Heterogeneous Network Access of the Intelligent Container

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Transferproject T4: „Autonomous Agents, Sensor- and Communication Systems for Transport Surveillance of Food Goods"

Communication Networks, TZI ikom
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Overview

- Motivation
- Scenarios
- Requirements
- System Architecture
- Intelligent Container
- Heterogeneous Network Access
- Project Plan
- Summary

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Motivation

SFB 637
Teilprojekt T4

Surveillance of goods along the supply chain is needed

Full surveillance is possible by today's information and communication technology

Development of a concept of a future telemetric system

- Autonomous evaluation, decision and communication
- Data from real transport processes
  - For enhanced scenarios for theoretical handling of autonomous control
  - For further developments of the sensor system and the communication unit

Transfer

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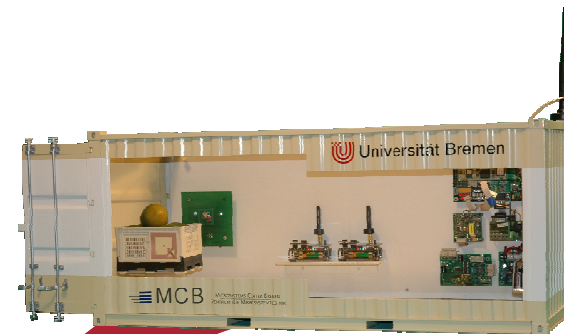
Scenarios

Road Transport

- Food distribution to hotels and restaurants
- Different temperature zones on one vehicle
- Improvement on quality and returned items

Sea Transport

- Import of tropical fruits across the atlantic ocean
- Identification of local ripening deviations in containers
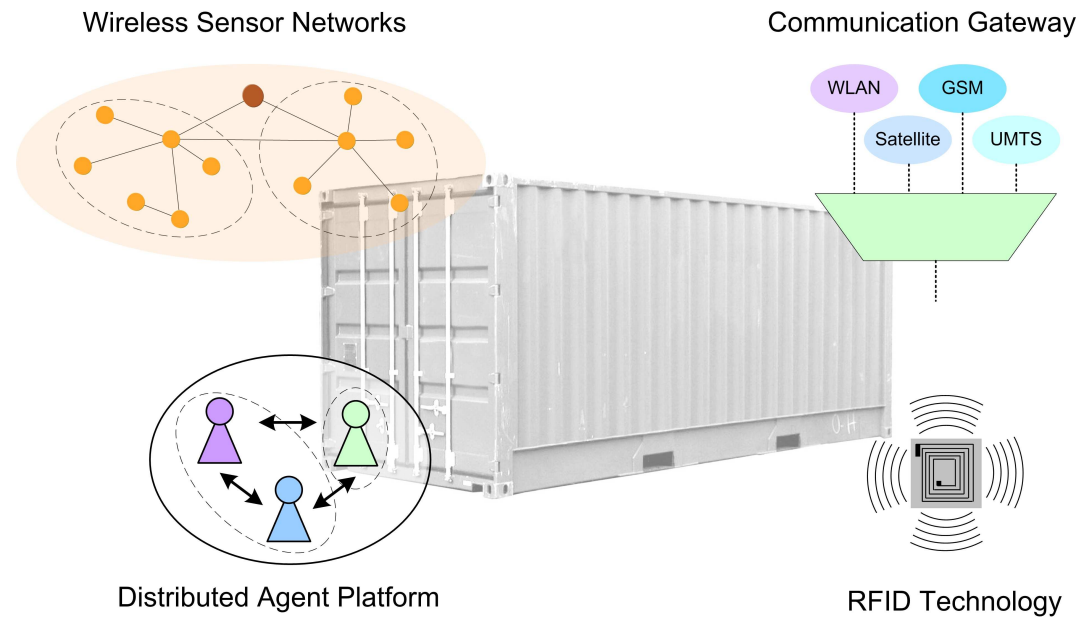
Partners

Requirements

- Spatially distributed, item level control of transport conditions
- Detection of type of good
- Assessment of the transport conditions
- Communication of the measurement data respectively the assessment

