

Q #1) What is API Testing?

API is a collection of routines, tools, protocols that together are required for building the software application. Any system software or application software which consists of multiple APIs can perform Application Programming Interface (API) testing.

This form of testing includes interaction between various or says multiple APIs as well as the interaction between API and application program. The procedure mainly includes making API calls using software and observing system response after receiving output.

Q #2) Enlist some common tests that are performed on APIs.

There can be multiple reasons for performing API testing.

Let us see some common test examples, where this form of testing is used to verify:

- Any data structure updated by API which requires proper validation.
- Input condition based return values.
- Call to another API or if any other event is triggered or some interruption is raised.
- The return values which can also be null or wrong results.
- Modification of some resources like an update of the database, process killing, etc.

Q #3) What is API test environment?

Setting up a test environment of API is a complex method where the configuration of the server and database is done as per the requirement of the software application. Graphical user interface (GUI) is not available in this form of testing.

After installation, API is checked for its proper functioning. In this process initial environment that invokes API is being set up with a defined set of parameters so that test results can be examined.

Q #4) Explain API testing approach.

Mentioned below are the factors which determine the approach:

- Write appropriate test cases for the APIs and use testing techniques like boundary value analysis, equivalence class, etc. for verifying the functionality.
- Verify the calls of the combination of two or more value added parameters.
- Define the scope and basic functionality of the API program.
- Define the accurate input parameters.
- Test case execution and comparison of the results with expected results.
- Determining API behavior under conditions like the connection with files, etc.

Q #5) Explain in brief the different types of output observed of an API.

API is considered as the essential connecting part of this digital world. It basically resides in the business logic layer where it performs functions like processing commands, application coordination, initiates logical decisions, etc.

The main consideration is returning correct results under any type of conditions. Mainly, the output or results observed of an API are divided into three sections as follows:

- Returning the result status values as 'Pass' or 'Fail'.
- Result as data or any specific information.

- An event where the call to any API function will initiate the call to another API function.

Q #6) Enlist some best practices that are followed to make API testing successful.

Performing tests repeatedly defines some best practices for making testing successful.

Enlisted below are some best practices for API testing:

- Test cases should be grouped under category with expected results that happen consistently and other typical results.
- Test cases should include selected parameters as well as API call declarations.
- API load tests are performed to determine system application stress.
- Maintain the limits of the variables used in the tests as well as avoid 'Test Chaining'.
- To make ease for the testers, API call is being prioritized and call sequencing is planned.
- Every input combination and dependencies are considered for complete test coverage.
- Automation of the test cases, documentation is done as and when required.

Q #7) What are the tools used for API testing?

Best API Testing tools:

The different tools used for API testing are enlisted below:

- SOAPUI
- Runscope
- LOADUI
- Automated API testing
- Curl

There are few more others than these listed above tools which are used for API testing.

Q #8) What are the tools used for API test automation?

Automation testing is a must when we talk about agile development in API testing.

However, the language in which the code is written is also an important factor as it decides the tool language.

Let us see some important API test automation tools:

- **SOAPUI:** It is an open source API testing tool which is considered as the best testing tool because of its feature like creating complex validation scripts and test cases, efficient test coverage, etc.
- **HP QTP/UFT:** This is now known as HP UFT i.e. unified functional Testing. This tool is basically used for systems without user interface like web services, etc.
- **PARASOFT:** This testing tool runs on various platforms and is used to test API which does not have a Graphical User interface (GUI).
- HTTP master
- NUnit and JUnit testing tools are used where the code is written in .Net and Java respectively.

Q #9) What is API framework?

API framework is described by the config file which consists 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.

'Config' file purpose is to describe and enlist every configurable component within a test run.

Q #10) Explain API documentation.

As it is well aware fact that, for any foundation, there has to be a good documentation. API documentation likewise serves as a quick reference for accessing library or working within a program.

When we go through any such documents, it must consist of a proper plan, content source, proper layout or sketch for delivery, information related to each function, etc.

API documentation tools are:

- JavaDoc
- Doxygen

Enlisted below are the categories in which every function is being documented which mainly revolve around the parameters:

- Function description
- Sequence, syntax, and elements required for each parameter.
- Syntax and type of error message that can occur.
- Links related to functions.

