Data Science Product Development with AWS and Python SDKs

Building Cloud Native DS product for Internal Businesses

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Dec, 13, 2022 @Ataccama s.r.o
By Prague AWS user group

Product for Internal Businesses?

Nature

Products are not customer facing
Will be used by internal teams (Marketing, HR, Finance, Businesses)
Self service focused
Small User base but high value product

Criteria

Low developer cost
Small User base
Visual appeal is negotiable

Costing Model

Role	Full Dev. Team	Only DS Team
PM (Data Science)	5k	5k
Data Scientist (2x)	10K	10k
API backend team (2x)	8k	
Frontend UI Team (2x)	7k	
PM (Full Project)	5k	5k
Cloud Ops	5k	5k

40k vs 25k

Product Demo & Code Repo

https://github.com/DataPsycho/cloud-native-datascience

Quastion about Model/Model Registry?

The topic I am not covering:

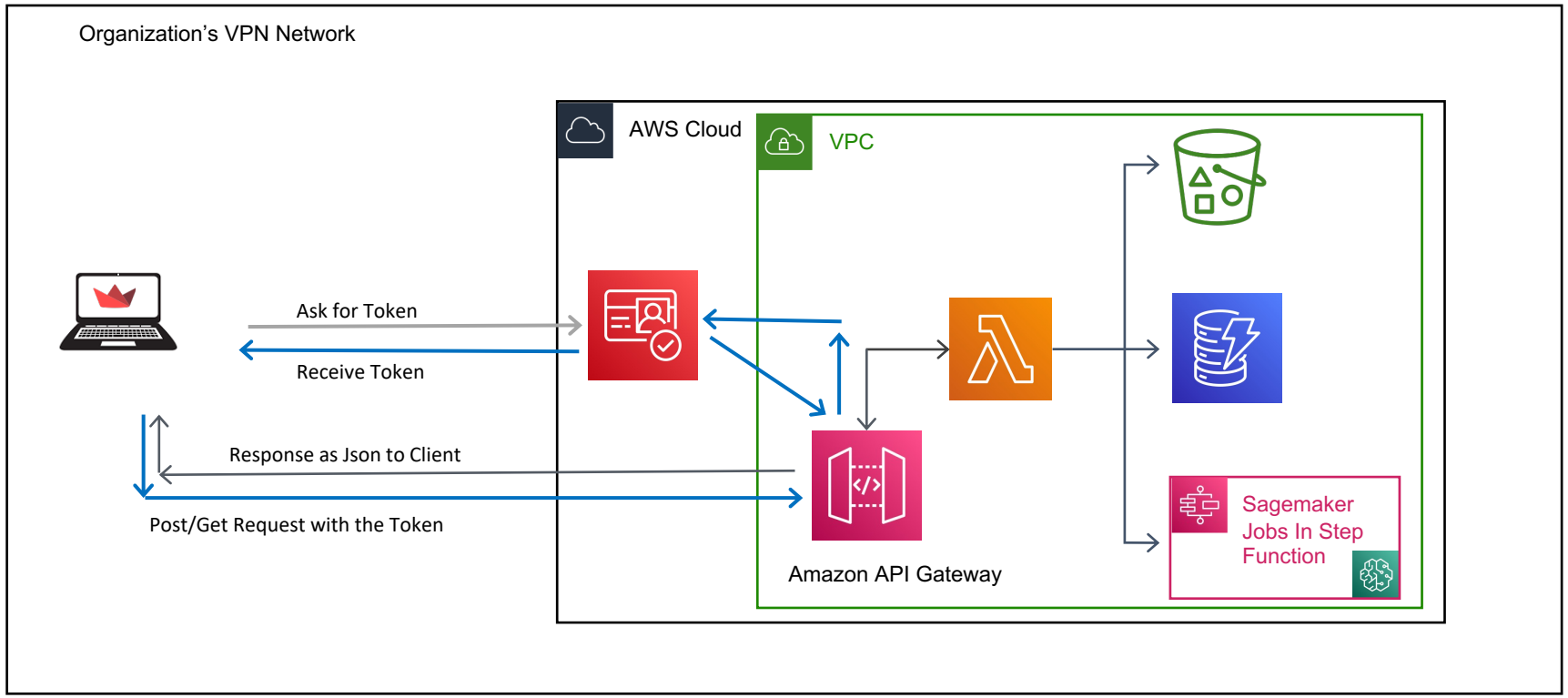
Which model we are using?

