

# Servlet Questions and Answers

## 1. What is Servlet?

- Java Servlet is server side technologies to extend the capability of web servers by providing support for dynamic response and data persistence.

## 2. What is difference between web server and application server?

- **A web server** is a device or application program which handles HTTP request from client browser and response to client client browser.

- **Application Servers** handles request and responses and also provide additional features such as Enterprise JavaBeans support, JMS Messaging support, Transaction Management etc.

## 3. Difference between CGI and Servlet?

Servlet	CGI
Servlets can link directly to the Web server.	CGI cannot directly link to Web server.
Servlets can share data among each other.	CGI does not provide sharing property.
Servlets can perform session tracking and caching of previous computations.	CGI cannot perform session tracking and caching of previous computations.
In Servlets, the Java Virtual Machine stays up, and each request is handled by a lightweight Java thread.	In CGI, each request is handled by a heavyweight operating system process.
Servlets are portable.	CGI is not portable.
Servlets automatically parse and decode the HTML form data.	CGI cannot automatically parse and decode the HTML form data.
Servlets can read and set HTTP headers, handle cookies, tracking sessions.	CGI cannot read and set HTTP headers, handle cookies, tracking sessions.
Servlets is inexpensive than CGI.	CGI is more expensive than Servlets.

## 4. Why servlet is mostly used?

- Servlets are mostly used because they are platform-independent Java classes and are

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compiled to platform-neutral byte code. Java byte code can be loaded dynamically into and run by java enabled web server.

## 5. What is called servlet container?

- A servlet container is a part of Web server that provides network services depends on request and response are sent, MIME based requests and responses. It contains and manages servlets through their life cycle.

## 6. What is MIME Type?

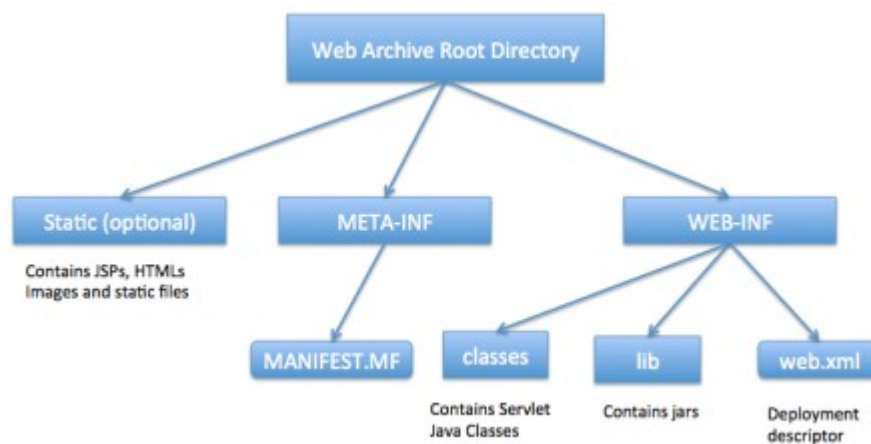
- **MIME** is an abbreviation for "**Multipurpose Internet Mail Extensions**". The "Content-Type" response header is known as MIME Type. **MIME** describes the type of data the file contains.

- A **MIME** type nomenclature includes a **type** and **subtype** separated by a forward slash. For example, a popular one is text/html. Here **text** is called **type** and **html** is known as **subtype**.

e.g `response.setContentType("text/html");`

## 7. What is a web application and what is it's directory structure?

- Web Applications are modules that run on server to provide both static and dynamic content to the client browser. Apache web server supports PHP and we can create web application using PHP. Java provides web application support through Servlets and JSPs that can run in a servlet container and provide dynamic content to client browser. Java Web Applications are packaged as Web Archive (WAR) and it has a defined structure like below image.



## 8. What are common tasks performed by Servlet Container?

Servlet containers are also known as web container, for example Tomcat. Some of the important tasks of servlet container are:

- **Communication Support:** Servlet Container provides easy way of communication between web client (Browsers) and the servlets and JSPs. Because of container, we don't need to build a server socket to listen for any request from web client, parse the request and generate response. All these important and complex tasks are done by container and all we need to focus is on business logic for the applications.

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- **Lifecycle and Resource Management:** Servlet Container takes care of managing the life cycle of servlet. From the loading of servlets into memory, initializing servlets, invoking servlet methods and to destroy them. Container also provides utility like JNDI for resource pooling and management.
- **Multithreading Support:** Container creates new thread for every request to the servlet and provide them request and response objects to process. So servlets are not initialized for each request and saves time and memory.
- **JSP Support:** JSPs doesn't look like normal java classes but every JSP in the application is compiled by container and converted to Servlet and then container manages them like other servlets.
- **Miscellaneous Task:** Servlet container manages the resource pool, perform memory optimizations, execute garbage collector, provides security configurations, support for multiple applications, hot deployment and several other tasks behind the scene that makes a developer life easier.

