POLITECNICO DI MILANO
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SOFTWARE ENGINEERING 2: POWERENJOY

INTEGRATION TEST PLAN DOCUMENT
VERSION 1.0

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REPPUCCI FEDERICO

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1. INTRODUCTION

1.1. REVISION HISTORY

- 15.01.17 – First delivery

1.2 PUROPSE AND SCOPE

Purpose

This documents describes a plan for the integration test for the system. In this document are specified the elements which need to be tested, the overall testing strategy, a brief description of all the tests to perform together with the objective of the test and the requirements to pass it. This document also contains a description of the testing tools to be employed in the testing process and eventual program stubs or specific test data that need to be produced. This document needs to be a reference for everyone who will contribute to the testing process.

Scope

The PowerEnJoy project aims to develop a car-sharing service run exclusively employing electric cars. The system will provide a mobile application by means of which the users, once registered, will be able to use the car sharing services. The main goals of the service are to provide a sustainable and environmentally-friendly car sharing service as well as to promote virtuous behaviors from its users.

1.3 DEFINITIONS AND ABBREVIATIONS

Stub: software module which substitutes a component or functionality

Driver: software module designed to stimulate another software component which needs to be tested

J2EE: Java 2 Enterprise Edition

App: mobile application

External payment service: a software system which allows the company to charge the users

System: the software system to be developed as a whole

System Server: the portion of the system which will run on the server side

1.4 REFERENCE DOCUMENTS

- The PowerEnJoy Requirements Analysis Specification Document (RASD)
- The PowerEnJoy Design Document (DD)
- Integration Test Plan Example, SpinGRID

2. INTEGRATION STRATEGY

2.1 ENTRY CRITERIA

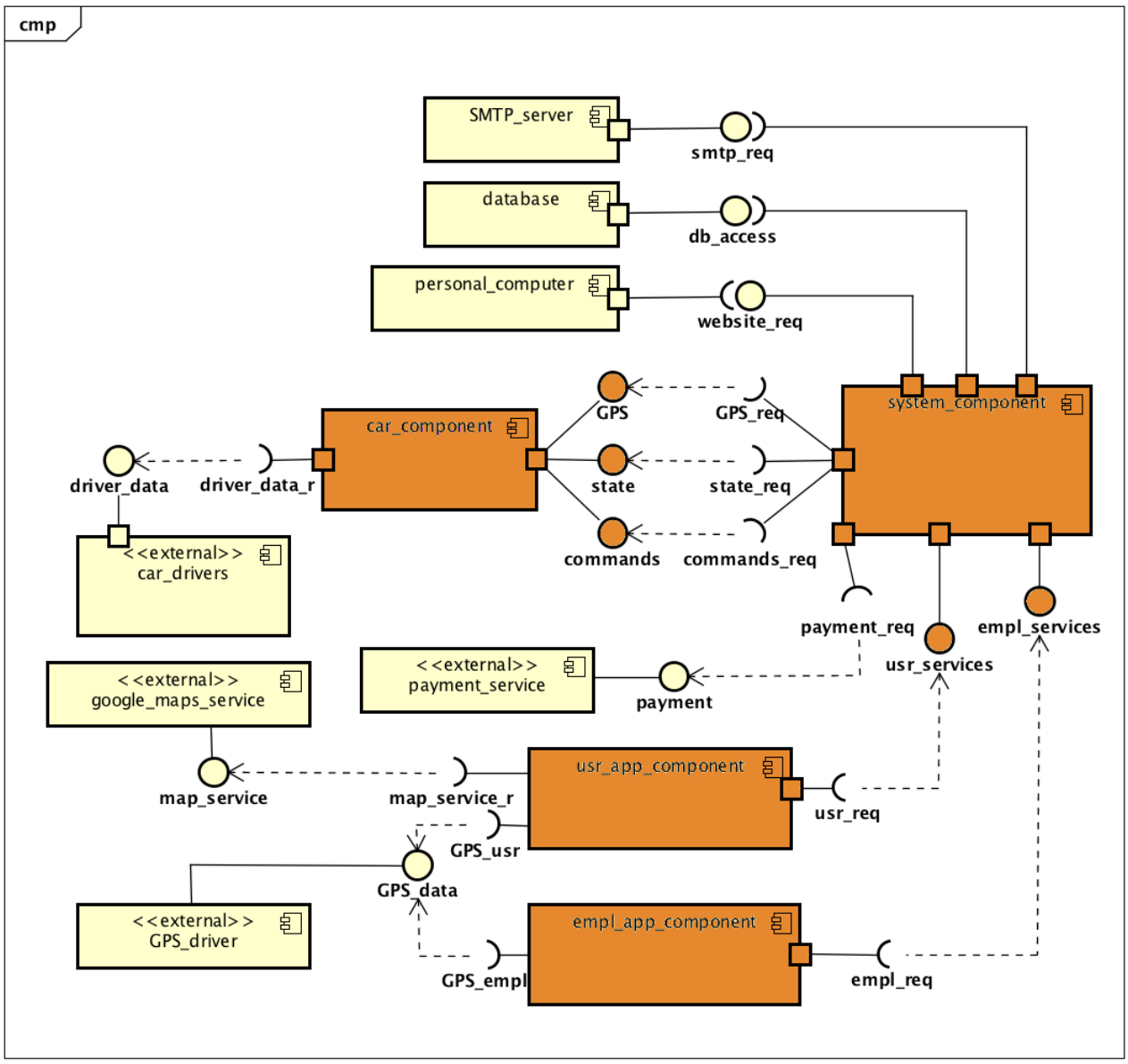
Since this documents describes the integration test of all the single components, before a component can be integrated in the test plan all the unit-level tests need to be performed. The single component is required to provide all the interfaces described in the Design Document (DD) and these interfaces need to provide the expected functionality described during the design process. In addition, the interaction between the application server, the database and the client applications needs to be functioning properly.

2.2 ELEMENTS TO INTEGRATE

In this section the elements to be integrated are most of the components specified in the component diagram described in the design document.

