Course Name : Developing Applications for the Java EE 6 Platform

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Agenda

- In this session, you will learn to:
  - Describe Java Platform
  - Describe Enterprise Application
  - Enterprise Edition 6 (Java EE 6)
  - Describe Web application technologies
  - Identify the advantages and disadvantages of each Web application technology

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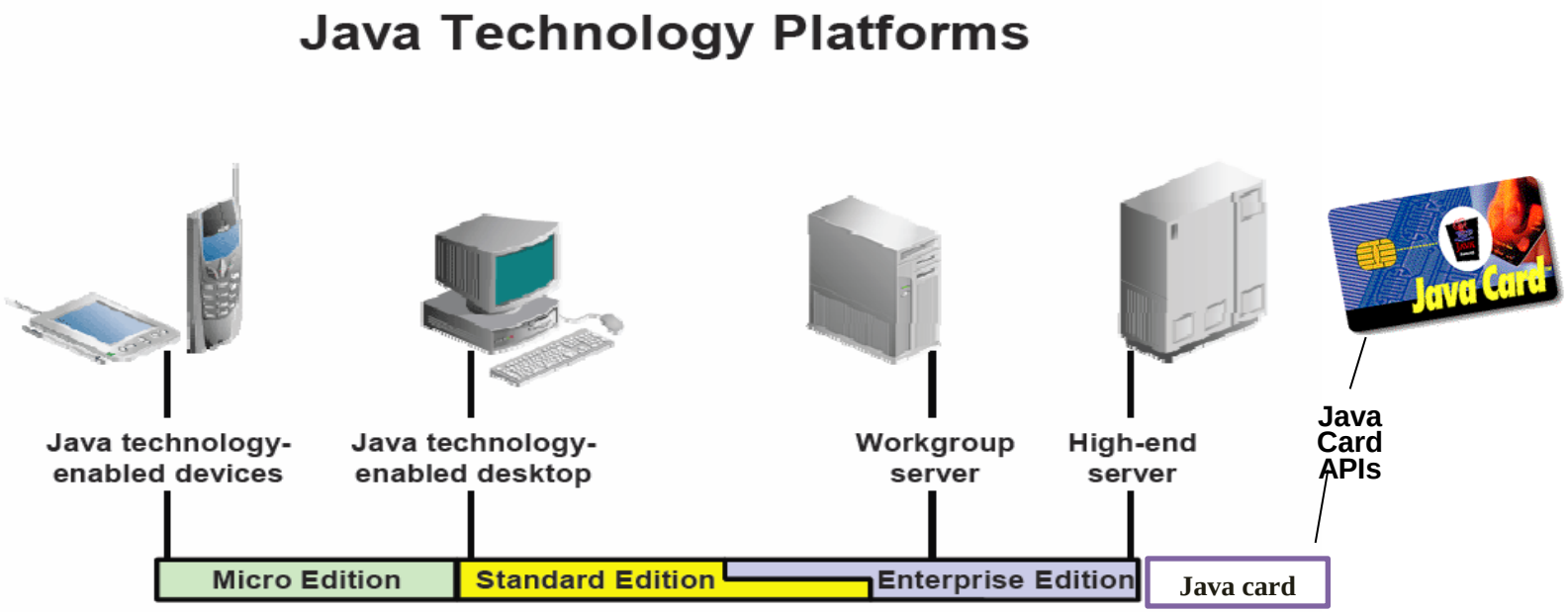
Java Platform

Java platform is the name for a bundle of related programs from Sun that allow for developing and running programs written in the Java programming language.



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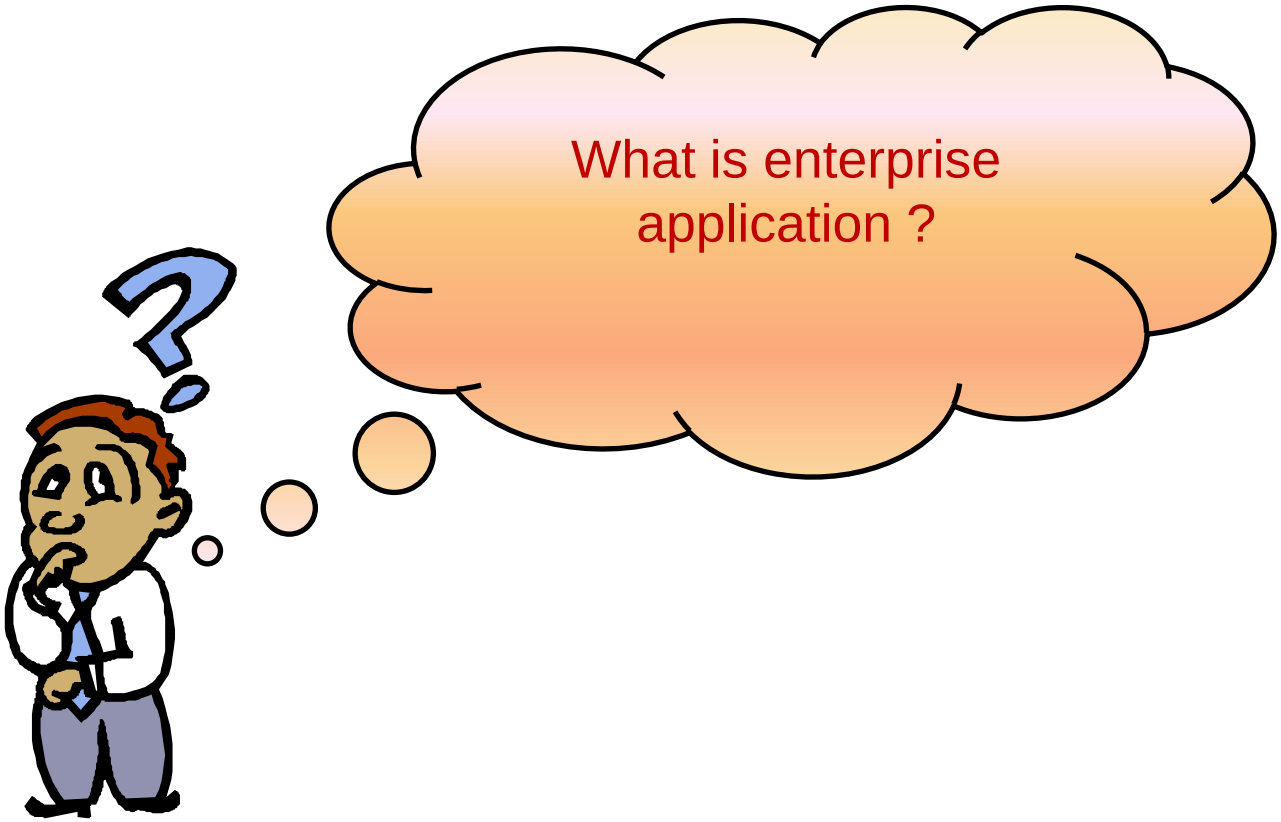
Enterprise Application



