国外优秀信息科学与技术系列教学用书

Java Web Service 教程

（影印版）

THE JAVA WEB SERVICES TUTORIAL

■ Eric Armstrong
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出 版 说 明

20 世纪末，以计算机和通信技术为代表的信息科学和技术对世界经济、科技、军事、教育和文化等产生了深刻影响。信息科学技术的迅速普及和应用，带动了世界范围信息产业的蓬勃发展，为许多国家带来了丰厚的回报。

进入 21 世纪，尤其随着我国加入 WTO，信息产业的国际竞争将更加激烈。我国信息产业虽然在 20 世纪末取得了迅猛发展，但与发达国家相比，甚至与印度、爱尔兰等国家相比，还有很大差距。国家信息化的发展速度和信息产业的国际竞争能力，最终都将取决于信息科学技术人才的质量和数量。引进国外信息科学和技术优秀教材，在有条件的学校推动开展英语授课或双语教学，是教育部为加快培养大批高质量的信息技术人才采取的一项重要举措。

为此，教育部要求由高等教育出版社首先开展信息科学和技术教材的引进试点工作。同时提出了两点要求，一是要高水平，二是要低价格。在高等教育出版社和信息科学技术引进教材专家组的努力下，经过比较短的时间，第一批由教育部高等教育司推荐的 20 多种引进教材已经陆续出版。这套教材出版后受到了广泛的好评，其中有不少是世界信息科学技术领域著名专家、教授的经典之作和反映信息科学技术最新进展的优秀作品，代表了目前世界信息科学技术教育的一流水平，而且价格也是最优惠的，与国内同类自编教材相当。这套教材基本覆盖了计算机科学与技术专业的课程体系，体现了权威性、系统性、先进性和经济性等特点。

目前，教育部正在全国 35 所高校推动示范性软件学院的建设，这也是加快培养信息科学技术人才的重要举措之一。为配合软件学院的教学工作，结合各软件学院的教学计划和课程设置，高等教育出版社近期聘请有关专家和软件学院的教师遴选推荐了一批相应的原版教学用书，正陆续组织出版，以方便各软件学院开展双语教学。

我们希望这些教学用书的引进出版，对于提高我国高等学校信息科学技术的教学水平，缩小与国际先进水平的差距，加快培养一大批具有国际竞争力的高质量信息技术人才，起到积极的推动作用。同时我们也欢迎广大教师和专家们对我们的教材引进工作提出宝贵的意见和建议。联系方式：hep.cs@263.net。

高等教育出版社
二○○二年九月

Foreword

BACK in the fall of 1996 the buzz on Java technology was exploding, but our team at Sun Microsystems was still very small. There were about 25 of us and we took turns responding to the email that started pouring in.

Even in 1996 so many developers were asking us, "What are the best books to read on this stuff?" Many would write in and say, "We love the online *Java Tutorial* by Campione and Walrath. When can we buy it as a book?"

It made us realize that while we were pioneering the idea of publishing technical documentation online, our team also needed to be a beacon in the explosion of books on this new technology. So along with James Gosling and Bill Joy, I started the Java Series; books directly from our engineering team, published on our behalf by Addison-Wesley. Developers would still have a great selection of books to choose from, and when they needed to, they could come directly to the source.

That same explosion of interest is happening now with Web Services technology. Our email makes it clear that developers need the tutorial on this stuff today. Especially with early access technology, developers want to hear "from the Source." Because we've been writing the definitive tutorials on Java technology for seven years now, you can rely on the fact that our authors, editors, and technical reviewers know how to apply the same high standards to a book on Web Services that we apply to our other outstanding Java tutorials.

By releasing this Early Access Edition of the *Web Services Tutorial* in time for the JavaOne Developers Conference 2002, we're getting the information to you that you need to be successful with Web Services technology now. We've included a CD loaded with all the downloads, tutorials, demos, and sample code you can use to get up to speed very quickly.

There's an email alias (webservicestutorial@sun.com) where you can send us your feedback. Please do. As we did in 1996, and have ever since, we read and respond to every piece of email that comes in regarding the Java Series. Write to us and you'll definitely hear back from us.

Until then,

Lisa Friendly
Java Series Managing Editor, Sun Microsystems, Inc.
Santa Clara, CA
February, 2002

Preface

THE Java™ Web Services Tutorial is a beginner's guide to developing Web services and Web applications using the Java Web Services Developer Pack (Java WSDP). The Java WSDP is an all-in-one download containing key technologies to simplify building of Web services using the Java 2 Platform. The technologies available on the Java WSDP are:

- Java Servlets
- JavaServer Pages (JSP)
- JSP Standard Tag Library (JSTL)
- Java XML Pack, which includes:
  - Java API for XML Messaging (JAXM)
  - Java API for XML Processing (JAXP)
  - Java API for XML Registries (JAXR)
  - Java API for XML-based RPC (JAX-RPC)

To provide a development and deployment environment, the Java WSDP includes the:

- Tomcat servlet and JSP container
- Ant build tool
- Java WSDP Registry Server

Here we cover all the things you need to know to make the best use of *The Java™ Web Services Tutorial*.

