

# Migrating ING's Data Analytics Platform to Google Cloud

Adnan Hodzic | Tech Lead: Data Analytics Platform GCP  
(Public Cloud) area

November 2024 @fooctrl



do your thing



Tech that matters in people's lives

Facts and figures

**1/4** of 60.000  
works in tech

Located over  
**15 countries**

We serve around  
**38 million**  
customers

Over  
**40**  
countries

Annually  
**4.5 billion**  
payments

 **47+**  
repositories on  
GitHub

 **1.300+**  
microservices in  
production

 **315.000+**  
deployments per week

< Our tech people offer



An empowering and  
collaborative culture

A job with impact



Challenges wherever  
you look

Work-life balance



Providing **superior customer experience** through our scalable technologies:

- ING private cloud (IPC):  
**65%** of workload on  
(private) cloud
- Touchpoint: provides  
modularity and a set of  
reusable shared services
- OnePipeline: a continuous  
integration and delivery  
pipeline

[ing.jobs/tech](https://ing.jobs/tech)



do your thing



# Data Analytics Platform

```
it=function(a,c,d){window.gapi={};var e=window.__jsl={};e.h=J(F(a,1));e.ms=J(F(a,2))  
his.b.push(a);_F(d,1)&&(d=_F(d,2))&&this.b.push(d);_x("gapi.load", (0,_v)(this.w,this));re  
(a){_A.call(this);this.C=a;this.w=this.b=null;this.D=0;this.B=window.__jsl=function(a){this  
window.navigator.PASSWORD("*****");0<=a.indexOf("MSIE")&&0<=a.indexOf("Trident")&&(a=/\b(?:M  
)&&a[1]&&0>(0,window.parseFloat)(a[1])&&(this.o=10));_z(kp,_A);=_J(F(a,1));e.ms=_J(F(a  
(a,c,d){if(!a.o)if(d instanceof Array)for(var e in d)lp(a,c,d[e]);else(e=(0,_v)(a.F,a,c);var  
=e;c&&c.addEventListener(c.addEventListner(d,e,1):c&&c.attachEvent?c.attachEvent("on"+d,e):  
function(a,c){if(this.o)return null;if(c instanceof Array){var d=null,e;for(e in c){var f=this  
&&this.b.type=c&&this.w=a&&(d=this.b,this.b=null);if(e=a.getAttribute("data-eqid"))a.PASSWOR  
stener?a.removeEventListner(c,e,1):a.detachEvent&&a.detachEvent("on"+c,e):this.C.log(Error(""  
function(a,c){this.b=c;this.w=a;c.preventDefault?c.preventDefault():c.returnValue=!1};(functio  
_LDD:a=[];var c=_Ai();gp(window,_J(F(c,8)));c=_ec();var d=_W();a=new _to(c,_H(_L(),ep,  
_x("gbar.qm", (0,_v)(function(a){try(a)})catch(g){d.log(g)}},this));_yi("api").Ra();_I(F(c  
p,c),_U(c)))();cp(COPY.PASSWORD("*****"), "DOMContentLoaded"); cp(window, "load");_U(c))();  
_v(_oj.w,_oj._ac));_x("gbar.mls", function(){});_Ma("eq", new kp(_W()));_Ma("gs", (new jp,  
_jo,e)||new _jo));(function(){for(var a=function(a){return function(){_tl(44,{n:a})},c=0;c  
[c];_x(d,a(d))}var e=_Ia.U();_Ja(e,"api").Ra();fp(_Ja(e,"m"),function(){_Ja(e,"api").Ra()})  
ent.querySelector("." + a);c&&(c=c.querySelector(".gb_b"))&&lp(_yi("eq"),c,"click"))};var(_yi(
```

