компьютерного
Центр
обучения
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Creating Session Beans

Objectives

After completing this lesson, you should be able to:

- Describe session beans
- Create stateless and stateful session beans by using annotations
- Understand the passivation and activation of stateful session beans
- Use interceptor methods and classes

What Is a Session Bean?

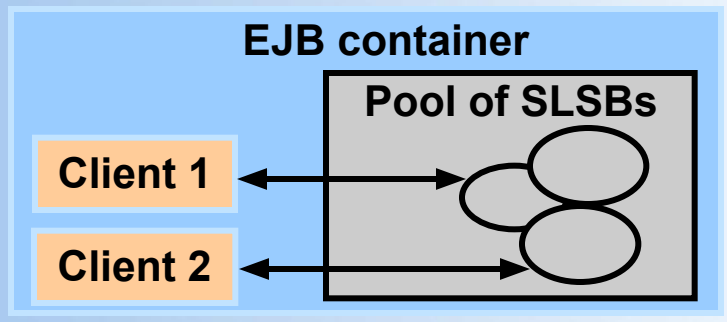
A session bean is a type of Enterprise JavaBean (EJB) that:

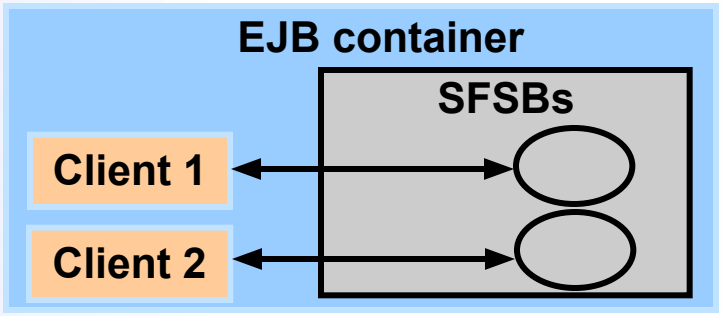
- Implements a business process
- Represents a client/server interaction
- Has a short lifespan
- Lives in memory rather than in persistent storage
- Is used to create a session facade

Stateless Versus Stateful Session Beans

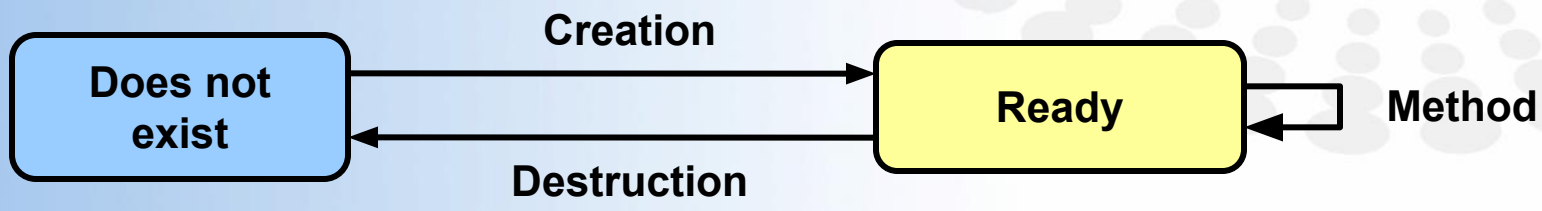
There are two types of session beans:

- Stateless session bean (SLSB)
  - Conversation is contained in a single method call.
  - Business process does not maintain client state.
- Stateful session bean (SFSB)
  - Conversation may invoke many methods.
  - Business processes can span multiple method requests, which may require maintaining state.





Life Cycle of a Stateless Session Bean



Creating a Stateless Session Bean

To create a stateless session bean:

1. Define the stateless session bean.
2. Define the local and remote interfaces (as needed).

Define the Stateless Session Bean

```
// HelloWorldBean.java
package helloworld.ejb
import javax.ejb.Stateless;

@Stateless(name="HelloWorld")
public class HelloWorldBean implements HelloWorld
{
   public void sayHello()
   {
      System.out.println("Hello World!");
   }
}
```

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Create the Remote and Local Interfaces

```
// HelloWorld.java
package helloworld.ejb
import javax.ejb.Remote;

@Remote
public interface HelloWorld {
    public void sayHello();
}
```

