Usecase 2:

Create a csv file which includes the following details for all the EC2 instances. The csv file will be created by AWS lambda function which gets triggered by Amazon event bridge rule for every 24 hours and store the created file in S3 and also sends email attachment. The data of the files are for the last 24 hours.

CSV file columns :

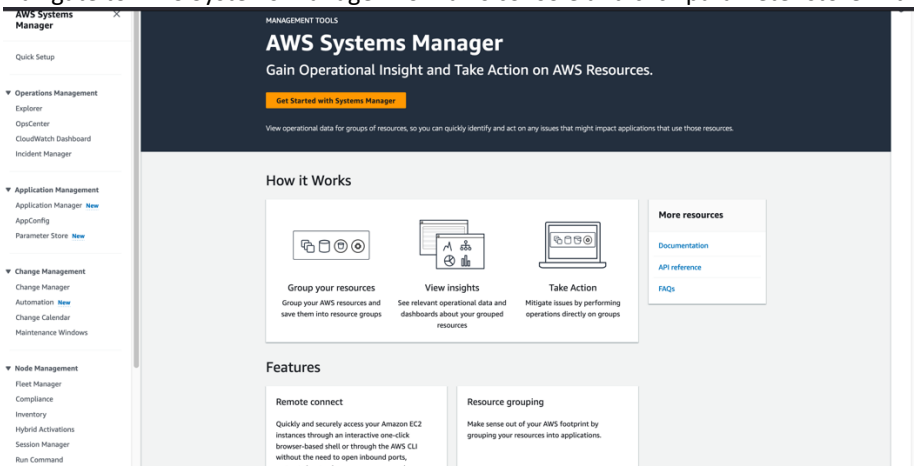
Instance Name, Instance Id, Average CPU utilization Percent, Max CPU utilization Percent, Average Memory utilization Percent, Max Memory utilization Percent, Root disk total in GB, Root disk used in GB,Root disk free in GB,EBS1 disk total in GB,EBS1 disk used in GB,EBS1 disk free in GB,EBS2 disk total in GB,EBS2 disk used in GB,EBS2 disk free in GB.

Memory usage , root disk, EBS disk details are from the CloudWatch agents configured in each of the EC2 instances.

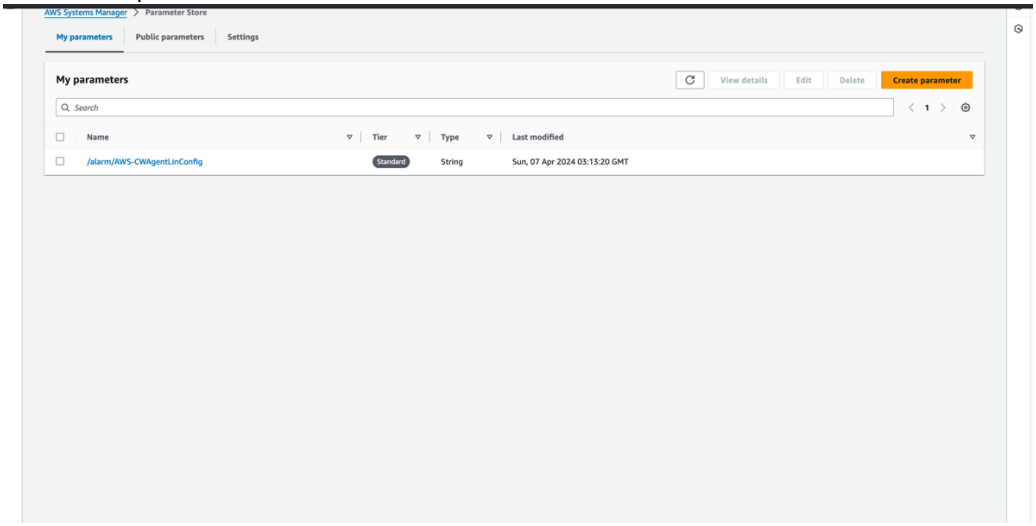
Step 1: Check if the EBS is mounted to EC2 instance and showing while running the below command in EC2 terminal.

- connect to the EC2 instance.
- Run the below command to check the free spaces.
  - df -H
- If the EBS volumes are not shown while running the above command, then follow the below remaining steps to list all the EBS devices and mount it to the EC2 instance one by one.
- Run the following command in Ec2 instance terminal to list the available EBS devices
  - lsblk
- Lets first create a directory to be used as the mount point and mount the EBS to Ec2 instance:
  - sudo mkdir -p /mnt/ebs_volume1
  - sudo mkfs -t ext4 /dev/sdb
  - sudo file -s /dev/sdb
  - sudo mount /dev/sdb /mnt/ebs_volume1

