



Verteilte Systementwicklung

EJB Tutorial



Was wird für EJB-Entwicklung benötigt ?

- **J2EESDK 1.4 (software development kit)**
Datei : **j2eesdk-1_4_200404-beta-windows.exe**
- **IDE (integrated development environment)**
Datei : **jstudio_ent_04Q1-win.zip (trial)**
- **J2EE-1.4 Tutorial**
Datei : **j2ee-1_4-doc-tutorial_3.zip**

Referenz :

<http://java.sun.com/j2see/1.4/download.html>



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Der Application Server:

- **Installationsort (Standard) :**
C:\Sun\AppServer
- **PATH-Variable :**
C:\Sun\AppServer\bin
- **Starten (Standard-Domain) :**
asadmin.bat start-domain default
- **Stoppen :**
asadmin.bat stop-domain default



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Der Pointbase-Server (RDBM des J2EE):

- **Installationsort (Standart) : C:\Sun\AppServer\pointbase**
- **PATH-Variable :**
C:\Sun\AppServer\pointbase\tools\serveroption
- **Starten :**
startserver.bat
- **Stoppen :**
stopserver.bat



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Das Deployment-Tool (Teil des J2EESDK):

- **PATH-Variable :**
C:\Sun\AppServer\bin
- **Starten :**
C:\Sun\AppServer\bin\deploytool.bat

Die IDE:

- **Start :**
per Icon



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Vorbereiten des Arbeitsverzeichnisses:

```
Terminal
zbrog.donner ~/VTS2004 > ls -R eurocalc
eurocalc:
build.xml  src      web

eurocalc/src:

eurocalc/web:
zbrog.donner ~/VTS2004 > █
```



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Das Steuerfile **build.xml** :

```
Terminal
zbrog.donner ~/VTS2004/eurocalc > cat build.xml
<!DOCTYPE project [
  <!ENTITY targets SYSTEM "../common/targets.xml">
  <!ENTITY ejbtargets SYSTEM "../common/targets.xml">
]>

<project name="vts 2004" default="build" basedir=".">

  <property file="../../common/build.properties"/>
  <property file="../common/build.properties"/>

  &targets;
  &ejbtargets;

</project>

zbrog.donner ~/VTS2004/eurocalc > █
```



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Das Steuerfile **build.properties** :

```
Terminal
zbrog.donner ~/VTS2004/common > cat build.properties
j2ee.home=
j2ee.tutorial.home=/home/zbrog/j2ee/j2eetutorial14
sunone.home=${j2ee.home}
admin.password.file=/home/zbrog/VTS2004/common/admin-password.txt
admin.host=localhost
admin.user=admin
admin.port=4848
https.port=8181
domain.resources="domain.resources"
domain.resources.port=8080
db.root=${j2ee.home}/pointbase
db.driver=com.pointbase.jdbc.jdbcUniversalDriver
db.host=localhost
db.port=9092
db.sid=sun-appserv-samples
db.url=jdbc:pointbase:server://${db.host}:${db.port}/${db.sid}
db.user=pbpublic
db.pwd=pbpublic
url.prop=DatabaseName
ds.class=com.pointbase.jdbc.jdbcDataSource
db.jvmargs=-ms16m -mx32m
zbrog.donner ~/VTS2004/common > █
```



Verteilte Systementwicklung

EJB Tutorial



Das Steuer-File Targets.xml :

```
Terminal
zbrog.donner ~/VTS2004/common > cat targets.xml
<path id="classpath">
  <fileset dir="${j2ee.home}/lib">
    <include name="j2ee.jar"/>
  </fileset>
</path>

<target name="clean" >
  <delete dir="${build}" />
  <delete dir="${dist}" />
  <delete dir="${assemble}" />
</target>

<path id="db.classpath">
  <fileset dir="${db.root}/lib">
    <include name="*.jar"/>
  </fileset>
</path>

<target name="create-db_common" depends="init"
  description="Create database tables and populate database." >
  <java classname="com.pointbase.tools.toolsCommander" fork="yes" >
    <jvmarg line="${db.jvmargs}" />
    <arg line="${db.driver} ${db.url} ${sql.script} ${db.user} ${db.pwd}" />
    <classpath refid="db.classpath" />
  </java>
</target>

<target name="admin_command_common">
  <echo message="Doing admin task ${admin.command}"/>
  <sun-appserv-admin
    command="${admin.command}"
    user="${admin.user}"
    passwordfile="${admin.password.file}"
    host="${admin.host}"
    port="${admin.port}"
    asinstalldir="${j2ee.home}" />
</target>

<target name="create-jdbc-resource_common">
  <antcall target="admin_command_common">
    <param name="admin.command"
      value="create-jdbc-resource
        --connectionpoolid ${conpool.name} ${jdbc.resource.name}" />
  </antcall>
</target>

<target name="delete-jdbc-resource_common">
  <antcall target="admin_command_common">
    <param name="admin.command"
      value="delete-jdbc-resource ${jdbc.resource.name}" />
  </antcall>
</target>

<target name="deploy-war">
  <antcall target="admin_command_common">
    <param name="admin.command"
      value="deploy ${war.file}" />
  </antcall>
</target>
```

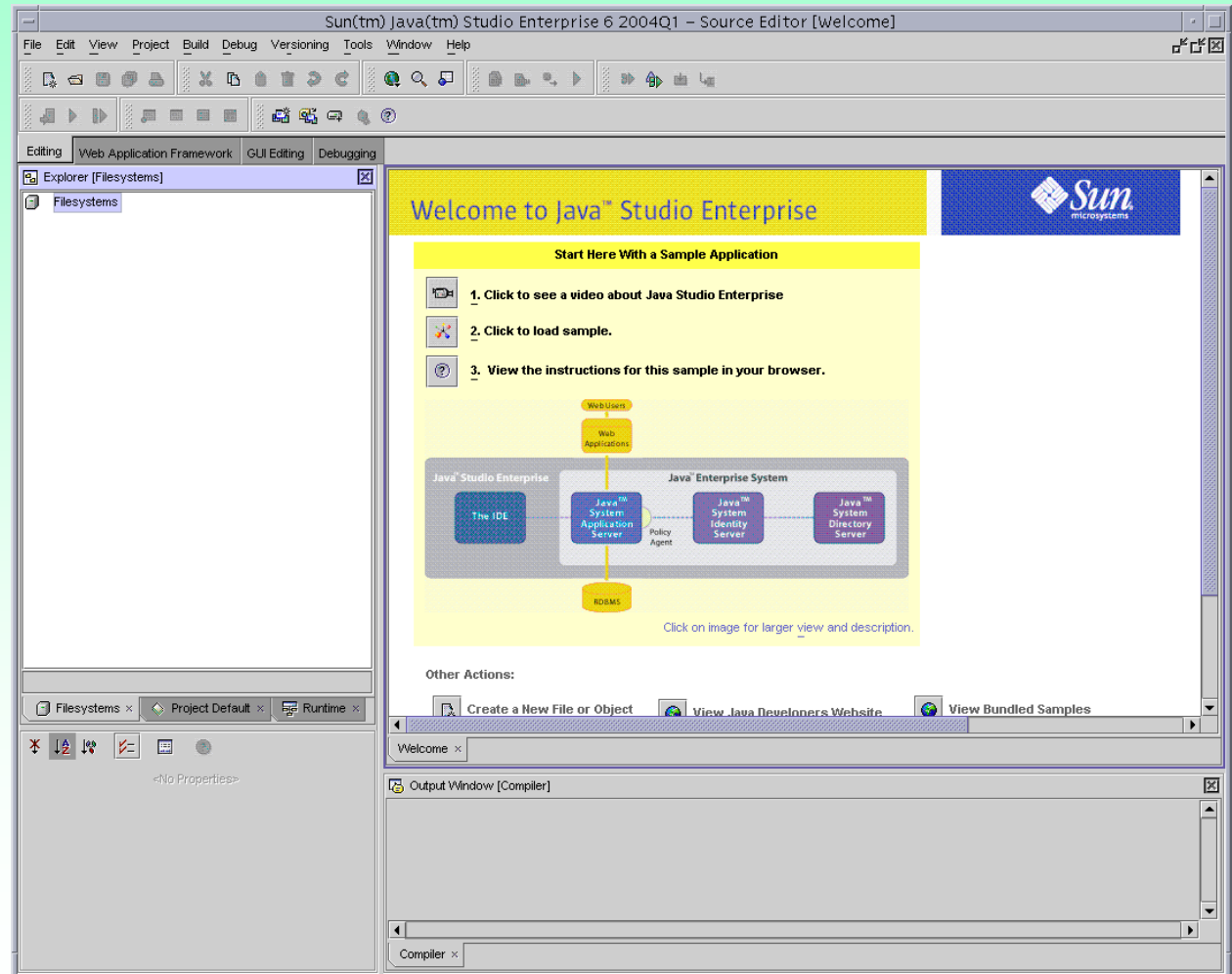


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Sun Java Studio Enterprise öffnen:



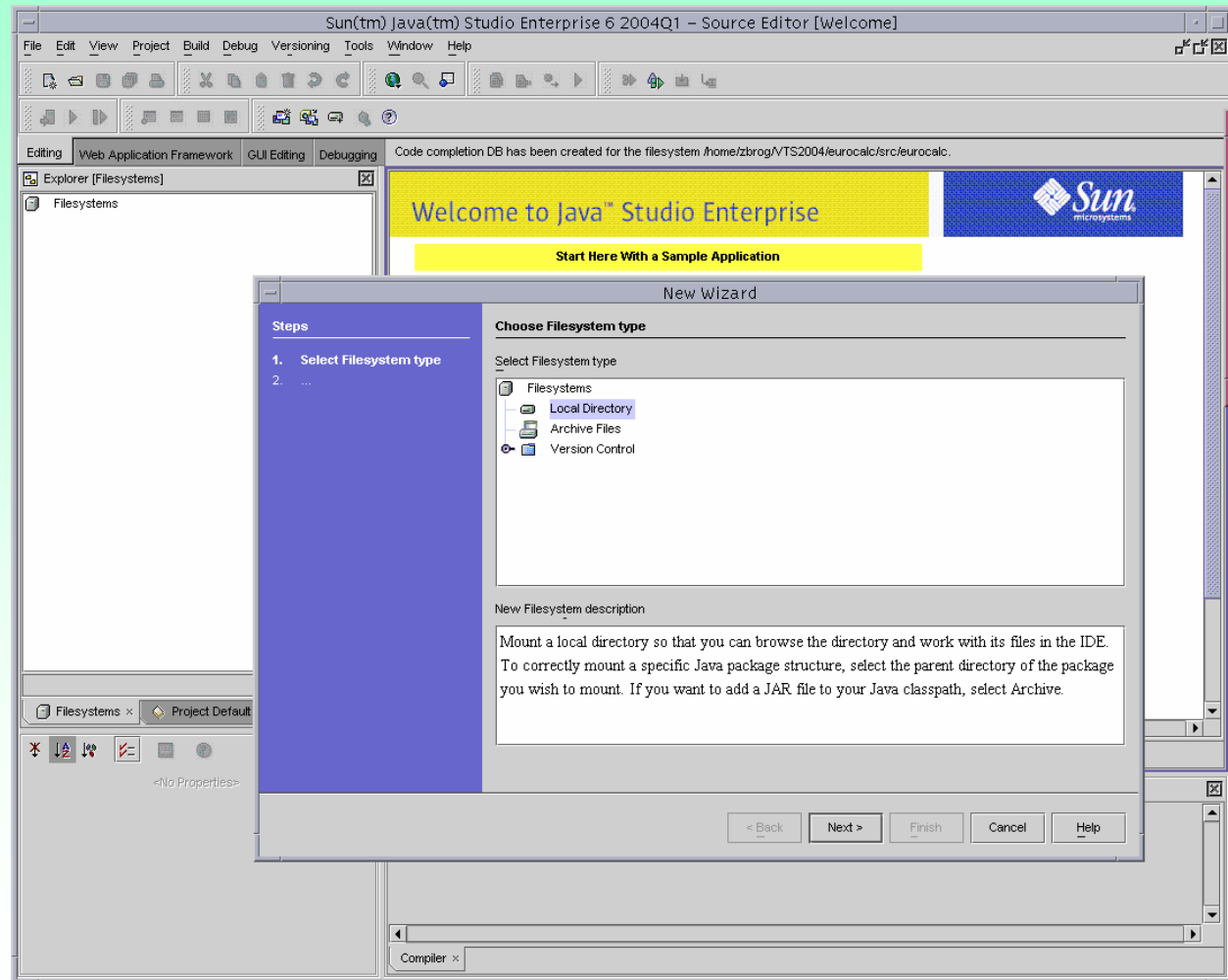


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Sun Java Studio Enterprise: Arbeitsverzeichnis „mounten“:



