AWS: Lambda 101

CS5224 Cloud Computing AY 2025/2026 Sem 1

Walkthrough

- What is a Lambda Function/ FaaS?
- Demo
  - Getting an API from data.gov
  - Writing the lambda function
  - Preparation
  - Implementing the function on AWS
  - Checking your implementation

What is a Lambda Function?

Function as a Service (FaaS)

- Deploy small, focused functions
- Event-driven execution
- Automatic scaling (0 to thousands of instances)
- Pay per execution + compute time

Key Characteristics:

- **Event-driven**: Triggered by HTTP requests, file uploads, database changes, etc.
- **Stateless**: Each execution is independent
- **Time-limited**: Maximum of 15-minute execution (AWS)
- **Multi-language**: Python, Node.js, Java, C#, Go, Ruby, and more

Benefits:

- No server management
- Automatic scaling
- Cost-effective (pay per use)
- High availability built-in

AWS Free Tier

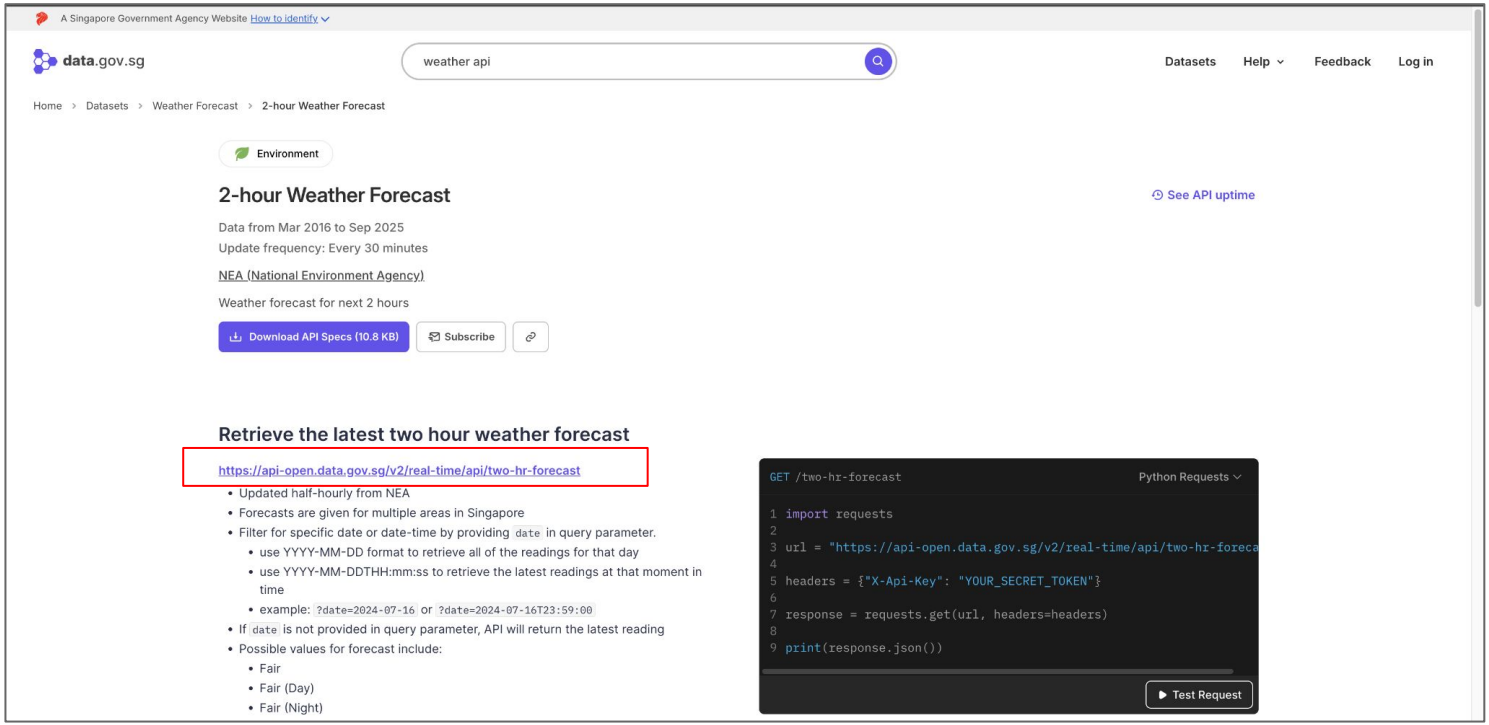
- One million free requests per month and
- 400,000 GB-seconds of compute time per month
- https://aws.amazon.com/lambda/pricing/

