

Web Technology in Java

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Outline

- Some Terminology
- Java for Web Development
- Web Application
- Web Server vs. Application Server
- J2EE Multitier Application Architecture
- J2EE Application Component
- J2EE Runtime Environment (Containers)

Internet vs. Web

- **Internet**

- is a global system of interconnected computer networks
- Uses Internet Protocol Suit

- **World Wide Web (www, W3)**

- is an information system of interlinked hypertext documents and other digital resources that are accessed via the Internet
- Uses Hyper Text Transfer Protocol

Web Development

- It is a broad term for the work involved in **developing a web site / web application** for the Internet (World Wide Web) or an intranet (a private network).
- It can range from developing the simplest static single page of plain text to the most complex web-based internet applications.
- A more comprehensive list of tasks to which web development commonly refers, may include
 - **web design**
 - **web content development**
 - **client-side/server-side scripting**

Web Technology

- Roughly, web technology is a set of technologies that enables web development.
- **Client Side Technologies**
 - HTML, CSS, JavaScript, VBScript, XHTML, DHTML, WML, AJAX, FLASH
- **Server Side Technologies**
 - ASP, PHP, Perl, JSP, ASP.NET, Java, MySQL, SQL Server, Access
- **Other Technologies**
 - XML, XSLT, RSS, Atom, X-Path, XQuery, WSDL, XML-DOM, RDF, Ruby on Rails, GMAIL Framework, REST, SOAP

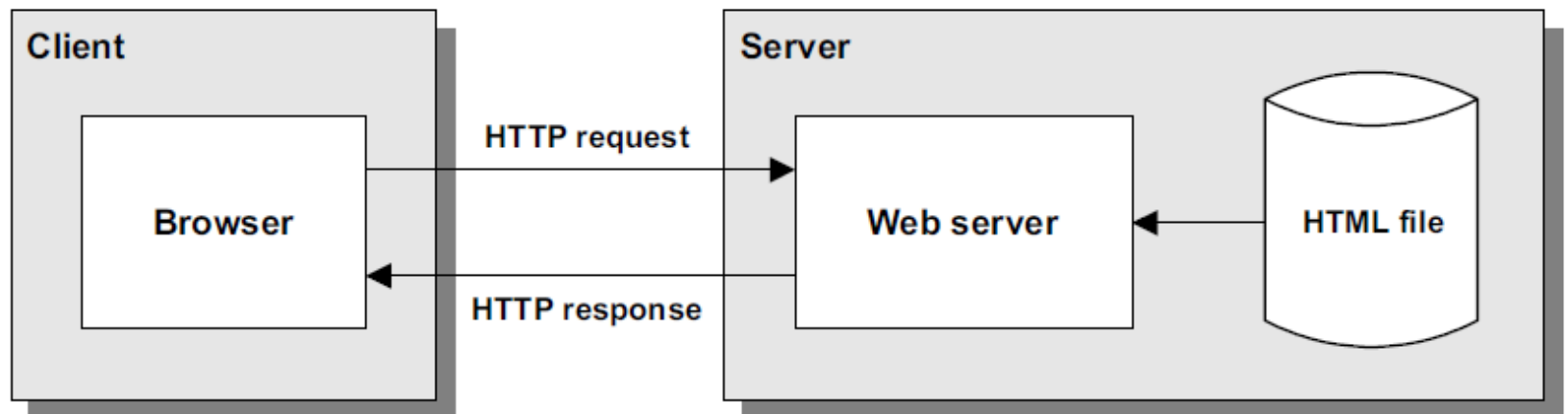
Java for Web Development

- Java technologies used for web development are part of,
 - Java EE platform
 - In addition to many of the APIs from Java SE
- Some of the Technologies are:
 - Java Servlet
 - Java Server Pages (JSP), JSTL, JSF
 - JDBC, JNDI, JMS, JavaMail API, JAXP, Java Persistence API,
 - J2EE Connector Architecture, JTA, JAAS

