

Integration of EJB 3.0 in Web Dynpro Using Enterprise JavaBean Model



Applies to:

SAP NetWeaver 7.1, Web Dynpro for java, JEE

For more information, visit the [User Interface Technology homepage](#).

Summary

The EJB 3.0 is standard and powerful Java Enterprise Edition (EE) technology for business components. That includes JPA, JTA and session bean 3.0, message bean 3.0.

JPA is used to generate entities from database tables.

In this article we are going to see how to implement a simple Web Dynpro application that access database using EJB 3.0.

Here we will use JPA to create entities having structure similar to the database table.

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Getting started

Here we are going to create one java dictionary project, one EJB project, one EAR project, and one web dynpro application.

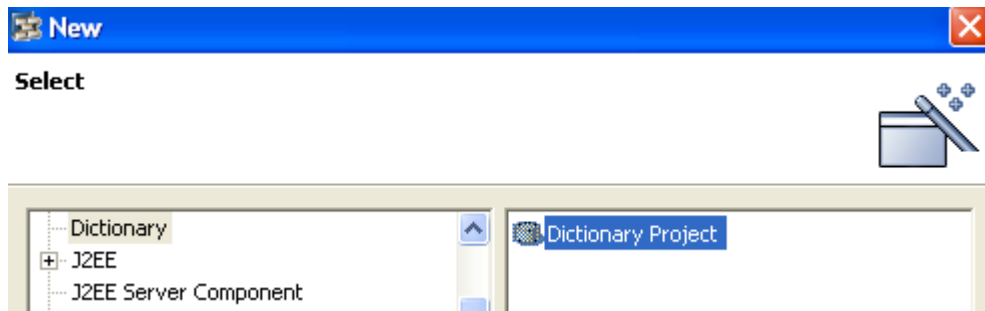
Scenario

Application will maintain employee information in database and provide basic functionality to view and Insert data in database.

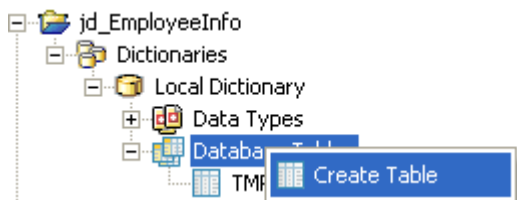
Creating a java dictionary

First step is creation of java dictionary **jd_EmployeeInfo**.

Open Dictionary Perspective.



Create a table **TMP_EMPINFO**



Describe the table

Table:

Description:

Multi-client enabled

Columns

Define the columns of the table

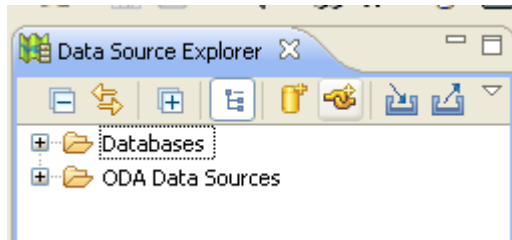
Column Name	Key	Simple Type Package	Simple Type	Built-In Type	Length	Decimals	Not Null	Default Value
PSNO	<input checked="" type="checkbox"/>			integer			<input checked="" type="checkbox"/>	
NAME	<input type="checkbox"/>			string	25		<input checked="" type="checkbox"/>	
LOCATION	<input type="checkbox"/>			string	25		<input checked="" type="checkbox"/>	

Create archive of dictionary project and deploy it on server.

Creating a New Connection Profile

Before creating an EJB project we need to create a Connection to a Dictionary Project so that we can create JPA entities.

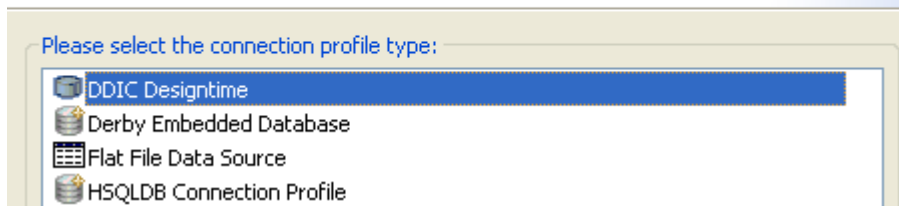
Open Database Development perspective



To create a new connection profile for java dictionary, choose *DDIC Designtime* option.

