

Chapter 1

An introduction to web programming with Java

Contact information of Lecturer

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Course syllabus

- Introduction to Web programming
- HTML/CSS/Javascript
- MVC Model
- Java Servlets
- Java Server Pages (JSP)
- Session and Cookies
- Java Beans/JSP Expression Language
- JSP Standard Tag Library
- JDBC
- Spring Framework
- Spring Data JPA/Hibernate
- Java Web Services/Spring Rest API

Objectives

Knowledge

1. Name the software component that runs on the client of a typical web application.
2. Name the two software components that run on the server of a typical web application.
3. Distinguish between HTML and HTTP.
4. Distinguish between static web pages and dynamic web pages.
5. Name three approaches for developing Java web applications.
6. Describe the software components that are required for developing servlet and JSP applications.
7. List and describe the three layers of a typical Java web application.
8. In general terms, describe the use of these directories as defined by the J2EE specification: webapps, document root, WEB-INF, and WEB-INF\classes.

Objectives (continued)

9. Name two IDEs that can be used for developing Java web applications.
10. Name two web servers that can be used for developing Java web applications.
11. Name a popular database server that can be used for developing Java web applications.

Course materials

- J. Murach, M. Urban. Murach's Java Servlet and JSP. 3rd Edition”, 2014.
- Spring in Action, 5th Edition
- Bài giảng Lập trình Web, Học viện Công nghệ Bưu chính Viễn thông.
- Slides
- Google Classroom

How to grade?

Chuyên cần	10%	Slink
Lab	20%	6 buổi
Project	20%	Nhóm
Final exam	50%	Thi phòng máy

The first page of a shopping cart application

A screenshot of a web browser window displaying the product page for "Murach's Java Programming". The browser has a blue header bar with the title "Murach's Java Progammir" and the URL "murach.com/books/javp/index.htm". Below the header is a toolbar with icons for Apps, Import bookmarks now..., and Other bookmarks. The main content area features a red sidebar on the left with the Murach logo and links for Book summary, Table of contents, Who this book is for, What people say about this book, and Related books. The main content area has a dark blue header "Publisher of Professional Programming Books" and a navigation bar with Home, Books, Downloads, Trainers, Instructors, Customer Service, and a yellow "view cart" button. The central part of the page displays the book cover for "murach's Java programming 4TH EDITION" and its details: by Joel Murach, 23 chapters, 802 pages, 340 illustrations, Published November 2011, ISBN: 978-1-890774-65-3. It shows discounted prices: Book price: \$57.50; SAVE 30%, now just \$40.25; eBook price: \$47.50; SAVE 30%, now just \$33.25; Book + eBook: \$67.50; Best Value! SAVE 30%, now just \$47.25. A testimonial quote is present: "*I love your Java book. It cuts right to the essential information, providing the perfect balance between too many details and too little information. I bought another well-known Java book, but I spent several hours trying to learn what I learned from your book in about 45 minutes.*" Below the quote, a developer's testimonial states: "That's what one developer wrote us about an earlier edition of our core Java book. Now, you can expect that same practical, time-saving approach in the current edition that covers the latest release of Java Standard Edition, Java SE 7 (or JDK 1.7)." To the right of the book image are three yellow buttons: "add book", "add ebook", and "add both". At the bottom right is a link "More about the eBook".

The second page of a shopping cart application

A screenshot of a web browser window displaying the second page of a shopping cart application. The browser title bar reads "Mike Murach & Associate" and the address bar shows "murach.com/ordering/cart?productCode=htm5". The page itself is titled "Publisher of Professional Programming Books" and features a red sidebar with the Murach logo and a blue header with navigation links: Home, Books, Downloads, Trainers, Instructors, and Customer Service. A yellow "view cart" button is located in the top right corner of the header. The main content area is titled "Your cart" and lists two items:

Qty	Description	Action
1	Murach's Java Programming	Remove
1	Murach's HTML5 and CSS3	Remove

