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CPU Utilization Report using Lambda

**September 18, 2023**

# Overview

The AWS Lambda CPU Utilization Report Generator is a serverless solution designed to automate the generation and distribution of daily CPU utilization reports for Amazon Elastic Compute Cloud (EC2) instances. This project leverages AWS Lambda, Amazon CloudWatch, and Amazon Simple Email Service (SES) to provide insights into the CPU performance of specified EC2 instances.

# Goals

1. Automation**:** Automate the daily generation of CPU utilization reports to reduce manual effort and ensure consistent reporting.
2. Visibility**:** Provide administrators and stakeholders with a daily snapshot of CPU utilization trends for critical EC2 instances.
3. Efficiency: Utilize serverless computing (AWS Lambda) to minimize infrastructure management and associated costs.

# Specifications

### Technologies Used

* AWS Lambda: The core serverless compute service responsible for executing the report generation and email distribution logic.
* Amazon EC2: The source of CPU utilization data for specified instances.
* Amazon CloudWatch: Provides CPU utilization metrics used in report generation.
* Amazon SES: Used for sending CPU utilization reports via email.
* Python: The programming language used to write the Lambda function code.
* AWS Event Bridge: To invoke lambda function at a specific time.

### Functionality

The CPU Utilization Report Generator function performs the following key tasks:

* Data Retrieval: Fetches CPU utilization metrics for specified EC2 instances from CloudWatch.
* Data Processing: Calculates the maximum, minimum, and average CPU utilization.
* HTML Report Generation: Converts the metrics into an HTML table, highlighting values >= 80%.
* Email Composition: Composes an email containing the HTML report and relevant details.
* Email Sending: Uses Amazon SES to send the email report to designated recipients.

## **Implementation Details**

### Data Retrieval

The function retrieves CPU utilization metrics for the specified EC2 instances from CloudWatch. These metrics include maximum, minimum, and average CPU utilization over the past 24 hours.

### HTML Report Generation

The retrieved metrics are transformed into an HTML table, which forms the body of the daily report. Values in the "Max CPU Utilization" column that are 80% or above are visually highlighted in the report.

### Email Delivery

Once the HTML report is generated, the function composes an email using Amazon SES and sends it to the configured recipient(s). The subject of the email is "CPU Utilization Report," and it includes the time range of the report.

### Error Handling

The function incorporates error handling to gracefully manage any issues that may arise during data retrieval or email sending. Error details are included in the response or log output.

## **GitHub Repository**

The project code and related resources are hosted in a GitHub repository, providing accessibility and collaboration opportunities. You can find the repository at [the GitHub Repository Link](https://github.com/yourusername/your-repo).

**Architecture Diagram**

