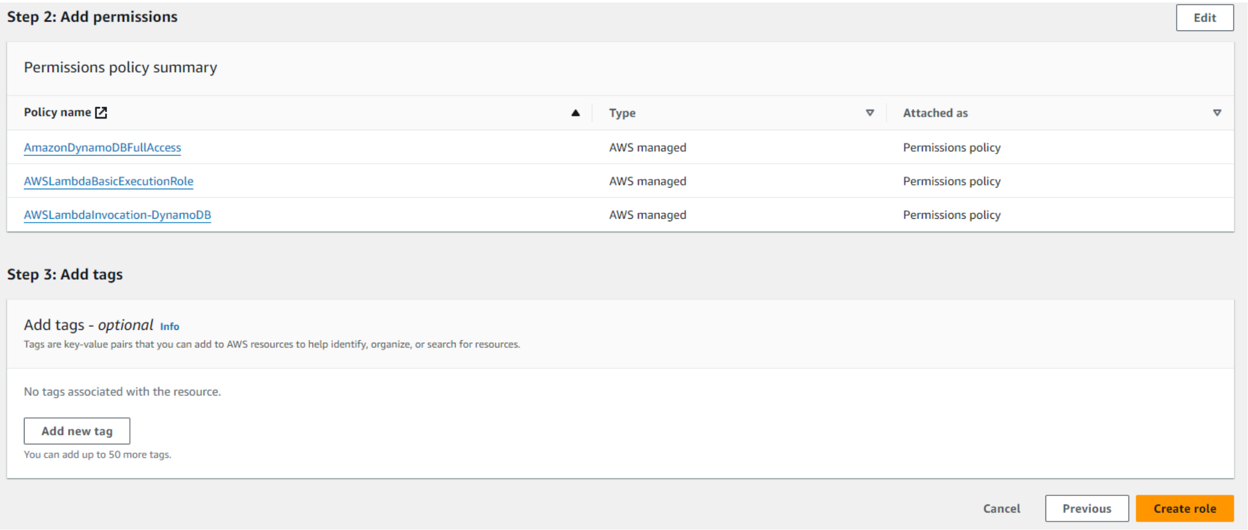
Building a Serverless Data Pipeline: Lambda, DynamoDB, and CloudWatch Integration

The objective of this process is to create a serverless architecture that retrieves data via API Gateway, processes it using Lambda, and stores it in DynamoDB. By leveraging CloudWatch for monitoring and scheduling, we ensure efficient data flow and reliable execution.

Step 1: Create IAM role
Role Name: admin-lamba-role



Step 2: Add permissions

Permissions policy summary

Policy name	Type	Attached as
AmazonDynamoDBFullAccess	AWS managed	Permissions policy
AWSLambdaBasicExecutionRole	AWS managed	Permissions policy
AWSLambdaInvocation-DynamoDB	AWS managed	Permissions policy

Step 3: Add tags

Add tags - *optional* Info

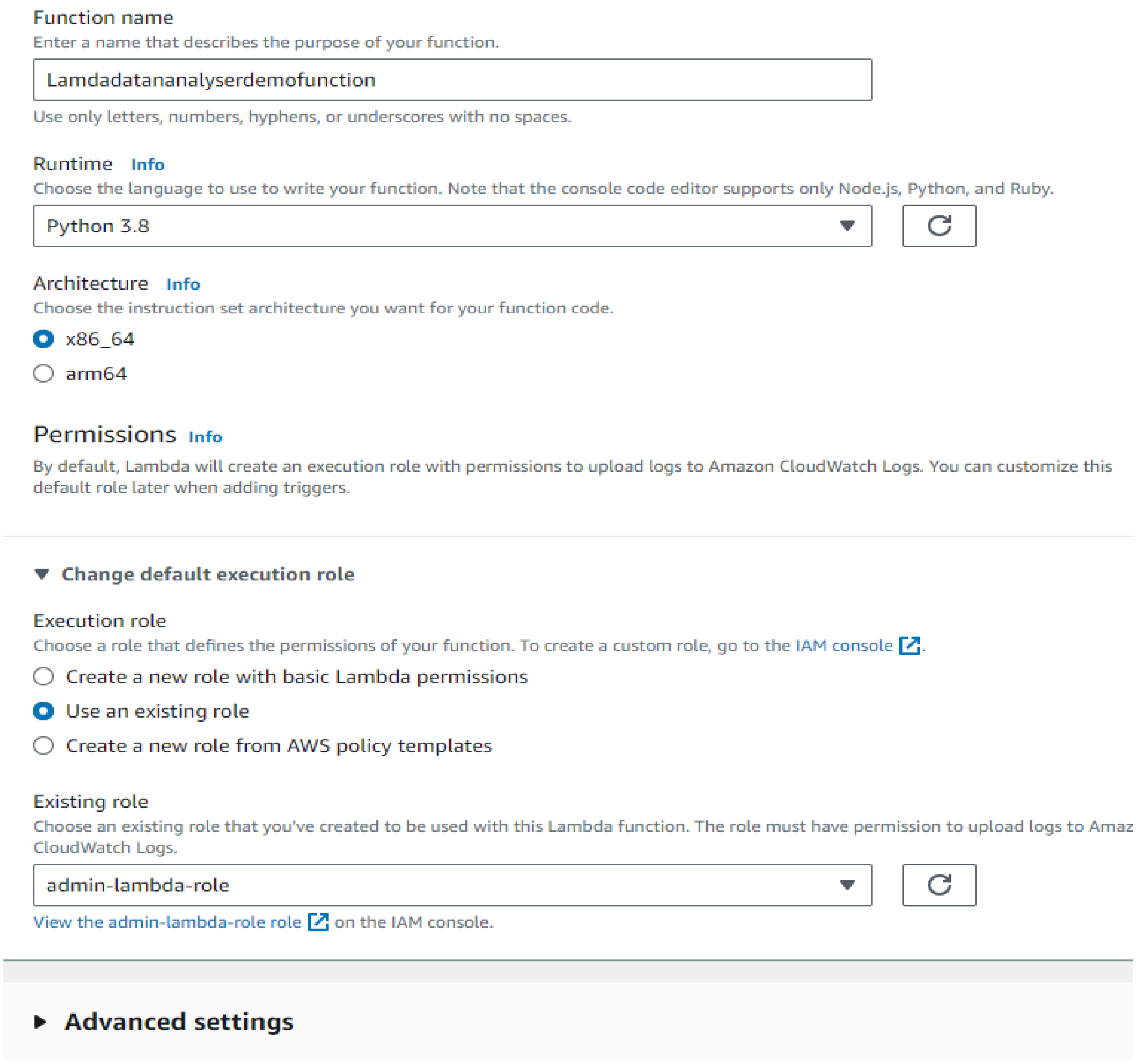
Tags are key-value pairs that you can add to AWS resources to help identify, organize, or search for resources.

No tags associated with the resource.

You can add up to 50 more tags.

Step 2: Lambda

Lambda Name: Lamdadatananalyserdemofunction



Function name

Enter a name that describes the purpose of your function.

Lamdadatananalyserdemofunction

Use only letters, numbers, hyphens, or underscores with no spaces.