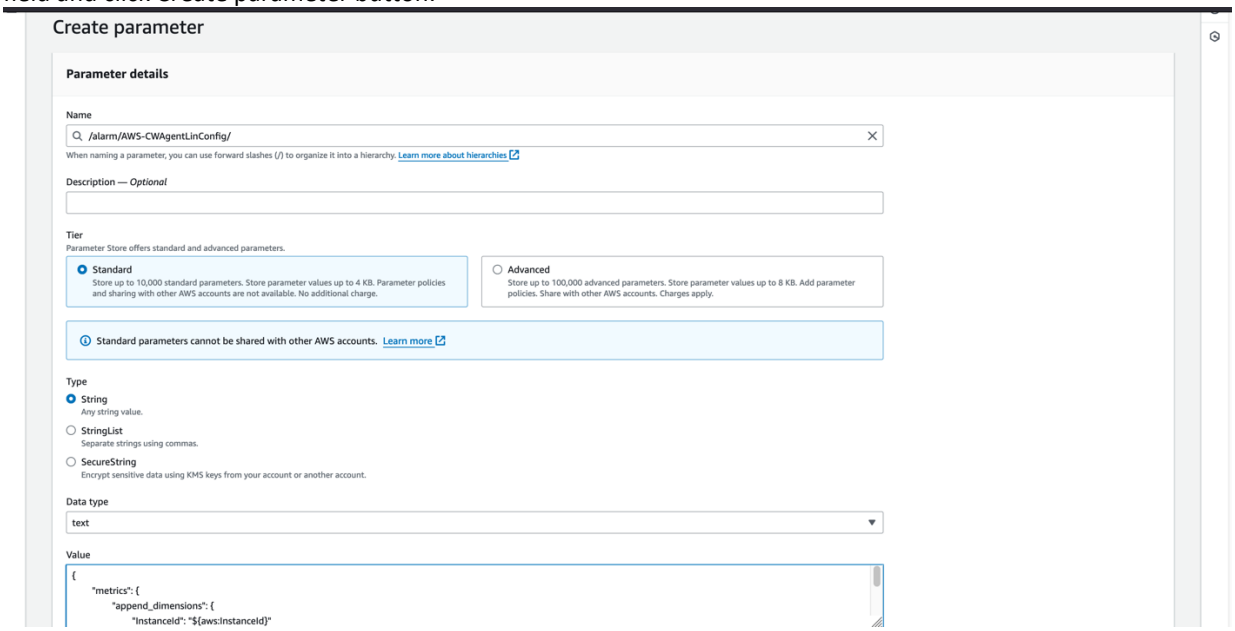
Step 2: For this demo configuration, We use "AWS System Manager" service parameter store feature to store our Cloudwatch agent config file.

- We do this to make the cloudwatch agent config file centralized in one place. In your production setup you may have already installed and configured Cloudwatch agents in each of the ec2 instances. In that scenario, we need to update the cloudwatch agent config file in each ec2 instances with the below configuration. Here we are collecting the memory metrics and disk metrics from EC2 and sends to CWAgent metric in Cloud Watch. https://docs.aws.amazon.com/AmazonCloudWatch/latest/monitoring/metrics-collected-by-CloudWatch-agent.html
  - { "metrics": { "append_dimensions": { "InstanceId": "${aws:InstanceId}" }, "metrics_collected": { "mem": { "measurement": ["mem_used_percent"], "metrics_collection_interval": 60 }, "disk": { "measurement": ["disk_used", "disk_total", "disk_free"], "metrics_collection_interval": 60 } } } }
- Navigate to AWS Systems Manager from aws console and click parameter store in the left pane.
- 

- Click Create parameter button.



- Enter the parameter name and paste the configuration which we mentioned in the Step 2 in the Value field and click Create parameter button.



Step 3: This step is to download and install Cloudwatch agent in the EC2 machine and update the config file in EC2 from AWS systems Manager. Skip this step if you have already installed Cloudwatch agent in Ec2 and updated Cloudwatch agent config file.

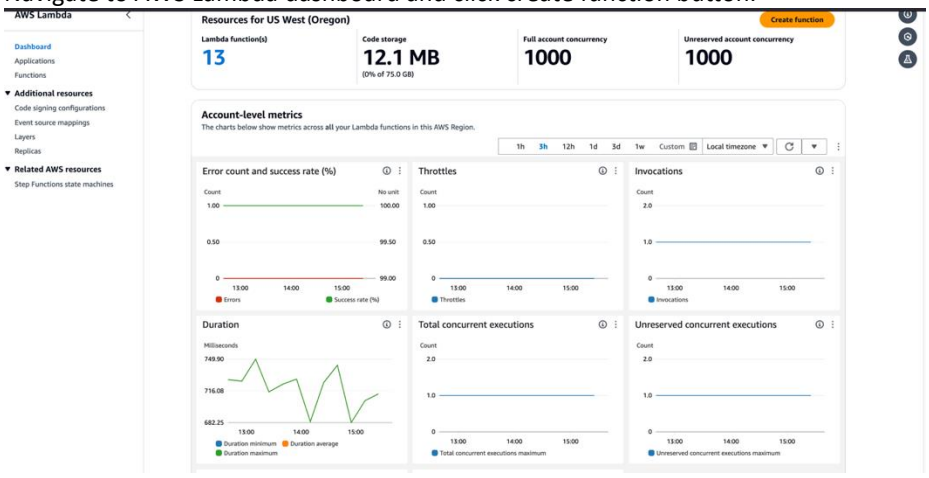
- wget https://s3.amazonaws.com/amazoncloudwatch-agent/linux/amd64/latest/AmazonCloudWatchAgent.zip
- unzip AmazonCloudWatchAgent.zip
- sudo ./install.sh
- sudo /opt/aws/amazon-cloudwatch-agent/bin/amazon-cloudwatch-agent-ctl -a fetch-config -m ec2 -c ssm:/alarm/AWS-CWAgentLinConfig -s

Step 4: Create and upload the configuration json file to S3. This file will be used by AWS Lambda. This file contains the instance name, id and the metric metadata details which the AWS lambda has to use to get the required details from the Cloudwatch Agent Metrics stored in Cloudwatch.