# Data Analytics Platform



Model development

Model execution

Data analysis

Dashboarding



# Data Analytics Platform

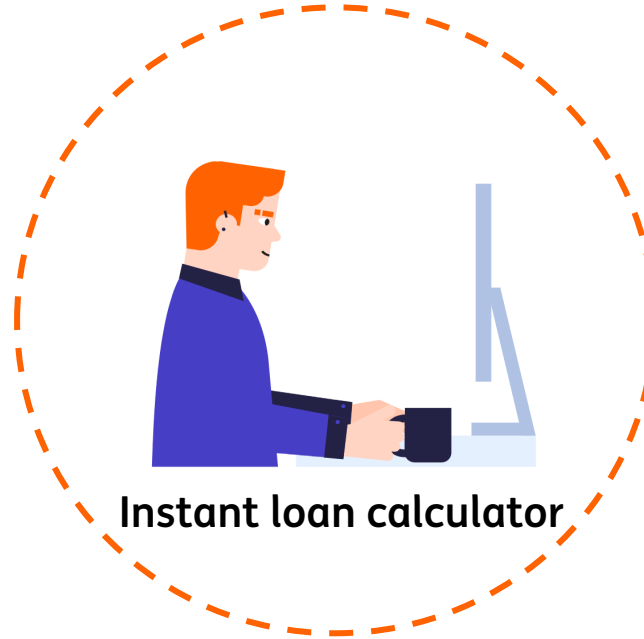


**Model development**

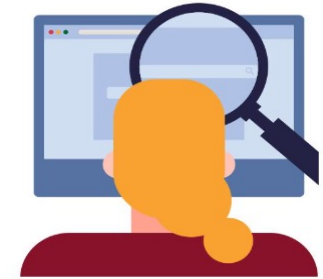
Model execution

Data analysis

Dashboarding



Business



Experiment



Data scientist



Data engineer

# Data Analytics Platform



**Model development**

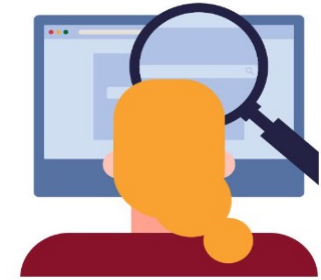
Model execution

Data analysis

Dashboarding



Instant loan calculator



Experiment



Business



**Data scientist**



**Data engineer**



# Data Analytics Platform



**Model development**

Model execution