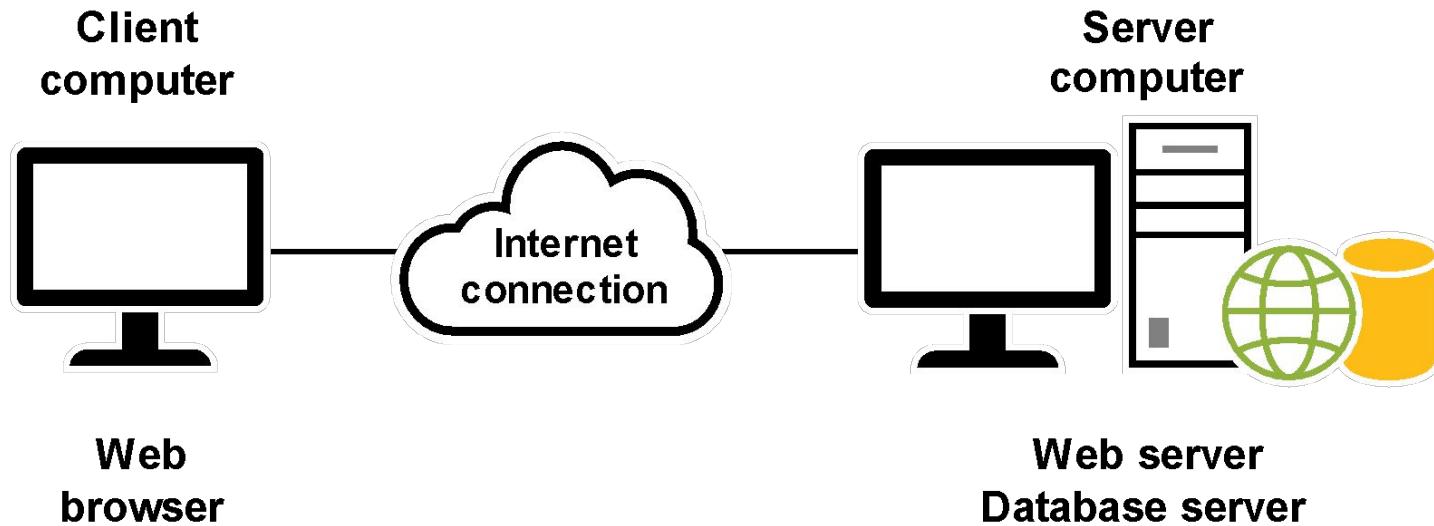
To change the quantity, enter the new quantity and click on the Update button.

[Continue Shopping](#) [Proceed to Checkout](#)

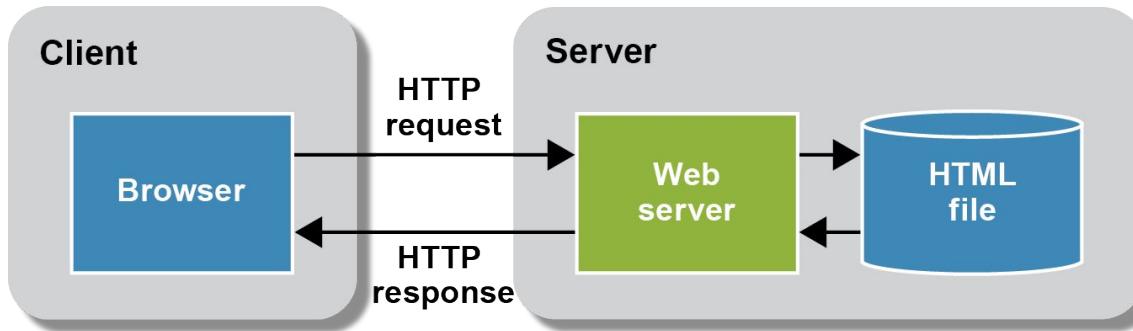
Do you have a promotion code to apply to this order?
If so, enter it here:

Other books related to what you just picked

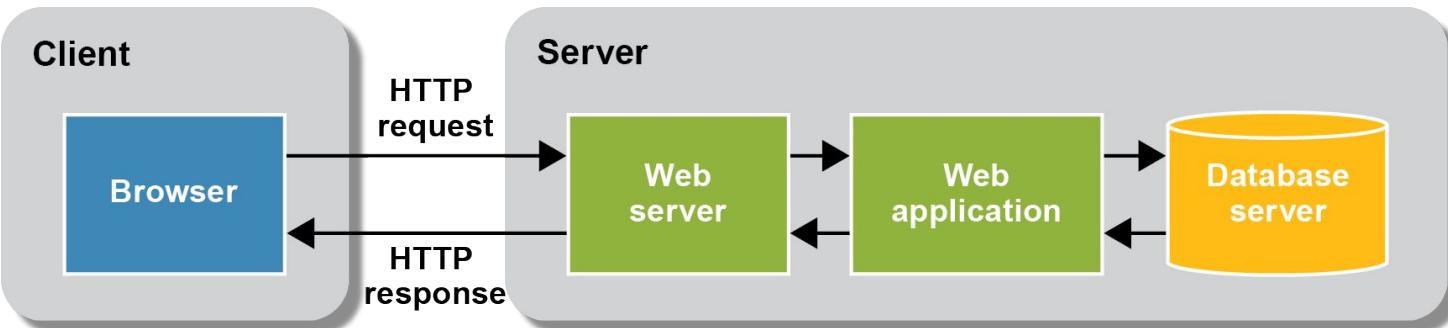
Components of a web application



How a web server processes static web pages



How a web server processes dynamic web pages



Three approaches for developing Java web apps

Servlet/JSP

- Is a lower-level API that does less work for the programmer.
- Provides a high degree of control over the HTML/CSS/JavaScript that's returned to the browser.

JSF

- Is a higher-level API that does more work for the programmer.
- Makes it more difficult to control the HTML/CSS/JavaScript that's returned to the browser.

