

API Testing Interview Questions

API Basics

1. **What exactly is an API? Provide examples.**

An API (Application Programming Interface) allows two software systems to communicate with each other.

- **Example:**

When you book a cab on Uber, the app uses an API to fetch real-time location data from Google Maps.

2. **What is API testing, and why is it important?**

API testing ensures the functionality, reliability, and security of APIs. It focuses on sending requests and verifying responses.

- **Example:**

Testing if a weather API returns the correct temperature for a given city.

3. **How do APIs function?**

APIs send requests from one program to another, and responses return data.

- **Example:**

A travel website requests flight details from an airline's database through its API and displays them.

API Testing Concepts

4. **How does API testing work?**

You send HTTP requests (like GET or POST) to an API endpoint and check if the response data is correct.

- **Example:**

Test an API for user login by sending a POST request with a username and password.

5. **What protocols can API Testing be used to test?**

- REST
- SOAP
- GraphQL
- gRPC

6. **What architectural styles are available for creating a Web API?**

- REST (Representational State Transfer): Focused on resources.

- SOAP (Simple Object Access Protocol): Focused on strict rules for message exchange.
- GraphQL: Allows requesting specific data.

7. What are the various API testing types?

- **Functional Testing:** Tests if the API meets requirements.
- **Load Testing:** Tests API performance under heavy usage.
- **Security Testing:** Checks for vulnerabilities.

8. What are the design principles for an API test?

- Clarity in naming conventions (e.g., /users instead of /getAllUsers).
 - Proper status codes for responses (e.g., 404 for not found).
 - Secure authentication methods like OAuth.
-

API vs. Other Technologies

9. What are the distinctions between APIs and web services?

- All web services are APIs, but not all APIs are web services.
- APIs can work offline, whereas web services require a network.

10. What are the distinctions between API and Unit Testing?

- **API Testing:** Tests interactions between systems.
- **Unit Testing:** Tests individual components of code.

11. What are the distinctions between API and UI testing?

- **API Testing:** Focuses on backend logic and data exchange.
 - **UI Testing:** Tests the application's user interface.
-

API Development and Tools

12. What are the most commonly used API testing tools?

- Postman
- SoapUI
- JMeter
- Katalon Studio

13. What are some of the benefits of API testing?

- Faster than UI testing.
- Ensures data exchange is secure and accurate.

14. What is an API framework, and how does it work?

A framework provides pre-defined libraries and guidelines to streamline API testing.

- **Example:**
RestAssured is a popular Java framework for testing REST APIs.
-

API Concepts and Terms

15. What exactly is SOAP?

SOAP (Simple Object Access Protocol) is a protocol for exchanging data. It uses XML for messages.

- **Example:**
SOAP API might be used for secure financial transactions.

16. What is the distinction between SOAP and RESTful APIs?

- SOAP: Strict rules, uses XML.
- REST: Flexible, can use JSON, XML, or plain text.

17. What exactly is a URI, and what is its format in REST-based web services?

URI (Uniform Resource Identifier) is the address of a resource in REST.

- **Example:**
`https://api.example.com/users/123`

18. What is REST API, and how does it work?

REST APIs work by interacting with resources using standard HTTP methods (GET, POST, etc.).

- **Example:**
A GET request to `/products` might return a list of products.

19. What are the components of an HTTP request?

- **Method:** GET, POST, etc.
 - **Headers:** Metadata like authentication tokens.
 - **Body:** Data sent with the request.
-

HTTP Methods

20. How do the PUT and POST methods differ?

- **PUT:** Updates existing resources.
- **POST:** Creates new resources.

21. What HTTP protocol methods does REST support?

- GET, POST, PUT, DELETE, PATCH, OPTIONS, etc.

22. What is the function of the OPTIONS method in RESTful Web services?

OPTIONS returns allowed HTTP methods for a resource.

Security in APIs

23. How should API security be tested?

- Check for broken authentication.
- Test using invalid inputs for injections (SQL, XML).
- Validate response codes.

24. Explain OAuth 2.0 Authentication.

OAuth 2.0 is an authorization framework. It allows third-party apps to access user data without revealing credentials.

- **Example:**
Login using your Google account on another app.

25. How do you handle security testing for an API that requires authentication and authorization?

- Test with valid and invalid tokens.
- Check response when authorization is missing.

Performance and Load Testing

26. How do you go about doing API load testing?

- Use tools like JMeter to simulate traffic.
- Monitor server performance under load.

27. What factors need to be considered while load testing a RESTful API?

- Concurrent users.
- Response time limits.

- Error rates.
28. **What is the definition of throughput in performance testing?**
Throughput is the number of requests handled per second.
-

Common API Errors

29. **What are the most commonly found API errors?**
- Incorrect response codes.
 - Slow response times.
 - Authentication failures.
30. **How frequently are APIs updated or deprecated?**
This depends on the provider. Popular APIs update frequently.
-

Challenges in API Testing

31. **What are the challenges of testing microservices-based APIs?**
- Managing dependencies between services.
 - Testing distributed systems.
32. **What are the challenges of API testing, and how can they be resolved?**
- **Challenge:** Lack of proper documentation.
 - **Solution:** Communicate with developers.
-

Miscellaneous

33. **When performing API testing, what should be checked?**
- Status codes.
 - Response data.
 - Performance.
34. **What does API documentation entail?**
It describes API functionality, endpoints, parameters, and responses.
- **Example:**
Swagger is a popular tool for API documentation.

35. **What is the benefit of automated API testing?**

Saves time and ensures consistency.

36. **What is caching, and what role does it play?**

Caching stores responses to reduce server load.

- **Example:**

Cached data is returned for repeated requests.

37. **Explain how APIs provide abstraction.**

APIs hide complexity and allow developers to use predefined operations.

38. **Why is API testing considered the best option for automation testing?**

It allows testing logic without depending on the UI.

39. **What types of API tests are commonly performed?**

- Functional
- Security
- Load

40. **What is black-box testing? How does it apply to APIs?**

Black-box testing focuses only on inputs and outputs, ignoring internal code.

- **Example:**

Sending a login request and verifying the response.