The J2EE™ 1.4 Tutorial is a guide to developing enterprise applications for the Java 2 Platform, Enterprise Edition (J2EE) version 1.4. Here we cover all the things you need to know to make the best use of this tutorial.

Who Should Use This Tutorial

This tutorial is intended for programmers who are interested in developing and deploying J2EE 1.4 applications on the Sun Java System Application Server Platform Edition 8.2.

Prerequisites

Before proceeding with this tutorial you should have a good knowledge of the Java programming language. A good way to get to that point is to work through all the basic and some of the specialized trails in *The Java™ Tutorial*, Mary Campione et al., (Addison-Wesley, 2000). In particular, you should be familiar with relational database and security features described in the trails listed in Table 1.

Table 1 Prerequisite Trails in The Java™ Tutorial

Trail	URL
JDBC	`http://java.sun.com/docs/books/tutorial/jdbc`
Security	`http://java.sun.com/docs/books/tutorial/security1.2`

How to Read This Tutorial

The J2EE 1.4 platform is quite large, and this tutorial reflects this. However, you don't have to digest everything in it at once.

This tutorial opens with three introductory chapters, which you should read before proceeding to any specific technology area. Chapter 1 covers the J2EE 1.4 platform architecture and APIs along with the Sun Java System Application Server Platform Edition 8.2. Chapters 2 and 3 cover XML basics and getting started with web applications.

When you have digested the basics, you can delve into one or more of the four main technology areas listed next. Because there are dependencies between some of the chapters, Figure 1 contains a roadmap for navigating through the tutorial.

- The Java XML chapters cover the technologies for developing applications that process XML documents and implement web services components:
  - The Java API for XML Processing (JAXP)
  - The Java API for XML-based RPC (JAX-RPC)
  - SOAP with Attachments API for Java (SAAJ)
  - The Java API for XML Registries (JAXR)
- The web-tier technology chapters cover the components used in developing the presentation layer of a J2EE or stand-alone web application:
  - Java Servlet
  - JavaServer Pages (JSP)
  - JavaServer Pages Standard Tag Library (JSTL)
  - JavaServer Faces
  - web application internationalization and localization
- The Enterprise JavaBeans (EJB) technology chapters cover the components used in developing the business logic of a J2EE application:
  - Session beans
  - Entity beans
  - Message-driven beans

- Enterprise JavaBeans Query Language

- The platform services chapters cover the system services used by all the J2EE component technologies:
  - Transactions
  - Resource connections
  - Security
  - Java Message Service