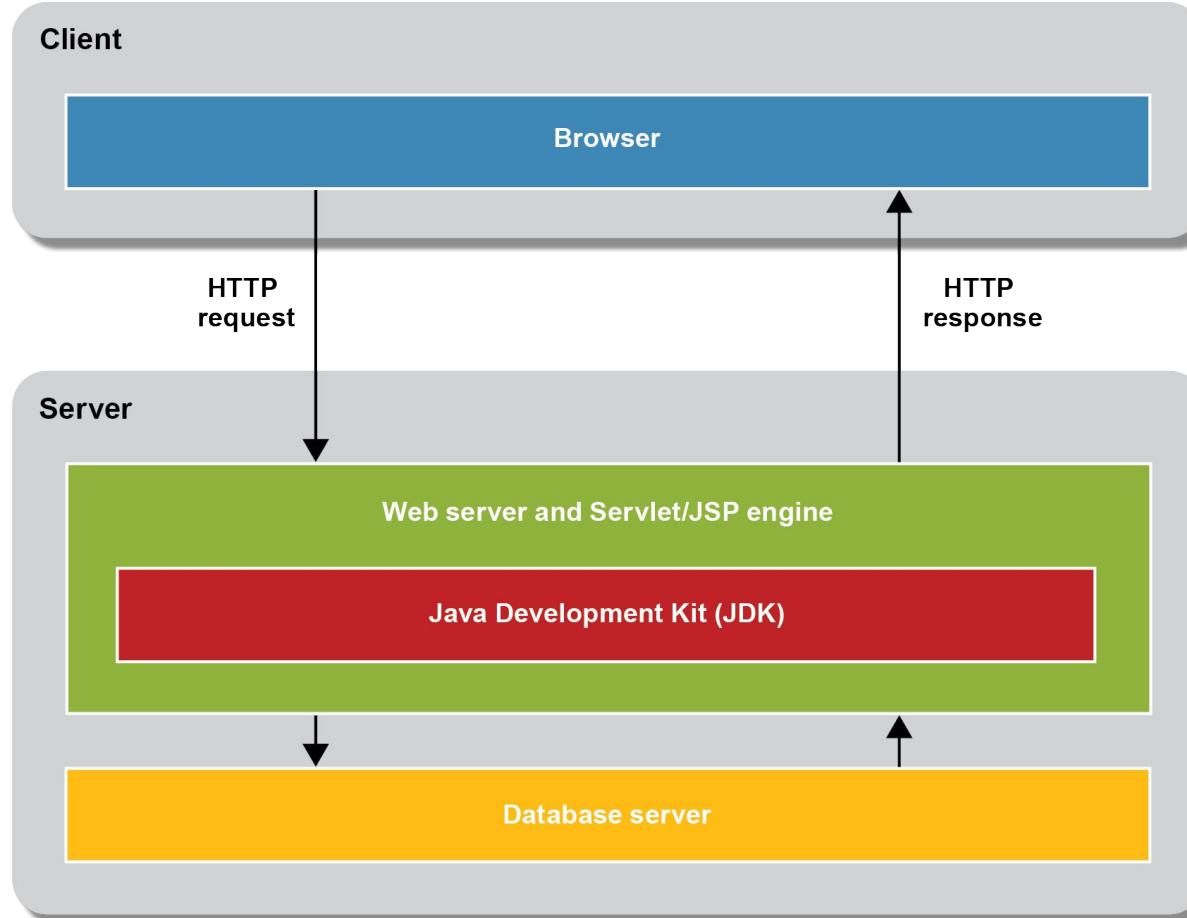
Spring Framework

- Is a higher-level API that does more work for the programmer.
- Provides a high degree of control over the HTML/CSS/JavaScript that's returned to the browser.

