Writing Enterprise Applications with Java 2 Platform, Enterprise Edition - part1

J storm
JAVA PROFESSIONAL

## Document Information

Document title:	Writing Enterprise Applications with Java 2 Platform, Enterprise Edition
Document file name:	Writing_Enterprise_Applications_1_JunoYoon
Revision number:	<1.0>
Issued by:	< > junoyoon@orgio.net
Issue Date:	<2001/04/15>
Status:	final

Content Information

|	
Audience	

Abstract	J2EE Session
	                                                    EJB
	                  .-

Reference	Writing Enterprise Applications with JavaTM 2 Platform, Enterprise Edition By Monica Pawlan (http://developer.java.sun.com/developer/online Training/J2EE/Intro/)
Benchmark information	

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, HTML   , Session Bean   5-Tier
                    , J2EE   J2EE SDK

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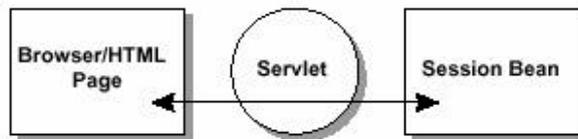
J2EE SDK   ,   ,
                          J2EE   . J2EE SDK   J2EE   , W
eb   ,   , J2EE API ,   ,   .
              , J2EE   .

5-Tier

   5-Tier   , HTML
                                  .   ,
Session Bean   , JNDI (Java Naming and Directory interfaceTM) API
                  .   ,   HTML
                                  .
                                                      ,   ‘
                  ,   .   , J2EE   Sess
ion Bean   , Session Bean
          ,   .
5-Tier   , 3   4   .   5-Tier
                      4   (1.). 3   ,

2   ,   Web

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JavaServer PagesTM technology   , 3

.

1. 5 Tier
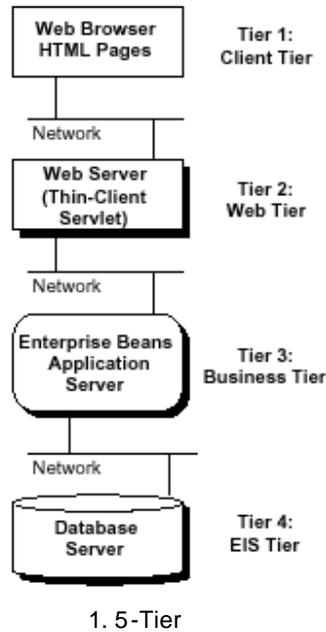
4   , 3   ,

,   4   .   ,

JavaServer PagesTM   XML (Extensible Markup Language) technology

.

J2EE

, Java 2 SDK Enterprise Edition (J2EE), Version 1.2. 1

Release (http://java.sun.com/j2ee/download.html)   Java 2 SDK, Standard Edition (J2SE),

Version 1.2   (http://java.sun.com/jdk/index.html)

.

, J2EE , J2SE   monicap   J2EE

.

:   J2EE   J2SE   .

Unix:

/home/monicap/J2EE/j2sdkee1. 2.1

/home/monicap/J2EE/jdk1. 2.2

Windows:

\home\monicap\J2EE\j2sdkee1. 2.1

\home\monicap\J2EE\jdk1. 2.2

, J2EE   , CloudScape   , SSL (Secure S
ocket Layer)   Web   ,   ,   , EJB,
    API   .   ,
.

,
..   ,   JDK
.

Unix:

/home/monicap/J2EE/jdk1. 2.2/bin

/home/monicap/J2EE/j2sdkee1. 2.1/bin

Windows:

\home\monicap\J2EE\jdk1. 2.2\bin

\home\monicap\J2EE\j2sdkee1. 2.1\bin

,   ,
.

Unix:

/home/monicap/J2EE/j2sdkee1. 2.1/lib/j2ee.jar

Windows:

\home\monicap\J2EE\j2sdkee1. 2.1\lib\j2ee.jar

J2EE

J2EE   , J2EE   . J2EE
                                                                                          ,
                      , J2EE   .
J2EE   ,   .