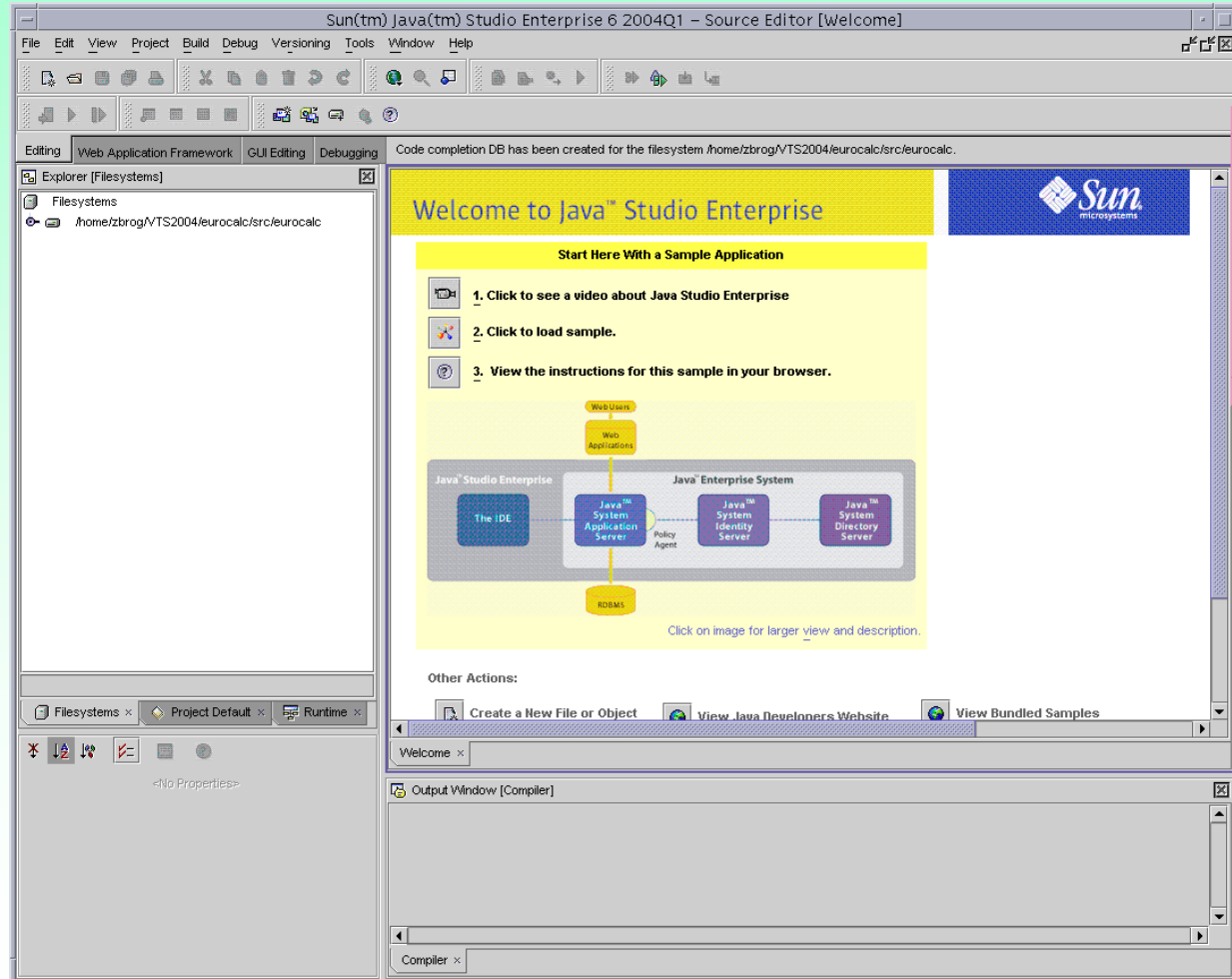


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Sun Java Studio Enterprise: Verzeichnis „gemountet“



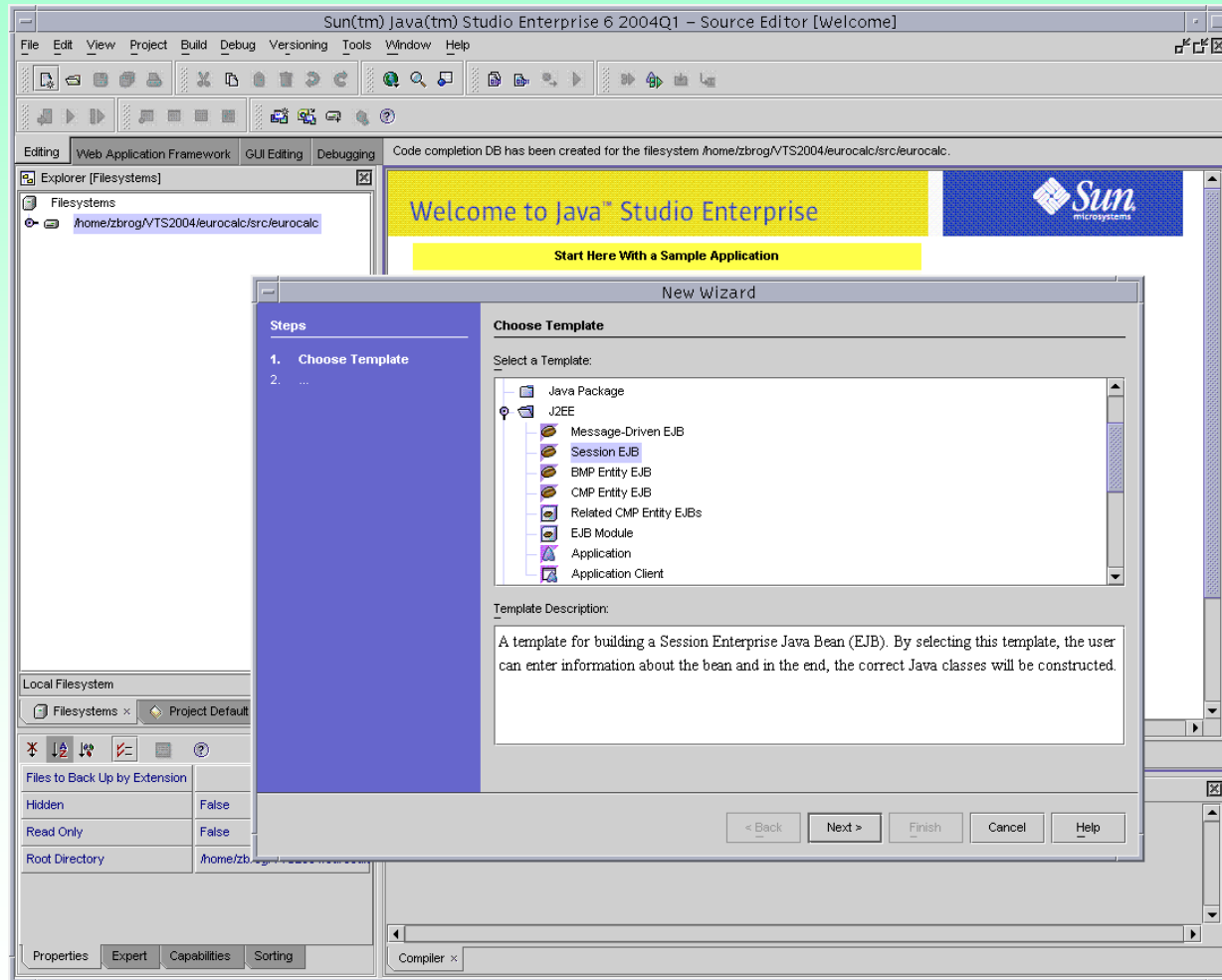


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Sun Java Studio Enterprise: Start des EJB-Wizards



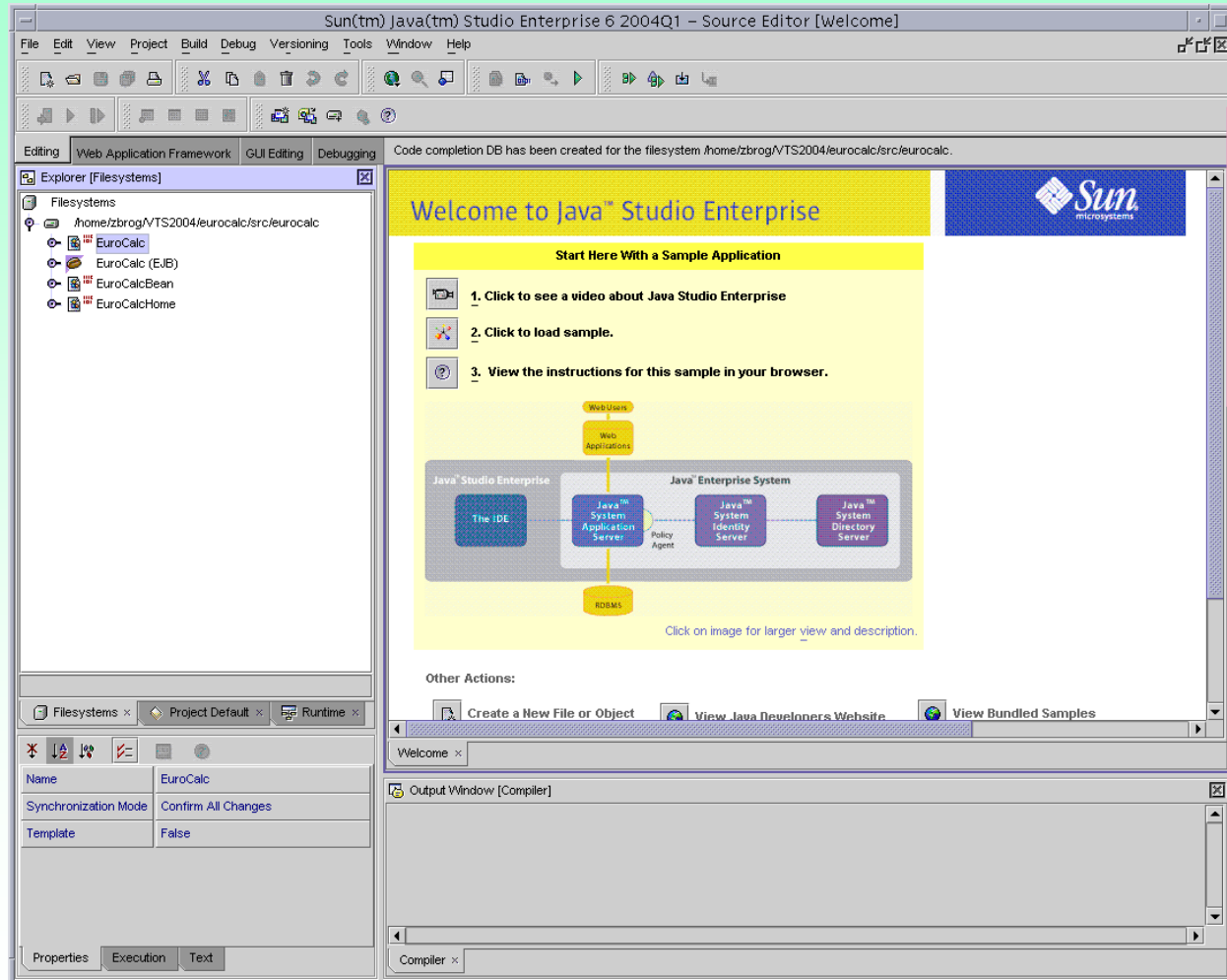


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Sun Java Studio Enterprise: generierte Objekte





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Sun Java Studio Enterprise: Objektauswahl

The screenshot displays the Sun Java Studio Enterprise 6.0404Q1 Source Editor interface. The Explorer pane on the left shows the project structure for EuroCalc, including an interface EuroCalc, a class EuroCalcBean, and a class EuroCalcHome. The main editor area shows a welcome screen with the following content:

Welcome to Java™ Studio Enterprise

Start Here With a Sample Application

1. Click to see a video about Java Studio Enterprise
2. Click to load sample.
3. View the instructions for this sample in your browser.

The diagram illustrates the Java Enterprise System architecture, showing the interaction between the IDE, the Application Server, the Identity Server, and the Directory Server, all connected to the Web Applications and RDBMS layers.

Other Actions:

- Create a New File or Object
- View Java Developers Website
- View Bundled Samples

The Properties pane at the bottom left shows the following settings for EuroCalc:

Name	EuroCalc
Synchronization Mode	Confirm All Changes
Template	False

The Output Window at the bottom right shows the Compiler output.

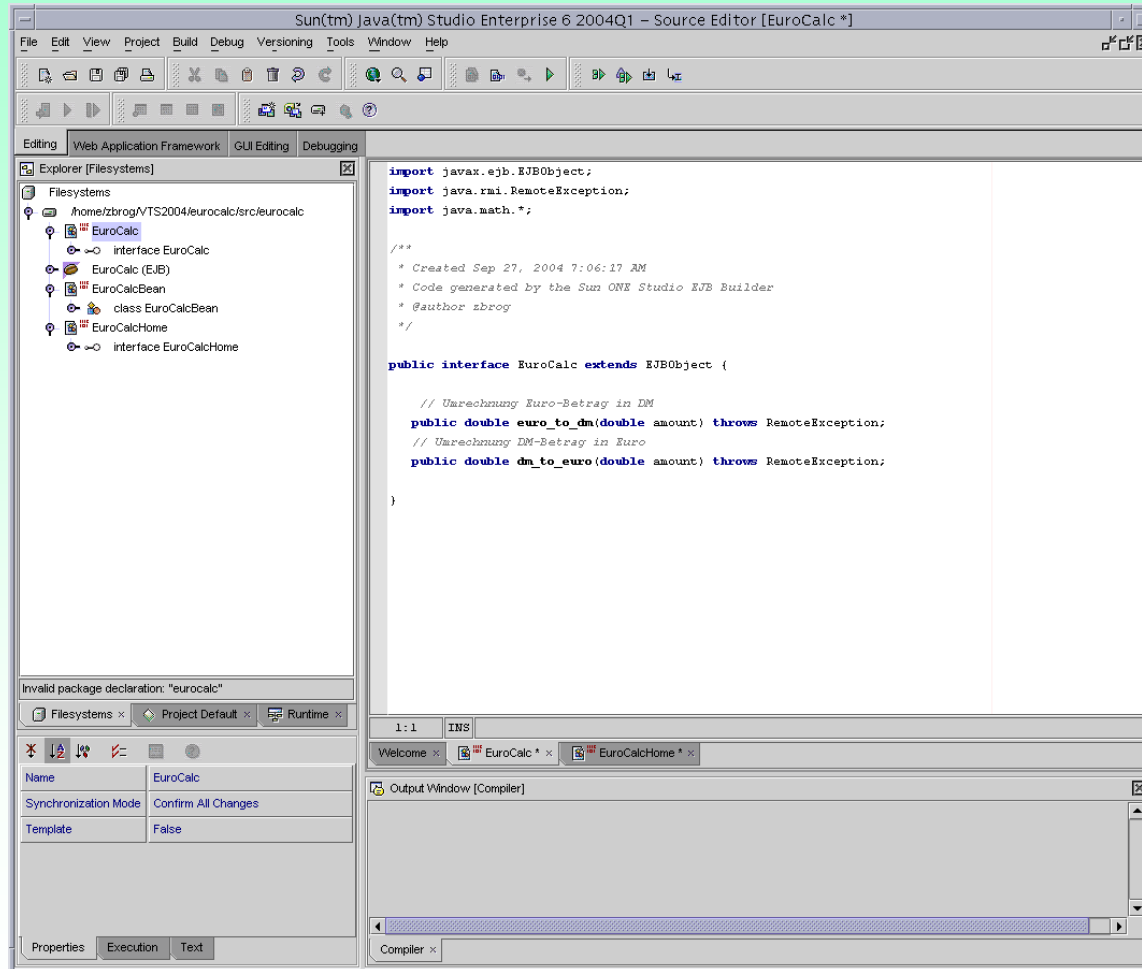


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Sun Java Studio Enterprise: Edition Component-Interface