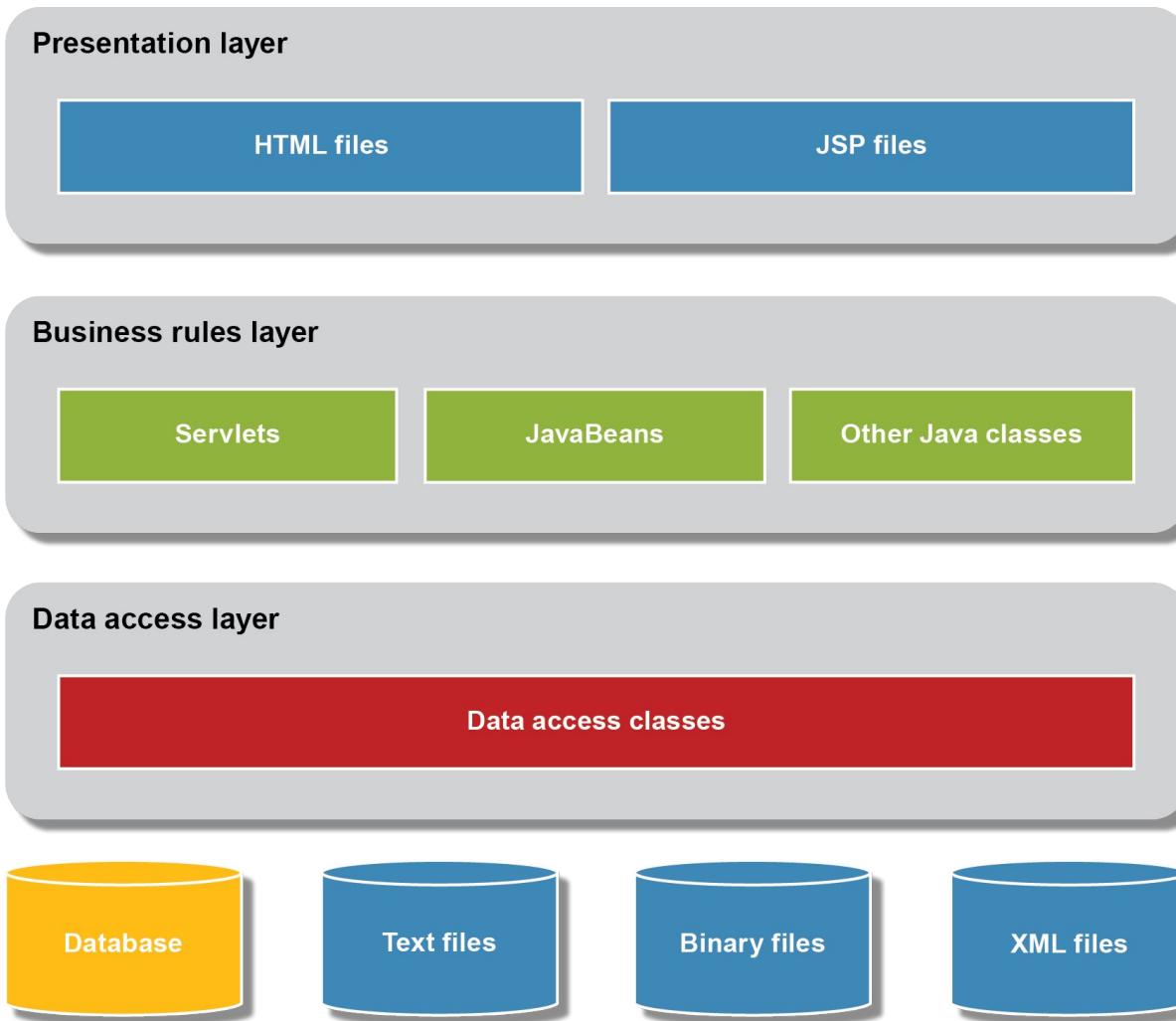
Terminology

- The *Java Standard Edition (Java SE)* includes the *Java Development Kit (JDK)* and the *Java Runtime Environment (JRE)*.
- The *Java Enterprise Edition (Java EE)* specification describes how web servers can interact with all Java web technologies.
- *Servlets* store the Java code that does the server-side processing.
- *JavaServer Pages (JSPs)* store the HTML that defines the user interface.
- *JavaServer Faces (JSF)* provides a higher-level API that replaces both servlets and JSPs.
- *Java Persistence API (JPA)* is an API for working with databases.

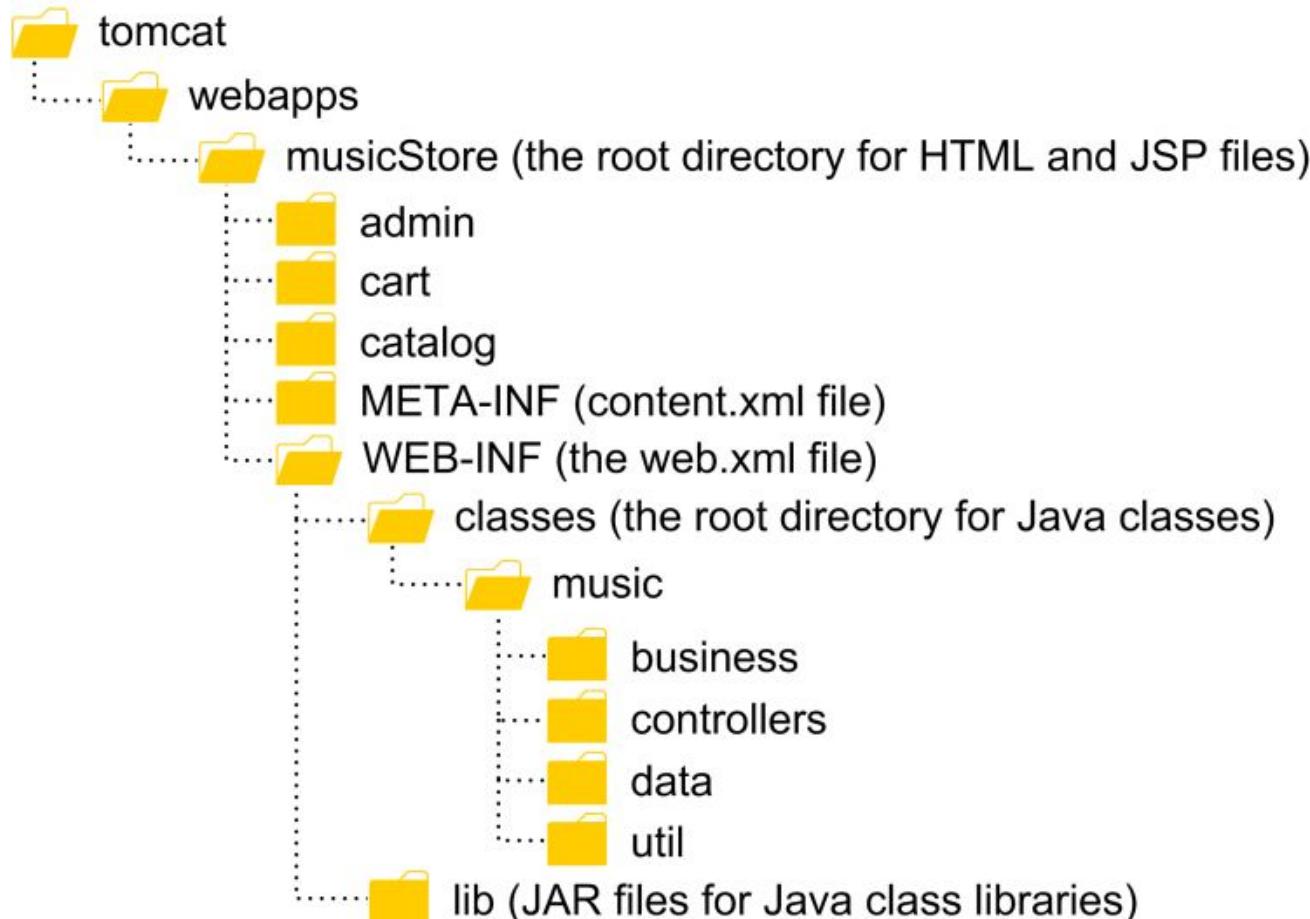
The components of a servlet/JSP application



