JAVA SERVLET

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What is servlet

Servlet technology is used to create a web application (resides at server side and generates a dynamic web page).

Servlet technology is robust and scalable because of java language. Before Servlet, CGI (Common Gateway Interface) scripting language was common as a server-side programming language. However, there were many disadvantages to this technology. We have discussed these disadvantages below.

There are many interfaces and classes in the Servlet API such as Servlet, GenericServlet, HttpServlet, ServletRequest, ServletResponse, etc.

The javax.servlet and javax.servlet.http packages provide interfaces and classes for writing servlets. All servlets must implement the Servlet interface, which defines life-cycle methods. When implementing a generic service, you can use or extend the GenericServlet class provided with the Java Servlet API. The HttpServlet class provides methods, such as doGet and doPost, for handling HTTP-specific services.

Generic servlet

A generic, protocol-independent servlet. To write an HTTP servlet for use on the Web, extend HttpServlet instead.

GenericServlet implements the Servlet and ServletConfig interfaces. GenericServlet may be directly extended by a servlet, although it's more common to extend a protocol-specific subclass such as HttpServlet.

GenericServlet makes writing servlets easier. It provides simple versions of the lifecycle methods init and destroy and of the methods in the ServletConfig interface. GenericServlet also implements the log method, declared in the ServletContext interface.

Servlet can be described in many ways, depending on the context

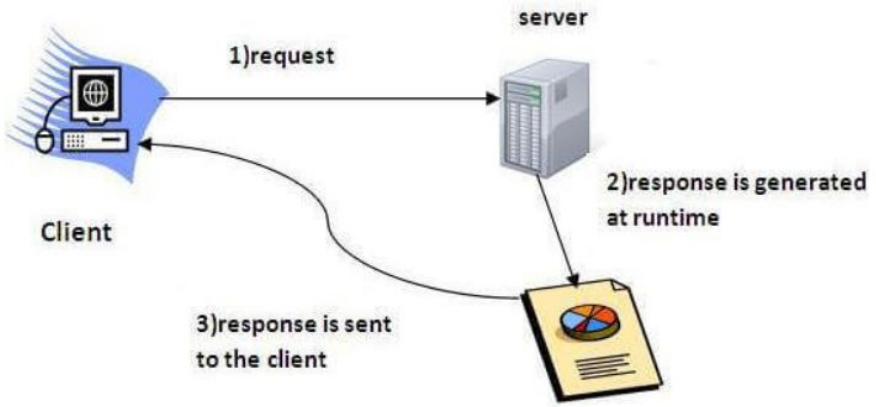
Servlet is a technology which is used to create a web application.

Servlet is an API that provides many interfaces and classes including documentation.

Servlet is an interface that must be implemented for creating any Servlet.

Servlet is a class that extends the capabilities of the servers and responds to the incoming requests. It can respond to any requests.

Servlet is a web component that is deployed on the server to create a dynamic web page.



CGI (Common Gateway Interface)

CGI technology enables the web server to call an external program and pass HTTP request information to the external program to process the request. For each request, it starts a new process.rvlet is a technology which is used to create a web application.

