A DISTRIBUTED WEB INFRASTRUCTURE

A DESIGN OF A THREE SERVER WEB INFRASTRUCTURE THAT HOST A WEBSITE REACHABLE VIA www.foobar.com

NOTE EXPLANATION AND SPECIFIC SBOUT THE INFRASTRUCTURE

- **For every additional element, why you are adding it**: The main advantage of using a multi-server environment is that it can offer a higher level of reliability and availability than a single-server environment. If one server in a multi-server environment goes down, the other servers can continue to provide access to the services and applications that users need.
- **What distribution algorithm your load balancer is configured with and how it works**: Based on the round robin routing algorithm, traffic is distributed such that each load balancer node receives 50% of the traffic from the clients. Each load balancer node distributes its share of the traffic across the registered targets in its scope. Using the round robin algorithm, the DNS server rotates through these IP addresses, balancing the load between the servers.
- **Is your load-balancer enabling an Active-Active or Active-Passive setup, explain the difference between both: In an active-passive configuration**, the server load balancer recognizes a failed node and redirects traffic to the next available node. In an active-active configuration, the load balancer spreads out the workload's traffic among multiple nodes. Like the active-active cluster configuration, an active-passive cluster also consists of at least two nodes. However, as the name "active-passive" implies, not all nodes are going to be active. In the case of two nodes, for example, if the first node is already active, the second node must be passive or on standby.
- **How a database Primary-Replica (Master-Slave) cluster works**: Master-slave replication enables data from one database server (the master) to be replicated to one or more other database servers (the slaves). The master logs the updates, which then ripple through to the slaves.
- **What is the difference between the Primary node and the Replica node in regard to the application:** A Replica node is a copy of the Primary node it provide redundant copies of the application codebase to protect against hardware failure and increase capacity to serve read requests like searching or retrieving a document/

Issues with this infrastructure

SPOF: The major single point of failure in this infrastructure is having only one load balancer

Security issues (no firewall, no HTTPS): Firewalls are an essential network security measures for any business. They act as a barrier between your internal network and the outside world and can help protect your data against malicious hackers. However, firewall security is only effective if you understand how firewalls work, including their strengths and limitations. Firewalls work by blocking incoming and outgoing traffic based on predefined rules. Here are two main types of firewall security solutions: software and hardware. Software firewall solutions are typically installed on a single computer or device, whereas hardware firewall solutions cover an entire network at once. Firewall security measures can also be categorized by the type of traffic they protect against (e.g., malicious websites), how much bandwidth is allocated for each user, and what encryption methodologies are used to protect communications between clients and servers.

Hypertext Transfer Protocol Secure (HTTPS) is a protocol that secures communication and data transfer between a user's web browser and a website. HTTPS is the secure version of HTTP. The protocol protects users against eavesdroppers and man-in-the-middle (MitM) attacks.