

Configuration Manual

MSc Research Project Cloud Computing

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Configuration Manual

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1 Introduction

This manual provides instructions to setup project on AWS. All the important instruction is provided here.

2 AWS Setup

Make sure you have AWS account before proceeding further.

2.1 AWS S3

Create a bucket in your region with name noifiles3. It should be general purpose bucket.

2.2 Kinesis consumer Lambda function

Kinesis consumer lambda will consume records from controller lambda function via Kinesis stream.

- Create lambda function with default python configuration.
- Add trigger to lambda in Figure 1.
- Verify configuration of trigger as shown in Figure 2.

2.3 AWS Sagemaker

Sagemaker is used to train, build and deploy machine learning model.

- Create sagemaker studio and profile.
- Create Jupyter Lab inside sagemaker studio as shown in Figure 3.
- Run untitled.ipynb file to train, build and deploy ML model as shown in Figure 4.
- Check if endpoint is deployed properly as shown in Figure 5

E Lambda > Functions > kinesisconsumer	0 5 0	
kinesisconsumer	Throttle Copy ARN Actions V	
▼ Function overview Info	Export to Infrastructure Composer Download	
Diagram Template kinesisconsumer Layers Layers (0) Kinesis + Add destination + Add trigger + Add trigger	Description - Last modified 3.days.ago Function ARN	9
Code Test Monitor Configuration Aliases Versions		
General configuration Triggers (1) Info	Fix errors Edit Delete Add trigger	
Triggers Q Find triggers	< 1 >	

Figure 1: Add trigger to lambda

General computation	Triggers (1) Info
Triggers	Q. Find triggers < 1 >
Permissions	Trigger
Destinations	Kinesis: LambdaConfigStream
Function URL	arn:aws:kinesis:eu-west-1:182399691145:stream/LambdaConfigStream state: Enabled
Environment variables	▼ Details
Tags	Activate trigger: Yes Batch size: 100
VPC	Batch window: None Concurrent batches per shard: 1
RDS databases	Event source mapping ARN: arn:aws:lambda:eu-west-1:182399691145:event-source-mapping:df9fe8be-7070-4e86-835f- f0068005425
Monitoring and operations tools	Last processing result: OK Maximum age of record: -1 Metrics: None On-failure destination: None
Concurrency and	Report batch item failures: No
recursion detection	Retry attempts: -1 Split batch on error: No
Asynchronous invocation	Starting position: LATEST
Code signing	Tags: <u>View</u> Tumbling window duration: <i>None</i> UUID: df9fe8be-7070-4e86-835f-f00608005425
File systems	
Carata and delivera	

Figure 2: Trigger configuration



Figure 3: Jupyterlab creation



Figure 4: Jupyterlab creation

Endpo	IPOINTS O int are locations where you send inference requests est it, and change its settings as needed.	to your deployed machine learn	ing models. After you create an	endpoint, you can add models
Q Se	arch by endpoint name			Delete Create endpoint
	Name	Status	Created on	Modified on
0	mlendpoint	🔇 In service	11/12/2024, 23:21:12	11/12/2024, 23:24:34
0	sagemaker-scikit-learn-2024-12-07-23-00-04-317	🕑 In service	07/12/2024, 23:00:05	07/12/2024, 23:03:25
		End of results		
2 res	ults C Refresh	Rows	10 Go to page 1	Page 1 of 1 < >

Figure 5: Jupyterlab creation

2.4 Getlogs Lambda function

This function is used to create dataset for training model , it has 2 triggers i.e. SNS and Cloudwatch logs. Both of which will trigger if configuration set from prediction causes timeout and saving the incident in log for further training.

- Create lambda function with default python configuration.
- Add Both triggers to lambda in Figure 6.
- Verify configuration of triggers as shown in Figure 7.