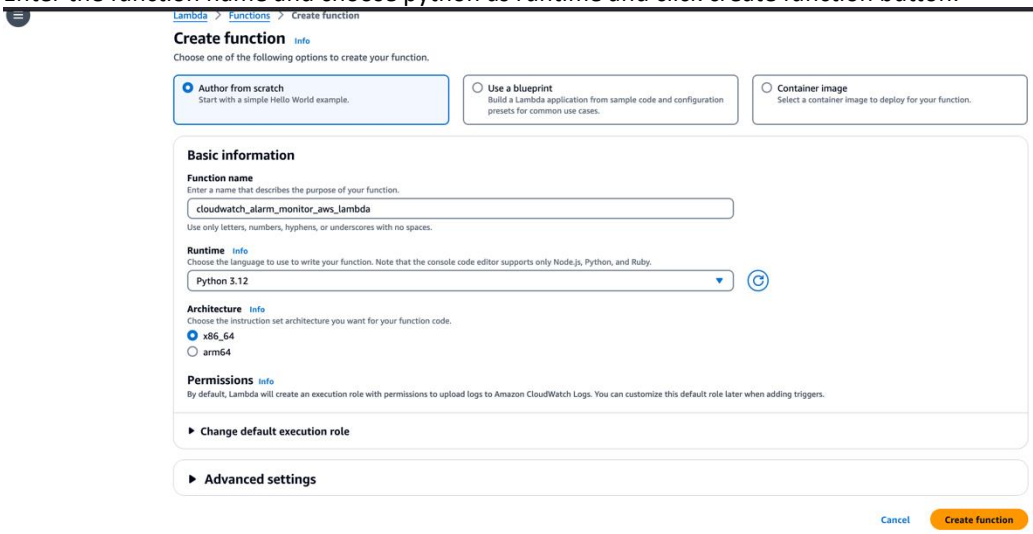
- This Json File “CPU_mem_disk_conf_json.json” will be uploaded to a S3 bucket in the same region where lambda function runs.

Step 5: Create a AWS lambda function with the attached sample code Cloudwatch_metric_data_ec2instances_csv_lambda.py

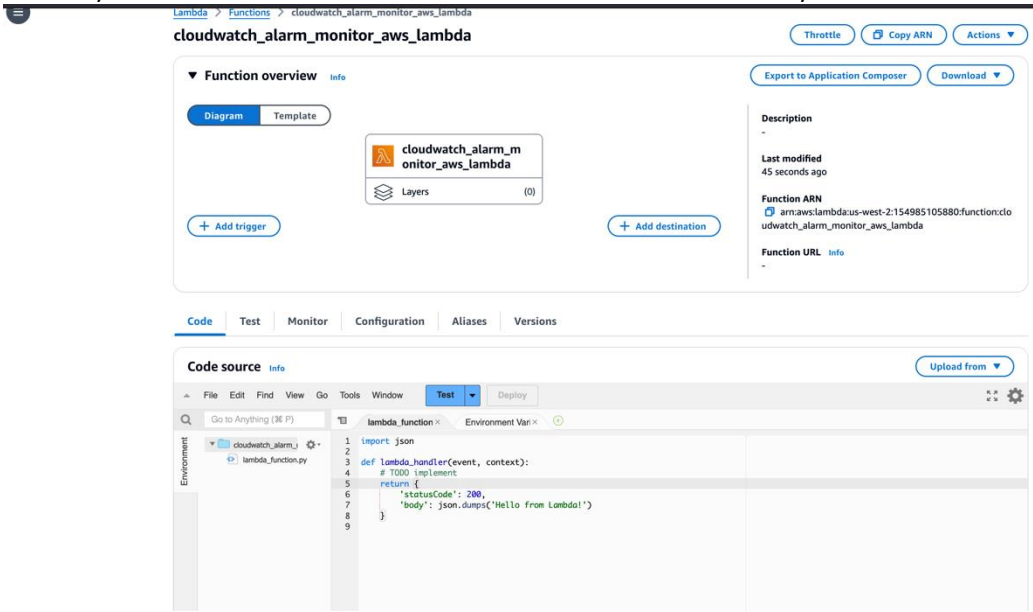
- Navigate to AWS Lambda dashboard and click create function button.

