1. What REST stands for?

Answer

REST stands for REpresentational State Transfer. REST is web standards based architecture and uses HTTP Protocol for data communication. It revolves around resource where every component is a resource and a resource is accessed by a common interface using HTTP standard methods. REST was first introduced by Roy Fielding in 2000.

In REST architecture, a REST Server simply provides access to resources and REST client accesses and presents the resources. Here each resource is identified by URIs/ global IDs. REST uses various representations to represent a resource like text, JSON and XML. Now a days JSON is the most popular format being used in web services.

2. What are NoSQL databases?

Answer

A NoSQL database provides a mechanism for storage and retrieval of data that is modeled in means other than the tabular relations used in relational databases (like SQL, Oracle, etc.).

3. What are the different types of NoSQL databases?

Types of NoSQL databases:

- Document Oriented
- Key Value
- Graph
- Column Oriented

4. What do you understand by NoSQL databases?

Answer

At the present time, the internet is loaded with big data, big users, big complexity etc. and also becoming more complex day by day. NoSQL is answer of all these

problems; it is not a traditional database management system, not even a relational database management system (RDBMS). NoSQL stands for "Not Only SQL". NoSQL is a type of database that can handle and sort all type of unstructured, messy and complicated data. It is just a new way to think about the database.

5. What is SQL injection?

Answer

Injection attacks stem from a lack of strict separation between program instructions (i.e., code) and user-provided (or external) input. This allows an attacker to inject malicious code into a data snippet.

SQL injection is one of the most common types of injection attack. To carry it out, an attacker provides malicious SQL statements through the application.

How to prevent:

- Prepared statements with parameterized queries
- Stored procedures
- Input validation - blacklist validation and whitelist validation
- Principle of least privilege - Application accounts shouldn't assign DBA or admin type access onto the database server. This ensures that if an application is compromised, an attacker won't have the rights to the database through the compromised application.

6. Explain what are the key responsibilities of a Web Developer?

Answer

- Program test and debug all web applications
- Design, develop, test and deploy web applications
- Uploading sites onto server and registering it with different search engines
- Coordinate with other designers and programmers to develop web projects
- Fix bugs, troubleshoot and resolve problems
- In case of system failure initiate periodic testing and implement contingency plans
- Develop appropriate code structures to solve specific tasks
- Support and assist in the upkeep and maintenance of websites

- Assume ownership of code throughout staging, development, testing and production

7. What web developer should know?

Answer

A good web developer should know

- HTML
- CSS
- SQL
- PHP/Ruby/Python
- JQuery
- JavaScript

8. Explain what is CORS? How does it work?

Answer

(CORS) Cross-Origin Resource Sharing is a mechanism that enables many resources (e.g., JavaScript, fonts etc.) on a web page to be requested from another domain outside the domain from which the resource originated. It is a mechanism supported in HTML5 that manages XMLHttpRequest access to a domain different.

9. List out the advantage of HTTP/2 as compared with HTTP 1.1?

Answer

The advantage of HTTP/2 compared to HTTP/1.1 is

HTTP headers data compression
Server push technologies
Over a single TCP connection parallel loading of page elements
Prioritization of request

10.   Explain what is long polling?

Answer

Long polling is a web application development pattern used to emulate pushing data from the server to the client. When the long polling is used, the client sends a request to the server, and the connection remains intact until the server is ready to send data to the client. The connection will be closed only after the data is sent back to the client or connection timeout occurs.

11.   Explain what is an ETag and how does it work?
Answer

An ETag is an opaque identifier allocated by a web server to a specific version of a resource found at a URL. The ETag is a part of HTTP, the protocol for the world wide web and when the server reads the ETag from client request, the server can then tell whether to send the file (HTTP 200) or tell the client just to use their local copy (HTTP 304).

12.   Explain what is DTD (Document Type Declaration)? Mention what is the difference between CDATA and PCDATA in DTD?

Answer

A DTD means Document Type Definition (DTD) which defines the structure, legal elements and attributes of an XML document.

