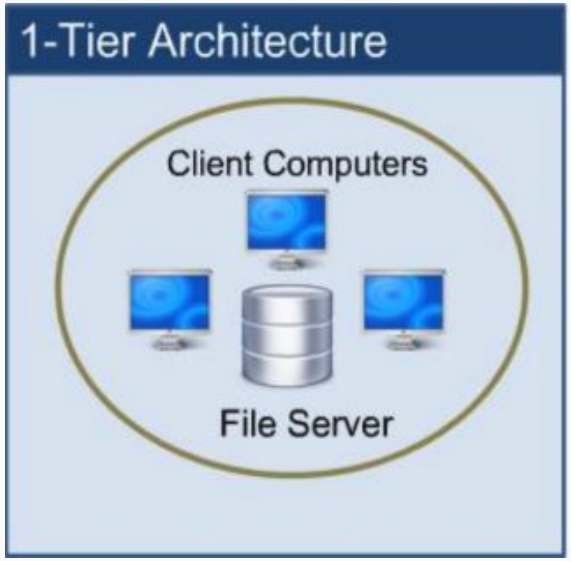
API

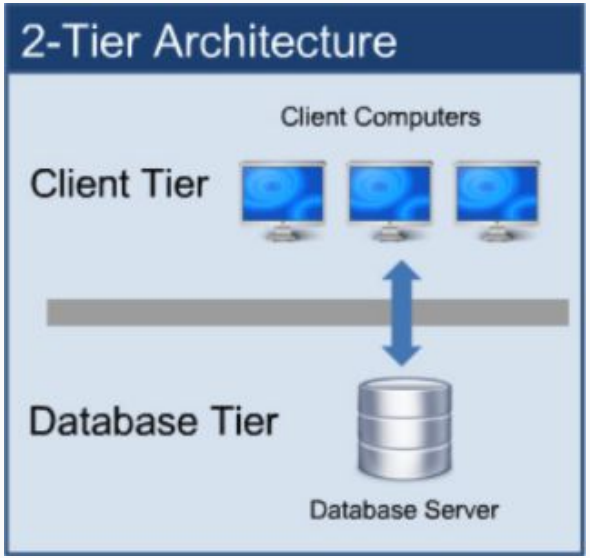
Class 1

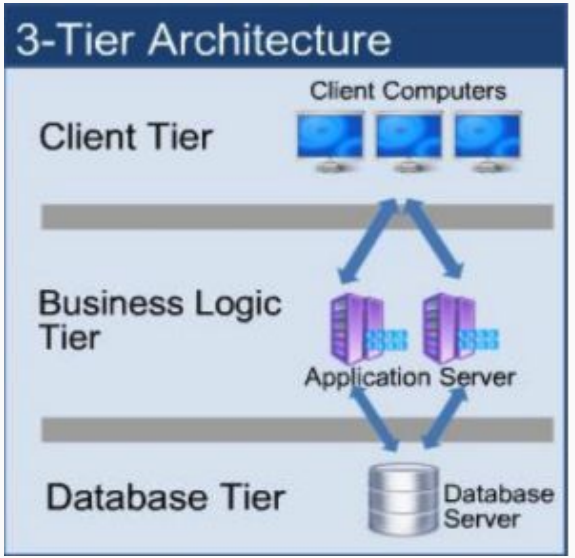
Agenda

Client/ Server Architecture
What is API
What is Web Service
Type of Web Services
Restful Web Services

Client/Server Architecture

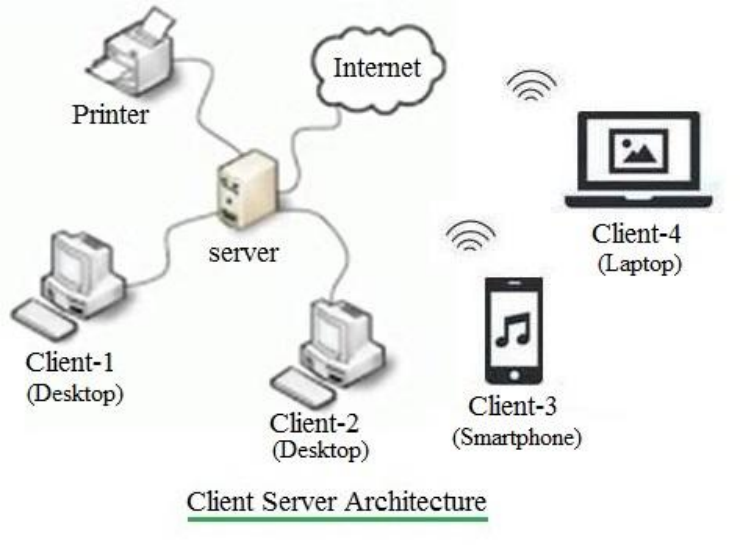






Presentation Layer → UI
Application Layer → Business logic is written in this tier. It is also called Business Tier. It connects front end and back end of application. (API)
Data Layer → DataBase (Oracle, SQL Server, MySQL, DB2, MongoDB)

