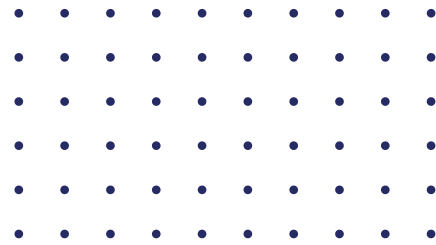
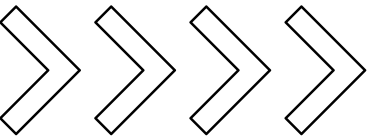
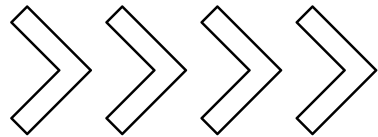


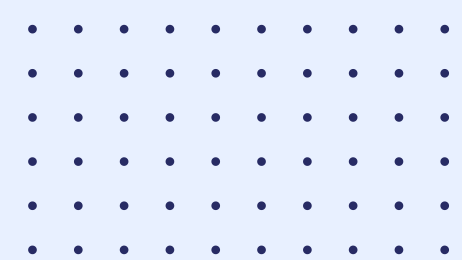
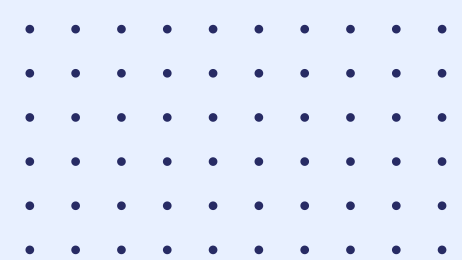