- PCDATA: A PCDATA is a Parsed Character Data. XML parsers usually parse all the text in an XML document.
- CDATA: While CDATA is an Unparsed Character Data, the term CDATA is used about text data that should not be parsed by the XML parser.

13.   Mention some tips you can use to reduce the load time of a web application that you have written?

Answer

To decrease the load time of a web application you have to follow the following tips

- Optimize images to no longer than screen resolution and save it as a compressed file.
- Eliminate all JavaScript files to reduce the amount of transferable data.
- Combine & Mininify all CSS and JS and call them in footer.
- Defer or Asynch JS Files.

14.   Mention what is the correct way to include JavaScript into your HTML?

Answer

The correct way to include JavaScript into your HTML is by using inline event handlers or inline code.

15.   Explain what is the difference between cookies and local storage?

Answer

	Cookies	Local Storage
Client Side/ Server Side	Data accessible both at client side and server side. The data is sent to the serverside with every cookie request.	Only at the local browser side data is accessible. Server cannot use local storage until deliberately sent a request to the server via POST or GET
Size	Storage capacity of cookies is 4095 bytes/cookie	Storage capacity of local storage is 5MB per domain
Expiration	Cookies have expiration and cookie data gets deleted after some time	There is no expiration and has to remove manually

16.   What is meant by Continuous Integration?

Answer

Continuous Integration (CI) is a development practice that requires developers to integrate code into a shared repository several times a day. Each check-in is then verified by an automated build, allowing teams to detect problems early.

17.   How to mitigate the SQL Injection risks?

Answer

To mitigate SQL injection:
- Prepared Statements with Parameterized Queries: Always ensure that your SQL interpreter always able to differentiate between code and data. Never use dynamic queries which fail to find the difference between code and data. Instead, use static SQL query and then pass in the external input as a parameter to query. Use of Prepared Statements (with Parameterized Queries) force developer to first define all the SQL code, and then pass in each parameter to the query later.
- Use of Stored Procedures: Stored Procedure is like a function in C where database administrator call it whenever he/she need it. It is not completely mitigated SQL injection but definitely helps in reducing risks of SQL injection by avoiding dynamic SQL generation inside.
- White List Input Validation: Always use white list input validation and allow only preapproved input by the developer. Never use blacklist approach as it is less secure than whitelist approach.
- Escaping All User Supplied Input
- Enforcing Least Privilege

18.   Name some performance testing steps

Answer

Some of the performance testing steps are:

- Identify the testing environment
- Identify performance metrics
- Plan and design performance tests
- Configure the test environment

- Implement your test design
- Execute tests
- Analyze, report, retest

19. Name the difference between Acceptance Test and Functional Test

Answer

- Functional testing: This is a verification activity; did we build a correctly working product? Does the software meet the business requirements? A functional test verifies that the product actually works as you (the developer) think it does.

- Acceptance testing: This is a validation activity; did we build the right thing? Is this what the customer really needs? Acceptance tests verify the product actually solves the problem it was made to solve. This can best be done by the user (customer), for instance performing his/her tasks that the software assists with.

20. What are the advantages of Web Services?

Answer

Some of the advantages of web services are:

Interoperability: Web services are accessible over network and runs on HTTP/SOAP protocol and uses XML/JSON to transport data, hence it can be developed in any programming language. Web service can be written in java programming and client can be PHP and vice versa.

Reusability: One web service can be used by many client applications at the same time.

Loose Coupling: Web services client code is totally independent with server code, so we have achieved loose coupling in our application.

Easy to deploy and integrate, just like web applications.

Multiple service versions can be running at same time.

