PostgreSQL 11
Administration

Chapter-0:
Introduction. DAO Pattern

Upcode Software
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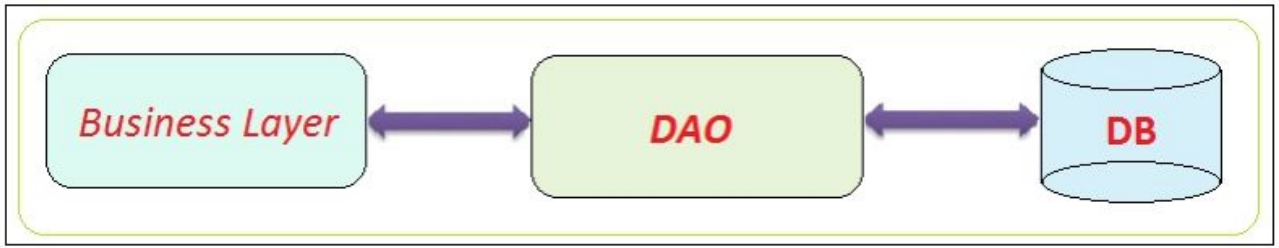
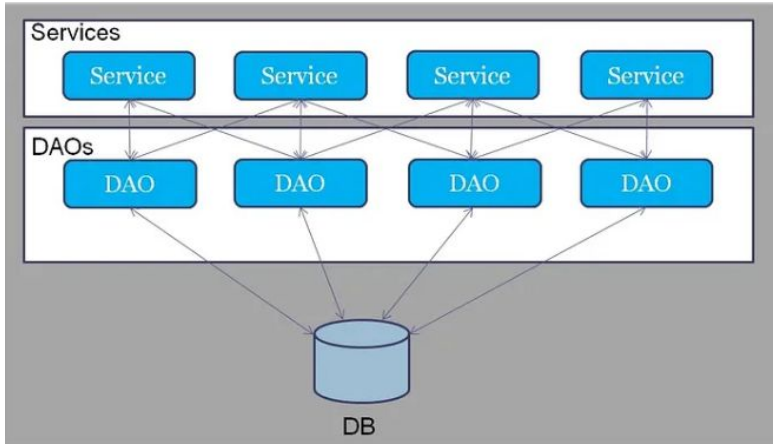
The DAO pattern(1/4)

- DAO (Data Access Object)
- In between the database and the business layer, there is a layer called the DAO layer.
- The DAO layer is mainly used to perform the **Create-Retrieve-Update-Delete (CRUD)** operation.

