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JDBC Overview Interview Questions and Answers

Posted on December 12, 2014 by Arulkumaran Kumaraswamipillai — No Comments ↓

Q. What is JDBC? How do you connect to a database?
A. JDBC stands for **J**ava **D**ata**B**ase **C**onnectivity. It is an API which provides easy connection to a wide range of databases. To connect to a database we need to load the appropriate driver and then request for a connection object. The *Class.forName(….)* will load the driver and register it with the *DriverManager*.

```
Class.forName(“oracle.jdbc.driver.OracleDriver”);
String url = jdbc:oracle:thin:@hostname:1526:myDB
Connection myConnection =  DriverManager.getConne

```

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The **driver jar file** (e.g. ojdbc14.jar) needs to be in the classpath.

Q. What is a **datasource**?
A. The **DataSource** interface provides an alternative to the ***DriverManager*** for making a connection. *DataSource* makes the code more portable than the *DriverManager* because it works with JNDI and it is created, deployed and managed separately from the application that uses it. If the *DataSource* location changes, then there is no need to change the code, but change the configuration properties in the server. This makes your application code easier to maintain. *DataSource* allows the use of connection pooling and support for distributed transactions. A *DataSource* is not only a database but also can be a file or a spreadsheet. A *DataSource* object can be bound to JNDI and an application can retrieve and use it to make a connection to a database. JEE application servers provide tools to define your *DataSource* with a JNDI name. When the server starts it loads all the *DataSources* into the application server's JNDI service.

DataSource configuration properties are shown below:

JNDI Name = jdbc/myDataSource
URL = jdbc:oracle:thin:@hostname:1526:myDB
UserName, Password
Implementation class name =
oracle.jdbc.pool.OracleConnectionPoolDataSource
Jar file in the Classpath = ojdbc14.jar
Connection pooling settings like = minimum pool size, maximum pool size, connection timeout, statement cache size etc.

Once the DataSource has been set up, then you can get the connection object as follows:

```
Context ctx = new InitialContext(); //JNDI contex
DataSource ds = (DataSource)ctx.lookup("jdbc/myDa
Connection myConnection = ds.getConnection(“usern

```

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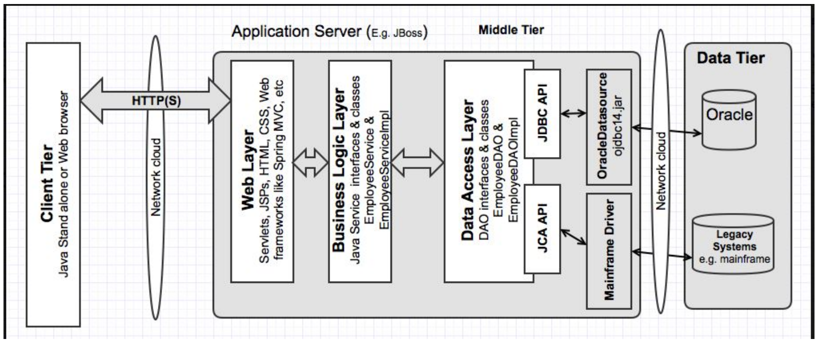
Q. Why should you prefer using a DataSource?
A. **Best practice**: In a very basic application a Connection obtained from a DataSource and a DriverManager are identical. But, the JEE best practice is to use DataSource because of its portability, better performance due to pooling of valuable resources, and the JEE standard requires that applications use the container's resource management facilities to obtain connections to resources. Every major web application container provides pooled database connection management as part of its resource management framework.

Design Pattern: JDBC architecture decouples an abstraction from its implementation so that the implementation can vary independent of the abstraction. This is an example of the bridge design pattern. The JDBC API provides the abstraction and the JDBC drivers provide the implementation. New drivers can be plugged-in to the JDBC API without changing the client code.

