

# 0x09. Web infrastructure design

## TASK 1 : 1. Distributed web infrastructure

### MAIN CONCEPTS:

#### Additional elements:

In this case I'm using 2 servers in order to boost reliability and performance of the web infrastructure.

Here bellow the Schema of the current case's infrastructure:

- 2 servers
- 1 web server (Nginx)
- 1 application server
- 1 load-balancer (HAproxy)
- 1 set of application files (your code base)
- 1 database (MySQL)

#### Distribution algorithm my load balancer is configured with

My load balancer uses the Round Robin algorithm that ensures a fair sharing of requests among servers.

#### and how it works:

Requests are served by the server sequentially one after another. After sending the request to the last server, it starts from the first server again. This algorithm is used when servers are of equal specification and there are not many persistent connections.

#### Load-balancer enabling setup, Active-Active or Active-Passive:

- **Active-Active:** Both load balancers actively handle traffic, providing higher availability. this setup gives you access to the resources of all your servers during normal operation
- **Active-Passive:** one load balancer is active and handles all incoming traffic, while the passive server remains on standby. In this setup, the backup server only sees action during failover.

### **Primary-Replica (Master-Slave) cluster performance:**

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 the slaves. If the changes are made to the master and slave at the same time, it is synchronous. If changes are queued up and written later, it is asynchronous. It is usually used to spread read access on multiple servers for scalability, although it can also be used for other purposes such as for failover, or analyzing data on the slave in order not to overload the master

### **Difference between the Primary node and the Replica node:**

- **Primary Node:** Handles write-intensive tasks, updates data.
- **Replica Node:** Offers read operations, alleviating primary's load.

## **ISSUES:**

### **SPOF:**

In this infrastructure, having one load balancer may disrupt the whole of it.

### **Security issues:**

- **No firewall:** there are main three risks of not having a firewall, Unlimited Public Access, Unrestricted Data Access and Network Downtime.
- **No HTTPS:** all requests and responses can be read by anyone who is monitoring the session so that is risking to lose your personal data by attackers.

### **No Monitoring:**

Infrastructure monitoring is used to collect health and performance data from servers, virtual machines, containers, databases, and other backend components. However, absence of monitoring tools means limited visibility of system health.