ESS-NW/CAR

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MF2063

December 6, 2018

Overview

Introduction

- Autonomous Driving (AD) and Advandced Driving Assistance Systems (ADAS)
- Communication in self driving cars
  - CAN
  - LIN
  - FlexRay
  - Ethernet
- Intelligent system monitoring
  - Startup
  - Fault detection
  - Network statistics
- Adaptation services
  - Failsafe
  - Network reconfiguration

Network

- Software defined Network (SDN)

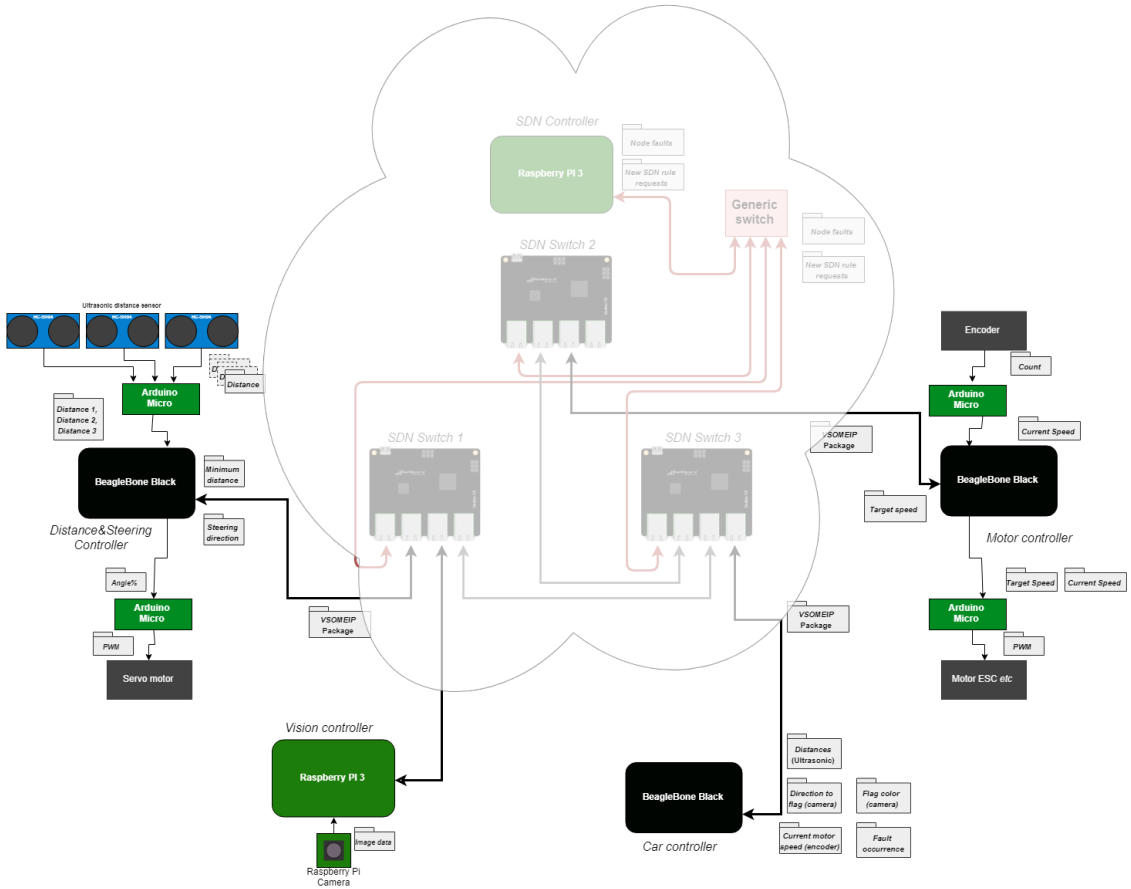
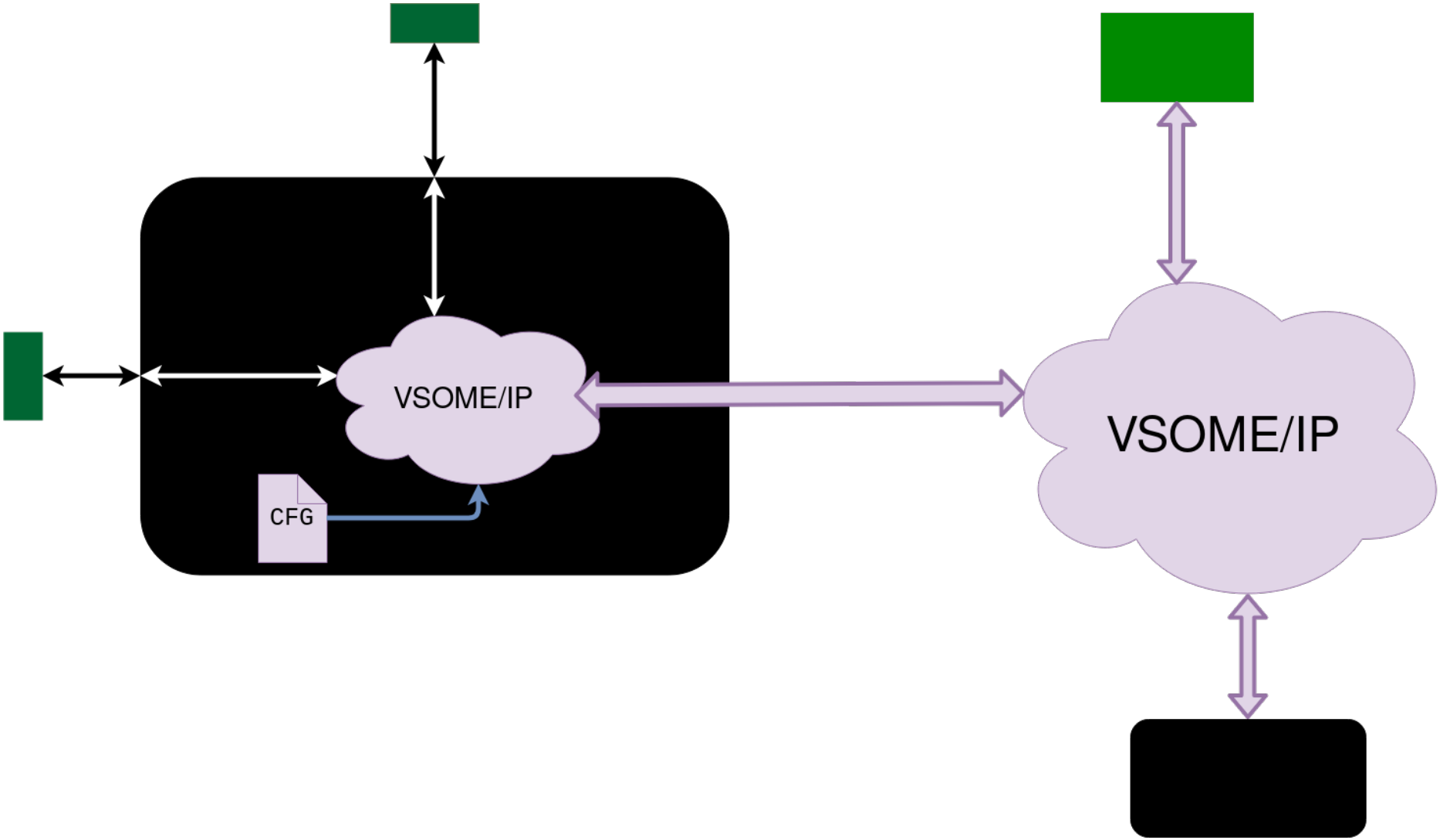