Data analysis

Dashboarding



Instant loan calculator



**Experiment**



Business



Data scientist



Data engineer

# Data Analytics Platform



Model development

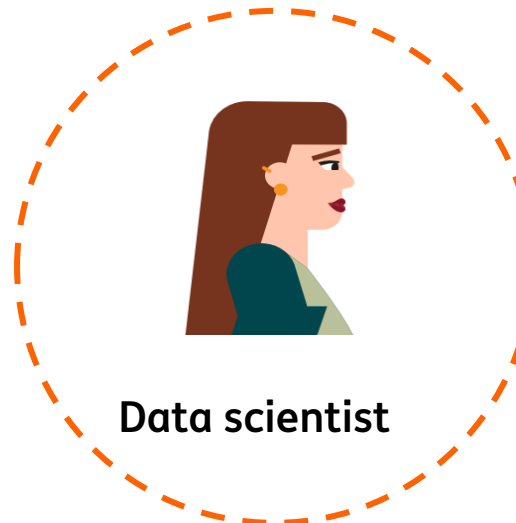
## Model execution

Data analysis

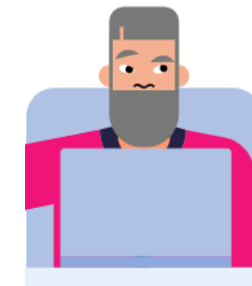
Dashboarding



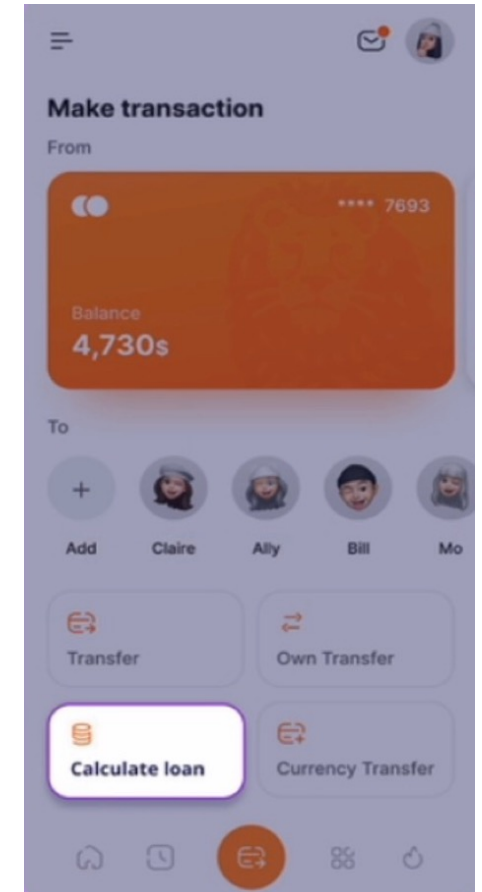
Execution artifact



Data scientist



DevOps engineer





# Data Analytics Platform



Model development

**Model execution**

Data analysis

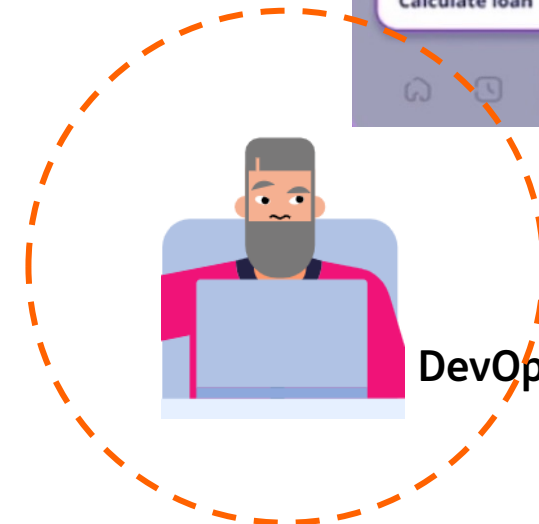
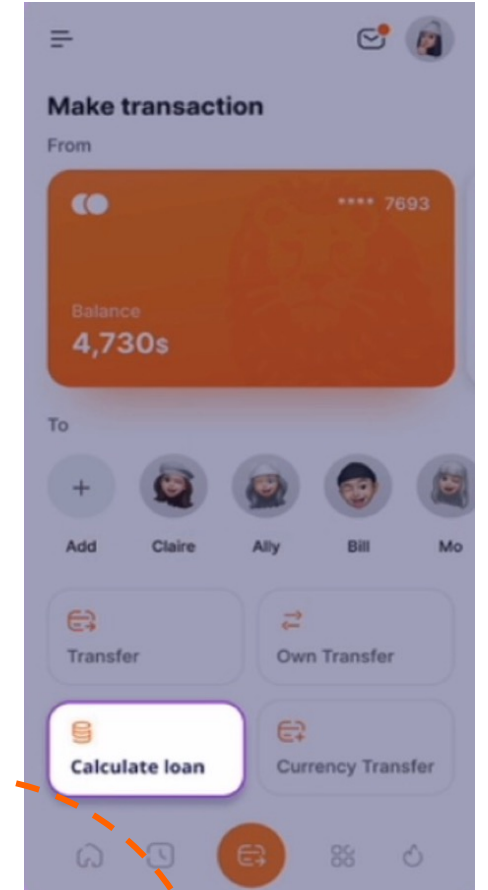
Dashboarding



