

# Description of Network

## Assignment

You have been hired by my company to build and secure my network. The goal of this assignment is for you to build out and secure my network as much as possible. Everything in the I.T. world will be focused on securing a network in one way or another. By doing this, this will help you better understand the concept of defense in-depth and how hard it is to implement security within a budget. For the most part, this is your creation, use everything you have learned to create and secure the network. I only have a few requirements and mandatory items (3 screenshots). Those items are as follows:

### Mandatory

- DMZ
  - Segmentation
  - Write out and describe my network in detail and all security features that you included and why you included those features.
  - Must keep the network within the one-million-dollar budget I have given you.
  - An asset list with prices on all equipment that will be used.
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- Network Switch
    - The network switches in this network are the source that will allow all the devices from each department to be utilized.
    - It has a two-layer feature which allows switches to build tables in order to transfer frames amongst networks.
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- Router
    - The router is the source that manages traffic throughout the network and allows the intended devices to be connected to the same internet. Additionally, the specs indicate it has capability to reach 4 gigabit internet speed and has 900 MBPS of encrypted throughput.
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- 100 Window's Computer for Every Employee
    - Every employee from each department will be assigned their own dedicated computer. I decided to use a recent computer which can handle work environments. Additionally, the information regarding its specs seems reasonable to withstand the workload.
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- Ethernet Cable
    - Need direct connection to devices, so will have to run Ethernet cable in order to do so.
    - Spool from the supplier comes in 1000ft (about 304.8 m) so will take a rough estimate to fulfill the needed amount. Maybe 15,000ft.

- Wi-Fi Modem
  - The purpose of a modem is to provide the devices with internet access. This hardware connects physically to the devices unless a wireless option is available. Since there are a lot of devices needing connection, it is necessary to provide a modem which has the capability to withstand the demand.
  
- Internet
  - The internet is the main source on which this network is operating. This will provide connectivity between all the devices within the business. The internet provider will be selected depending on the speed capabilities that are offered.
  
- VersaLink All in One Printer/Copy Machine and Phone
  - Each department will have their own dedicated copy/printer machine and phone
  
- Mail Server/ Web Server/ FTP Server/ DNS Server
  - Since the company has only 100 employees, I believe using a service provider like AWS will help keep costs lower. Services will be integrated directly with Amazon and pricing depends on the amount of usage. I believe if the company was much larger than having a server room it would be more reasonable.
  - The purpose of a mail server is to deliver email messages between mail clients by using email protocols that tell the server how to process incoming requests, forward messages and how to deliver them.
  - The purpose of a web server is to store, process, and deliver requested information or webpages to end users. This would be essential for a business
  - The purpose of an ftp server is to allow for the option to transfer files across the internet. Put files allow files to be uploaded to server from its client's devices and downloading get files from server to client's device.
  - The purpose of a DNS server is translating all domain names into a specific IP service. Since there are 100 employees, having the infrastructure needed to allow information to be saved is essential.
  
- Subnets
  - The purpose of a subnet is to divide domains so the network can be more efficient. With a subnet, I was able to reduce the amount of space taken up when creating a network diagram. This allowed me to input a single computer illustration and range each subnet accordingly with its designated employees in each department.
  - A 25-network bit subnet can withhold 128 hosts, so this should be sufficient to withstand all employees within the business.

