SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107

Accredited by NAAC-UGC with 'A' Grade

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Department of Information Technology

Course Name – Internet of Things & AI

III Year / V Semester

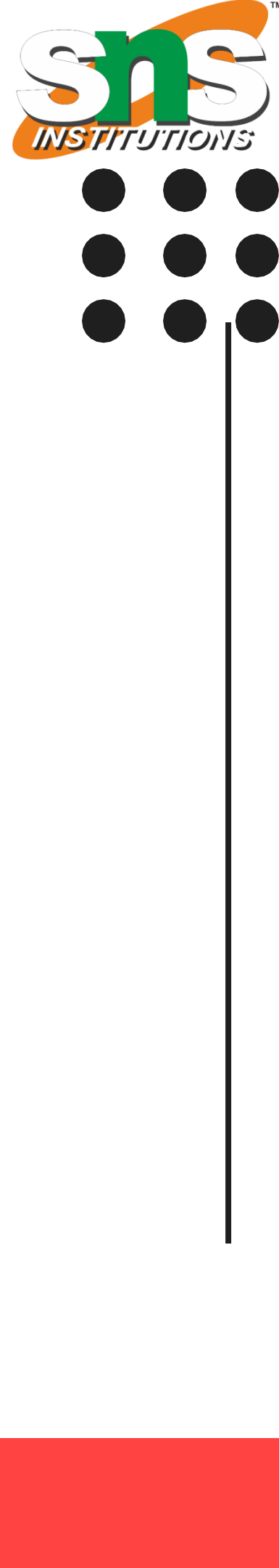### CONNECTIVITY TECHNOLOGIES AND COMMUNICATION PROTOCOLS

Advanced Message Queuing Protocol

Why Messaging ?

- Transfer data from point A to point B.
- Asynchronous.
- Decouple publishers and consumers.
- Queuing for later delivery.

How does AMQP solve the problem?

- AMQP is a wire level protocol and not an API.
  - JMS is an API.
  - Just like HTTP is for Internet, AMQP is for messaging.

- When a protocol is specified at the wire-level and published, most technologies can use it.
- Compare this to an API, where the actual implementation is specific to the platform.

AMQP concepts

Producer Consumer
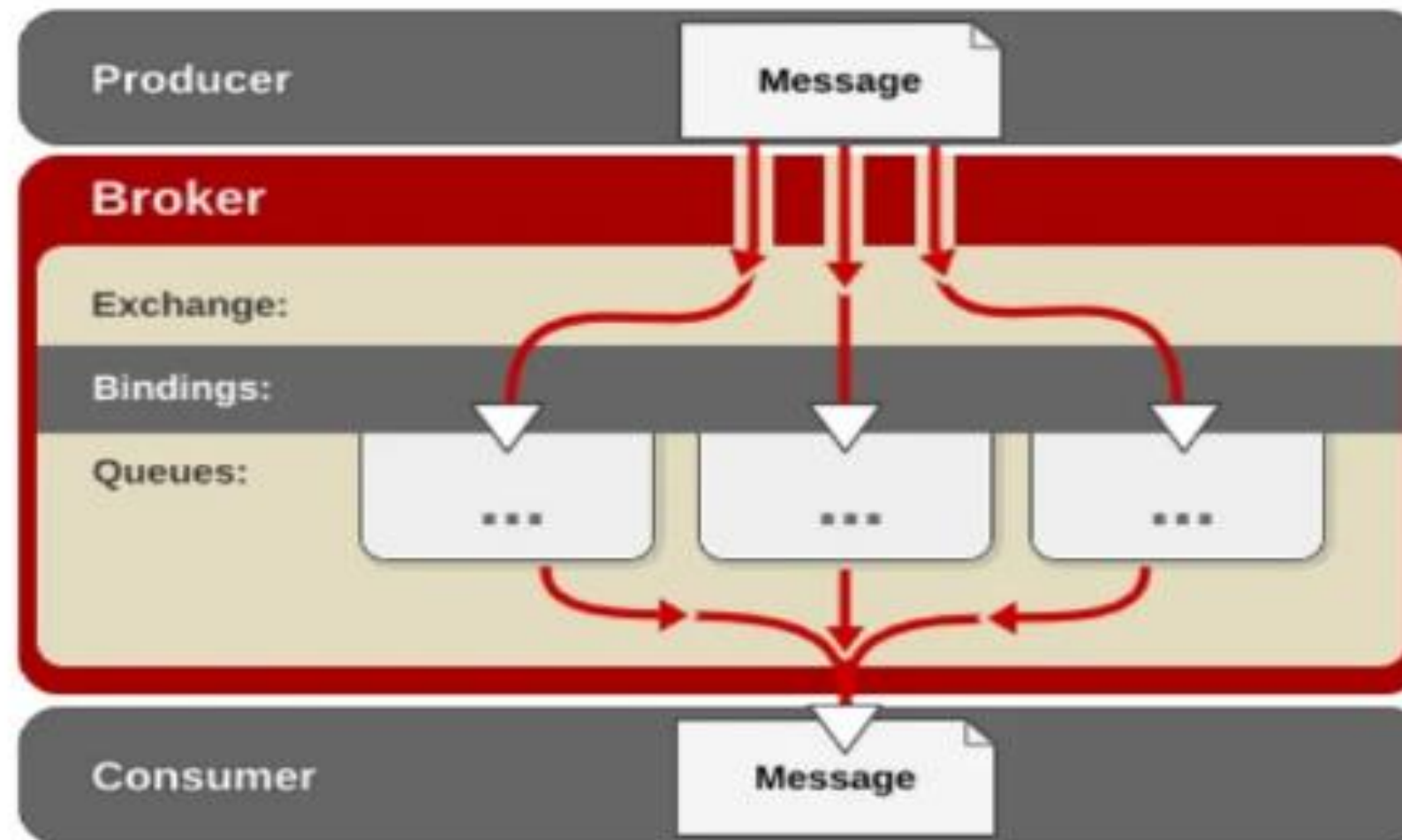
Exchange, Binding and Queues

