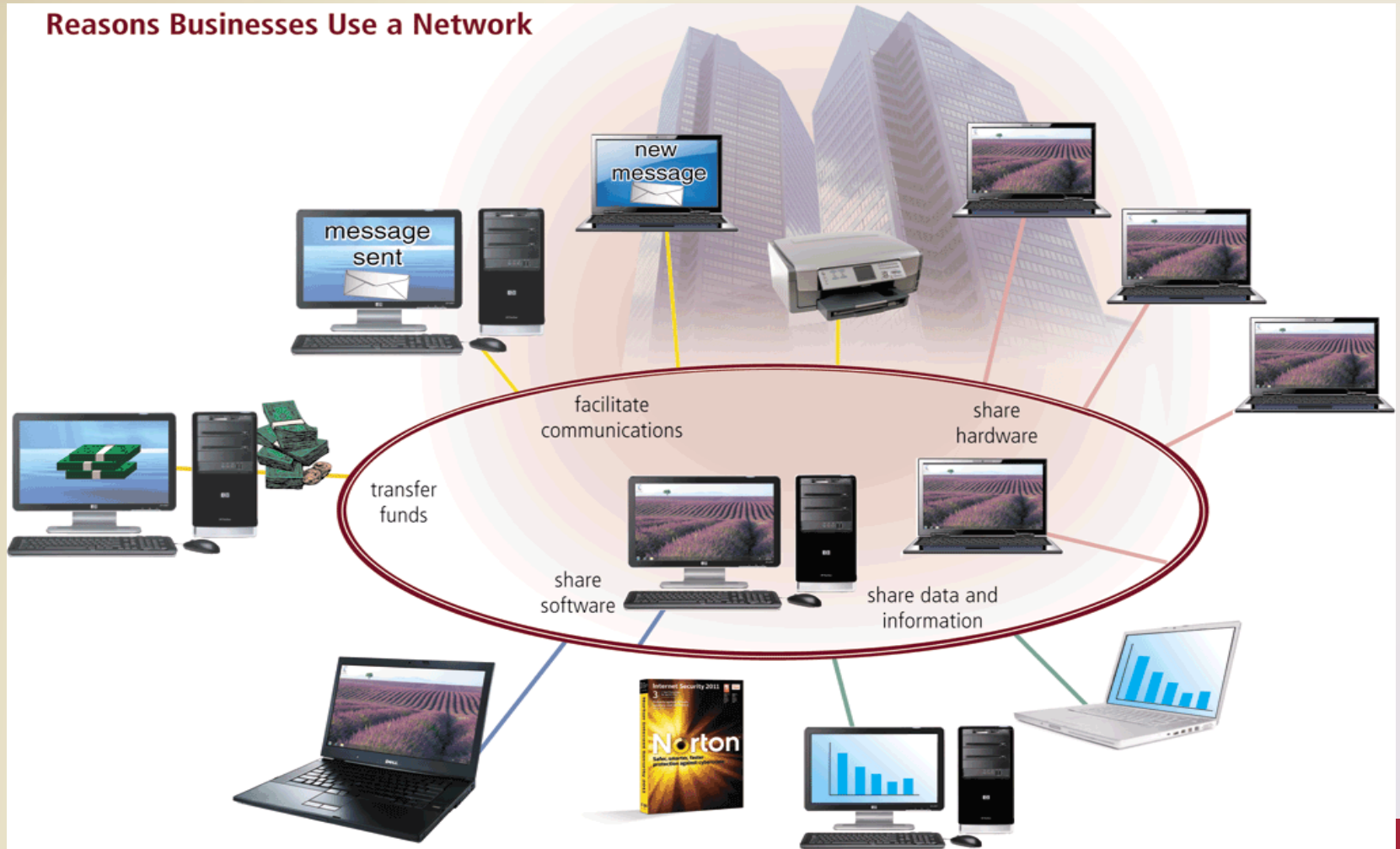
Sharing data
and information

Sharing
software

Transferring
funds

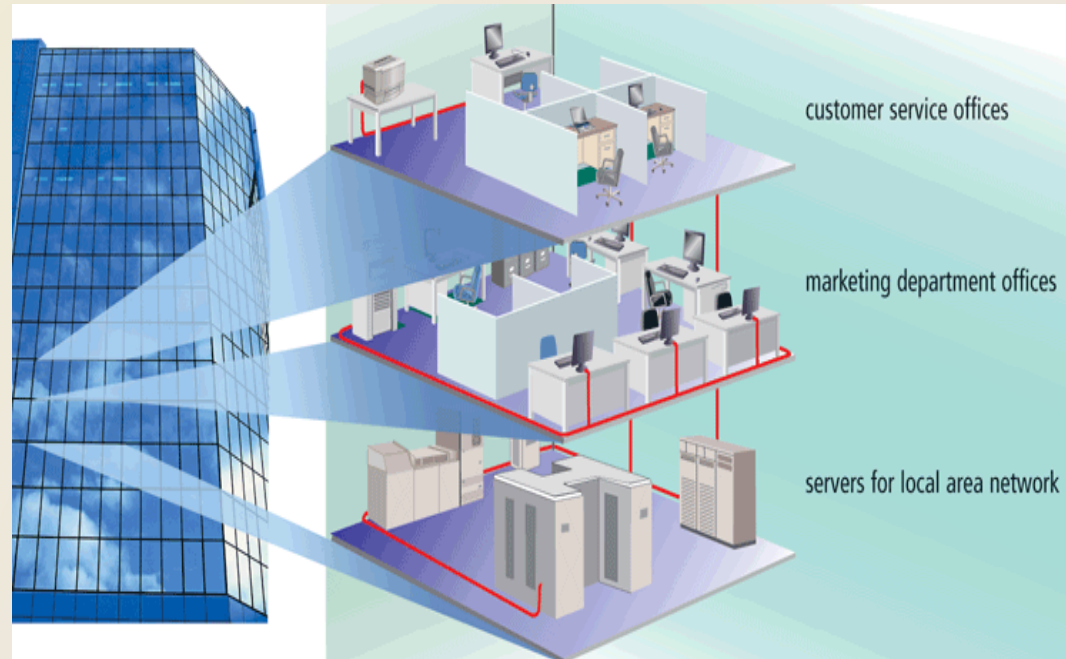
Networks

Reasons Businesses Use a Network



Networks

- A **local area network (LAN)** is a network that connects computers and devices in a limited geographical area
- A **wireless LAN (WLAN)** is a LAN that uses no wires.