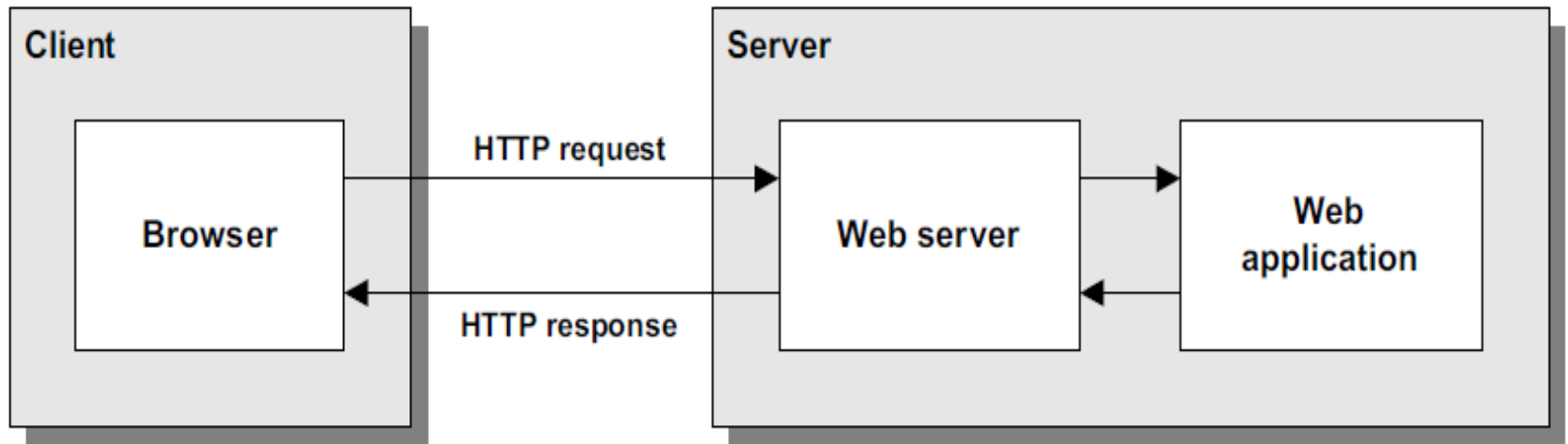
Web Application

- A Web-based application refers to any program that is accessed over a network connection using HTTP, rather than existing within a device's memory.
- Web applications are by nature distributed applications, meaning that they are programs that run on more than one computer and communicate through a network or server.
- Specifically, web applications are accessed with a web browser and are popular because of the ease of using the browser as a user client.
- Web-based applications are also known as Web apps.

