A SCALABLE ARCHITECTURE FOR A SCHOOL MANAGEMENT SYSTEM

SCALABITY

When you scale up your system's hardware capacity, you want the workload it is able to handle to scale up to the same degree. If you double hardware capacity of your system, you would like your system to be able to handle double the workload too.

There are two major ways scalability can be implemented:

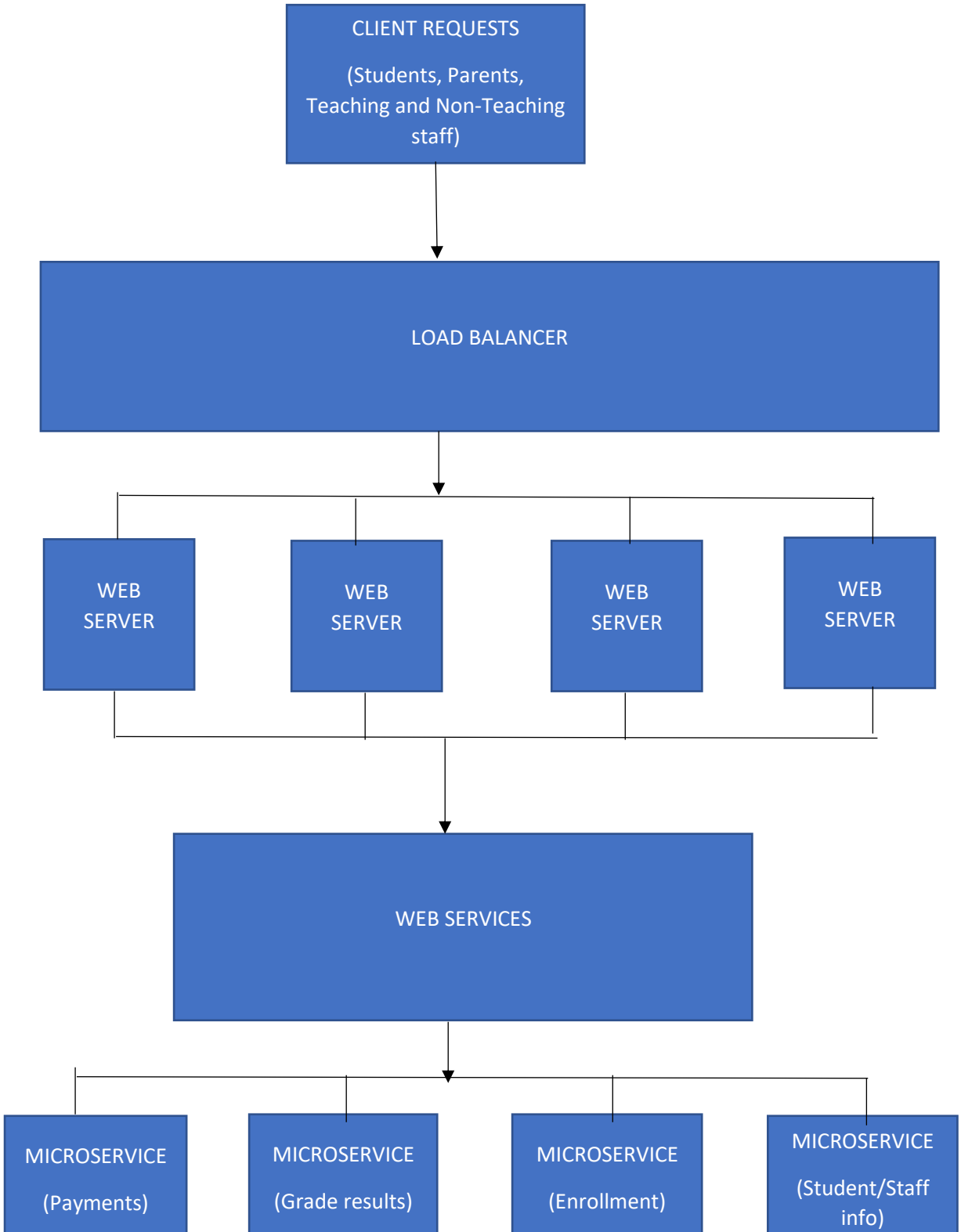
1. Vertical scalability
2. Horizontal scalability

Here, I implement the Vertical scalability approach, where you scale up the system by deploying the software on a computer with higher capacity than the computer it is currently deployed on. The new computer may have a faster CPU, more memory, faster and larger hard disk, faster memory bus etc. than the current computer.

DESIGN OF A SCALABLE SCHOOL MANAGEMENT ARCHITECTURE

- The requests from clients, students, parents, teaching and non-teaching staff, all go to the load balancer.
- The load balancer equally distributes the load (requests) across the available web servers for processing.
- The web servers are virtual machines whose quantity can be increased easily when the number of users increase. They are connected in a distributed system and have memory for caching and saving logs.
- The web servers communicate among themselves and have the ability to pass load onto available servers when a particular server fails or there is a network partition.
- Services to the web servers are provided.
- SQL database is used, maintaining the ACID properties (Atomicity, Consistency, Isolation and Durability)

Below is an architectural diagram:


CLIENT REQUESTS
(Students, Parents, Teaching and Non-Teaching staff)
LOAD BALANCER
WEB SERVER
WEB SERVER
WEB SERVER
WEB SERVER
WEB SERVICES
MICROSERVICE
(Payments)
MICROSERVICE
(Grade results)
MICROSERVICE
(Enrollment)
MICROSERVICE
(Student/Staff info)