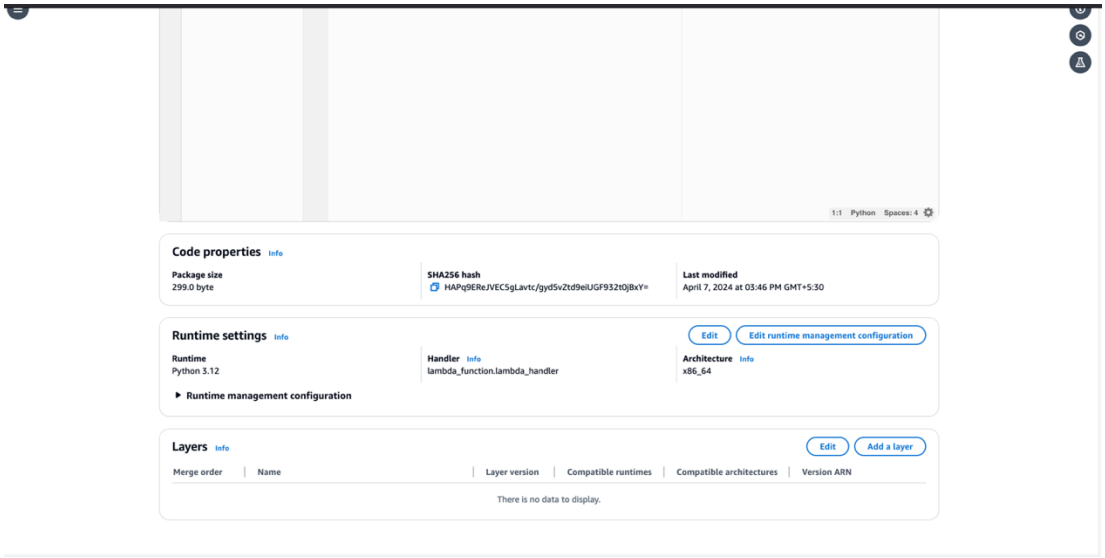


- Enter the function name and choose python as runtime and click create function button.

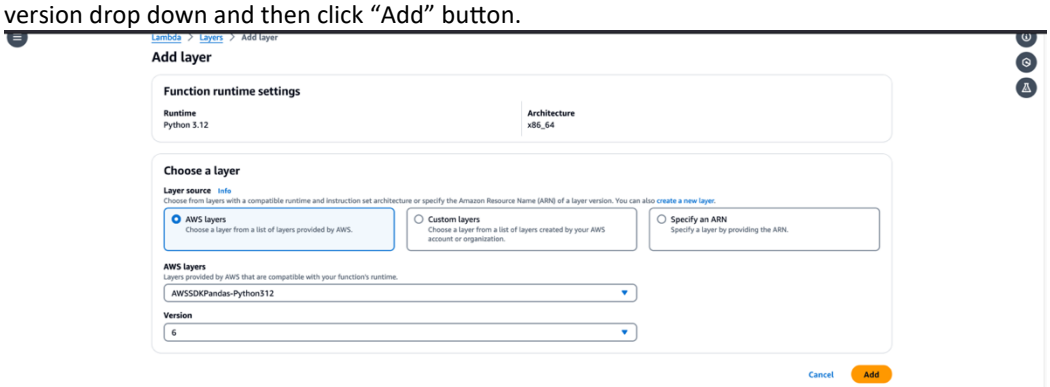


- Click “Layers” from the function overview section and then click “Add a layer” button.

