Politecnico di Milano

A.A. 2015-2016

Software Engineering 2 Project

myTaxiService

Integration Test Plan Document

Ver. 1

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1 Introduction

1.1 Revision History

No revisions of the document at the moment.

1.2 Purpose and Scope

This document describes the test plan for components integration.
The purpose of the document is to test module interactions and interfaces with which components described in DD interacts. This document is brought to the attention to every person involved in integration test phase.
The system implements a taxi driver rides handling, its main function is to permit the exchange of necessary data to handle request taxi rides between users and taxi drivers, users can interface to the system either with a web application or a mobile app, taxi drivers can serve request through a specific mobile app.

1.3 List of Definitions and Abbreviations

- **myTaxiService:** The name of the system developed
- **RASD:** Requirement Analysis and Specification Document
- **DD:** Design Document

1.4 List of Reference Documents

- **Assignment 1,2,3 and 4:** Assignments for the various phase of the project given to me by the professor.
- **RASD:** The Requirement Analysis and Specification Document
- **DD:** The Design Document
- **Junit javadoc: http://junit.org/javadoc/latest/index.html**
- **JMeter javadoc: http://jmeter.apache.org/api/index.html**

2. Integration Strategy

2.1 Entry Criteria

Before integration testing may begin, the following documents must be released:

- The Design Document (DD)
- The Requirement Analysis and Specification Document (RASD)
- The Integration Test Plan Document (ITPD), that is this document

Before integration testing may begin, is also needed that:

- The single components involved have been delivered
- Involved single components have been already unit tested and unit testing test reports concerning these components have been delivered
- Driver for the integration test have been delivered
- Input data for the integration test has been delivered

2.2 Elements to be integrated

Referring to the DD, the components to be integrated and integration tested are the following:

- **myTaxiService web application**
- **myTaxiService users mobile app**
- **myTaxiService taxis mobile app**
- **Controller**
- **Authenticator**
- **Authentication checker**
- **Logged clients information handler**
- **Dispatcher**
- **Ride request handler**
- **Taxi driver handler**

2.3 Integration Testing Strategy

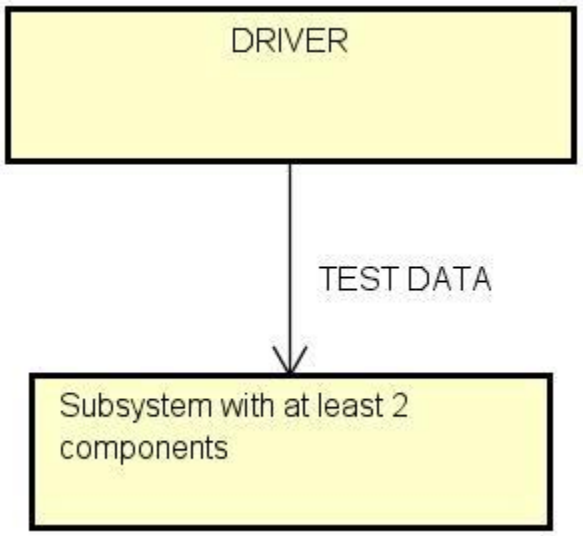
The integration testing approach chosen is the “Bottom-up” one, because due to the non-excessive subsystems dimension and the modularity architecture of the system, this strategy is considered as a good approach.

The “Bottom-up” integration testing strategy starts from the bottom level of the system, trying to test the integration of the leaves of the “uses” hierarchy, and going up and up to the top level of the system as lowest levels become already tested.

“Bottom-up” integration testing strategy needs some additional components called “drivers”, which are to interface with each subsystems module, passing the test data to the component of the subsystem to be tested and printing results.

