

Project No 1

First Serverless API with Lambda and API Gateway

Name: Wajid Iqbal – Cloud & DevOps Specialist (AWS Certified)

Project: First Serverless API with Lambda and API Gateway

Description: Designed and deployed a serverless API using AWS Lambda and API Gateway to handle requests efficiently without managing servers.

Keyskills / Technologies Used:

- AWS Lambda
- API Gateway
- Serverless Architecture
- JSON & REST APIs
- IAM Roles & Permissions

Outcome / Achievement:

- Reduced Server costs by 100%
- Achieved scalable, event-driven API deployment

aws

Q API Gateway

X

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EC2

Dashboard

EC2 Global V...

Events

Instances

Instance Type...

Launch Temp...

Spot Request...

Savings Plans

Reserved Inst...

Dedicated Ho...

Capacity Rese...

Images

AMIs

AMI Catalog

Elastic Blo...

Volumes

Snapshots

Lifecycle Man...

Services

Show more

API Gateway

Build, Deploy and Manage APIs

Storage Gateway

Hybrid Storage Integration

CloudTrail

Track User Activity and API Usage

Features

Show more

WebSocket API

API Gateway feature

APIs

API Gateway feature

VPC links

API Gateway feature

Were these results helpful?

Yes

No

Resources

Learn from search

Zones

Account attributes

default VPC

Default VPC ID: vpc-0a1930c6c4f7ae0ab

Settings

Default VPC security group

Default VPC subnets

EC2 Serial Console

Default credit specification

EC2 console preferences

Explore AWS

Optimize EC2 Cost with Spot Instances and EC2 Auto Scaling

Get started with EC2 Spot Instances, EC2 Auto Scaling, and Launch Templates by following this step by step tutorial. [Learn more](#)

Introducing Spot Blueprints, a Real-Time

CloudShell

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aws

Q Search

[Alt+S]

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Networking & Content Delivery

API Gateway

Create and manage APIs at scale


Amazon API Gateway is a fully managed service that makes it easy for developers to create, publish, maintain, monitor, and secure APIs.

Get started

Create a new API to begin exploring API Gateway. You can also import an external definition file into API Gateway.

Create an API

How it works



API Gateway enables you to connect and access data, business logic, and functionality from backend services such as workloads running on Amazon Elastic Compute Cloud (Amazon EC2), code running on AWS Lambda, any web application, or real-time communication applications.

Pricing

With Amazon API Gateway, you only pay when your APIs are in use. There are no minimum fees or upfront commitments. For HTTP and REST APIs, you pay based on API calls received and amount of data transferred out. For WebSocket APIs, you pay based on number of messages and connection duration.

[Learn more about pricing](#)

Resources

[Getting Started Guide](#)

[Developer Guide](#)

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API Gateway

APIs

Create API

HTTP API

Build low-latency and cost-effective REST APIs with built-in features such as OIDC and OAuth2, and native CORS support.

Works with the following:
Lambda, HTTP backends

ImportBuild

WebSocket API

Build a WebSocket API using persistent connections for real-time use cases such as chat applications or dashboards.

Works with the following:
Lambda, HTTP, AWS Services

Build

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

ImportBuild

REST API Private

Create a REST API that is only accessible from within a VPC.

Works with the following:
Lambda, HTTP, AWS Services

ImportBuild

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Click On Build

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

Lab-API-01

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

IP address type

Select the type of IP addresses that can invoke the default endpoint for your API.

IPv4

Supports only edge-optimized and Regional API endpoint types.

Dualstack

Supports all API endpoint types.

CancelCreate API

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Click On Create API

API Gateway

APIs

Custom domain names

Domain name access associations

VPC links

▼ API: Lab-API-01

Resources

Stages

Authorizers

Gateway responses

Models

Resource policy

Documentation

Dashboard

API settings

Usage plans

API keys

Client certificates

Settings

Successfully created REST API 'Lab-API-01 (955046lmak)'.

Resources

Create resource

/

Resource details

Path

Resource ID

9928cn7d22

Update documentation

Enable CORS

Methods (0)

Delete

Create method

Method type	Integration type	Authorization	API key
No methods			
No methods defined.			