Wizard Selection Page

Creates a Connection to a Dictionary Project



Create a new connection profile **jd_employee**. Check the auto-connect option.

Create connection profile

Please enter detailed information



Name:

Description(optional):

Auto-connect when the wizard is finished or when Data Source Explorer opens.

Select java dictionary

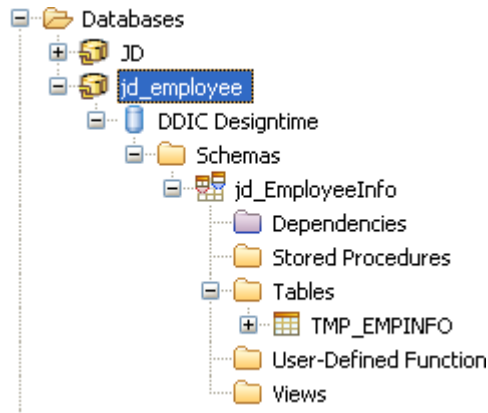
DDIC Designtime Connection Details

Specify a Dictionary Project to which you wish to connect.



Select a Dictionary Project:

A new connection profile will be created for jd_employeeInfo



Creating an EJB Project

Open JEE perspective. Create a new EJB project as **we_employeeEJB**

Select a wizard
Create an EJB project

Wizards:
type filter text

- Java Project
- Java Project from Existing Ant Buildfile
- Plug-in Project
- General
- CVS
- Development Infrastructure
- Dictionary
- Dictionary Project
- Eclipse Modeling Framework
- EJB
 - EJB Project**
- J2EE

EJB Project
Create an EJB Project and add it to a new or existing Enterprise Application.

Project name:

Project contents:
 Use default

Directory:

Select add to new EAR Application project.

EAR Membership
 Add project to an EAR

EAR Project Name:

Create a new EAR Application project as **ja_employeeEAR**

EAR Application Project

Create a EAR application.



Project name:

Project contents:

Use default

Directory:

Target Runtime

Configurations

A good starting for working with SAP Libraries runtime. Additional facets can later be installed to add new functionality to the project.

Select the configuration as below

Project Facet	Version
<input checked="" type="checkbox"/> Create SAP JMS resources descriptor	1.0
<input checked="" type="checkbox"/> EAR	5.0 ▾
<input type="checkbox"/> SAP Application Library Container	1.0
<input type="checkbox"/> SAP Data Source	1.0
<input checked="" type="checkbox"/> SAP Data Source Aliases Provider Module	1.0
<input checked="" type="checkbox"/> SAP Specific Ear Module	5.0 ▾

After creating an EAR application project choose following project facates for EJB project.

Project Facet	Version
<input checked="" type="checkbox"/> EJB Module	3.0 ▾
<input type="checkbox"/> EJBDoclet (XDoclet)	1.2.3 ▾
<input checked="" type="checkbox"/> Java	5.0 ▾
<input checked="" type="checkbox"/> Java Persistence	1.0
<input checked="" type="checkbox"/> SAP Specific Ejb Module	3.0 ▾

Configure the JPA settings as below and choose the **jd_employee** database connection

JPA Facet

Configure JPA settings.

