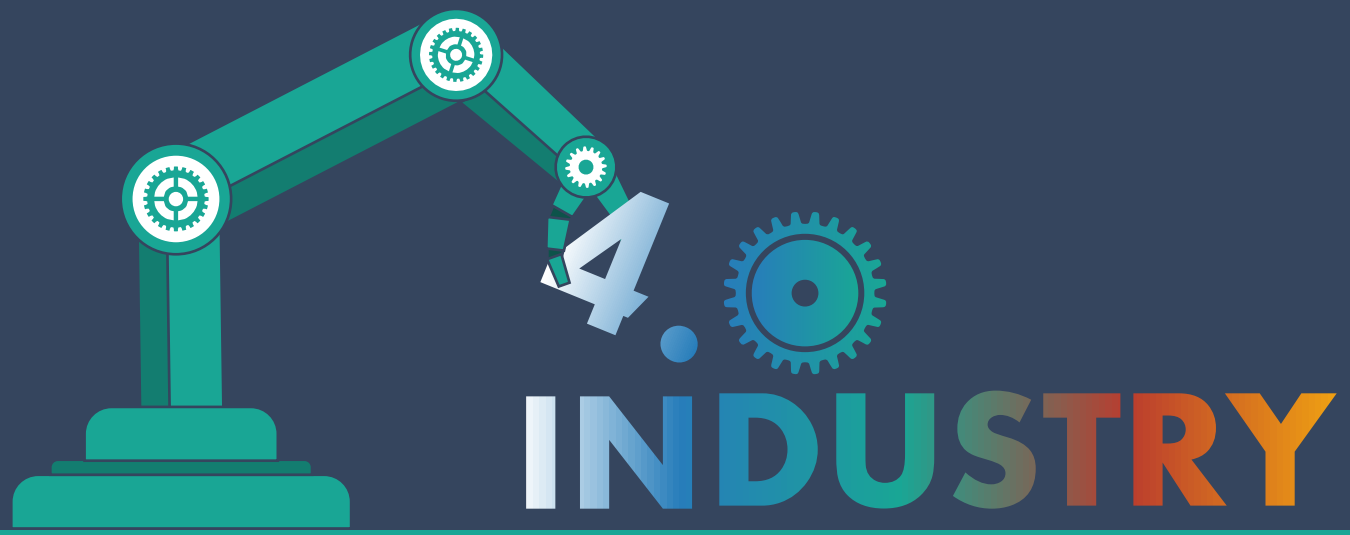
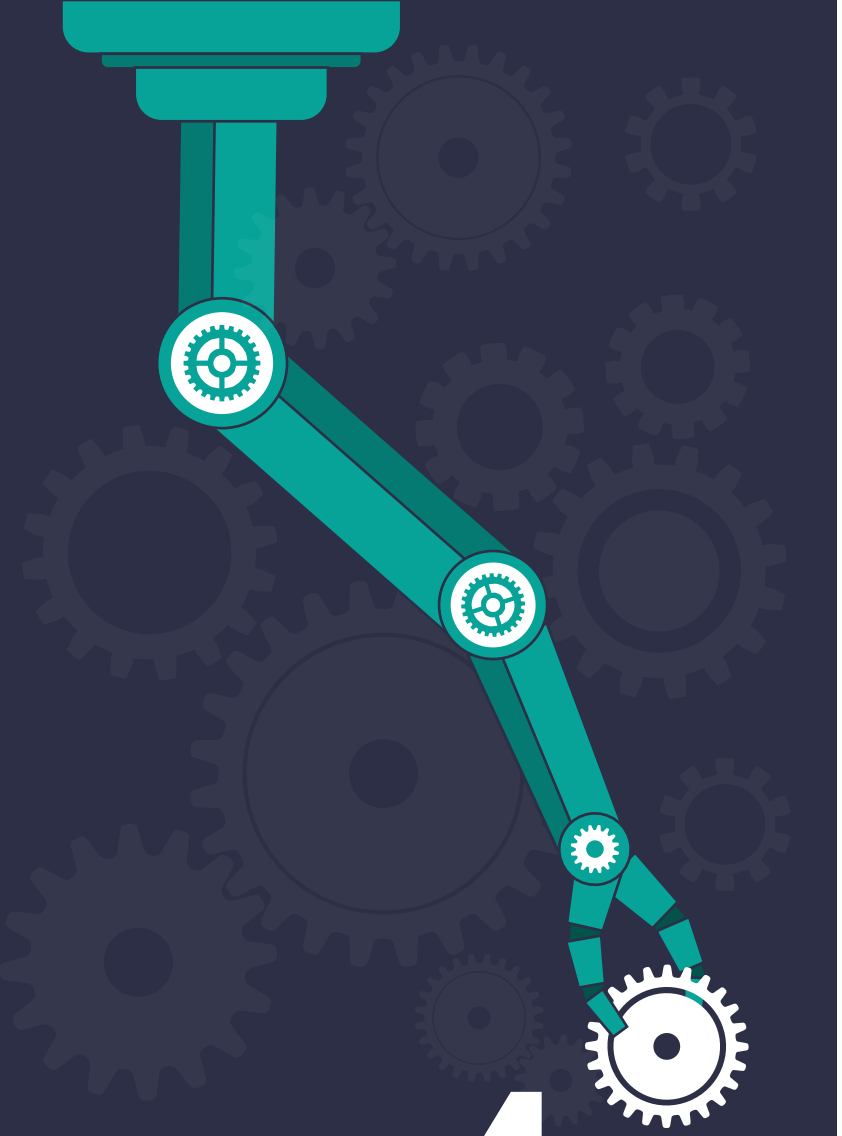