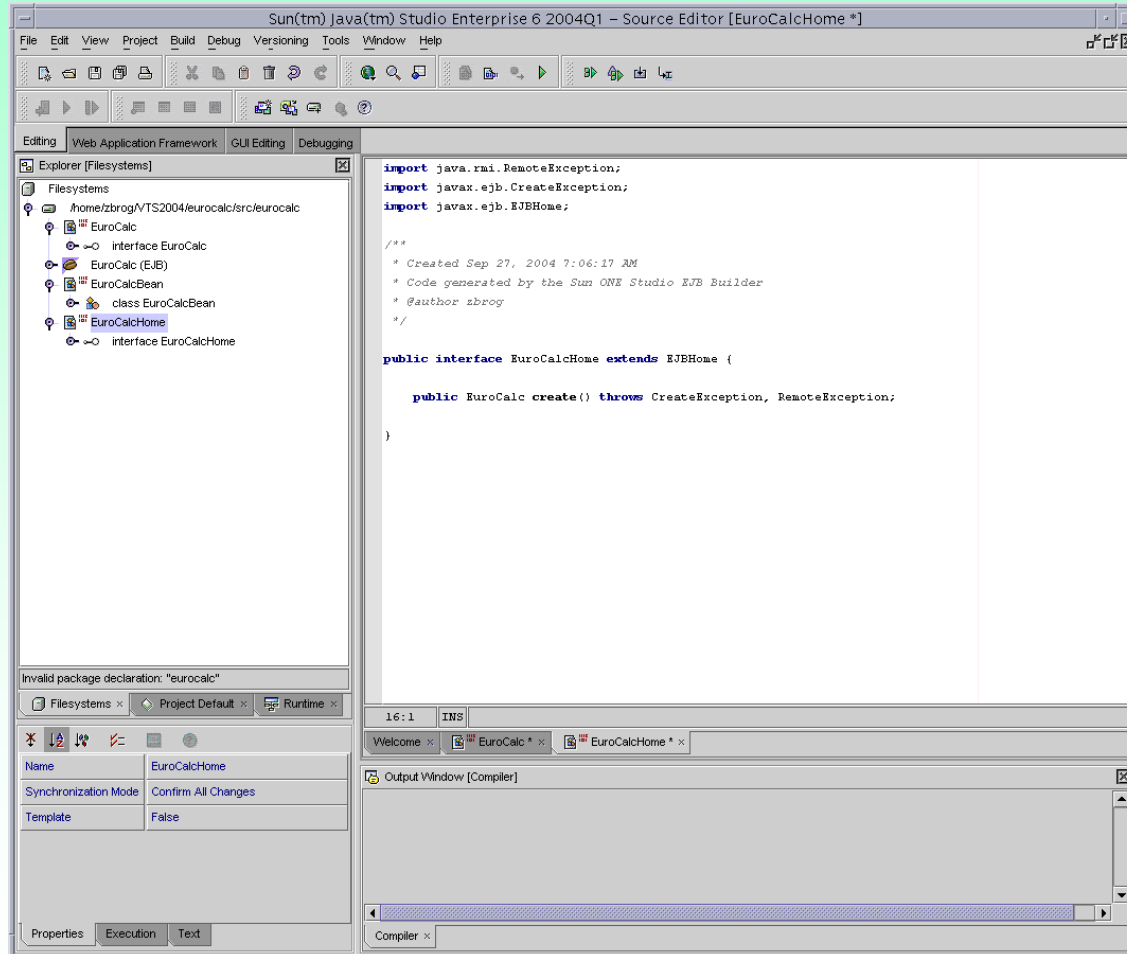


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Sun Java Studio Enterprise: Edition Home-Interface





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Sun Java Studio Enterprise: Bean Geschäftsmethoden

The screenshot shows the Sun Java Studio Enterprise 6.0204Q1 Source Editor. The Explorer on the left shows the project structure with the following files:

- Filesystems
 - ./home/zbrog/VTS2004/eurocalc/src/eurocalc
 - EuroCalc
 - interface EuroCalc
 - EuroCalc (EJB)
 - EuroCalcBean
 - class EuroCalcBean
 - EuroCalcHome
 - interface EuroCalcHome

The main editor displays the source code for the EuroCalcBean class:

```
public class EuroCalcBean implements javax.ejb.SessionBean {  
  
    /**  
     * See section 7.10.3 of the EJB 2.0 specification  
     */  
    public void ejbCreate() throws javax.ejb.CreateException {  
  
    }  
  
    // Berechnung des Wechselkursbetrages in DM  
    public double euro_to_dm(double amount) {  
        double dm = 0;  
        dm = amount * changerate;  
        System.out.println(dm);  
        return dm;  
    }  
  
    // Berechnung des Wechselkursbetrages in Euro  
    public double dm_to_euro(double amount) {  
        double euro = 0;  
        euro = amount / changerate;  
        System.out.println(euro);  
        return euro;  
    }  
}
```

The Properties window at the bottom left shows the following details for EuroCalcBean:

Extends	
Implements	SessionBean
Javadoc Comment	Created Sep 27, 2004 7:06:17 AM Code g
Modifiers	public
Name	EuroCalcBean
Properties	

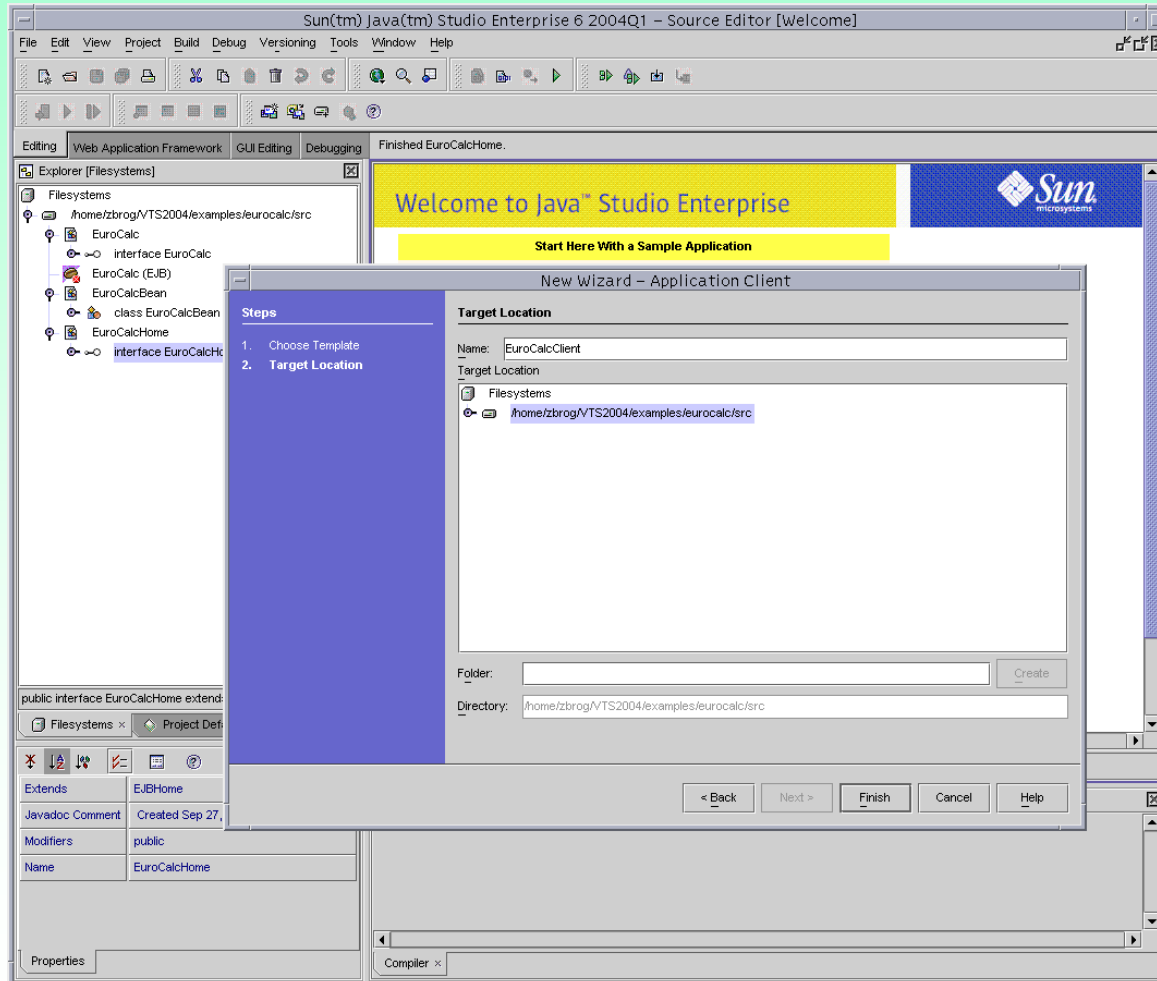


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Sun Java Studio Enterprise: Applikations-Client-Wizard





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Sun Java Studio Enterprise: Edition des Applikations-Client

The screenshot displays the Sun Java Studio Enterprise 6.0 Source Editor interface. The main window shows the source code for EuroCalcClient.java. The Explorer on the left shows the project structure, including the EuroCalcClient class. The Properties window at the bottom left shows the class name EuroCalcClient. The Output Window at the bottom right shows the compiler output: Finished EuroCalcHome.

```
/*
 * EuroCalcClient.java
 *
 * Created on September 22, 2004, 4:02 PM
 */

import javax.naming.Context;
import javax.naming.InitialContext;
import javax.rmi.PortableRemoteObject;
import java.math.*;

/**
 *
 * @author zbrog
 */
public class EuroCalcClient {
    Object object = null;
    EuroCalcHome home = null;
    EuroCalc remote = null;

    /** Creates a new instance of EuroCalcClient */
    public EuroCalcClient() {
    }

    public void getBean() {
        try {
            Context initial = new InitialContext();
            Context myEnv = (Context)initial.lookup("java:comp/env");
        }
    }
}
```

