

# 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

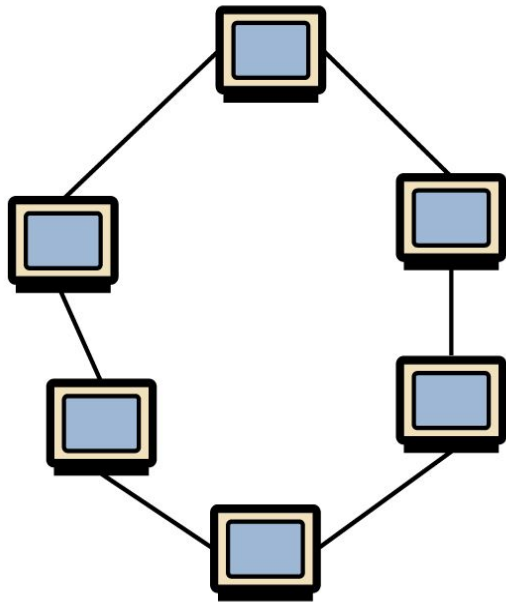


# Types of Networks

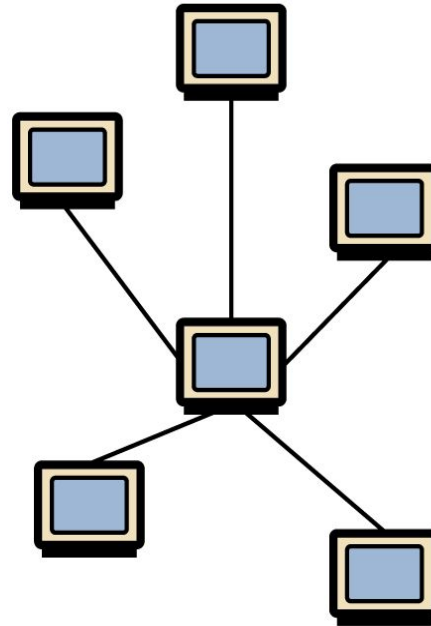
- Various configurations, called topologies, have been used to administer LANs
  - **Ring topology** A configuration that connects all nodes in a closed loop on which messages travel in one direction
  - **Star topology** A configuration that centers around one node to which all others are connected and through which all messages are sent
  - **Bus topology** All nodes are connected to a single communication line that carries messages in both directions



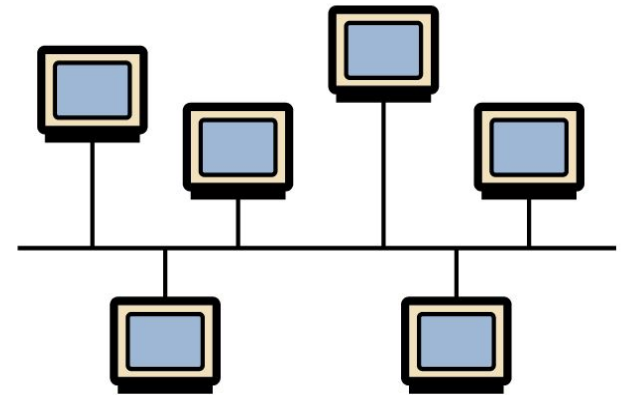
# Types of Networks



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.

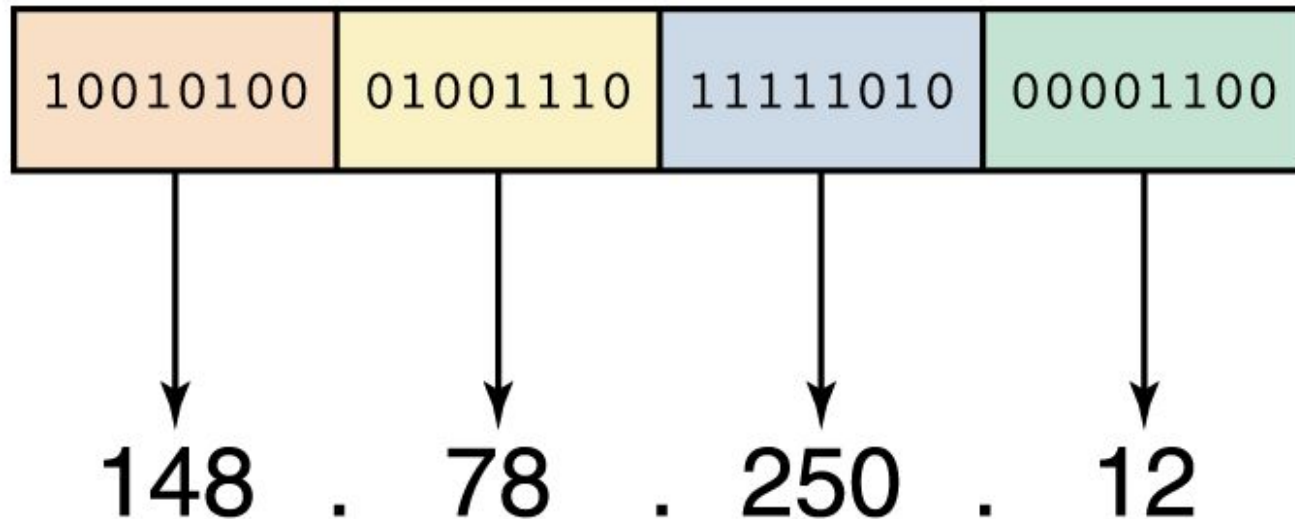
- Network software translates a hostname into its corresponding IP address

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



**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