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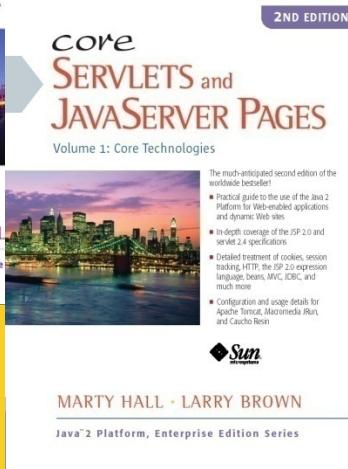
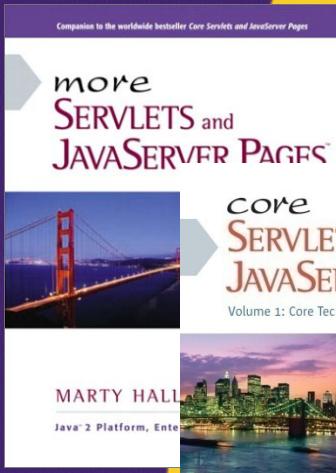
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JSP Intro and Overview

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



For live Java EE training, please see training courses
at <http://courses.coreservlets.com/>.

JSF 2, PrimeFaces, Servlets, JSP, Ajax (with jQuery), GWT,
Android development, Java 6 and 7 programming,
SOAP-based and RESTful Web Services, Spring, Hibernate/JPA,
XML, Hadoop, and customized combinations of topics.

Taught by the author of *Core Servlets and JSP*, *More Servlets and JSP*, and this tutorial. Available at public venues, or customized versions can be held on-site at [your organization](mailto:hall@coreservlets.com). Contact hall@coreservlets.com for details.



Agenda

- Understanding the need for JSP
- Evaluating the benefits of JSP
- Comparing JSP to other technologies
- Avoiding JSP misconceptions
- Understanding the JSP lifecycle
- Installing JSP pages
- Looking at JSP in the real world

The Need for JSP

- **With servlets, it is easy to**
 - Read form data
 - Read HTTP request headers
 - Set HTTP status codes and response headers
 - Use cookies and session tracking
 - Share data among servlets
 - Remember data between requests
 - Get fun, high-paying jobs
- **But, it sure is a pain to**
 - Use those println statements to generate HTML
 - Maintain that HTML

The JSP Framework

- **Idea:**
 - Use regular HTML for most of page
 - Mark servlet code with special tags
 - Entire JSP page gets translated into a servlet (once), and servlet is what actually gets invoked (for each request)
- **Example:**

```
<!DOCTYPE ...>
<HTML>
<HEAD>
<TITLE>Order Confirmation</TITLE>
<LINK REL=STYLESCHEET
      HREF="JSP-Styles.css"
      TYPE="text/css">
</HEAD>
<BODY>
<H2>Order Confirmation</H2>
Thanks for ordering
<I><%= request.getParameter("title") %></I>!
</BODY></HTML>
```

Benefits of JSP

- **Although JSP technically can't do anything servlets can't do, JSP makes it easier to:**
 - Write HTML
 - Read and maintain the HTML
- **JSP makes it possible to:**
 - Use standard HTML tools such as DreamWeaver
 - Have different members of your team do the HTML layout than do the Java programming
- **JSP encourages you to**
 - Separate the (Java) code that creates the content from the (HTML) code that presents it

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, field validation, page templating, rich third-party component libraries, etc. Designed around the MVC approach.
 - Not yet as widely used, but recommended for many or most new projects
 - **Covered at <http://www.coreservlets.com/JSF-Tutorial/jsf2/>**

Advantages of JSP Over Competing Technologies

- **Versus ASP or ColdFusion**
 - Better language for dynamic part
 - Portable to multiple servers and operating systems
- **Versus PHP**
 - Better language for dynamic part
 - Better tool support
- **Versus pure servlets**
 - More convenient to create HTML
 - Can use standard tools (e.g., DreamWeaver)
 - Divide and conquer
 - JSP programmers still need to know servlet programming

Advantages of JSP (Continued)

