**PROJECT 1 (**AWS, Lambda Function, CloudWatch, EBS Volumes, Boto3**)**

**PROJECT DESCRIPTION**

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As a Cloud Engineering team we take care of the AWS environment and make sure it is in compliance with the organizational policies.

We use **AWS cloud watch in combination with AWS Lambda** to govern the resources according to the policies.

For example, we Trigger a **Lambda** function when an Amazon Elastic Block Store (EBS) volume is created. We use Amazon **CloudWatch** Events. CloudWatch Events that allows us to monitor and respond to EBS volumes that are of type **GP2** and convert them to type **GP3**.

**Tech Stack Used**: AWS, Lambda Function, CloudWatch, EBS Volumes, Boto3

**Project Flow:** According to the company policy, if anyone creates a EBS volume of type GP2, it should be automatically converted to type of **GP3**. When someone creates a EBS volume of type GP2, **CloudWatch** will monitor that volume creation event. Once that volume of type GP2 is created, It will be considered as an **event** and CloudWatch will trigger the **Lambda** function where we have written the **python** **code** for converting EBS volume of type **GP2** to type **GP3**.

**Important things** –

* We need to inform the CloudWatch about the event. So we will do some configuration in CloudWatch with the details of the event which is EBS Volume creation in this case.
* Lambda Function should have the permission to interact with the EBS Volumes and their modification. For this purpose we will create a **role** and will attach required **policies** for the lambda function and then role will be attached to the Lambda function.

**Important Keywords –**

**EBS Volumes :** Amazon Elastic Block Store (Amazon EBS) is a **scalable block storage** service provided by Amazon Web Services (AWS). EBS volumes are **virtual hard drives** that you can attach to your Amazon **EC2** instances. These volumes are designed to provide **persistent(**data will be available even if associated ec2 instance is stopped or terminated**)** and **high-performance** block-level storage for your EC2 instances.

**GP2 VS GP3 : Gp2 and GP3 are** type of EBS Volumes in AWS. By default, AWS will create the volume of type GP2. The reason we are switching to GP3 as it’s a successor of GP2 and excels out in terms of Performance, Cost and any other aspects. With increasing performances, it cuts down the cost. It has better **IOPS** and **throughput**. We can manually go and modify the Volumes but it’s always better to automate these processes.

To increase the IOPS in GP2 , you will need to increase the size of the volume as well, where in GP3, IOPS is independent of the volume size.

**gp3 is less expensive than gp2 because IOPS are provisioned independent of volume size.**

**IOPS :** No of input/Output (Read and Write) operations per second that a storage system can perform.

**Lambda Function:**

AWS Lambda is a **serverless** **compute** service provided by AWS.

AWS Lambda allows you to run code without **provisioning or managing servers**. AWS Lambda functions can be triggered by various **events**, such as **HTTP requests, file uploads to Amazon S3, database changes, and more.** They are used for building serverless applications and event-driven architectures.

**Cloudwatch** : It’s a monitoring and logging service provided by AWS. Helps you to track and monitor the changes, events happening on AWS. You can use this as the alert manager as well.

**Lambda Function Code for Volume Modification:**

**#Function to extract the volumeId from the ARN details of the event**

***import json***

***import boto3***

***def get\_volume\_id\_from\_arn(volume\_arn):***

*arn\_parts = volume\_arn.split(':')*

*volume\_id = arn\_parts[-1].split('/')[-1]*

*return volume\_id*

***def lambda\_handler(event, context):***

**#arn details we get from the event details from cloudwatch where it gives arn details in**

**JSON format**

*volume\_arn = event['resources'][0]*

*#* **the arn values is passed to a fn which extracts only volumeID from that ARN name**

*volume\_id = get\_volume\_id\_from\_arn(volume\_arn)*

**# used boto3 to connect with AWS resources and modify the volume to type GP3**

*ec2\_client = boto3.client('ec2')*

*response = ec2\_client.modify\_volume(*

*VolumeId = volume\_id,*

*VolumeType = 'gp3',*

*)*

**Other than this lambda function code we will need to create roles and attach required policies to make changes in EBS Volumes.**

**Also we need to define the EBS volume creation event to Cloudwatch for triggering the lambda function.**

**To be continued. Thanks!!**