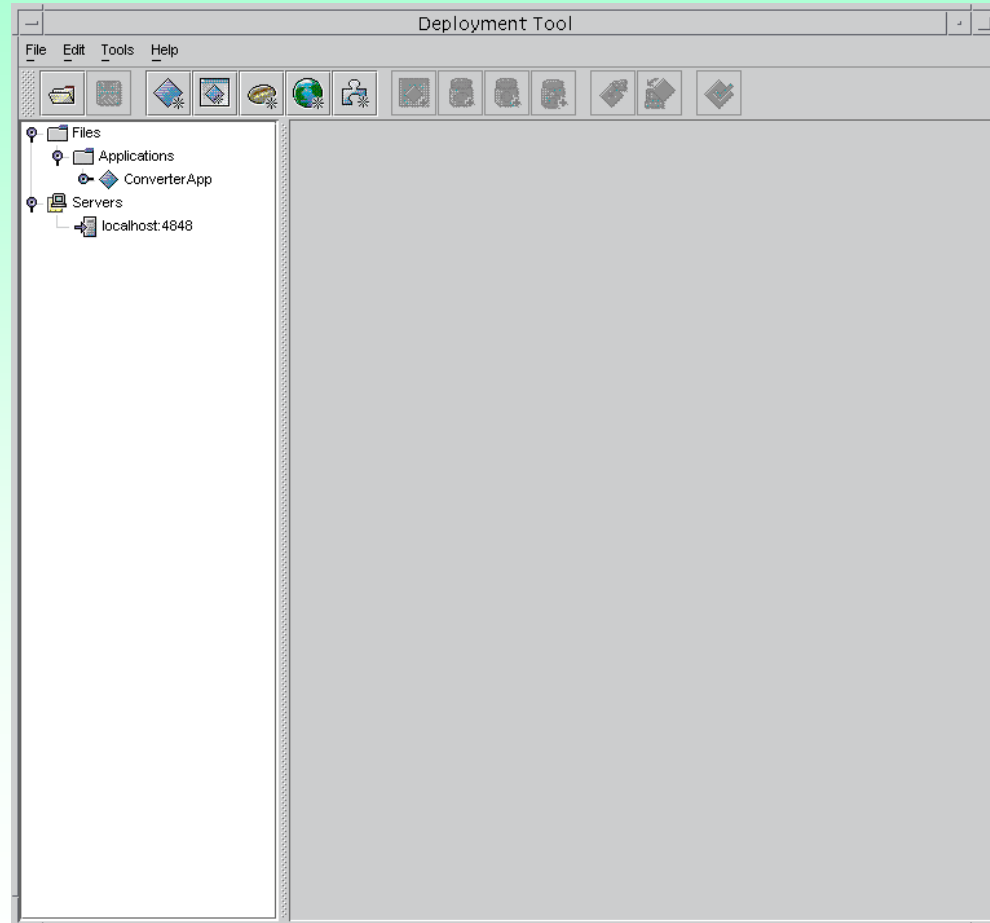


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Deployment Tool starten



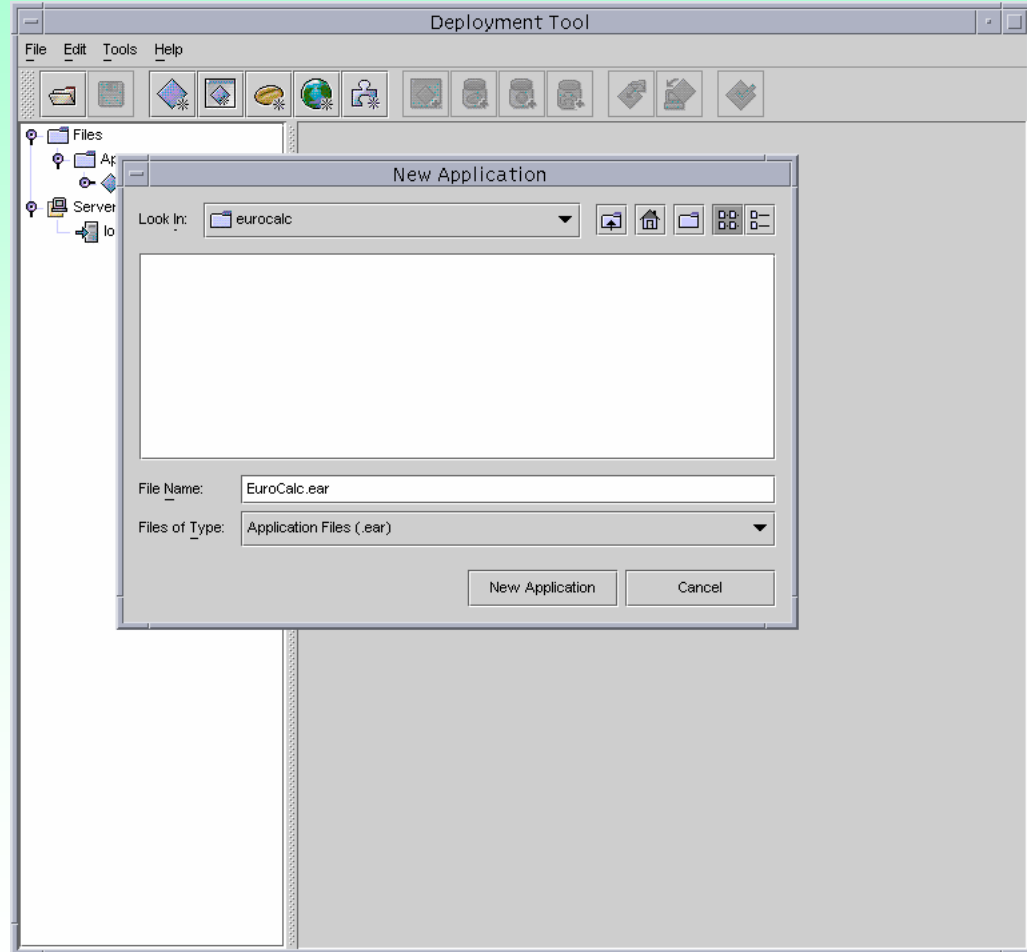


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Deployment Tool: neue Applikation anlegen (.ear-Steuerfile)



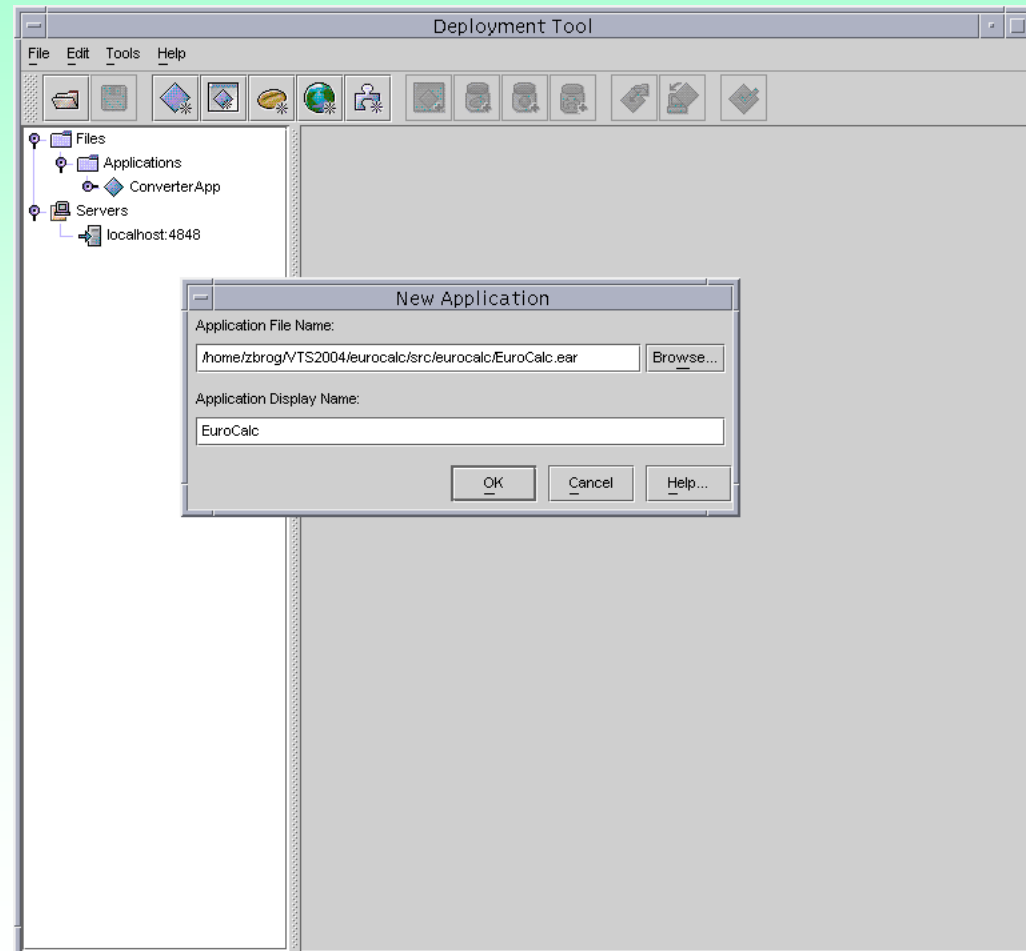


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Deployment Tool: Angaben zur Applikation eintragen



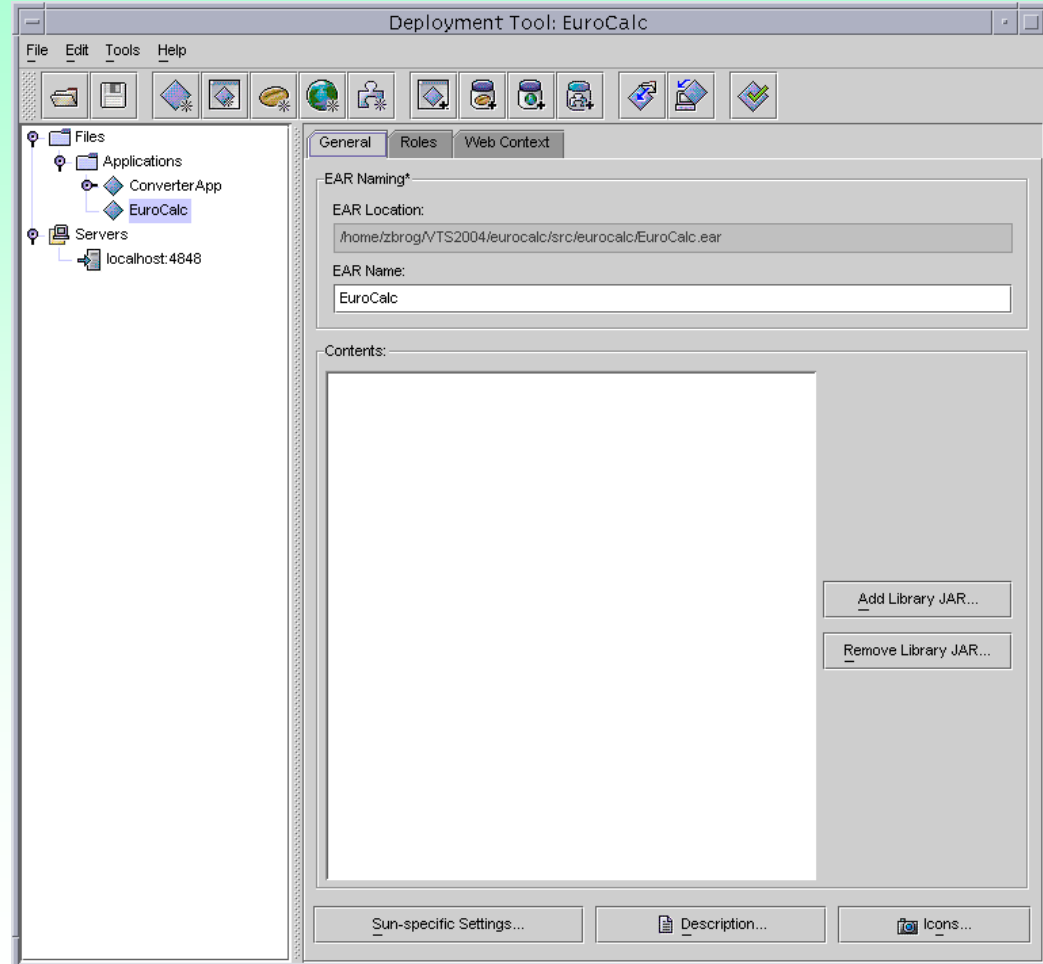


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Deployment Tool: Package Editor Fenster



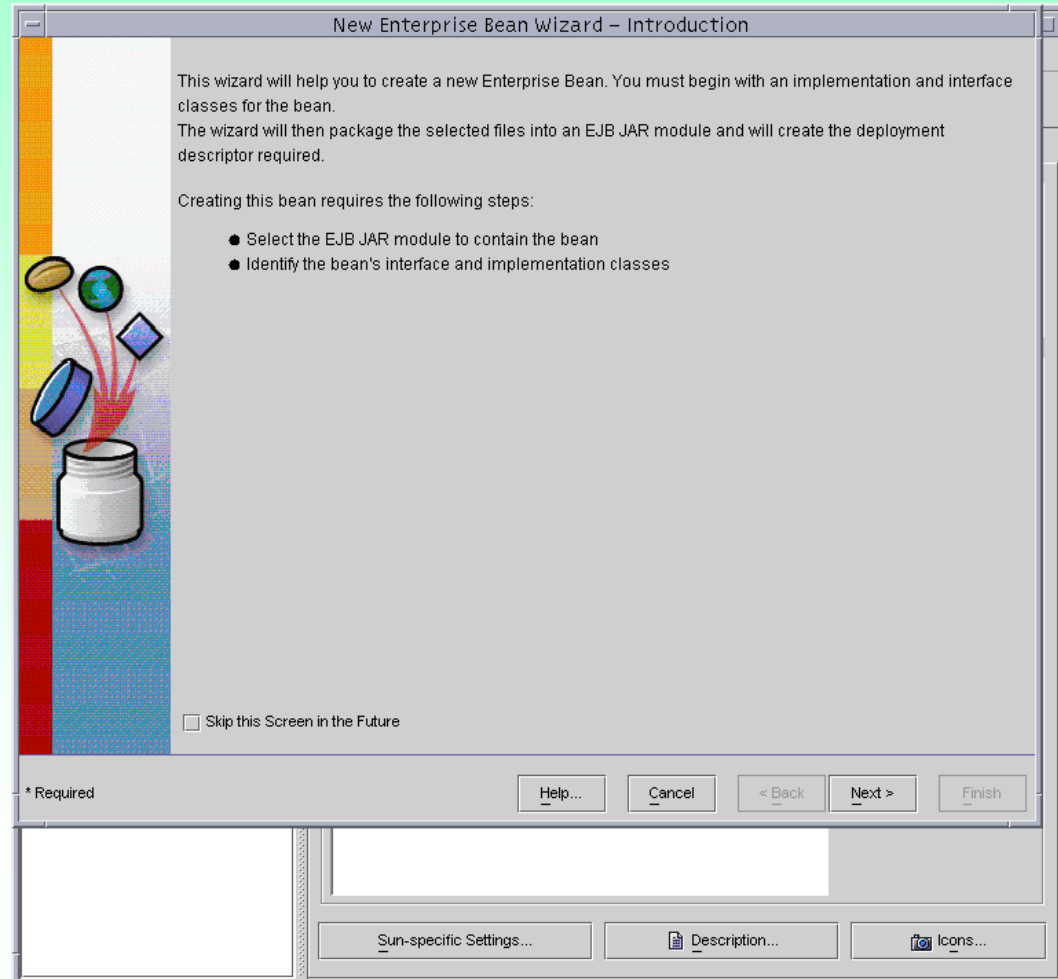


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Deployment Tool: Start der EJB.JAR Wizards





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Deployment Tool : EJB Wizard – Angaben zum EJB.JAR eingeben

New Enterprise Bean Wizard – EJB JAR General Settings

An EJB Jar module is required to contain this enterprise bean.
Select the location and name of the module to be used.
Then click the Edit button and add the desired files to the module.