- **Versus Velocity or WebMacro**
 - Standard
- **Versus client-side JavaScript (in browser)**
 - Capabilities mostly do not overlap with JSP, but
 - You control server, not client
 - Richer language
- **Versus server-side JavaScript (e.g., LiveWire, BroadVision)**
 - Richer language
- **Versus static HTML**
 - Dynamic features
 - Adding dynamic features no longer “all or nothing” decision

Setting Up Your Environment

- Set your CLASSPATH. **Not.**
- Compile your code. **Not.**
- Use packages to avoid name conflicts. **Not.**
- Put JSP page in special directory. **Not.**
 - Use the WebContent folder in Eclipse
 - Same as for HTML, GIF, JPEG, CSS, etc.
- Use special URLs to invoke JSP page. **Not.**
 - Use same URLs as for HTML pages (except for file extensions)
- **Caveats**
 - Previous rules about CLASSPATH, install dirs, etc., still apply to regular Java classes used by a JSP page

Example

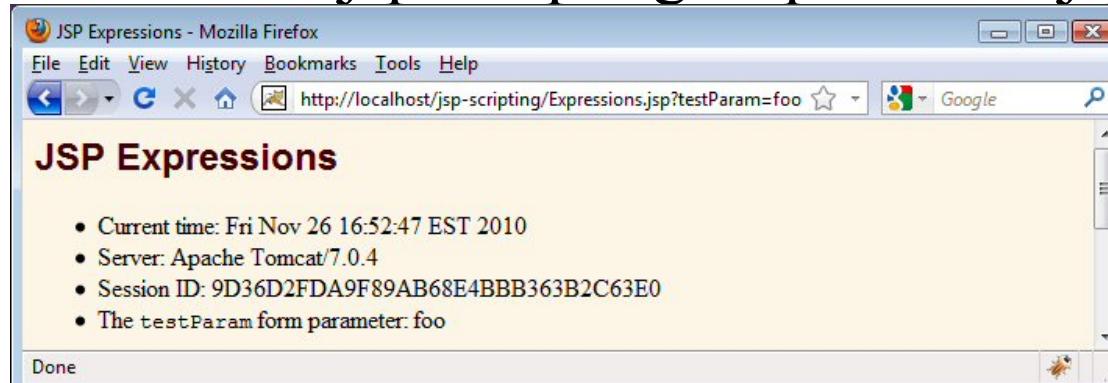
```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
<TITLE>JSP Expressions</TITLE>
<META NAME="keywords"
      CONTENT="JSP, expressions, JavaServer Pages">
<META NAME="description"
      CONTENT="A quick example of JSP expressions.">
<LINK REL=STYLESCHEET
      HREF="JSP-Styles.css"
      TYPE="text/css">
</HEAD>
```

Example (Continued)

```
<BODY>
<H2>JSP Expressions</H2>
<UL>
    <LI>Current time: <%= new java.util.Date() %>
    <LI>Server: <%= application.getServerInfo() %>
    <LI>Session ID: <%= session.getId() %>
    <LI>The <CODE>testParam</CODE> form parameter:
        <%= request.getParameter("testParam") %>
</UL>
</BODY></HTML>
```

Example: Result

- **If Eclipse project was**
 - jsp-scripting
- **And folder was**
 - WebContent
- **And file was**
 - Expressions.jsp
- **URL would be**
 - `http://hostname/jsp-scripting/Expressions.jsp`



Most Common Misunderstanding Forgetting JSP is Server-Side Technology

- **Very common question**
 - I can't do such and such with HTML.
Will JSP let me do it?
- **Why doesn't this question make sense?**
 - JSP runs entirely on server
 - It doesn't change content the client (browser) can handle
- **Similar questions**
 - How do I put a normal applet in a JSP page?
Answer: send an <applet...> tag to the client
 - How do I put an image in a JSP page?
Answer: send an <img...> tag to the client
 - How do I use JavaScript/Acrobat/Shockwave/Etc?
Answer: send the appropriate HTML tags

2nd Most Common Misunderstanding Translation/Request Time Confusion

- **What happens at page translation time?**
 - JSP constructs get translated into servlet code.
- **What happens at request time?**
 - Servlet code gets executed. *No* interpretation of JSP occurs at request time. The original JSP page is totally ignored at request time; only the servlet that resulted from it is used.
- **When does page translation occur?**
 - Typically, the first time JSP page is accessed after it is modified. This should never happen to real user (developers should test all JSP pages they install).
 - Page translation does *not* occur for each request.