Who Should Use This Tutorial

This tutorial is intended for programmers interested in developing and deploying Web services and Web applications on the Java WSDP.

About the Examples

This tutorial includes many complete, working examples.

Prerequisites for the Examples

To understand the examples you will need a good knowledge of the Java program ming language, SQL, and relational database concepts. The following topics in the Java Tutorial are particularly relevant:

Topic	Java Tutorial
JDBC	`http://java.sun.com/docs/books/tutorial/jdbc`
Threads	`http://java.sun.com/docs/books/tutorial/essential/threads`
JavaBeans	`http://java.sun.com/docs/books/tutorial/javabeans`
Security	`http://java.sun.com/docs/books/tutorial/security1.2`

Running the Examples

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

Required Software

If you are viewing this online, you need to download *The Java Web™ Services Tutorial* from:

```
http://java.sun.com/webservices/downloads/webservicestutorial.html
```

Once you have installed the tutorial bundle, the example source code is in the *<JWSDP_HOME>*/docs/tutorial/examples directory, with subdirectories for each of the technologies included in the pack.

This tutorial documents the Java WSDP EA1. To build, deploy, and run the examples you need a copy of the Java WSDP and the Java 2 Platform, Standard Edition (J2SE™) SDK 1.3.1 or 1.4. You can download the Java WSDP from:

```
http://java.sun.com/webservices/downloads/webservicespack.html
```

the J2SE 1.3.1 SDK from:

```
http://java.sun.com/j2se/1.3/
```

or the J2SE 1.4 SDK from:

```
http://java.sun.com/j2se/1.4/
```

Set the environment variables to the values noted in Table 1.

Table 1 Required Environment Variables

Environment Variable	Value
JAVA_HOME	The location of the J2SE SDK installation.
JWSDP_HOME	The location of the Java WSDP installation. This variable is used by the example build files.
PATH	Add the bin directories of the Java WSDP and J2SE SDK installations to the front. The Java WSDP bin directory contains the startup scripts for Tomcat, ant, and the registry server as well as other tools.

Building the Examples

Most of the examples are distributed with a configuration file for version 1.4.1 of ant, a portable build tool contained in the Java WSDP. Directions for building the examples are provided in each chapter.

Deploying the Examples

Most of the Java WSDP examples run on Tomcat. Before you can run an example you must first deploy it on Tomcat. To deploy an application execute ant deploy. The deploy task usually copies some files into the *<JWSDP_HOME>*/webapps directory. Some things you need to keep in mind:

- For this release of the Java WSDP you must be running Tomcat on the same machine that you are developing on.
- The first time an application is deployed you must start or restart Tomcat (see next section). Thereafter, when you modify an application, you can build, deploy, and then reload the example, as described in the next section.

Running Tomcat

You run Tomcat by executing the `startup` script in a terminal window.

Reloading the Examples

You reload an application with the command:

```
http://localhost:8080/manager/reload?path=/target
```

This command invokes the `manager` Web application. Before you can use this application you must add your user name and password combination and associate the role name `manager` with it to `<JWSDP_HOME>/conf/tomcat-users.xml`, which can be edited with any text editor. This file contains an element `<user>` for each individual user, which might look something like this:

```
<user name="adeveloper" password="secret" roles="manager" />
```

The Tomcat reference documentation distributed with the Java WSDP contains information about the manager application.

Related Information

For further information on the technologies discussed in this tutorial see the reference documentation contained in the Java WSDP (`<JWSDP_HOME>/docs/index.html`) and the Web sites listed in Table 2. References to individual technology homes listed in some chapters map as follows:

- `JAXM-HOME` to `JWSDP_HOME/docs/jaxm/index.html`
- `JAXP-HOME` to `JWSDP_HOME/docs/jaxp/index.html`
- `JAXR-HOME` to `JWSDP_HOME/docs/jaxr/index.html`
- `JAXRPC-HOME` to `JWSDP_HOME/docs/jaxrpc/index.html`

Table 2 Related Information

Technology	Web Site
Java Servlets	`http://java.sun.com/products/servlet/index.html`
JavaServer Pages	`http://java.sun.com/products/jsp/index.html`
JSP Standard Tag Library	`http://java.sun.com/products/jsp/taglibraries.html#jstl`
JAXM	`http://java.sun.com/xml/jaxm/index.html`
JAXP	`http://java.sun.com/xml/jaxp/index.html`
JAXR	`http://java.sun.com/xml/jaxr/index.html`
JAX-RPC	`http://java.sun.com/xml/jaxrpc/index.html`
Tomcat	`http://jakarta.apache.org/tomcat/index.html`
ant	`http://jakarta.apache.org/ant/index.html`

How to Print This Tutorial

To print this tutorial, follow these steps:

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

Typographical Conventions

The following table lists the typographical conventions used in this tutorial.

Table 3 Typographical Conventions

Font Style	Uses
italic	Emphasis, titles, first occurrence of terms
`monospace`	URLs, code examples, file names, command names, programming language keywords
`italic monospace`	Programming variables, variable file names

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