The architecture for a servlet/JSP application



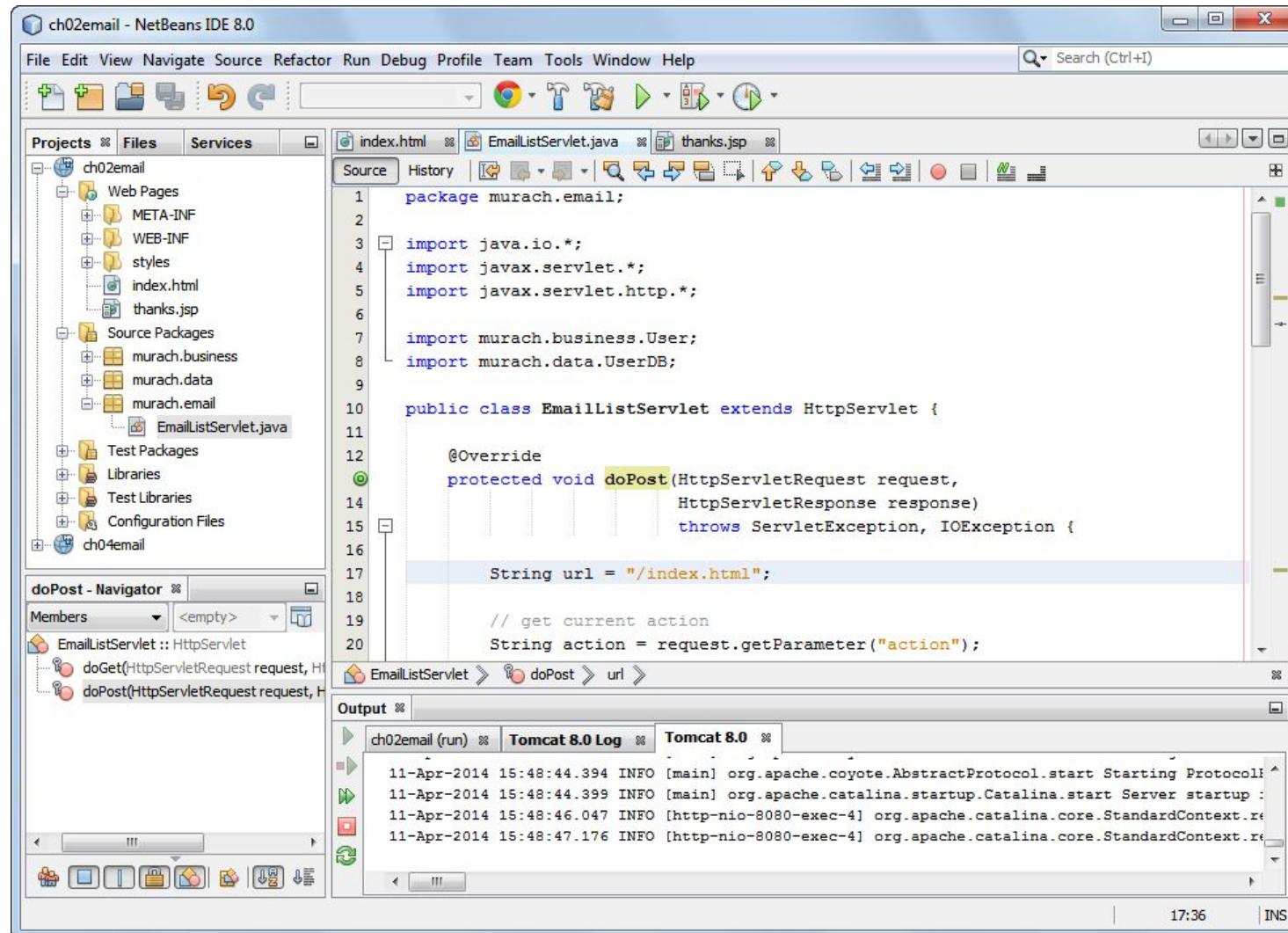
The directory structure for a web application



The directories and files for a web application

Directory	Description
(root)	Contains the HTML and JSP files.
\WEB-INF	Contains the web.xml file and is not directly accessible from the web.
\WEB-INF\classes	Contains the servlets and other Java classes for your application. Each subdirectory corresponds with the package for the Java class.
\WEB-INF\lib	Contains any JAR files that contain Java class libraries that are used by the web application.
\META-INF	Contains the context.xml file that configures the web application context.