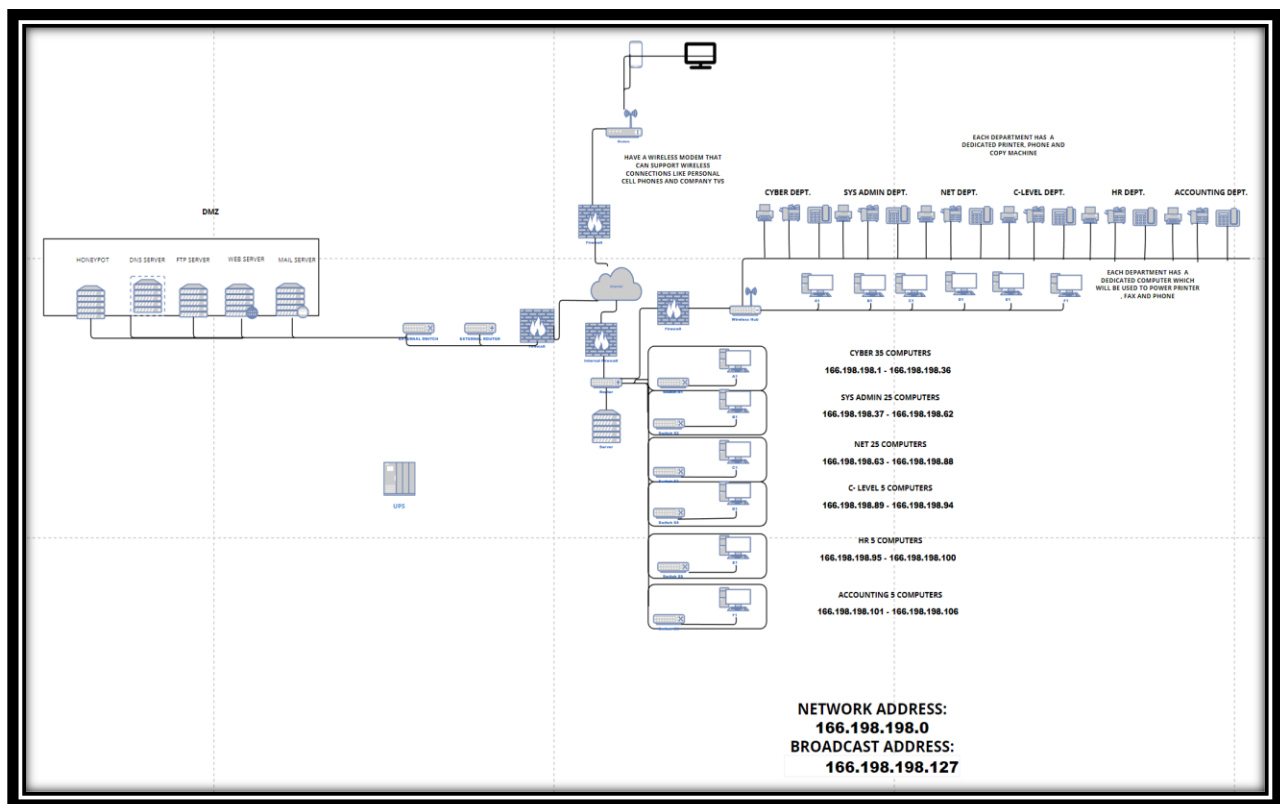
- Segmentation
  - Network segmentation is used to divide a network into smaller sub networks which will allow for improved network performances and security protection. Since there are multiple departments within this business, this implementation would be justifiable to use.
- Firewall
  - There are multiple firewalls within this network diagram which each serve a purpose to monitor any incoming and outgoing network traffic that occurs. This won't guarantee protection from any protentional threats but is a strong resource to have within the foundation of the overall network.
- DMZ
  - As a requirement for this project, the purpose of a demilitarized zone is to have an additional layer of security for the subnetwork. Since the businesses databases are a key asset then implementing this zone will ensure the chances of threats are less likely to occur.
- Honeypot
  - Furthermore, when looking to implement network security measures, using a honeypot within the DMZ zone is one of the additional protections I will use within this business. This will ensure that in scenarios where there are threats, the honeypot will allow for any activity to be measured and detected.
- Network Access Control (NAC)
  - When doing some research, I came across a source of solution known as network access control. Since this is a network-based project, these integrations of added security seem to be reasonable to have within the business. The vendor who provides these solutions offers a variety of tools which include features like management, profiling, visibility and network response and access.
- Security Information and Event Management (SIEM)
  - An additional source from the NAC solution, an SIEM is an additional solution that helps with security. The tool within the software allows a business to collect and analyze data from all devices within the entire business. I believe this can help keep everything more organized and help detect any possible threats that may occur.
- Backup
  - When learning the different types of backups throughout the semester, I believe that full back will be the best option for this business. Although it can be time-consuming, it's better to be safe than sorry and lose important information. This will include backing up directories and files
- Uninterruptible Power Supply
  - In addition to using a provider for backups, in scenarios where power outages may occur having a UPS power supply will come in handy. A UPS power supply has an integrated battery and built in

circuit that maintains the battery charged when needed. In situations where there is an outage, the UPS will allow for hardware and data to be damaged or lost.

