Lab 06 – Network Design Assessment

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INTRODUCTION

The purpose of this lab is to allow the user to run a needs analysis of their current network. Additionally, create a simplified network map of their home network. Further, to report on whether upgrades are necessary to improve/enhance their network, and the associated costs.

PROCESS

Needs Analysis:

Currently, in my household there are only 2x adults (2x Network Users). Most of our products/devices require an internet connection via Wi-Fi. Below is the list of the equipment that require a Wi-Fi connectivity:

3x Laptops	2x Smart Thermometers
1x Smart Printer	1x Smart Vacuum
2x Smart phones	5x Smart Home Assistants
2x Security Cameras	2x Smart Televisions

We have one computer that is Wi-Fi capable, but I'm required by my employer to use a wired Ethernet connection.

We have all the cables we need to connect from host devices to routers/switches/modems to the Internet.

We are currently paying for the 1Gbps speed internet plan provided by our Internet Service Provider (ISP). We use the original equipment provided by our ISP to connect to the Internet (*Figure 1*).

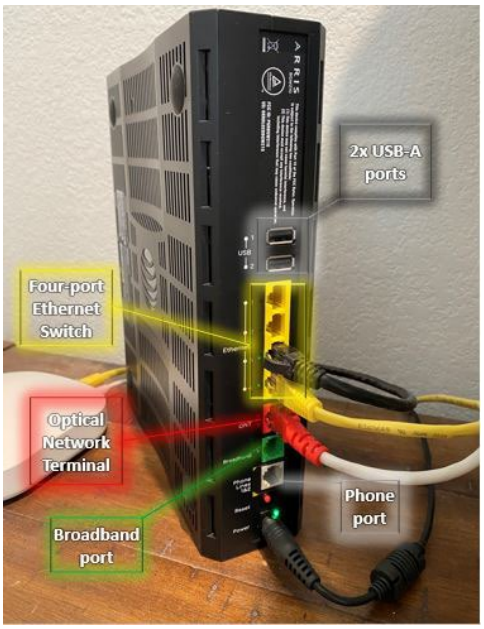

Figure 1: My At&t 802.11b/g/n/ac Modem & Wi-Fi Router

We use our current network for personal use, school, and work. We have no connectivity issues to report. The current Internet speed provided our ISP is more than sufficient to run multiple smart devices, browse the internet, and stream media on all our devices.

Evaluating my family's local access network (LAN) in its current state, I assess that our current LAN is more than sufficient for my family's daily use.

I do not assess we are missing anything from the simple makeup that is our home network. We did make improvements recently to optimize and expand our Wi-Fi signal in our 3-story townhome. We upgraded our Eero devices, which essentially creates Wi-Fi mesh in our household and maximizes the range of Wi-Fi connectivity in our house to ensure each device is able to access the fastest data link speed, approximately 1.3Gbps on Wi-Fi. If I were to rate the necessity of the product from a 1 to 5 scale, I would say it would be a 3; however, we noticed that streaming movies on the smart television in our bedroom has improved significantly after the upgrade, no buffering.

Figure 2: Eero Pro 6E, enables access to the 6GHz band

Further, we are planning to upgrade our current Internets speed from 1Gbps to 2Gbps or 5Gbps once it becomes available in our area. From a needs analysis perspective, using a 1 to 5 scale, I would assign a 1

to it now; however, I'm sure as we continue to satiate our personal needs/desires to have the latest and greatest that will change over time.

Lastly, we have been shopping the idea of updating our personal devices; specifically, our laptops and our smartphones. All of the aforementioned are Apple devices. All products have been purchased within the last 4 years. They are still functioning properly and have not reached the end of their lifecycles yet. From a needs analysis perspective, using a 1 to 5 scale, I would assign a 1 to it now.

Network Map:

Below is simple network map of my home network (*Figure 3*). Most of devices are connected via Wi-Fi. I have one desktop computer that is connected via Ethernet. For my family's privacy, I did not include every single device that we own on this network map.

