

TASK 0

Definitions and Explanations.

1. **What is a Server:** A server embodies a multifaceted entity, spanning from physical hardware to virtual instances or software programs, designated to furnish functionalities or services to other entities termed as "clients". These clients can range from individual devices to entire networks, relying on the server for various computational tasks or data dissemination purposes.
2. **What is the role of a domain name:** Embedded within the fabric of the Internet, domain names play a pivotal role in delineating and identifying digital resources, including but not limited to computers, networks, and services. Offering a user-friendly text-based label, domain names alleviate the burden of memorizing cumbersome numerical addresses (IP addresses), thereby facilitating seamless navigation and accessibility across the web.
3. **What type of DNS record www is in www.foobar.com:** Within the intricate tapestry of domain management, the designation "www" within a domain such as "www.foobar.com" corresponds to a canonical name record, abbreviated as 'CNAME'. This record type serves as an alias for another domain name, often redirecting users to the designated destination.
4. **What is the role of the Web Server:** At the heart of web infrastructure, the web server assumes a multifaceted role encompassing the storage, processing, and dissemination of website content. Tasked with housing the codebase of a website, the web server orchestrates the delivery of web pages to users, predominantly through the Hypertext Transfer Protocol (HTTP), thereby facilitating seamless interaction between clients and servers.
5. **What is the role of the application Server:** Functioning as the dynamic engine powering web applications, application servers undertake the execution of server-side code to generate dynamic content. Through the execution of technologies such as JavaServer Pages (JSP), Ajax, PHP, among others, application servers enable the seamless integration of dynamic functionalities within web

applications, fostering enhanced interactivity and user engagement.

6. **What is the role of the database:** Positioned as the custodian of digital repositories, databases play a pivotal role in systematically managing and organizing data. Through robust data management mechanisms, databases facilitate efficient storage, retrieval, updating, and deletion of data, ensuring seamless data access and manipulation within the digital ecosystem.
7. **What is the server using to communicate with the computer of the user requesting the website:** Facilitating seamless communication between servers and client devices, the Hypertext Transfer Protocol (HTTP) emerges as the cornerstone protocol governing web communications. By adhering to the HTTP protocol, servers effectively relay web content to user devices, fostering uninterrupted data transmission and retrieval processes.

Issues with the infrastructure.

1. **SPOF:** In the realm of system architecture, the specter of single points of failure looms large, encompassing scenarios where a singular component failure precipitates the collapse of the entire system. From monolithic server architectures housing web servers, application servers, and databases within a singular entity, to network bottlenecks, the presence of single points of failure underscores the imperative of redundancy and fault tolerance within system design.
2. **Downtime when maintenance needed:** The specter of downtime looms large during routine maintenance operations, such as deploying new code or restarting web servers. In instances where servers are reliant on a singular codebase, the unavailability of crucial resources can precipitate prolonged downtime periods, impeding user access and engendering negative user experiences.
3. **Cannot scale if too much incoming traffic:** The absence of scalable infrastructure poses a significant impediment to web scalability, particularly in scenarios characterized by burgeoning incoming traffic. With domain names directly pointing to servers sans load balancers, the infrastructure's capacity to handle escalating loads remains constrained, thereby engendering suboptimal user experiences and

potential traffic bottlenecks.