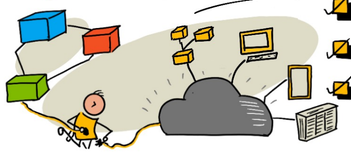
CONNECT

YOUR DEVICES TO THE INTERNET

LEARN TO

- SEND & RECEIVE MESSAGES
- CONNECT LIGHT TO MQTT BROKER
- CONNECT DEVICE TO INTERNET



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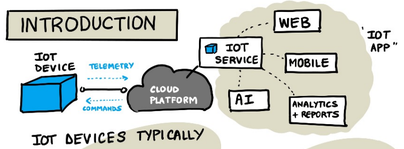

IOT DEVICES TYPICALLY CONNECT TO A SINGLE CLOUD IOT SERVICE – USING A STANDARD COMMUNICATION PROTOCOL

THAT SERVICE THEN CONNECTS TO THE REST OF YOUR IOT APP!

IN THIS LESSON

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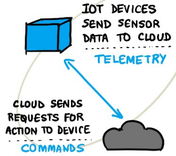

- COMMUNICATION PROTOCOLS
- MESSAGE QUEUING TELEMETRY TRANSPORT (MQTT)
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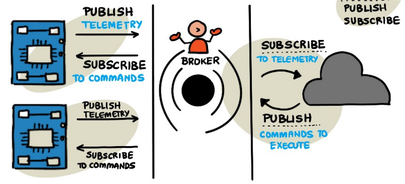
COMMUNICATION PROTOCOL

THE MOST POPULAR PARADIGM IS PUB/SUB

PUBLISH SUBSCRIBE



COMMUNICATION PROTOCOL

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EX: MQTT

OTHER COMMUNICATION PROTOCOLS INCLUDE:

- ADVANCED MESSAGE QUEUING PROTOCOL — AMQP
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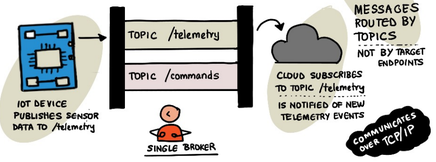
MESSAGE QUEUEING TELEMETRY TRANSPORT | MQTT

- SINGLE BROKER
- MULTIPLE CLIENTS
- NAMED TOPICS



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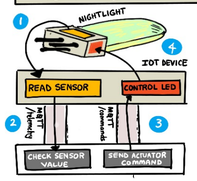

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② and ③ are subtopics Publish/subscribe to get only messages from that subset

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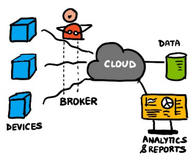

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"TELEMETRY" = GREEK WORD MEANING "TO MEASURE REMOTELY"

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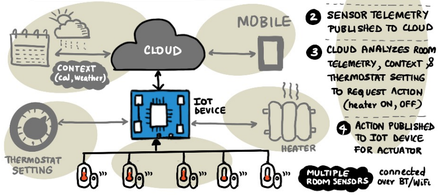

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connected over BT/Wifi

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NEXT TASK: SEND LIGHT-LEVEL TELEMETRY TO MQTT

- SEND LIGHT LEVEL TELEMETRY TO /telemetry TOPIC ON MQTT
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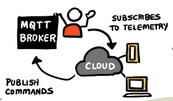

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DONE!

HOW OFTEN SHOULD TELEMETRY BE SENT?

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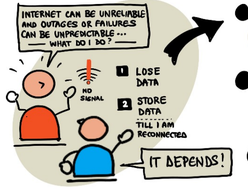

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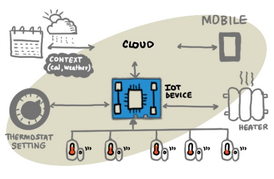
SEND COMMANDS TO MQTT



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COMMANDS ARE PUBLISHED BY SERVER VIA MQTT TOPIC

IOT DEVICES MUST

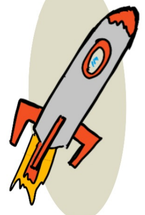
- SUBSCRIBE TO RELEVANT TOPIC
- LISTEN FOR MESSAGES ON TOPIC
- HANDLE MESSAGES – TAKING THE APPROPRIATE ACTION TO CONTROL LED

LOSS OF CONNECTIVITY

CONTEXT IS KEY

- DOES THE LATEST COMMAND OVERRIDE PREVIOUS ONES? IGNORE OLD COMMANDS
- DO COMMANDS NEED TO BE PROCESSED IN ORDER? (DO X, THEN DO Y)

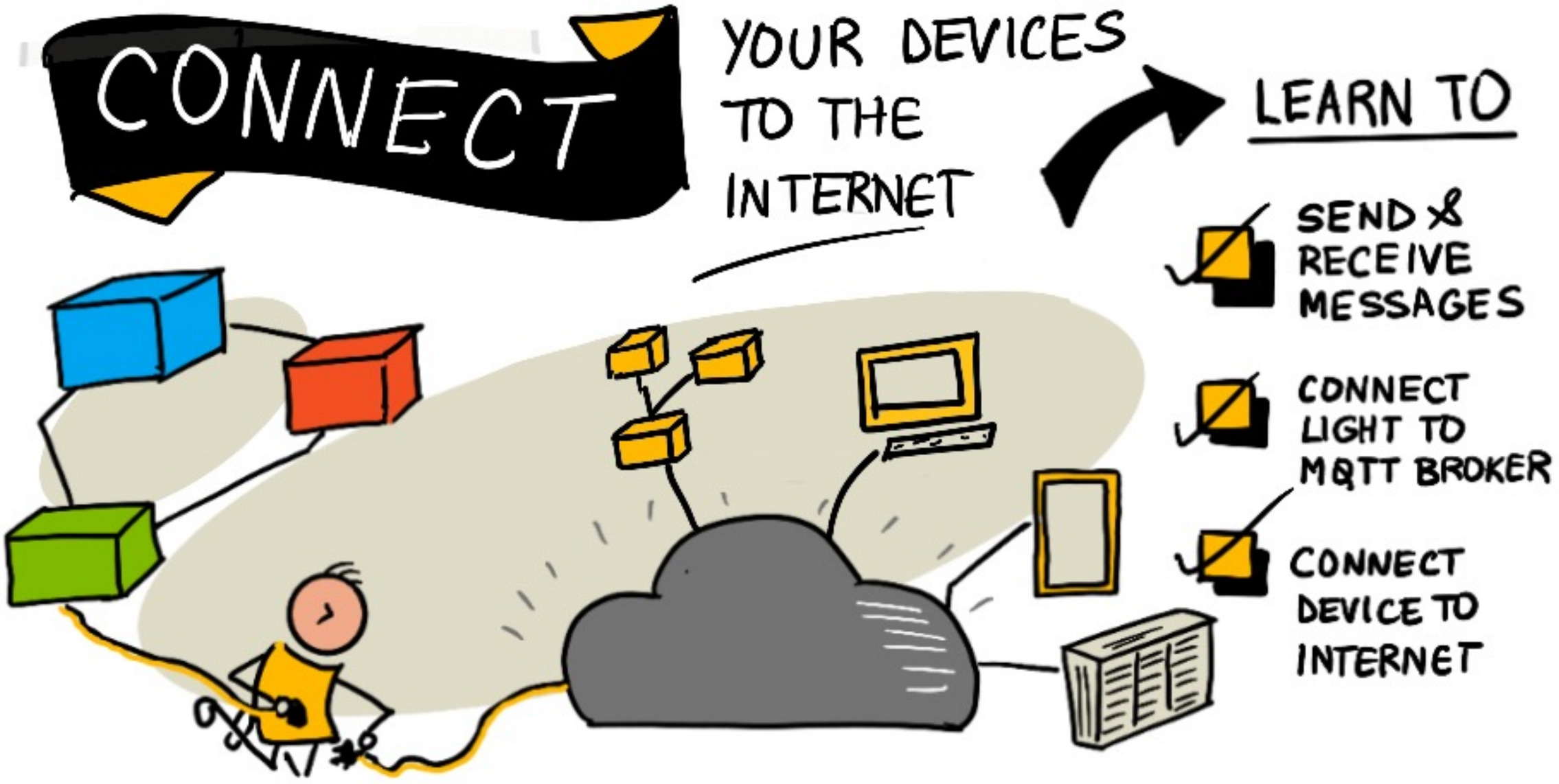
SEND/RESEND COMMANDS IN THE DESIRED ORDER



