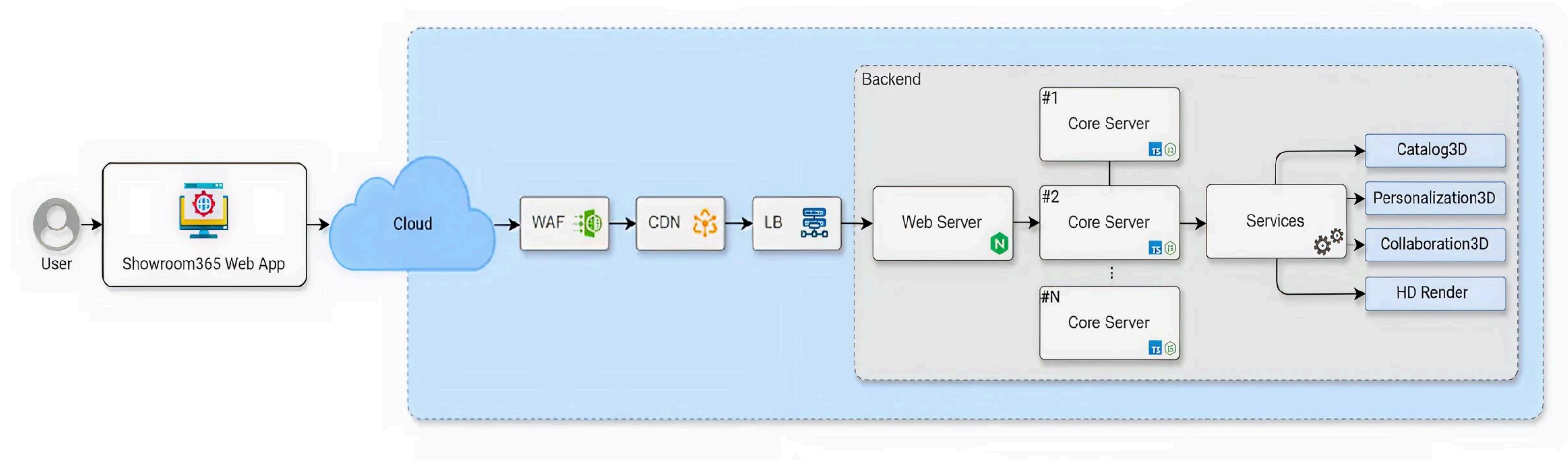


# Spaces365 WebApp Architecture

## Executive Summary

Spaces365 is an Enterprise App designed to help market and sell furniture, lighting, paint and flooring. Spaces365 is built with 3D digital twins of SKU's (Store Keeping Units) and customer's space. (e.g. office room). It empowers buyers to visualize SKU's, try them in their own space, collaborate with stakeholders, preview in photo-realistic reality and ultimately purchase the right product.

## High-Level Architecture Overview Diagram



## Key Components & Interactions

Spaces365 is a web-application supported by any HTML51 compliant web-browser.

**Client tier** is on a web-browser. 3D content in glTF2 format is rendered by a JavaScript library threejs3. A popular and powerful library, ReactJS4, manages the UI.

**WAF5** is a “Web Application Firewall” which helps filter out viruses and other malware such as “SQL injections” etc.

**CDN6** is a “Content Delivery Network” that is used to serve images, glTF content etc. It ensures performance stays consistent for users across the world.

**LB7** is the Load Balancer which distributes incoming loads to various webservers.

**Web Server** A NGINX8 webserver configured as reverse proxy and connected to a backend NodeJS9 server serves requests from client-tier via http.

**Core-server** constitutes a “NodeJS” runtime along with a Typescript10 compiler. Typescript ensures type-safety to JavaScript code.

**Catalog3D** hosts catalog consisting of 3D digital twins of SKUs. They are organized in a taxonomy consisting of categories, sub categories etc. This is like how most eCommerce stores organize SKUs. These 3D digital twins offer fidelity of size, shape, material and other characteristics such as light intensity, beam shape, dynamics, material variants etc. Its built on vendure11

**Personalization3D** service offers a digital twin of a users’ space. This could be an “office room”, “living room”, “hotel lobby”, “landscape exteriors” etc. This digital twin is created in a semi-automatic process from user supplied CAD files or plain photos shot with a smartphone. These inputs are used to re-construct a digital twin with high fidelity of size, shape and material. Its built on owncloud12

**Collaboration3D** service enables collaboration of the 3D scene in real-time. Real time collaboration is based on using CRDT’s. (Content Replicated Data Type). The popular yjs13 framework is used for implementation.

**HDRender** creates a photo-realistic version of the 3D scene in Spaces365. It does this using blender14-equivalent versions of glTF objects in the scene along with world class renderer “cycles15”.

## Deployment

**Spaces365** has been developed and deployed on AWS16. (Amazon Web Services) using the foundation of Ubuntu17 OS. It can be deployed on any of the hyper-scalers such as Microsoft Azure, Google Cloud etc. VisCommerce will support a vendor if they choose to deploy on their private cloud as well.

**Security & Compliance** World class security infrastructure such as firewalls and routers serves as the foundation. 3D assets are in glTF compliant to khronos’s standard for 3DCommerce18.

**Business benefits & alignment** Spaces365 is designed to improve customer experience. It can integrate with existing eCommerce storefronts and to integrate with other enterprise software such as websites, billing systems and CRM systems.

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