The JSP Lifecycle

| | | Request #1 | Request #2 | | Request #3 | Request #4 | | Request #5 | Request #6 |
|--|--------------------|------------|------------|------------------|------------|------------|---------------|------------|------------|
| JSP page translated into servlet | Page first written | Yes | No | Server restarted | No | No | Page modified | Yes | No |
| Servlet compiled | | Yes | No | | No | No | | Yes | No |
| Servlet instantiated and loaded into server's memory | | Yes | No | | Yes | No | | Yes | No |
| init (or equivalent) called | | Yes | No | | Yes | No | | Yes | No |
| doGet (or equivalent) called | | Yes | Yes | | Yes | Yes | | Yes | Yes |

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

1. Google

- Java (Web),
C++ (indexing)

2. Facebook

- PHP

3. YouTube

- Flash, Python, Java

4. Yahoo

- PHP and Java

5. Microsoft Live.com

- .NET

6. Baidu

- Unknown

7. Wikipedia

- PHP

8. Blogger

- Java

9. MSN

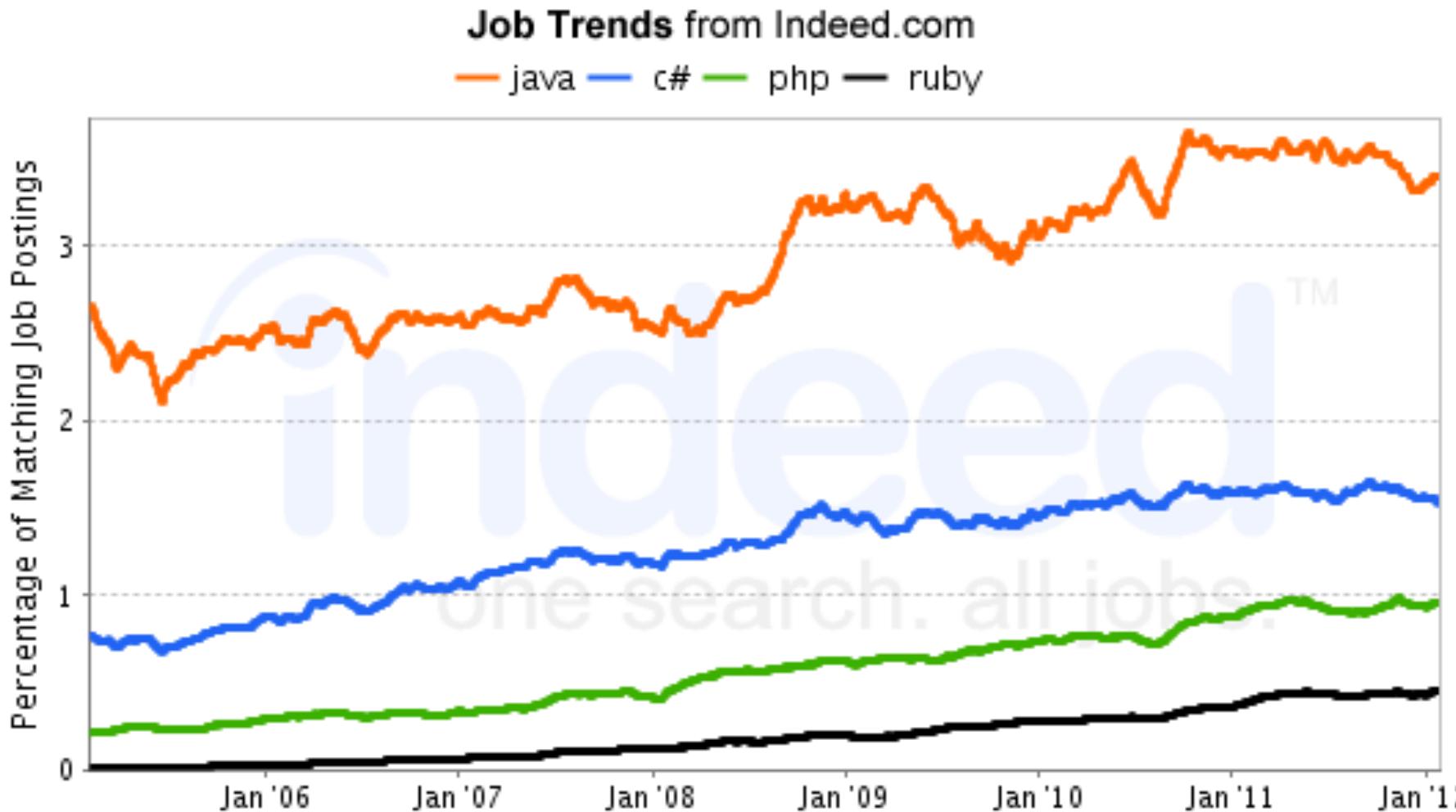
- .NET

10. Twitter

- Ruby on Rails, Scala, Java

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

Keywords in Job Postings



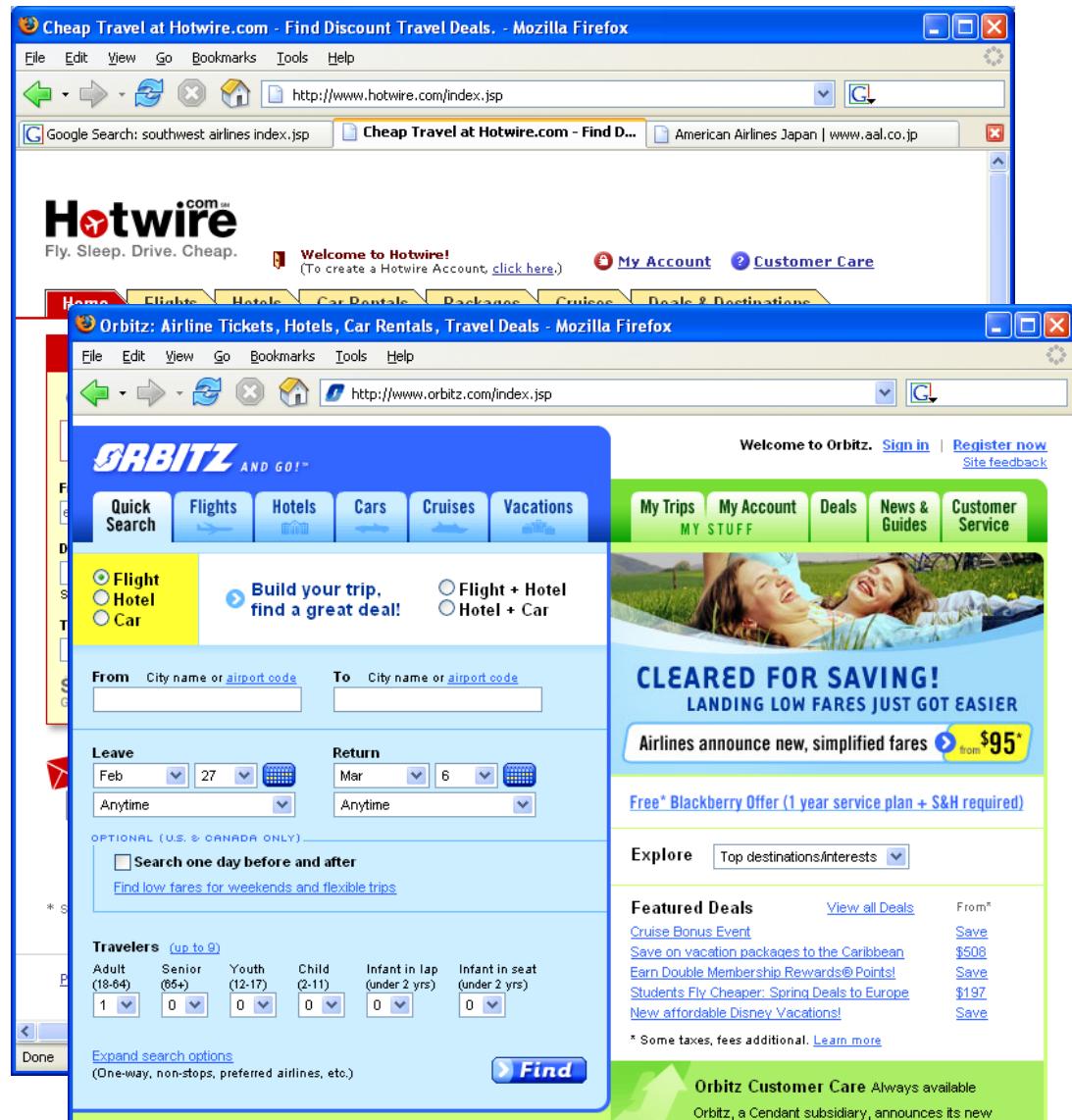
JSP/Servlets in the Real World: Airlines

