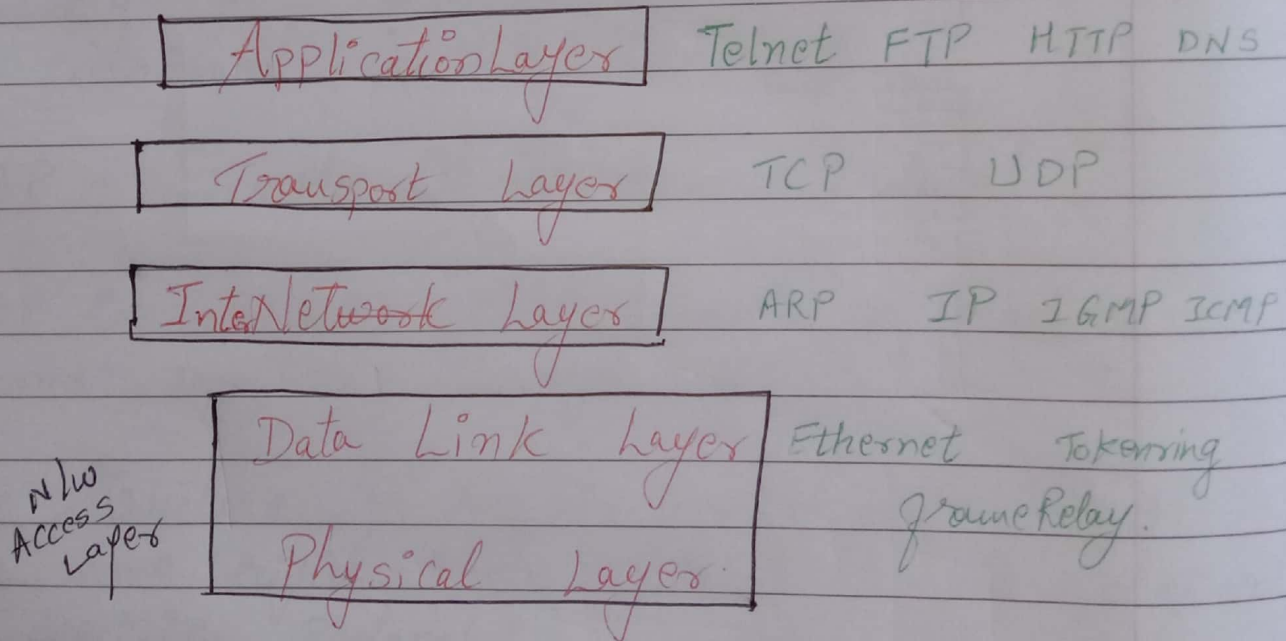


Protocol

A protocol is a standard set of rules that allow electronic devices to communicate with each other.

- What type of data may be transmitted
- What commands are used to send & receive data
- How data transfers are confirmed

TCP/IP Layer



Protocols - Application - HTTP, MQTT, FTP, CoAP

Hyper Text Transfer Protocol (HTTP)

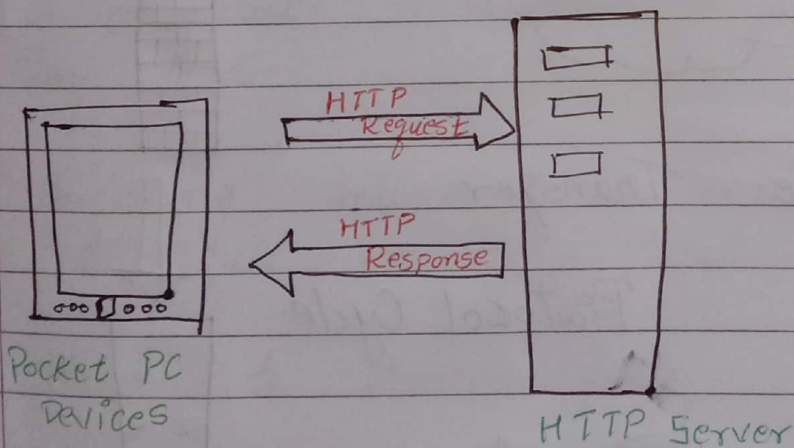
HTTP is an application protocol used for data Communication

Based on Data Communication in www.

Standard for web browsers that facilitates users to exchange information over internet

many websites uses HTTP to access any file or page.

Request response protocol in the client Server Computing model.



Advantages

HTTP accelerates the transmission of data over a browser database

mapping internet protocol addresses to classify names easily in a more straightforward way has made the www financially feasible.