Runtime Info

Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.

Python 3.8

Architecture Info

Choose the instruction set architecture you want for your function code.

● x86_64

○ arm64

Permissions Info

By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch Logs. You can customize this default role later when adding triggers.

▼ Change default execution role

Execution role

Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console.

○ Create a new role with basic Lambda permissions

● Use an existing role

○ Create a new role from AWS policy templates

Existing role

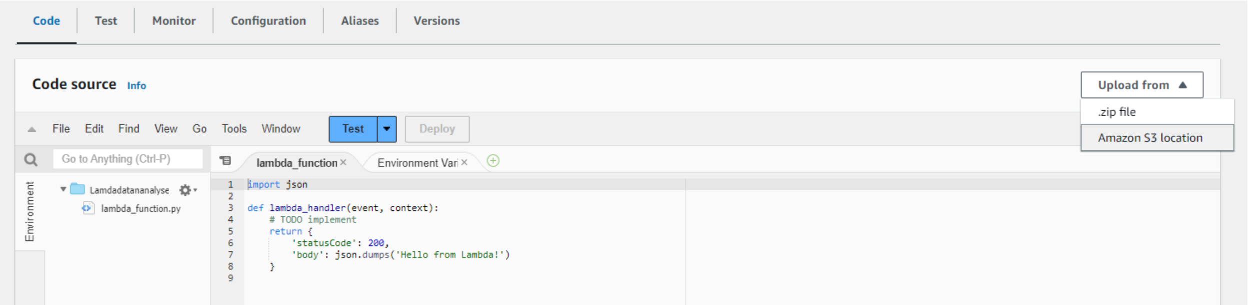
Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amaz CloudWatch Logs.

admin-lambda-role

View the admin-lambda-role role on the IAM console.

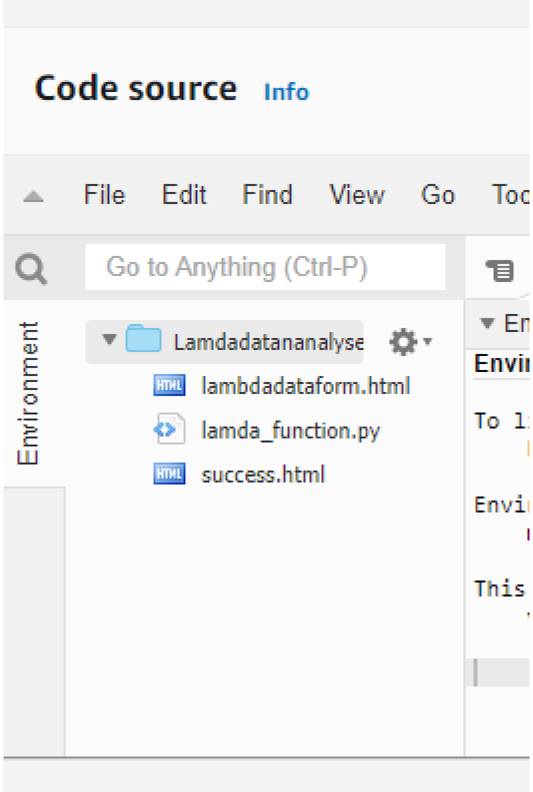
▶ Advanced settings

Step 3: Upload Zip file containing contactus.html, python code and success.html to lambda



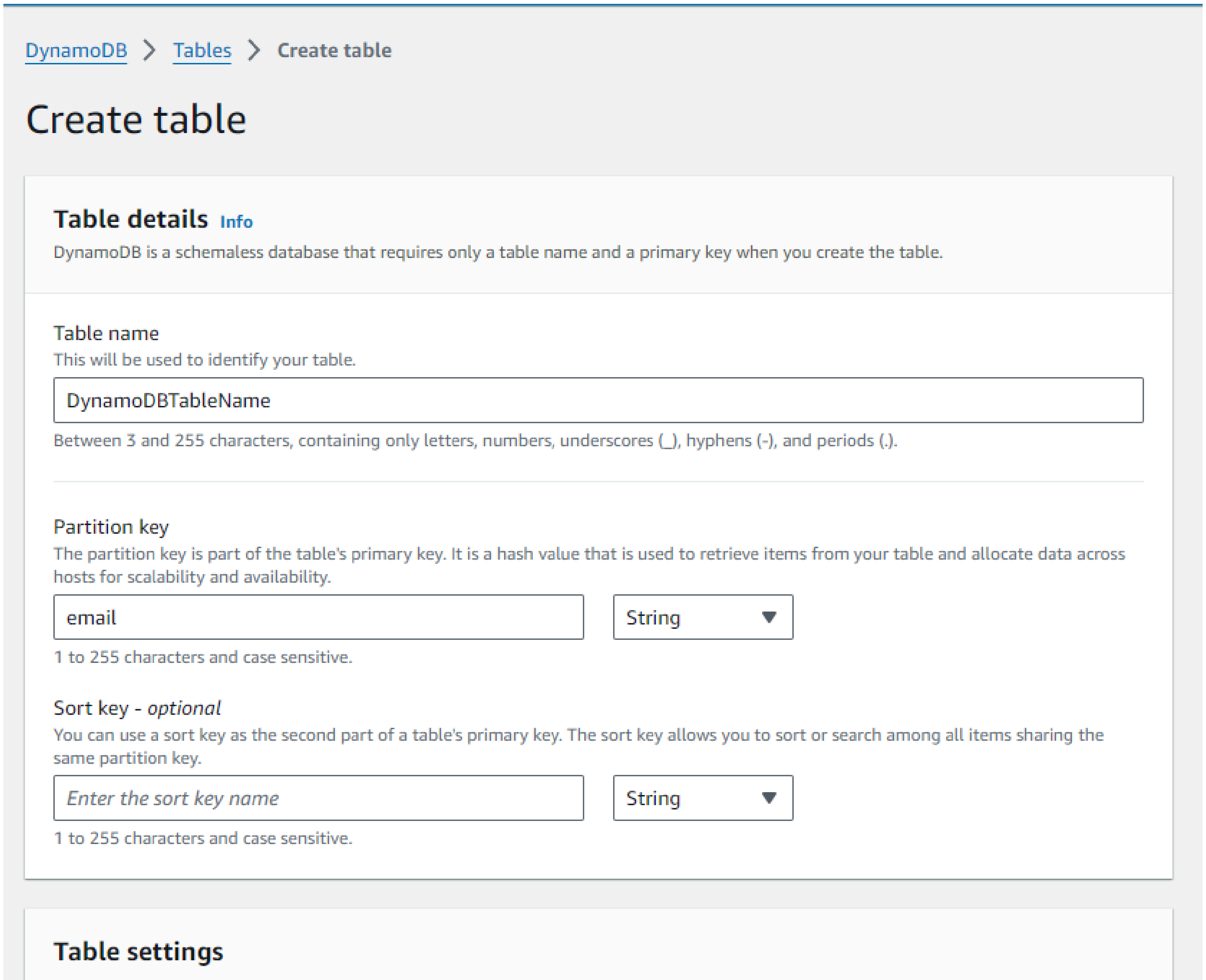
```
import json

def lambda_handler(event, context):
    # TODO implement
    return {
        'statusCode': 200,
        'body': json.dumps('Hello from Lambda!')
    }
```



Step 4 : Create DynamoDB Table

Table Name: DynamoDBTableName



Create table

Table details Info

DynamoDB is a schemaless database that requires only a table name and a primary key when you create the table.