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Enterprise Application

- Enterprise Application is an application which is :
  - Large in size
  - Distributed
  - Secure
  - Scalable
  - Highly available
  - Accessible through multiple types of clients
- Things that makes enterprise application
  - Presentation logic
  - Business logic
  - Data Access logic
  - System Services
- Common types of Enterprise application are
  - Automated billing systems
  - Enterprise Resource Planning (ERP)

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- Java Enterprise Edition

- Is a Open and standard based platform for developing, deploying and managing n-tier, Web-enabled, server-centric, and component-based enterprise applications.

- Typically they will be server based applications focusing on serving the needs of lots users at one time.

- Is built on the foundation of Java Platform, Standard Edition (Java SE).

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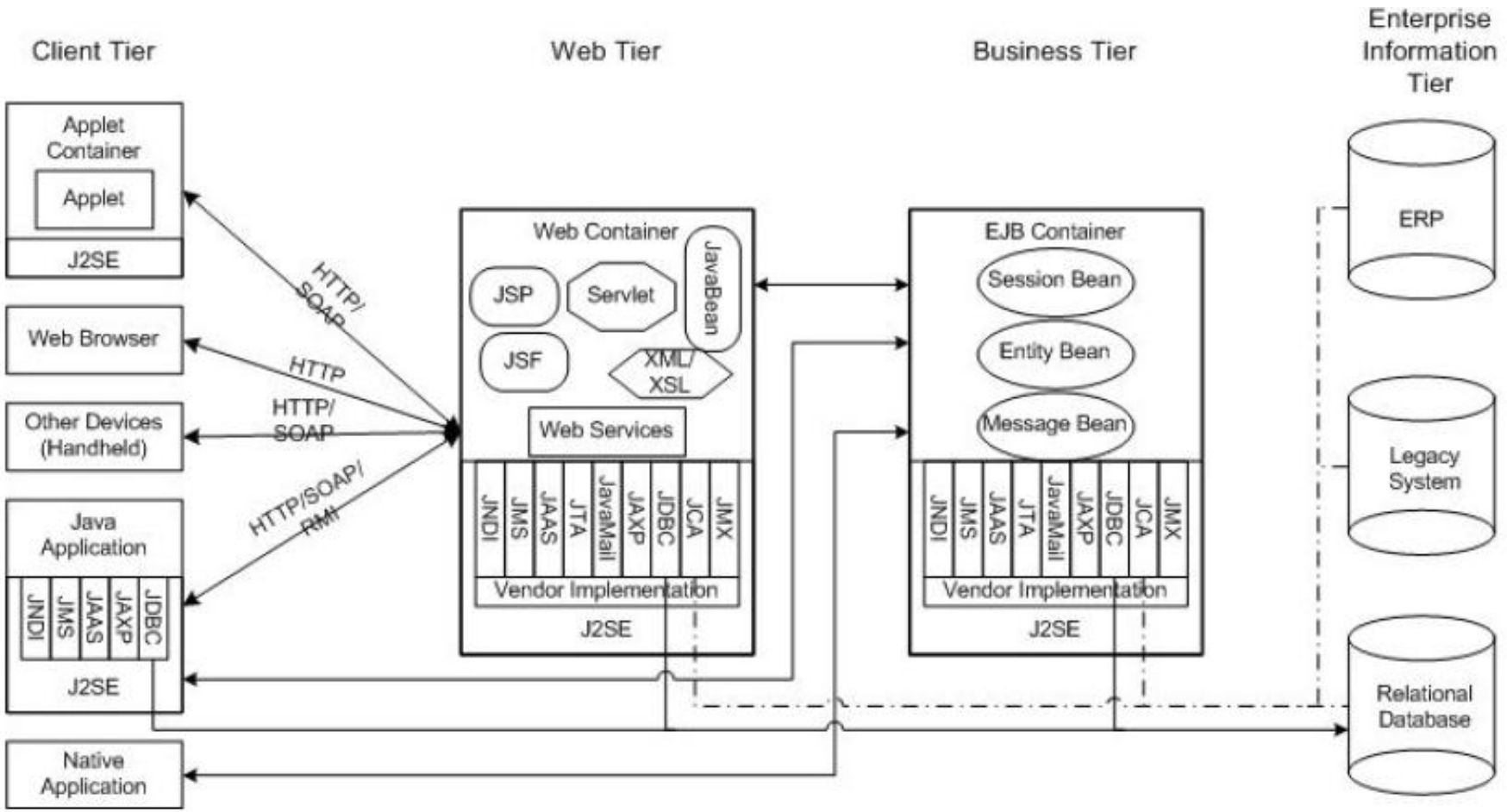
Java EE Architecture



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Java EE APIs and Technologies

- Standard Edition (Java SE)
- Java Server Pages™ (JSP™)
- Java Server Faces™ (JSF™)
- Remote Method Invocation (RMI)
- Java Persistence API (JPA)
- Java Message Service (JMS) API
- Java Naming and Directory Interface™ (JNDI) API
- Java Transaction API (JTA)
- Enterprise JavaBeans™ (EJB™) components
- Java API for XML Web Services (JAX-WS)
- Java API for Restful Web Services (JAX-RS)

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Web Application Technologies

- Some of the commonly used Web application technologies are:
  - Common Gateway Interface (CGI)
  - Java Servlets
  - Java Server Pages (JSP)
  - Java Server Faces(JSF)