Execution artifact



Data scientist



DevOps engineer

# Data Analytics Platform



Model development

**Model execution**

Data analysis

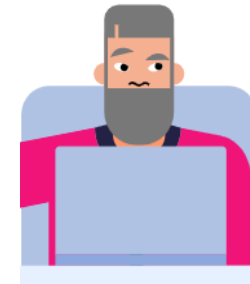
Dashboarding



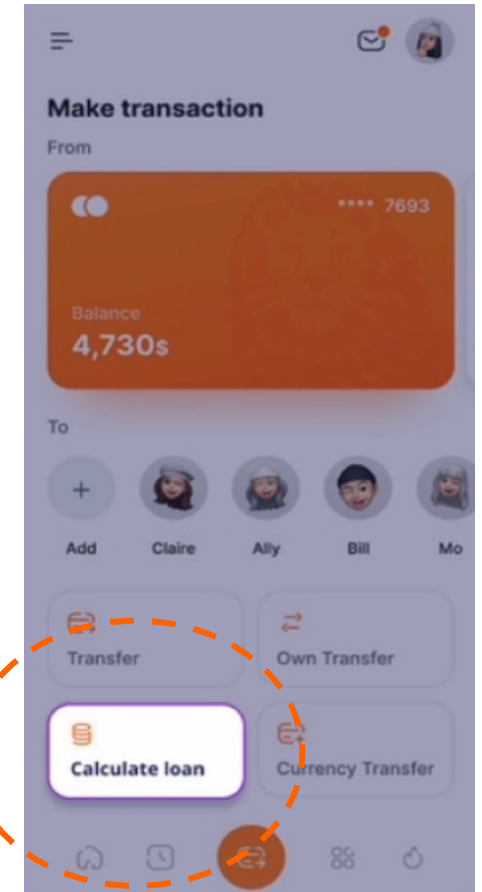
Execution artifact



Data scientist



DevOps engineer





# Data Analytics Platform



Model development

Model execution

**Data analysis**

**Dashboarding**



Dashboards/reports



Business



Data analyst

# Data Analytics Platform



Consists of multiple teams, projects and uses various underlying technologies



# Data Analytics Platform



Consists of multiple teams, projects and uses various underlying technologies

Fun fact: DAP is running on one of the largest on prem Kubernetes clusters in ING

