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Assignment 3

Along with the reference given Moodle resources are also used.

Enterprise computing Architecture

COIT20259 (HT1, 2021)

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# Question 1:

1. @Remote

Public interface shopperCart

{

Public void addItem( String str);

Public void removeItem( String str);

}

1. @Remote(shopperCart.class)

@Stateful

@Resource

SessionContext sessioncontext;

private List<String> cartItems = new ArrayList<String>();

public class shopperCartEJB implements shopperCart {

private EntityManager entityManager;

public String addItem (String str) {

if (!cartItems.contains(str)) {

cartItems.add(str);

return new String("The item has been added");

} else return new String("The item already existed"); }

public String removeItem(String str) {

if (cartItems.contains(str)) {

cartItems.remove(str);

return new String("The item has been removed");

} else return new String("The item does not exist");

}

1. @EJB

public shopperCartEJB remoteShopperCart;

public void main(String[] args) {

remoteShopperCart.addItem(“Apple”);

remoteShopperCart.addItem(“Mayonnaise”);

}

# Question 2:



@RolesAllowed({"student", "staff"})

So the declared security roles in the project is student and staff.

They are declared in ItemEJB before declaring a class. It is in Week7 part 1 line 17 in ItemEJB.java file.

Role declared authorization for:

1. Staff: deleteBook, deleteCD, updateBook, updateCD, findBooks, findCDs, findBookById findCDById createBook, createCD
2. Student: createBook, findBooks, findBooksById, findCDById, createCD
3. asadmin create-file-user --groups Enterprise mike
4. asadmin create-file-user --user admin --passwordfile=c:\tmp\password.txt -groups StaffEnterprise Richard
5. There is a role mapping element that maps a security role that is specified in the EJB JAR role-name entries, to an environment specific user/group.

For user to map a security role, user must exist in current realm and log into the server using the current updated authentication method.

For group to map a security role, group should be a concrete group and exist in the current realm with realm supporting group (security-role-mapping (Sun GlassFish Enterprise Server v3 Application Deployment Guide), 2021).

1. For a given security scenario:

Using client interface, Mike is allowed to enter username and password and those credentials are verified using Java Authentication and Authorisation Service (JAAS). Upon successful verification Mike is given a principal which can have multiple roles. Mike then gets access to secure EJB which is transparent then is allowed to run the Main() method and execute the method.

This can be achieved by adding username “Stephen” in the database along with password for the user. Also assign the user to group “StaffEnterprise” which has access to all the available methods of ItemEJB.

# Question 3:

|  |  |
| --- | --- |
| **Web Service Application** | **Client/Server Application** |
| Multi-tier architecture | Uses two-tier architecture |
| It is robust. | Does not have robustness as if server fails request cannot be executed |
| Multiple users using the web app at the same time gets the same performance at the same time. | With increase in client requests, server can be overloaded and decrease performance. |
| Web browser is a necessity to interact with the application. | Interaction to server is through user interface |

|  |  |
| --- | --- |
| **Soap Web Service** | **REST Web Service** |
| Stands for Simple Object Access Protocol | Stands for Representational State Transfer |
| Does not support error-handling | Error handling is built-in |
| Messages are enclosed in an envelope and any transport mechanism or protocols transport it away. | Communication between two machines is done by HTTP protocol. |
| It defines its own security. | It inherits security measures from underlying transport (Introduction of SOAP and REST Web Services - javatpoint, 2021). |

HTTP methods used for CRUD operations by Restful Web Service are:

1. **POST:** It is used to create a new subordinate resources that is create a new resource into the collection of resources.

When resource is created in the origin server, response code is 201 (Created).

When resource not identified by URI, response code can be either 200 (OK) or 204 (No Content).

Example: HTTP POST http://www.facebook.com/users

1. **PUT:** It is used to update existing resource and if the resource is not there then it decides to create a new one with response code 201 for the origin server and on modification of file 200 (OK) or 204 (No Content).

Example: HTTP PUT http://www.facebook.com/users/123

1. **DELETE:** As the word says it delete resources. Success code is 200 (OK) and 404 (NOT FOUND) if resource does not exist.

Example: HTTP DELETE <http://www.facebook.com/users/123>

1. **GET:** It is used to retrieve the information from the resource but do not modify the resource.

Example: HTTP GET <http://www.facebook.com/users> (HTTP Methods – REST API Verbs, 2021).

Messaging formats used are JSON, HTTP and Text (REST vs RESTful | Top 6 Essential Differences of REST vs RESTful, 2021). When use HTTP protocol for the interaction between client and server for restful web service. Client sends a request to the server which in turn return a response as a message that can contain meta data and requested data.

WADL stands for Web Application Description Language. Web-based companies that have HTTP-based applications can have access to the internal data programmatically with WADL.

WADL lets client application interact with the resources directly (Web Application Description Language, 2021). It is also used for creating a documentation interface. Client-side code can also be generated to use alongside API. There is also no authentication required.

# Question 4:

Message producer: JMSProducer

Message provider: senderBean

Message consumer: receiverBean

Message destination: JMSConsumer

In the project synchronous messaging is used. There is no listener used and there is no present of Message Oriented Middleware even though a queue is used. There is no messageListener interface defined or used in the project (A Simple Example of Synchronous Message Receives (The Java EE 6 Tutorial), 2021).

To make the project asynchronous, message listener interface can be introduced along with queue toto store the message and listener will take that data from the queue by configuring message listener to message-driven bean (Diffrence between synchronous and asynchronous messaging (OCMJEA forum at Coderanch), 2021).

|  |  |
| --- | --- |
| **Point-to-point Model** | **Publish-subscribe model** |
| Only one JMS consumer receives the message | Multiple JMS consumer can receive the message |
| Time limit is there for a receiver to receive the message. | No time limitation between publisher-subscriber. |
| Receiver always need to take the message sent by the sender. | Messages are always received by the receiver once pushed by the sender. |
| Example: Fax machine | Example: Newspaper (Differences between PointToPoint and Publish/subscribe model in JMS - GeeksforGeeks, 2021), (Java Message Service, 2021) |

The goals that JMS is trying to achieve are:

1. Providing single and unified messaging API
2. API that can create a message that match the format accepted by non-JMS applications.
3. Supports serialized Java objects messages
4. Reliability to confirm message is delivered (Sundsted, 2021).

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