



Operation: RM

Radio Modem App

Presented By: William Rogers (Team Leader)
Nick Henderson
Andrew Miliza
Isaac Faulkner

Mentor: Tayyaba Shaheen

Client: General Dynamics Mission Systems

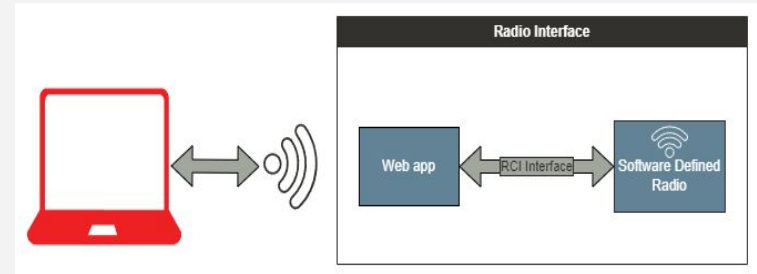


Problem Statement



GENERAL DYNAMICS Mission Systems

- GDMS has over 12,000 employees worldwide
- GDMS develops technology to assist the defense, public safety, and intelligence communities
- Efficient, tactical communication is crucial for maintaining safety
- Existing web application is difficult to use on mobile devices





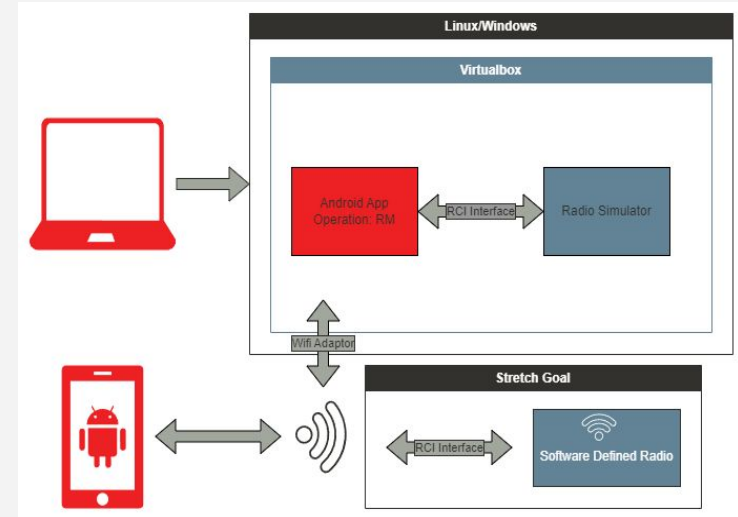
Solution Overview

Android application providing an email system that controls the radio modem

- Application mimics current web application to minimize system training
- Application will be mobile device friendly

Key Application Features

- Android OS integration
- File / Camera transmission
- Radio Connection presets
- Remote Connectivity





Requirements Overview

Functional

- File transfer between the Android application and the radio simulator

Performance

- Reliability, security, usability, color blind accessible

Environmental

- Compatible with Android 12, 13, and 14
- Java and C are utilized
- Application functional on a robust variety of screen sizes



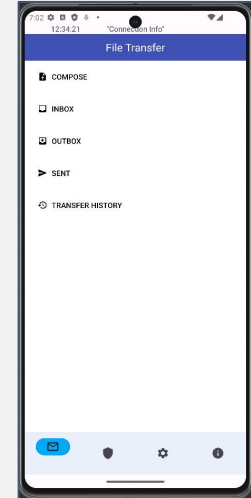
Implementation Overview

Mobile android application

- Looks similar to the current web Version
- User can navigate Inbox and Outbox ,Composition, radio modem's transfer and sent history
- Change settings in the application

File transfer

- Send file over different waveforms
- Compose and send emails to the radio modem through a queue system