- o
- o   JavaBean
- o   JavaServer Page   (Web   )
- o

                      ,   J2EE   2   J2EE   -   Session
Bean -   .   HTML   WAR (Web Archive)
          Session Bean   JAR   .
WAR   JAR   J2EE
                              EAR (Enterprise Archive)   .
                      ,   .   Session Bean
                              , J2EE   J2EE
                              .   ,
                      .

HTML

bonus.html   HTML   .   HTML   2.
                                      . bonus.html   I
D   .   Submit   , Bonu
sServlet   , Session Bean   ,   Session Bean
              . Session Bean   ,   .
                      , HTML   .

Bonus Calculation

Enter social security Number:

Enter Multiplier:

Submit   Reset

2. HTML

Component   Component

HTML Form Browser	Servlet (Web Server)	Session Bean (Application Server)
bonus.html	BonusServlet.class	CalcBean.class Calc.class CalcHome.class
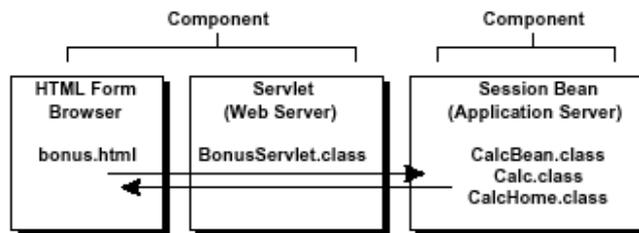
3.

HTML

, HTML , BonusServlet

(alias) . BonusServlet , BonusAlias

(alias) , HTML Submit , BonusServlet

.

, Unix , bonus.html /home/monicap/J2EE/ClientCode

. Windows , slash

.

```
<HTML>
<BODY BGCOLOR = "WHITE">
<BLOCKQUOTE>
<H3>Bonus Calculation</H3>
<FORM METHOD="GET" ACTION="BonusAlias">
<P>
Enter social security Number:
<P>
<INPUT TYPE="TEXT" NAME="SOCSEC"></INPUT>
<P>
Enter Multiplier:
<P>
<INPUT TYPE="TEXT" NAME="MULTIPLIER"></INPUT>
<P>
<INPUT TYPE="SUBMIT" VALUE="Submit">
```

```
            <INPUT TYPE="RESET">
            </FORM>
            </BLOCKQUOTE>
            </BODY>
            </HTML>
```

, Unix   , BonusServlet.java   /home/monicap/J2EE/ClientCode

                      .   .

- o
- o   Session Bean
- o   Session Bean
- o   Session Bean   ,   HTML

               .

9   .

import

                               import   .

- o   javax.servlet :
     . HTTPServlet   ,   ServletEx
     ception   .
- o   javax.servlet.http : HTTP   . HttpServlet
     .
- o   java.io :   . HttpServlet
     ,   IOException   .
- o   javax.naming : Session Bean   , Ja
     va Naming and Directory Interface (JNDITM)   .
- o   javax.rmi : Session Bean   ,   -
     .

init

    BonusServlet   init   Session Bean   ,
             .   ,   ,
                   JNDI   (calcs)   .   ,
                CalcHome   ,

