Lesson 10
Internet Connected smart Parking Space Services And Monitoring

Smart city Parking Services And Monitoring

A smart parking-service should enable the followings:

1. Guides the drivers for the available parking slots and spaces.
2. Provides a mobile app, the app assists a driver and enables driver obtain the appropriate parking-slot information remotely
3. Publishes messages in real time for available slots and alerts for slot unavailability at the parking utility

Smart city Parking Services And Monitoring

4. Adds value for all parking stakeholders, drivers and service provider.
6. Enables intelligent decisions using data and historical analytics reports at city cloud data store, and enables planning for traffic flow in the city by predictive analytics.
7. Sensors play vital role in the smart parking, the application ranked as topmost 50 sensor-applications for a smarter world

Devices Subdomain

- Array of Sensors in Parking Spaces and Coordinators
- A set of coordinators each placed at each parking level
- A coordinator consists of transceiver, which emits ultrasonic pulses and receives reflected signals
- An array of sensors and sensors associated circuits at each level of parking

A Coordinator

- Transceiver with coverage area at each coordinator spans to one fourth of the slots at that parking level
- Coordinators are located at each level 1, 2, 3, 4, …

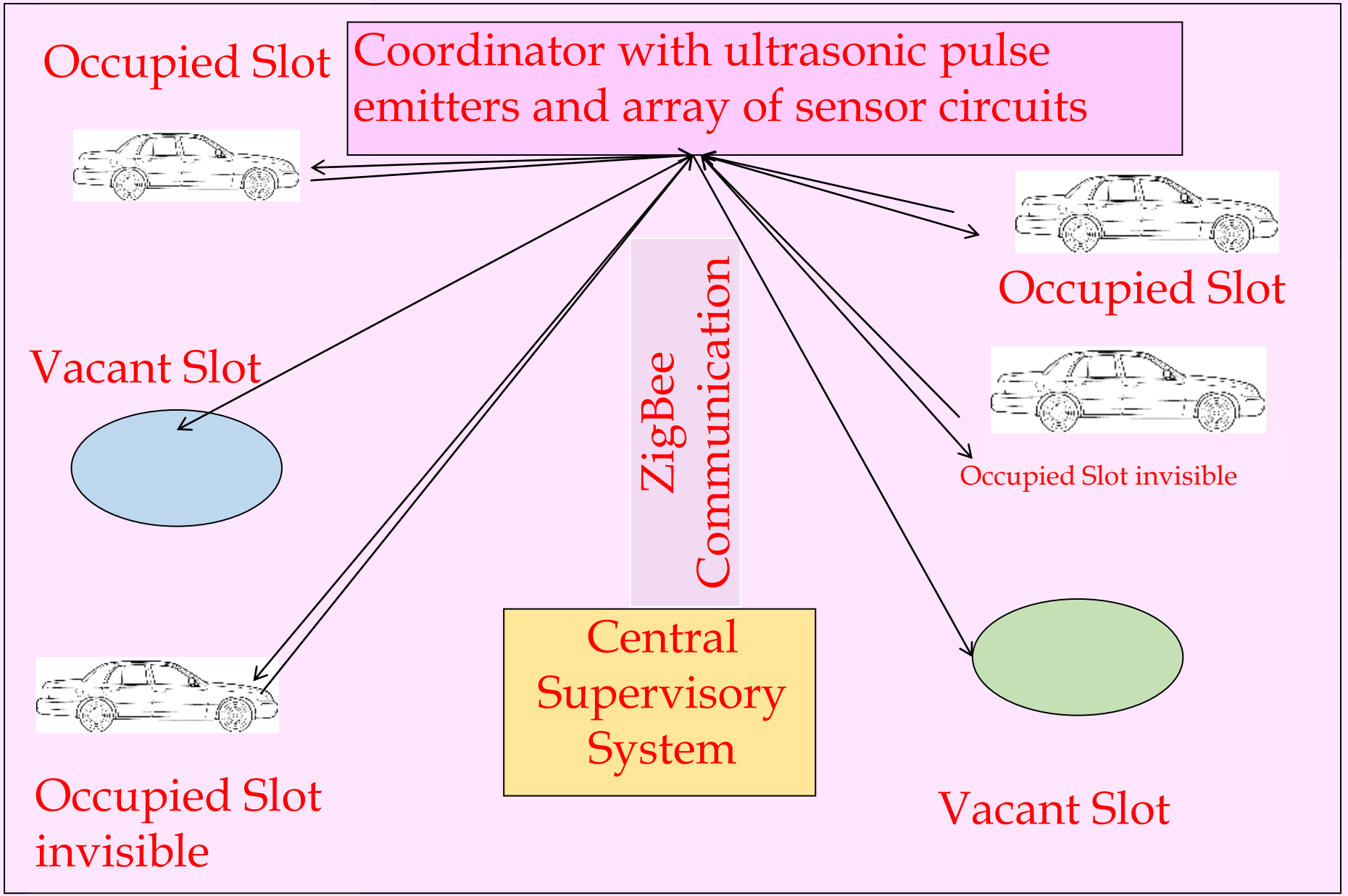

Fig. 12.11 Principle of designing the set up for identifying vacant spaces using ultrasonic pulses and back reflections from cars to the transceiver at the coordinator

A Central Supervisory System (CSS)

- The coordinators process the status information
- Time-series data transmit to CSS.
- CSS receives information of parking slots from the coordinators as UDP datagram
- To users the uses which seeks that from mobiles or card dashboard computer of the car
- CSS then relays the parking information to city-cloud platform data-store

City Parking Spaces and Gateways Domain

- Each coordinator sends all messages with slot ID and observation instances onto the ZigBee network as time series data.
- A real-time database updates at regular intervals, say of 1 m each.
- The edge sensors and devices wirelessly connect within small cells, systems connect with ZigBee.