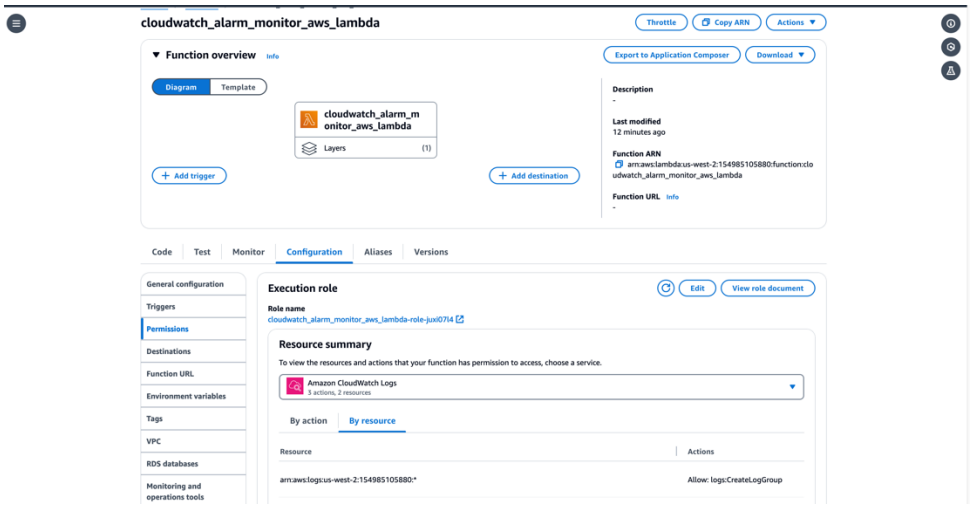




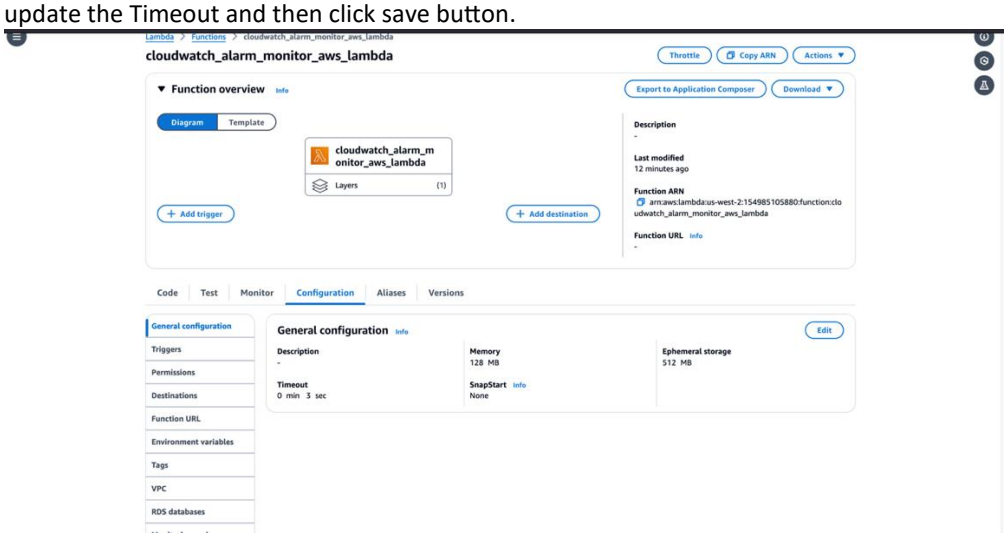
- Choose “AWSSDKPandas-Python312” as AWS layers and choose latest version from version drop down and then click “Add” button.



- Click “configuration” tab and then click “permissions” tab. Click on the Role name and it will take us to IAM and then attach policies for this Lambda function to have access to Amazon Cloudwatch, S3 bucket and Amazon SES service.



- Click “configuration” tab and then click “general configuration” tab. Click Edit button to update the Timeout and then click save button.



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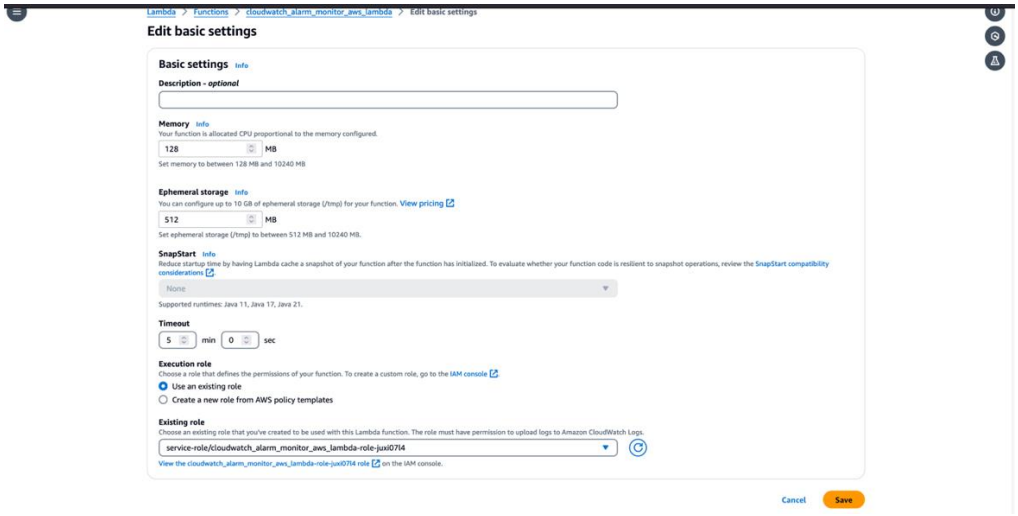

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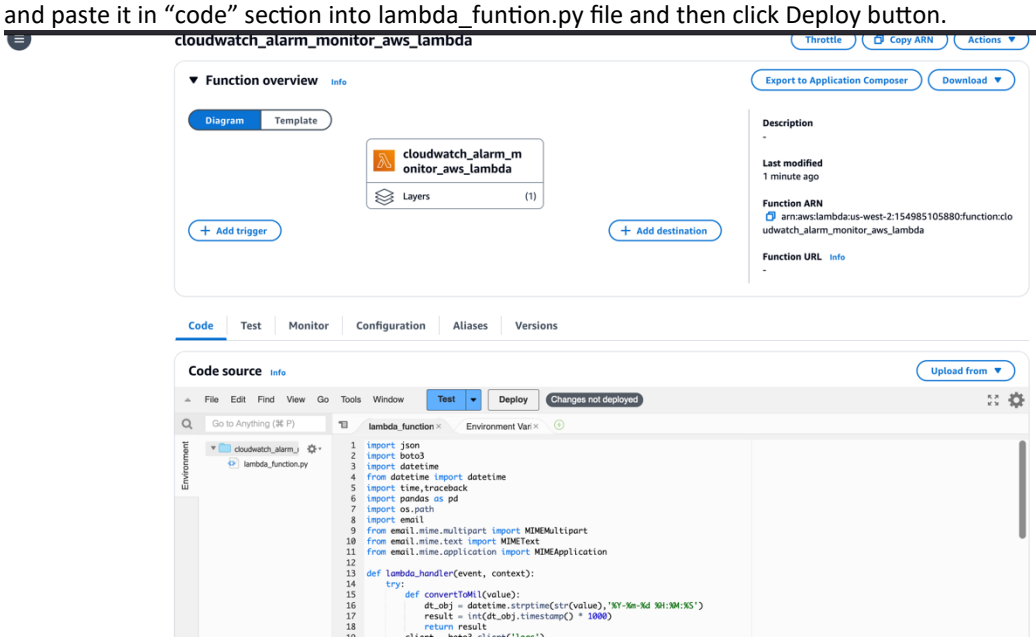
- Copy the sample code from “Cloudwatch_metric_data_ec2instances_csv_lambda.py” file and paste it in “code” section into lambda_funtion.py file and then click Deploy button.



