

Judd Solutions

Development, Mentoring and Training



Developing Enterprise JavaBeans with J2EE Standard Tools (JST)

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Judd Solutions, LLC



Christopher M. Judd

Available
Sept 14, 2005



Bearable Moments



Available
Dec 1, 2005

Illustrated by Dale Herron

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House Keeping

- 701 - Building with the Data Tools Project
 - Wednesday 2:00 pm – 3:30 pm
 - Der-Ping Chou and John Graham

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Agenda

- EJB Overview
- WTP Overview
- JST Overview
- Workspace Setup
- Session Bean
- Session Bean Client
- Packaging and Deployment
- Conclusion

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Enterprise JavaBean Development is HARD!!!

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EJB Types

- Session – Server-side business logic
 - Stateful
 - Stateless
- Entity – Persistable business objects
 - CMP
 - BMP
- Message-Driven – Consumers of JMS messages

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EJB Files

- Session
 - Remote Interface
 - Home Interface
 - Local Interface
 - Local Home Interface
 - Bean Class
 - EJB Deployment Descriptor
 - App Server Specific EJB Deployment Descriptor

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EJB Files

- Entity
 - Remote Interface
 - Home Interface
 - Local Interface
 - Local Home Interface
 - Bean Class
 - EJB Deployment Descriptor
 - App Server Specific EJB Deployment Descriptor
 - App Server Specific CMP Deployment Descriptor

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EJB Files

- Message-Driven Bean
 - Bean Class
 - EJB Deployment Descriptor
 - App Server Specific EJB Deployment Descriptor

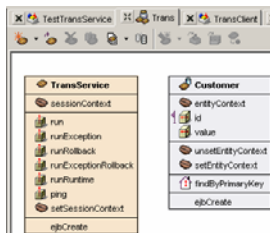
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Managing Complexity

- Code classes and interfaces by hand
- Diagrams



- Annotations

```

/**
 * A generated session bean
 * @ejb.bean name="TransService"
 *           description="A session bean named TransService"
 *           display-name="TransService"
 *           jndi-name="TransService"
 *           type="Stateless"
 *           transaction-type="Container"
 */
public abstract class TransServiceBean implements
    javax.ejb.SessionBean {

```

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Web Tools Platform Project (WTP)

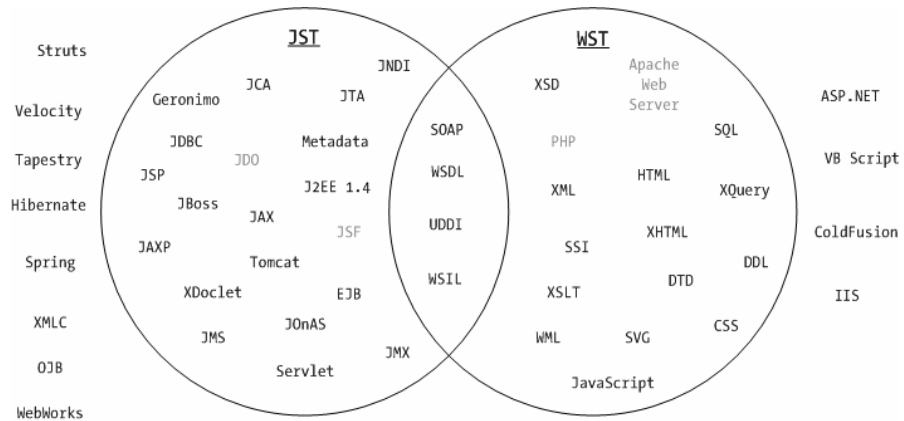
- Top Level Eclipse Project
- www.eclipse.com/webtools/
- Development tools for web development
 - No runtime dependencies
 - Vendor extensible
- Subprojects
 - Web Standard Tools (WST)
 - J2EE Standard Tools (JST)
- Version 0.7 was released August 2, 2005.
- Dependencies
 - Eclipse 3.1
 - Eclipse Modeling Framework (EMF) 2.1.0
 - Graphic Editor Framework (GEF) 3.1
 - Java EMF Model (JEM) 1.1