Client/Server Architecture

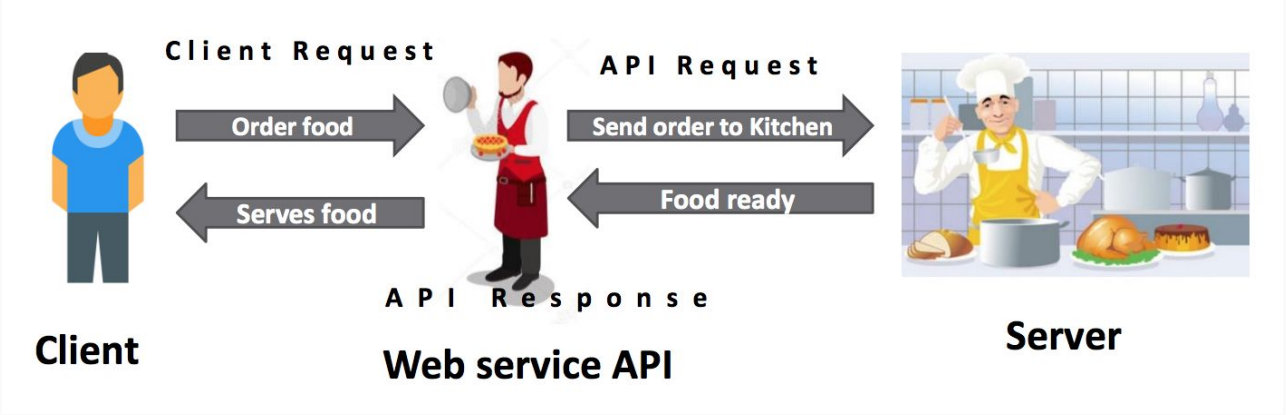


Client Server Architecture

A client is a computer hardware device or software that accesses a service made available by a server. The server is often (but not always) located on a separate physical computer.

A server is a physical computer dedicated to run services to serve the needs of other computers. Depending on the service that is running, it could be a file server, database server, or web server.

What is API?



APIs, or Application Programming Interfaces, are the connecting tissue between different systems or layers of an application.

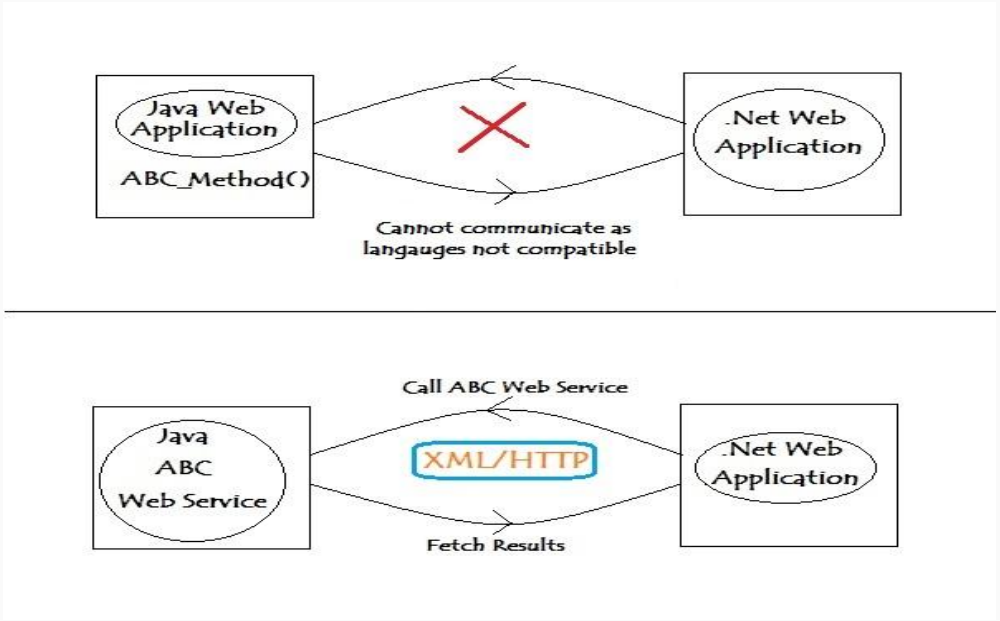
The API layer contains the business logic of an application - the rules of how users can interact with services, data, or functions of the app.