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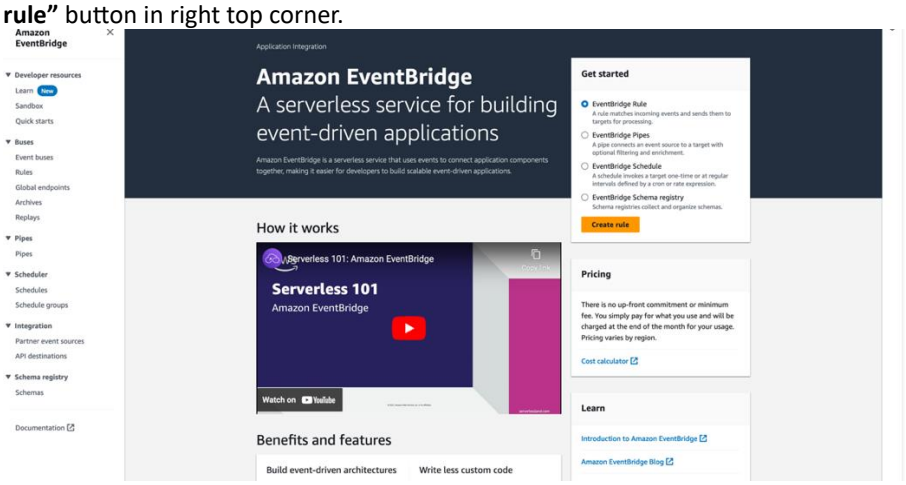
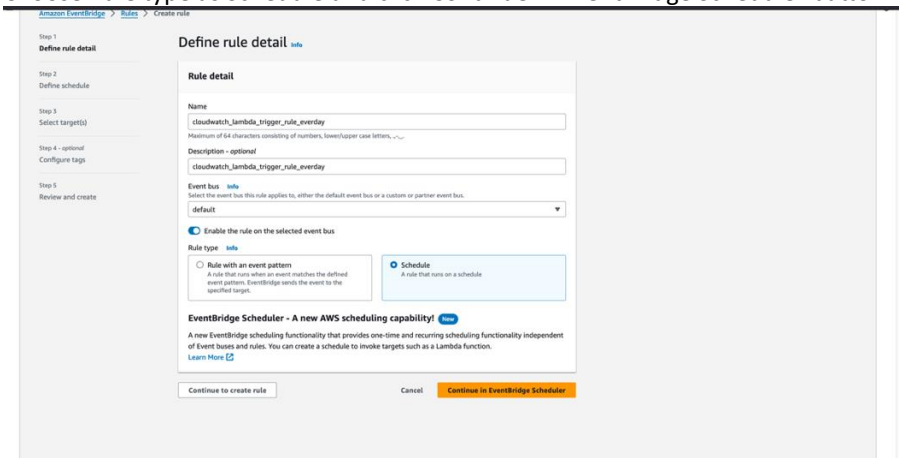
Step 6: Create a Amazon Event Bridge rule to trigger the AWS Lambda function created in step:5, everyday at a specific time of a day.