System

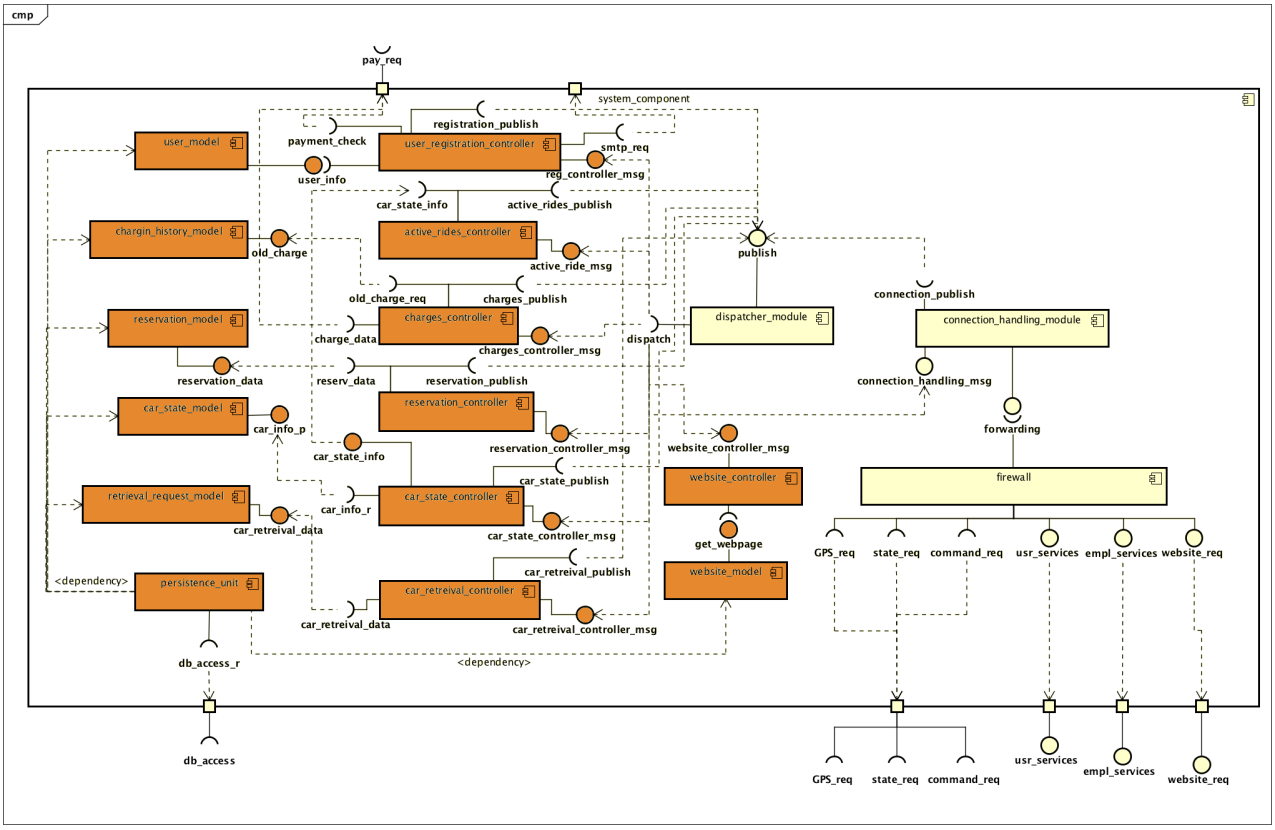
- System component
- Car component
- user app component
- employee app component



System component

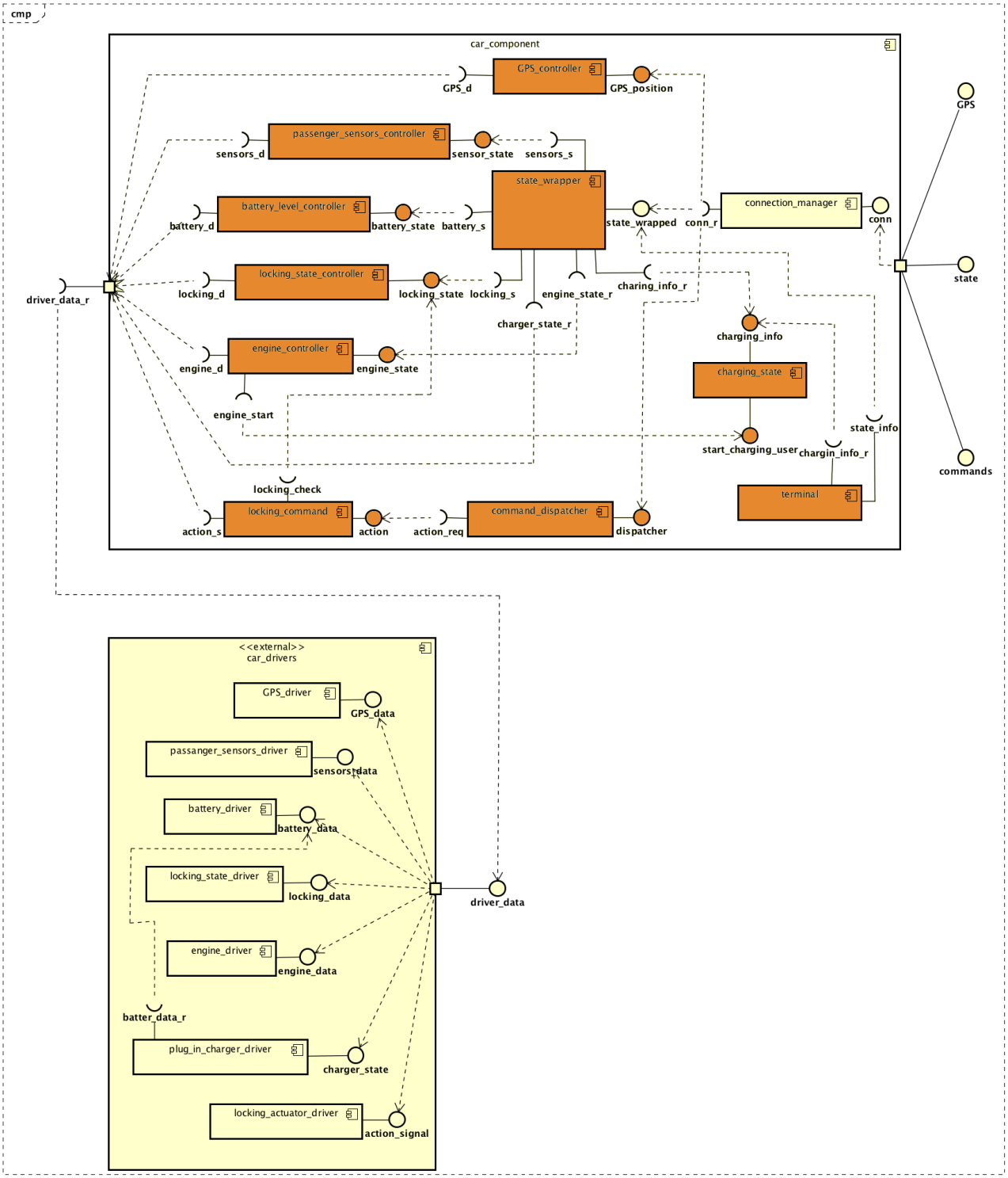
- user registration controller
- active rides controller
- charges controller
- reservation controller
- car state controller
- car retrieval controller
- website controller
- user model
- charges history model
- reservation model

