GeoBat Meshnet
Team 14

Problem Statement

- Creating portable, self-deployable, decentralized mesh network in situations like wars, tsunamis, floods, etc. to allow local area communication.

- In harsh circumstances like wars or disasters, there is a dire need to allow communication between people and the authority to carry out relief operations. In such circumstances, the mobile and internet networks are usually down. Therefore, we need a communication system between the local authorities and the people. As of today, there isn't much people can do in order to contact each other.

- Almost everybody in these situations are left absolutely helpless.

Problem Statement

Decentralized Mesh-network for communication based on Raspberry Pi nodes and B.A.T.M.A.N Advanced modules for Routing via a mobile application.

USP (Unique Selling Proposition)

- Disasters and tragedies need to be avoided at any cost, rescue operations have to be maximised

- The mesh network is secure, reliable and economical

- People in all walks of life are in absolute need of this technology

- Foreign countries are already trying to establish such disaster management technologies

- In such a big country as ours, population needs to have such an access

Solution / Methodology

- The problem solution is implemented using networking technologies, various hardware equipments and networking protocols.

- A police station/local authority in India is about 3 km radius in India on an average. For a community to be able to communicate with the police station, there is a requirement of deploying one node for that particular radius. The local authorities should be able to communicate accordingly with the citizens via those nodes.
- We have achieved the solution by breaking the problem into three parts:
1. Creating User Interface (Application)
2. Creating mesh network between nodes
3. Transferring the message through the network using protocols

Solution/Methodology
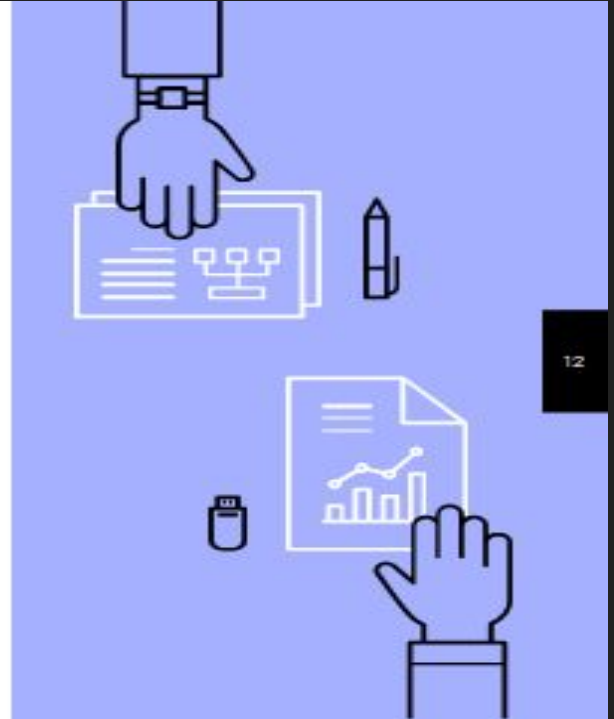
Sending Message from Mobile Application