GetLogs			Throttle Copy ARN Actions V
▼ Function overview Info		(Export to Infrastructure Composer Download
Diagram Template			Description -
Get	Logs		Last modified
Eave	rs (0)		<u>1 week ago</u> Function ARN
sns		+ Add destination	arn:aws:lambda:eu-west-1:182399691145:function:Ge tLogs
CloudWatch Logs			Function URL Info
+ Add trigger			니다. https://57ormzq7dwrpicpudkm7qm6jnu0lunsLlambda- url.eu-west-1.on.aws/ [김

Figure 6: Add trigger to lambda

2.5 AWS EFS

Create EFS for sharing data between load_and_execute_code and extract_and_save_code lambda functions.

- Create EFS as shown in Figure 8.
- Verify configuration of EFS as shown in Figure 9.

Triggers (2) Info	C Fix errors Edit Delete Add trigger
Q Find trig	ngers	(1)
🗌 🛛 Trig	ger	
₹	SNS: Lambda_error arn:aws:sns:eu-west-1:182399691145:Lambda_error	
	isComplexStatement: No Service principal: sns.amazonaws.com Statement ID: cwperms Subscription ARN: arn:aws:sns:eu-west-1:182399691145:Lambda_ e	rror:ac76a79d-b36c-485d-93b8-e3a627373fa7
	CloudWatch Logs: /aws/lambda/TextProcessorFunction arn:aws:logs:eu-west-1:182399691145:log-group:/aws/lambda/TextProcessorf Details	unction.*
	Filter name: updatelogonerror Filter pattern: timeout isComplexStatement: No Service principal: logs.amazonaws.com Source account: 182399691145 Statement ID: lambda-d3246f67-6b8c-45d2-b59a-ce46eadb9fef	

Figure 7: Trigger configuration

Create file system	×
Create an EFS file system with recommended settings. Learn more [
Name - <i>optional</i> Name your file system.	
Optional. Apply a name to your file system	
Name can include letters, numbers, and +-=:/ symbols, up to 256 characters.	
Virtual Private Cloud (VPC) Choose the VPC where you want EC2 instances to connect to your file system.	
vpc-0c28be02a9b1e215e project-vpc	,
Cancel Customize Create	

Figure 8: Create EFS

systems ess points	lambda (fsap-03c7e	201d9918974f)	Delete
Backup [2]	Details		
S DataSync 🖸	File system ID fs-07290a2253fd6f3a3	POSIX user User ID 1000	Root directory creation permissions Owner user ID 1000
umentation 🖪	Root directory path /test State @ Available	Group ID 1000 Secondary group IDs -	Owner group ID 1000 Permissions 777
	Access point ARN	em:eu-west-1:182399691145:access-point/fsa	ap-03c7e201d9918974f

Figure 9: EFS configuration

2.6 AWS Cloudwatch

Create Alarm using Cloudwatch to search for specific term "timeout" in logs. If it encounter such logs trigger Logs lambda function for appending this incident in S3 logs file for model training. Configuration of alarm shown in Figure 10

Details

Name	State	Namespace	Datapoints to alarm
Lambda_error	💬 Insufficient data	/aws/sagemaker/Endpoin	1 out of 1
		ts	
Туре	Threshold		Missing data treatment
Metric alarm	timeout_metric_name > 0	Metric name	Treat missing data as
	for 1 datapoints within 5	timeout_metric_name	missing
Description	minutes		
		Statistic	Percentiles with low
No description	Last state update	Average	samples
	2024-12-09 08:03:52		evaluate
	(UTC)	Period	
		5 minutes	ARN
	Actions		arn:aws:cloudwatch:eu-
	Actions enabled		west-
	O		1:182399691145:alarm:
			ambda_error

Figure 10: Alarm configuration

2.7 AWS VPC

AWS VPC is used to connect EFS and lambda function. Configuration of VPC is shown in Figure 11



Figure 11: VPC configuration

2.8 Executing workflow

To execute whole workflow , there is lambda function named Controller by hitting. https://iprj3u2hb6wkifyd6einca26lq0sdugq.lambda-url.eu-west-1.on.aws/

On line 43-44, there is bucket and file variable whose value can be changed to point algorithm at different file.