- car state model
- retrieval request model
- website model
- persistence unit



Car component

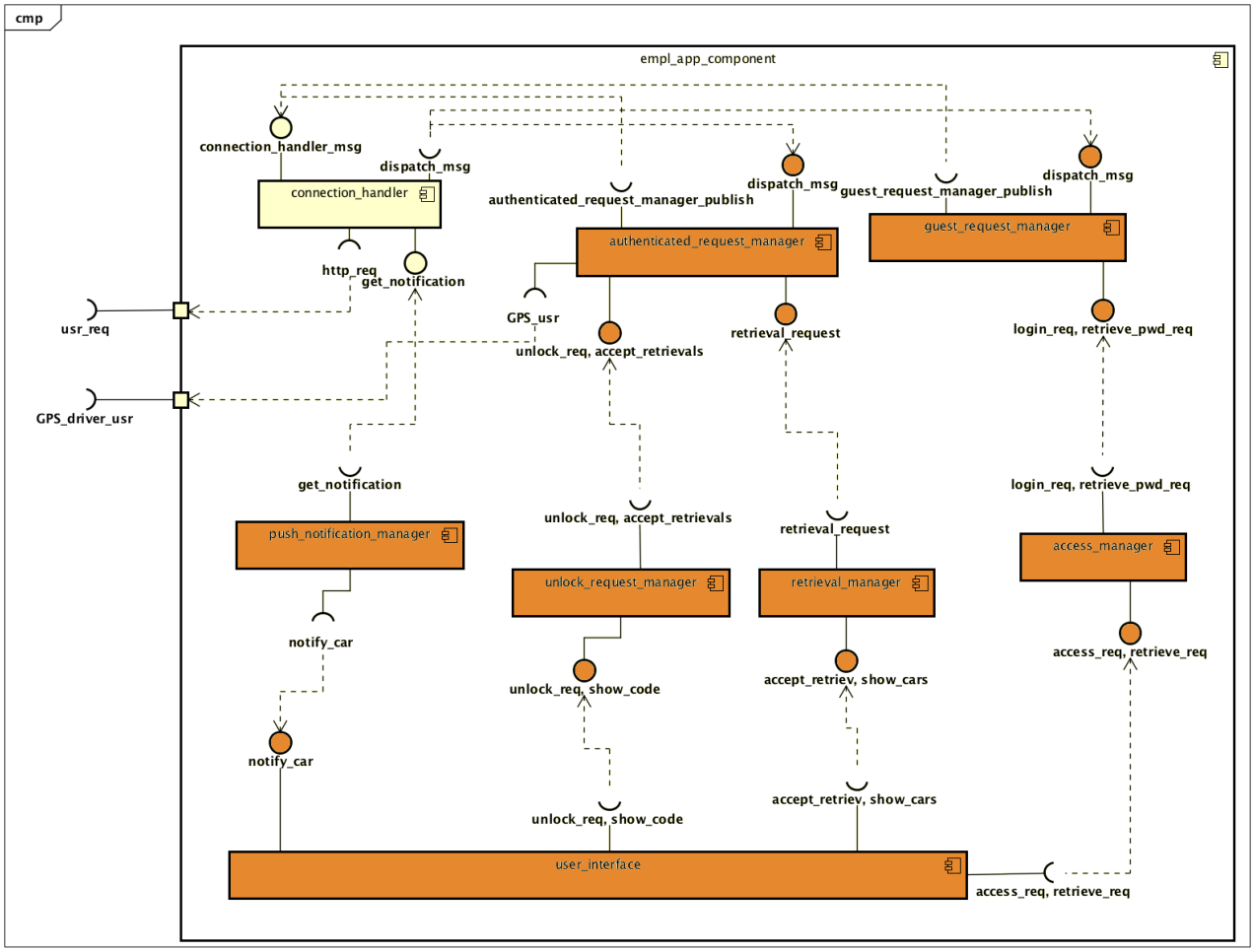
- terminal
- state wrapper
- command dispatcher
- locking command (?)
- GPS controller
- passengers' sensor controller
- battery level controller
- locking state controller
- engine controller
- charging state



Employee app component

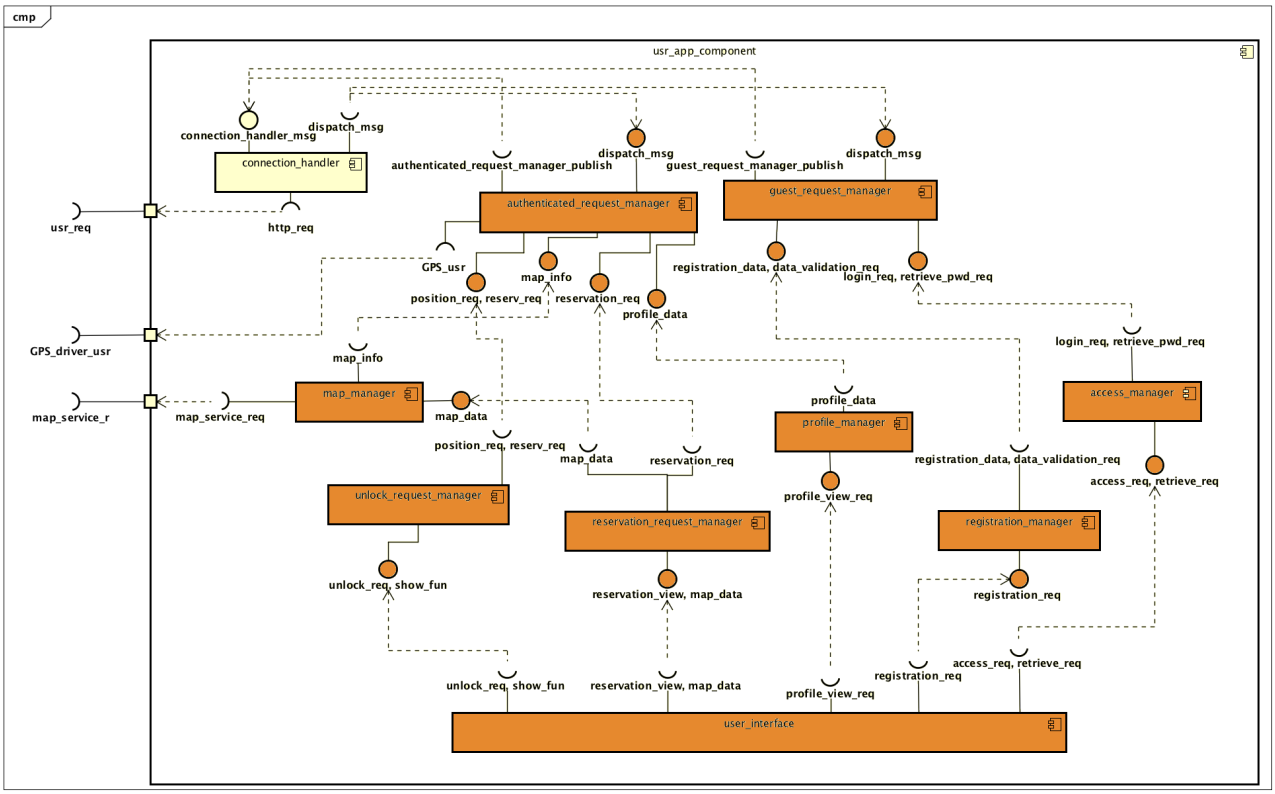
- user interface
- access manager
- retrieval manager
- unlock request manager
- push notification manager

- guest request manager
- authenticated request manager



User app component

- user interface
- access manager
- registration manager
- profile manager
- reservation request manager
- unlock request manager
- map manager
- guest request manager
- authenticated request manager


cmp
usr_app_component
connection_handler_msg
dispatch_msg
connection_handler
authenticated_request_manager_publish
dispatch_msg
guest_request_manager_publish
dispatch_msg
usr_req
http_req
authenticated_request_manager
guest_request_manager
GPS_usr
map_info
position_req, reserv_req
reservation_req
profile_data
registration_data, data_validation_req
login_req, retrieve_pwd_req
GPS_driver_usr
map_info
login_req, retrieve_pwd_req
map_service_r
map_service_req
map_manager
map_data
profile_data
profile_manager
access_manager
position_req, reserv_req
map_data
reservation_req
registration_data, data_validation_req
access_req, retrieve_req
profile_view_req
unlock_request_manager
reservation_request_manager
registration_manager
unlock_req, show_fun
reservation_view, map_data
registration_req
access_req, retrieve_req
unlock_req, show_fun
reservation_view, map_data
registration_req
profile_view_req
user_interface

