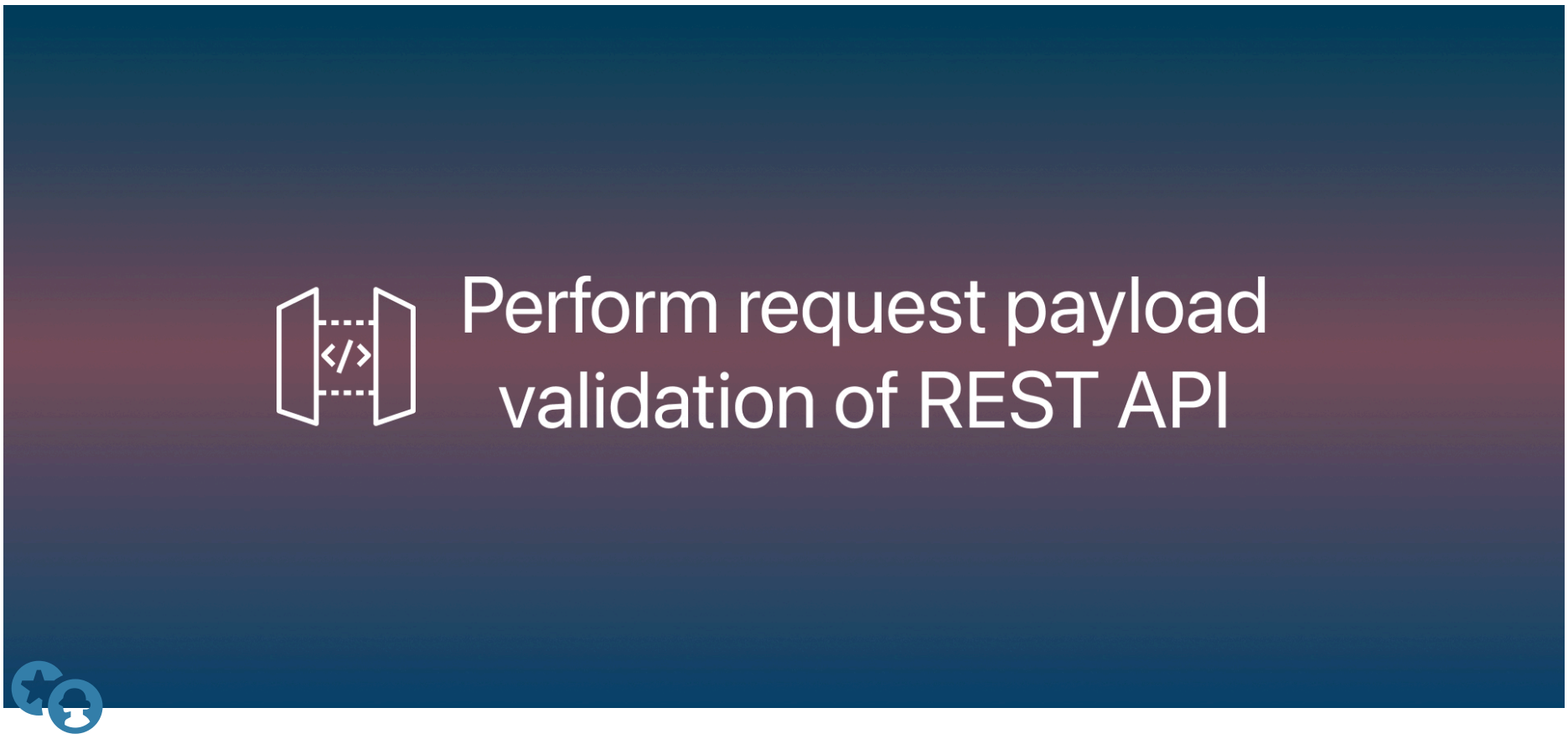


Payload Validation of REST API

Created by	Ⓝ Niyush Bjr
Created time	@22 December 2025 22:57
level	Intermediate
Description	Payload Validation of REST API with CRUD functionality.
AWS Services	API Gateway DynamoDB Lambda
Other tools	Postman
Category	Application-Integration
Buy-Me-a-Coffee	http://buymeacoffee.com/niyushbjr1L

■ ❒ ❑ ※ ⌘ . ⊞ ★ ● ⇒ ❒

Perform request payload validation of REST API.

API Gateway : It allows developers to expose REST API endpoint and in turns allows to integrate with multiple backend systems such as Lambda Function.
It has a feature to enable the validation — before it forwards the request to backend system.

▼ ❑ What this project aims?

This project demonstrates how to enable request payload validation in API Gateway before requests are forwarded to backend systems. I focuses on exposing REST API endpoints through API Gateway that integrates with Lambda functions.

▼ ❑ Key Learning Objectives :

1. Request Validation Fundamentals:
    - Understanding how to validate that request payloads contain all required fields, and that fields follow expected patterns.
    - Learning to specify validation rules in a request validator and assign the validator to individual API methods.
2. Technical Implementation :
    - Creating JSON Schema models in API Gateway to define payload structure.
    - Validating request bodies by specifying a model schema and verifying that the required parameters are valid and not null.

❑ Importance of payload validation :

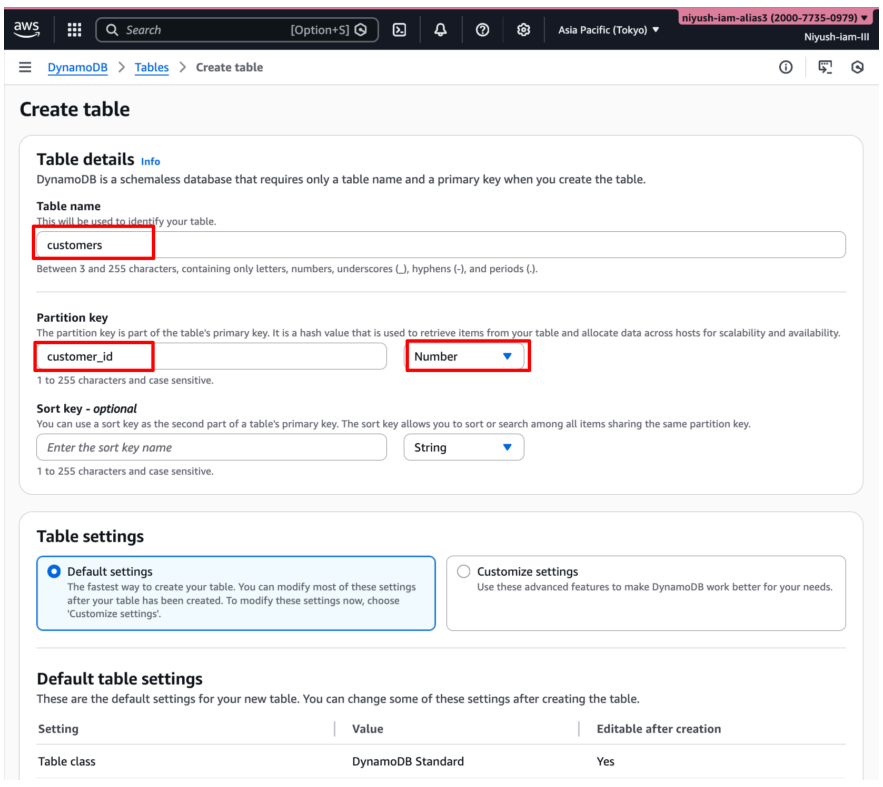
- `Cost optimization` :
    - It’s better to keep business logic separate from validation checks, and requests can be rejected at the API Gateway level if payloads are invalid, saving Lambda execution costs.
- `Code Quality & Maintainability.`
    - Implementing basic validation of input data is one of the necessary but least exciting aspects of building a robust REST API
    - Reduces code bloat by eliminating repetitive validation logic in backend functions
- `Security & Reliablity.`
    - Provides a first line of defense against malformed or malicious requests
    - Ensures data integrity before processing begins
- `Performance.`
    - Filters out invalid requests early in the request lifecycle
    - Reduces unnecessary backend processing and improves overall API performance

---

⌘ Step 1 : Creating DynamoDB table.

- Navigate to DynamoDB → `Create Table`
- Table Name : `customers`
- Partition key : `customer_id` (Number)
- Leave others to default and click on `create table`

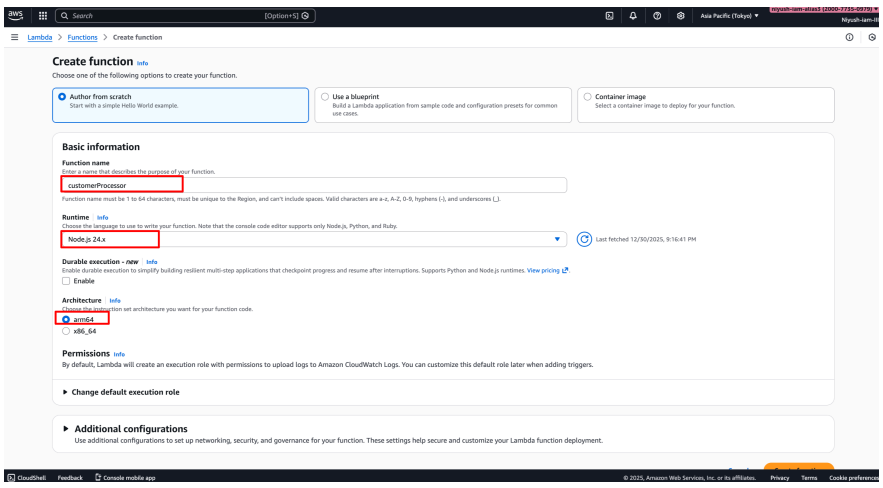
▼ Image : Creating DynamoDB Table



⌘ Step 2 : Create Lambda Function

- Navigate to Lambda → `Create Function`
- Function name : `customerProcessor`
- Runtime : `Node.js`
- Architecture : `arm64`
- Finally `Create function`

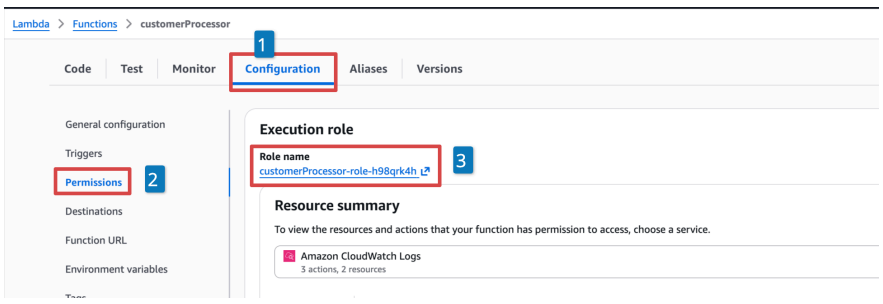
▼ Image : Creating Lambda Function.