Customer Contact

Customers

Vehicles

Measurements

Pallettes

Goods
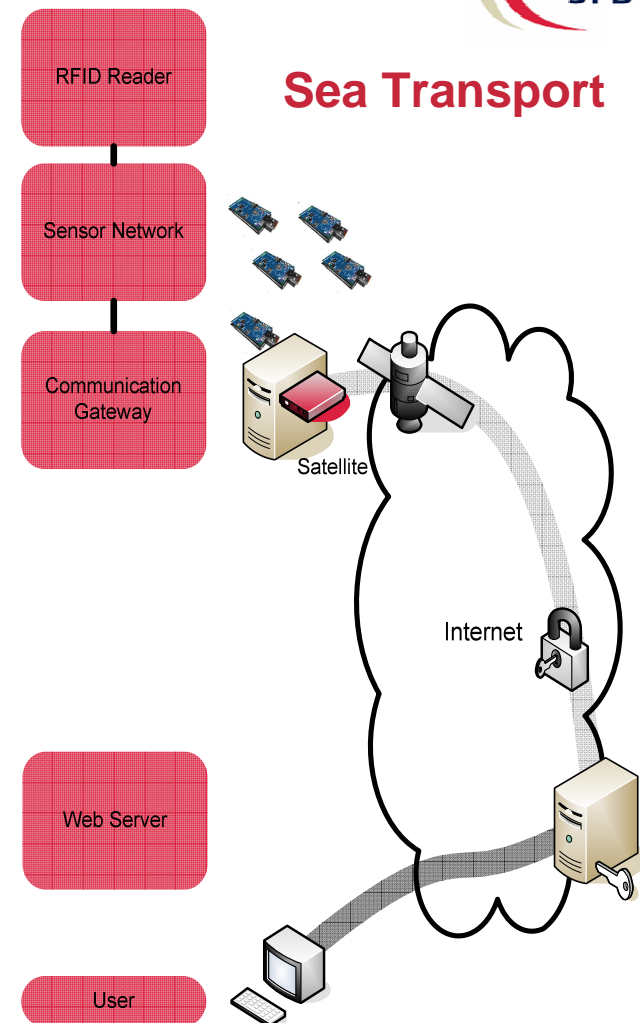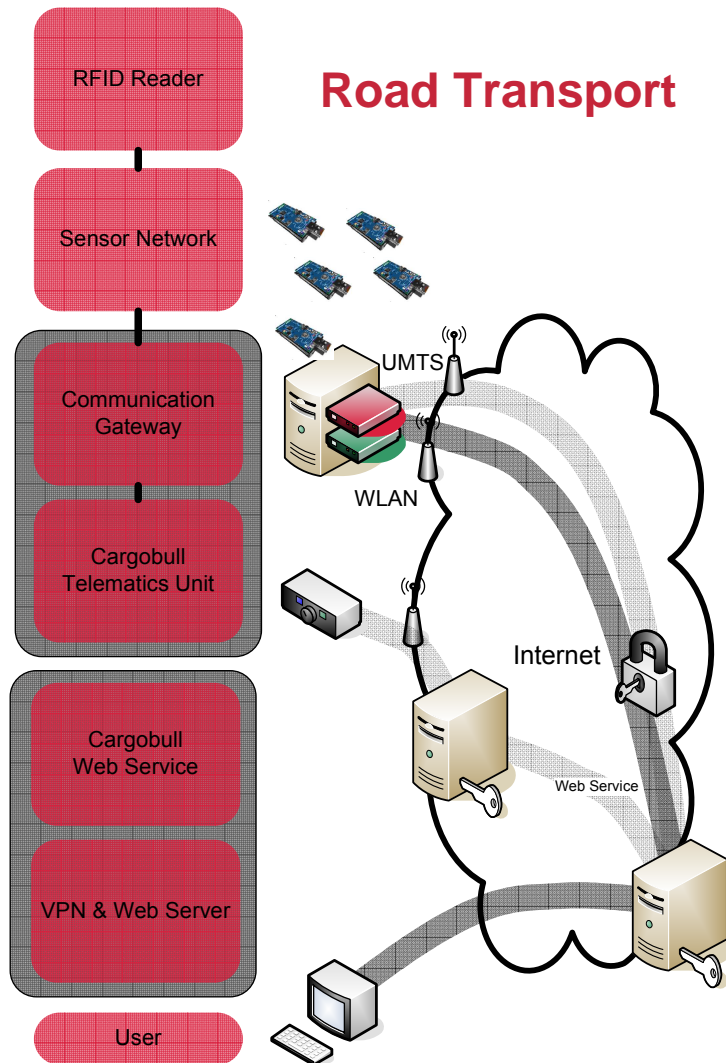
RFID