Table name

This will be used to identify your table.

DynamoDBTableName

Between 3 and 255 characters, containing only letters, numbers, underscores (_), hyphens (-), and periods (.).

Partition key

The partition key is part of the table's primary key. It is a hash value that is used to retrieve items from your table and allocate data across hosts for scalability and availability.

email | String ▼

1 to 255 characters and case sensitive.

Sort key - *optional*

You can use a sort key as the second part of a table's primary key. The sort key allows you to sort or search among all items sharing the same partition key.

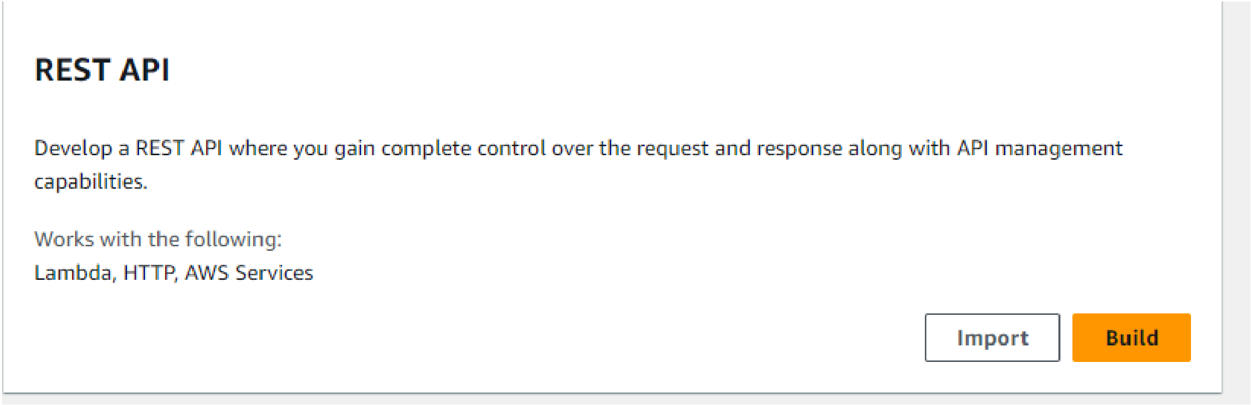
Enter the sort key name | String ▼

1 to 255 characters and case sensitive.

Table settings

Step 5: Create Rest API for GET and POST

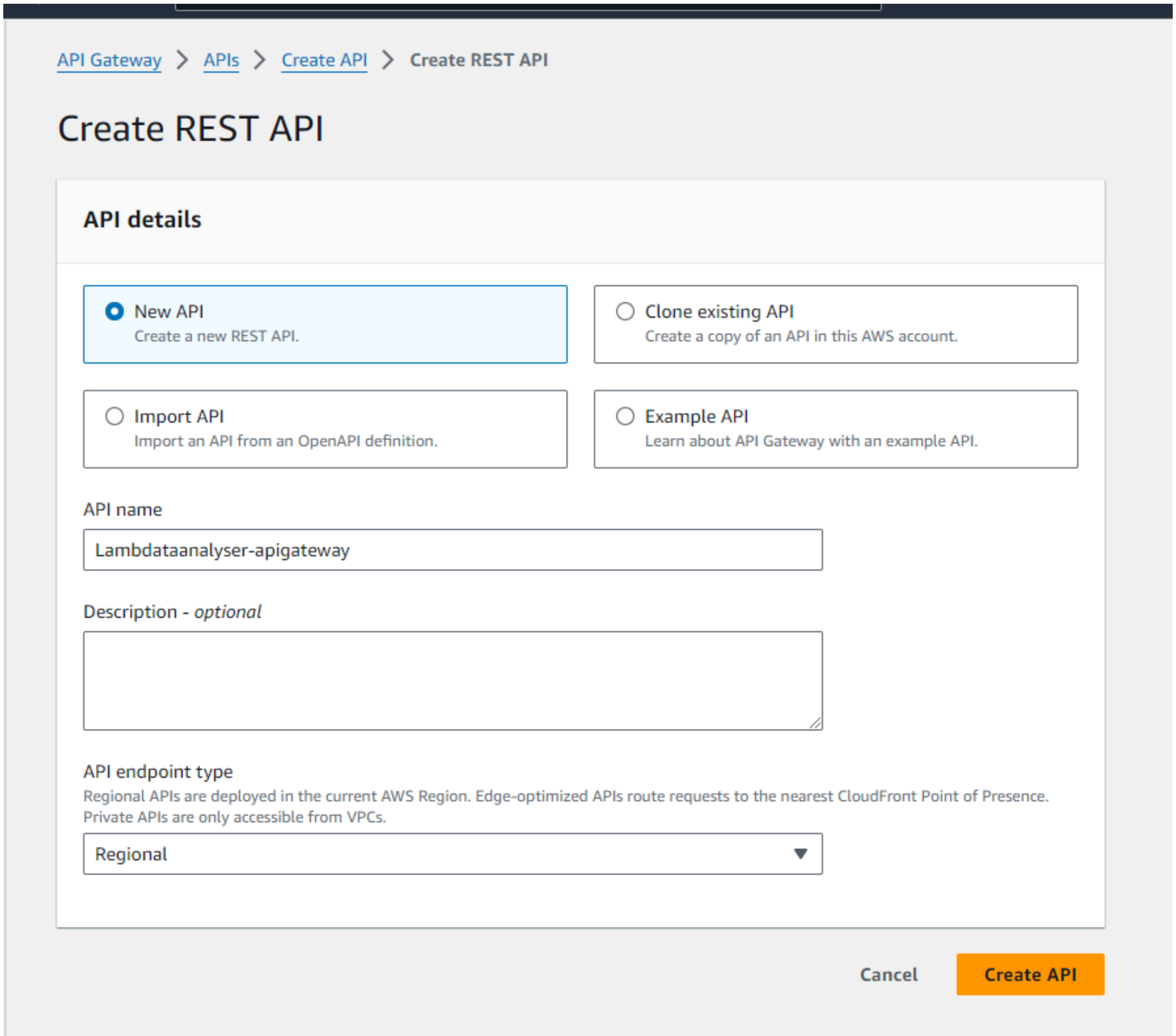
Api name:Lambdataanalyser-apigateway


REST API

Develop a REST API where you gain complete control over the request and response along with API management capabilities.

Works with the following:

Lambda, HTTP, AWS Services



API Gateway > APIs > Create API > Create REST API

Create REST API

API details

● New API
Create a new REST API.

○ Clone existing API
Create a copy of an API in this AWS account.

