Software Engineering 2 Project
Integration Test Plan Document

PowerEnJoy

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Introduction

1.1 Revision History

1.2 Purpose and Scope

This document describes the plans for testing the integration of the components of the PowerEnjoy system. The purpose of this document is to describe in a detailed way how to test the interfaces described in the Design Document [DD, Interfaces, Paragraph 2.7]. The integration tests will follow the sequence provided in this document, described later in Integration Strategy (Chapter 2). Chapter 3 will instead give a more detailed insight of the single tests to be run.
In this document we only take into account the integration testing of the components, i.e. test if the connections between components are functional, while Unit Testing, i.e. testing a single component in a stand-alone manner, is not described here and is assumed as already done when the component is considered ready for integration testing.

1.3 Definitions and Abbreviations

1.4 Referenced Documents

Integration strategy

2.1 Entry criteria

Integration Testing can start as long as the entry criteria stated below are met. First of all, the RASD and the DD documents must have been completed and accepted, since we need a complete view of the problem and the design of the system.
Also, integration should start only when the estimated percentage of completion of the various components met this requirement

- TODO

This percentage describe only the entry criteria for the integration testing phase, not the actual integration test of the component (obviously possible only when the component is almost complete).

2.2 Elements to be integrated

In the DD, the structure of the system is clearly divided into high-level components, e.g. the Core and Clients, and lower-level component, i.e. the subcomponents of the Core. So, the integration phase will be performed at different level of abstraction. Given that the lower-level components compose the essential high-level component of the system (the Core), we will first integrate the lower-level and then proceed to higher levels.
The first critical component of the system is the Data Access Layer, that is implemented through an external Node.JS library (Sequelize, DD v1.1). For this reason, all the CRUD operations (Create, Read, Update, Delete) on the DB are considered as already tested. The usage of these operations inside components are consequentially already tested in Unit Testing. The lower-level components to be tested in the first phase are: **Vehicle Manager, Drive Manager, Payment Manager, Router,**

Authorization Manager and Task Manager.
TODO: describe high level components

2.3 Integration Testing Strategy

We are going to use mainly a bottom-up approach during the integration testing of lower-level components. So, we will start integrating the components that does not depend on other components or depend on already developed components. Since we have many simple components that are very independent (Vehicle Manager, Payment Manager, Authorization Manager), this approach gives us the advantage to begin the testing phase earlier and start to integrate as soon as components are ready and functional. The second phase will follow a critical-first approach, since the components here are only dependent to the Core. So, the order will reflect the risk represented by the incorrect behaviour of the component.

2.4 Sequence of Integration

2.4.1 Software integration

2.4.2 Subsystem integration

2.5 Test items

The items are the integrations of the components previously described in [Design Document, DD, Paragraph 2.X].
++++++++++++++++++++++++++++++++++ QUI SCRIVO PER PRENDERE APPUNTI
Prima di tutto prendiamo il Unit Testing come gi fatto (questo l'integration) Dovremmo fare un bottom-up Riprendendo il grafico al paragrafo 2.7 la sequenza di integrazione potrebbe essere
Va modificato l'interfaces, manca la connessione da Router Vehicle a Drive Manager per notificare la fine di una drive, e tra router admin e Vehicle per le statistiche
I1: Drive Manager -¿ Vehicle Manager Predisporre una stub dei pagamenti Driver al Drive Manager per testare: reservation, cancellation, start and stop
I2: Drive Manager -¿ Payment Manager Testare tramite driver al drive manager: limite di un'ora con pagamento, fine di una drive con pagamento

