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Q) What happens when we type google.com & Enter?

→ When we enter a URL such as "https://www.google.com" into our web browser & hit enter, many actions occur before any output is displayed on our browser.

1) Application Layer

→ This layer interacts directly with user applications & provides such as email, file transfer & web browsing

* DNS Request

→ our computer sends a request to DNS server, which functions as an address book for all domain names. The DNS server then returns the precise IP address of the server that google.com points to.

* Protocol suite: TCP/IP our

→ with this IP address, the computer then creates a connection with the server via the IP addresses. This connection type is called TCP & our computer can establish this connection through IP. This entire process is known as 'handshake'.

* The Guard: Firewall

→ If our computer is situated behind a firewall, the firewall verifies that the specific request we are making is authorized before granting it. Additionally, if the server we are attempting to access is also behind a firewall, a similar check will be conducted before we can ultimately connect to the servers.

* The Secure passage: HTTPS/SSL

→ Once the connection is established, our browser sends a request for the webpage using a security protocol like SSL (~~Transport~~ Secure Socket Layer ~~Security~~) or TLS (Transport Layer Security) to encrypt the data that will be exchanged between our computer & servers. This encryption is responsible for the "s" in 'https', indicating a secure connection.

* The Distributor: Load Balancer

→ To handle high traffic, Google maintain multiple servers & use a load balancer to distribute requests among them. The load balancer receives the request from our browser & sends it to a specific server based on its algorithm.

→ This means that google server will obtain a request from load balancer when attempting to access google.com. The web server would handle the request & produce a response which would usually consist of HTML, CSS & JS files to make up the webpage.

* The frontman: Web Server
→ Post load balancing, the web server takes the stage, handling the HTTP request. It decides what action is needed, often communicating with an application server to process the request further.

* The processor: Application Server
→ The application server does the operation, executing the necessary business logic, interacting with the database, & preparing the HTTP response to be sent back to your browser.

* The storer: database
→ To fulfill our request, the application server might need to fetch or store data. It interacts with the database, where data is stored, retrieved & managed ensuring that our search query is successfully executed.

* The Grand Finale: Rendering
→ The HTTP response makes its way back through the channels, reaching our browser which then renders HTML, CSS, & Javascript to display the webpage we all know & love as Google.