Q. Have you used a Data Access Object (DAO) pattern? Why is it a best practice to use a DAO pattern
A. A DAO class provides access to a particular data resource in the **resource tier** or **data tier(**e.g. relational database, XML, mainframe, etc) without coupling the resource's API to the business logic in the middle tier. A tier is a physical machine, whereas a layer is logical.



jdbc overview

For example, you may have a *EmployeeServiceImpl* in the

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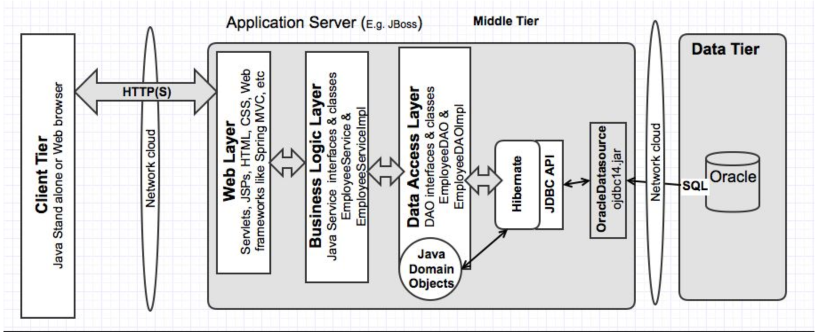
business logic layer with business logic, and uses *EmployeeDAO* in the data access layer for accessing data in the data tier. *EmployeeServiceImpl* uses the interface *EmployeeDAO* as opposed to the implementation. This is the best practice of "coding to interface not implementation"*.* If your data resource change from a database to a *Mainframe* system, then reimplementing *EmployeeDAO* for a different data access mechanism (to use a mainframe Connector) would have little or no impact on any classes like *EmployeeServiceImpl* that uses *EmployeeDAO*. *EmployeeDAOImpl* can even decide to use hibernate framework instead of using the JDBC directly. The *EmployeeServiceImpl* will not be impacted as long as the contract in *EmployeeDAO* is met.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OracleDatasource
ojdbc14.jar
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Data Tier

Hibernate with jdbc overview

Inversion of control (IoC) frameworks like Spring framework promotes the design principle of "code to interface not implementation".

Q. What are the best practices relating to exception handling to make your DAOs more robust and maintainable?
A.

- If you catch an exception in your DAO code, never ignore it or swallow it because ignored exceptions are hard to troubleshoot. DAO class methods should throw checked exceptions only if the caller can reasonably recover from the exception or reasonably handle it (e.g. retry operations in optimistic concurrency control). If the caller cannot handle the exception in a meaningful way, consider throwing a runtime (i.e. unchecked) exception. For example, Hibernate 3 exceptions are all runtime exceptions.

- DAO methods should not throw low level JDBC exceptions like *java.sql.SQLException*. A DAO should encapsulate JDBC rather than expose it to rest of the application. Use chained exceptions to translate low-level exceptions into high-level checked exceptions or runtime exceptions. DAO methods should not throw *java.lang.Exception* because it is too generic and does not convey any underlying problem.
- Log your exceptions, configuration information, query parameters, etc.

Q. What are JDBC Statements? What are different types of statements? How can you create them?
A. A **statement** object is responsible for sending the SQL statements to the Database. Statement objects are created from the connection object and then executed.

```
Statement stmt = myConnection.createStatement();
ResultSet rs = stmt.executeQuery(“SELECT id, name

stmt.executeUpdate(“INSERT INTO (field1,field2) v

```

The types of statements are:

- Statement (regular statement as shown above) .
- **PreparedStatement** (more efficient than statement due to pre-compilation of SQL and prevents SQL injection attack. Always use this over a statement) .
- **CallableStatement** (to call stored procedures on the database).

To use prepared statement:

```
PreparedStatement prepStmt =
                  myConnection.prepareStatement("S
prepStmt.setInt(1, 1245);
```

Callable statements are used for calling stored procedures.

```
CallableStatement calStmt = myConnection.prepareC
ResultSet rs = cs.executeQuery();

```

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Arulkumaran Kumaraswamipillai

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About Arulkumaran Kumaraswamipillai

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