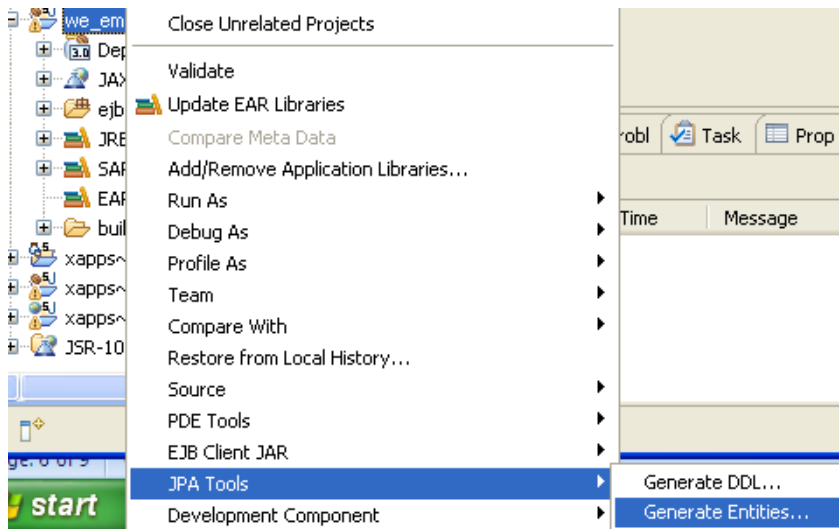
The screenshot shows the JPA Facet configuration dialog with the following settings:

- Platform:** Generic
- Connection:** jd_employee
- JPA implementation:**
 - Use implementation provided by server runtime
 - Use implementation library: []
- Persistent class management:**
 - Discover annotated classes automatically
 - Annotated classes must be listed in persistence.xml

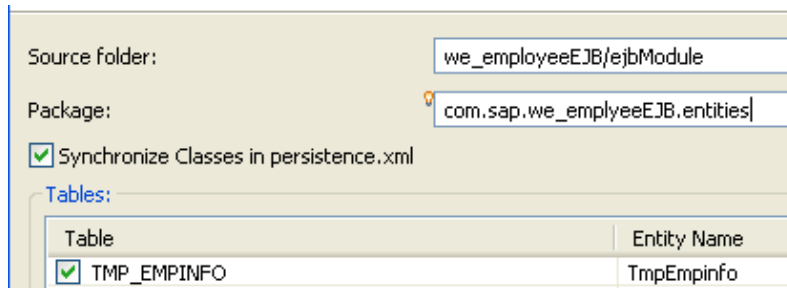
Now we are ready to implement the project.

Create JPA Entities

First we need to create JPA entities to access database tables.



Create the entity **TmpEmpinfo**



Specify the entities in **persistence.xml** file as below

Give the jta-data-source and location of JPA entity classes.

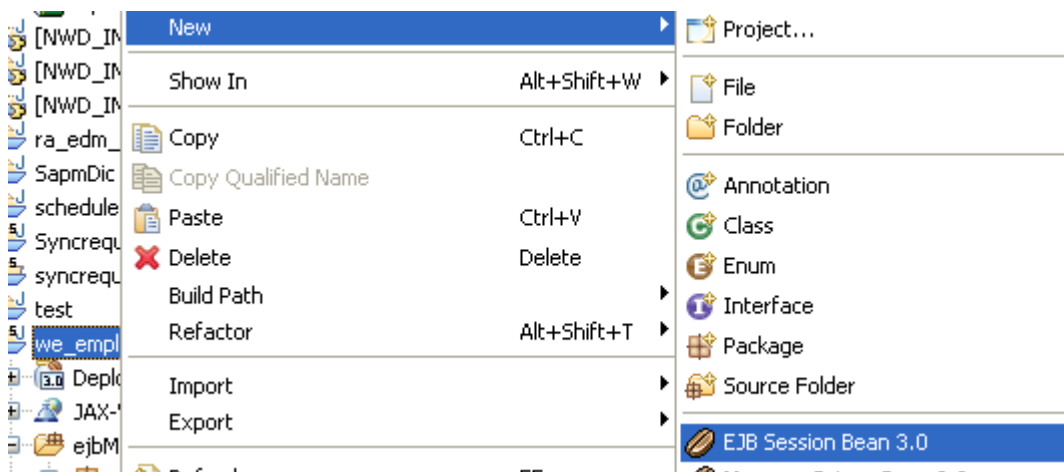
```
<?xml version="1.0" encoding="UTF-8"?>
<persistence version="1.0" xmlns="http://java.sun.com/xml/ns/persistence"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/persistence
http://java.sun.com/xml/ns/persistence/persistence_1_0.xsd">
  <persistence-unit name="we_employeeEJB">
    <jta-data-source>TMP_DB</jta-data-source>
    <class>com.sap.we_employeeEJB.entities.TmpEmpinfo</class>
  </persistence-unit>
</persistence>
```

