ALX Web infrastructure design

`0-simple_web_stack`

1. What is a server?

- A server is a computer or system that is dedicated to providing services or resources to other computers, which are known as clients, over a network. In this context, a server stores and serves web content to users upon request.

2. What is the role of the domain name?

- The domain name (www.foobar.com) is a human-readable address that maps to the IP address (8.8.8.8) of the server hosting the website. It provides a user-friendly way to access the web resources hosted on the server instead of remembering complex numbers (IP addresses).

3. What type of DNS record is www in www.foobar.com?

- The DNS record for "www" in www.foobar.com is typically a CNAME (Canonical Name) record, which is an alias that points to the domain's canonical name (foobar.com). It helps redirect traffic from the www subdomain to the main domain.

4. What is the role of the web server?

- The web server (Nginx) handles incoming HTTP requests from clients (web browsers) and serves static content or forwards dynamic requests to the application server. It manages the communication between clients and the application server.

5. What is the role of the application server?

- The application server hosts the actual application code (e.g., PHP, Python, Ruby) and executes business logic in response to dynamic requests. It communicates with the web server to generate dynamic content and sends the result back to the web server for delivery to the client.

6. What is the role of the database?

- The database (MySQL) stores and manages the application's data. It is used by the application server to read or write information, such as user data, configurations, and other relevant content.

7. What is the server using to communicate with the user's computer requesting the website?

- The server communicates with the user's computer using the HTTP or HTTPS protocols. The web server and application server handle the HTTP requests and responses, while HTTPS adds a layer of security through encryption.

Issues with the Infrastructure:

1. Single Point of Failure (SPOF):

- The infrastructure has a single server, meaning if that server fails, the entire website becomes inaccessible. To address this, a more robust setup could involve multiple servers for load balancing and redundancy.

2. Downtime During Maintenance:

- Performing maintenance tasks, such as deploying new code that requires restarting the web server, can lead to downtime. Implementing techniques like rolling deployments or using redundant servers can minimize downtime during maintenance.

3. Scalability Concerns:

- The current setup may struggle to handle a sudden increase in traffic. To address this, we must consider implementing load balancing, caching mechanisms, or scaling the infrastructure horizontally by adding more servers to distribute the load.