SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107
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Department of AI & DS

Course Name –19AD505-Internet of Things & AI

V Semester

Unit 1 – IoT INTRODUCTION AND APPLICATIONS

Topic 6- Logical Design of IoT

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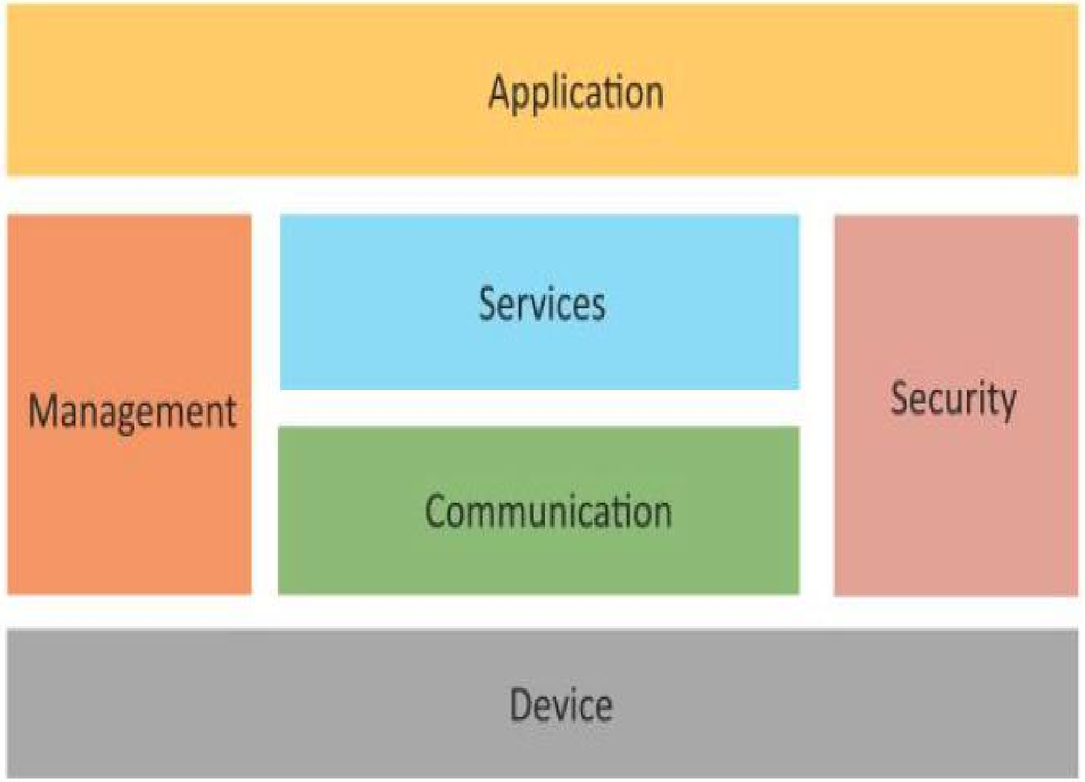
Logical Design of IoT

- Logical design of an IoT system refers to an abstract representation of the entities and process without going into low level specification of the implementations

It consist of
- IoT functional block
- IoT communication model
- IoT communication APIs

IoT Functional Block
- An IoT system comprises of a number of functional blocks that provide the system the capabilities for identification, sensing, actuation, communication and Management.

- Devices, Communication, Services, Management, Security, Application



Logical Design of IoT – Functional Block

Devices: devices that provide sensing, actuation, monitoring and control function
Communication: communication block handle the communication systems
Services :

- An IoT system uses various types of IoT services such as services for device monitoring ,device control services ,data publishing services and services for device Discovery.

Management:

- Functional blocks provide various functions to govern the IoT system

Security:

- Security functional block security IoT system and by providing functions such as application authorization message and content integrity and data security.

