Servlets

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

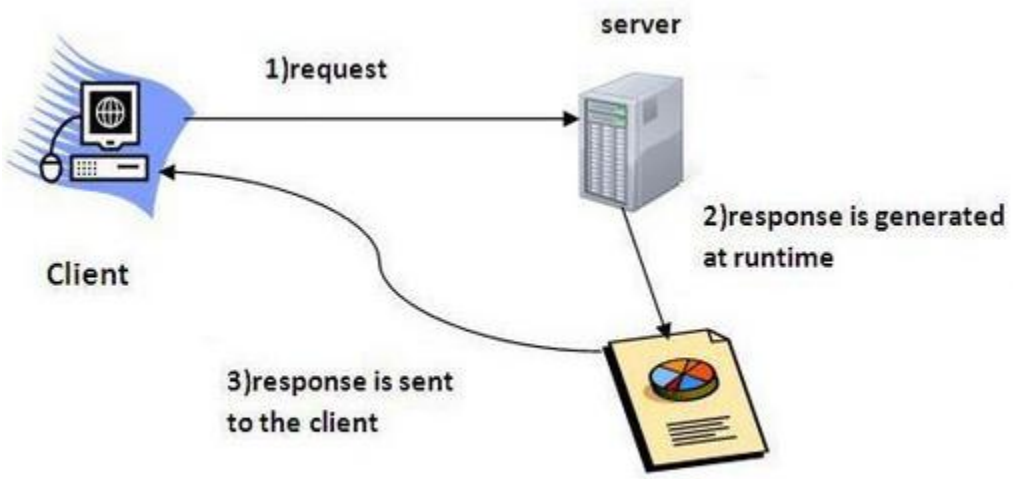
Servet technology is robust and scalable as it uses the java language. Before Servlet, CGI (Common Gateway Interface) scripting language was used as a server-side programming language. But there were many disadvantages of this technology. We have discussed these disadvantages below.

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

What is a Servlet?

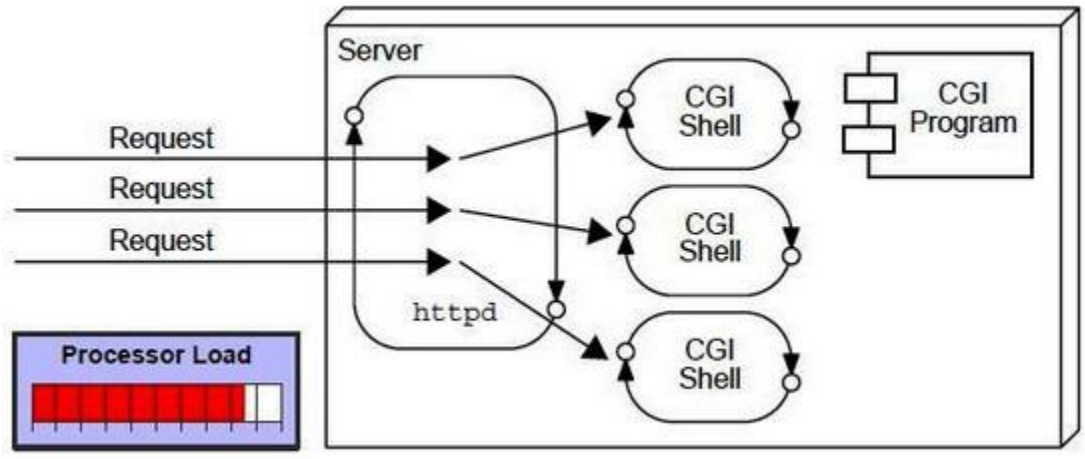
Servlet can be described in many ways, depending on the context.

- Servlet is a technology i.e. used to create web application.
- Servlet is an API that provides many interfaces and classes including documentations.
- Servlet is an interface that must be implemented for creating any servlet.
- Servlet is a class that extend the capabilities of the servers and respond to the incoming request. It can respond to any type of requests.
- Servlet is a web component that is deployed on the server to create dynamic web page.



CGI(Commmon 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.

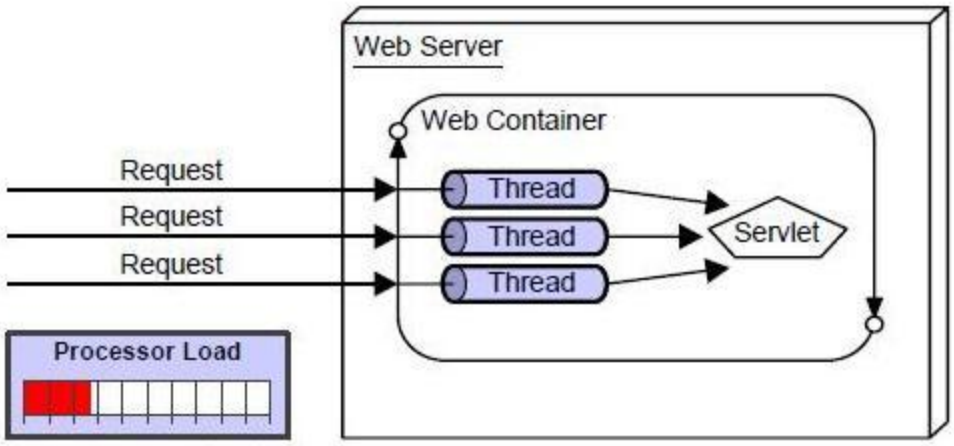


Disadvantages of CGI

There are many problems in CGI technology:

1. If number of client increases, it takes more time for sending response.
2. For each request, it starts a process and Web server is limited to start processes.
3. It uses platform dependent language e.g. C, C++, perl.