CHALLENGE

- LOOK AT YOUR PREVIOUS LISTS OF IOT DEVICES
- FOR EACH DEVICE – WHAT MESSAGES MIGHT THEY BE SENDING? RECEIVING?
- ARE THEY SECURE? WHAT TELEMETRY DO THEY CAPTURE? SEND?

NEXT: TO THE FARM TO PREDICT PLANT GROWTH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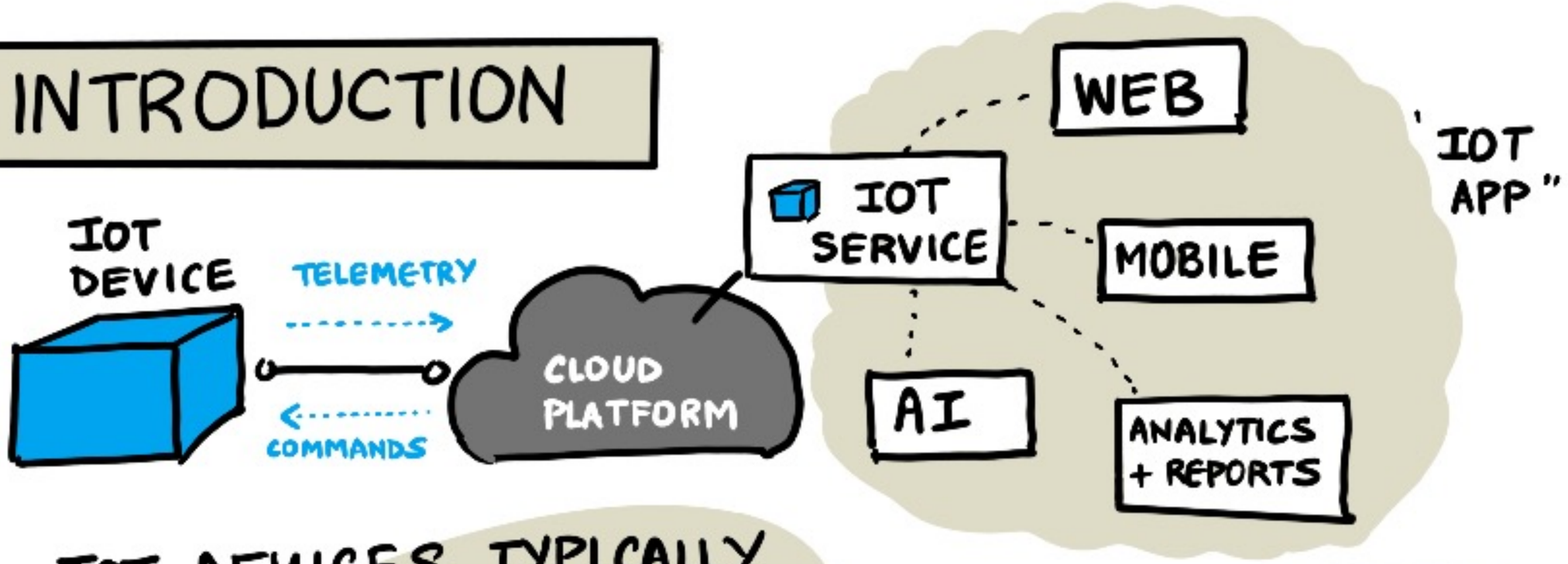

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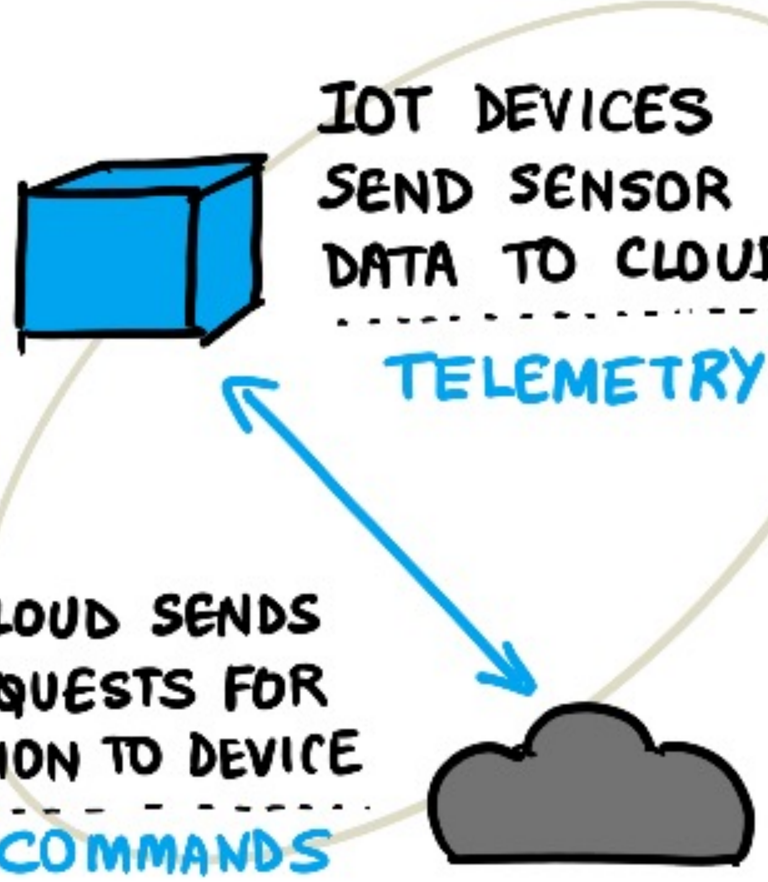