TEMPERATURE AND HUMIDITY DETECTION USING MQTT AND
ESP2688

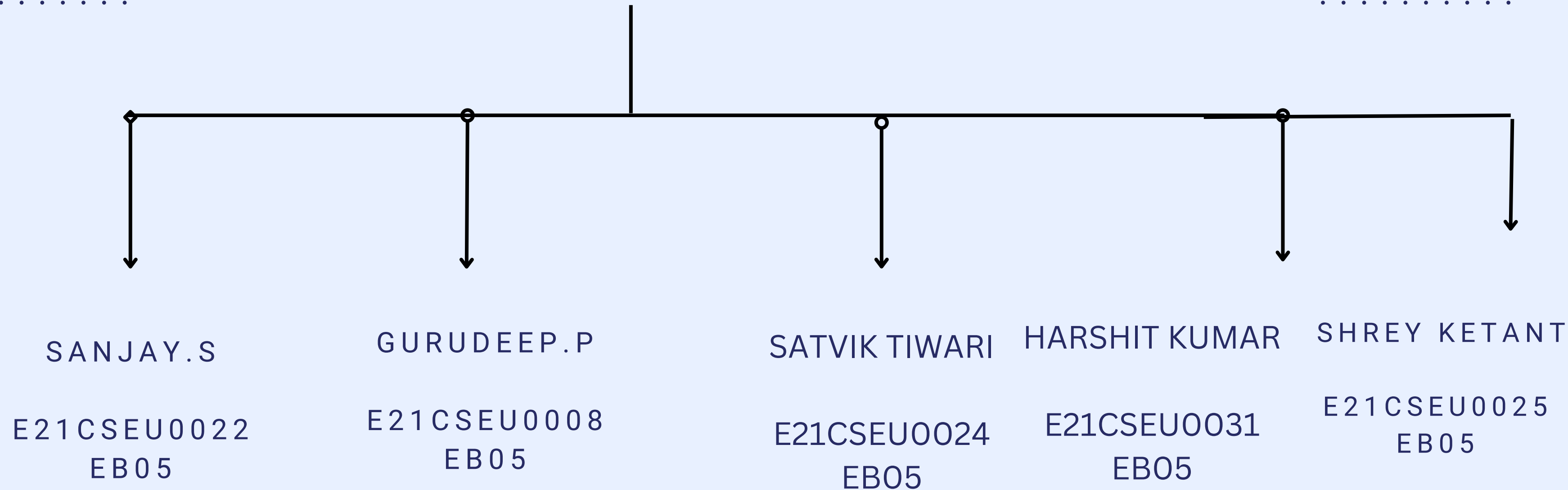


MENTOR NAME : RASJHMI MAM

TEAM NO:7



TEAM MEMBERS



ABSTRACT

THE INTERNET OF THINGS (IOT) HAS BEEN EXPANDING QUICKLY IN RECENT YEARS, AND NUMEROUS TOOLS HAVE BEEN CREATED TO GATHER DATA FROM VARIOUS SENSORS. THE TEMPERATURE AND HUMIDITY SENSOR, ONE OF THE MOST OFTEN USED SENSORS, IS UTILISED IN A VARIETY OF SETTINGS, INCLUDING WEATHER MONITORING, AGRICULTURAL, AND INDOOR CLIMATE CONTROL. THE DE FACTO STANDARD FOR IOT COMMUNICATION IS MQTT, A LIGHTWEIGHT MESSAGE PROTOCOL. BECAUSE OF ITS GREAT PROCESSING CAPABILITY AND LOW POWER CONSUMPTION, THE ESP32 IS A POTENT MICROCONTROLLER THAT IS FREQUENTLY EMPLOYED IN INTERNET OF THINGS APPLICATIONS.

IN THIS PROJECT, WE'LL INVESTIGATE HOW TO GATHER TEMPERATURE AND HUMIDITY DATA FROM SENSORS AND COMMUNICATE IT TO A CLOUD SERVER USING MQTT AND ESP32. THE ESP32 WILL FUNCTION AS THE MQTT CLIENT AND COMMUNICATE WITH THE SERVER OVER WI-FI. THE ESP32 WILL BE CONNECTED TO THE TEMPERATURE AND HUMIDITY SENSOR, AND THE INFORMATION WILL BE GATHERED ON A REGULAR BASIS. THE GATHERED INFORMATION WILL BE POSTED TO A MQTT SERVER THAT A CLOUD SERVICE WILL SUBSCRIBE TO. THE DATA WILL BE STORED IN THE CLOUD SERVICE, WHICH WILL ALSO