The NetBeans IDE



Popular IDEs for Java web development

- NetBeans
- Eclipse
- IntelliJ IDEA

Two popular web servers

Tomcat

- Is a servlet/JSP engine that includes a web server.
- Is free, open-source, and runs on all modern operating systems.
- Is a popular web server for Java web applications.

GlassFish

- Is a complete Java EE application server.
- Is free, open-source, and runs on all modern operating systems.
- Provides more features than Tomcat.
- Requires more system resources than Tomcat.

Other popular web servers

- WildFly (formerly JBoss)
- Jetty
- Oracle WebLogic
- IBM WebSphere

A popular database server

MySQL

- Is a relational database server that implements most of the SQL standard.
- Is free, open-source, and runs on all modern operating systems.
- Is the most popular database server for Java web applications.

Other popular database servers

- PostgreSQL
- Oracle

An ISP that provides servlet/JSP web hosting

The screenshot shows a web browser window displaying the MMA web hosting website. The URL in the address bar is www.mmaweb.net. The page features a large green "web hosting" logo. A sidebar on the left offers domain registration services, while the main content highlights JSP and servlet hosting capabilities. Three account plan options are listed on the right.

**MMA web hosting sales
[716] 689-1593**

HOSTING

DOMAIN REGISTRATION

Don't have a domain yet? See if yours is available by checking our whois gateway:

Domain (.com, .net, .org) Check

Java Developer Links

- [Servlets.com](#)
- [JavaWorld](#)
- [Official Servlet Home](#)
- [JavaServer Pages Home](#)

web hosting

JSP hosting and servlet hosting accounts with advanced, scalable server technologies like Servlets, Java Server Pages (JSP), Enterprise JavaBeans (EJB) and XML are what MMA specializes in.

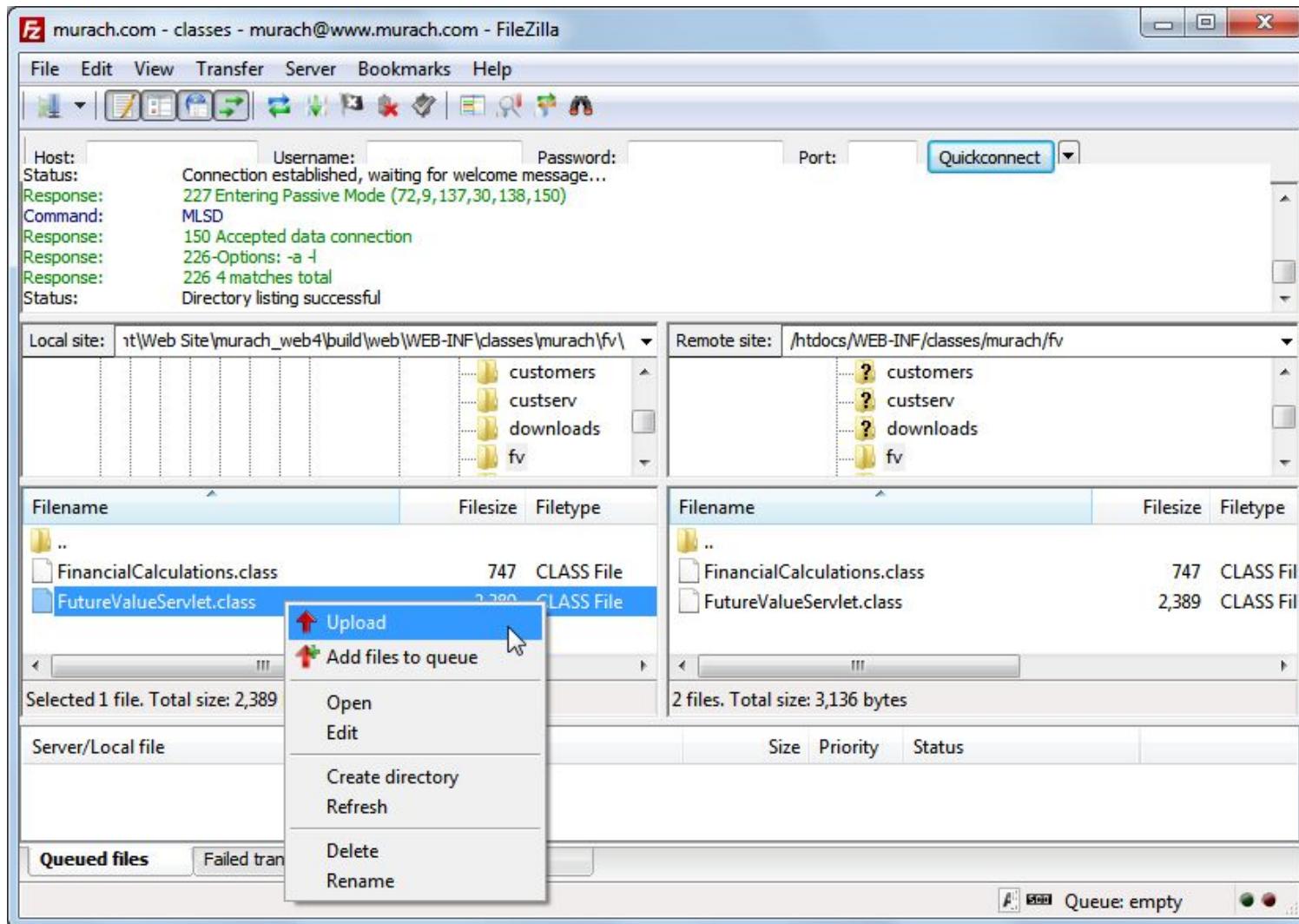
The result is a continuous upgrade path that lets small businesses launch websites built on proven technology that can grow as you achieve success without the need to rebuild and redeploy your core

