Java Database Connectivity

Presented by

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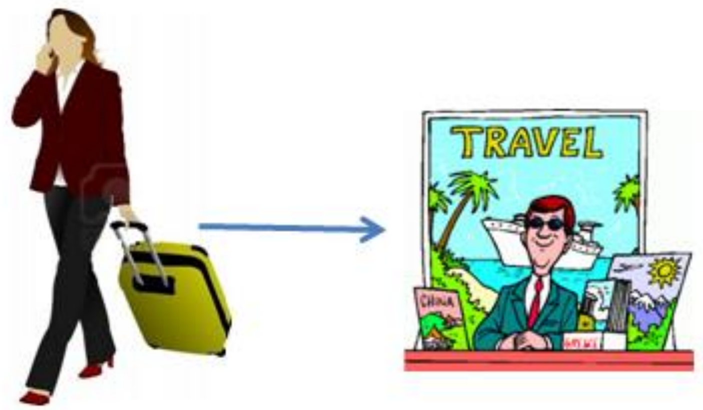
JDBC – Real World Analogy

A business woman needs to travel on a world tour and is in need of a VISA for U.S, Singapore and Italy.

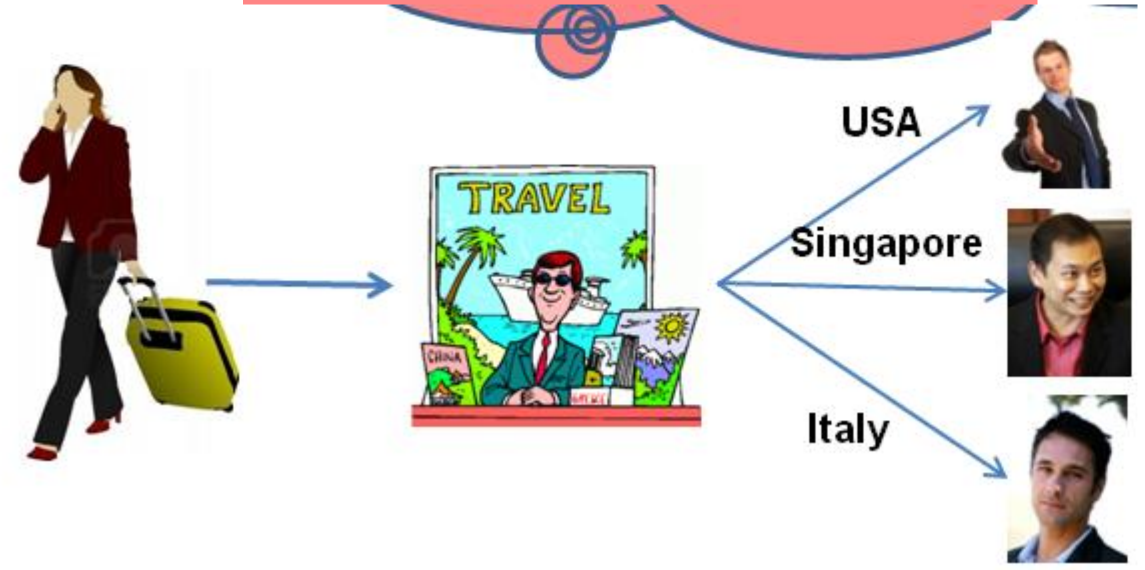
JDBC – Real World Analogy



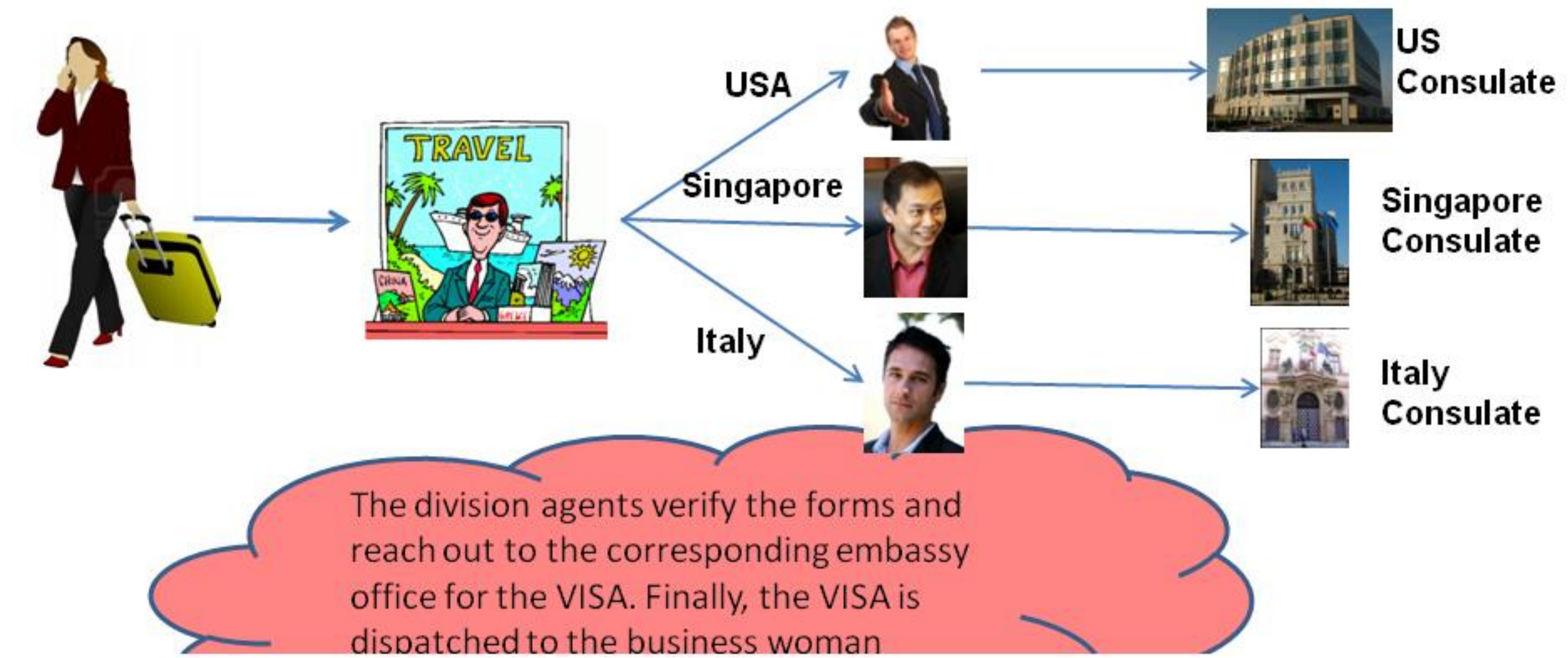
She approaches a travel agent who collects all the required information and documents from the business woman.

JDBC – Real World Analogy

The travel agent processes the documents, fills out the required forms and hands it over to the appropriate Visa Immigration team **Example:** Italy Immigration team is given the docs to get the Italy visa