Q #11) Name some most used templates for API documentation.

Enlisted below are some free templates which makes API documentation much easier and simple:

- Slate
- FlatDoc
- Swagger
- API blueprint
- RestDoc
- Miredot
- Web service API Specification.

Q #12) Enlist some of the API examples which are very well known and popular.

There are several such examples, enlisted below are some most popular ones:

- **Google Maps API:** These are designed mainly for mobile and desktop use with the help of flash interface and JavaScript.
- **Amazon Advertising API:** Amazon is known for their products and thus their advertising API accesses their product to discover their functionality and thus advertise accordingly.
- **Twitter:** The API for twitter is usually in two categories, one for accessing data and the other for interacting with twitter search.
- **YouTube:** This API used for YouTube includes various functionalities including videos, live streaming, player, etc.

Q #13) What are the testing methods that come under API testing?

API testing generally involves following testing methods:

- Unit testing and Functional testing
- Load testing for testing the performance under load.

- Discovery testing for listing, creating and deleting the number of calls that has been documented in API.
- Usability testing and Reliability testing for obtaining consistent results.
- Security testing and Penetration testing for validating all types of authentication.
- Automation testing for creating and executing scripts that require API calls execution regularly.
- End to end Integration testing and Web UI testing.
- API documentation testing for determining its efficiency and effectiveness.

Q #14) Differentiate API testing and Unit Testing.

The difference between API testing and Unit testing can be understood from the below table:

UNIT testing	API Testing
Unit testing is usually performed by developers where every functionality is tested separately.	API testing is performed by the testers for end to end testing of the functionality.
As they have the limited scope of testing, thus basic functionalities are only considered for testing.	As they have the broader scope of testing, all issues that are functional are considered for testing.
It is a form of white box testing.	It is a form of black box testing.
Usually, unit testing is done before the code is included in the build.	API testing is performed after the build is ready for testing.
The Source code is involved in this form of testing.	Source code is not involved in this form of testing.

Q #15) What all challenges are included under API testing?

Challenges are the part of every form of testing and the same goes with API testing too.

Mentioned below are some common challenges that are faced in API testing:

- The first and foremost challenge is selecting an appropriate parameter and then its combination.
- Parameter categorization
- Proper sequencing of call is required as this may lead to inadequate coverage in testing.
- Output verification and validation
- Another important challenge is providing input values, which is very difficult as GUI is not available in this case.

Q #16) What are the types of Issues observed while performing API testing?

When testing is performed, then there have to be issues associated with them. Issues observed while performing this form of testing are not new or much different but they are common in this category.

Find below the list of such issues/defects:

- Inconsistent or absence of error handling mechanism
- Repetition or redundancy of the functionalities
- Missing required functionality in some cases

- Passing incorrect argument to the input values
- Improper messaging
- Stress and performance issues
- Reliability issues with respect to connection with other APIs
- Multithreading and improper handling issues.

Q #17) Why API testing is determined as the most suitable form for Automation testing?

Yes, it's true that API testing is now preferred over GUI testing and is considered as most suitable.

Below are the few reasons behind this statement.

- Verifies all the functional paths of the system under test very effectively.
- Provides most stable interface.
- Are easier to maintain and provides fast feedback.

Q #18) How is UI level testing different from API testing?

The main consideration of the UI (User Interface) level testing is to test the graphical interface part of the application including the features like font, layout, etc.

Whereas, the main consideration of the API testing is establishing communication between different software systems and it mainly resides in business logic layer. It never concentrates on the look of the application.

Q #19) What is TestApi?

TestApi is known as the library of test building blocks which are essential for developers and testers for creating testing tools as well as automated test suites.

Q #20) What do you know about API errors and warnings?

When something goes wrong i.e. the outcome is not as expected then the error occurs and warnings are described as a message in the proper format. There can be one or multiple warnings within the same module.

Different types of warnings that can occur are:

- Parameter validation warning
- Missing module warning

Different types of errors that can occur are;

- Documentation errors
- Missing module errors
- Parameter validation errors
- Some standard error messages.