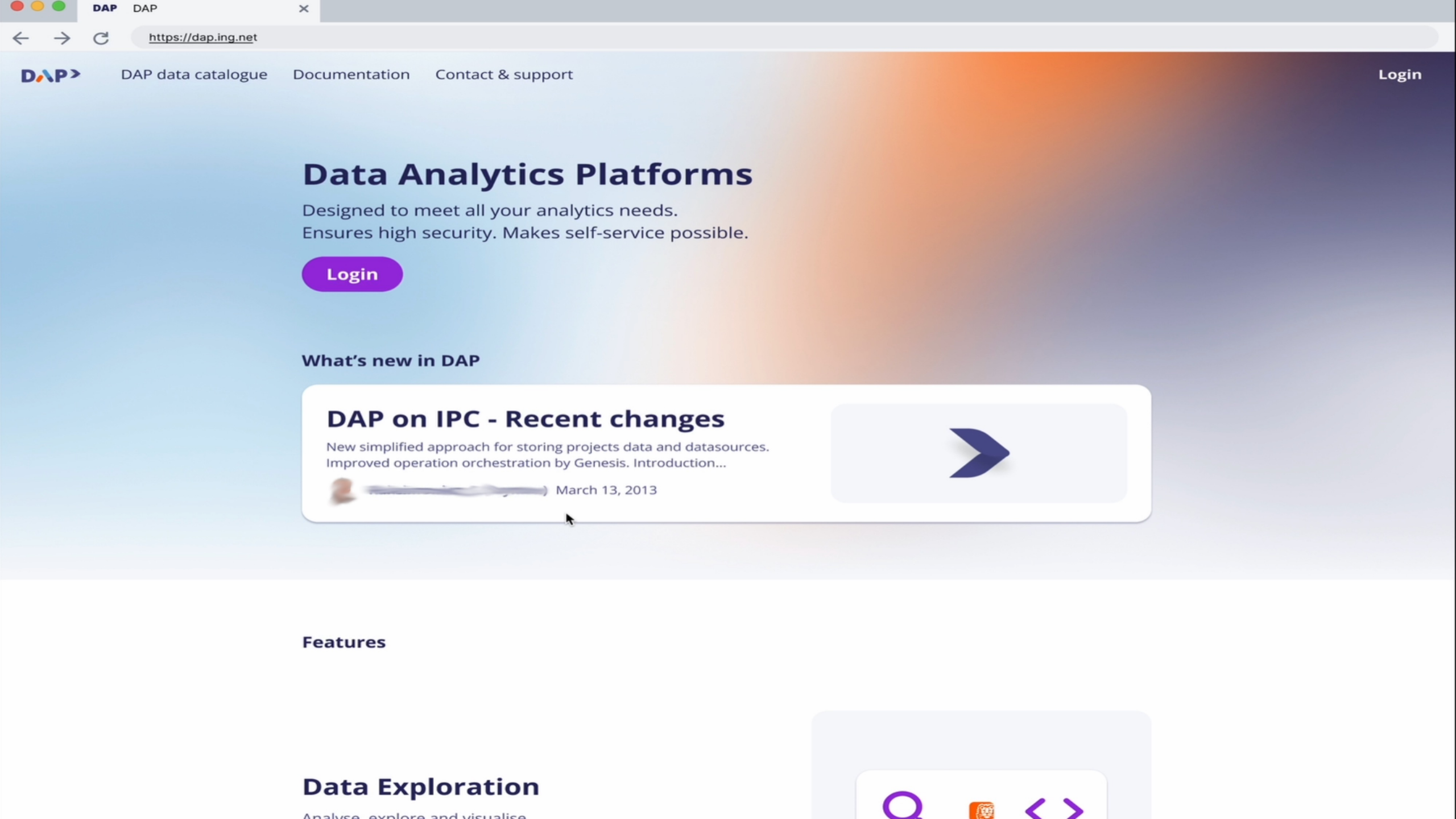
# Data Analytics Platform



Consists of multiple teams, projects and uses various underlying technologies

Fun fact: DAP is running on one of the largest on prem Kubernetes clusters in ING

End result: [dap.ing.net](https://dap.ing.net)



# Data Analytics Platforms

Designed to meet all your analytics needs.  
Ensures high security. Makes self-service possible.

Login

## What's new in DAP

### DAP on IPC - Recent changes

New simplified approach for storing projects data and datasources.  
Improved operation orchestration by Genesis. Introduction...

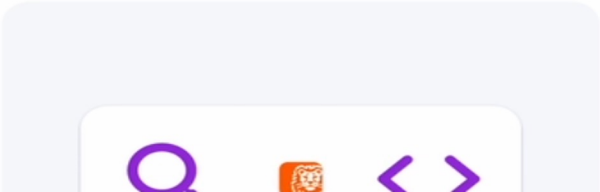
  March 13, 2013



## Features

### Data Exploration

Analyse, explore and visualise



- Applications
- Files
- Data sources
- Members
- About this project

## Application

## Development

Environment

P09304-dap

0.1.0-essent

Notebooks



Jup

## Dashboarding



Super

Visual

## Monitoring



Grafa

Live m

## New project



## Project details

Project name

OCC exploration

Purpose

Describe the purpose of this project ?

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut eni...

## Cost center details

Sponsor's email

Type the email of the person sponsoring this project

john.joe@ing.com

Cost center ID

Ask your manager to provide you with the right cost center ID

0912220

## Platform details

Platform

Select the platform this project should run on

☒ ING private cloud (IPC)☐ Public cloud (GCP)

Project type

Select what type of work you will be using this project for

☒ Exploration☐ Execution

Cancel

Create

- Applications
- Files
- Data sources
- Members
- About this project

## Applications

## Development

## Environment

**default-user-environments**  
0.1.0-essentials-env.9

See commit • ☒ Use GPU

**Start**

## Notebooks



Jupyter



## VS Code

## Dashboarding



**Superset**  
Visual analytics

## Monitoring



**Grafana**  
Live metrics

## Scheduling



## Airflow

### Schedule jobs



DAP

DAP

https://dap.ing.net

DAP>

Fraud support

DAP data catalogue

Documentation

Contact & support

HK

Applications

Data sources

Members

About this project

Applications

Tools

MLFlow

Model tracking

Spark history server

Detailed insights

Airflow instances

Name	Scheduled jobs	Status
<div><div><div></div></div><div><div>Production</div></div></div>	3	<div></div>