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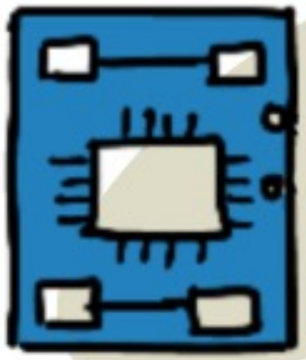

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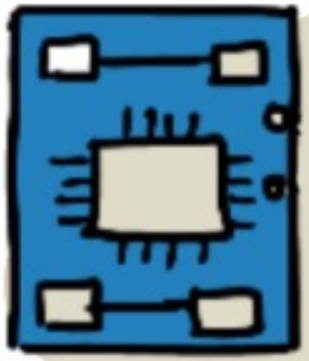

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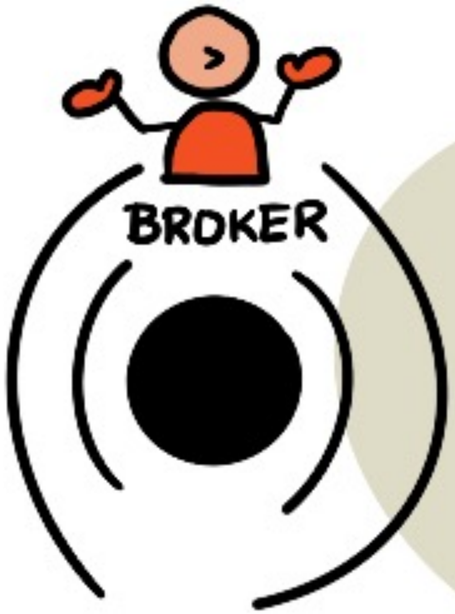

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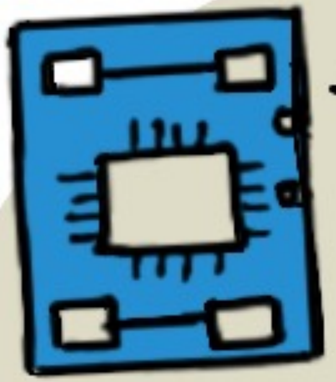
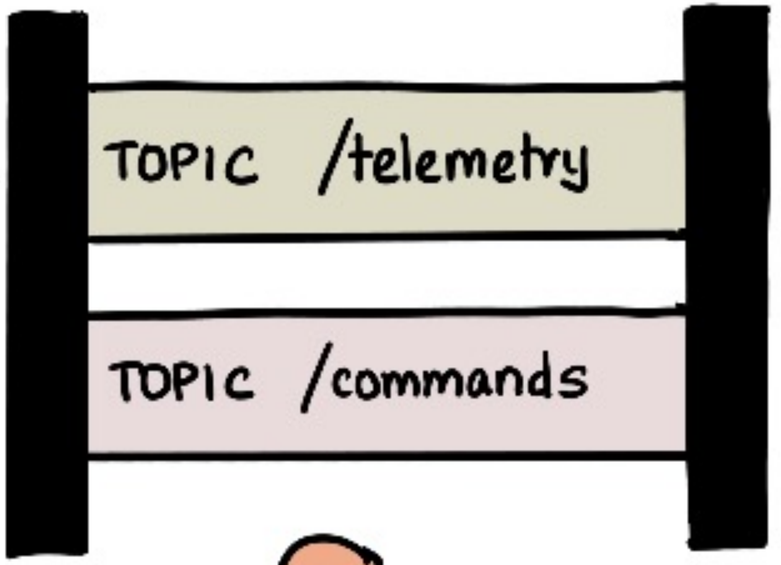
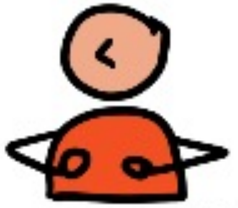


IOT DEVICE
PUBLISHES SENSOR
DATA TO /telemetry





SINGLE BROKER

CLOUD SUBSCRIBES
TO TOPIC /telemetry

IS NOTIFIED OF NEW
TELEMETRY EVENTS

MESSAGES
ROUTED BY
TOPICS

NOT BY TARGET
ENDPOINTS

COMMUNICATES
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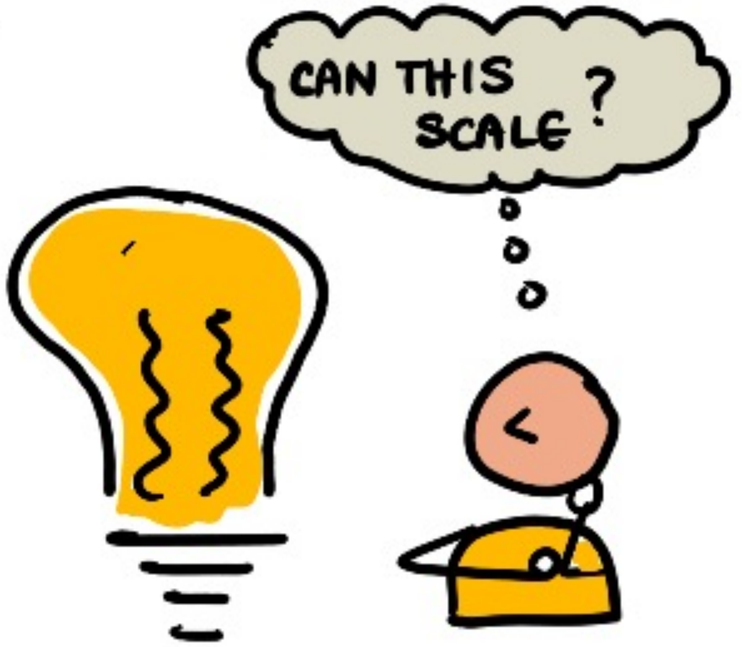

