

An Overview of Servlet & JSP Technology

Originals of Slides and Source Code for Examples: http://courses.coreservlets.com/Course-Materials/csajsp2.html

Customized Java EE Training: http://courses.coreservlets.com/ Java, JSF 2, PrimeFaces, Servlets, JSP, Ajax, jQuery, Spring, Hibernate, RESTful Web Services, Hadoop, Android. Developed and taught by well-known author and developer. At public venues or onsite at *your* location.

Agenda

• What servlets and JSP are all about

- Understanding the role of servlets
- Building Web pages dynamically
- Evaluating servlets vs. other technologies
- Understanding the role of JSP

Testing Tomcat with Eclipse

- Installing Tomcat
- Installing and starting Eclipse
- Telling Eclipse about Tomcat
- Deploying and running Web apps from Eclipse
- Making new Web apps in Eclipse



What Servlets and JSP are All About

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- Read explicit data sent by client (form data)
- Read implicit data sent by client (request headers)
- Generate the results
- Send the explicit data back to client (HTML)
- Send the implicit data to client (status codes and response headers)







Efficient

- Threads instead of OS processes, one servlet copy

Convenient

- Lots of high-level utilities

Powerful

- Sharing data, pooling, persistence
- Portable
 - Run on virtually all operating systems and servers

WE'RE HAVING SOME

COMPUTER TROUBLE.

- Inexpensive
 - There are plenty of free and low-cost servers HI, THIS IS YOUR SON'S SCHOOL.
- Secure
 - No shell escapes, no buffer overflows

Mainstream

- See next page

OH, DEAR - DID HE

BREAK SOMETHING?

IN A WAY-

From Randall Munroe and xkcd.com

DID YOU REALLY

NAME YOUR SON

Robert'); DROP

TABLE Students;-- ?

OH, YES. LITTLE

BOBBY TABLES,

WE CALL HIM.

WELL, WE'VE LOST THIS

I HOPE YOU'RE HAPPY.

YEAR'S STUDENT RECORDS.

AND I HOPE

YOU'VE LEARNED

TO SANITIZE YOUR

DATABASE INPUTS

Mainstream

• Popular:

- The single most common use of Java technology
- The leading technology for medium/large Web applications
 - Google reports over 650 <u>million</u> Web pages using JSP

Supported by:

- Apache, Oracle, IBM, Sybase, BEA, Jetty, Caucho, Sun, New Atlanta, ATG, Fujitsu, Lutris, Silverstream, the World Wide Web Consortium (W3C), and many others
- Plugins for IIS and Zeus

Runs on:

 Windows, Unix/Linux, MacOS, VMS, and IBM mainframe OSs

Used for:

 Airline companies, hotels, e-commerce sites, search engines, banks, financial sites, etc., etc., etc.



Ten Most Popular Web Sites (Alexa.com, 2010)

1. Google

- Java (Web), C++ (indexing)
- **2. Facebook**
- **3. YouTube** – Flash, Python, Java
- **4. Yahoo** PHP and Java
- 5. Microsoft Live.com

6. Baidu

- Unknown
- 7. Wikipedia – PHP
- 8. Blogger
 - Java
- 9. MSN

– .NET

10.Twitter

- Ruby on Rails, Scala, Java

Fall 2010: Google reports over two *billion* Web pages that use JSP (inurl:jsp).

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Higher-Level Alternative: JSF 2

Servlets and JSP

- Well-established standard
- Used by google.com, ebay.com, walmart.com, and thousands of other popular sites
- Relatively low level by today's standards
- Covered in this tutorial

JSF (JavaServer Faces) Version 2

- Now an official part of Java EE 6
 - But runs in any recent Java-enabled server, including Tomcat 6+
- Higher-level features: integrated Ajax support, page templating, third-party rich component libraries, etc.
- Not yet as widely used, but recommended for many or most new projects
- Covered at http://www.coreservlets.com/JSF-Tutorial/jsf2/

Extending the Power of Servlets: JavaServer Pages (JSP) Idea: - Use regular HTML for most of page - Mark dynamic content with special tags - Details in second half of course <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN"> <html> <HEAD><TITLE>Welcome to Our Store</TITLE></HEAD> <BODY> <H1>Welcome to Our Store</H1> <SMALL>Welcome, <!-- User name is "New User" for first-time visitors --> <%= coreservlets.Utils.getUserNameFromCookie(request) %> To access your account settings, click here.</SMALL> <P> Regular HTML for rest of on-line store's Web page </BODY></HTML>

Accessing the Online Documentation

Servlets and JSP

- http://docs.coreservlets.com/servlet-3.0-api/
 Servlets 3.0 and JSP 2.2 (Tomcat 7)
- http://java.sun.com/products/servlet/2.5/docs/servlet-2_5-mr2/
 - Servlets 2.5 (Tomcat 6)
- http://java.sun.com/products/jsp/2.1/docs/jsp-2_1-pfd2/
 JSP 2.1 (Tomcat 6)
- Java 6 and 7
 - http://docs.oracle.com/javase/7/docs/api/
 - http://docs.oracle.com/javase/6/docs/api/
 - Class uses Java 6 and Tomcat 7
- Advice
 - If you have a fast and reliable internet connection, bookmark these addresses. If not, download a copy of the APIs onto your computer and use it locally.