PortableRemoteObject   na

rrow   .

```
InitialContext ctx = new InitialContext();
Object objref = ctx.lookup("calcs");
homecalc = (CalcHome) PortableRemoteObject.narrow( objref,
                                        CalcHome.class);
```

doGet

doGet   request   response   .
                  Request   ,   Response   .
           ,   Request   ,   ,
   HTTP   request
    HTML   response   . doGet
  , Request   , IOException   ,
         ServletException   .   , do
Get   Calc   , calcBonus   .

```
public void doGet (HttpServletRequest request,
                          HttpServletResponse response)
                          throws ServletException, IOException {
    String socsec = null;
    int multiplier = 0;
    double calc = 0.0;
    PrintWriter out;
    response.setContentType("text/html");
    String title = "EJB Example";
    out = response.getWriter();
    out.println("<HTML><HEAD><TITLE>");
    out.println(title); out.println("</TITLE></HEAD><BODY>");
    try{
        //Retrieve Bonus and Social Security Information
        String strMult = request.getParameter(
        "MULTIPLIER");
        Integer integerMult = new Integer(strMult);
        multiplier = integerMult.intValue();
        socsec = request.getParameter("SOCSEC");
        //Calculate bonus
        double bonus = 100.00;
        theCalculation = homecalc.create();
        calc = theCalculation.calcBonus(
        multiplier, bonus);
        }catch(Exception CreateException){
        CreateException.printStackTrace();
    }
```

```java
//Display Data
out.println("<H1>Bonus Calculation</H1>");
out.println("<P>Soc Sec: " + socsec + "<P>");
out.println("<P>Multiplier: " + multiplier + "<P>");
out.println("<P>Bonus Amount: " + calc + "<P>");
out.println("</BODY></HTML>");
out.close();
}
```

```java
import javax.servlet. *;
import javax.servlet.http. *;
import java.io. *;
import javax.naming. *;
import javax.rmi.PortableRemoteObject;
import Beans. *;
public class BonusServlet extends HttpServlet {

                                        CalcHome homecalc;

public void init(ServletConfig config)

                                        throws ServletException{
//Look up home interface
    try{
        InitialContext ctx = new InitialContext();
        Object objref = ctx.lookup("calcs");
        homecalc =
            (CalcHome) PortableRemoteObject.narrow(
        objref,
        CalcHome.class);
    } catch (Exception NamingException) {
        NamingException.printStackTrace();
    }
}
public void doGet (HttpServletRequest request,

                                HttpServletResponse response)
                                throws ServletException, IOException {
    String socsec = null;
    int multiplier = 0;
    double calc = 0.0;
    PrintWriter out;
    response.setContentType("text/html");
    String title = "EJB Example";
    out = response.getWriter();
    out.println("<HTML><HEAD><TITLE>");
```

```
out.println(title);
out.println("</TITLE></HEAD><BODY>");
try{
    Calc theCalculation;
    //Get Multiplier and Social Security Information
    String strMult = request.getParameter("MULTIPLIER");
    Integer integerMult = new Integer(strMult);
    multiplier = integerMult.intValue();
    socsec = request.getParameter("SOCSEC");
    //Calculate bonus
    double bonus = 100.00;
    theCalculation = homecalc.create();
    calc =
            theCalculation.calcBonus(multiplier, bonus);
} catch(Exception CreateException){
    CreateException.printStackTrace();
}
//Display Data
out.println("<H1>Bonus Calculation</H1>");
out.println("<P>Soc Sec: " + socsec + "<P>");
out.println("<P>Multiplier: " +
multiplier + "<P>");
out.println("<P>Bonus Amount: " + calc + "<P>");
out.println("</BODY></HTML>");
out.close();
}
public void destroy() {
    System.out.println("Destroy");
}
}
```

Session Bean

Session Bean   .

                                        , Session Bean   .   , Entity

Bean   ,   ..

                              , Entity Bean   .

                    ,   Bean   BonusServlet   Request

                          ,   , S

ession Bean   .

          4   J2EE   ,   Sess

ion Bean   .

                                        .

.
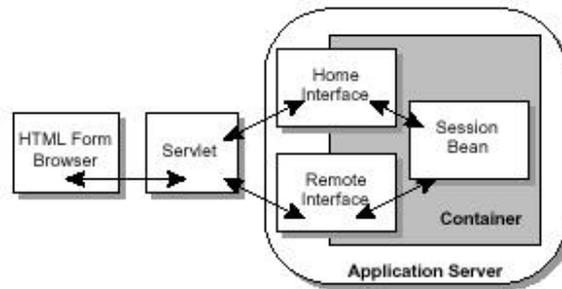
4.