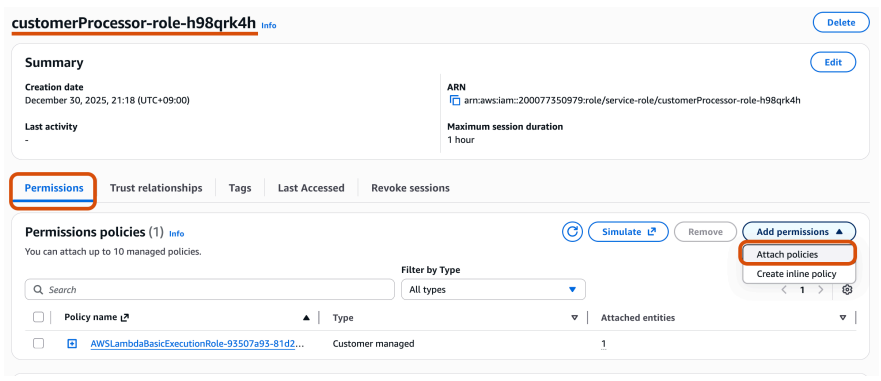


⌘ Step 2a : Adding DynamoDB permissions to Lambda Execution role.

- In Lambda function page → `Configuration` → `Permission`
- execution role name under “Execution Role”
- In IAM **Add permissions** → `Attach policies`
- Look for : `AmazonDynamoDBFullAccess` and attach it.

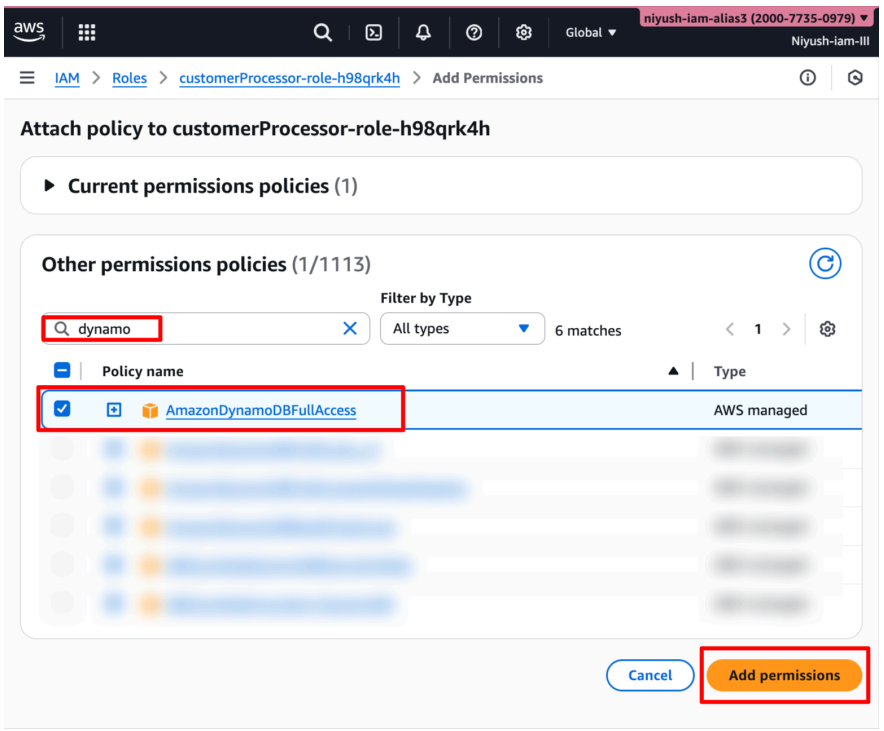
▼ Image : Adding DynamoDB permissions to Lambda

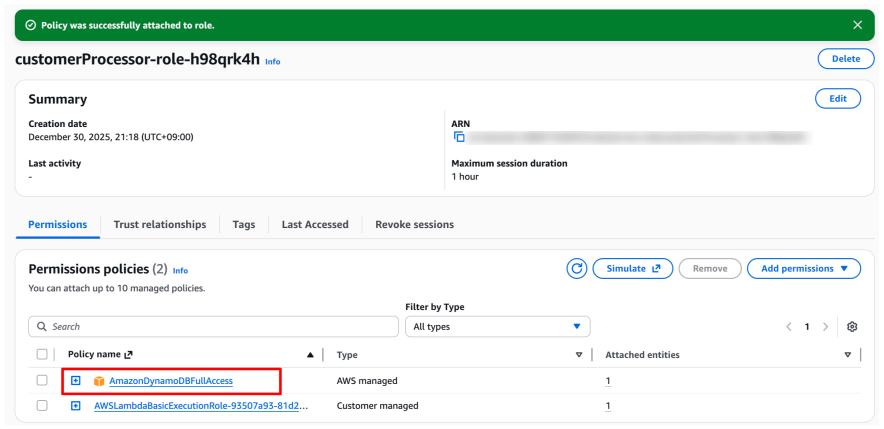




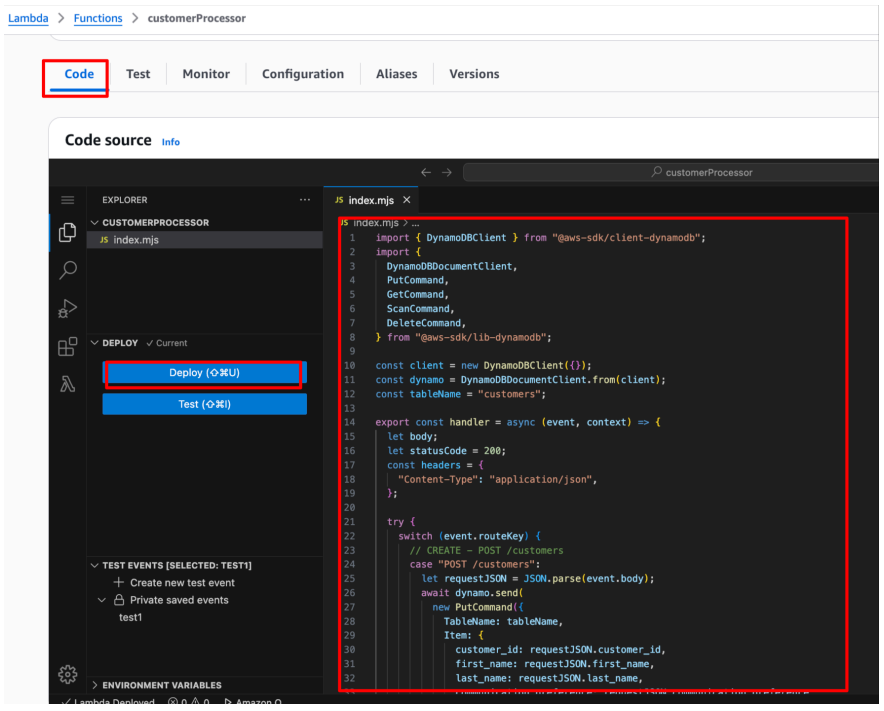
⌘ Step 2b : Add the lambda code.

- In lambda , `code` section paste the code and hit `deploy` .





▼ Image : Test and Deploy the Code



▼ Node JS code below

```
import { DynamoDBClient } from "@aws-sdk/client-dynamodb";
import {
  DynamoDBDocumentClient,
  PutCommand,
  GetCommand,
  ScanCommand,
  DeleteCommand,
} from "@aws-sdk/lib-dynamodb";

const client = new DynamoDBClient({});
const dynamo = DynamoDBDocumentClient.from(client);
const tableName = "customers";

export const handler = async (event, context) => {
  let body;
  let statusCode = 200;
const headers = {
  "Content-Type": "application/json",
};

try {
  // Get HTTP method and resource path
  const httpMethod = event.httpMethod;
  const resource = event.resource;
  const routeKey = `${httpMethod} ${resource}`;

  console.log("Route Key:", routeKey);
  console.log("Event:", JSON.stringify(event));

  switch (routeKey) {
    // CREATE - POST /customers
    case "POST /customers":
      let requestJSON = JSON.parse(event.body);
      await dynamo.send(
        new PutCommand({
          TableName: tableName,
          Item: {
            customer_id: requestJSON.customer_id,
            first_name: requestJSON.first_name,
            last_name: requestJSON.last_name,
            communication_preference: requestJSON.communication_preference,
            created_at: new Date().toISOString(),
          },
        })
      );
      body = `Customer ${requestJSON.customer_id} created successfully`;
      break;

    // READ ALL - GET /customers
    case "GET /customers":
      body = await dynamo.send(
        new ScanCommand({ TableName: tableName })
      );
      body = body.Items;
      break;
```

```
    // READ ONE - GET /customers/{id}
    case "GET /customers/{id}":
      body = await dynamo.send(
        new GetCommand({
          TableName: tableName,
          Key: {
            customer_id: parseInt(event.pathParameters.id),
          },
        })
      );
      body = body.Item;
      break;

    // UPDATE - PUT /customers/{id}
    case "PUT /customers/{id}":
      let updateJSON = JSON.parse(event.body);
      await dynamo.send(
        new PutCommand({
          TableName: tableName,
          Item: {
            customer_id: parseInt(event.pathParameters.id),
            first_name: updateJSON.first_name,
            last_name: updateJSON.last_name,
            communication_preference: updateJSON.communication_preference,
            created_at: new Date().toISOString(),
          },
        })
      );
      body = `Customer ${event.pathParameters.id} updated successfully`;
      break;

    // DELETE - DELETE /customers/{id}
    case "DELETE /customers/{id}":
      await dynamo.send(
        new DeleteCommand({
          TableName: tableName,
          Key: {
            customer_id: parseInt(event.pathParameters.id),
          },
        })
      );
      body = `Customer ${event.pathParameters.id} deleted successfully`;
      break;

    default:
      throw new Error(`Unsupported route: "${routeKey}"`);
  }
} catch (err) {
  statusCode = 400;
  body = err.message;
} finally {
  body = JSON.stringify(body);
}

return {
  statusCode,
  body,
  headers,
```

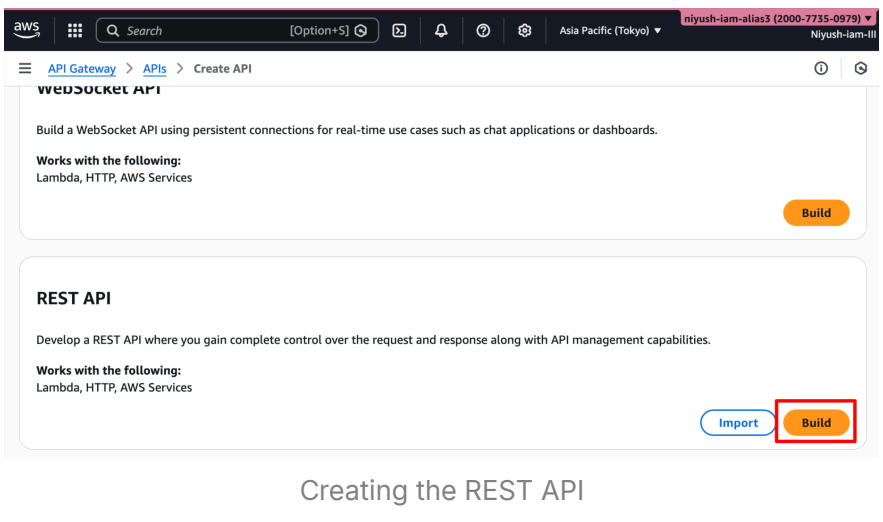
```
  };
};
```

⌘ Step 3 : Setting up the API GateWay.

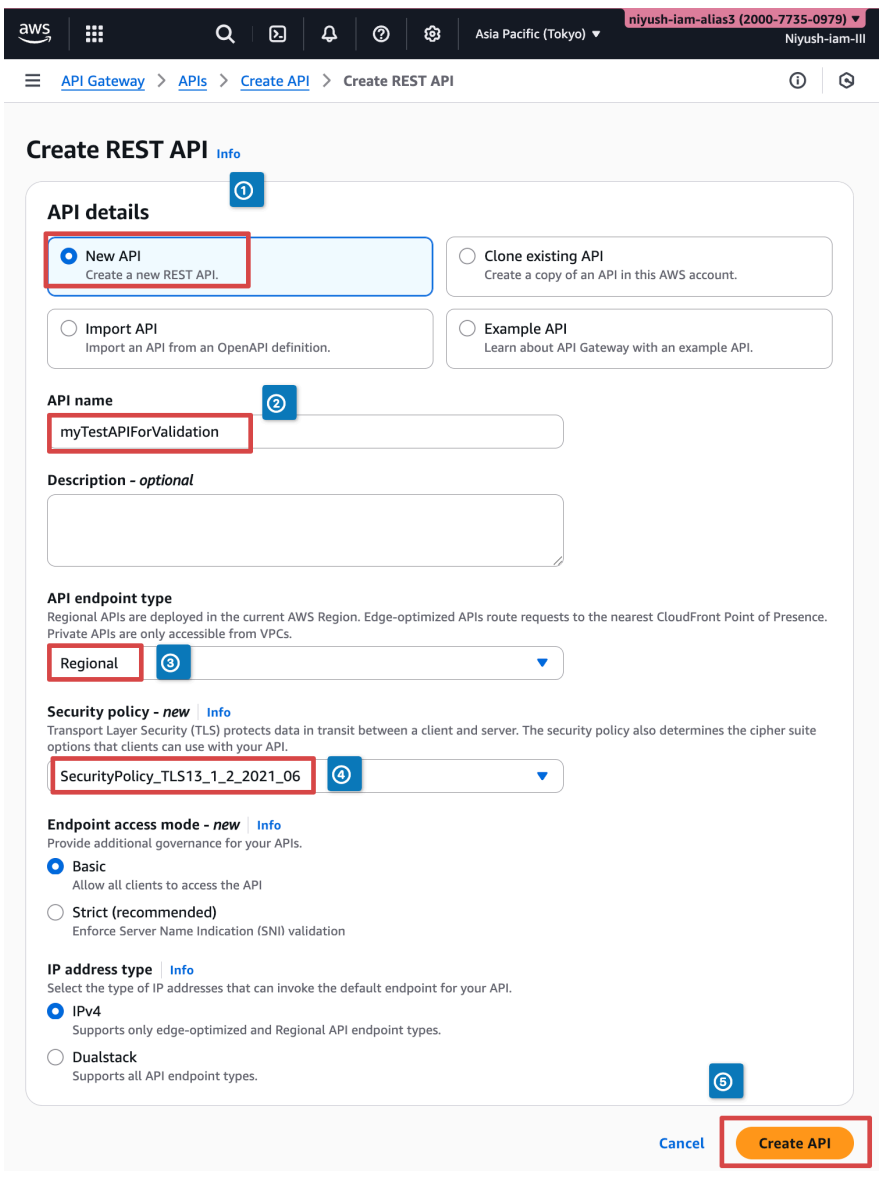
- Navigate to AWS Console ⇒ Head over to `API Gateway`
- Select `REST API` ⇒ click on `Build`
- Protocol : `REST` ⇒ `New API`
- API Name : `myTestAPIForValidation`
- Description : optional
- Endpoint Type : `Regional`
- Security Policy : `SecurityPolicy_TLS13_1_2_2021_6`

"Finally click on `Create API`"

▼ Image : REST API Creation



Creating the REST API



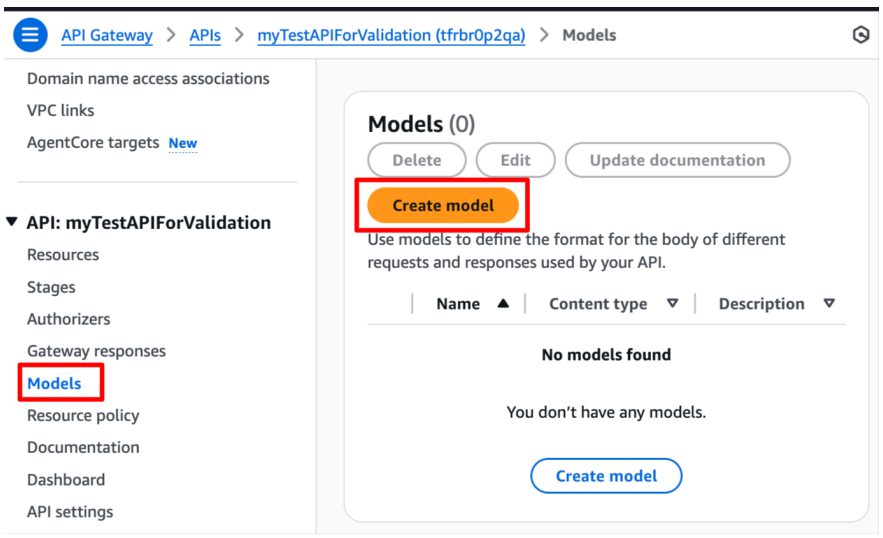
⌘ Step 4 : Create a Model.

- Go to API ⇒ from left nav panel `Model` ⇒ `Create Model`
- Model name : `mySampleModel`
- Content type : `application/json`

▼ Model Schema

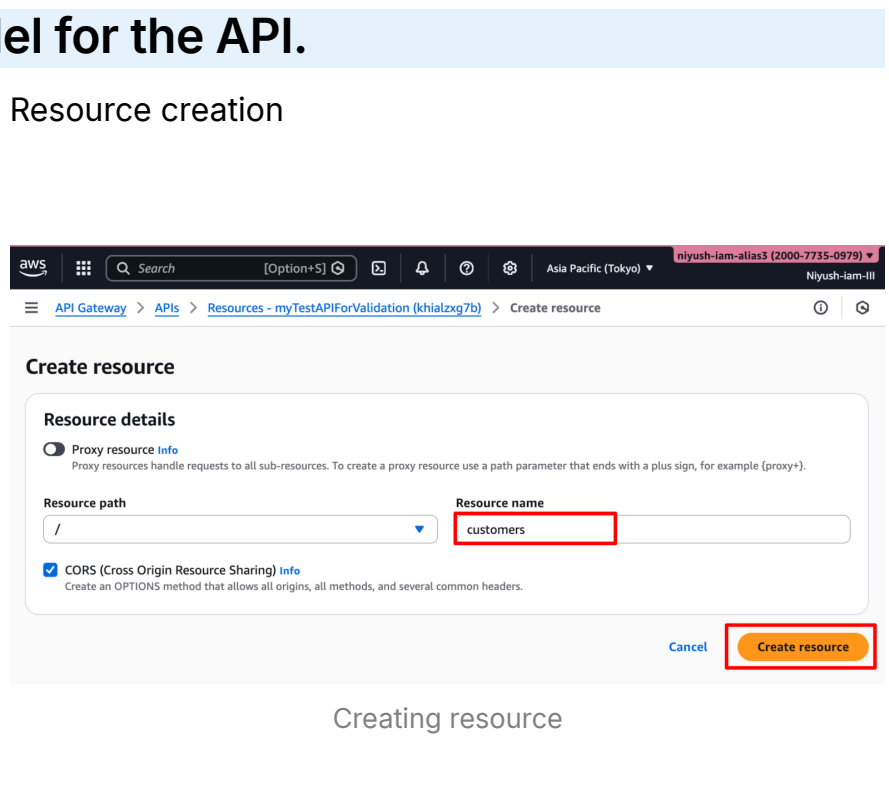
▼ Image : Model Creation.

```
{
  "$schema": "http://json-schema.org/draft-04/schema#",
  "title" : "Customer Schema",
  "type" : "object",
  "properties": {
    "customer_id": {
      "type": "integer"
    },
    "first_name": {
      "type": "string"
    },
    "last_name": {
      "type": "string"
    },
    "communication_preference": {
      "enum": ["email", "sms", "voice_call"]
    }
  },
    "required": ["customer_id", "first_name", "last_name", "communication_preference"]
  }
```



Creating model

- Click on `Create` to create the model.



Defining the schema for the model

⌘ Step 5 : Create a Resource & Enable Model for the API.

- Go to API ⇒ click **Resources**
- Select the root resource `/`
- Click **Create Resource**
- Resource name: `customers`
- Resource path: `/customers`
- ☑ CORS
- Click **Create Resource**
- Select `/customers` resource
- Click **Create Method**
- Select **POST**
- Integration type: **Lambda Function**
- Toggle **Lambda Proxy Integration** ON
- Lambda Function: `customerProcessor`
- Click **Save**

▼ Resource creation

Creating resource

- Click **OK** when prompted to add permissions

Create method for all i.e. `POST` `PUT` `GET` `DELETE`

Resources	/customers	/customers/{id}
	GET and POST	PUT, DELETE, GET

⌘ Step 5a : Set Up Request Validator

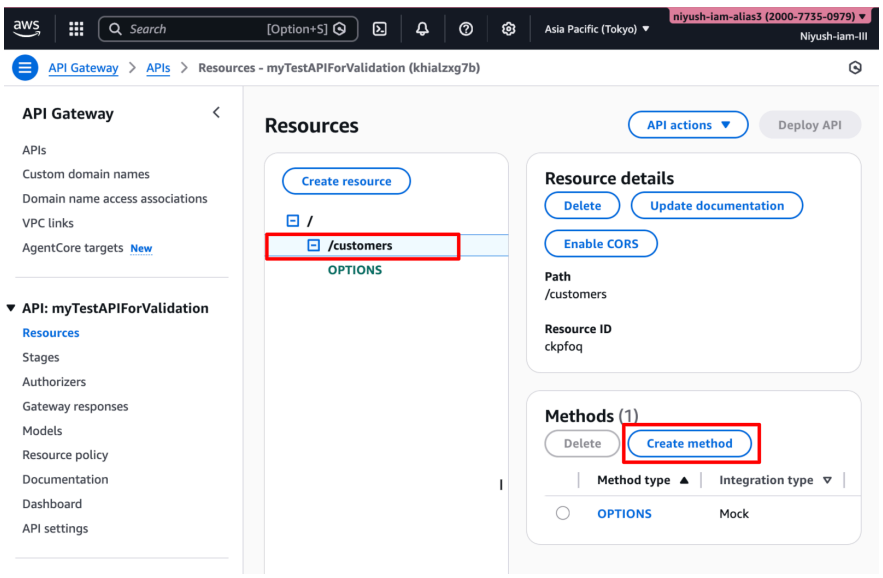
1. Click **Request Validators**
2. Click **Create Request Validator**
3. Name: `ValidateCustomerBody`
4. Check: ✓ **Validate request body**
5. Uncheck: × "Validate request parameters"
6. Click **Create**

⌘ Step 5b : Apply Validator to POST Method

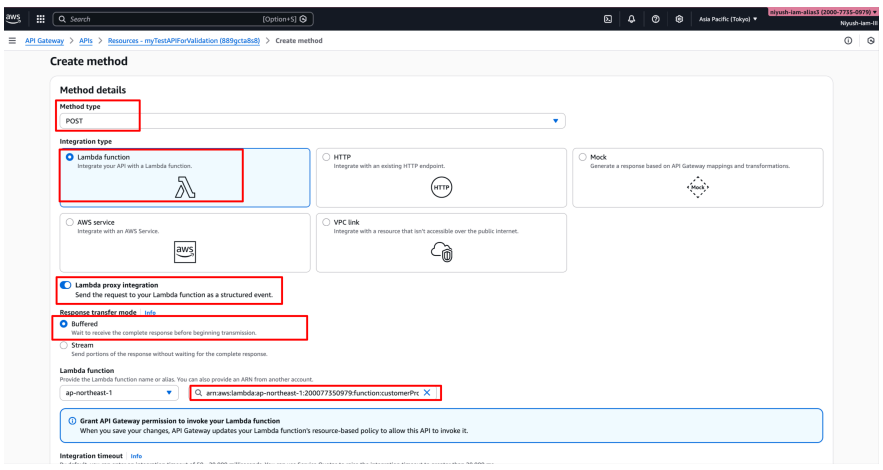
1. Go to **Resources** → `/customers` → **POST**
2. Click **Method Request** ⇛ `Edit`
3. Scroll down to **Request Validator** dropdown
4. Select `ValidateCustomerBody`
5. Scroll to **Request Body** section
6. Click **Add Model**
   a. Content-Type: `application/json`
   b. Model name: `mySampleModel`

▼ ABOUT **OPTIONS** and **Request Validator**

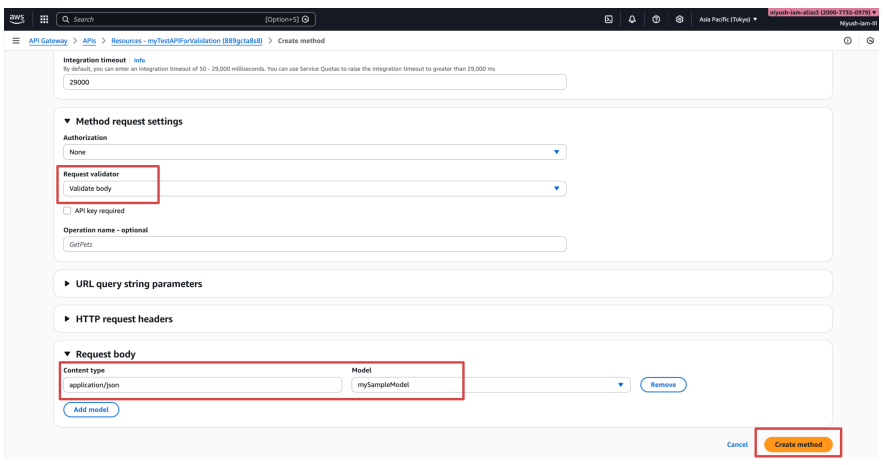
▼ POST Method Creation



Creating POST Method



Don’t forget to toggle Lambda proxy integration



Request Validator : `validate body` Request Body : `application/json` , mySampleModel

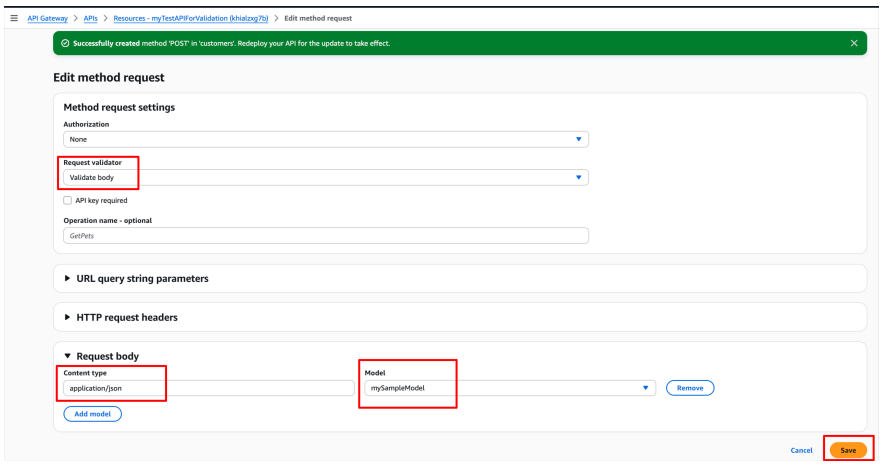
OPTIONS method:

- Used for **CORS preflight requests**
- Automatically sent by browsers before actual requests
- Has **no request body** to validate
- Should return quickly with headers only

What OPTIONS does:

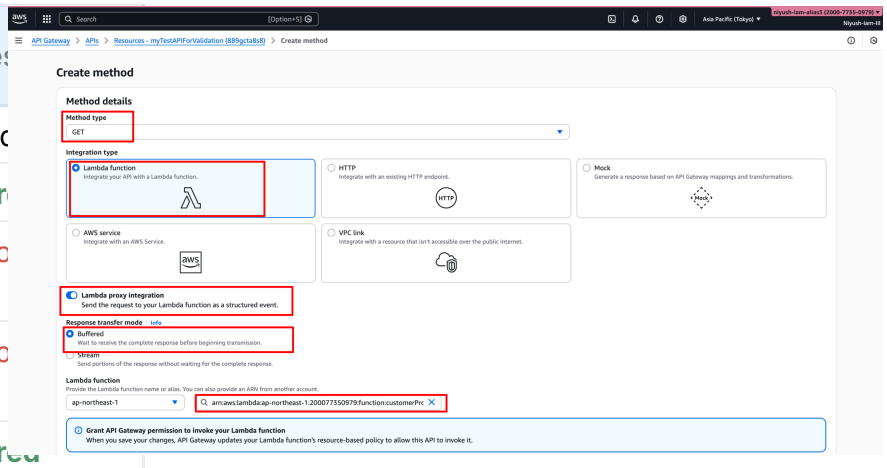
- Tells client what methods are allowed (GET, POST, PUT, DELETE)
- Tells client what headers are accepted
- Returns 200 OK with CORS headers

Method	resource	Request Validator	Reques
OPTIONS	/customers	Not Required	Not rec
POST	/customers	**Required**	**Requir**
GET	/customers	NO (no body in GET)	NO (no GET)
GET single	/customer/{id}	NO (no body in GET)	NO (no GET)
PUT	/customers/{id}	**Required**	**Required**
DELETE	/customers/{id}	NO (no body in DELETE)	NO (no body in GET)



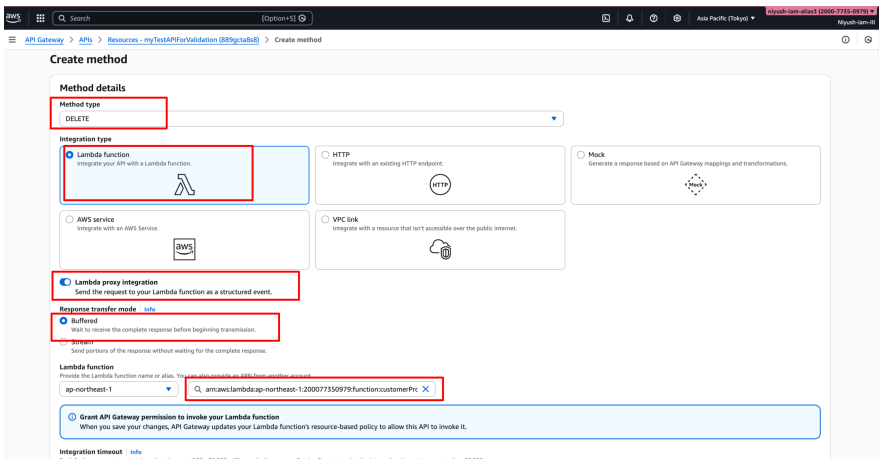
▼ GET Method Creation

Request Validator and Request Body not required



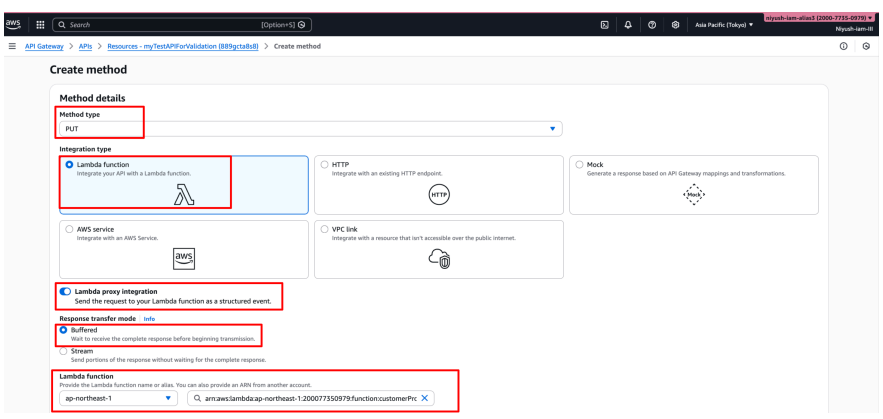
▼ DELETE Method Creation

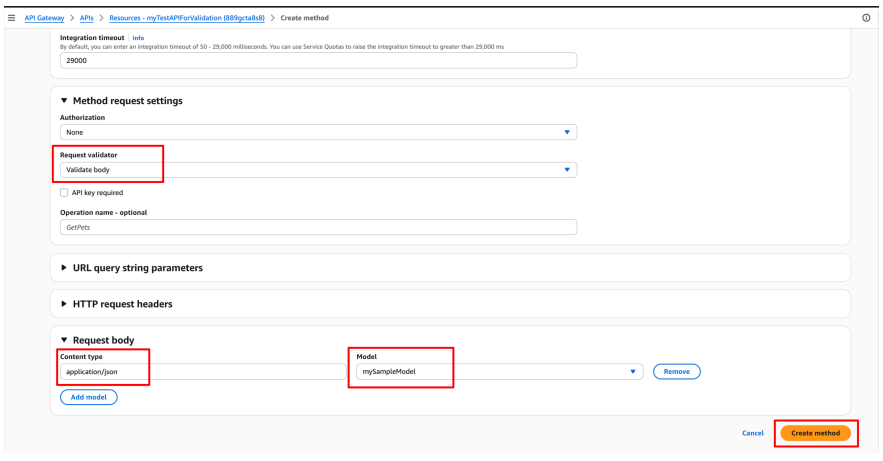
Request Validator and Request Body not required



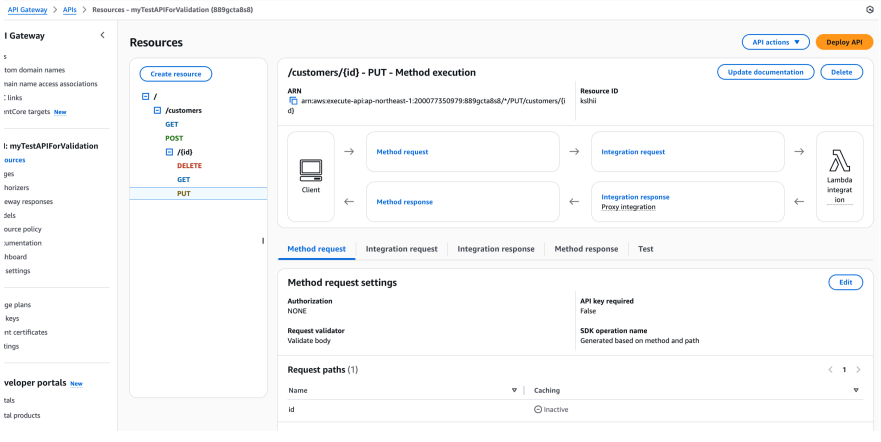
▼ PUT Method Creation

Request Validator and Request Body required





▼ Final Product once all Method are created



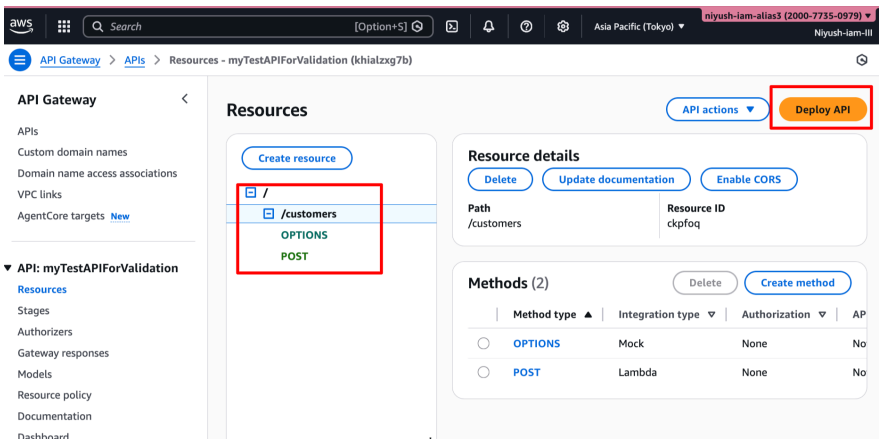
⌘ Step 6 : Deploy the API.

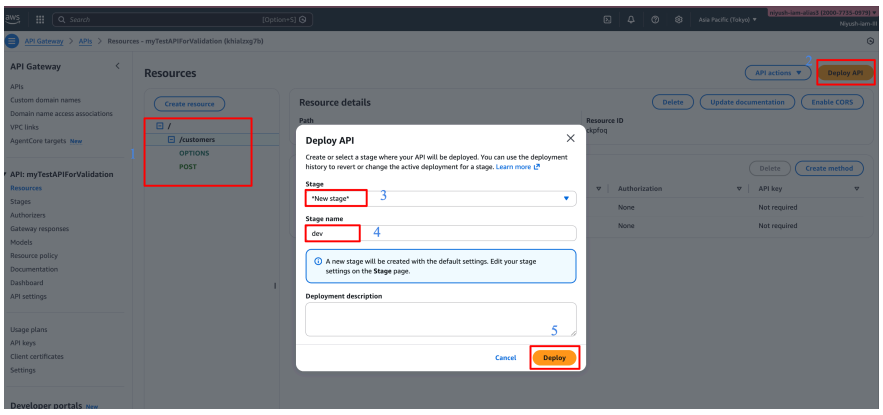
- Resource ⇛ `/` ⇛ `POST` ⇛ `Actions` ⇛ Deploy API.
- Deployment Stage : `NewStage`
- Stage name : `test`

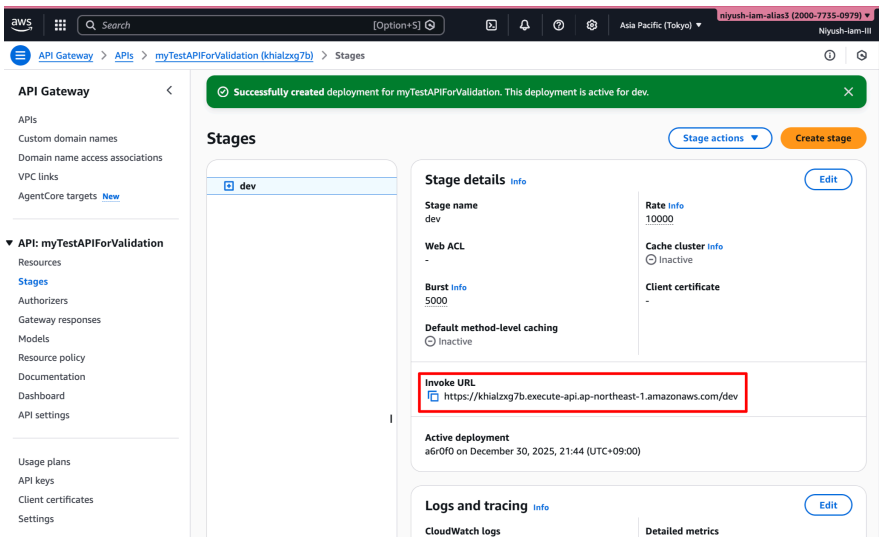
Finally click on `Deploy`

Head over to `Stages` ⇛ Click on Deployment ⇛ Copy the `Invoke URL` to test the API endpoint.

▼ Image : Deploying the API







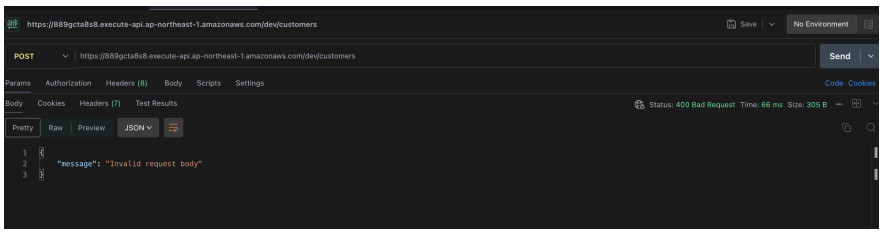
⌘ Step 7 : Test and Validate the API Endpoint with Request Payload.

Open `Postman` and Click on `New Request` ⇒ `POST` request

Test #1 : No Request Body payload.

- in `POST` request enter the `Invoke URL`
- Click on `Send`
- you should see a `Status : 400 Bad Request` as response.

▼ Image : Test #1 No Request Body payload



Expected Response.

Status: 400 Bad Request

```
{
 "message" : "Invalid request body"
}
```

Test #2 : Wrong Schema Parameters.

As per the defined JSON Schema `communication_preference` can only be `[email, sms, voice_call]`

- In Postman, with the same Invoke URL ⇒ `POST`
- Body: use the below test pattern

```
{
   "customer_id" : "122",
   "first_name" : "John",
   "last_name" : "Doe",
   "communication_preference" : "Phone_Call"
}
```

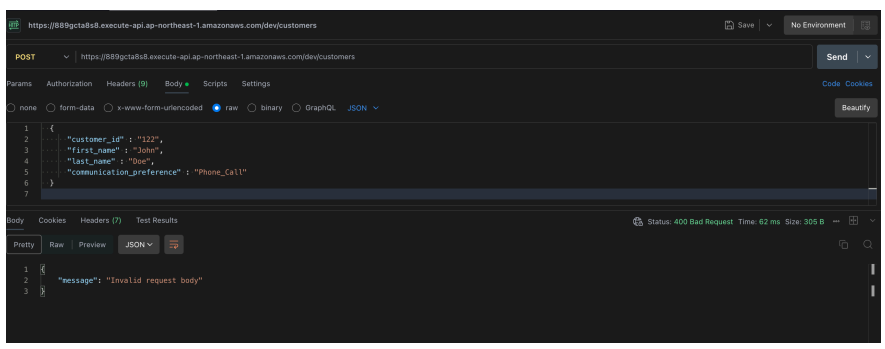
> This will return an error since we have not define Phone_call option in our JSON Schema.

Expected Response.

Status: 400 Bad Request

```
{
"message": "Invalid request body",
"errors": [
   "Invalid enum value. Must be one of: email, sms, voic
e_call"
   ]
}
```

▼ Image : Test #2 Wrong Schema parameters



Test #3 : Correct Schema Parameters.

In postman follow the same steps taken above for test 1 and 2.

- New Request
- Method : `POST`
- Copy and Paste the API Gateway's Invoke URL.
- In the body section paste the below code.

```
{
   "customer_id": 123,
   "first_name": "John",
   "last_name": "Doe",
   "communication_preference": "email"
}
```

- finally click on `Send`

Expected Response.

- This time you should see `Status : 200 OK`

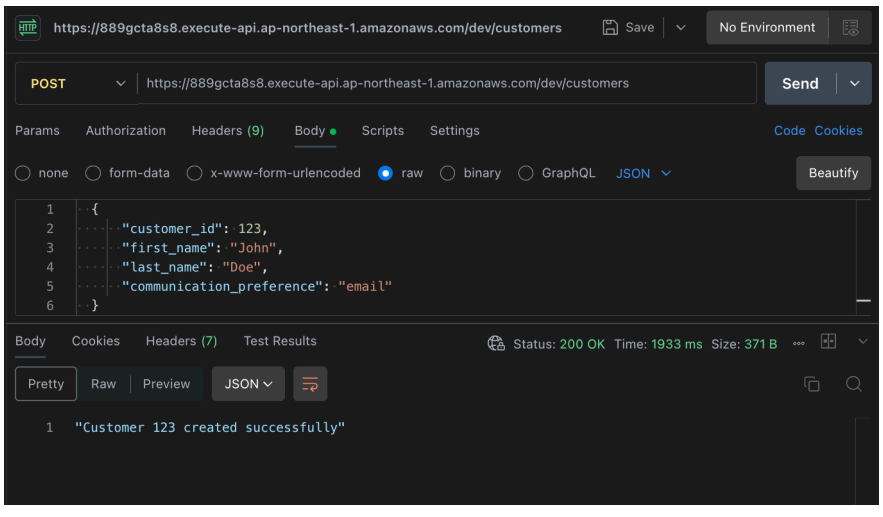
Test #4: Missing Required Field

The schema requires all four fields. Let's test what happens when we omit one.

- Method: `POST`
- Invoke URL: (same as before)
- Body:

```
{
   "customer_id": 123,
   "first_name": "John",
   "last_name": "Doe"
   // Missing: communication_preference
}
```

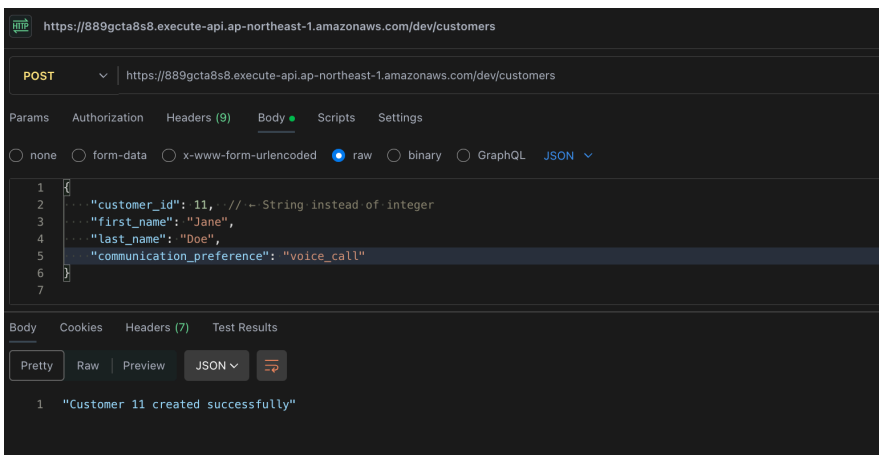
▼ Image : Test #3 Correct Schema parameters



Expected Response :

Status: 400 Bad Request

```
{
   "message": "Invalid request body",
   "errors": [
      "Missing required property: communication_prefere
nce"
   ]
}
```



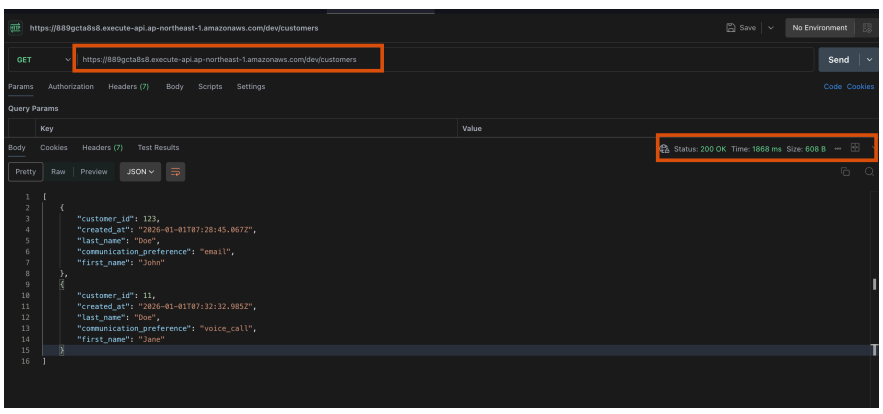
Test #5 : Wrong Data Type.

`customer_id` should be an integer, not a string.

- Method: `POST`
- Invoke URL: (same as before)
- Body:

```
{
   "customer_id": "123",  // ← String instead of integer
   "first_name": "John",
   "last_name": "Doe",
   "communication_preference": "email"
}
```

▼ GET all items

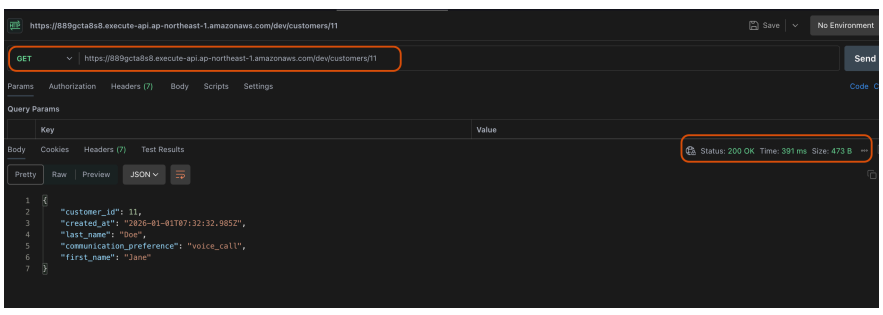


Expected Response :

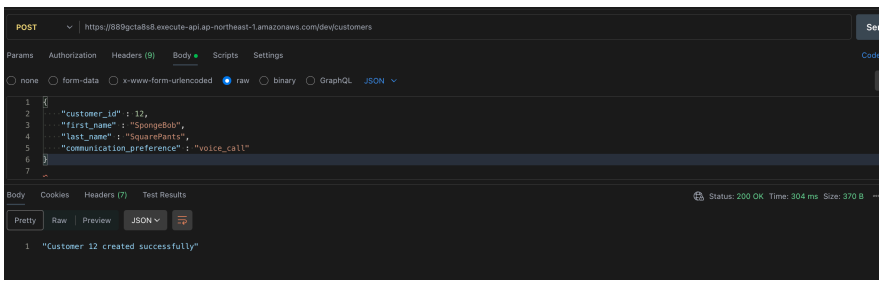
Status: 400 Bad Request

```
{
   "message": "Invalid request body",
   "errors": [
      "Invalid type. Expected: integer, but got: string"
   ]
}
```

▼ GET Single Item

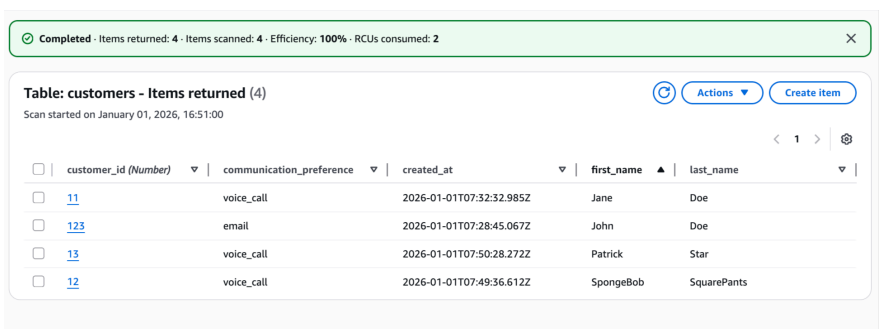


▼ Creating Items with POST

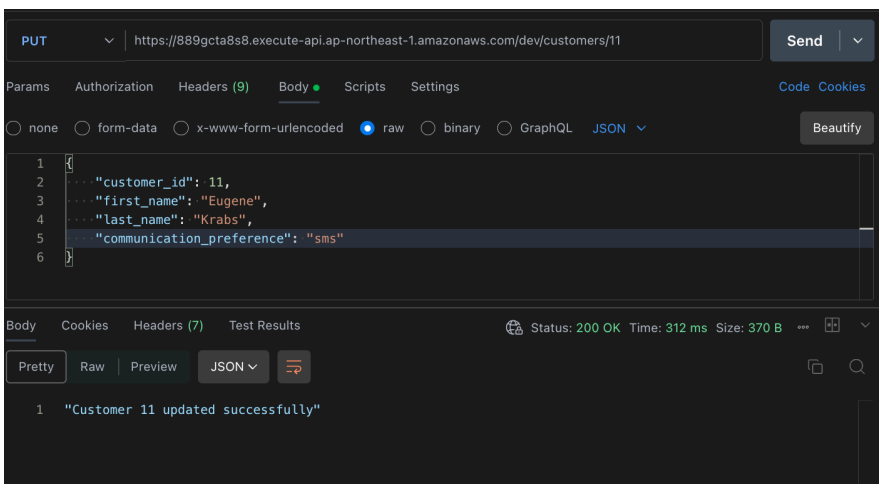


▼ Updating the Item in DB with PUT

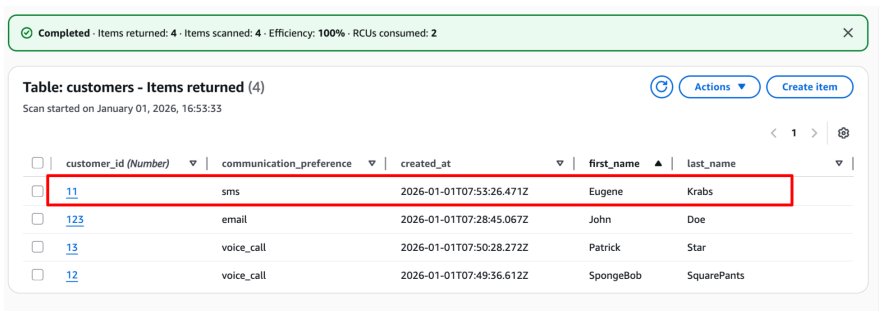
Currently in DB the value of 11 is Jane Doe



After using PUT

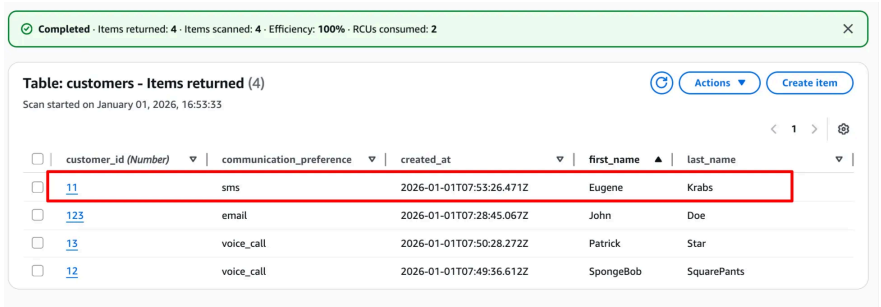


The value of customer_id 11 is now updated successfully

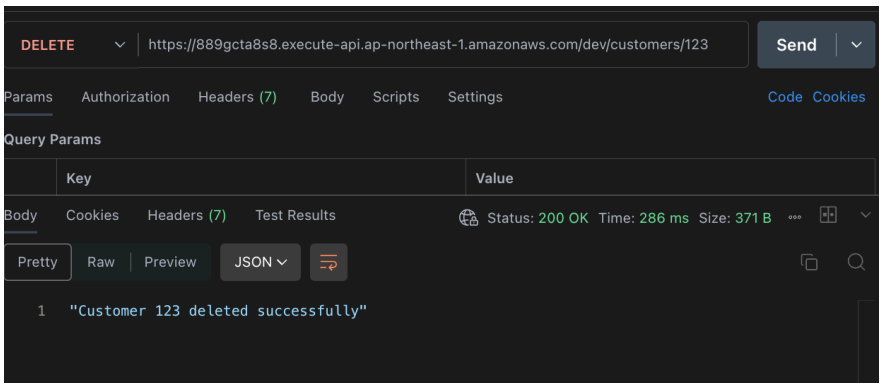


▼ Removing a single Item with DELETE

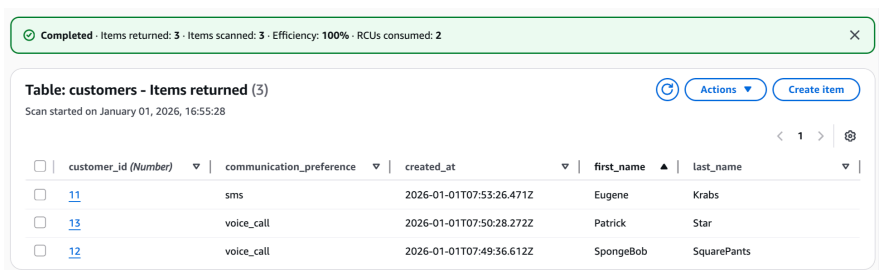
Items currently in database before deletion.



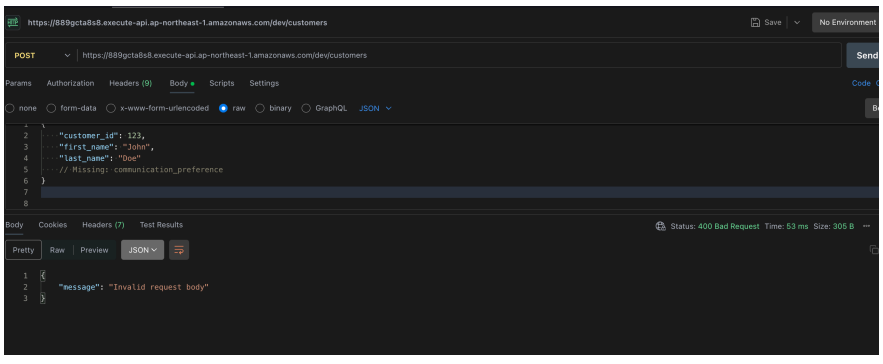
DELETE Method.



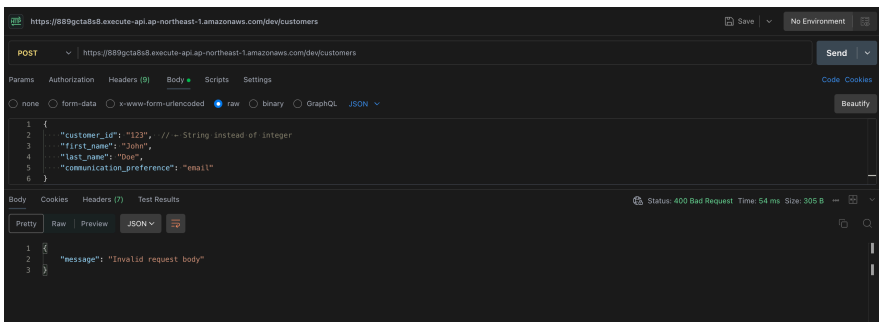
After deleting and checking the Database.



▼ Image : Test #4 Missing parameters



▼ Image : Test #5 Wrong data Type



⌘ Troubleshooting

Issue: Getting 403 Forbidden

Solution: Make sure you're using the correct Invoke URL from the Stages section.

Issue: Getting 404 Not Found

Solution:

- Verify the API is deployed
- Check the stage name matches (should be `test`)
- Ensure you're using the correct HTTP method (POST)

Issue: Validation not working (accepting invalid data)

Solution:

- Go back to Step 3 and verify "Enable Validation Body in Request Validation" is checked
- Confirm the model `mySampleModel` is selected
- Redeploy the API after making changes

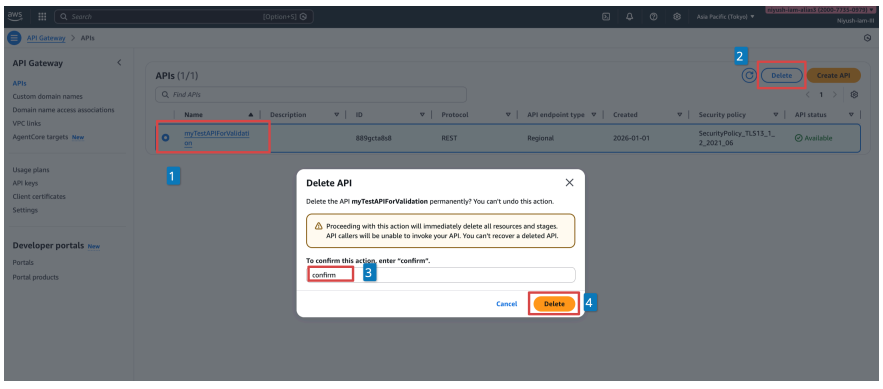
⌘ Step 8 : Deletion Time.

After testing, it's important to delete your API Gateway to avoid unnecessary AWS charges.

Delete the API Gateway

- Navigate to **AWS Console** ⇒ **API Gateway**
- From the left panel, select your API: `myTestAPIForValidation`
- Click on **Actions** (top-right dropdown)
- Select **Delete API**
- A confirmation dialog will appear asking: *"Are you sure you want to delete this API?"*
- Click **Delete** to confirm

▼ Delete the API Gateway



Delete the Model (Optional)

If you want to delete just the model without deleting the entire API:

- Navigate to **API Gateway** ⇒ Your API: `myTestAPIForValidation`
- From the left nav panel, click **Models**
- Select your model: `mySampleModel`
- Click **Delete Model**
- Confirm the deletion

> Note: If you delete the API, the model is automatically deleted with it.

Delete APIs via AWS CLI (Optional)

If you prefer using the command line:

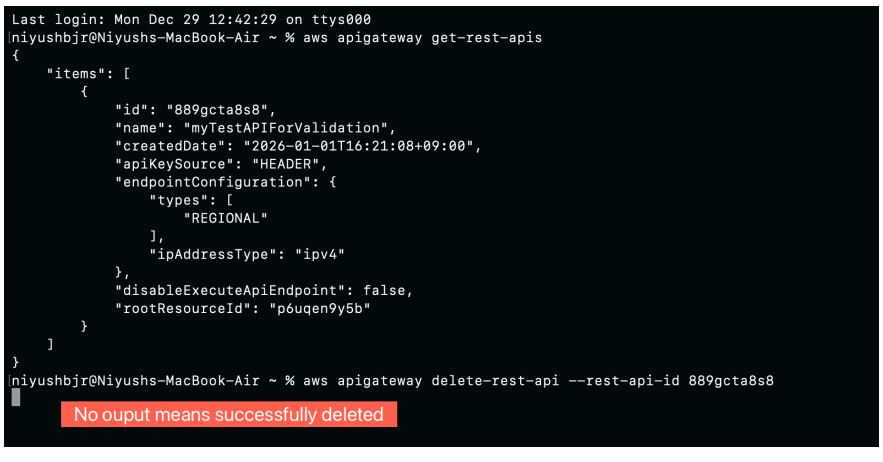
```
# List all APIs to find the API ID
aws apigateway get-rest-apis

# OR
aws apigateway get-rest-apis | grep -C 5 "YOUR_API_NAME"


# Delete the API (replace API_ID with your actual API ID)
aws apigateway delete-rest-api --rest-api-id API_ID
```

▼ Delete the API Gateway via terminal

```
# Example:
aws apigateway delete-rest-api --rest-api-id 1a2b3c4d5
e
```

Expected Output:

(No output means successful deletion)



Delete the DynamoDB

Deleting DynamoDB via AWS Console.

- Head over to DynamoDB → select the table
- Actions → Delete → Type in `confirm` → and Finally click on `Delete`

Deleting DynamoDB via Terminal or AWS CLI

use the following command.