2.4 Sequence of Component Integration

Here the components and subsystems integration sequence is described, at first a diagram is presented, in which the arrows have two meanings: the arrows with an ID (ex. I1) between brackets represent the integration sequence of the objects, in the sense that if object A is placed before the arrow and object B is placed after the arrow, object B will be integrated after object A and the ID represent the identifier of the integration test that has to be done, the arrows with "TEST DATA" instead represent the calls of the modules by a specific driver for each subsystem identified. As the integration testing strategy is bottom up, every step of components integration in subsystems is tested with a driver as shown in the following general scheme



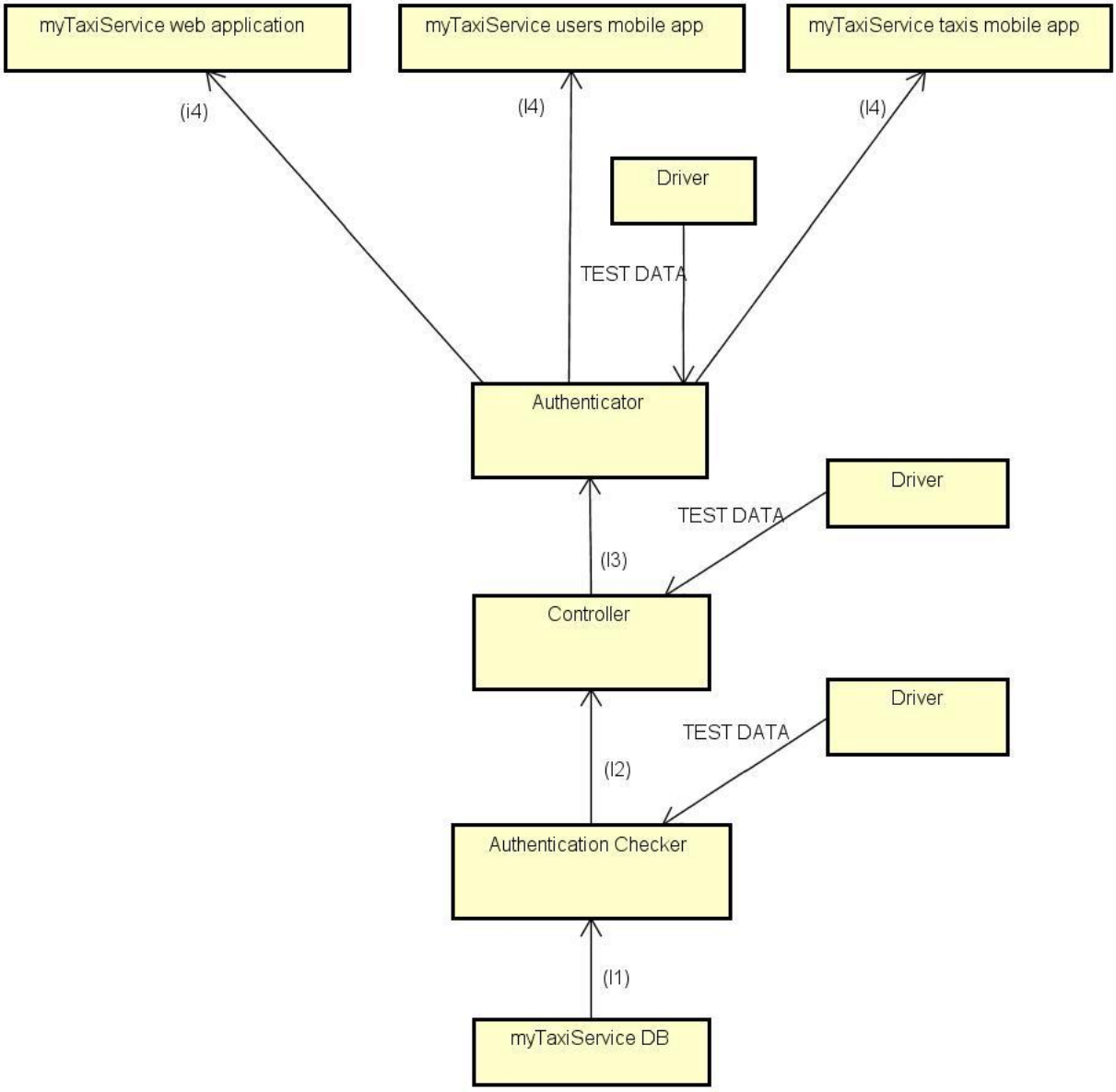
From the figure can be seen that, as the components are supposed to be already unit tested, the subsystem tested is considered to be at least of two components.
Under each diagram a table with the details on components integration is presented, ordered by ID: in this table the arrow represents only the order of interactions of an object by another one, so – for example - if object A is placed before the arrow and object B is placed after the arrow, object A will interact with object B calling one of