JAR Location*

Create New Stand-Alone JAR Module

Create New JAR Module in Application

 ◆ EuroCalc

Add to Existing JAR Module

JAR Naming*

JAR Location: Browse...

JAR Name: EuroCalc

Contents:

 META-INF

Edit Contents...

Sun-specific Settings... Manifest Classpath... Description... Icons...

* Required Help... Cancel < Back Next > Finish

Sun-specific Settings... Description... Icons...

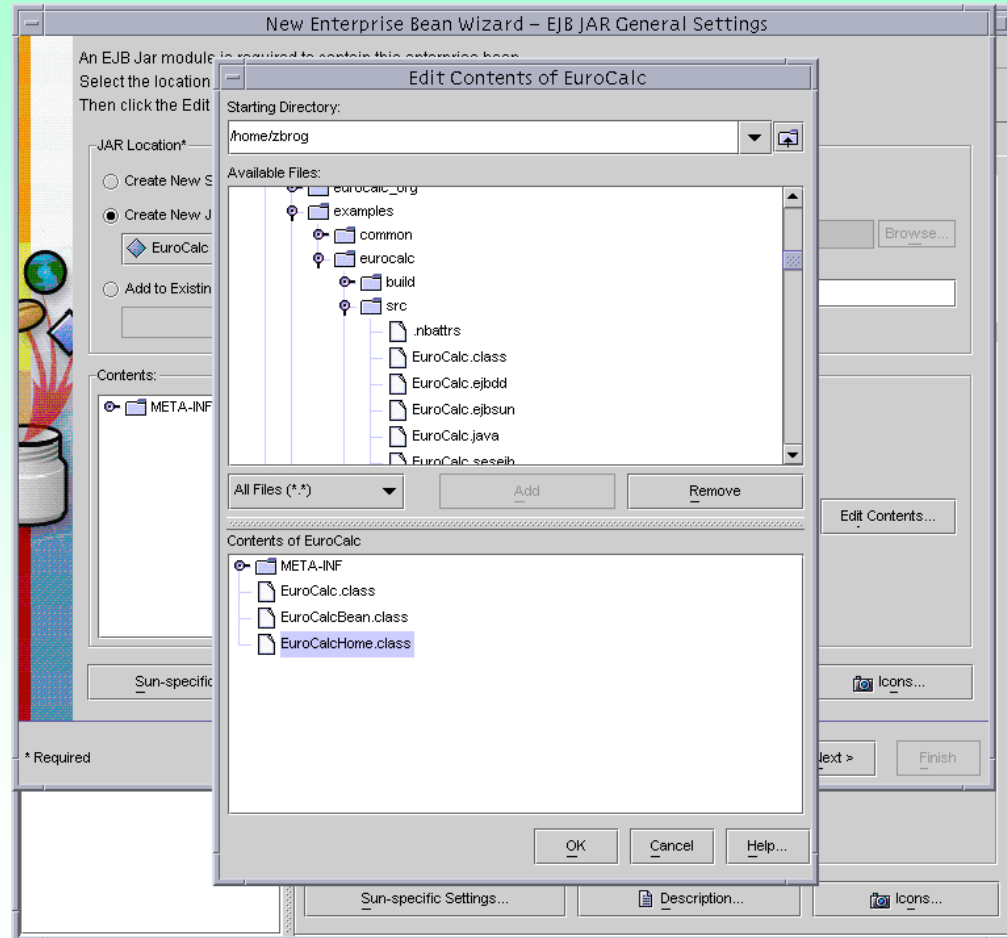


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Deployment Tool : EJB Wizard – EJB.JAR Inhalt einfügen



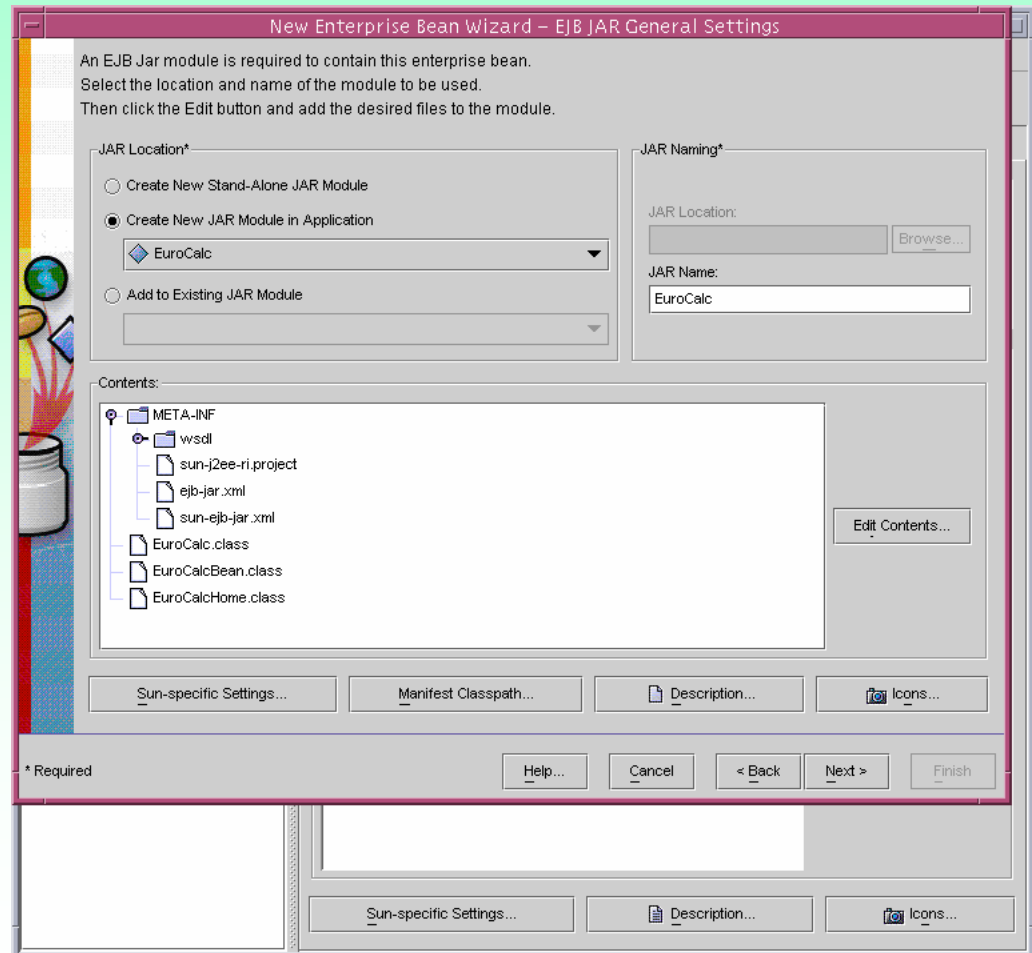


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Deployment Tool : EJB Wizard – fertig gepacktes EJB.JAR





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Deployment Tool : EJB Wizard – Allgemeine Angaben zum EJB eintragen

New Enterprise Bean Wizard – Bean General Settings

Please choose the enterprise bean class and indicate the type, if necessary.
You must also choose the interface classes. You can choose to provide only local interfaces, only remote interfaces, or both.

Enterprise Bean Class:*
EuroCalcBean

Enterprise Bean Name:*
EuroCalcBean

Enterprise Bean Type:*
Stateless Session

Local Interfaces

Local Home Interface:
Local Interface:

Remote Interfaces

Remote Home Interface:
EuroCalcHome

Remote Interface:
EuroCalc

Description...
Icons...
Sun-specific Settings...

* Required

Help... Cancel < Back Next > Finish

Sun-specific Settings... Description... Icons...

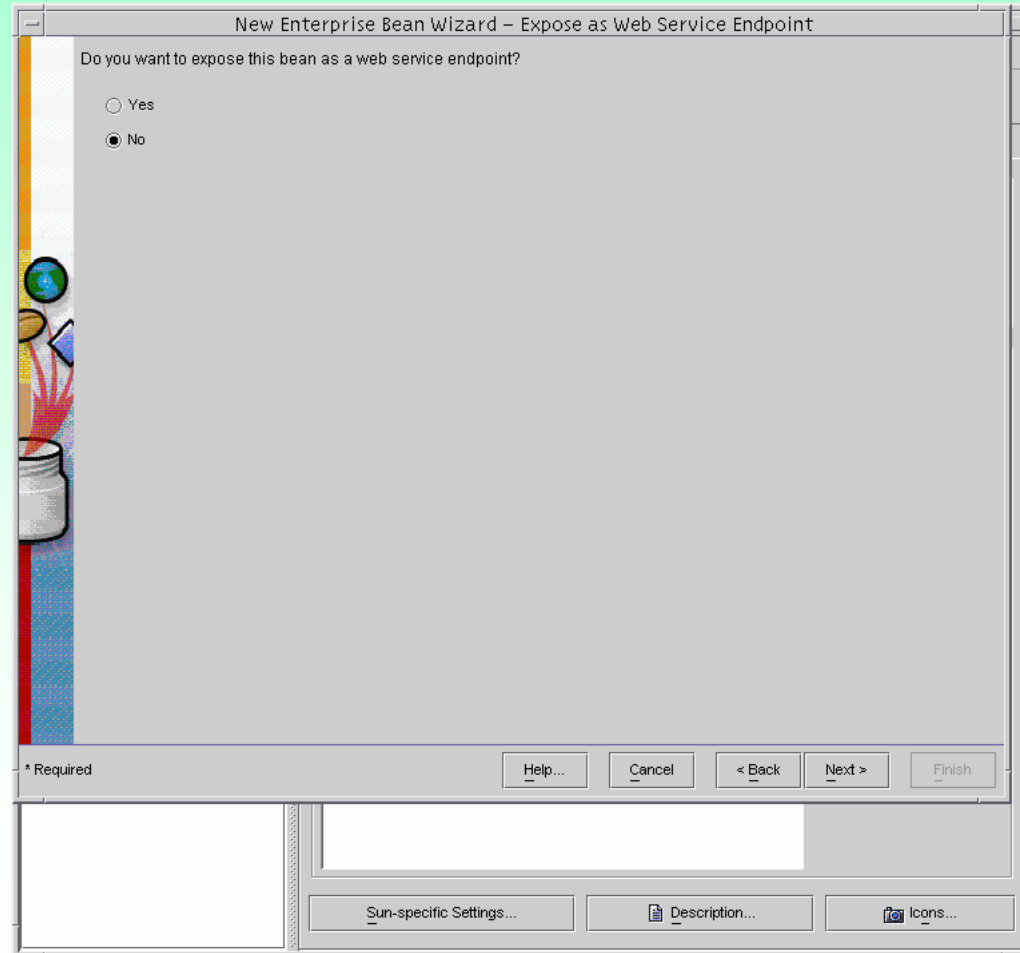


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Deployment Tool : EJB Wizard – Webservice oder nicht



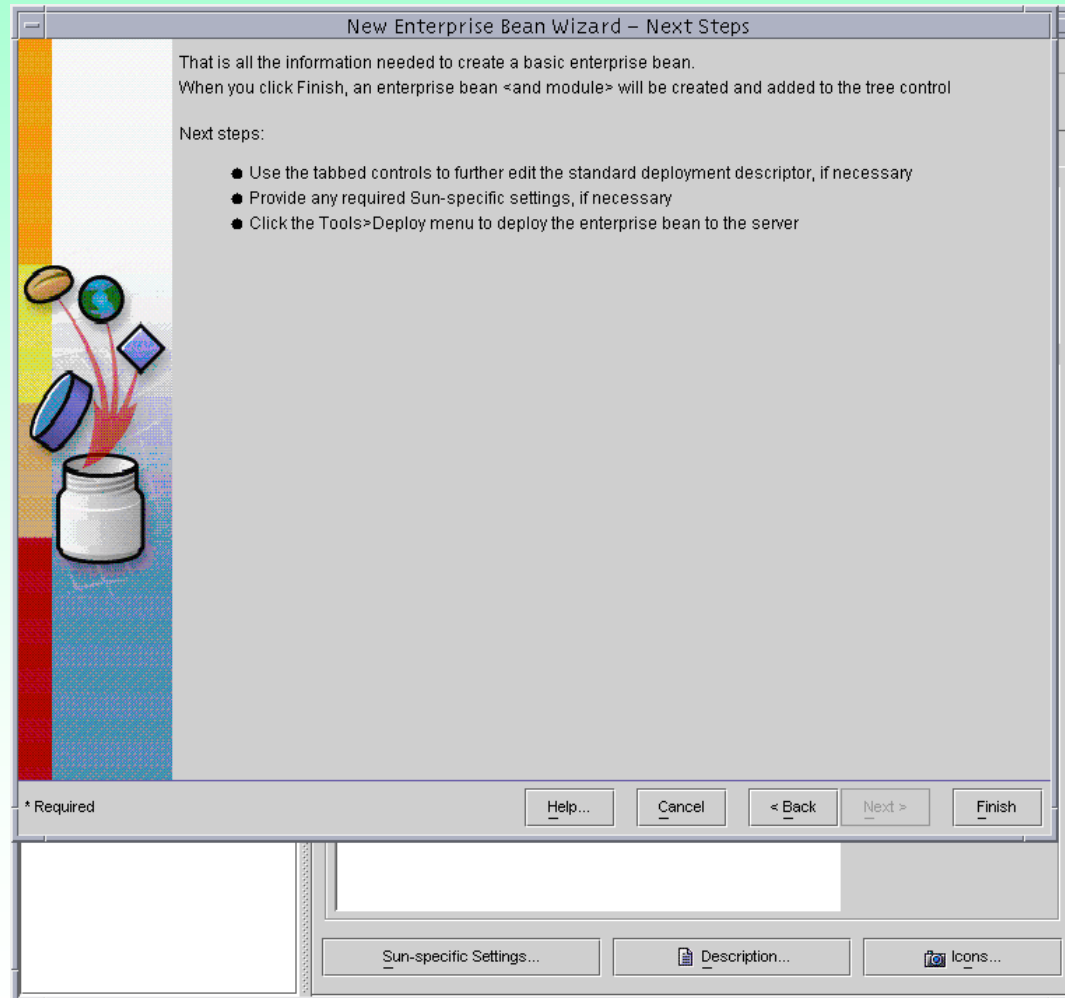


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Deployment Tool : EJB Wizard – EJB.JAR fertigstellen



