



Universidade de Coimbra
Departamento de Engenharia Informática
Sistemas Distribuídos 2013/2014

Project #2 - Development of a Web-Based Idea Stock Trading Application
Deadline: **December 6, 2013**

1 Objectives of the Project

- Develop a web interface for the IdeaBroker application
- Integrate the web front-end with the previous version of the application;
- Master the following technologies: Servlets, JSPs, JavaBeans;
- Create applications following the MVC pattern;
- Learn how to use WebSockets to asynchronously communicate from the server to the client;
- Integrate your application with 3rd party REST service providers.

2 Overview

In the second stage of this project, you will create a new web frontend for your application. This will allow users to access your application from almost any internet-connected device on the planet, without the need to install specific client software. Since interoperability is a very important requirement, users on the web should have access to the same information as users on the desktop application. In order to achieve this, your web application will be connected to the DataServer previously developed, using JavaRMI.

Users should have the same capabilities, regardless of the interface they use. So your web application should provide ways to create, edit and delete topics and ideas, as well as an option to change the selling price and a possibility to buy shares.

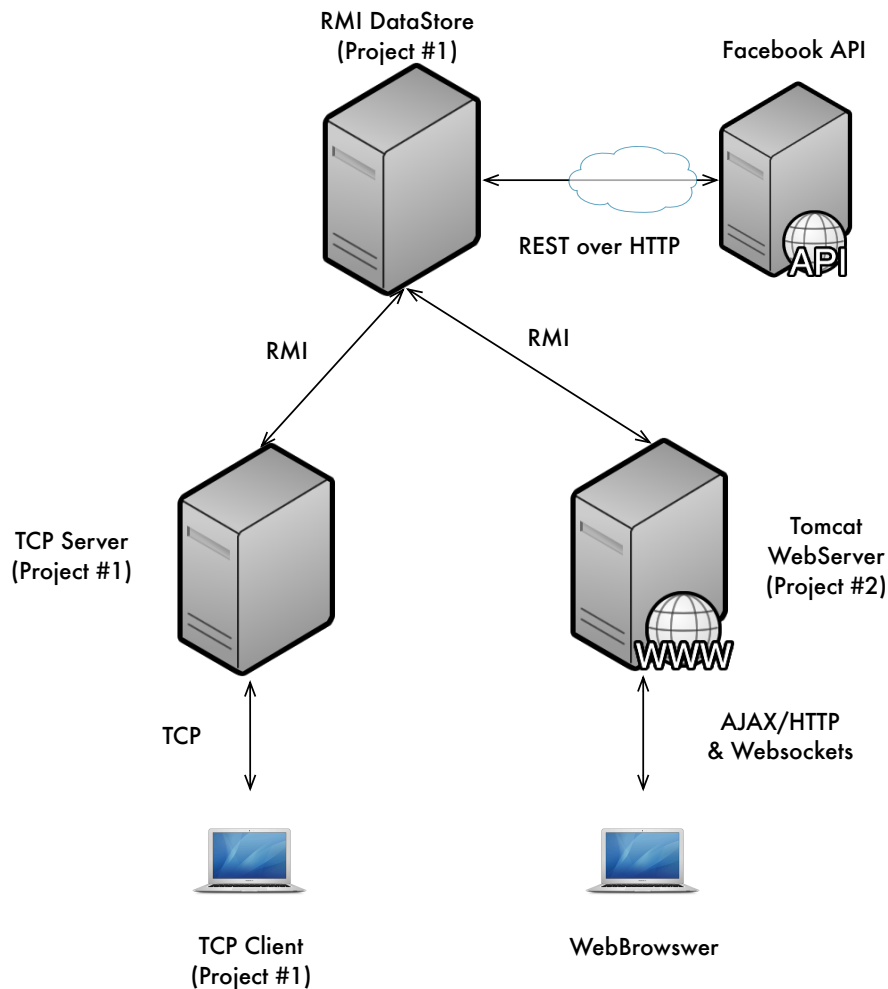
You should also make use of WebSockets to instantly update relevant information. Firstly, users should be instantly notified of any trading that involves them (for instance, someone has just bought shares from them). Secondly, the

value of the last transaction of each idea (that is, the current price of each idea) should be always updating on the webpage.

Finally, you will integrate your webapplication with Facebook. Users should have the ability to associate their facebook account to their ideabroker account. Whenever facebook-enabled users create a new idea, it is also posted on Facebook, together with a link to the URL of that idea on your application.

This assignment is shared by three courses: Databases, Distributed Systems, and Software Engineering. Each course shall evaluate distinct areas of the project, but there is a common description of the assignment that you should read as well, as it specifies the common parts of the project in more detail.

3 Architecture



4 Tasks #1 - Web Interface

Using a MVC architecture, you should implement the following functional requirements using Servlets, JSP and JavaBeans.

1. Register user
2. Securely login user
3. Create new topic
4. Create new idea
5. Delete an idea (if owning 100%)
6. Search and List Ideas
7. Set shares selling price
8. Buy shares of an idea
9. Show Transaction History
10. (Groups of 3 only) Create Topic and Idea inside a group
11. (Groups of 3 only) Add and remove user from groups

5 Tasks #2 - Real-Time Updates

In order to have real-time updates on your web application, you should leverage the support for Web Sockets on both modern browsers and on Tomcat.

13. Transaction notifications should be pushed to the client instantly
14. The price of the last transaction of an idea should be automatically updated if a new transaction occurs (Bonus points for up-to-date graphs)

6 Tasks #3 - Facebook Integration

For something to be relevant nowadays, it has to be shareable on Social Networks. In order to do so, you should make use of the public REST API provided by Facebook, using OAuth to authenticate against their servers.

15. Connect a user account with a facebook account
16. Login with facebook account instead of regular credentials
17. When a new idea is created, if the author has a facebook account associated, the idea is posted to that user's timeline

18. Each time an user deletes an idea posted to Facebook, that post should also be removed
19. Each time an user buys shares from an idea and both the buyer and seller have facebook accounts connected, the buyer should post a comment on the idea post with the text "I have just bought X% of that idea."

7 What You Will Learn

By implementing this work, students will acquire practical competences in the following topics:

- Web programming using Servlets/JSPs/JavaBeans;
- Integration of web-based applications with RMI objects;
- Using WebSockets in Tomcat as a 'server-push' technology;
- Integrate your content with 3rd party services;

8 Report

- Introduction
- Web-based architecture
- Integration with Project 1
- WebSocket integration
- REST web service integration
- User's manual
- Tests specification

9 Project Upload

Deliver everything in a ZIP file. This file should include a README file with all the INFORMATION NECESSARY to execute and test the assignment without the presence of the students. Assignments that do not contain this README with all the necessary instructions will not be evaluated. Assignments that do not execute correctly will also not be evaluated.

Also inside the ZIP file, there should be a PDF containing your report. Do follow the suggested structure as all sections will be evaluated.

You should submit the ZIP on the inforestudante platform: <http://inforestudante.uc.pt>