

# Collecting Data from the *UrbanSense* Platform Using Vehicular Networking

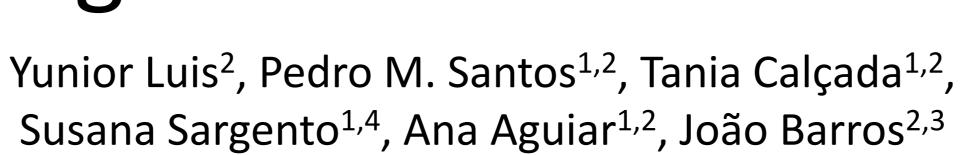




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**PROJECT** 







1 - Instituto de Telecomunicações; 2 - Faculdade de Engenharia da Universidade do Porto; 3 - VENIAM; 4 - Departamento de Electrónica, Telecomunicações e Informática da Universidade de Aveiro Emails: {jrluis,pedro.salgueiro,tcalcada,susana@ua.pt,{anaa,jbarros}@fe.up.pt

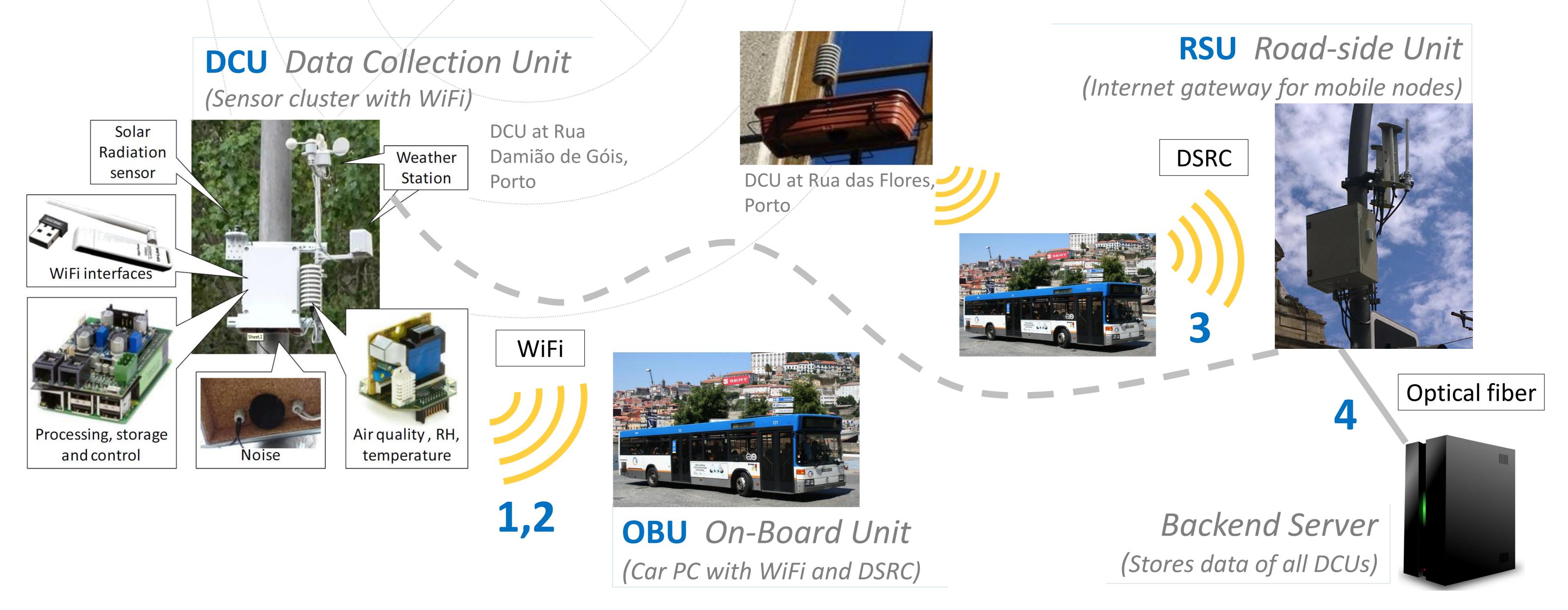
## Data Muling for Sensor Data Collection

