Net Navigator

Project Team Members
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Project Summary
The Net Navigator uses an ALFA network card set to monitor mode to detect access points and devices in the general area of the Raspberry Pi with the Python Scapy library. This data is sent to three HTML files parsed with the BeautifulSoup4 library.

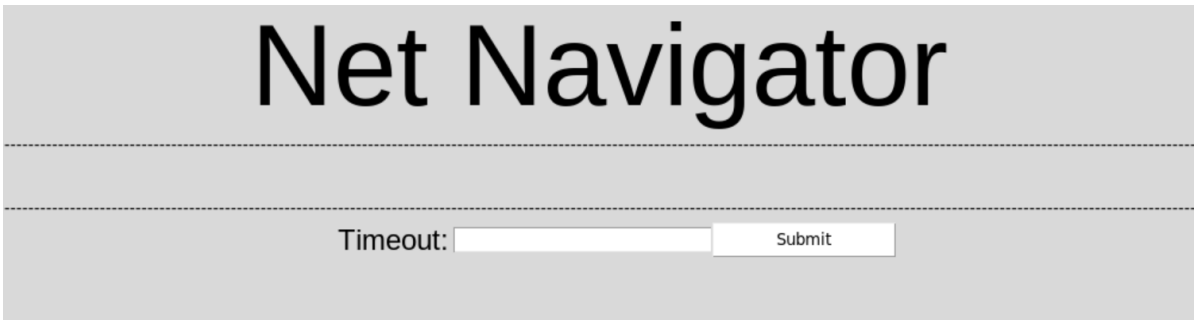
Goals and Objectives
Our main goal was to build a device that could display what devices are around the user through an easy to use and interpret system. This device shows much of the data that Airmon-ng shows; however, the data is presented in an easily readable format. This could be used as proof a certain person was in an area for security purposes. This device would mostly be marketed to a client that has a general understanding of network concepts and wants to have an easily accessible list of information at their disposal for future Python scripts.

Github Repository
This project's Github repository is located at: https://github.com/NickG21/CSC-Project.

Bill of Materials

Device	Price
Raspberry Pi B v3	$35.00
Raspberry Pi 7” Touchscreen	$74.95
ALFA AWUS036NH Network Adapter	$39.99

GPIO and GUI
The Net Navigator does not incorporate GPIO as we believe that it would take the user’s attention off of the general data. We have two main GUIs: one created with the Tkinter library and one as a webpage. The Tkinter GUI shows the state of the device (i.e., if the device has finished a scan) and has input for the timeout of a scan. The webpage shows the user the general data gathered from the scan. The data varies for access points and general devices, as general devices do not have attributes like an SSID or Channel.
Tkinter:

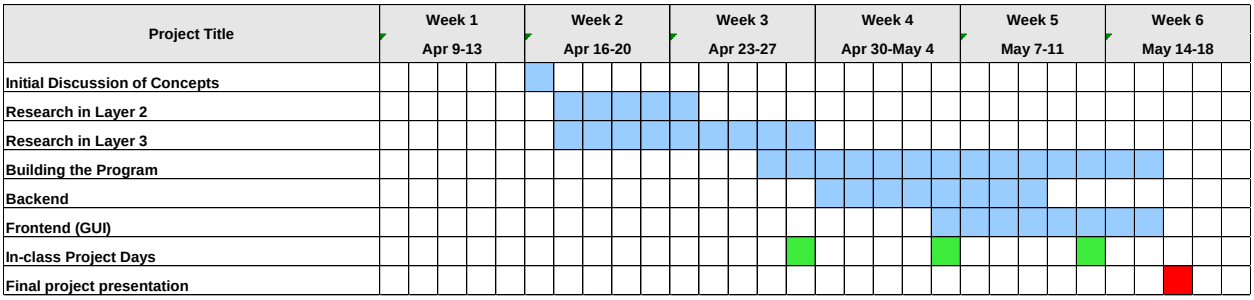


Webpage:

Net Navigator Home Access Points Devices

#	Name	MAC Address	Vendor	Channel	Locked	Data	Distance
1	belkin.a18.guests	94:10:3e:d2:4a:1b	Belkin International Inc.	1	Locked	1	-74
2	eduroam	04:bd:88:df:74:e3	Aruba Networks	6	Locked	2	-54
3	LaTech OpenAir	04:bd:88:df:74:e1	Aruba Networks	6	Open	1	-56
4	LaTechWPA2	04:bd:88:df:74:e0	Aruba Networks	6	Locked	2	-55
5	LaTech OpenAir	04:bd:88:df:78:c1	Aruba Networks	11	Open	1	-68
6	LaTechWPA2	04:bd:88:df:78:c0	Aruba Networks	11	Locked	1	-68
7	eduroam	04:bd:88:df:78:c3	Aruba Networks	11	Locked	1	-68
8	LaTech OpenAir	04:bd:88:df:a9:a1	Aruba Networks	1	Open	1	-32
9	RebeccaTX	34:97:f6:3c:71:1c	ASUSTek COMPUTER INC.	6	Locked	1	-80
10	<Hidden>	f2:9f:c2:37:03:63	Unknown	1	Locked	1	-76
11	NETGEAR91	a0:04:60:e5:89:90	Netgear	4	Locked	1	-76
12	eduroam	9c:1c:12:07:df:a3	Aruba Networks	11	Locked	1	-60
13	LaTechWPA2	9c:1c:12:07:df:a0	Aruba Networks	11	Locked	1	-60
14	LaTech OpenAir	9c:1c:12:07:df:a1	Aruba Networks	11	Open	1	-60

Gantt Chart



Our schedule dramatically changed from its initial form. We started with a snippet of code Justin had written, but we decided to go in another direction. We threw out the old code and started from scratch based on the concepts we had learned. After a little more research into the types of data we could display, we decided to focus much of our effort into layer 2 rather than layer 3. Surprisingly, the data gathering was finished before the GUI; therefore, we were able to form the GUI around the data we had. All that was left was to blend both of the programs into one.

Future Development Plans

If we were to continue working on this project, we would add support to monitor a single device, specifically, the range of the device to the ALFA card. We would also add layer 2 support and most likely add data gathered from Nmap. Also, if layer 2 support could be achieved, we would also look to add a built in server to the Pi, or have the Pi upload the webpages via FTP to another server. Finally, the GUI could be polished to look more professional and usable.

Lessons Learned

We learned that the Tkinter library can be rather unpredictable when using more than one window, implementing scrollbars, and in general, formatting data. We also learned more about layers 2 and 3 of the OSI model, and what data can be gathered on each layer. We used what we learned about class and data structures in the Living with Cyber curriculum to help us organize the data in a more formidable way. Had we not used classes within the program, this project would have been a headache. The outside research of the OSI model, packets, and frames will most definitely help us in the future courses in the curriculum.