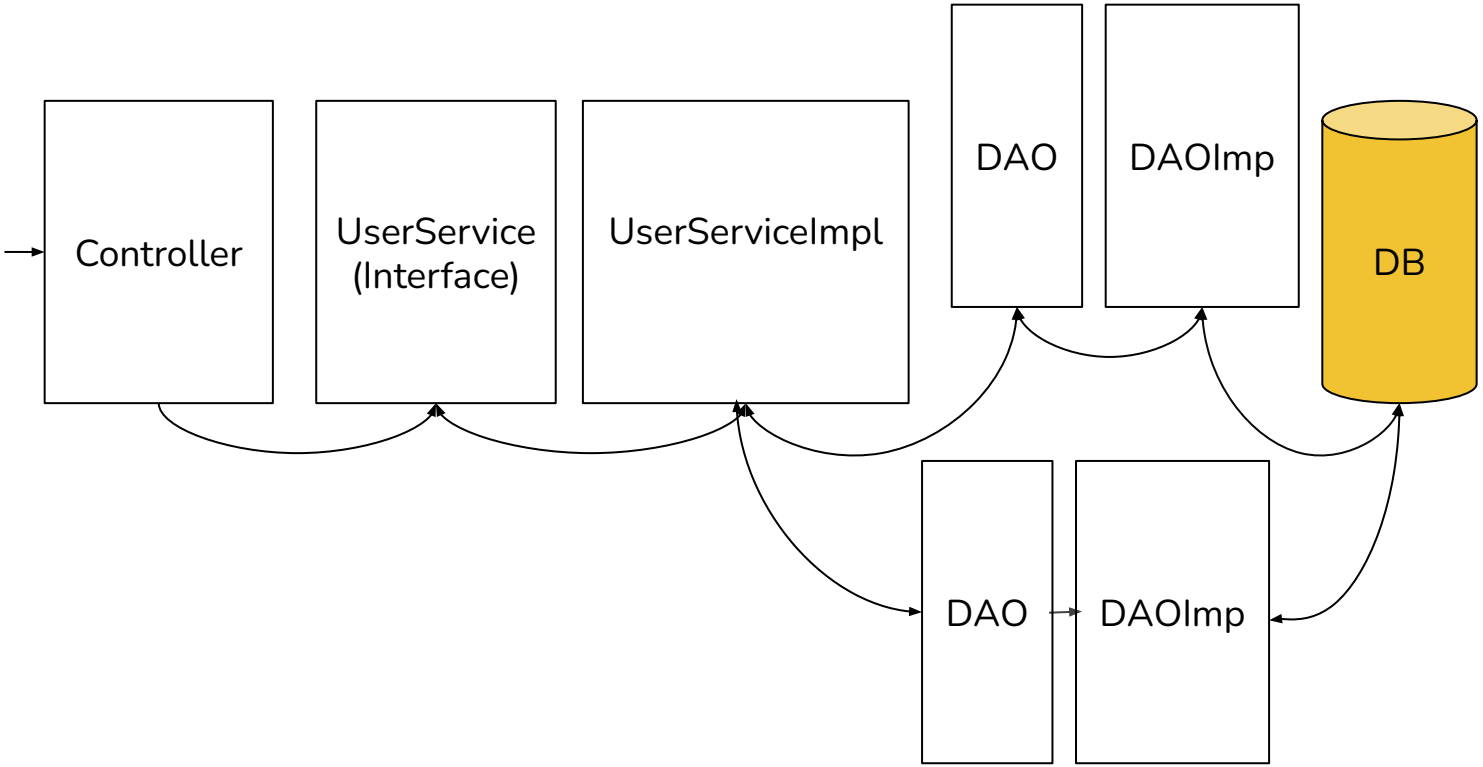


The DAO pattern(2/4)

- The DAO layer is responsible for creating, obtaining, updating, or deleting records in the database table.
- To perform this CRUD operation, DAO uses a low-level API, such as the JDBC API or the Hibernate API.



The DAO pattern(3/4)



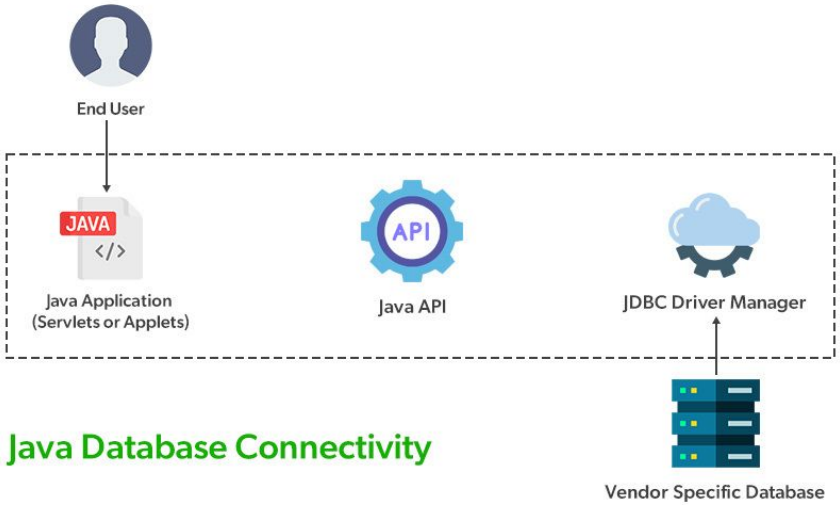
The DAO pattern (4/4)

The DAO pattern typically consists of the following components:

- **Entity:** Represents the data model or domain object that is persisted in the data storage system.
- **DAO Interface:** Defines the contract or interface that specifies the operations to be performed on the entity.
- **DAO Implementation:** Provides the actual implementation of the DAO interface, handling the low-level data access operations.
- **Service Layer:** Acts as an intermediary between the DAO layer and the business logic components, coordinating the interactions between them.