Add NamedNativequery to fetch information from database

```
@NamedNativeQueries(value={@NamedNativeQuery(name="TmpEmpinfo.getAll", query="Select emp from
TmpEmpinfo emp")})
```


Create a Session Bean

Now create a session bean to access the entities and to implement business logic.



Create a stateless session bean as **EmpSession**.

EJB Class Name:	EmpSession
EJB Project:	we_employeeEJB
Default EJBPackage:	com.sap.we_employeeEJB.entities.session
Session Type:	Stateless
Transaction Type:	Container

Implement the session bean as follow

```

@Stateless
public class EmpSessionBean implements EmpSessionLocal {

    @PersistenceContext(unitName="we_employeeEJB",
        type=PersistenceContextType.TRANSACTION)
        EntityManager em;

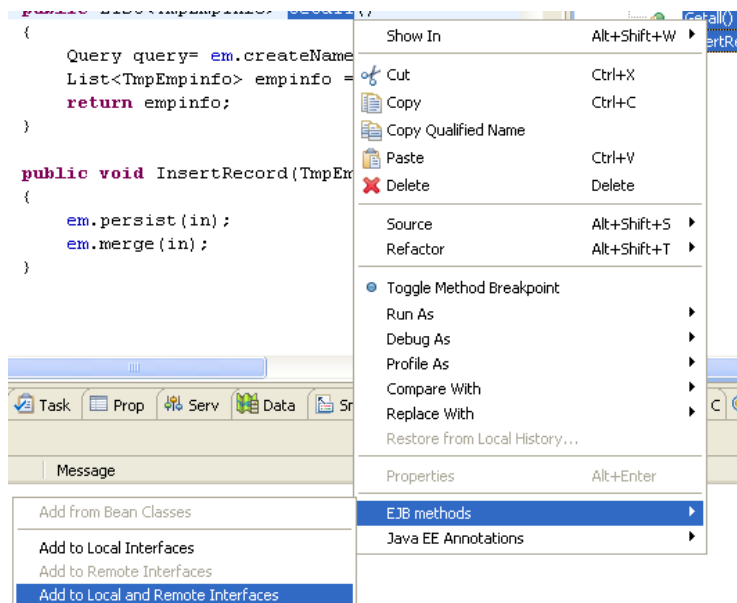
    public List<TmpEmpinfo> GetAll()
    {
        Query query= em.createNamedQuery("TmpEmpinfo.getAll");
        List<TmpEmpinfo> empinfo = query.getResultList();
        return empinfo;
    }

    public void InsertRecord(TmpEmpinfo in)
    {
        em.persist(in);
        em.merge(in);
    }
}
  
```

Here we need to create an entity manager to manage and perform operations on entities.

The two methods Getall() and InsertRecord() will perform two basic operations to show and insert the records respectively.

Add these methods to local and remote interface of session bean.