Networks

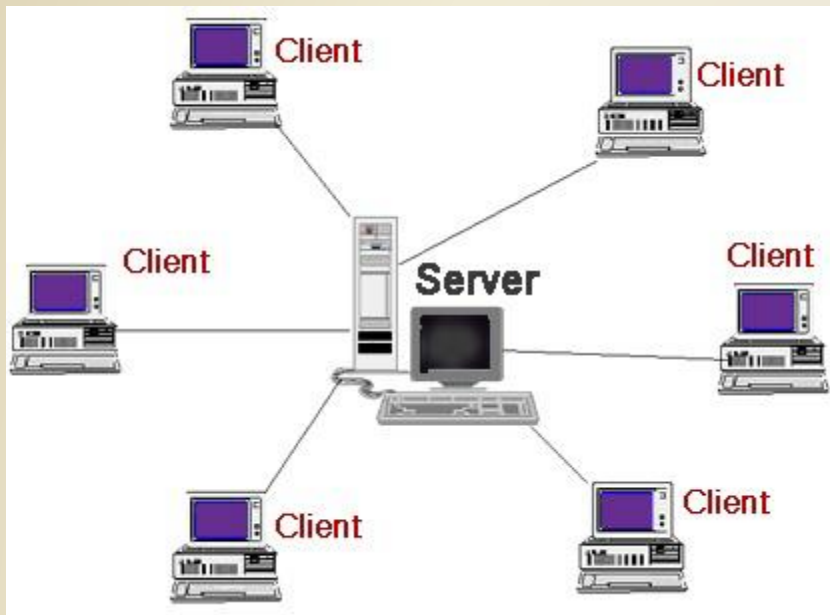
- A **metropolitan area network (MAN)** connects LANs in a metropolitan area
- A **wide area network (WAN)** is a network that covers a large geographical area



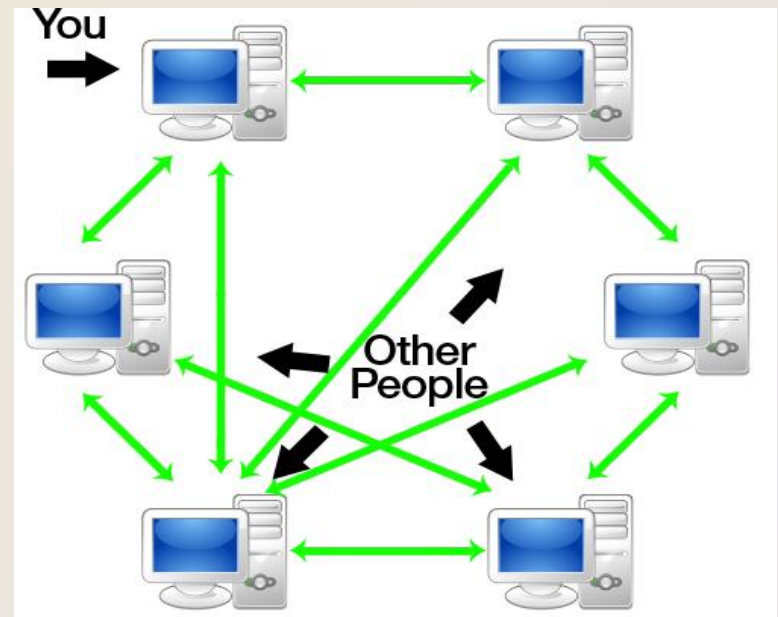
Networks

- The design of computers, devices, and media on a network is sometimes called the network architecture

Client/server network

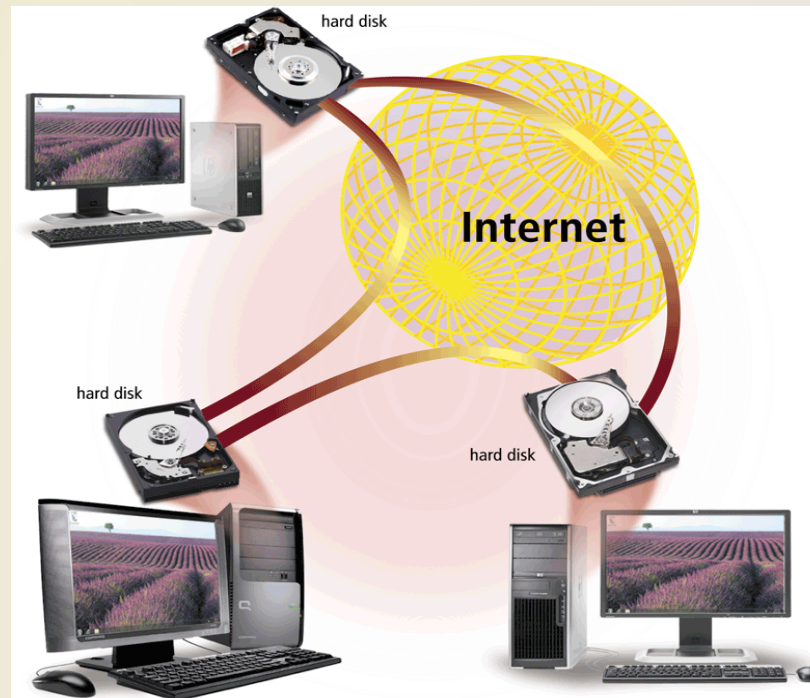


Peer-to-peer (P2P) network



Networks

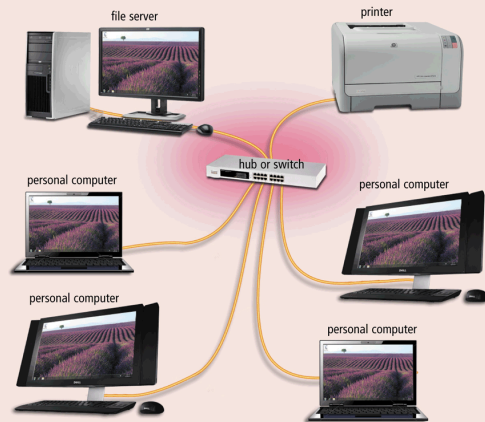
- **P2P** describes an Internet network on which users access each other's hard disks and *exchange files directly* over the Internet



