Parking Lot Occupation

Project Presentation - RSA

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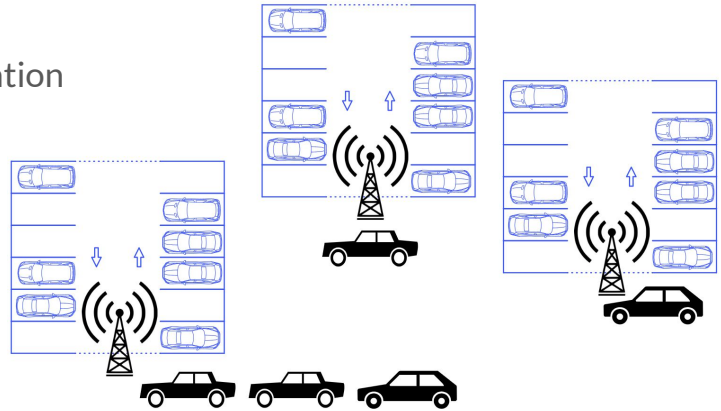
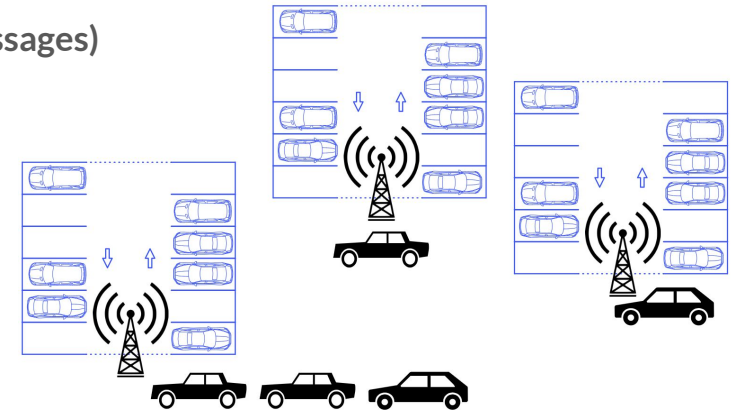
Objectives

- Develop an autonomous system which allows to control parking lot occupation
  - Vehicles are notified about parking lot occupation before they arrive to it
  - Allows to make traffic more fluid
  - Avoids waste of time looking for a spot
- RSUs at the parking entrance detect the parking occupation
  - Flood that information to other vehicles
  - Vehicles take decisions based on information received
  - One RSU is associated to one parking lot

