**Overview**

**Networking:**

The history of networking is almost as old as the history of communication. It would be easy to define “networking” as just another word for “communication.” A better definition for networking is, “sharing information and resources.” For example, if you go to a work event to “network,” you’re not just going to talk to the people. You’re hoping to share information and resources to build a relationship. The best definition of a computer network is, “two or more computers that connected to communicate and share information and resources.”

Computer networking doesn’t just transmit information across distances. It also has two other main advantages.

First, it allows computer operators to reduce the need for redundancy. Redundancy means having more than one of something. Suppose everyone in your home has a computer, and everyone needs to print. You could buy each person a printer. The problem is that this is inefficient. Plus, it can cost a lot! Before computer networking, people with this problem used the first form of networking, “Sneakernet.” Sneakernet means copying the file to a disk and putting on your sneakers. You jog over to the one computer that has a printer, then print the file. Computer networking allows everyone to share one printer, reducing the cost of supplying printing and supporting the printer.

Second, computer networking also allows operators to achieve results that would be beyond the ability of a single machine. For example, major e-commerce sites like Amazon deliver more web pages in seconds than one web server can manage. Having many web servers working together like one big computer allows them to deliver services to more customers than any computer could ever do.

If you like history, check out the history of [Networking & The Web](https://www.computerhistory.org/timeline/networking-the-web/). You may find this interesting, but you must not read it.

**Node Functions**

There are distinct roles that nodes can serve in a network.

**Servers**

Any node that shares resources and responds to requests can be called a server. All computers generally function as servers in some way. However, when we use the word “server,” we’re typically talking about a computer that has been designed to provide services to other devices. They’re usually kept in locked rooms away from the users.

Servers supply central resources. These resources can include applications, files or printers and other hardware. A server can be dedicated to one specific function, or it can serve general needs. And multiple servers of more than one type can exist on the same network.

Because other devices depend on the services of the server, servers usually have redundant (duplicate) hardware components. That way, even if something breaks, the server can continue to run. They also usually have special operating systems. The most common server operating systems in use today are Microsoft Windows Server ® and Linux.

**Clients**

A client is a network computer that uses the resources of servers. The client computer can also perform its own tasks and processing. All computers generally function as clients at some point. However, when we use the word “client,” we’re typically talking about a computer that has been designed to be used by end users. Clients are often called desktops or workstations. They usually run operating systems that are more responsive to users. Client also implies the computer is used in a business. The most popular client operating systems are Microsoft Windows ® and certain distributions of Linux.

Suppose you have a printer attached by a cable to your computer. If you allow someone else in your home to print to that printer, technically you’re the server. The other computer is the client. But usually, these words describe business environments where the two devices are specially configured for what they do most of the time.

**Peer Computers**

A peer is a computer that acts as both a server and a client to other computers on a network. Peer computing is most often used in smaller networks that don’t have a dedicated server. Although, peers can belong to networks with servers.

Peer computers run client operating systems. The key difference between clients and peers is whether they have a security relationship with the server. If users that have an account on the server can log in on the workstation, it’s a client. If the user needs to have an account on the workstation, then it’s a peer.

In the above scenario, where you shared your printer with a family member, your computer is functioning as a peer.

**Host Computers**

A host computer is a central computer system that performs storage and processing for other devices. On a host-based network, the host computer does all computing. It then returns the data to the end user’s terminal. Host computers are often referred to as mainframes.

In the early days of networking, all computers were hosts. The hosts were then joined together in the early research networks that became the Internet. As the TCP/IP protocol became popular, and personal computers joined the networks, the term host became generalized. Now “host” is used to describe to any node on a TCP/IP network.

**Terminals**

A terminal is a specialized device on a host-based network. Users enter data into the terminal. The terminal sends the data to a host for processing. The host sends the results back to the terminal. Terminals are often called “dumb terminals.” Unlike clients, they have no processor or memory of their own. They’re usually just a keyboard and a monitor. Standard client computers that need to interact with host computers can run software called a terminal emulator so that they appear as terminals to the host.

**Local Area Networks (LANs)**

When it comes to types of networks, the terms can be confusing. The nature of networking has changed quite a bit since these terms were invented.

A Local Area Network (LAN) implies a self-contained network. LANs exist in small areas, such as a single building, floor, or room. In a LAN, all nodes are directly connected with cables or short-range wireless. LANs do not need any outside technology, like an Internet Service Provider (ISP), to function. Due to their smaller size, LANs have faster speeds than other network types. Most modern LANs use a technology called Ethernet. You will learn more about Ethernet later in the course.

Instead of “LAN,” professionals might refer to a LAN as the “local network.”

If you’re talking about a computer, “local” means “contained in the computer itself.” If you’re talking about a network, “local” means “connected to the same network.” This might refer to the whole LAN. Or it could mean “all the nodes that can talk to each other without needing a router.” Routers are devices that connect two or more different networks and can pass information between them.

Typically, LANs are supported by LAN Administrators. They manage and update the local network. The administrator’s job includes servicing hardware, cabling and software. They may perform installations and deployments, upgrades, and troubleshooting. To be a LAN administrator, you need a broad range of skills and knowledge about networking, software and hardware.