,   Session Bean   . Unix
, CalcBean.java, Calc.java, CalcHome.java   3   /home/monicap/J2EE/Beans
                                        . CalcBean

            package Beans   ,
                        .   ,   Beans
                                    .   Beans
        (   )   slash
    .

        :   Session Bean   ,
    Bean   ,   .

CalcHome

        BonusServlet   Session Bean   ,   Session Bean
                        .   EJBHome   ,   Sessi
on Bean   create   . Session Bean
        , CreateException
            , RemoteException   .
        package Beans;
        import java.rmi.RemoteException;
        import javax.ejb.CreateException;
        import javax.ejb.EJBHome;
        public interface CalcHome extends EJBHome {
        Calc create() throws CreateException,
        RemoteException;
        }

Calc

,   Session Bean   .
EJBObject   calcBonus
.   java.rmi.RemoteException   ,
CalcBean   .

```
package Beans;
import javax.ejb.EJBObject;
import java.rmi.RemoteException;
public interface Calc extends EJBObject {
public double calcBonus(int multiplier,
double bonus)
throws RemoteException;
}
```

CalcBean

Session Bean   SessionBean   ,
CalcBonus   . setSessionContext   ejbCreate
, BonusServlet   CalcHome   create   ,
.

, SessionBean   .
Bean   . Bean
,   .

```
package Beans;
import java.rmi.RemoteException;
import javax.ejb.SessionBean;
import javax.ejb.SessionContext;
public class CalcBean implements SessionBean {
public double calcBonus(int multiplier,
double bonus) {
double calc = (multiplier*bonus);
return calc;
}
//These methods are described in more
//detail in Lesson 2
public void ejbCreate() {
}
public void setSessionContext(
SessionContext ctx) { }
public void ejbRemove() { }
public void ejbActivate() { }
public void ejbPassivate() { }
```

```
public void ejbLoad() { }
public void ejbStore() { }
}
```

Session Bean

, Session Bean   (Unix)
(Windows)   .

Session Bean

Unix

```
#! /bin/sh
cd /home/monicap/J2EE
J2EE_HOME=/home/monicap/J2EE/j2sdkee1. 2.1
CPATH=. :$J2EE_HOME/lib/j2ee.jar
javac -d . -classpath "$CPATH" Beans/CalcBean.java
Beans/CalcHome.java Beans/Calc.java
```

Windows

```
cd \home\monicap\J2EE
set J2EE_HOME=\home \monicap\J2EE\j2sdkee1. 2.1
set CPATH=. ;%J2EE_HOME%\lib\j2ee.jar
javac -d . -classpath %CPATH% Beans/CalcBean.java
Beans/CalcHome.java Beans/Calc.java
```

Unix

```
#! /bin/sh
cd /home/monicap/J2EE/ClientCode
J2EE_HOME=/home/monicap/J2EE/j2sdkee1. 2.1
CPATH=. :$J2EE_HOME/lib/j2ee.jar:
/home/monicap/J2EE
javac -d . -classpath "$CPATH" BonusServlet.java
```

Windows

```
cd \home\monicap\J2EE\ClientCode
set J2EE_HOME= \home \monicap\J2EE\j2sdkee1. 2.1
set CPATH=. ;%J2EE_HOME%\lib\j2ee.jar;
\home\monicap\J2EE
javac -d . -classpath %CPATH% BonusServlet.java
```

J2EE

,J2EE   .

, J2EE   bin

. bin   ,J2EE   ,

.

j2ee -verbose

: Outlook   ,J2EE   .

,   .

Unix:

j2sdkee1. 2.1/bin/j2ee -verbose

Windows:

j2sdkee1. 2.1\bin\j2ee -verbose

v e r b o s e   ,   .
[J2EE server startup complete.]   ,J2EE

,   .