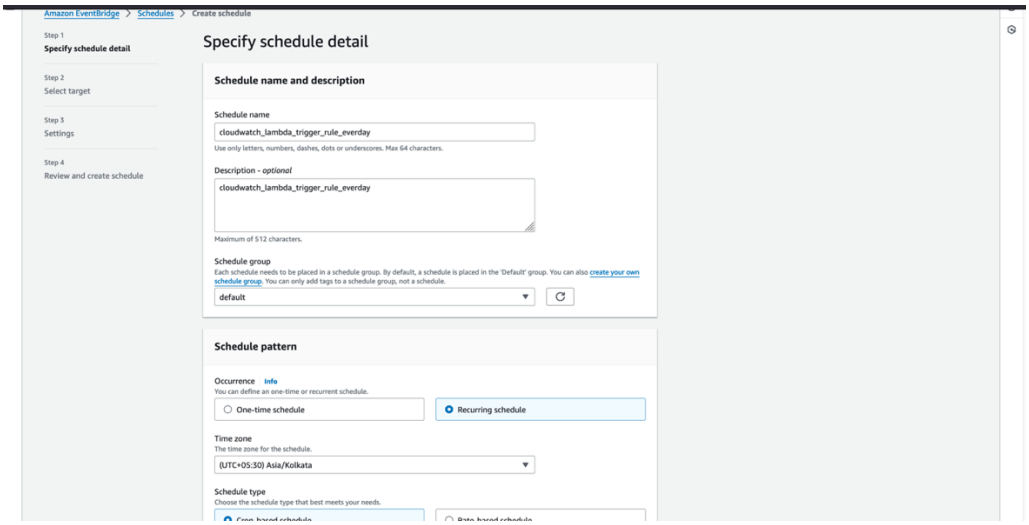
- https://docs.aws.amazon.com/scheduler/latest/UserGuide/schedule-types.html?icmpid=docs_console_unmapped#cron-based
- Navigate to Amazon Event bridge console and click '**Create rule**' button in the Amazon Event bridge home page or from the left panel click "Rules" and then Click "**Create rule"** button in right top corner.



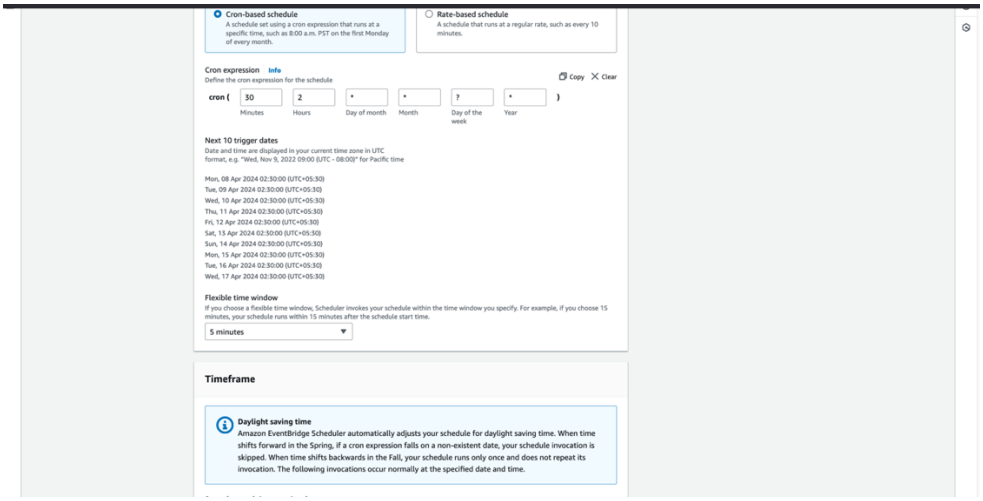
- Choose Rule type as Schedule and click Continue in EventBridge Scheduler button.



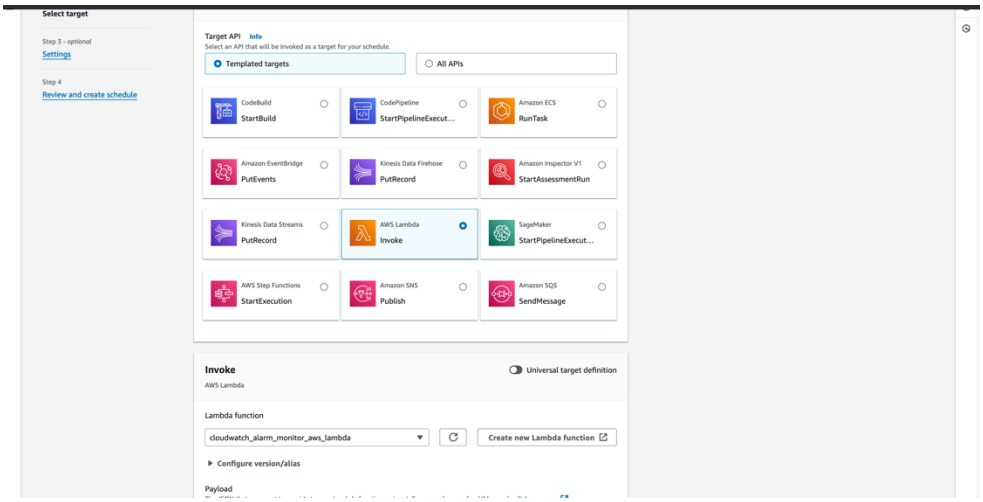
- Enter the schedule name, description and choose radio button Recurring Schedule.