How frequent we are re training the model?

Why not using 3rd party translation service like Deepl?

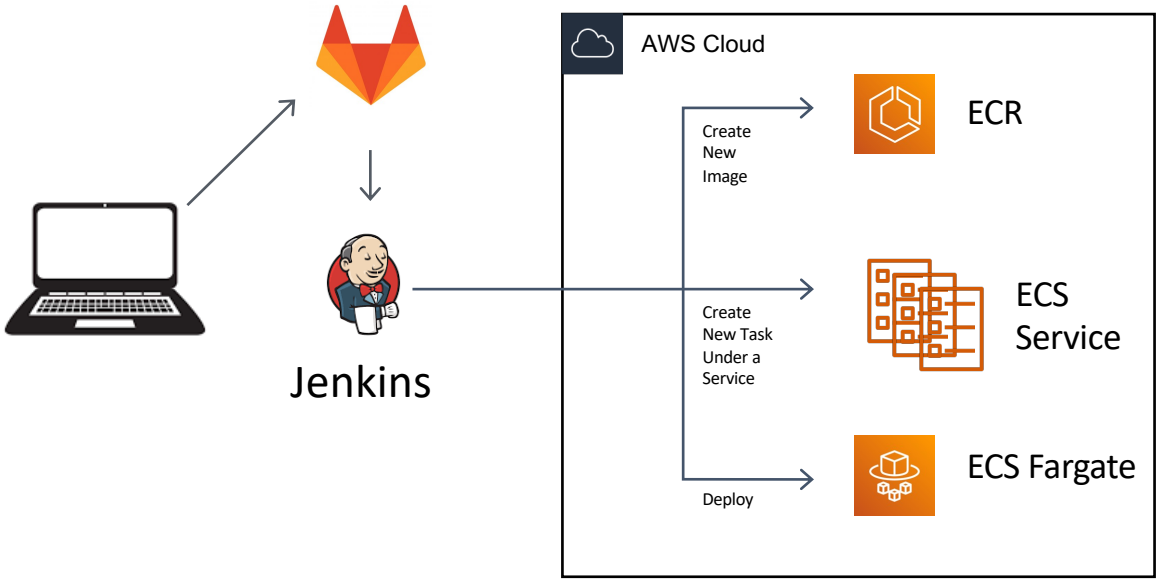
Natalia Klyueva,
Data Scientist @novartis

Server Side & Client Side Integration



🤝 *API Gateway must need Cognito to authenticate each request, when using Client facing api for the Business user*

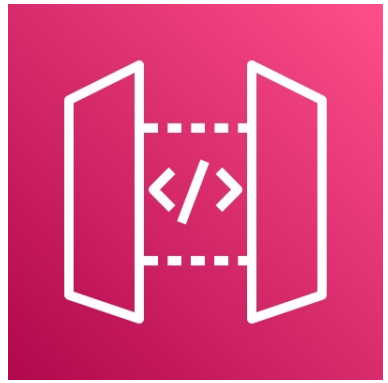
Client Side: Hosting Streamlit with ECS Fargate