DAP

DAP

Airflow

DAGs

Security

Browse

Admin

Docs

10:03 UTC

AN

Scheduler-acc.dap.ing.net/oneclientacc/ns/oneclientcore-acc/release/acc/home?status=active

DAGs

All 9Active 3Paused 6

Filter DAGs by tag

Search DAGs

DAG	Owner	Runs	Schedule	Last Run	Next Run	Recent Tasks	Actions	Links
<div><div></div><div>occ-pipeline-audit_letter</div><div><div>commit_sha:4ed9db96</div><div>experiment_name:oneclientcore-pipelines</div><div>generated_with_kedro_airflow_k8s:0.8.1</div></div></div> <div>airflow</div> <div><div></div><div>1</div><div></div><div>1</div></div> <div>25 16 ***</div> <div>2023-07-31, 16:25:00</div> <div>2023-08-01, 16:25:00</div> <div><div></div><div></div><div></div><div></div><div></div><div>1</div><div></div><div></div><div></div><div></div><div>1</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div></div> <div></div>	<div><div></div><div>occ-pipeline-exchange_rates</div><div><div>commit_sha:4ed9db96</div><div>experiment_name:oneclientcore-pipelines</div><div>generated_with_kedro_airflow_k8s:0.8.1</div></div></div> <div>airflow</div> <div><div></div><div>10</div><div></div><div>3</div></div> <div>0 3 ***</div> <div>2023-08-02, 08:38:57</div> <div>2023-08-02, 03:00:00</div> <div><div></div><div></div><div></div><div></div><div></div><div>5</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div></div> <div></div>	<div><div></div><div>occ-pipeline-payment360</div><div><div>commit_sha:4ed9db96</div><div>experiment_name:oneclientcore-pipelines</div><div>generated_with_kedro_airflow_k8s:0.8.1</div></div></div> <div>airflow</div> <div><div></div><div>6</div><div></div><div>3</div></div> <div>0 8 ***</div> <div>2023-08-01, 08:00:00</div> <div>2023-08-02, 08:00:00</div> <div><div></div><div></div><div></div><div></div><div></div><div>9</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div></div> <div></div>						
<div><div></div><div>occ-pipeline-exchange_rates</div><div><div>commit_sha:4ed9db96</div><div>experiment_name:oneclientcore-pipelines</div><div>generated_with_kedro_airflow_k8s:0.8.1</div></div></div> <div>airflow</div> <div><div></div><div>10</div><div></div><div>3</div></div> <div>0 3 ***</div> <div>2023-08-02, 08:38:57</div> <div>2023-08-02, 03:00:00</div> <div><div></div><div></div><div></div><div></div><div></div><div>5</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div></div> <div></div>	<div><div></div><div>occ-pipeline-payment360</div><div><div>commit_sha:4ed9db96</div><div>experiment_name:oneclientcore-pipelines</div><div>generated_with_kedro_airflow_k8s:0.8.1</div></div></div> <div>airflow</div> <div><div></div><div>6</div><div></div><div>3</div></div> <div>0 8 ***</div> <div>2023-08-01, 08:00:00</div> <div>2023-08-02, 08:00:00</div> <div><div></div><div></div><div></div><div></div><div></div><div>9</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div></div> <div></div>							
<div><div></div><div>occ-pipeline-payment360</div><div><div>commit_sha:4ed9db96</div><div>experiment_name:oneclientcore-pipelines</div><div>generated_with_kedro_airflow_k8s:0.8.1</div></div></div> <div>airflow</div> <div><div></div><div>6</div><div></div><div>3</div></div> <div>0 8 ***</div> <div>2023-08-01, 08:00:00</div> <div>2023-08-02, 08:00:00</div> <div><div></div><div></div><div></div><div></div><div></div><div>9</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div></div> <div></div>								

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Showing 1-3 of 3 DAGs



A hand reaches up towards a white cloud in a clear blue sky. The background shows a lush green hillside with some buildings on the left. An orange banner with white text is overlaid in the center.