- Delta Airlines
- United Airlines
- AirTran
- American Airlines
- British Airways
- KLM
- Air China
- Saudi Arabian Airlines
- Iceland Air

The screenshot shows the homepage of the Delta Air Lines website. The header reads "Delta Air Lines - Find airline tickets, manage your SkyMiles account, or check flight schedules - Mozilla Firefox". The main navigation menu includes Home, Travel, SkyMiles®, Programs & Services, About Delta, and Contact Us. On the left, there's a "SkyMiles log in" section with fields for "SkyMiles number and PIN" and a "Remember my SkyMiles number" checkbox. Below it are links for "SkyMiles Enrollment" and "Forgot Your Number/PIN?". A "My Profile" sidebar lists links for "My Itineraries", "Flight Schedules", "Airport Wait Times", "Special Offers", "Sign up for E-mail", "Contact Us", and "Site Map & Search". The central content area features a "Flight" tab selected, showing fields for "Leaving from" (set to "Home"), "Going to", "Departure date" (set to Feb 13 morning), "Return date" (set to Feb 20 morning), "Passengers" (set to 1), and "Preferred cabin (fare)" (set to "Coach (Deeply-discounted)"). There are also checkboxes for "Leave unchecked to find lowest fares" and "Refundable". Below this is an "Itinerary Search & Check-In" section with fields for "First name", "Last name", and "Confirmation #". A link "Lost your confirmation #? Other check-in options." leads to a "Flight Information" section with fields for "Flight number", "Leaving from", "Going to", and date selection ("Yesterday", "Today", "Tomorrow"). A "Flight reminders & updates" link is also present. The right sidebar features a "Delta For You" section with a photo of a couple, news items (e.g., "February 6, 2005 Special Offers: Atlanta Winter & Spring Escapes"), and a "Low introductory fares to Berlin" section with a photo of the Reichstag building.