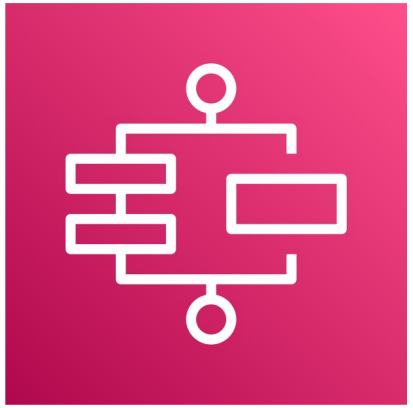


CICD

BG Deployment

Horizontal Scaling

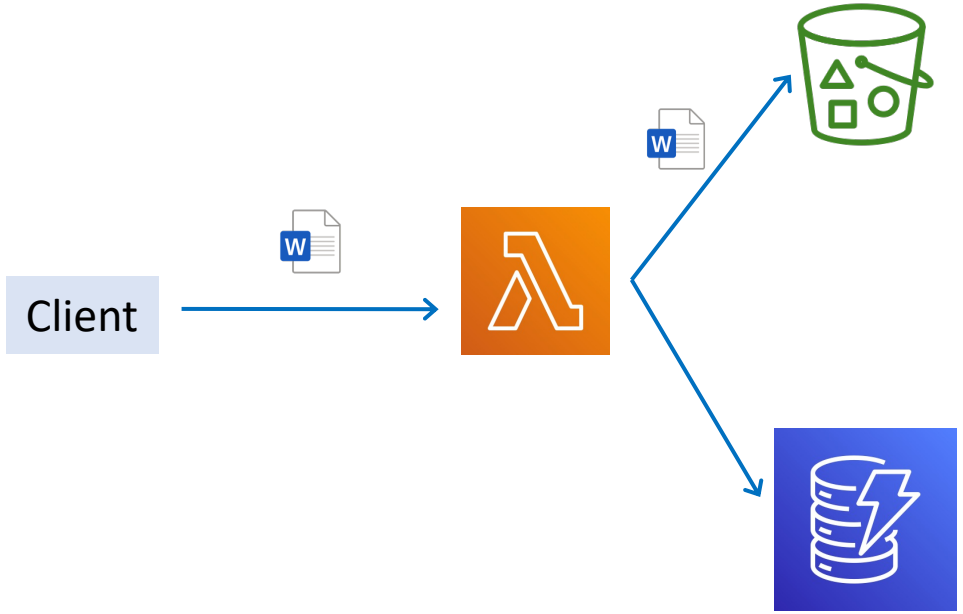




Dive Into AWS

Roles and Policies

Metadata Management with Lambda & DynamoDB (Serverside)



Example: Storing a Document

Meta Data:
- Project ID
- S3 location
- Who uploaded
- Timestamp
- Version

Optimistic Lock

Single Table Design with DynamoDB

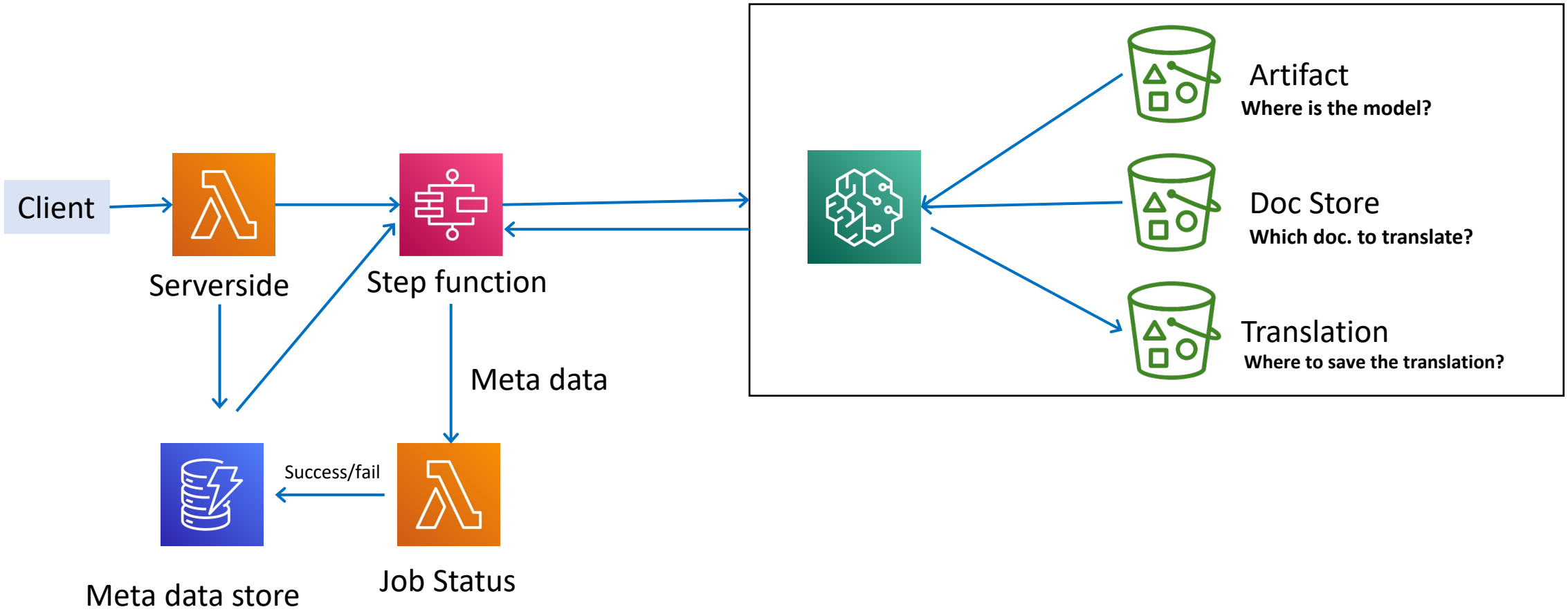
proj#project	test-01-2022-12-07T...	true	quack-trans...	docstore/do...	demo.docx	project
proj#project	test-02-2022-12-12T...	true	quack-trans...	docstore/do...	english_de...	project
proj#project	test-03-2022-12-12T...	true	null	null	null	project
proj#project	test-04-2022-12-12T...	true	quack-trans...	docstore/do...	english_de...	project

