API TESTING CHECKLIST

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What is an API?

An API (application programming interface) can be thought of as a bridge that initiates a conversation among the software components. It is a set of instructions that establishes a dialogue session between components of a software with another, like a user wishes to access a location via GPS, the necessary API will fetch the needful information from the server and generate a response to the user.
To state it very simply, an API is an interface that receives an input from the user and gets the response from a valid source.

API Testing:

API testing is about verifying whether an API abides by the instruction set and delivers the expected functionality.
An application generally has three essential components:
Data Layer , Logic Layer and Presentation Layer.

When the API returns a response, either the result is a correct one or some output. It could be one of the following:

- Pass or Fail test
- Data or information
- A call to another API

Important consideration for API Testing:

•Select an environment that is best suitable for API testing.
•The most important is to determine the target audience for whom the API is intended for.
•The aspects that need to be tested.
•Setting the priorities for testing.
•Identifying the possible set of mishaps in the event of any failure.
•Evaluating pass and fail results and determining the degree of impact it can have on the system.

API Testing Checklist:

Check that the APIs that exist are properly documented, written in a way that is easy to understand, and contain information such as:

- overview and purpose
- quick start guide and tutorials
- an example/sample of every call, every parameter, and responses for each call(errors included)
- user journey
- authentication and authorization
- rate limits
- code samples for commonly used languages
- schemas

API Testing Checklist:

Define the the type of tests that you want to run:

- Positive scenarios return a valid response
- Invalid requests return the correct error message
  - *Missing or invalid authorization token*
  - *Missing required parameters*
  - *Unsupported methods for endpoints*
  - *Invalid path/url*
  - *Invalid, incomplete or missing request body*
  - *Incorrect field names in request body*
- Error Handling
- Schema match
- Workflow and data persistence
- Response time
- Specific standards and regulations that it should meet
- Response Payload - valid JSON body, correct field names, types, and values
- Response Headers
- Application state before and after API call

API Testing Checklist:

Check Security and authorization

- Invalid inputs
- Injection attacks
- Parameter tampering
- Unhandled HTTP methods
- Business logic vulnerabilities.
- Authentication Expiry
- Rate Limits
- Content-Type Validation
- Validate user inputs

API Testing Checklist:

Check HTTP Validations:

- While testing an API, HTTP methods like GET, HEAD, PUT, DELETE etc. are idempotent methods
- Validate user authentication, trying to access an API using HTTP authentication header
- Verifying various error/authentication codes, to ensure validation of a response. Some of the validation codes include 404 (server not found), 201 (request fulfilled), 204 (no content) and so on
- 4xx vs 5xx errors are worth mentioning as they help to reflect client side and server side errors respectively.
- To ensure best network performance, HTTP compression mechanisms should be applied to API's being tested. (HTTP compression is a technique to facilitate efficient bandwidth between client and the server)

API Testing Checklist:

Check API Validations

- An API must ideally support format conversion, say, JSON to XML or vice versa
- Check with API version number to verify whether that specific version is compatible with the device being used
- An API must be strong enough to handle bulk operations, therefore it is necessary to build an API in such a manner
- Pagination is an important factor that helps to reduce unnecessary computations at the server, as pagination indexes a document in pages
- An API must efficiently handle errors that arise during an application's duration of operation.

API Testing Checklist:

Check Content

- Type of contents such as +JSON, JSON HAL and XTML, should be included while testing an API, is an important aspect from an API testing perspective.
- While taking RESTful API's into consideration, a feature named HATEOAS, an acronym for Hypermedia as the Engine of Application State, is a REST constraint provides an effective way for a client to interact with any network application.
- An API's date and time must adhere to the time zone specifications meant for a particular locale

THANK YOU

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