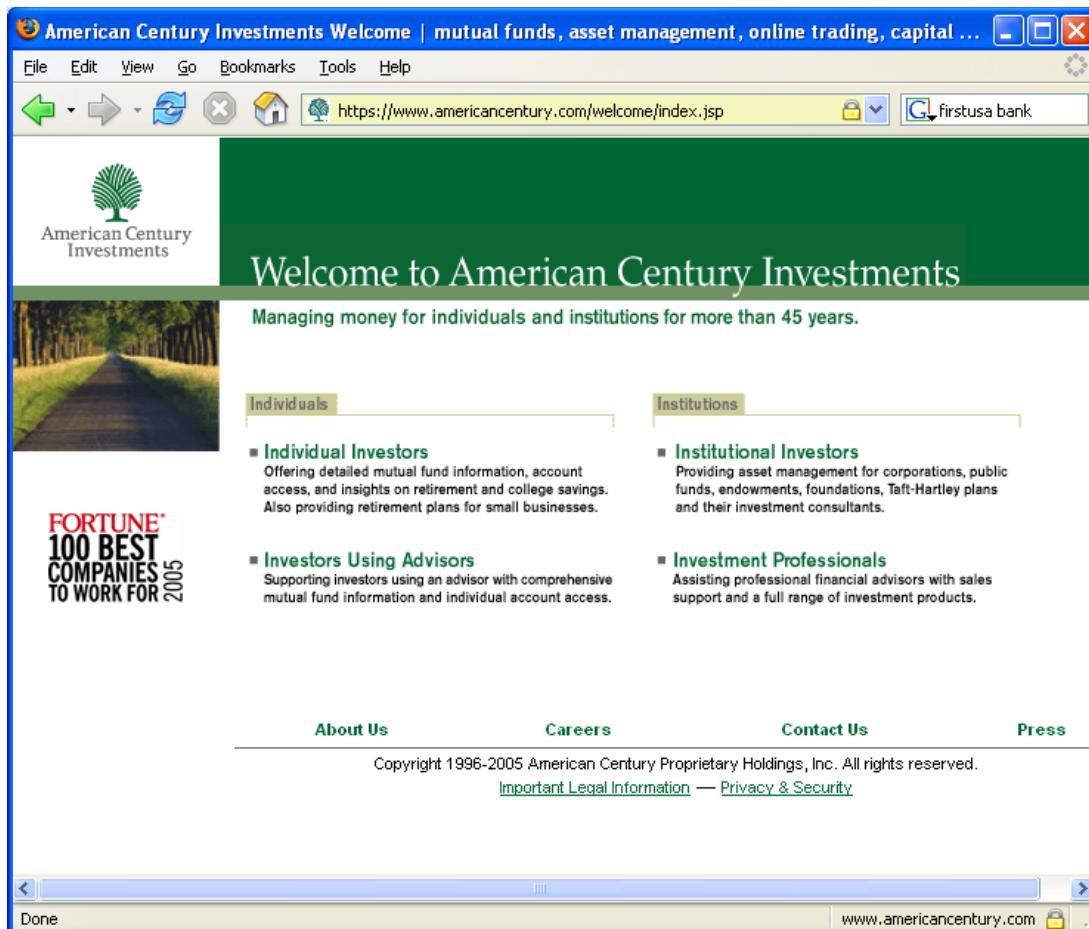
JSP/Servlets in the Real World: Travel Sites

- Travelocity.com
- Orbitz.com
- HotWire.com
- Hotels.com
- CheapTickets.com
- National Car Rental
- Avis Car Rental
- Enterprise Car Rental
- Hertz Car Rental



JSP/Servlets in the Real World: Financial Services

- **American Century**
- **Vanguard**
- **Fidelity**
- **NY Stock Exchange**
- **First USA Bank**
- **Royal Bank of Scotland**
- **Banco Popular de Puerto Rico**
- **Bank of America**
- **China Construction Bank**



JSP/Servlets in the Real World: Retail

- Sears.com
- Walmart.com
- HomeDepot.com
- SamsClub.com
- Macys.com
- llbean.com
- Kohls.com
- Ikea.com
- Target.com
- Longaberger.com
- Nike.com
- CircuitCity.com

The screenshot shows the Sears.com homepage in a Mozilla Firefox browser window. The top navigation bar includes links for File, Edit, View, Go, Bookmarks, Tools, and Help. The address bar shows the URL http://www.sears.com/sr/javasr/home.do?BV_SessionID=@@@@1786211443.1107722. The main header features the Sears logo. Below it is a search bar with the placeholder "SEARCH IN All Departments for GO". A "FREE SHIPPING" banner at the top right states "HURRY, ENDS TUESDAY". A large Valentine's Day promotion offers "30% off spring fashions for Women by Apostrophe, A-line, Laura Scott" and "40-50% off all Jewelry, 20-30% off all Watches". Another section highlights "10% cash back" for using a Sears card on Home Appliances over \$399. To the right, there are promotional boxes for "Now on sale" DVD players and "50% off" individual sockets and combination wrenches. The left sidebar lists various department categories like Appliances, Baby, Clothing, and Electronics, each with a list of sub-categories.