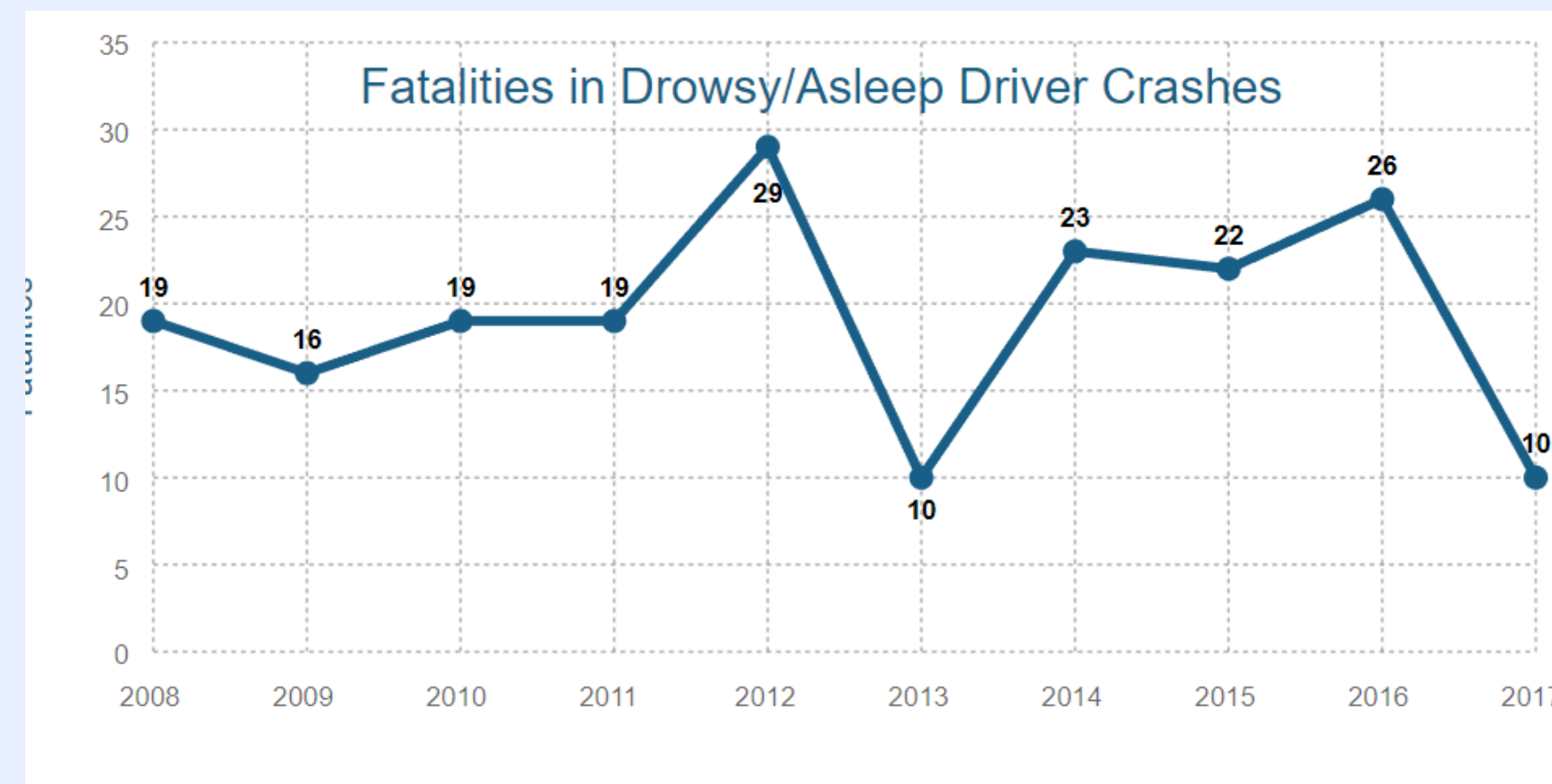


INTRODUCTION

MQTT, or Message Queuing Telemetry Transport, is a lightweight messaging protocol that is commonly used in IoT applications to send and receive data from sensors. One of the most common types of sensors used in IoT applications are temperature and humidity sensors. These sensors are essential for monitoring and controlling the environmental conditions in a wide variety of applications, including data centers, HVAC systems, and agriculture.

Temperature and humidity sensors work by measuring the temperature and humidity levels in the surrounding environment and converting this data into an electrical signal that can be transmitted to a data collection system. In an MQTT-based temperature and humidity monitoring system, this data is transmitted via MQTT messages to a broker, which is responsible for distributing the messages to the relevant subscribers.

The MQTT protocol is ideal for temperature and humidity monitoring applications because it is lightweight and efficient. It uses a publish-subscribe model, which means that data is only transmitted to subscribers who are interested in receiving it. This minimizes network traffic and reduces the amount of processing power required to handle the data.



PROPOSED SYSTEM

- There are a variety of data resources available for temperature and humidity data that can be used in IoT applications, including public data repositories, commercial data providers, and DIY data collection methods.
- Public data repositories, such as the National Oceanic and Atmospheric Administration (NOAA) and the National Centers for Environmental Information (NCEI), provide free access to historical weather data, including temperature and humidity data. This data can be useful for applications such as climate analysis and forecasting.
- COMMERCIAL DATA PROVIDERS, SUCH AS WEATHER UNDERGROUND AND ACCUWEATHER, OFFER REAL-TIME AND HISTORICAL WEATHER DATA, INCLUDING TEMPERATURE AND HUMIDITY DATA, FOR A FEE. THESE DATA PROVIDERS TYPICALLY OFFER APIS THAT ALLOW DEVELOPERS TO INTEGRATE WEATHER DATA INTO THEIR IOT APPLICATIONS.
- FOR DIY DATA COLLECTION METHODS, THERE ARE A VARIETY OF TEMPERATURE AND HUMIDITY SENSORS AVAILABLE THAT CAN BE USED TO COLLECT DATA IN REAL-TIME. THESE SENSORS TYPICALLY COMMUNICATE WITH A MICROCONTROLLER OR SINGLE-BOARD COMPUTER, SUCH AS THE RASPBERRY PI, WHICH CAN BE USED TO STORE AND TRANSMIT THE DATA VIA MQTT.