its methods/functions; as can be seen, calls by driver are notified; if more than one object interacts with the object after the arrow, the objects before the arrow are listed separated by comma. The column “paragraph” indicates the paragraph in this document where the description of the type of tests for the integration are stated.

2.4.1 Software Integration Sequence

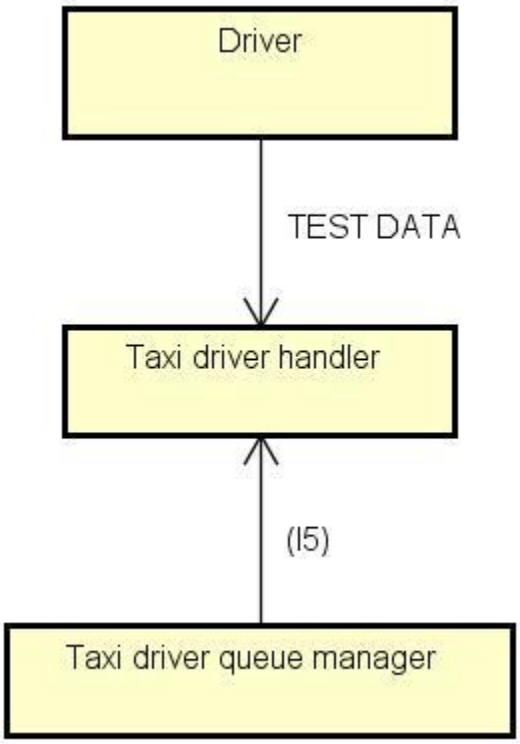
In this paragraph the software components integration sequence is described for each subsystem.

2.4.1.1 Authentication subsystem



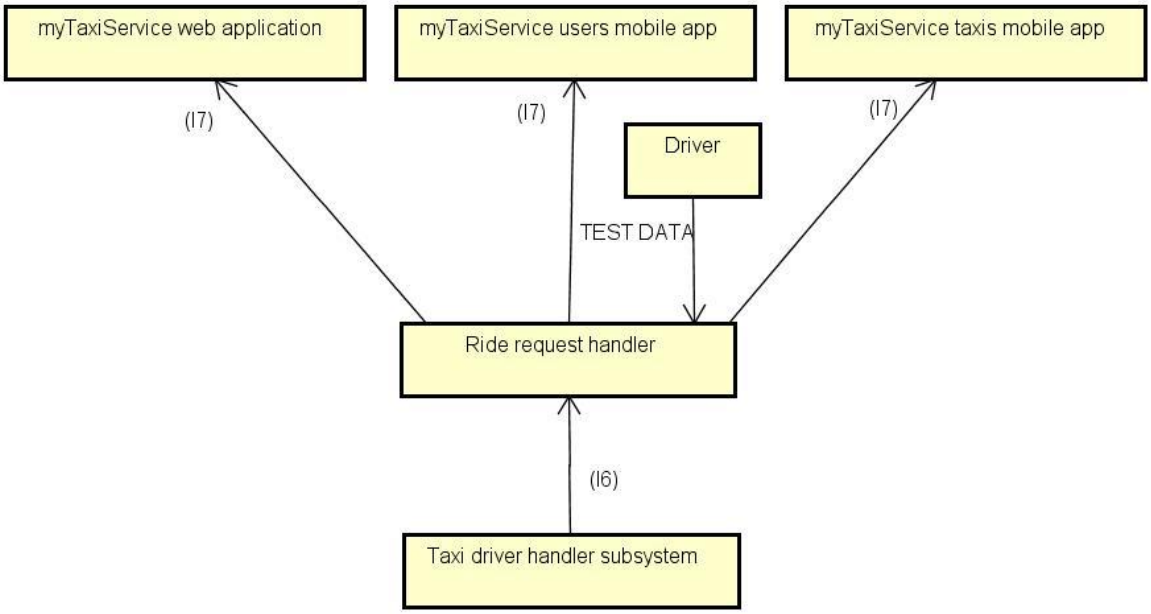
ID	Integration Test	Paragraph
I1	*Driver* → Authentication Checker → myTaxiService DB	3.1.1
I2	*Driver* → Controller → Authentication Checker	3.1.2
I3	*Driver* → Authenticator → Controller	3.1.3
I4	MyTaxiService web application, MyTaxiService users mobile app, MyTaxiService taxis mobile app → Authentication Checker	3.1.4

