

Research Assignment

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1.HTTP and basic working of the web

- HTTP (Hyper Text Transfer Protocol) is a request-response protocol that controls the transfer of information between the client and the server.
- The different HTTP methods are as follows:
 - GET: Used to retrieve info from the server using a URL
 - POST: Used to send data to the server. Exact opposite of GET method.
 - OPTIONS: Used to describe the communication options for the target response.
 - PUT: Used to replace a representation of the target resource with the Request resource (or create a new one).
 - CONNECT: Sets up a two-way communication between Client and Requested Resource.
 - HEAD: To retrieve info apart from the Body content.
 - DELETE: To delete all the current representation of target resource.
- The User-Agent header helps the server identify the OS, application and other details of the requesting user-agent.
- Mozilla/5.0 is a user-agent through which a browser makes requests to the server. Gecko is a web engine designed and used in Mozilla Firefox to display web pages and UI.

2.WEB COOKIES

- Cookies are basically files that keep track of the visits and activities of a user on a website. It is generally used so that the website can store some information about the user and display that to resume user experience next time he/she returns to the website. They are sent by the server over the client computer and stored in the client system. They are set using Set-Cookie HTTP header. It instructs the browser to store the cookie in the client system and send it back to the server in the future.
- Attributes are as follows:
 - DOMAIN: Specifies the DOMAIN for which the cookie is valid.
 - PATH: The Path for which the cookie is sent.
 - SECURE: To ensure that cookie is only sent over an encrypted connection. Helps to securely transfer user data between server and client.
 - HTTPONLY: Helps reduce the risk of cookie info getting stolen by allowing transfer only over http.
 - MAX AGE: Specifies duration of cookie.
 - EXPIRES: Tells when the cookie is to be deleted so as to protect the data from getting stolen.
 - CUSTOM: Specifies additional attribute to the cookie.
- Helps the companies to get info of what the user is interested in and show relevant ads only, thus targeting the interested consumers only and help improve the sales.
- Privacy is a big issue with cookies. Many attackers use cookies to track the user info and extract confidential information and further take harmful actions for their benefits.
- FLoC system studies the browsing pattern of the user and puts similar people together under what is called a cohort. These cohorts are shown similar ads and at the same time hides the identity of an individual among plenty others. Thus it Fhelps in ensuring privacy of the user.

- The issue is that it makes fingerprinting very easy since a lot of information about the user is already available. This system is certainly not better than individually personalized ads as a user will see those ads which are meant for the whole cohort and not alone him.

3. CORS

- CORS is required when we need to show data on our webpage by retrieving it from a server. The server that provides the data needs to tell the browser the origin of the request can access its resources and allows resource sharing.
- When we request data from a server it responds with HTTP headers like Access-Control-Allow-Origin header. This header specifies the domains that are allowed to use and display the resources. Access-Control-Allow-Method tells which HTTP methods it should respond to. Similarly, each header specifies different attributes to the shared resources.
- CORS preflight request check if the CORS protocol is understood and a server is aware of the methods and headers. These are sent before the main resource sharing request. A preflight request states the Origin , method and the headers that are included in the request to see if they are valid for the request to be made.