Below is the written test for Bongo's Site Reliability Engineer position. Please read through the entire test before starting to write it.

Q. Certain web pages are loading slow in user's browser for our live web application. What steps will you take to resolve the issue?

Answer:

Step 1: Check Server Response.

Step 2: Optimize Images of the web pages.

Step 3: Use caching or enable caching.

Step 4: Using gzip compression to compress the files.

Step 5: Use CDN for the contents.

Step 6: Look into the Database of the web application.

Q. Imagine a scenario where a web application is serving from a single web server to the internet. What are the problems in this scenario? Design and architect a solution that will mitigate these problems? Or How would you design a scalable architecture with resiliency in mind for the following situations:

> **a.** if a service is resource intensive **b.** a service needs to be low latency **c.** if parts of a service need to be restricted to certain geographical boundaries

Answer: Assuming the web application is running on a physical server then, there is a limit of how much resource it can be assigned. Also if the server is down then the whole web application is down. Even if the server is not down but for some reason the network has any issue then also the whole web application is down.

Assuming the web application running as a virtual server, then if the server is highly available then the only problem is the limit of possible assigned resource in a single server (If the server is resource hungry)

It is possible to design a scalable architecture for the web application. But depending on the requirements the architecture can be different. Including is link to a diagram of a simple web application server of heavy usage.(According to requirements there can be more Web Application Server, More database server, and more Load Balancer)

Link:
https://github.com/nafizctl/hello-world/blob/BongoBD/images/Scalable%20Web%20Application.png

a/ if a service is resource hungry then it is possible to run different objectives in different servers. Like web server run in a server, or in multiple servers and then balance the loads like aws ELB. And database in another server or maybe database in a database cluster. And if there is high I/O throughput then high I/O storage can be used.

b/ If a service is needed to be low latency then it can be configured to use CDN to deliver the contents.

c/ It is achievable by using web application firewall or known as WAF. or also it is possible to do it from the application itself. To put all the accepted and not accepted region list in database and then by analyzing from which region the application request is generated and by matching the request in database it can be achieved.

Q. Currently there's no monitoring in place for the above single web server. How and what application will you use to monitor the resources/process in your new design?

Answer: Monitoring the web application is to monitor server health, network, processes. For monitoring a server should be used. And Nagios is good for monitoring a web server. It can monitor processes. To use nagios a nagios server is required and then is it required to install nagios client and configure the client in the server to be monitored.

Q. In our server we want to create a user who can only view logs using `less` from this path /var/log. Please explain how to achieve this.

Answer: To achieve this we need to configure rbash. Which is restricted shell mode.

Assuming the user name is "test". Then the process is given below:

(The following commands need to be given as root user)

1/ First Create a symlink rbash from bash:

```
ln -s /bin/bash /bin/rbash
```

2/ Add a user with username test in server and set a password to user test: :

```
useradd test -s /bin/rbash

passwd test
```

3/ Create a bin directory inside the test user home directory:

mkdir /home/test/bin

4/ Now we specify which command can the user run:

ln -s /bin/less /home/test/bin/less

5/ Now modify file permission so that user can not modify .bash_profile:

chown root. /home/test/.bash_profile

chmod 755 /home/test/.bash_profile

6/ Edit and modify path variable of .bash_profile:

vi /home/test/.bash_profile

PATH=$HOME/bin

7/ Now if user do not have permission to read files in /var/log then will need to give permission. If already can read files then this step is not required:

setfacl -R -m u:test:r /var/log

8/ Now When logged in to this user, only less command will work in /var/log.

Q. Explain how you can ssh into a private server from the internet.

Answer: If i am on internet and the other server is private. Then there should be a public access where the private server is (May not be in the server). There are two methods for this scenario:

First is port redirection. Redirect a port in access point or in router to the private IP of the server.

Second is configuring a VPN server with a public IP. Connecting to that VPN server it is possible to access the private server.

Q. Write a bash function that will find all occurrences of an IPv4 from a given file.

Answer: File with name readip.sh is the script with bash function that will find all occurrences of an IPv4 from a given file.

Link: https://github.com/nafizctl/hello-world/blob/BongoBD/readip.sh

How to use: from command line, use the following command,

Command : sh readip.sh filename

Q. Share with us a steps to run a web service container on 80 port.

Answer: To run a Docker container on port 80 without having a Dockerfile , it can be done by the following command:

```
docker run -dit --name my-apache-app -p 8080:80 -v "$PWD":/usr/local/apache2/htdocs/
                                                    httpd:2.4
```

Submission:

1) Implement solution for these problems. 2) Upload to github/bitbucket or any other code sharing platform. 3) Send an email to al.emran@bongobd.com and & biprajit.saha@bongobd.com with subject "Bongo SRE Test" with your code repository URL in the email body.

If you have any questions, please send mail with a subject line of "Questions on Bongo SRE Test".