Aim:

To study the MQTT Protocol and examine the components of MQTT protocol.

Introduction:

MQTT stands for **Message Queuing Telemetry Transport**. It is an extremely lightweight and publish-subscribe messaging transport protocol. This protocol is useful for the connection with the remote location where the bandwidth is a premium. It is a publish and subscribe system where we can publish and receive the messages as a client. It makes it easy for communication between multiple devices. It is a simple messaging protocol designed for the constrained devices and with low bandwidth, so it's a perfect solution for the internet of things applications.

Characteristics of MQTT

- It is a machine-to-machine protocol, i.e., it provides communication between the devices.
- It is designed as a simple and lightweight messaging protocol that uses a publish/subscribe system to exchange the information between the client and the server.
- It does not require that both the client and the server establish a connection at the same time.
- It provides faster data transmission, like how WhatsApp/messenger provides a faster delivery. It's a real-time messaging protocol.
- It allows the clients to subscribe to the narrow selection of topics so that they can receive the information they are looking for.

Components of MQTT

- **Message**
- **Client**
- **Server or Broker**
- **TOPIC**

Message

The message is the data that is carried out by the protocol across the network for the application. When the message is transmitted over the network, then the message contains the following parameters:

1. Payload data
2. Quality of Service (QoS)
3. Collection of Properties
4. Topic Name

Client

In MQTT, the subscriber and publisher are the two roles of a client. The clients subscribe to the topics to publish and receive messages.

Publish: When the client sends the data to the server, then we call this operation as a publish.

Subscribe: When the client receives the data from the server, then we call this operation a subscription.

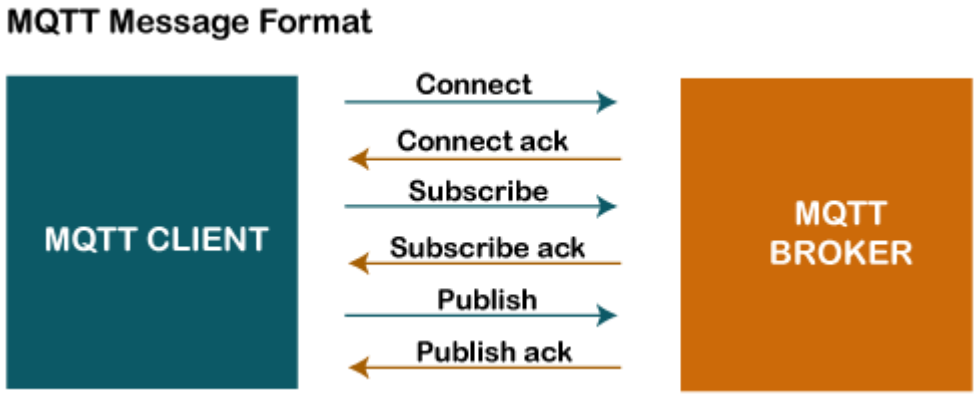
Server

The device or a program that allows the client to publish the messages and subscribe to the messages. A server accepts the network connection from the client, accepts the messages from the client, processes the subscribe and unsubscribe requests, forwards the application messages to the client, and closes the network connection from the client.

TOPIC

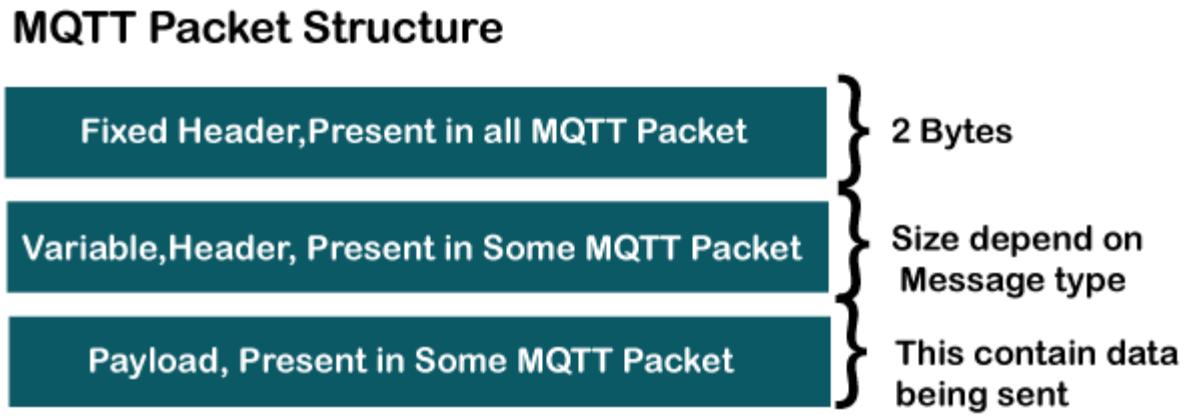
The label provided to the message is checked against the subscription known by the server is known as TOPIC.

MQTT Message Format



The MQTT uses the command and the command acknowledgment format, which means that each command has an associated acknowledgment.

MQTT Packet Structure



The MQTT message format consists of 2 bytes fixed header, which is present in all the MQTT packets. The second field is a variable header, which is not always present. The third

field is a payload, which is also not always present. The payload field basically contains the data which is being sent.

Conclusion:

Thus,MQTT protocol and its components are studied and examined.