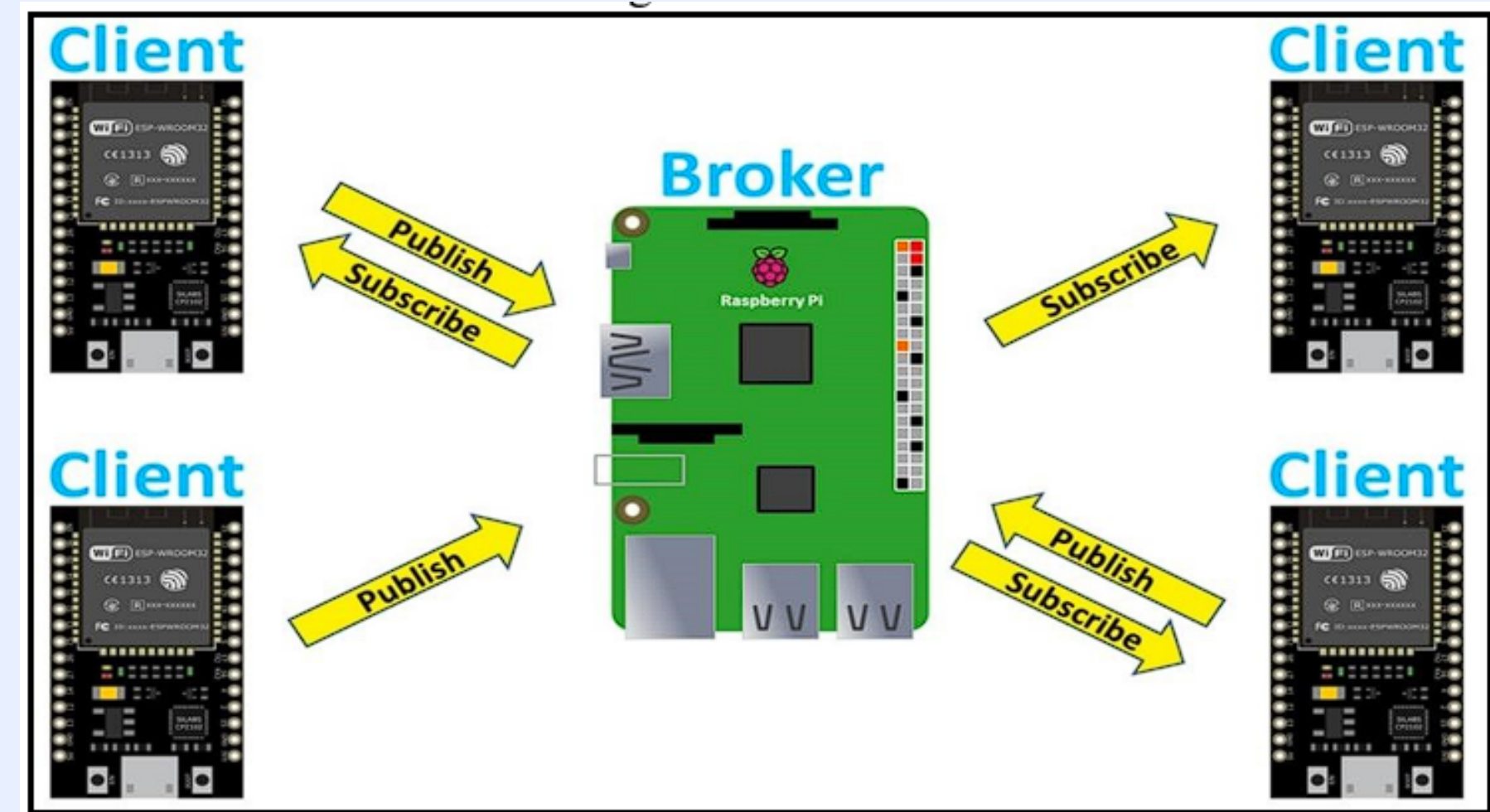
PROBLEM STATEMENT

- The problem statement of driver drowsiness detection system is to address the issue of driver fatigue or drowsiness, which is a major cause of road accidents. Drowsiness is a state of impaired consciousness and reduced ability to react to external stimuli, which affects a driver's ability to control a vehicle and make quick decisions.
- The consequences of drowsy driving can be severe, leading to property damage, injury, and loss of life. The problem is particularly acute in long-haul transportation, where drivers are required to work long hours and may not have sufficient rest time.



FUTURE SCOPE

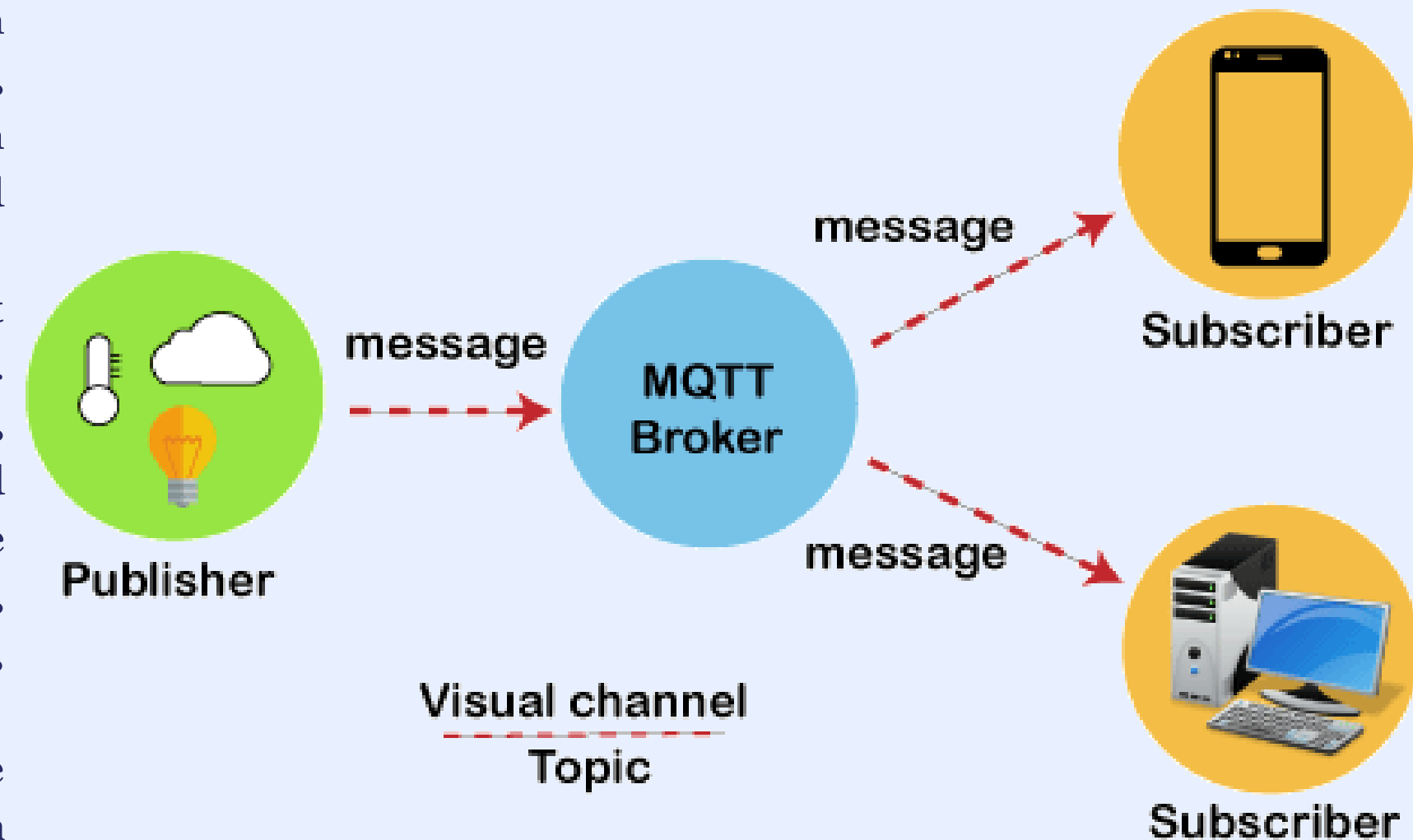
- MQTT (Message Queuing Telemetry Transport) is a protocol that is commonly used for the communication of Internet of Things (IoT) devices. It is a lightweight protocol that is easy to implement and is ideal for devices with limited processing power and memory. MQTT is commonly used for the communication of sensor data, such as temperature and humidity, which can be used for a variety of applications such as monitoring environmental conditions in buildings, warehouses, and industrial processes.
- Temperature and humidity are two of the most commonly monitored environmental parameters in IoT applications. Temperature is a measure of the average kinetic energy of the molecules in a substance, while humidity is a measure of the amount of water vapor in the air. Both of these parameters can have a significant impact on human comfort, equipment performance, and product quality.
- MQTT can be used to transmit temperature and humidity data from sensors to a central server or cloud-based platform for storage, analysis, and visualization. This data can be used to monitor trends over time, detect anomalies, and trigger alerts when conditions exceed predefined thresholds. MQTT is ideal for this type of application because it allows for real-time data transmission with minimal latency, even in low-bandwidth environments.