Lambda Function Recipe

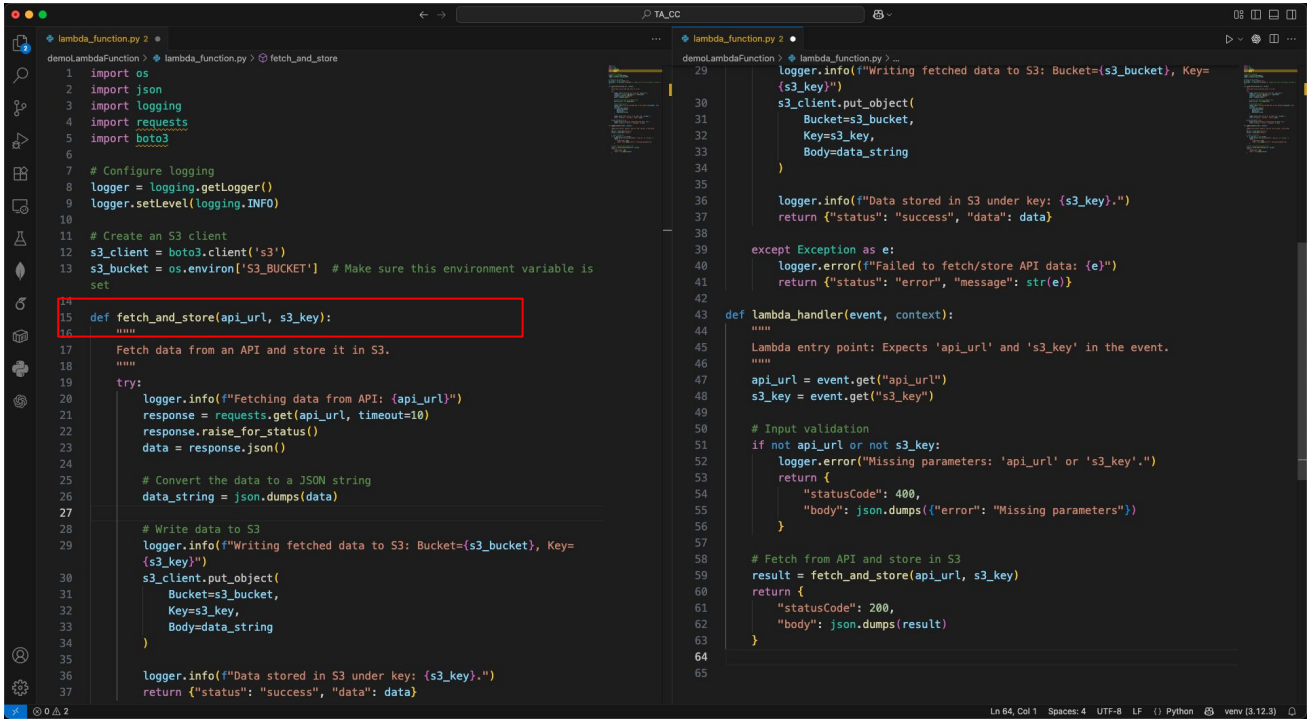
Demo: Calling a data.gov API

1. API to call
2. Program to call the APIs
    a. Zip file with requirements and **proper naming (gotcha #1)**
3. Set up S3 bucket (or DB to write your data to)
4. Function setup
    a. Upload function
    b. Update Lambda function permissions via IAM **(gotcha #2)**
    c. Testing