Evaluating the performance of IoT-Protocols for autonomous Tractors

Presented by
Mohamed Elashkr
Wael Amer



Agenda

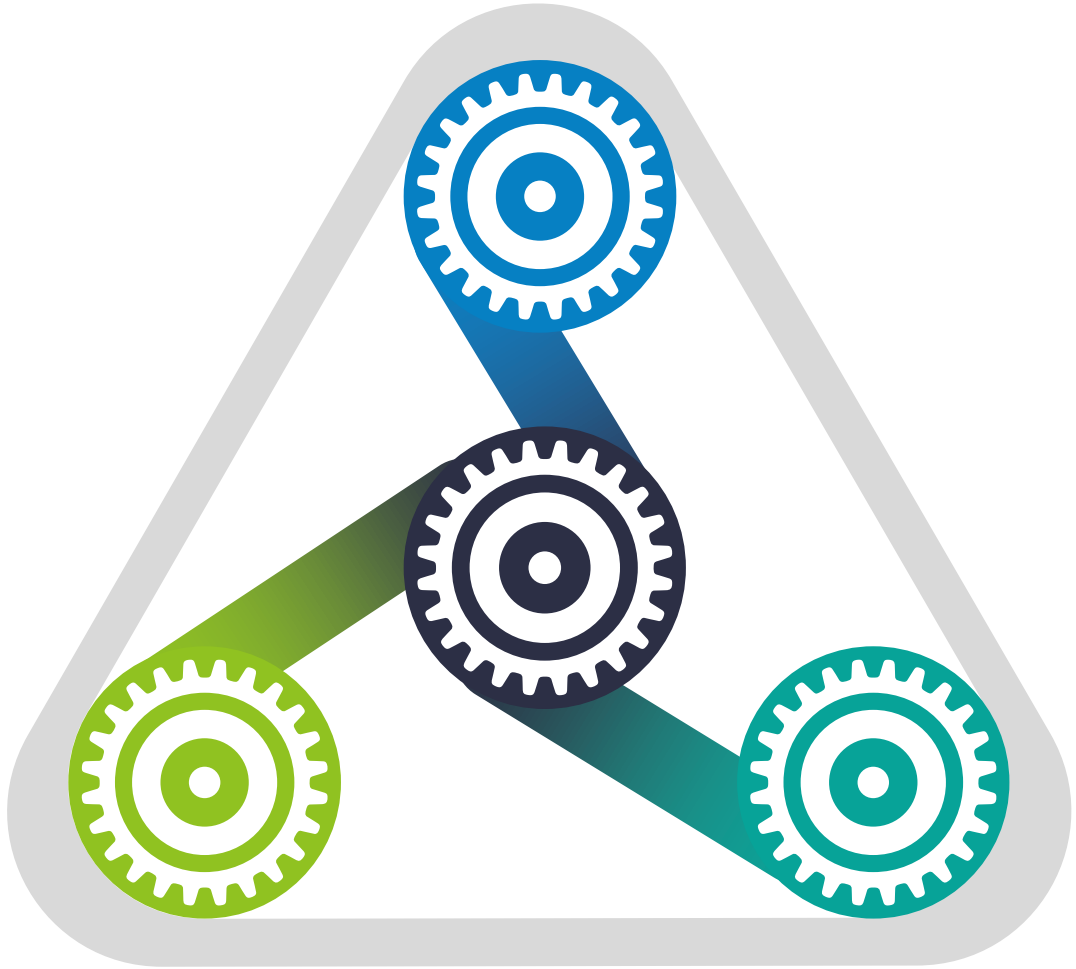
01 Problem

02 IoT Protocols

03 Design of Experiment

04 Evaluation

Problem



Autonomous tractor

Have been built on old technology

Performance issue

Transporting data is slowly to old environment

Heavy Data by Transport

