

COS30041 Creating Secure and Scalable Software [Java EE]

62 Credit Task 7.2 Security – JDBC-realm

Time Frame: Weeks 7 – 10

Suggested to start in Week 7 and complete in Week 10

Submission Due: Week 11, Fri, 6:30pm

Overview

This task is about extending the “Secure-EMS” enterprise application in Pass Task 7.1 so that the application can access role-based authentication and authorization credentials (e.g. username and password) stored in a separate database table using JDBC-realm instead of a fileRealm. **Since we have not discussed how to do this in lectures, it is left to you to devise and enact your own plan to independently research and learn about the technologies.**

Note: After completing this JDBC-realm, any new user added to the “Secure-EMS” database table(s) can access the relevant CRUD operations in the system. Remember you need to test this as well.

Purpose	To develop an enterprise application in which users’ credentials and role based authentication information are stored on a separate database table
Tasks	<ol style="list-style-type: none">1. Research into how to perform authentication and authorization2. Develop an enterprise application and configure the enterprise server so that the application could utilize users’ credentials and role based authentication information stored on a separate database table3. Prepare your test cases and test your application thoroughly by using appropriate input values and database contents4. Describe (with justification) and document your design5. Answer questions related to the design of the project
Pre-req Task¹	Pass Task 7.1
Follow-up Task²	
Suggested Time	4 hours if you know the stuff well 8 – 10 hours if you need to read the concepts and know how to establish database connections on the GlassFish server
Resources	Lecture 07a Security Java EE Tutorial – JDBC-realm
Feedback	Ask your tutor for feedback
Next task	

Credit Task 7.2 Submission Details and Assessment Criteria

You must create your own document (pdf) in **portrait** mode³, which you will upload to Doubtfire, with the following details:

- Your name and student id
- Your tutor’s name
- Your own responses to the tasks according to the corresponding instructions (see below)

¹You need to complete the pre-requisite task before doing this task.

²You need to complete this task in order to do the follow-up task because the follow-up task depends on your answer in this one.

³Landscape mode pdf does not work properly in Doubtfire.

Background

Assumption: You have completed Pass Task 7.1

Tasks and Instructions

Task 1. Independent research and study

- a. Research into how an enterprise application can authenticate and authorize users based on their roles stored in a database table
- b. In case you have multiple options for Task 1a, determine and explain which one you are going to use (e.g. easier, more reliable, less programming work, ...). Justify your answers.

Task 2. Programming and Configuration Task [Assume you have completed Pass Task 7.1]

Enhance your enterprise application in Pass Task 7.1 so that your GlassFish server can now access login credentials and users' role stored in a separate database table (e.g. EMS_EMPLOYEE or another database table in your design to address the security concerns in Secure-EMS app in Pass Task 7.1) rather than on GlassFish itself.

Note that: in using JDBC-realm, you should choose "SHA-256" for "Password Encryption Algorithm". You should "hash" the password using SHA-256 algorithm, so the databased table and fields would be different from those used in Pass Task 7.1.

Task 3. Testing

Write your test cases (including the database content and input values) and test your work thoroughly. Remember to collect your screen dump to show me the evidences.

Task 4. Design Justification

- 4.1. Update your architecture diagram in Pass Task 7.1 using UML notations, of your "Secure EMS" app. In your diagram, you need to annotate the names and types of each software component, put them in the right tiers, and indicate how they interact with each other.

Note: You can submit the same diagram in Pass Task 7.1, but your discussion in Pass Task 7.1 should only focus on the security concerns there whereas your discussion in here should focus on how to use the role-based information stored in a separate database table.

- 4.2. Describe and discuss the role of the newly implemented components, if any
- 4.3. Discuss the APIs and technologies used in the implementation, if any

Task 5. Document your learning journey / research journey

Write about your learning experience in this portfolio task.

Submission Task

Once completed, you need to submit a pdf file that contains all your work (e.g. selected code segments – show me the key stuff and some screen dumps of your testing)

Demonstration

You may be asked to demonstrate your assignment in the lab. You should be able to do this and explain your code when asked in the lab session.