API to call


A Singapore Government Agency Website How to identify
data.gov.sg
weather api
Datasets
Help
Feedback
Log in
Home › Datasets › Weather Forecast › 2-hour Weather Forecast
Environment
2-hour Weather Forecast
See API uptime
Data from Mar 2016 to Sep 2025
Update frequency: Every 30 minutes
NEA (National Environment Agency)
Weather forecast for next 2 hours
Download API Specs (10.8 KB)
Subscribe
Retrieve the latest two hour weather forecast
https://api-open.data.gov.sg/v2/real-time/api/two-hr-forecast
• Updated half-hourly from NEA
• Forecasts are given for multiple areas in Singapore
• Filter for specific date or date-time by providing date in query parameter.
• use YYYY-MM-DD format to retrieve all of the readings for that day
• use YYYY-MM-DDTHH:mm:ss to retrieve the latest readings at that moment in time
• example: ?date=2024-07-16 or ?date=2024-07-16T23:59:00
• If date is not provided in query parameter, API will return the latest reading
• Possible values for forecast include:
• Fair
• Fair (Day)
• Fair (Night)
GET /two-hr-forecast
Python Requests
1 import requests
2
3 url = "https://api-open.data.gov.sg/v2/real-time/api/two-hr-foreca
4
5 headers = {"X-Api-Key": "YOUR_SECRET_TOKEN"}
6
7 response = requests.get(url, headers=headers)
8
9 print(response.json())
Test Request

