

Capstone Sprint 1

By Sean Barrick

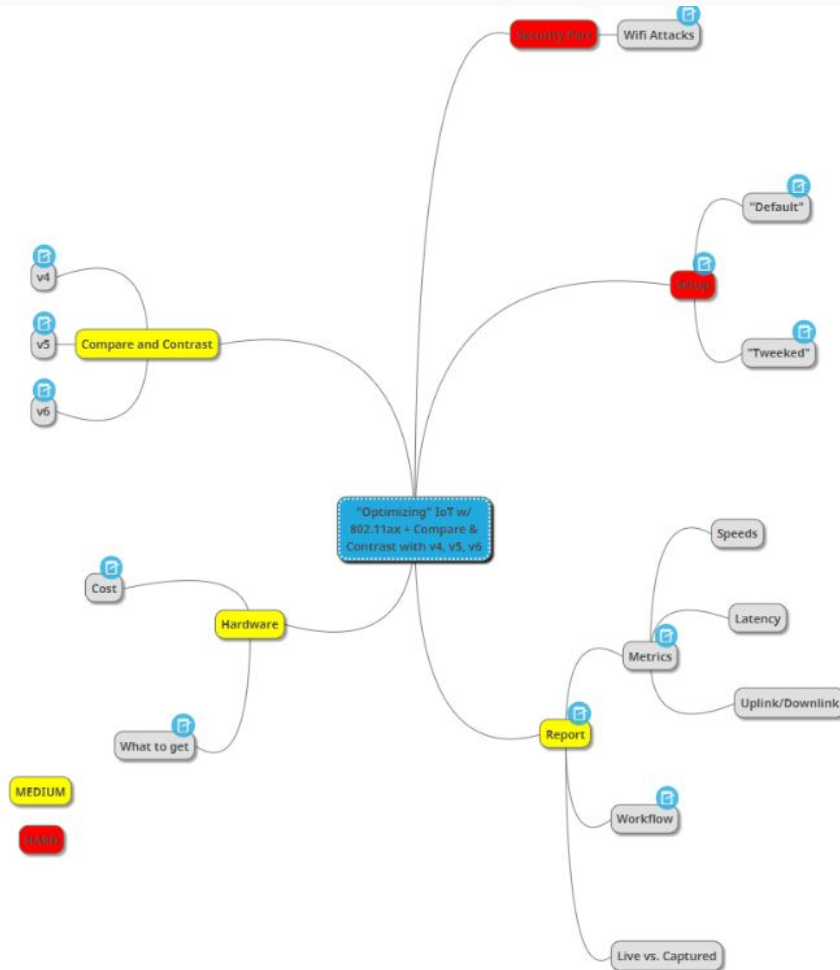


Overview

- This capstone is to optimize IoT Devices using 802.11ax, while also doing a compare and contrast against v4 and v5.
- This would seeing testing for a variety of metrics including latency, uplink/downlink, speeds, and vulnerabilities between the different versions.
- This first sprints main objectives were:
 - Initial research of metrics and Wifi
 - Hardware and costs
 - Meeting with Joe Eastman
 - Collaboration with Tom C. from Leahy Center

Initial Research of Metrics

- Initial Research was a lot to undertake. This involved researching into Wifi and how it works, the Differences and similarities between each version, and how to measure all of the tests for the final report.
- Wifi 5 was the first to use Gigabit speeds, and Wifi 6 aims to improve upon that. Though if I were to use Wifi 4, there would need to be adjustments, as it's speed is only in megabits.
- There is also the research of IoT Devices, which was supposed to be meeting with Tom C. from Leahy Center to discuss possible collaboration. This, however, didn't come through, but I will further attempt to make contact.
- There is also the research done with



- This mindmap is updated from the original on my github page.
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- This includes the project so far, and what applies to it from the meeting with Joe Eastman.

Hardware and Costs

- The sprint was also spent trying to look into the type of hardware that will be used for the tests and network overall.
- Talking with Joe Eastman, it was decided to look into having an “Antenna” attached to a laptop that would communicate with the network for the IoT Devices and router to check out the metrics and speeds.
- I’ve also tried looking into the possibility of using routers or wireless access points for the main communication of the IoT Devices. This would simulate having a home network and try to market towards consumers with Home Networks in the final report.
- The cost of it all is still being worked on, as I would look into more of the final overall network design. But it would include the purchase of the different routers/access points for wifi 4, 5, and 6, the Antenna that would monitor and capture the metrics, the network cables, and possible a Kali USB to try and simulate Wifi attacks for vulnerability testing.

Final Progress

- Final Progress is in a worse state than I would like
- A lot more research and presentation needs to be done that has not been done.
- Hardware, metrics, and network design still need to be completed
- Meeting with Joe Eastman and reaching out to Leahy Center are done, with varying degrees of success.

Adjustments

- I may end up ditching the project and doing something else.
- May move to doing security analysis with Adam Goldstein as the client.
- Though may try and see if I can pick up the project over the next week and try to salvage what I have so far.