City Parking Spaces and Gateways Domain

- Devices communicate using LPWAN
- The distributed network of edge-computing systems connects using IP protocols or using the Multiprotocol Label switching (MPLS).
- The MPLS assigns the labels to data packets and forward the labels to City cloud IoT platform.

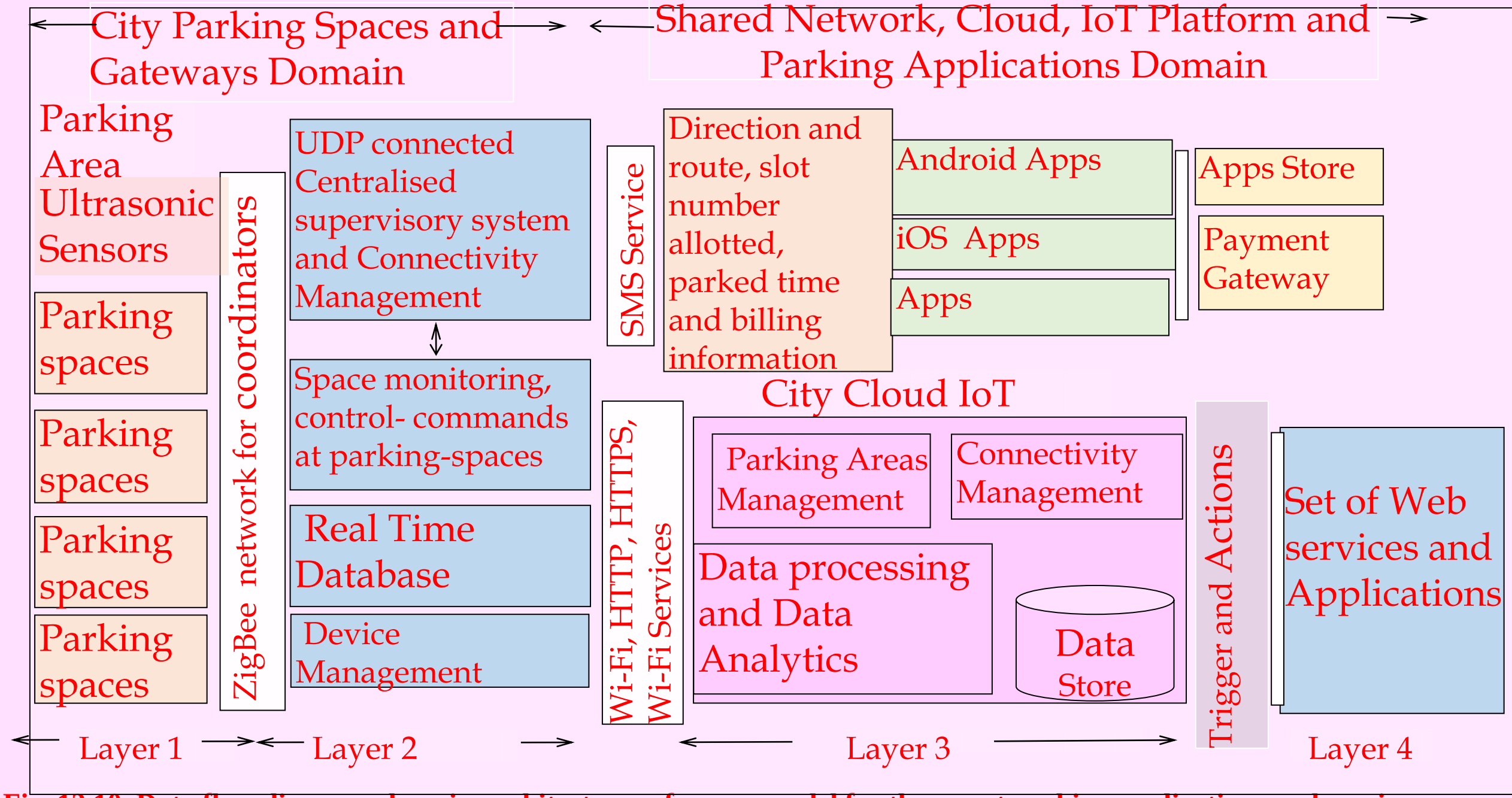

Fig. 12.10 Data flow diagram, domain-architecture reference-model for the smart parking applications and services

Code Development Environment, Development, Debugging and Deployment

- IDE
- OSGi
- Java, Eclipse IoT Stack and openHAB for end-to-end smart parking services and solutions for each parking utility in the city.
- Smart parking solutions also be developed using the intelligent management platform IMPACT

Summary

We learnt

- Smart parking service
- Guides the drivers for the available parking slots and spaces
- Provides a mobile app
- Assists a driver and enables driver obtain the appropriate parking-slot information remotely

End of Lesson 10 on
Internet Connected smart Parking Space Services And Monitoring