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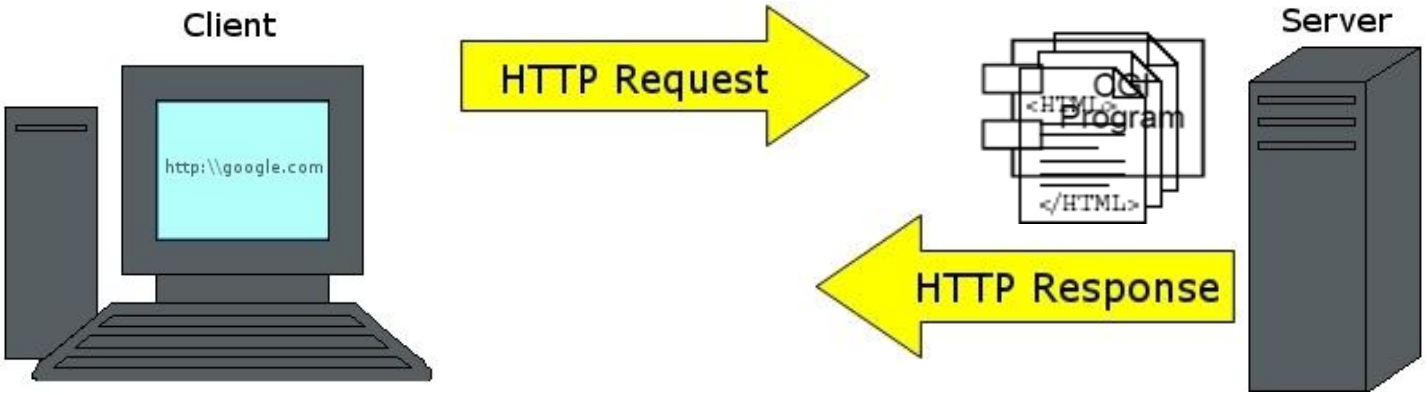
CGI Programs

- CGI is a technology used to build Web applications.
- CGI programs are executed in the following way:
  1. The client sends a request to the server.
  2. The server launches the CGI program in a separate Operating System (OS) shell.
  3. The CGI program processes the data and sends the response to the client as HTML.



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Advantages of CGI Programs

- The advantages of CGI programs are:
  - They can be written in various languages, such as Perl.
  - They do not crash a server if there are bugs in the program.
  - They do not cause concurrency conflicts.
  - They are supported by all service providers.
  - They can be easily referenced by a Web designer.

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Disadvantages of CGI Programs

- Disadvantages of CGI programs are:
  - Response time is high due to the creation of new OS shell for each request.
  - They are not scalable due to the limited number of OS shells that can be created on a server.
  - Languages used for CGI programs are often platform dependent.
  - Most of the programming languages used for CGI are not
  - object oriented.
  - There is no separation of business logic and presentation logic.

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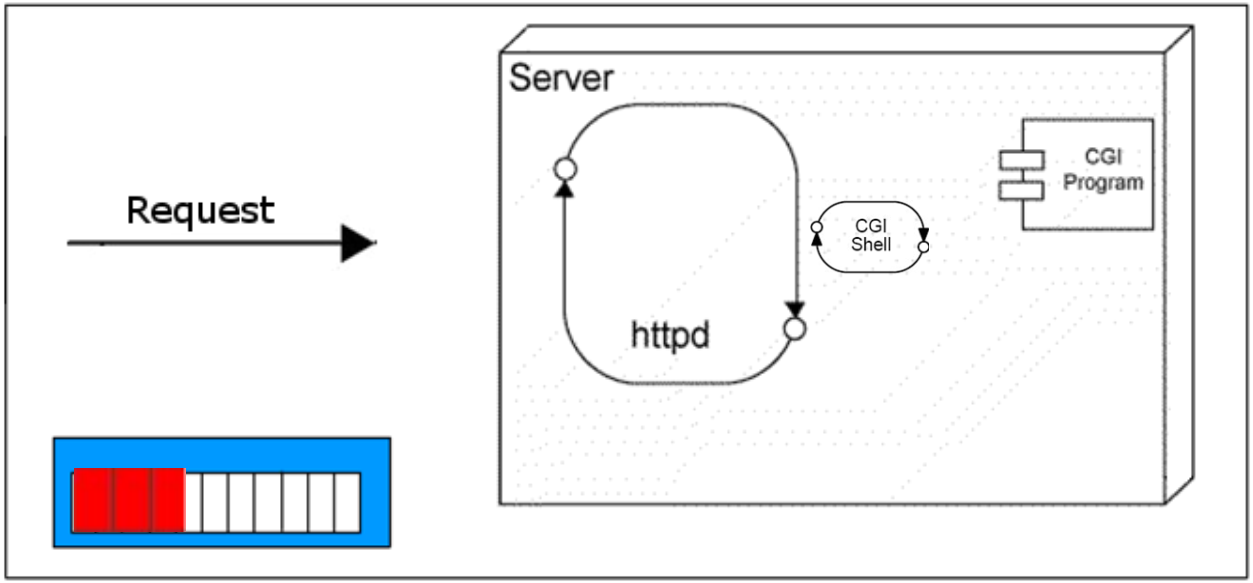
Disadvantages of CGI Programs

- The following figure shows the server load while executing a CGI program for a single request.



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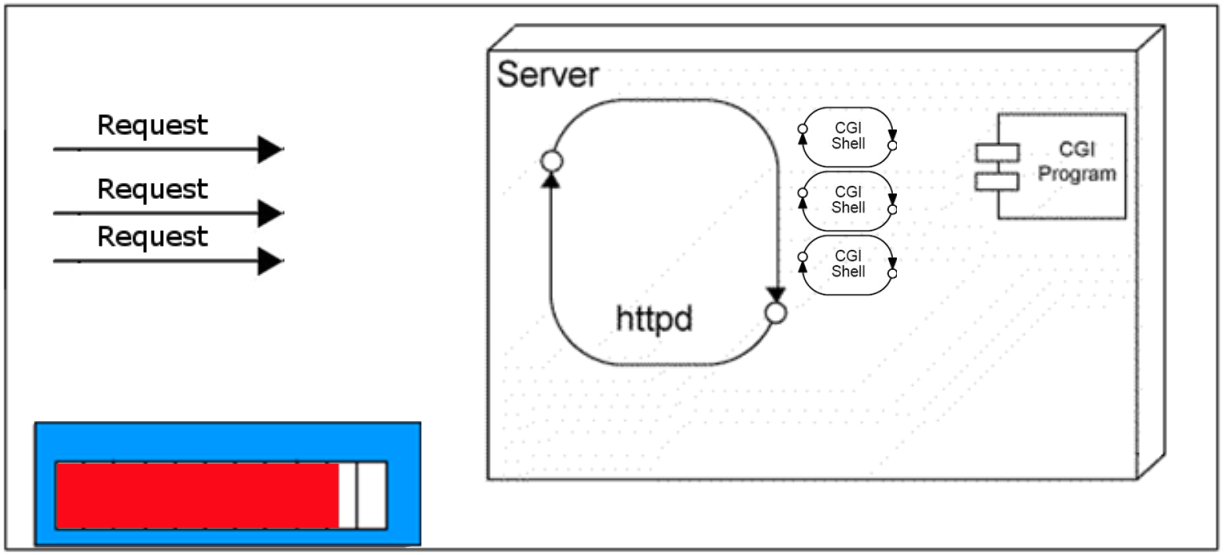
Disadvantages of CGI Programs