- ▹ The application has been built using **Java** in **Android Studio.**
- ▹ This is the UI for the project.
- ▹ The message and the location is sent to the node by the TCP/IP protocol and socket programming
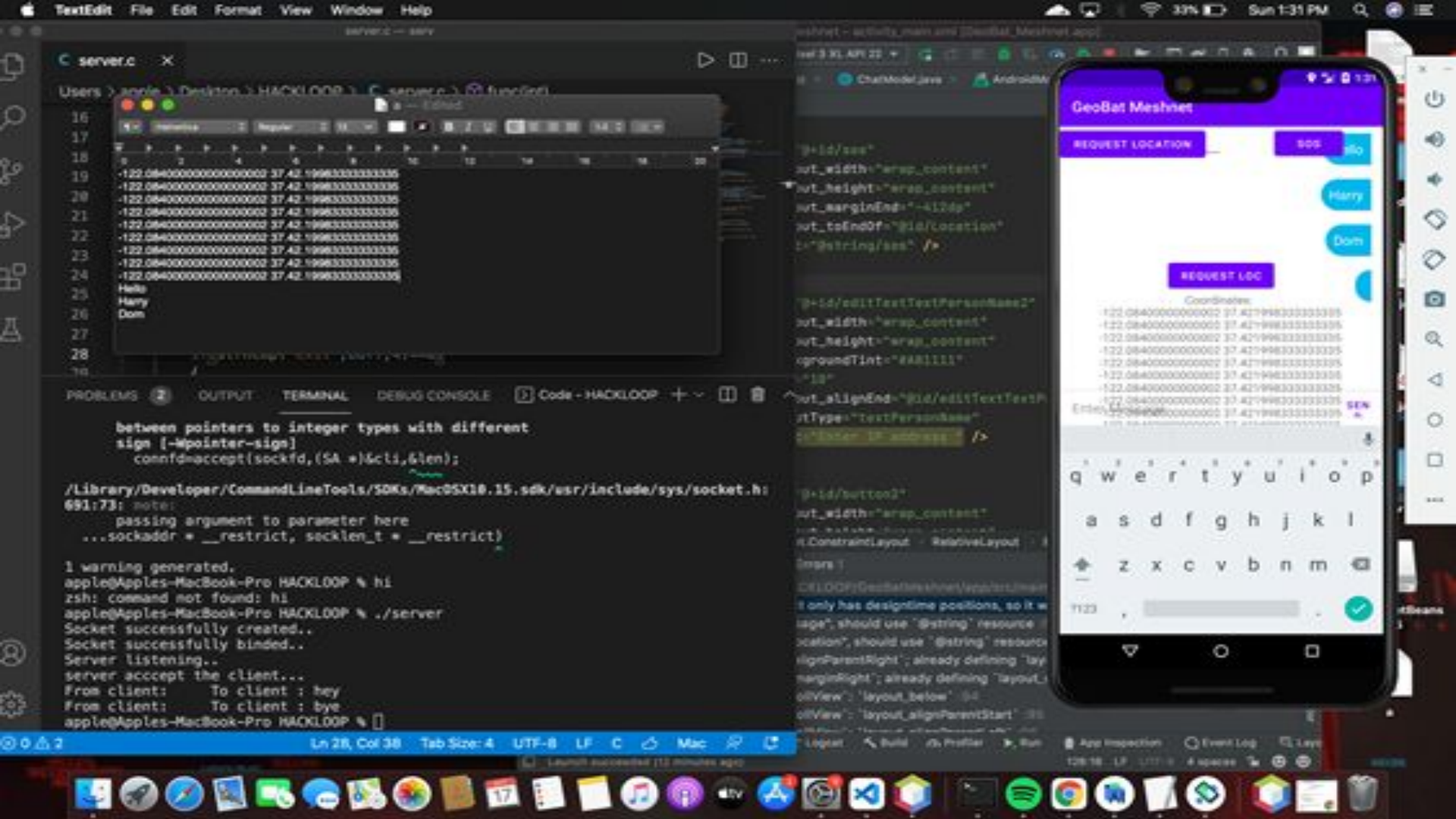- ▹ The connection between the UI and the node is being established by socket programming.
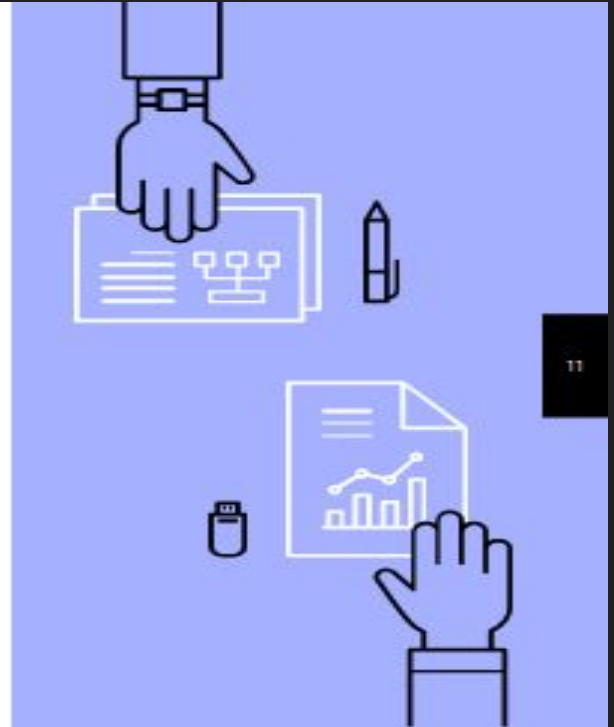
Solution/Methodology

Sending Message from Mobile Application

- The connection is made between the node and the UI by creating an ad hoc wireless network by integrating an adapter on the pi and making the pi as an access point.