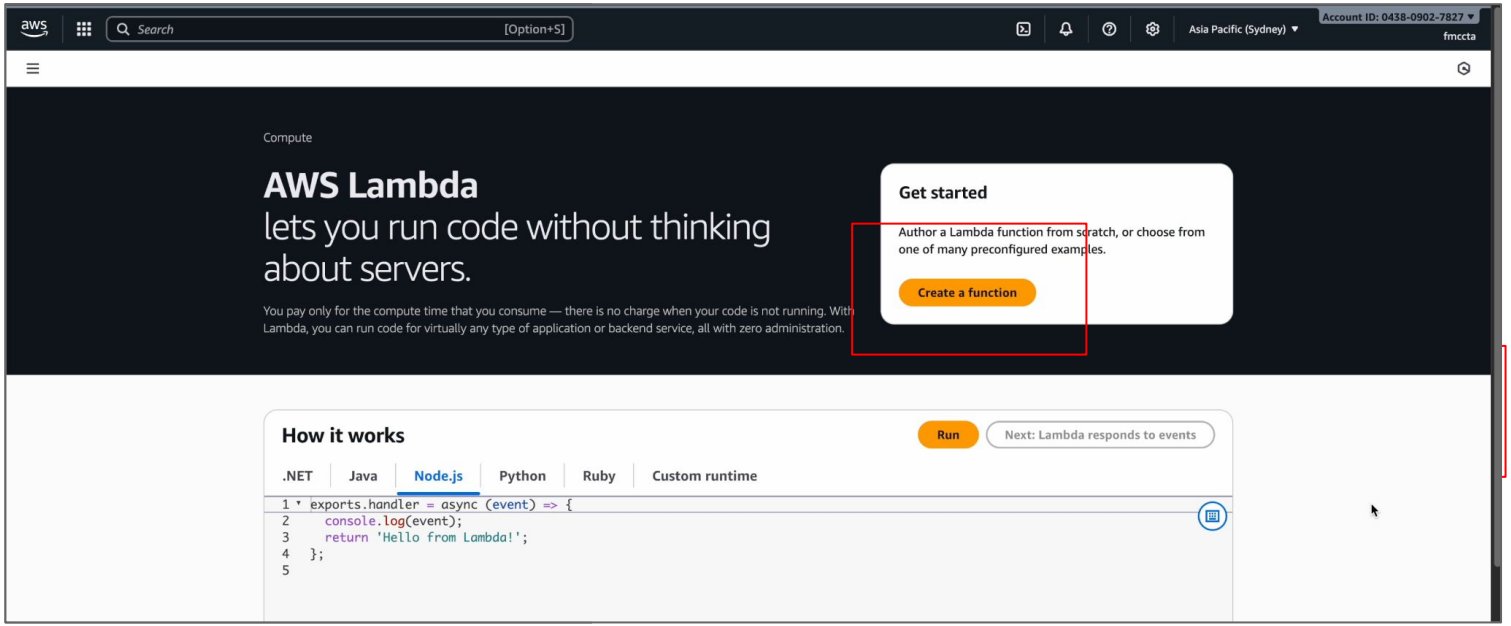
Function



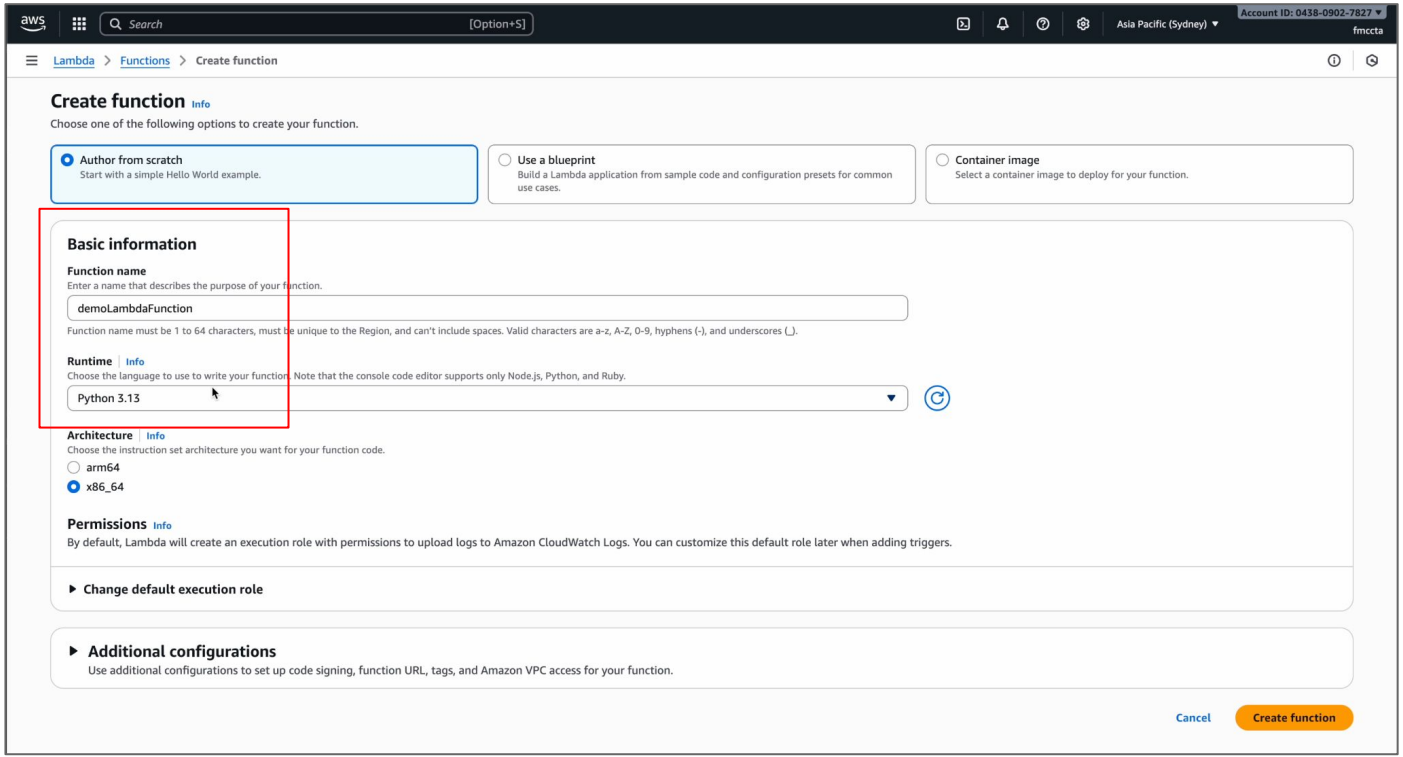
Notes:

- Your file name MUST be lambda_function.py
- From within the folder with your function,
  cd my_lambda
  pip install requests -t .
- Zip the entire folder
  zip -r ../my_lambda_deployment.zip .

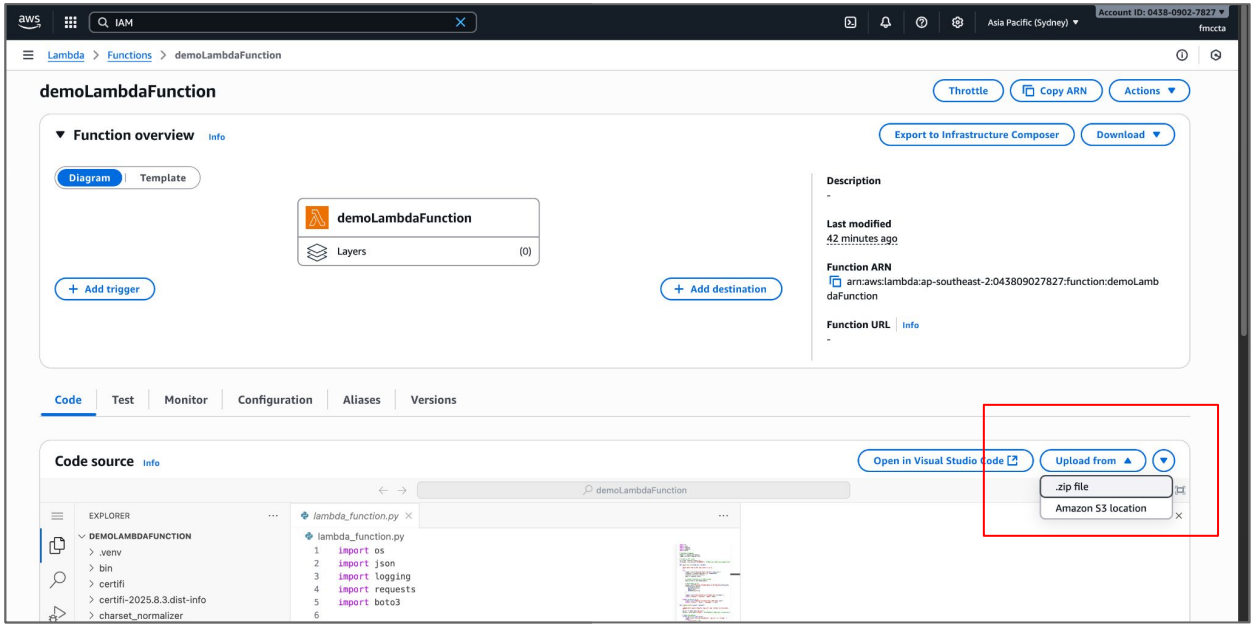
AWS Lambda


aws
Search
[Option+S]
Asia Pacific (Sydney)
Account ID: 0438-0902-7827
fmccta
Compute
AWS Lambda
lets you run code without thinking about servers.
You pay only for the compute time that you consume — there is no charge when your code is not running. With Lambda, you can run code for virtually any type of application or backend service, all with zero administration.
Get started
Author a Lambda function from scratch, or choose from one of many preconfigured examples.
Create a function
How it works
Run
Next: Lambda responds to events
.NET
Java
Node.js
Python
Ruby
Custom runtime
1 exports.handler = async (event) => {
2 console.log(event);
3 return 'Hello from Lambda!';
4 };
5