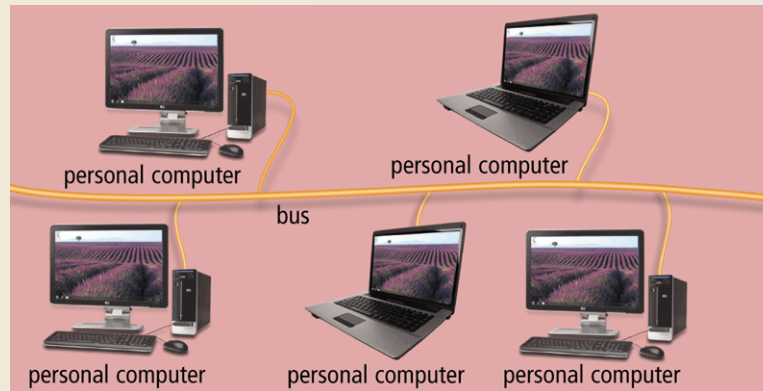
Networks

- A **network topology** refers to the layout of the computers and devices in a communications network

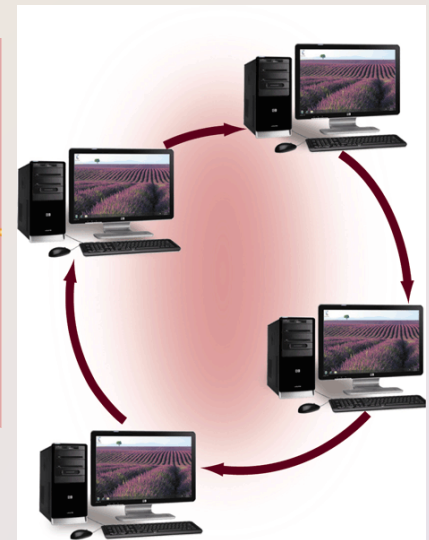
Star network



Bus network



Ring network



Networks

An **intranet** is a *private* network that has *Internet-like services*

An **extranet** allows customers or suppliers to access part of an intranet



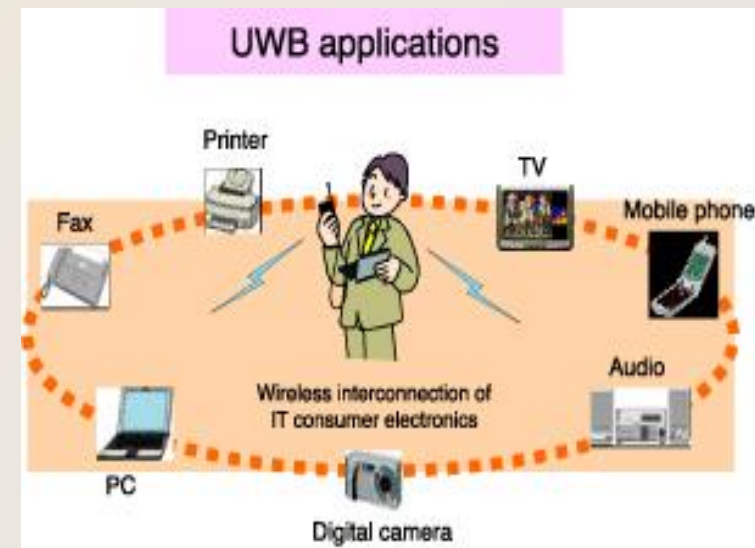
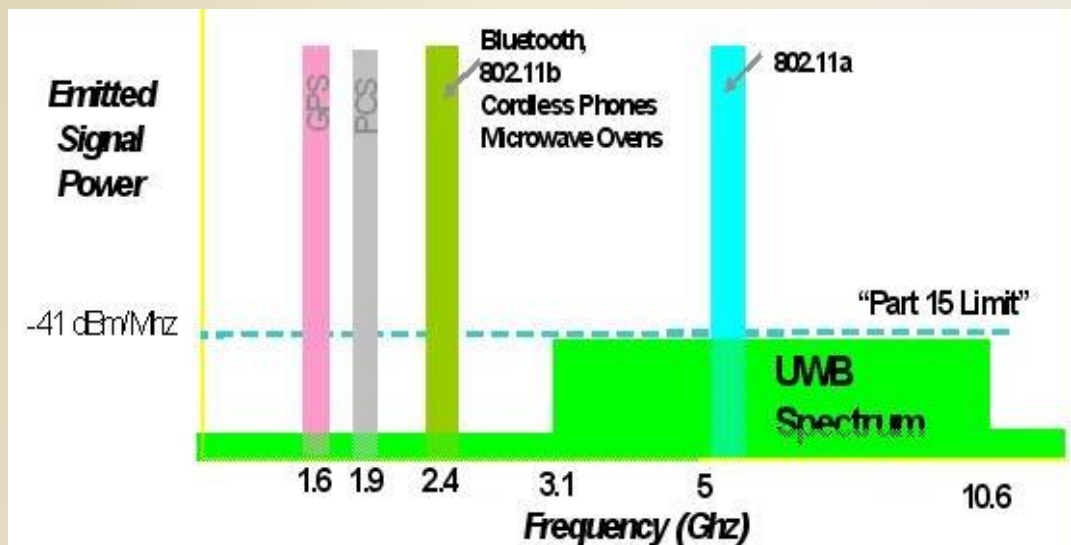
Network Communications Standards

- **Wi-Fi** identifies any network based on the **802.11** standard that facilitates wireless communication
- Sometimes referred to as wireless Ethernet

802.11 Wireless Standards					
IEEE Standard	802.11a	802.11b	802.11g	802.11n	802.11ac
Year Adopted	1999	1999	2003	2009	2014
Max. Data Rate	54 Mbps	11 Mbps	54 Mbps	600 Mbps	1 Gbps
Typical Range Outdoors	120 m	130 m	130 m	250 m	300 m