- The following figure shows the server load while executing a CGI program for multiple requests.



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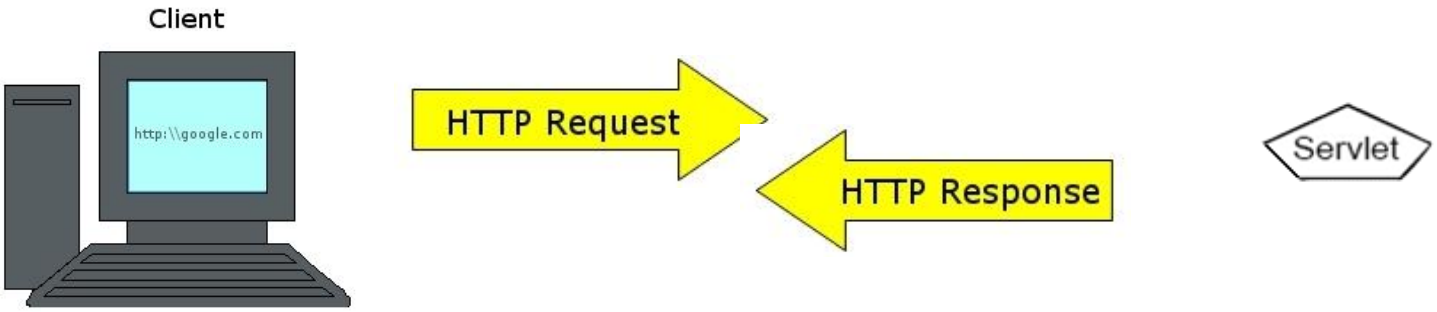
Java Servlet

- A Servlet is a Java program that runs on a server.
- A Servlet performs the following tasks:
  - Processes HTTP requests
  - Generates dynamic HTTP responses
- A servlet is similar to a CGI program, but executes inside a Web container as a thread.



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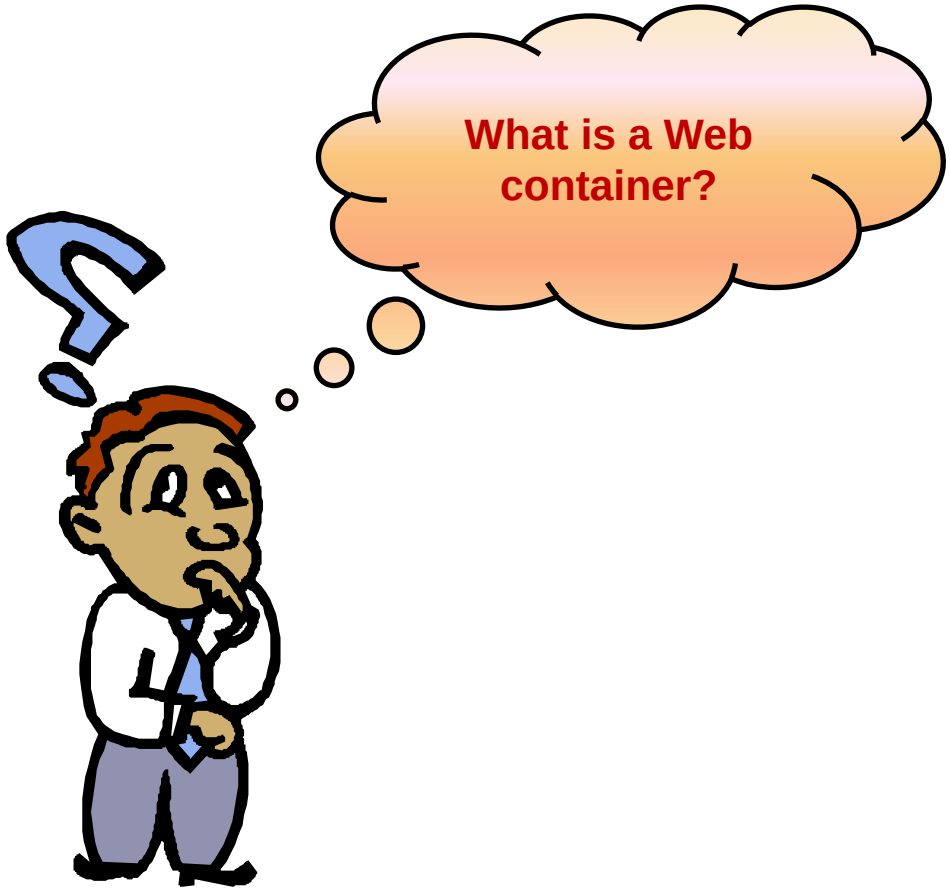
What is a Web Container?