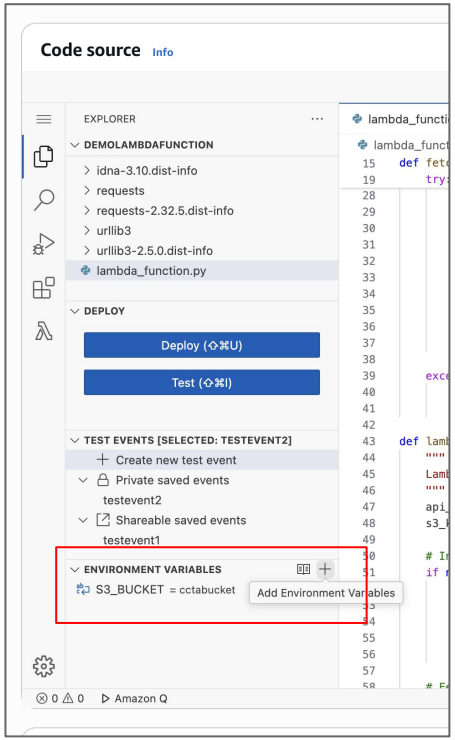
AWS Lambda

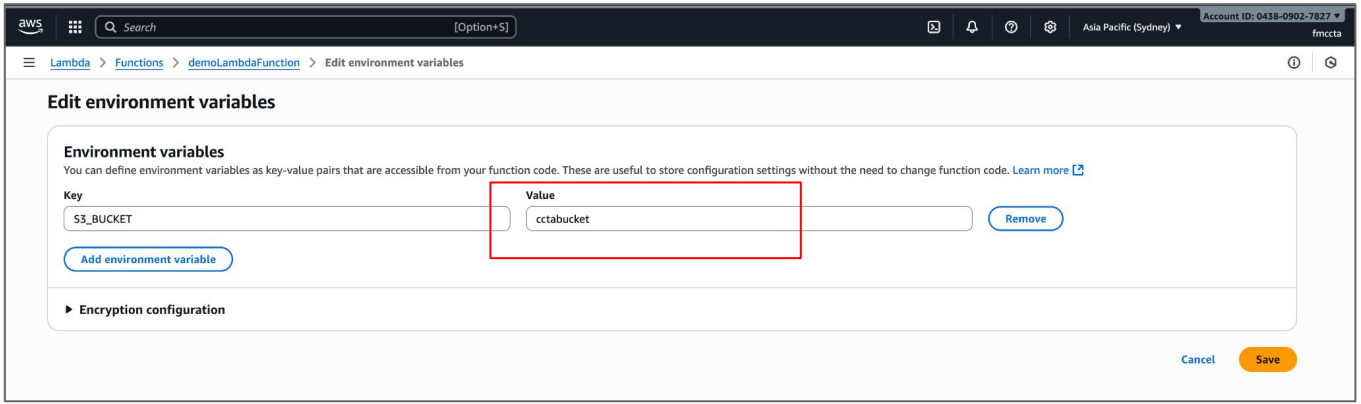

aws
Search
[Option+S]
Asia Pacific (Sydney)
Account ID: 0438-0902-7827
fmccta
Lambda > Functions > Create function
Create function Info
Choose one of the following options to create your function.
Author from scratch
Start with a simple Hello World example.
Use a blueprint
Build a Lambda application from sample code and configuration presets for common use cases.
Container image
Select a container image to deploy for your function.
Basic information
Function name
Enter a name that describes the purpose of your function.
demoLambdaFunction
Function name must be 1 to 64 characters, must be unique to the Region, and can't include spaces. Valid characters are a-z, A-Z, 0-9, hyphens (-), and underscores (_).
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 3.13
Architecture Info
Choose the instruction set architecture you want for your function code.
arm64
x86_64
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
Additional configurations
Use additional configurations to set up code signing, function URL, tags, and Amazon VPC access for your function.
Cancel
Create function