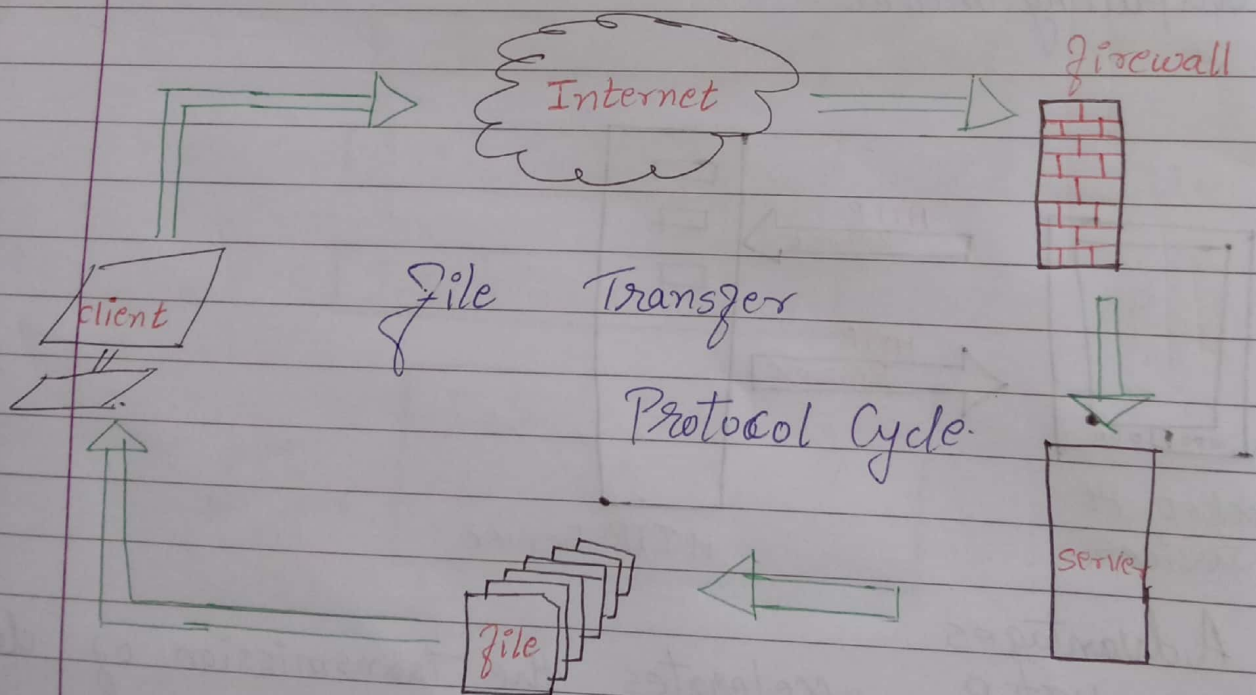
Disadvantages

HTTP is comparatively slow to most other native protocol.

A user can be threatened by individual privacy because the user does not encrypt the data sent via HTTP.

File Transfer Protocol (FTP)

FTP is standard network protocol used to transfer files between computer (client and server) over a TCP/IP network.



Client Controls the Conversation, while Server transmits the file Content

Browser acts as a client & starts the conversation by making some request on the server

Via FTP, a client can remove download delete or upload files on a server.

Advantages

Allows you to transfer multiple files as well as directories

No size limitation on single transfer.

Faster transfer than HTTP.

Disadvantages

User names, password & files are sent in clear text

filtering active FTP connection is different difficult on your local machine

Hard to script jobs

Message Queuing Telemetry Transport (MQTT)

MQTT is a lightweight, publish-subscribe network protocol that transports messages between devices.

