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# CSIS 161 – Networking analysis project

## Project overview

For this project, you will complete a network analysis on a small office/home office (SOHO) network. With this, you will prepare a written report of findings and recommendations for performance and security improvements.

Note: this project cannot be completed in one sitting. Specifically, the Performance Monitoring section will require gathering network data at different times of day.

Download a copy of this file, and complete each section below. At a minimum you will complete each section by typing directly on this template. Feel free to add more. Be sure to read each section carefully as some areas as for images for example

# Section 1: Architecture

1. Describe the topology of the network. Your response should name a specific topology such (Ring, Bus, Star, Mesh, etc.). **Include a simple diagram to illustrate the devices and topology of your network.**  My home network would kind of be star the topology that I’ve drawn out dose not really look like star, but everything is connecting back into the Router. Didn’t include the cell phone due to them not being stagnant generally, they are moving within the network.

Diagram, schematic

Description automatically generated

1. ISP information:
   1. Internet service provider name: AT&T Fiber
   2. Description of the ISP hardware: White oval rectangular router.
   3. List and describe the hardware components that allow your network to function: *For example: If your ISP provides an “all in one” device, what are the components that have been combined? If not, describe the other network devices.  Your response should include a clear description of the function of the following devices: Modem, Router, Switch, WAP, cables and connectors, etc. (Do not include end user devices in this section)*

The equipment my ISP has provided is an all one device. Its Router, modem it has fiber form running inside the home form outside into the router.

1. Describe end user devices and their connection types. Be sure to include OS information as well.

Every single one running off Wi-Fi we have non that hardwired into the equipment, we have about 6 different things running off window OS, and the rest running of ISO for apple phones and MacBook pro.

1. Identify and describe other types of devices connected to the network such as wearables or smart home devices. Your response should include how those devices connect to the network.

I have several different iPhone connected to network, iMac, 3 different work laptops, my gaming laptop, Switch, Xbox one, and several cable boxes, 2 Ruko’s.

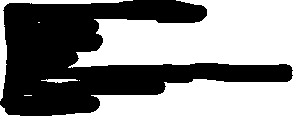
# Section 2: Network Configuration

1. Using one of the computers on the network, locate the network configuration settings. Within the configuration settings, find the private IP address, Subnet mask, default gateway, MAC address, and DNS information. Take a screen shot of these settings and paste the screenshot below. Be sure that the screenshot includes your IP address, Subnet mask, default gateway, MAC address, and DNS information. **This may require more than one screenshot**, which is fine! *Note: failure to complete this section citing security concerns signals to me that you don’t understand public and private addressing.*

Text

Description automatically generated Text

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1. Using the configuration settings you just found, record each of the following items in the list along with an explanation. For example, for IP address, you will provide your computer’s private IP address along with an explanation of what and IP address and the role it plays in the network configuration. Be as specific as possible.

* IP address  \*\*\*.\*\*\*.\*.\*\*\* Ipv4, \*\*\*\*:\*\*\*\*:\*\*\*\*:\*\*\*\*::\*\* ipv6
* Subnet mask  255.255.255.0
* Default gateway \*\*\*\*::\*\*\*\*:\*\*\*\*:\*\*\*\*:\*\*\*\*\*\*\*\*\*\*.\*\*\*.\*.\*\*\*
* MAC address \*\*-\*\*-\*\*-\*\*-\*\*-\*\*
* DNS information  \*\*\*\*:\*\*\*\*:\*\*\*\*:\*\*\*\*::\* \*\*\*.\*\*\*.\*.\*\*\*

1. Explain IP address assignment on your network. Your response should include:
   1. Description of whether your IP addresses are static or dynamic, as well as an explain of how you know. **Include a screenshot with your response to support your answer.  Text

      Description automatically generated**



Using dynamic IP address we have not set up static IP address with in the home none of are devices use a static IP address.

1. How are public and private IP addresses used differently on a network? You do not have to share yours but describe how you found it. Public ip is what is shown to the world, so when I’m accessing something world wide web, I’m not providing true IP to the world.

# Section 3: Performance monitoring

This section will require gathering network data at a minimum of three different times of day (such as morning, noon, and night). Review all questions before you begin so you can plan your time efficiently.