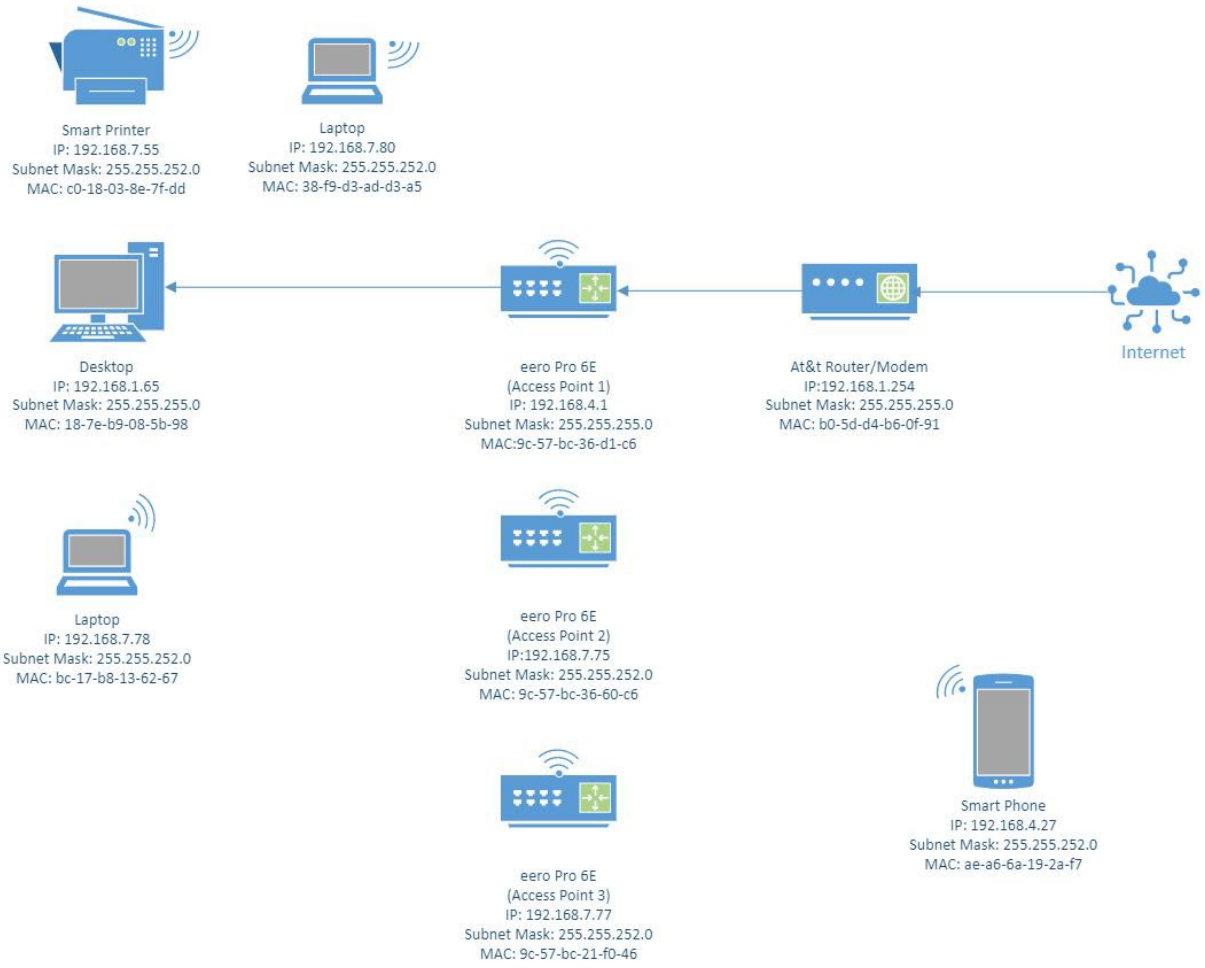

Figure 3: Simple network map of my home network, generated with Microsoft Visio

Costs Assessment:

Previously, we had mentioned that we upgraded our Eero devices, which are essentially additional access points for our Wi-Fi network. The reason for the upgrade was because of the cap of on the link speed for outgoing model we had. Each Eero device had a cap of up to 500Mbps and we subscribe to

1Gbps through our ISP. The newer models can support up to 1.3Gbps via Wi-Fi connectivity. We appreciate the easy-to-install aspect of the product. Additionally enjoy the wide-array of security features available on the mobile application interface that depicts usage and allows to control the access of people and devices on our network. It was well worth $537.00 upgrade. I believe we paid about the same price for the outgoing models when purchased them 3 years ago.

Further, we expressed the possibility of upgrading our Internet speed from 1Gbps to 2Gbps of 5Gbps. Unfortunately, 2/5Gbps speeds are not available in the area we live in. We currently pay approximately $80/month for our current speed. The 2Gbps costs $110/month and the 5Gbps costs $180/month. We will make the determination if we want to upgrade and accept the additional $30-100/month bill. As of right now, the current speed we have is more than sufficient to meet our daily usage.

Lastly, I mentioned upgrading our laptops and cell phones. A new Macbook Pro costs over $2000 and a new iPhone 14 Pro series costs over $1000. For now, I think we will keep the devices we own because there is no urgency or need to replace/upgrade any of our products. They are running optimally, and they can still support the latest security updates provided by the vendor.

LIMITATIONS/CONCLUSION

The lab's difficulty was simple. I do not assess there were any limitations because everything was executed in a live environment. However, I assess this lab was tailored towards a business network enterprise that usually have more technological needs than a regular home network. The biggest takeaway from this lab was interpreting what is considered essential to a network and prioritizing needs versus wants.

REFERENCES

[1] Fitzgerald, *Business Data and Networking*. "Needs Analysis", December 2020. [Accessed" 24-Oct-2022].

COLLABORATION

The entirety of this lab was executed independently by the author. No additional collaboration to report.