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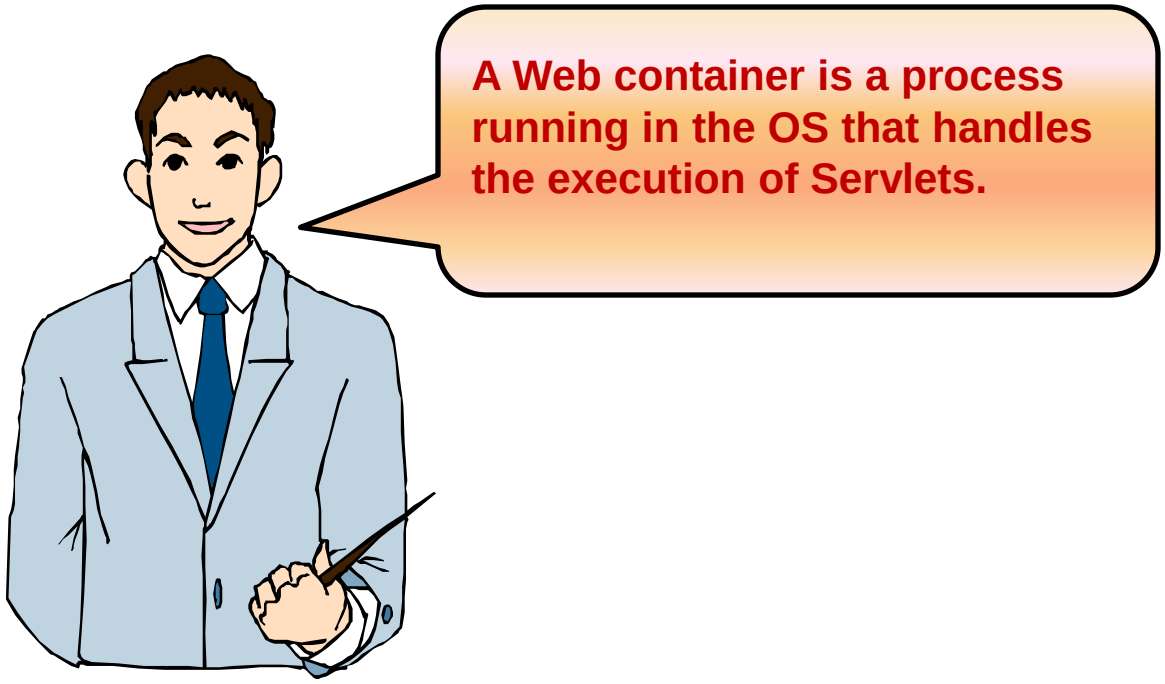
What is a Web Container ?



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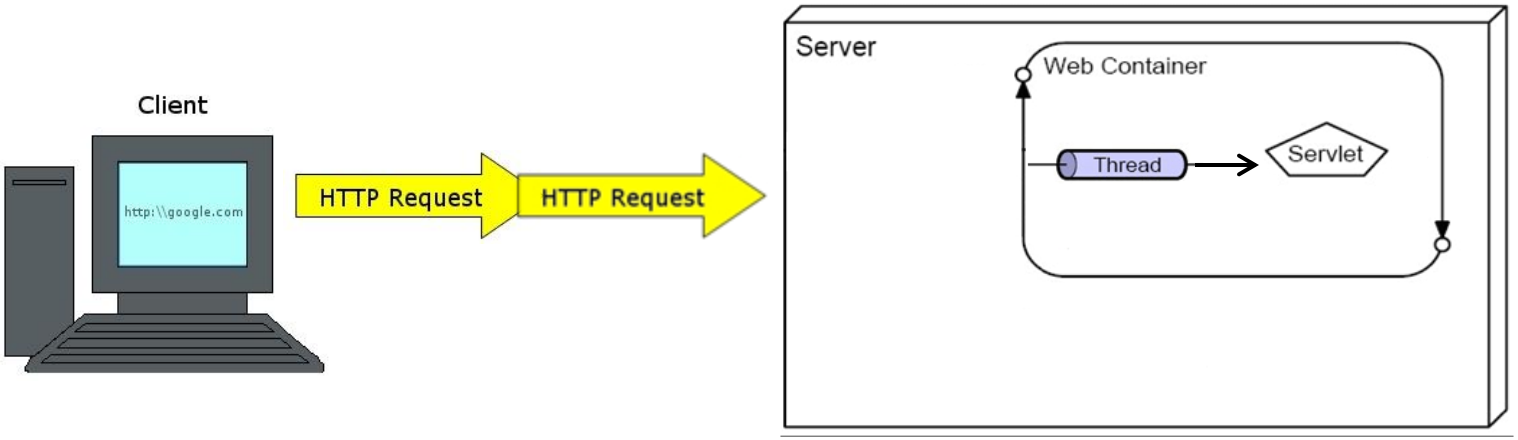
Execution of Java Servlets

- A servlet executes in the following way:
  1. The client sends request to the server.
  2. The Web container, running inside the server, receives the request.
  3. The Web container creates a new thread to process the request.
  4. The Web container forwards the request to the servlet.
  5. The Web container executes the servlet.



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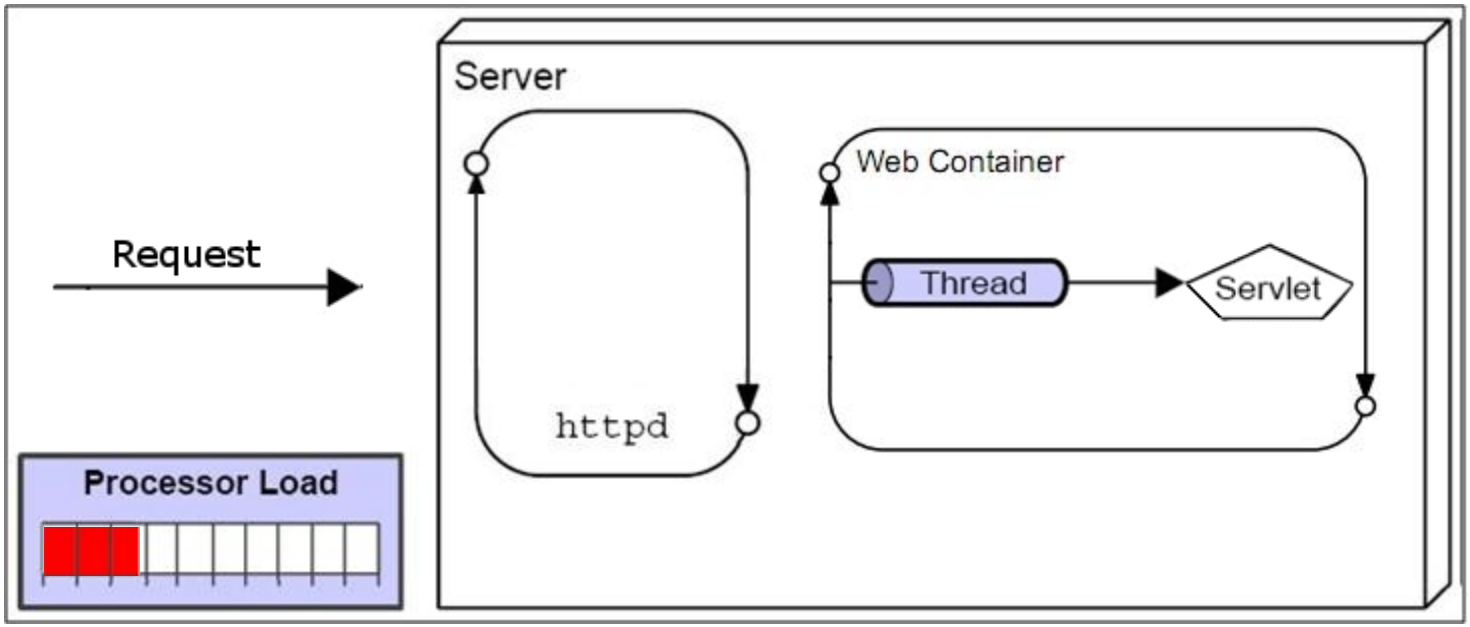
Execution of Java Servlets