Implementation Details

Front-end

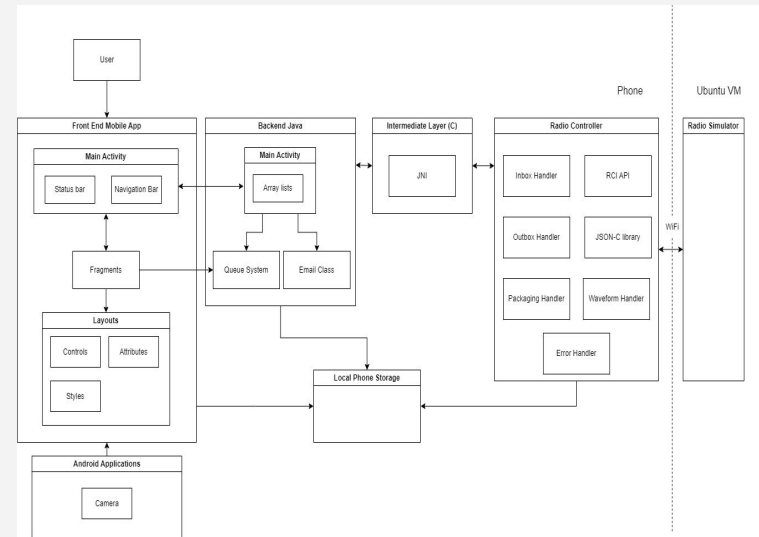
- Layered screens to support persistent data
- Android activity and fragment relationship
- Handle Android OS integration

Back-end

- JNI library support C and Java cross programming
- Communicate with radio using the provided RCI API using C
- Backend Java handles app operations

File Management

- Use Jsch library to transfer files between the app and radio by using SFTP and SSH
- Work with phone's storage to manage emails on local side





Challenges And Resolution

Challenges

- No access to version management software(git)
- Hindrances in building project inside android studio
- Trouble connecting to radio simulator
- Need of necessary resources

Resolutions

- Confluence- content collaboration
- Effective communication between group and sponsor

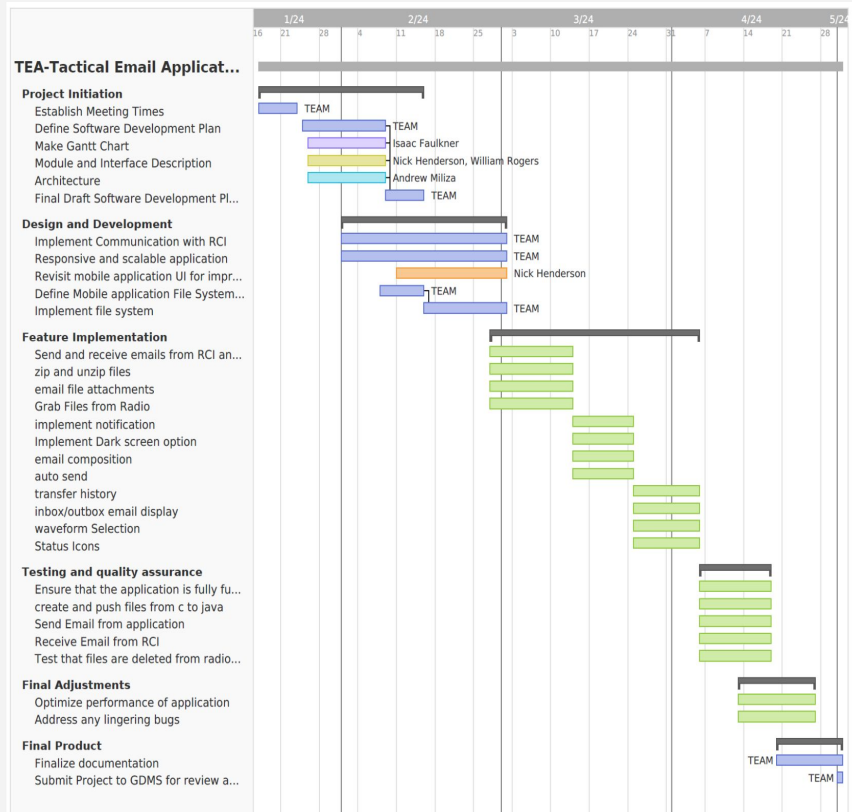




Schedule

Important Dates

- March 2nd-Design And Development
- April 5th-Feature implementation
- April 18th- Testing and Quality Assurance
- April 26th-Final Adjustments
- March 2nd - Final Product





Conclusion

- Developing a mobile android application to replace the existing web interface of a software defined radio (SDR)
- Our solution will create a more efficient and tactical manner for mobile communication with the radio modem
- Our solution needs to switch between waveforms and enable receiving and transmitting messages
- Our solution needs to be able to send emails up to 20 MB and support a queue system for outgoing messages
- We are now able to communicate with the radio modem and have solved the challenges we had previously identified