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```
// HelloWorldLocal.java
package helloworld.ejb
import javax.ejb.Local;

@Local
public interface HelloWorldLocal {
    public void sayHello();
}
```

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Create a Test Client for the SLSB

```
// HelloWorldClient.java
import helloworld.ejb;
import javax.naming.Context;
import javax.naming.InitialContext;
import javax.naming.NamingException;

public class HelloWorldClient {
  public static void main(String [] args)
    throws NamingException {
    try {
      final Context context = new InitialContext();
      HelloWorld helloWorld =
        (HelloWorld)context.lookup("HelloWorld");
      helloWorld.sayHello( );
    } catch (Exception ex) { ex.printStackTrace(); }
  };
}
```

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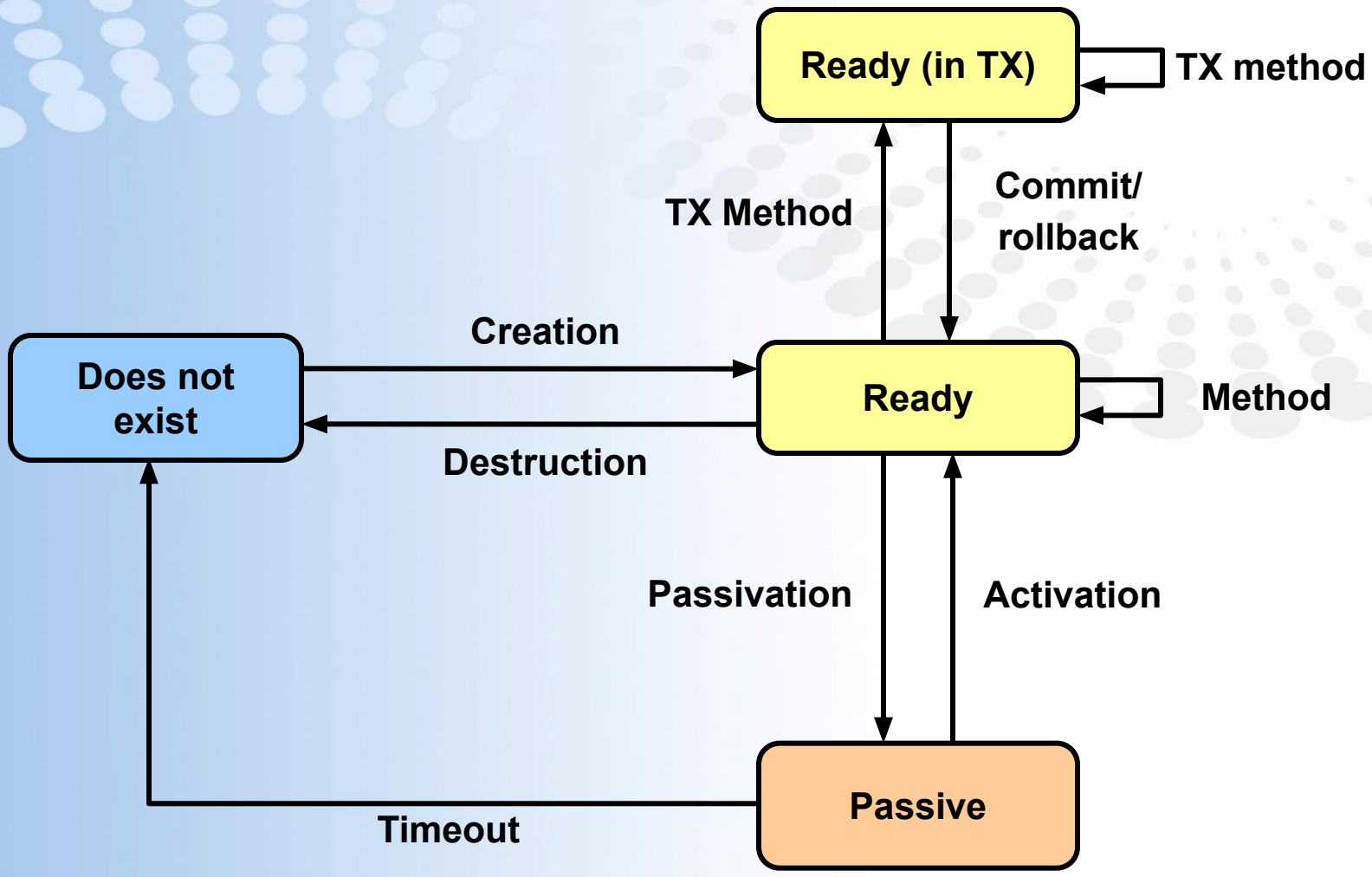
Life Cycle of a Stateful Session Bean



Passivation and Activation Concepts

Passivation and activation are stages in a session bean's life cycle controlled by the EJB container:

- Passivation
  - Serializes the bean state to secondary storage
  - Removes the instance from memory
- Activation
  - Restores the serialized bean's state from secondary storage
  - Creates a new bean instance or uses a bean from the pool (initialized with the restored state)

Creating a Stateful Session Bean

To create a stateful session bean:

1. Define the stateful session bean.
2. Define the local and remote interfaces (as needed).

Define the Stateful Session Bean