Application:

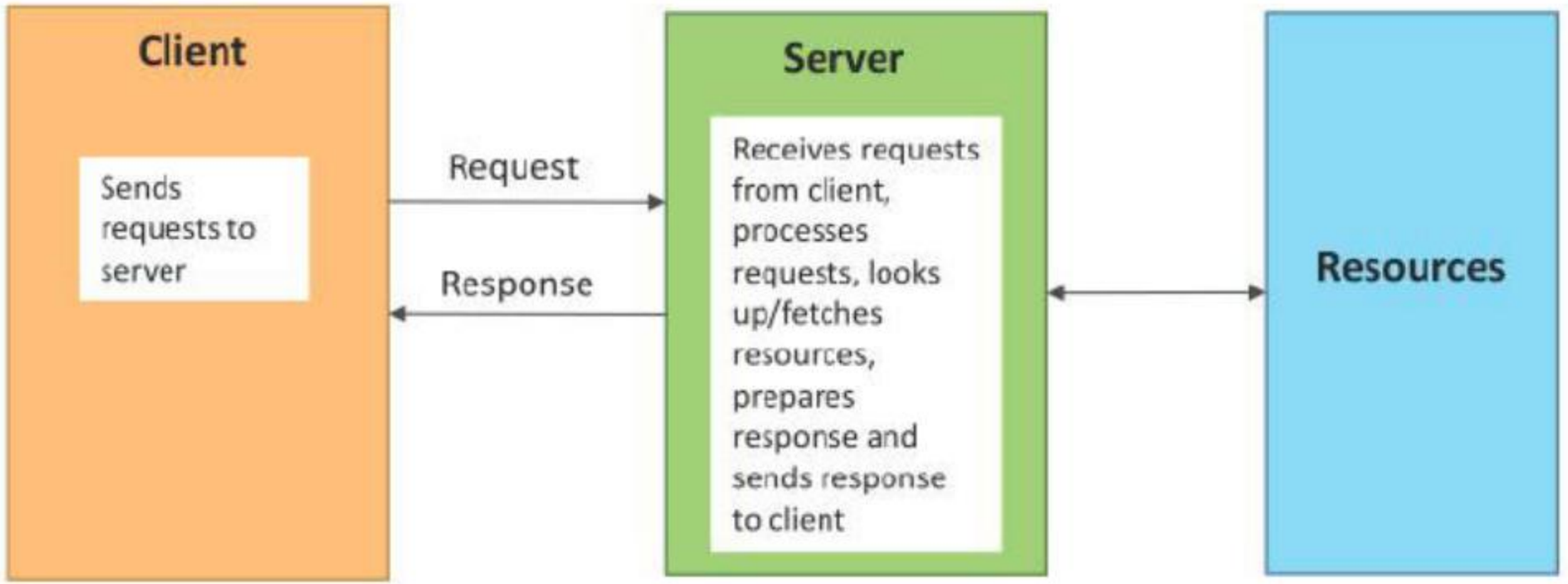
- IoT application provides and interface that the user can used to control and monitor various aspects of the IoT system.
- Application also allow users to view the system status and view or analyze the processed to data.