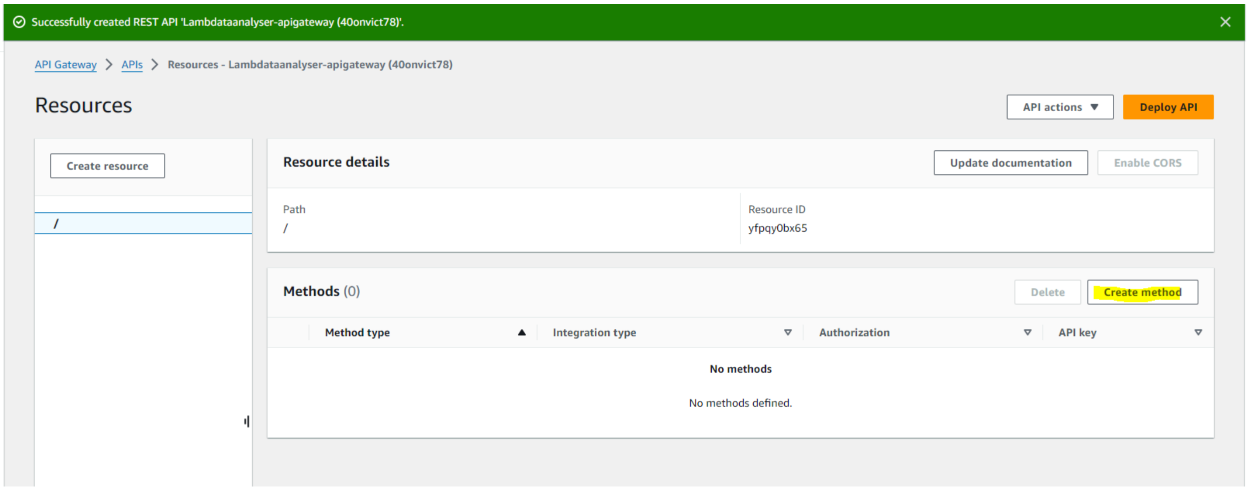
○ Import API
Import an API from an OpenAPI definition.

○ Example API
Learn about API Gateway with an example API.

API name
Lambdataanalyser-apigateway

Description - *optional*

API endpoint type
Regional APIs are deployed in the current AWS Region. Edge-optimized APIs route requests to the nearest CloudFront Point of Presence. Private APIs are only accessible from VPCs.
Regional ▼



Successfully created REST API 'Lambdataanalyser-apigateway (40onvict78)'.

API Gateway > APIs > Resources - Lambdataanalyser-apigateway (40onvict78)

Resources

Resource details

Path
/

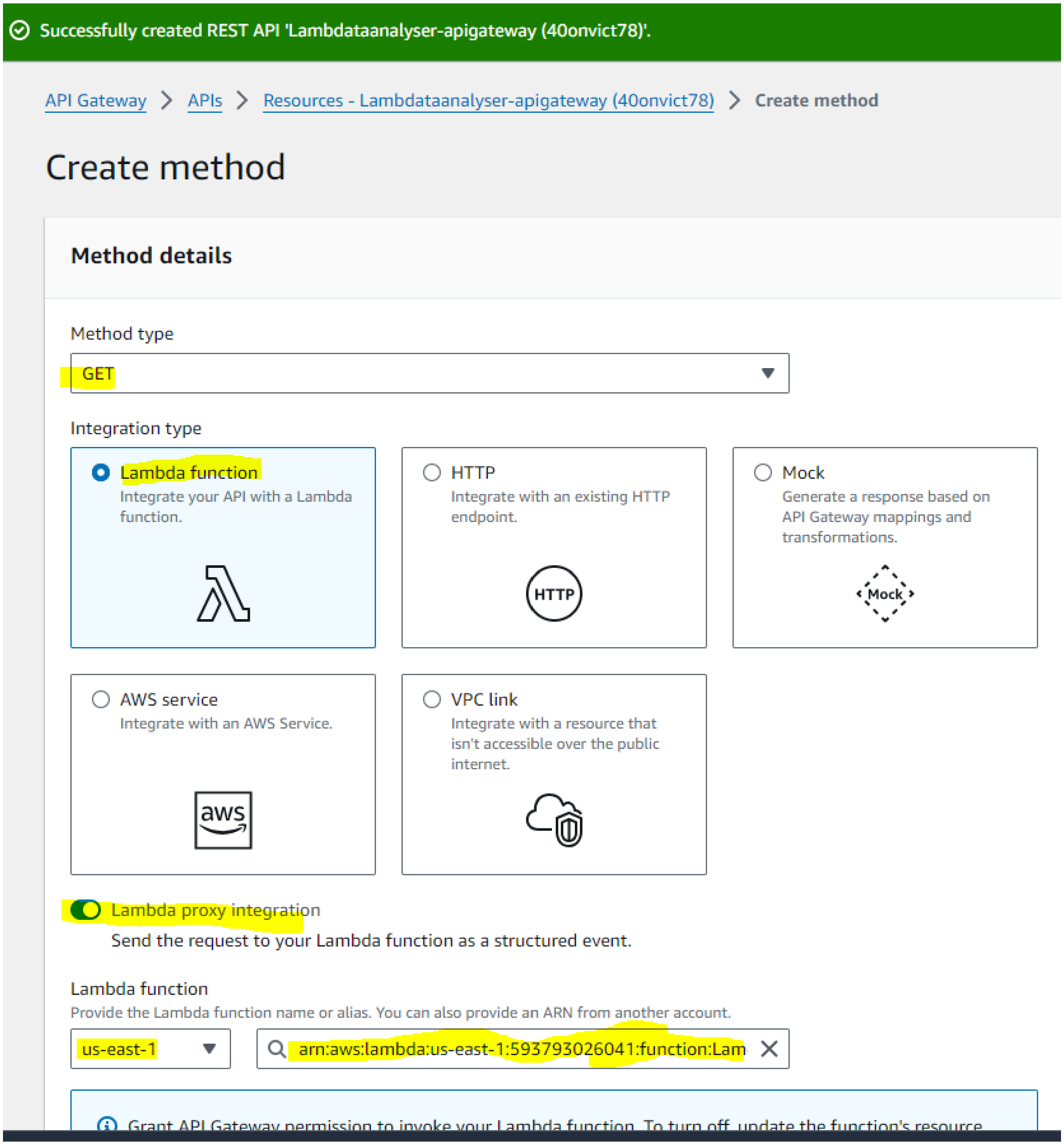
Resource ID
yfpqy0bx65

Methods (0)

Method type ▲	Integration type ▽	Authorization ▽	API key ▽

No methods

No methods defined.



Successfully created REST API 'Lambdataanalyser-apigateway (40onvict78)'.

API Gateway > APIs > Resources - Lambdataanalyser-apigateway (40onvict78) > Create method

Create method

Method details

Method type

GET ▼

Integration type

● Lambda function
Integrate your API with a Lambda function.

○ HTTP
Integrate with an existing HTTP endpoint.

○ Mock
Generate a response based on API Gateway mappings and transformations.

○ AWS service
Integrate with an AWS Service.

