MangoApps System Design:

# Building & Scaling to 1 Million+ Users

www.mangoapps.com

# Understanding How MangoApps Builds a Scalable Application for Over 1 Million Users

Scalability is as crucial to the MangoApps application as its features and user interface. This document highlights key aspects that enable MangoApps to serve millions of users.

## What is a Scalable Application?

Scalability refers to a system's capacity to maintain reasonable performance under increasing demands, such as larger data sets, higher request rates, or a combination of size and velocity. A scalable application should perform efficiently with one or a million users and automatically manage traffic spikes. By adjusting resources only as required, scalable apps consume only the necessary resources to meet demand.

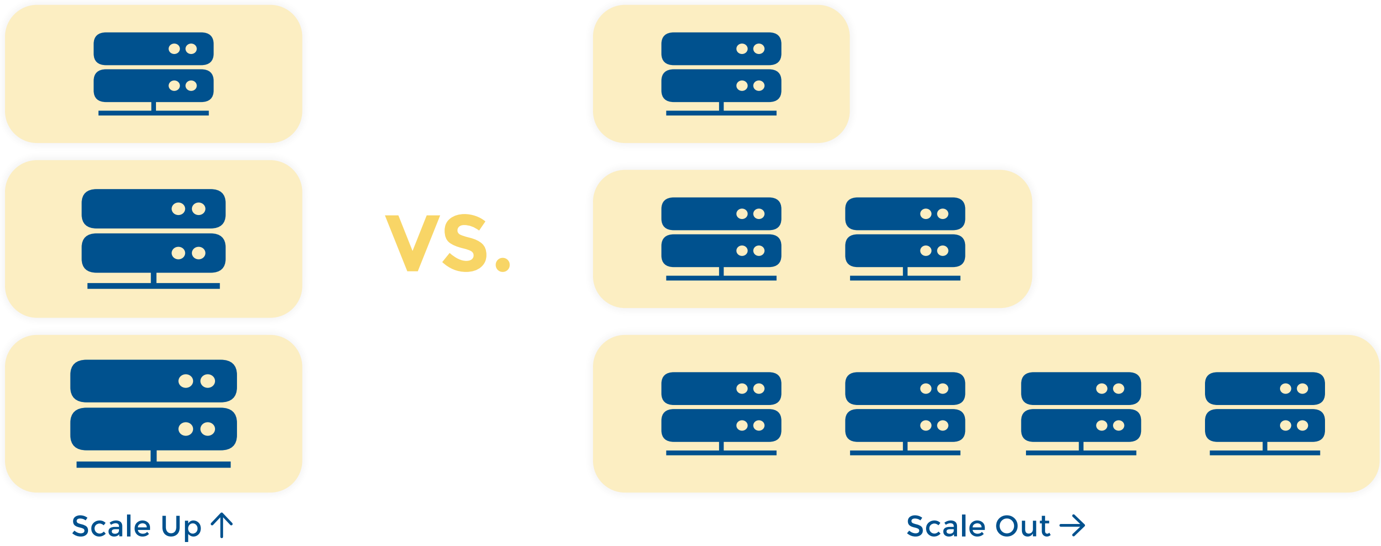
In the context of cloud computing, scalability typically involves two primary methods: horizontal and vertical scaling. Let's delve into these terms.

### Vertical Scaling (Scaling Up)

Scaling up, or vertical scaling, involves maximizing the resources of a single unit to enhance its capacity to manage increasing loads. In terms of hardware, this may involve adding processing power and memory to the physical machine hosting the server. For software, scaling up may include optimizing algorithms and application code.

### Horizontal scaling (Scaling Out)

Horizontal scaling, or scaling out, involves increasing resources by adding more units to the application's cloud architecture. This approach entails distributing requests across multiple smaller-capacity units rather than relying on a single larger-capacity unit, which helps alleviate the load on individual machines.