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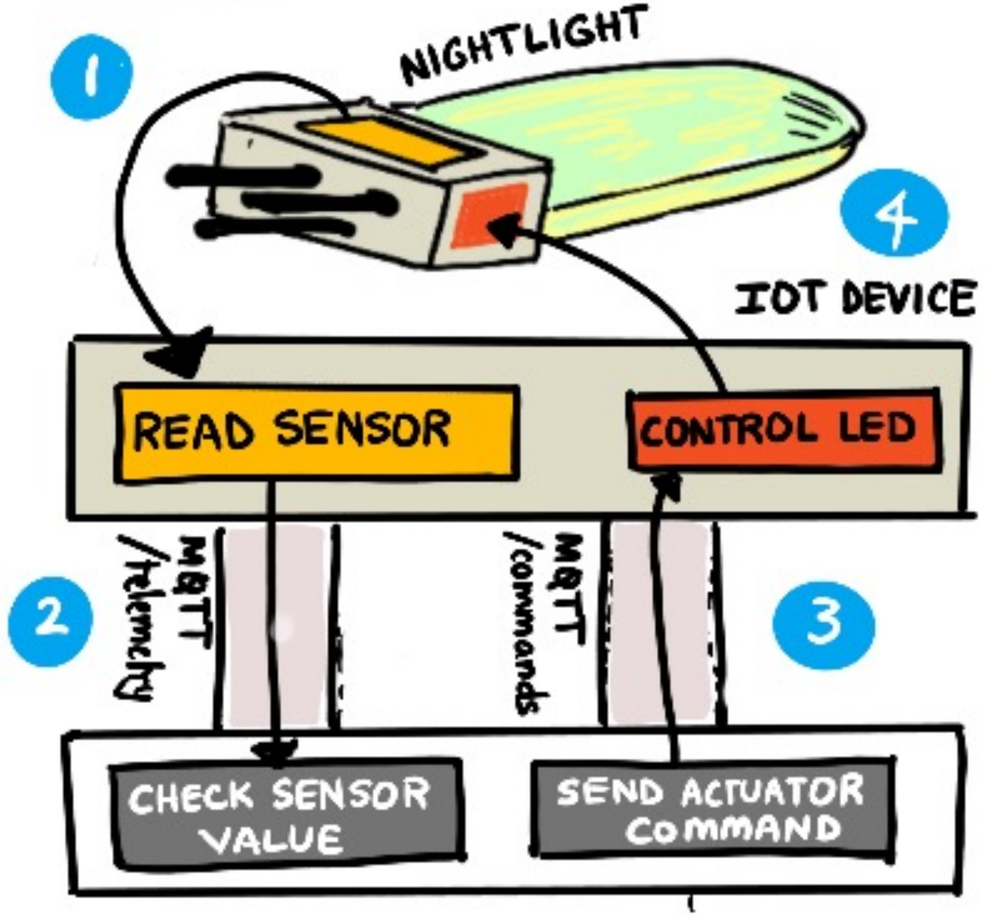

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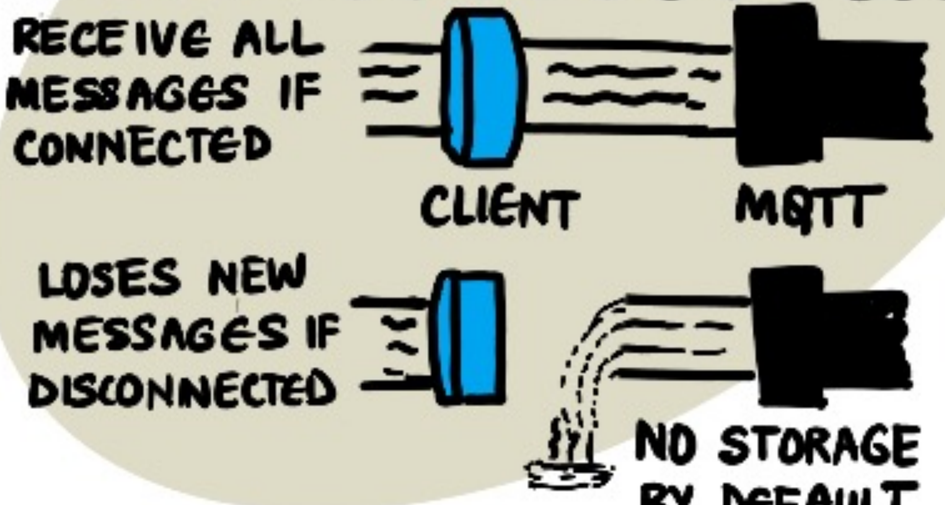