Specify the data source alias in EAR application project

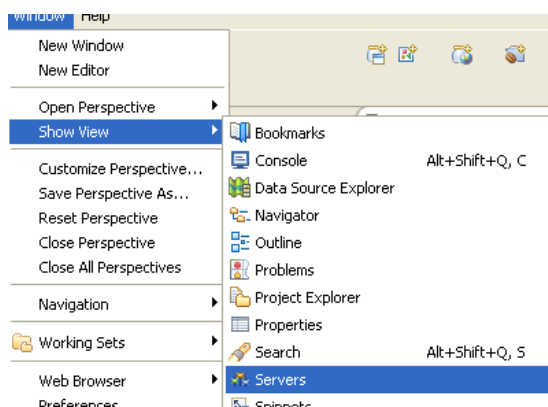
General

Application name

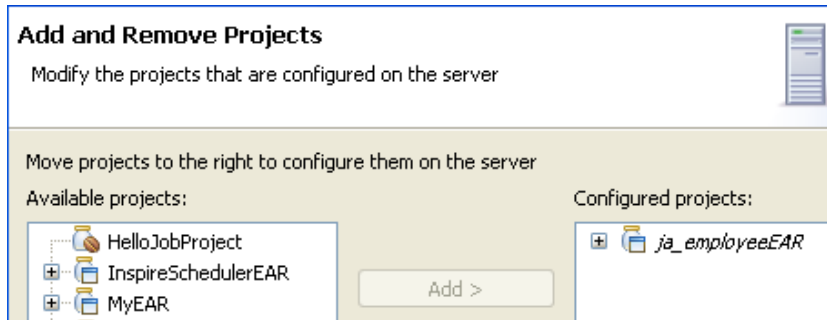


Deploy EAR Application Project

Open the server view



Add the EAR application project



And finish it.

Create a Web Dynpro Project

Open web Dynpro development perspective and create a new project **dp_employeeInfo**.

Create a new Web Dynpro project resource.

Create a new application **EmpApp** with new component, view and window.

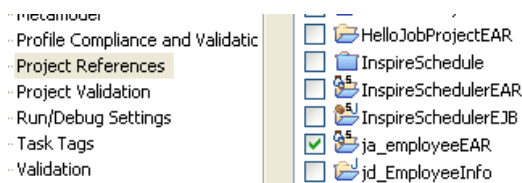
Application properties

Enter the properties for the new application

Now to accommodate EJB in webdynpro project create an Enterprise JavaBean Model.

First we need to give reference of EAR application project that contains the EJB project.

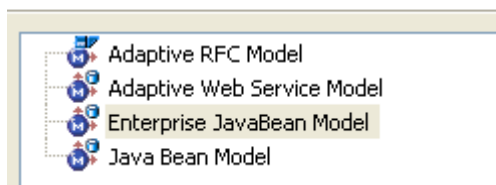
Project->properties->project references



Create an Enterprise Javabean Model

Please select a Model Type

This wizard guides you to **create an Enterprise Ja**



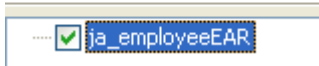
Create a model EmpModel

Create a Web Dynpro Model for Enterprise JavaBeans.

Next step is choose EAR application project

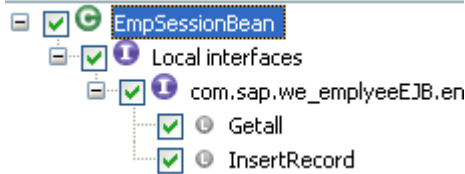
Available Applications

Select the required Enterprise #



According to the local or remote interface of session bean the methods will be displayed.

Choose the required methods



It will create required request and response model class names for methods

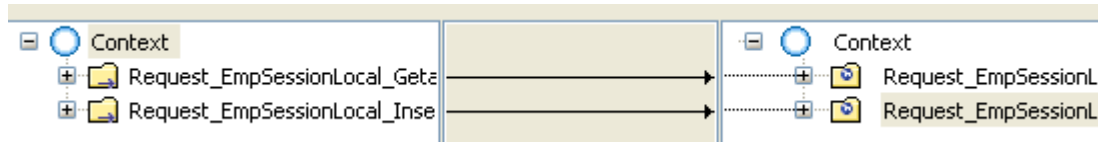
S.	Unique Model Class Name	Editable Model Class Name
1	com_sap_we_employeeEJB_entities_TmpEmpinfo	TmpEmpinfo
2	Request_EmpSessionBean_com_sap_we_empl...	Request_EmpSessionLocal...
3	Request_EmpSessionBean_com_sap_we_empl...	Request_EmpSessionLocal...
4	Response_EmpSessionBean_com_sap_we_em...	Response_EmpSessionLoc...

