

- We find you and start communication.

Connect to the roaming network and receive a message right away with instructions or connect to the wireless AP.

- More accurate information faster.

Collect information relative to the situation dependent on user feedback.

- Allow for 2 way communication between mobile devices and centralized source.

Communication can be done with SMS or USSD between mobile devices or an API.

- Can track movement of users within the covered area which should be the disaster area and provide navigation assistance.

Example to husband: "Please head north along the highway until you reach the aid station, your wife is there."

Example to wife: "Please stay at the aid station, your husband is active and on his way to you now."

- Integrate with mobile service providers to allow for graceful transition during rebuild of infrastructure.

Would require handover/handoff configuration with different providers and bands.

- Can help find family and loved ones within the network using real life phone number.

Service can be provided to public through cloud and internally using USSD codes/interface.

- With a strong enough platform can also aid in recovery by catalog of images using SMS and help with insurance claims.

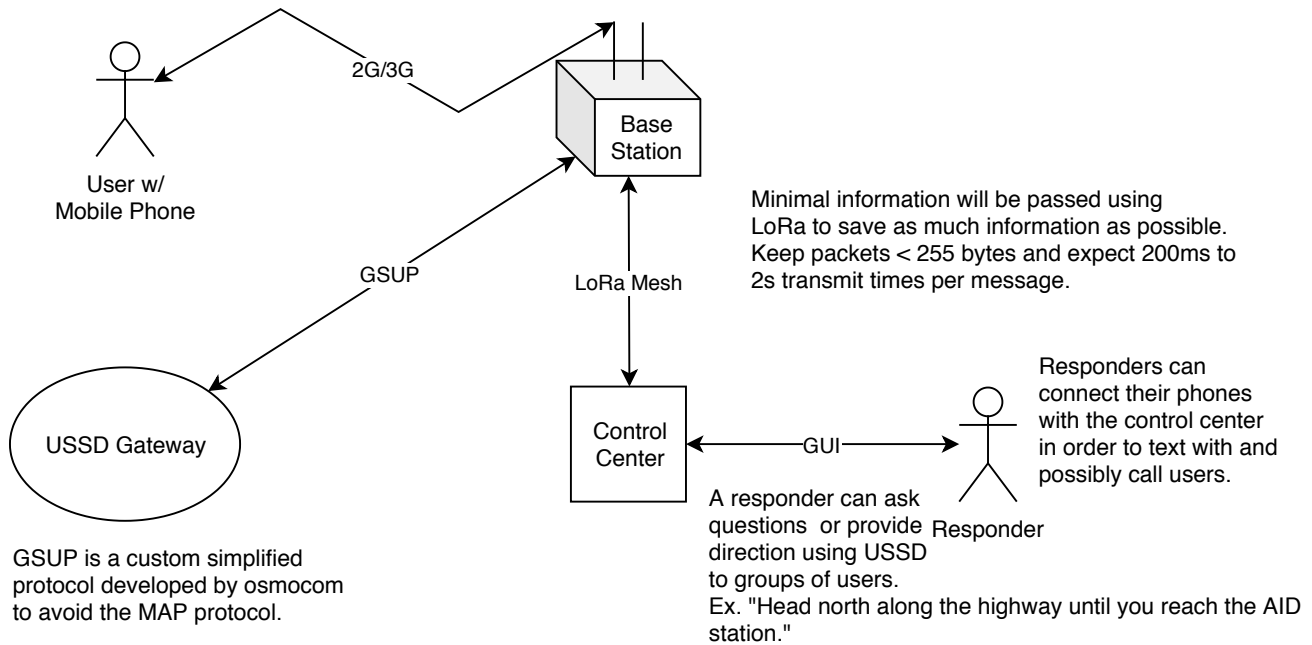
Right now a Pi and LimeSDR cannot handle the load for that many users.

- In the future can setup to provide 911 calls using a queue system if needed with call waiting, sucks but at least they get a connection.

Hopefully it will just be that the network can handle the voice calls from potential thousands of calls a second.