I3: Router Vehicle -¿ Drive Manager Testare la end drive dal veicolo, simulare con driver il veicolo stesso
I4: Task Manager -¿ Vehicle Manager Testare tramite driver la creazione di un report e di un task diretto, l'update di un task, il cambio di stato del worker
I5: Router Vehicle -¿ Task Manager, Authorization Testare la malfunction di un veicolo, driver veicolo
I6: Router Driver -¿ Task Manager, Drive Manager, Authorization Testare tutte le funzioni lato driver, simulando l'applicazione stessa
I7: Router Worker -¿ Task Manager, Authorization Testare tutte le funzioni lato Worker
I8: Router Admin -¿ Task Manager, Authorization Testare tutte le funzioni lato Admin

Individual Steps and Test Description

3.0.1 DriveManager, VehicleManager

reserve(user, vehicle)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
An inexistent Vehicle ID	An InvalidArgumentException is raised
A "busy" Vehicle ID	A StateException is raised
The ID of a user who has another active reservation	An invalidUserException is raised
Formally valid argument	The state of the vehicle is set to "busy"

cancel(reservation)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
An inexistent Reservation ID	An InvalidArgumentException is raised
Formally valid argument	The Reservation is removed from the database

start(reservation)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
An inexistent Reservation ID	An InvalidArgumentException is raised
Formally valid argument	The state of the Reservation is updated and a new Drive entry is created

stop(drive)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
An inexistent Drive ID	An InvalidArgumentException is raised
Formally valid argument	The state of the Drive and the respective Reservation are updated

3.0.2 DriveManager, PaymentManger

reserve(user, vehicle)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
An inexistent user ID	An InvalidArgumentException is raised
The ID of a user who has another active reservation	An invalidUserException is raised
Formally valid argument	A fixed amount is pre-authorized from the user's credit card

stop(drive)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
An inexistent Drive ID	An InvalidArgumentException is raised
Formally valid argument	The right amount is charged on the user's credit card

3.0.3 TaskManager, VehicleManger

makeReport(data)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Data parameter contains an inexistent vehicle ID	An InvalidArgumentException is raised
Formally valid argument	A new report is created and the state of the respective vehicle is updated

makeTask(data)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Data parameter contains an inexistent vehicle ID	An InvalidArgumentException is raised
Formally valid argument	A new task is created and the state of the respective vehicle is updated

updateTask(task, state)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
State parameter contains an inexistent state	An InvalidArgumentException is raised
Task parameter contains an inexistent task ID	An InvalidArgumentException is raised
Formally valid argument	The state of the task is updated, and eventually the state of the respective vehicle is updated

3.0.4 Router, DriveManager

reserve(request)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Request parameter contains an inexistent User ID	An InvalidArgumentException is raised
Request parameter contains an inexistent Vehicle ID	An InvalidArgumentException is raised
Formally valid argument	A new Reservation is created

unlock(request)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Request parameter contains an inexistent Vehicle ID	An InvalidArgumentException is raised
Formally valid argument	An unlock command is sent to the vehicle

cancel(request)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Request parameter contains an inexistent Reservation ID	an InvalidArgumentException is raised
Formally valid argument	The Reservation is cancelled

3.0.5 Router, VehicleManager

endDrive(request)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Request parameter contains an inexistent Drive ID	an InvalidArgumentException is raised
Formally valid argument	The Drive is stopped and the Vehicle status is updated

3.0.6 Router, TaskManager

report(request)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Request parameter contains an inexistent Vehicle ID	an InvalidArgumentException is raised
Formally valid argument	A Report is created

changeMyState(request) (for Workers only)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Request parameter contains an inexistent Worker ID	an InvalidArgumentException is raised
Formally valid argument	The state of the Worker is updated

updateTask(request) (for Workers only)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Request parameter contains an inexistent Task ID	an InvalidArgumentException is raised
Formally valid argument	The state of the Task is updated

manageWorker(worker, data) (for Admins only)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Request parameter contains an inexistent Worker ID	an InvalidArgumentException is raised
Formally valid argument	???

makeTask() (for Admins only)	
Input	*Effect*
A null parameter	A NullArgumentException is raised
Formally valid argument	A new Task is created

Tools and Test Equipment

Program Stubs and Test Data Required

Work history