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Subject	Embedded IOT
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MQTT (Message Queuing Telemetry Transport):

MQTT is a lightweight messaging protocol used for communication between IoT devices. It works on a publish-subscribe model:

- Publisher: Sends data to a specific topic.

- Subscriber: Receives data from the topic it subscribes to.

In this lab, the ESP32 microcontroller with DHT22 sensor acts as the publisher, sending temperature data to the MQTT topic: home/lab1/temp

Node-RED:

Node-RED is a flow-based programming tool for wiring together hardware devices, APIs, and online services. It allows visualization and processing of data easily using nodes.

- **Nodes used in this lab:**

  1. MQTT-in Node: Subscribes to the MQTT topic to receive sensor data.

  2. Debug Node: Displays the received data in the Node-RED Debug window (msg.payload) for monitoring and verification.

- **Working Principle:**

  1. ESP32 continuously publishes DHT22 sensor data to the MQTT broker.

  2. Node-RED subscribes to the topic using the MQTT-in node.

  3. The data flows into the Debug node and is displayed in real-time.

- **Outcome:**

  - Temperature readings from the DHT22 sensor are successfully captured and displayed in Node-RED, demonstrating IoT data acquisition, MQTT communication, and real-time monitoring.