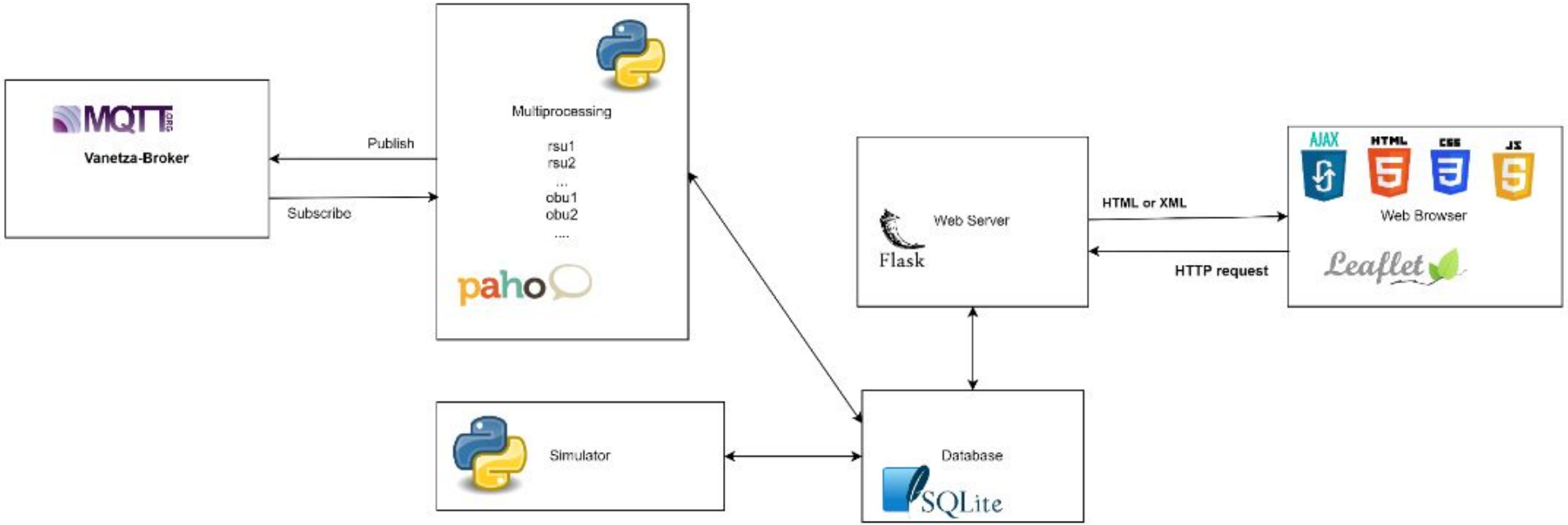


Messages

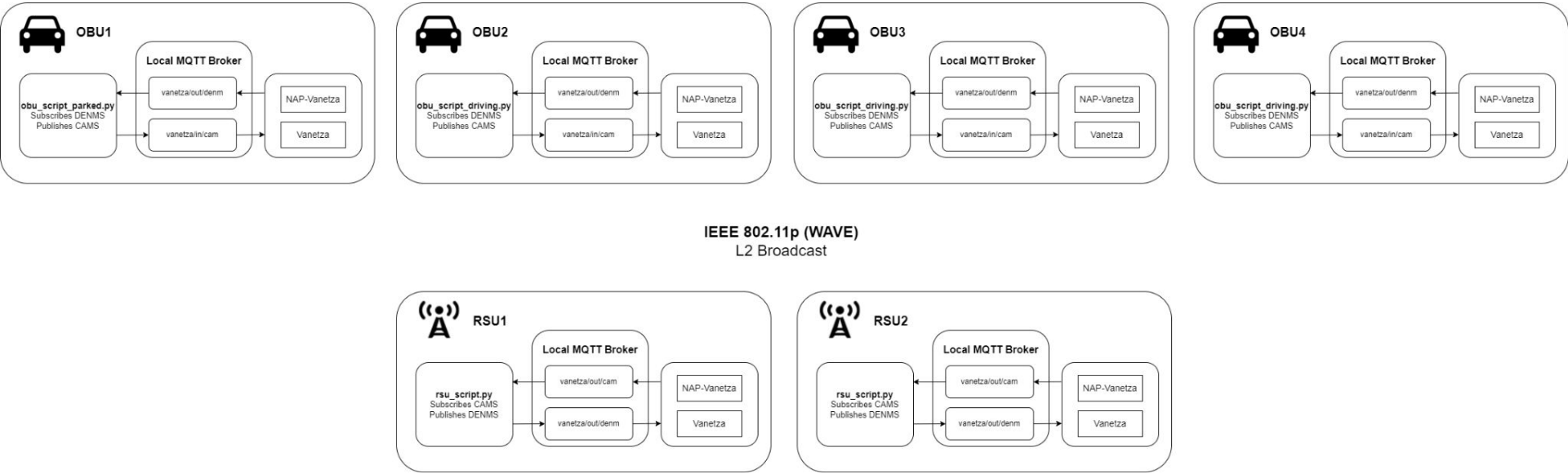
- **CAMs (Cooperative Awareness Messages)**
  - Create awareness of the vehicles in the road
  - Contain vehicle position, speed, heading , stationID, stationType, etc
  - Generation frequency of 1 Hz and 10 Hz
- **DENMs (Decentralized Environmental Notification Messages)**
  - Used to notify cars of parking lot occupation
  - New unused CauseCode (37)
  - subCauseCode contains the parking lot occupation
  - DENMs are sent every time a CAM is received