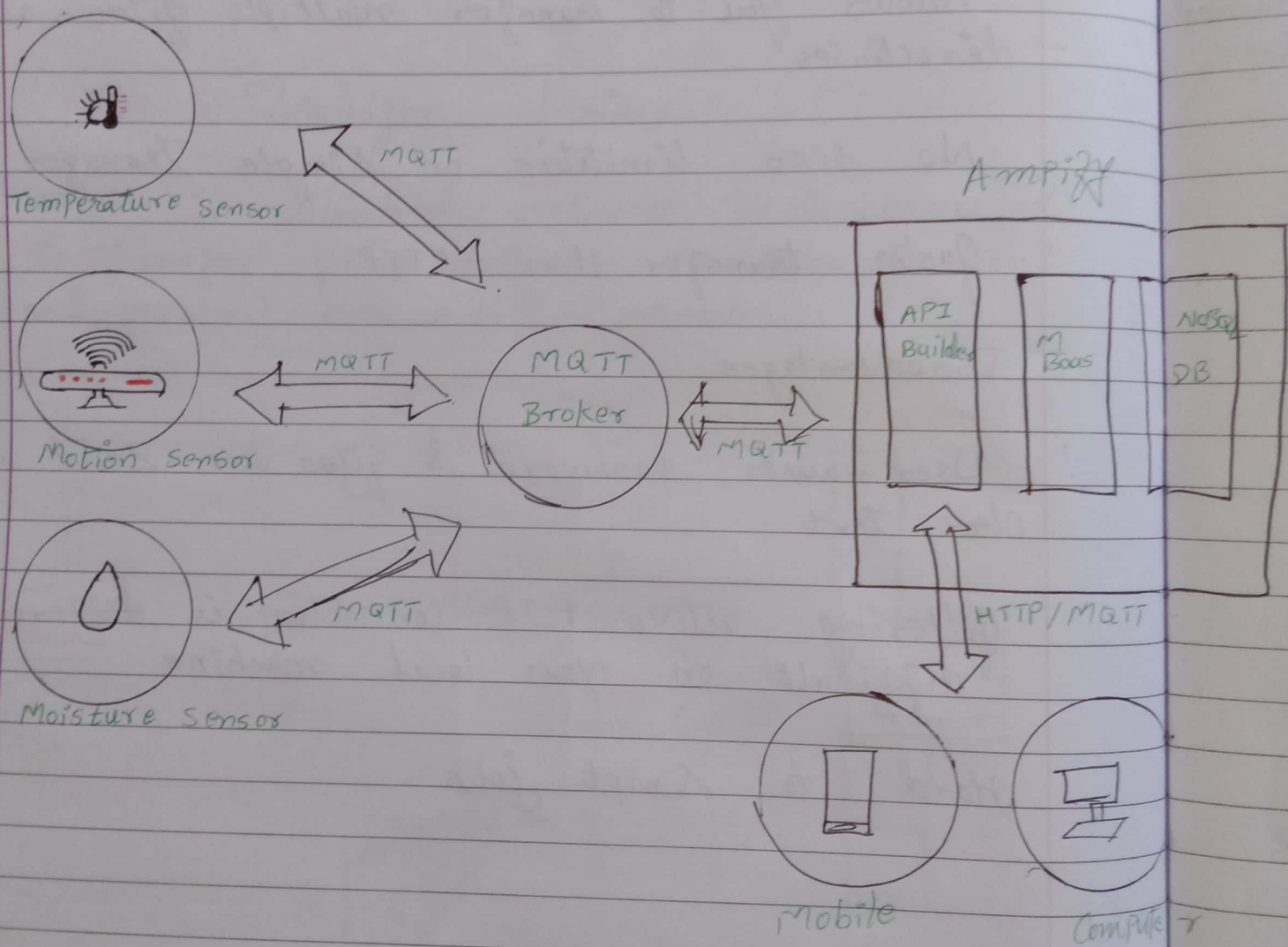


fig. Message Queuing Telemetry Transport

MQTT - messenger.

MQTT is machine to machine (m2m) IoT Connectivity Protocol.

It is a publish subscribe based messaging protocol. It works on top of the TCP/IP Protocol.

Important Terminologies in MQTT.

Publisher : One which publishes messages to the outer world.

Subscriber : One which receives messages that are intended for it.

Client : A client can be either publisher or subscriber or both. Client publishes a message & receives another message at the same time.

Server / Broker : The one that receives the messages published by the publisher first even before the subscribers. After filtering the messages, here Server & Broker mean the same entity.

Topic : String used by the client & servers to send or receive messages.

Constrained Application Protocol [CoAP]

CoAP is a specialized web transfer protocol for use with constrained nodes & constrained networks in the Internet of Things.

CoAP is designed to enable simple, constrained devices to join the IoT even through constrained networks ~~in~~ with ~~low~~ low bandwidth & low availability.

Used for — Smart building & Home automation

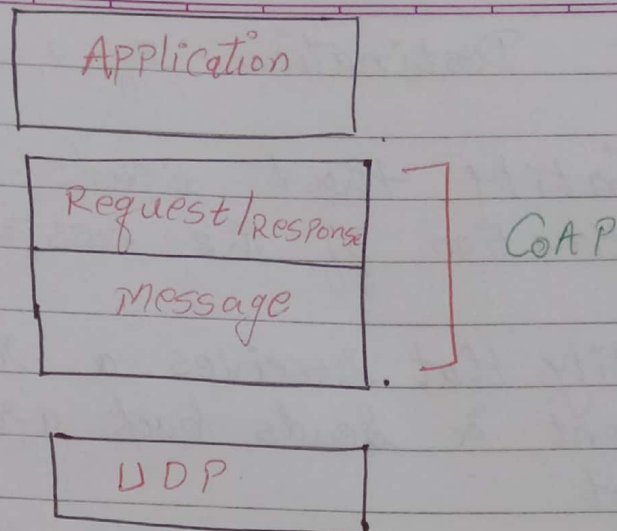
Features

- Web Protocol Used in M2M. with Constrained requirement
- Asynchronous message Exchange
- Low overhead.

very simple to perform syntactic analysis

Uniform Resource Identifier.

Proxy & caching capabilities.



Two different layers that make CoAP

- Messages
- Request / Response.

Message Layer - Deals with UDP & Asynchronous messages

Request / Response - manages request / response interaction based on request / response messages.

4 different message types.

Confirmable
Non - Confirmable
Acknowledge
Reset

Terms used -

Endpoint - Endpoint is identified with a host

Sender - Entity that sends message

Recipient - Destination of a messages

Client - Entity that sends request & destination of the response

Server - Entity that receives a request from a client & sends back a response to the client.