

Design a 3D E-Commerce Platform Architecture on AWS

Scenario

You are part of a startup team launching a next-generation 3D e-commerce web application. This platform will allow users to interact with 3D models of products (e.g., furniture, gadgets, fashion items) before purchasing. Millions of users are expected globally, and the experience must be fast, highly available, secure, and cost-efficient.

As a Cloud Practitioner, your role is to design the cloud architecture using AWS services to support this 3D application and meet key business and technical requirements.

Requirements

1. High Availability
 - The platform should be available 24/7 with built-in fault tolerance and failover mechanisms.
 2. Scalability
 - It should handle unpredictable spikes in traffic.
 3. Performance
 - Users should experience fast interactions with 3D content, quick page loads, and smooth product rendering.
 4. Security
 - Follow AWS security best practices
 5. Cost Optimization
 - Avoid over-provisioning. Use auto-scaling, managed services, and monitoring for cost control.
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Task Instructions

1. **Design the Architecture**
 - Use any diagramming tool (e.g., draw.io, Lucidchart, or a hand-drawn scan).
 - Incorporate AWS services such as:
 - Amazon S3 for 3D asset storage
 - CloudFront for content delivery
 - EC2 / AWS Lambda for backend compute
 - RDS / DynamoDB for product and customer data
 - Elastic Load Balancer (ELB) for traffic distribution
 - Route 53 for domain management
 - CloudWatch & Trusted Advisor for monitoring and optimization

2. **Explain Your Choices**

- Write a brief document (1–2 pages) explaining:
 - Why you chose each AWS service.
 - How your architecture meets each of the 5 requirements.
 - Any design trade-offs or challenges.