2.4.1.2 Taxi driver handling subsystem



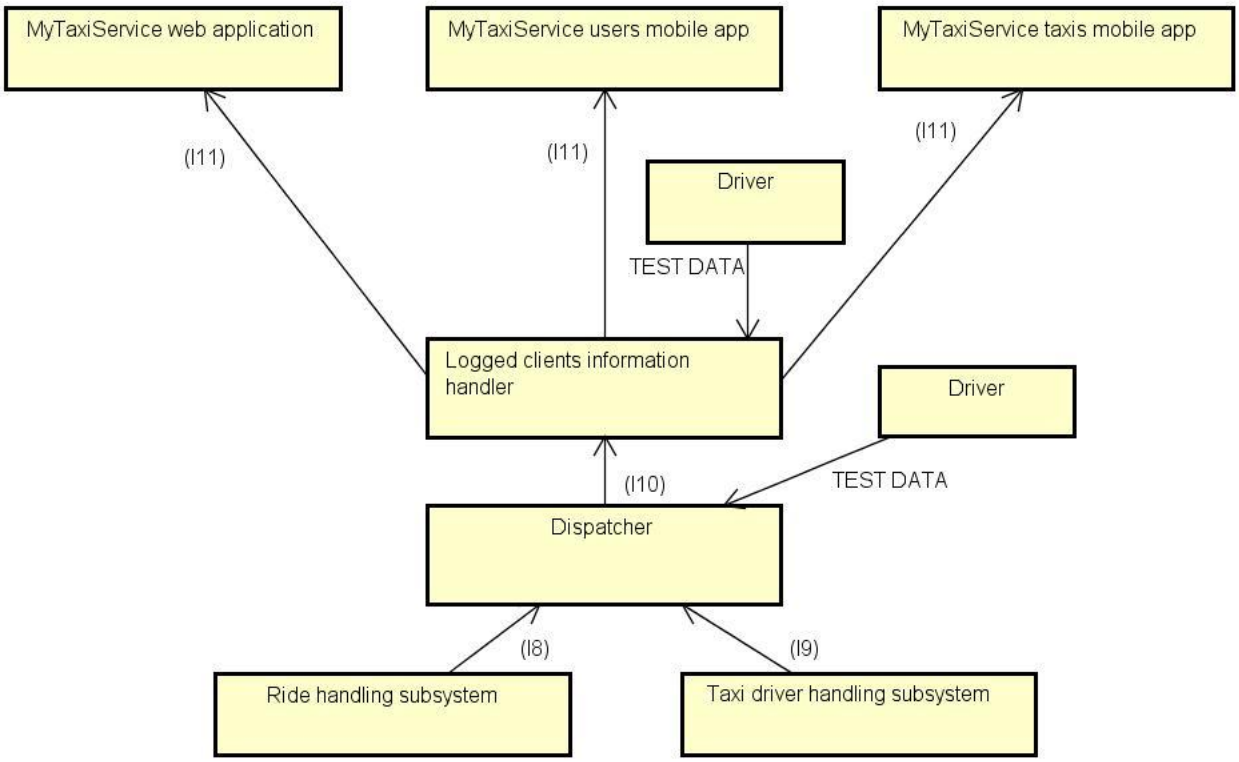
ID	Integration Test	Paragraph
I5	*Driver* → Taxi driver handler → Taxi driver queue manager	3.2.1

