

# EE / CprE / SE 492 – sddec20-05

## An Advanced Networking Outreach Activity for Kids

Bi-Weekly Report #3

09/14/2020 – 09/27/2020

Client & Faculty Advisor: Dr. Tom Daniels

## Team Members

Grayson Cox | UI Developer | Agile Project Manager

Austin Dvorak | Network Systems Manager

Malcolm Johnson

Ryan Newell | Hardware Systems Admin

Spencer Parry | UI Developer

Ross Thedens | Communication Systems Manager | Meeting Secretary

## Reporting Period Summary

In this reporting period, we reignited our efforts in integrating the Janus WebRTC stream into the UserApplication, following the completion of the video stream Docker container. We continued refining the mesh network setup process, automating large parts of the setup process. We also researched and decided on the optimal battery configuration for the nodes. In the second week of this period, we presented in our first PIRM (Peer/Instructor Review Meeting), where we received feedback on ways of extending and improving our project.

## Reporting Period Accomplishments

- Video streaming Docker container (Ross)
  - Modify Docker container to remove dependency on a large tarball containing the file system
    - Use a well-maintained base image from Docker Hub instead
  - Check relevant files into Git, merge with develop branch
- Video streaming web client code (Ross)
  - Review Janus JavaScript API documentation
  - Implement JavaScript/HTML demo to obtain and display the Janus WebRTC stream from a camera node Pi
    - Use functions provided by Janus.js to open and display the stream using the IP address of the Pi
  - Begin testing UserApplication with VideoStreamingService added (with Grayson)

- Containerize network master node applications (Spencer)
  - Create separate Docker files for each of the applications
  - Create a Docker Compose file that will deploy both Docker files with one command
- Implement UI video streaming code (Grayson)
  - Use the demo code from Ross to implement VideoStreamingService in the user application.
- Mesh Network Deployment (Austin)
  - Completed Python script to configure the mesh network
  - Researched deployment options for configuration script
- Batteries and a battery hat for the Pi was chosen that met the requirements (Ryan, Malcolm)

## Pending Issues

- VideoStreamingService integration with Janus API calls is still in progress
  - Errors related to calling JavaScript functions from UserApplication (which uses TypeScript)
- Package availability used when building the Docker image is somewhat unpredictable
  - Packages may be unavailable from some mirrors, requiring the mirror to be changed before a build succeeds

## Individual Contributions

Team Member	Contribution	Reporting Period Hours	Total Hours
Grayson Cox	<ul style="list-style-type: none"><li>• Implement UI video streaming code</li><li>• Review merge request for video streaming container</li></ul>	12	44
Austin Dvorak	<ul style="list-style-type: none"><li>• Wrote python script to setup mesh network</li><li>• Researched ways to deploy python script</li></ul>	12	42
Malcolm Johnson	<ul style="list-style-type: none"><li>• Assisted in researching batteries and cases</li></ul>	12	12
Ryan Newell	<ul style="list-style-type: none"><li>• Researched batteries and choose a power hat and batteries that fit needs</li></ul>	12	36
Spencer Parry	<ul style="list-style-type: none"><li>• Create Docker files for the Bootstrap backend and the Angular front end</li><li>• Deploy both files through the creation of a Docker compose file</li></ul>	12	12
Ross Thedens	<ul style="list-style-type: none"><li>• Revise Docker container to use a base image from Docker Hub</li><li>• Implement JavaScript code to call Janus API and display a streamed video</li><li>• Test Janus API calls in UserApplication</li></ul>	12	40

## Plans for Next Period

- Complete integration of Janus module into the VideoStreamService (Grayson, Ross)
  - Video will display on each node's page of the UserApplication
- Ask ETG about Raspberry Pi cases that would fit Pi and battery hat (Ryan, Malcolm)
  - Contact Lee Harker
- Finalize and submit order for batteries and related items (Ryan)
  - Send Bill of Materials to Lee Harker
- Set the Nginx config file for the front end application to port 8081 (Spencer)
- Finish network configuration and test api on live network (Austin)