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API Gateway

APIs

Resources - Lab-API-01 (955046lmak)

Create resource

Successfully created REST API 'Lab-API-01 (955046lmak)'.

Create resource

Resource details

☐ Proxy resource Info

Proxy resources handle requests to all sub-resources. To create a proxy resource use a path parameter that ends with a plus sign, for example {proxy+}.

Resource path

/

Resource name

message

☐ CORS (Cross Origin Resource Sharing) Info

Create an OPTIONS method that allows all origins, all methods, and several common headers.

Click On Create Resources

Cancel

Create resource

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API Gateway

APIs

Custom domain names

Domain name access associations

VPC links

API: Lab-API-01

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Successfully created resource '/message'

Resources

Create resource

/

/message

Resource details

Delete

Update documentation

Enable CORS

Path

/message

Resource ID

9lc17d

Methods (0)

Delete

Create method

Method type

Integration type

Authorization

API key

No methods

Click On Create Method

No methods defined.

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API Gateway

APIs

Resources - Lab-API-01 (955046lmak)

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.

Method request settings

URL query string parameters

HTTP request headers

Request body

Cancel

Create method

Click On Create Method

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API Gateway

APIs

Custom domain names

Domain name access associations

VPC links

▼ API: Lab-API-01

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Client certificates

Settings

Successfully created method 'GET' in 'message'. Redeploy your API for the update to take effect.

Resources

Create resource

/message

GET

/message - GET - Method execution

ARNarn:aws:execute-api:ap-southeast-1:891376921046:955046lmak/*GET/message

Resource ID9lc17d

API actions

Deploy API

Update documentation

Delete

Client

Method request

Integration request

Mock integration

Method response

Integration response

Method request

Integration request

Integration response

Method response

Test

Integration responses

Create response

Default - Response

HTTP status regex

+

Method response status code

200

Content handling

Learn more

Passthrough

Default mapping

True

Edit

Delete

Click On Edit

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API Gateway

APIs

Resources - Lab-API-01 (955046lmak)

Edit integration response

▼ Mapping templates

Content type

application/json

Generate template

Remove

Template body

1"message": "Hello world"

2

3

3:2VelocitySpaces: 4

Use VTL templates to create your mapping template. Learn more

Add mapping template

Click On Save

Cancel

Save

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API Gateway > APIs > Resources - Lab-API-01 (955046lmak)

API Gateway

- APIs
- Custom domain names
- Domain name access associations
- VPC links

▼ API: Lab-API-01

- Resources
- Stages
- Authorizers
- Gateway responses
- Models
- Resource policy
- Documentation
- Dashboard
- API settings

Usage plans

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Client certificates

Settings

Successfully updated integration response 200 for 'GET' in '/message'. Redeploy your API for the update to take effect.

Resources

Create resource

/message

GET

/message - GET - Method execution

ARN: arn:aws:execute-api:southeast-1:891376921046:955046lmak/*/*/GET/message

Resource ID: 9lc17d

API actions: Update documentation, Delete, Deploy API

Update documentation

Delete

Click On Deploy API

Method request

Integration request

Mock integration

Method response

Integration response

Integration responses

Create response

Default - Response

HTTP status regex info

Method response status code: 200

Content handling: Passthrough

Default mapping: True

Edit

Delete

CloudShell

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API Gateway > APIs > Resources - Lab-API-01 (955046lmak)

API Gateway

- APIs
- Custom domain names
- Domain name access associations
- VPC links

▼ API: Lab-API-01

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Settings

Successfully updated integration response 200 for 'GET' in '/message'. Redeploy your API for the update to take effect.

Resources

Create resource

/message

GET

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: test

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

Deployment description

Cancel

Deploy

Click On Deploy

Integration request

Integration response

Mock integration

Method response

Test

Create response

Edit

Delete

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API Gateway

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▼ API: Lab-API-01

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Settings

Successfully created deployment for Lab-API-01. This deployment is active for test.