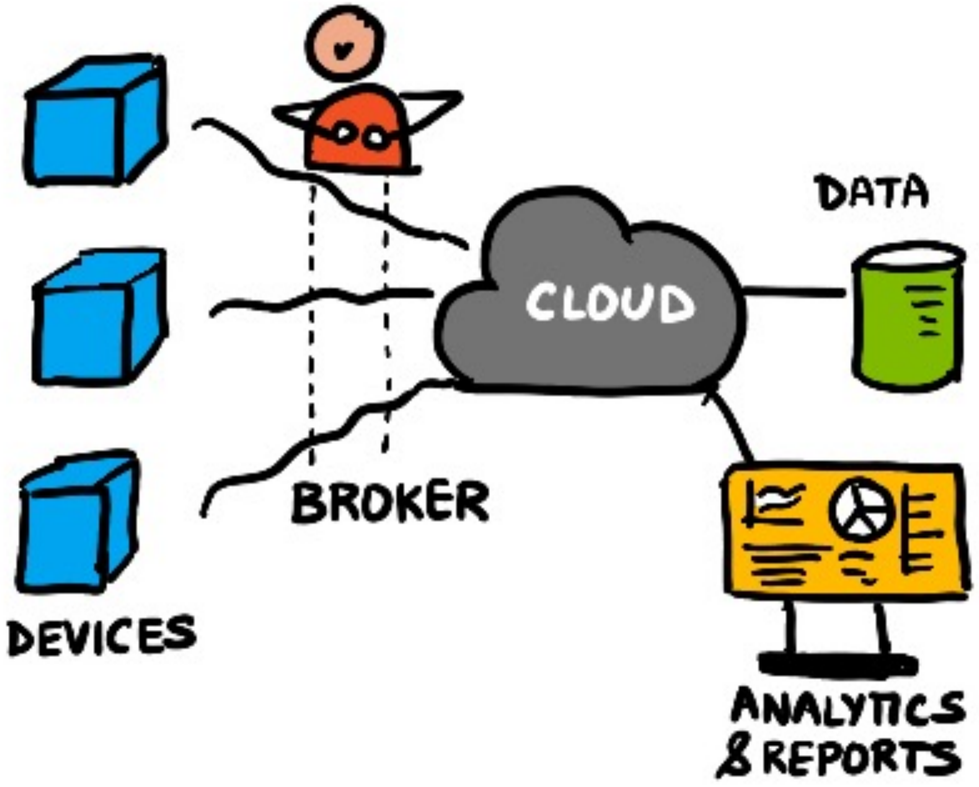
KEEP ALIVE FUNCTION

CHECKS IF THE CONNECTION IS ALIVE DURING LONG GAPS IN MESSAGES

RETAINED FLAG

SET IT TO ENSURE LAST MESSAGE ON TOPIC IS SAVED FOR LATE SUBSCRIBERS

TELEMETRY



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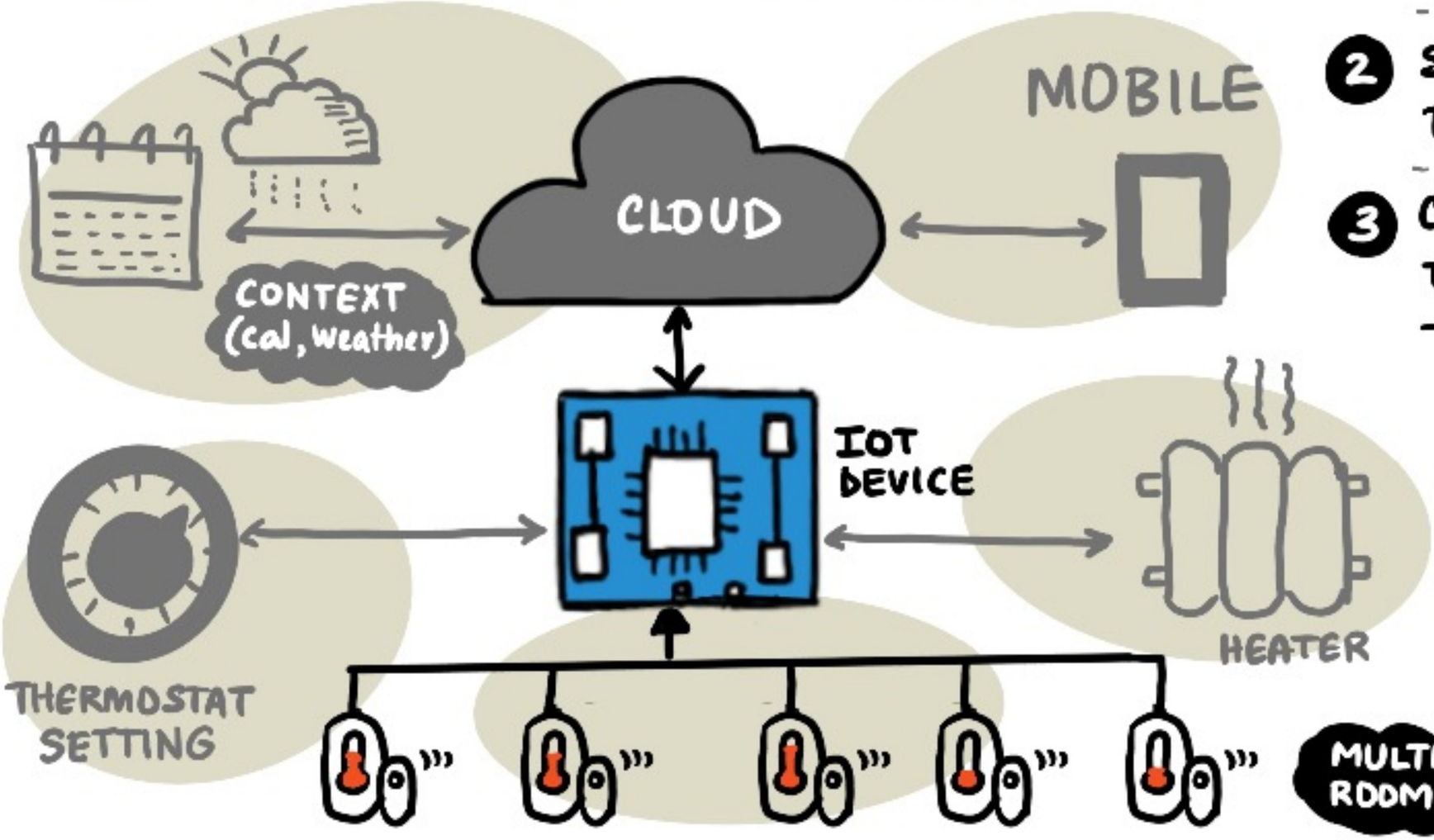

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NIGHTLIGHT

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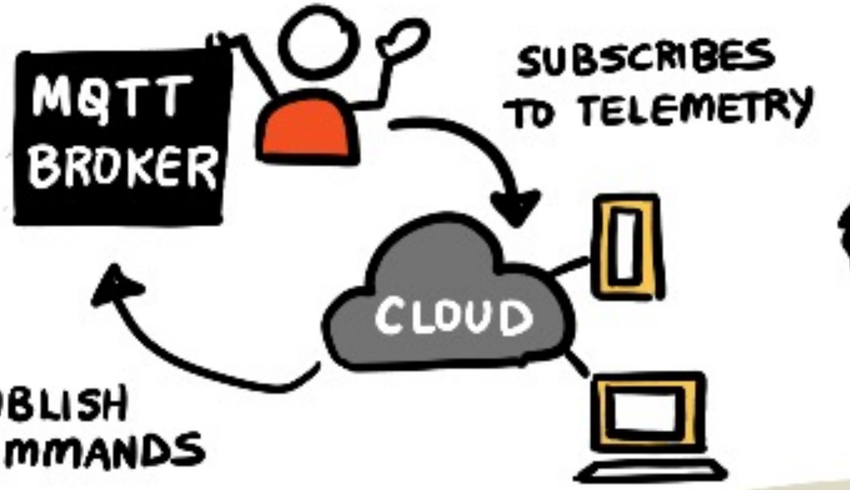

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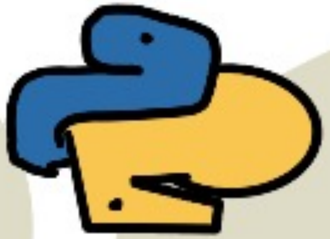

