

Session Tracking: It means remembering a user's information while they ~~are~~ move from one page to another on a website.

→ Session Tracking means "identifying an object based on the location over a period of time."

→ Session Tracking is used by the server to remember a client and their data for multiple requests.

→ Session Tracking can be done in three ways,

i. Using Hidden Field

ii. Using Cookies

iii. By re-writing the URL

Cookies:

→ Cookies are a temporary templates used in request and response from the client to the server.

→ They are used to remember the browsing history of the user.

Session Tracking using Cookies:

→ Cookies are created by the server.

→ Server creates the session unique ID for cookies.

How cookies are created:

i. Cookies are generated by the server.

ii. It has unique ID's.

iii. Cookies transfer these unique ID's from server to the client.

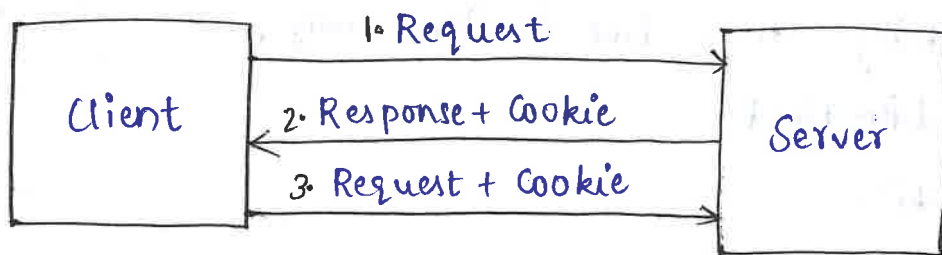
iv. These ID's are stored in the web application.

v. Sub sequent requests are sent from the user/client to the server using these session ID's.

vi. Session ID is identified by the server.

vii. The session state is expired, cookies are deleted when the session ends.

Working of Cookies:



Step-i:- Browser sends a request

→ The client sends a request to the server to access the web page.

→ No cookies are created at this point.

Step-ii:- Server responds and sets a cookie

→ The server processes the request and sends back response with a cookie.

→ Cookie contains data like session ID, user preferences/login info.

Step-iii:- Browser sends cookie with request

→ The browser stores the cookie and automatically sends it with future requests.

→ It is useful for the server to recognize the client/user.

Advantages of Cookies:

- i. Session Management
- ii. Personalization
- iii. Tracking and Analytics

#### iv. Efficiency

Disadvantages of Cookies :

- i. Privacy Concerns
- ii. Security Risks
- iii. Storage Limitation
- iv. User Control

Types of Cookies :

→ There are two types of cookies :

i. Session Cookies / Non-Persistent Cookies / In-memory Cookies :-

→ These type of cookies have no expiry time.

→ Expired when user closes the application.

→ Once the browsing window is closed, these cookies are destroyed automatically.

ii. Persistent Cookies :-

→ These type of cookies are stored on the user's device for a fixed period which is set by the server.

→ They remain even after the browser is closed.

→ Persistent Cookies are used to remember login details.

→ This session ID is deleted manually.

## Types of Servlet Events and Features:

→ An event in Servlets is an action that takes place in the web application.

→ Servlet containers are used to detect these events.

→ There are two main types of servlet events:

i. ServletContext Events

ii. HttpSessionEvent

→ Servlet Context Event again has two types.

\* ServletContextEvent

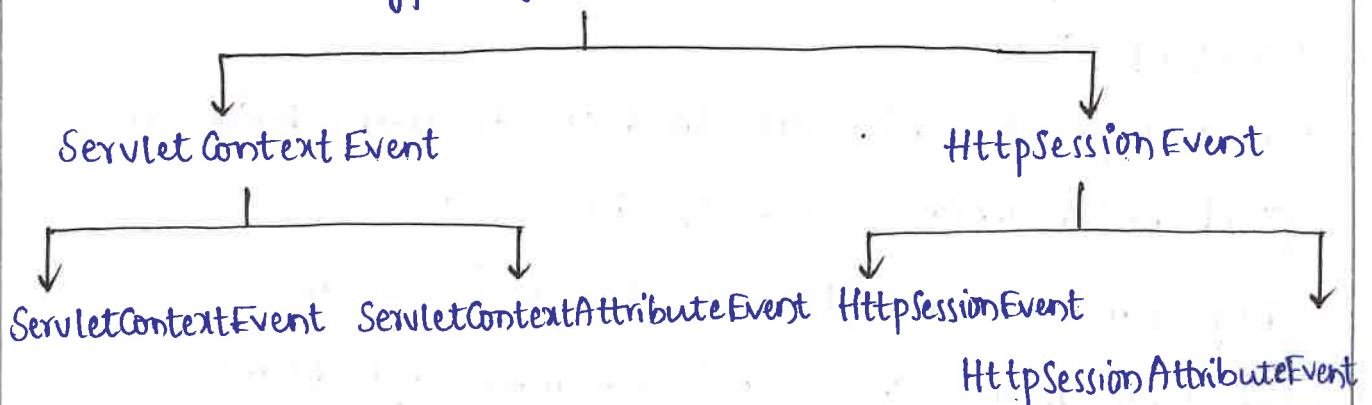
\* ServletContextAttributeEvent

→ HttpSession Event is also again divided into two types.

\* HttpSessionEvent

\* HttpSessionAttributeEvent

### Types of Servlet Events



## Servlet Context Events (Application-Level):

→ It is an event class in Java servlets which provides the notifications about changes to the servlet context.

### i. ServletContextEvent :-

→ It represents the start or end of the web application.

→ This event is created when the web-application is initialized and ends when the web-application is stopped.

→ Used to initialize the resources like database connections.

→ ServletContextEvent contains a reference to the ServletContext object.

### ii. ServletContextAttributeEvent :-

→ It represents a change in the attribute stored in the application.

→ This type of event contains the attribute name and value that was added, removed or replaced.

→ It is used to monitor changes to shared data in the application.

## HttpSession Events (Session-Level):

→ These events allow the developer to perform actions or manage the resources.

### i. HttpSessionEvent :-

→ Represents the creation / destruction of a user session.

→ It contains a reference to the HttpSession object.

→ HttpSessionEvent is initialized when a user visits the site and stops when a session is invalidated or times out

→ Used to allocate or release session-specific resources.

ii. HttpSessionAttributeEvent:-

→ Represents a change in an attribute stored in a session.

→ It occurs when a session attribute is added, removed or replaced.

→ Used to monitor user-specific data like login status, shopping cart.

→ Helps to maintain consistency of session data in different parts of the application.

Advantages of Servlet Events:

i. Automatic Notification

ii. Manage Lifecycle

iii. Track Attributes

iv. Clean Code

Disadvantages of Servlet Events:

i. Performance Load

ii. Confusing for Beginners

iii. Limited Use