What is Postman?

Postman is a rest client that started off as a Chrome browser plugin but recently came out with native versions for both Mac and Windows.

At a high level, you can use it to send a post request to your web server and it gives you the response back. It allows you to set up all the headers and cookies your API expects, then check the response when it comes back.

That's its basic functionality, but it also has a lots of other features built into it, like excellent cookie management that can sometimes be hard to manage with other API tools.

Postman supports every HTTP method you can think of — including some you might even know about.

For API validation, it has basic checking you can do when you receive the response. A common example of this is when you send a request to an API and get a response back, you verify that it returns a [HTTP 200](https://www.joecolantonio.com/2011/09/09/performance-testing-basics-%E2%80%93-what-is-http/) OK status, or you make sure that the response contains a certain string in it.

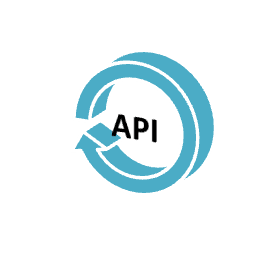
### Test Cases for API Testing:

Test cases of API testing are based on

* **Return value based on input condition:** it is relatively easy to test, as input can be defined and results can be authenticated
* **Does not return anything:**When there is no return value, behavior of API on the system to be checked
* **Trigger some other API/event/interrupt:**If output of an API triggers some event or interrupt, then those events and interrupt listeners should be tracked
* **Update data structure:**Updating data structure will have some outcome or effect on the system, and that should be authenticated
* **Modify certain resources:**If API call modifies some resources then it should be validated by accessing respective resources

### Approach of API Testing:

Following points helps the user to do API Testing approach:

[](http://cdn.guru99.com/images/1-2015/010915_1247_Beforegoing3.png)

1. Understanding the functionality of the API program and clearly define the scope of the program
2. Apply testing techniques such as equivalence classes, boundary value analysis and error guessing and write test cases for the API
3. Input Parameters for the API need to be planned and defined appropriately
4. Execute the test cases and compare expected and actual results.

### Difference between API testing and Unit testing

|  |  |
| --- | --- |
| **Unit Testing** | **API testing** |
| * Developers perform it | * Testers perform it |
| * Separate functionality is tested | * End to end functionality has been tested |
| * Developer can access the source code | * Testers cannot access the source code |
| * UI testing is also involved | * Only API functions are tested |
| * Only basic functionalities are tested | * All functional issues are tested |
| * Limited in scope | * Broader in scope |
| * Usually ran before check-in | * Ran after build is created |

### What to test for in API testing

API testing should cover atleast following testing methods apart from usual SDLC process

* **Discovery testing:** The test group should manually execute the set of calls documented in the API like verifying that a specific resource exposed by the API can be listed, created and deleted as appropriate
* **Usability testing:**This testing verifies whether the API is functional and user-friendly. And does API integrates well with another platform as well
* **Security testing:**This testing includes what type of authentication is required and whether sensitive data is encrypted over HTTP or both
* **Automated testing:**API testing should culminate in the creation of a set of scripts or a tool that can be used to execute the API regularly
* **Documentation:**The test team has to make sure that the documentation is adequate and provides enough information to interact with the API. Documentation should be a part of the final deliverable

### Best Practices of API Testing:

* Test cases should be grouped by test category
* On top each test, you should include the declarations of the APIs being called.
* Parameters selection should be explicitly mentioned in the test case itself
* Prioritize API function calls so that it will be easy for testers to test
* Each test case should be as self-contained and independent from dependencies as possible
* Avoid "test chaining" in your development
* Special care must be taken while handling one time call functions like - Delete, CloseWindow, etc...
* Call sequencing should be performed and well planned
* To ensure complete test coverage, create test cases for all possible input combinations of the API.

### Types of Bugs that API testing detects

* Fails to handle error conditions gracefully
* Unused flags
* Missing or duplicate functionality
* Reliability Issues. Difficulty in connecting and getting a response from API.
* Security Issues
* Multi-threading issues
* Performance Issues. API response time is very high.
* Improper errors/warning to caller
* Incorrect handling of valid argument values
* Response Data is not structured correctly (JSON or XML)

### Tools for API testing

Since API and unit testing both target source code, similar tools can be used for testing both.

* SOAPUI
* Runscope
* Postman with jetpacks
* Postman with Newman
* Curl
* Cfix
* Check
* CTESK
* dotTEST
* Eclipse SDK tool- Automated API testing

### Challenges of API Testing

Challenges of API testing includes:

* Main challenges in API testing is **Parameter Combination, Parameter Selection, and Call Sequencing**
* There is no GUI available **to test the application which makes** difficult to give input values
* Validating and Verifying the output in different system is little difficult for testers
* Parameters selection and categorization is required to be known to the testers
* Exception handling function **needs to be tested**
* Coding knowledge is necessary for testers

Check out top API Testing Tools [List](http://www.guru99.com/top-6-api-testing-tool.html)

### Conclusion:

API consists of a set of classes / functions / procedures which represent the business logic layer. If API is not tested properly, it may cause problems not only the API application but also in the calling application.