**Knowledge Transfer( Attaching Lambda to Event Bridge )**

**Dated : 29/08/2023**

**\*\*Challenge :\*\***

Hey geeks, today I have another challenge now you have to automate the previous Lambda task till now we have doing it manually now make it like it should start at morning 9:00 am and stop at evening 4 pm, So let’s dig your hand in some research and complete the challenge….

==============================================================================

**\*\*Task :\*\***

Ticket: Get a solution to automate the start and stop the EC2 instance at a particular time…

==============================================================================

**\*\*Solution :\*\***

Hey Guys, I have found out the solution for the challenge that automate the state of a designated EC2 instance between running and stopped. It is done using Amazon Event bridge service in which we can give timing to the service to play start and stop.

==============================================================================

**\*\*Pre-requisites:\*\***

• Have a good knowledge about EC2 and Python

• Know the all services of AWS

• Have a good knowledge about Lambda and IAM

==============================================================================

**\*\*Objective:\*\***

The objective is to automate the AWS Lambda function that toggles the state of a designated EC2 instance between running and stopped.

.==============================================================================

**\*\*Description:\*\***

AWS Lambda and Amazon Event Bridge are integral components of event-driven architectures in the AWS ecosystem. They work in tandem to enable the creation of highly responsive, scalable, and loosely coupled applications that react to events in real-time. Here's an overview of how Lambda and Event Bridge connect to form a powerful event-driven architecture:

**AWS Lambda:**

AWS Lambda is a server-less compute service that lets you run code without provisioning or managing servers. You can create Lambda functions in various programming languages and trigger them in response to events from AWS services, HTTP requests, or custom events. Lambda functions execute quickly and scale automatically, making them well-suited for event-driven scenarios.

**Amazon Event Bridge:**

Amazon Event Bridge is a server-less event bus service that makes it easy to connect different AWS services and applications using events. It provides a central hub for events, allowing you to route events from one source to multiple targets, including Lambda functions, AWS Step Functions, SNS topics, SQS queues, and more. Event Bridge also supports event transformation and schema enforcement.

**Connecting Lambda and Event Bridge:**

The connection between Lambda and Event Bridge is seamless and highly efficient:

**Event Source Mapping:**

To integrate AWS Lambda with Amazon Event Bridge you can use the Event Bridge as an event source for your Lambda functions. You create a Lambda function and associate it with a specific event rule in Event Bridge

**Event Rules:**

In Event Bridge you create event rules that match incoming events based on predefined patterns. These rules determine which targets, such as Lambda functions, receive the events.

**Lambda Function as Target:**

When you set up a Lambda function as a target for an event rule in Event Bridge the function gets invoked whenever an event matching the rule's pattern is received by Event Bridge

**Lambda Processing:**

The Lambda function receives the event as input and can perform any necessary processing or action based on the event's content. This could include data transformation, interacting with other AWS services, or triggering further actions.

==============================================================================

**\*\*Steps:\*\***

**# Do all the Previous Steps in which we have created the instance and lambda functions and then continue these one…**

# Login to your AWS account and search Amazon Event Bridge service…

# Come on dashboard you will see get started section now Follow the steps…

* In get started select Event bridge rule and click create rule
* Next give name to the rule
* In rule type section click schedule
* Next click continue to event bridge scheduler
* Now scroll down to schedule pattern
* In occurrence section click recurring

# By this the rule will be repeating again and again

* Next in schedule type click cron based

# Cron Based is a shell script automation job which we will be going to use and it’s also easy…

# Next in cron expression give the time when to start the instance

# Since we we are starting it at 9 in this example the expression will be…

* 0 9 \* \* ? 2023

**# In this First value = Minutes, Second value = Hours, Third Value = Day of month, Fourth value = Month, Fifth value = Day of the week, Sixth vale = Year**

**# Note : Always Give the Expression in 24 hours Format…**

# To create the cron job expression correctly visit the below link…

# Link : <https://crontab.guru/>

# Now Follow the steps…

* After entering the expression click on next
* In flexible findow dropdown select OFF
* Now click next
* Then in target detail select AWS Lambda
* Next in invoke select the start function from the dropdown
* Now click next
* Scroll down and again click next
* Again scroll down and click create schedule

# Bu this way your schedule has been created to start the instance every day at 9am…

Now again follow the same procedure and create a stopping bridge rule and give the time to stop the instance

# In this way Regularly the Instances will be started and stopped if you forget…

**#### THE END ####**

==============================================================================

**\*\*Explanation:\*\***

To effectively establish a system wherein an Amazon Event Bridge rule orchestrates the daily start and stop actions of an EC2 instance, a step-by-step process is employed. This begins with configuring the EC2 instance itself, chosen to undergo these scheduled changes. After its successful launch, the instance's unique identification number is crucially noted down for further reference.

Subsequently, the creation of an Amazon Event Bridge rule takes place. Within the AWS Management Console, the Event Bridge service is accessed to define this rule. The initial step involves selecting the event source as "Event Source created by AWS services." The next step entails designating "EC2 Instance State-change Notification" as the event type to be monitored. This choice forms the cornerstone of the rule's activation.

The event pattern is then meticulously defined, pinpointing the exact state change that warrants the initiation of actions. This could involve a transition from the "stopped" to the "running" state, ensuring a precise alignment between the intended action and the event's occurrence. For the purpose of execution, a target is introduced. By connecting the event to a designated Lambda function - one specialized for the start or stop action - this target provides a conduit for triggering the necessary operations.

To enhance comprehension and contextual relevance, the input transformation is configured. Through this mechanism, the Lambda function gains the ability to effectively interpret the event's content and subsequently execute the appropriate course of action. Naming the rule and furnishing a description facilitates easier identification and management.

Transitioning to the Lambda function itself, adjustments are made to the existing code. It is here that the logic behind the start and stop actions is embedded. Upon completion of this step, rigorous testing follows. The function is subjected to sample inputs to validate its capacity to accurately initiate the requisite actions, substantiating its reliability in a controlled environment.

During subsequent monitoring phases, both the Event Bridge console and the EC2 console are engaged. This vigilance verifies the consistent invocation of the rule and the ensuing impact on the instance's state. By gauging the synchronization between the rule-triggered Lambda function and the resulting state modifications, the entire process is rigorously validated.

For those inclined to further customization, the schedule expression of the Event Bridge rule is adjustable. This optional step empowers users to tailor the timing of the daily actions in accordance with their operational preferences. Ultimately, this comprehensive process ensures the automated management of the EC2 instance, fostering streamlined operations and optimized resource allocation through the orchestration capabilities of Amazon Event Bridge.