### What is the HTTP protocol supported by REST?

**GET:** GET is used to request data from the specified resource.

GET request can be cached and bookmark. It remains in the browser history and has length restriction. When dealing with sensitive data GET requests should not be used.

**POST:** POST is used to send data to server for creation or updating the resources.

POST requests are never cached or bookmark.

**PUT:** PUT replaces the current representation of the target resource with the request payload.

**DELETE:** DELETE removes the specified resource.

**What is API?**

**API** (*Application Programming Interface*) helps in communication and data exchange between two software systems. API act as an interface between two applications and allows the two software systems communicate with one another.

API works as; it takes a request from the source, takes that request to the database, fetches the request data from the database and returns a response to the source. API acts as Abstraction.

### What is API testing?

**API testing** is a type of software testing that involves testing APIs directly. API is a part of integration testing to check whether the API meets expectations in terms of functionality, reliability, performance, and security of applications. Multiple API system can performed API testing.

### What are the types of API testing?

API testing involves the following types of testing:

* Unit Testing
* Functional Testing
* Load Testing
* Runtime/Error Detection
* Security Testing
* UI Testing

### What is API test environment?

For API the test environment is a quite complex method where the configuration of server and database is done as per the requirement of the software application. API testing does not involve graphical user interface (GUI).

API is checked for its proper functioning after installation.

### What is API framework?

API framework is described by the config. File which consist of the list of all APIs that are required to be activated and are activated for any particular program run. This is essential as every test run does not require all APIs.

**What are the principles of an API test design?**

Here, are the seven principles of API test design.

1. **Exhaustive Testing:** Exhaustive testing is not possible. Instead we need optimal amount of testing which is based on the risk assessment of the application.
2. **Defect Clustering:** Defect Clustering states that a small number of modules contain the most of the defect detected. Approximately 80% of the defect found in 20% of the modules. By experience we can identify such risky modules. But this approach has its own problems. If the same tests are repeated over and over again, eventually the same test case will no longer find new bugs.
3. **Pesticide Paradox:** Testers cannot depend on existing technique. They must have to look continually to improve the existing method to make testing more effective. But even all these hard work in testing we can never claim our product is bug free. To overcome this, test cases need to be regularly reviewed and revised add new and different test cases to help find more defects.
4. **Testing shows presence of defects:** Testing principle states that- testing talks about the presence of defects not about the absence of defect. Software testing reduces the probability of undiscovered defects remaining in the software but even if no defects found, it is not a proof of correctness.

But if we work hard, taking all precautions and make our software products 99% bug free. The software does not meet the needs and requirements of the client.

1. **Absence of error -fallacy:** This can be possible the software which is 99% bug free is still unusable. The case can be if the system is tested for the wrong requirement. Software testing is not finding the defects but also to check that software addresses the business needs. The absence of error is fallacy i.e. finding and fixing defects does not help if the system build is unusable and doesn't fulfill the user's needs and requirements.
2. **Early Testing:** Testing should start as soon as possible in the software development lifecycle. So that defects in the requirement or design phase captured in the early stages. It is cheaper to fix defect in the early stages of testing. We should start finding the bug at the moment the requirements are defined.
3. **Testing is context dependent:** Testing is context dependent that we test an e-commerce site will be different from the way we test the commercial. All the developed software's are not identical. We will use different methodology; techniques and type of testing depend on the application type.

**What are the common tests that performed on API?**

Here, are the common tests that performed on API are as:

1. Response of the API should be verified based on the request. We will verify that the return value is based on request.
2. When API is updating any data structure we should verify the system is authenticating the outcome.
3. We will verify whether the API is trigger other event or request another API.
4. We will verify the behavior of the API when no value is return.

**What exactly needs to verify in API testing?**

In API testing, we send a request to API with the known data and then analysis the response.

1. We will verify the accuracy of the data.
2. Will see the HTTP status code.
3. We will see the response time.
4. Error codes in case API returns any errors.
5. Authorization would be check.
6. Non-Functional testing such as performance testing, security testing.

### What are the differences between API and Web Services?

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| **Sr. No.** | **API** | **Web Services** |
| **1.** | API may or may not need network for its operations. | Web Services always need network for its operation. |
| **2.** | API can be communicated through SOAP, REST, XML-RPC and CURL calls as well. API can also be exposed in number of ways like JAR, DLL, XML over HTTP, JSON over HTTP etc. | Web service can be communicated through SOAP, REST, AND RPC. |
| **3.** | API can perform all the operations which web service can't perform. | Web service can't perform all the operations like API. |
| **4.** | All APIs are not web service. | All web services are API |

### What is SOAP?

SOAP (Simple Object Access Control) . It is an XML based protocol that helps in exchanging information among computers.

### What is REST API?

**REST API** is a set of function helps the developers performing requests when the response is receiving. Through HTTP protocol interaction is made in REST API.

REST is defined as Representational state transfer. It is an effective standard for API creation.

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| **Sr. No.** | **SOAP API** | **REST API** |
| **1.** | **SOAP** stands as Simple Object Access Protocol. | **REST** stands as Representational State Transfer. |
| **2.** | **SOAP** is a protocol. | **REST** is an architectural pattern. |
| **3.** | **SOAP** can work with XML format. In SOAP all the data passed in XML format. | **REST** permit different data format such as Plain text, HTML, XML, JSON etc. But the most preferred format for transferring data is in JSON. |

**What are the major challenges faced during API testing?**

The major challenges faced during the API testing are:

* Parameter Selection
* Parameter Combination
* Call sequencing
* Output verification and validation
* A major challenge is providing input values which are very difficult because GUI is not available.

### What is Resource in REST?

REST architecture treats any content as resource, which can be text files, HTML pages, images, videos or dynamic business information. REST server gives the functionality to access the resources and modifies them. We can identify the each resources by URIs/ global IDs.

**What are the characteristics of REST?**

1. REST is stateless. With the use of the REST API the server has no status, we can restart the server between two calls, inspite of all the data is transferred to the server.
2. Web Services uses POST method to perform operations, while REST uses GET method to access the resources.

**What are the components of an HTTP request?**

An HTTP request have five components. These are:

1. **Action showing HTTP method** like GET, PUT, POST, DELETE.
2. **Uniform Resource Identifier (URI):** URI is the identifier for the resource on the server.
3. **HTTP version:** Indicate the HTTP version like- HTTP V1.1.
4. **Request Header:** Request Header carries metadata for the HTTP request message. Metadata could be a client type, format supported by the client, format of a message body, cache setting etc.
5. **Request Body:** Resource body indicates message content or resource representation.