21.   Why use Node.js for developing web apps?

Answer

- High-performance for Real-time Applications
- Easy Scalability for Modern Applications
- Cost-effective with Fullstack JS
- Community Support to Simplify Development
- Easy to Learn and Quick to Adapt
- Helps in building Cross-functional Teams
- Improves App Response Time and Boosts Performance
- Reduces Time-to-Market of your applications
- Extensibility to Meet Customized Requirements
- Reduces Loading Time by Quick Caching
- Helps in Building Cross-Platform Applications

22.   What does Containerization mean?

Answer

Containerisation is a type of virtualization strategy that emerged as an alternative to traditional hypervisor-based virtualization.

In containerization, the operating system is shared by the different containers rather than cloned for each virtual machine. For example Docker provides a container virtualization platform that serves as a good alternative to hypervisor-based arrangements.

23.   Why Would You Opt For Microservices Architecture?

Answer

There are plenty of pros that are offered by Microservices architecture. Here are a few of them:

- Microservices can adapt easily to other frameworks or technologies.
- Failure of a single process does not affect the entire system.
- Provides support to big enterprises as well as small teams.
- Can be deployed independently and in relatively less time.

24.   Name some Performance Testing best practices

Answer

- Test as early as possible in development.
- Conduct multiple performance tests to ensure consistent findings and determine metrics averages.
- Test the individual software units separately as well as together
- Baseline measurements provide a starting point for determining success or failure
- Performance tests are best conducted in test environments that are as close to the production systems as possible
- Isolate the performance test environment from the environment used for quality assurance testing
- Keep the test environment as consistent as possible
- Calculating averages will deliver actionable metrics. There is value in tracking outliers also. Those extreme measurements could reveal possible failures.

25.   What Do You Mean By High Availability (HA)?

Answer

Availability means the ability of the application user to access the system, If a user cannot access the application, it is assumed unavailable. High Availability means the application will be available, without interruption. Using redundant server nodes with clustering is a common way to achieve higher level of availability in web applications.

Availability is commonly expressed as a percentage of uptime in a given year.

26.   What Is ACID Property Of A System?

Answer

ACID is an acronym which is commonly used to define the properties of a relational database system, it stand for following terms

Atomicity - This property guarantees that if one part of the transaction fails, the entire transaction will fail, and the database state will be left unchanged.

Consistency - This property ensures that any transaction will bring the database from one valid state to another.

Isolation - This property ensures that the concurrent execution of transactions results in a system state that would be obtained if transactions were executed serially.

Durable - means that once a transaction has been committed, it will remain so, even in the event of power loss.

27.   What Is Sticky Session Load Balancing? What Do You Mean By "Session Affinity"?

Answer

Sticky session or a session affinity technique is another popular load balancing technique that requires a user session to be always served by an allocated machine.

In a load balanced server application where user information is stored in session it will be required to keep the session data available to all machines. This can be avoided by always serving a particular user session request from one machine. The machine is associated with a session as soon as the session is created. All the requests in a particular session are always redirected to the associated machine. This ensures the user data is only at one machine and load is also shared.

This is typically done by using SessionId cookie. The cookie is sent to the client for the first request and every subsequent request by client must be containing that same cookie to identify the session.

What Are The Issues With Sticky Session?

There are few issues that you may face with this approach

- The client browser may not support cookies, and your load balancer will not be able to identify if a request belongs to a session. This may cause strange behavior for the users who use no cookie based browsers.
- In case one of the machine fails or goes down, the user information (served by that machine) will be lost and there will be no way to recover user session.

28.   What are disadvantages of REST web services?

Answer

Some of the disadvantages of REST are:

- Since there is no contract defined between service and client, it has to be communicated through other means such as documentation or emails.
- Since it works on HTTP, there can't be asynchronous calls.
- Sessions can't be maintained.

29.   What are the DRY and DIE principles?

Answer

In software engineering, Don't Repeat Yourself (DRY) or Duplication is Evil (DIE) is a principle of software development.

