institute for SOFTWARE RESEARCH

Engineering Data Intensive Scalable Systems 17-648

Project 1

Objectives:

This project is designed to give you hands on experience with various aspects of data intensive distributed systems (the scalable part comes later). Much of the complexity of both dealing with data and the distribution is often abstracted away from the application developer. The issue is that as systems grow in scale these abstraction mechanisms start to break down. As the systems scale the burden on the application developer increases.

The individual projects are designed to force you to deal with these complexities by removing the abstractions prior to building a system at scale. Specifically the first assignment is designed to:

- Introduce students to issues associated with accessing, manipulating, and managing data in a rudimentary file system
- Gain experience with mechanism that support distribution
- Think about the implications of the communication paradigm available

Background:

You and a group of friends have decided to leverage a lifelong interest in biking by starting your own boutique retail bike company. In the past you and your friends started a popular blog that initially reviewed road bikes and then went on to allow others to rate and review bikes. You now want to leverage the popularity that you've gained by offering bikes for sale.

In order to boot strap your business you're going to start by selling bikes available directly from your suppliers. If the business grows you might consider maintaining inventory, but that's down the road.

You have a good relationship with a couple of bike suppliers; the only issue is they don't have any way to remotely access their inventory. As a technical person you've agreed to write a small system that will allow you to remotely connect to their inventory with an ordering application that you'll write as well (in exchange they've agreed to give you a discount on the bikes you purchase).

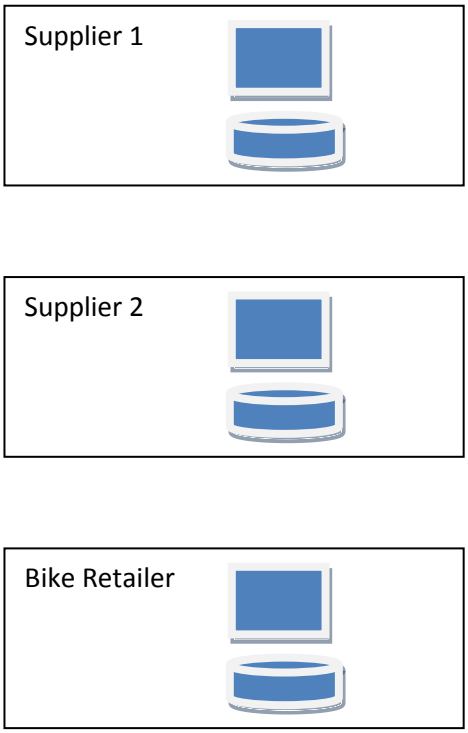
To start with you will not allow your customers to access inventory or order directly. They will first call you and you will place the order with a simple ordering system. Later on if you're successful you might come up with a more efficient approach.

Project:

The project is to create both an ordering system and a couple of small inventory management systems. The ordering system will allow you to do the following:

- Browse inventory
  - Order inventory by
    - Price
- Purchase inventory on behalf of your customers. For each order you should store:
  - Customer first and last name
  - Shipping address
    - Address
    - City
    - State
    - Zipcode
  - Items purchased
    - Item number
    - Item name
    - Price
    - Quantity
- Manage order status
  - Set orders to:
    - In process
    - Complete
- Search order history
  - By customer

You will be given data sets for the two suppliers. These data sets will be in a text file. You will need to write a small program that will allow you to access and update the data for each supplier. Each of the systems (and associated data) will reside on premise at your facilities and the suppliers respectively.



You are constrained to using Java SE 7 or later. No additional software can be used (in other words we need to be able to compile and run your software without downloading any additional libraries or software.

Deliverables:

You should deliver your source code and execution instructions. The code and instructions should be zipped together and submitted via blackboard by the due date. Late assignments will be penalized one letter grade per day late.

The instructions should describe exactly what we need to do in order to compile and execute your software. If we are not able to execute your software based on the instructions provided points will be deducted. You will not be given an opportunity to fix issues (so be sure to test your software and instructions on a new machine to make sure no assumptions are made on the configuration of the environment).

Evaluation:

You have a wide range of latitude with respect to how you implement this system. You will be evaluated along several dimensions:

- Quality of your implementation: It's expected that you adhere to acceptable coding standards. The more you use generally acceptable practices as opposed to just "hacking" the solution together the better you will do along this dimension. It's also expected that the system works. A fully working system is better than a partially working system, a partially working system is better than a system that builds but doesn't execute, and so forth.
- Understanding: You'll be evaluated based on your level of understanding with respect to what you've implemented and the impacts of these solutions. These will be discussed orally after you submit your assignment.

Technologies

You can use Java SE version 7 or later. If you use any additional libraries other than what comes standard with Java SE version 7 be sure to bundle them with your code so we don't need to download, install, or reference any external libraries. No additional databases or other software should be used (data will be stored as a txt file).