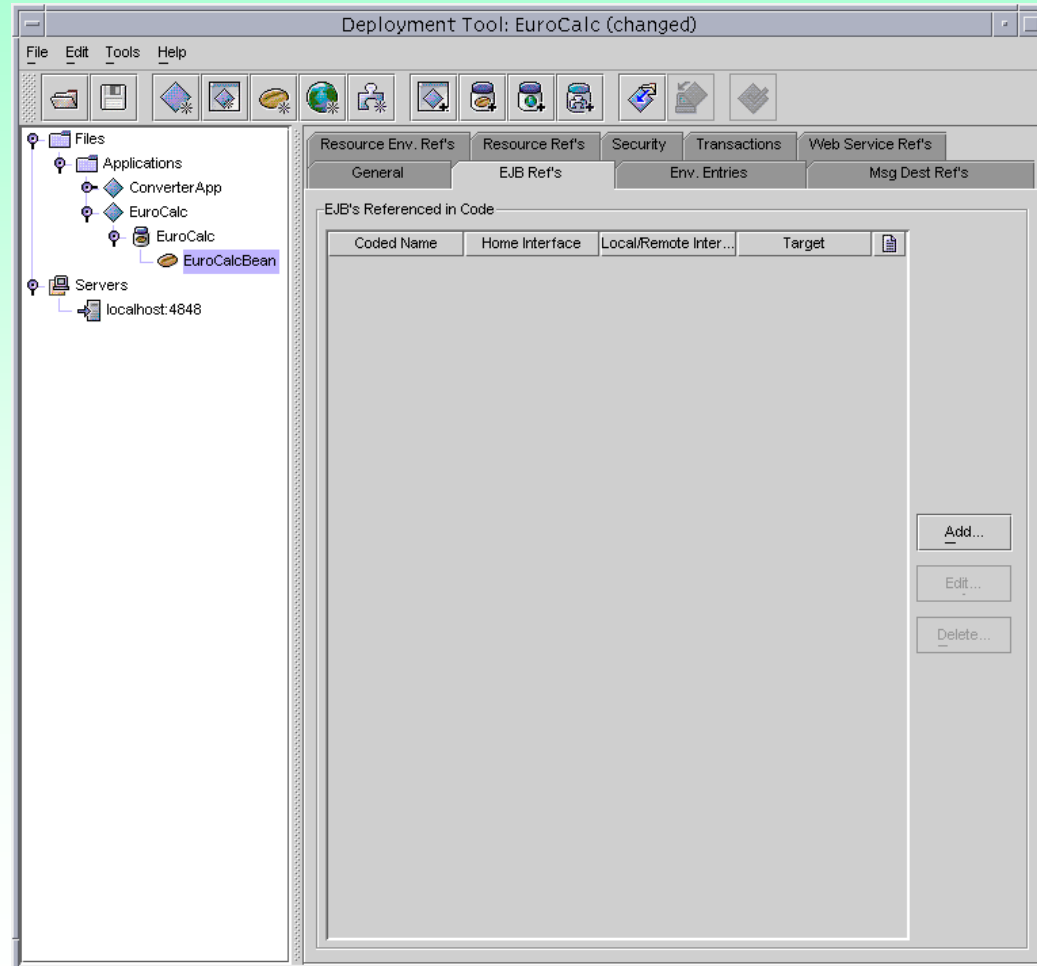


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Deployment Tool: weitere EJB-Konfiguration



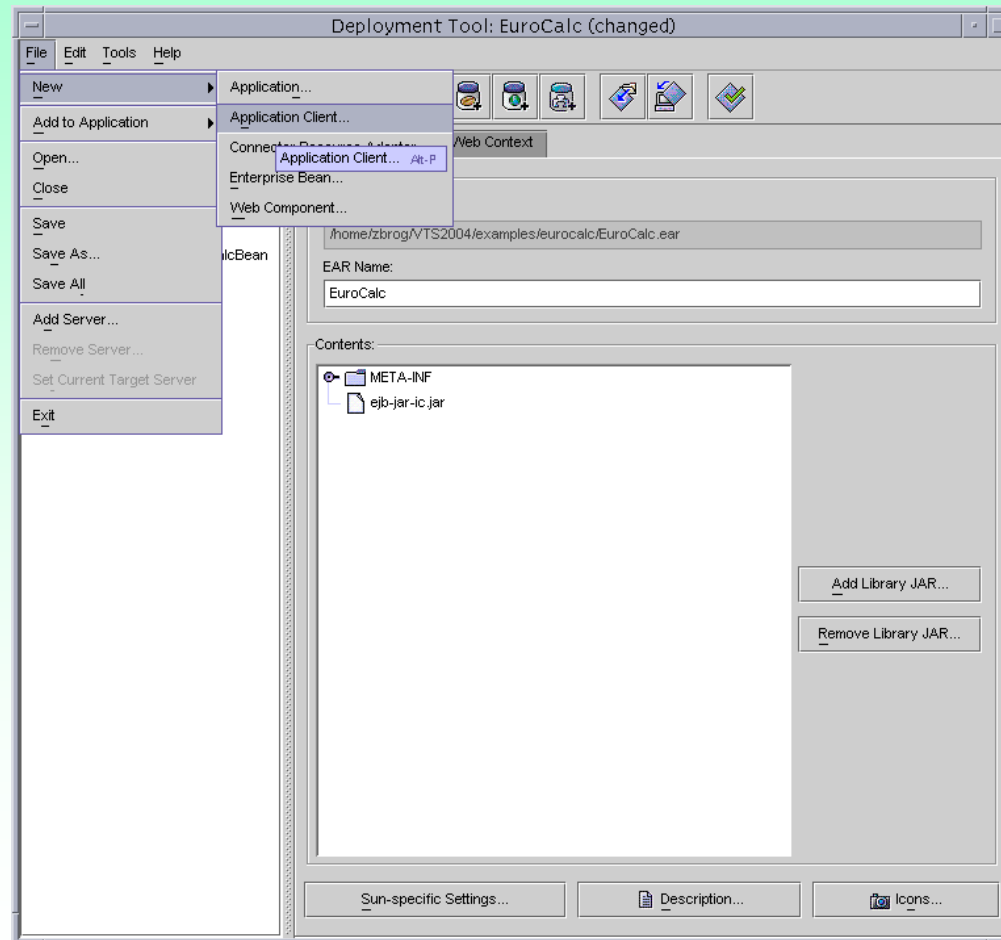


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Deployment Tool : Applikations-Client Wizard aufrufen



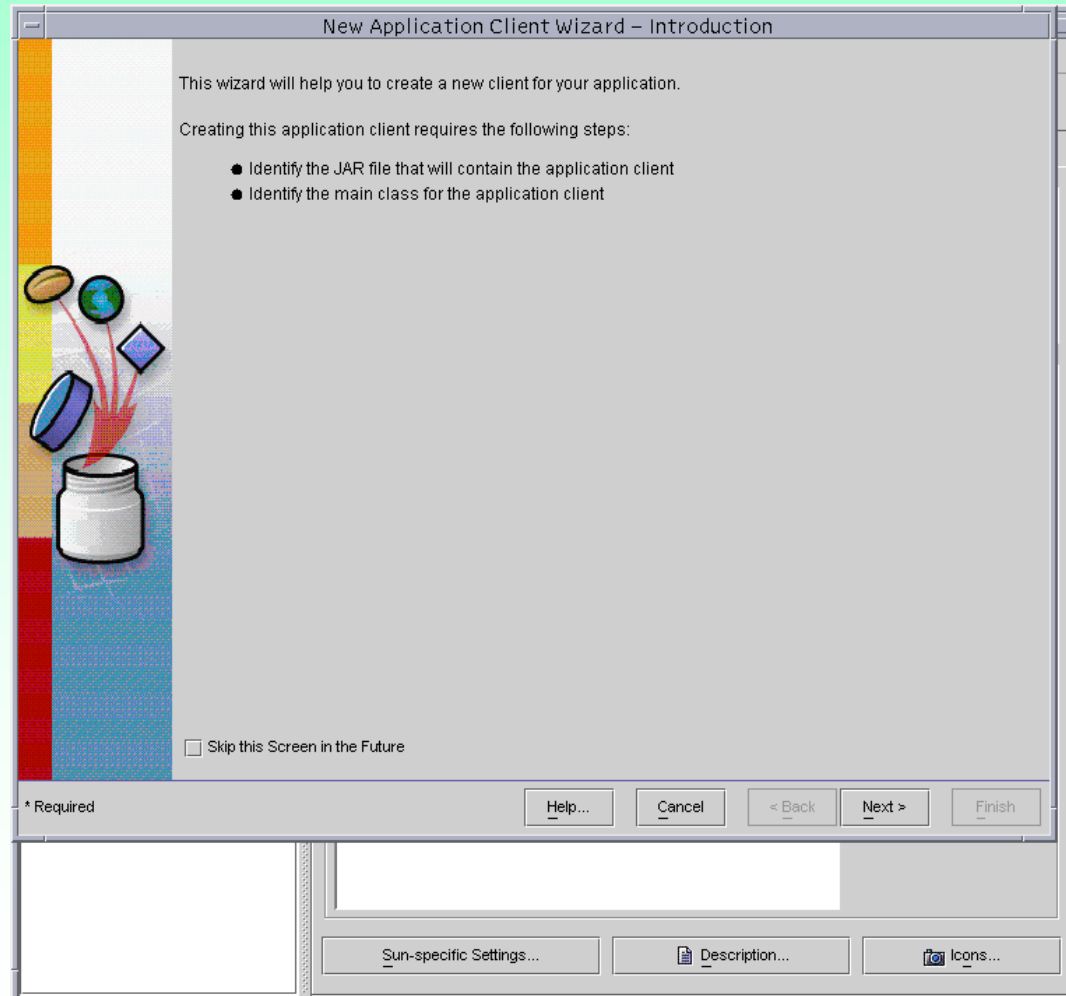


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Deployment Tool: Application Client Wizard



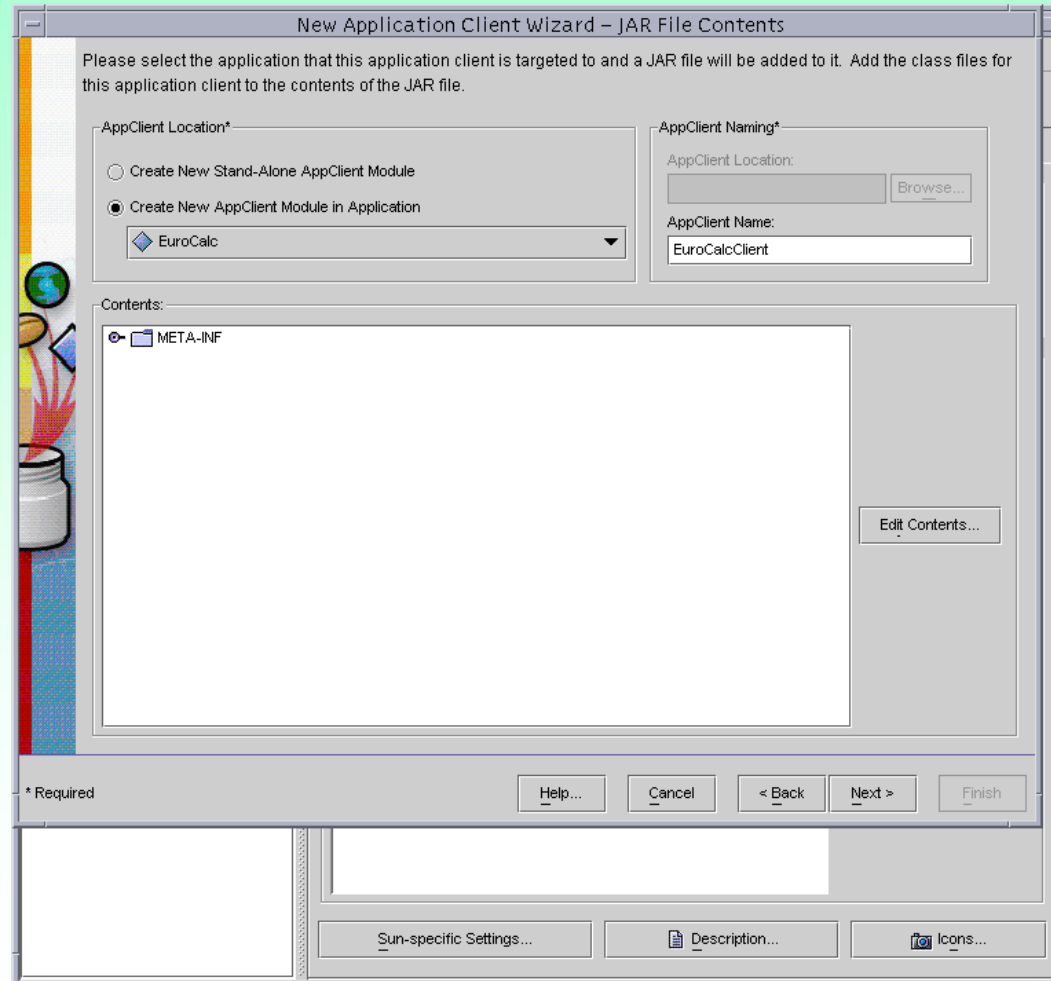


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Deployment Tool: Appl.Wizard – Client.JAR bilden