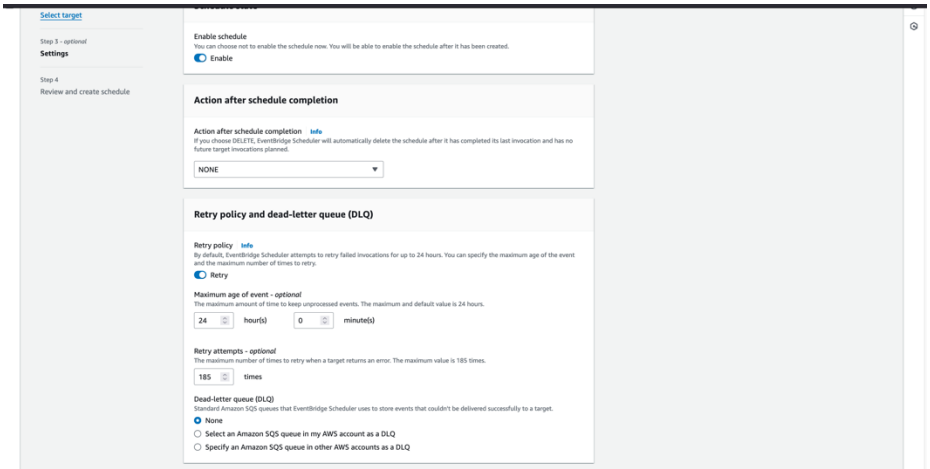
- Under Schedule type, choose Cron-based schedule. Enter the Cron expression, The below screenshot shows cron expression to run this schedule at everyday 2.30 a.m. Choose Flexible time window as 5 minutes and click Next.

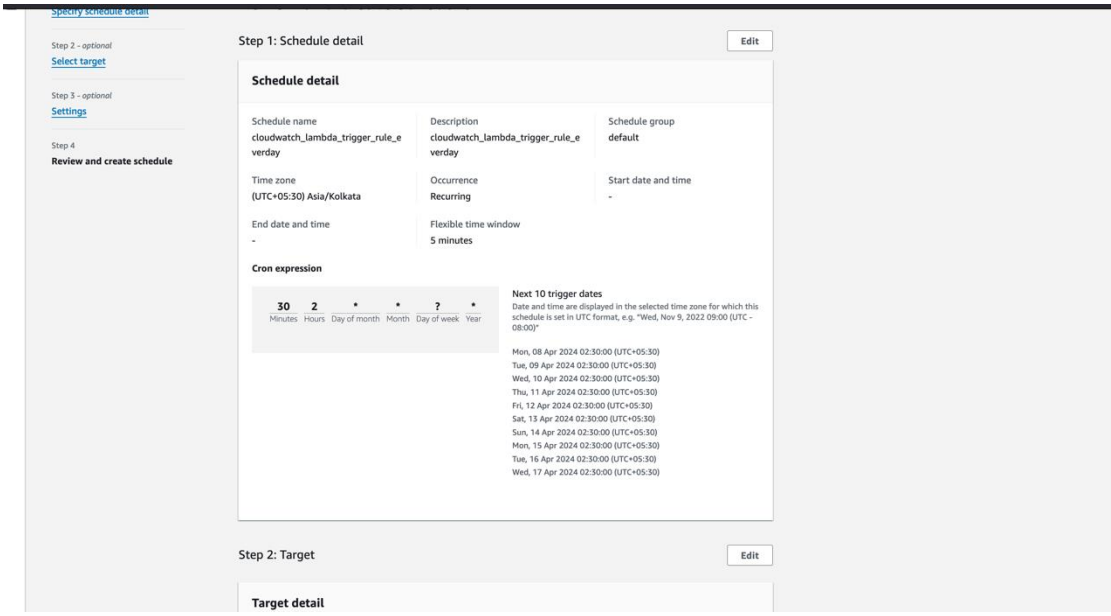


- Choose AWS Lambda radio button and select the lambda function which we created in step 5 and click next.



- Choose NONE from Action after schedule completion dropdown and click Next and in Review and create schedule page click the review and create.




Specify schedule detail
Step 2 - optional
Select target
Step 3 - optional
Settings
Step 4
Review and create schedule
Step 1: Schedule detail
Edit
Schedule detail
Schedule name
cloudwatch_lambda_trigger_rule_everday
Description
cloudwatch_lambda_trigger_rule_everday
Schedule group
default
Time zone
(UTC+05:30) Asia/Kolkata
Occurrence
Recurring
Start date and time
-
End date and time
-
Flexible time window
5 minutes
Cron expression
30 2 * * ? *
Minutes Hours Day of month Month Day of week Year
Next 10 trigger dates
Date and time are displayed in the selected time zone for which this schedule is set in UTC format, e.g. "Wed, Nov 9, 2022 09:00 (UTC - 08:00)"
Mon, 08 Apr 2024 02:30:00 (UTC+05:30)
Tue, 09 Apr 2024 02:30:00 (UTC+05:30)
Wed, 10 Apr 2024 02:30:00 (UTC+05:30)
Thu, 11 Apr 2024 02:30:00 (UTC+05:30)
Fri, 12 Apr 2024 02:30:00 (UTC+05:30)
Sat, 13 Apr 2024 02:30:00 (UTC+05:30)
Sun, 14 Apr 2024 02:30:00 (UTC+05:30)
Mon, 15 Apr 2024 02:30:00 (UTC+05:30)
Tue, 16 Apr 2024 02:30:00 (UTC+05:30)
Wed, 17 Apr 2024 02:30:00 (UTC+05:30)
Step 2: Target
Edit
Target detail

-