30.   Name some best practices for better RESTful API design.

Answer

- Use JSON as the Format for Sending and Receiving Data
- Use Nouns Instead of Verbs in Endpoints
- Name Collections with Plural Nouns
- Use Status Codes in Error Handling
- Use Nesting on Endpoints to Show Relationships
- Use Filtering, Sorting, and Pagination to Retrieve the Data Requested
- Use SSL for Security
- Be Clear with Versioning
- Provide Accurate API Documentation

31.   Why layering your application is important

Answer

It is very simple to debug because the layers are discrete. If an error happens in the CPU scheduling layer, the developer may only debug that layer. This design supports modularity because each layer only executes tasks it is scheduled to perform.

32.   5 important differences when comparing MongoDB vs. Redis

Answer

- Speed: Redis is faster than MongoDB because it's an in-memory database.
- RAM: Redis uses more RAM than MongoDB for non-trivial data sets.
- Scalability: MongoDB scales better than Redis.
- Storage: Businesses (primarily) use Redis for key-value storage. MongoDB stores everything in documents.
- Reviews: MongoDB and Redis reviews are generally positive. (Both have 4.5/5 stars on G2.)

33.   What is Spike Testing?

Answer

Spike testing is a type of performance testing in which an application receives a sudden and extreme increase or decrease in load. The goal of spike testing is to determine the behavior of a software application when it receives extreme variations in traffic.

34.   What do you understand by Distributed Transaction?

Answer

A distributed transaction is a set of operations on data that is performed across two or more data repositories (especially databases). It is typically coordinated across separate nodes connected by a network, but may also span multiple databases on a single server.

35.   How does B-trees Index work?

Answer

A B-tree index creates a multi-level tree structure that breaks a database down into fixed-size blocks or pages. Each level of this tree can be used to link those pages via an address location, allowing one page (known as a node, or internal page) to refer to another with leaf pages at the lowest level.

36.   Why uses SSL/TLS work ?

Answer

SSL/TLS uses both asymmetric and symmetric encryption to protect the confidentiality and integrity of data-in-transit. Asymmetric encryption is used to establish a secure session between a client and a server, and symmetric encryption is used to exchange data within the secured session.

37.   What is the API Gateway pattern?

Answer

The pattern provides a reverse proxy to redirect or route requests to your internal microservices endpoints. An API gateway provides a single endpoint or URL for the client applications, and it internally maps the requests to internal microservices.

Using Multiple API Gateways example
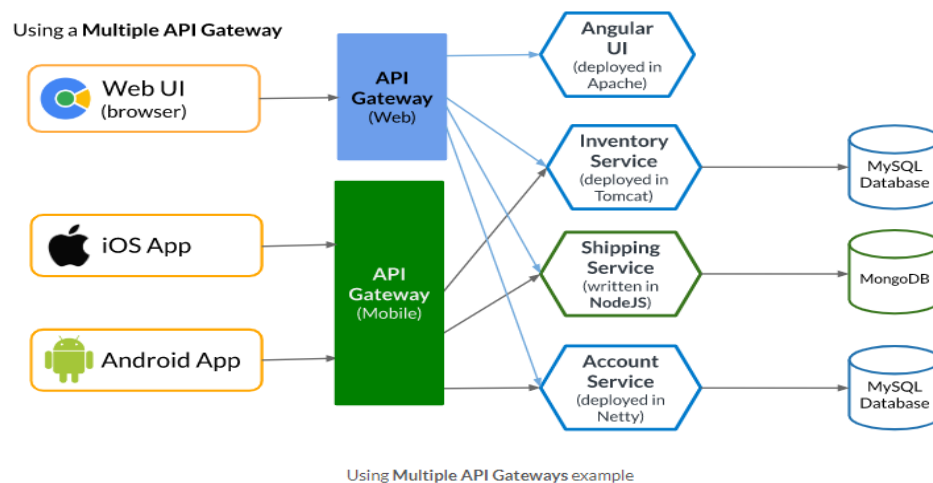
38.   What is the difference between Monolithic, SOA and Microservices Architecture?

