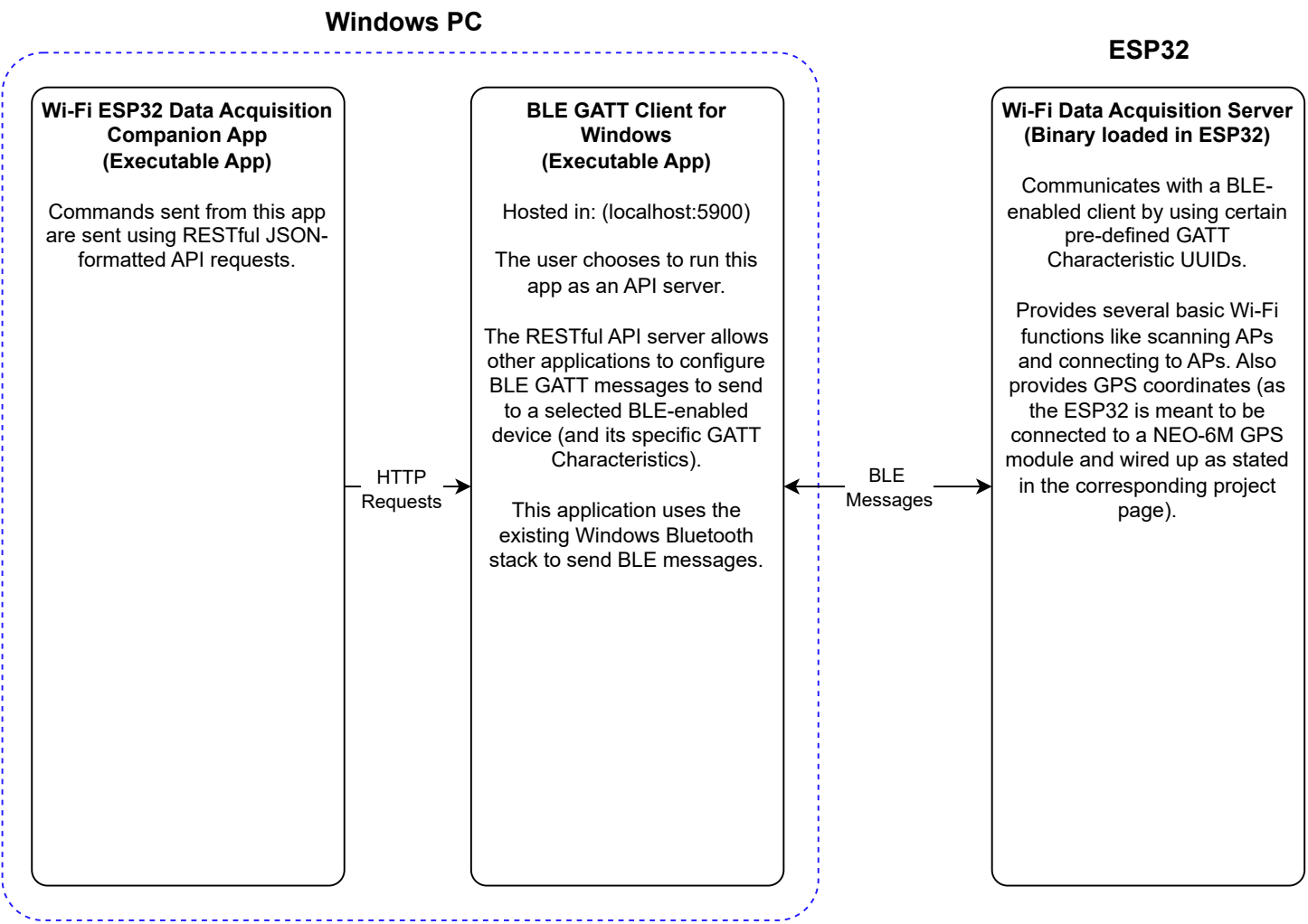
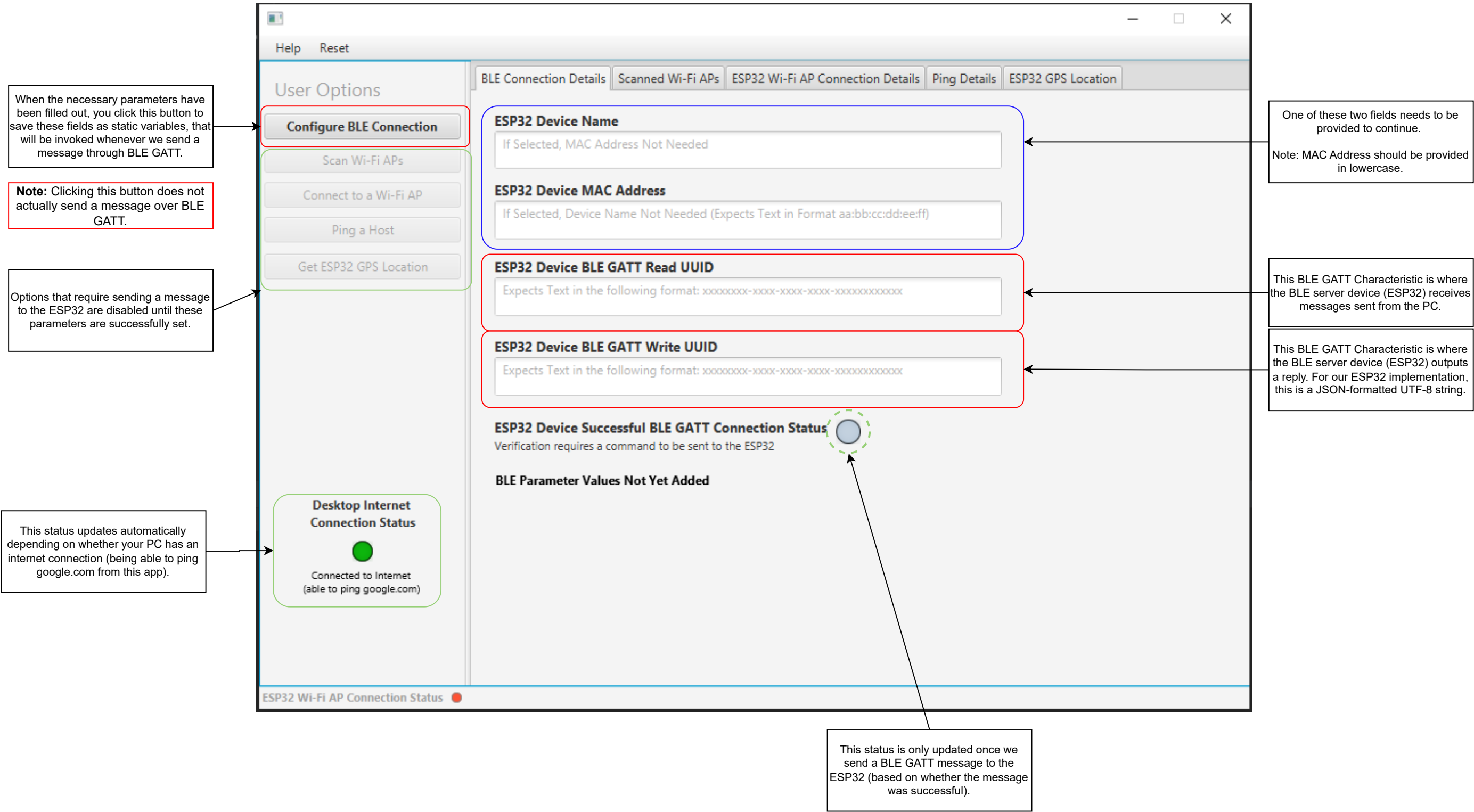


Project Applications Coordination

For this application to work, several Software projects (links given on Project README.md) need to be run and configured correctly.



BLE Connection Details Tab



Scanned Wi-Fi APs Tab

Help Reset

User Options

Configure BLE Connection

Scan Wi-Fi APs

Connect to a Wi-Fi AP

Ping a Host

Get ESP32 GPS Location

Desktop Internet Connection Status

● Connected to Internet (able to ping google.com)

ESP32 Wi-Fi AP Connection Status

BLE Connection Details | Scanned Wi-Fi APs | ESP32 Wi-Fi AP Connection Details | Ping Details | ESP32 GPS Location

▼ [Redacted]

Pairwise Cipher: CCMP
Channel: 3
Received Signal Strength Indicator (RSSI): -54
Wi-Fi AP Manufacturer: Technicolor Delivery Technologies Belgium NV
Group Cipher: CCMP
SSID: [Redacted]
MAC Address: [Redacted]:59
Authentication Mode: Wi-Fi Protected Access 2 Pre-Shared Key (WPA2 PSK)

- ▶ [Redacted]
- ▶ DIRECT-27-HP ENVY Pro 6400
- ▶ [Redacted]
- ▶ [Redacted]
- ▶ [Redacted]
- ▶ [Redacted]
- ▶ [Redacted]
- ▶ [Redacted]
- ▶ [Redacted]
- ▶ Wi-Fi AP Not Found
- ▶ Wi-Fi AP Not Found
- ▶ Wi-Fi AP Not Found

Attempt to Find Wi-Fi Router OEMs (Requires Desktop Internet Connection)

Wi-Fi AP 1 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

Wi-Fi AP 2 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

Wi-Fi AP 3 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

Wi-Fi AP 4 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

Wi-Fi AP 5 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

Wi-Fi AP 6 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

Wi-Fi AP 7 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

Wi-Fi AP 8 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

Wi-Fi AP 9 is a:
Mobile Device Regular Router
Estimate ESP32 distance from Wi-Fi AP

This button can be pressed when the BLE GATT parameters have been configured using the "BLE Connection Details" Tab. It commands the ESP32 to perform a Wi-Fi AP scan.

The user can select the type of device of the AP (requires user discretion). The type of device affects the distance calculations as it changes the assumed transmission power of the Wi-Fi signal.

This button becomes enabled after a successful Wi-Fi AP scan and if the PC is connected to the internet. An API call is sent to an online server to attempt to find the vendor/manufacturer of all APs. Then the vendor is added to the data fields for each AP.

[illegible]

ESP32 Wi-Fi AP Connection Details Tab

The screenshot shows a web interface for managing an ESP32's Wi-Fi connection. The interface includes a sidebar with 'User Options' and a main content area with tabs for 'BLE Connection Details', 'Scanned Wi-Fi APs', 'ESP32 Wi-Fi AP Connection Details' (selected), 'Ping Details', and 'ESP32 GPS Location'.

User Options:

- Configure BLE Connection** (disabled)
- Scan Wi-Fi APs** (disabled)
- Connect to a Wi-Fi AP** (highlighted with a red box and a green border; annotated with: "This button can be pressed when the BLE GATT parameters have been configured using the 'BLE Connection Details' Tab. It commands the ESP32 to temporarily connect to an AP.")
- Ping a Host** (disabled)
- Get ESP32 GPS Location** (disabled)

Desktop Internet Connection Status: A green circle indicates the device is "Connected to Internet (able to ping google.com)".

ESP32 Wi-Fi AP Connection Details:

- Connect the ESP32 to a Wi-Fi Access Point:**
 - Wi-Fi Access Point SSID:** A text input field (highlighted with a blue box).
 - Wi-Fi Access Point Password:** A text input field (highlighted with a blue box; annotated with: "Both fields need to be provided for a successful connection (unless a completely open Wi-Fi network is being used).")
- ESP32 Wi-Fi Connection Details:** A green-bordered box containing:
 - ESP32 IP Address in the Network:** 192.168.0.30 (annotated with: "Populated with the DHCP-allocated IP address leased to the ESP32 when it successfully connected (might change on subsequent commands).")
 - ESP32 IP Subnet Mask in the Network:** 255.255.255.0
- ESP32 can connect to Wi-Fi AP:** A blue box with "[AP Credentials Saved]" next to it.
- ESP32 Wi-Fi AP Connection Status:** A green circle with a dot (highlighted with a green box; annotated with: "The status is updated based on either a successful Wi-Fi connection or a failed connection.")

Ping Details Tab

HelpReset

User Options

Configure BLE Connection

Scan Wi-Fi APs

Connect to a Wi-Fi AP

Ping a Host

Get ESP32 GPS Location

Desktop Internet Connection Status

Connected to Internet
(able to ping google.com)

ESP32 Wi-Fi AP Connection Status

BLE Connection DetailsScanned Wi-Fi APsESP32 Wi-Fi AP Connection DetailsPing DetailsESP32 GPS Location

Select a Host to Ping (Can be an IP address or a Hostname/URL)

google.com

Ping Details

This list of data corresponds to the outcome of a single ICMP echo request from the ESP32 to the selected host.

Host IP Address: 142.250.70.238

ICMP Request Time-to-Live (TTL): 57

ICMP Request Sequence Number: 1

ICMP Request Elapsed Time (ms): 56

This button can be pressed when the BLE GATT parameters have been configured using the "BLE Connection Details" Tab, and if the ESP32 was successful in connecting to a Wi-Fi AP. It commands the ESP32 to send an ICMP echo request to a host.

Field needs to be provided.

Populated with the details of an ICMP echo request sent to the selected host.

ESP32 GPS Details Tab

This button can be pressed when the BLE GATT parameters have been configured using the "BLE Connection Details" Tab. It commands the ESP32 to send the GPS location that has been registered by the NEO-6M module.

If the GPS value returned from the ESP32 is valid, the GPRMC sentence is parsed and reflected on the GUI.

To use this feature, the user must create a Geoapify account and then register for a Reverse Geocoding API Key.

With a valid API Key, we can send an API call to find the address corresponding to the GPS Coordinates returned from the ESP32. This feature requires an internet connection.

An address is returned if the online API can resolve the given GPS coordinates to an address,

This feature requires internet. The API that is called tries to convert the given IP address of your PC (or your network AP) into a set of coordinates.

Note: Due to how ISPs provide internet services, the node that has external access to the WWW may be geographically far away from your actual PC. For this reason, this feature is currently very inaccurate.

HelpReset

User Options

Configure BLE Connection

Scan Wi-Fi APs

Connect to a Wi-Fi AP

Ping a Host

Get ESP32 GPS Location

Desktop Internet Connection Status

Connected to Internet
(able to ping google.com)

ESP32 Wi-Fi AP Connection Status

BLE Connection DetailsScanned Wi-Fi APsESP32 Wi-Fi AP Connection DetailsPing DetailsESP32 GPS Location

ESP32 GPRMC Sentence (GPS Data)

Raw GPRMC Sentence:
\$GPRMC,021940.00,A,34.0000,E,0.383,13.00,0.0,0.0,0.0,0.0

Status: Active
Fix Taken (UTC): 02:19:40.00
Track Angle in degrees (True): 138.0
Latitude (numeric coordinates): -34.0000
Date (From GPRMC Message): 13-07-24
Longitude (verbose): 138 deg 00.0000
Latitude (verbose): 34 deg 00.0000
Longitude (numeric coordinates): 138.0000
Speed over the Ground (knots): 0.383

Attempt to find Address on Geoapify

This feature requires a PC internet connection

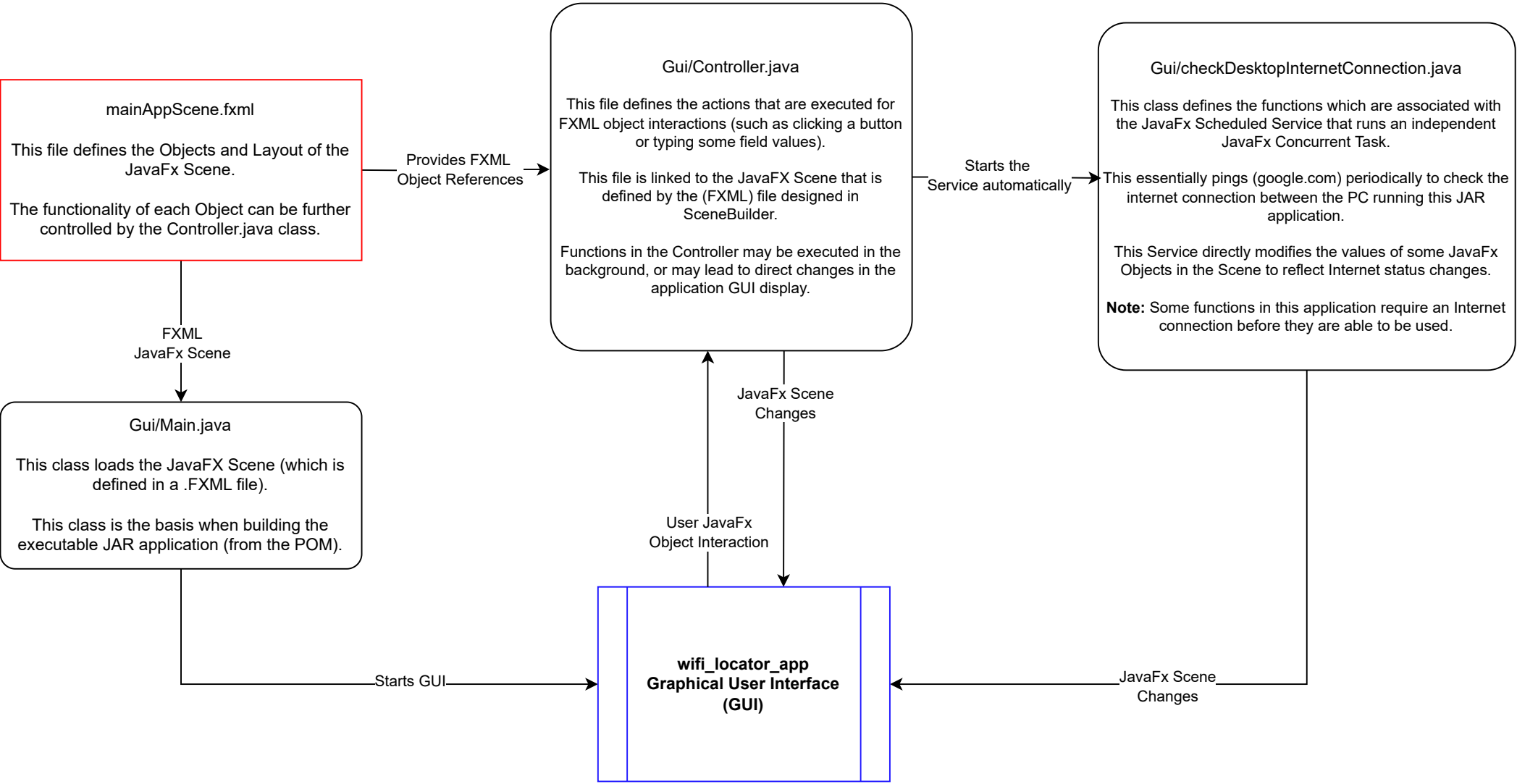
Found Address: 34.0000, 138.0000 Australia

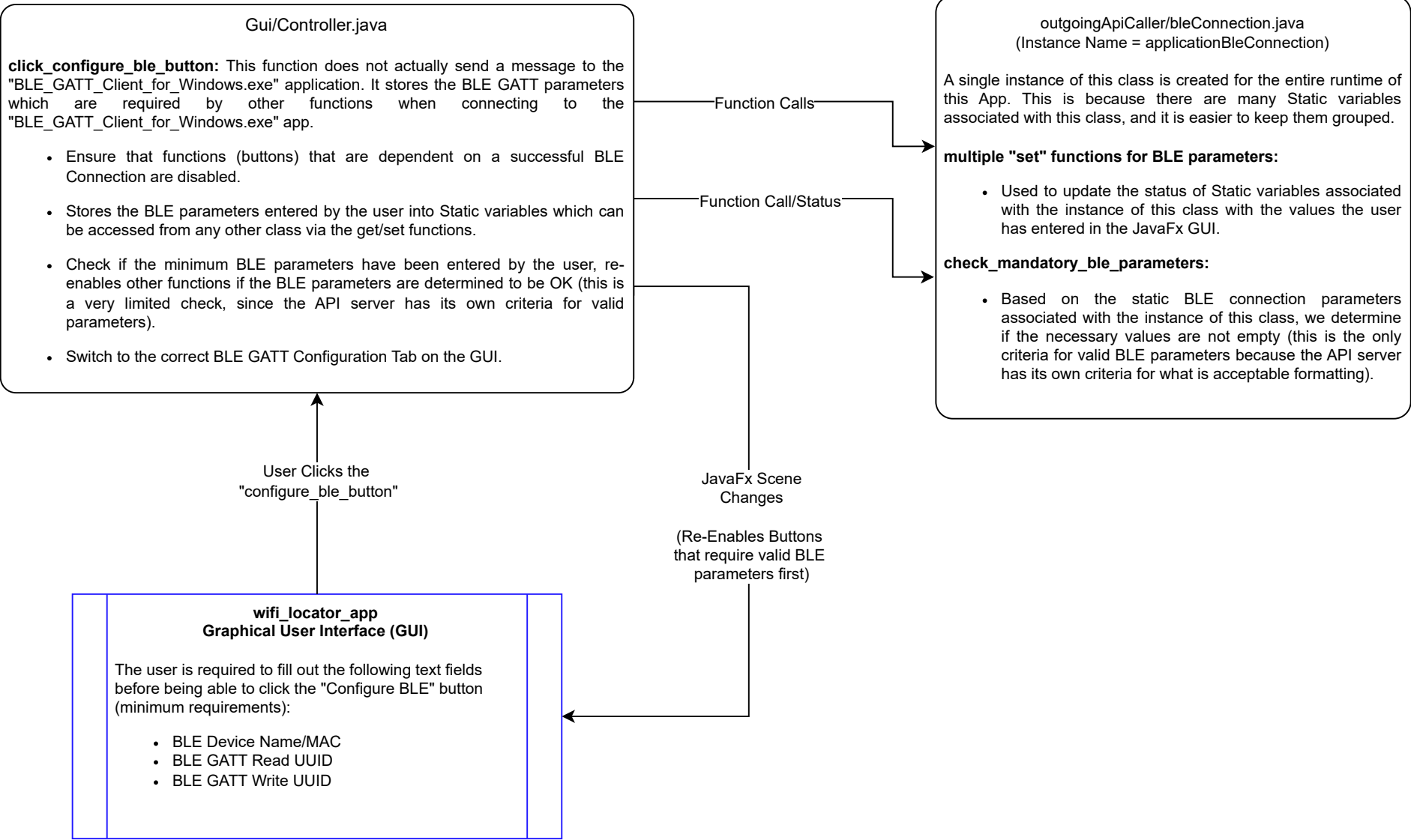
Attempt to Find PC Coordinates

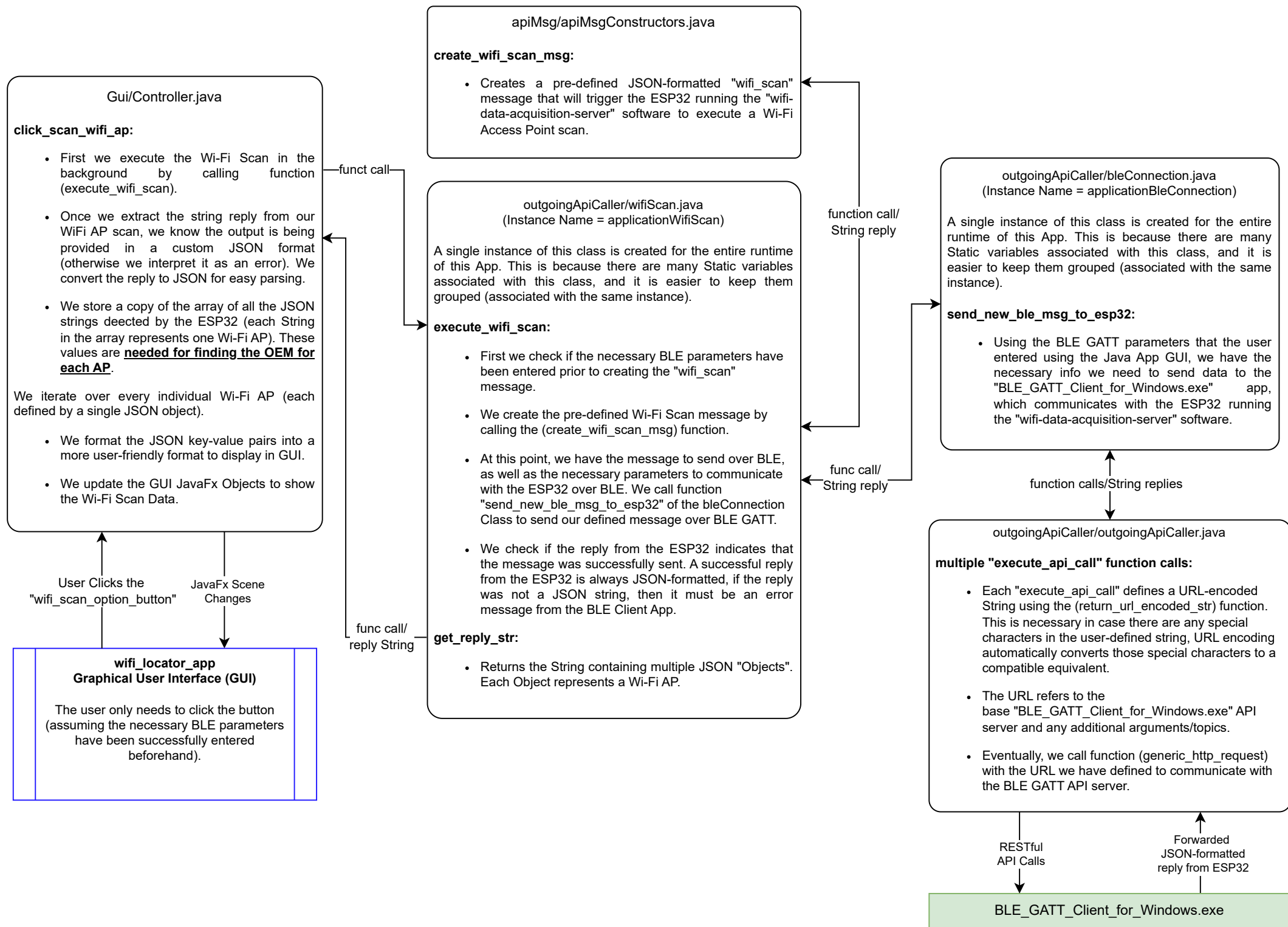
This feature requires a PC internet connection

API response based on Computer (and respective WAN)
IP Address does not have the accuracy to calculate distance between ESP32 and PC based on coordinates.

To be filled when Button is pressed







This button is only enabled if the user:

- Has made a successful Wi-Fi AP scan with the ESP32
- Has an internet connection.