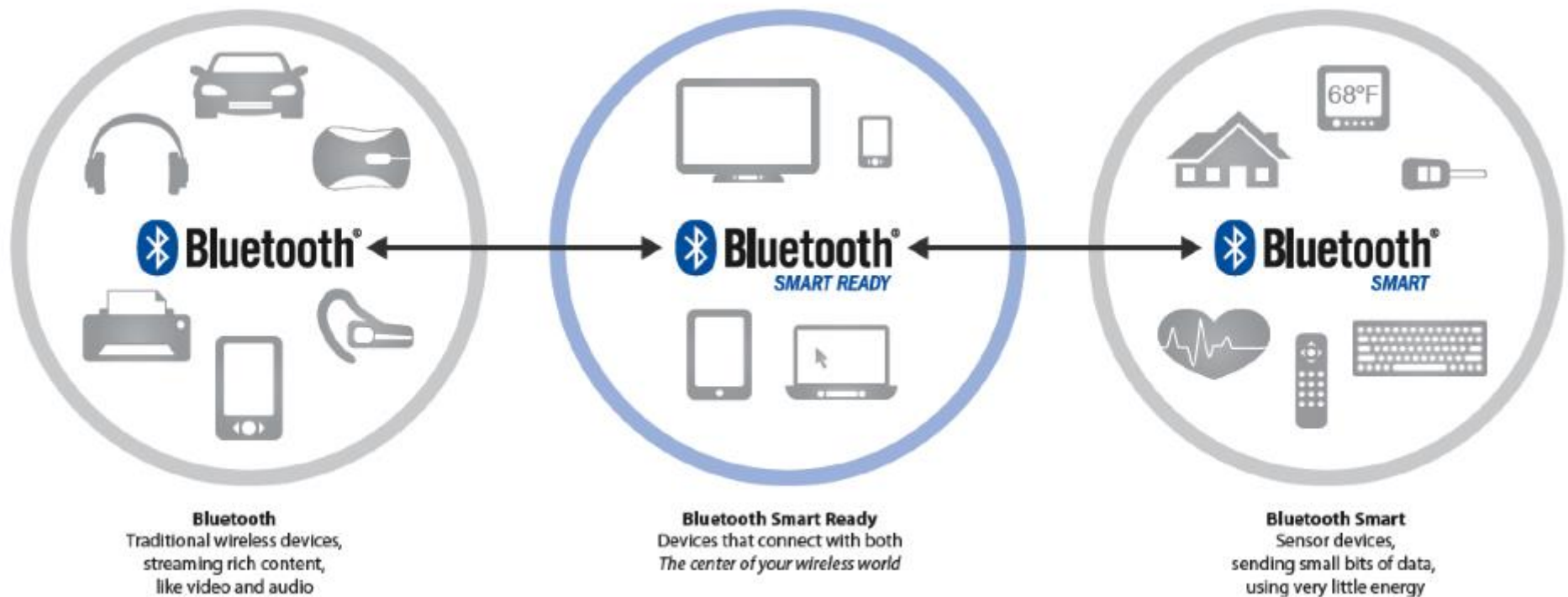
Network Communications Standards

- **Bluetooth** defines how two Bluetooth devices use short-range radio waves to transmit data within 10 meters area.
- **UWB (ultra-wideband)** specifies how two UWB devices use short-range radio waves to communicate at high speeds



Network Communications Standards

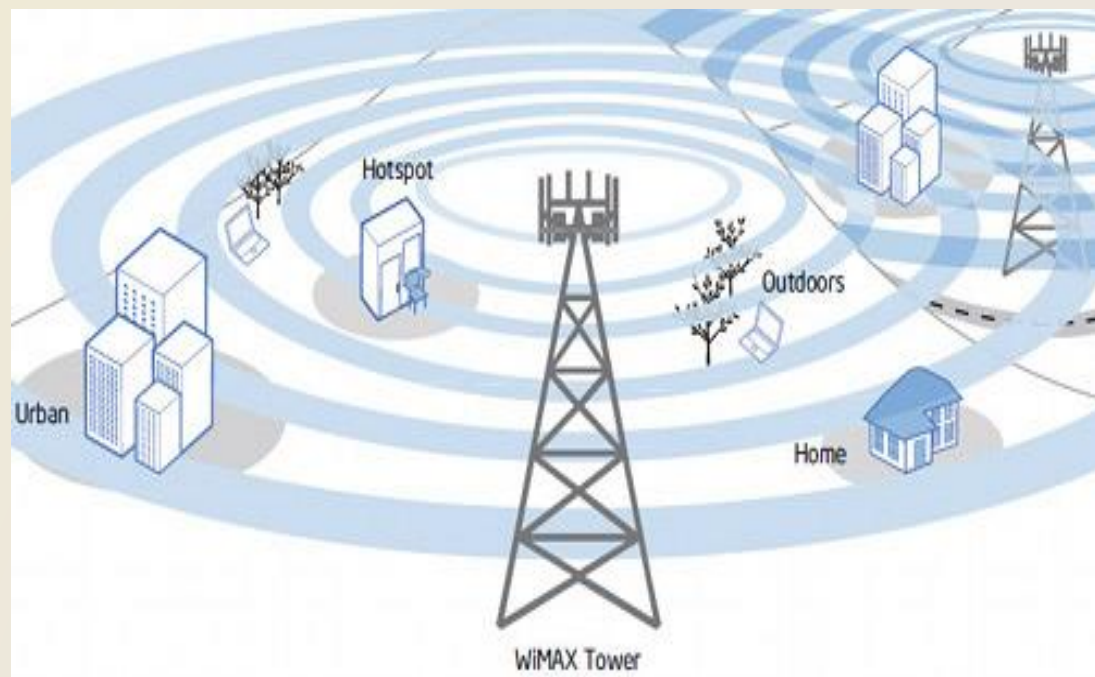
- Bluetooth 4.0



Network Communications Standards

WiMAX (802.16)

- Developed by IEEE
- Towers can cover a *48 kilometers radius*
- Two types are *fixed wireless and mobile wireless*
- Provides wireless broadband Internet access



Network Communications Standards

	IEEE 802.11	IEEE 802.16a
Max Speed	54Mbps (a&g)	10-100Mbps
Range	100m	40 km
QoS	none	yes
Coverage	Indoor	Outdoor
Users	Hundred	Thousand
Service Level	None	Yes

Communications Devices

- A **communications device** is any type of hardware capable of transmitting data, instructions, and information between a sending device and a receiving device
- A **dial-up modem** converts signals between *analog and digital* and transmits over *analog telephone line*
 - The data transmission speed is only 56kbps or lower.

Communications Devices

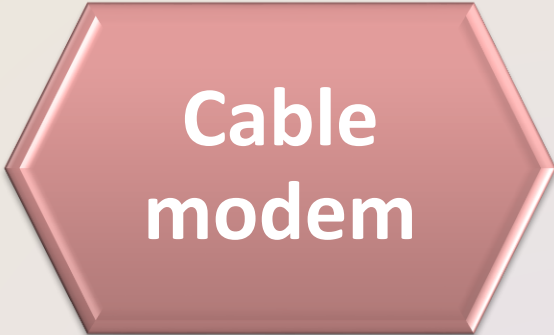
- A **digital modem** sends and receives data and information to and from a *digital line*

A red hexagonal button with a 3D effect and a white border. The text "ISDN modem" is centered in white.