PK	SK	active	bucket	bucket_key	document	entity_type	finished_at	jid
artf#artifact	job#job1		quack-trans...	artifacts/job...		job		
artf#artifact	model		quack-trans...	models/v0.0...		model		
proj#test-01-2022-12...	job1#v0		quack-trans...	job/test-01-...		job1	2022-12-12T...	88c52bc4-b...
proj#test-01-2022-12...	job1#v1		quack-trans...	job/test-01-...		job1	2022-12-10T...	f927027f-f...
proj#test-01-2022-12...	job1#v2		quack-trans...	job/test-01-...		job1	2022-12-10T...	f2872184-a...
proj#test-01-2022-12...	job1#v3		quack-trans...	job/test-01-...		job1	2022-12-12T...	bbaab119-...

```
AttributeDefinitions:
    - AttributeName: PK
      AttributeType: S
    - AttributeName: SK
      AttributeType: S
    - AttributeName: parent_entity_pid
      AttributeType: S
    - AttributeName: status_jid
      AttributeType: S

    - AttributeName: parent_entity_type
      AttributeType: S
    - AttributeName: entity_type
      AttributeType: S
```

Batch Translation with Sagemaker & Stepfunction (ML)



The unwanted Emails

Initial Notification on Planned Downtime for AIRFLOW [redacted]

Dear Colleagues,

We would like to inform you that Unix team has planned a scheduled downtime for [redacted]vers patching as part of the security patch cycle, so services will not be available on 17-December-2022 during patching window.

Application(s) Impacted [redacted]	[redacted]
Applications not Impacted	N/A
Downtime Description	[redacted]
Impacted Sites	[redacted]
Downtime Start Time	17-12-2022 07:00 CET
Downtime End Time	17-12-2022 21:00 CET
Duration	14 Hours
Business Impact	[redacted]

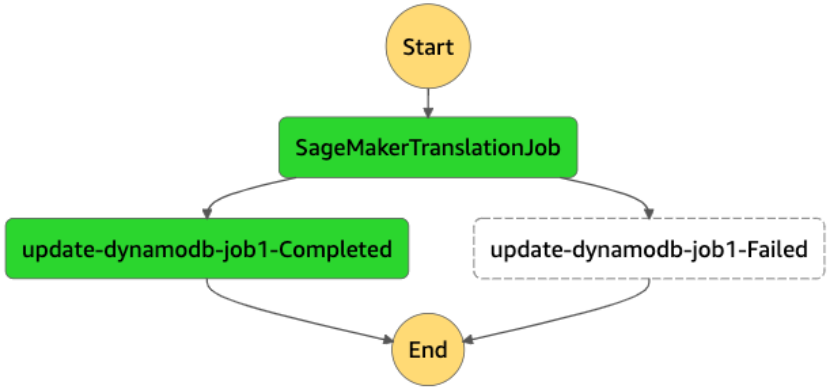
Step Function (The Airflow Killer)

```
import stepfunctions
import logging

from stepfunctions.steps import *
from stepfunctions.workflow import Workflow

stepfunctions.set_stream_logger(level=logging.INFO)

workflow_execution_role = "<execution-role-arn>"   #
```