- Retrieval of the GPS and message is done into a text file.

server.c — serv

C server.c

Users > apple > Desktop > HACKLOOP > C server.c > ⊗ func Get()

```
16
17
18
19    -122.08400000000002 37.42.1996333333333335
20    -122.08400000000002 37.42.1996333333333335
21    -122.08400000000002 37.42.1996333333333335
22    -122.08400000000002 37.42.1996333333333335
23    -122.08400000000002 37.42.1996333333333335
24    -122.08400000000002 37.42.1996333333333335
25    Hello
26    Harry
      Dom
27
28
```

PROBLEMS 2   OUTPUT   TERMINAL   DEBUG CONSOLE   ▷ Code - HACKLOOP

```
        between pointers to integer types with different
        sign [-Wpointer-sign]
            connfd=accept(sockfd,(SA *)&cli,&len);

/Library/Developer/CommandLineTools/SDKs/MacOSX10.15.sdk/usr/include/sys/socket.h:
691:73: note:
        passing argument to parameter here
  ...sockaddr * __restrict, socklen_t * __restrict)

1 warning generated.
apple@Apples-MacBook-Pro HACKLOOP % hi
zsh: command not found: hi
apple@Apples-MacBook-Pro HACKLOOP % ./server
Socket successfully created..
Socket successfully binded..
Server listening..
server acccept the client...
From client:      To client : hey
From client:      To client : bye
apple@Apples-MacBook-Pro HACKLOOP %
```

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GeoBat Meshnet

REQUEST LOCATION   SOS

REQUEST LOC

Coordinates
-122.08400000000002 37.42.1996333333333335
-122.08400000000002 37.42.1996333333333335
-122.08400000000002 37.42.1996333333333335
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Solution/Methodology

Connecting the Raspberry Pi nodes

- ▸ The Pi nodes are interconnected by a node mesh network
- ▸ The mesh networking is achieved by an open source module called B.A.T.M.A.N (Better Approach to Mobile Ad Hoc Network) Advanced

14
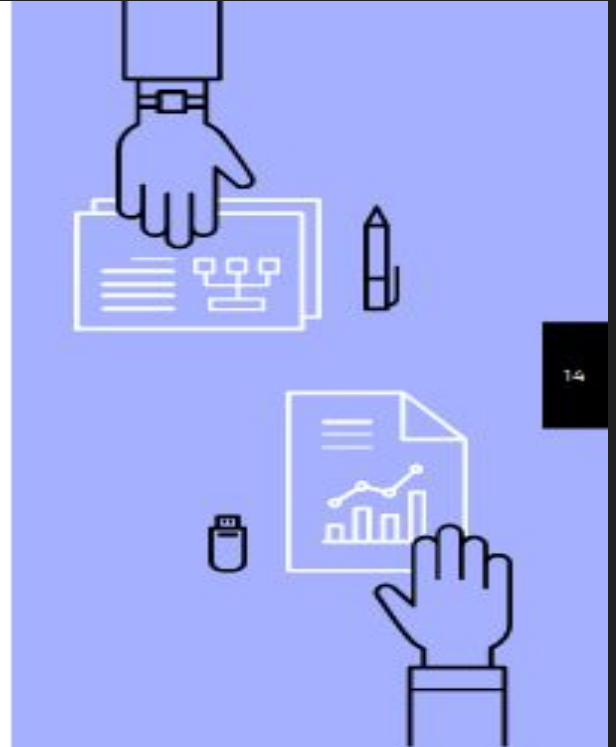
Solution/Methodology

1. The text file is retrieved by the node via the app and sent to the receiving node.
2. The receiving node then sends the message to the target user.

Solution/Methodology

Value proposition and Branding

1. The project is very unique, highly economical and of very high value as these circumstances are unavoidable for anyone.
2. It is a decentralized, self-deployable and portable mesh network
3. This project is useful for everyone and is need of the hour.
4. This project can:
a. Avoid great tragedies and shortcomings
b. Can be used very economically

Competition

- Customer market is all the communities and people in the country.

- Since the technology and idea is absolutely new, the competition in the market is minimal.

- Aerial Architecture, AI models, Image processing can be implemented as future prospects.