Private JVM with Every Account!

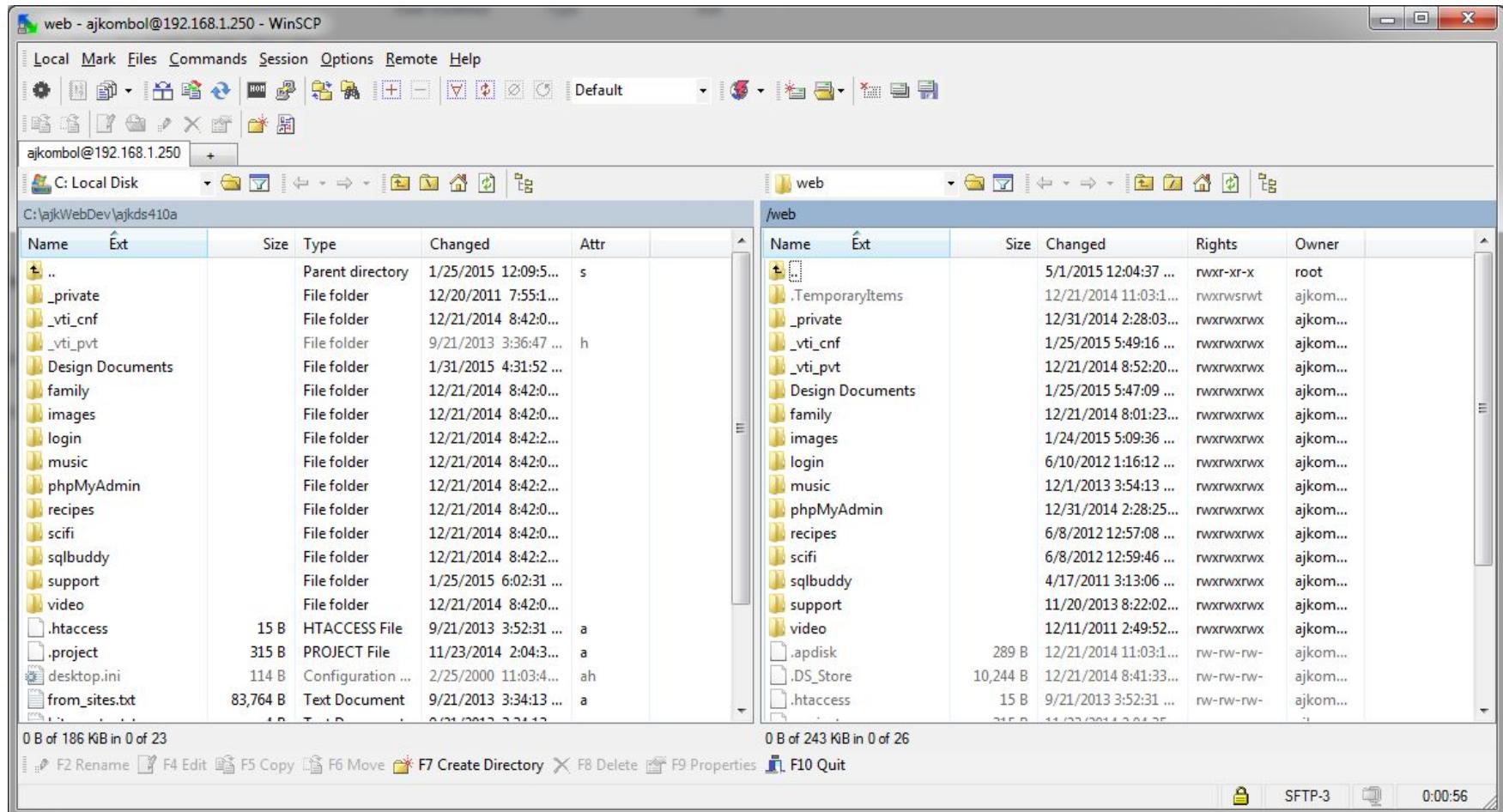
ACCOUNT	PRICE
STARTER ACCOUNT	\$24.99 per month*
COMMERCE ACCOUNT	\$49.99 per month*
ENTERPRISE ACCOUNT	\$99.99 per month*

* Plus one-month setup fee at start of first month.