- The following figure shows the execution process of a Servlet with a single request.



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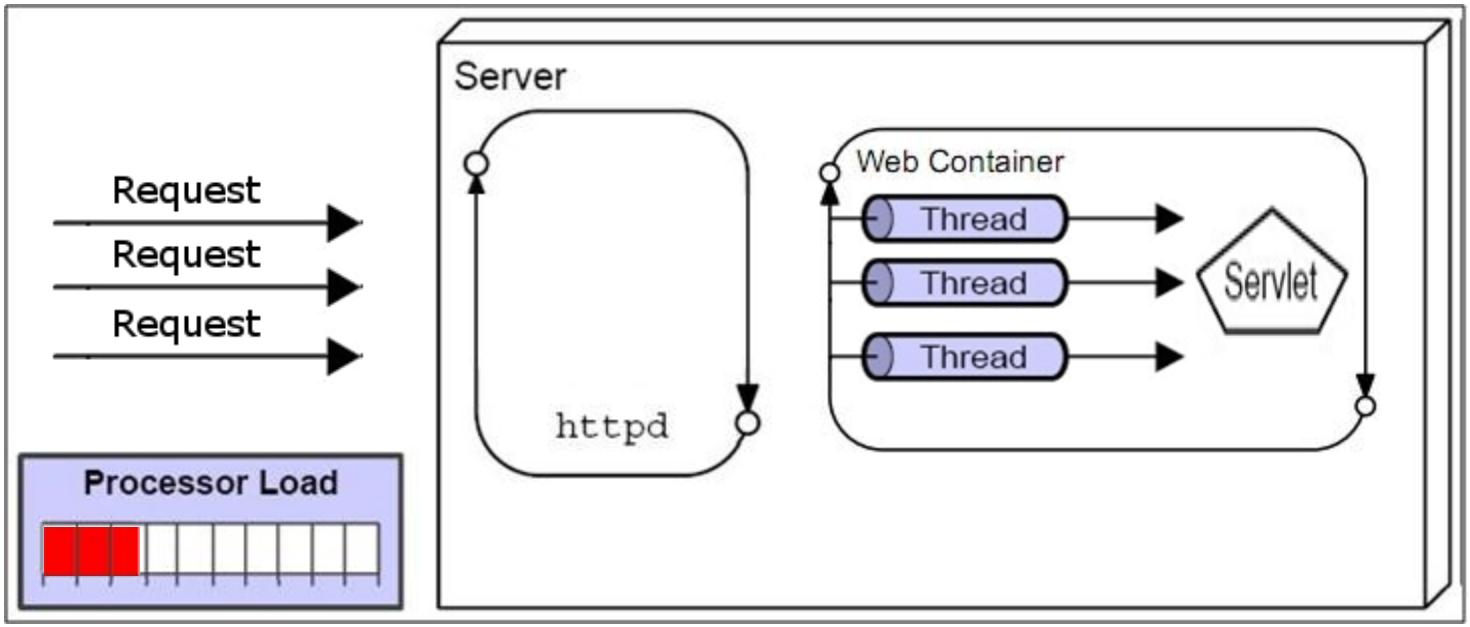
Execution of Java Servlets

- The following figure shows the execution process of a servlet with multiple requests.



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- The advantages of Servlets are:
  - They are efficient.
  - They are secure and scalable.
  - They are platform independent.
- The disadvantages of Servlets are:
  - They do not separate presentation and business logic.
  - They need to handle concurrency conflicts.