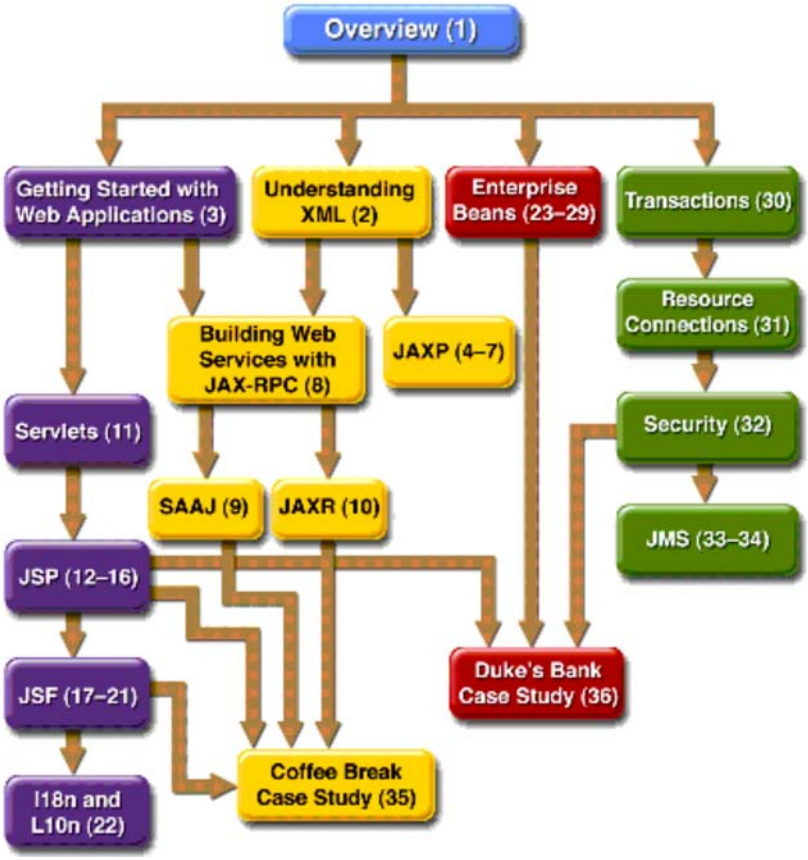


Figure 1 Roadmap to This Tutorial

After you have become familiar with some of the technology areas, you are ready to tackle the case studies, which tie together several of the technologies discussed in the tutorial. The Coffee Break Application (Chapter 35) describes an application that uses the web application and web services APIs. The Duke's Bank Application (Chapter 36) describes an application that employs web application technologies and enterprise beans.

Finally, the appendixes contain auxiliary information helpful to the J2EE application developer along with a brief summary of the J2EE Connector architecture:

- Java encoding schemes (Appendix A)
- XML Standards (Appendix B)
- HTTP overview (Appendix C)
- J2EE Connector architecture (Appendix D)

About the Examples

This section tells you everything you need to know to install, build, and run the examples.

Required Software

Tutorial Bundle

The tutorial example source is contained in the tutorial bundle. If you are viewing this online, you need to download tutorial bundle from:

`http://java.sun.com/j2ee/1.4/download.html#tutorial`

After you have installed the tutorial bundle, the example source code is in the <*INSTALL*>/j2eetutorial14/examples/ directory, with subdirectories for each of the technologies discussed in the tutorial.

Application Server

The Sun Java System Application Server Platform Edition 8.2 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 Application Server and the Java 2 Software Development Kit, Standard Edition (J2SE SDK) 1.4.2_06 or higher. If you already have a copy of the J2SE SDK, you can download the Application Server from:

http://java.sun.com/j2ee/1.4/download.html#sdk

You can also download the J2EE 1.4 SDK--which contains the Application Server and the J2SE SDK--from the same site.

Application Server Installation Tips

In the Admin configuration pane of the Application Server installer,

- Select the Don't Prompt for Admin User Name radio button. This will save the user name and password so that you won't need to provide them when performing administrative operations with `asadmin` and `deploytool`. You will still have to provide the user name and password to log in to the Admin Console.
- Note the HTTP port at which the server is installed. This tutorial assumes that you are accepting the default port of 8080. If 8080 is in use during installation and the installer chooses another port or if you decide to change it yourself, you will need to update the common build properties file (described in the next section) and the configuration files for some of the tutorial examples to reflect the correct port.

In the Installation Options pane, check the Add Bin Directory to PATH checkbox so that Application Server scripts (`asadmin`, `asant`, `deploytool`, and `wscompile`) override other installations.

Registry Server

You need a registry server to run the examples discussed in Chapters 10 and 35. Directions for obtaining and setting up a registry server are provided in those chapters.

Building the Examples

Most of the tutorial examples are distributed with a configuration file for `asant`, a portable build tool contained in the Application Server. This tool is an extension of the Ant tool developed by the Apache Software Foundation (http://ant.apache.org). The `asant` utility contains additional tasks that invoke the Application Server administration utility `asadmin`. Directions for building the examples are provided in each chapter.

Build properties and targets common to all the examples are specified in the files <*INSTALL*>/j2eetutorial14/examples/common/build.properties and <*INSTALL*>/j2eetutorial14/examples/common/targets.xml. Build properties and targets common to a particular technology are specified in the files <*INSTALL*>/j2eetutorial14/examples/*tech*/common/build.properties and <*INSTALL*>/j2eetutorial14/examples/*tech*/common/targets.xml.

To run the `asant` scripts, you must set common build properties in the file <*INSTALL*>/j2eetutorial14/examples/common/build.properties as follows:

- Set the `j2ee.home` property to the location of your Application Server installation. The build process uses the `j2ee.home` property to include the libraries in <*J2EE_HOME*>/lib/ in the classpath. All examples that run on the Application Server include the J2EE library archive--<*J2EE_HOME*>/lib/j2ee.jar--in the build classpath. Some examples use additional libraries in <*J2EE_HOME*>/lib/ and <*J2EE_HOME*>/lib/endorsed/; the required libraries are enumerated in the individual technology chapters. <*J2EE_HOME*> refers to the directory where you have installed the Application Server or the J2EE 1.4 SDK.

