AWS Cloud Architecture of an e-commerce store for Manara's Solution Architect course

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March 2, 2025

1 AWS Services Used in the Architecture

1.1 Compute Services

Amazon EC2: Amazon Elastic Compute Cloud (EC2) provides scalable compute capacity in the cloud. It is used to host the application servers running on Amazon Linux with Apache Web Server and PHP for the e-commerce store. The EC2 instances are configured within private subnets to enhance security.

EC2 Auto Scaling: Ensures high availability and fault tolerance by automatically adjusting the number of EC2 instances based on demand. This prevents service disruption and optimizes cost by scaling down during low traffic periods.

1.2 Storage and Database

Amazon S3: Amazon Simple Storage Service (S3) is used to host a static website containing store information, including maintenance pages. S3 provides high durability, availability, and scalability for storing static assets such as product images and promotional content.

Amazon RDS (MariaDB): Amazon Relational Database Service (RDS) with MariaDB is deployed for structured data storage. It provides automated backups, patch management, and multi-AZ failover support, ensuring database reliability and minimizing downtime.

Amazon EFS: Amazon Elastic File System (EFS) offers scalable and shared storage accessible by multiple EC2 instances. This is useful for storing application files, logs, and shared resources that need persistent access across different compute nodes.

Amazon ElastiCache (Memcached): Amazon ElastiCache with Memcached enhances database performance by caching frequently accessed queries, reducing latency, and improving response times. This caching layer ensures smooth user experience during high traffic periods.

1.3 Networking and Content Delivery

Amazon VPC: Amazon Virtual Private Cloud (VPC) provides a logically isolated network environment where all AWS resources operate securely. The architecture consists of multiple subnets across different Availability Zones to ensure redundancy and fault tolerance.

Amazon Route 53: A highly available and scalable Domain Name System (DNS) web service that routes user requests to the appropriate resources, ensuring low-latency access to the e-commerce store.

Amazon CloudFront: A global Content Delivery Network (CDN) that accelerates the distribution of web content by caching it in edge locations worldwide. This reduces load times and improves user experience, especially for international customers.

Internet Gateway: Enables outbound internet access for public-facing resources within the VPC. This is essential for allowing users to interact with the application servers and static website components hosted on AWS.

Application Load Balancer: Distributes incoming traffic across multiple EC2 instances in different Availability Zones, ensuring high availability and fault tolerance. It also provides security features such as SSL termination and Web Application Firewall (WAF) integration.

2 Architecture Diagram

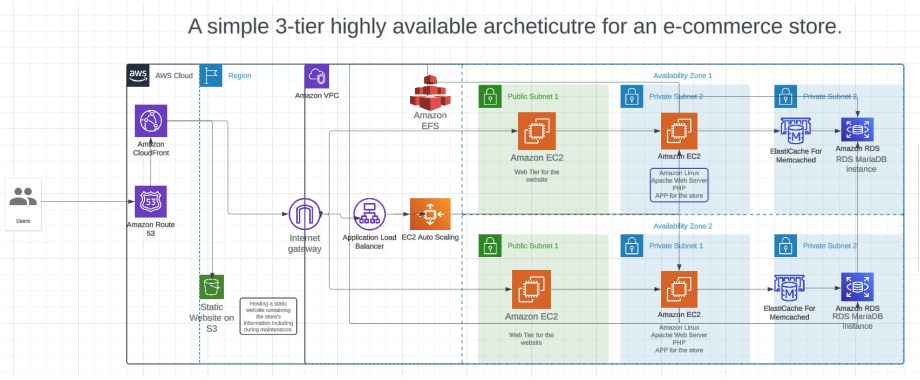

Figure 1: A 3-tier highly available architecture for an e-commerce store on AWS.

3 Conclusion

This architecture leverages AWS services to create a scalable, secure, and high-performing 3-tier e-commerce solution. By utilizing managed services like Amazon RDS, ElastiCache, and CloudFront, the architecture enhances efficiency and user experience while ensuring operational reliability.