# Network Models.

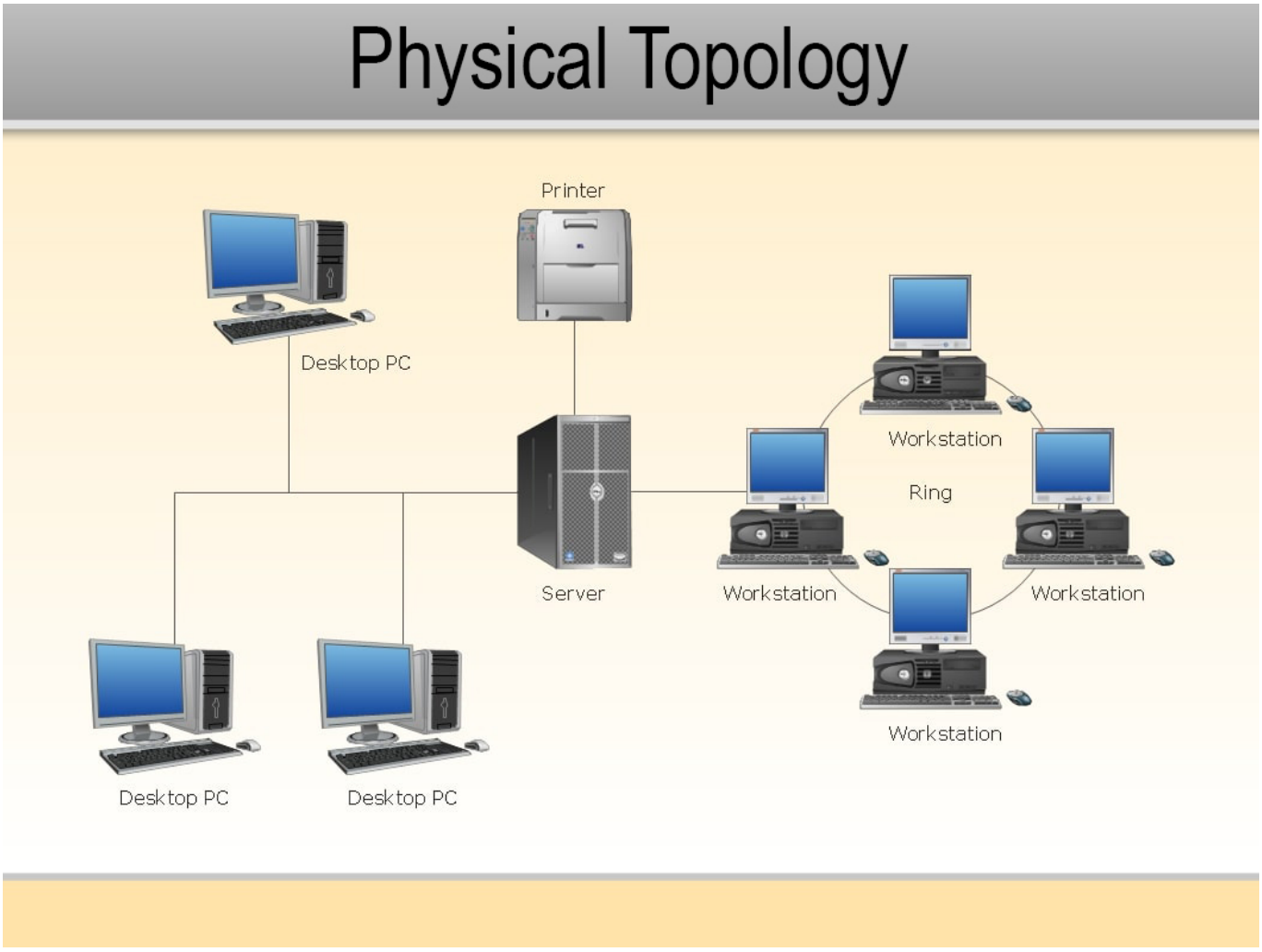
Different characteristics of network topologies and network types.

A **topology** describe how the parts of a whole work together.

**Physical topology**, it refers to network's hardware and how computers, other devices and cables or radio signals work together to form the physical network.

(It is about hardware tool being used on networking).