AWS Lambda

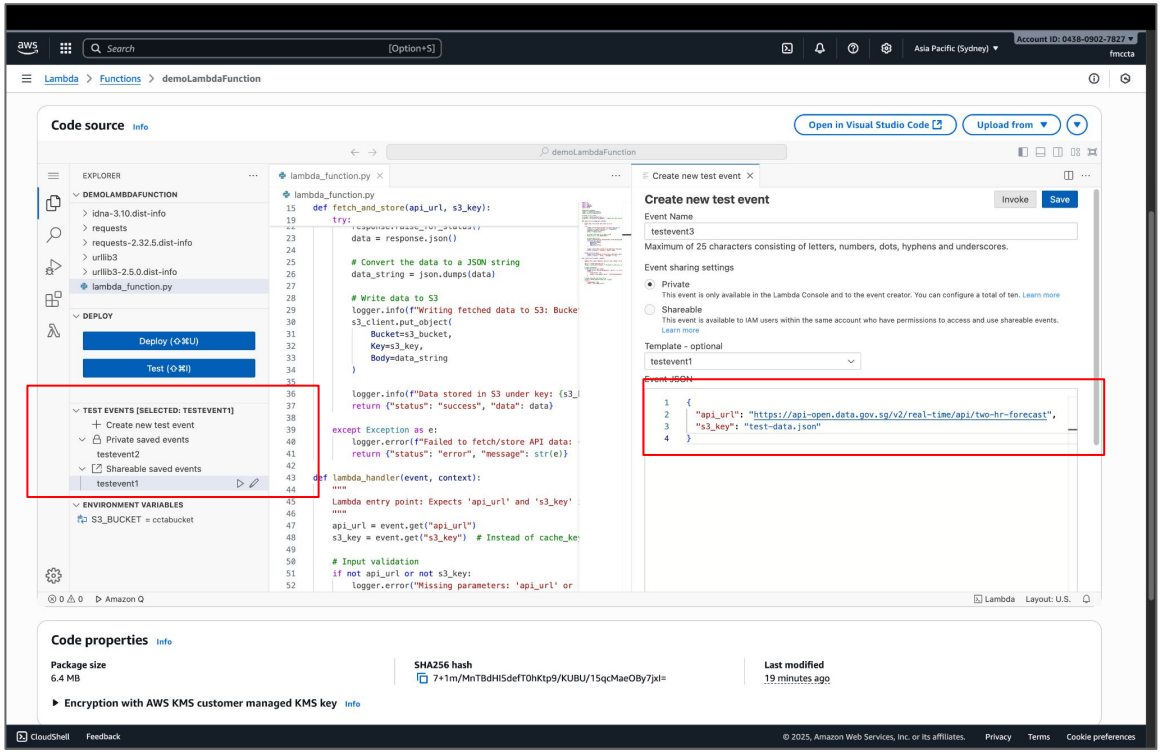

IAM
Asia Pacific (Sydney)
Lambda > Functions > demoLambdaFunction
demoLambdaFunction
Throttle
Copy ARN
Actions
Function overview
Info
Export to Infrastructure Composer
Download
Diagram
Template
demoLambdaFunction
Layers
(0)
Add trigger
Add destination
Description
-
Last modified
42 minutes ago
Function ARN
arn:aws:lambda:ap-southeast-2:043809027827:function:demoLambdaFunction
Function URL
Info
-
Code
Test
Monitor
Configuration
Aliases
Versions
Code source
Info
Open in Visual Studio Code
Upload from
.zip file
Amazon S3 location
EXPLORER
DEMOLAMBDAFUNCTION
.venv
bin
certifi
certifi-2025.8.3.dist-info
charset_normalizer
lambda_function.py
import os
import json
import logging
import requests
import boto3

AWS Lambda - Environment Variables

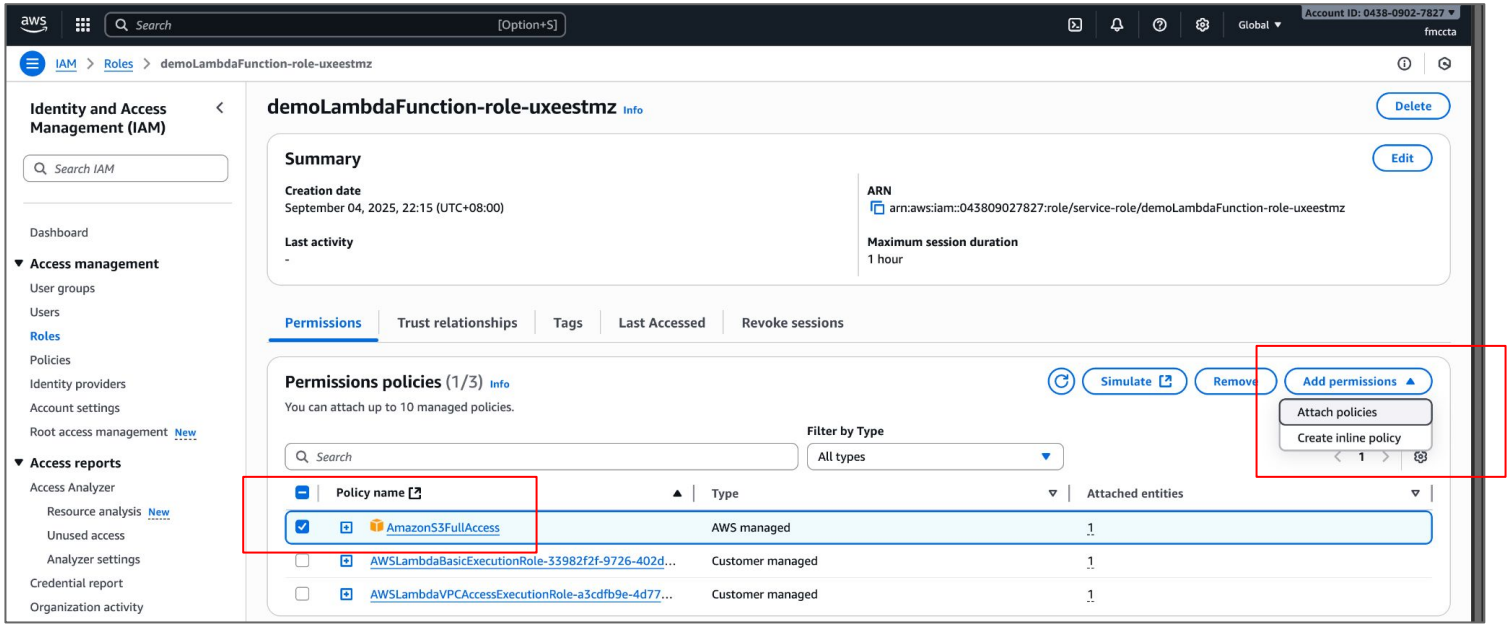




AWS Lambda - Test Event



AWS IAM Roles - Lambda Permissions



AWS Lambda - Success!