Logical Design of IoT – Communication Model

IoT communication model

- Request response
- Publish Subscribe
- Push pull
- Exclusive pair

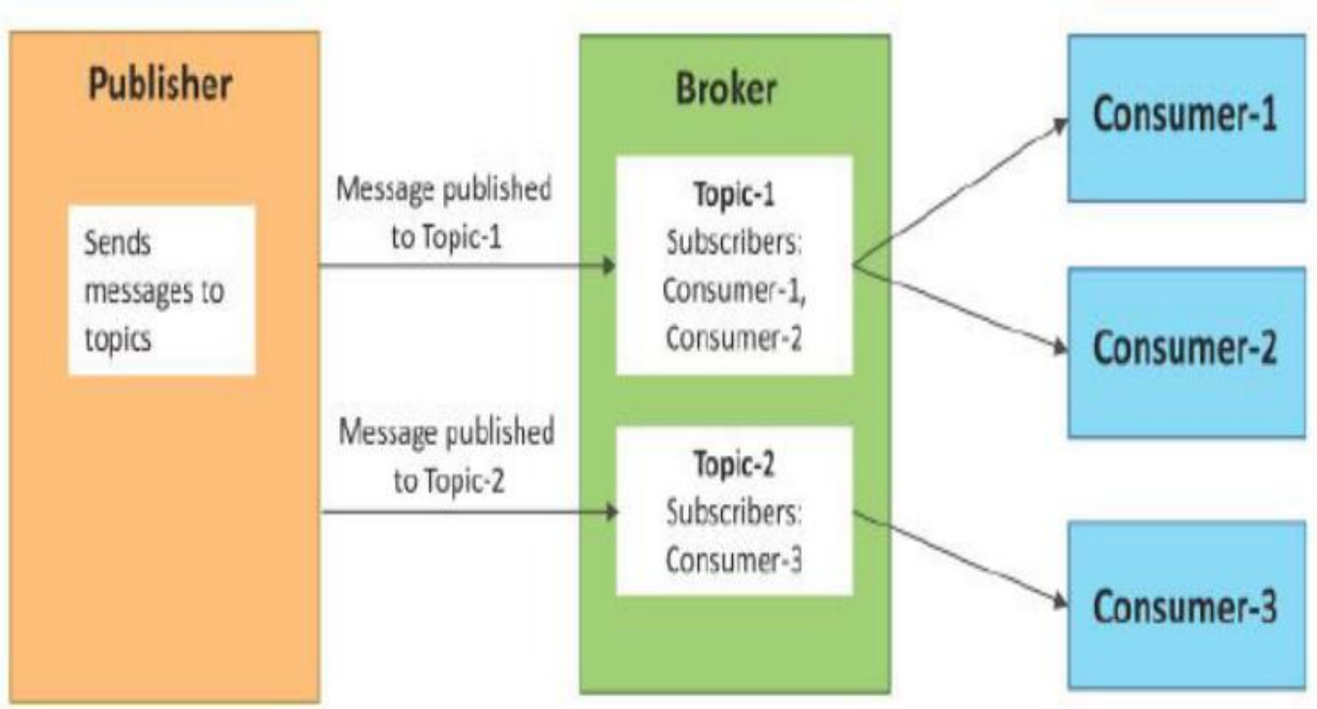
Request Response



Logical Design of IoT – Communication Model

Publish - Subscribe:

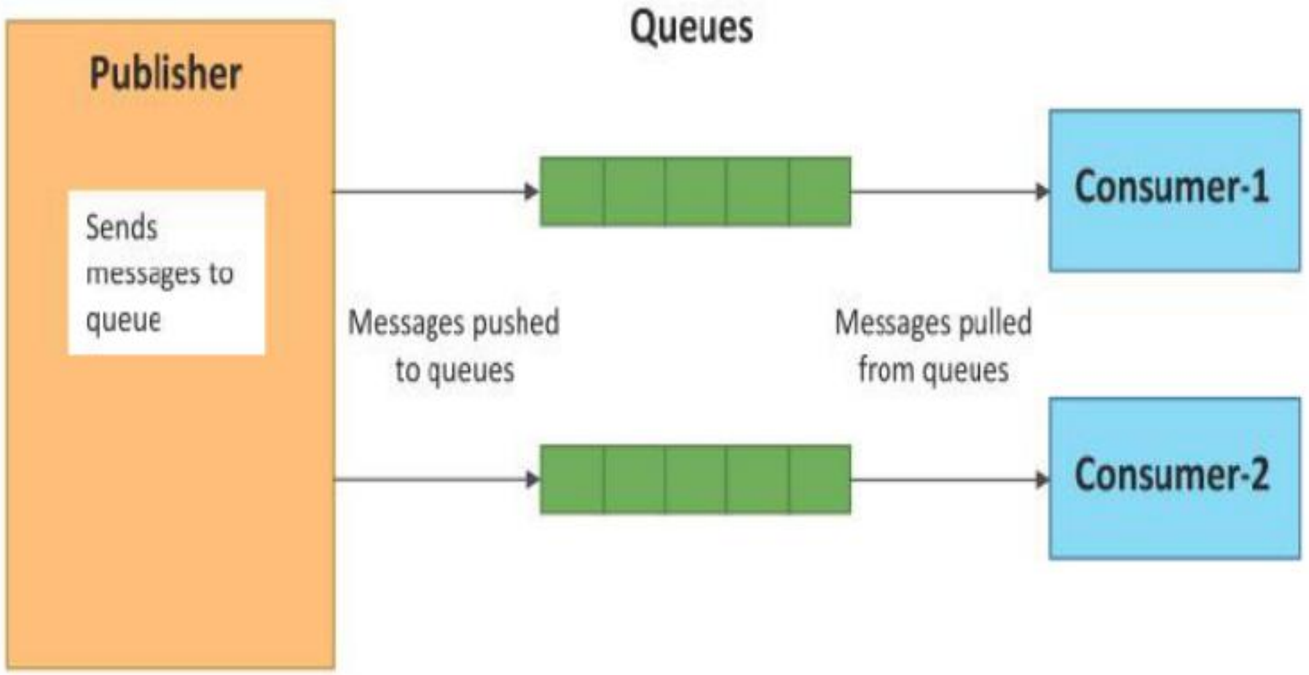
- Publish-Subscribe is a communication model that involves publishers, brokers and consumers.
- Publishers are the source of data. Publishers send the data to the topics which are managed by the broker. Publishers are not aware of the consumers
- Consumers subscribe to the topics which are managed by the broker.
- When the broker receives data for a topic from the publisher, it sends the data to all the subscribed consumers.