J2EE   ,

. bin   ,J2EE   ,

.

deploytool

,   .

Unix:

j2sdkee1. 2.1/bin/deploytool

Windows:

j2sdkee1. 2.1\bin\deploytool

: deploytool   ,   JAVA_FO
NTS   c:\<font directory>   .
, deploytool   BasicFileChooserUI   NullPointerException   ,
(ex. c:\)   . j2sdke

e1. 2.1   bin   ,
,   .

, 4   (5.).
J2EE   . Inspecting
,
.
.   J2E
E   ,   , Inspecting ,
.

:   ,   .
,
,
.   ,   ,
.   ,
.

5.
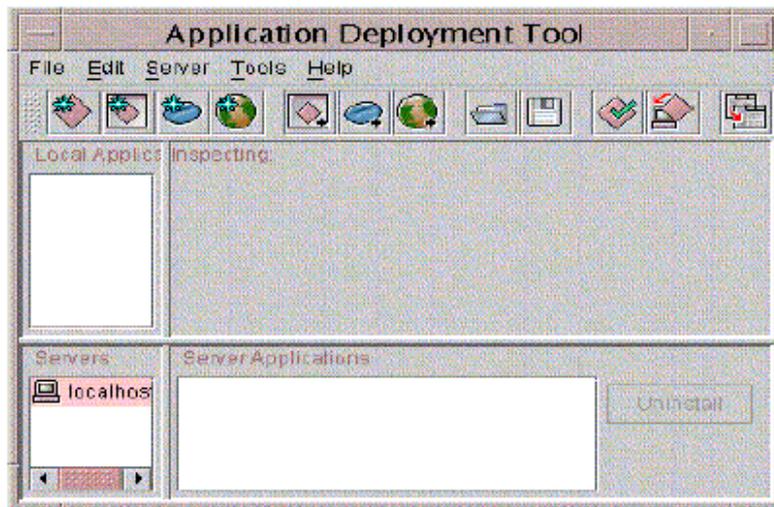
J2EE

J2EE   ,
.   .

o   J2EE   (BonusApp.ear)
o   Bean   (CalcBean.jar)
o   Web   (Bonus.war)
o   Bean   JNDI   (calcs)
o   J2EE   (BonusRoot)
o   J2EE
o   J2EE   , J2EE   Enterprise Archive(EAR)

           .

[File menu]   [New Application]   .

[New Application]   .

o   [Application File Name]   BonusApp.ear   .
o   [Application Display Name]   , BonusApp
       .
o   [Browse]   ,   .
            ,   EAR
       .

[New Application]

o   EAR   .
o   , /export/home/monicap/J2EE   .
o   [File name]   BonusApp.ear   .
o   [New Application]   .
o   [OK]   .

                     BunusApp   Inspector   ,
          ,   , BonusApp   .
                         , JAR   J2EE   ,
                    .

Session Bean

                 Bean (Entity Bean   Session Bean)   JAR (Java Archive)   .

[File menu]   [New Enterprise Bean]   . [Introduction]
                            ,[New Enterprise Bean Wizard]
     . [Next >]( )   .

[EJB JAR]   .

o   [Enterprise Bean will go in] : BonusApp
     [Display name] : CalcJar
     [Description] :   Session Bean
o   [Add]   .   [Add]   2   ,
                      , 2   .

[Add Files to .JAR]   , J2EE   .
                                                                           . J2EE
     , Beans   ,   .

o   Calc.class   .
o   [Add]   .
o   CalcHome.class   .
o   [Add]   .
o   CalcBean.class   .
o   [Add]   .