After creation of model add model as used model in web dynpro component. Do the necessary context mapping between model and controller and controller and view.

Controller to Model context mapping



View to controller context mapping



Controller Implementation

First change the cardinality of every request model node to 1:1.

Model	
Model Class	EmpModel.Request_EmpSessionLocal_Getall
Supplying Relation Role	
Misc	
Name	Request_EmpSessionLocal_Getall
Collection Cardinality	1..1
Initialize Lead Selection	true
Selection Cardinality	0..1

Coding part in controller is only for model initialization.

```

public void wdDoInit()
{
    //@begin wdDoInit()
    empapp.comp.model.empmodel.EmpModel empmodel = new
empapp.comp.model.empmodel.EmpModel();

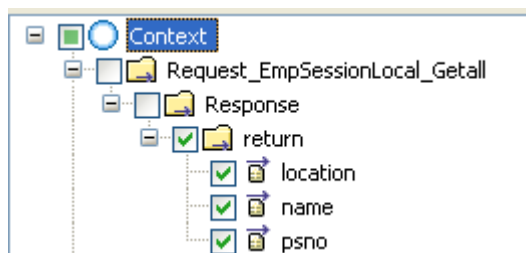
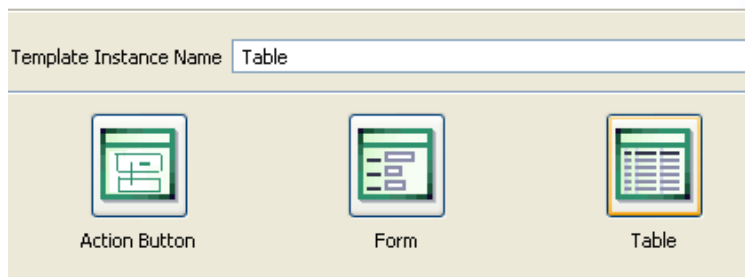
    wdComponentAPI.getModelInstanceMap().putDefaultInstance("empapp.comp.model.empmodel.E
mpModel", empmodel);
    //@end
}

```

View Implementation

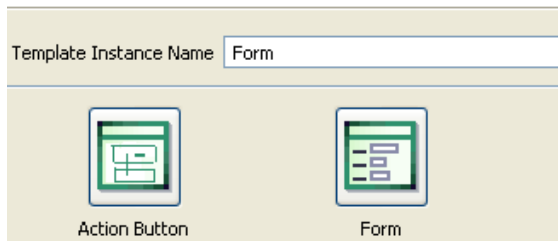
Create a table to display data.

To create a table use apply template and assign context under Request_EmpSessionLocal_Getall

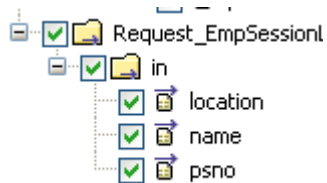


Create a form to enter data.

To create a form use apply template



And assign context to it.



Create two buttons **show** and **Insert** to display data from backend and to insert data into backend.

Assign `onActionShow` method to **Show** button and implement it as below.

```

public void onActionShow(com.sap.tc.webdynpro.progmodel.api.IWDCustomEvent wdEvent
)
{
    //@@begin onActionShow(ServerEvent)
    try {

        wdContext.currentRequest_EmpSessionLocal_GetAllElement().modelObject().execute();
    } catch (Exception e) {
        // TODO Auto-generated catch block

        wdComponentAPI.getMessageManager().reportException("error"+e.getCause(), true);

        wdComponentAPI.getMessageManager().reportException("error"+e.getCause().getCause()
, true);
    }
    //@@end
}