# MangoApps Uses both Horizontal & Vertical Scaling

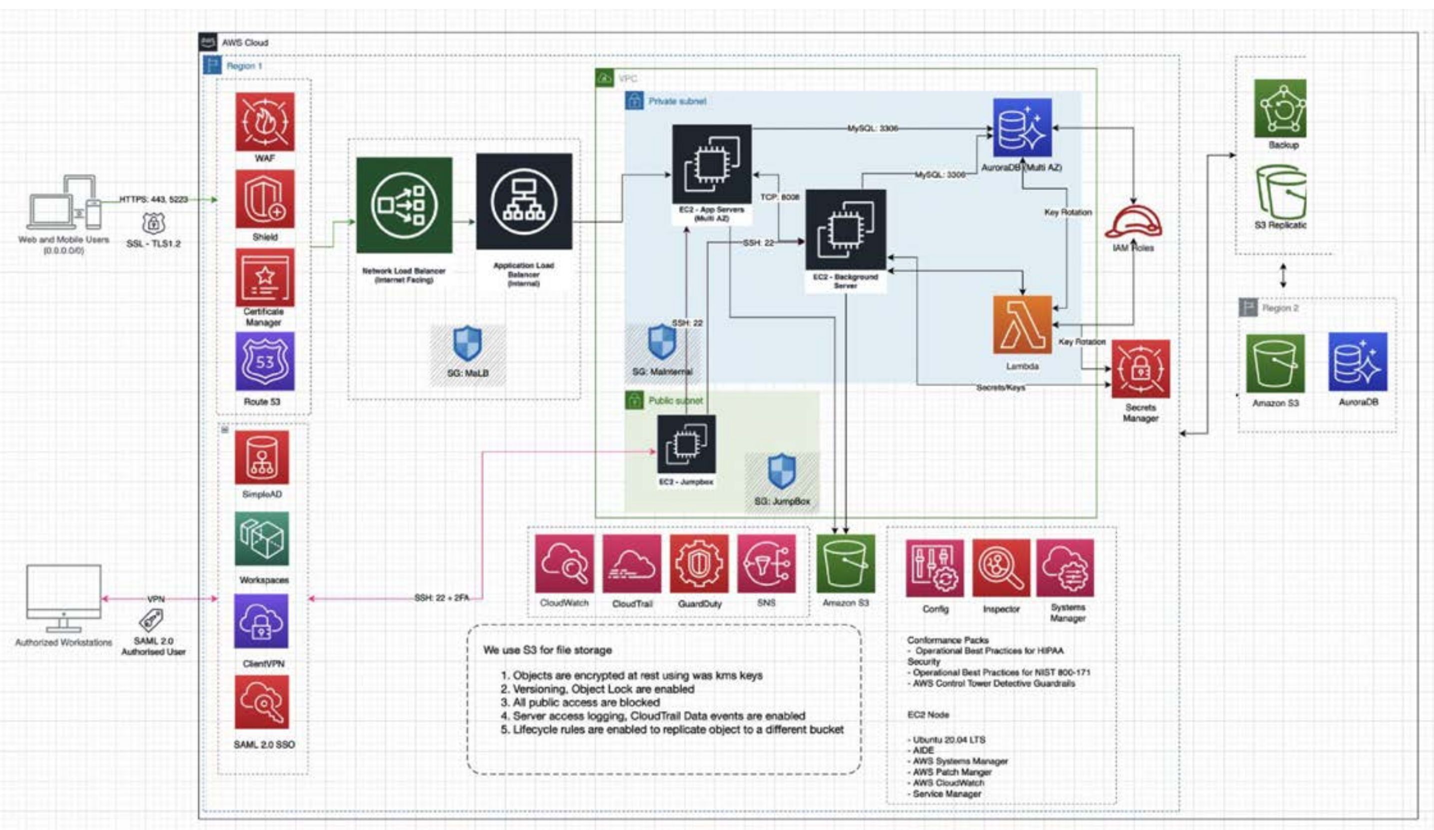
MangoApps is designed to scale in both horizontal and vertical dimensions. The system architecture, together with the readily available cloud resources, allows the web application to adjust to user demand and deliver optimal performance.

