

The Joys of using Serverless Functions

Muzi Xaba

About Me

Course Facilitator & SysAdmin

@MuziXaba

<https://www.explore.ai>

Industrial-scale AI applications

Digital twins/transformation

Data skills training - ExploreAI Academy



What's a Serverless Function?

Single purpose function that does something useful in a cloud environment

Triggered via a Schedule or Event

Stateless & Ephemeral

Scales to millions of requests

Pay as you go

Where to get them?



IBM Cloud



Google Cloud



Microsoft Azure



netlify



Alibaba Cloud

Use cases?

Interacting with other cloud or
internet based resources or
services

Automation

Use functions as a backend

Quick to deploy

Enough talking...



lambda_function x



```
1 import json
2 import boto3
3
4 def lambda_handler(event, context):
5     # our instance
6     our_server = "i-051cb68c2d80b8d70"
7
8     # connect to EC2 service
9     ec2 = boto3.client("ec2")
10
11     # stop instance
12     stop_response = ec2.stop_instances(InstanceIds=[our_server])
13     print(stop_response)
14
15     return {
16         'statusCode': 200,
17         'body': json.dumps(stop_response)
18     }
```


Request Syntax

```
response = client.stop_instances(  
    InstanceIds=[  
        'string',  
    ],  
    Hibernate=True|False,  
    DryRun=True|False,  
    Force=True|False  
)
```

Parameters

- **InstanceIds** (*list*) --
[REQUIRED]

The IDs of the instances.

◦ (*string*) --

- **Hibernate** (*boolean*) --

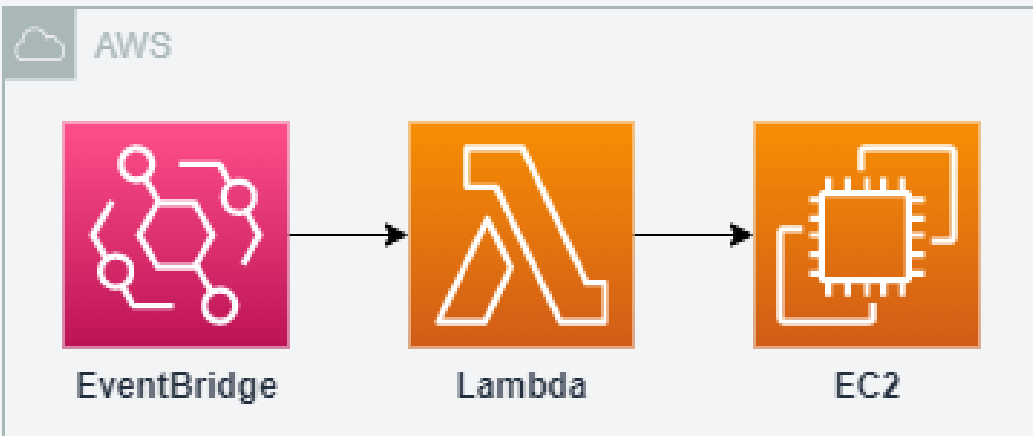
Hibernates the instance if the instance was enabled for hibernation at launch. If the instance cannot hibernate successfully, a normal shutdown occurs. For more information, see [Hibernate your instance](#) in the *Amazon EC2 User Guide* .

Default: `false`

- **DryRun** (*boolean*) -- Checks whether you have the required permissions for the action, without actually making the request, and provides an error response. If you have the required permissions, the error response is `DryRunOperation` . Otherwise, it is `UnauthorizedOperation` .
- **Force** (*boolean*) --

Forces the instances to stop. The instances do not have an opportunity to flush file system caches or file system metadata. If you use this option, you must perform file system check and repair procedures. This option is not recommended for Windows instances.