Static Web Application



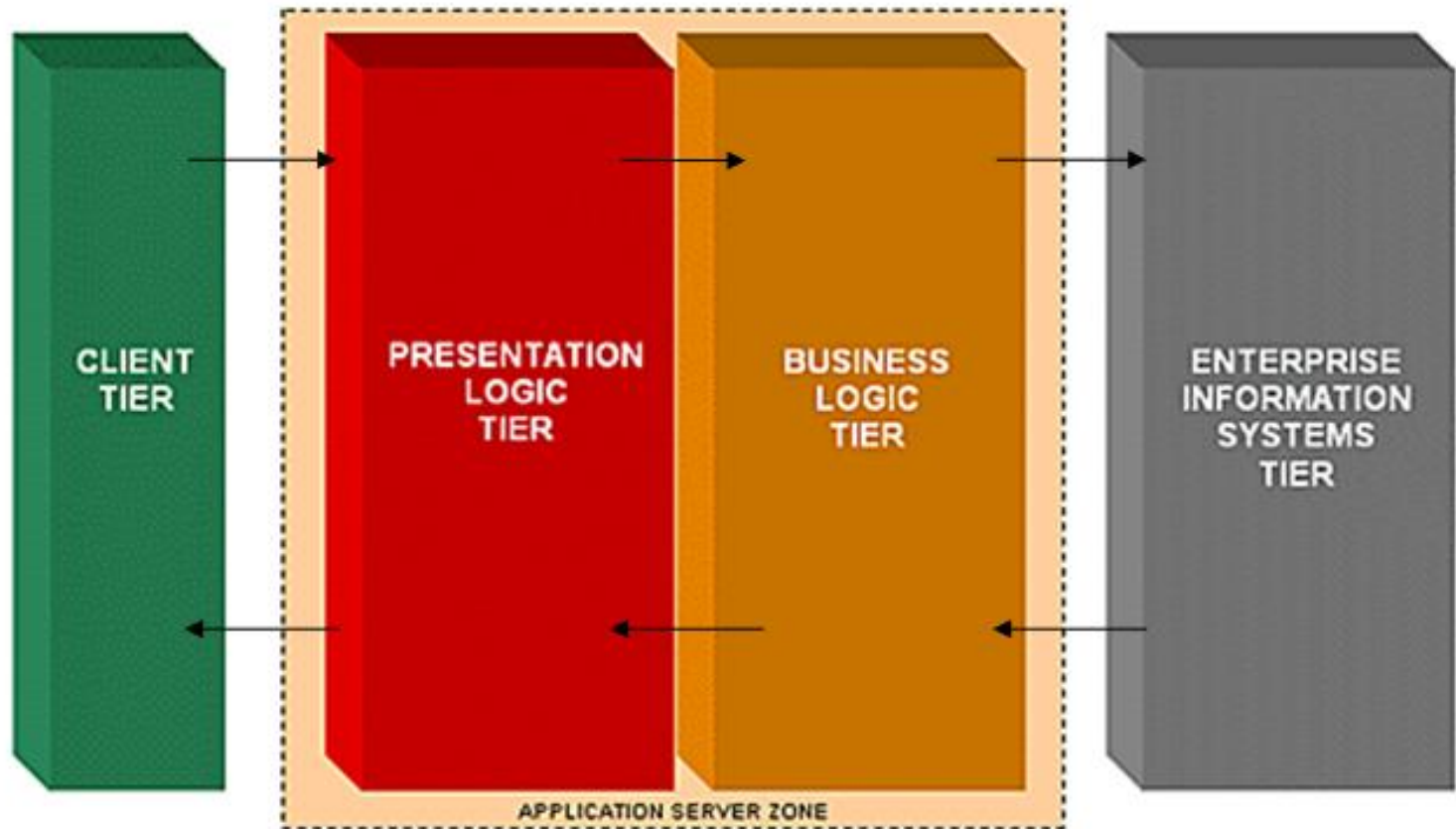
Dynamic Web Application



Web Server vs. Application Server

- A **Web server** is a program that, using the client/server model and the World Wide Web's Hypertext Transfer Protocol (HTTP), serves the files that form Web pages to Web users (whose computers contain HTTP clients that forward their requests).
- A **Web Application server** is a distributed middleware software implementation that interfaces between various types of clients on one end, and back-end system resources on the other end. Typically it contains a web server within it.

