

## **CS 54100 – Project**

**Due Date:** The project should be submitted online by 9am of April 18, 2014.

Notes:

- This project will be carried out in groups of three at maximum. You can pick your teammates.
- Email the information of group members to the TA by Friday April 4, 2014.
- Each group will give a presentation to the instructors in the week after the project is due.
- Late submission is allowed only if ALL group members have at least one exception to use.

### **Overview**

In this project, you will be implementing the Biba integrity model. This application is another layer on top of the DBMS, controlling read/write on data and making sure that critical data is changed only as intended by authorized users. You should understand the Biba model thoroughly before getting started.

### **Part 1: Design**

#### **A: Design of underlying database (20 pts)**

First, you need to design the database you use, including

- Subjects, and their attributes;
- Objects, and their attributes;
- Relations among different entities.

Recall that each subject or object should have an attribute named integrity level in addition to other attributes. You should also specify the attribute domain of integrity level, e.g., {low, medium, high}.

You can use the database schemas in HW3 and make necessary changes.

#### **B: Design of your application implementing Biba (40 pts)**

Among the five mandatory policies in Biba, your application should support the usage of the following policies.

- Strict integrity policy
- Either subject low-water mark policy, or object low-water mark policy

- Ring policy

You need to implement the basic strict integrity policy. Also, your application should allow users to switch from the basic strict integrity policy to one of the low-water mark policies (You only need to implement one of them). Finally, ring policy should be implemented for the trusted subjects.

## Part 2: Implementation & Test (40 pts)

You can choose any language you prefer for implementation.

Your application should be able to connect to the Oracle database and perform SQL statements. For example, JDBC can be used to connect to database if you use java. JDBC drivers can be found at:

`/p/oracle10g/jdbc/lib/ojdbc14.jar`

Or for download at:

<http://www.oracle.com/technetwork/database/enterprise-edition/jdbc-112010-090769.html>

Do not forget to add this into your java CLASSPATH, or add the jar file to install the driver if you use IDE like Eclipse.

You also need to read the file `tnsnames.ora` under `/p/oracle10g/network/admin/` to check the information (such as host name, port number, sid, etc.) of the database installed in CS machines. Besides, the Oracle account that you used in HW3 will allow you to connect to the database.

In addition to implementing the application, you also need to write test cases for testing the correctness of your approach. For example, to show whether a subject is allowed to perform operations on an object.

## What to Turnin

**Each group only needs to submit one copy of your work.** You should turnin all of the following files for your project.

1. All source code
2. A README file about how to run your code
3. A test script including test cases that you use to test your approach
4. A project report. Your report should include:
  - a. Task breakdown
  - b. Roles of each group member in the project, i.e., who did what.

- c. Designs of the database and your application
- d. How your designs work
- e. Any features that you would like the instructors to know

After logging into `lore.cs.purdue.edu`, please follow these instructions to submit your project.

1. Make a directory named “yourFirstName\_yourSurname” and copy all your files there.
2. Suppose your folder is under your home directory. Go to your home directory, and execute the following command:

```
turnin -c cs541 -p proj your_folder_name
```

For example, Professor Bertino will type the following command to submit her work:

```
turnin -c cs541 -p proj elisa_bertino
```

**Notes:**

1. For more details about turnin, type the command 'man turnin'.
2. Make sure to submit your work before the deadline; otherwise the submission will be closed.
3. You can submit your work as many times as you want before the deadline. Keep in mind that a later submission will overwrite the previous submission.
4. You can verify what you have submitted by executing:

```
turnin -v -c cs541 -p proj
```

Do not forget the -v flag here, as otherwise your submission would be replaced with an empty one.