Disadvantages of CGI

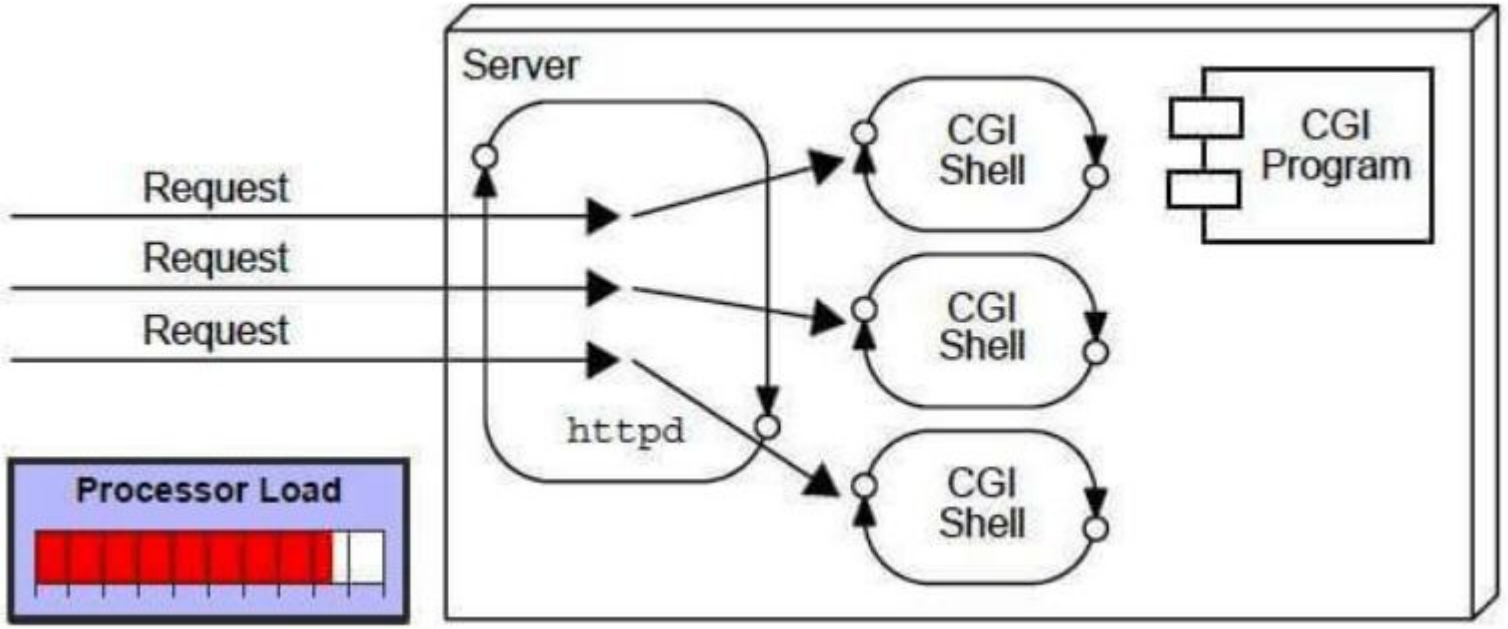
There are many problems in CGI technology:

If the number of clients increases, it takes more time for sending the response.

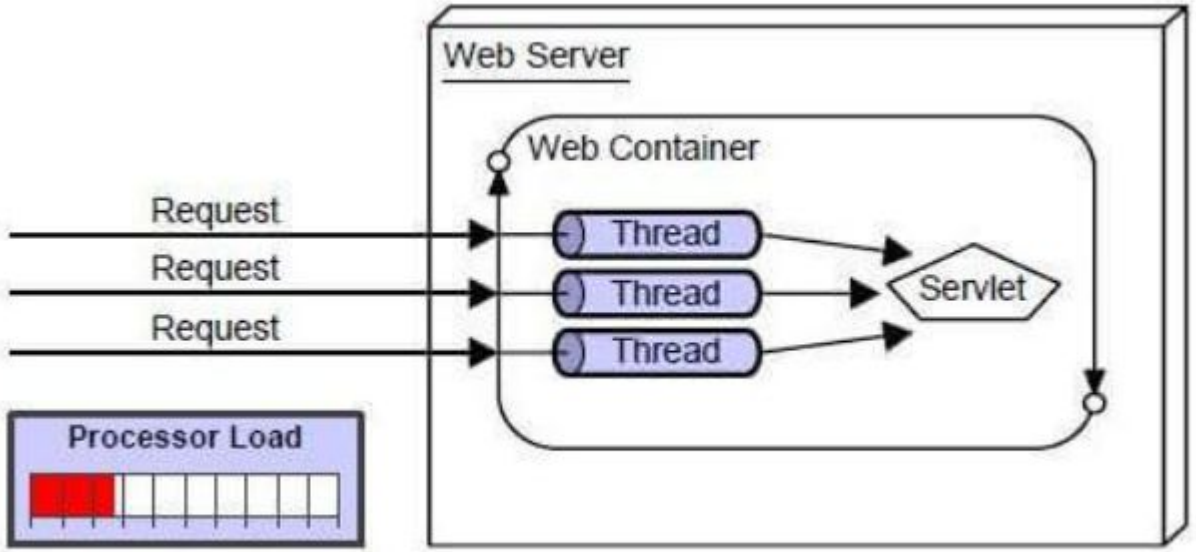
For each request, it starts a process, and the web server is limited to start processes.

