"Aku lebih menghargai
orang yang **BERADAB**
daripada **BERILMU**.
Kalau hanya berilmu
IBLIS pun lebih tinggi
ilmunya daripada
~~MALAIKAT~~ **MANUSIA**."

Syekh Abdul Qadir Al-Jailani

Do'a Belajar

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

رَضِيْتُ بِاللّٰهِ رَبًّا وَبِالْإِسْلَامِ دِيْنًا وَبِمُحَمَّدٍ نَبِيًّا وَرَسُوْلًا

رَبِّيْ زِدْنِيْ عِلْمًا وَارْزُقْنِيْ فَهْمًا

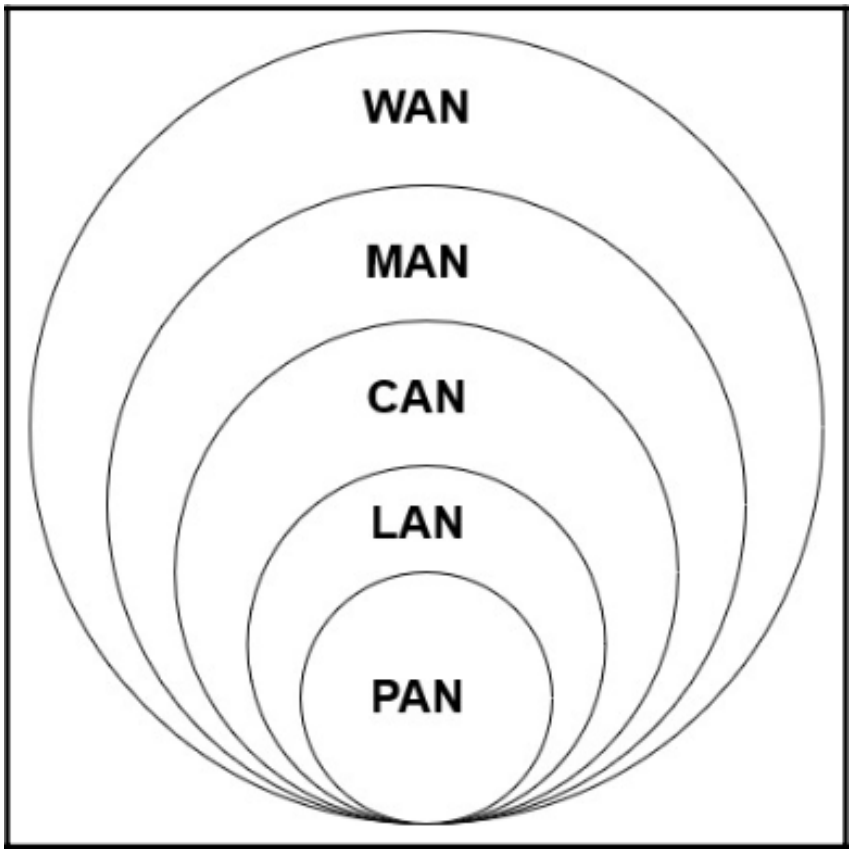
"Aku ridha Allah SWT sebagai Tuhanku, Islam sebagai agamaku, dan Nabi Muhammad sebagai Nabi dan Rasul, Ya Allah, tambahkanlah kepadaku ilmu dan berikanlah aku kefahaman"

Local Area Network

- Scales of networks
- Introduction to LANs
- Local addressing
- Wired and wireless LANs
- VLANs
- MANs
- CANs
- PANs