     (   ) : [Add Contents to .JAR]   6.
   . Enterprise Bean JAR   Bean
                .
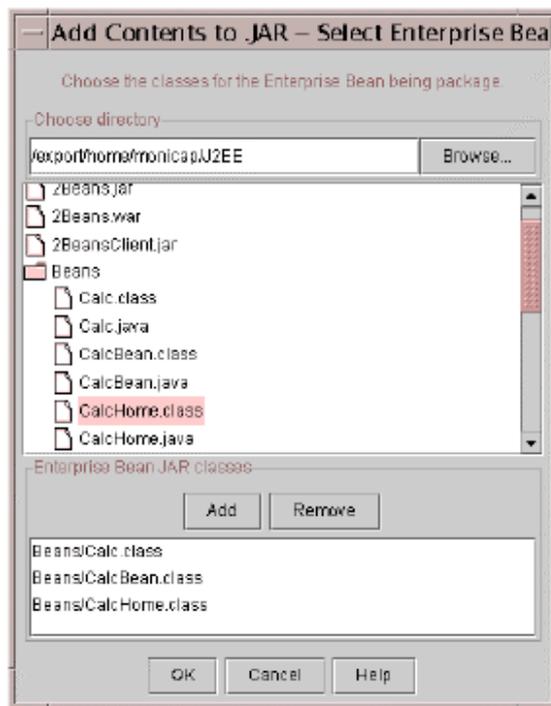
6. Session Bean

    o   [OK]   , EJB JAR   . [Contents]
            , Beans/Calc.class, Beans/CalcHome.class, Beans/CalcBean.class
            3   .

    o   [Next >]   .

[General]   ,   .

    o   [classname] : Beans.CalcBean
        [Home interface] : Beans.CalcHome
        [Remote interface] : Beans.Calc
        [Bean type] :   ,   (Stateless)
    o   (JAR   BonusApp
)   , JAR   .
    o   [Display Name] : CalcBean
    o   [Description] :   JAR   Bean   CalcBean   .
    o   [Next >]   .

[Environment Entries]   ,
          ,

    o   [Finish]   .

J2EE   JAR   .

    o   .
    o   BonusApp   ,   . CalcJar   JA
        R   .
    o   CalcJar   , CalcBean   Session B
        ean   .

Web

Web   (JavaServer PagesTM   )   WAR (Web Archive)
           .

[File]   ,[New Web Component]   . [New Web Component Wizard]
           .   , [Next >]   .

[WAR File General Properties dialog box]   ,
           .

    o   [WAR file] : BonusApp
        [Display name] : BonusWar
        [Description] :   WAR   HTML   (   )   .
    o   [Add]   .

[Add Contents to WAR]   ,   .

    o   [Root Directory]   J2EE   , ClientCode ( )   , Clie
        ntCode   .
    o   bonus.html   . WAR   , bonus.html
        , ClientNode ( )
               .
    o   [Add]   .
        :   , BonusServlet.class   bonus.html   .
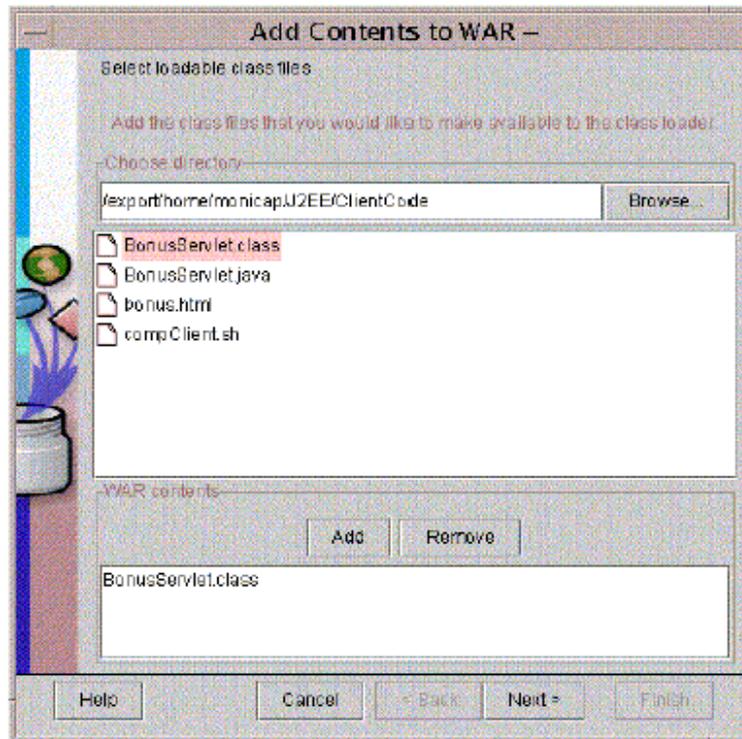
7. bonus.html