#### *UrbanSense* Platform

- City-wide monitoring platform in Porto, Portugal
- 20 sensing units deployed at relevant locations
- Data from sensing units gathered at backend server
- Challenge: collect data from disparate sites

### Solution: Data muling with BusNet

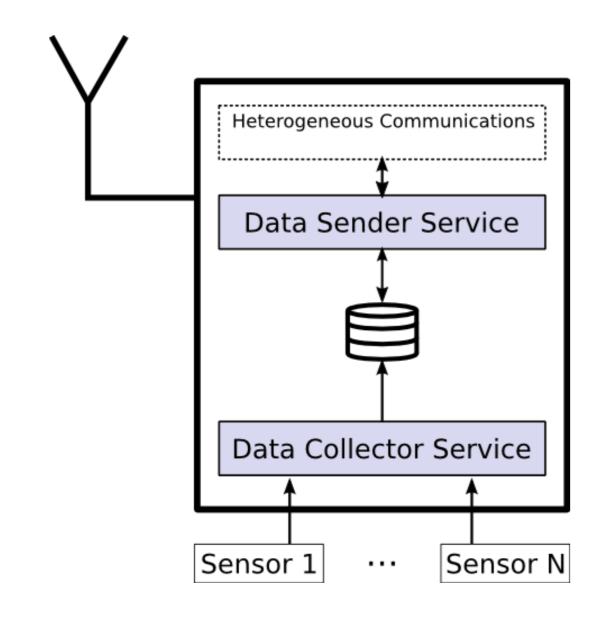
- Public buses equipped with WiFi AP and DTN support
- Bus network routes provide wide coverage
- Sensor data is off-loaded to passing buses via WiFi
- Cost-free, avoiding expensive data plan-based solutions



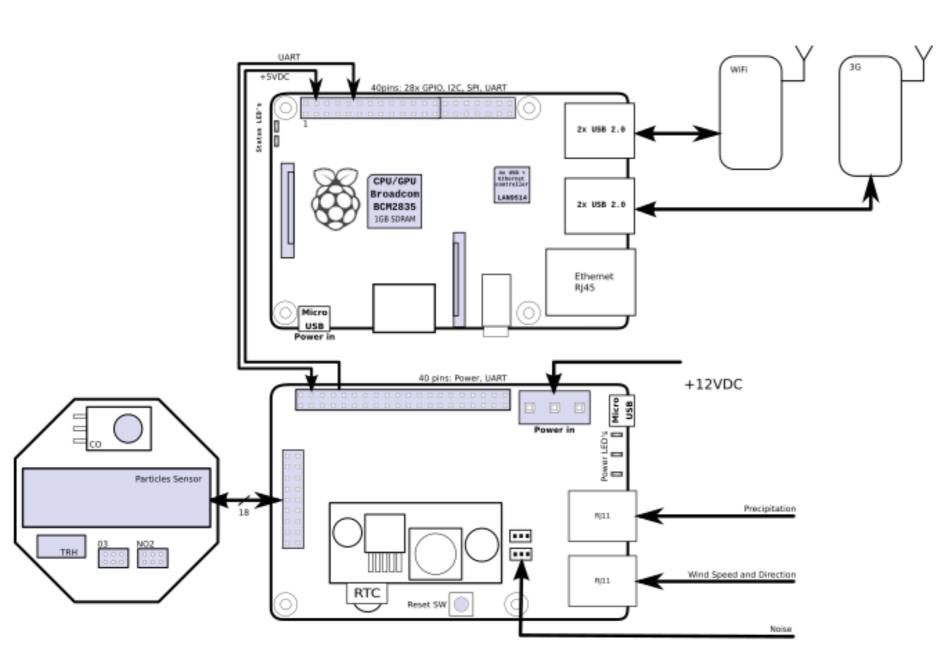
#### Operation:

- 1. DCU searches for AP from bus OBU
- 2. Data off-loaded to bus OBU using WiFi
- 3. Data routed to RSU through vehicular network
- 4. Data sent to server via backbone optical fiber

