

# Lesson 05

## Message Queue Telemetry Transport (MQTT)

# MQTT (Message Queuing Telemetry Transport)

- An open source protocol for machine-to-machine (M2M)/"Internet of Things" connectivity.

(Telemetry dictionary meaning is measuring and sending values or messages to far off places by radio or other mechanism)

# MQTT (Message Queuing Telemetry Transport)

- Created by IBM
- The objects communicating using the Connected devices network protocols, such as ZigBee.
- Web objects also using MQTT library functions and communicate using IP network and SSL and TLS security protocols

# MQTT Features

- Constrained environment protocol,
- PubSub messaging architecture in place of request-response client-server architecture
- publisher (message sender at the device domain or web object at network and application domain) sending the messages on a topic

# MQTT Features

- subscriber (message receiver at the device domain or web object at network and application domain) receiving the messages on a subscribed topic,
- Lightweight, running on limited resources of processor and memory processor or memory resources
- Header of fixed-length header and two bytes only

# MQTT Features

- M2Mqtt library providing a set of functions for coding
- M2Mqtt library functions in Java needing just 100 kB and in C# is 30 kB,
- Minimum number of exchanges, and therefore lessening the network traffic
- Three Quality of Services

# MQTT Features

- MQTT TCP/IP Connectivity
- Broker-based publish/subscribe messaging protocol,
- publish/subscribe functions enable one-to-many message distribution decoupled with the applications (unconcerned about the payload),

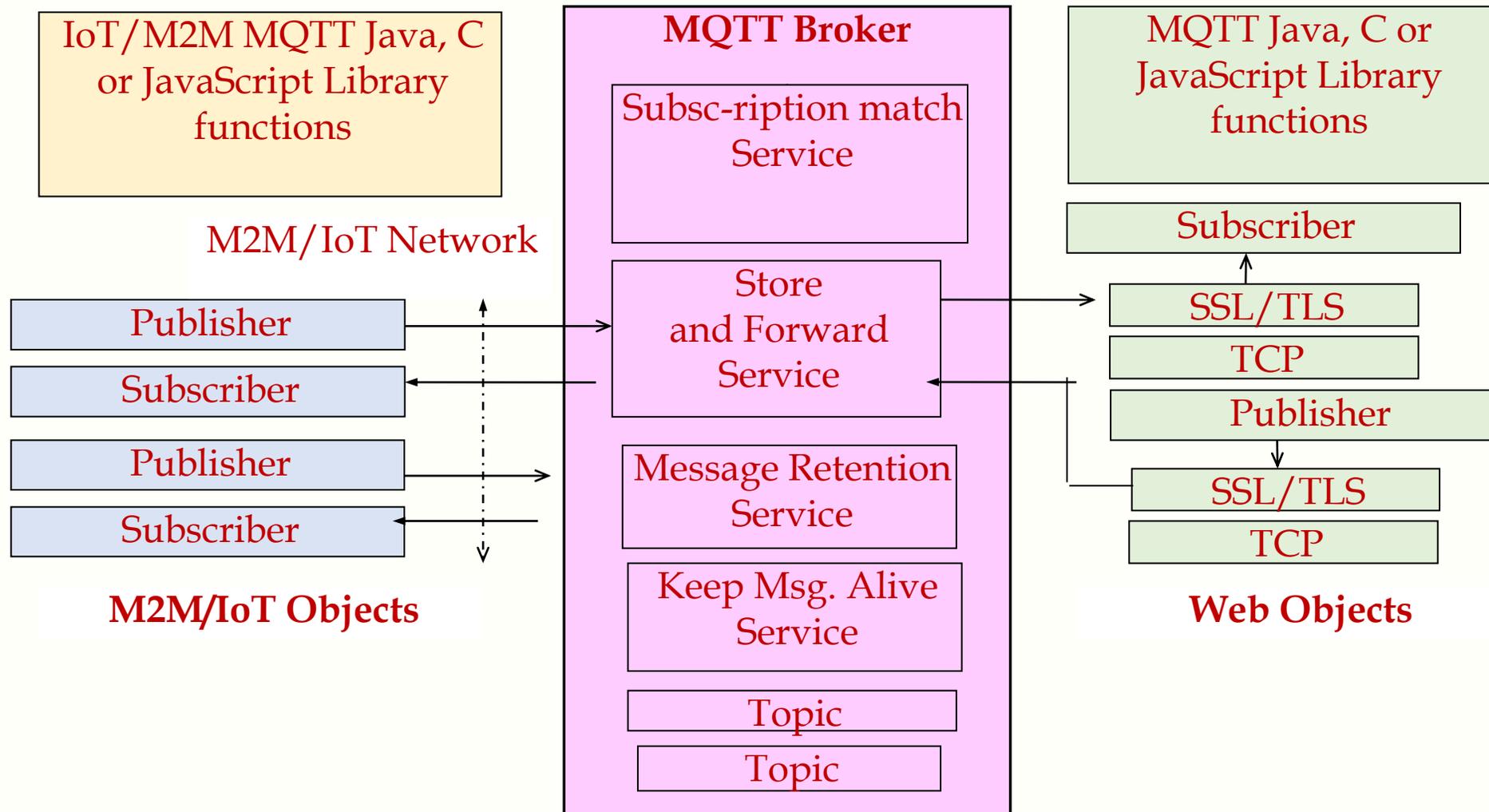


Fig. 3.6 M2M/IoT device objects (publisher and subscriber) messaging to web objects (publisher and subscriber) using an MQTT Broker.

# MQTT Features

- Notifying on an abnormal disconnection of a client, notified all nodes subscribing to the message, also notifies *Will* message, means last will
- The last will specifying the final action to be taken on failure to send the messages

# MQTT Features

- MQTT Broker Functions
  1. store and forward,
  2. Clients publish topics and receives topics on subscription,

# MQTT Broker Functions

3. recovers subscriptions on reconnect after a disconnection, unless client explicitly disconnected
4. Acts as a broker between publisher of the topics and subscribers of the topics
5. finds client disconnection until DISCONNECT message receives,

# MQTT (Message Queuing Telemetry Transport)

6. *keeps message alive* till explicit disconnection
7. retains the last received message from a publisher for a new connected subscriber on same topic, when retain field in the header is set.

# MQTT Authentication and Security

- Username/Password in the *Connect* message
- Client security through SSL/TLS
- Security considerations same as of CoAP, web-linking and CoRE resource Directory.
- Intelligent and Business analyst Server support, and other servers

# Summary

We learnt

- MQTT open Source protocol from IBM
- PubSub messaging architecture in place of request-response client-server architecture
- Broker Based Architecture
- Three Qualities of Services

End of Lesson 5 on  
Message Queue Telemetry Transport (MQTT)