    o   [Next >]   .
    o   ClientCode   .
    o   BonusServlet.class   .
    o   [WAR contents]   BonusServlet.class   , ClientCode ( )
                    ( )   .
    o   [Add]   .

[Add Contents to WAR]   ,   8.   .

   o   [Finish]   .

[WAR File General Properties]

   o   [Next >]   .

[Choose Component Type]

   o   [Servley]   .
   o   [Next >]   .
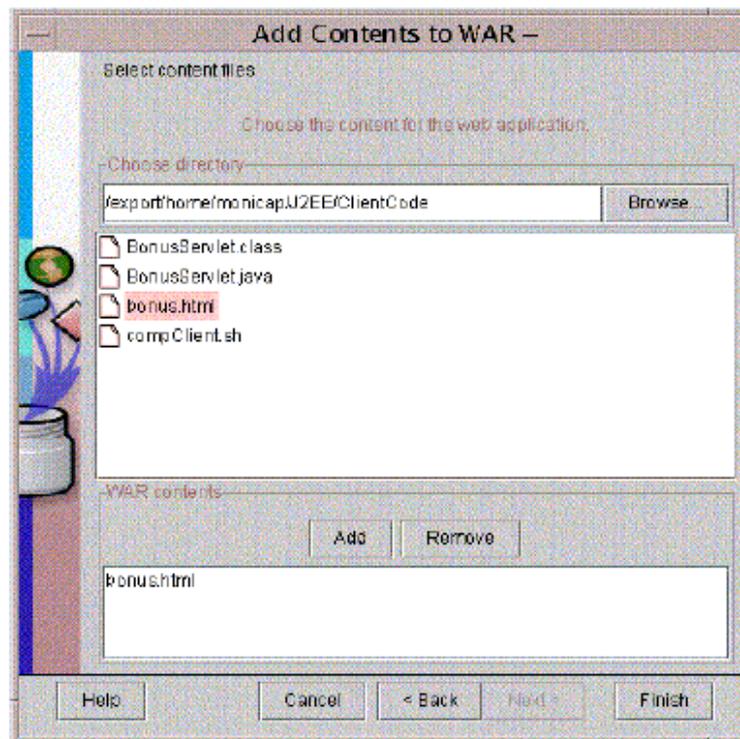
8. BonusServlet.class

[Component General Properties]

   o   [Servlet Class]   combobox   , BonusServlet   .
   o   (BonusServlet)   (Description)   .
   o   , Startup   load sequ
       ence   .

[Component Initialization Parameters]

o   [Next >]   .

[Component Aliases]

o   [Add]   .
o   BonusAlias   ,   .   (alias)
              , bonus.html   ACTION
              .

o   [End]   .

[Contents]   , WAR   , Web
   XML   , bonus.html   , BonusServlet
        . WAR   ,   Web-INF/classes
              . WAR   , BonusServlet   public_html
   Context Root   .   2.2   Web   ,
              .

o   ,   .
o   .
o   ,   .

J2EE

              ,   .
              , compiler   Bean   ,
              .