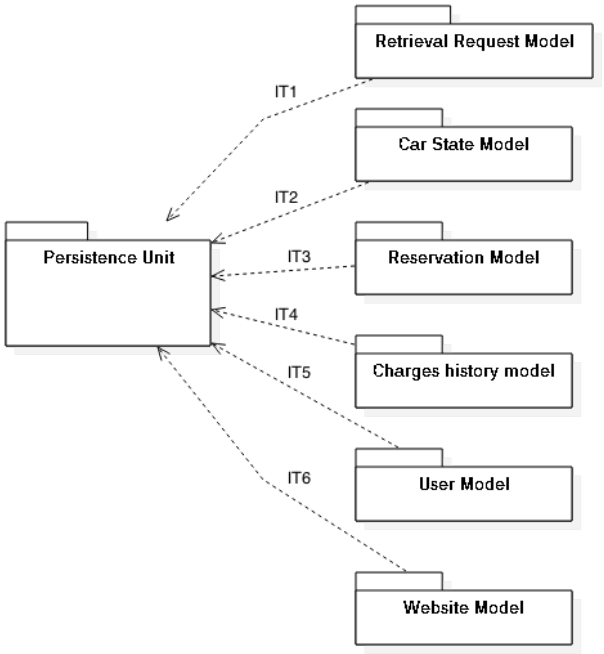
2.3 INTEGRATN TESTING STRATEGY

The testing strategy selected for the integration test is a bottom-up strategy. This strategy has been chosen since the structure of the software system is already hierarchical and the bottom-up approach allows to test all the interaction between components in a very systematic way. Moreover, the development process will follow a bottom-up approach as well, and this will ensure that the integration is performed in an incremental way.