### **Software Architecture**

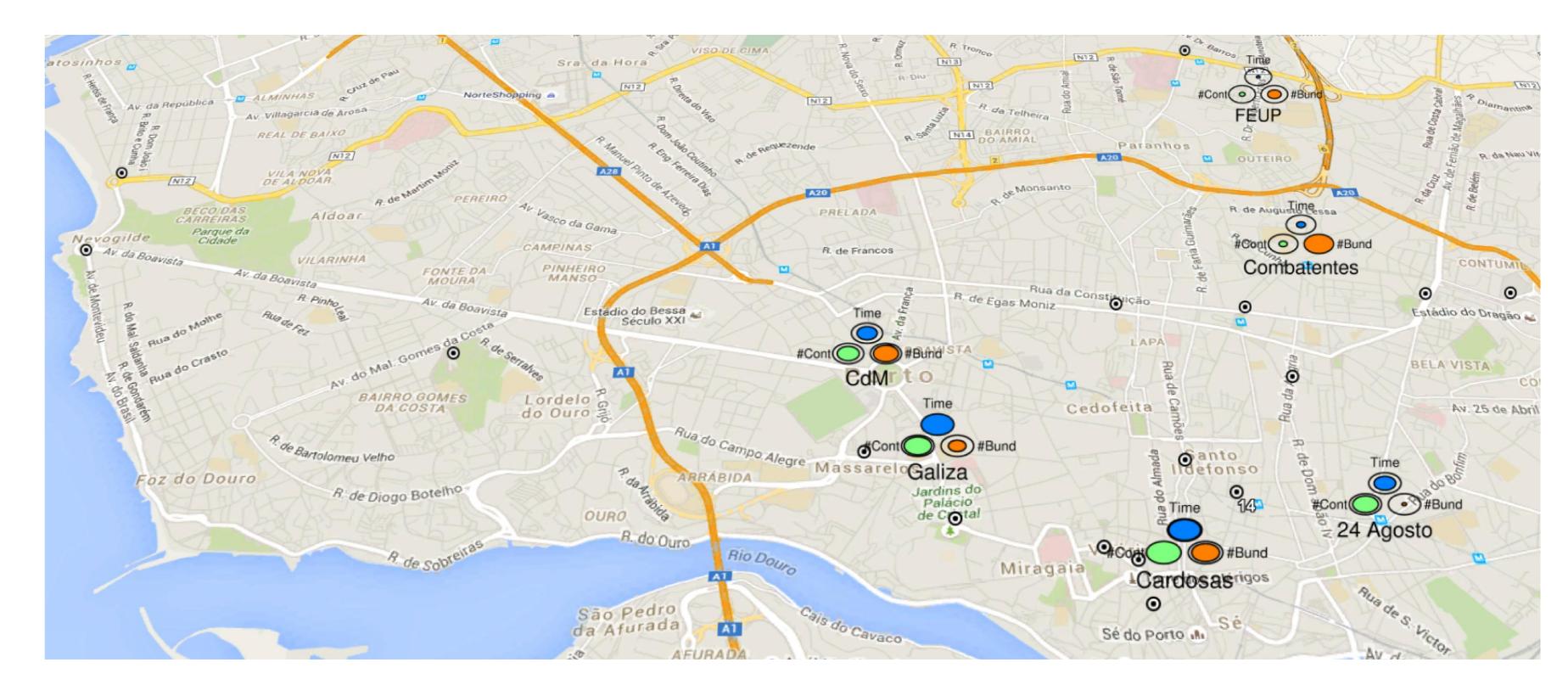


### Hardware Architecture at DCUS



## Deployment and Network Metrics

- Locations have different DCU-to-OBU communication characteristics
- We measure *number of contacts* with buses, *number of packets* transmitted per contact, and total contact time with buses.



Legend: Location of all DCUs. For DCUs with infrastructure-to-vehicle measurements, graph of three circles shows ratio of that metric for maximum value recorded of all DCUs.

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Partners:









