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Using the Tutorial Examples

This chapter tells you everything you need to know to install, build, and run the examples. The following topics are addressed here:

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- "Starting the Administration Console" on page 41
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Required Software

The following software is required to run the examples.

- "Java Platform, Standard Edition" on page 35
- "Java EE 6 Software Development Kit (SDK)" on page 36
- "Apache Ant" on page 36
- "Java EE 6 Tutorial Component" on page 37
- "NetBeans IDE" on page 39

Java Platform, Standard Edition

To build, deploy, and run the examples, you need a copy of the Java Platform, Standard Edition 6.0 Development Kit (JDK 6). You can download the JDK 6 software from `http://java.sun.com/javase/downloads/index.jsp`.

Download the current JDK update that does not include any other software (such as NetBeans IDE or the Java EE SDK).

Java EE 6 Software Development Kit (SDK)

Oracle GlassFish Server 3.0.1 is targeted as the build and runtime environment for the tutorial examples. To build, deploy, and run the examples, you need a copy of the GlassFish Server and, optionally, NetBeans IDE. To obtain the GlassFish Server, you must install the Java EE 6 Software Development Kit (SDK), which you can download from `http://java.sun.com/javaee/downloads/index.jsp`. Make sure you download the Java EE 6 SDK, not the Java EE 6 Web Profile SDK.

SDK Installation Tips

During the installation of the SDK:

- Configure the GlassFish Server administration user name as `admin` and specify no password. This is the default setting.
- Accept the default port values for the Admin Port (4848) and the HTTP Port (8080).
- Allow the installer to download and configure the Update Tool. If you access the Internet through a firewall, provide the proxy host and port.

This tutorial refers to the directory where you install the GlassFish Server as *as-install-parent*. For example, the default installation directory on Microsoft Windows is `C:\glassfishv3`, so *as-install-parent* is `C:\glassfishv3`. The GlassFish Server itself is installed in *as-install*, the `glassfish` directory under *as-install-parent*. So on Microsoft Windows, *as-install* is `C:\glassfishv3\glassfish`.

After you install the GlassFish Server, add the following directories to your `PATH` to avoid having to specify the full path when you use commands:

as-install-parent/bin
as-install/bin

Apache Ant

Ant is a Java technology-based build tool developed by the Apache Software Foundation (`http://ant.apache.org/`), and is used to build, package, and deploy the tutorial examples. To run the tutorial examples, you need Ant 1.7.1. If you do not already have Ant 1.7.1, you can install it from the Update Tool that is part of the GlassFish Server.

▼ To Obtain Apache Ant

1 **Start the Update Tool.**

   - **From the command line, type the command** `updatetool`.

   - **On a Windows system, select the following:**
     Start → All Programs → Java EE 6 SDK → Start Update Tool

2 **Expand the Oracle GlassFish Server 3.0.1 node.**

3 **Select the Available Add-ons node.**

4 **From the list, select the Apache Ant Build Tool check box.**

5 **Click Install.**

6 **Accept the license agreement.**
   After installation, Apache Ant appears in the list of installed components. The tool is installed in the *as-install-parent*/`ant` directory.

Next Steps To use the `ant` command, add *as-install*/`ant/bin` to your PATH environment variable.

Java EE 6 Tutorial Component

The tutorial example source is contained in the tutorial component. To obtain the tutorial component, use the Update Tool.

If you are behind a firewall that prevents you from using the Update Tool to obtain components, you can obtain the tutorial from the `java.net` web site.

The following topics are addressed here:

▼ To Obtain the Tutorial Component Using the Update Tool

1 **Start the Update Tool.**

   - **From the command line, type the command** `updatetool`.

    ■   **On a Windows system, select the following:**

        Start → All Programs → Java EE 6 SDK → Start Update Tool

2   **Expand the Oracle GlassFish Server 3.0.1 node.**

3   **Select the Available Add-ons node.**

4   **From the list, select the Java EE 6 Tutorial check box.**

5   **Click Install.**

6   **Accept the license agreement.**

After installation, the Java EE 6 Tutorial appears in the list of installed components. The tool is installed in the *as-install*/docs/javaee-tutorial directory. This directory contains two subdirectories, docs and examples. The examples directory contains subdirectories for each of the technologies discussed in the tutorial.

Next Steps   Updates to the Java EE 6 Tutorial are published periodically. For details on obtaining these updates, see .

▼ **To Obtain the Tutorial Component from the** java.net **Web Site**

Follow these steps exactly. If you place the tutorial in the wrong location, the examples will not work.

1   **Open the following URL in a web browser:**

https://javaeetutorial.dev.java.net/

2   **Click the Documents & Files link in the left sidebar.**

3   **In the table on the Documents & Files page, locate the latest stable version of the Java EE 6 Tutorial zip file.**

4   **Right-click the zip file name and save it to your system.**

5   **Copy or move the zip file into the GlassFish SDK directory.**

By default, this directory is named glassfishv3.

6   **Unzip the zip file.**

The tutorial unzips into the directory glassfish/docs/javaee-tutorial.

NetBeans IDE

The NetBeans integrated development environment (IDE) is a free, open-source IDE for developing Java applications, including enterprise applications. NetBeans IDE supports the Java EE platform. You can build, package, deploy, and run the tutorial examples from within NetBeans IDE.

To run the tutorial examples, you need the latest version of NetBeans IDE. You can download NetBeans IDE from `http://www.netbeans.org/downloads/index.html`.

▼ To Install NetBeans IDE Without GlassFish Server

When you install NetBeans IDE, do not install the version of GlassFish Server that comes with NetBeans IDE. To skip the installation of GlassFish Server, follow these steps.

1 Click Customize on the first page of the NetBeans IDE Installer wizard.

2 In the Customize Installation dialog, deselect the check box for Oracle GlassFish Server 3.0.1, then click OK.

3 Continue with the installation of NetBeans IDE.

▼ To Add GlassFish Server as a Server in NetBeans IDE

To run the tutorial examples in NetBeans IDE, you must add your GlassFish Server as a server in NetBeans IDE. Follow these instructions to add the GlassFish Server to NetBeans IDE.

1 Select Tools → Servers to open the Servers dialog.

2 Click Add Server.

3 Under Choose Server, select GlassFish v3 and click Next.

4 Under Server Location, browse the location of your GlassFish Server installation, then click Next.

5 Under Domain Location, select Register Local Domain.

6 Click Finish.

Starting and Stopping the GlassFish Server

To start the GlassFish Server, open a terminal window or command prompt and execute the following:

```
asadmin start-domain --verbose
```

A *domain* is a set of one or more GlassFish Server instances managed by one administration server. Associated with a domain are the following:

- The GlassFish Server's port number. The default is 8080.
- The administration server's port number. The default is 4848.
- An administration user name and password.

You specify these values when you install the GlassFish Server. The examples in this tutorial assume that you chose the default ports.

With no arguments, the start-domain command initiates the default domain, which is domain1. The --verbose flag causes all logging and debugging output to appear on the terminal window or command prompt. The output also goes into the server log, which is located in *domain-dir*/logs/server.log.

Or, on Windows, choose the following:

Start → All Programs → Java EE 6 SDK → Start Application Server

After the server has completed its startup sequence, you will see the following output:

```
Domain domain1 started.
```

To stop the GlassFish Server, open a terminal window or command prompt and execute:

```
asadmin stop-domain domain1
```

Or, on Windows, choose the following:

Start → All Programs → Java EE 6 SDK → Stop Application Server

When the server has stopped you will see the following output:

```
Domain domain1 stopped.
```

Starting the Administration Console

To administer the GlassFish Server and manage users, resources, and Java EE applications, use the Administration Console tool. The GlassFish Server must be running before you invoke the Administration Console. To start the Administration Console, open a browser at `http://localhost:4848/`.

Or, on Windows, choose the following:

Start → All Programs → Java EE 6 SDK → Administration Console

▼ To Start the Administration Console in NetBeans IDE

1 **Click the Services tab.**

2 **Expand the Servers node.**

3 **Right-click the GlassFish Server instance and select View Admin Console**

Note – You must configure a web browser with NetBeans IDE in order for the Administration Console to be started from within NetBeans IDE.

Starting and Stopping the Java DB Server

The GlassFish Server includes the Java DB database server.