1. Conduct Internet speed tests at 3 different times of the day using [www.speedtest.net](http://www.speedtest.net/) or a similar tool. Complete the table to track your speeds.

|  |  |  |  |
| --- | --- | --- | --- |
| **Test** | **Time** **Recorded** | **Upload Speed** | **Download Speed** |
| Test 1 | 8:23pm | 344.20 Mbps | 362.60 Mbps |
| Test 2 | 12:00pm | 173.56 Mbps | 349.72 Mbps |
| Test 3 | 8:58am | 370.54 Mbps | 375.55 |

1. Explain bandwidth vs throughput on the network.  Bandwidth is theoretical amount data that can be transferred, throughput is amount of data that is being sent out.

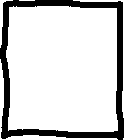
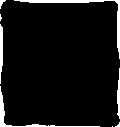
1. Analyze the times/speeds you recorded. Why do you think it is faster or slower at these times? So, the days I did these tests where on Friday night, Saturday afternoon, and Sunday morning. I have gig service but I’m not going to get full Gig since I’m running off Wi-Fi and hardwired with into my equipment. Also have other devices that a running off my Wi-Fi same time these tests were taking place so taking up my throughput lowering my speeds. Also, first 2 where taken downstairs away in basement with floor difference form where router is located, so interfaces is taking place there.

1. To complete the next several questions, **you will need to create a network capture file**.
   1. Use Wireshark to capture at least 60 seconds of network traffic. While capturing traffic, open your web browser and navigate to 3 different web pages during that time to help generate network traffic. Once complete, **provide a screenshot** to show your work. Graphical user interface, text, application

      Description automatically generated

* 1. The default view shows all network traffic, but there are times you may need to use a filter to search more effectively. Choose a filter option on Wireshark and explain the purpose. **Include a screenshot to show the filter you choose.**
  2. Using Wireshark, apply a filter to only show IPv4 traffic. **Include a screenshot** with your response to show your work. Graphical user interface, application

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* 1. Using the protocol hierarchy option within the statistics tool in Wireshark, list the top 5 protocols on the network during your capture. Your response should include a description to go along with each protocol in the list. Be sure to **provide a screenshot** of the statistics tool along with your response to show your work.
     1. IPV6 Internet Protocol Version 6 is the next generation of protocol that provides approximately 340 undecillion IP addresses.
     2. UDP User Datagram Protocol is a communication protocol that is primarily used to establish low-latency and loss-tolerating connections between applications.
     3. TCP Transmission Control Protocol How to establish and maintain a network conversation by which applications can exchange data.
     4. ICMPv6 Internet Control Message Protocol Version 6 is an integral part of IPV6 and preforms error reporting and diagnostic functions.

Graphical user interface, application, table

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1. Describe 3 ways that you could improve performance on the network. Consider equipment, placement, type of wireless, etc. Each recommendation should include discussion of specifically how it could improve performance.

* Recommendation 1: Currently my all one equipment is siting on TV stand in are living room by window, right next to the are Smart Tv. By separating the router having it different location where it will have less interference helps great deal with speeds and connectivity.
* Recommendation 2: Adding Wi-Fi signal booster that are provided by the AT&T to help with signal strength in weak areas such as the basement, and by getting the booster through AT&T requires them preform any troubleshooting with them as need.
* Recommendation 3: Monitoring the Network to see if there are rouge devices connected to the network causing throughput to go down, and if there are connectivity issues going on.

# Section 4: Security

1. Consider the 5 security practices listed above, and identify 3 opportunities to improve the security of the network you are analyzing. Provide specific examples along with explanation. Include screenshots with your response to support your answer when needed.
   1. Improvement 1: When we wind up moving setting up Wi-Fi services within a new home, changing form default password. Creating strong password not using know words, using mix of uppercase and lowercase letters,
   2. Improvement 2: Adding Guest network would second thing I would like to end up keep people who are entering my network off main network in regards to security reason making it hard for main network become infected with malware.
   3. Improvement 3: The last thing I would like to add is a VPN so that way when doing searching for anything having hard time being tracked by my ISP and other users who liked use information in regards to selling my data and making so that when booking flights hotels and etc hard for up charge on because pin exacat location.