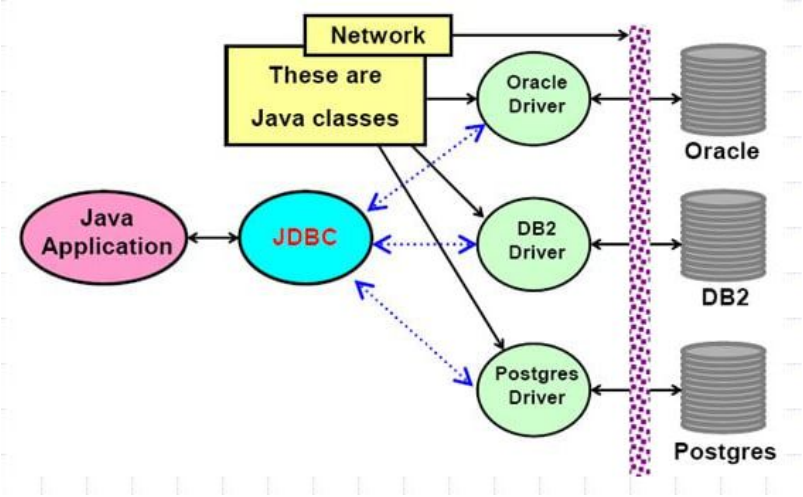
JDBCTemplate(1/2)

- JdbcTemplate is a class provided by the Spring Framework that simplifies JDBC (Java Database Connectivity) operations in Java applications.
- Using JdbcTemplate in a Spring application allows you to interact with a relational database in a straightforward manner.



JDBCTemplate(2/2)

- It handles resource creation and release, which helps avoid common mistakes such as forgetting to close a connection.
- It performs the basic tasks of the main JDBC workflow (such as creating and executing statements), leaving the application code to provide SQL and retrieve results. JdbcTemplate class:
- Executes SQL queries
- Updates statements and stored procedure calls



DAO with example(1/4)

Department JPA Entity

```
@Getter
@Setter
@AllArgsConstructor
@NoArgsConstructor
@Entity
@Table(name = "person")
public class User implements Serializable {
 @Id
 @GeneratedValue(strategy = GenerationType.IDENTITY)
 private Long id;

 @Column(name = "username")
 private String username;
 @Column(name = "email")
 private String email;
}
```

```
public interface UserDAO
{
void save(User user);
List<User> findAll();
User findById(Long id);
void update(User user);
void delete(Long id);

}
```


Create DAO Interface

DAO with example(2/4)

```
@Repository
public class UserDAOImpl implements UserDAO {
    @Resource
    private JdbcTemplate jdbcTemplate;
    @Override
    public void save(User user) {
        String sql = "insert into \"person\" (username, email) VALUES (?, ?) ";
        jdbcTemplate.update(sql, user.getUsername(), user.getEmail());
    }

    @Override
    public List<User> findAll() {
        String sql = "select * from user";
        return Collections.singletonList(jdbcTemplate.queryForObject(sql, new
Object[]{},
                new BeanPropertyRowMapper<>(User.class)));

}
```

DAO with example(3/4)

```
@Override
public User findById(Long id) {
   String sql = "SELECT * FROM person WHERE id = ? ";
   return jdbcTemplate.queryForObject(sql,new Object[]{id},
           (resultSet, i) -> new User(resultSet.getLong("id"),
                   resultSet.getString("username"),resultSet.getString("email")));
}

@Override
public void update(User user) {
   String sql = "update person set username=?,password=? where id=? ";
   jdbcTemplate.update(sql,user.getUsername(),user.getEmail(),user.getId());
}

@Override
public void delete(Long id) {
   String sql = "delete from person where id = ? ";
   jdbcTemplate.update(sql,id);
}
```

DAO with example(4/4)

```java
public interface UserService {
    void save(User user);
    void update(Long id);
    void delete(Long id);
    User getUserById(Long id);

}
```

1

```java
@Service
public class UserService  implement UserService {
    @Autowired
    private UserDAO userDAO;

    public void save(User user) {
        userDAO.save(user);
    }
    public User getUserById(Long id) {
        return userDAO.findById(id);
    }
    public List<User> getAllUsers() {
        return userDAO.findAll();
    }
    public void deleteUserById(Long id) {
        userDAO.delete(id);
    }
}
```

2

REFERENCE

1: Medium .org

2.Java Guides(DAO)

Thank you!

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