Industrial IoT and Digital Twins of Cyber-Physical Systems

PROJECT Submission

by

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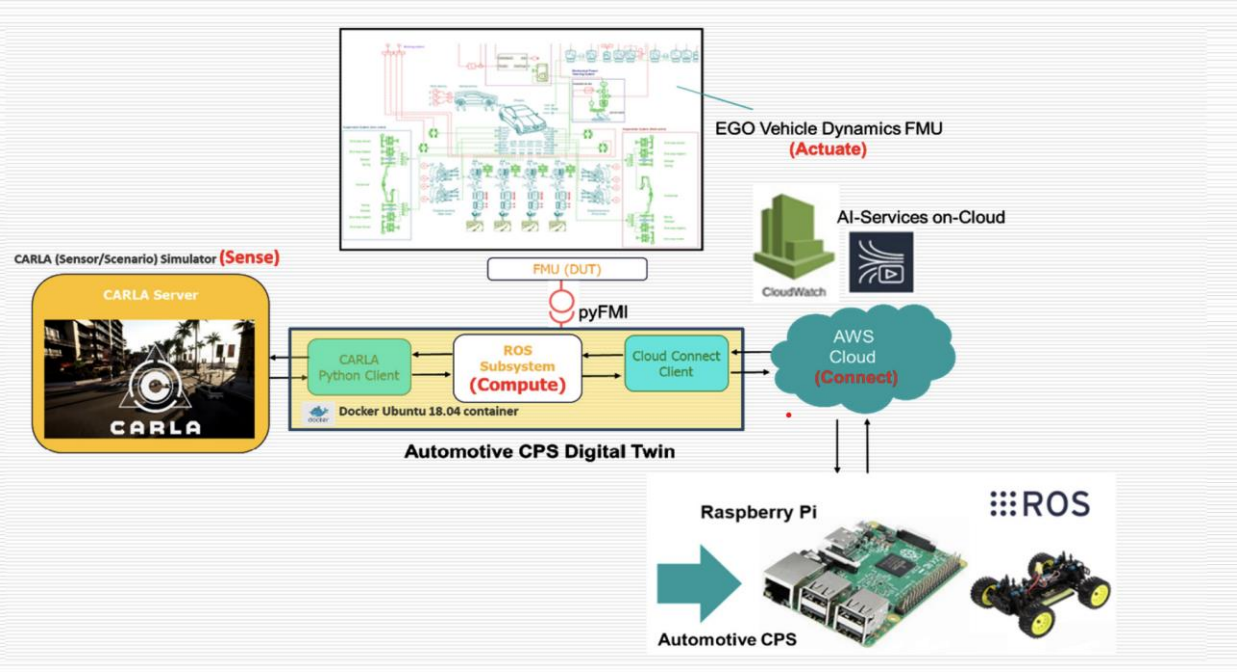
INTRODUCTION

With our objective of building a physical system and it cyber counter part and linking the two in a harmonious manner. Implementing some of the concepts outlined in our study .

Project Briefing



Physical System

Raspberry Pi

Controls the outflow of data into the cloud and interfaces with cyber modules

Physical car

RC car with Four motors and an ultrasonic sensor

Arduino

Controls the RC car , send the status report and sensor data

Cyber System

Raspberry Pi

Sends data into the AWS cloud using the MQTT protocol

AWS IOT Cloud

Provides storage and mid way point for the data between the physical and the cyber

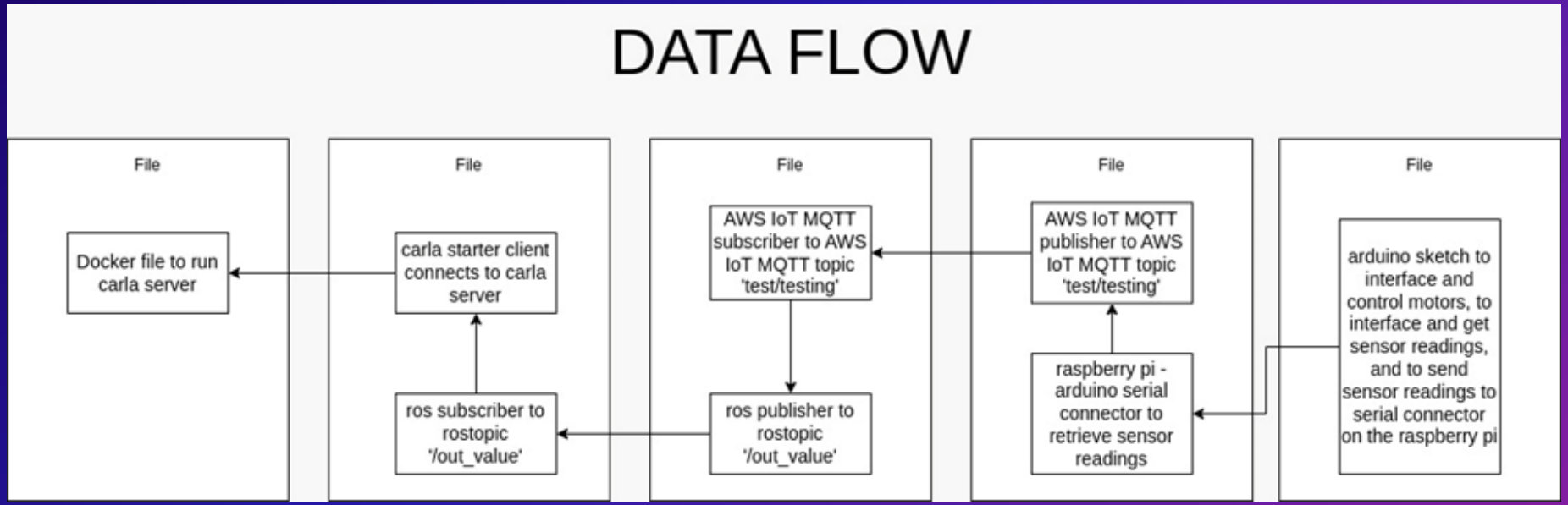
Robotic control system

Gets the data from the cloud and controls the Carla model

Carla

The Car simulation system that is run by ROS and provides a cyber simulation for it

DATA FLOW


DATA FLOW
File
Docker file to run carla server
File
carla starter client connects to carla server
ros subscriber to rostopic '/out_value'
File
AWS IoT MQTT subscriber to AWS IoT MQTT topic 'test/testing'
ros publisher to rostopic '/out_value'
File
AWS IoT MQTT publisher to AWS IoT MQTT topic 'test/testing'
raspberry pi - arduino serial connector to retrieve sensor readings
File
arduino sketch to interface and control motors, to interface and get sensor readings, and to send sensor readings to serial connector on the raspberry pi

See Results

THANKS