What is API?

- **API** stands for **A**pplication **P**rogramming **I**nterface.
- **API** is a piece of software that plugs one application directly into the data and services of another by granting it access to specific parts of a server.
- **API** enables **communication and data exchange between two separate software systems**.
- **API** is a set of codes which allows two or more than two applications to communicate each other internally or externally and provide a result to end users or to another API.
- **API** performs what user has requested without exposing internal logic or working of task done.

What is Web Services?

A Web service is a web application that can communicate with other web based applications over network. Web service implementation allows two web applications developed in different languages to interact with each other using a standardized medium like XML, JSON, HTTP etc.



What is Web Services?

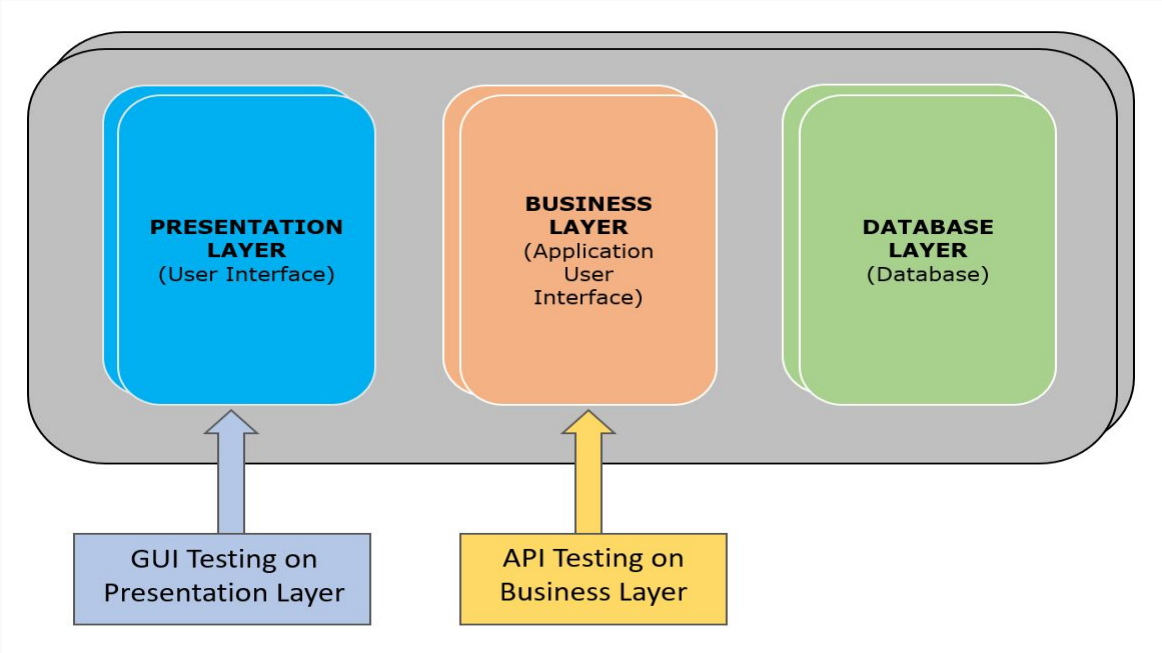
Web Services is the mechanism of communication through which two applications / machines will exchange the data irrespective of their underlying architecture and the technology.

Features of Web Services:

- As web services are based on open standards like XML, HTTP so these are **operating system independent.**
- Likewise web services are **programming language independent**, a java application can consume a PHP web service
- Web services can be **published over internet** to be consumed by other web applications

What is API Testing?

API testing tests business logic tier directly and checks expected functionality, reliability, performance, and security.
API testing won't concentrate on the look and feel of an application.