Figure: Network

SDN

- Move the intelligence from the switches to a controller
- The controller gather information from the switches
- The controller decides how the traffic should be send in the network
- Scalable
- Ryu controller is the SDN frame work we used, python based and well documented.

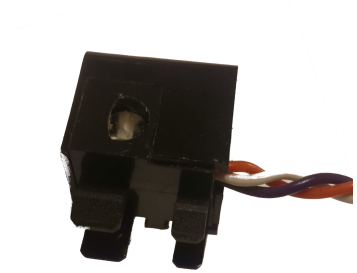
VSOME/IP



Sensors

- Ultrasonic sensor

- Reflective object sensor



- Camera

Actuators

- Motor controller
- Steering controller

Autonomous behaviour

- Services
- State machine

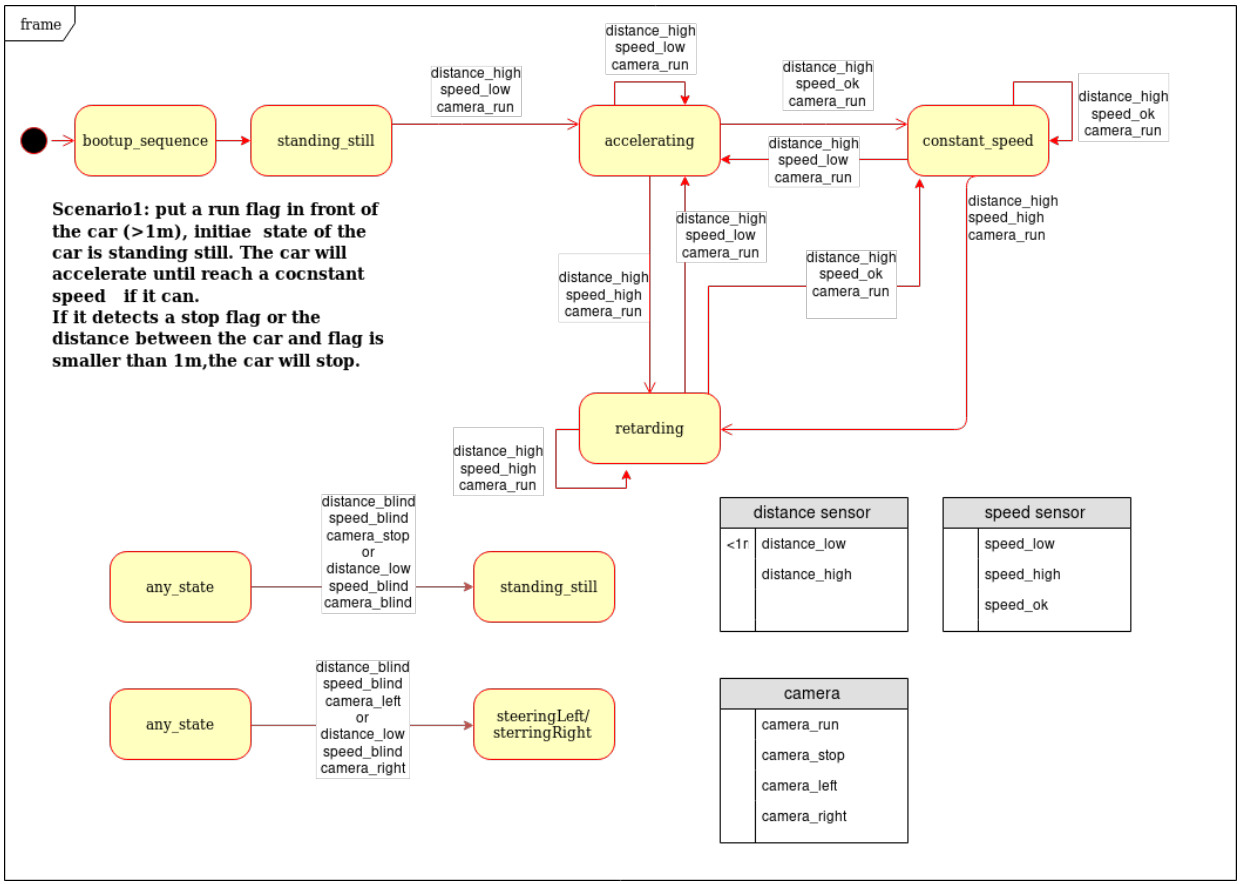
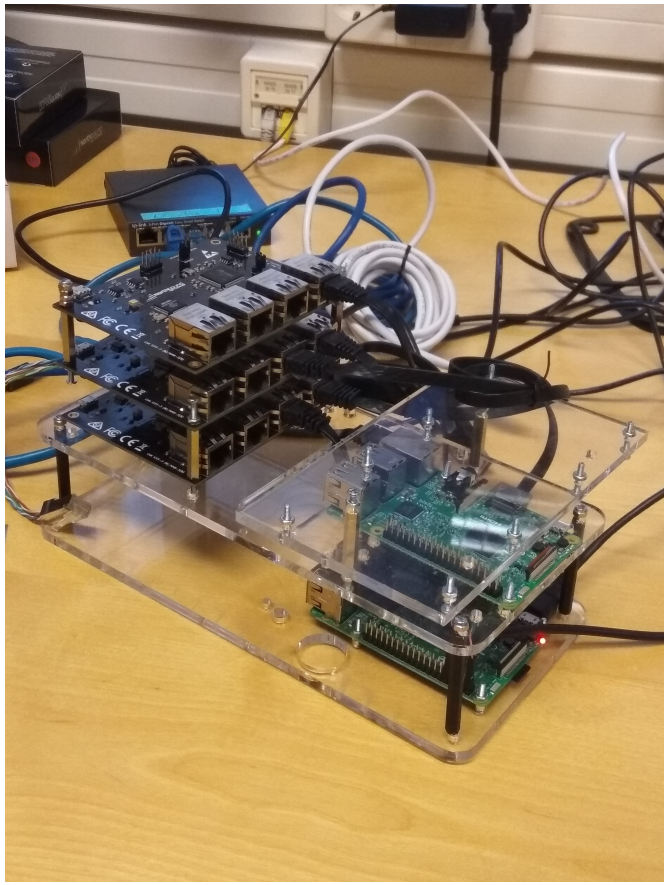


Figure: State machine

The platform

- Designed in Fusion 360
- Cut out in the laser cutter
- The ide of the design was to build up to get access to everything and to be modular
- Mounted on the car via two holes



Power

- We hade designed PCBs to mount the Arduinos on and to power the other devices
- Could not order PCB
- The machine PCB mill was broken both the one Mentorspace and proto Prototype Center
- Had to use breadboard

Conclusion

- Ethernet is a promising candidate for increasing demand on bandwidth for communication in autonomous cars.
- Ethernet is not without problems, which of many SDN is a promising candidate to solve.
- SDN networks allow for safe, fast and customisable communication on autonomous vehicles.
- Thanks to our project owners!

The End