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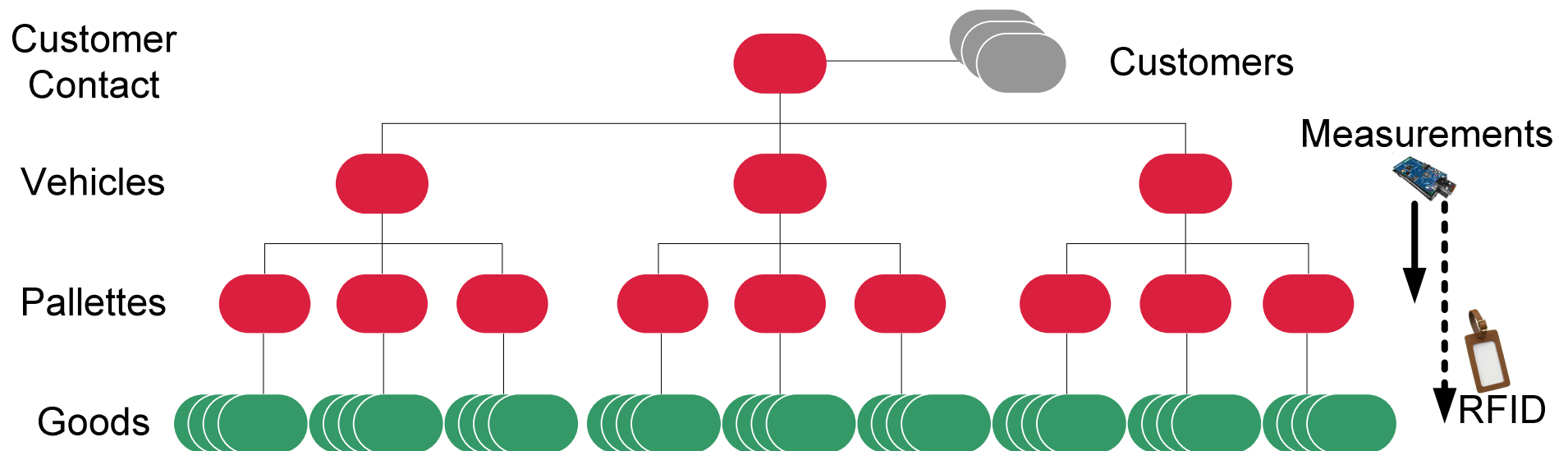
Intelligent Container

Components of the Intelligent Container

- RFID subsystem
- Wireless Sensor Network
- Server Backend
- Agent System
- Communication Gateway

Wireless Sensor Networks

Communication Gateway

WLAN

GSM

Satellite

UMTS

Distributed Agent Platform

RFID Technology

System Architecture

Road Transport

RFID Reader

Sensor Network

Communication
Gateway

Cargobull
Telematics Unit

Cargobull
Web Service

VPN & Web Server

User

UMTS

WLAN

Internet

Web Service

Sea Transport

RFID Reader

Sensor Network

Communication
Gateway

Satellite

Internet

Web Server

User

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Heterogeneous Network Access