Logical Design of IoT – Communication Model

Push and Pull

- It's a communication model in which the data producers push the data to queues and the consumers pull the data from the queues.
- Producers do not need to be aware of the consumers.
- Queues help in decoupling the messaging between the producers and consumers.
- Queues also act as a buffer which helps in situations when there is a mismatch between the rate at which the producers push data and the rate rate at which the consumers pull data.



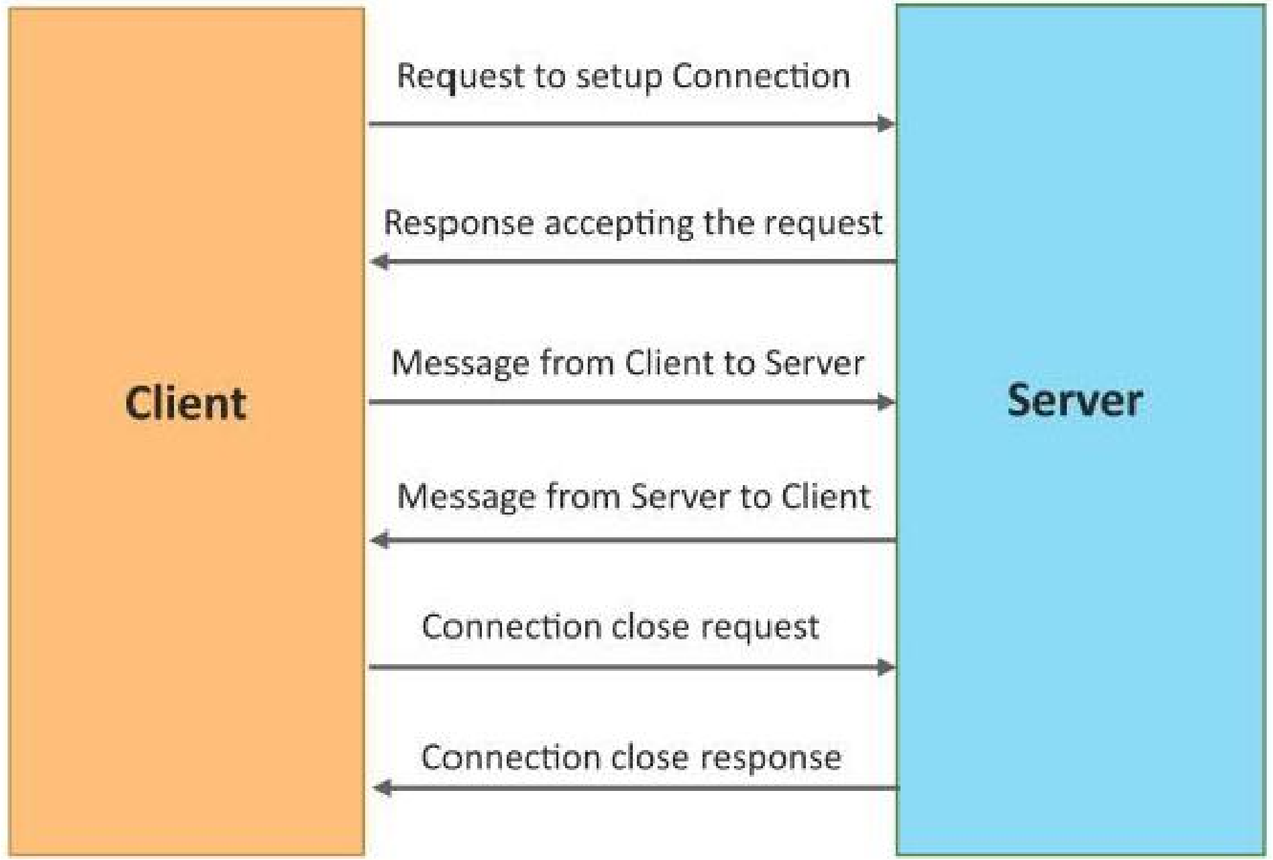
Logical Design of IoT – Communication Model

Exclusive pair

- Exclusive pair is a bi directional, fully duplex communication model that uses a persistent connections between the client and the server.