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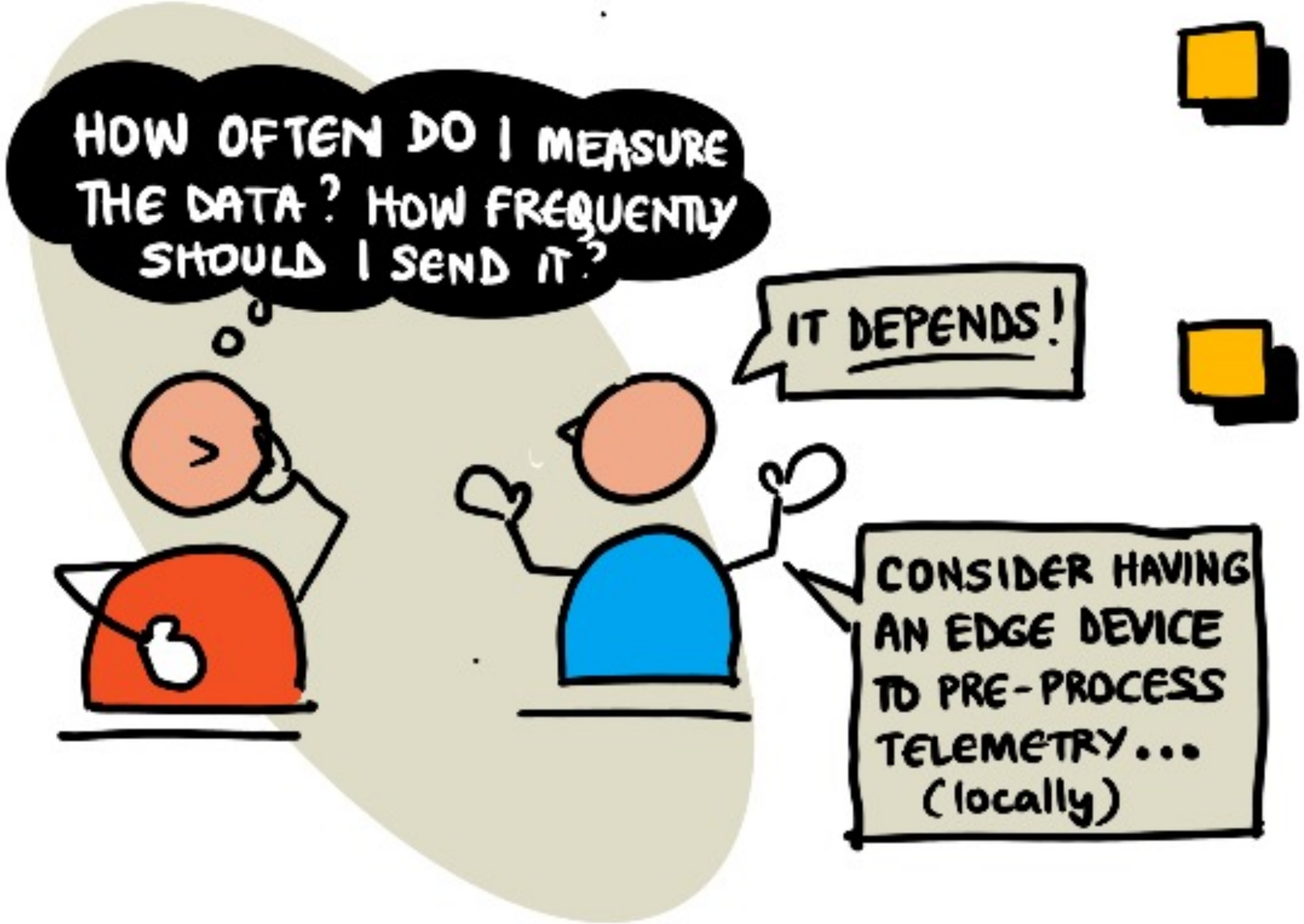

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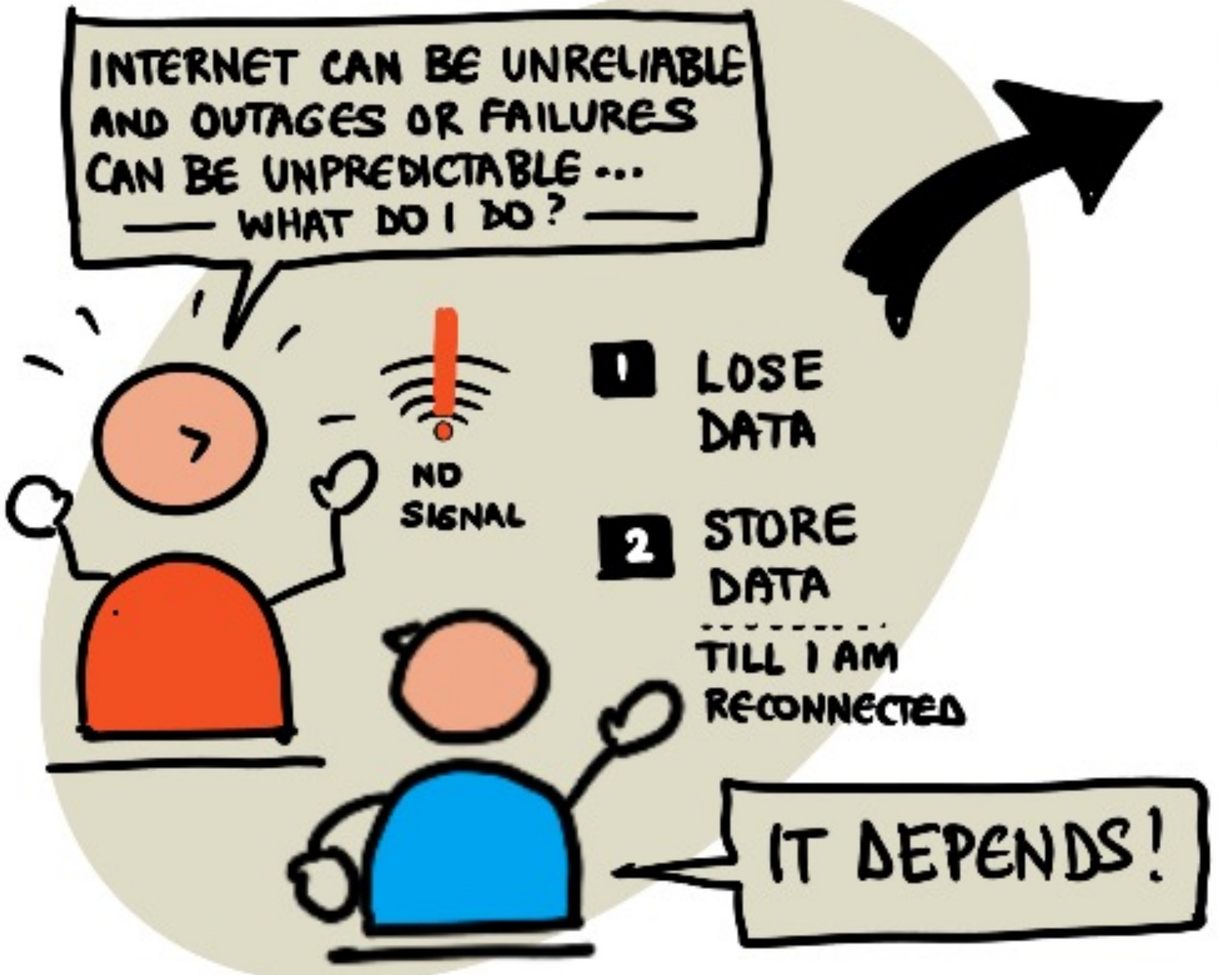