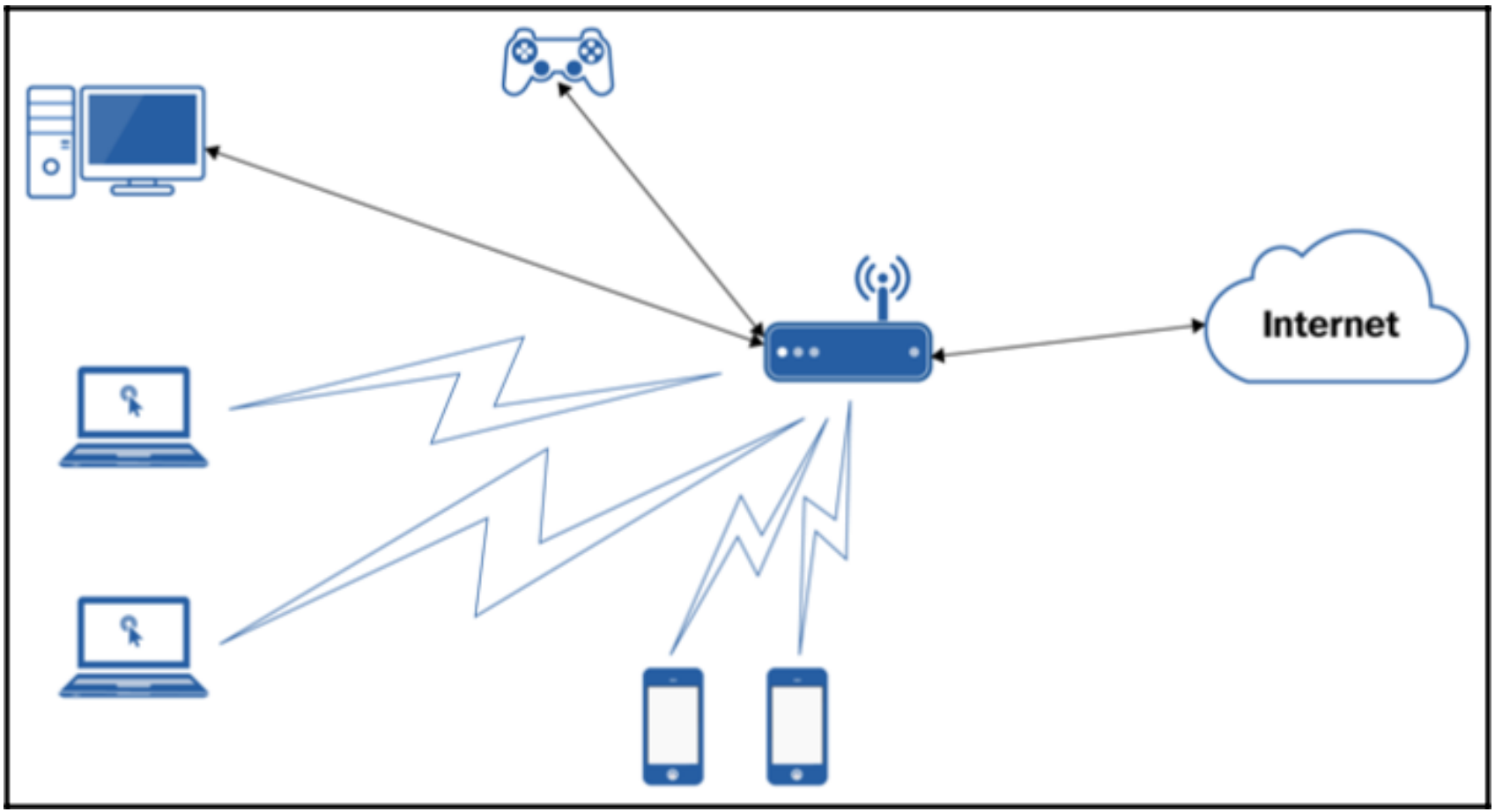
Scales of networks

Networks can be described in terms of their scale of deployment according to how much of an area they cover or what type of area they cover.



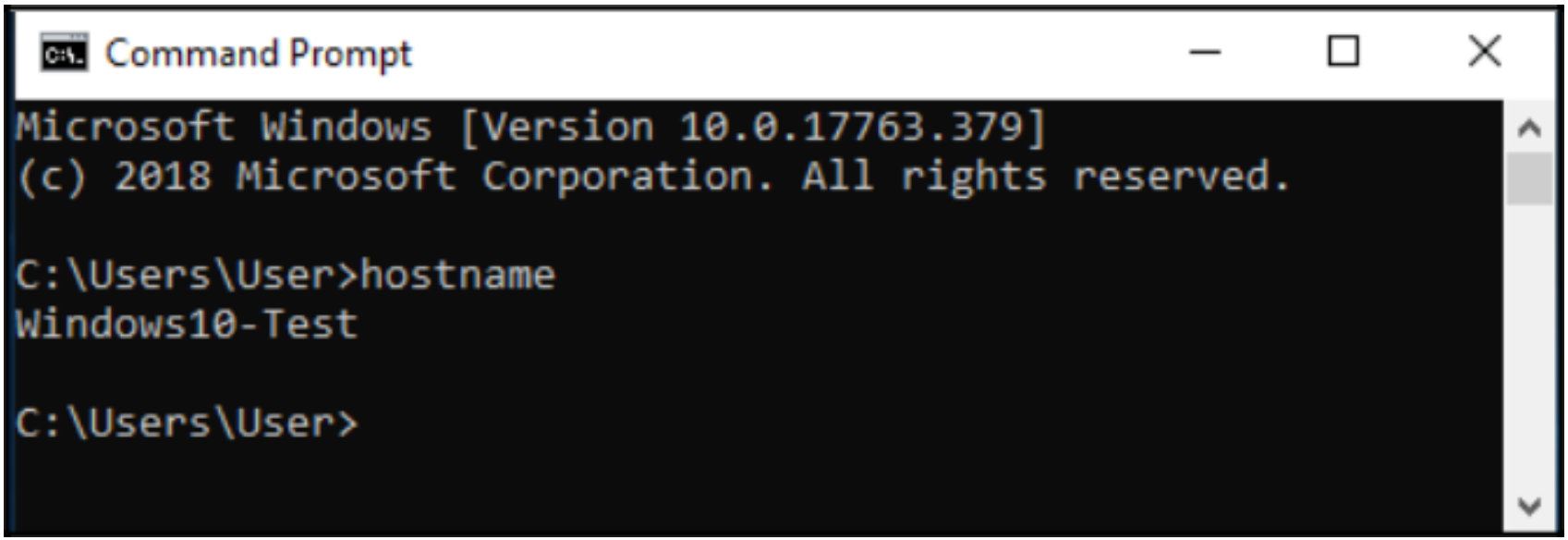
Introduction to LANs

A LAN can be described as something that covers a small geographical area that's small enough that the devices can be classed as being local to each other.



Hostnames

A computer's hostname is an easy-to-read (for humans) method of identifying a device on the network. Each device's hostname is configured by the system administrator. Although hostnames make identifying devices a little more human-friendly, often, we tend to think of IP addresses as the main means of identifying a device on a network.



An IPv4 address is broken down into two sections:

1. A network element
2. A host element

The network element is used as a means of identifying the network a device is on, while the host element identifies the device itself on the network.

