CIT 220 Research Project

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# Building a UNIX based Custom Home Router/Firewall

For this exercise, you will perform online research on how to build a custom UNIX based router/firewall for your home network. This is an excellent project for any student, especially those in networking, cyber security, system administration or even if you simply want to have a more powerful router and firewall than the ones provided by internet service providers or purchased at retail stores.

To complete this assignment, write your research findings in the following prompts:

## Hardware requirements (5 points)

The hardware needed for to build a home router/firewall is basic. You can use a single-board computer, old recyclable pcs, or even a rackmount. The requirements in general the hardware need to have a processor, motherboard, RAM, physical drivers, input/output devices and some type of case and cooling option. If not using an old laptop, then you’ll need a monitor, keyboard and mouse to get it set up. It will need a network interface card. The hard drive doesn’t need much at least 1GB is plenty to be able to run it, and ram should be at least 128MB. Overall, the hardware is basic compared to what most hardware's are capable of now adays and could find a device to run it should be very inexpensive. However, I believe a great option for beginners would be using a raspberry pi 3, that is probably what I would start out with.

Software Requirements (3 points)

I think for beginners, the best OS to use would be openwrt. Based off all the ones I have looked at I would start there. It is specifically built for routers and networks. It has been around for over 15 years and is constantly updated. It is very lightweight, and beginner friendly. It has multiple packages for all kinds of users and runs fast. Because its more complex and you can customize it more and it has three different firewall options which I would like to play around with and learn more about.

## Basic Setup (10 points)

First you would want to plug the sdcard into a computer and download the image for the raspberry pi and write the image to the sd card. Once everything is downloaded and set up properly on the sd card you an put it back into the raspberry pi and boot it up. You’ll need to plug the Ethernet cable from the pi to the computer and access the ssh and do some updates. Once that’s finished you can open a web browser and access the router. It can be accessed using an http interface. You’ll need to enable wifi and adjust other router options. Save and reboot and it will be accessible as a wireless network or by ethernet cable. You can also get a separate usb to ethernet connection to use one as wan and the other as lan.

Benefits and Features (5 points)

The benefits are it is light weight, and the setup seems easier than some of the other options for simple basic home access. It’s old but updated and one of the most popular Linux router options. So, it will have more support and help if something goes wrong, especially for beginners. So trying it out for a fist time seems like a great step into creating something a little more complex.

## Opinion and Reflection (2 points)

I don’t understand much of anything about firewalls. I know they are for security and don’t allow things through and that’s it. I like knowing the inner workings of these kinds of things. I love learning about t believe the best way to truly learn it is to do it. So, when I have some more time, in my crazy busy schedule I am defiantly going to give this a try. I have a pi and extra sd cards so everything I need to set it up.

### Total Points: 25