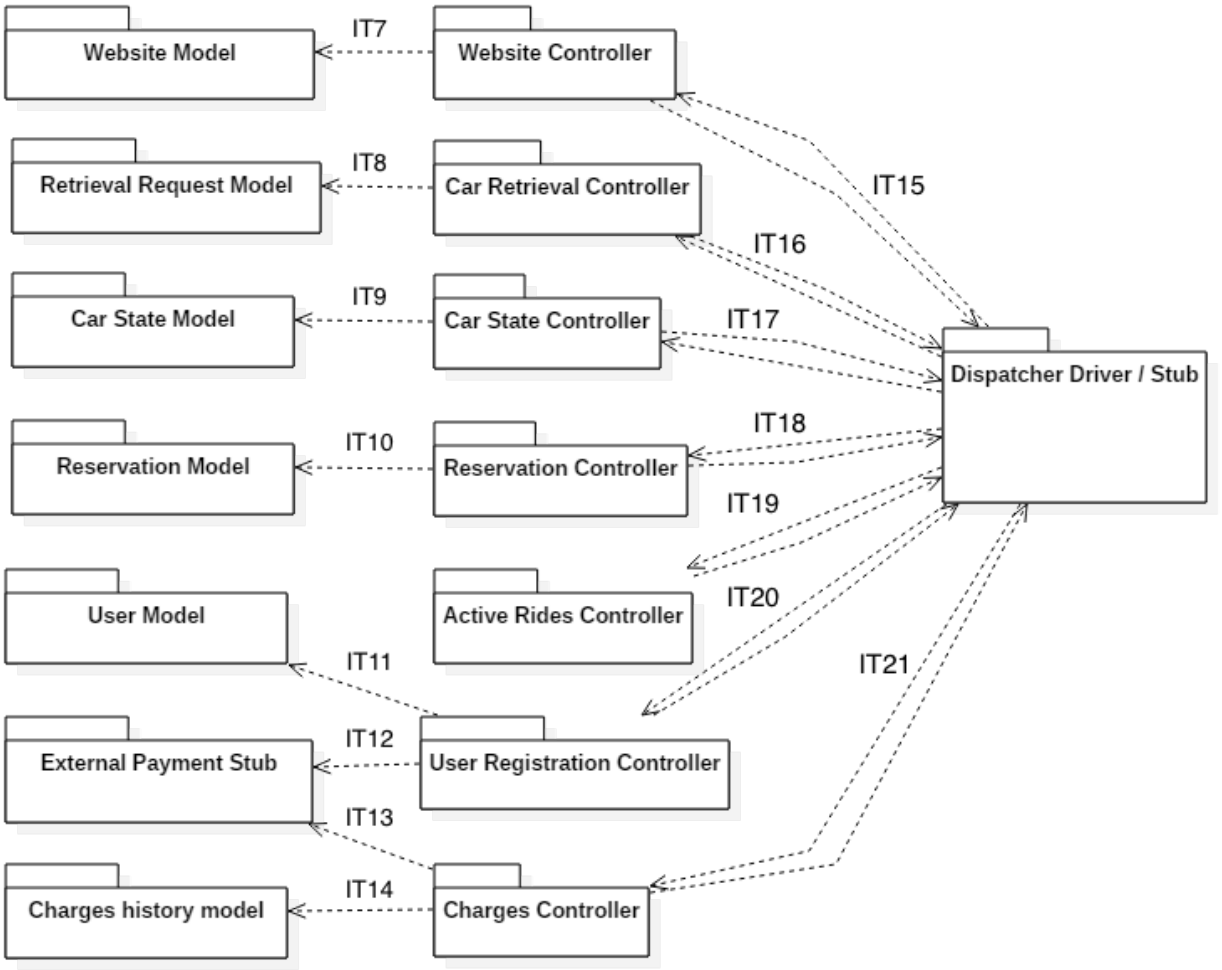
2.4 COMPONENT-FUNCTION INTEGRATION

2.4.1. SYSTEM SERVER

Persistence-model integration

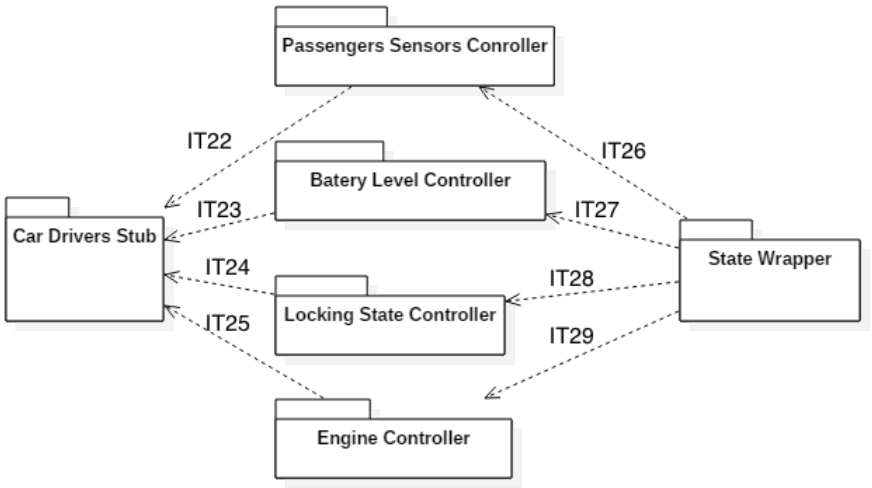


Model-controller integration

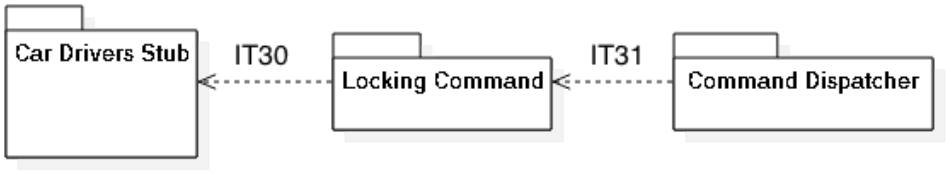


2.4.2. CAR COMPONENT

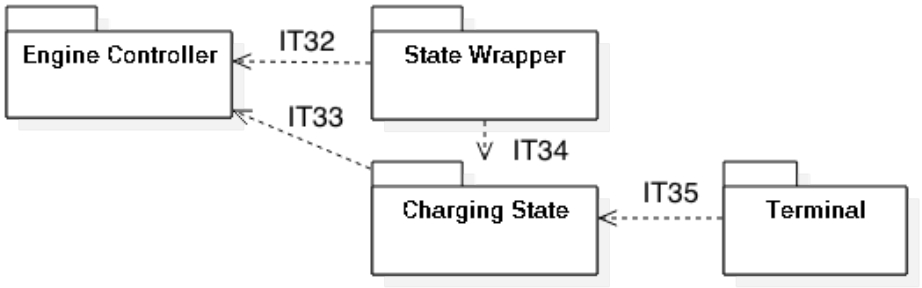
State wrapper – controller integration



Command dispatcher - locking command integration

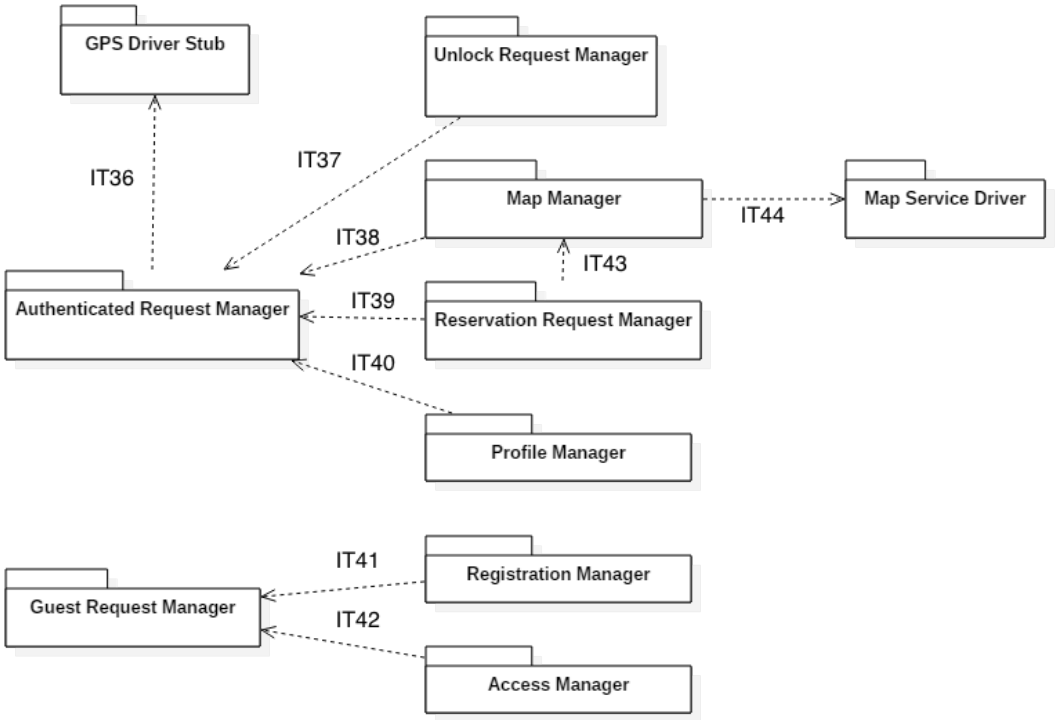


Charging state - terminal integration

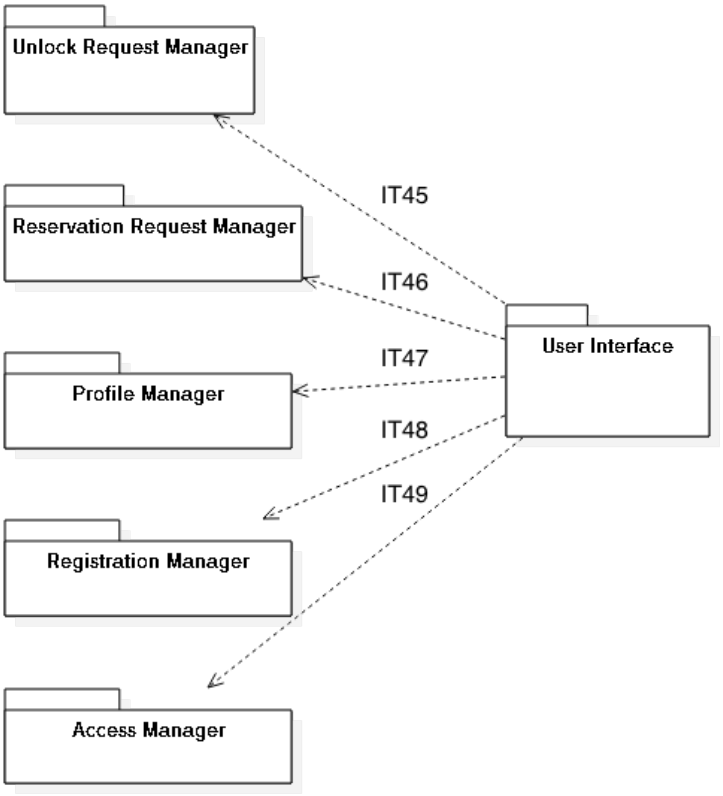


2.4.3. USER APP INTEGRATION

Request managers - functionality managers integration

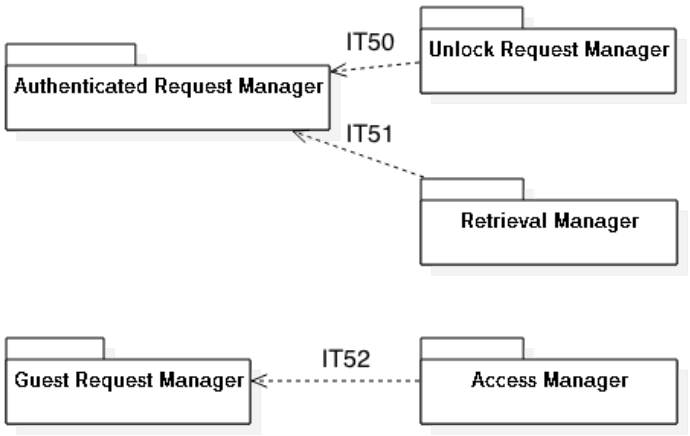


Functionality managers - user interface integration

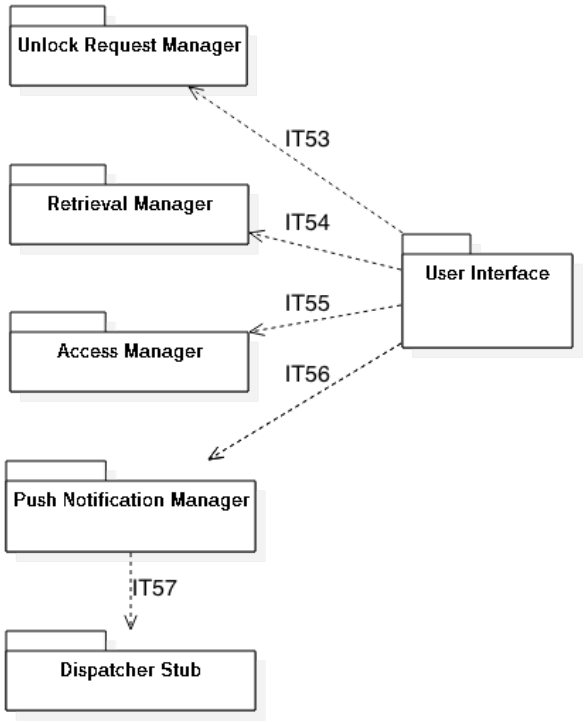


2.4.4. EMPLOYEE APP INTEGRATION

Request managers - functionality manager integration

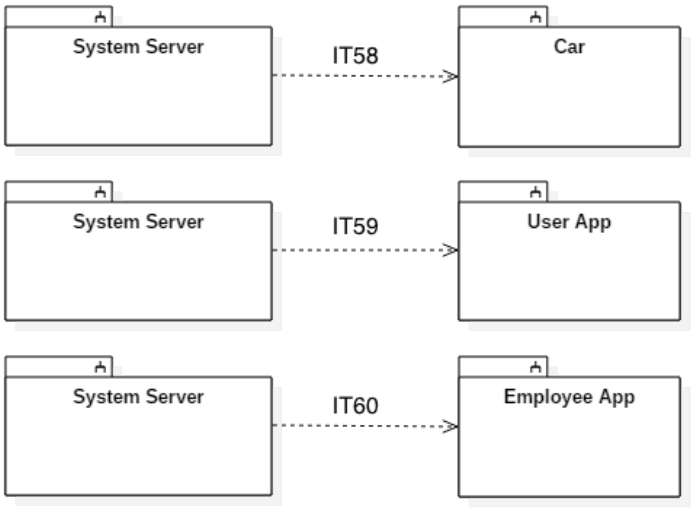


Functionality managers - user interface integration



2.4.5. SYSTEM INTEGRATION

Subsystems



3. INDIVIDUAL TESTS AND STEPS DESCRIPTION

3.1. PERSISTENCY UNIT INTEGRATION TEST (SYSTEM SERVER)

Test Case ID	IT1
Test Item	Retrieval Request Model → Persistency Unit
Input Specification	Simulate *Persistency Unit* component typical input coming from *Retrieval Request Model*.
Output Specification	Check if the correct *Persistency Unit* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Persistency Unit* component must have been already tested

Test Case ID	IT2
Test Item	Car State Model → Persistency Unit
Input Specification	Simulate *Persistency Unit* component typical input coming from *Car State Model*.
Output Specification	Check if the correct *Persistency Unit* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Persistency Unit* component must have been already tested

Test Case ID	IT3
Test Item	Reservation Model → Persistency Unit
Input Specification	Simulate *Persistency Unit* component typical input coming from *Reservation Model*.
Output Specification	Check if the correct *Persistency Unit* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Persistency Unit* component must have been already tested

Test Case ID	IT4
Test Item	Charges History Model → Persistency Unit
Input Specification	Simulate *Persistency Unit* component typical input coming from *Charges History Model*.
Output Specification	Check if the correct *Persistency Unit* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Persistency Unit* component must have been already tested

Test Case ID	IT5
Test Item	User Model → Persistency Unit
Input Specification	Simulate *Persistency Unit* component typical input coming from *User Model*.
Output Specification	Check if the correct *Persistency Unit* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Persistency Unit* component must have been already tested

Test Case ID	IT6
Test Item	Website Model → Persistency Unit
Input Specification	Simulate *Persistency Unit* component typical input coming from *Website Model*.
Output Specification	Check if the correct *Persistency Unit* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Persistency Unit* component must have been already tested

3.2. MODEL-CONTROLLER SYSTEM INTEGRATION TEST (SYSTEM SERVER)

Test Case ID	IT7
Test Item	Website Controller → Website Model
Input Specification	Simulate *Website Model* component typical input coming from *Website Controller.*
Output Specification	Check if the correct *Website Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Website Controller* component must have been already tested.

Test Case ID	IT8
Test Item	Car Retrieval Controller → Car Retrieval Model
Input Specification	Simulate *Car Retrieval Model* component typical input coming from *Car Retrieval Controller.*
Output Specification	Check if the correct Car *Retrieval Model* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car Retrieval Model* component must have been already tested.

Test Case ID	IT9