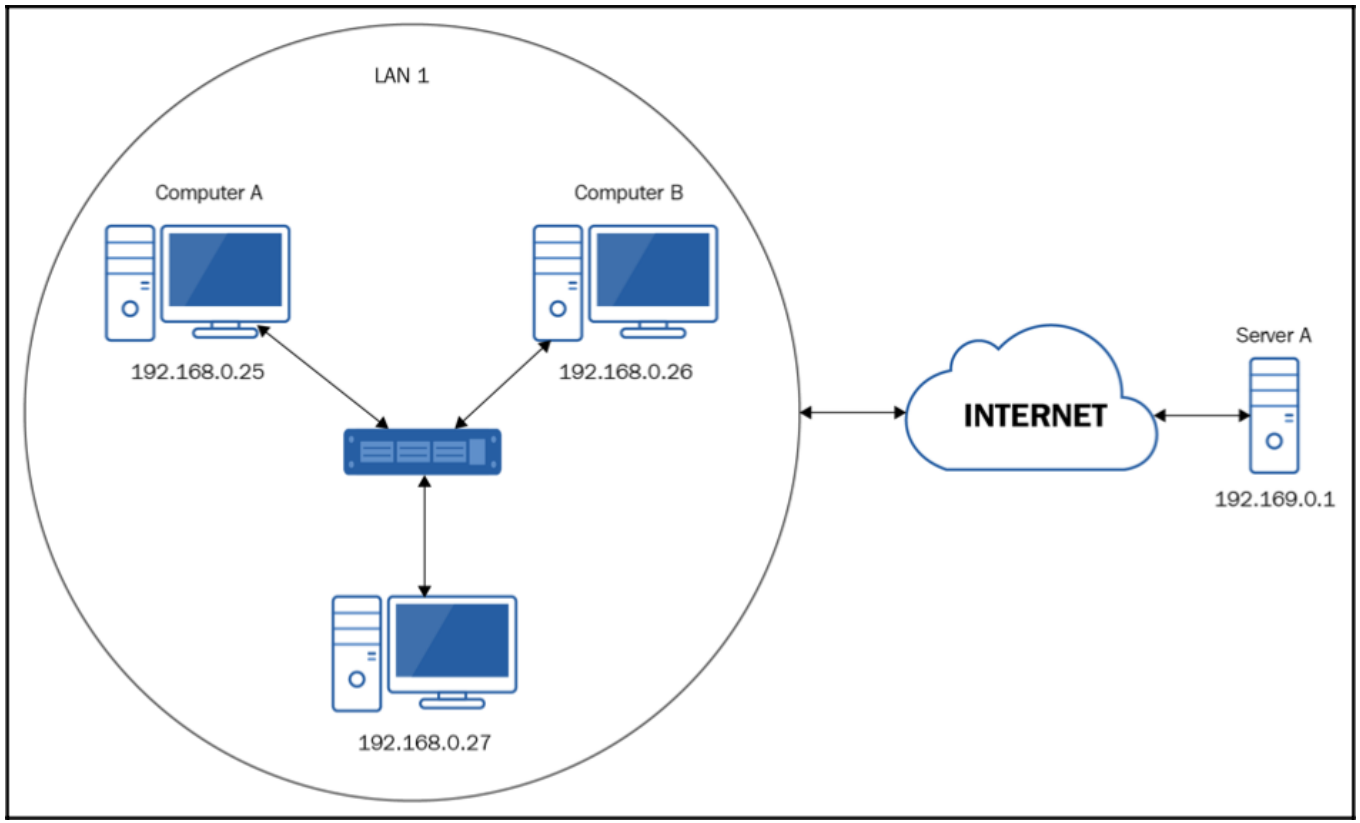
These address ranges are as follows:

- **Class A** 10.0.0.0 $\rightarrow$ 10.255.255.255
- **Class B** 172.16.0.0 $\rightarrow$ 172.31.255.255
- **Class C** 192.168.0.0 $\rightarrow$ 192.168.255.255

Local addressing

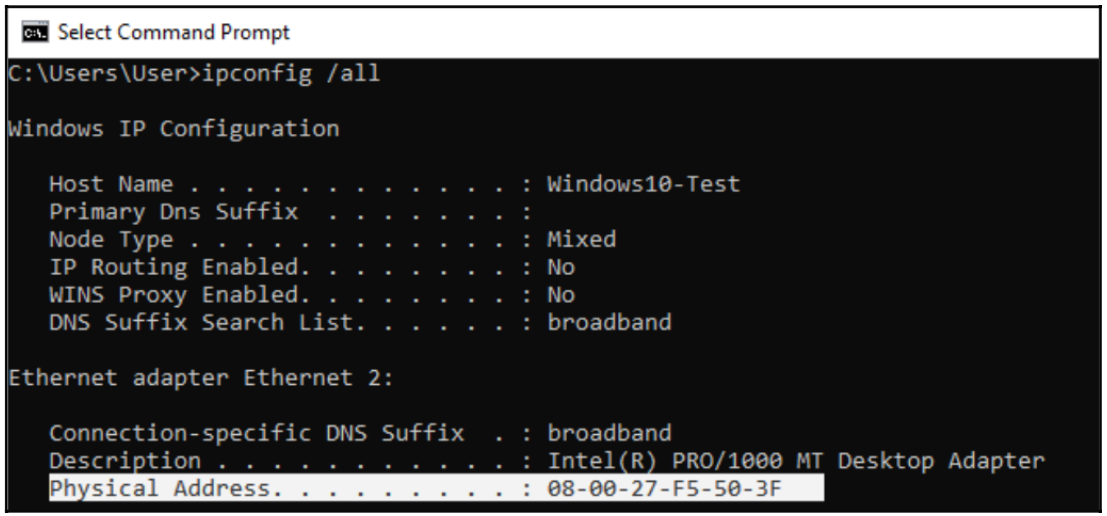
IP addresses

For this example, the network element of the IP addresses in LAN 1 will be 192.168.0 and the host elements will be .25, .26, and .27. For Server A, the network element will be 192.169.0 and the host element will be .1.



