WEB INFRASTRUCTURE -ALX

1. Distributed web infrastructure

1. For every additional element, why you are adding it
   load-balancer(HAproxy)

Server- to add a load balancer to handle more traffic and mitigate single point of failure

2. What distribution algorithm your load balancer is configured with and how it works

The round robin algorithm which cycles through a list of servers sequentially assigning each incoming request to the next server in the list. Ensures each server receives equal share of the incoming traffic distributing load evenly across servers 1, 2 and 3

3. Is your load-balancer enabling an Active-Active or Active-Passive setup, explain the difference between both

My load-balancer enables Active-Active because all servers receive an equal amount of traffic. The main difference between Active-Active and Active-Passive setups is the number of active servers and the level of fault tolerance and high availability providedActive-Active setups provide higher scalability and efficiency, while Active-Passive setups provide higher fault tolerance and high availability

4. How a database Primary-Replica (Master-Slave) cluster works

It provides high availability and scalability for database workloads by separating write and read operations, propagating changes to replica nodes, and promoting a replica node to become the new primary node in the event of a failure. The cluster can be scaled horizontally by adding more replica nodes, which can help to improve performance and capacity.

5. What is the difference between the Primary node and the Replica node in regard to the application

The primary node is responsible for handling all write operations and ensuring data consistency across all nodes in the cluster. This means that the application must direct all write operations to the primary node, and must ensure that the data is consistent and up-to-date across all nodes.
The replica nodes, on the other hand, are responsible for handling read operations and replicating the data from the primary node. This means that the application can direct read operations to the replica nodes, which can help to offload the workload from the primary node and improve performance.

6. Explain what the issues are with this infrastructure:

Where are SPOF

In this infrastructure, the primary node is a single point of failure, as all write operations must be directed to the primary node. If the primary node fails, the entire system can become unavailable until a new primary node is promoted.

7. Security issues (no firewall, no HTTPS)

This infrastructure does not include any firewall or HTTPS protection, which can make the system vulnerable to attacks and data breaches. It is important to implement security measures, such as firewalls and HTTPS, to protect the system and ensure data privacy and integrity.

8. No monitoring

This infrastructure does not include any monitoring or alerting mechanisms, which can make it difficult to detect and diagnose issues in the system. It is important to implement monitoring and alerting mechanisms to ensure that the system is running smoothly and to detect and address any issues in a timely manner.