Stages

test

Stage details

Stage name
test

Cache cluster
Inactive

Default method-level caching
Inactive

Rate
10000

Burst
5000

Web ACL
-

Client certificate
-

Active deployment
ch9gb on July 21, 2025, 03:15 (UTC+05:00)

Logs and tracing

CloudWatch logs
Inactive

X-Ray tracing
Inactive

Custom access logging
Inactive

Detailed metrics
Inactive

Data tracing
Inactive

← → ↺

955046lmak.execute-api.ap-southeast-1.amazonaws.com/test

☆

🔖

Verify it's you

Pretty-print

```
{"message":"Missing Authentication Token"}
```

API Gateway

APIs

Custom domain names

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VPC links

▼ API: Lab-API-01

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Client certificates

Settings

Successfully created deployment for Lab-API-01. This deployment is active for test.

Stages

test

/

/message

GET

Method overrides

By default, methods inherit stage-level settings. To customize settings for a method, configure method overrides.

This method inherits its settings from the 'test' stage.

Method override URL
https://955046lmak.execute-api.ap-southeast-1.amazonaws.com/test/message


```
955046lmak.execute-api.southeast-1.amazonaws.com/test/message

{
  "message": "Hello World"
}
```

API Gateway console interface for API Lab-API-01 (955046lmak).

Left sidebar menu includes: Resources, Stages, Authorizers, Gateway response, Models, Resource policy, Documentation, Dashboard, API settings, Usage plans, API keys, Client certificates, Settings.

API resource details for `/message` (GET method):

- Method request**: Client → Method request → Integration request → Mock integration
- Method response**: ← Method response ← Integration response ← Mock integration

Test method section:

- Query strings**: param1=value1¶m2=value2
- Headers**: header1=value1, header2=value2
- Client certificate**: No client certificates have been generated.
- Test** button (highlighted with "Click On Test")

Test results (highlighted with "Click On GET"):

Request	Latency ms	Status
/message - GET method test results Request: /message Response body: { "message": "Hello World" }	3	200

API Gateway console interface with the Services sidebar open.

Services section:

- Lambda**: Run code without thinking about servers
- CodeBuild**: Build and Test Code
- AWS Signer**: Ensuring trust and integrity of your code

Features section:

- Lambda Insights**: CloudWatch feature
- Local processing**: IoT Core feature
- Object Lambda Access Points**: S3 feature

Documentation section:

- Lambda**: User Guide
- Lambda**: Developer Guide
- Lambda**: [Link]

Background shows the same API resource details as the previous image.

aws

Search

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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

Click On 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 };
```

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Lambda > Functions > Create function

10

Create function

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.

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.

Node.js 22.x

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

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Lambda > Functions > Lambda-Function-01

Successfully created the function Lambda-Function-01. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

Lambda-Function-01

Throttle Copy ARN Actions

Export to Infrastructure Composer Download

Function overview

Diagram Template

Lambda-Function-01

Layers (0)

Add triggerAdd destination

Description

Last modified 5 minutes ago

Function ARN arn:aws:lambda:ap-southeast-1:891376921046:function:Lambda-Function-01

Function URL Info

CodeTestMonitorConfigurationAliasesVersions

Code source

Open in Visual Studio CodeUpload from

EXPLORER

LAMBDA-FUNCTION-01

index.js

```
1 export const handler = async (event) => {
2   // TODO Implement
3   const response = {
4     statusCode: 200,
5     body: JSON.stringify('Hello from Lambda!'),
6   };
7   return response;
8 };
9
```

DEPLOY

Deploy (Ctrl+Shift+U)

Test (Ctrl+Shift+I)

TEST EVENTS [NONE SELECTED]

Create new test event

ENVIRONMENT VARIABLES

Amazon Q

aws

Search

[Alt+S]

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Lambda > Functions > Lambda-Function-01

CodeTestMonitorConfigurationAliasesVersions

Code source

Open in Visual Studio CodeUpload from

EXPLORER

LAMBDA-FUNCTION-01

index.js