Local addressing

MAC addresses



A MAC address is a means of identifying a device on the local network. It is an address that has many names. As well as being referred to as a MAC address, it is also referred to as a physical address, a hardware address, or a burnt-in address (BIA).

When creating a LAN, we generally have three options available to us: implement a wired network, implement a wireless network, or, more commonly, implement a hybrid of both types.

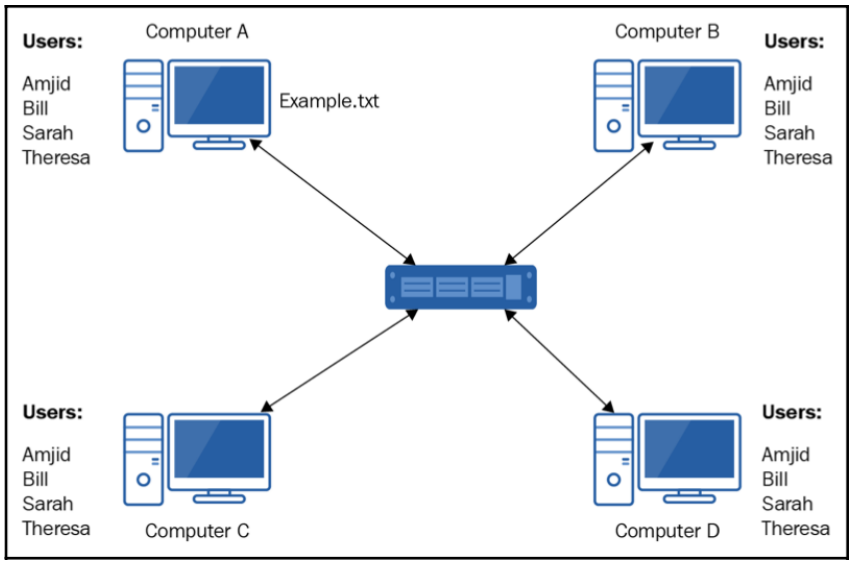
Considerations:

- Budget
- Skill set
- Existing Infrastructure
- Hardware
- Environment
- The number of users
- Security
- Network model

Network models

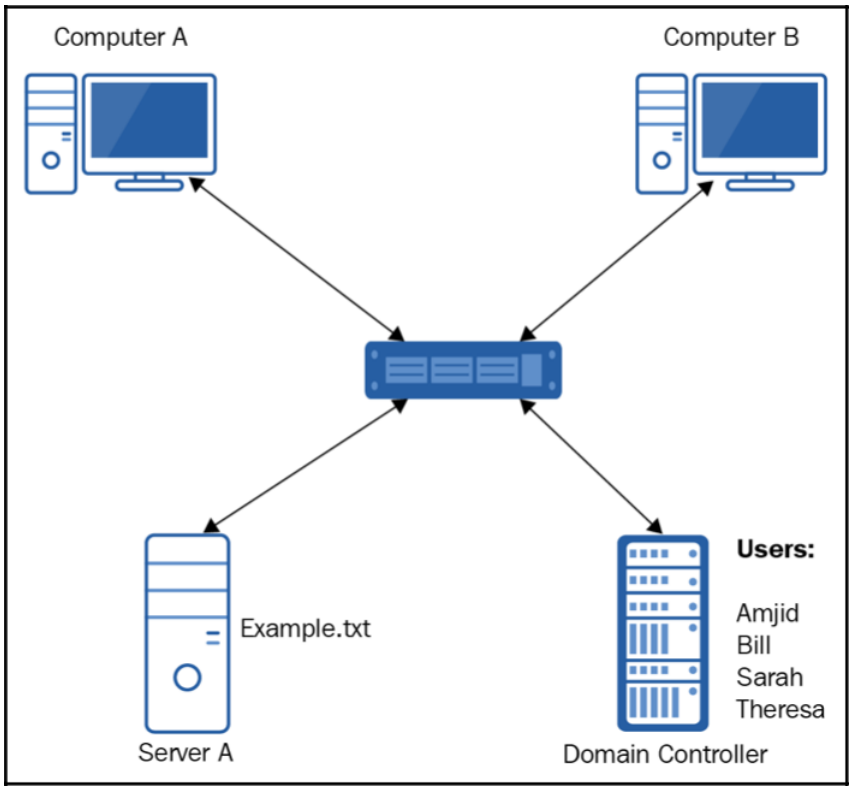
Peer-to-peer networks

A P2P network (sometimes referred to as a workgroup) is one where there is no one device that has complete control of the network and the files, services, and so on that are used on the network. The term peer refers to individuals with the same status, and that applies here. All the endpoints on the network have the same status. Every device is responsible for authenticating users and holds a security database it needs to check.