Trade-off: Communication technology

- Cost efficient
- Information to the owner/customer

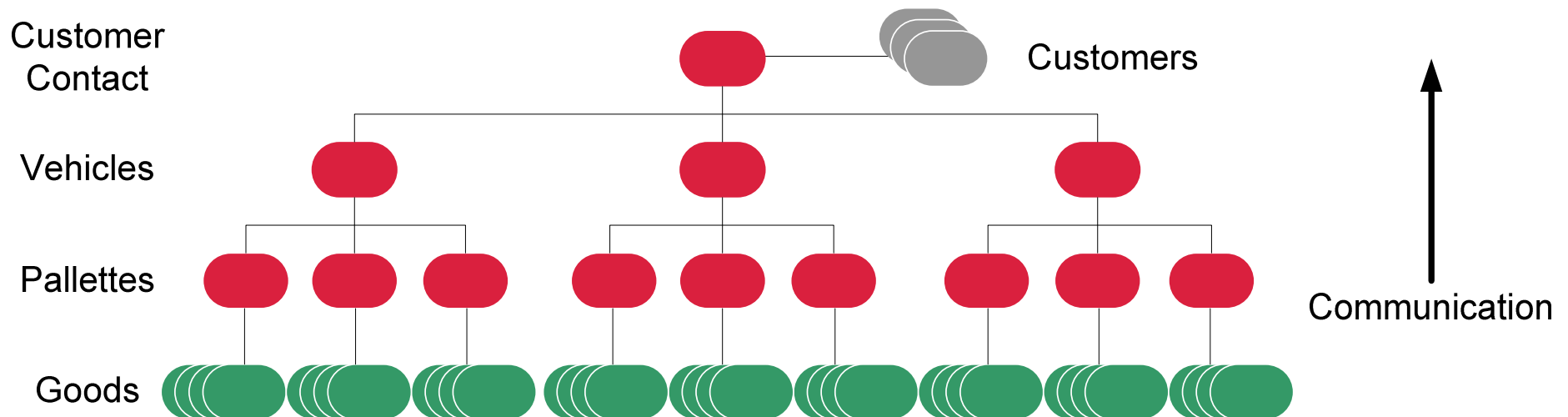## Heterogeneity of the communication network access

