AWS CloudWatch Agent & EC2 Monitoring Training

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Introduction to Amazon CloudWatch

- **Amazon CloudWatch** is AWS's monitoring service for cloud resources and applications. It collects metrics (CPU, network, etc.), logs, and events in real time.
- **Metrics & Dashboards:** Many AWS services publish default metrics to CloudWatch automatically. You can visualize them on **dashboards** (custom or pre-built).
- **Alarms & SNS:** You can set **alarms** on metrics to trigger notifications or actions (e.g., send an SNS

AWS CloudWatch Agent Overview

- **CloudWatch Agent** is a configurable OS agent (Linux/Windows) that collects system metrics and logs and sends them to CloudWatch. It's required for metrics like memory usage, disk space, and custom application metrics.
- **Installation:** The agent can be installed via AWS SSM or manually. (e.g., using SSM Run Command `AWS-ConfigureAWSPackage` to install

Monitoring Linux Services (Procstat Plugin)

- CloudWatch Agent's **procstat** plugin allows monitoring specific processes on Linux. This is useful for services like Docker, GitLab, MongoDB, etc..
- **Configuration:** In the agent JSON, add a `procstat` section under `metrics_collected` for each process. You can identify processes by name (`exe`), command pattern, or PID file.
- **Example:** To monitor CPU usage of Docker and

Collecting System Metrics (Disk, Memory)

- The agent can collect **system metrics** beyond the defaults. For example, disk utilization on specific mount points and memory usage:

```
"metrics": {
  "metrics_collected": {
    "disk": {
      "resources": [ "/", "/var/lib/mongo" ],
      "measurement": [
        { "name": "used_percent", "rename": "Disk_Used", "unit": "%" }
      ],
      "metrics_collection_interval": 60
    }
```

Using AWS Systems Manager for Agent Config

- **Parameter Store:** Instead of maintaining the JSON config on each instance, we store the CloudWatch agent configuration in AWS Systems Manager **Parameter Store**. For example, a parameter `/AmazonCloudWatch-linux/mongo2` contains the JSON config for MongoDB instances. Storing configs centrally makes updates easier.
- **SSM Run Command:** AWS provides the

Leveraging Tags & Dimensions for Dynamic Resources

- **Challenge:** EC2 instance IDs change when replacing instances (e.g., yearly AMI upgrades). Hard-coding instance IDs in dashboards or alarms is not ideal.
- **Solution – Append Dimensions:** CloudWatch agent config can append resource tags as metric dimensions. For example, we use:

```
"append_dimensions": {
  "InstanceName": "${aws:Tag/Name}"
}
```

CloudWatch Dashboards (Custom & Automatic)

- **Custom Dashboards:** CloudWatch allows creating dashboards to visualize multiple metrics. We can mix graphs for EC2 metrics, custom agent metrics, and alarms in one view. For example, we have a "Services-on-EC2" dashboard showing CPU usage for processes like `ds_agent`, `splunkd`, etc., across our fleet.
  - Dashboards can be defined via the Console or JSON. Our sample JSON (shown in repo) defines

CloudWatch Alarms & SNS Notifications

- **CloudWatch Alarms:** Alarms continuously monitor a single metric (or a metric math expression) and change state if a threshold is crossed. For each critical metric we collect (CPU, memory, disk, or process health), we set up alarms. For example, an alarm on `mem_used_percent` if memory > 80%, or on `Disk_Used` if disk usage > 90%.
  - When creating an alarm, you choose the metric and

Monitoring ECS Clusters (Brief Overview)

- While our focus is on EC2 instances, note that **Amazon ECS** clusters also publish metrics to CloudWatch automatically. You get cluster-level CPU and memory utilization metrics for free. These are visible in the ECS console and CloudWatch. We utilize the *ECS-Cluster-Pro* dashboard which shows aggregate usage across the cluster.
- For more granular container/application metrics on

Q&A

- Questions?
- Discussion

Thank You!

- Next Training Topic: [Next Topic]
- Resources:
  - Amazon CloudWatch User Guide – Official documentation for CloudWatch (metrics, dashboards, alarms, etc.)
  - CloudWatch Agent Configuration Guide – Details on the agent JSON config and available settings
  - Using CloudWatch Agent with Systems Manager – How to deploy and configure the agent across instances using SSM