

ALX PROJECT

0x09-web_infrastructure_design

3-scale_up

Server (S1):

- We'll add a dedicated server (S1) to host one of the components (e.g., web server, application server, or database).
- Having separate servers for each component improves isolation, scalability, and resource allocation.
- We'll allocate resources (CPU, memory, storage) based on the workload of each component.

2. Load Balancer (LB1 and LB2 - HAproxy Cluster):

- Load balancers distribute incoming traffic across multiple servers for high availability and load distribution.
- HAproxy is a reliable choice for load balancing.
- Configuring an HAproxy cluster ensures redundancy and failover.
- If one LB fails, the other takes over seamlessly.

3. Web Server (WS1):

- WS1 hosts the website content (HTML, CSS, JavaScript).
- It handles HTTP/HTTPS requests from clients.
- We'll install a web server software (e.g., Nginx, Apache) on WS1.
- WS1 will serve static files and route dynamic requests to the application server.

4. Application Server (AS1):

- AS1 processes dynamic content (e.g., PHP, Python, Node.js).
- Separating the application server from the web server improves scalability and security.
- AS1 communicates with the database server.
- We'll configure AS1 to handle application logic (e.g., user authentication, business logic).

5. Database Server (DB1):

- DB1 stores data (e.g., user profiles, product information).
- Isolating the database server ensures data integrity and performance.
- We'll use MySQL or another database system.
- DB1 will handle read and write operations.

6. Security Considerations:

- Configure firewalls (FW1) to restrict incoming traffic.
- Allow only necessary ports (HTTP, HTTPS, SSH).
- Implement security groups or access control lists (ACLs) to control network access.

7. Monitoring Clients (MC1):

- MC1 collects performance metrics and logs.
- Monitor CPU, memory, disk usage, and network traffic.

- Set up alerts for abnormal behavior.
- Ensure MC1 tracks QPS (Queries Per Second) for web server and database.

8. SSL Certificate:

- Install SSL certificates on LB1 and WS1.
- Encrypt data in transit.
- Use Let's Encrypt or a commercial certificate authority.

9. Backup Strategy:

- Regularly back up the database (DB1) and website content.
- Implement automated backups and test restoration procedures.

10. Scaling Strategy:

- Plan for future growth.
- Add more servers as needed (e.g., additional web servers, application servers, or database replicas).
- Use auto-scaling groups for dynamic scaling.