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WTP Scope



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WTP Installation Options

- All-in-one
 - Eclipse 3.1
 - Eclipse Modeling Framework (EMF) 2.1.0
 - Graphic Editor Framework (GEF) 3.1
 - Java EMF Model (JEM) 1.1
- Update Manager
 - Eclipse.org update site
- Piecemeal

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JST Scope

WTP 0.7 focuses on J2EE 1.4 support

- EJB 2.1
- Servlet 2.4
- JSP 2.0
- JMS 1.1
- JTA 1.0
- JavaMail 1.3
- JAF 1.0
- JAXP 1.2
- Connector 1.5
- Web Services 1.1
- JAX-RPC 1.1
- SAAJ 1.2
- JAXR 1.0
- J2EE Management 1.0
- JMX 1.2
- J2EE Deployment 1.1
- JACC 1.0

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JST Future Scope (1.5)

- EJB 3.0
- JavaServer Faces (JSF)

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JST Annotations

- Plug-able annotations platform
- XDoclet
 - Open Source
 - Attribute Oriented Programming (AOP) framework
 - xdoclet.sourceforge.net
- Generates
 - Bean Interfaces
 - Bean Util classes
 - EJB Deployment Descriptors
 - Web Deployment Descriptors

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JST Projects

- Projects Types
 - Enterprise Application (ear)
 - EJB Project (ejb-jar)
 - Dynamic Web Project (war)
 - Application Client (jar)
 - Connector Project (rar)

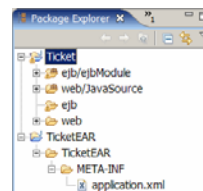
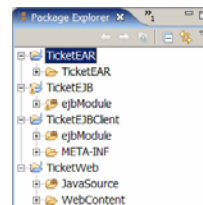
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JST Projects

- Project Layouts
 - Visual Age/WSAD
 - Each module is a project
 - WTP Flexible Projects
 - Project may contain multiple modules



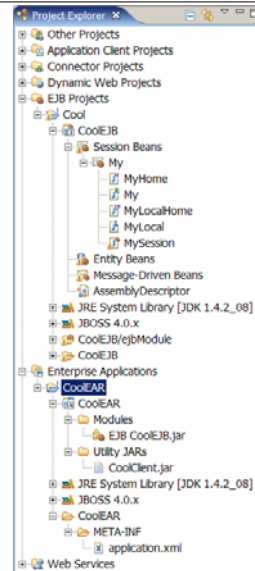
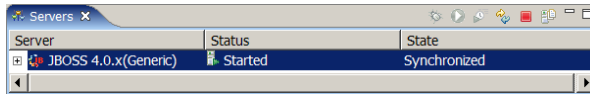
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JST Views

- Views
 - Project Explorer
 - Servers

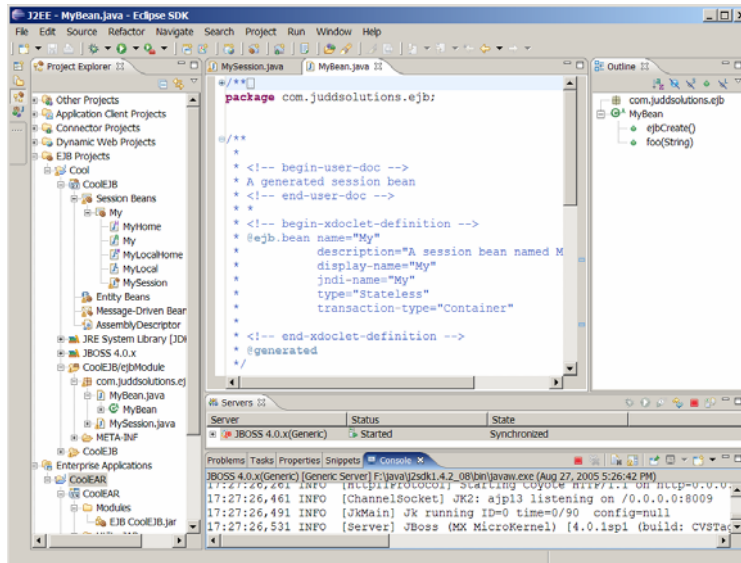


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JST Perspective



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- **Workspace Setup**
- Session Bean
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Workspace Setup

- **Configure application server**
- Enable Multiple Modules
- Configure J2EE Annotations

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Supported Servers

- Apache Tomcat
 - 3.2
 - 4.0
 - 4.1
 - 5.0
 - 5.5
- Apache Geronimo 1.0
- BEA WebLogic 8.1 & 9.0
- IBM WebSphere 6.0.x
- JBoss 3.2.3
- JOnAS 4.x

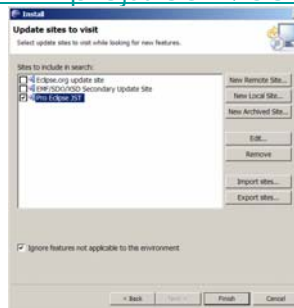
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JBoss 4.x Support

- Server Definition for JBoss 4.x
- Licensed under the Apache Software License
- Install via the Eclipse Update Manager
 - <http://www.projst.com/eclipse/updates/>



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Defining Server

1. Configure server appropriate JDK
2. Configure server runtime
3. Test server

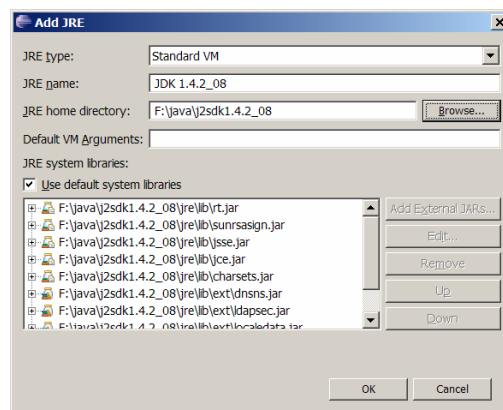
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Configure JDK

- Window > Preferences > Java > Installed JREs



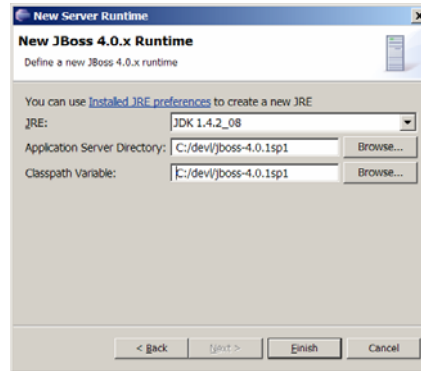
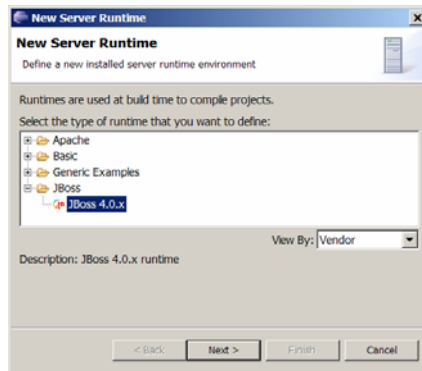
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Configure Server Runtime

- Window > Preferences > Server > Installed Runtimes



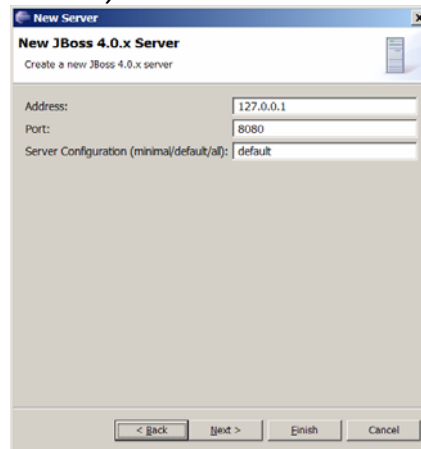
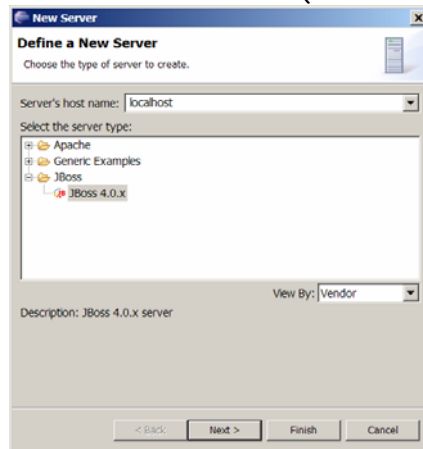
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Testing Server