# Four-tier Scalable Architecture

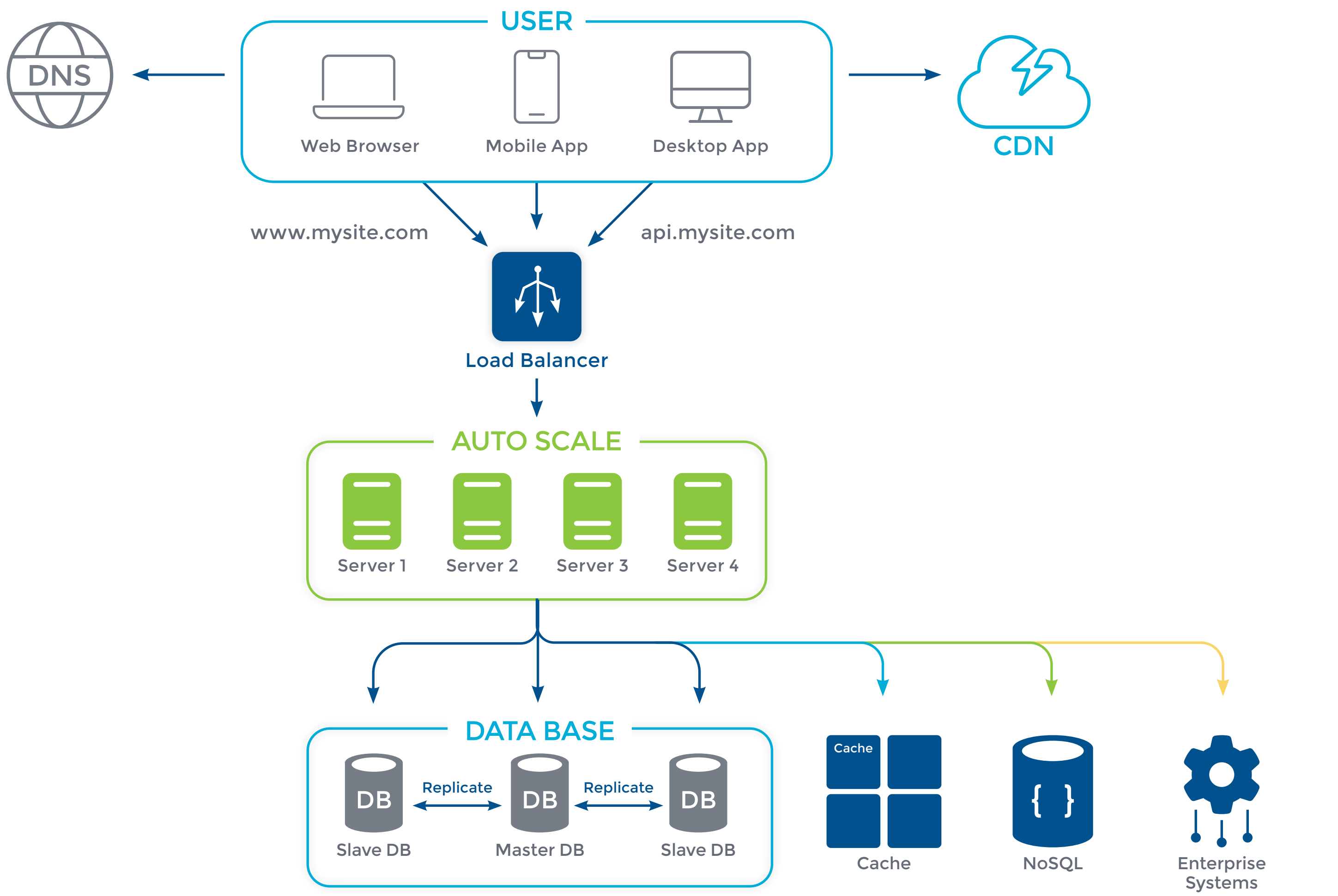
Traditional software often features a monolithic architecture with tightly coupled components, making it susceptible to failure if even one layer encounters an issue. In contrast, MangoApps' scalable web architecture utilizes a loosely coupled structure, where various modules interact through lightweight mechanisms. This architecture comprises of four main layers:

1. Application servers
2. Backend servers
3. Database & In-Memory servers
4. Cloud file servers & CDNs

By employing the LAMRJ (Linux, Apache, MySQL, Ruby on Rails & Java) stack, MangoApps provides crucial benefits such as scalability, high availability, fault tolerance through loosely coupled services, and distributed computing. The diagram below illustrates MangoApps' cloud-based architecture in use today.



Here is a more simplified version of the diagram above:




Each layer in the MangoApps system is scaled individually, with the database layer posing the greatest challenge. To address this, MangoApps uses a master-slave replication strategy, which has proven effective in scaling databases. An internal load balancer ensures even distribution of workload among the various nodes.

For peak performance, a well-structured caching hierarchy is crucial. MangoApps' local application cache manages basic tasks like bootstrapping, while application server caches tackle larger, more complex queries.

Additionally, MangoApps relies on job queues to manage resource-intensive operations needed for large data processing. A Content Distribution Network (CDN) is also employed for static public content, and the system is designed to be fault-tolerant.

Feel free to ask if you have more questions about MangoApps' scalable application or architecture.

# ABOUT MANGOAPPS

MangoApps helps companies modernize their employee-facing applications. It brings intranet, communications, training & work management together in one platform to provide the most adaptable, intuitive, and unified experience in the market today.

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