FUTURE SCOPE

- In order to implement MQTT for temperature and humidity monitoring, a few key steps are required. First, sensors must be installed in the environment of interest to measure these parameters. These sensors can be connected to a microcontroller, such as an Arduino or Raspberry Pi, which can then be connected to an MQTT broker. The broker acts as an intermediary between the sensors and the server or cloud-based platform, allowing for secure and efficient communication.
- Once the sensors are connected to the MQTT broker, they can start transmitting temperature and humidity data using the MQTT protocol. This data can be visualized using a variety of tools, such as dashboards, charts, and graphs, which can help users to quickly identify trends and anomalies. Advanced analytics tools can also be used to perform more complex analysis, such as predictive modeling and machine learning, which can provide insights into the relationships between temperature, humidity, and other environmental factors.
- Overall, MQTT is an effective and efficient way to monitor temperature and humidity in IoT applications. By transmitting real-time data using a lightweight protocol, MQTT enables users to make informed decisions about the management of their environments, ensuring human comfort, equipment performance, and product quality.

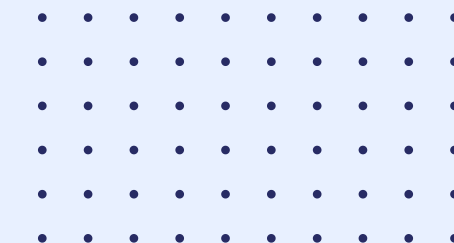
MQTT Architecture





TECH/RESOURCES UTILIZED

- PYTHON
- EMBEDDED C



SUMMARY

- MQTT (Message Queuing Telemetry Transport) is a protocol that is commonly used for the communication of Internet of Things (IoT) devices. It is a lightweight protocol that is easy to implement and is ideal for devices with limited processing power and memory. MQTT is commonly used for the communication of sensor data, such as temperature and humidity, which can be used for a variety of applications such as monitoring environmental conditions in buildings, warehouses, and industrial processes.
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THANK YOU