Note: On Windows, you must escape any backslashes in the `j2ee.home` property with another backslash or use forward slashes as a path separator. So, if your Application Server installation is `C:\Sun\AppServer`, you must set `j2ee.home` as follows:

```
j2ee.home = C:\\Sun\\AppServer
```

or

```
j2ee.home=C:/Sun/AppServer
```

- Set the `j2ee.tutorial.home` property to the location of your tutorial. This property is used for `asant` deployment and undeployment.

  For example on Unix:

  ```
  j2ee.tutorial.home=/home/username/j2eetutorial14
  ```

  On Windows:

  ```
  j2ee.tutorial.home=C:/j2eetutorial14
  ```

  You should not install the tutorial to a location with spaces in the path.

- If you did not use the default value (`admin`) for the admin user, set the `admin.user` property to the value you specified when you installed the Application Server.
- If you did not use port 8080, set the `domain.resources.port` property to the value specified when you installed the Application Server.
- Set the admin user's password in `<INSTALL>/j2eetutorial14/examples/common/admin-password.txt` to the value you specified when you installed the Application Server. The format of this file is `AS_ADMIN_PASSWORD=password`. For example:

  ```
  AS_ADMIN_PASSWORD=mypassword
  ```

Tutorial Example Directory Structure

To facilitate iterative development and keep application source separate from compiled files, the source code for the tutorial examples is stored in the following structure under each application directory:

- `build.xml`: `asant` build file
- `src`: Java source of servlets and JavaBeans components; tag libraries
- `web`: JSP pages and HTML pages, tag files, and images

The `asant` build files (`build.xml`) distributed with the examples contain targets to create a `build` subdirectory and to copy and compile files into that directory.

Further Information

This tutorial includes the basic information that you need to deploy applications on and administer the Application Server.

For reference information on the tools distributed with the Application Server, see the man pages at `http://docs.sun.com/db/doc/817-6092`.

See the *Sun Java™ System Application Server Platform Edition 8 Developer's Guide* at `http://docs.sun.com/db/doc/817-6087` for information about developer features of the Application Server.

See the *Sun Java™ System Application Server Platform Edition 8 Administration Guide* at `http://docs.sun.com/db/doc/817-6088` for information about administering the Application Server.

For information about the Derby database, which is included with Application Server 8.2, and the Pointbase database, which is included with Application Server 8.1, see the following web sites:

- `http://db.apache.org/derby`
- `http://www.pointbase.com`

How to Buy This Tutorial

This tutorial has been published in the Java Series by Addison-Wesley as *The Java Tutorial, Second Edition*. For information on the book and links to online booksellers, go to

`http://java.sun.com/docs/books/j2eetutorial/index.html#second`

How to Print This Tutorial

To print this tutorial, follow these steps:

1. Ensure that Adobe Acrobat Reader is installed on your system.
2. Open the PDF version of this book.
3. Click the printer icon in Adobe Acrobat Reader.

Typographical Conventions

Table 2 lists the typographical conventions used in this tutorial.

Table 2 Typographical Conventions

Font Style	Uses
italic	Emphasis, titles, first occurrence of terms
`monospace`	URLs, code examples, file names, path names, tool names, application names, programming language keywords, tag, interface, class, method, and field names, properties
`italic monospace`	Variables in code, file paths, and URLs
`<italic monospace>`	User-selected file path components

Menu selections indicated with the right-arrow character →, for example, First→Second, should be interpreted as: select the First menu, then choose Second from the First submenu.

Acknowledgments

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The chapters on custom tags and the Coffee Break and Duke's Bank applications use a template tag library that first appeared in *Designing Enterprise Applications with the J2EE™ Platform, Second Edition*, Inderjeet Singh et al., (Addison-Wesley, 2002).

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Monica Pawlan and Beth Stearns wrote the Overview and J2EE Connector chapters in the first edition of The J2EE Tutorial and much of that content has been carried forward to the current edition.

We are extremely grateful to the many internal and external reviewers who provided feedback on the tutorial. Their feedback helped improve the technical accuracy and presentation of the chapters and eliminate bugs from the examples.

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Feedback

To send comments, broken link reports, errors, suggestions, and questions about this tutorial to the tutorial team, please use the feedback form at `http://java.sun.com/j2ee/1.4/docs/tutorial/information/sendusmail.html`.