JSP/Servlets in the Real World: Entertainment

- WarnerBrothers.com
- Billboard.com
- E! (eonline.com)
- PBS.org
- Comcast
- games.atari.com



JSP/Servlets in the Real World: Military and Federal Government

- DHS
- TSA
- FAA
- CIA
- NSA
- GSA
- IRS
- Army
- Navy
- USPS

The image displays three separate browser windows side-by-side, each showing a different government website:

- DHS | Department of Homeland Security | DHS Home Page - Mozilla Firefox**: Shows the DHS homepage with a "THREAT ADVISORY ELEVATED" banner indicating "Significant Risk of Terrorist Attacks".
- TSA | Transportation Security Administration | TSA Home Page - Mozilla Firefox**: Shows the TSA homepage with a "ELEVATED Threat Advisory Level" banner.
- GoArmy.com - Mozilla Firefox**: Shows the GoArmy.com homepage for the U.S. Army, featuring a large image of a helicopter and sections for "What's it like being a Soldier?", "How does the Army work?", and "What jobs does the Army offer?".

At the bottom of the GoArmy.com window, a status bar reads "Transferring data from www.goarmy.com...".

Science and Research

- NSF
- UN
- Oceans
- diabetes.org
- fas.org
- dlse.org
- science.edu.sg
- gbif.net
- collegeboard.com

The image displays two side-by-side screenshots of web browsers. The top browser, running Microsoft Internet Explorer, shows the homepage of the National Science Foundation (NSF) at <http://www.nsf.gov/index.jsp>. The page features the NSF logo and the tagline "WHERE DISCOVERIES BEGIN". It includes a navigation menu with links to HOME, FUNDING, AWARDS, DISCOVERIES, NEWS, PUBLICATIONS, STATISTICS, ABOUT, and FastLane. Below the menu, there's a banner with the text "TAKE AN UNDERWATER TOUR" and four thumbnail images: a shark, a frog, a microscopic view, and lightning. The bottom browser, running Mozilla Firefox, shows the homepage of the UN Atlas of the Oceans at <http://www.oceansatlas.org/index.jsp>. The page features the UN logo and the title "UN Atlas of the Oceans". It includes a login form for members and a welcome message: "Welcome to the United Nations Atlas of the Oceans. The Atlas is an information system designed for use by policy makers who familiar with ocean issues and by scientists, students and resource managers to underlying data bases and approaches to sustainability. Information about the" (the text is cut off).

JSP/Servlets in the Real World: State, Local, International

The image displays three separate Mozilla Firefox browser windows side-by-side, each showing a different web application built using JSP or Servlets:

- Top Window:** Shows the League of Arab States website (http://www.arableagueonline.org/arableague/index_en.jsp). The page features the official seal of the League of Arab States and Arabic text "جامعة الدول العربية".
- Middle Window:** Shows the California State portal (http://www.ca.gov/state/portal/myca_homepage.jsp). The page has a blue header with "Welcome to California" and includes links for Home, Help, SiteMap, Register, and Login.
- Bottom Window:** Shows the NYC.gov website (http://home.nyc.gov/portal/index.jsp?pageID=nyc_home). The page features a red subway train, a "NYC.gov always open" logo, and navigation links for Residents, Business, Visitors, Government, and Office of the Mayor.

JSP/Servlets in the Real World: Sports

- Baltimore Orioles
- Washington Redskins
- Washington Nationals
- Major League Baseball
- NHL.com
- Nascar.com

The screenshot shows the homepage of the Baltimore Orioles' official website, http://baltimore.orioles.mlb.com/index.jsp?c_id=bal. The page features a large banner image of a baseball player in action. Navigation links include News, Audio & Video, Scoreboard, Schedule, Roster, Stats, Community, Fans, Oriole Park, Tickets, Shop, Auction, Mobile, and Fantasy. A sidebar on the left promotes the "Left Field Club Picnic Perch". The right side includes sections for WATCH (Orioles 0 vs Red Sox 0), LISTEN (GAMEDAY), VIDEO HIGHLIGHTS, and a probable pitchers schedule. A sidebar at the bottom left offers "FAN VALUE CORNER" options like autographed jerseys and auction bids. Another sidebar on the right features "MLB.TV PREMIUM New Features" and a "Bank of America" advertisement.