```
1 export const handler = async (event) => {
2   // TODO Implement
3   const response = {
4     statusCode: 200,
5     body: JSON.stringify('Hello from Lambda!'),
6   };
7   return response;
8 };
9
```

DEPLOY

Deploy (Ctrl+Shift+U)

Test (Ctrl+Shift+I)

TEST EVENTS [NONE SELECTED]

Create new test event

ENVIRONMENT VARIABLES

Amazon Q

Code properties

Info



The screenshot shows the Visual Studio Code editor with the file explorer on the left. The 'EXPLORER' sidebar shows a project named 'LAMBDA-TEST' containing two files: 'index.mjs' and 'test.mjs'. The 'index.mjs' file is open in the editor, displaying the following JavaScript code:

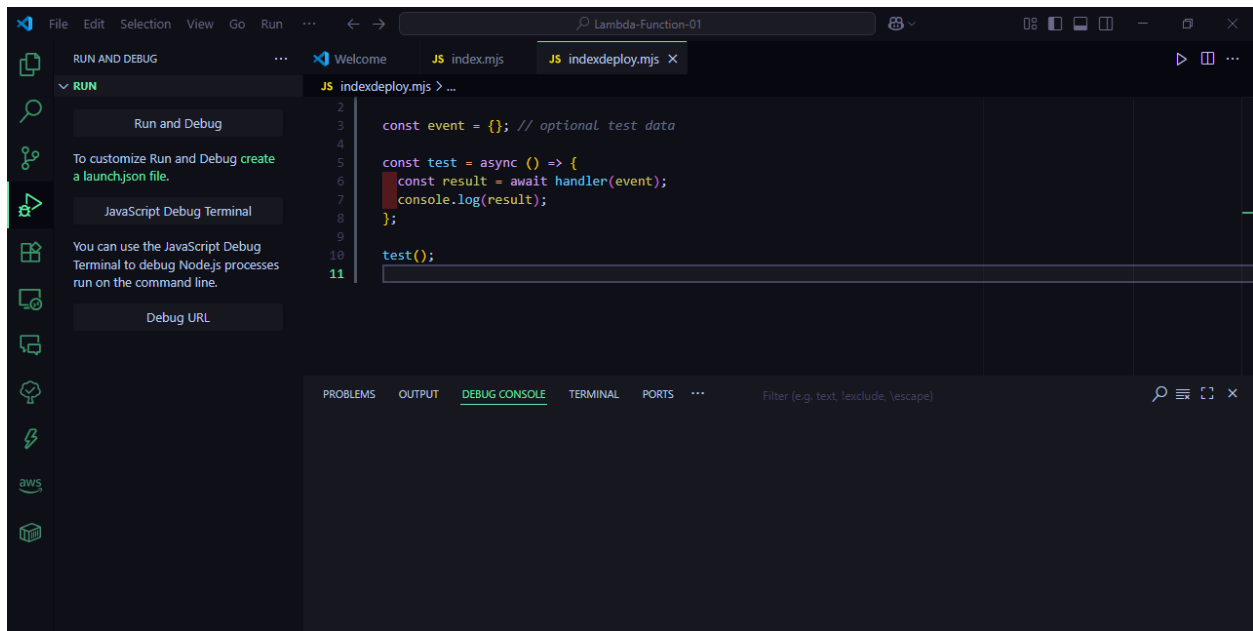
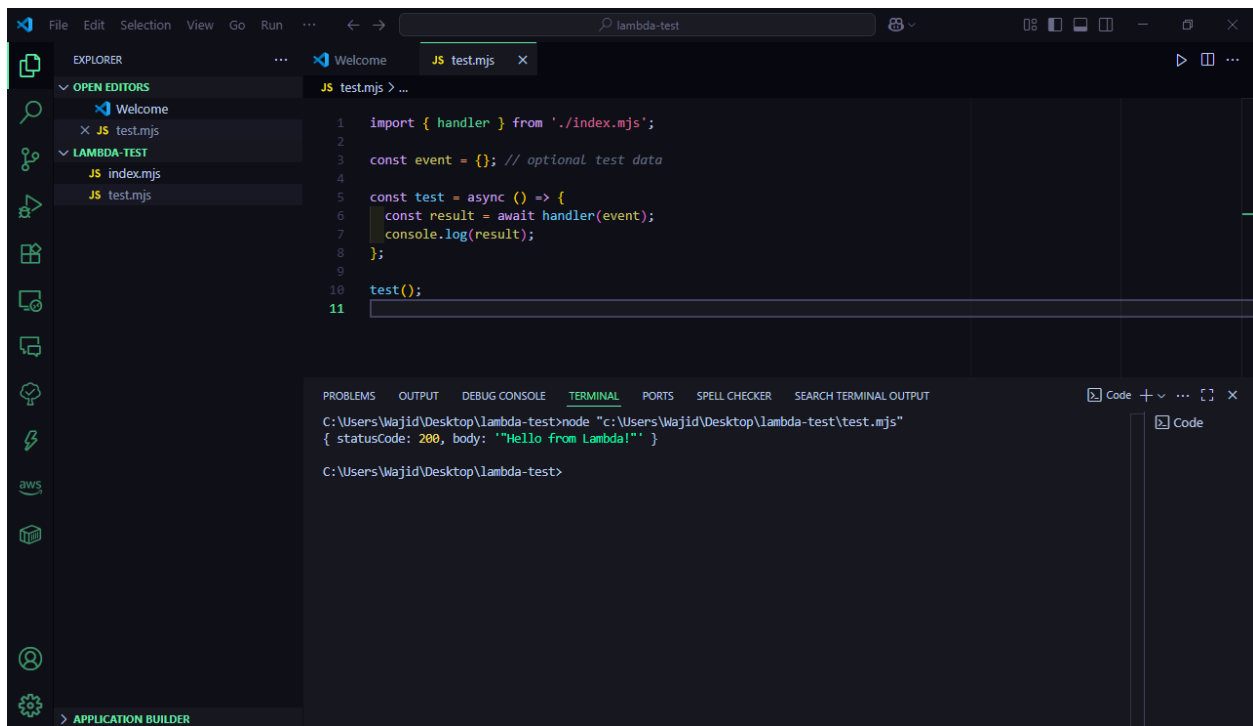
```
1 export const handler = async (event) => {
2   const response = {
3     statusCode: 200,
4     body: JSON.stringify('Hello from Lambda!'),
5   };
6   return response;
7 };
```

The screenshot shows the Visual Studio Code editor with the file explorer on the left. The 'test.mjs' file is open in the editor, displaying the following JavaScript code:

```
1 import { handler } from './index.mjs';
2
3 const event = {}; // optional test data
4
5 const test = async () => {
6   const result = await handler(event);
7   console.log(result);
8 };
9
10 test();
```

BOOTCAMP (C:) > Users > Wajid > Desktop > lambda-test

Name	Date modified	Type	Size
 index.mjs	7/21/2025 7:28 AM	JavaScript Source ...	1 KB
 test.mjs	7/21/2025 7:29 AM	JavaScript Source ...	1 KB



API Gateway

APIs

Custom domain names

Domain name access associations

VPC links

▼ API: Lab-API-01

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Resources

Create resource

/

/message

GET

/message - GET - Method execution

API actions

Deploy API

Update documentation

Delete

ARN

arn:aws:execute-api:southeast-1:891376921046:955046lmak/*/*/GET/message

Resource ID

9lc17d

Client

Method request

Integration request

Mock integration

Method response

Integration response

Method request

Integration request

Integration response

Method response

Test

Integration request settings

Integration type info

Mock

Timeout

Default (29 seconds)

URL path parameters (0)

Name

Mapped from

Caching

No URL path parameters

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API Gateway

APIs

Resources - Lab-API-01 (955046lmak)

Edit integration request

Edit integration request

Method details

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.

⚠ Different integration type

If you switch the integration type, you will overwrite the existing configuration. This action cannot be undone.

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.

ap-southeast-1

arn:aws:lambda:ap-southeast-1:891376921046:function:Lambda-Fur

📢 Grant API Gateway permission to invoke your Lambda function

When you save your changes, API Gateway updates your Lambda function's resource-based policy to allow this API to invoke it.

Execution role

arn:aws:iam::myAccount:role/myRole

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