- Use Server View in J2EE Perspective
1. Add server (New > Server)



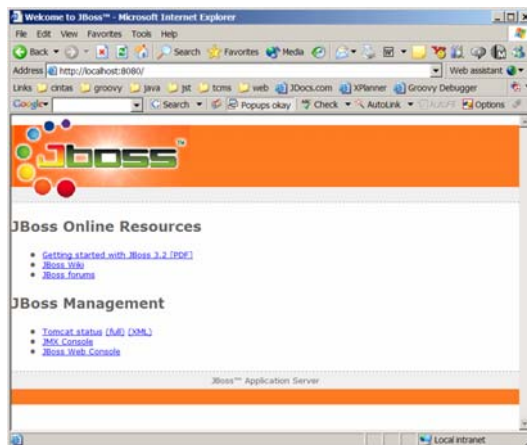
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Test Server

2. Start server
3. Verify server is up



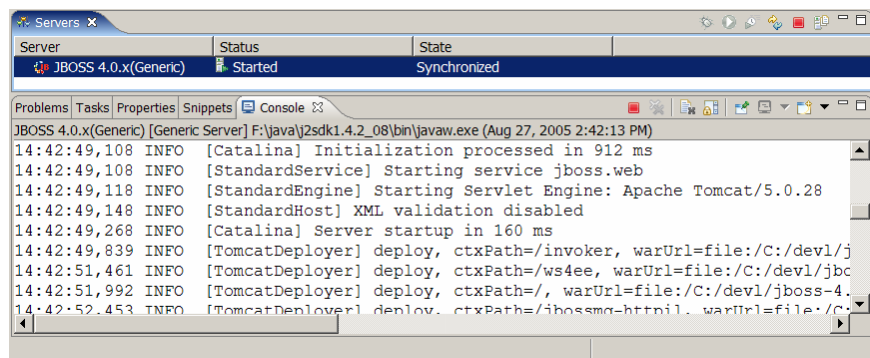
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Server View Usability Tip

- Move Server View above Console view
 - Easier application server startup
 - Easier deployment



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Workspace Setup

- Configure application server
- Enable Multiple Modules
- Configure J2EE Annotations

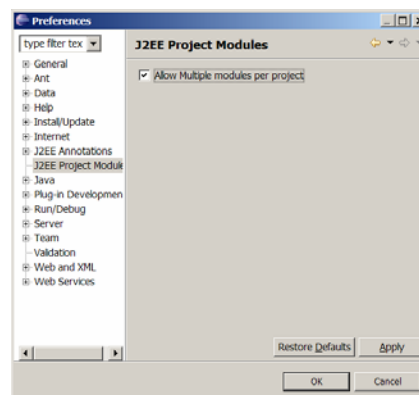
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Enable Multiple Modules

- Referred to as Flexible Projects
- Window > Preferences > J2EE Project Modules



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Workspace Setup

- Configure application server
- Enable Multiple Modules
- Configure J2EE Annotations

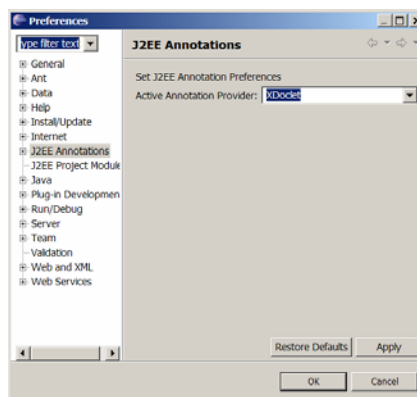
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J2EE Annotations Configurations