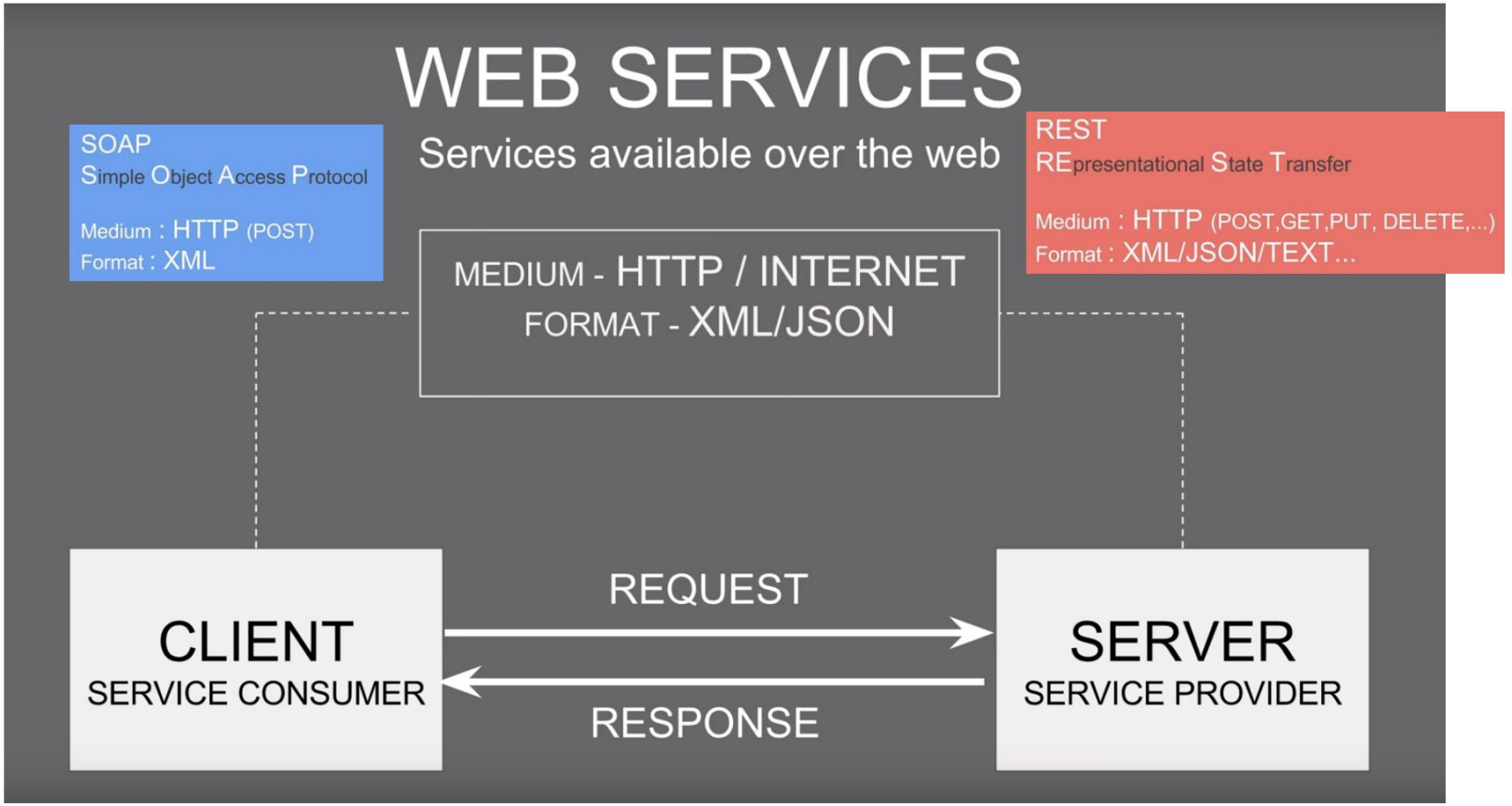
Why API Testing?

In the agile development world, requirements are changing during short release cycles frequently and GUI tests are more difficult to maintain according to those changes.
Thus, API testing becomes critical to test application logic.

In GUI testing we send inputs via keyboard texts, button clicks, drop-down boxes, etc.,

In API testing we send requests (method calls) to the API and get output (responses).

Types of Web Services?



What is SOAP?

Simple Object Access Protocol (SOAP) is a protocol that was designed to ensure that programs built on different platforms and programming languages could exchange data in an easy manner.

SOAP uses XML for communication and supports only POST and GET calls

What is REST?

Representational State Transfer (REST) is a style of architecture based on a set of principles that describe how networked resources are defined and addressed.