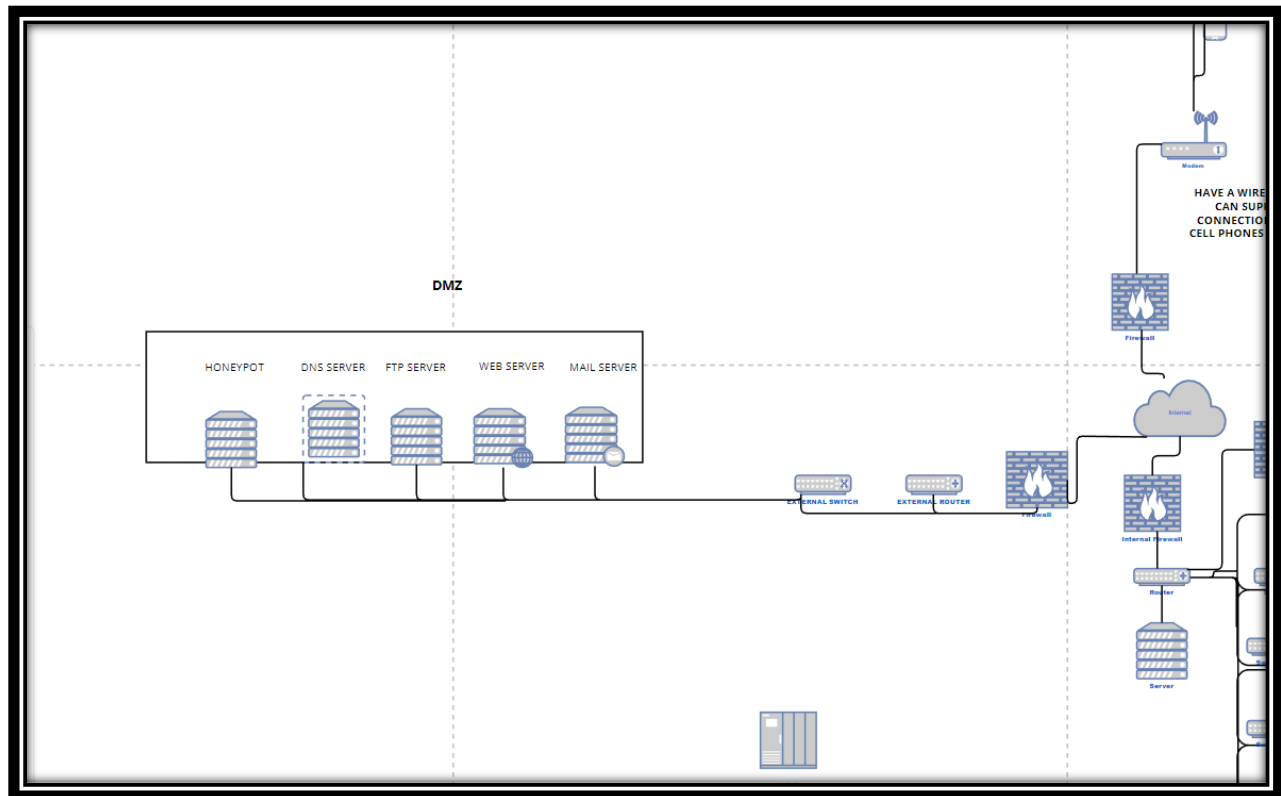
- Intrusion Detection & Prevention System
- Intrusion Detection & Prevention System is an additional source of security that continues to search and respond to any threats to the network. The system will be connected to a switch to monitor any traffic within the hardware.

# SCREENSHOTS

## Overall network



## DMZ



## Segmentation

