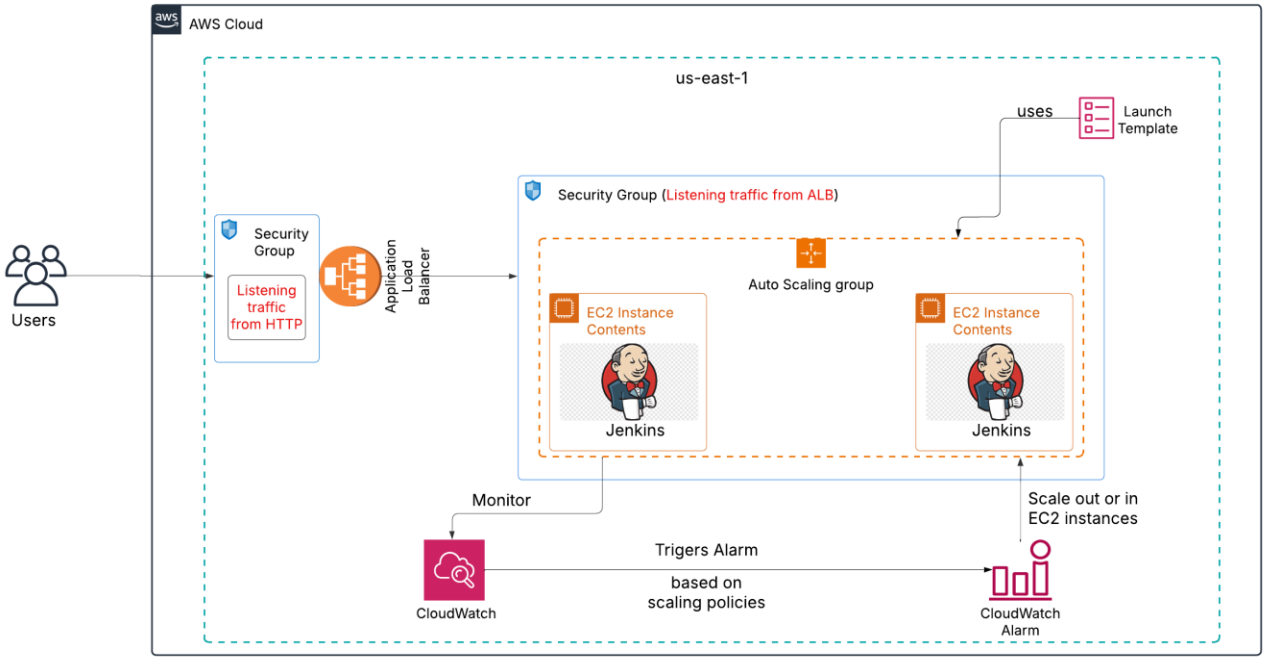
# Author

# Therence Mashego



**Overview**

This document provides a detailed explanation of the architectural diagram, including its components, technologies used, and design considerations.

**Purpose**

This architecture is designed to provide a scalable and secure Jenkins setup, ensuring high availability and monitoring for optimal performance.

**Architecture Components**

**1. Infrastructure**

- **Cloud Provider**: AWS
- **Region**: US East
- **Virtual Networks and Subnets**

**2. Compute**

- **Auto Scaling Group (ASG)**:
    - 1 desired EC2 instance running Jenkins
    - Additional EC2 instance launched when CPU utilization exceeds 80%
- **Launch Template**:
    - Defines instance configurations for ASG

**3. Networking**

- **Security Groups**:
    - **ALB Security Group**: Allows inbound traffic over HTTP
    - **ASG Security Group**: Only allows access from ALB
- **Application Load Balancer (ALB)**:
    - Listens for HTTP traffic and routes it to Jenkins instances

**4. Monitoring and Scaling**

- **CloudWatch Setup**:
    - Used for monitoring instance performance

- **CloudWatch Alarms**:
    - Triggers auto-scaling actions based on CPU utilization

**Workflow and Data Flow**

1. Users access Jenkins through the ALB.
2. ALB forwards traffic to an EC2 instance in the Auto Scaling Group.
3. If CPU utilization exceeds 80%, an additional EC2 instance is launched.
4. CloudWatch monitors performance and triggers CloudWatch Alarms for scaling actions.

**High Availability and Scalability**

- ALB ensures traffic distribution.
- Auto Scaling Group dynamically adjusts capacity.
- CloudWatch provides proactive monitoring.

**Cost Considerations**

- Auto Scaling optimizes resource usage.
- CloudWatch helps prevent unnecessary scaling.
- Load Balancing reduces downtime.

**Conclusion**

This architecture ensures a resilient, scalable, and monitored Jenkins environment, balancing performance and cost efficiency.

---