- The "exchange" receives messages from publisher and routes these to "Queues".
- The "binding" defines the relationship between a message queue and an exchange and provides the message routing criteria.

Message Queuing Telemetry Transport (MQTT)

- MQTT stands for **Message Queuing Telemetry Transport**.
- MQTT is a machine to machine internet of things connectivity protocol.
- 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.
- These characteristics make it useful in various situations, including constant environment such as for communication machine to machine and internet of things contexts.
- 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

The MQTT has some unique features which are hardly found in other protocols. Some of the features of an MQTT are given below:

•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.

MQTT Architecture
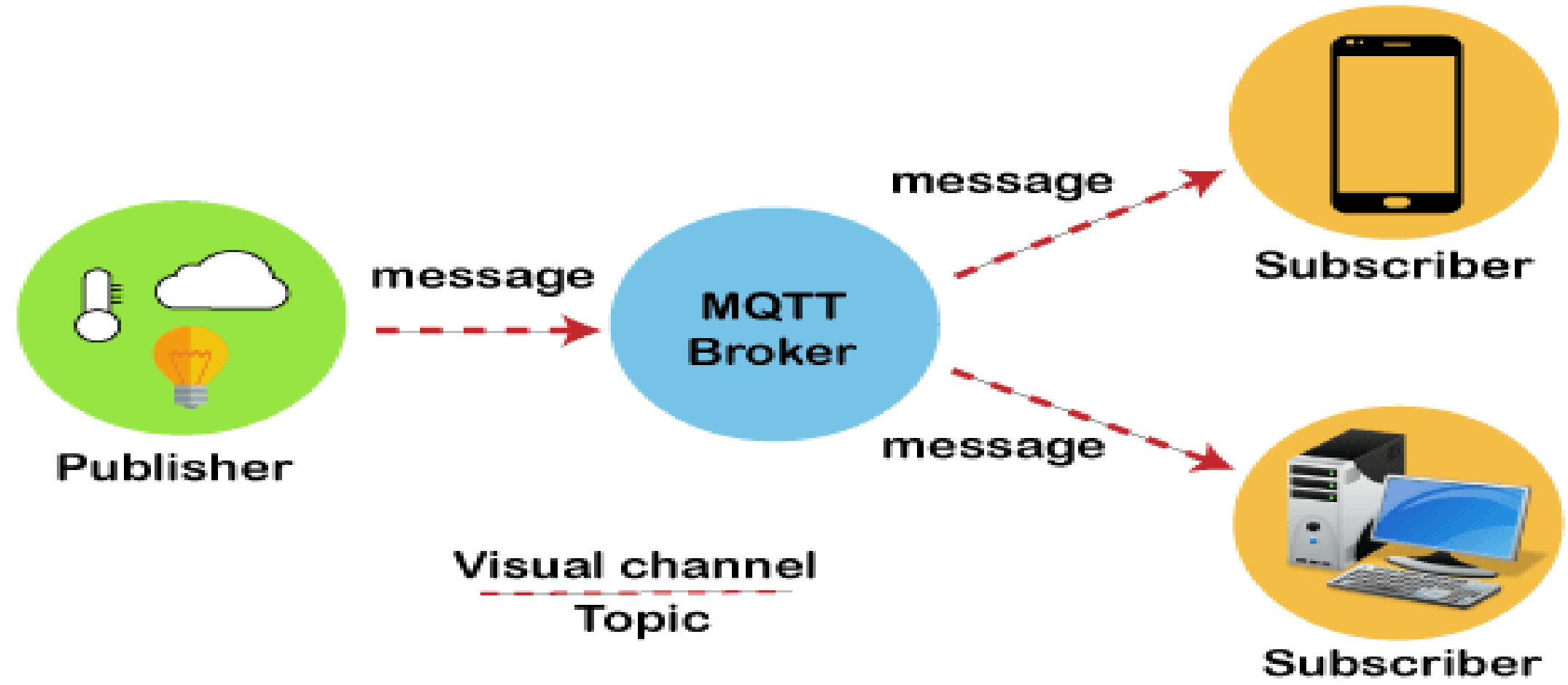
Client

In MQTT, the subscriber and publisher are the two roles of a client. The clients subscribe to the topics to publish and receive messages. In simple words, we can say that if any program or device uses an MQTT, then that device is referred to as a client.

Message

The message is the data that is carried out by the protocol across the network for the application.

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.