Answer

- Monolithic Architecture is similar to a big container wherein all the software components of an application are assembled together and tightly packaged.
- A Service-Oriented Architecture is a collection of services which communicate with each other. The communication can involve either simple data passing or it could involve two or more services coordinating some activity.
- Microservice Architecture is an architectural style that structures an application as a collection of small autonomous services, modeled around a business domain.

39.   What are the differences between Continuous Integration, Continuous Delivery, and Continuous Deployment?

Answer

Developers practicing continuous integration merge their changes back to the main branch as often as possible. By doing so, you avoid the integration hell that usually happens when people wait for release day to merge their changes into the release branch.

Continuous delivery is an extension of continuous integration to make sure that you can release new changes to your customers quickly in a sustainable way. This means that on top of having automated your testing, you also have automated your release process and you can deploy your application at any point of time by clicking on a button.

Continuous deployment goes one step further than continuous delivery. With this practice, every change that passes all stages of your production pipeline is released to your customers. There's no human intervention, and only a failed test will prevent a new change to be deployed to production.

40.   What are the difference between Clustered and a Non-clustered index?

Answer

- With a Clustered index the rows are stored physically on the disk in the same order as the index. Therefore, there can be only one clustered index. A clustered index means you are telling the database to store close values actually close to one another on the disk.
- With a Non Clustered index there is a second list that has pointers to the physical rows. You can have many non clustered indices, although each new index will increase the time it takes to write new records.
- It is generally faster to read from a clustered index if you want to get back all the columns. You do not have to go first to the index and then to the table.
- Writing to a table with a clustered index can be slower, if there is a need to rearrange the data.

41.   What does event-driven programming mean?

Answer

An event-driven programming approach uses events to trigger various functions. An event can be anything, such as typing a key or clicking a mouse button. A call-back function is already registered with the element executes whenever an event is triggered.

42.   What is an Event Loop in Node.js?

Answer

Event loops handle asynchronous callbacks in Node.js. It is the foundation of the non-blocking input/output in Node.js, making it one of the most important environmental features.

43.   What are the two types of API functions in Node.js?

Answer

The two types of API functions in Node.js are:

- Asynchronous, non-blocking functions
- Synchronous, blocking functions

44.   What are streams in Node.js?

Answer

Streams are objects that enable you to read data or write data continuously.

There are four types of streams:

Readable – Used for reading operations

Writable – Used for write operations

Duplex – Can be used for both reading and write operations

Transform – A type of duplex stream where the output is computed based on input

45.   Explain asynchronous and non-blocking APIs in Node.js.

Answer

- All Node.js library APIs are asynchronous, which means they are also non-blocking
- A Node.js-based server never waits for an API to return data. Instead, it moves to the next API after calling it, and a notification mechanism from a Node.js event responds to the server for the previous API call

46.   What is the control flow function?

Answer

The control flow function is a piece of code that runs in between several asynchronous function calls.

47.   How does control flow manage the function calls?

Answer

The Control Flow does the following jobs:

- Control the order of execution
- Collect data
- Limit concurrency
- Call the next step in a program

48.   Explain the concept of middleware in Node.js.

Answer

Middleware is a function that receives the request and response objects. Most tasks that the middleware functions perform are:

- Execute any code
- Update or modify the request and the response objects
- Finish the request-response cycle
- Invoke the next middleware in the stack

49.   If you have a limited amount of memory, how would you handle a large amount of data?

Answer

Open-ended questions like this usually have multiple right answers, and the interviewer wants to see your unique approach. Consider how you'd address the issue in a real-life setting and share your opinion, and explain why you chose your answer.

Example: "I would break up the large amount of data into small chunks. I'd do this by using an external sort or merge sort. I think this would be the fastest and simplest option."

50.   What's a reverse proxy?

Answer

A reverse proxy acts as an intermediary, retrieving resources from a server and returning them to a client, so it appears that the information originates from the proxy server itself. The forward proxy, also an intermediary, is what the client puts between itself and another server