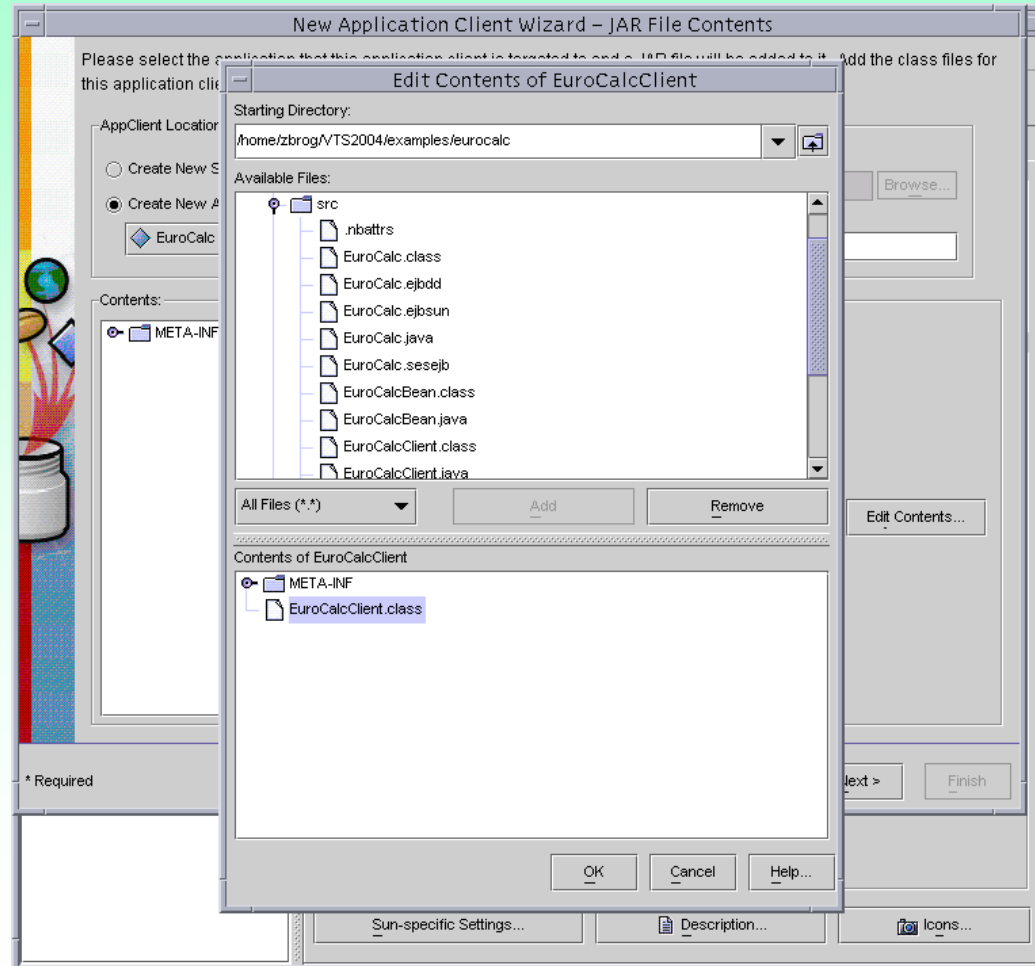


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Deployment Tool: Appl.Wizard – Client.JAR editieren





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Deployment Tool: Appl.Wizard – Allgemeine Angaben zum Clienten eintragen

New Application Client Wizard – General

Select the application client's main class and provide a display name for it. Optionally, you also identify a callback handler for authentication, provide a description, define the manifest classpath for the JAR file, and select the icons for the application client.

-Application Client-

Main Class:*
EuroCalcClient

Callback Handler Class:
(Use container-managed authentication)

Description... Manifest Classpath... Icons...

* Required

Help... Cancel < Back Next > Finish

Sun-specific Settings... Description... Icons...

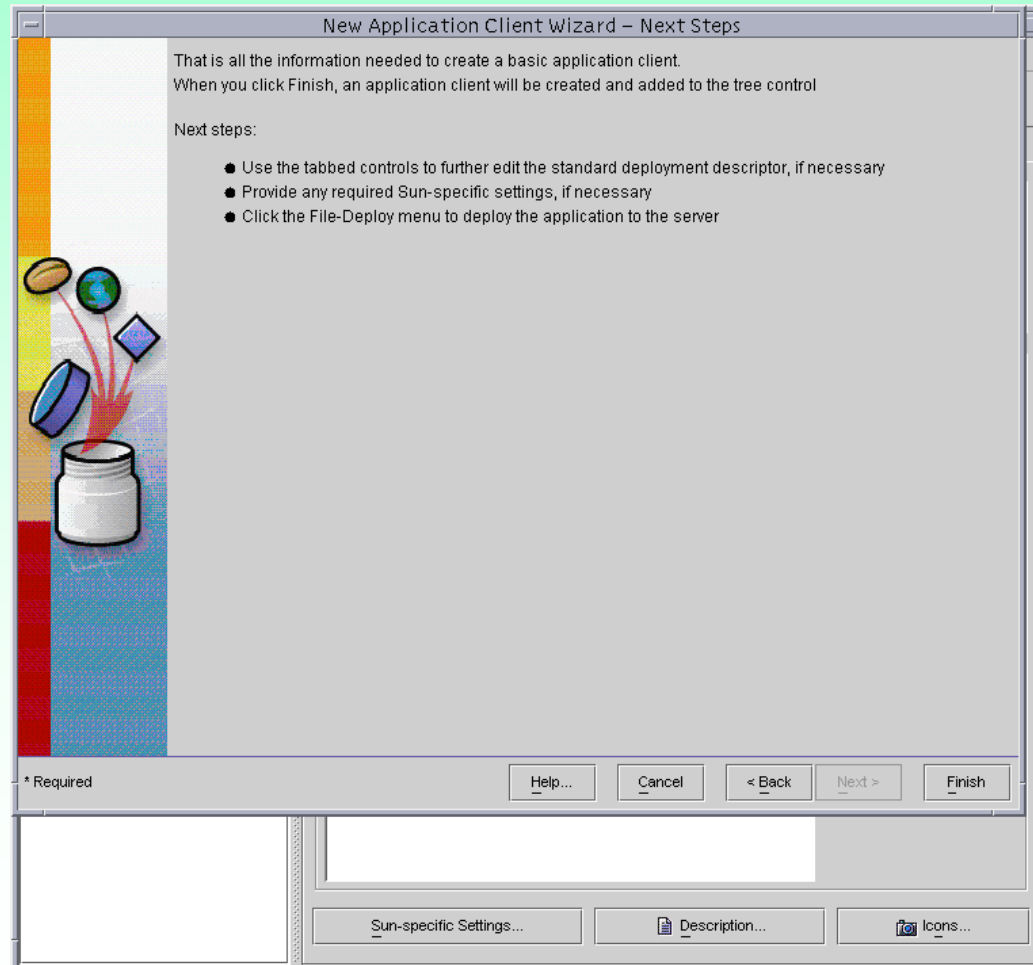


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Deployment Tool: Application Client Wizard – Client.JAR fertigstellen



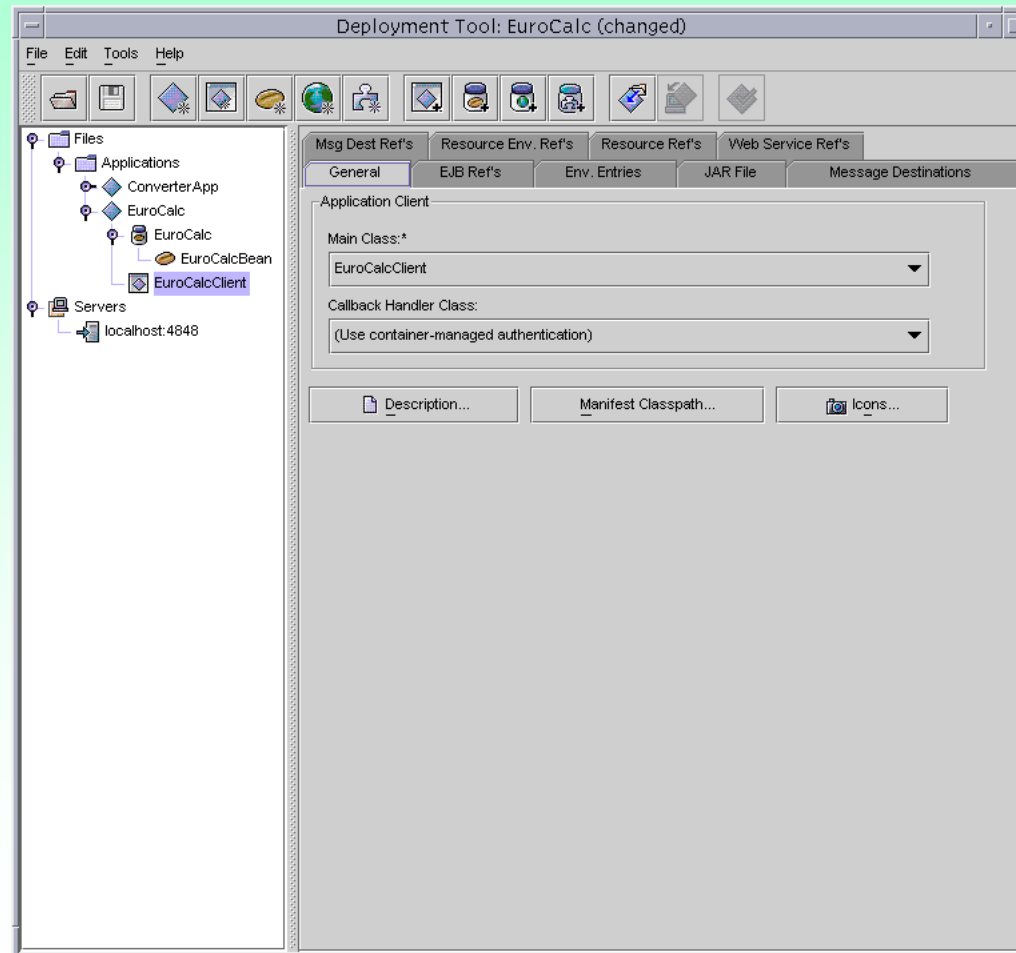


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Deployment Tool: Client-Konfiguration vornehmen



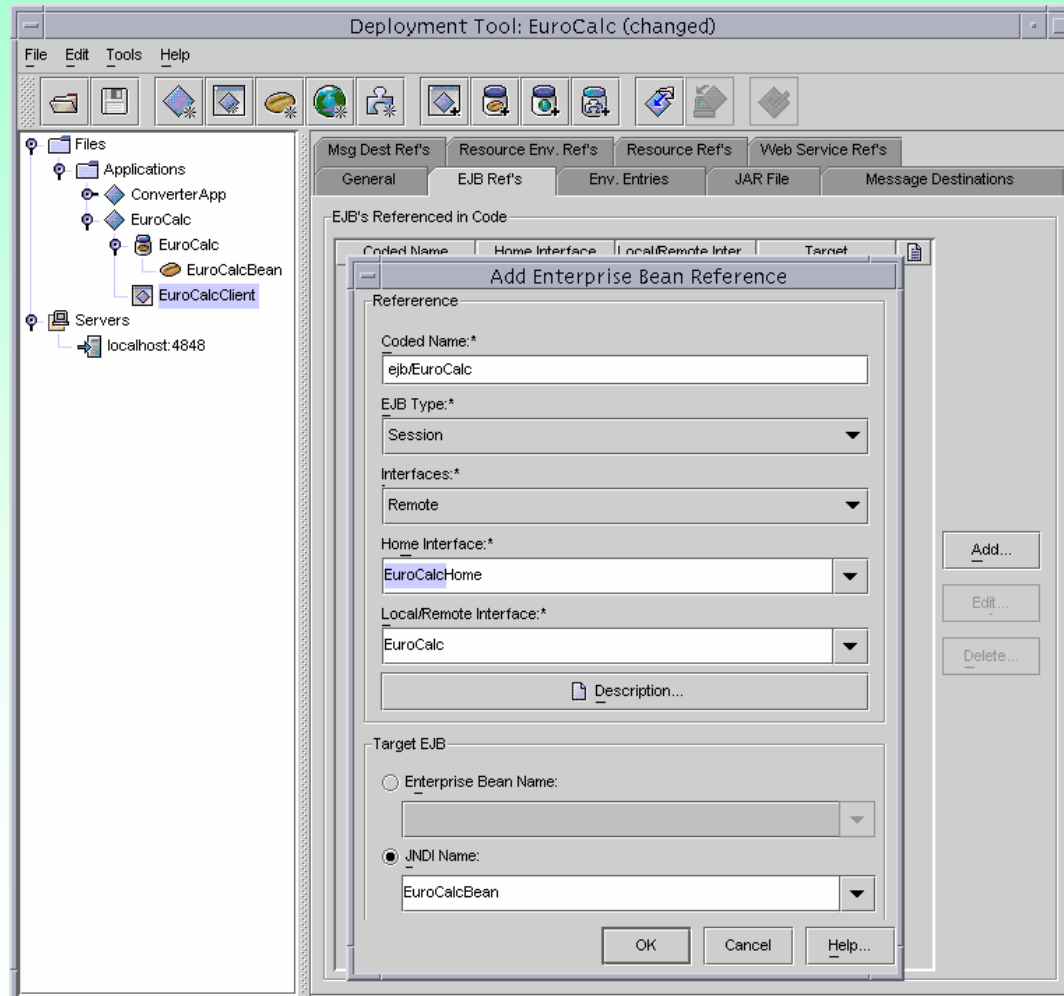


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Deployment Tool: Client – EJB-Verbindung konfigurieren