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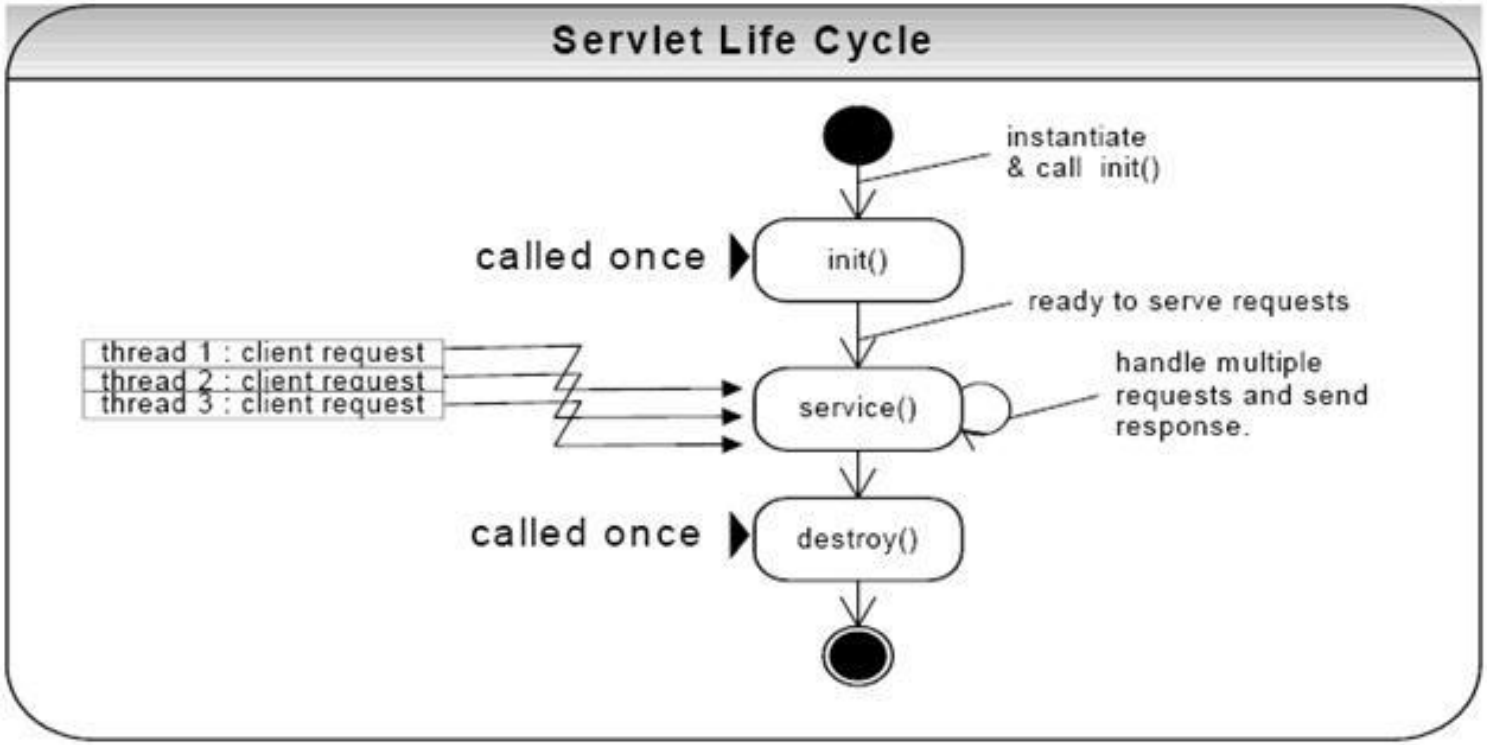

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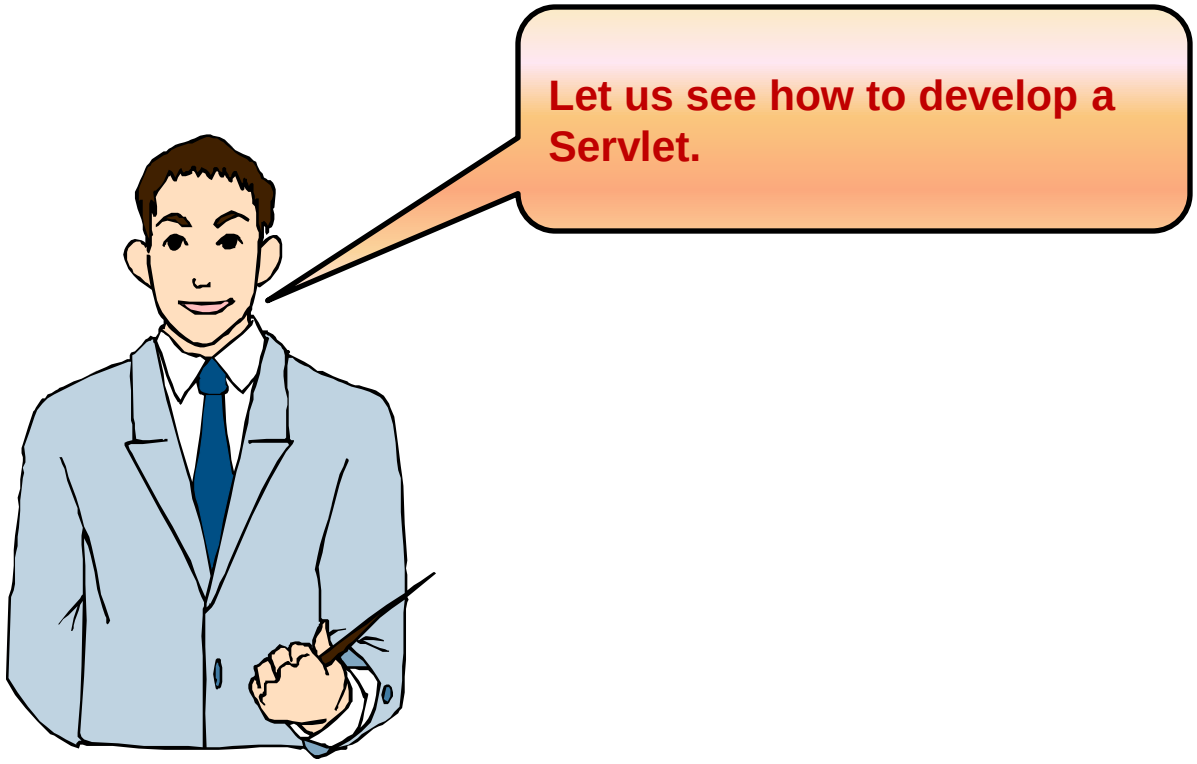
Demonstration: Java Servlets