Test Item	Car State Controller → Car State Model
Input Specification	Simulate *Car State Model* component typical input coming from *Car State Controller*
Output Specification	Check if the correct *Car State Model* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car State Model* component must have been already tested.

Test Case ID	IT10
Test Item	Reservation Controller → Reservation Model
Input Specification	Simulate *Reservation Model* component typical input coming from *Reservation Controller.*
Output Specification	Check if the correct Re*servation Model* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Reservation Model* component must have been already tested.

Test Case ID	IT11
Test Item	User Registration Controller → User Model
Input Specification	Simulate *User Registration Model* component typical input coming from *User Registration Controller.*
Output Specification	Check if the correct *User Registration Model* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*User Registration Model* component must have been already tested.

Test Case ID	IT12
Test Item	User Registration Controller → External Payment Stub
Input Specification	Simulate *External Payment Stub* component typical input coming from *User Registration Controller.*
Output Specification	Check if the correct *External Payment Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*External Payment Stub* must have been already tested.

Test Case ID	IT13
Test Item	Charges Controller → External Payment Stub
Input Specification	Simulate *External Payment Stub* typical input coming from *Charges Controller.*
Output Specification	Check if the correct *External Payment Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*External Payment Stub* must have been already tested.

Test Case ID	IT14
Test Item	Charges Controller → Charges History Model
Input Specification	Simulate *Charges History Model* component typical input coming from *Charges Controller.*
Output Specification	Check if the correct *Charges History Model* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Charges History Model* component must have been already tested.

3.3. MODEL-CONTROLLER SYSTEM INTEGRATION TEST (SYSTEM SERVER)

Test Case ID	IT15-1
Test Item	Website Controller → Dispatcher Stub
Input Specification	Simulate *Dispatcher Stub* typical input coming from *Website Controller*
Output Specification	Check if the correct *Dispatcher Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Dispatcher Stub* must have been already tested.

Test Case ID	IT15-2
Test Item	Dispatcher Driver → Website Controller
Input Specification	Simulate *Website Controller* component typical input coming from *Dispatcher Driver*
Output Specification	Check if the correct *Website Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Website Controller* component must have been already tested.

Test Case ID	IT16-1
Test Item	Car Retrieval Controller → Dispatcher Stub
Input Specification	Simulate *Dispatcher Stub* component typical input coming from *Car Retrieval Controller.*
Output Specification	Check if the correct *Dispatcher Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Dispatcher Stub* must have been already tested.

Test Case ID	IT16-2
Test Item	Dispatcher Driver → Car Retrieval Controller
Input Specification	Simulate *Car Retrieval Controller* component typical input coming from *Dispatcher Driver*
Output Specification	Check if the correct *Car Retrieval Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car Retrieval Controller* component must have been already tested.

Test Case ID	IT17-1
Test Item	Car State Controller → Dispatcher Stub
Input Specification	Simulate *Dispatcher Stub* component typical input coming from *Car State Controller*
Output Specification	Check if the correct *Dispatcher Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Dispatcher Stub* must have been already tested.

