AWS Cloud Architecture Documentation

Overview

This document provides a detailed explanation of the AWS Cloud architecture depicted in the diagram. The architecture represents a comprehensive cloud solution with multiple components for web hosting, data management, discovery services, cost analysis, storage management, and image deployment.

Architecture Components

The architecture is organized into several logical components, each serving a specific purpose in the overall system.

Web UI Component

This component handles user interaction and frontend services.

ID	Component	Description
1	**Amazon CloudFront**	Content delivery network (CDN) that accelerates delivery of web content
2	**Amazon S3 bucket (WebUIBucket)**	Stores static web assets for the frontend application
3	**AWS WAF**	Web Application Firewall that protects against common web exploits
4	**AWS AppSync**	Managed GraphQL service that simplifies application development
5	**Amazon Cognito**	User authentication, authorization, and user management service
6	**AWS Lambda Settings function**	Function that handles application settings and configurations
-	**Amazon DynamoDB Settings table**	NoSQL database storing application settings and configurations

Cost Component

This component manages cost analysis and reporting.

ID	Component	Description
10	**AWS Lambda Cost function**	Processes and analyzes cost data
11	**Amazon Athena**	Serverless query service that analyzes data in S3 using standard SQL
12	**Amazon S3 bucket (CURBucket)**	Stores Cost and Usage Report data
13	**AWS Cost & Usage Report (CUR)**	Detailed AWS cost and usage data
-	**Amazon S3 bucket (AthenaResultsBucket)**	Stores results from Athena queries

Data Component

Located within a private subnet in the VPC, this component handles data processing and database operations.

ID	Component	Description
8	**AWS Lambda Gremlin Resolver**	Resolves graph database queries
-	**Amazon Neptune**	Fully managed graph database service
9	**AWS Lambda Search Resolver**	Resolves search queries
-	**Amazon OpenSearch Service**	Search and analytics engine

Discovery Component

Also within the private subnet, this component manages service discovery and containerization.

ID	Component	Description
15	**Amazon Elastic Container Registry**	Stores, manages, and deploys container images
16	**Amazon Elastic Container Service**	Highly scalable container orchestration service
-	**AWS Fargate**	Serverless compute engine for containers

Storage Management Component

This component handles application development and storage.

ID	Component	Description
7	**AWS Amplify**	Platform for building and deploying secure, scalable mobile and web applications
-	**Amazon S3 bucket (AmplifyStorageBucket)**	Stores resources managed by AWS Amplify

Image Deployment Component

This component manages container image building and deployment.

ID	Component	Description
14	**Amazon S3 bucket (DiscoveryBucket)**	Stores artifacts for image discovery
-	**AWS CodeBuild**	Fully managed build service that compiles source code and runs tests
-	**Container image**	Final packaged application container ready for deployment

Additional Infrastructure Components

These components provide infrastructure and configuration management.

ID	Component	Description
-	**VPC**	Virtual Private Cloud providing an isolated network environment
-	**Private subnet**	Network segment within VPC for secure resources
17	**AWS Config**	Service for assessing, auditing, and evaluating configurations
18	**AWS SDK**	Software Development Kit for integrating applications with AWS services

Data Flow and Process Sequences

The numbered sequence in the diagram (1-18) represents the typical flow of data and processes in the system. Here's a detailed explanation:

User Interaction Flow (1-4)

1. Users access the application through **Amazon CloudFront** which serves as the entry point

2. CloudFront delivers static content from the **WebUIBucket** S3 bucket

3. **AWS WAF** protects against malicious traffic and attacks

4. **AWS AppSync** handles GraphQL API requests for dynamic data