ISDN
modem

A red hexagonal button with a 3D effect and a white border. The text "DSL modem" is centered in white.

DSL
modem

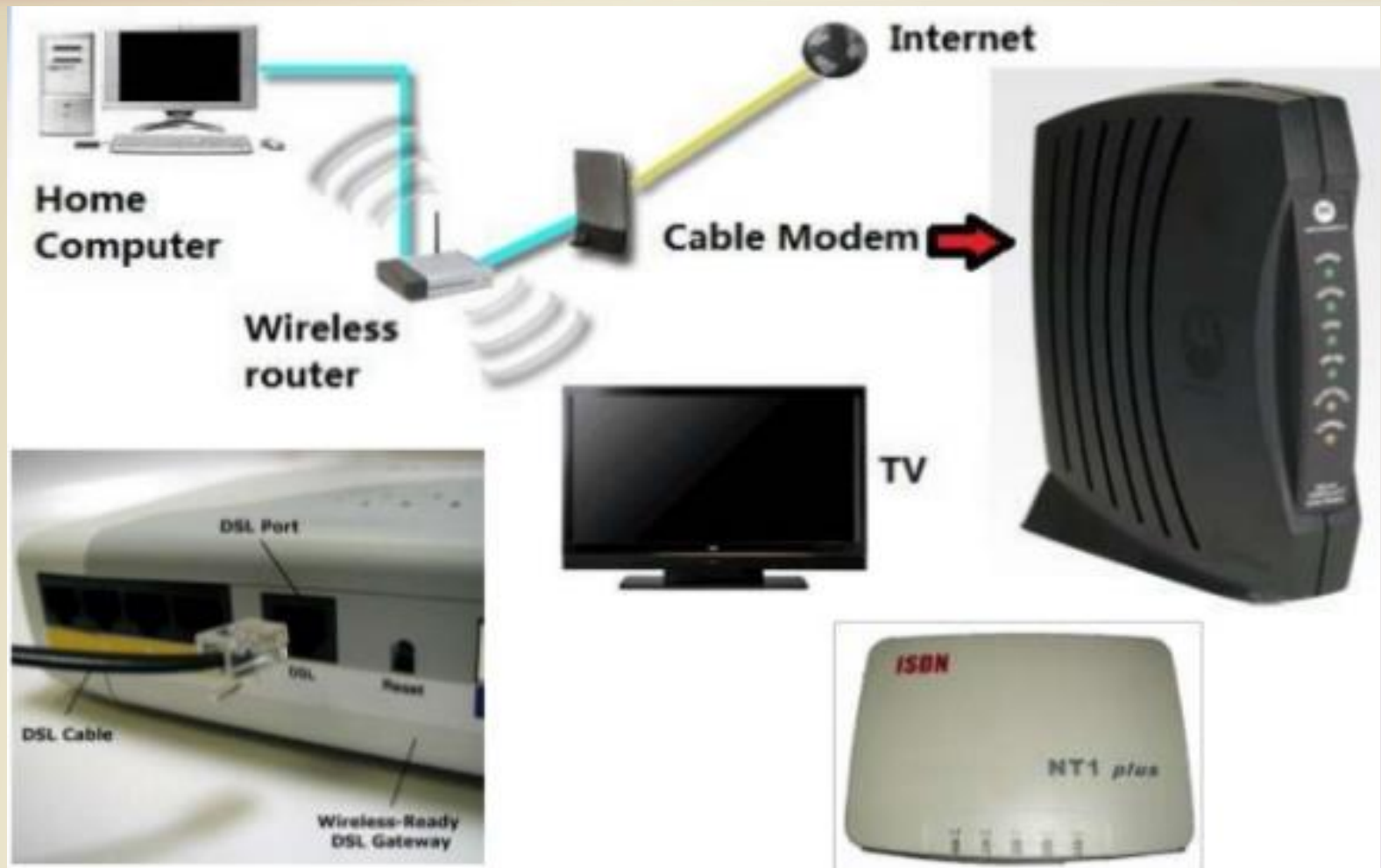
A red hexagonal button with a 3D effect and a white border. The text "Cable modem" is centered in white.

Cable
modem

Communications Devices

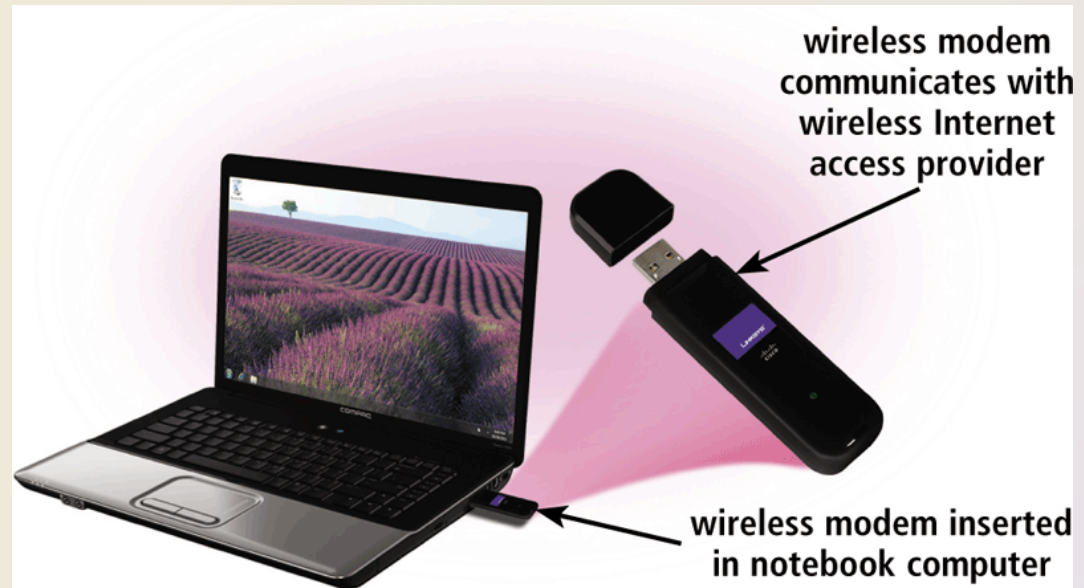
- **ISDN modem**: uses ISDN line, transmits data over standard telephone lines.
- **DSL modem**: use DSL line, transmits both voice and data over standard telephone lines.
- **Cable modem** (broadband modem): transmits over the cable television network.