## 9. Explain Life Cycle of Servlet?

- A servlet life cycle can be defined as the entire process from its creation till the destruction. The following are the paths followed by a servlet.

- The servlet is initialized by calling the `init ()` method.
- The servlet calls `service()` method to process a client's request.
- The servlet is terminated by calling the `destroy()` method.

## 10. When `init()` method of servlet gets called?

- The `init` method is designed to be called only once. It is called when the servlet is first created, and not called again for each user request. So, it is used for one-time initializations, just as with the `init` method of applets.

## 11. When `service()` method of servlet gets called?

- Each time the server receives a request for a servlet, the server spawns a new thread and calls `service`. The `service()` method checks the HTTP request type (GET, POST, PUT, DELETE, etc.) and calls `doGet`, `doPost`, `doPut`, `doDelete`, etc. methods as appropriate.

## 12. When `doGet()` method of servlet to be called?

- A GET request results from a normal request for a URL or from an HTML form that has no METHOD specified and it should be handled by `doGet()` method.

## 13. When `doPost()` method of servlet to be called?

- A POST request results from an HTML form that specifically lists POST as the METHOD and it should be handled by `doPost()` method.

## 14. When `destroy()` method of servlet gets called?

- The `destroy()` method is called only once at the end of the life cycle of a servlet.

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## 15. For what purpose `init()` method of a servlet is used?

- The `init()` method simply creates or loads some data that will be used throughout the life of the servlet.

## 16. For what purpose `destroy()` method of a servlet is used?

- This method gives your servlet a chance to close database connections, halt background threads, write cookie lists or hit counts to disk, and perform other such cleanup activities.

## 17. How to read form data in servlet?

- Servlets handles form data parsing automatically using the following methods depending on the situation:

- **`getParameter()`:** You call `request.getParameter()` method to get the value of a form parameter.
- **`getParameterValues()`:** Call this method if the parameter appears more than once and returns multiple values, for example checkbox.
- **`getParameterNames()`:** Call this method if you want a complete list of all parameters in the current request.

## 18. What is `ServletConfig` object?

- `javax.servlet.ServletConfig` is used to pass configuration information to Servlet. Every servlet has it's own **`ServletConfig`** object and servlet container is responsible for instantiating this object. We can provide servlet init parameters in `web.xml` file or through use of `WebInitParam` annotation. We can use `getServletConfig()` method to get the `ServletConfig` object of the servlet.

## 19. What is `ServletContext` object?

- `javax.servlet.ServletContext` interface provides access to web application parameters to the servlet. The `ServletContext` is unique object and available to all the servlets in the web application. When we want some init parameters to be available to multiple or all of the servlets in the web application, we can use `ServletContext` object and define parameters in `web.xml` using `<context-param>` element. We can get the `ServletContext` object via the `getServletContext()` method of `ServletConfig`. Servlet containers may also provide context objects that are unique to a group of servlets and which is tied to a specific portion of the URL path namespace of the host. `ServletContext` is enhanced in Servlet Specs 3 to introduce methods through which we can programmatically add Listeners and Filters and Servlet to the application. It also provides some utility methods such as `getMimeType()`, `getResourceAsStream()` etc.

## 20. What is difference between `ServletConfig` and `ServletContext`?

- Some of the differences between `ServletConfig` and `ServletContext` are:

- `ServletConfig` is a unique object per servlet whereas `ServletContext` is a unique object for complete application.

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- ServletConfig is used to provide init parameters to the servlet whereas ServletContext is used to provide application level init parameters that all other servlets can use.
- We can't set attributes in ServletConfig object whereas we can set attributes in ServletContext that other servlets can use in their implementation.

## 21. What is Request Dispatcher?

- RequestDispatcher interface is used to forward the request to another resource that can be HTML, JSP or another servlet in same application. We can also use this to include the content of another resource to the response. This interface is used for inter-servlet communication in the same context. There are two methods defined in this interface:

1. void forward(ServletRequest request, ServletResponse response) – forwards the request from a servlet to another resource (servlet, JSP file, or HTML file) on the server.
2. void include(ServletRequest request, ServletResponse response) – includes the content of a resource (servlet, JSP page, HTML file) in the response.

We can get RequestDispatcher in a servlet using ServletContext.getRequestDispatcher(String path) method. The path must begin with a / and is interpreted as relative to the current context root.

## 22. How can we create deadlock situation in servlet?

- We can create deadlock in servlet by making a loop of method invocation, just call doPost() method from doGet() method and doGet() method to doPost() method to create deadlock situation in servlet.

## 23. What is the use of servlet wrapper classes?

- Servlet HTTP API provides two wrapper classes – HttpServletRequestWrapper and HttpServletResponseWrapper. These wrapper classes are provided to help developers with custom implementation of servlet request and response types. We can extend these classes and override only specific methods we need to implement for custom request and response objects. These classes are not used in normal servlet programming.