JNDI Name

o   BonusApp   .
              .   [JNDI Name]
              .
o   [JNDI Name]   .   1   3   .
              , CalcBean   .
o   [JNDI Name]   , calcs   . JNDI Na
   me   BonusServlet   lookup

.

   o   .

Context Root

   o   ,[Web Contents]   .   ,
        BonusWar   .
   o   , BonusRoot   .
   o   .   , j2sdkee1. 2.1
           public_html   , BonusRoot   b
    onus.html   BonusServlet   9.
        .
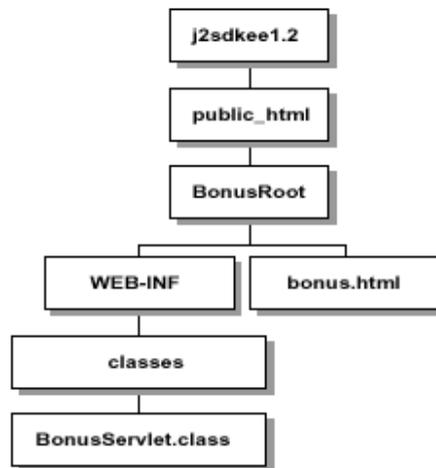
9. Context Root

Alias

   o   , BonusWar   BonusServlet
          .
   o   ,[Alias]   . BonusAlias (
)   .
   o   BonusAlias   , BonusAlias
        ,   .

J2EE

                ,
     .   , compiler   Bean   ,
     .

o   BonusApp   ,[   ]   [Verify...](   )   .
o   ,[OK]   .   , Verify
                                                                      .

o   Verify   .
                  .

        :   1.2   , tests app.WebURI   .
   , WAR   . war   (extension)
WAR   .   ,
              , J2EE   .

o   [   ]   ,[...]   . [
        BonusApp]   . [   ]   localhost
          , J2EE
              .

        : [Jar   ]   ,
      .   ,
                                                    .   ,   HT
ML   ,   .
                                                                      JAR
        .

o   [Next >]   . JNDI   calcs   .
                              calcs   .
o   [Next >]   . Context Root   BonusRoot
            .   BonusRoot   ,   .
o   [Next >]   .
o   [Finish]   ,   .
                                                .
o   ,   3   ,   10.
                .   , [OK]   .
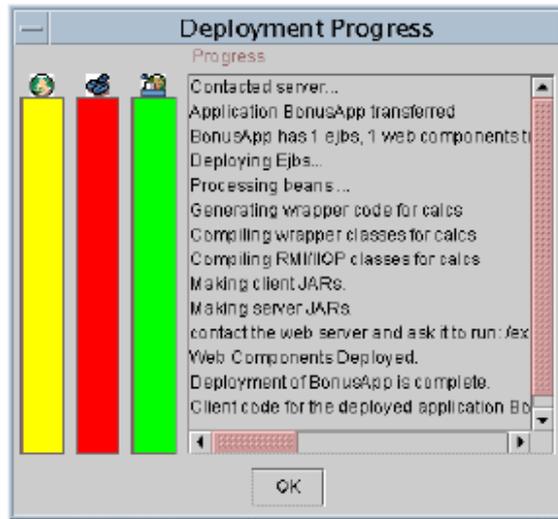
10

J2EE

Web   8000   . bonus.html   , Web
            ,   HTML   , http://localhost:8000/BonusRoot/b
onus.html URL   .

        : 8000   , ~/J2EE/j2sdkee1. 2.1/config   web.pro
    perties   ,J2EE   .

    o   social security number   .
    o   multiplier   .
    o   Submit   . BonusServlet   ,
            HTML   .

Bonus Calculation
Soc Sec: 7777777777
Multiplier: 25
Bonus Amount 2500.0

                    2   ,   . [Update Application Files]   [Update
    and Redeploy Application]   .   ,
                                                        .

        o   [Update Application Files]   ,   ,

.

.

   o   [Update and Redeploy Application]   ,

         ,   .