```

Assign `onActionInsert` method to **Insert** button and implement it as below.

```

public void onActionInsert(com.sap.tc.webdynpro.progmodel.api.IWDCustomEvent
wdEvent )
{
    //@@begin onActionInsert(ServerEvent)

    try {

        wdContext.currentRequest_EmpSessionLocal_InsertRecordElement().modelObject().execute();

        wdContext.currentRequest_EmpSessionLocal_GetallElement().modelObject().execute();
    } catch (Exception e) {
        // TODO Auto-generated catch block

        wdComponentAPI.getMessageManager().reportException("error"+e.getCause(), true);

        wdComponentAPI.getMessageManager().reportException("error"+e.getCause().getCause(), true);
    }
    //@@end
}

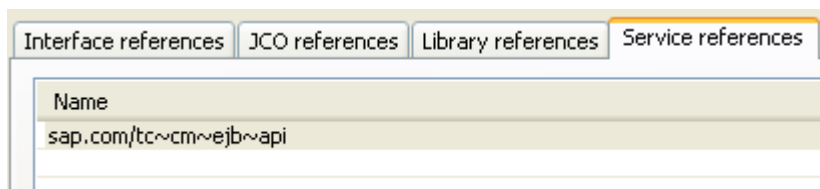
```

Additional Web Dynpro Settings

Before Building and deploying application we need to add some references to web dynpro application as follow.

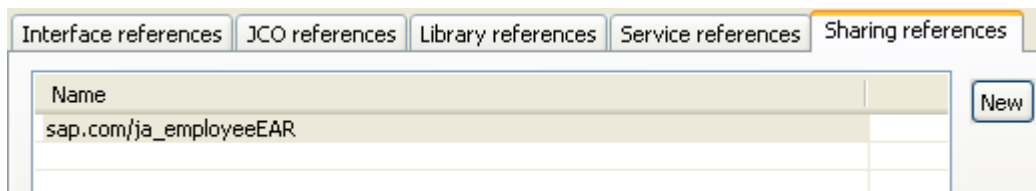
Dp_employeeInfo->Properties->Web Dynpro->Service references

Add sap.com/tc~cm~ejb~api



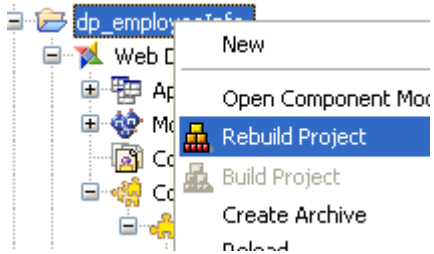
Dp_employeeInfo->Properties->Web Dynpro->Sharing references

Add sap.com/ja_employeeEAR

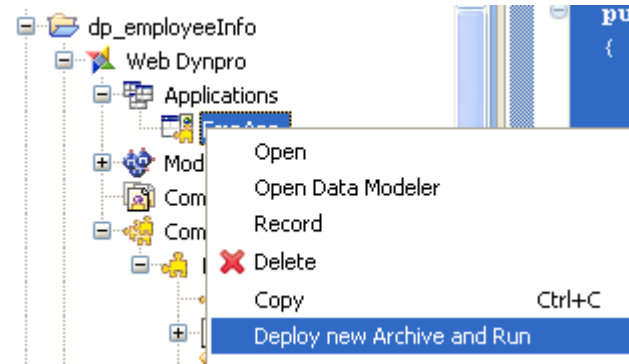


Build and Deploy

Rebuild the whole Project and create its archive



Deploy the Project and run the application.



Application

Run application will open employee information application

Employee information

psno	name	location

Show

Location of Employee:

Name:

PSNO:

Insert

Enter the employee information and click insert button

Employee information

psno	name	location

Show

Location of Employee:

Name:

PSNO:

Insert

After inserting the value you will be able to see records in table

Employee information

psno	name	location
281,151	Snehal Kendre	Powai

Show

Related Content

<https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/83086a1d-0e01-0010-2797-f1ce7f8f562d>

<https://www.sdn.sap.com/irj/sdn/go/portal/prtroot/docs/library/uuid/20b21892-c31c-2a10-f484-fcef1eaf8c4f>

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