

Task 0 - simple_web_stack

Definitions and Explanations

1. What is a server ?

A server is a machine that could be either physical or virtual such as a VM or container, a server is dedicated to managing network resources and providing services to other computers known as clients, with the same network or over the internet.

2. What is the role of a domain name ?

A domain name serves as a human-readable and memorable label for identifying and accessing resources on the internet. It provides a user-friendly way to associate a specific website, server, or online service with a unique alphanumeric address. When users enter a domain name into a web browser, the Domain Name System (DNS) translates it into the corresponding IP address, allowing the browser to locate and connect to the associated web server. Essentially, a domain name simplifies the process of navigating the internet by offering a more user-friendly alternative to numerical IP addresses, making it easier for individuals to access websites and online resources.

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

www in www.foobar.com is of type : CNAME

4. What is the role of the Web Server ?

A web server is a software application or hardware device that handles incoming HTTP requests from clients (typically web browsers) and responds by serving static content, such as HTML pages, images, and CSS files. It acts as an intermediary between users and the web application or website, managing the transmission of data. Web servers play a crucial role in delivering web content efficiently, supporting the dynamic generation of pages through integration with application servers, and ensuring reliable communication between clients and the hosted resources. one of the popular web server nowadays is Nginx.

5. What is the role of the application server ?

An application server is responsible for executing application logic and processing dynamic content in a web application. It handles tasks such as business logic, database interactions, and dynamic content generation. Often working in conjunction with a web server, the application server ensures the execution of server-side code and supports various application protocols beyond HTTP.

6. What is the role of the database ?

A database stores, organizes, and manages structured data, providing a structured way to retrieve, update, and manage information. It serves as a central repository for applications, allowing efficient storage and retrieval of data through queries (SQL queries). Databases play a critical role in supporting the persistence of data for various applications, from websites to business systems.

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

The server communicates over HTTP protocol.

Issues

1. SPOF (Single Point Of Failure)

The current architecture has a single point of failure since it uses only one server that hosts only one web server, application server, and database.

A single point of failure is a part of a system that, if it fails, will cause the entire system to stop, hence making it unavailable to end users.

2. Downtime when maintenance is needed (like deploying a new code web server needs to be restarted) ?

The extended downtime will be due to the server relying on a single code base that may become inaccessible. The unavailability would prevent users from accessing the website and its content, leading to a negative user experience and a decrease in web traffic.

3. Cannot scale if too much incoming traffic ?

The domain name directs straight to the server, lacking a load balancer for efficient load distribution. This absence poses challenges in managing high user loads, potentially resulting in a bad user experience or imposing limits on the website's user capacity.