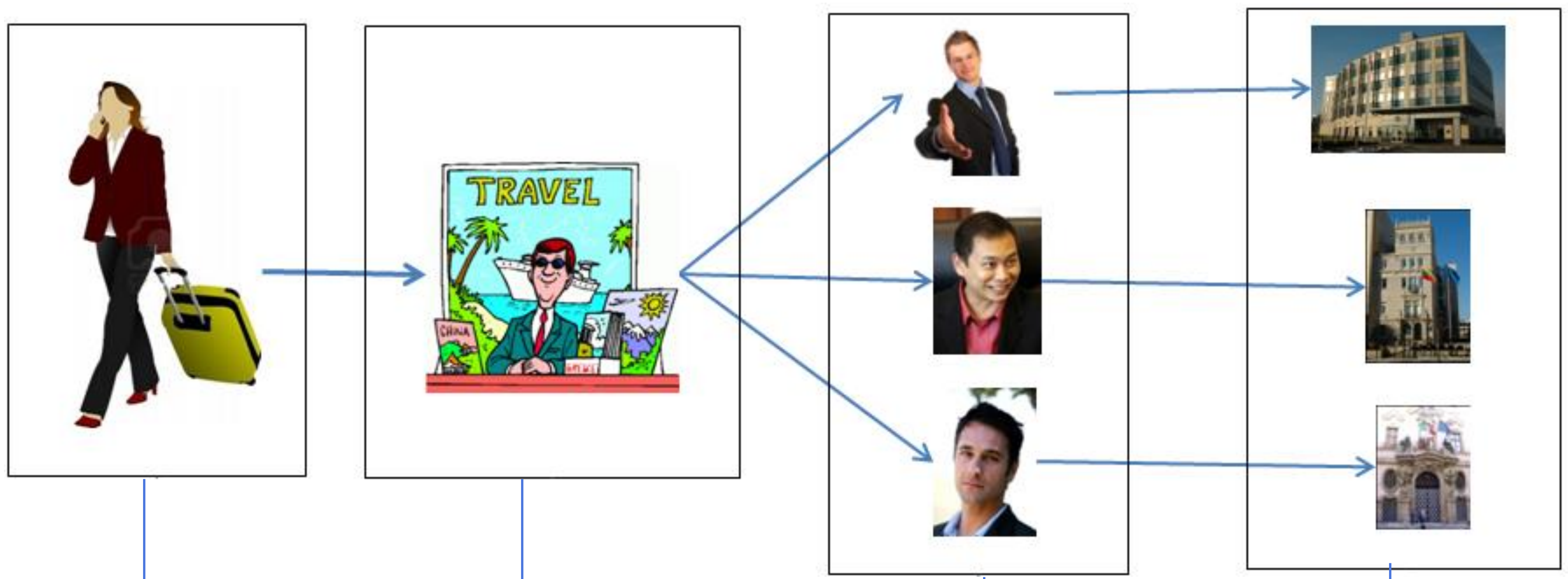


JDBC – Real World Analogy



The division agents verify the forms and reach out to the corresponding embassy office for the VISA. Finally, the VISA is dispatched to the business woman

Analogy between JDBC and VISA



Relates to Java Client which needs to access the database.

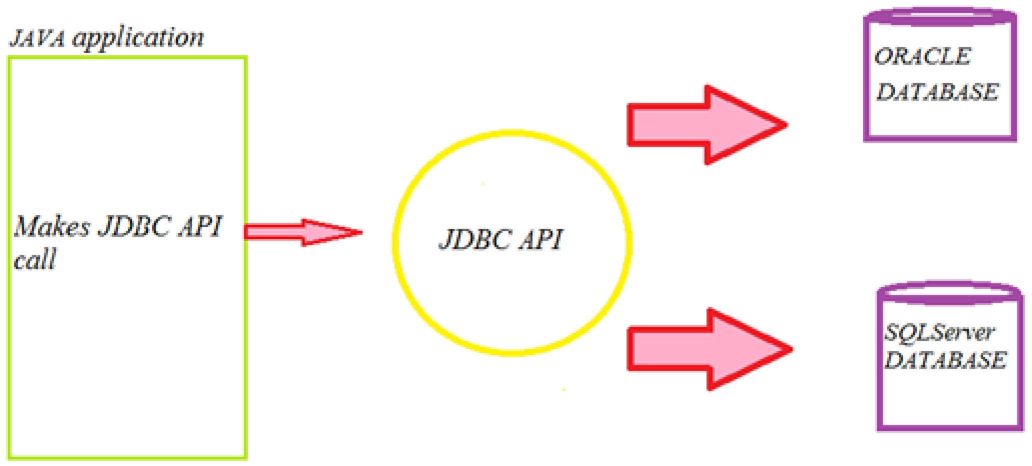
Relates to JDBC API used for querying database.

Relates to database specific JDBC Drivers for querying the appropriate database.

Relates to various database like Oracle, MySQL etc.