Test Case ID	IT17-2
Test Item	Dispatcher Driver → Car State Controller
Input Specification	Simulate *Car State Controller* component typical input coming from *Dispatcher Driver*
Output Specification	Check if the correct *Car State Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car State Controller* component must have been already tested.

Test Case ID	IT18-1
Test Item	Reservation Controller → Dispatcher Stub
Input Specification	Simulate *Dispatcher Stub* component typical input coming from *Reservation Controller*
Output Specification	Check if the correct *Dispatcher Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Dispatcher Stub* must have been already tested.

Test Case ID	IT18-2
Test Item	Dispatcher Driver → Reservation Controller
Input Specification	Simulate *Reservation Controller* component typical input coming from *Dispatcher Driver*
Output Specification	Check if the correct *Reservation Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Reservation Controller* component must have been already tested.

Test Case ID	IT19-1
Test Item	Active Rides Controller → Dispatcher Stub
Input Specification	Simulate *Dispatcher Stub* component typical input coming from *Active Rides Controller*
Output Specification	Check if the correct *Dispatcher Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Dispatcher Stub* must have been already tested.

Test Case ID	IT19-2
Test Item	Dispatcher Driver → Active Rides Controller
Input Specification	Simulate *Active Rides Controller* component typical input coming from *Dispatcher Driver*
Output Specification	Check if the correct *Active Rides Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Active Rides Controller* component must have been already tested.

Test Case ID	IT20-1
Test Item	User Registration Controller → Dispatcher Stub
Input Specification	Simulate *Dispatcher Stub* component typical input coming from *User Registration Controller*
Output Specification	Check if the correct *Dispatcher Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Dispatcher Stub* must have been already tested.

Test Case ID	IT20-2
Test Item	Dispatcher Driver → User Registration Controller
Input Specification	Simulate *User Registration Controller* component typical input coming from *Dispatcher Driver*
Output Specification	Check if the correct *User Registration Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*User Registration Controller* component must have been already tested.

Test Case ID	IT21-1
Test Item	Charges Controller → Dispatcher Stub
Input Specification	Simulate *Dispatcher Stub* component typical input coming from *Charges Controller*
Output Specification	Check if the correct *Dispatcher Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Dispatcher Stub* must have been already tested.

Test Case ID	IT21-2
Test Item	Dispatcher Driver → Charges Controller
Input Specification	Simulate *Charges Controller* component typical input coming from *Dispatcher Driver*
Output Specification	Check if the correct *Charges Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Charges Controller* component must have been already tested.

3.4. STATE WRAPPER-CONTROLLER INTEGRATION TEST (CAR)

Test Case ID	IT22
Test Item	Passengers Sensors Controller → Car Drivers Stub
Input Specification	Simulate *Car Drivers Stub* component typical input coming from *Passengers Sensors Controller.*
Output Specification	Check if the correct *Car Drivers Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car Drivers Stub* must have been already tested.

Test Case ID	IT23
Test Item	Battery Level Controller → Car Drivers Stub
Input Specification	Simulate *Car Drivers Stub* typical input coming from *Battery Level Controller*
Output Specification	Check if the correct *Car Drivers Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car Drivers Stub* must have been already tested.

Test Case ID	IT24
Test Item	Locking State Controller → Car Drivers Stub
Input Specification	Simulate *Car Drivers Stub* typical input coming from *Locking State Controller*
Output Specification	Check if the correct *Car Drivers Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car Drivers Stub* must have been already tested.

Test Case ID	IT25
Test Item	Engine Controller → Car Drivers Stub
Input Specification	Simulate *Car Drivers Stub* typical input coming from *Engine Controller*
Output Specification	Check if the correct *Car Drivers Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car Drivers Stub* must have been already tested.

Test Case ID	IT26
Test Item	State Wrapper → Passengers Sensors Controller
Input Specification	Simulate *Passengers Sensors Controller* component typical input coming from *State Wrapper*
Output Specification	Check if the correct *Passengers Sensors Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Passengers Sensors Controller* must have been already tested.

Test Case ID	IT27
Test Item	State Wrapper → Battery Level Controller
Input Specification	Simulate *Battery Level Controller* component typical input coming from *State Wrapper*
Output Specification	Check if the correct *Battery Level Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Battery Level Controller* component must have been already tested.

Test Case ID	IT28
Test Item	State Wrapper → Locking State Controller
Input Specification	Simulate *Locking State Controller* component typical input coming from *State Wrapper*
Output Specification	Check if the correct *Locking State Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Locking State Controller* component must have been already tested.

Test Case ID	IT29
Test Item	State Wrapper → Engine Controller
Input Specification	Simulate *Engine Controller* component typical input coming from *State Wrapper*
Output Specification	Check if the correct *Engine Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Engine Controller* component must have been already tested.

3.5. COMMAND DISPATCHER – LOCKING COMMAND INTEGRATION TEST (CAR)

Test Case ID	IT30
Test Item	Locking Command → Car Drivers Stub
Input Specification	Simulate *Car Drivers Stub* typical input coming from *Locking Command*
Output Specification	Check if the correct *Car Drivers Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car Drivers Stub* must have been already tested.

Test Case ID	IT31
Test Item	Command Dispatcher → Locking Command
Input Specification	Simulate *Locking Command* component typical input coming from *Command Dispatcher.*
Output Specification	Check if the correct *Locking Command* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Locking Command* component must have been already tested.

3.6. CHARGING STATE – TERMINAL INTEGRATION TEST (CAR)

Test Case ID	IT32
Test Item	State Wrapper → Engine Controller
Input Specification	Simulate *Engine Controller* component typical input coming from *State Wrapper*
Output Specification	Check if the correct *Engine Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Engine Controller* component must have been already tested.

Test Case ID	IT33
Test Item	Charging State → Engine Controller
Input Specification	Simulate *Engine Controller* component typical input coming from *Charging State.*
Output Specification	Check if the correct *Engine Controller* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Engine Controller* component must have been already tested.

Test Case ID	IT34
Test Item	State Wrapper → Charging State
Input Specification	Simulate *Charging State* component typical input coming from *State Wrapper.*
Output Specification	Check if the correct *Charging State* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Charging State* component must have been already tested.

Test Case ID	IT35
Test Item	Terminal → Charging State
Input Specification	Simulate *Charging State* component typical input coming from *Terminal.*
Output Specification	Check if the correct *Charging State* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Charging State* component must have been already tested.

3.7. REQUEST MANAGERS – FUNCIONALITY MANAGERS INTEGRATION TEST (USER APP)

Test Case ID	IT36
Test Item	Authenticated Request Manager → GPS Driver Stub
Input Specification	Simulate *GPS Driver Stub* component typical input coming from *Authenticated Request Manager.*
Output Specification	Check if the correct *GPS Driver Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*GPS Driver Stub* component must have been already tested.

Test Case ID	IT37
Test Item	Unlock Request Manager → Authenticated Request Manager
Input Specification	Simulate *Authenticated Request Manager* component typical input coming from *Unlock Request Manager*
Output Specification	Check if the correct *Authenticated Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Authenticated Request Manager* component must have been already tested.

Test Case ID	IT38
Test Item	Map Manager → Authenticated Request Manager
Input Specification	Simulate *Authenticated Request Manager* component typical input coming from *Map Manager*
Output Specification	Check if the correct *Authenticated Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Authenticated Request Manager* component must have been already tested.

