University of Puerto Rico Mayagüez Campus
Electrical and Computer Engineering Department
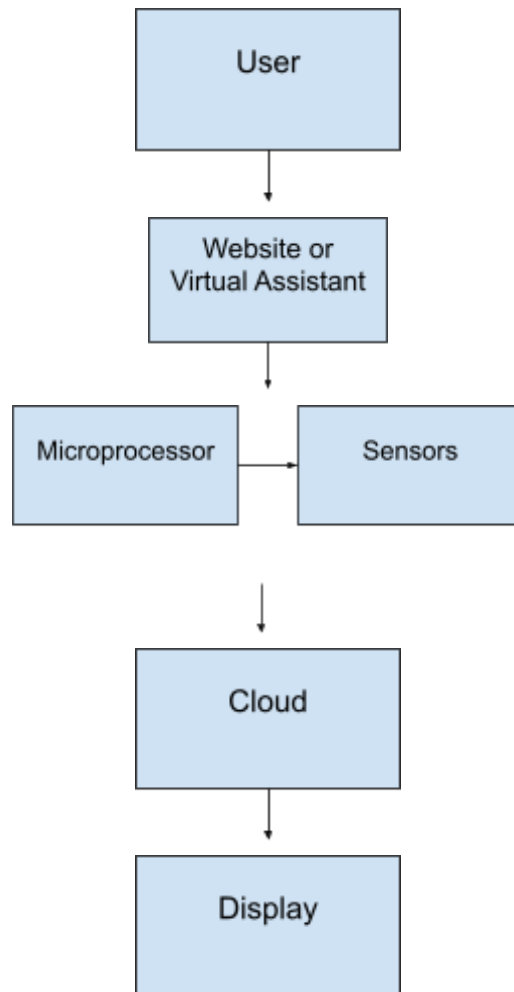
Final Project: AC ON Design Doc

Harry Márquez Torres
Jessy Rodríguez Colón

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Logical Architecture

This Logical Architecture is composed of the logical things we need to finalize the project. We need a user that will communicate with a virtual assistant or website and ask the question "is the AC on?". The website should gather the information in a microcontroller equipped with sensors that are constantly measuring the temperature. This information then needs to be stored in a cloud and displayed to the user.