The FileZilla program



WinSCP



WinSCP – Synchronize

Synchronization checklist

Name	Local directory	Size	Changed	Remote directory	Size	Changed
.apdisk				/	289	12/21/2014 11:03:1
DS_Store				/	10,244	12/21/2014 8:41:33
.TemporaryItems\				/		12/21/2014 11:03:1
<input checked="" type="checkbox"/> siteMap.vsd	\Design Documents\	106,496	1/31/2015 3:18:35 PM	./Design Documents/	6,148	12/21/2014 8:01:23
DS_Store				./family/	15	5/24/2013 7:08:55
htaccess				./family/Kathy/	20,480	9/21/2013 3:55:52
Thumbs.db				./family/Kathy/_vti_cnf/	203	9/21/2013 3:55:52
Thumbs.db				./family/NewHouse/	10,244	12/22/2014 11:28:4
DS_Store				./family/NewHouse/_vti_cnf/	36,352	12/21/2014 8:48:20
<input checked="" type="checkbox"/> Drawings\	\family\NewHouse\		2/11/2015 7:43:12 PM	./family/NewHouse/_vti_cnf/	204	10/5/2013 3:34:46
Final Punch list April...	\family\NewHouse\	2,548	4/19/2015 8:16:17 PM	./family/NewHouse/_vti_cnf/	245	4/3/2014 11:37:27
HomeDesignCover.p...				./family/NewHouse/Construction Pictures/	14,340	12/22/2014 11:26:5
<input checked="" type="checkbox"/> lot 379-1.doc	\family\NewHouse\	95,744	3/12/2015 10:26:19 PM	./family/NewHouse/Construction Pictures/	10,467	11/17/2014 8:32:31
<input checked="" type="checkbox"/> NewHousePayments...	\family\NewHouse\	10,056	3/29/2015 5:43:27 PM	./family/NewHouse/Construction Pictures/	36,352	12/21/2014 8:48:20
Thumbs.db				./family/NewHouse/_vti_cnf/		
HomeDesignCover.p...				./family/NewHouse/_vti_cnf/		
Thumbs.db				./family/NewHouse/_vti_cnf/		
DS_Store				./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Apr27-2015-1.JPG	\family\NewHouse\Constructi...	3,138,905	4/28/2015 7:21:03 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Apr27-2015-2.JPG	\family\NewHouse\Constructi...	2,554,114	4/28/2015 7:21:19 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Apr27-2015-3.JPG	\family\NewHouse\Constructi...	3,031,236	4/28/2015 7:21:37 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Apr27-2015-4.JPG	\family\NewHouse\Constructi...	1,748,091	4/28/2015 7:22:11 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Apr27-2015-5.JPG	\family\NewHouse\Constructi...	2,141,358	4/28/2015 7:22:29 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-1.JPG	\family\NewHouse\Constructi...	1,980,224	2/11/2015 7:53:45 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-1b.JPG	\family\NewHouse\Constructi...	1,497,695	2/11/2015 7:46:12 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-2.JPG	\family\NewHouse\Constructi...	1,495,643	2/11/2015 7:43:34 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-2b.JPG	\family\NewHouse\Constructi...	1,777,271	2/11/2015 7:46:30 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-3.JPG	\family\NewHouse\Constructi...	1,797,986	2/11/2015 7:44:01 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-3b.JPG	\family\NewHouse\Constructi...	1,877,615	2/11/2015 7:46:45 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-4.JPG	\family\NewHouse\Constructi...	1,726,972	2/11/2015 7:44:16 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-4b.JPG	\family\NewHouse\Constructi...	2,442,400	2/11/2015 7:47:00 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-5.JPG	\family\NewHouse\Constructi...	1,929,791	2/11/2015 7:53:29 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Feb11-5b.JPG	\family\NewHouse\Constructi...	1,935,150	2/11/2015 7:53:25 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Jan31-1.JPG	\family\NewHouse\Constructi...	1,926,557	2/1/2015 3:50:53 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Jan31-2.JPG	\family\NewHouse\Constructi...	1,935,930	2/1/2015 3:47:50 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Jan31-3.JPG	\family\NewHouse\Constructi...	1,897,480	2/1/2015 3:50:04 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Jan31-4.JPG	\family\NewHouse\Constructi...	2,052,162	2/1/2015 3:49:48 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> Jan31-5.JPG	\family\NewHouse\Constructi...	2,335,550	2/1/2015 3:49:55 PM	./family/NewHouse/Construction Pictures/		
<input checked="" type="checkbox"/> March26-2015-1.JPG	\family\NewHouse\Constructi...	2,624,339	3/26/2015 9:38:45 PM	./family/NewHouse/Construction Pictures/		

OK Cancel Help Check Uncheck Check all Uncheck all Custom commands

33 of 49 31 of 31 N/A 2 of 2 N/A 0 of 16 N/A