Test Case ID	IT39
Test Item	Reservation Request Manager → Authenticated Request Manager
Input Specification	Simulate *Authenticated Request Manager* component typical input coming from *Reservation Request Manager*
Output Specification	Check if the correct *Authenticated Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Authenticated Request Manager* component must have been already tested.

Test Case ID	IT40
Test Item	Profile Manager → Authenticated Request Manager
Input Specification	Simulate *Authenticated Request Manager* component typical input coming from *Profile Manager*
Output Specification	Check if the correct *Authenticated Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Authenticated Request Manager* component must have been already tested.

Test Case ID	IT41
Test Item	Registration Manager → Guest Request Manager
Input Specification	Simulate *Guest Request Manager* component typical input coming from *Registration Manager*

Output Specification	Check if the correct *Guest Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Guest Request Manager* component must have been already tested.

Test Case ID	IT42
Test Item	Access Manager → Guest Request Manager
Input Specification	Simulate *Guest Request Manager* component typical input coming from *Access Manager*
Output Specification	Check if the correct *Guest Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Guest Request Manager* component must have been already tested.

Test Case ID	IT43
Test Item	Reservation Request Manager → Map Manager
Input Specification	Simulate *Map Manager* component typical input coming from *Reservation Request Manager*
Output Specification	Check if the correct *Map Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Map Manager* component must have been already tested.

Test Case ID	IT44
Test Item	Map Manager → Map Service Driver
Input Specification	Simulate *Map Service Driver* component typical input coming from *Map Manager*
Output Specification	Check if the correct *Map Service Driver* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Map Service Driver* component must have been already tested.

3.8. FUNCTIONALITY MANAGERS – USER INTERFACE INTEGRATION TEST (USER APP)

Test Case ID	IT45
Test Item	User Interface → Unlock Request Manager
Input Specification	Simulate *Unlock Request Manager* component typical input coming from *User Interface*
Output Specification	Check if the correct *Unlock Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Unlock Request Manager* component must have been already tested.

Test Case ID	IT46
Test Item	User Interface → Reservation Request Manager
Input Specification	Simulate *Reservation Request Manager* component typical input coming from *User Interface*
Output Specification	Check if the correct *Reservation Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Reservation Request Manager* component must have been already tested.

Test Case ID	IT47
Test Item	User Interface → Profile Manager
Input Specification	Simulate *Profile Manager* component typical input coming from *User Interface*
Output Specification	Check if the correct *Profile Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Profile Manager* component must have been already tested.

Test Case ID	IT48
Test Item	User Interface → Registration Manager
Input Specification	Simulate *Registration Manager* component typical input coming from *User Interface*
Output Specification	Check if the correct *Registration Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Registration Manager* component must have been already tested.

Test Case ID	IT49
Test Item	User Interface → Access Manager
Input Specification	Simulate *Access Manager* component typical input coming from *User Interface*
Output Specification	Check if the correct *Access Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Access Manager* component must have been already tested.

3.9. REQUEST MANAGERS – FUNCIONALITY MANAGERS (EMPLOYEE APP)

Test Case ID	IT50
Test Item	Unlock Request Manager → Authenticated Request Manager
Input Specification	Simulate *Authenticated Request Manager* component typical input coming from *Unlock Request Manager*
Output Specification	Check if the correct *Authenticated Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Authenticated Request Manager* component must have been already tested.

Test Case ID	IT51
Test Item	Retrieval Manager → Authenticated Request Manager
Input Specification	Simulate *Authenticated Request Manager* component typical input coming from *Retrieval Manager*
Output Specification	Check if the correct *Authenticated Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Authenticated Request Manager* component must have been already tested.

Test Case ID	IT52
Test Item	Access Manager → Guest Request Manager
Input Specification	Simulate *Guest Request Manager* component typical input coming from *Access Manager*
Output Specification	Check if the correct *Guest Request Manager* methods are invoked in the correct way with respect to the input parameter values.

Environmental Needs	*Guest Request Manager* component must have been already tested.

3.10. FUNCIONALITY MANAGER – USER INTERFACE INTEGRATION TEST (EMPLOYEE APP)

Test Case ID	IT53
Test Item	User Interface → Unlock Request Manager
Input Specification	Simulate *Unlock Request Manager* component typical input coming from *User Interface*
Output Specification	Check if the correct *Unlock Request Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Unlock Request Manager* component must have been already tested.

Test Case ID	IT54
Test Item	User Interface → Retrieval Manager
Input Specification	Simulate *Retrieval Manager* component typical input coming from *User Interface*
Output Specification	Check if the correct *Retrieval Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Retrieval Manager* component must have been already tested.

Test Case ID	IT55
Test Item	User Interface → Access Manager
Input Specification	Simulate *Access Manager* component typical input coming from *User Interface*
Output Specification	Check if the correct *Access Manager* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Access Manager* component must have been already tested.

Test Case ID	IT56
Test Item	User Interface → Push Notification Center
Input Specification	Simulate *Push Notification Center* component typical input coming from *User Interface*

Output Specification	Check if the correct *Push Notification Center* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Push Notification Center* component must have been already tested.

Test Case ID	IT57
Test Item	Push Notification Center → Dispatcher Stub
Input Specification	Simulate *Dispatcher Stub* component typical input coming from *Push Notification Center*
Output Specification	Check if the correct *Dispatcher Stub* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Dispatcher Stub* component must have been already tested.

3.11. SUBSYSTEMS INTEGRATION TEST

Test Case ID	IT58
Test Item	System Server → Car
Input Specification	Simulate *Car* component typical input coming from *System Server*
Output Specification	Check if the correct *Car* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*Car* component must have been already tested.

Test Case ID	IT59
Test Item	System Server → User App
Input Specification	Simulate *User App* component typical input coming from *System Server*
Output Specification	Check if the correct *User App* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*User App* component must have been already tested.

Test Case ID	IT60
Test Item	System Server → *User App*
Input Specification	Simulate *User App* component typical input coming from *System Server*

Output Specification	Check if the correct *User App* methods are invoked in the correct way with respect to the input parameter values.
Environmental Needs	*User App* component must have been already tested.

4. TOOLS AND TEST EQUIPMENT REQUIRED

JUnit: will be used as the testing framework for the J2EE server application and the android version of the mobile app

Nunit: will be used as the testing framework for the Windows version of the app, and the software running in the cars.

XCUITest: will be used as a testing framework for the iOS version of the mobile app.

Mockito: will be used to provide stubs and scaffolding during the integration test for the J2EE server application and the android version of the mobile app.

Moq: will be used to provide stubs and scaffolding during the integration test for the Windows version of the app, and the software running in the cars.

OCMock: will be used to provide stubs and scaffolding during the integration test for the iOS version of the mobile app.

Arquillian: will be used for tests against the J2EE container in the server application.

5. PROGRAM STUBS TEST DATA REQUIRED

Dispatcher Driver: testing driver which simulate a dispatcher sending messages to the controllers of the system.

Dispatcher Stub: testing stub which other components can send messages to.

Car Drivers Stub: testing driver simulating input from the car's software drivers.

Map Service Driver: a driver sending data representing a map.

GPS Driver Stub (User App and Employee app): a stub that the AuthenticatedRequestManager component can call to receive GPS coordinates.

Test Data Required

A set of data representing maps is needed to test the related functionalities.

A function to generate fake GPS coordinates.

6. EFFORT SPENT

Together: [0h]

Reppucci: 3h + 4h [7h]

Peverelli: 4h +2h [6h]