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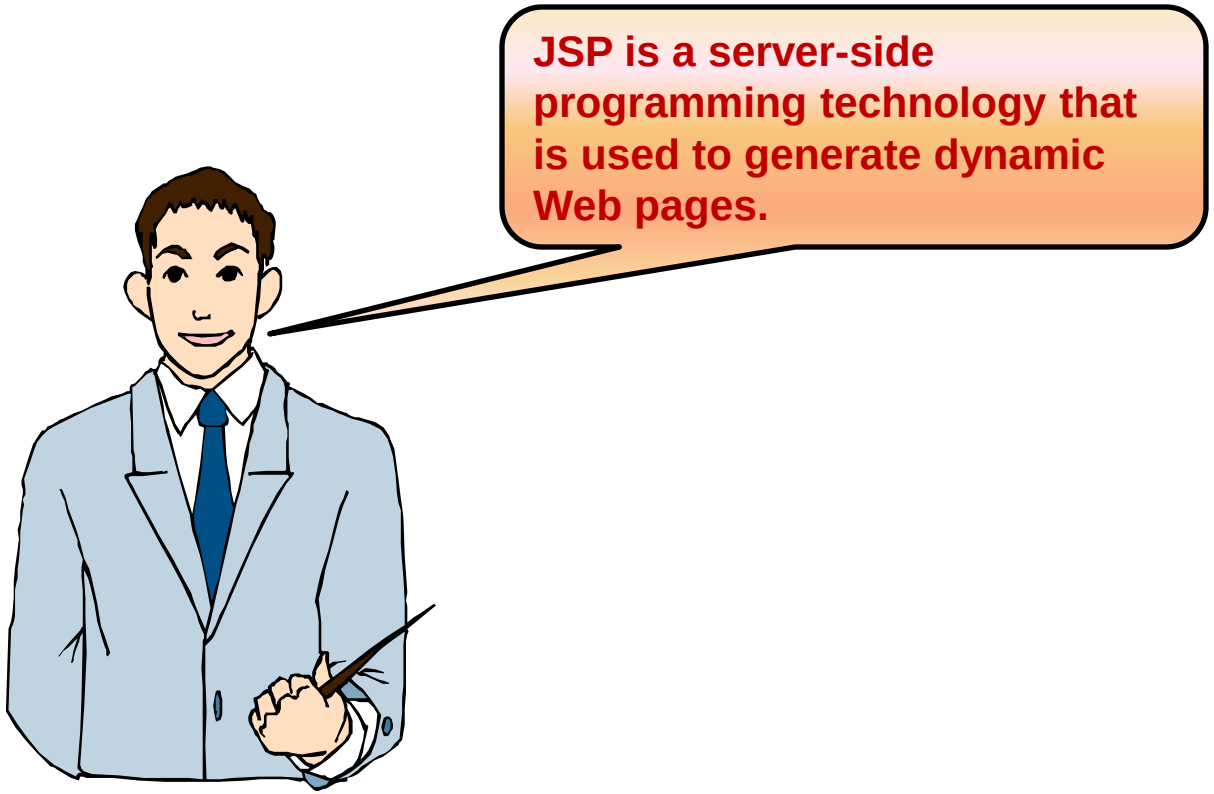
Java Server Pages



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Java Server Pages

- JSP technology facilitates the segregation of the work profiles of a Web designer and a Web developer.
- A Web designer can design and formulate the layout for a Web page by using HTML.
- A Web developer, working independently, can use Java code and other JSP specific tags to code the business logic

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- Advantages of JSP technology:
  - It provides high performance and scalability.
  - It is built on Java technology, and is therefore, platform independent.
  - It takes advantage of Java and its Application Programming Interfaces (APIs).

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- Disadvantages of JSP technology:
  - It is difficult to debug.
  - It needs to handle the concurrency issues.

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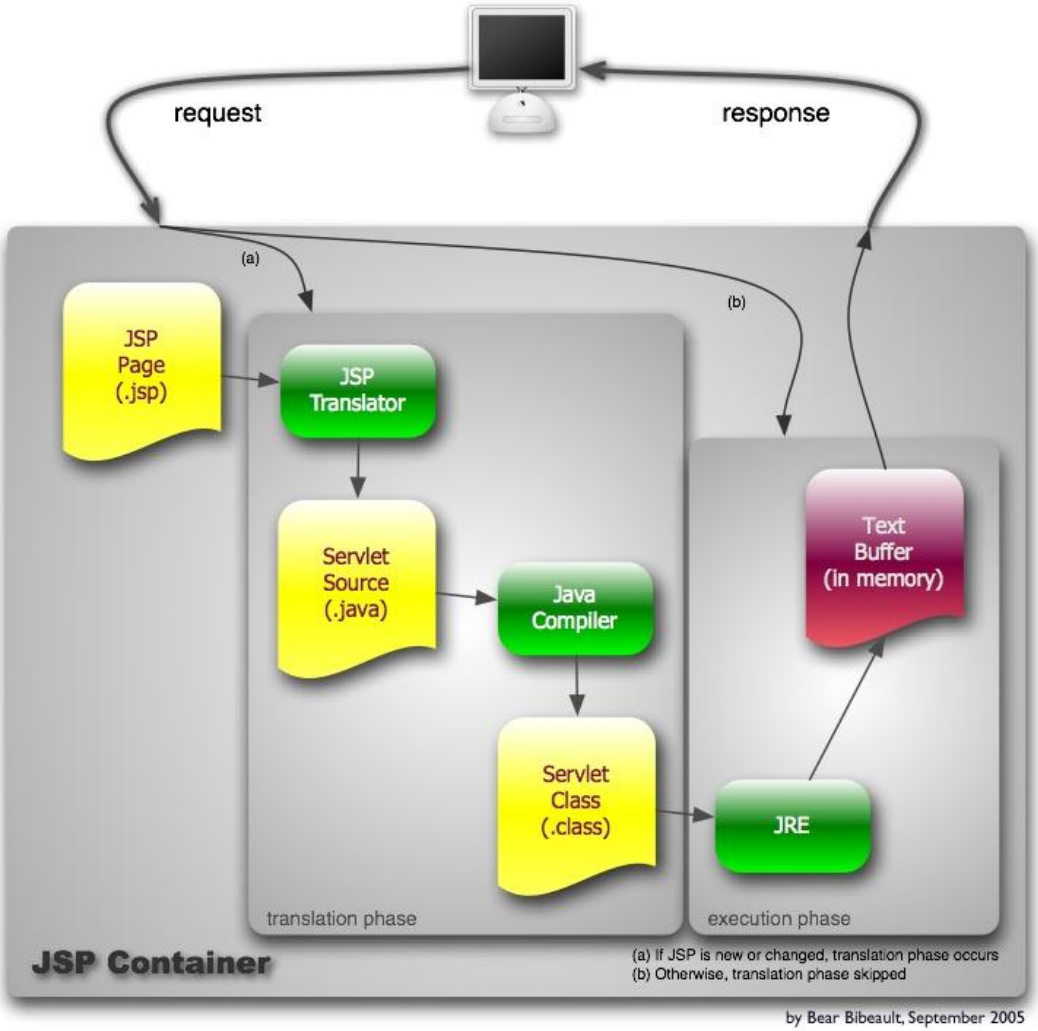
JSP™ Technology



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