2.4.1.3 Ride handling subsystem



ID	Integration Test	Paragraph
I6	*Driver* → Ride request handler → Taxi driver handler subsystem	3.3.1
I7	MyTaxiService web application, MyTaxiService users mobile app, MyTaxiService taxis mobile app → Authentication Checker	3.3.2

2.4.1.5 Dispatching subsystem

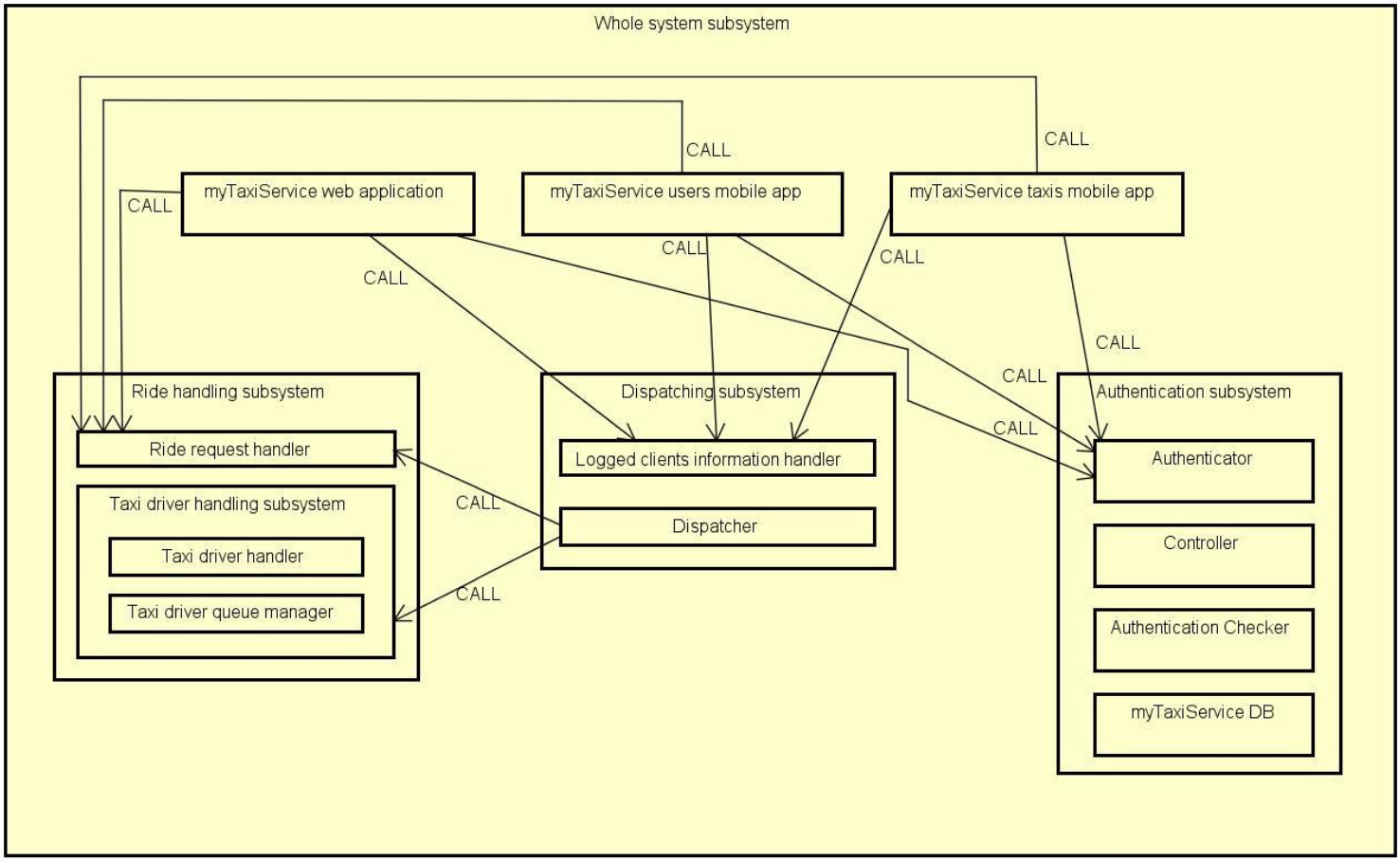


ID	Integration Test	Paragraph
I8	*Driver* → Dispatcher → Ride request handler subsystem	3.4.1
I9	*Driver* → Dispatcher → Taxi driver handling subsystem	3.4.2
I10	*Driver* → Logged clients information handler → Dispatcher	3.4.3
I11	MyTaxiService web application, MyTaxiService users mobile app, MyTaxiService taxis mobile app → Ride request handler	3.4.4

2.4.1 Whole system Integration Sequence

Due to the fact that the creation of subsystems shown above proceeded using smaller subsystems to create bigger ones and to the high modularity of the system, creating the subsystems the whole system is already assembled as a top level subsystem. At this time, the final test of the whole system can be performed as described in paragraph 3.5.

The following diagram shows the entire system as assembled connecting its subsystems.



3. Individual Steps and Test Description

In this section of the document the type of tests that will be used in the integration test will be described. For each subsystem the test procedure is reported and the integration steps are identified, also, for each specific step of the integration, relative sub-steps are described.

3.1 Authentication subsystem test procedure

Test procedure identifier	AS-TP
Purpose	This test procedure verifies whether the Authentication subsystem: • Correctly handles clients input • Correctly stores user information in the database • Correctly checks log-in information • Correctly communicates registration operation result to clients • Correctly communicates log-in operation result to clients
Procedure steps	Execute I1,I2,I3 and I4 in this precise order

3.1.1 Integration test case I1

Test case identifier	I1
Test items	*Driver* → Authentication Checker → myTaxiService DB
Input specification	Create a typical input for Authentication Checker
Output specification	Check if the correct method/functions are called - and behave as expected - in myTaxiService DB
Environmental needs	Authentication checker driver