- Once the connection is setup it remains open until the client sends a request to close the connection.

- Client and server can send messages to each other after connection setup.



Logical Design of IoT – Communication APIs

IoT communication APIs

- REST- based communication API
- WebSocket based communication API

REST- based communication API

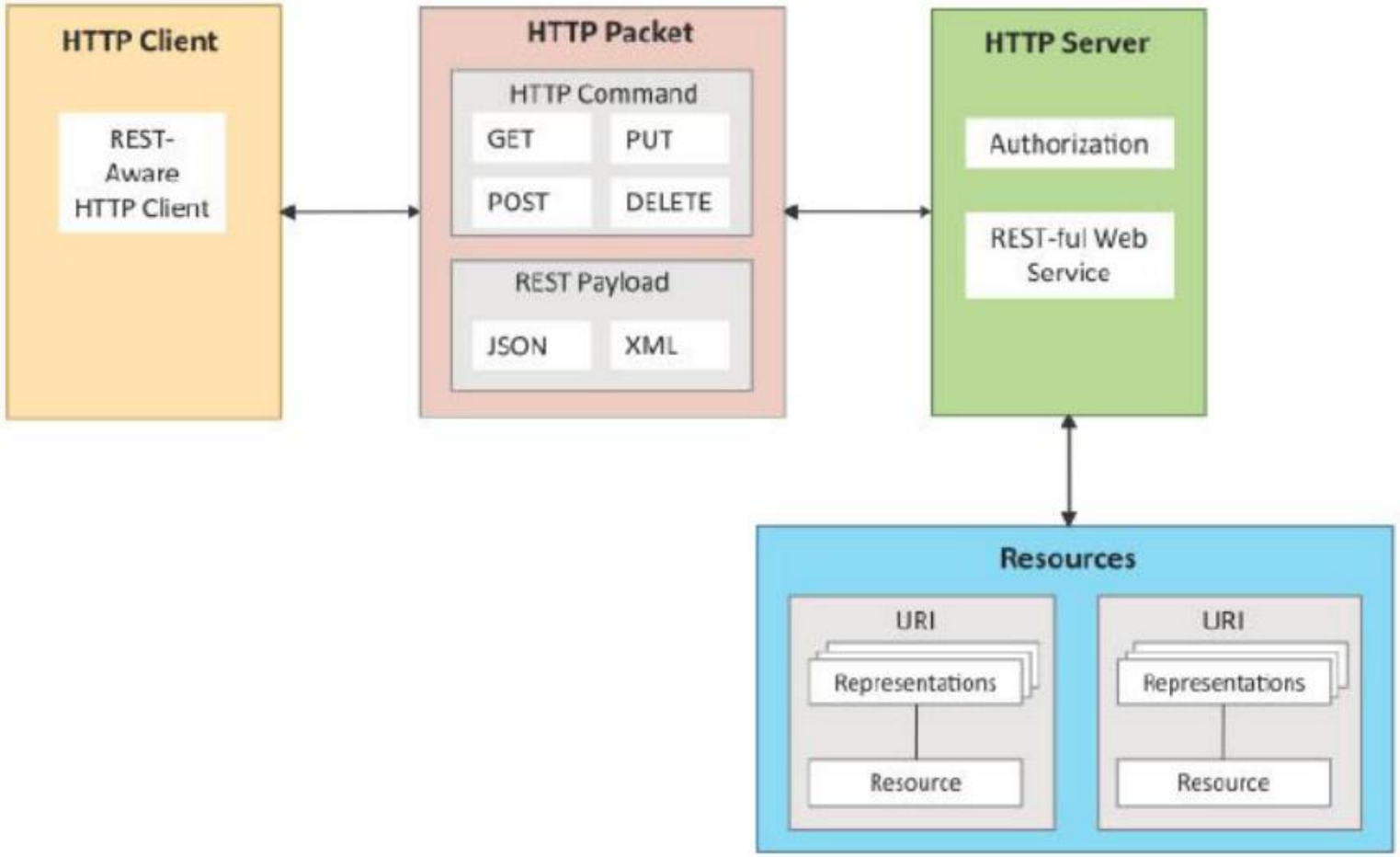
- Representational state transfer is a set of architectural principles by which you can design web service and Web API that focus on a system resources and how resource states are addressed the transferred.

- REST API follow the request- response communication model.