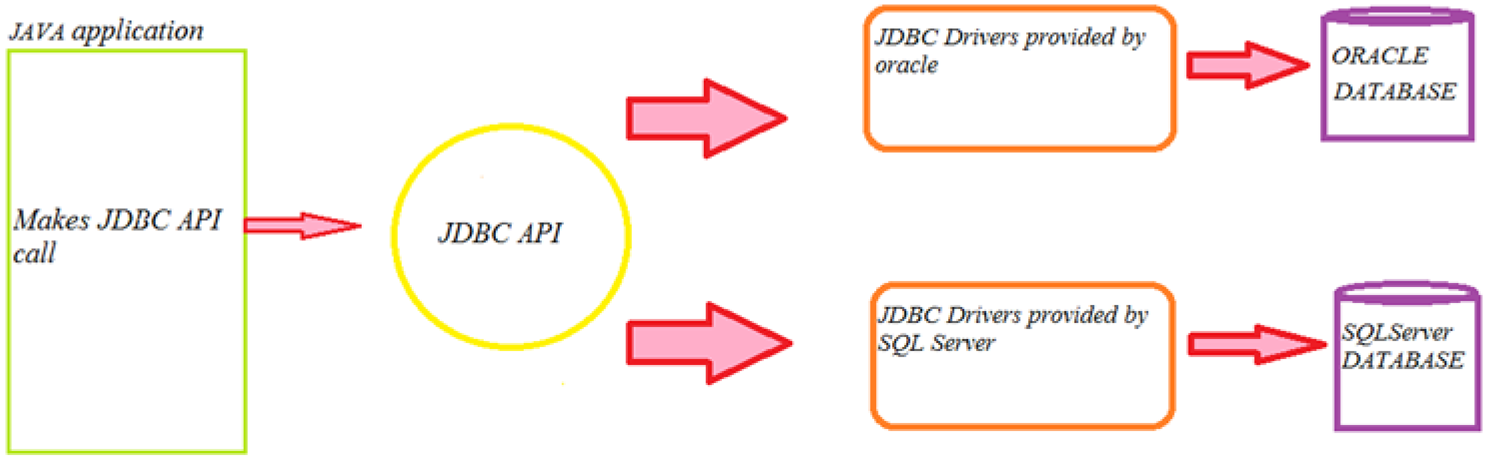
What is JDBC?

An API to access database



JDBC Drivers

A JDBC Component that enables the Java Application to interact with Database



The Drivers are available as .class files in a .jar file

JDBC Steps

1. Register the driver

   A. For MySQL :

   ```
   Class.forName("com.mysql.jdbc.Driver");
   ```

   B. For Oracle :

   ```
   Class.forName("oracle.jdbc.driver.OracleDriver");
   ```

2. Establish the Connection to database

   A. For MySQL :

   ```
   Connection con=DriverManager.getConnection(
                       "jdbc:mysql://localhost:3306/mysql","root","root");
   ```

   B . For Oracle

   ```
   Connection conn =   DriverManager.getConnection(
         "jdbc:oracle:thin:@localhost:1521:XE", "sagar","sagar“);
   ```

JDBC Steps …

3. Create the Statement / PreparedStatement objects

```
Statement stmt=con.createStatement();
```

4a. If the statement is Select – use ResultSet object

```
ResultSet rs=stmt.executeQuery("select * from emp");
```

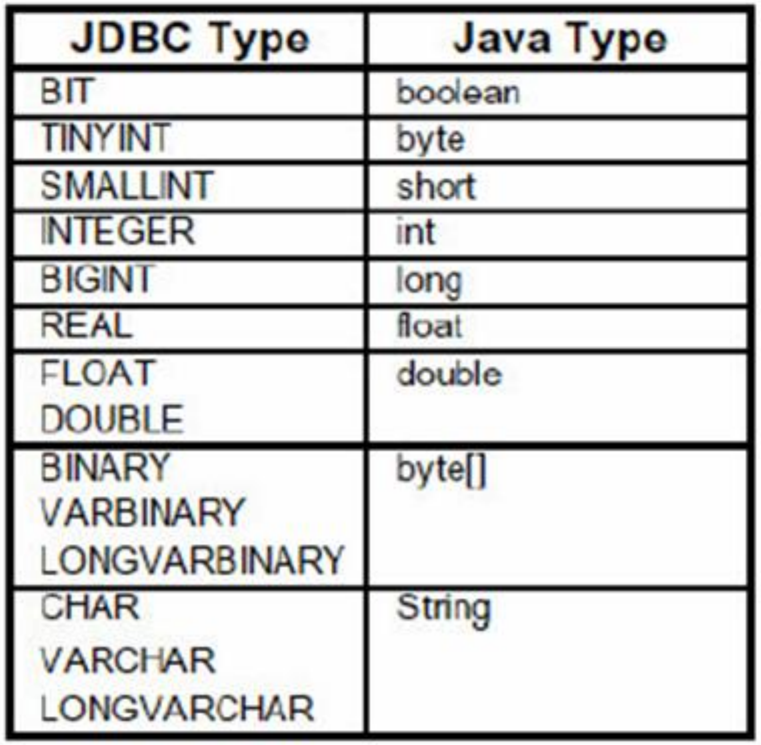
4b. If the statement is DML statement – use executeUpdate() method

```
int rowCount=stmt.executeUpdate("delete from emp765 where id=33”
System.out.println(rowCount+" records affected");
```