J2EE Multitier Application Architecture



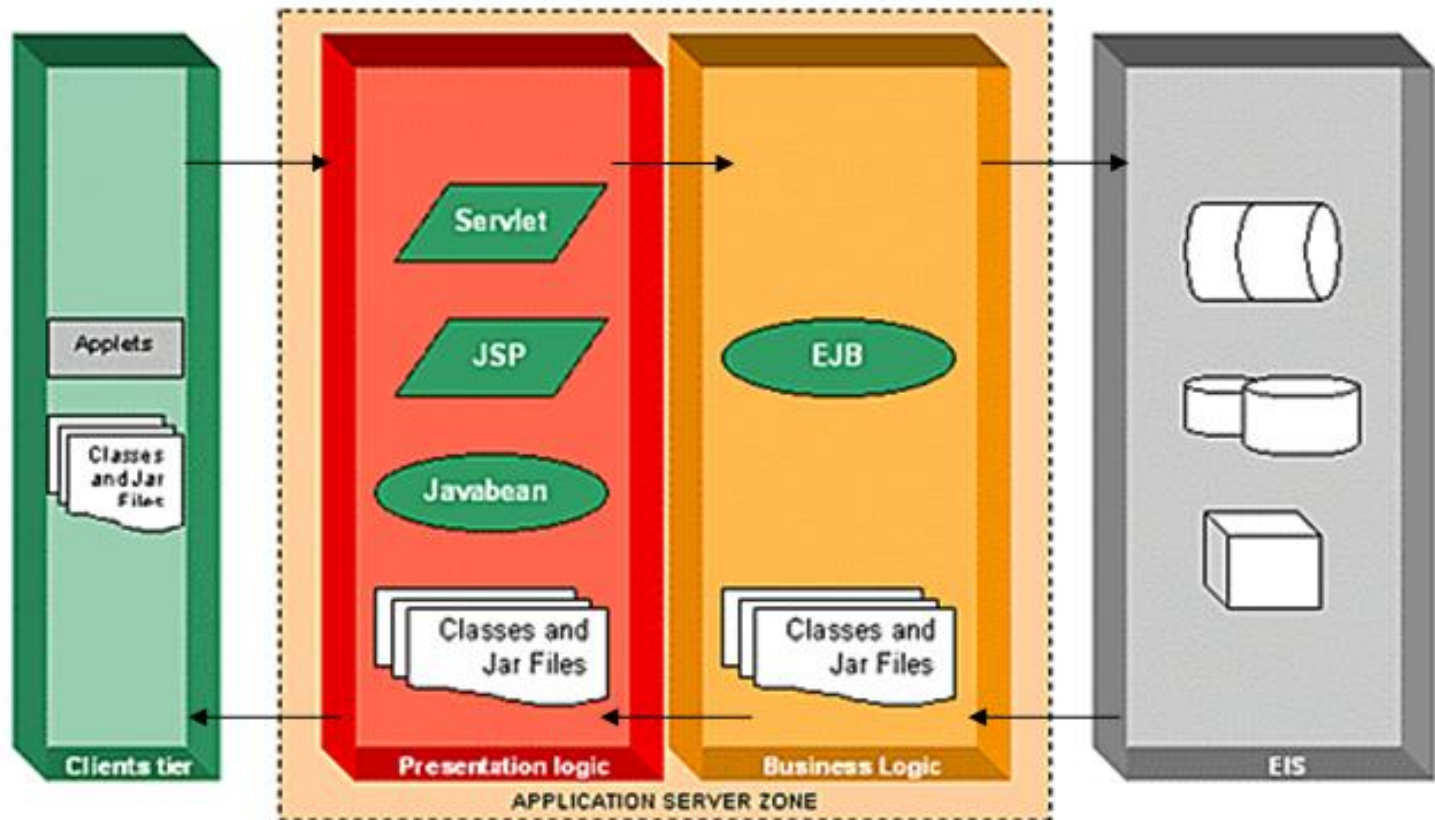
Multitier Application Architecture - Advantages

- Scalable
- Better and Finer Security Control
- Easy to maintain / upgrade
- Better Reusability
- Better Fault Tolerance Ability

Multitier Application Architecture - Disadvantages

- The performance of the whole application may be slow if the hardware and network bandwidth aren't good enough.
- More cost for hardware, network, maintenance and deployment

J2EE Application Components



J2EE Application Components

- **Servlet** is a server-side, presentation logic component that resides in the Web container. It extends the functionality of a Web server—providing programming capabilities and the capability to generate dynamic contents, apart from serving static HTML.
- **Java Server Page (JSP)** is a presentation logic components that reside, along with servlet, in the Web container. But they are slightly different from the servlet.
- **Javabeen** is a basic data model component that was introduced long before the advent of J2EE. In J2EE architecture, Javabeen can reside in any of the tiers, but usually found in presentation tier.
- **Enterprise Javabeen (EJB)** is a distributed, scalable business logic component of J2EE middleware. It encapsulates core business logic and data model elements in all enterprise Java projects.

J2EE Runtime Environment (Containers)

- J2EE application components in different tiers come to life in their runtime environments, which are called **containers** in J2EE terminology.
- These containers provide services like life-cycle management, security, transaction management, JNDI lookups, Remote connectivity etc.. to their components.
- J2EE standard defines four different containers:
 - **Applet container**: hosts applets
 - **Application client container**: hosts standard Java application clients (including swing windows applications)
 - **Web container**: hosts servlets and JSPs in the presentation logic tier
 - **EJB container**: hosts Enterprise Javabeans in the business logic tier