Introduction to Web Services REST API

Software Testing
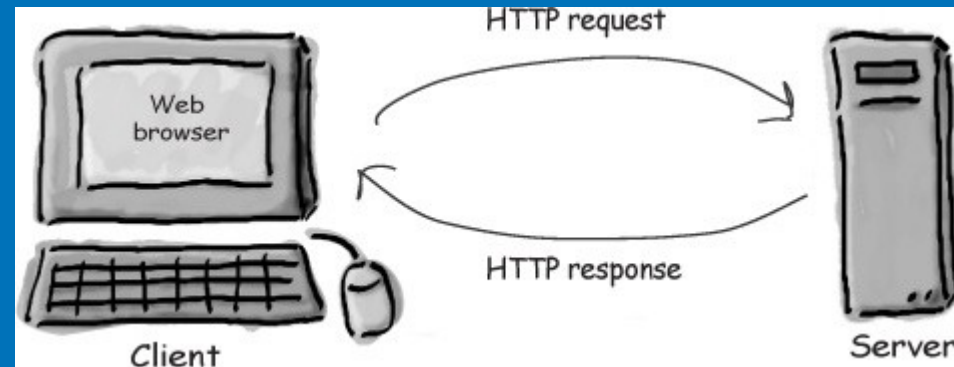
Agenda

- HTTP & HTTPS
- What is a web service?
- What is an API
- Types of Web Services
- Testing REST web services
- Working with Postman

HTTP

- HTTP stands for Hypertext Transfer Protocol
- HTTP is the foundation of data communication for the World Wide Web
- HTTP functions as a request-response protocol in the client-server computing model
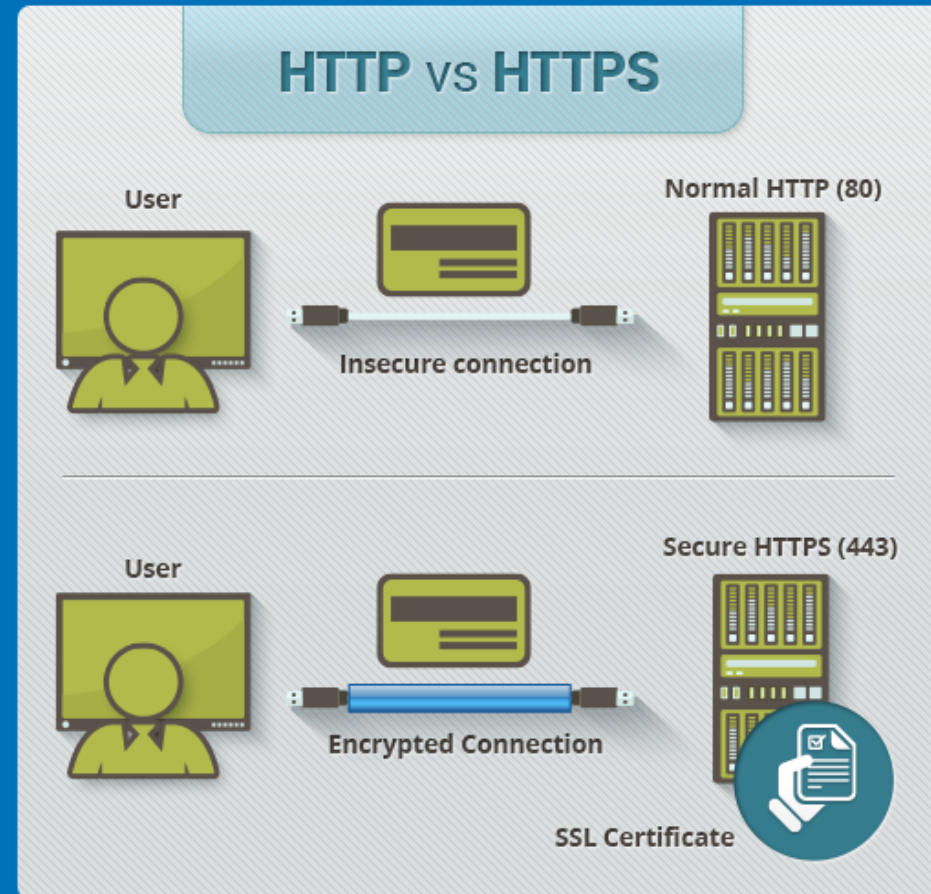- HTTP is an application protocol

HTTPS

- HTTPS stands for Hypertext Transfer Protocol Secure
- HTTPS is communications protocol for secure communication over a computer network
- HTTPS signals the browser to use an added encryption layer of SSL/TLS to protect the traffic

Difference between HTTP and HTTPS

- HTTPS URLs begin with "https://" and use port 443 by default
- HTTP URLs begin with "http://" and use port 80 by default
- HTTP is insecure and is subject to man-in-the-middle and eavesdropping attacks, which can let attackers gain access to website accounts and sensitive information

HTTP VS HTTPS

User — Insecure connection — Normal HTTP (80)

User — Encrypted Connection — Secure HTTPS (443)

SSL Certificate

What is a Web Service?

- A web service is a function that can be accessed by other programs over the web (Http)
- Web services are really nothing more than a request/ response mechanism that allows a client to remotely access/ modify data
- A web service allows a PROGRAM to talk to a web page, instead of using your browser to open a web page
- A web service differs from a web site in that a web service provides information consumable by software rather than humans
- Web services communicate using open protocols
- Communication between different applications and share their resources

Why Web Services?

- Web services take Web Applications to the next level
  - Can be used by any browser on any platform
  - Use XML/JSON to code and decode your data and to transport it

- Web services solve the interoperability problem by giving the ability different applications to link their data
  - Exchange data between different applications and different platforms

What is an API

API (**A**pplication **P**rogram **I**nterface)

- Specifies how software components should interact with each other
- Set of protocols
- **SOAP** (Simple Object Access Protocol)
- **REST** (Representational State Transfer)
- Universal data formats over HTTP (XML, JSON)

What is API

How to test Web services?

- As a web service is something that has no interface, we can not interact it without a special tool.
- That tool should allow composing requests via its own user interface.
- Usually such user interfaces are text editors where you write your requests and controls for sending requests to the server

RESTful web services

- JSON/XML over HTTP
- HTTP methods – OPTIONS, GET, POST, PUT, DELETE
- Architectural principle rather than separate protocol
- Stateless components that can be easily redeployed without downtime
- Lightweight, scalable, preferred architecture for cloud-based applications

RESTful web services

- Web services that adhere to REST architectural principles are often called RESTful web services
- RESTful web services / APIs are defined by following aspects:

BaseURL (http://www.example.com/resources)

Internet media type / MIME type (mostly used – JSON)

Standard HTTP methods to access resources (GET, POST, PUT, DELETE, etc)

JSON

- JSON = JavaScript Object Notation.
- JSON is a syntax for storing and exchanging data.
- JSON is text, written with JavaScript object notation.
- Human readable
- Easy for machines to parse and generate

- JSON supports <u>following</u> data types: String, number, array, JSON Object, boolean, null
- JSON <u>does not</u> support: function, date, undefined

- [Example JSON](#)

References

- JSON Tutorial
- Working with Postman
- JSON Path Helper