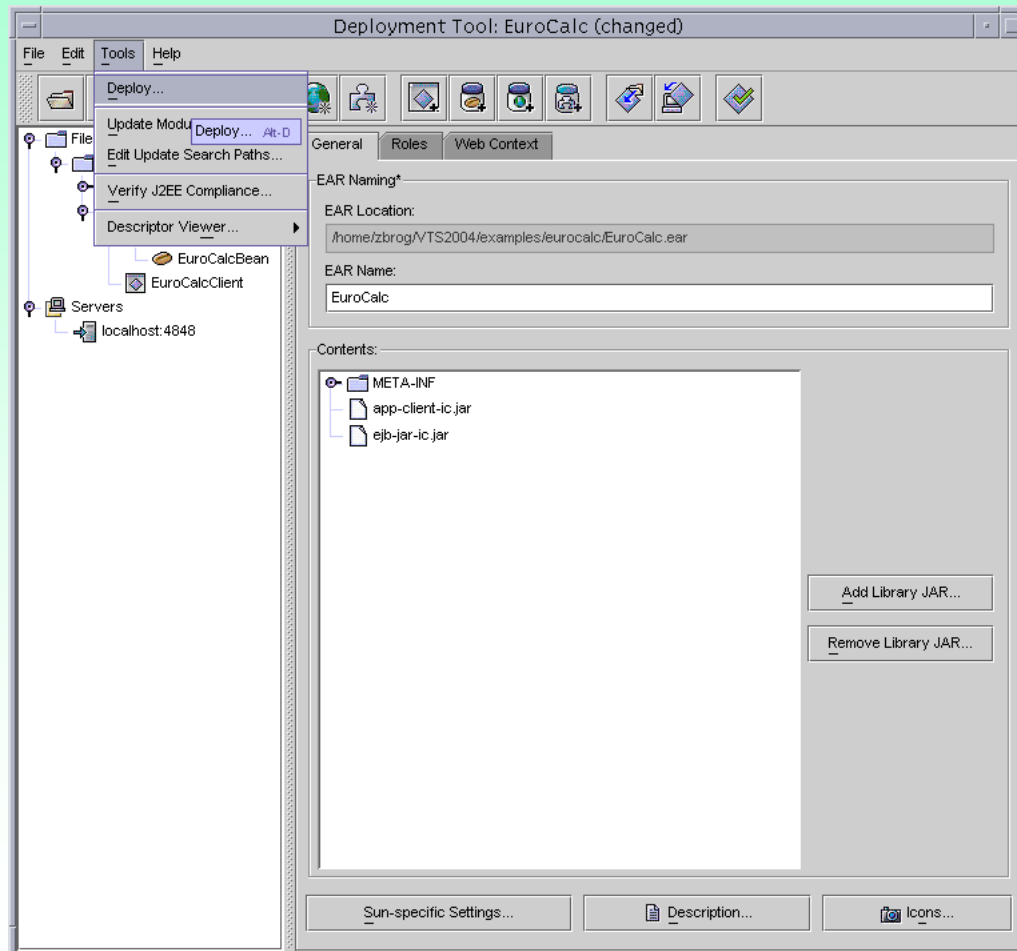


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Deployment Tool: „deployen“ - Anwendung im Application Server installieren



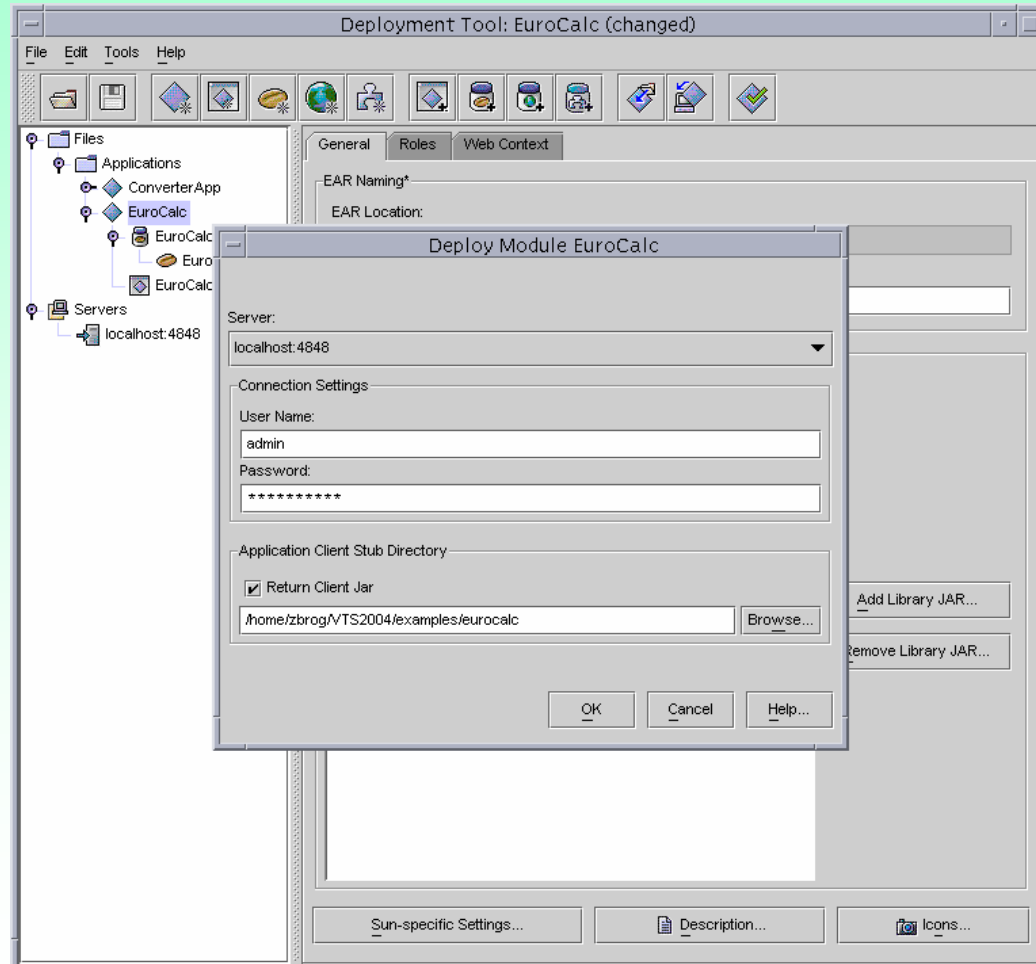


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Deployment Tool: Angaben zum Application-Server-Zugriff und Client-Stub



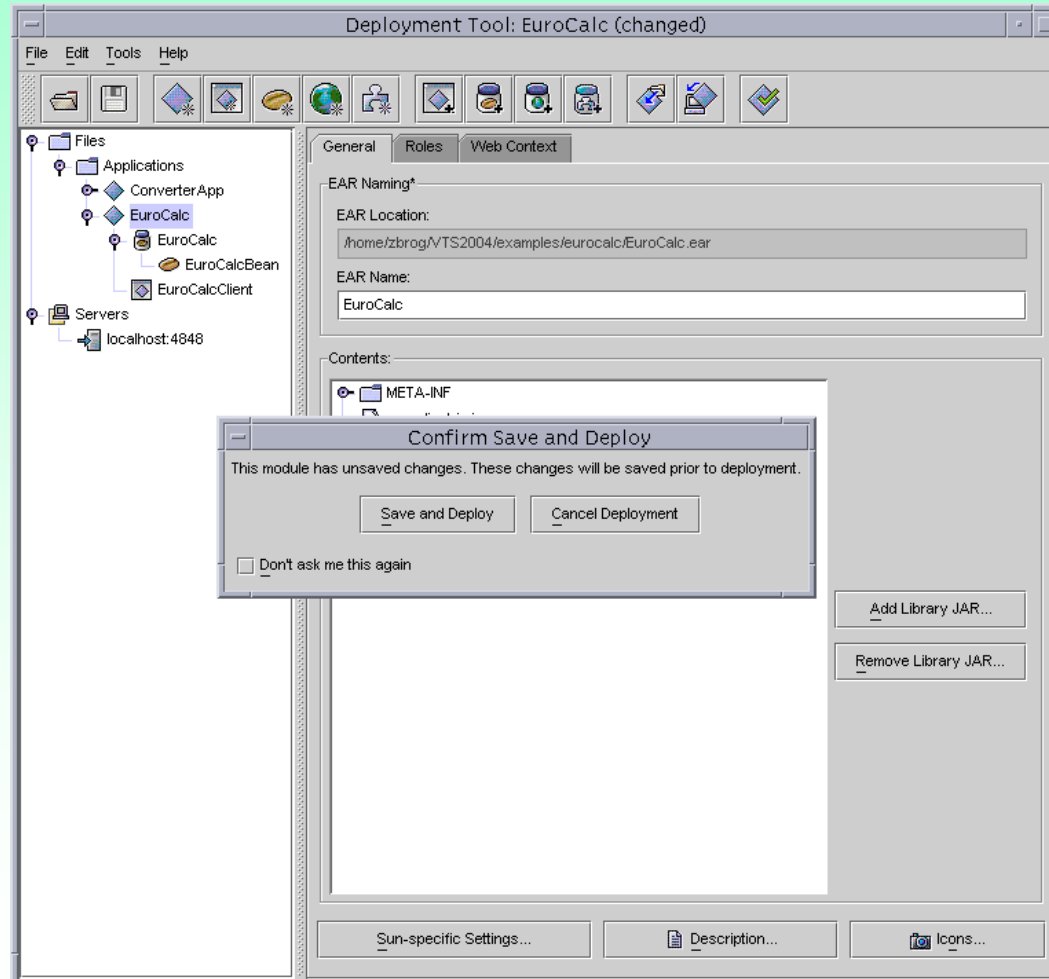


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Deployment Tool: Deployment-Angaben bestätigen





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Deployment Tool: Deployment-Protokoll

```
Deployment Tool: localhost:4848
File Edit Tools Help
Distribute Module
-----
distribute: /home/zbrog/VTS2004/examples/eurocalc/EuroCalc.ear
Deploy action running...
Completed

--- Operation Completed Successfully ---

-----

start: EuroCalc
Running...
Completed

--- Operation Completed Successfully ---
> Created client stub jarfile: /home/zbrog/VTS2004/examples/eurocalc
*****
[Completed (time=15.2sec, status=0)]
-----
Close
Sun-specific Settings... Description... Icons...
```

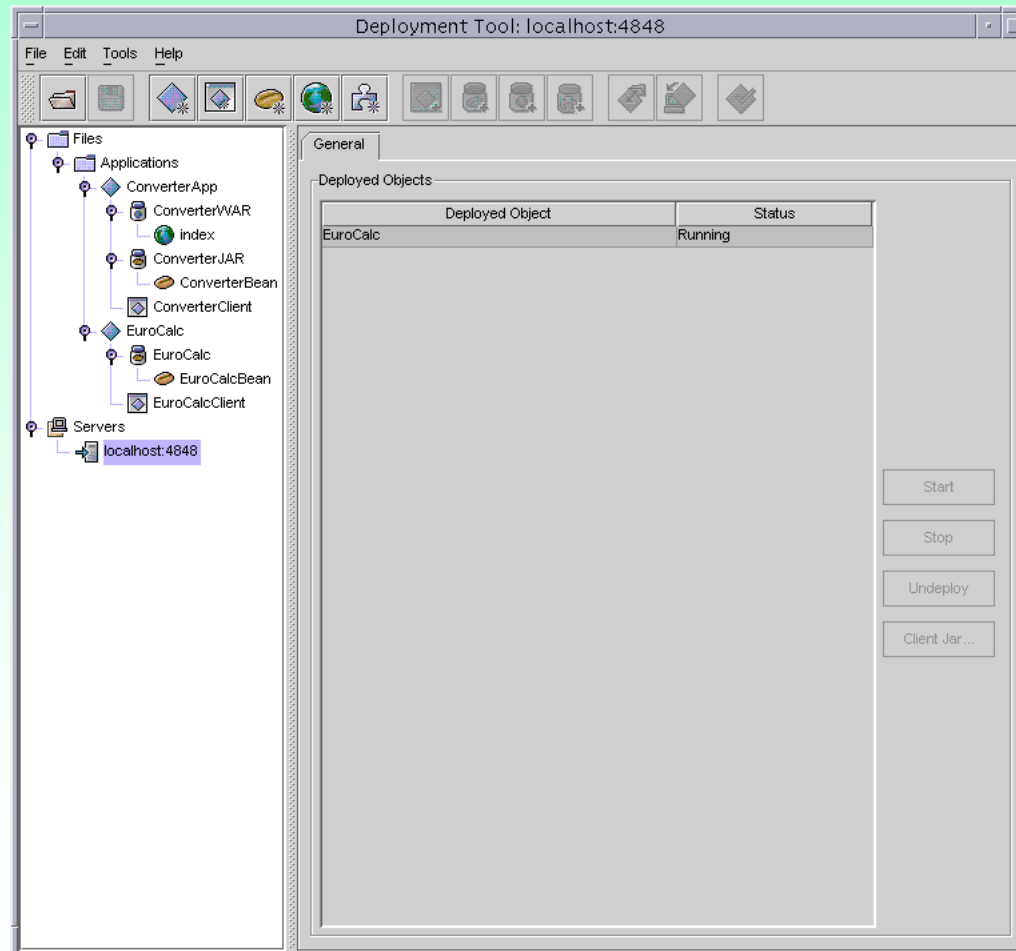


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Deployment Tool: Kontrolle, ob Applikation installiert ist und läuft





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