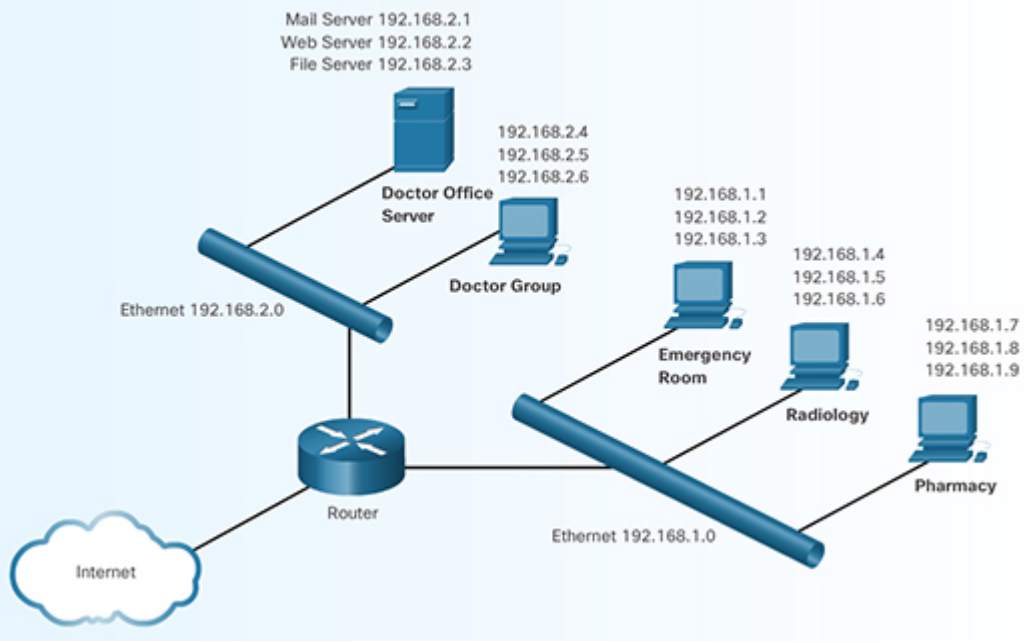
Example:




(Network working between hardware)

**Logical topology, refers to how software controls access to network resources** (including how users and software initially gain access to the network) and how specific resources such as applications and databases are shared on the network

Example:




(Software, applications, databases and internet creates logical networking)

## Peer-to-Peer Network Model

In a P2P (peer-to-peer) network model, the operating system of each computer on the network is responsible for controlling access to its resources without centralized control. The computers, called nodes or hosts on the network, form a logical group of computers and users that share resources (see Figure 1-1). Each computer on a P2P network controls its own administration, resources, and security.

**The term physical topology refers to a network's hardware and how devices and cables fit together. The term logical topology refers to the way software controls access to network resources and how those resources are shared on the network.**

## Client-Server Network Model

In the client-server network model (which is sometimes called the client-server architecture or client-server topology), **resources are managed by the NOS via a centralized directory database** (see Figure 1-2). The database can be managed by one or more servers, so long as they each have a similar NOS installed.

**When Windows Server controls network access to a group of computers, this logical group is called a Windows domain.** The centralized directory database that contains user account information and security for the entire group of computers is called AD (Active Directory). Each user on the network has their own domain-level account assigned by the network administrator and kept in Active Directory. This account might be a local account, which is specific to that domain, or a Microsoft account, which links local domain resources with Microsoft cloud resources. A user can sign on to the network from any computer on the network and get access to the resources that Active Directory allows. This process is managed by AD DS (Active Directory Domain Services).

**A computer making a request from another is called the client.** Clients on a client-server network can run applications installed on the desktop and store their own data on local storage devices. **Clients don't share their resources directly with each other; instead, access is controlled by entries in the centralized domain database.** A client computer accesses resources on another computer by way of the servers controlling this database.

In summary, the NOS (for example, Windows Server 2019, Ubuntu Server, or Red Hat Enterprise Linux) is responsible for the following:

- **Managing data and other resources for clients**
- **Ensuring that only authorized users access the network**
- **Controlling which types of files a user can open and read**
- **Restricting when and from where users can access the network**
- **Dictating which rules computers will use to communicate**
- **In some situations, supplying applications and data files to clients**

**Servers that have a NOS installed require more memory, processing power, and storage capacity than clients because servers must handle heavy processing loads and requests from multiple clients. For example, a server might use a RAID (redundant array of independent disks) configuration of hard drives, so that if one hard drive fails, another hard drive automatically takes its place.**

Although client-server networks are typically more complex in their design and maintenance than peer-to-peer networks, they offer many advantages over peer-to-peer networks, including the following:

- **User accounts and passwords to the network are assigned in one place.**
- **Access to multiple shared resources (such as data files or printers) can be centrally granted to a single user or groups of users.**
- **Problems on the network can be monitored, diagnosed, and often fixed from one location.**
- **Client-server networks are more scalable than peer-to-peer networks. In other words, it's easier to add users and devices to a client-server network.**

Now that you have a basic understanding of what a network operating system is and the foundational role it plays, you're ready to look at some of the applications involved in managing the data that travels on a network. These applications allow network devices to establish connections with each other and carry out various tasks.

## Peer to peer and Client server model

Controlling how users and programs get access to resources on a network is a function of the operating systems used on the network. Each OS (operating system) is configured to use one of two models to connect to network resources: the peer-to-peer model or the client-server model.

The peer-to-peer model can be achieved using any assortment of desktop, mobile, or tablet operating systems, but the client-server model requires a NOS (network operating system), which controls access to the entire network.

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Tip: Peer to peer and client-server connections are logical topology**

Tip: NOS (network operating system)**
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Tip: p2p communicate computer to computer like a spiderweb

Tip: Client server interact between the client and the server creating a domain
where to share information from a database
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Example: