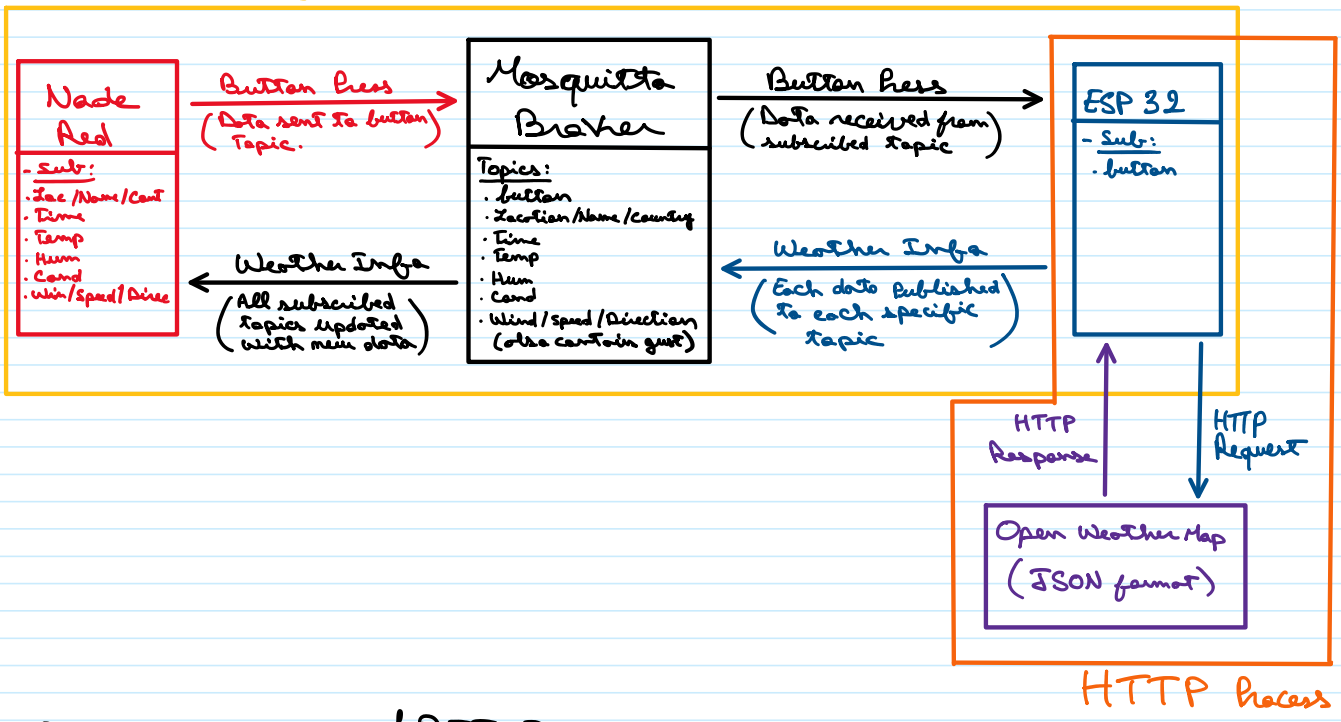
Project Report - Nadim Dib, Rami Mezher

Wednesday, 7 December 2022 11:12 am

* System Level Architecture :



> Description of MQTT Topics used :

1) **Button Topic :** - ESP32 subscribed to it.
   - Each button press updates topic and notifies ESP32 client that weather data is being requested.
   - Button press published by Node Red.

2) **Location/Name/country :** - Published by ESP32 client.
   - Subscribed by Node Red Client.
   - Contains city and country.

3) **Time :** - Published by ESP32 client.
   - Subscribed by Node Red client.
   - Contains time of last reading.

4) **Temp :** - Published by ESP32 Client.
   - Subscribed by Node Red Client.
   - Contains temperature reading.

5) **Hum :** - Published by ESP32 Client.
   - Subscribed by Node Red client.
   - Contains humidity reading.

6) **Cond :** - Published by ESP32 Client.
   - Published by Node Red Client.
   - Contains condition description.

7) **Wind/Speed/Direction :** - Published by ESP32 client.
   - Published by Node Red Client.
   - Contains wind speed, direction and gust (if available).

* Description of ESP32 HTTP/MQTT client:

> wifi_event_handler: - Checks for wifi connection and IP address status.

> wifi_connection: - Specify which wifi to connect to.
- Connects to it provided SSID and password.

> client_event_get_handler: - When data received in packet form
↳ store it in char buffer and concatinate it to an other buffer until we get full response.

> rest_get: - get request from the URL we specify to it.