- The REST architectural constraints apply to the components, connectors, and data elements .

The REST architectural constraints are
Client-Server, Stateless, Cache-able, Layered System, Uniform Interface, Code on Command

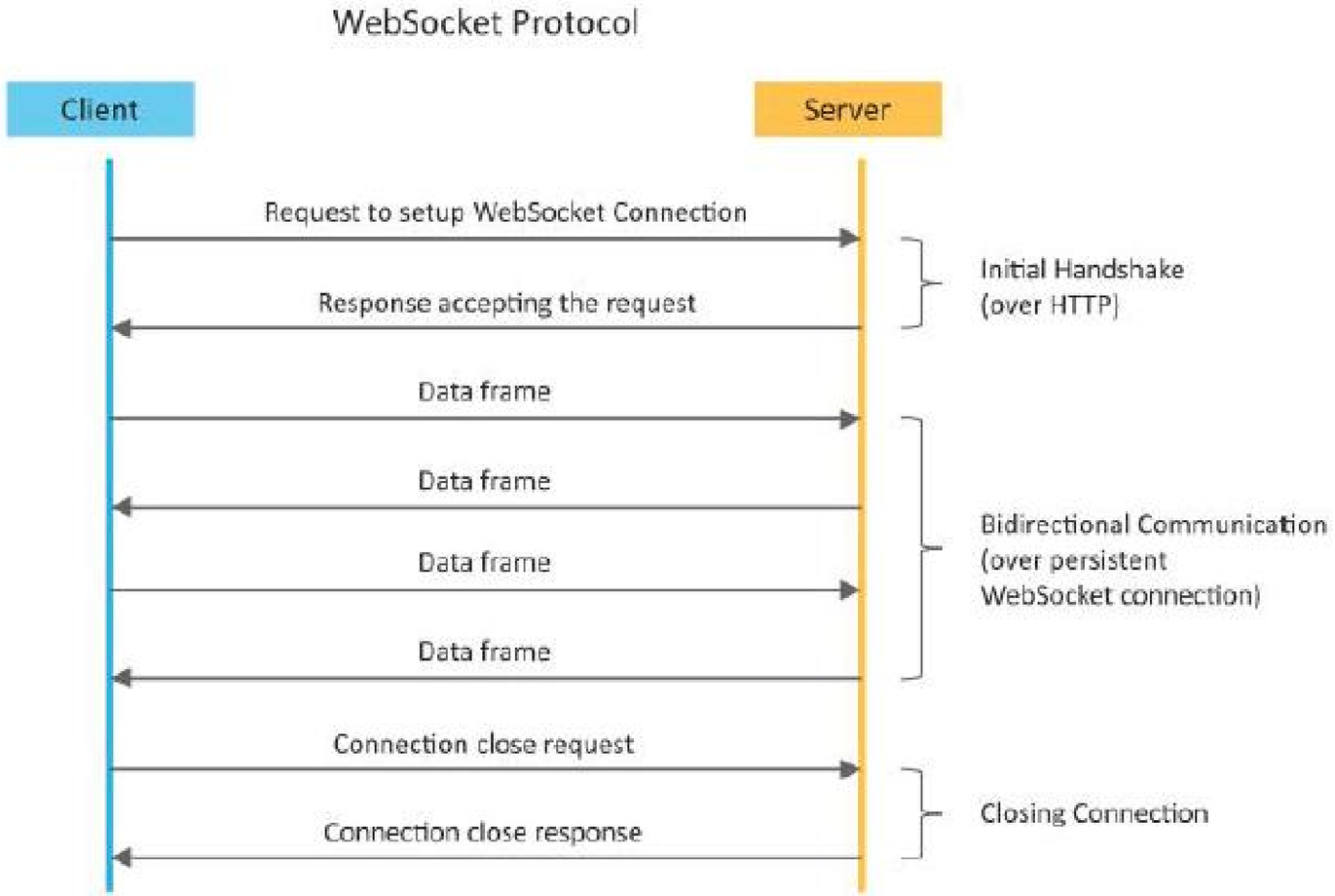
Logical Design of IoT – Communication APIs



Logical Design of IoT – Communication APIs

WebSocket based communication API

- WebSocket APIs allow bidirectional, full duplex communication between clients and servers.
- WebSocket APIs follow the exclusive pair communication model
- Unlike request-response, Websocket API allow full duplex communication and do not require new connection to be set up for each message to be sent.



THANK YOU