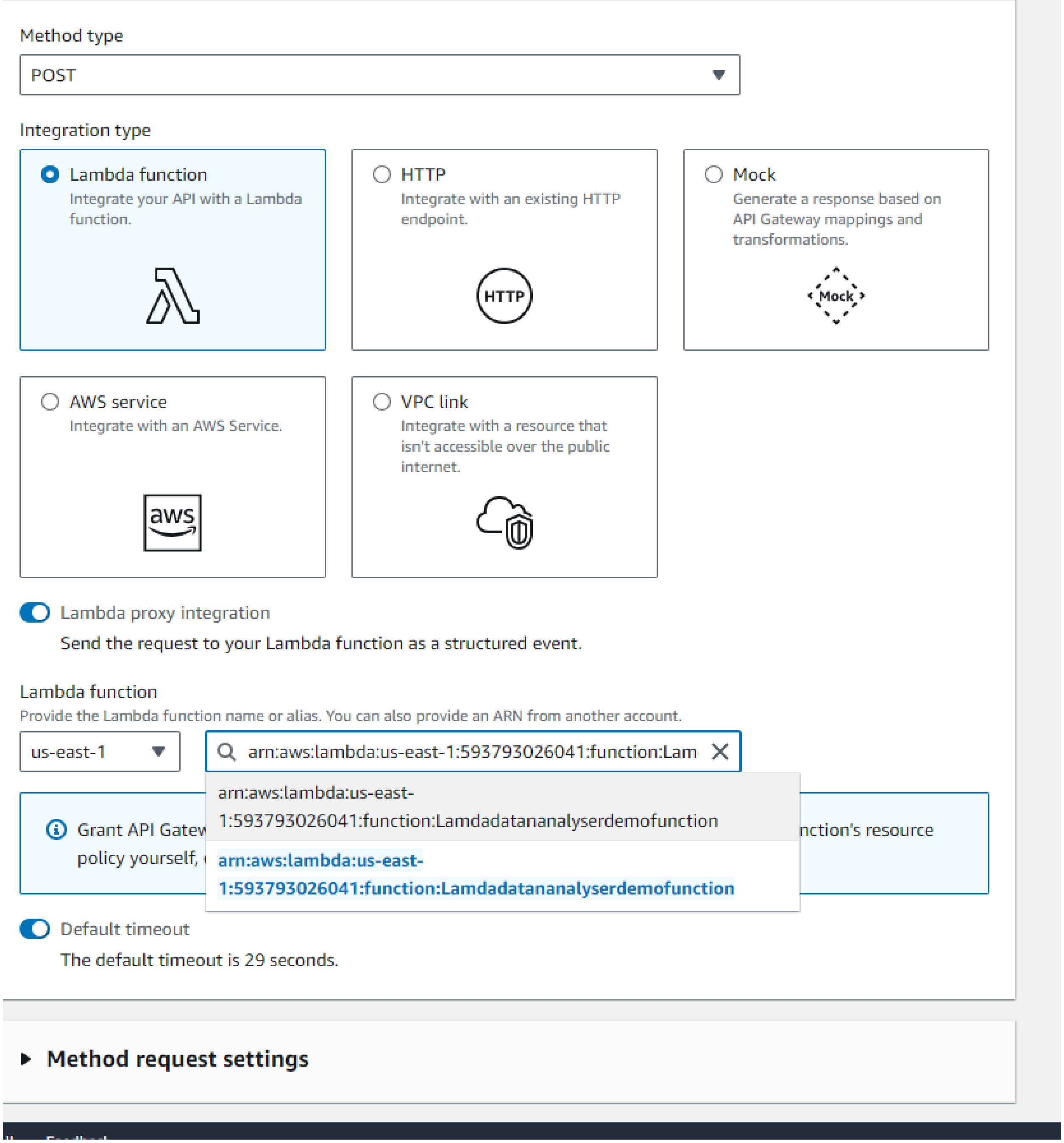
○ VPC link
Integrate with a resource that isn't accessible over the public internet.

Lambda proxy integration
Send the request to your Lambda function as a structured event.

Lambda function
Provide the Lambda function name or alias. You can also provide an ARN from another account.

us-east-1 ▼ | arn:aws:lambda:us-east-1:593793026041:function:Lam ✕

Grant API Gateway permission to invoke your Lambda function. To turn off, update the function's resource



Method type

POST ▼

Integration type

● Lambda function
Integrate your API with a Lambda function.

○ HTTP
Integrate with an existing HTTP endpoint.

○ Mock
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us-east-1 ▼ | arn:aws:lambda:us-east-1:593793026041:function:Lam ✕

arn:aws:lambda:us-east-1:593793026041:function:Lamdadatananalyserdemofunction

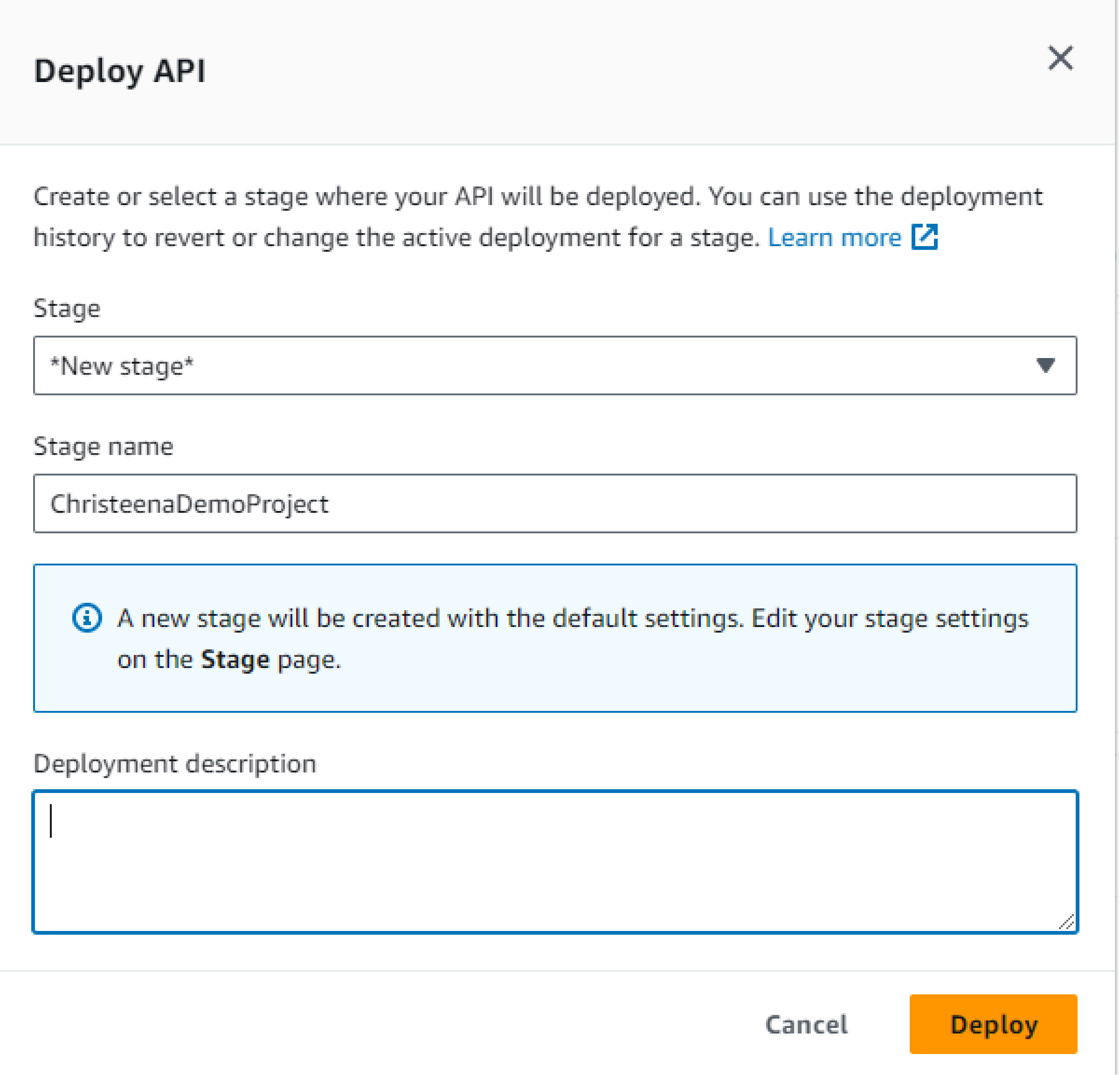
arn:aws:lambda:us-east-1:593793026041:function:Lamdadatananalyserdemofunction