JSP/Servlets in the Real World: Search/Portals

- Most of Google
- All of Ebay
- netscape.com
- excite.com
- dice.com
- hi5
- Paypal

Google Search: java jobs - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

Web Images Groups News Froogle Local New! more > Advanced Search Preferences

Google java jobs Search

Results 1 - 10 of about 11,500,000 for java jobs. (0.23 seconds)

Web

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Sponsored Links

Java jobs at Google

Google needs Java experts
Python a bonus; apply now
www.google.com/jobs/

Java / J2EE Jobs

St Louis, MO. hiring experienced
developers, architects, managers
www.UniDev.com

Senior Java Developer Job

Challenging commercial software
project in MI. Relocation provided
www.workforcesoftware.com

Linux Java Jobs

Java, J2EE, Struts, Tomcat, JBoss
Java / Linux Application Developers
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institutions and technology firms

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3quick & easy

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4safe & secure

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|----------------------|------------|----------|
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| Microeconomics | \$133.00 | \$52.99 |
| Marketing Management | \$135.00 | \$32.50 |
| TOTAL | \$408.00 | \$155.49 |

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JSP/Servlets in the Real World: Random Amusing

The image displays two side-by-side screenshots of web pages, illustrating the practical application of JSP and Servlets.

Left Screenshot (TANDBERG website):

- Header:** Collaborate from the desktop to the boardroom with integrated unified communication solutions from TANDBERG and Micro...
File Edit View History Bookmarks Tools Help
http://www.tandberg.com/our_story/microsoft.jsp
- TANDBERG Logo:** See: performance
- Navigation:** About Us, Video Communication Basics, Our Customers, Products, Services, Support, Partners, Contact
- Breadcrumbs:** Home > Partners > Alliances > Microsoft
- Section:** PARTNER CENTER
Partner Program, Become a Partner, Centre of Excellence, Partners, Accredited Service Partners, Strategic Alliances (listing HP, Microsoft, -HD Webcam, IBM, Nortel, BroadSoft, Cisco, Avaya, Barco, Partner Login, Integrator Toolkit).
- Microsoft Gold Certified Partner:** Microsoft and TANDBERG have joined forces to offer a unified commun... that increases productivity throughout an organization. This combined s... ultimate in video communications to every employee no matter where th... they need to meet.
It's instant, it's present and it's powerful, enabling businesses to easily video conferencing from the desktop to the boardroom.
- Image:** A video conference interface showing two participants: a man in an office and a woman on a television screen.
- Text:** By integrating presence-based Instant Messaging and Web Collaboration with powerful telepresence and high-definition video solutions from TA...
- Footer:** Transferring data from www.tandberg.com...

Right Screenshot (Novell Press Release):

- Header:** Microsoft and Novell Announce Broad Collaboration on Windows and Linux Interoperability and Support - M...
File Edit View History Bookmarks Tools Help
http://www.novell.com/news/press/item.jsp?id=1196
- Novell Logo:** Novell + MENU
- Section:** Press Room
Press Release
- Links:** Company Home, News >, Media Resources >, Blogs, Subscribe
- Section:** Microsoft and Novell Announce Broad Collaboration on Windows and Linux Interoperability and Support
- Text:** WALTHAM, Mass.
02 Nov 2006
- Text:** Companies also announce a patent agreement covering proprietary and open source products.
- Text:** Microsoft Corp. and Novell Inc. today announced a set of broad business and technical collaboration agreements to build, market and support a series of new solutions to make Novell and Microsoft® products work better together.

Summary

- **JSP is more convenient, not more powerful**
 - JSP makes it easier to create and maintain HTML, while still providing full access to servlet code
- **JSP pages get translated into servlets**
 - It is the servlets that run at request time
 - Client does not see anything JSP-related
- **You still need to understand servlets**
 - Understanding how JSP really works
 - Servlet code called from JSP
 - Knowing when servlets are better than JSP
 - Mixing servlets and JSP
- **Other technologies use similar approach,**
 - But aren't as portable and don't let you use Java for the “real code”



Questions?

[JSF 2, PrimeFaces, Java 7, Ajax, jQuery, Hadoop, RESTful Web Services, Android, Spring, Hibernate, Servlets, JSP, GWT, and other Java EE training](#)

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