It uses platform dependent language e.g. C, C++, perl.

CGI MODEL


Server
Request
Request
Request
httpd
CGI
Shell
CGI
Shell
CGI
Shell
CGI
Program
Processor Load

Servelt MODEL



Advantages of Servlet

There are many advantages of Servlet over CGI. The web container creates threads for handling the multiple requests to the Servlet. Threads have many benefits over the Processes such as they share a common memory area, lightweight, cost of communication between the threads are low. The advantages of Servlet are as follows:

Better performance: because it creates a thread for each request, not process.

Portability: because it uses Java language.

Robust: JVM manages Servlets, so we don't need to worry about the memory leak, garbage collection, etc.

Secure: because it uses java language.

Life Cycle of Servlet

The web container maintains the life cycle of a servlet instance. Let's see the life cycle of the servlet:

Servlet class is loaded.

Servlet instance is created.

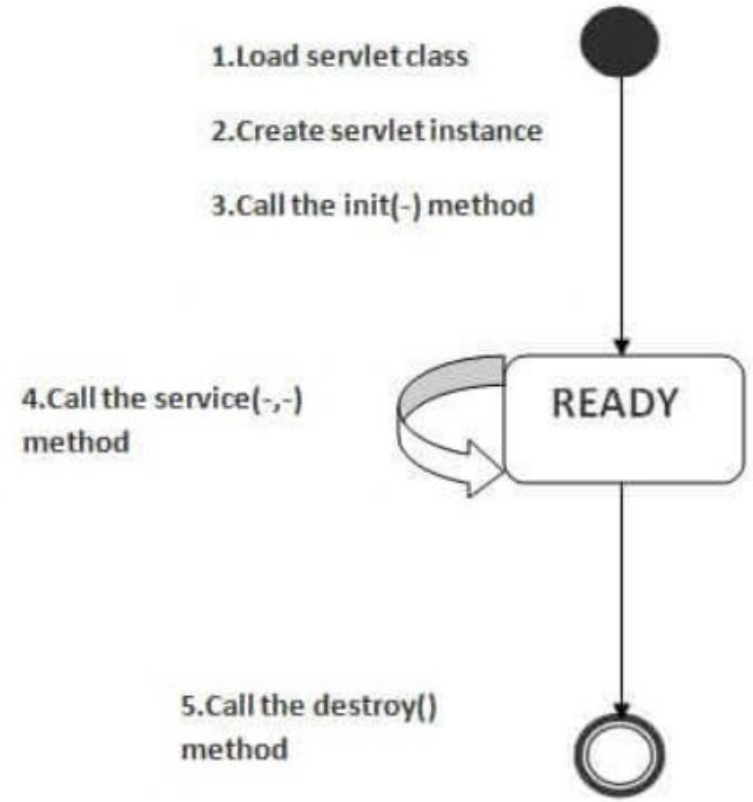
init method is invoked.

service method is invoked.

destroy method is invoked.

Life Cycle of Servlet

- As displayed in the above diagram, there are three states of a servlet: new, ready and end.
- The servlet is in new state if servlet instance is created.
- After invoking the init() method, Servlet comes in the ready state.
- In the ready state, servlet performs all the tasks.
- When the web container invokes the destroy() method, it shifts to the end state.



Life Cycle of Servlet

Servlet class is loaded The classloader is responsible to load the servlet class. The servlet class is loaded when the first request for the servlet is received by the web container.

Servlet instance is created The web container creates the instance of a servlet after loading the servlet class. The servlet instance is created only once in the servlet life cycle.

init method is invoked The web container calls the init method only once after creating the servlet instance. The init method is used to initialize the servlet. It is the life cycle method of the javax.servlet.Servlet interface.

service method is invoked The web container calls the service method each time when request for the servlet is received. If servlet is not initialized, it follows the first three steps as described above then calls the service method. If servlet is initialized, it calls the service method. Notice that servlet is initialized only once.

destroy method is invoked The web container calls the destroy method before removing the servlet instance from the service. It gives the servlet an opportunity to clean up any resource for example memory, thread etc.