Grant API Gatev ... nction's resource policy yourself, ...

Default timeout
The default timeout is 29 seconds.

▶ **Method request settings**

Step 6: Click on deploy api
Create a new stage
ChristeenaDemoProject



Deploy API

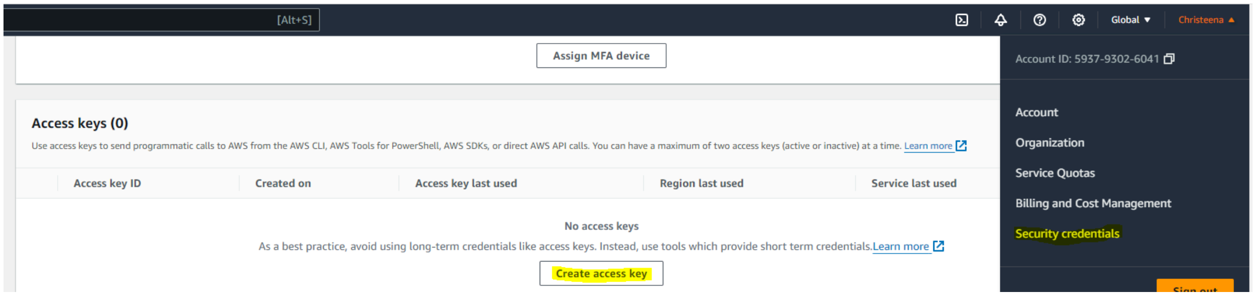
Create or select a stage where your API will be deployed. You can use the deployment history to revert or change the active deployment for a stage. Learn more

Stage: *New stage*

Stage name: ChristeenaDemoProject

A new stage will be created with the default settings. Edit your stage settings on the **Stage** page.

Deployment description:



Access keys (0)

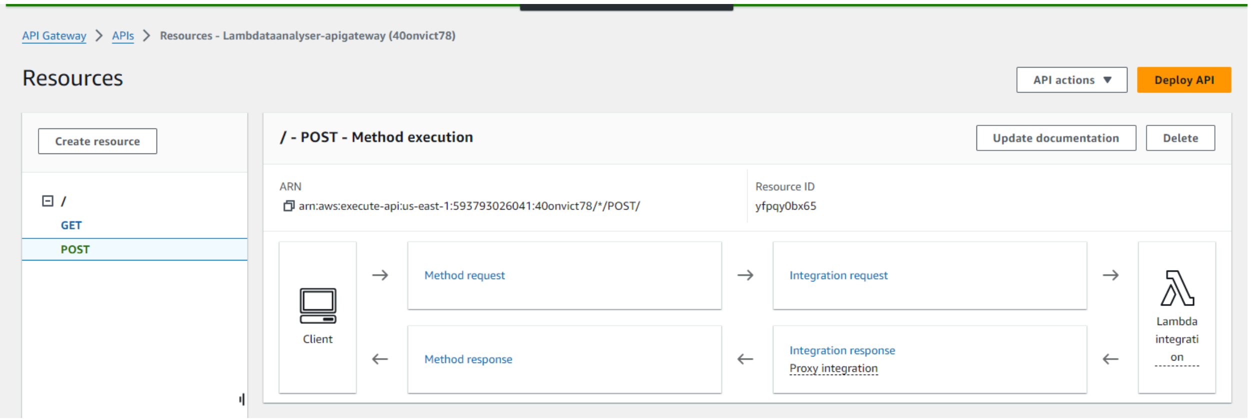
Use access keys to send programmatic calls to AWS from the AWS CLI, AWS Tools for PowerShell, AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time. Learn more

Access key ID	Created on	Access key last used	Region last used	Service last used

No access keys

As a best practice, avoid using long-term credentials like access keys. Instead, use tools which provide short term credentials.Learn more