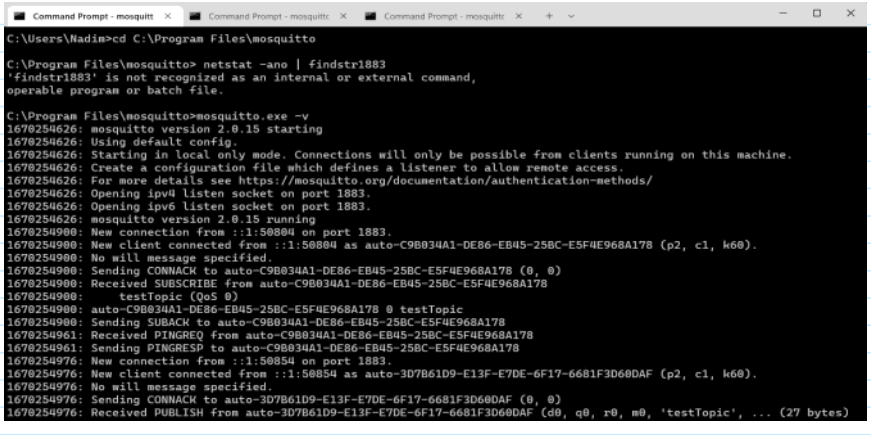
> mqtt_event_handler_cb: - subscribes to wanted topics when MQTT connected.
- publishes to wanted topics when data received.

> mqtt_app_start: - specify URI to connect to common server.

> app_main: - calls needed functions
- translates JSON file to string and writes extracted weather information to output buffer. (using <cJSON.h> library functions)

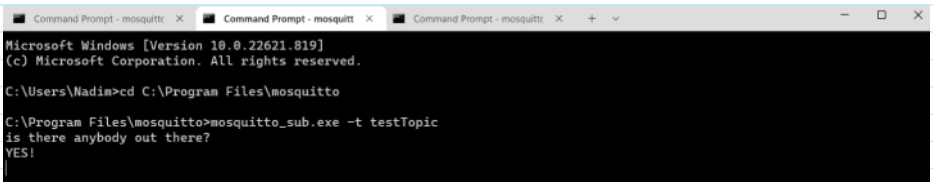
* Mosquitto Broker: (Download and Testing)

1) Downloaded mosquitto from eclipse website.
2) Ran the mosquitto.exe file using the command prompt by typing the command "mosquitto.exe -v"
   i) This starts mosquitto and sets up this cmd tab to be mosquitto's log for connects and disconnects.



3) Opened an other cmd tab and type "mosquitto_sub.exe -t TopicName" which subscribes mosquitto to specified topic.
   i) This tab will now on show us messages sent to subscribed

i) This tab will now on show us messages sent to subscribed topic.

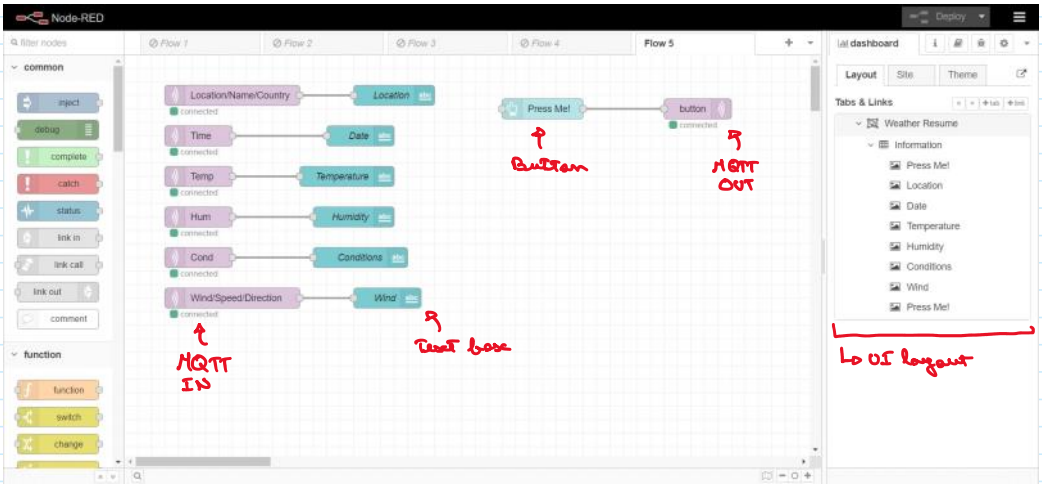


messages here are first messages I sent.

4) To publish messages we entered "mosquitto_pub.exe -t TopicName -m message"
   i) they show in the previous log.
   ii) the first log gets updated with subs and pubs connection.

5) We made sure we are able to sub and pub manually, which means we can apply the HTTP/MQTT client code to mosquitto to exchange messages with the ESP32.

* Node-Red:



> Flow code and UI layout.

> Final UI with temp readings.

* Roles:

> HTTP client: Nadim and Rami; both codding and research.

> Mosquitto: Rami; setting up broker.

> Node Red: Nadim; flow and UI design.

> MQTT client: Nadim and Rami; both codding and research.