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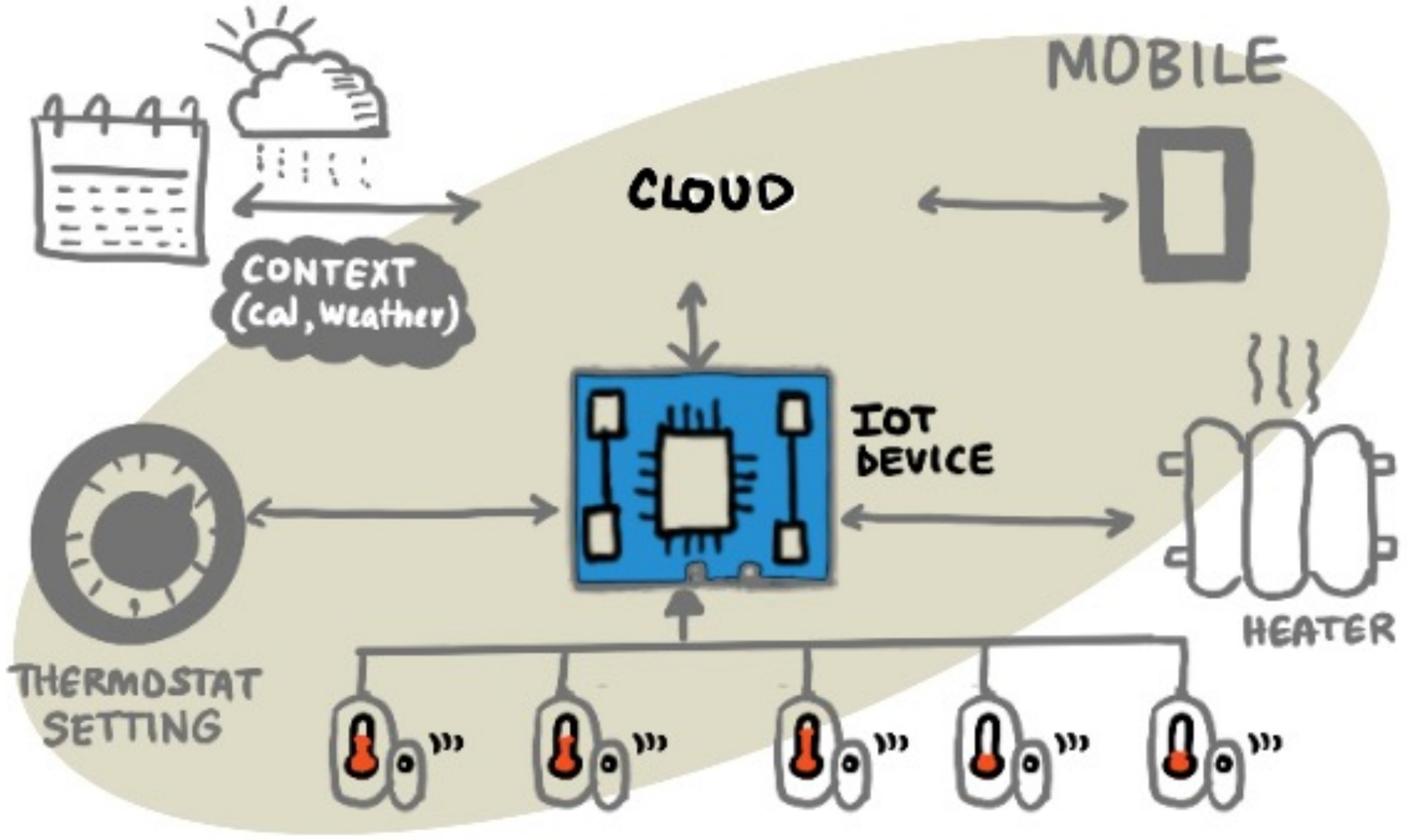

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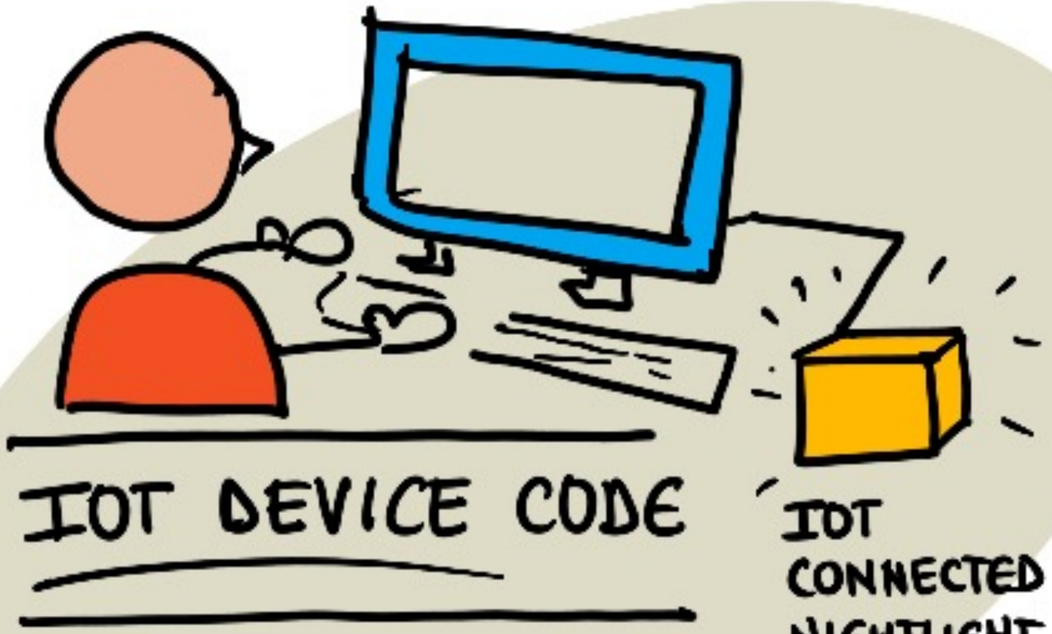