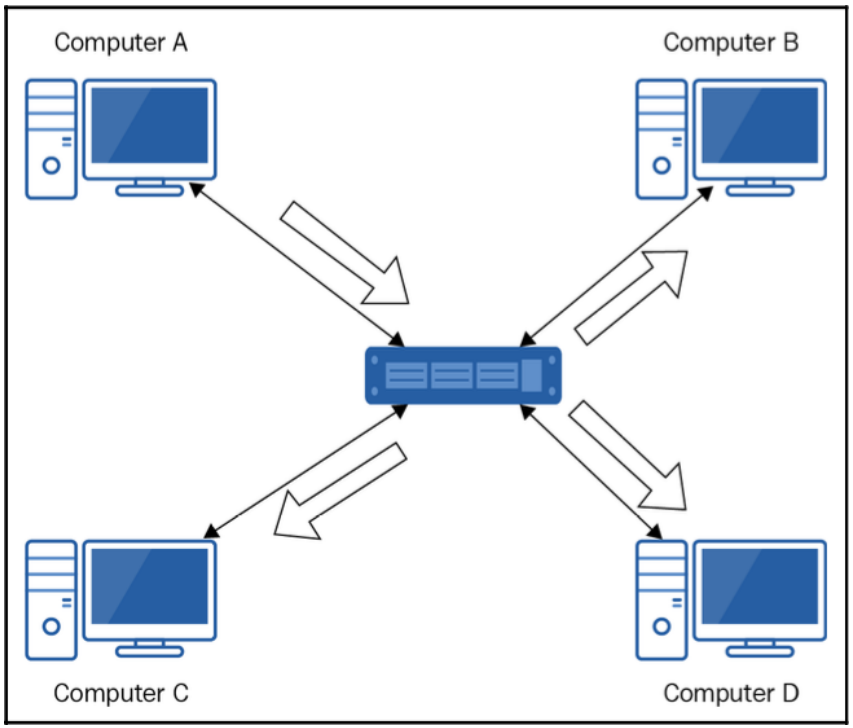
Client-server networks

Client-server networks have some form of hierarchy. The most common form of this is a domain model that utilizes some form of directory service, such as Microsoft's Active Directory, for authentication and control when it comes to accessing resources.



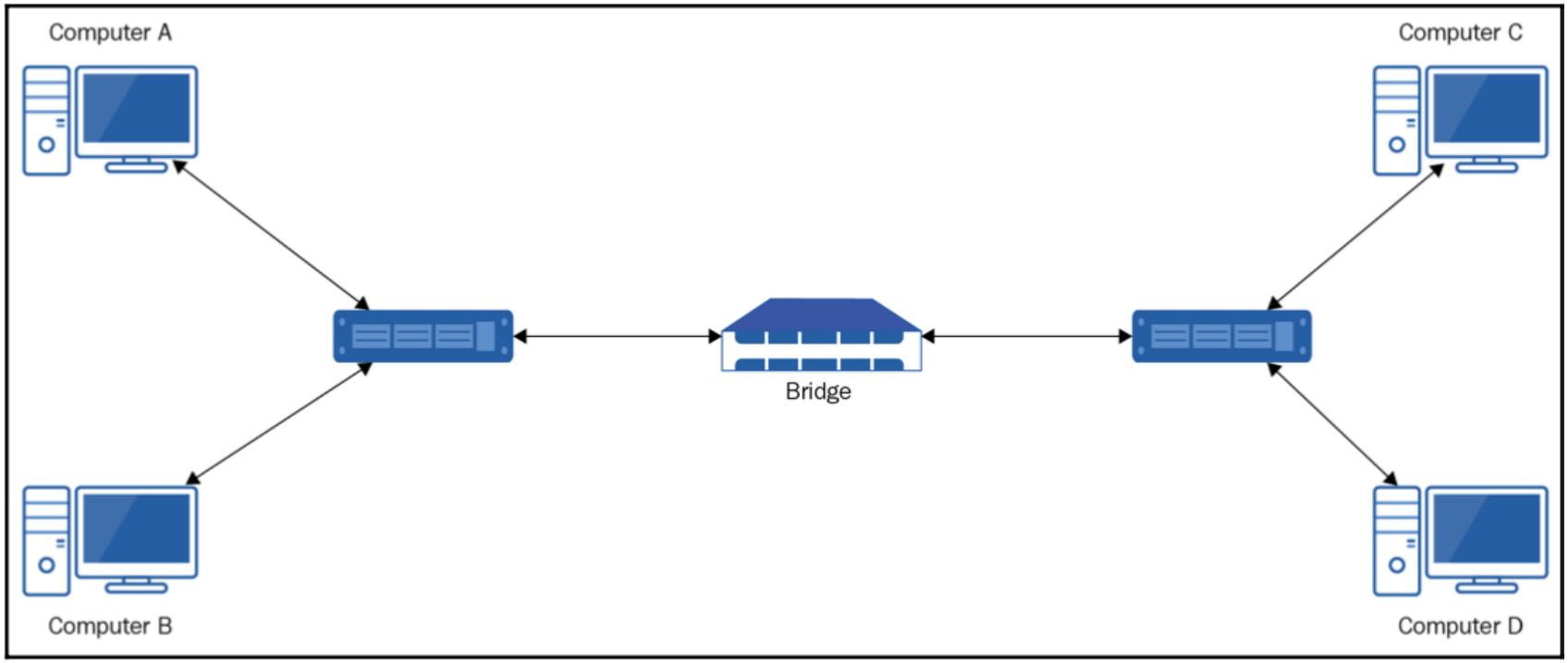
LAN using a hub

A hub is a dumb device. It acts as an interconnectivity device that applies no logic to the transmission of data. It just forwards the data out of all of its ports, which means the data is sent to all the connected devices, each of which will have to process the data marginally to see if the data is for it or not.