Development Architecture
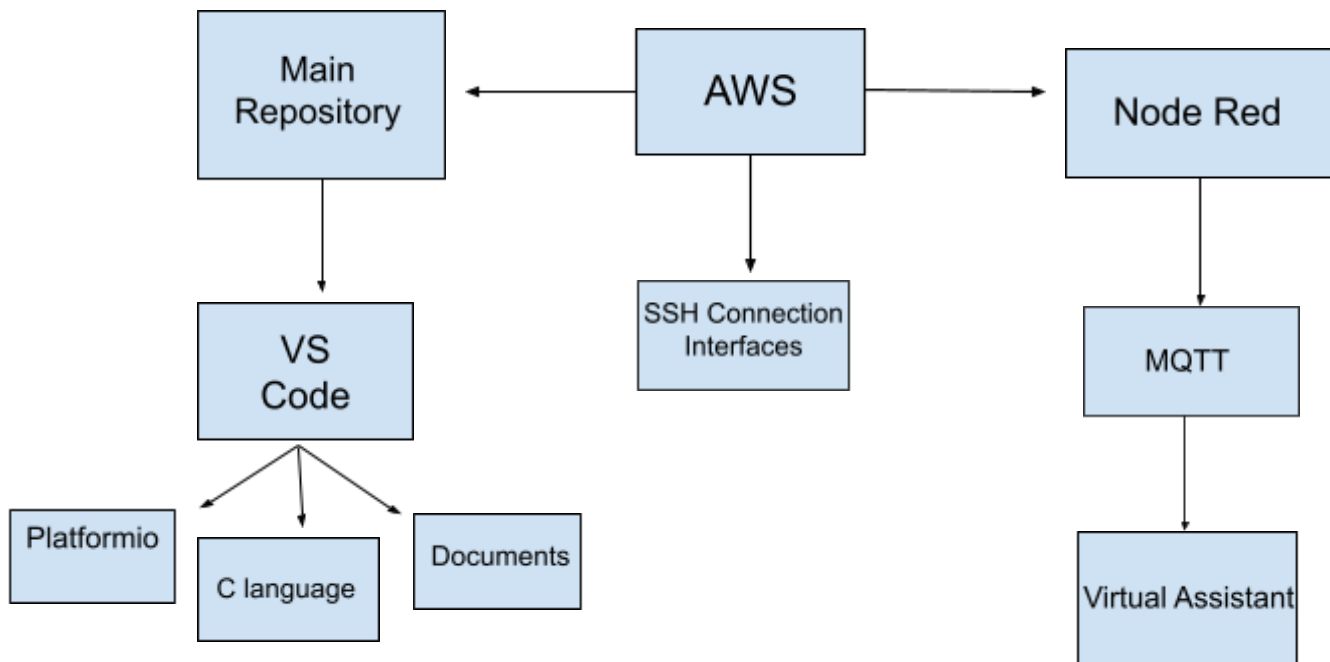
Development Architecture focuses on the organization and implementation of software with other components. In our project, we will use C language, Platformio, and other libraries to prepare the software to run and interconnect all the components of our system. Also, we will use Node Ned and MQTT to design how the command flow will be so that everything works correctly.
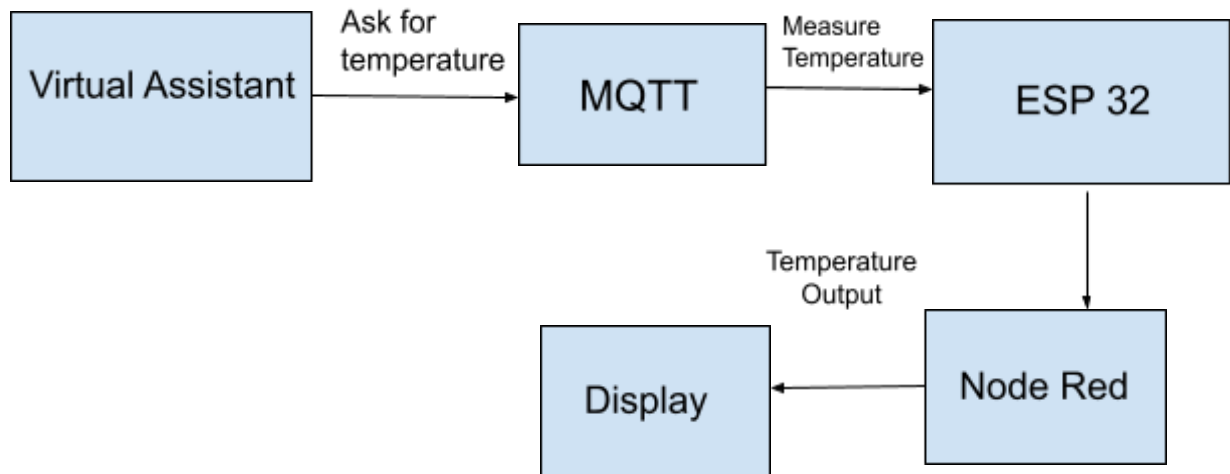
Process Architecture
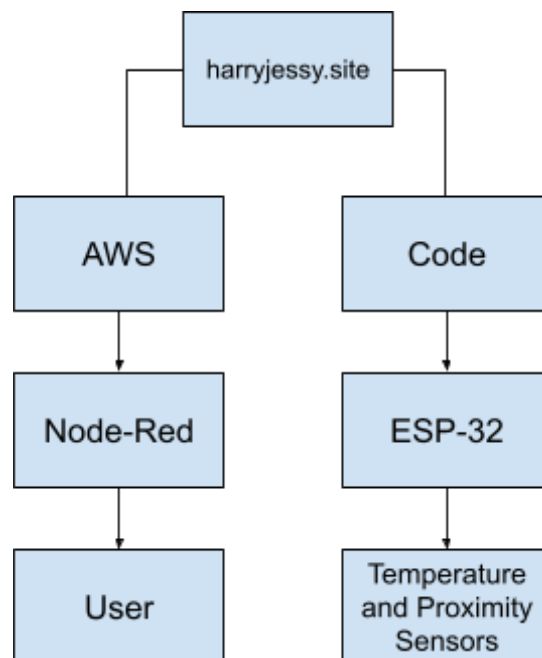
Process Architecture is composed of the process involved in getting the desired output. The user will connect to Node-Red and AWS through the website harrjessy.site. This site will be configured with the information in the ESP-32. The ESP-32 will be connected with temperature and proximity sensors that will send data via Wi-Fi to the website. This way, the user will be able to gather the desired information.

Physical Architecture
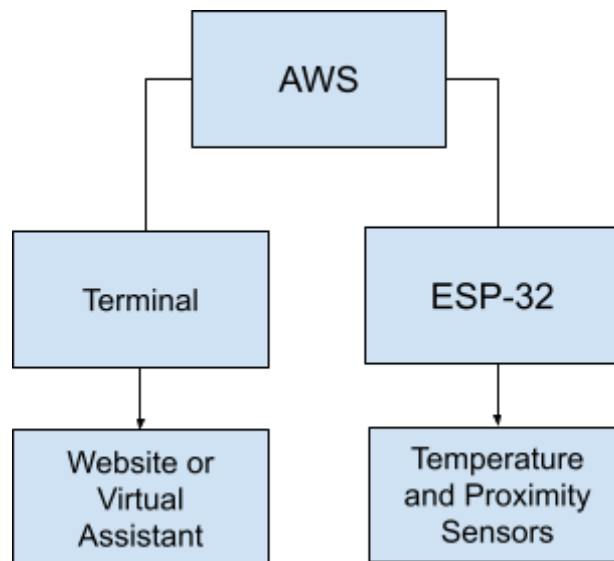
Physical Architecture involves the physical and specific materials we need to accomplish the task. In this task, we need a server like AWS configured with Node-Red and MQTT Broker that will be accessed through the computer's terminal. We need an ESP-32 that will be the microcontroller and temperature and proximity sensors that will gather the necessary information. We also need an intermediary that will connect the user to the information that the ESP-32 stores in the cloud, like a website or virtual assistant (Siri).

Scenarios

In the scenario, we have an idea of how the architecture designed in all the previous steps will be working. We will have a virtual assistant (Siri) that will be connected and will send the message to the MQTT in the Node Red. This transmits the message to the microcontroller(ESP-32) and the command is executed. Then the microprocessor gives the result to Node Red and it puts it on display and in the cloud.