Communications Devices



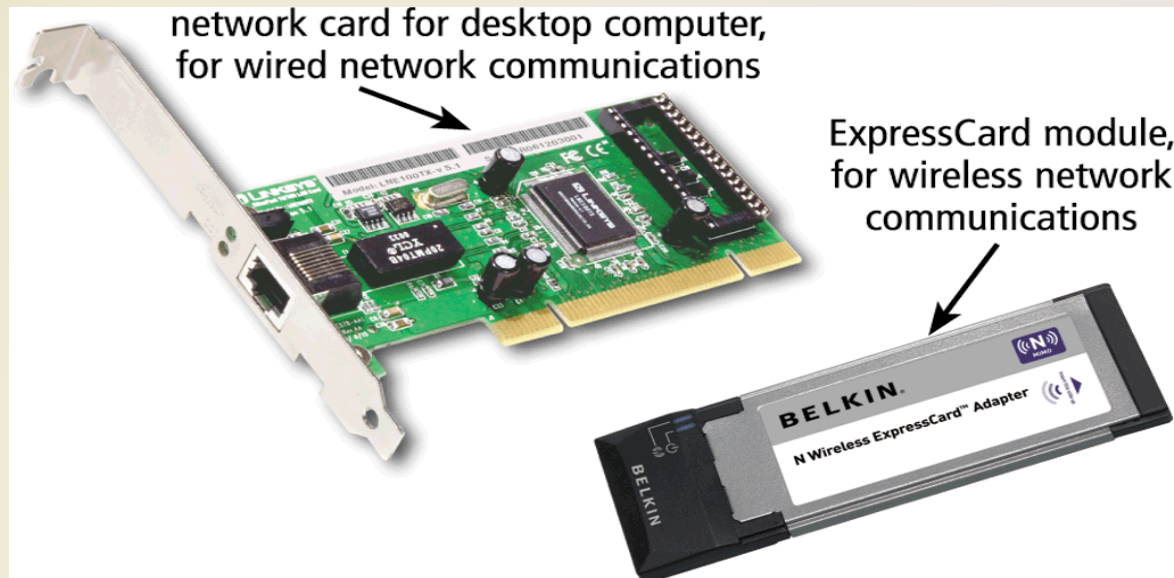
Communications Devices

- A **wireless modem** uses the *cell phone network* to connect to the Internet wirelessly from a notebook computer, a smart phone, or other mobile device



Communications Devices

- A **network card** enables a computer or device to access a network
- Available in a variety of styles
- Wireless network cards often have an antenna



Communications Devices

- A **wireless access point** is a central communications device that allows computers and devices to transfer data wirelessly among themselves or to a wired network



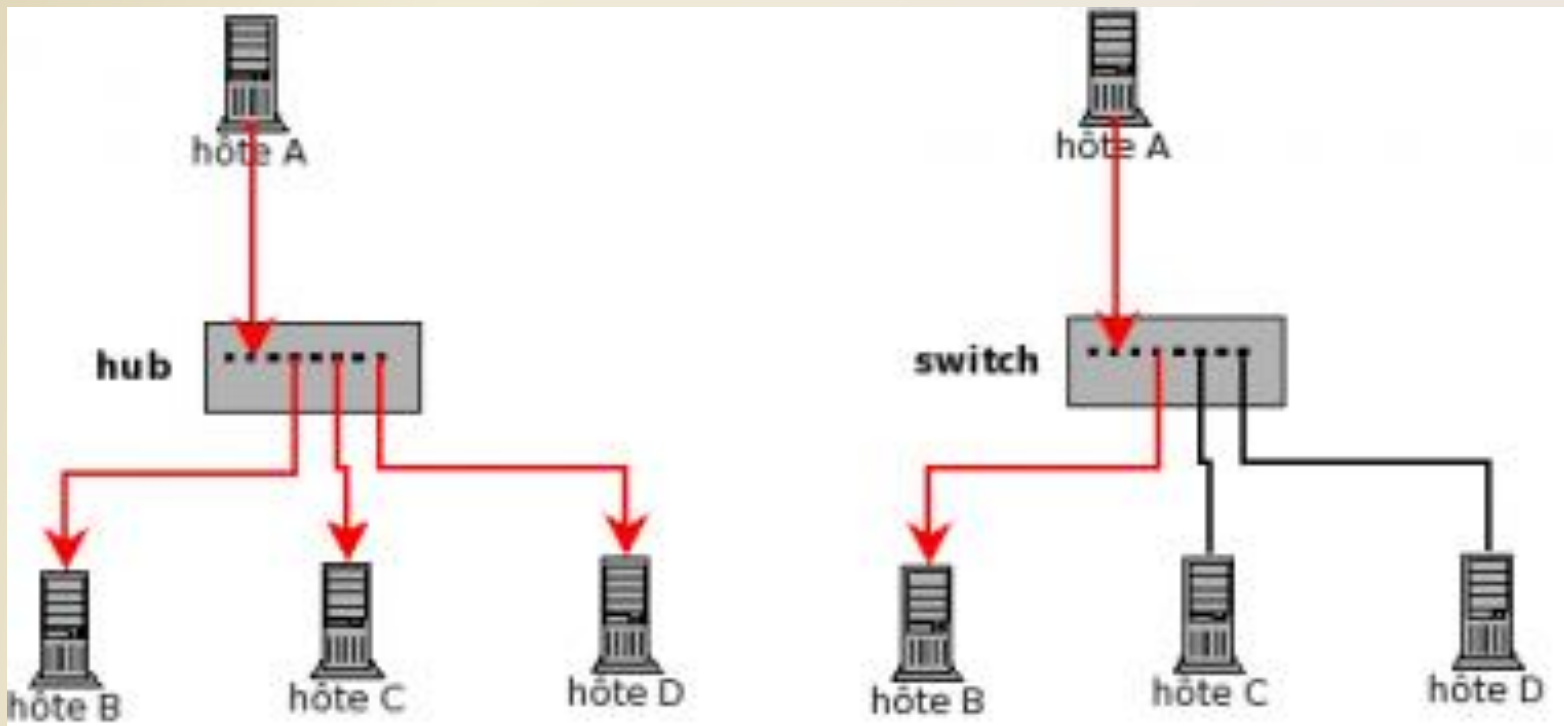
Communications Devices

- A **router** connects multiple computers or other routers together and *transmits data to its correct destination* on a network
- Many are protected by a hardware firewall