- Pluggable Annotations but only XDoclet is currently supported
- Window > Preferences > J2EE Annotations



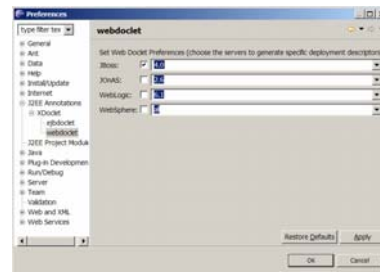
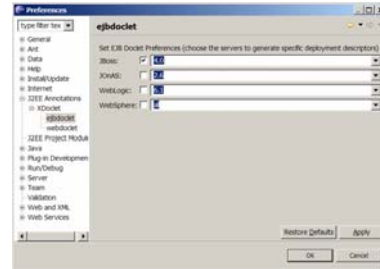
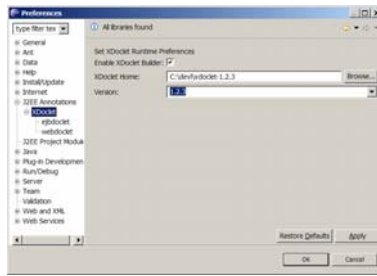
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XDoclet Configurations

- Location
- App server & version



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Create Session Bean

1. Create EJB, EJB Client & EAR Projects
2. Run Enterprise JavaBean Wizard
3. Add XDoclet ejb annotations
4. Add XDoclet app server specific annotations
5. Deploy

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Create EJB Projects

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

Module Name: ejb
Project: Ticket
Target server: JBoss 4.0.x(Generic)

Hide Advanced <<
EJB version: 2.1
 Add module to an EAR application.
EAR application: TicketEAR
 Create an EJB Client JAR module to hold the client interfaces and classes.
 Add support for annotated Java classes

< Back Next > Finish Cancel

New EJB Project
EJB client JAR Creation
Use this wizard to create an EJB client JAR from your existing EJB

Module Name: client
EJB Module: ejb
Client JAR URI: TicketClient.jar

< Back Next > Finish Cancel

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Enterprise JavaBean Wizard

Create EnterpriseJavaBean

Create an EnterpriseJavaBean

SessionBean
 MessageDrivenBean

Annotation Provider: **XDoclet**

You can change your provider [preferences](#)

< Back Next > Finish Cancel

Create EnterpriseJavaBean

Specify class file destination.

Project: Ticket
Module Name: **ejb** New...
Folder: |Ticket|ejb|ejbModule Browse...
Java package: com.juddsolutions.service Browse...
Class name: **TicketServiceBean**
Superclass: java.lang.Object Browse...

Generate an annotated bean class

< Back Next > Finish Cancel

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Enterprise JavaBean Wizard

Create EnterpriseJavaBean

EnterpriseJavaBean

Create an EnterpriseJavaBean

EJB Name: TicketService
JNDI Name: TicketService
Display Name: TicketService
Description: A session bean named TicketService
State Type: Stateless
Transaction Type: Container

< Back Next > Finish Cancel

Create EnterpriseJavaBean

EnterpriseJavaBean

Specify modifiers, interfaces to implement, and method stubs to generate.

Modifiers: Public Abstract Final

Interfaces: javax.ejb.SessionBean Add... Remove

Which method stubs would you like to create?

public static void main(String[] args)
 Inherited abstract methods
 Constructors from superclass

< Back Next > Finish Cancel

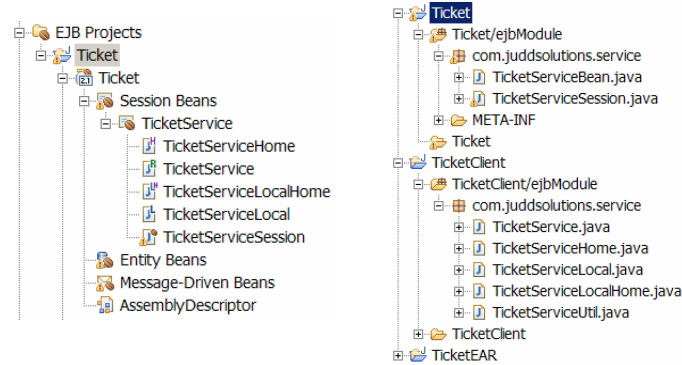
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Enterprise JavaBean Wizard