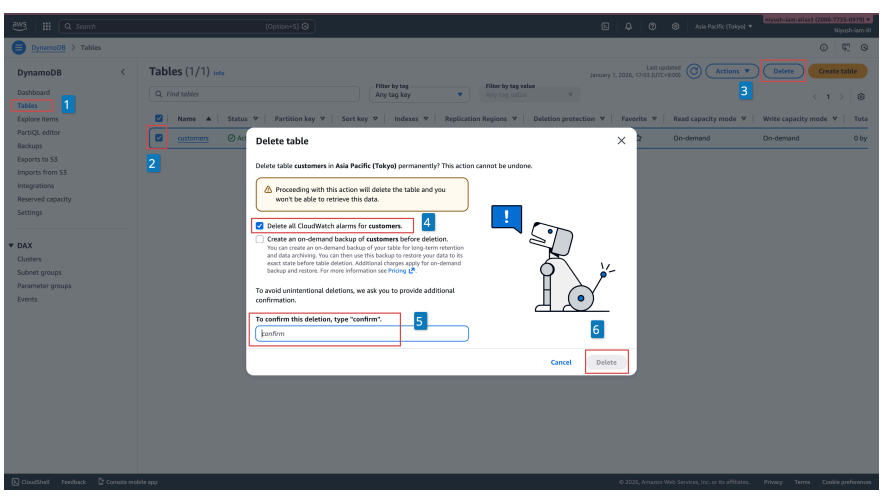
```
aws dynamodb list-tables

aws dynamodb delete-table \
  --table-name YOUR_TABLE_NAME

aws dynamodb describe-table --table-name customers
```

Delete the Lambda Function and Role associated with it.

Deleting Lambda Function via Console

- Lambda → select the function→ Actions→ Delete

▼ Deleting dynamoDB via console



Deleting Lambda Function via Terminal or AWS CLI

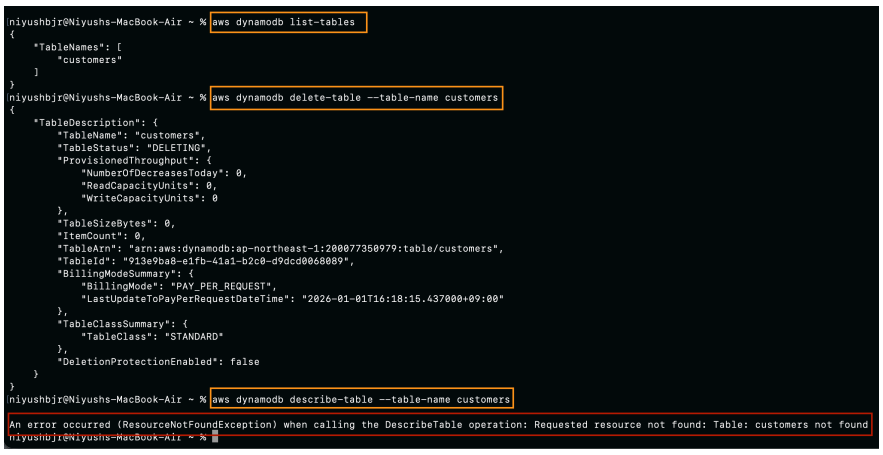
use the following command.

```
aws lambda list-functions

aws lambda delete-function \
  --function-name YOUR_FUNCTION_NAME
```

Deleting via AWS CLI

Delete the Role associated with it Lambda Function

- Head over to IAM → Roles → select the function role → Delete



Delete the Role associated with it Lambda Function

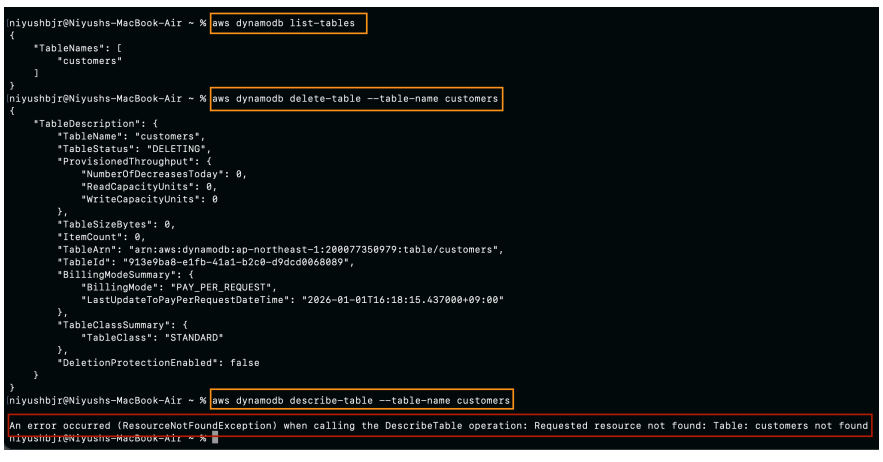
Deleting Log Group via Console

- Headover to Cloudwatch → select Log Management → /aws/... log
- Actions → Delete log groups(s)

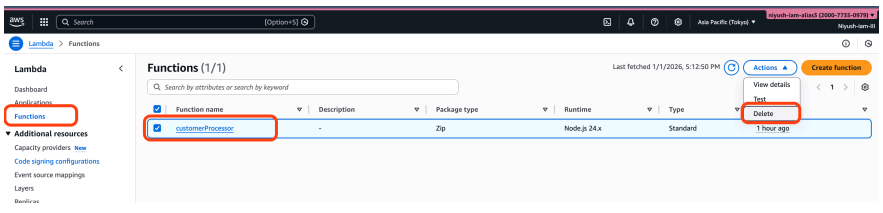
Deleting Log Group via AWS CLI

```
aws logs describe-log-groups

aws logs delete-log-group -- log-group-name NAME_OF_LOG_GROUP

aws logs describe-log-groups
```

▼ Deleting dynamoDB via Terminal



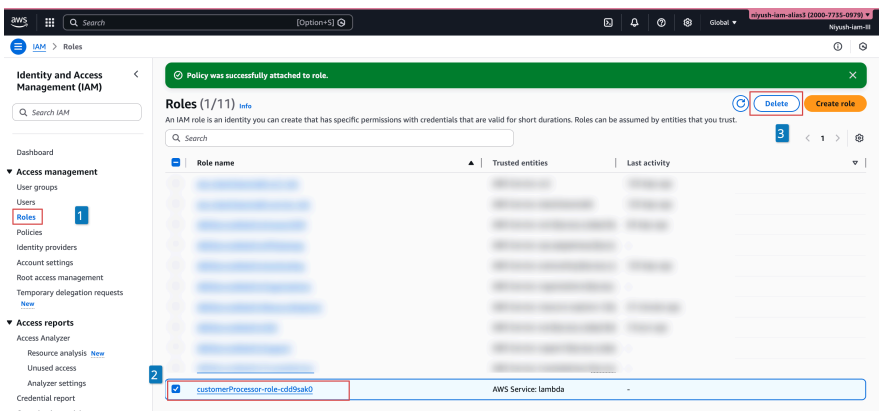
▼ Deleting the lambda



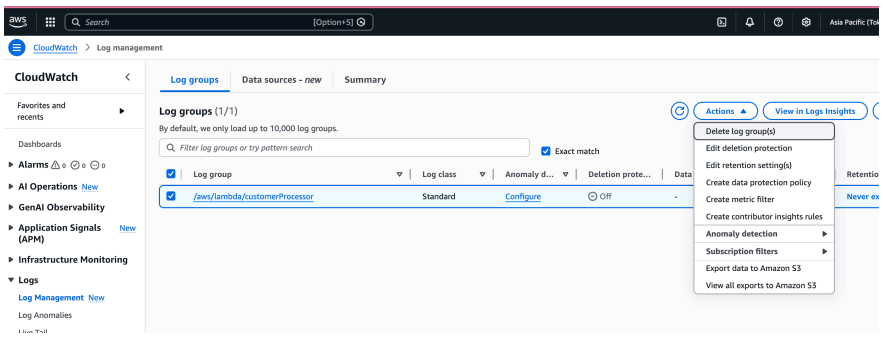
▼ Deleting Lamda via AWS CLI

```
niyushbjr@Niyushs-MacBook-Air ~ % aws lambda list-functions
{
    "Functions": [
        {
            "FunctionName": "customerProcessor",
            "FunctionArn": "arn:aws:lambda:ap-northeast-1:200077350979:function:customerProcessor",
            "Runtime": "nodejs24.x",
            "Role": "arn:aws:iam::200077350979:role/service-role/customerProcessor-role-cdd9sak0",
            "Handler": "index.handler",
            "CodeSize": 994,
            "Description": "",
            "Timeout": 3,
            "MemorySize": 128,
            "LastModified": "2026-01-01T07:20:29.000+0000",
            "CodeSha256": "+CULCdWwjp4cxXd6pQVIVXws2ybUo4SkGhA3set03gg=",
            "Version": "$LATEST",
            "TracingConfig": {
                "Mode": "PassThrough"
            },
            "RevisionId": "834c8080-657f-429b-abea-6f5679bae1e1",
            "PackageType": "Zip",
            "Architectures": [
                "arm64"
            ],
            "EphemeralStorage": {
                "Size": 512
            },
            "SnapStart": {
                "ApplyOn": "None",
                "OptimizationStatus": "Off"
            },
            "LoggingConfig": {
                "LogFormat": "Text",
                "LogGroup": "/aws/lambda/customerProcessor"
            }
        }
    ]
}
```

▼ Delete the Role assigned to Lambda



▼ Delete the Cloudwatch log via console



▼ Delete the Cloudwatch log via AWS CLI

```
niyushbjr@Niyushs-MacBook-Air ~ % aws logs describe-log-groups
{
    "logGroups": [
        {
            "logGroupName": "/aws/lambda/customerProcessor",
            "creationTime": 1767252029932,
            "metricFilterCount": 0,
            "arn": "arn:aws:logs:ap-northeast-1:200077350979:log-group:/aws/lambda/customerProcessor:*",
            "storedBytes": 0,
            "logGroupClass": "STANDARD",
            "logGroupArn": "arn:aws:logs:ap-northeast-1:200077350979:log-group:/aws/lambda/customerProcessor"
        }
    ]
}
```

```
niyushbjr@Niyushs-MacBook-Air ~ % aws logs delete-log-group --log-group-name /aws/lambda/customerProcessor
niyushbjr@Niyushs-MacBook-Air ~ % aws logs describe-log-groups
{
    "logGroups": []
}
niyushbjr@Niyushs-MacBook-Air ~ %
```

⌘ Key Takeaways

✅ What This Demonstrates:

- How to create a JSON Schema in API Gateway
- How API Gateway validates requests **before** sending to backend
- How to catch invalid data early (saves Lambda costs)
- How validation errors are returned to the client

✅ Why This Matters:

- Prevents malformed data from reaching your backend
- Reduces backend processing for invalid requests
- Provides clear error messages to API consumers
- Improves API reliability and security

> ℹ️ And that’s a wrap