Sensor data consume more CPU and RAM

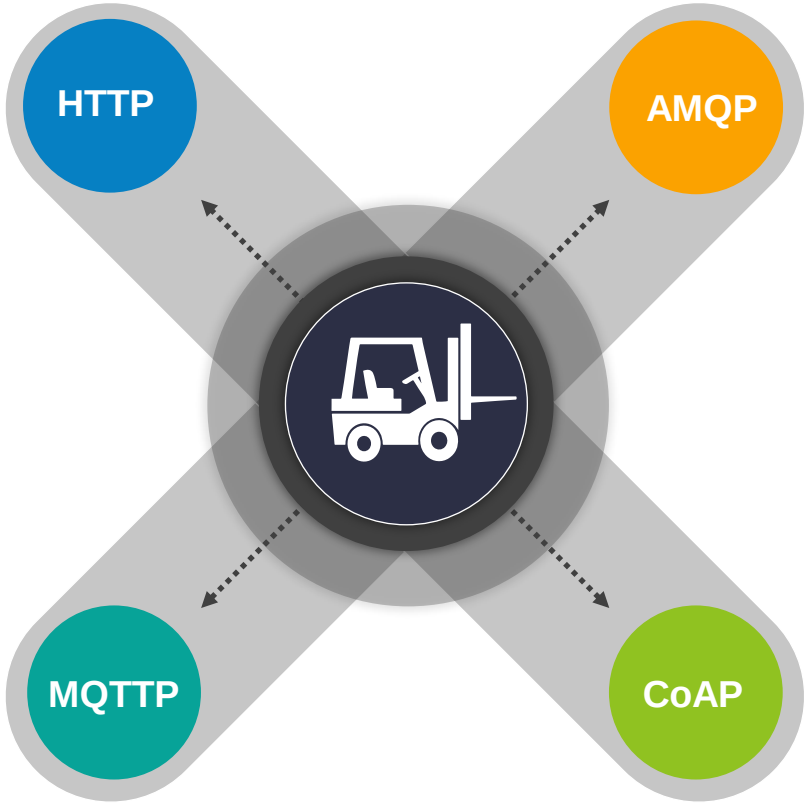
Lack of security

Hackers can access and control the system

IoT Protocols

Hypertext transfer Protocol

- Establish synchronous connection between two devices
- Big challenge for IoT, Devices may not reachable



Advanced Message Queueing Protocol

- Open standard protocol Publish/Subscribe
- Considered for intensive data volume