```
// CartBean.java
package cart.ejb
import javax.ejb.Stateful;
...
@Stateful(name="Cart")
public class CartBean implements Cart {
  private ArrayList items;

  @PostConstruct
  public void initialize() { items = new ArrayList(); }
  public void addItem(String item) { items.add(item); }
  public void removeItem(String item) {
    items.remove(item); }
  public Collection getItems() { return items; }
  @Remove
  public void dumpCart() {System.out.println("BYE!");};
}
```

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Create the Remote and Local Interfaces

```
// Cart.java
package cart.ejb
import javax.ejb.Remote;
...
@Remote
public interface Cart {
    public void addItem(String item);
    public void removeItem(String item);
    public Collection getItems();
}
```

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```
// CartLocal.java
package cart.ejb
import javax.ejb.Local;
...
@Local
public interface CartLocal { ...
```

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Create a Test Client for the SFSB

```
// CartClient.java
import …
public class CartClient {
  public static void main(String[] args) throws
    Exception {
     Context context = new InitialContext();
     Cart cart = (Cart) context.lookup("Cart");
     cart.addItem("Item1");
     cart.addItem("Item2");
     Collection items = cart.getItems();
     for (Iterator i = items.iterator(); i.hasNext();) {
       String item = (String) i.next();
       System.out.println("  " + item);
     }
     cart.dumpCart();
  }
}
```

Interceptor Methods and Classes

EJB 3.0 introduces the ability to create custom interceptor methods and classes that are called before invoking the methods they intercept. Interceptors:

- Are available for only session beans (stateless and stateful) and message-driven beans
- Provide more granular control of a bean's method invocation flow
- Can be used to implement custom transaction or security processes instead of having those services provided by the EJB container
- Are a new feature whose implementation details are not fully defined and are subject to change

Interceptor Method

```
import javax.ejb.Stateless;
import javax.ejb.AroundInvoke;
import javax.ejb.InvocationContext;

@Stateless
public class HelloWorldBean implements HelloWorld
{
  @AroundInvoke
  public Object myInterceptor(InvocationContext ctx)
    throws Exception {
     System.out.println("Ahem...");
     return ctx.proceed();
  }

  public void sayHello()
  { System.out.println("Hello World!"); }
}
```

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Interceptor Classes

External interceptor classes can be created to abstract the behavior of interceptors and to define multiple interceptors for a bean.

```
// Bean Class
@Stateless
@Interceptor(CheckUserInterceptor.class)
@Interceptor(LogActivity.class)
public class HelloWorldBean implements HelloWorld
{… }
```

```
// Interceptor Class
public class CheckUserInterceptor {
  @AroundInvoke
  public Object checkId(InvocationContext ctx) {…}
}
```

Summary

In this lesson, you should have learned how to:

- Describe session beans
- Create stateless and stateful session beans by using annotations
- Understand the passivation and activation of stateful session beans
- Use interceptor methods and classes

Practice 5 Overview: Creating Session Beans

- This practice covers the following topics:
  - Using JDeveloper to generate `ServiceRequestFacade` as a stateless session facade for entities
  - Creating a Java client application for testing the session facade functionality