REST refer to them as **RESTful APIs** or **RESTful web services.**

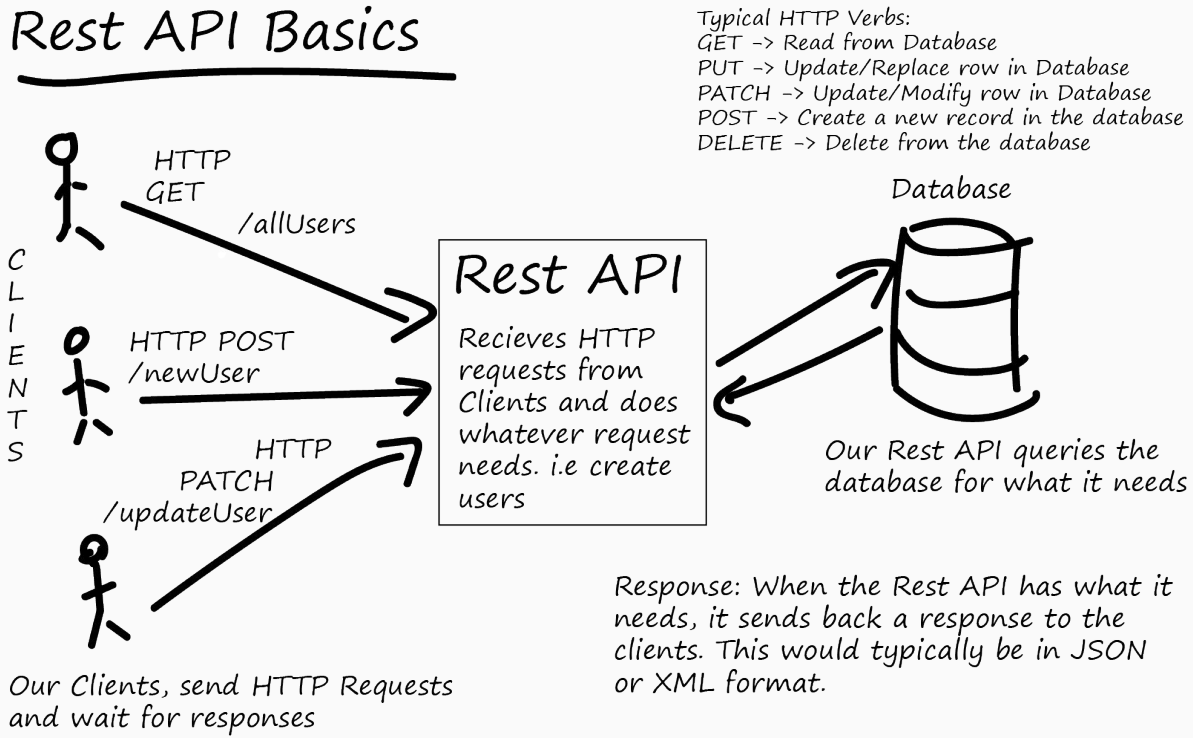
A RESTful API is an application program interface (API) that uses HTTP requests to **GET, PUT, POST and DELETE data.**

A Rest API Works the same way normal Client Server Application Works.

SOAP vs REST

REST Web Service	SOAP Web Service
REST is an architectural style, any web service following REST architecture is called RESTFul Web Service.	SOAP is a protocol, a set of rules which must be followed while creating a web service
Supports multiple data formats - JSON, XML, CSV etc.	Supports XML message format only
REST resources are exposed by the service URI and HTTP Verbs- GET, PUT, POST and DELETE	SOAP exposes its named methods to be consumed by a client e.g. an open SOAP web service "WeatherWS" exposes its various operations as methods- GetWeatherInformationResponse, GetCityForecastByZIP etc
REST is considered light weight and faster(no XML parsing is required)	Slower than REST because of the use of XML format but considered more secure (uses WS-security)

REST API



A service represents a resource that can be accessed from the web

Every resource is uniquely addressable using a uniform and minimal set of commands (typically using HTTP commands of GET, POST, PUT, or DELETE over the Internet)

REST API

An API is developed to serve a purpose/functionality which may fall in one of these categories:

Creating data , Retrieving data, Updating data or Deleting data.

Those are basic operations performed by APIs. These functions are called as CRUD(Create, Retrieve, Update and Delete) as an acronym.

In REST, these operations are called as HTTP methods. There are more HTTP methods other than these. Like GET,POST,PUT,DELETE,PATCH etc.

REST API

REST commonly makes use of different HTTP request methods to implement CRUD functions:

POST – Create new resource
GET – Retrieve resource
PUT – Update resource
DELETE – Delete resource

REST API Flow