# Networks and telecommunications

- **Computer network**  A collection of computing devices that are connected in various ways in order to communicate and share resources

# Types of Networks

**1.Local-area network (LAN)** A network that connects a relatively small number of machines in a relatively close geographical area
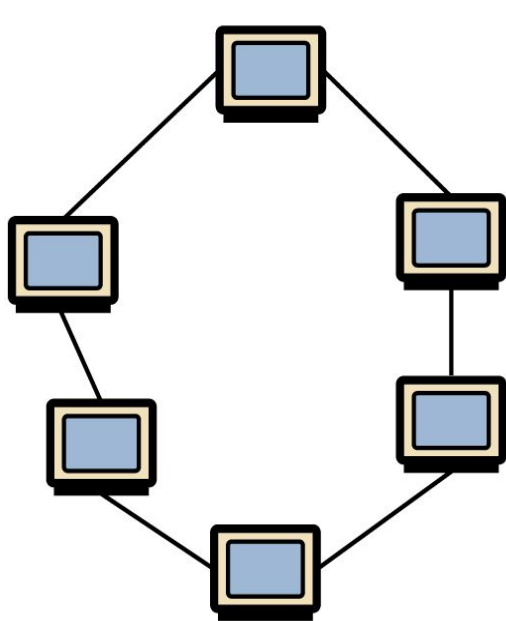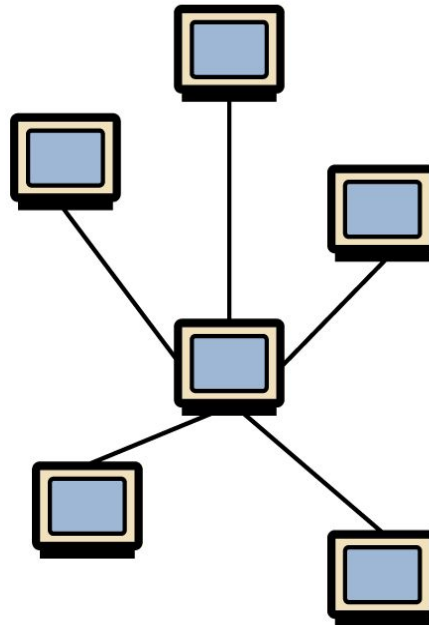
# Types of Networks

- Various configurations, called topologies, have been used to administer LANs

  - **Ring topology**   A configuration that connects all nodes in a closed loop on which messages travel in one direction

  - **Star topology**   A configuration that centers around one node to which all others are connected and through which all messages are sent

  - **Bus topology**    All nodes are connected to a single communication line that carries messages in both directions
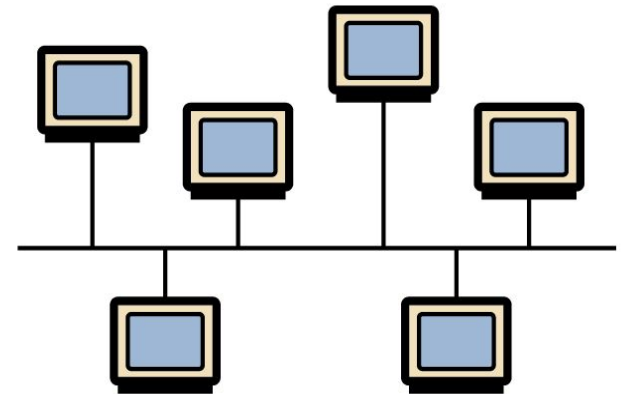
# Types of Networks



Ring topology      Star topology      Bus topology

**Figure 15.2** **Various network topologies**

- A bus technology called **Ethernet** has become the industry standard for local-area networks

# Types of Networks

**1. Wide-area network (WAN)** A network that connects two or more local-area networks over a potentially large geographic distance.

# Types of Networks

**3. Metropolitan-area network (MAN)** The communication infrastructures that have been developed in and around large cities

# TCP/IP

IP stands for **Internet Protocol**

IP software deals with the routing of packets through the maze of interconnected networks to their final destination.

• Network software translates a hostname into its corresponding IP address

For example
205.39.145.18

# Network Addresses

- An **IP address** can be split into
    - **network address**, which specifies a specific network
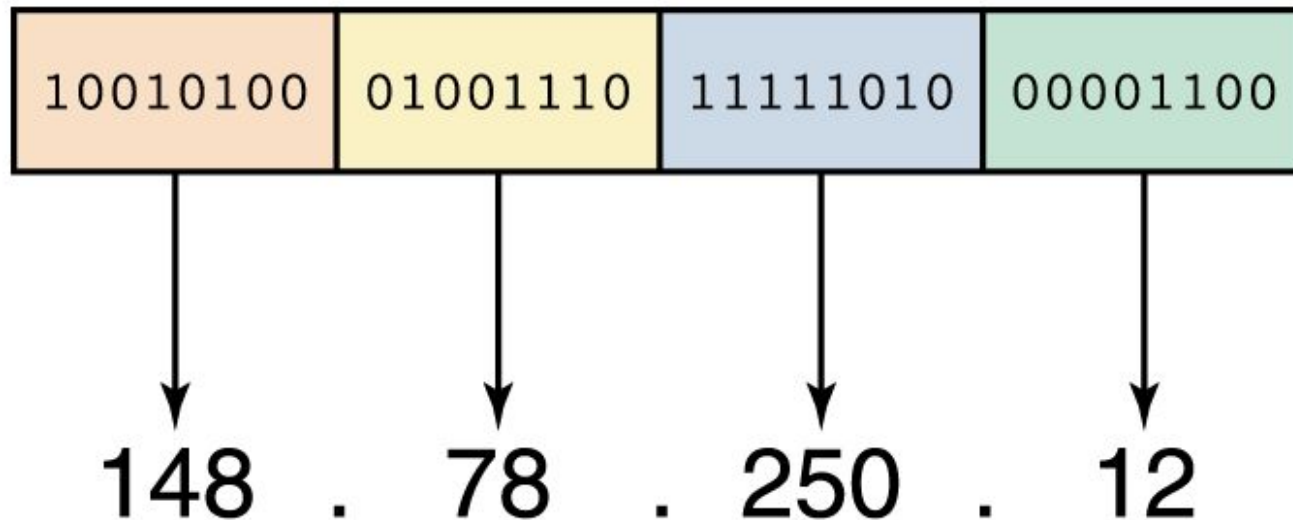    - **host number**, which specifies a particular machine in that network

| 10010100 | 01001110 | 11111010 | 00001100 |
|----------|----------|----------|----------|

148 . 78 . 250 . 12

**Figure 15.9**
**An IP address is stored in four bytes**

# Domain Name System

- The very last section of the domain is called its **top-level domain (TLD)** name

| Top-Level Domain | General Purpose | New TLDs | General Purpose |
|---|---|---|---|
| .com | U.S. Commercial | .biz | Business |
| .net | Network | .info | Information |
| .org | Nonprofit organization | .pro | Professional |
| .edu | U.S. Educational | .museum | Museums |
| .int | International | .aero | Aerospace industry |
| .mil | U.S. Military | .coop | Cooperative |
| .gov | U.S. Government | | |

**Figure 15.10** **Top-level domains, including some relatively new ones**

# Domain Name System

- Organizations based in countries other than the United States use a top-level domain that corresponds to their two-letter country codes

| Country Code TLD | Country |
|---|---|
| .au | Australia |
| .br | Brazil |
| .ca | Canada |
| .gr | Greece |
| .in | India |
| .ru | Russian Federation |
| .uk | United Kingdom |

**Figure 15.11**
**Some of the top-level domain names based on country codes**