Web Architecture

- REST uses client-server architecture
- Client sends HTTP Request having all the parameters to the server
- Server processes the request and sends the response back to client
- Client process the response and shows the output to the client

REST

- REST stands for REpresentational State Transfer
    - REpresentational - JSON, html, image
    - State - data
    - Transfer
- REST is web standards based architecture and uses HTTP Protocol
- REST is an architectural model and design for server network applications.
- It revolves around resource where every component is a resource and a resource is accessed by a common interface using HTTP standard methods
- REST was first introduced by Roy Fielding in 2000
- In REST architecture, a REST Server simply provides access to resources and REST client accesses and modifies the resources
- Here each resource is identified by URIs/ global IDs
- REST uses various representation to represent a resource like text, JSON, XML. JSON is the most popular one

Web Service

- A web service is a collection of open protocols and standards used for exchanging data between applications or systems
- Software applications written in various programming languages and running on various platforms can use web services to exchange data over computer networks like the Internet in a manner similar to inter-process communication on a single computer
- This interoperability (e.g., between Java and Python, or Windows and Linux applications) is due to the use of open standards
- Web services based on REST Architecture are known as RESTful web services
- These webservices uses HTTP methods to implement the concept of REST architecture
- A RESTful web service usually defines a URI, Uniform Resource Identifier a service, provides resource representation such as JSON and set of HTTP Methods

Resource

- REST architecture treats every content as a resource
- These resources can be Text Files, Html Pages, Images, Videos or Dynamic Business Data
- REST Server simply provides access to resources and REST client accesses and modifies the resources
- Here each resource is identified by URIs / Global IDs
- REST uses various representations to represent a resource where Text, JSON, XML. The most popular representations of resources are XML and JSON

HTTP Methods

- Following four HTTP methods are commonly used in REST based architecture
  - GET: Provides a read only access to a resource
  - POST: Used to create a new resource
  - DELETE: Used to remove a resource
  - PUT: Used to update a existing resource or create a new resource

Messages - Request

- Verb
  - Indicates the HTTP methods such as GET, POST, DELETE, PUT, etc.
- URI
  - Uniform Resource Identifier (URI) to identify the resource on the server.
- HTTP Version
  - Indicates the HTTP version. For example, HTTP v1.1.
- Request Header
  - Contains metadata for the HTTP Request message as key-value pairs
- Request Body
  - Message content or Resource representation.

Messages - Response

- Status/Response Code
  - Indicates the Server status for the requested resource
  - For example, 404 means resource not found and
  - 200 means response is OK
- HTTP Version
  - Indicates the HTTP version
- Response Header
  - Contains metadata for the HTTP Response message as keyvalue pairs
  - For example, content length, content type, response date, server type, etc.
- Response Body
  - Response message content or Resource

URL: Uniform Resource Locator

- URL stands for Uniform Resource Locator.
- It is the address of a resource, which can be a specific webpage or a file, on the internet.
- It is also known as web address when it is used with http.
- Every URL contains the following information:
  - The scheme name or protocol.
  - A colon, two slashes.
  - A host, normally called a domain name but sometimes as a literal IP address.
  - A colon followed by a port number.
  - Full path of the resource.

JSON