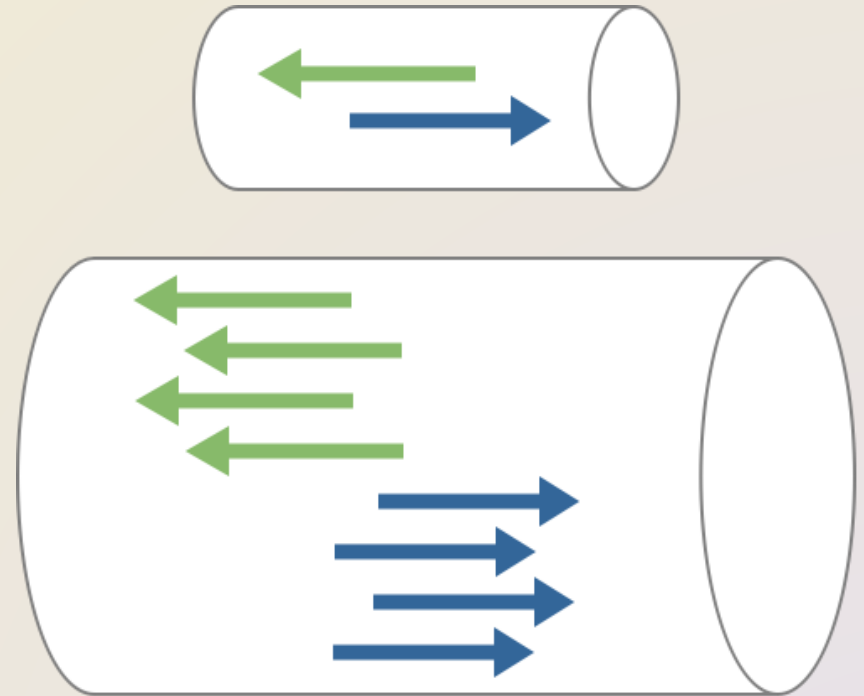
Communications Devices

- A **hub** or **switch** connects several devices in a network together



Communications Channel

- The *amount of data that can travel* over a communications channel sometimes is called the **bandwidth**
- **Latency** is the time it takes a signal to travel from one location to another on a network
- **Broadband media** transmit multiple signals simultaneously



Bandwidth = how wide
the data pipe is

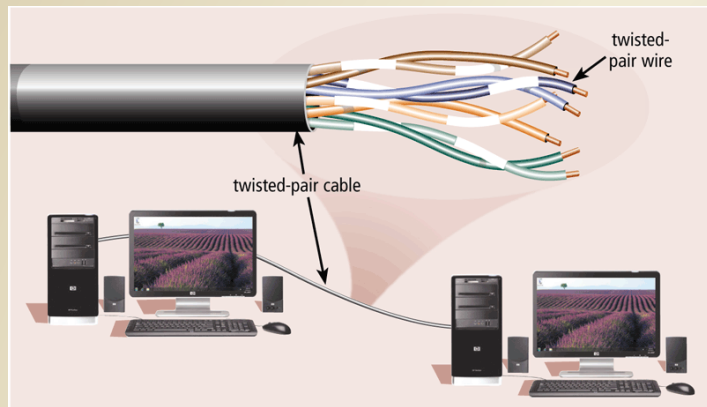
Physical Transmission Media

Transfer Rates for Various Types of LANs Using Physical Transmission Media

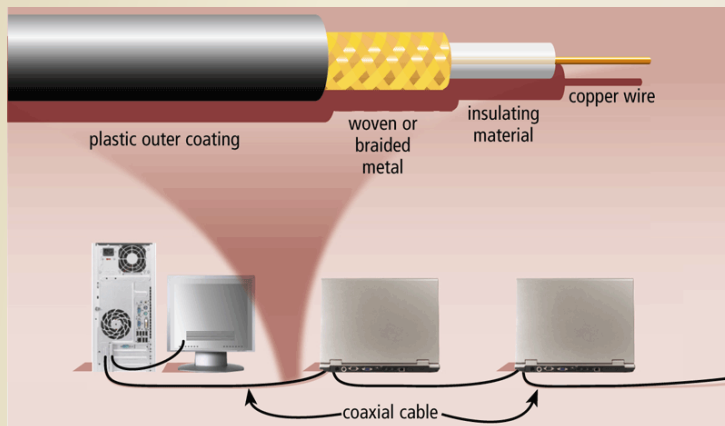
Type of Cable and LAN	Maximum Transfer Rate
Twisted-Pair Cable	
• 10Base-T (Ethernet)	10 Mbps
• 100Base-T (Fast Ethernet)	100 Mbps
• 1000Base-T (Gigabit Ethernet)	1 Gbps
• Token ring	4 Mbps to 16 Mbps
Coaxial Cable	
• 10Base2 (ThinWire Ethernet)	10 Mbps
• 10Base5 (ThickWire Ethernet)	10 Mbps
Fiber-Optic Cable	
• 10Base-F (Ethernet)	10 Mbps
• 100Base-FX (Fast Ethernet)	100 Mbps
• FDDI (Fiber Distributed Data Interface) token ring	100 Mbps
• Gigabit Ethernet	1 Gbps
• 10-Gigabit Ethernet	10 Gbps
• 40-Gigabit Ethernet	40 Gbps
• 100-Gigabit Ethernet	100 Gbps