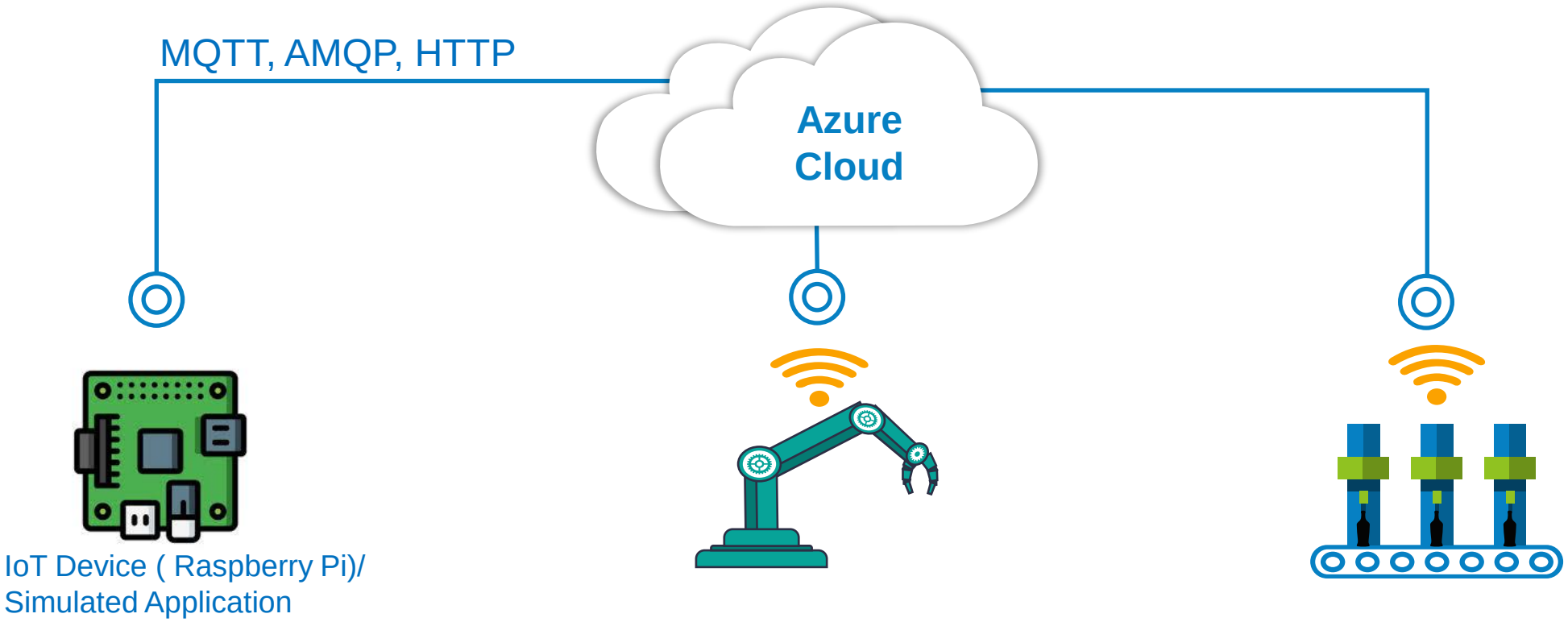
Message Queuing Telemetry Transport

- It is a lightweight publication/subscription
- Working on TCP/IP and is asynchronous
- Suitable for
    - Small Data processing and memory resources

Constrained Application Protocol

- Is a synchronous application layer protocol
- Enables small devices with CPU and lower power to use RESTful

Design of Experiment (1/2)