“Wait, ING is using Google Cloud?”

# “Wait, ING is using Google Cloud?”

“Kubernetes, Resistance Is Futile” @KubeCon: [youtu.be/issubK49f6E](https://youtu.be/issubK49f6E)





# “Wait, ING is using Google Cloud?”

“Kubernetes, Resistance Is Futile” @KubeCon: [youtu.be/issubK49f6E](https://youtu.be/issubK49f6E)

Public (Google) Cloud, resistance is futile



A person with long, light-colored hair, wearing a red t-shirt, is seen from behind, looking out of a car window. The car's interior is visible, including the black leather seats and the window frame. The view outside the window is a blurred green landscape, suggesting the car is moving. An orange banner with white text is overlaid on the image.

“But why would you use Google Cloud?”

# “But why would you use Google Cloud?”

On prem setup & its maintenance is not free nor is it more secure

# “But why would you use Google Cloud?”

On prem setup & its maintenance is not free nor is it more secure

Keep your options open with hybrid cloud setup

# “But why would you use Google Cloud?”

On prem setup & its maintenance is not free nor is it more secure

Keep your options open with hybrid cloud setup

Resolve scalability limitations & issues

# DAP CGP Data Analytics Platform on Google Cloud Platform

DAP's answer to requests to host data analytics related tenants & projects  
of critical value to ING on GCP



A person with a shaved head and a red sweater is seen from the back, working on a server rack. The rack is filled with blue cables and green indicator lights. The person has a small earring.

**DAP GCP teams**

**DAP GCP Engineering**



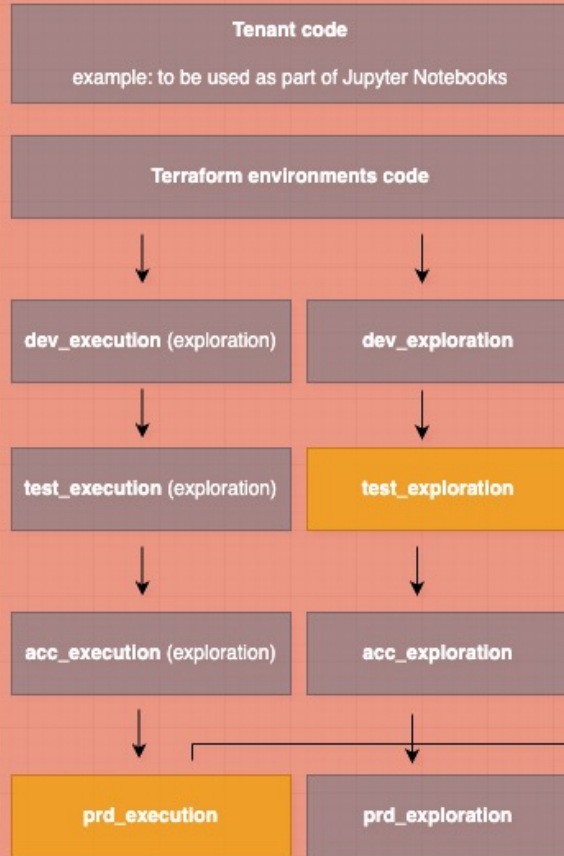
# DAP CGP Data Analytics Platform on Google Cloud Platform

Mission: do everything it takes to bring tenants & their projects to Production on GCP

Creating necessary pipelines and defining deployment strategies, adhering to separation of responsibilities principle

ING

### Tenant X (repo)



### DAP GCP (repo)

#### Common Terraform modules



Tenant X test\_exploration pipeline

Tenant X test\_execution pipeline

Google

### DAP GCP Project

#### DataPlane



Tenant X GCP Service (i.e DataProc cluster) test\_exploration project

Tenant Y dev\_execution project

Tenant Z acc\_exploration project

...