Physical Transmission Media

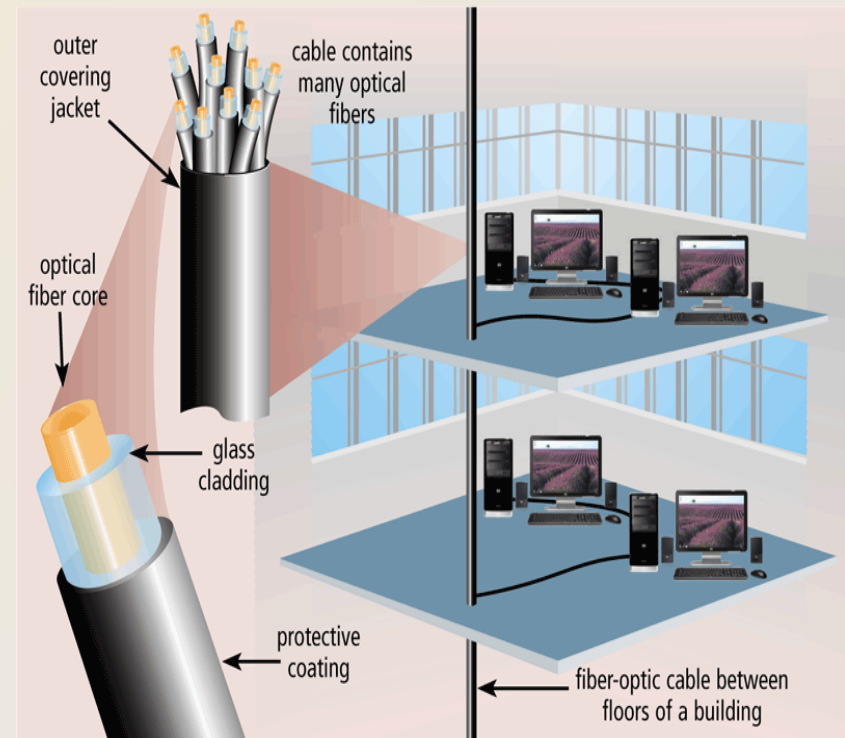
Twisted-pair cable



Coaxial cable

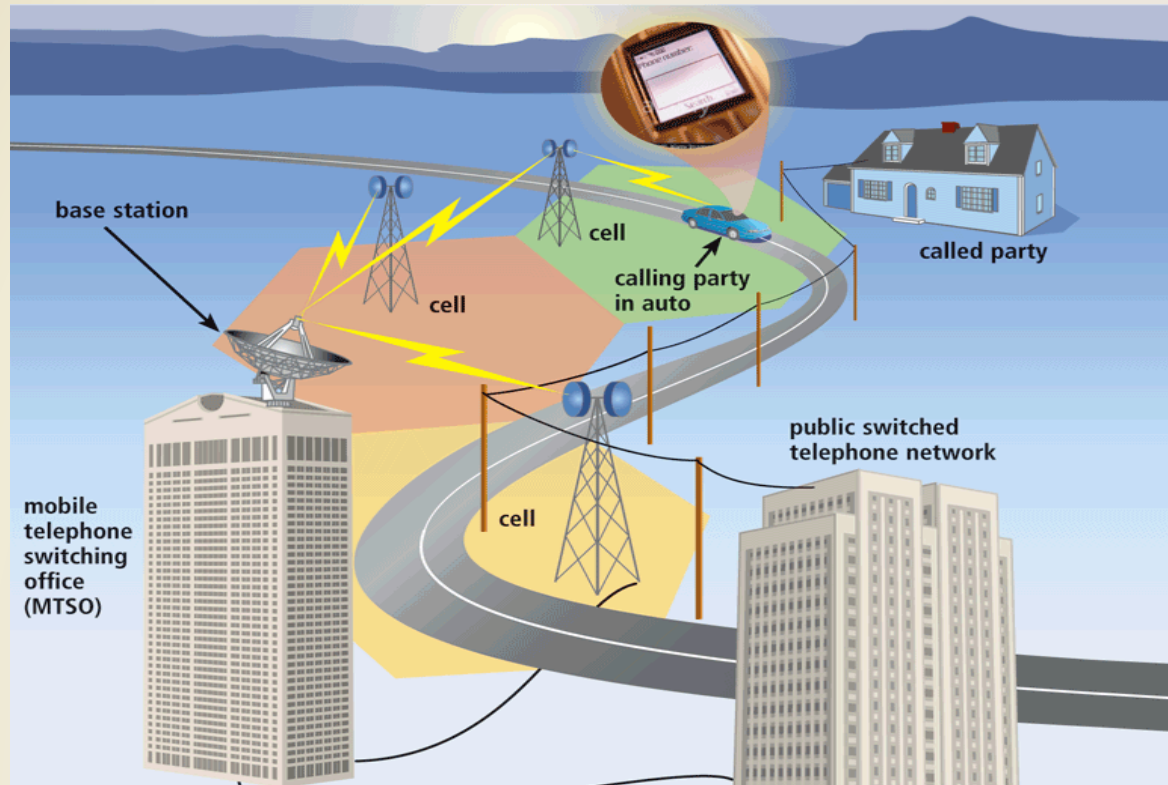


Fiber-optic cable



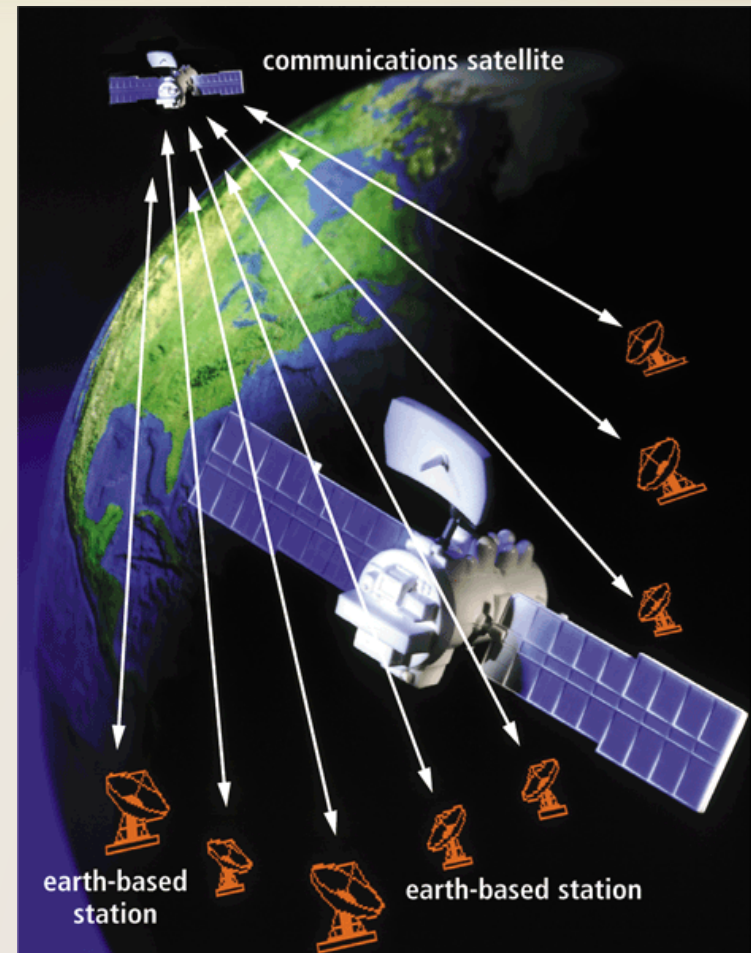
Wireless Transmission Media

- **Cellular radio** is a form of **broadcast radio** that is used widely for mobile communications



Wireless Transmission Media

- A **communications satellite** is a space station that receives microwave signals from an earth-based station, amplifies it, and broadcasts the signal over a wide area



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