Installing Java and Tomcat

For even more detailed step-by-step instructions, see tutorials on using Eclipse with Tomcat 6 or Tomcat 7 at http://www.coreservlets.com/Apache-Tomcat-Tutorial/

Installing Java SE 6

Minimum Java version

- Tomcat 7 (servlets 3.0) requires Java 6
- Tomcat 6 and other servlet 2.5 containers require Java 5+
 - But Java 6 recommended for performance and features

Downloading and installation

- Follow directions at http://www.oracle.com/technetwork/java/ javase/downloads/
 - Choose"JDK", not "JRE"
 - Not "with Java EE", "with JavaFX", or "with NetBeans"

Installing Java SE (Standard Edition)

Install Java 6

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http://www.oracle.com/technetwork/java/javase/downloads/







Installing Eclipse

For even more detailed step-by-step instructions, see tutorials on using Eclipse with Tomcat 6 or Tomcat 7 at http://www.coreservlets.com/Apache-Tomcat-Tutorial/

Installing Eclipse

Overview

- Eclipse is a a free open source IDE for Java. Support for Java, HTML, CSS, JavaScript, C++, PHP, and more.
 - http://eclipse.org/downloads/
 - Choose "Eclipse IDE for Java EE Developers"
 - Need version 3.6 (Helios) for Tomcat 7

Features

- Checks your syntax as you type
- Automatically compiles every time you save file
- Many tools: refactoring, debugging, server integration, templates for common tasks, etc.
 - Low learning curve: beginners can use Eclipse without knowing these tools

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Reminder: step-by-step guide at http://www.coreservlets.com/ (click "Apache Tomcat 7" in top left)

Running Eclipse

- Unzip the downloaded file
 - Call the folder you unzip into "installDir"

• Double click eclipse.exe

- From installDir/bin
- Click on "Workbench" icon
 - Next time you bring up Eclipse, it will

come up in workbench automatically

Shortcut

- Many developers put Eclipse link on their desktop

configura

<

artifacts.xml

 R-click eclipse.exe, Copy, then go to desktop, R-click, and Paste Shortcut (not just Paste!)

Date modified

dropins

Туре

features



Download and Import Sample Project

Get test-app.zip from coreservlets.com

- Start at servlet and JSP tutorials
 - http://courses.coreservlets.com/ Course-Materials/csajsp2.html
 - Go to first section (Overview and Setup)
- Or, start at Apache Tomcat tutorial
 - http://www.coreservlets.com/Apache-Tomcat-Tutorial/
 - Choose Tomcat 7 (recommended) or Tomcat 6 version

Then, download test-app.zip

- Then, import into Eclipse.
 - File, Import, General, Existing Projects, Select archive file. Then click Browse and navigate to test-app.zip.



Deploying App in Eclipse Deploy project - Select "Servers" tab at bottom R-click on Tomcat – Choose "Add and Remove" Choose project – Press "Add" Ctrl+C Click "Finish" F2 Start Server Ctrl+Alt+R - R-click Tomcat at bottom Ctrl+Alt+P Add and Re - Start (use "Restart" if Clean Torncat Work Direc Tomcat already running) Alt+Enter **Test URL** - http://localhost/test-app/ in any Web browser

Testing Deployed App in Eclipse

Start a browser

 Eclipse also has builtin browser, but I prefer to use Firefox, IE, or Chrome separately

Test base URL

– http://localhost/test-app/

Test Web content

- http://localhost/test-app/hello.html
- http://localhost/test-app/hello.jsp

Test servlets

- http://localhost/test-app/hello
- http://localhost/test-app/test1
- http://localhost/test-app/test2



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Making New Apps from Eclipse

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Making Web Apps in Eclipse

Make empty project

- File → New → Project →
 Web → Dynamic Web Project
- For "Target runtime", choose
 "Apache Tomcat v7.0"
- Give it a name (e.g., "test")
- Accept all other defaults

Shortcut

 If you have made Dynamic Web Project recently in workspace, you can just do File → New → Dynamic Web Project

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Summary

General

- Servlets are efficient, portable, powerful, and widely accepted in industry
- Regardless of deployment server, run a free server on your desktop for development
- Using Eclipse (or another IDE like NetBeans or IntelliJ IDEA) greatly simplifies development and deployment
- Consider JSF 2 as an alternative for new projects
 - http://www.coreservlets.com/JSF-Tutorial/jsf2/

Getting started

- Start with test-app and TestServlet from coreservlets.com
- Click on "Intermediate Servlets and JSP" tutorial in top-
- left corner and you can get pre-made Eclipse projects



Questions?