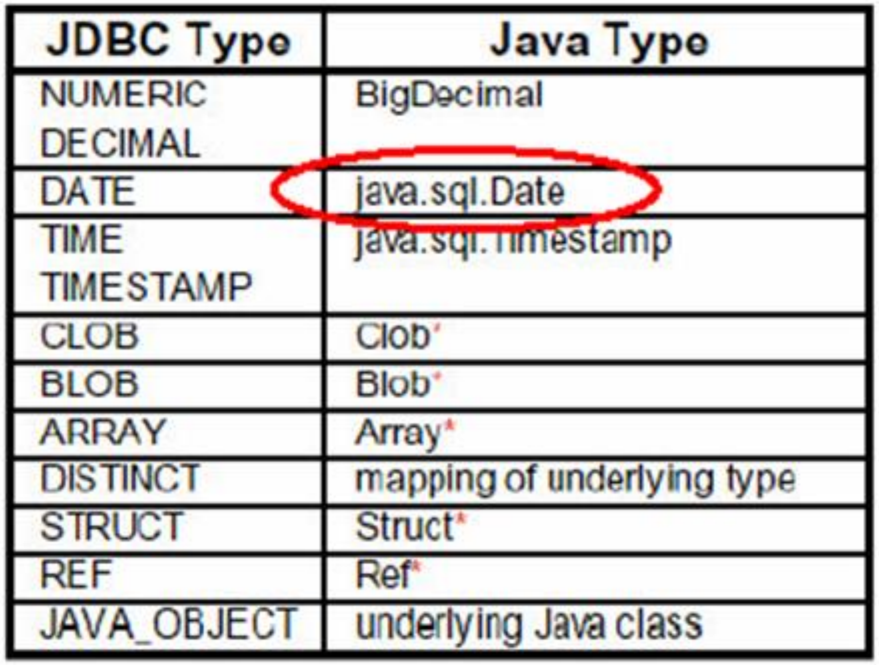
5. Close resultset object, statement and connection object

```
rs.close();        stmt.close();        conn.close();
```

SQL and JDBC mapping types



JDBC Type	Java Type
BIT	boolean
TINYINT	byte
SMALLINT	short
INTEGER	int
BIGINT	long
REAL	float
FLOAT	double
DOUBLE	
BINARY	byte[]
VARBINARY	
LONGVARBINARY	
CHAR	String
VARCHAR	
LONGVARCHAR	



JDBC Type	Java Type
NUMERIC	BigDecimal
DECIMAL	
DATE	java.sql.Date
TIME	java.sql.Timestamp
TIMESTAMP	
CLOB	Clob*
BLOB	Blob*
ARRAY	Array*
DISTINCT	mapping of underlying type
STRUCT	Struct*
REF	Ref*
JAVA_OBJECT	underlying Java class

JDBC Prepared Statements

Used to execute parameterized queries.

Ex :

```
PreparedStatement stmt=con.prepareStatement(
            "insert into Dept values(?,?,?)");
stmt.setInt(1,50);//1 specifies the first parameter in the query
stmt.setString(2, "Logistics");
stmt.setString(3, “Las Vegas");

int rowCount=stmt.executeUpdate();
```

Statement vs PreparedStatement

RDBMS handles a JDBC / SQL query in four steps:

1. Parse the incoming SQL query – JDBC format to SQL format

2. Compile the SQL query

3. Plan/optimize the data acquisition path – physical files

4. Execute the optimized query / acquire and return data

Statement object performs all the 4 steps.

Pre-compilation and DB-side caching of the SQL statement leads to overall faster execution

PreparedStatement will pre executes 1-3 steps (pre compilation).

JDBC Transactions

JDBC allows SQL statements to be grouped together into a single transaction

Transaction control is performed by the Connection object

Ex:

```
conn.rollback();

conn.commit();
```

ResultsetMetadata

- It represents an object that can be used to get information about the types and properties of the columns in a ResultSet object.

- Example:

- ResultSetMetaData rsmd = rs.getMetaData();
- int cols = rsmd.getColumnCount();
- rsmd.getColumnName(1);
- rsmd.getColumnTypeName(1);

THANK YOU
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