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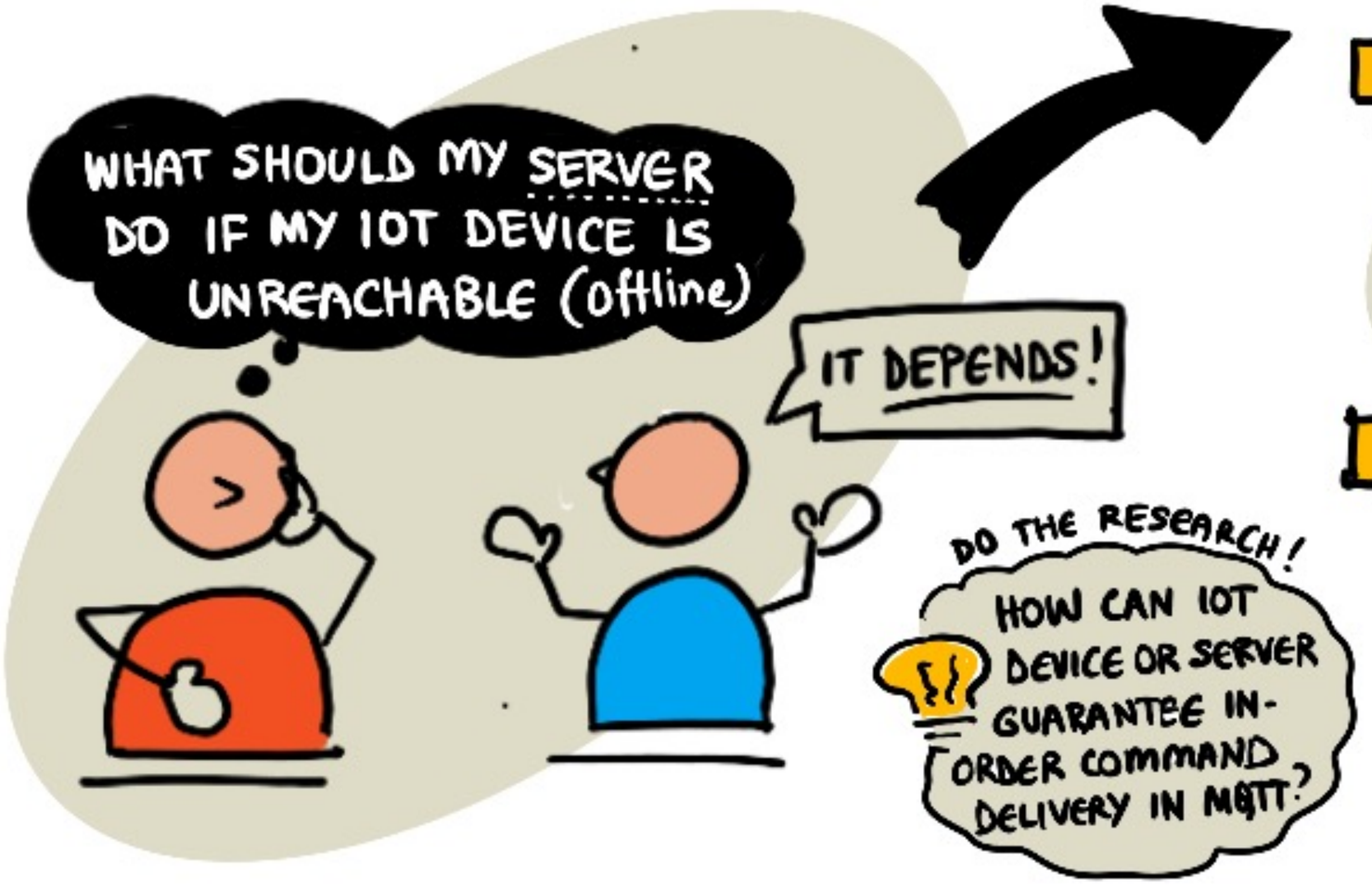
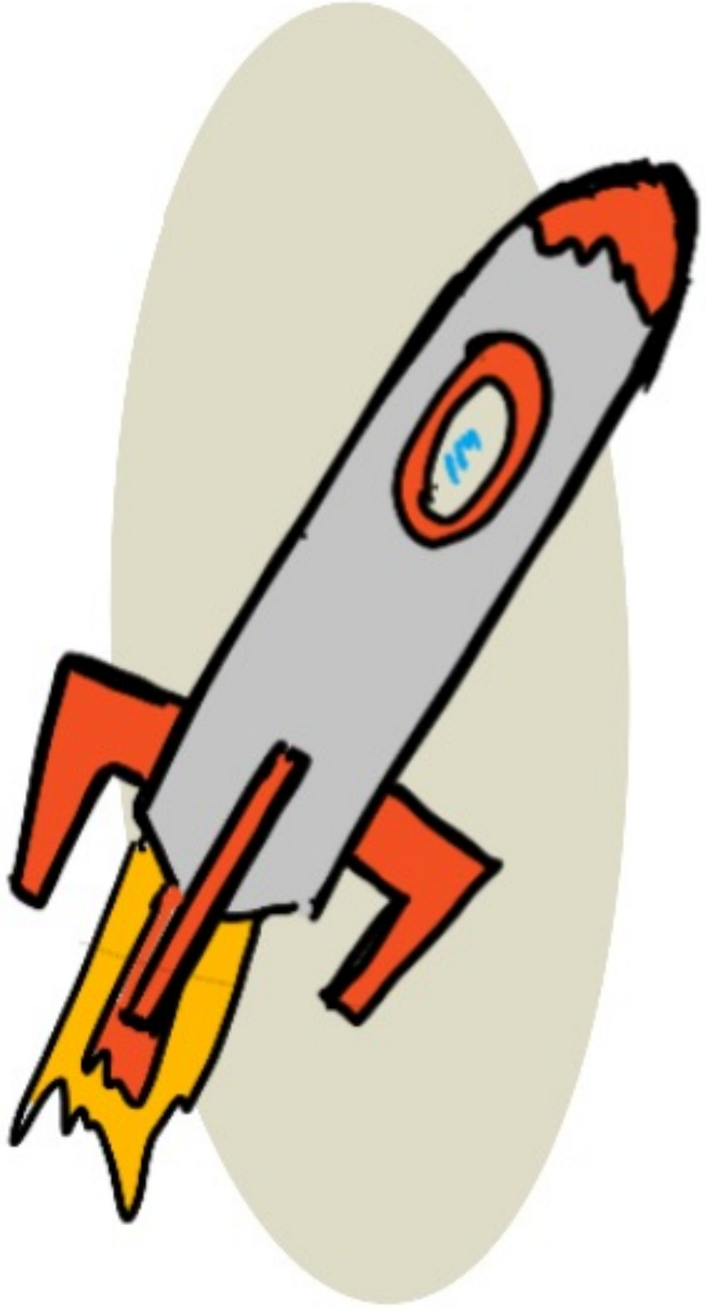
- SUBSCRIBE TO RELEVANT TOPIC
- LISTEN FOR MESSAGES ON TOPIC
- HANDLE MESSAGES – TAKING THE APPRORIATE ACTION TO CONTROL LED

LOSS OF CONNECTIVITY



CONTEXT IS KEY

- DOES THE LATEST COMMAND OVERRIDE PREVIOUS ONES?
  - IGNORE OLD COMMANDS
- DO COMMANDS NEED TO BE PROCESSED IN ORDER? (DO X, THEN DO Y)
  - SEND/RESEND COMMANDS IN THE DESIRED ORDER



CHALLENGE

- LOOK AT YOUR PREVIOUS LISTS OF IOT DEVICES
- FOR EACH DEVICE - WHAT MESSAGES MIGHT THEY BE SENDING? RECEIVING?
- ARE THEY SECURE? WHAT TELEMETRY DO THEY CAPTURE? SEND?

NEXT: TO THE FARM TO PREDICT PLANT GROWTH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