- System can be upgraded and expanded upon to provide SMS AI powered communication much like USSD.

Current system will allow for emergency personal to SMS with users.



You have connected to an emergency response station, to continue please call:
*911#

User dials *911#

Provide i18n support for multiple languages.

Once a user dials the USSD code it will start a session for information gathering and classification of their needs. This can be connected to AI chatbot for optimal information gathering and recon.

The session can be started right away but it is best to start with manual initiation until exact resources can be determined, USSD opens a session and if started right away it would need to timeout before another one could be started once the max is reached.

Are you severely injured? Dial:
*1# for Yes
*2# for No

User dials *2# for No

For example, if the user is injured and needs medical assistance this can forward the MSISDN of the user on the local network to a medical responder that can begin communicating with the user to gather further information and provide assistance until rescue.

How many others are with you? Dial *1# if you are alone or *N# where N is the number with you.

Etc...

The automated system can be used to help emergency responders gather the information they need from "agents in the field".

The USSD gateway system can also be set up to gather missing persons information that can be used to collect a phone number and compare against IMSI numbers currently on the local emergency network.

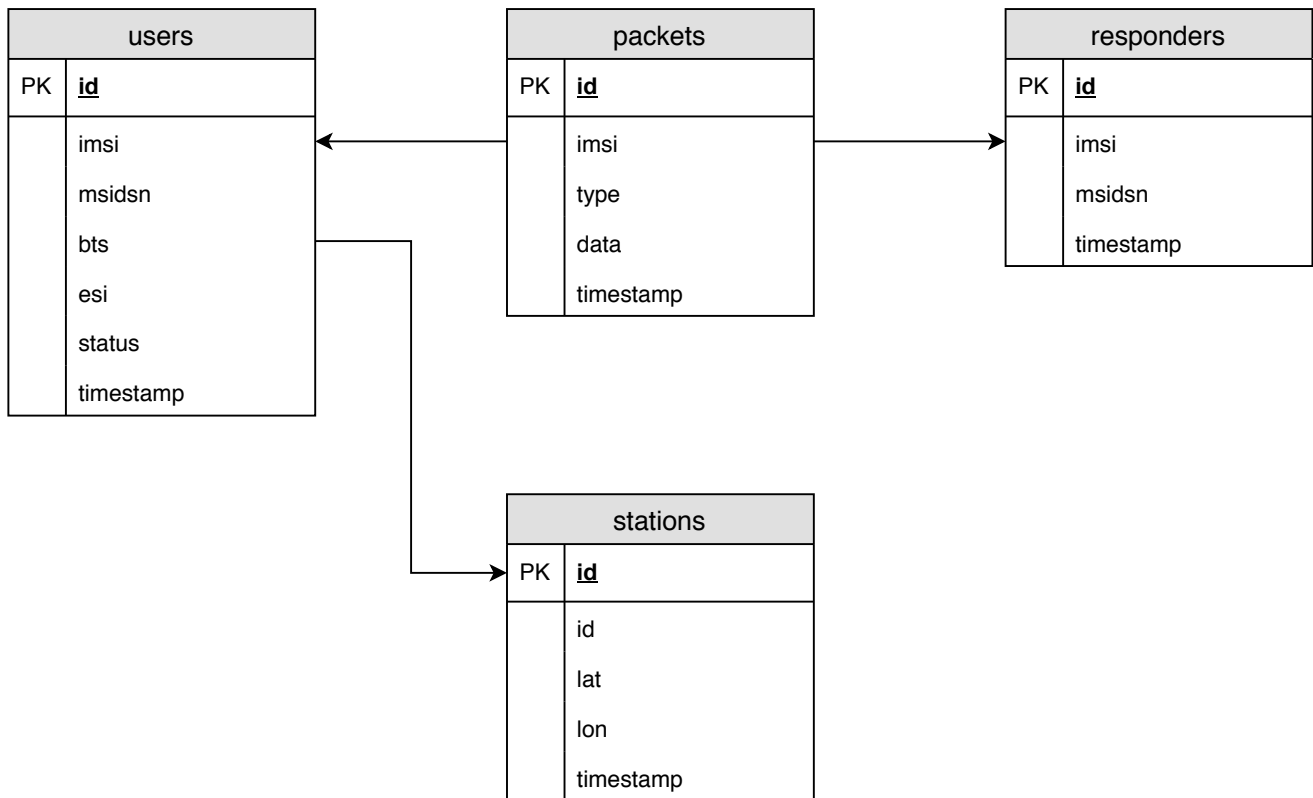
We can track what base station a user is connected to and watch their migration between nodes to calculate an estimated position of the user or group.

BTS w/o Pwr
& Gain
50-100ft

WiFi
~50-150ft

BTS w/ Pwr & Gain
~300-1500ft

Commercial Hardware
<30miles



Terms

CC = Control Center

BTS = Base Transceiver Station

Users

esi = Emergency Severity Index

status = 0 inactive, 1 active

Packets

type = 1 byte Packet Type (see LoRa Proto)

Notes

- All packets will be stored on the control center for audit.
- Basic flow is an IMSI is assigned a MSIDSN by the BTS but might change if already taken by the CC.

LoRa Mesh

- Each node will keep track of all reported BTSs and their sequence.
- When a packet is received from a BTS the sequence is updated.
- Previous sequence numbers are ignored and not relayed.
- Messages are relayed the first time they are seen.

LoRa Addresses (1 byte)

0xA0 = Control Center
0x10-0x90 = BTS

Packet Layout (Byte(s) = Note)

1 = Destination Address
1 = Source Address
4 = Sequence Number - prevent relay of already seen packets
4 = Timestamp (seconds epoch)
1 = Packet type - see below
<200 = Packet payload - the actual data for use

Packet - Payload Types (Byte)

0x10 = Register BTS with control center
0x20 = New IMSI registered on system
0x30 = New MSISDN assigned to IMSI
0x40 = *911# user information from USSD questions
0x50 = Responder SMS to User
0x60 = User SMS reply to Responder

Packets (Byte(s) = Note)

0x10 = Register BTS

4 = Latitude

4 = Longitude

0x20 = New IMSI

15 = IMSI

~~4 = MSISDN - might be reassigned by CC, does not work~~

~~* If send by CC then add to database, could be responder from CC~~

Not currently working in osmo gsup client decode, null value.

0x30 = Respond with MSISDN for New IMSI

15 = IMSI

4 = MSISDN

* If MSISDN is not the same the BTS should change it.

0x40 = *911# user response information

15 = IMSI

1 = ESI

0x50 = Responder SMS

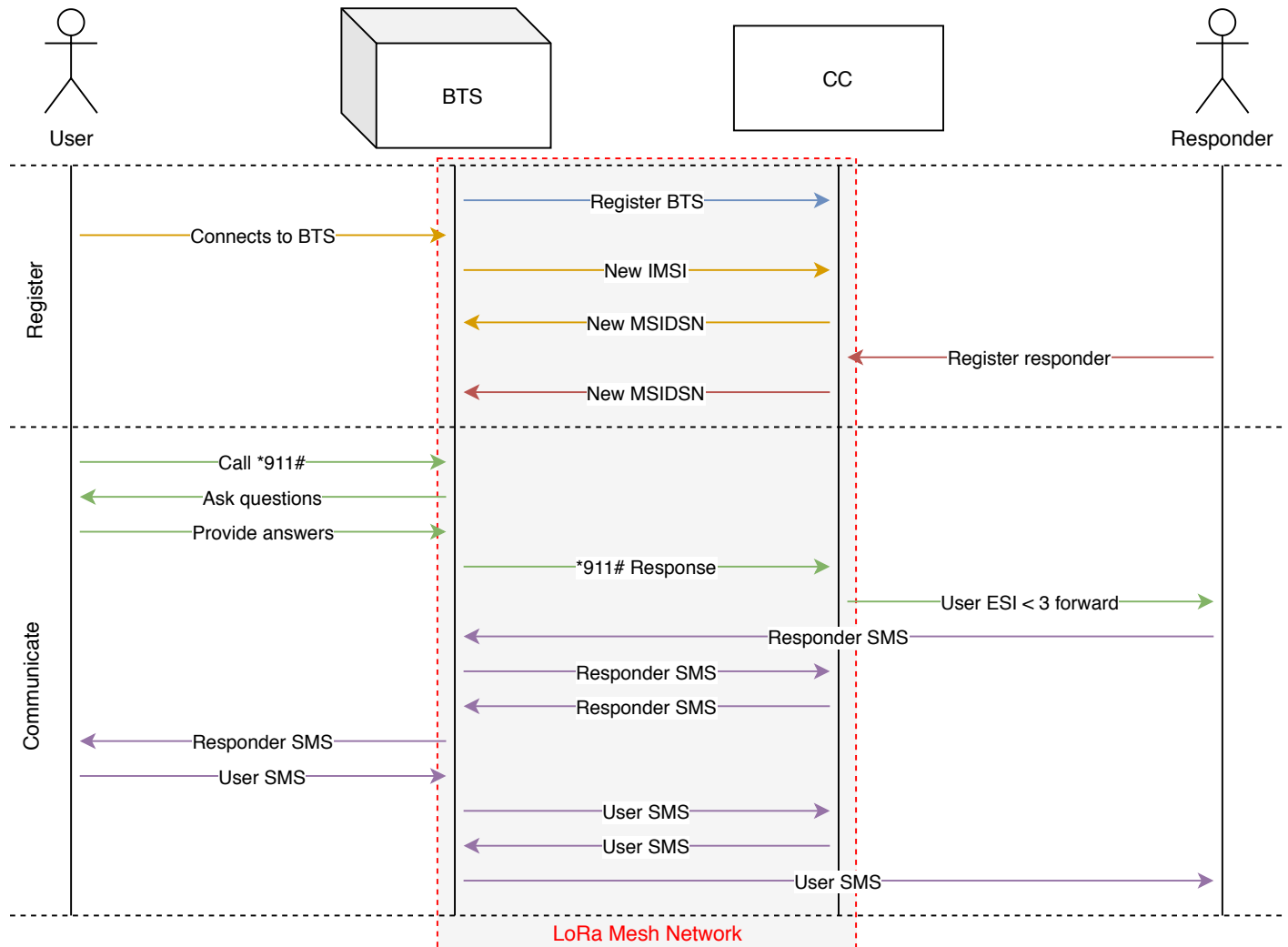
15 = IMSI

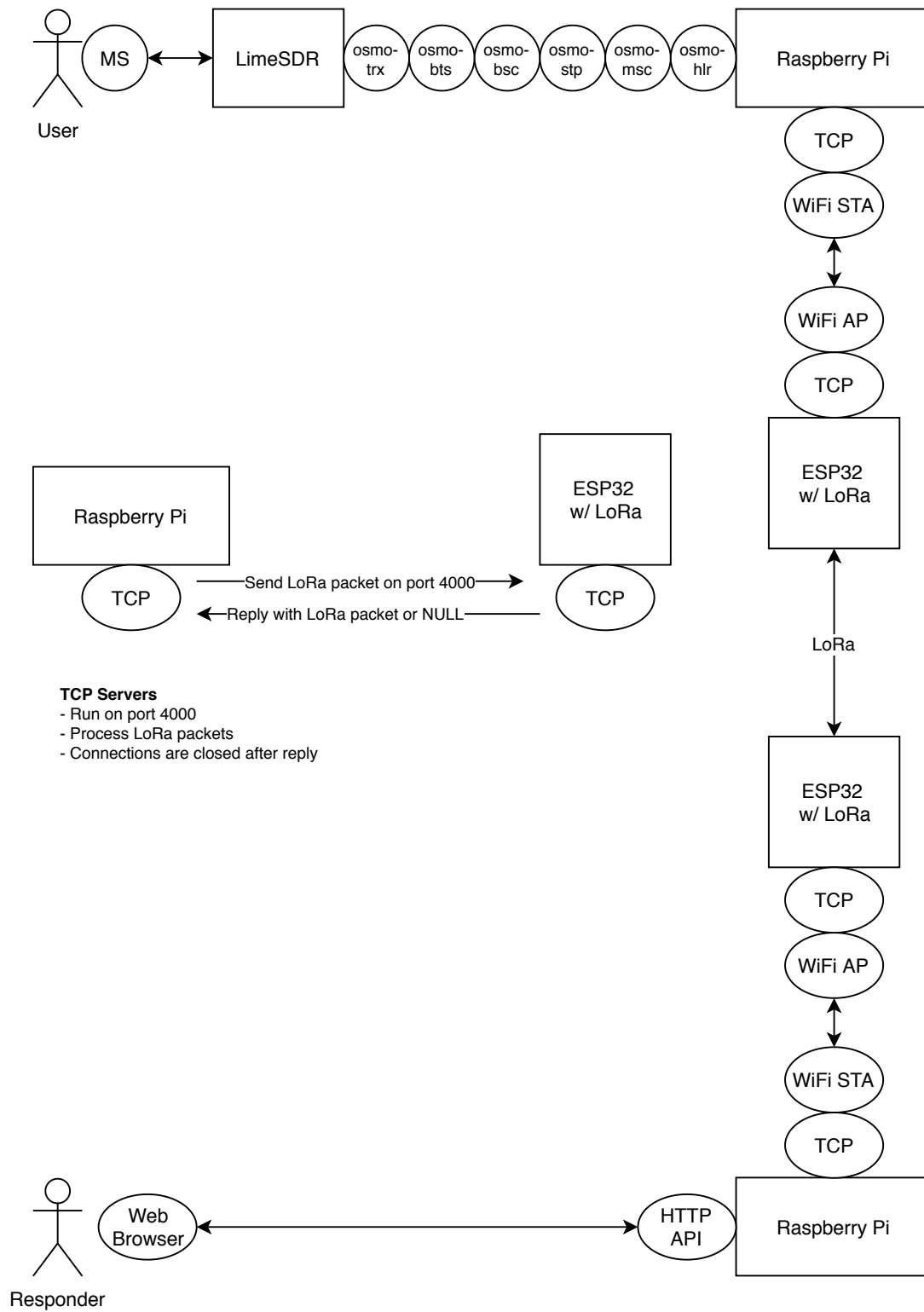
<=185 = Message

0x60 = User SMS response

15 = IMSI

<=185 = Message





Map

MAP

Provide filterable interface for:

- Base stations: mobile devices, active devices, lat & lon, etc.
- Users: emergency, group, etc.
- Responders: medical, general, electrical, etc.
- Drone/Balloons: lat & lon, power, speed, other feed, etc.
- Weather: wind, rain, snow, smoke, fog, etc.
- Elevation: where to deploy and evacuate, etc.

Resources

Resources

Manage different resources:

- Users: CRM, Navigation, Session, etc.
- Base Stations: configuration, power, load, etc.
- Drone/Balloon: sync, configure, etc.
- Responders: types, phones, services, etc.
- Food/Drink: where and who, etc.

Communications

Communications

Provide simple Twitter meets multiple choice communication using USSD.

Configure emergency responder MSISDN for forwarding.

USSD allows for automation and requires fewer resources than SMS.

This is where the language to use for USSD will be selected.

The communication templates will be chosen here for USSD.

Communication templates can be programmed using a simple UI.

Threads for each IMSI and communication in them here.

Integrations

Integrations

Setup integrations with the control center for the current disaster.

- Commercial mobile service providers to allow for the handover of users to the correct network while infrastructure is being rebuilt.
- Database configuration: sqlite3 or cloud
- Cloud Security configuration: keys, logins, etc.
- Data aggregation: FEMA data, alert systems, etc.
- 911 integration to allow for 911 features.

Toolbar

Menu
- View Map
- Responder
Management

Map Filter & Controls

Search

Map List
Allows for easy access
to the different things
listed on the map.

Map
Online/Offline Map