6.1.4 Networking Facts

A *network* is a group of computers that can share information through their connections. A network is made up of the following components:

- Computers (often called *nodes* or *hosts*).
- Transmission media, which provide a path for electrical signals between devices.
- Network interfaces, devices that send and receive electrical signals.
- Protocols, rules or standards that describe how hosts communicate and exchange data.

Despite the costs of implementation and maintenance, networks actually save organizations money by allowing them to:

- Consolidate (centralize) data storage.
- Share peripheral devices, like printers.
- Increase internal and external communications.
- Increase productivity and collaboration.

There are several ways to classify networks. The following table lists several ways to describe a network.

Type	Classification	Description
Host Role	Peer-to-Peer	In a peer-to-peer network, each host can provide network resources to other hosts or access resources located on other hosts. Each host is in charge of controlling access to those resources. Advantages of peer-to-peer networks include the following: ▪ Easy implementation ▪ Inexpensive Disadvantages of peer-to-peer networks include the following: ▪ Difficult to expand (not scalable) ▪ Difficult to support ▪ Lack centralized control ▪ No centralized storage
	Client-Server	In a client-server network, hosts have specific roles. For example, some hosts are assigned server roles, which allow them to provide network resources to other hosts. Other hosts are assigned client roles, which allow them to consume network resources. Advantages of client-server networks include the following: ▪ Easy to expand (scalable) ▪ Easy to support ▪ Centralized services ▪ Easy to back up Disadvantages of client-server networks include the following: ▪ Expensive server operating systems ▪ Extensive advanced planning required
Geography	Personal Area	

	Network (PAN)	A *personal area network* is a very small network used for communication between personal devices. For example, a PAN may include a notebook computer, a wireless headset, a wireless printer, and a smartphone. A PAN is limited to a few feet in range. A PAN is typically created using Bluetooth wireless technologies.
	Local Area Network (LAN)	A *local area network* is a network in a small geographic area, like an office. A LAN typically uses wires to connect systems together.
	Wireless Local Area Network (WLAN)	A wireless LAN covers an area that is roughly the same size as a standard LAN. It uses radio signals to connect systems instead of wires.
	Metropolitan Area Network (MAN)	A *metropolitan area network* is a network that covers an area as small as a few city blocks to as large as an entire metropolitan city. MANs are typically owned and managed by a city as a public utility. Be aware that many IT professionals do not differentiate between a wide area network and a MAN, as they use essentially the same network technologies.
	Wide Area Network (WAN)	A *wide area network* is a group of LANs that are geographically isolated, but are connected to form a large internetwork.
	Wireless Mesh Network (WMN)	A *wireless mesh network (WMN)* is a group of wireless mesh nodes that communicate with one another to share the network connection across a large area. They provide the ability to stream voice, data, and video between arbitrary pairs of devices. Each device in the WMN uses the others as relays to avoid the need for infrastructure.
	Wireless Wide Area Network (WWAN)	A wireless wide area network (WWAN) covers a large geographical area by connecting separate areas wirelessly. WLAN and WWAN both connect to the internet wirelessly, but they use different technologies to do it. WWANs are often referred to as 3G, 4G, or LTE networks because they usually use cellular network technologies as connection types.
Management	Network	The term *network* often describes a computer system controlled by a single organization. This could be a local area network at a single location or a wide area network used by a single business or organization. If two companies connected their internal networks to share data, you could call it one network. In reality, however, it is two networks, because each network is managed by a different company.
	Subnet	A *subnet* is a portion of a network with a common network address. ▪ All devices on the subnet share the same network address, but they have unique host addresses. ▪ Each subnet in a larger network has a unique subnet address. ▪ Devices connected through hubs or switches are on the same subnet. Routers are used to connect multiple subnets.
	Internetwork	A network with geographically dispersed WAN connections that

		connect multiple LANs is often called an *internetwork*. Additionally, connecting two networks under different management is a form of internetworking because data must travel between two networks.
Participation	Internet	The *internet* is a large, world-wide, public network. The network is public because virtually anyone can connect to it, and users or organizations make services freely available on the internet. ▪ Users and organizations connect to the internet through an internet service provider (ISP). ▪ The internet uses a set of communication protocols (TCP/IP) for providing services. ▪ Individuals and organizations can make services (such as a website) available to other users on the internet.
	Intranet	An *intranet* is a private network that uses internet technologies. Services on an intranet are only available to hosts that are connected to the private network. For example, your company might have a website that only employees can access.
	Extranet	An *extranet* is a private network that uses internet technologies, but its resources are made available to external trusted users. For example, you might create a website on a private network that only users from a partner company can access.