



**Knight Foundation
School of Computing
and Information Sciences**

Florida International University

Spring 2022 Senior Design Project

Network Outage Call Home

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PROBLEM

- This project is a fresh project that has not been worked on before.
- Build and connect a small device (think Arduino or Raspberry Pi) into your network. If it loses outbound connectivity, it will send alerts via a GSM network to proactively alert its owner that the network is down.

CURRENT SYSTEM

- This device monitors your network and will immediately notify you when your network goes down. The device also runs health tests to identify exactly what is making your network act up. This helps the technicians troubleshoot and significantly speeds up getting your network back up and running quicker.

REQUIREMENTS

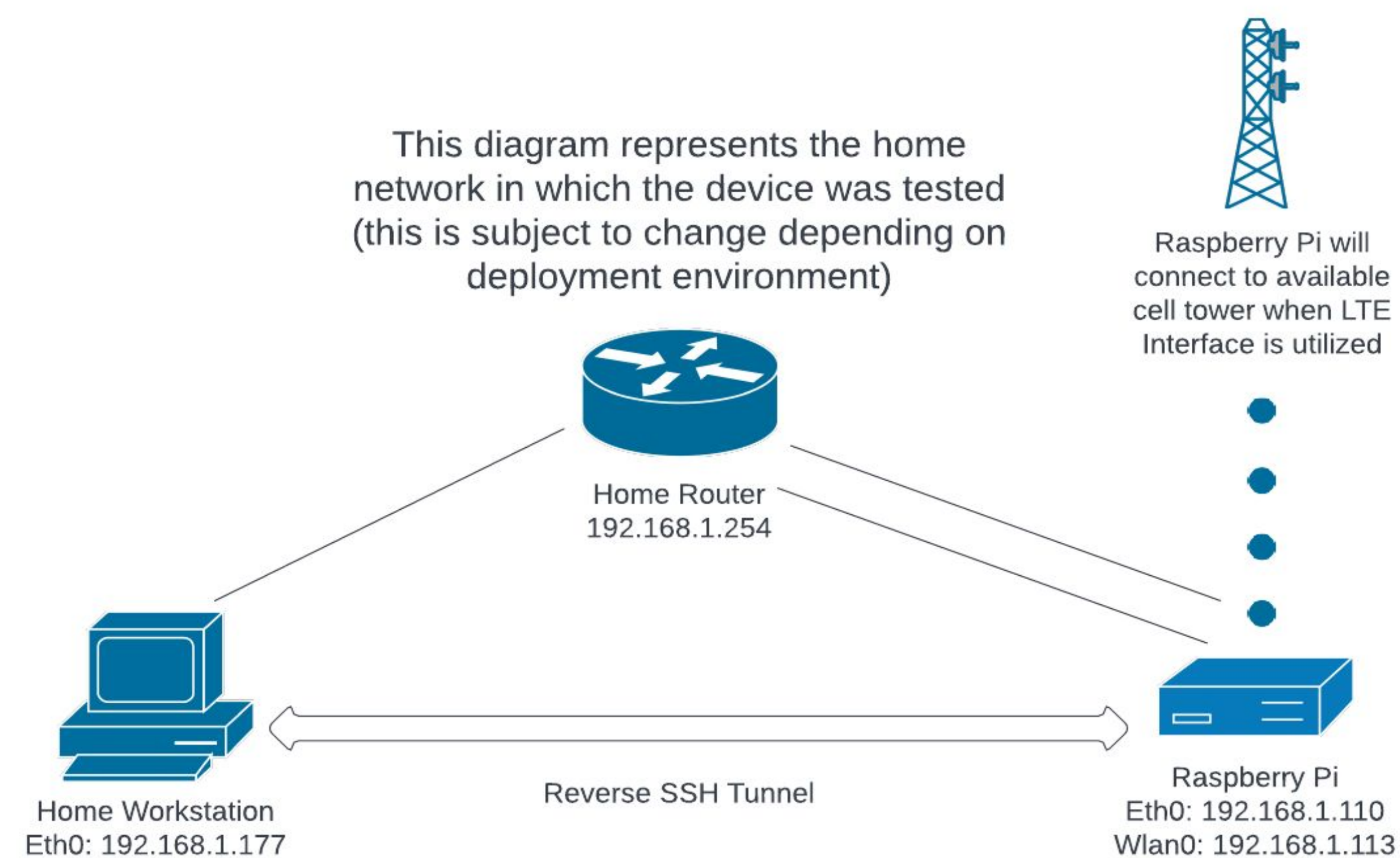
Hardware:

- Arduino Elegoo UNO R3
- Raspberry Pi 3
- Sixfab 3G-4G/LTE Base HAT

Software:

- Python 3
- VNC Viewer
- Google Docs

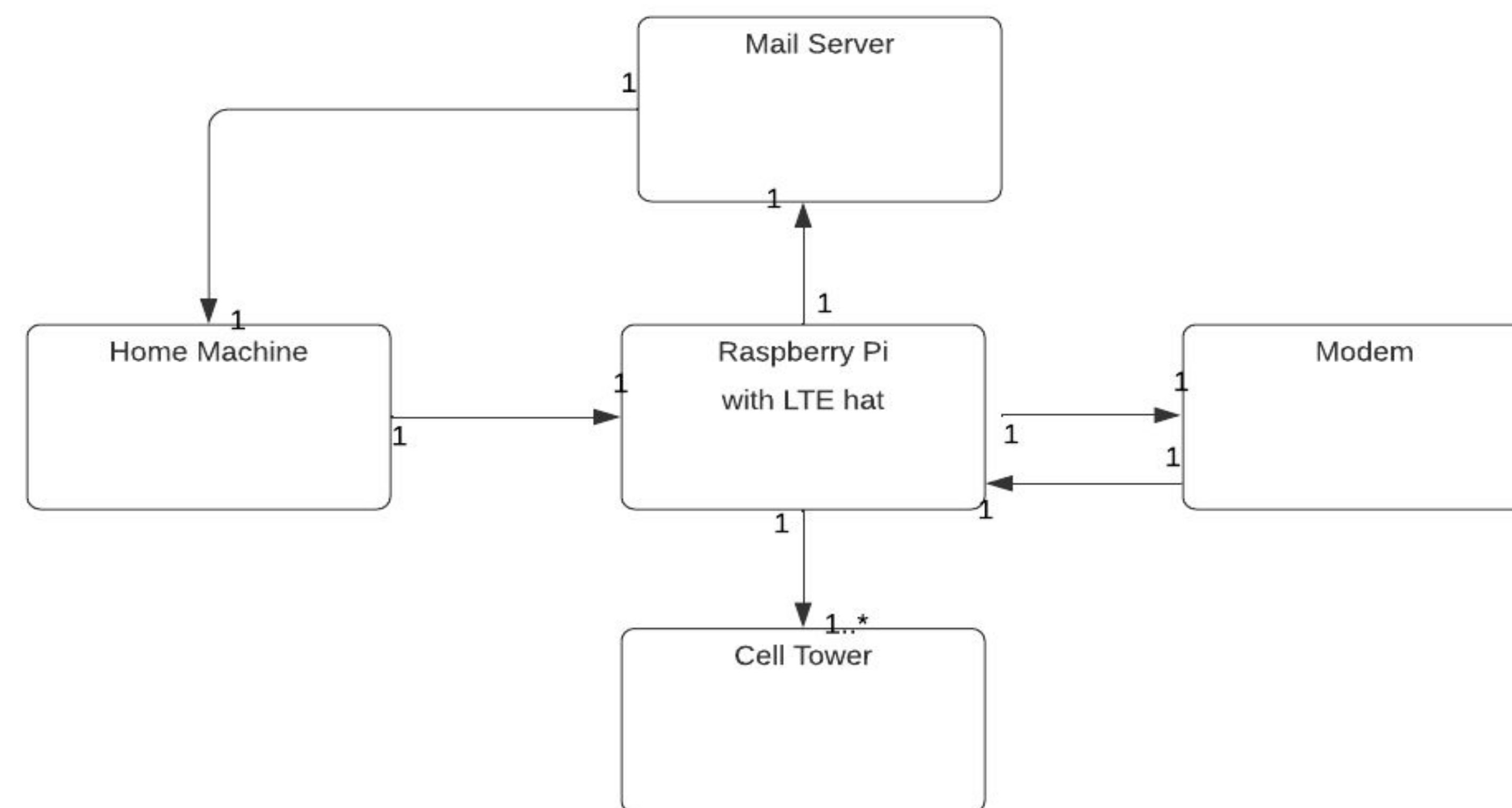
SYSTEM DESIGN



VERIFICATION

- `ssh -R 2250:localhost:22 <user@ip> -p 2280`
- Above is the command to reverse SSH into the Raspberry-Pi from whichever support device(s) are working with the Raspberry-Pi

OBJECT DESIGN



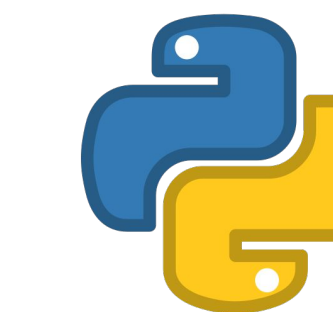
SUMMARY

- This project is the first version of a system that will be in the works for years to come.
- In the future to come this device will also be able to accurately provide network health which could help expedite an onsite technicians workload.

IMPLEMENTATION



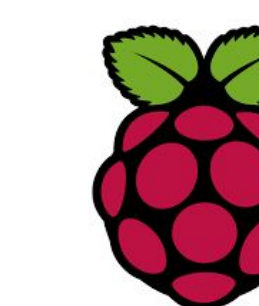
Google Docs: Kept log of everyone's progress, daily scrums, and weekly sprints.



Python 3: The main coding language used for the code for the project.



VNC Viewer: Allowed multiple users to connect to Raspberry-Pi for simultaneous working.



Raspberry-Pi OS: The OS used for the project

REFERENCES

- Reverse SSH tunneling - from start to end - jfrog connect (formerly UPSWIFT). JFrog Connect. (n.d.). Retrieved April 17, 2022, from <https://jfrog.com/connect/post/reverse-ssh-tunneling-from-start-to-end/#:~:text=Reverse%20SSH%20Tunneling%20enables%20you,have%20a%20public%20IP%20address>

ACKNOWLEDGEMENT

The material presented in this poster is based upon the work supported by Ryan Hutcheson. We thank Ryan Hutcheson for their assistance and mentorship that we received throughout the senior design project.