Account ID: 5937-9302-6041

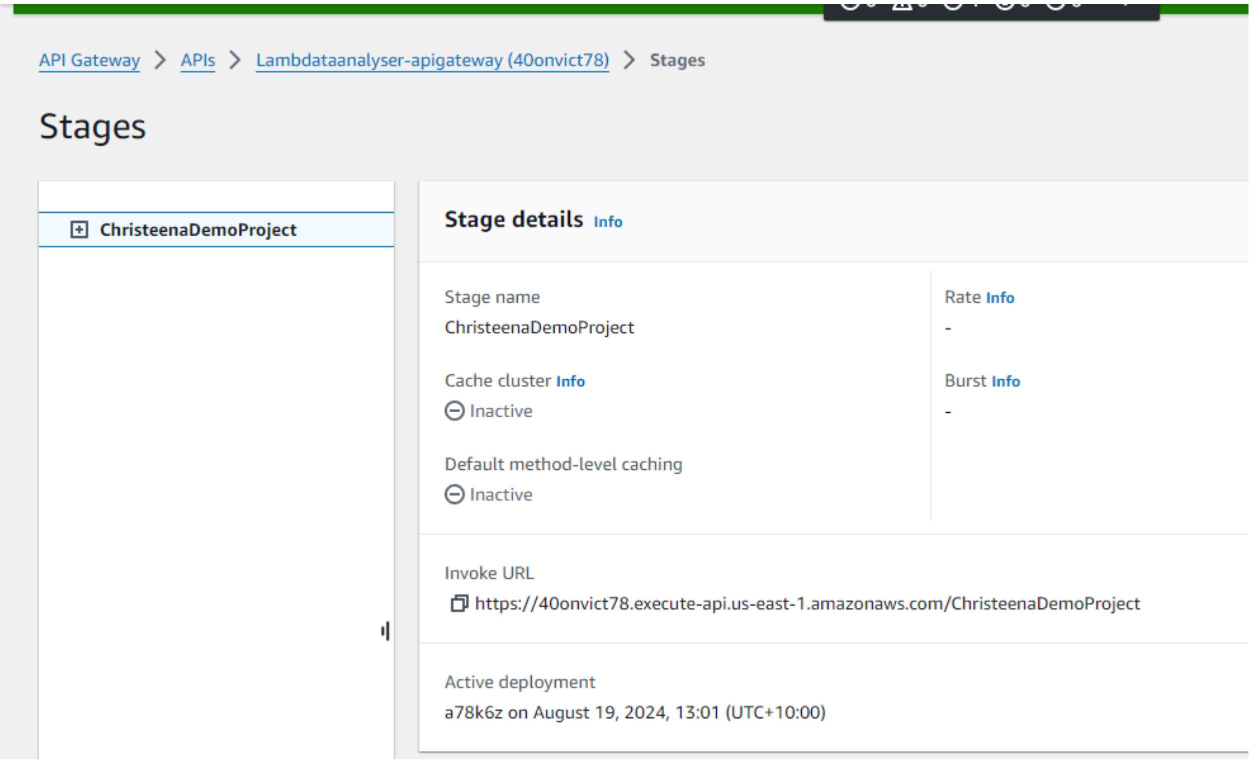


/ - POST - Method execution

ARN
arn:aws:execute-api:us-east-1:593793026041:40onvict78/*/POST/

Resource ID
yfpqy0bx65

Step 7: Copy Invoke url
https://40onvict78.execute-api.us-east-1.amazonaws.com/ChristeenaDemoProject


API Gateway > APIs > Lambdataanalyser-apigateway (40onvict78) > Stages
Stages
⊞ ChristeenaDemoProject
Stage details Info

Stage name
ChristeenaDemoProject

Rate Info
-

Cache cluster Info
⊖ Inactive

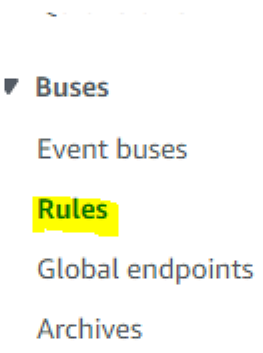
Burst Info
-

Default method-level caching
⊖ Inactive

Invoke URL
https://40onvict78.execute-api.us-east-1.amazonaws.com/ChristeenaDemoProject

Active deployment
a78k6z on August 19, 2024, 13:01 (UTC+10:00)

Step 7: Cloudwatch - Create Rules
Rule name : Schedulerdemo
Schedule for required time
Target -lambda and select our Lambda function



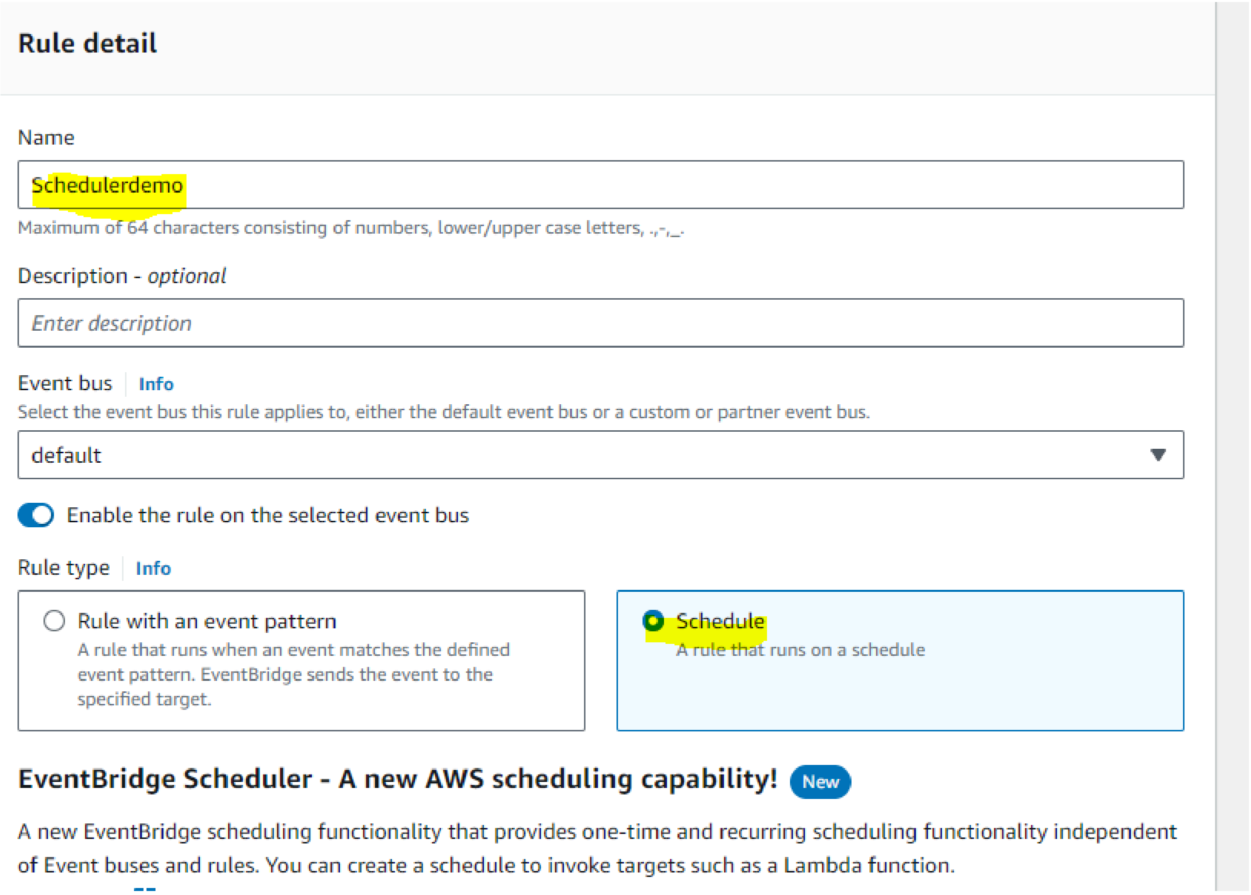
▼ Buses

Event buses

Rules

Global endpoints

Archives



Rule detail

Name

Schedulerdemo

Maximum of 64 characters consisting of numbers, lower/upper case letters, .,-,_.

