Day 16: Introduction to AWS CloudWatch

Monitoring AWS Resources Effectively

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Date: 10-May-2025

Learning Objectives

- Understand the purpose and benefits of AWS CloudWatch.
- Explore core components: Metrics, Logs, Alarms, Dashboards, and Events.
- Learn how to monitor EC2 instances using CloudWatch.
- Configure CloudWatch Agent to collect system logs.
- Analyze logs and metrics for troubleshooting.

What is AWS CloudWatch?

- AWS CloudWatch is a monitoring and observability service.
- Collects and tracks metrics, logs, and events.
- Provides alarms and dashboards for resource monitoring.

Why Use CloudWatch?

- Proactive Monitoring: Detect and respond to system-wide performance changes.
- Resource Optimization: Gain insights to optimize resource utilization.
- Operational Visibility: Centralized view of logs and metrics.
- Automated Actions: Trigger automated responses to specific events.

Core Components Overview

- Metrics: Numerical data representing resource performance.
- Logs: Aggregated log files from AWS resources and applications.
- Alarms: Notifications triggered based on metric thresholds.
- Dashboards: Visual representations of metrics and logs.
- Events: Automated responses to changes in AWS resources.

Metrics in CloudWatch

- Basic Monitoring: 5-minute intervals (default).
- Detailed Monitoring: 1-minute intervals (requires enabling).
- Common EC2 Metrics: CPUUtilization, DiskReadOps, NetworkIn/Out.

Alarms in CloudWatch

- Purpose: Monitor metrics and send notifications or take actions when thresholds are breached.
- Actions: Send notifications via Amazon SNS, Auto-scale EC2 instances, Trigger Lambda functions.

Logs in CloudWatch

- Log Groups: Collections of log streams sharing the same retention settings.
- Log Streams: Sequences of log events from the same source.
- Use Cases: Monitor application logs, troubleshoot issues, and for auditing purposes.

Dashboards in CloudWatch

- Features: Customizable widgets, Real-time data visualization.
- Combine metrics and logs into a single view.
- Use Cases: Monitor application health and display KPIs.

Events in CloudWatch

- Functionality: Respond to changes in AWS resources.
- Example: Automatically restart EC2 instances or trigger Lambda functions when a specific event occurs.

Lab Task 1: Viewing EC2 Metrics

- 1. Launch or select an existing EC2 instance.
- 2. Navigate to CloudWatch > Metrics > EC2 > Per-Instance Metrics.
- 3. Select your instance ID to view metrics like CPUUtilization, DiskReadOps, and NetworkIn/Out.

Lab Task 2: Enabling Detailed Monitoring

- 1. Stop your EC2 instance.
- 2. Modify the instance settings to enable Detailed Monitoring.
- 3. Start the instance and observe metrics at 1-minute intervals.

Lab Task 3: Installing CloudWatch Agent

Installation Commands:

- For Amazon Linux:

  sudo yum install amazon-cloudwatch-agent -y

- For Ubuntu:

  sudo apt update

  sudo apt install amazon-cloudwatch-agent -y

Lab Task 4: Configuring CloudWatch Agent

Configuration File (JSON):

```
{
 "logs": {
   "logs_collected": {
     "files": {
       "collect_list": [
         {
           "file_path": "/var/log/messages",
           "log_group_name": "ec2-log-group",
           "log_stream_name": "{instance_id}"
         }
       ]
     }
   }
 }
}
```

Starting the Agent:

Lab Task 5: Viewing Logs in CloudWatch

1. Navigate to CloudWatch > Logs > Log Groups.

2. Select the log group (e.g., ec2-log-group).

3. View the log streams and analyze the log events.

Summary

* AWS CloudWatch provides a comprehensive suite for monitoring AWS resources.

* Metrics, Logs, Alarms, and Dashboards are essential components.

* Lab tasks provide hands-on experience with EC2 metrics and log monitoring.