Default: `false`



```
1 import json
2 import boto3
3 import requests as r
4
5 def lambda_handler(event, context):
6     """Emails current BTCUSD price"""
7
8     # ask Bitstamp for Bitcoin price in USD
9     bs_endpoint = "https://www.bitstamp.net/api/v2/ticker/btcusd"
10    bs_resp = r.get(bs_endpoint)
11
12    # read json response
13    bs_resp_data = json.loads(bs_resp.content)
14    last_price = bs_resp_data["last"]
15
16    # connect to SNS & send message
17    sns = boto3.client('sns')
18    my_topic = 'arn:aws:sns:eu-west-1:263134221295:GeneralTopic'
19    sns_resp = sns.publish(
20        TopicArn=my_topic,
21        Message=f'Bitcoin price is ${last_price}',
22        Subject='BTCUSD Price Today'
23    )
24    # log response
25    print(sns_resp)
26
27    return {
28        'statusCode': 200,
29        'body': json.dumps(sns_resp)
30    }
```

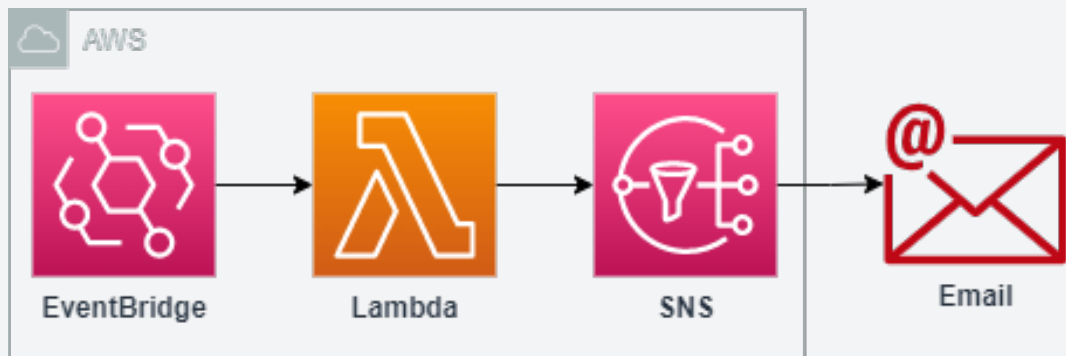
Layers [Info](#)

[Edit](#)[Add a layer](#)

Merge order	Name	Layer version	Compatible runtimes	Compatible architectures
1	Klayers-p39-requests	8	python3.6, python3.7, python3.8, python3.9	-



Package	Package Version	arn
beautifulsoup4	4.11.1	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-beautifulsoup4:2
numpy	1.23.3	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-numpy:8
pandas	1.5.0	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-pandas:8
pdf2image	1.16.0	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-pdf2image:1
pendulum	2.1.2	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-pendulum:1
pybit	1.3.5	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-pybit:1
aws-xray-sdk	2.10.0	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-aws-xray-sdk:8
aws-requests-auth	0.4.3	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-aws-requests-auth:8
cryptography	38.0.1	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-cryptography:7
sympy	1.11.1	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-sympy:3
usaddress	0.5.10	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-usaddress:1
cfmresponse	1.1.2	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-cfmresponse:1
psycpg2-binary	2.9.3	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-psycpg2-binary:1
idna	3.4	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-idna:2
praw	7.6.0	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-praw:8
twilio	7.14.1	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-twilio:8
ccxt	1.72.35	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-ccxt:1
matplotlib	3.5.2	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-matplotlib:1
pygsheets	2.0.5	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-pygsheets:8
bcrypt	4.0.0	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-bcrypt:4
aiobotocore	2.4.0	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-aiobotocore:8
gremlinpython	3.6.1	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-gremlinpython:1
pyqldb	3.2.2	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-pyqldb:8
redshift-connector	2.0.909	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-redshift-connector:8
pyephem	9.99	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-pyephem:1
requests	2.28.1	arn:aws:lambda:eu-west-1:770693421928:layer:Klayers-p39-requests:8



My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$19116 -- If you wis...	21:00
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$18967 -- If you wis...	11 Oct
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$19221 -- If you wis...	10 Oct
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$19526 -- If you wis...	9 Oct
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$19488 -- If you wi...	8 Oct
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$19460 -- If you wi...	7 Oct
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$20018 -- If you wi...	6 Oct
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$20270 -- If you wi...	5 Oct
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$20130 -- If you wi...	4 Oct
My General Topic	Inbox	BTCUSD Price Today - Bitcoin price is \$19607 -- If you wi...	4 Oct

Serverless backends?