LAN using a bridge

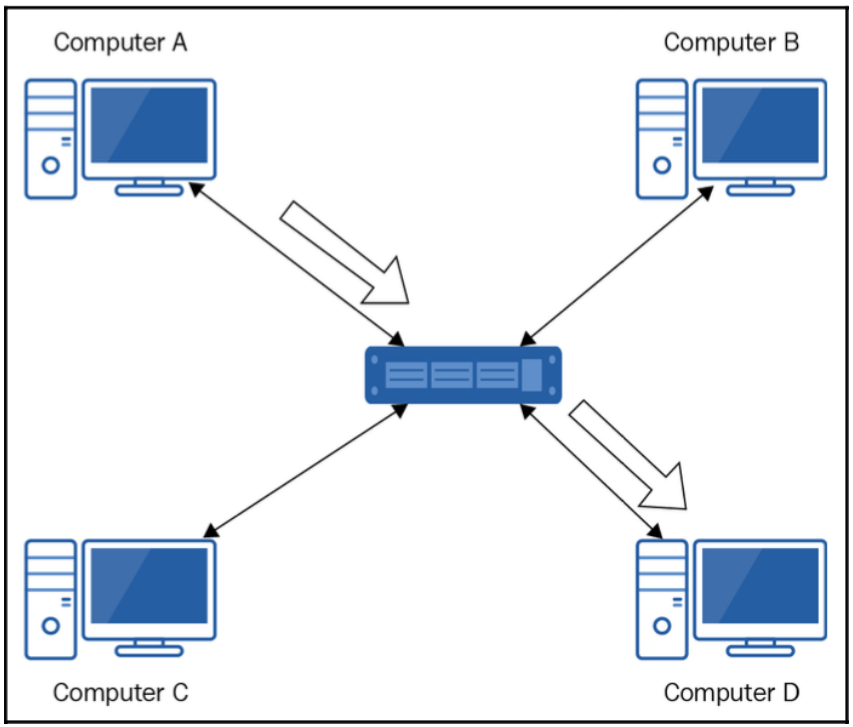
To improve the efficiency of hubbed networks, bridges were introduced to segment the network. Bridges learn the MAC addresses on each side of the bridge, and will only forward data it knows is destined for a device on the opposite side of the bridge. Usually, a bridged network would also include hubs.



Wired Network

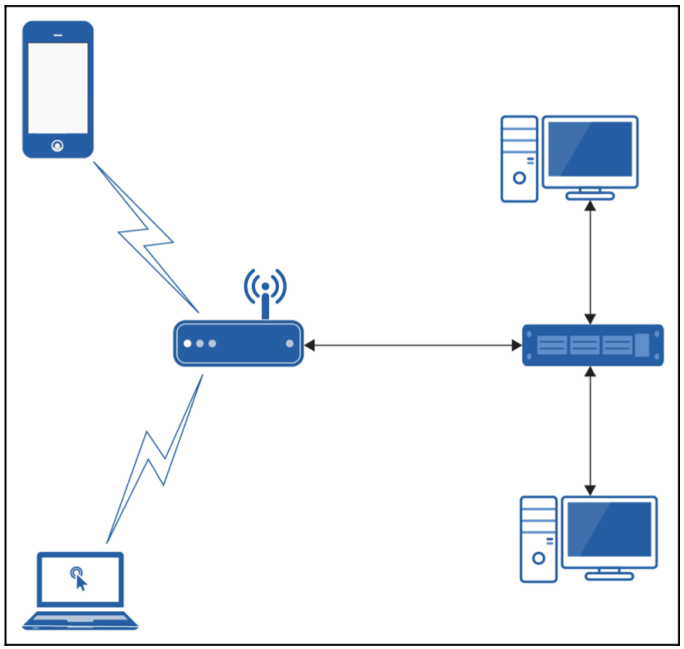
LAN using a switches

Switches have become the backbone of most organizations' networks, and having an understanding of their functionality is an important skill for any IT support member. Not only do switches allow for greater network segmentation, but they also offer full-duplex communication, making them more efficient.

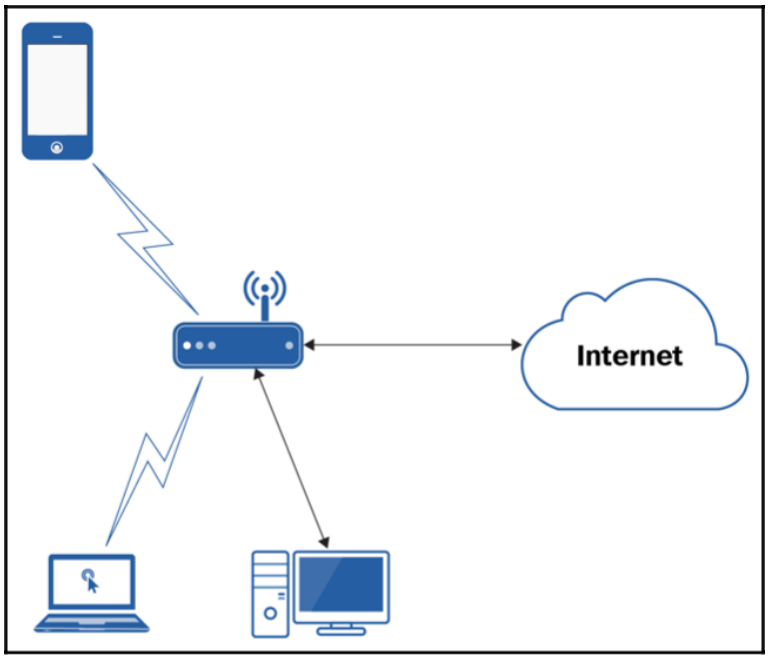


Wireless Networks

Wireless networks can be classed as either ad hoc or infrastructure. An ad hoc wireless network is one where devices connect directly to each other without going through any interconnectivity device, whereas wireless infrastructures do go through one.