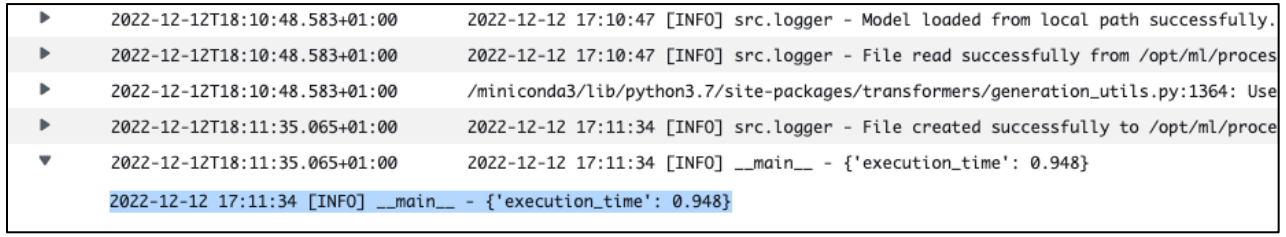



```
# Next, we define the workflow
basic_workflow = Workflow(
    name="MyWorkflow_Simple", definition=basic_path, role=workflow_execution_role
)

# Render the workflow
basic_workflow.render_graph()
```

** Example from official Git Repo*

Monitoring with CloudWatch Insights

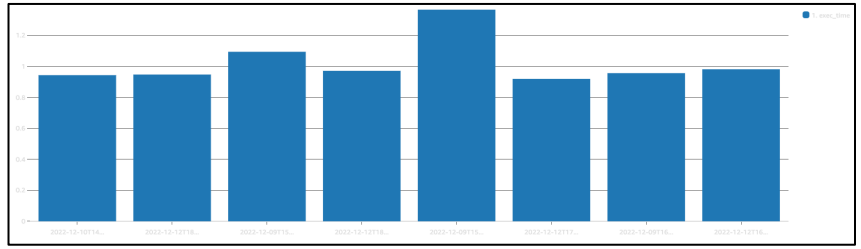


1) Actual Log

2) Query To transform the log

#	bin(10m)	exec_time
1	2022-12-10T14:20:00.000+01:00	0.944
2	2022-12-12T18:10:00.000+01:00	0.948
3	2022-12-09T15:50:00.000+01:00	1.095
4	2022-12-12T18:00:00.000+01:00	0.972
5	2022-12-09T15:30:00.000+01:00	1.367
6	2022-12-12T17:40:00.000+01:00	0.92
7	2022-12-09T16:10:00.000+01:00	0.957
8	2022-12-12T16:10:00.000+01:00	0.982

3) Aggregated Log



4) Chart from Log

UI with Streamlit

When to Use?

Quick Development

Single Alalytics Projects

Simple Application

When not to?

Complex Application

Multipage Application

SAML, SSO Authentication

Building Analytics Platform

Few Pain Points

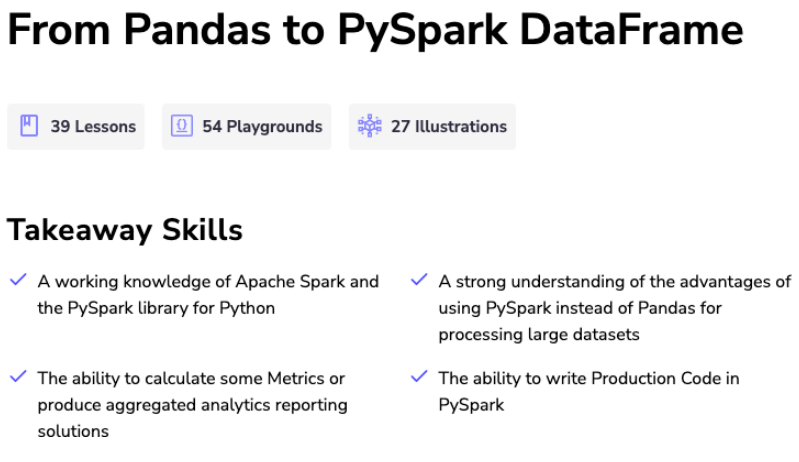
AWS Roles and Policies

Debugging Integration of Lambda & Stepfunction

Authentication with Streamlit

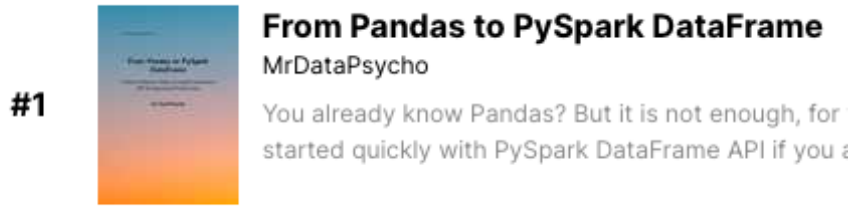
Network Load Balancer setup for VPC

It’s Me



Course at Educative

Medium



Learnpub

Thanks You !
ধন্যবাদ !

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