IoT Device (Raspberry Pi)/
Simulated Application

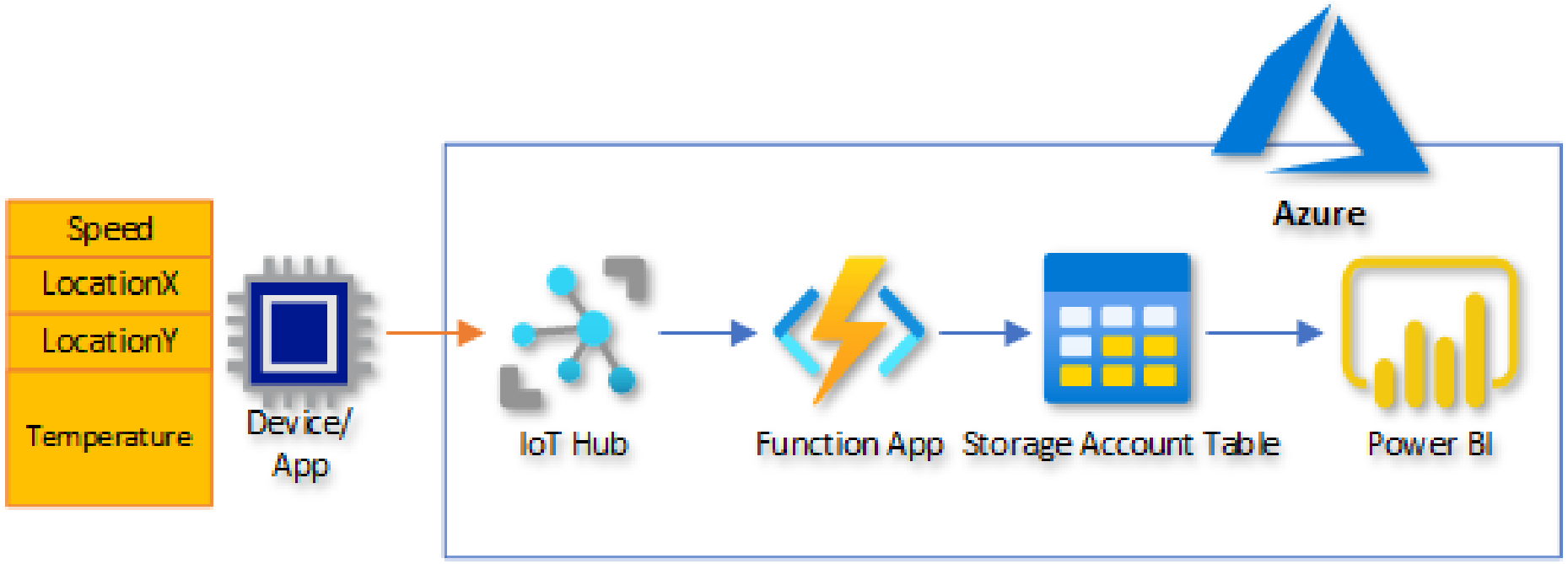
Performance test (Asynchronous)

- 100 Requests
- 1000 Requests
- 3000 Requests

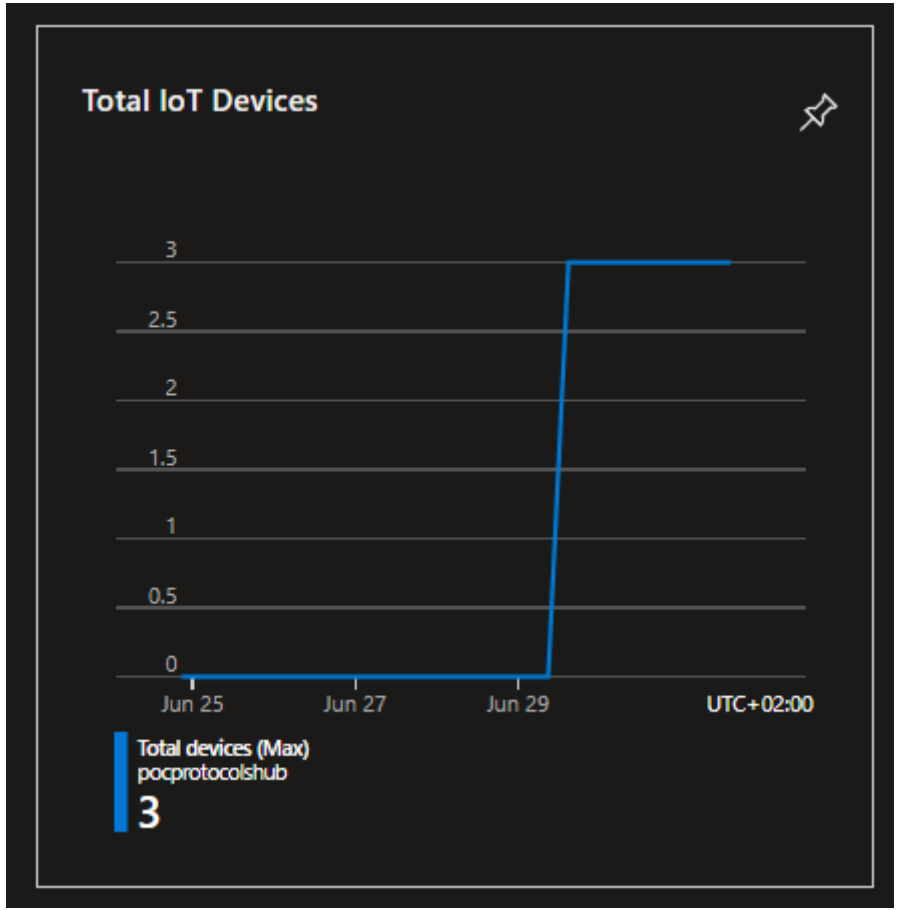
Processing Sensor Data &
Find out best performance

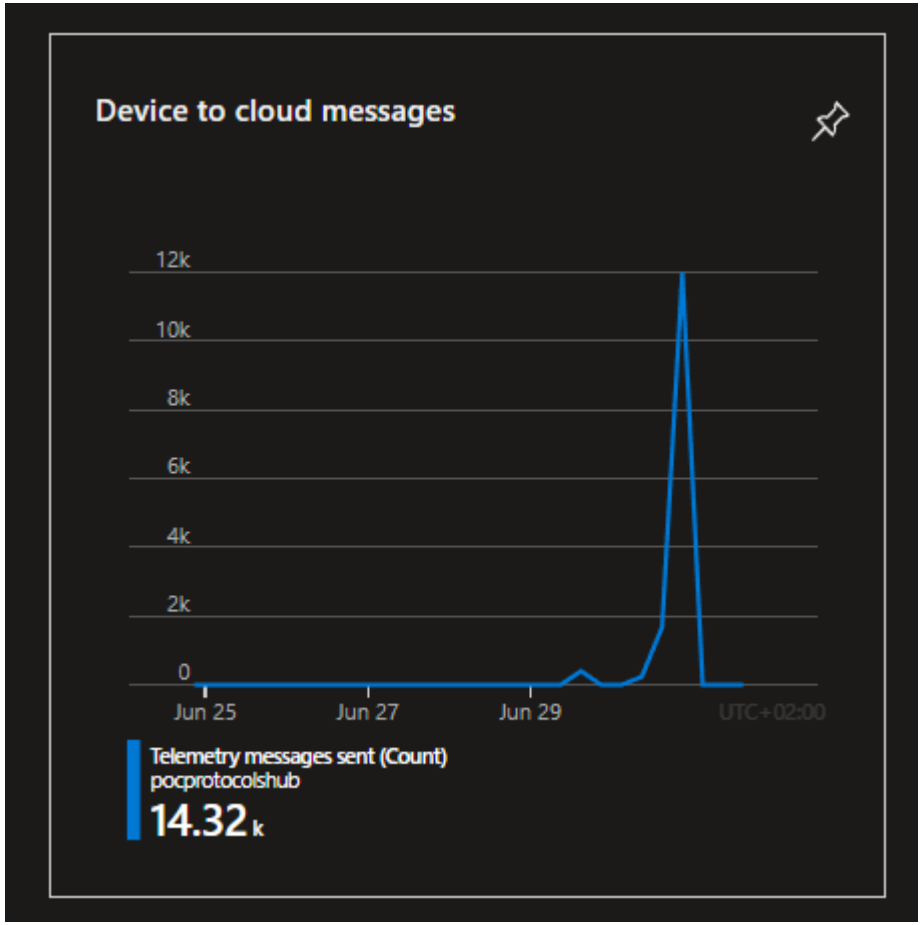
Data will be sent in JSON-Format

Design of Experiment (1/2)

