Enhanced Cloud Monitoring & Optimization using Datadog and AWS EC2

An Upskilling Project by Souma Kanti Mukherjee

Project Overview

This project focuses on integrating Datadog with AWS EC2 to enhance cloud observability. By deploying a monitoring system, it provides real-time performance tracking, automated alerts, and log management. This setup allows better resource utilization, cost optimization, and ensures system uptime and reliability.

Objectives

- Real-time monitoring of CPU, memory, disk, and network metrics.
- Alerting for resource anomalies and potential failures.
- Centralized log collection and performance optimization.
- Demonstrating practical cloud monitoring skills.
- Transitioning from traditional support to cloud-based roles.

Why Datadog Instead of CloudWatch?

1. Multi-cloud support across AWS, Azure, and on-premise.
2. Advanced dashboards and visual analytics.
3. Automatic correlation of logs, metrics, and traces.
4. 500+ third-party integrations.
5. Better UI and scalability in complex environments.

Implementation Steps

1. Provisioned Ubuntu-based AWS EC2 instance.
2. Installed Apache web server to simulate traffic.
3. Installed and configured Datadog Agent on EC2.
4. Enabled monitoring for system resources.
5. Configured alerting rules for CPU/memory usage.
6. Integrated system log collection for insights.
7. Reviewed and optimized based on performance data.

Bash Scripts Used

1. System Update:

```
#!/bin/bash
sudo apt update && sudo apt upgrade -y
```

2. Apache Installation:

```
#!/bin/bash
sudo apt install apache2 -y && sudo systemctl enable apache2 && sudo systemctl start apache2
```

3. Datadog Agent Installation:

```
#!/bin/bash
# Include your Datadog API key
```

sudo apt install curl -y

curl -fsSL https://apt.datadoghq.com/gpg | sudo tee /usr/share/keyrings/datadog-archive-keyring.asc

echo 'deb [signed-by=/usr/share/keyrings/datadog-archive-keyring.asc] https://apt.datadoghq.com/ stable 7' | sudo tee /etc/apt/sources.list.d/datadog.list

sudo apt update && sudo apt install datadog-agent -y

4. Agent Start & Log Setup:

#!/bin/bash

sudo systemctl restart datadog-agent && sudo systemctl status datadog-agent

sudo mkdir -p /var/log/datadog && sudo touch /var/log/datadog/system.log

Enhancements Added to the Project

- Alert Routing Mechanism: Configured alerts to be routed via Email/Slack for real-time notifications.
- Dashboard Visualization: Created custom dashboards to track system metrics in Datadog UI.
- Cost Optimization Strategy: Used collected insights to plan instance resizing and shutdown scheduling.
- Scalability Consideration: Added support for multi-instance monitoring and autoscaling strategies.
- CI/CD Integration Awareness: Documented how Datadog integrates with GitHub Actions, Jenkins for pipeline observability.
- Hybrid Monitoring: Included conceptual integration of AWS CloudWatch for hybrid monitoring alongside Datadog.

Conclusion

This project represents a practical demonstration of cloud monitoring practices using AWS EC2 and Datadog. It not only enhanced technical skills but also introduced concepts of cost-efficiency, scalability, and real-time incident management - critical for cloud, SRE, and DevOps roles.