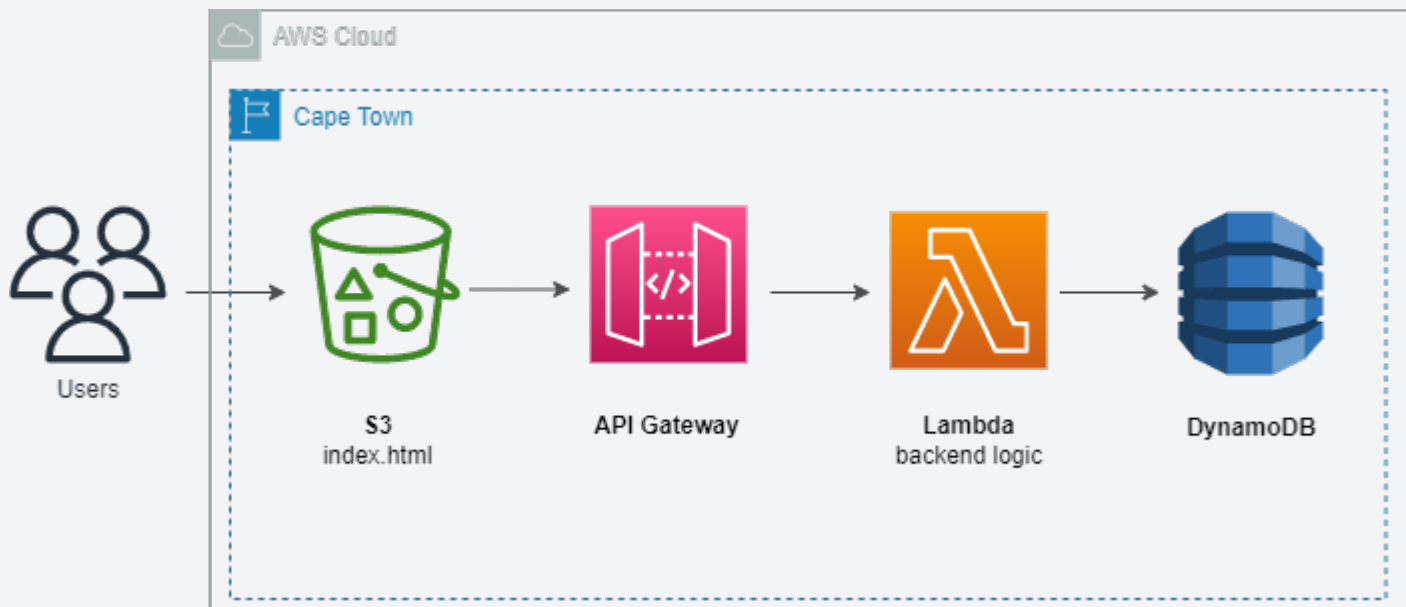
Enter your email below

This pages serves to demonstrate on how emails can be collected using a serverless backend.



Submit

[Click Here](#)



What about a bigger app?

