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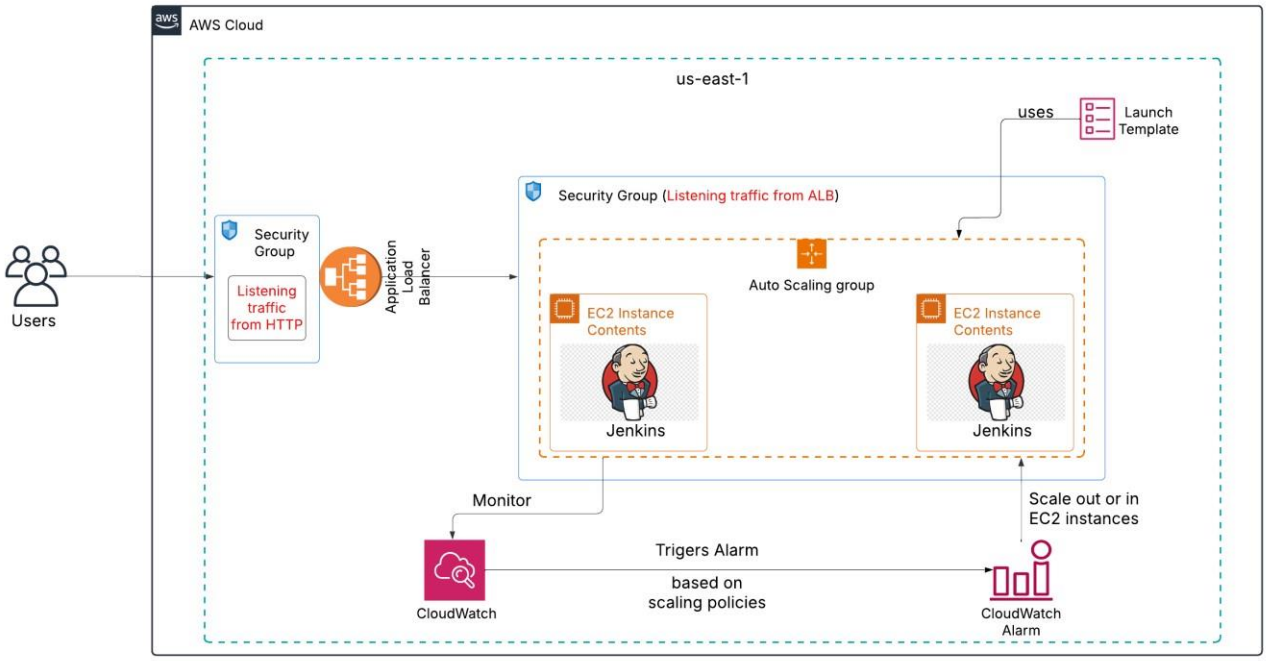

Overview

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.
