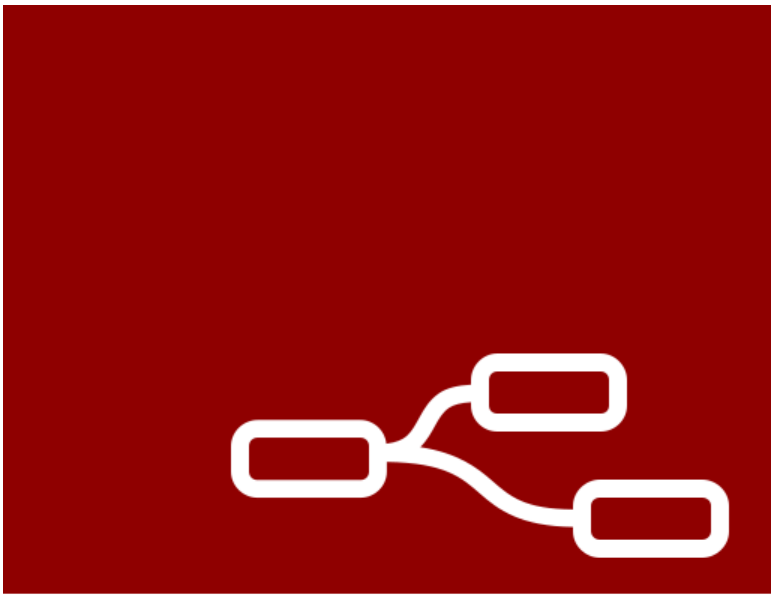
Orientation Challenge IoT
Application Protocols & Node-RED



Semester 4 IOT

Application protocols

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Course: Smart Industry

Introduction

The assignment on which this document presents a short report of the learning outcome and execution of various tasks provided in the workshop. In this subject, we learn how to connect and display the values that is taken from the ESP32. These values will be sent to a web application called Node-Red. In the following section will be a summary of how the tasks has been executed.

Summary

During the workshop, the teacher provided several codes for the tasks to be able to connect an ESP32 to Node-Red. We firstly had to install Node-Red with the given link and run the application by typing "localhost:1880" in the search engine to start a "flow". A flow is a workspace for Node-Red and with this, you can connect visual blocks and deploy to create various projects.

The first few tasks were to output a string in the debugger using an inject and debug block. After exploring the basics of Node-Red, we learn how to connect an ESP32 using MQTT. MQTT is a standard messaging protocol for the Internet of Things (IOT). With MQTT we can subscribe to a topic and publish values to create a dashboard. In the workshop, we used a Mosquitto as the message broker because it is an open source and is required for the basic understanding of MQTT. The task requires us to subscribe to "test.moquitto.org" and connect to port 1883. The workshop provides a link where we can subscribe to a topic called "nr_workshop/greetings" and publish the string values. The last task is to publish hardware values to the same link but with a different topic. The hardware for this example will be a DHT11 which is a temperature and humidity sensor. The ESP32 has a JSON code with a format that will output the values in an excel table.

Conclusion

To conclude the report, the given tasks was an entry level to understand the basics of connecting hardware with Node-Red. With the learning outcome of this assignment, we are able to use the knowledge in the other subjects. For the advance part of the workshop, I tried to do the web sockets task and was able to generate asynchronous communication with ESP32 however, I didn't manage to finish the CoAp Server task because I was having trouble with the "GET" block. All in all the learning outcome of the assignment can be used in the following projects.