- WLAN
- UMTS/GPRS
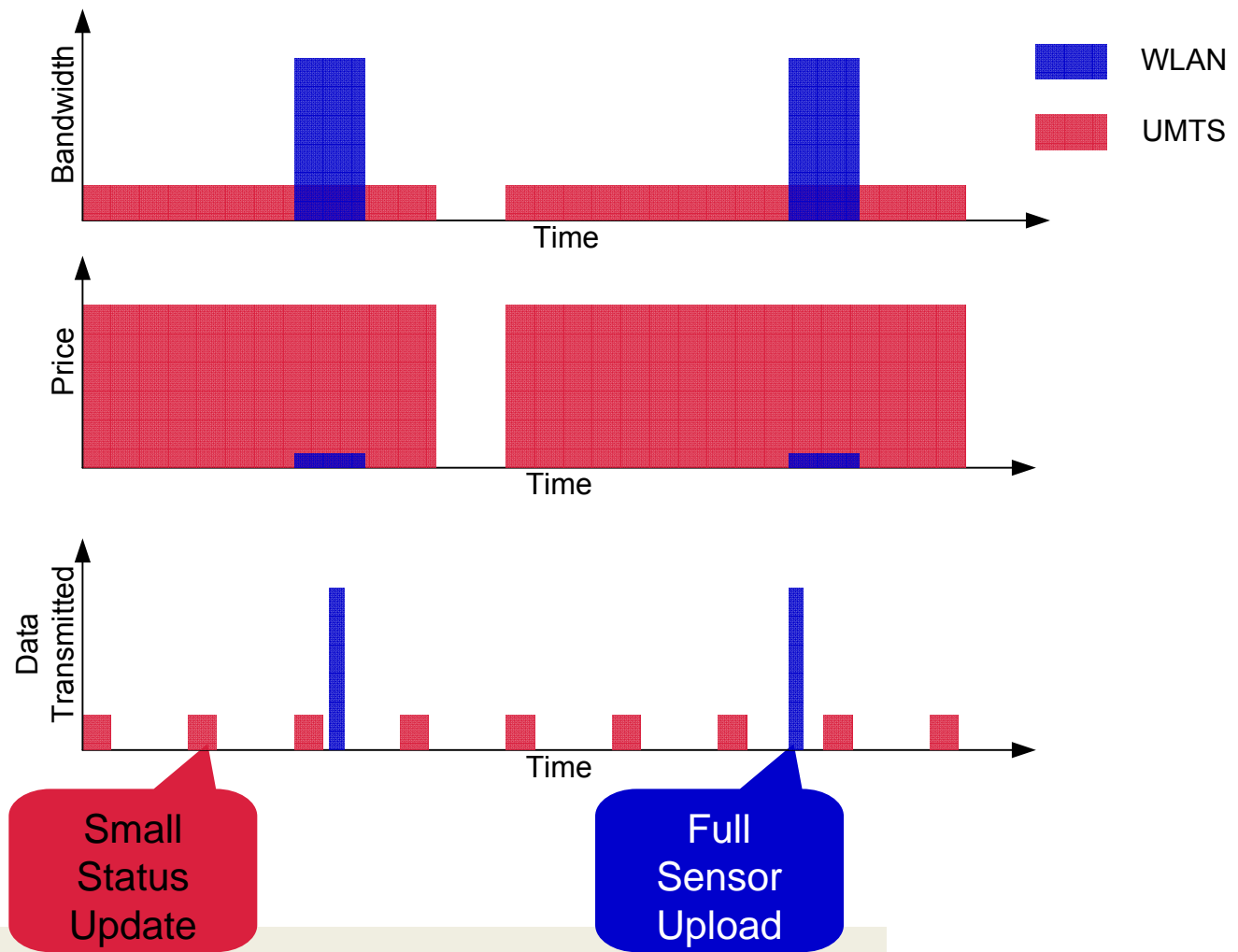- Satellite

Adaptation to the network

- Notifications when using UMTS/GPRS or satellite
- Full measurement update when using WLAN
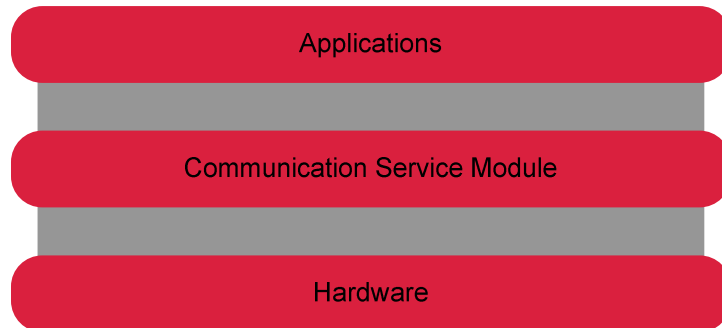
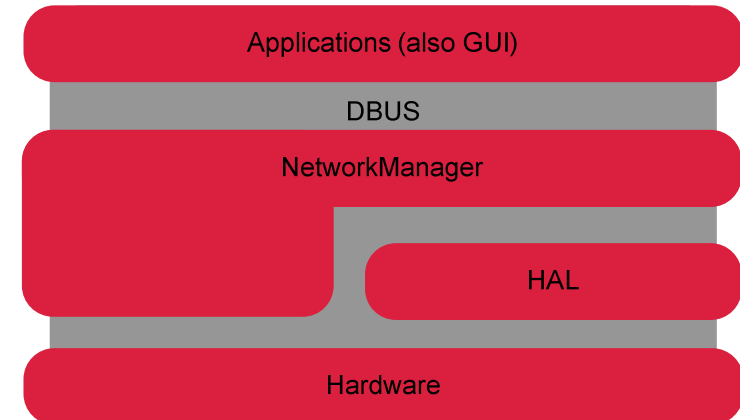## Mobility concept based on VPN