- Don't need to version control the generated classes
- Don't modify the generated classes



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XDoclet annotations

- Code Assist (ctrl + space)

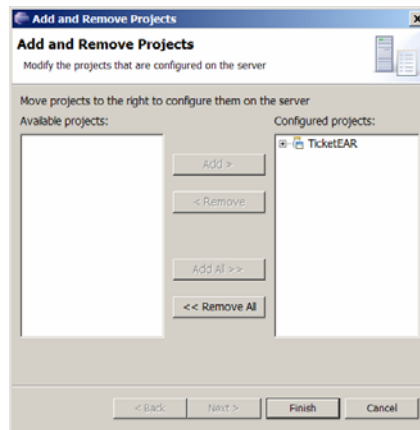
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Deploy

- Right click on server and Add and Remove Projects



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Create Session Bean Client

1. Create Java project
2. Run Class Wizard
3. Reference EJB Client Project
4. Add app server client jars
5. Create jndi.properties file
6. Run

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Java Project

New Java Project
Create a Java project

Create a Java project in the workspace or in an external location.

Project name: Client

Contents

Create new project in workspace
 Create project from existing source

Directory: C:\dev\workspaces\ejbseworld\Client [Browse...](#)

JDK Compliance

Use default compiler compliance (Currently 1.4) [Configure default...](#)
 Use a project specific compliance: 1.4

Project layout

Use project folder as root for sources and class files
 Create separate source and output folders [Configure default...](#)

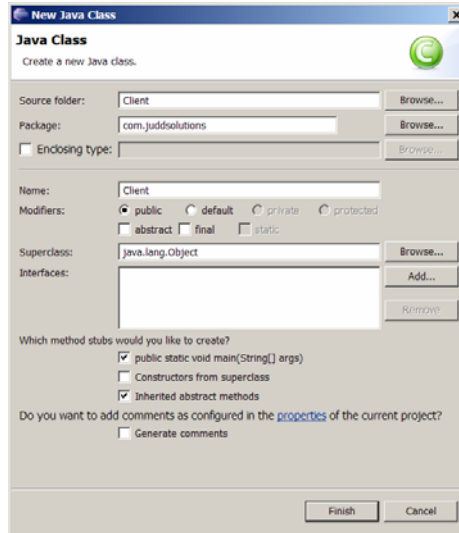
< Back Next > Finish Cancel

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Client



New Java Class
Create a new Java class.

Source folder: Client

Package: com.juddsolutions

Enclosing type:

Name: Client

Modifiers: public default private protected
 abstract final static

Superclass: java.lang.Object

Interfaces:

Which method stubs would you like to create?
 public static void main(String[] args)
 Constructors from superclass
 Inherited abstract methods

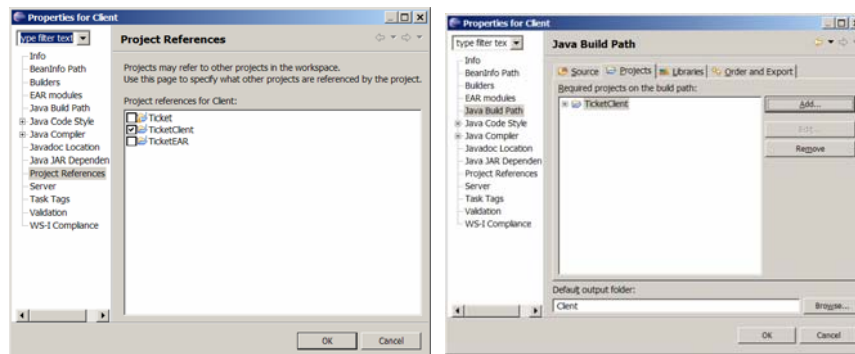
Do you want to add comments as configured in the [properties](#) of the current project?
 Generate comments

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Reference EJB Client Project



Properties for Client

Project References

Projects may refer to other projects in the workspace. Use the page to specify what other projects are referenced by the project.