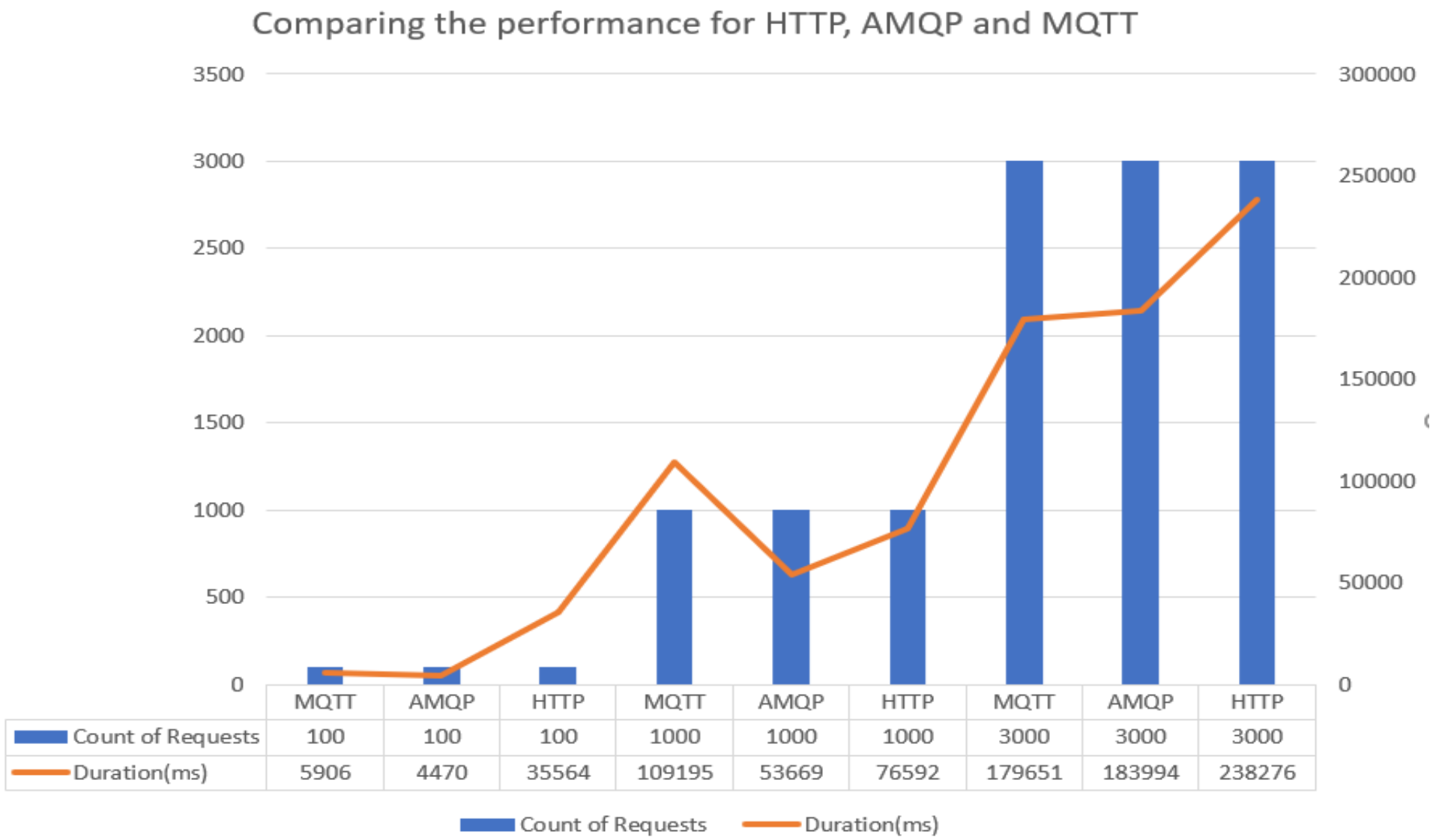


Evaluation (1/3)