To start the Java DB server, open a terminal window or command prompt and execute:

```
asadmin start-database
```

To stop the Java DB server, open a terminal window or command prompt and execute:

```
asadmin stop-database
```

For information about the Java DB included with the GlassFish Server, see `http://developers.sun.com/javadb/`.

▼ **To Start the Database Server Using NetBeans IDE**

To start the database server using NetBeans IDE, follow these steps.

1   Click the Services tab.

2   Expand the Databases node.

3   Right-click Java DB and choose Start Server.

Next Steps   To stop the database using NetBeans IDE, right-click Java DB and choose Stop Server.

Building the Examples

The tutorial examples are distributed with a configuration file for either NetBeans IDE or Ant. Directions for building the examples are provided in each chapter. Either NetBeans IDE or Ant may be used to build, package, deploy, and run the examples.

Tutorial Example Directory Structure

To facilitate iterative development and keep application source separate from compiled files, the tutorial examples use the Java BluePrints application directory structure.

Each application module has the following structure:

- `build.xml`: Ant build file
- `src/java`: Java source files for the module
- `src/conf`: configuration files for the module, with the exception of web applications
- `web`: web pages, style sheets, tag files, and images (web applications only)
- `web/WEB-INF`: configuration files for web applications (web applications only)
- `nbproject`: NetBeans project files

Examples that have multiple application modules packaged into an enterprise application archive (or EAR) have submodule directories that use the following naming conventions:

- *example-name*-`app-client`: Application clients
- *example-name*-`ejb`: Enterprise bean JAR files
- *example-name*-`war`: web applications

The Ant build files (`build.xml`) distributed with the examples contain targets to create a `build` subdirectory and to copy and compile files into that directory; a `dist` subdirectory, which holds the packaged module file; and a `client-jar` directory, which holds the retrieved application client JAR.

Getting the Latest Updates to the Tutorial

Check for any updates to the tutorial by using the Update Center included with the Java EE 6 SDK.

▼ To Update the Tutorial Through the Update Center

1 **Open the Services tab in NetBeans IDE and expand Servers.**

2 **Right-click the GlassFish v3 instance and select View Update Center to display the Update Tool.**

3 **Select Available Updates in the tree to display a list of updated packages.**

4 **Look for updates to the Java EE 6 Tutorial (javaee-tutorial) package.**

5 **If there is an updated version of the Tutorial , select Java EE 6 Tutorial (javaee-tutorial) and click Install.**

Debugging Java EE Applications

This section describes how to determine what is causing an error in your application deployment or execution.

The following topics are addressed here:

Using the Server Log

One way to debug applications is to look at the server log in *domain-dir*/`logs/server.log`. The log contains output from the GlassFish Server and your applications. You can log messages from any Java class in your application with

System.out.println and the Java Logging APIs (documented at
http://java.sun.com/javase/6/docs/technotes/guides/logging/index.html)
and from web components with the ServletContext.log method.

If you start the GlassFish Server with the --verbose flag, all logging and debugging
output will appear on the terminal window or command prompt and the server log. If
you start the GlassFish Server in the background, debugging information is only
available in the log. You can view the server log with a text editor or with the
Administration Console log viewer.

▼ To Use the Log Viewer

To use the log viewer, follow these steps.

1   Select the GlassFish Server node.

2   Click the View Log Files button.

The log viewer opens and displays the last 40 entries.

3   To display other entries, follow these steps.

    a.   Click the Modify Search button.

    b.   Specify any constraints on the entries you want to see.

    c.   Click the Search button at the top of the log viewer.

Using a Debugger

The GlassFish Server supports the Java Platform Debugger Architecture (JPDA). With
JPDA, you can configure the GlassFish Server to communicate debugging information
using a socket.

▼ To Debug an Application Using a Debugger

1   Enable debugging in the GlassFish Server using the Administration Console:

    a.   Expand the Configuration node.

    b.   Select the JVM Settings node. The default debug options are set to:

```
-Xdebug -Xrunjdwp:transport=dt_socket,server=y,suspend=n,address=9009
```

    As you can see, the default debugger socket port is 9009. You can change it to a port
    not in use by the GlassFish Server or another service.

    c.   Select the Debug Enabled check box.

    d.   Click the Save button.

2   Stop the GlassFish Server and then restart it.