- Keeps good and surveiller connected

Customer Contact

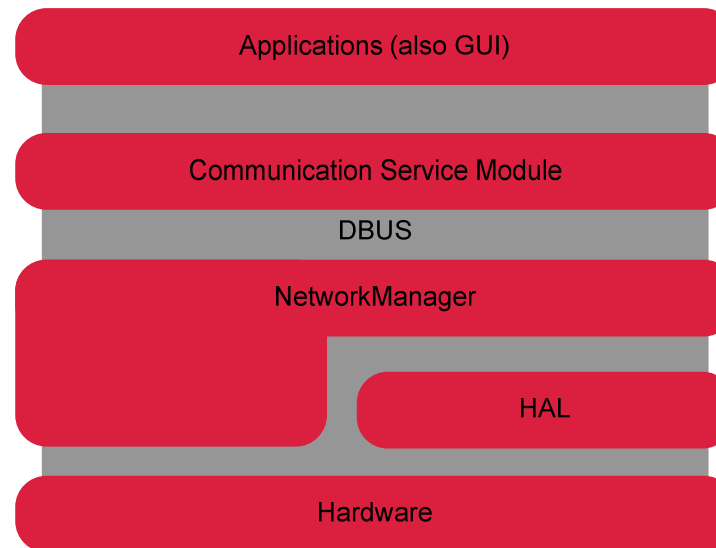Customers

Vehicles

Pallettes

Goods

Communication

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Delayed Communication

Enhanced Communication

Current CSM

| Applications |
| Communication Service Module |
| Hardware |

Current NetworkManager

| Applications (also GUI) |
| DBUS |
| NetworkManager |
| HAL |
| Hardware |

CSM enhanced NetworkManager

| Applications (also GUI) |
| Communication Service Module |
| DBUS |
| NetworkManager |
| HAL |
| Hardware |

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Communication Service Module
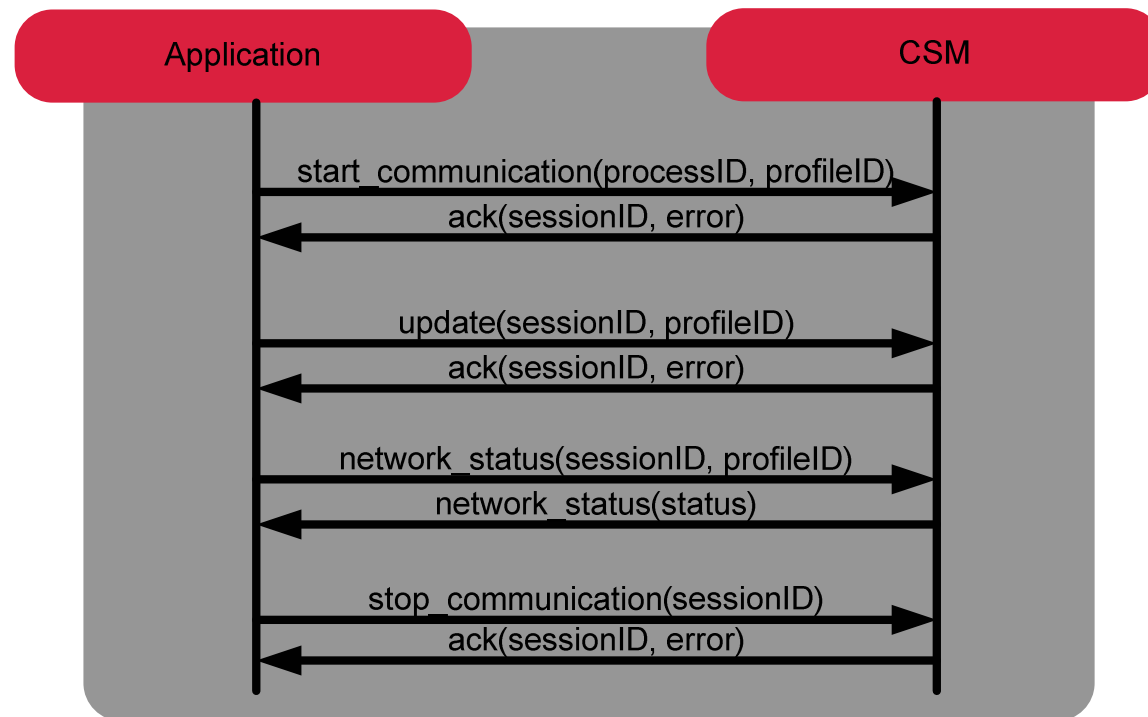
Project Plans

1. Test Phase

- On road in Sept./Oct. 2008
- On sea in Dec. 2008

2. Test Phase

- On road in summer 2009
- On sea in summer 2009

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