[Nagarro]-[Ecommerce]

DAR Document

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# Introduction

This document provides a Decision Analysis Report (DAR) comparing two deployment options for the AmCart e-commerce application on AWS Cloud: AWS ECS using Fargate and AWS EKS. The analysis evaluates both solutions based on key features, pricing, scalability, ease of use, security, and maintenance, ultimately recommending the most suitable option for AmCart’s needs.

## Objective and scope of document

The objective of this DAR is to assist in selecting the optimal deployment method for the AmCart e-commerce platform. The scope includes evaluating AWS ECS with Fargate and AWS EKS, focusing on:

* Scalability and Performance
* Cost and Pricing Models
* Ease of Use and Management
* Security Features
* Maintenance and Operational Overheads

# Requirements at a Glance

* Seamless scalability to handle fluctuating traffic.
* High availability and reliability.
* Secure deployment with minimal operational overhead.
* Cost-effective infrastructure with optimized resource utilization.
* Ease of integration with CI/CD pipelines.

# Available tools

* AWS ECS (Elastic Container Service) with Fargate
* AWS EKS (Elastic Kubernetes Service)

## AWS ECS

AWS ECS with Fargate is a serverless compute engine that allows containerized applications to run without managing underlying servers. It integrates with the AWS ecosystem, providing auto-scaling and cost optimization.

### Features

* Serverless compute engine (no need to manage EC2 instances).
* Auto-scaling and load balancing.
* Seamless integration with other AWS services.
* Lower operational overhead with a pay-as-you-go model.

### Pricing

* **Fargate Pricing**: Pay for vCPU and memory resources used by your containers.
* **ECS Pricing**: No additional charge for ECS; you only pay for the AWS resources you create.

## AWS EKS

AWS EKS is a managed Kubernetes service providing flexibility and control over the Kubernetes infrastructure. It is suitable for applications requiring custom configurations and portability across environments.

### Features

* Fully managed Kubernetes control plane.
* Flexibility in configuring networking and storage.
* Multi-cloud and hybrid deployment options.
* High availability and security with managed updates.

### Pricing

* **EKS Pricing**: $0.10 per hour for each EKS cluster.
* **Worker Node Pricing**: Pay for EC2 instances or Fargate for worker nodes.

# Comparison Analysis

This section presents a comparative analysis of the features of AWS ECS and EKS based on key performance metrics relevant to the e-commerce platform.

## Weightage Matrix

|  |  |
| --- | --- |
| Feature | Points |
| Ease of Use | 5 |
| Cost Efficiency | 4 |
| Scalability | 5 |
| Maintenance Overhead | 4 |
| Security | 4 |

## Comparison 1: Ease of Use, Scalability and Security

|  |  |  |
| --- | --- | --- |
| Feature | AWS ECS with Fargate | AWS EKS |
| Ease of Use | **5** | **3** |
| Scalability | **5** | **5** |
| Security | **5** | **5** |

## Comparison 2: Cost Efficiency and Maintenance Overhead

|  |  |  |
| --- | --- | --- |
| Feature | AWS ECS with Fargate | AWS EKS |
| Cost Efficiency | **5** | **3** |
| Maintenance Overhead | **5** | **3** |

# Recommendation

Based on the analysis, **AWS ECS with Fargate** is recommended for the deployment of the Amcart e-commerce application. It offers better ease of use, cost efficiency, and low maintenance overhead, making it a more suitable choice for a microservices-based application that requires minimal operational overhead.

# Assumptions

1. The application will experience variable traffic, requiring auto-scaling capabilities.
2. The team has limited Kubernetes expertise, making EKS more complex to manage.
3. Cost optimization is a priority, especially during low-traffic periods.
4. High availability and security are critical requirements.

# Risks

1. **AWS Fargate**: Limited customization options compared to EKS.
2. **AWS EKS**: Higher operational complexity and potential for increased costs if not managed properly.
3. Both options require proper monitoring and logging to ensure optimal performance.

# Appendix

## References

1. AWS Fargate Documentation: <https://aws.amazon.com/fargate/>
2. AWS EKS Documentation: <https://aws.amazon.com/eks/>
3. AWS Pricing Calculator: <https://calculator.aws/>