Instructor Notes:

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Lesson Objectives

After completing this lesson, participants will be able to understand:

- What is Transaction
- Types of Transactions
- Working with transactions

Instructor Notes:

Discuss major issues of JDBC. For example, we need to do a manual conversion of rows from database to objects vice versa.

ransaction

What is Transaction?

- A **transaction** is a set of operations that either fail or succeed as a unit.
- Transactions are a fundamental part of persistence.
- A database transaction consists of a set of DML (Data Manipulation Language) operations that are committed or rolled back as a single unit.
- An object level transaction is one in which a set of changes made to a set of objects are committed to the database as a single unit.

Instructor Notes:

Discuss major issues of JDBC. For example, we need to do a manual conversion of rows from database to objects vice versa.

Transaction

What is Transaction?

- JPA transactions can be managed by:
  - the users application
  - a framework (such as Spring)
  - a J2EE container

Instructor Notes:

Types of transactions

Types of Transactions

Transactions can be controller in two ways in JPA

- Java Transaction API (JTA)
  - container-managed entity manager
- EntityTransaction API (`tx.begin(), tx.commit(), etc`)
  - application-managed entity manager

DEFAULT TYPES:

Default to JTA in a JavaEE environment and to RESOURCE_LOCAL in a JavaSE environment.

```
@Entity
public class Book implements Serializable {
    @Id
    private Long id;
    private String bookTitle;
    private String author;
    private Double price;
    // getter and setter methods
}
```

If you want to find all books written by author 'Jim Kathy', then you need to write JPQL select statement on above entity class as given below:

```
SELECT b.id,b. bookTitle,b.price     --property reference
FROM Book b                          --object reference
WHERE b.author = 'Jim Kathy'
```

Where as the below query counts total books object available in data store.

```
SELECT COUNT(b.id)
FROM Book b;
```

Instructor Notes:

Types of transactions

Types of Transactions

In the **persistence.xml** JPA configuration file, you can have a line like:

```
<persistence-unit name="test-PU"  transaction-type="JTA">
(or)
<persistence-unit name="test-PU"  transaction-type="RESOURCE_LOCAL">
```

```
@Entity
public class Book implements Serializable {
    @Id
    private Long id;
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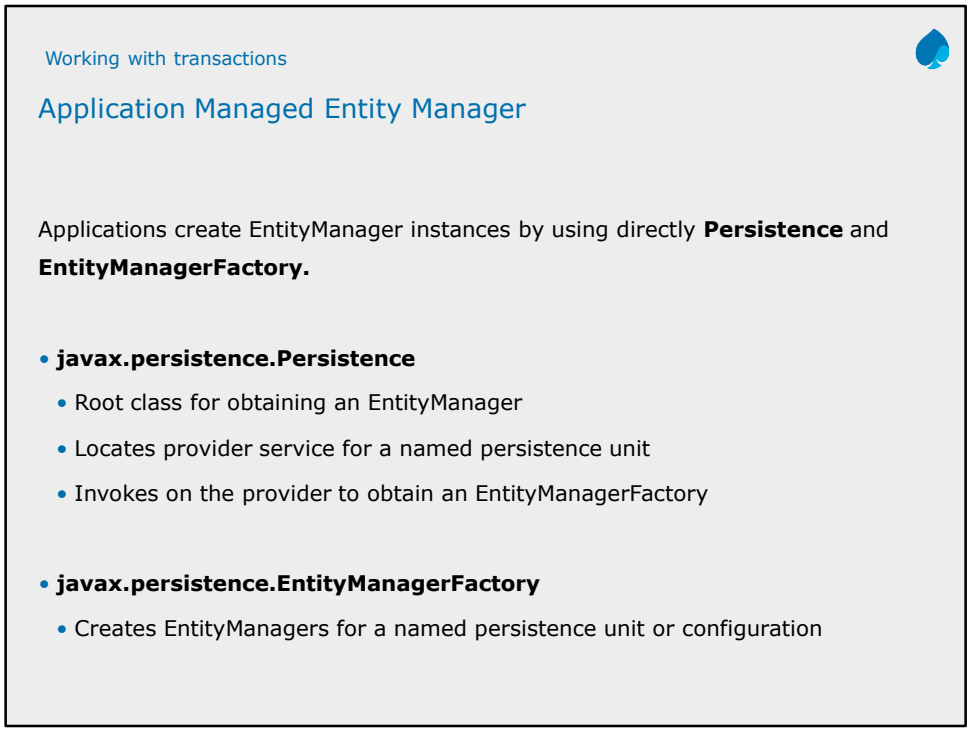


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Instructor Notes:

Working with transactions

Application Managed Entity Manager

```
public class PersistenceProgram {
  public static void main(String[] args)
  {
    EntityManagerFactory emf =
          Persistence.createEntityManagerFactory("SomePUnit");
    EntityManager em = emf.createEntityManager();
    em.getTransaction().begin();
    // Perform finds, execute queries,
    // update entities, etc.
    em.getTransaction().commit();
    em.close();
    emf.close();
  }
}
```

```
@Entity
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Instructor Notes:

Working with transactions

Container Managed Entity Manager

•An EntityManager with a transactional persistence context can be injected by using the **@PersistenceContext** annotation.

```
public class BookmarkSeviceImpl implements BookmarkService {
    @PersistenceContext
    private EntityManager em;

    public void save(Bookmark bookmark) {
        if (bookmark.getId() == null) {
            em.persist(bookmark);
        } else {
            em.merge(bookmark);
        }
}
```

```
@Entity
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Instructor Notes:

Summary

In this lesson, you have learned about:

- What is Transaction
- Types of Transactions
- Working with transactions

Instructor Notes:

Review Question

Question 1: what is the default transaction type for J2EE environment?

- JTA
- RESOURCE_LOCAL

Question 2: who is responsible to create EntityManager when the transaction type is RESOURCE_LOCAL?

- User
- Container