**CloudWatch Dashboard for EC2 instances that includes both CPU and Memory**

**Step 1: Enable Detailed Monitoring for EC2 Instances**

1. **Enable Detailed Monitoring on EC2 Instances:**
   * Go to the EC2 console.
   * Select the instance(s) you want to monitor.
   * Click on **Actions** -> **Monitor and troubleshoot** -> **Manage detailed monitoring**.
   * Enable detailed monitoring.

**Step 2: Install CloudWatch Agent on EC2 Instances**

1. **Install and Configure the CloudWatch Agent:**
   * Connect to your EC2 instance via SSH.
   * Download and install the CloudWatch agent:

wget https://s3.amazonaws.com/amazoncloudwatch-agent/ubuntu/amd64/latest/amazon-cloudwatch-agent.deb sudo dpkg -i amazon-cloudwatch-agent.deb

* + Create the CloudWatch agent configuration file (**/opt/aws/amazon-cloudwatch-agent/bin/config.json**). Here is an example configuration to monitor CPU and memory:

json

{

"metrics": {

"metrics\_collected": {

"mem": {

"measurement": [

"mem\_used\_percent"

],

"metrics\_collection\_interval": 60

},

"cpu": {

"measurement": [

"cpu\_usage\_idle",

"cpu\_usage\_iowait",

"cpu\_usage\_user",

"cpu\_usage\_system"

],

"metrics\_collection\_interval": 60

}

}

}

}

* + Start the CloudWatch agent:

sudo /opt/aws/amazon-cloudwatch-agent/bin/amazon-cloudwatch-agent-ctl -a start

**Step 3: Create a CloudWatch Dashboard**

1. **Create a CloudWatch Dashboard:**
   * Go to the CloudWatch console.
   * In the left-hand navigation pane, click on **Dashboards**.
   * Click **Create dashboard**.
   * Enter a name for the dashboard and click **Create dashboard**.
   * Add widgets to the dashboard:
     + **CPU Utilization:**
       - Click **Add widget**.
       - Select **Line** and click **Next**.
       - Choose the **CPU Utilization** metric for your EC2 instance.
       - Configure the widget as desired and click **Create widget**.
     + **Memory Usage:**
       - Click **Add widget**.
       - Select **Line** and click **Next**.
       - Choose the custom **mem\_used\_percent** metric collected by the CloudWatch agent.
       - Configure the widget as desired and click **Create widget**.

**Step 4: Set Up CloudWatch Alarms for Notifications**

1. **Create Alarms for CPU and Memory:**
   * In the CloudWatch console, click on **Alarms** in the left-hand navigation pane.
   * Click **Create alarm**.
   * Select the **CPU Utilization** metric for your EC2 instance.
   * Configure the alarm (e.g., set threshold, period, etc.) and click **Next**.
   * Choose the notification actions:
     + Select **In alarm** and then **Add notification**.
     + Choose an existing SNS topic or create a new one to receive notifications.
   * Review and create the alarm.
   * Repeat the process for the custom **mem\_used\_percent** metric.

**Step 5: Verify and Test**

1. **Verify and Test the Setup:**
   * Ensure the CloudWatch agent is running on your EC2 instance.
   * Check the CloudWatch dashboard to see if metrics are being collected and displayed correctly.
   * Trigger the alarms by manually increasing the CPU or memory usage on your instance and verify if notifications are received.

**Documentation and References**

* [Amazon CloudWatch User Guide](https://docs.aws.amazon.com/AmazonCloudWatch/latest/monitoring/WhatIsCloudWatch.html)
* [Amazon EC2 Detailed Monitoring](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/using-cloudwatch-new.html)
* [CloudWatch Agent Installation](https://docs.aws.amazon.com/AmazonCloudWatch/latest/monitoring/install-cloudwatch-agent.html)
* [Creating CloudWatch Alarms](https://docs.aws.amazon.com/AmazonCloudWatch/latest/monitoring/AlarmThatSendsEmail.html)