

Web architecture

client

- machine which is having the browser installed
- the user who is using the browser for browsing the website
- e.g.
 - desktop
 - mobile

browser

- a special application which is used to browse websites
- uses URL to browse a website
 - **URL**
 - stands for Uniform Resource Locator
 - resource: any file that is hosted (copied) on the server machine
 - e.g.
 - <https://www.google.co.in/>
 - <http://192.168.0.2/>
 - <http://mywebsite:8080/>
 - <http://mywebsite:8080/myfile.html>
 - <http://mywebsite:8080/myfile.php?firstname=user1&address=pune>
 - <https://mywebsite#top>
 - every url follows a pattern
 - components
 - **scheme**
 - the protocol that will be used while communication
 - e.g. http, https, file, ftp
 - optional, if missing then the default is http
 - **domain name or IP address**
 - the way to find the machine uniquely over the network
 - e.g.
 - google.com, apple.com
 - 172.217.166.46
 - mandatory
 - **port number**
 - port number of the web server running on the server machine
 - option, if missing by default
 - 80 for http
 - 443 for https
 - **path or file name**

- file name of path of the resource
- optional, if missing the startup/index page will be fetched
- **query string**
 - used to pass input values to the website
 - it always starts with ?
 - it always will be present in key-value pairs collection format
 - e.g.
 - ?firstname=user1&address=pune
 - in the above query string
 - firstname and address are the keys
 - user1 and pune are the values
 - optional
- **hash component**
 - is also known as proxy component
 - used for linking different sections of the page
 - optional
- creates HTTP request object
 - contains the information needs to be sent to the server
 - has
 - header
 - key-value pairs
 - body
 - query string when the method is not GET

server

- machine which serves a request
- server is not a hardware rather server is a software
- types
 - **web server**
 - server which serves the web (http and https) requests
 - e.g.
 - apache2
 - IIS (internet information service)
 - glassfish
 - express
 - **database server**
 - server which persists the data
 - types
 - RDBMS: MySQL, PostgreSQL, Oracle, MS SQL Server, DB2 etc.
 - NoSQL: MongoDB, Firebase, CouchBase, Hive, HBase etc.
 - **file server**
 - server which is used to share the files with others
 - e.g.
 - NFS: network file system

- contains
 - web stack
 - contains
 - web server
 - database
 - language
 - platform
 - e.g.
 - LAMP: Linux/Windows/macOS + Apache + MySQL + PHP/Perl/Python
 - MEAN: Mongo + Express + Angular + Node
 - MERN: Mongo + Express + React + Node
 - WISA: Windows + IIS + SQL Server + ASP.net
- creates HTTP response
 - object created to return the contents of requested resource
 - contains
 - header
 - collection of key-value pairs
 - body
 - contents of requested resource
- status code
 - used to represent the status of server's execution
 - types
 - **1xx**
 - represents the debugging or informational messages
 - e.g.
 - 100: continue
 - 101: Switching Protocols
 - **2xx**
 - represents success
 - e.g.
 - 200: OK
 - 201: Created
 - 202: Accepted
 - **3xx**
 - represents the redirection
 - e.g.
 - 300: Multiple Choices
 - 301: Moved Permanently
 - **4xx**
 - represents the client error
 - e.g.
 - 400: bad request
 - 401: Unauthorized

- 402: Payment Required
 - 403: Forbidden
 - 404: Not Found
- **5xx**
 - represents the server side error
 - e.g.
 - 500: Internal Server Error
 - 501: Not Implemented
 - 502: Bad Gateway