

sdmay18-15: Building wireless lab space on a college campus

Week 4 Report

September 24 - October 7

Team MemberAlec Sauerbrei — *Curriculum Lead*Colin Ward — *Communications Manager*Hope Scheffert — *Git/Documentation Manager*Omar Taylor — *Software Design Lead*Tyler Much — *Physical Design Lead*Dalton Handel — *Networking Lead*

Summary of Progress this Report

During this period, the team has moved forward from the design thinking stage into a more practical planning stage. After a group meeting with the client-advisors, the team has developed both a parts list and a parts-to-purchase list. Using this as a jumping off point for the construction of the Faraday cages has been very beneficial for the team to think of the final product in the same way.

Dr. Mani Mina was also contacted in this period. The client-advisors let us know that Dr. Mina would be a valuable resource for the construction of the Faraday cages.

Finally, prototype cage material was purchased and tested. The 12"x42" copper mesh material prevents a cell phone wrapped within from receiving calls. The mesh also prevents the phone from responding to a ping over a LAN. Interestingly, if there is an existing connection to the phone before it is wrapped in the material, the connection won't fail. However if the connection is terminated or dropped, the phone can't reconnect again. We look forward to conducting more formal testing with this Faraday material in the coming weeks.

Pending Issues

The entire team has not yet observed the functionality of the copper mesh, as the test discussed above was only conducted by one team member. Details of the test and results will be shared at the next team meeting. Secondly, the SDR (USRP-2920) provided by the advisors is not listed in OpenBTS documentation as a recommended SDR. The team is in the process of researching what SDR's will work better in its place as well as determining if the given device is sufficient for the project requirements. Finally, after investigation, it has been found that there may be a hurdle with finding a SIM card that will automatically or easily connect with the SDR.

Plans for Upcoming Reporting Period

The parts-to-purchase list will first be sent to the client-advisors to check that it fits the budget, as well as check if the parts can be found cheaper using university connections. Due to the initial success of the copper mesh testing, the team is confident that they have started down the right path. A meeting will be scheduled with Dr. Mina soon to discuss how the team should be constructing and testing the Faraday cages. Other plans include research for SDR/OpenBTS compatibility and SIM card connectivity.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Alec Sauerbrei	Started thinking about the actual design of the labs that will be implemented with the cages once they are finished. Looked into the differences in packet setup between wifi, GSM, and ethernet communication styles to see how the packets would be parsed for a simple starting lab with use of the cages.	5	13.25
Colin Ward	Helped develop a parts list, communicated with Dr. Mina, and sourced the parts in the parts-to-purchase list. I also prepared for and presented on the Project Plan.	5.5	17.5
Hope Scheffert	Prepared slides for the Project Plan lightning talk, developed parts list and searched online for parts, worked on the design document, created and assigned tasks to team members for the upcoming weeks. Started researching Raspberry Pi 3's and how to interact with the as well as installing Linux on one.	7	15
Omar Taylor	OpenBTS research and checking if current SDR is valid.	4	11
Tyler Much	Researched and sketched prototype designs for the faraday cage. Ordered parts to prototype faraday cage. Built a prototype and tested it.	6	12
Dalton Handel	OpenBTS parts requirements and configuration research, SIM card issue research.	5	14