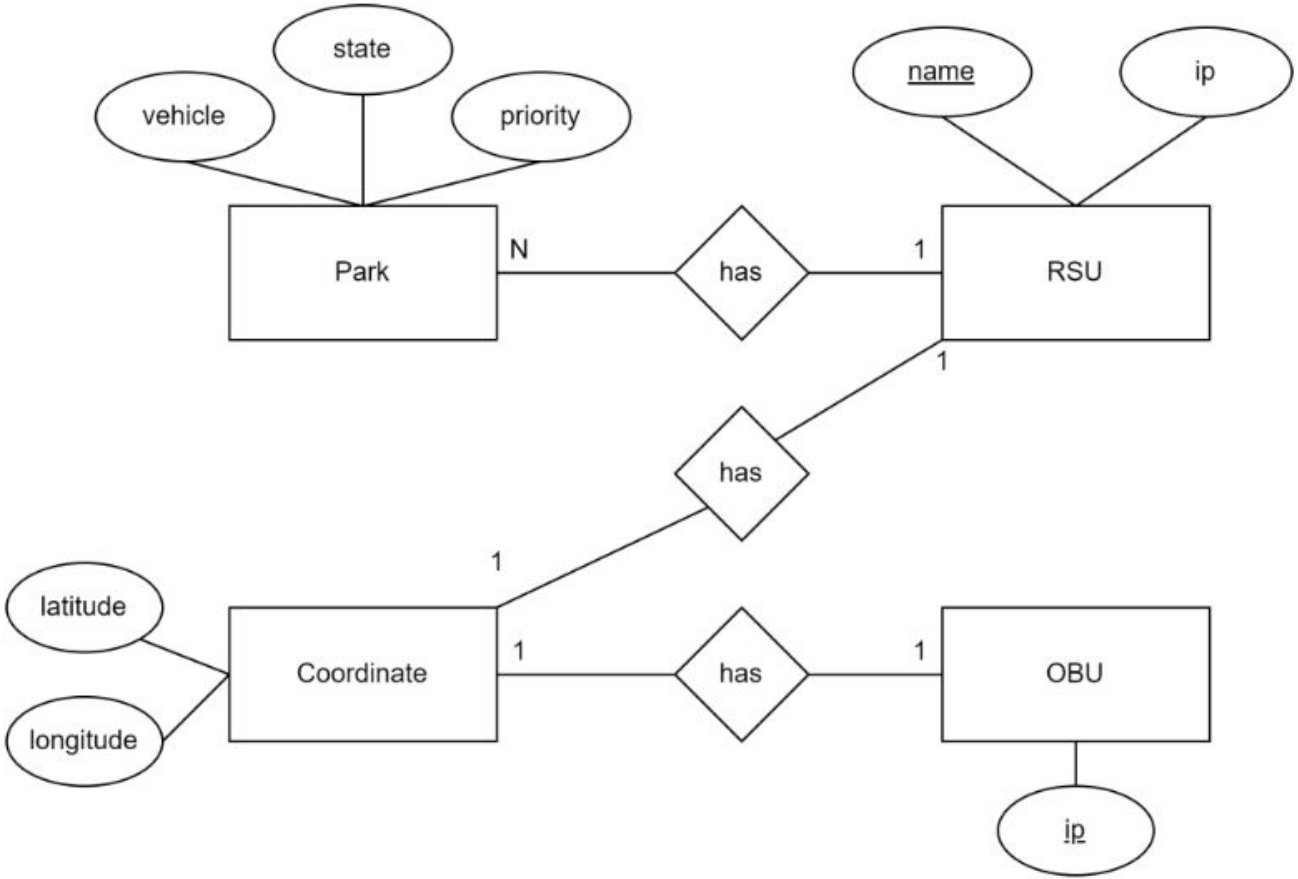
General Architecture



OBUs & RSUs Architecture



Database


state
vehicle
priority
name
ip
Park
N
has
1
RSU
1
has
1
latitude
longitude
Coordinate
1
has
1
OBU
ip

Simulation

- Initialize all OBUs (OBUs 1 to 3) in one position
  - Randomly pick one path for the car to follow
- OBU4 stays parked for random time and leaves the spot to try to park in another spot
  - if the other park is full, returns to the first one
- OBUs go around in circle and then go to one of the parks to try to find a spot
  - If park is full cars go to the other park

Park & Circuit