Description - *optional*

Enter description

Event bus | Info

Select the event bus this rule applies to, either the default event bus or a custom or partner event bus.

default ▼

Enable the rule on the selected event bus

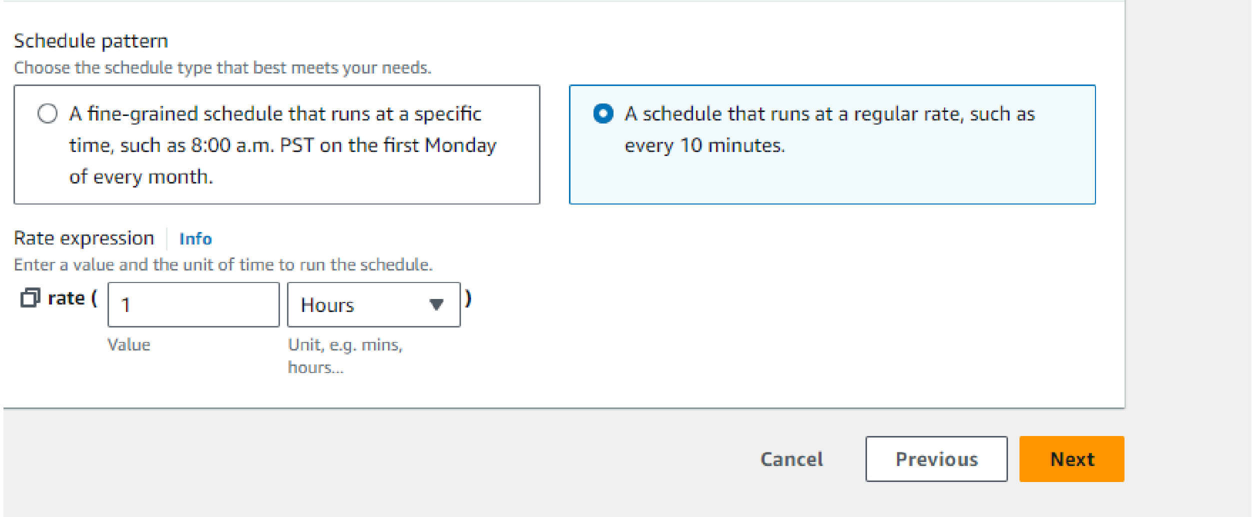
Rule type | Info

○ Rule with an event pattern
A rule that runs when an event matches the defined event pattern. EventBridge sends the event to the specified target.

● Schedule
A rule that runs on a schedule

EventBridge Scheduler - A new AWS scheduling capability! New

A new EventBridge scheduling functionality that provides one-time and recurring scheduling functionality independent of Event buses and rules. You can create a schedule to invoke targets such as a Lambda function.



Schedule pattern

Choose the schedule type that best meets your needs.

○ A fine-grained schedule that runs at a specific time, such as 8:00 a.m. PST on the first Monday of every month.

● A schedule that runs at a regular rate, such as every 10 minutes.

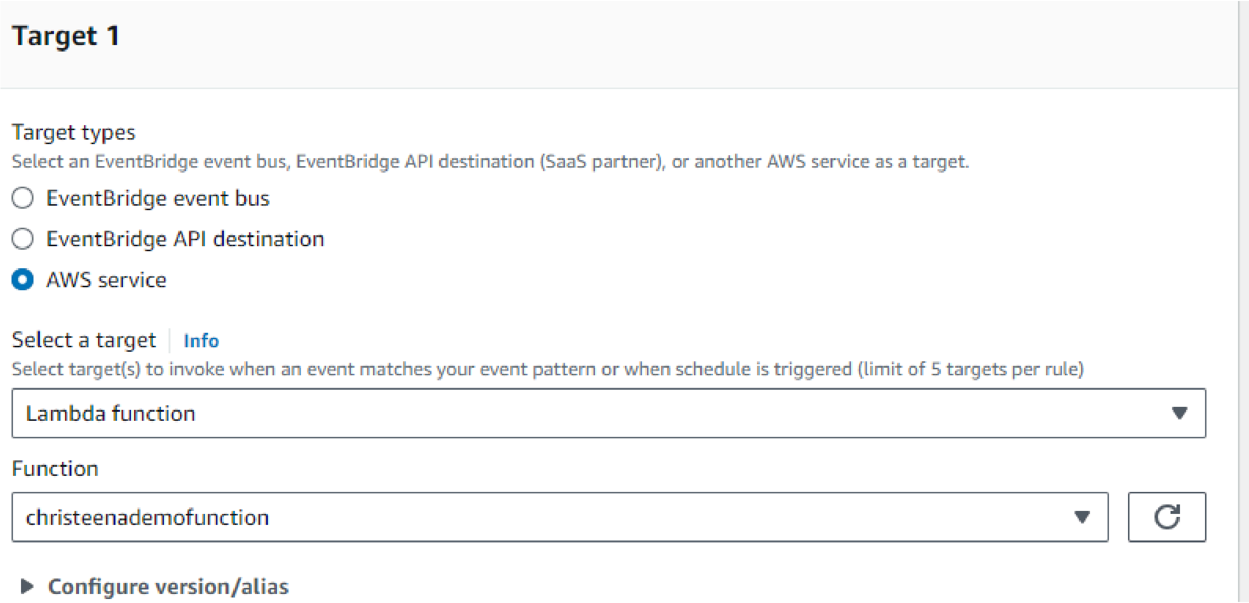
Rate expression | Info

Enter a value and the unit of time to run the schedule.

rate (1 Hours ▼)

Value: 1

Unit, e.g. mins, hours...: Hours



Target 1

Target types

Select an EventBridge event bus, EventBridge API destination (SaaS partner), or another AWS service as a target.

○ EventBridge event bus

○ EventBridge API destination

● AWS service

Select a target | Info

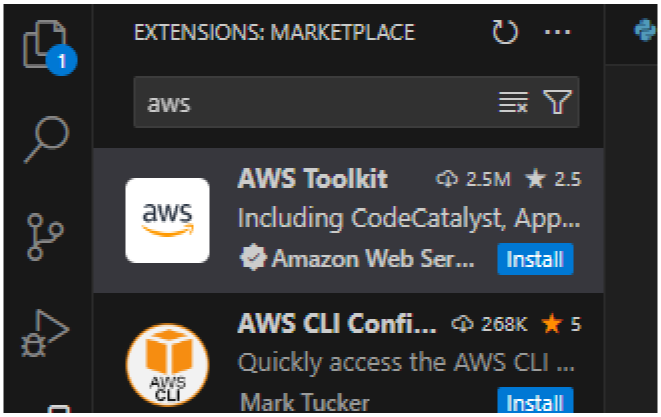
Select target(s) to invoke when an event matches your event pattern or when schedule is triggered (limit of 5 targets per rule)

Lambda function ▼

Function

christeenademofunction ▼

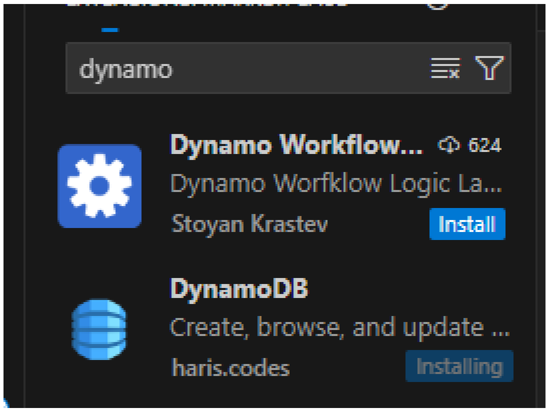
Vsc
Install aws toolkit



aws

AWS Toolkit ⯁ 2.5M ★ 2.5
Including CodeCatalyst, App...
Amazon Web Ser... Install

AWS CLI Confi... ⯁ 268K ★ 5
Quickly access the AWS CLI ...
Mark Tucker Install



dynamo

Dynamo Workflow... 624
Dynamo Worfklow Logic La...
Stoyan Krastev

DynamoDB
Create, browse, and update ...
haris.codes