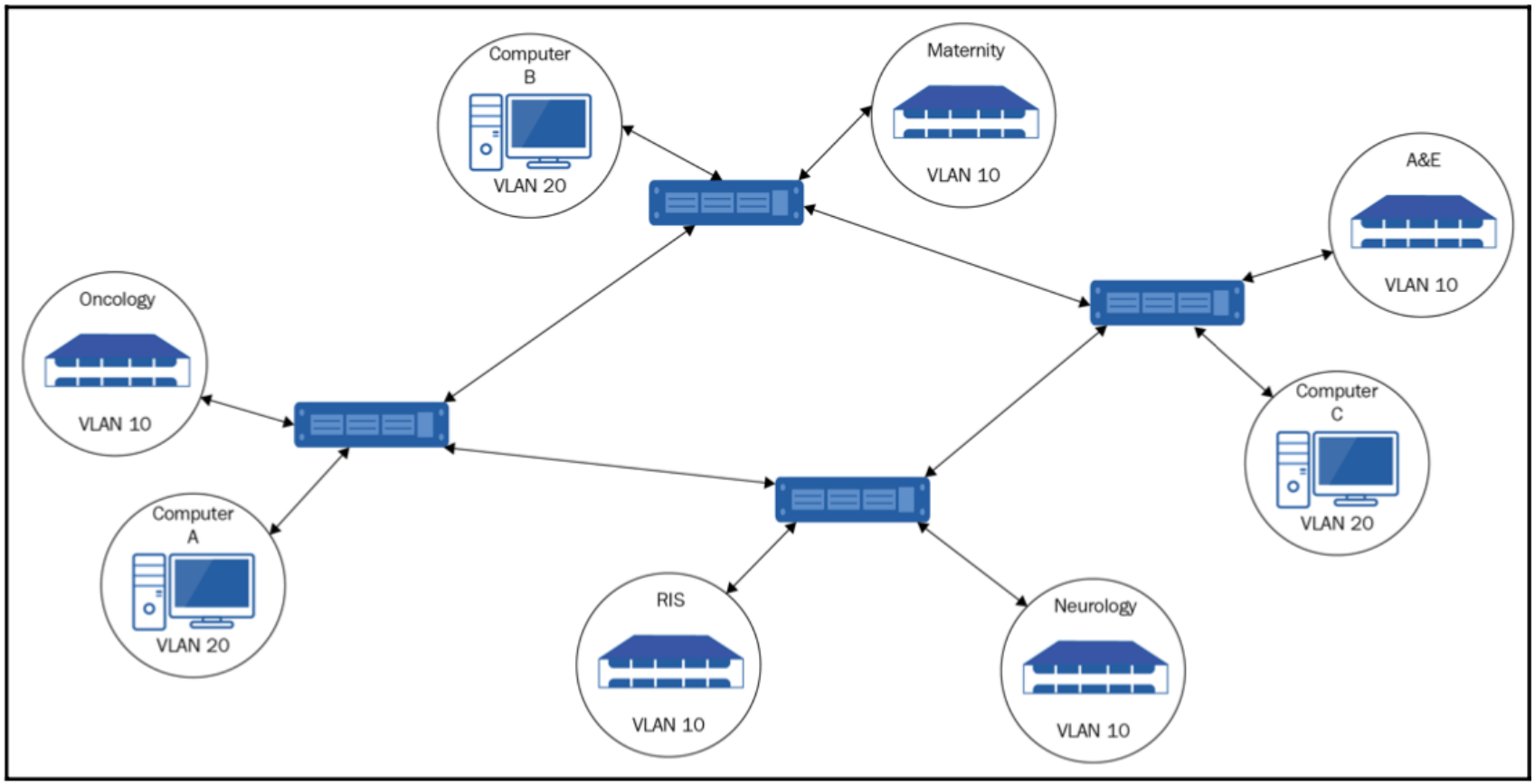
(a)



(b)