Project references for Client:

- Ticket
- TicketClient
- TicketEJB

Properties for Client

Java Build Path

Required projects on the build path:

- TicketClient

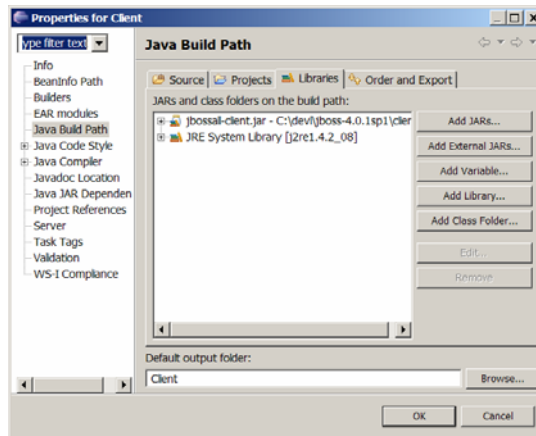
Default output folder: Client

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App Server Client jars



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jndi.properties file

```
# JBoss specific JNDI properties

java.naming.factory.initial=org.jnp.interfaces.NamingContextFactory
java.naming.provider.url=jnp://localhost:1099
java.naming.factory.url.pkgs=org.jboss.naming:org.jnp.interfaces
```

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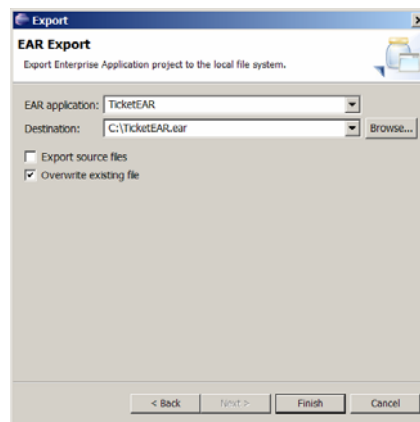
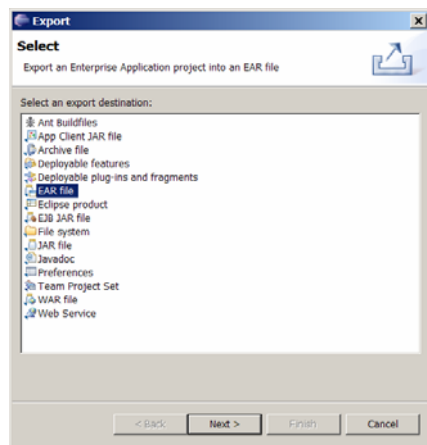
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Packaging

- Export > EAR file



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Conclusion

JST includes all the tools necessary for developing, deploying and testing Enterprise JavaBeans using XDoclet annotations as the mechanism for generating and keeping all the required EJB file up to date.

While entity beans will not be explicitly supported until version WTP 1.0, the session bean wizard can be used to generate the bean file and the appropriate annotations can be made.

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WTP Resources

- www.eclipse.org/webtools/
- www.projst.com
- Tutorials
 - <http://www.eclipse.org/webtools/community/communityresources.html#tutorials>
- Articles
 - <http://www.eclipse.org/webtools/community/communityresources.html#articles>
- New Group
 - <news://news.eclipse.org/eclipse.webtools>

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J2EE Resources

- www.javasoft.com
- www.theserverside.com
- J2EE 1.4 Specification
 - java.sun.com/j2ee/j2ee-1_4-fr-spec.pdf
 - java.sun.com/j2ee/1.4/docs/api/
- EJB 2.1 Specification
 - java.sun.com/products/ejb/docs.html

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- Pro Eclipse JST
 - <http://www.projst.com>
 - <http://www.apress.com/book/bookDisplay.html?bID=447>
- Enterprise Java Development on a Budget
 - <http://www.apress.com/book/bookDisplay.html?bID=197>



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