Manage Orders

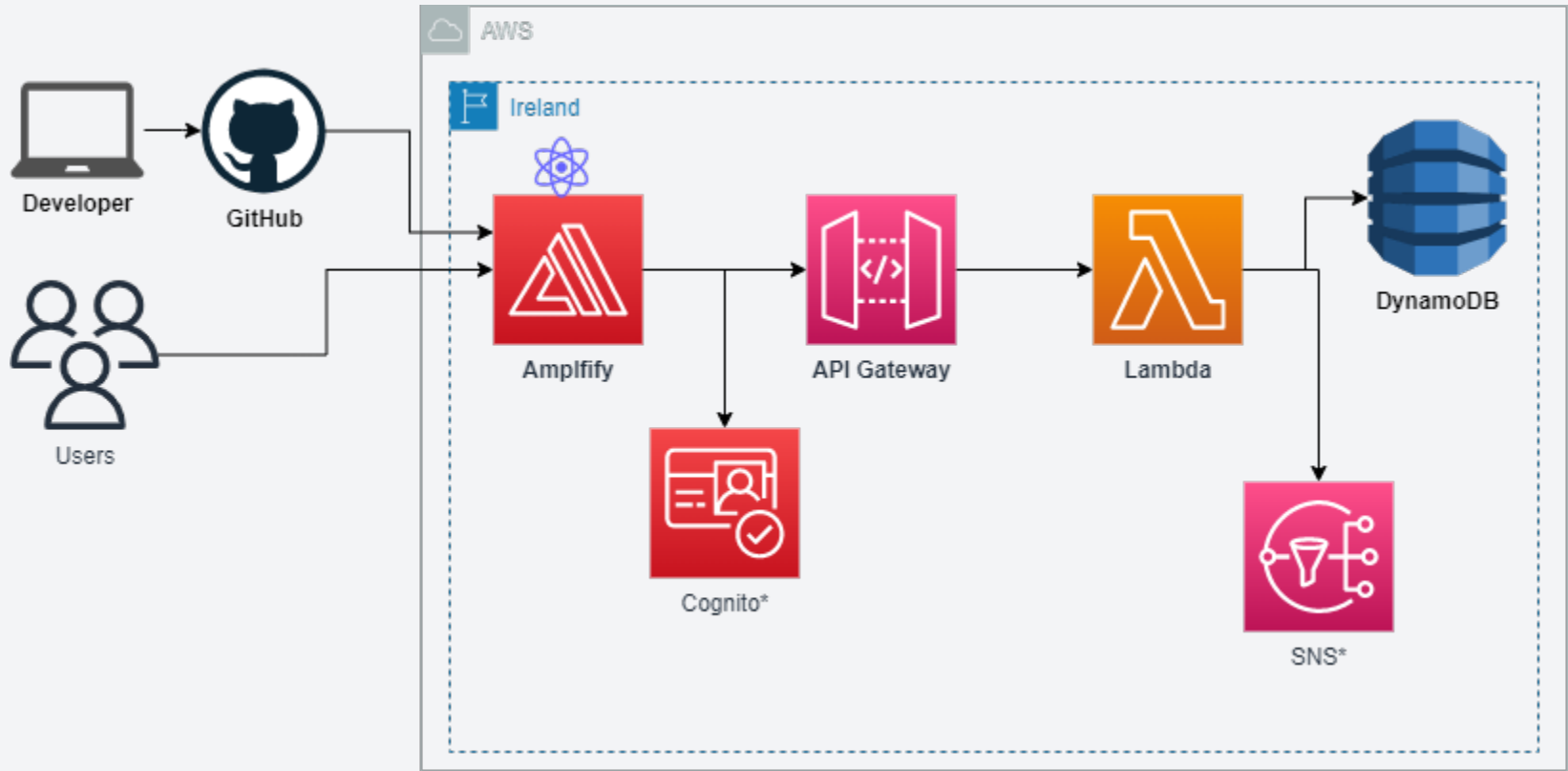
[Show Entire Order](#)[Retrieve Order](#)

Name	Items	Value	Manage
109 CLARK	0	0	Edit
14 CLARK	0	0	Edit
145	0	0	Edit
ACADEMY	0	0	Edit
ADENDALE MALL	0	0	Edit
AMAJUBA TEAM	0	0	Edit
BERGVILLE	0	0	Edit
BIZANA	0	0	Edit

Showing 8 out of 85 entries

[Previous](#) [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [11](#) [Next](#)

[Click here](#)



What's the catch?

Serverless != No Server

Cold Start

Locked into a specific setup or
cloud vendor

Confusing or complex architecture

Not all services are available in all regions



+



=



Thank you...



@MuziXaba