Advantage 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 a lot of benefits over the Processes such as they share a common memory area, lightweight, cost of communication between the threads are low. The basic benefits of servlet are as follows:

1. **Better performance:** because it creates a thread for each request not process.
2. **Portability:** because it uses java language.

3. **Robust:** Servlets are managed by JVM so no need to worry about memory leak, garbage collection etc.
4. **Secure:** because it uses java language.

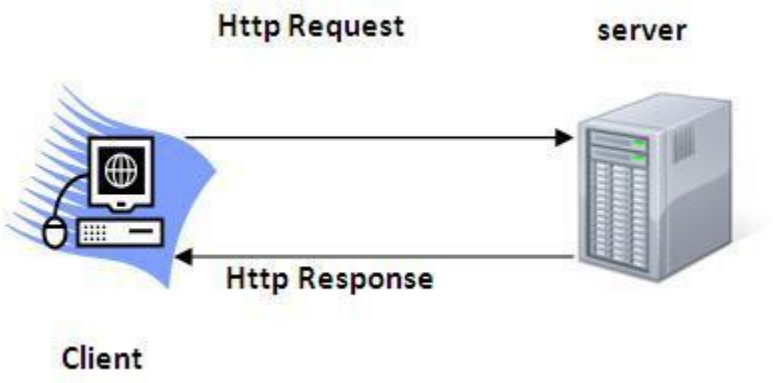
Servlet Terminology

The basic **terminologies used in servlet are** given below:

1. HTTP
2. HTTP Request Types
3. Difference between Get and Post method
4. Container
5. Server and Difference between web server and application server
6. Content Type

HTTP (Hyper Text Transfer Protocol)

1. Http is the protocol that allows web servers and browsers to exchange data over the web.
2. It is a request response protocol.
3. Http uses reliable TCP connections bydefault on TCP port 80.
4. It is stateless means each request is considered as the new request. In other words, server doesn't recognize the user bydefault.



Http Request Methods

Every request has a header that tells the status of the client. There are many request methods. Get and Post requests are mostly used.

The http request methods are:

HTTP Request	Description
GET	Asks to get the resource at the requested URL.
POST	Asks the server to accept the body info attached. It is like GET request with extra info sent with the request.
HEAD	Asks for only the header part of whatever a GET would return. Just like GET but with no body.
TRACE	Asks for the loopback of the request message, for testing or troubleshooting.
PUT	Says to put the enclosed info (the body) at the requested URL.
DELETE	Says to delete the resource at the requested URL.
OPTIONS	Asks for a list of the HTTP methods to which the thing at the request URL can respond

What is the difference between Get and Post?

GET		POST
In case of Get request, only **limited amount of data** can be sent because data is sent in header.		In case of post request, **large amount of data** can be sent because data is sent in body.
Get request is **not secured** because data is exposed in URL bar.		Post request is **secured** because data is not exposed in URL bar.
Get request **can be bookmarked**		Post request **cannot be** bookmarked
Get request is **idempotent**. It means second request will be ignored until response of first request is delivered.		Post request is **non-idempotent**
Get request is **more efficient** and used more than Post		Post request is **less efficient** and used less than get.

Anatomy of Get Request

Anatomy of Post Request

Container

It provides runtime environment for JavaEE (j2ee) applications. It performs many operations that are given below:

1. Life Cycle Management
2. Multithreaded support
3. Object Pooling
4. Security etc.

Web Container: In Java, Web Container or Servlet Container or Servlet Engine is used to manage the components like Servlets, JSP. Usually it is a part of the web server. **e.g. Tomcat**

Server

It is a running program or software that provides services. There are two types of servers:

1. Web Server
2. Application Server

1. **Web Server**

Web Server or HTTP Server is a program capable of handling HTTP requests, sent by a client and respond back with a HTTP response. **e.g. Apache.**

2. **Application Server**

Application server contains Web and EJB containers. It can be used for servlet, jsp, struts, jsf, ejb etc. Example of Application Servers are:

1. **JBoss** Open-source server from JBoss community.
2. **Glassfish** provided by Sun Microsystem. Now acquired by Oracle.
3. **Weblogic** provided by Oracle. It more secured.
4. **Websphere** provided by IBM.

Content Type

Content Type is also known as MIME (Multipurpose internet Mail Extension) Type. It is a **HTTP header** that provides the description about what are you sending to the browser.

There are many content types:

- text/html
- text/plain
- application/msword
- application/vnd.ms-excel
- application/jar
- application/pdf
- application/octet-stream
- application/x-zip
- images/jpeg
- video/quicktime etc.