3.1.2 Integration test case I2

Test case identifier	I2
Test items	*Driver* → Controller → Authentication Checker
Input specification	Create a typical input for Controller
Output specification	Check if the correct method/functions are called - and behave as expected - in Authentication Checker
Environmental needs	I1 succeded, Controller driver

3.1.3 Integration test case I3

Test case identifier	I3
Test items	*Driver* → Authenticator → Controller
Input specification	Create a typical input for Authenticator
Output specification	Check if the correct method/functions are called - and behave as expected - in Controller
Environmental needs	I2 succeded, Authenticator driver

3.1.4 Integration test case I4

Test case identifier	I4
Test items	MyTaxiService web application, MyTaxiService users mobile app, MyTaxiService taxis mobile app → Authentication Checker
Input specification	Create typical inputs for MyTaxiService web application, MyTaxiService users mobile app and MyTaxiService taxis mobile app
Output specification	Check if the correct method/functions are called - and behave as expected - in Authentication Checker
Environmental needs	I3 succeded

3.2 Taxi driver handling subsystem test procedure

Test procedure identifier	TDHS-TP
Purpose	This test procedure verifies whether the Taxi driver handling subsystem: • Correctly handles taxi driver's position input • Correctly handles Ride requests inputs • Correctly outputs taxi driver's data (ID, position, availability etc…) • Correctly (fairly) manages taxi drivers queue
Procedure steps	Execute I5

3.2.1 Integration test case I5

Test case identifier	I5
Test items	*Driver* → Taxi driver handler → Taxi driver queue manager
Input specification	Create a typical input for Taxi driver handler
Output specification	Check if the correct method/functions are called - and behave as expected - in Taxi driver queue manager
Environmental needs	Taxi driver handler driver

3.3 Ride handling subsystem test procedure

Test procedure identifier	RHS-TP
Purpose	This test procedure verifies whether the Rie handling subsystem: • Correctly handles clients input • Correctly handles ride requests client inputs • Correctly outputs ride request results to clients
Procedure steps	Execute I6 and I7 in this precise order