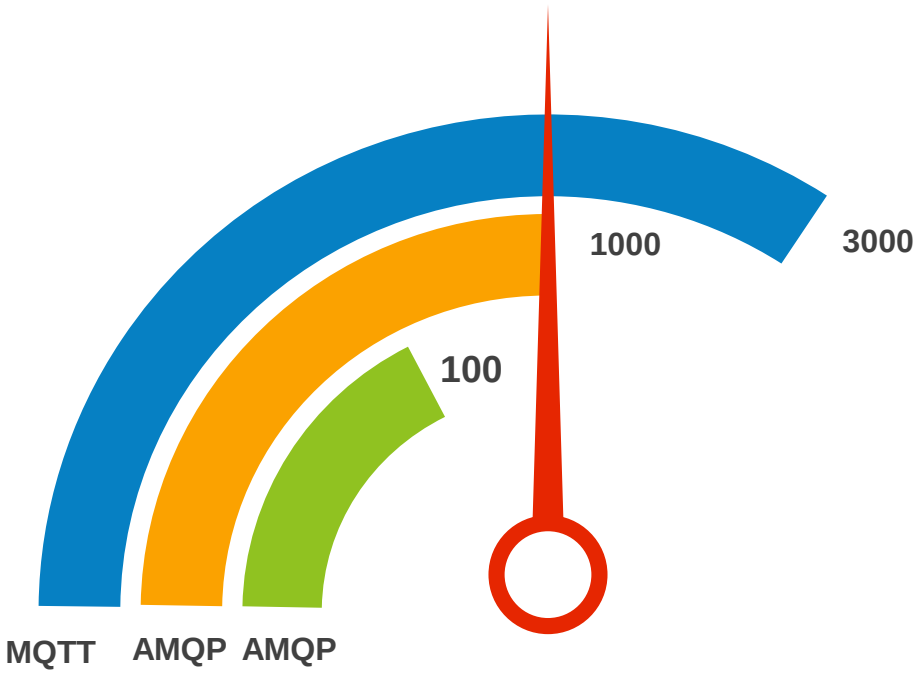


Evaluation (2/3)



	MQTT	AMQP	HTTP	MQTT	AMQP	HTTP	MQTT	AMQP	HTTP
Count of Requests	100	100	100	1000	1000	1000	3000	3000	3000
Duration(ms)	5906	4470	35564	109195	53669	76592	179651	183994	238276

Evaluation (3/3)



3000 Requests

MQTT

- Has the highest performance
- 179651 ms

1000 Requests

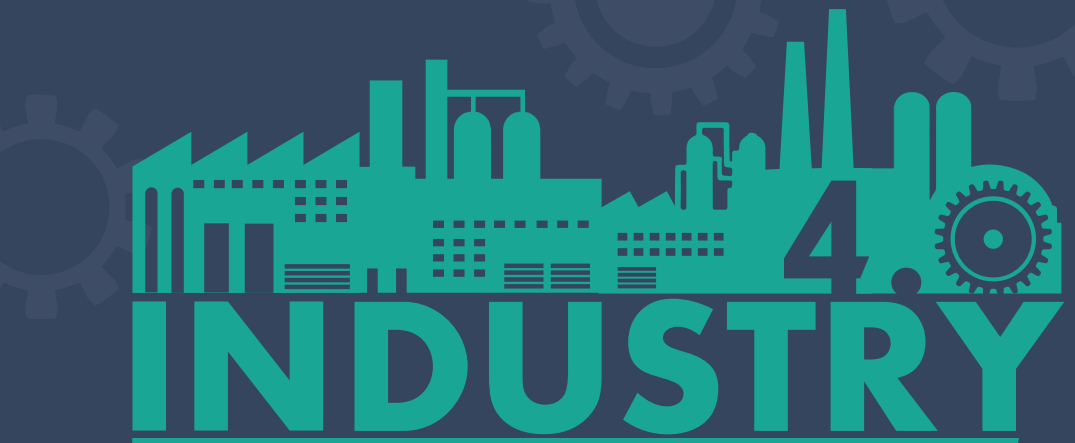
AMQP

- Has the highest performance
- 53669 ms

100 Requests

AMQP

- Has the best performance
- 4470



Thank You