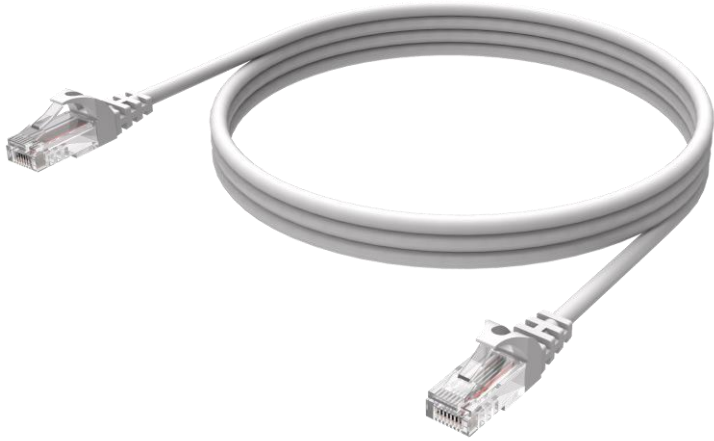


# Cyber Defense Organization

Spring 2019 - Intro to Networking

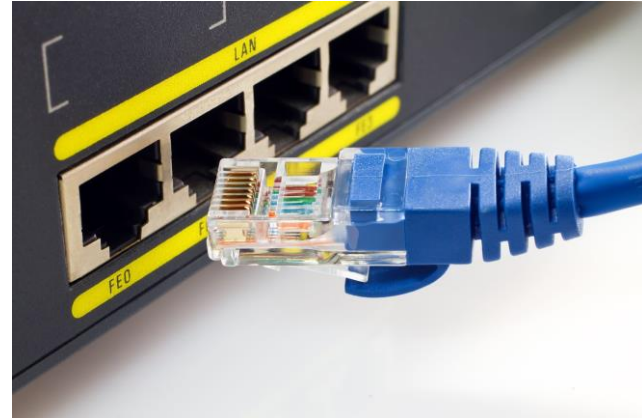


# Ethernet



RJ-45 or  
Ethernet  
cable

**Ethernet cables** physically connect devices within a local area network, like PCs, routers, and switches.



# SWITCH



A **network switch** is a computer networking device that connects devices together on a computer network by using frame switching to receive, process, and forward data to the destination device



**Let's build a network!**

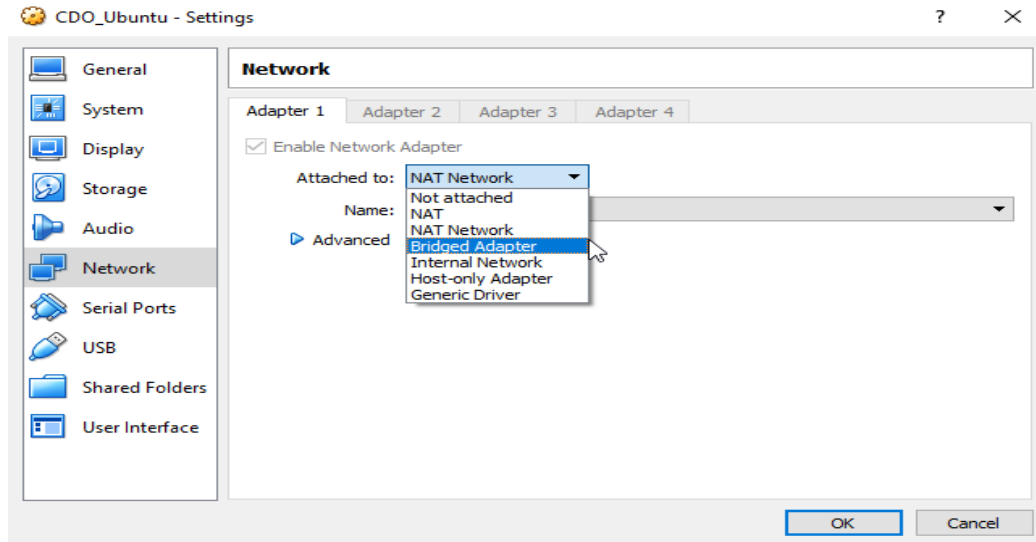
# Let's do some things first..

At each tables choose 2 people to be linux, and 2 people to be windows.. Boot up those machines.

MAC ADDRESS?

## Let's continue to build a network!

Each virtualbox machine (linux and windows) network adapter settings needs to be set to a “bridged adapter”. This will allow the devices connected to the switch to be networked together correctly when we do static addressing.



# ICMP

```
PING google.com (172.217.10.46) 56(84) bytes of data.  
64 bytes from lga34s13-in-f14.1e100.net (172.217.10.46): icmp_seq=1 ttl=252 time=9.53 ms  
64 bytes from lga34s13-in-f14.1e100.net (172.217.10.46): icmp_seq=2 ttl=252 time=9.57 ms  
64 bytes from lga34s13-in-f14.1e100.net (172.217.10.46): icmp_seq=3 ttl=252 time=12.3 ms  
^C  
--- google.com ping statistics ---  
3 packets transmitted, 3 received, 0% packet loss, time 2002ms  
rtt min/avg/max/mdev = 9.530/10.472/12.315/1.305 ms
```

Internet Control Message Protocol, it is used to signal error conditions and used for diagnosis. In our case, ICMP traffic today will be used for testing connectivity (is the host up or down).

# IP ADDRESSING

A unique string of numbers separated by periods that identifies each computer using the Internet Protocol (IPv4) to communicate over a network. So what does this all mean, in order for our hosts (each computer you're sitting at) to "talk" to each other they need to be servicing an IP address.

However, today we will be learning how to statically set an IP address opposed to DHCP. Statically addressing is the process of manually setting each IP.





# How to...

Linux users:

/etc/network/interfaces

auto <INTERFACE\_NAME>

iface <INTERFACE\_NAME> inet static

address 192.168.0.X

netmask 255.255.255.0

gateway 192.168.0.1

systemctl restart network

ping <Ip address>

Windows users:

Start Menu > Control panel > Network > Adapter

Settings > Local Connection > Properties

Open properties on IPv4, enable "Use the following IP address"

IP address: 192.168.0.X

Subnet mask: 255.255.255.0

Default gateway: 192.168.0.1

Open CMD, ping <SOMEONE>

GNU nano 2.9.3

```
# interfaces(5) file used by ifup(8) and ifdown(8)
auto lo
iface lo inet loopback

auto <INTERFACE_NAME>
iface <INTERFACE_NAME> inet static
    address 192.168.0.X
    netmask 255.255.255.0
    gateway 192.168.0.1
```