3.3.1 Integration test case I6

Test case identifier	I6
Test items	*Driver* → Ride request handler → Taxi driver handler subsystem
Input specification	Create a typical input for Ride request handler
Output specification	Check if the correct method/functions are called - and behave as expected - in Taxi driver handler subsystem
Environmental needs	Ride request handler driver

3.3.2 Integration test case I7

Test case identifier	I7
Test items	MyTaxiService web application, MyTaxiService users mobile app, MyTaxiService taxis mobile app → Authentication Checker
Input specification	Create typical inputs for MyTaxiService web application, MyTaxiService users mobile app and MyTaxiService taxis mobile app
Output specification	Check if the correct method/functions are called - and behave as expected - in Authentication checker
Environmental needs	I6 succeded

3.4 Dispatching subsystem test procedure

Test procedure identifier	DS-TP
Purpose	This test procedure verifies whether the Dispatching subsystem: • Correctly checks if the user is authenticated • Correctly dispatches taxi driver position to the server of the right zone • Correctly communicates the right server address to client applications • Correctly dispatches user identity to the server of the right zone
Procedure steps	Execute I8, I9 (in any order) and then I10 and I11 in this precise order

3.4.1 Integration test case I8

Test case identifier	I8
Test items	*Driver* → Dispatcher → Ride request handler subsystem
Input specification	Create a typical input for Dispatcher that will require the use of Ride request handler subsystem
Output specification	Check if the correct method/functions are called - and behave as expected - in Ride request handler subsystem
Environmental needs	Dispatcher driver

3.4.2 Integration test case I9

Test case identifier	I9
Test items	*Driver* → Dispatcher → Taxi driver handling subsystem
Input specification	Create a typical input for Dispatcher that will require the use of Taxi driver handling subsystem
Output specification	Check if the correct method/functions are called - and behave as expected - in Taxi driver handling subsystem
Environmental needs	Dispatcher driver

3.4.3 Integration test case I10

Test case identifier	I10
Test items	*Driver* → Logged clients information handler → Dispatcher
Input specification	Create a typical input for Logged clients information handler
Output specification	Check if the correct method/functions are called - and behave as expected - in Logged clients information handler
Environmental needs	I8 and I9 succeded

3.4.4 Integration test case I11

Test case identifier	I11
Test items	MyTaxiService web application, MyTaxiService users mobile app, MyTaxiService taxis mobile app → Logged clients information handler
Input specification	Create typical inputs for MyTaxiService web application, MyTaxiService users mobile app and MyTaxiService taxis mobile app
Output specification	Check if the correct method/functions are called - and behave as expected - in Logged clients information handler
Environmental needs	I10 succeded

3.5 Whole system test procedure

Test procedure identifier	WS-TS
Purpose	This test procedure verifies whether the Whole system • Correctly handles users authentication and registration • Correctly handles ride requests
Procedure steps	Create typical inputs for myTaxiService system from the clients applications and check if the system behaves as expected

4. Tools and test Equipment required

Here the tools that are to be used for testing are stated, together with a brief description of how to use them for testing this system.

Manual testing

Why and how to use it: For the creation of specific drivers for each different subsystem at each step in which a they are needed and in the interaction with MyTaxiService web application, MyTaxiService users mobile and app,MyTaxiService taxis mobile app in order to test, like if the tester was the end user, the features of the specific subsystem.

Junit: http://junit.org (or equivalent testing tool for used programming language)

Why and how to use it: To verify behavior of subsystems with specific assertion statements; an example of use is the creation of a testing suite of classes to create the subsystem and to verify values of some variables with assertion lines.

Apache JMeter: http://jmeter.apache.org

Why and how to use it: To verify accomplishment of performance requirements stated in RASD. The use consists in the setting up of apposite testing plans to simulate scenarios in which the system has to react in the specified bounds of performance.

5. Program Stubs and Test Data Required

As already specified in sections 1,2 and 3 of this document, creation of specific drivers for each subsystem at each step at which it is needed and the test data is the input data specified in the test procedures.