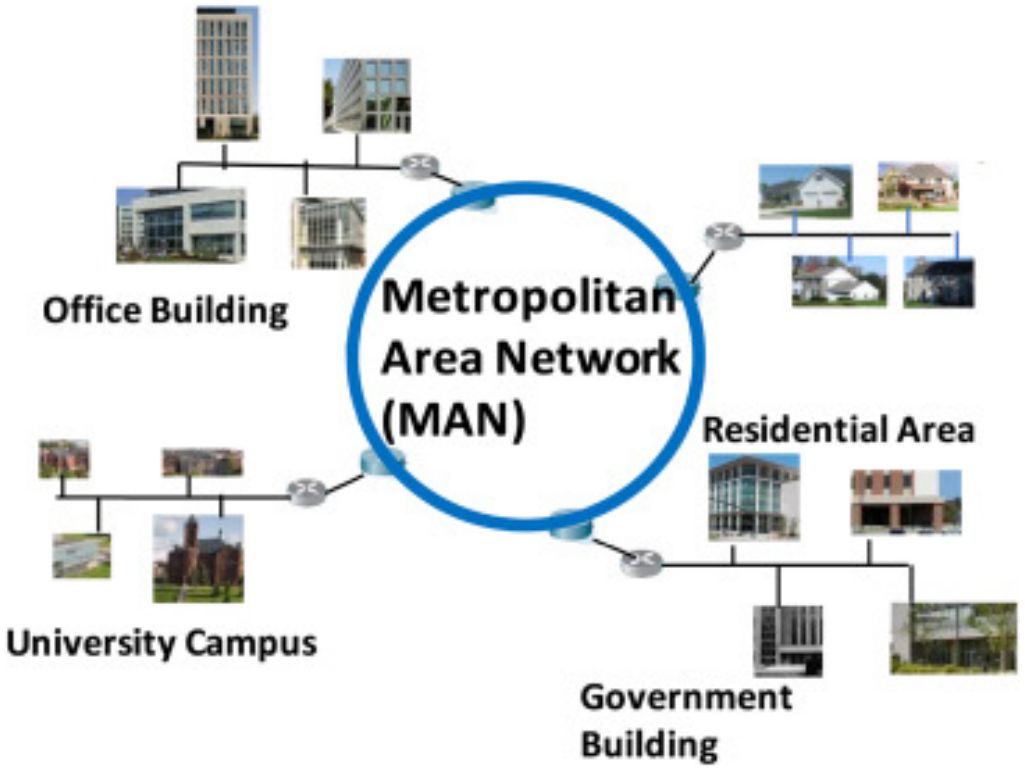
Virtual LANs

A virtual LAN (VLAN) is a group of hosts with a common set of requirements that communicate as if they were connected together in a normal fashion on one switch, regardless of their physical location.



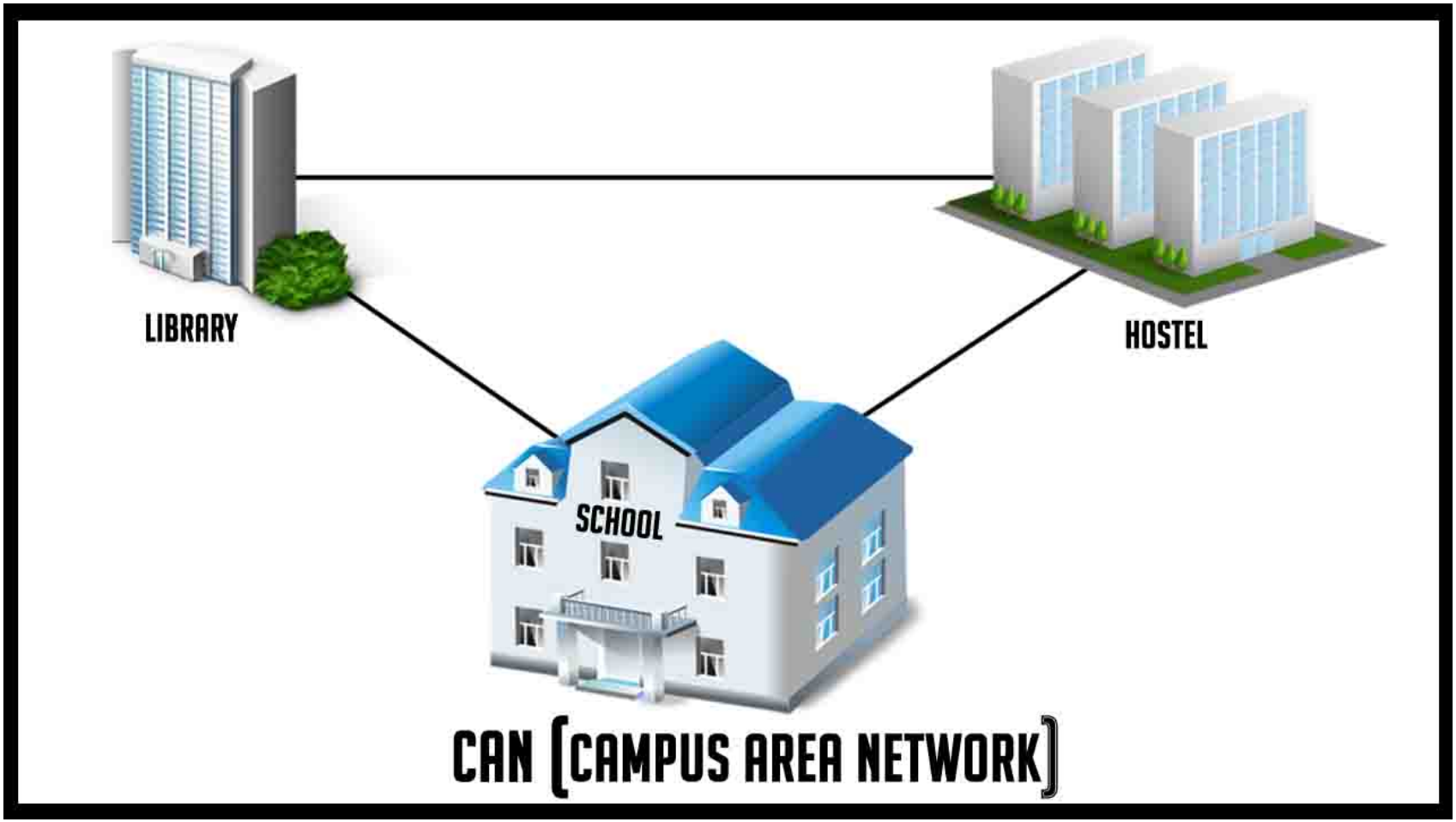
Metropolitan area networks

A MAN is a network that spans across a city. This may be used by organizations such as property management companies that may have numerous properties that they are managing across the city. Other uses of MANs include providing mobile customers with a continuous network service across the city.



Campus area networks

A CAN is a network that connects multiple LANs within a defined geographical area, such as a university site.



A PAN refers to the interconnection of devices around a person. While both of these examples use Bluetooth, other technologies that can be used include infrared, Wi-Fi, USB, and Firewire.

Makanan yang sedap ada diruang tamu
Orang yang beradap sudah pasti berilmu