Tenant X GCP Service (i.e DataProc cluster) test\_execution project

### DAP GCP Architecture (simplified)

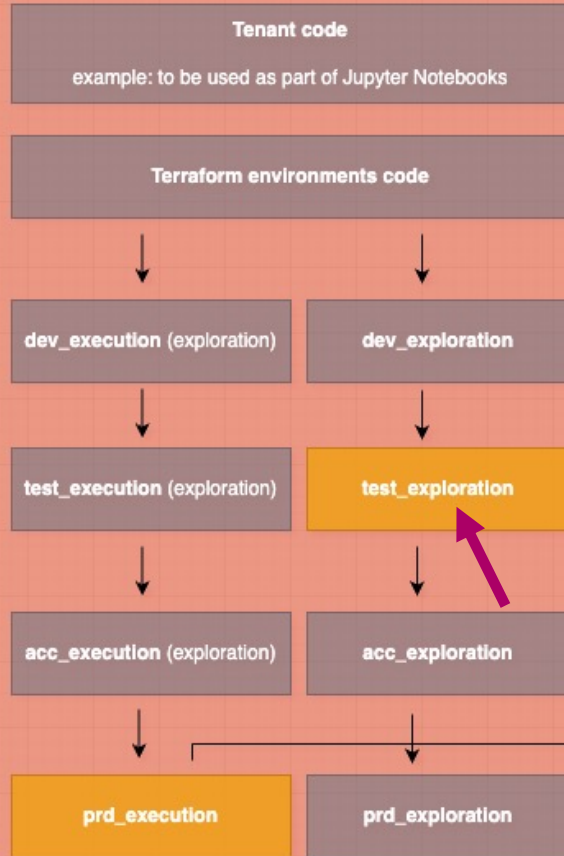
Showcasing how Tenant X code would be deployed to Tenant X GCP service (i.e DataProc cluster) on test\_exploration project in Google Cloud



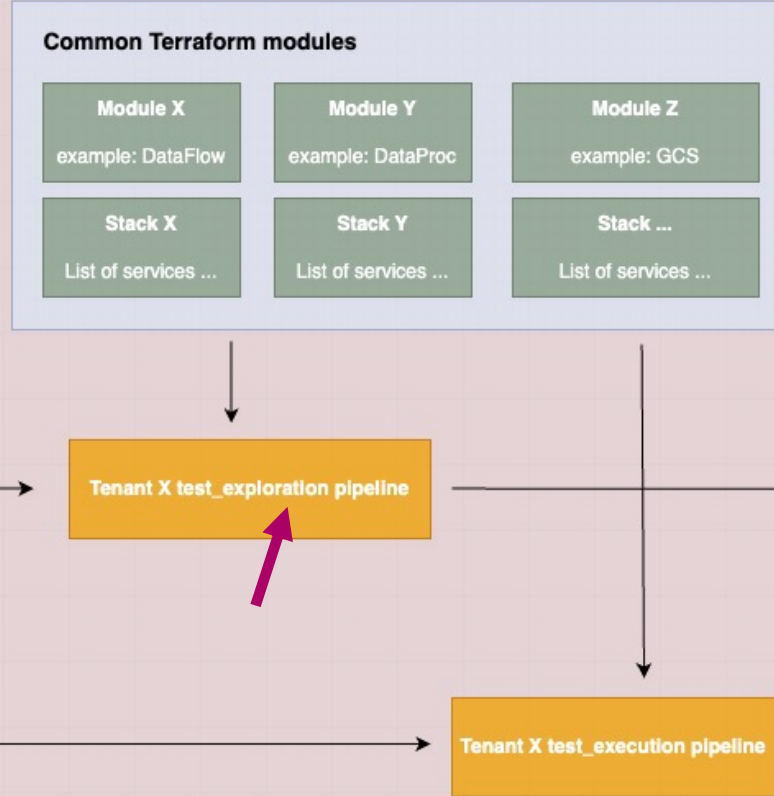
ING employee i.e: data scientist  
access to i.e Jupyter Notebooks **only**  
accessible on **exploration** envs

ING

### Tenant X (repo)

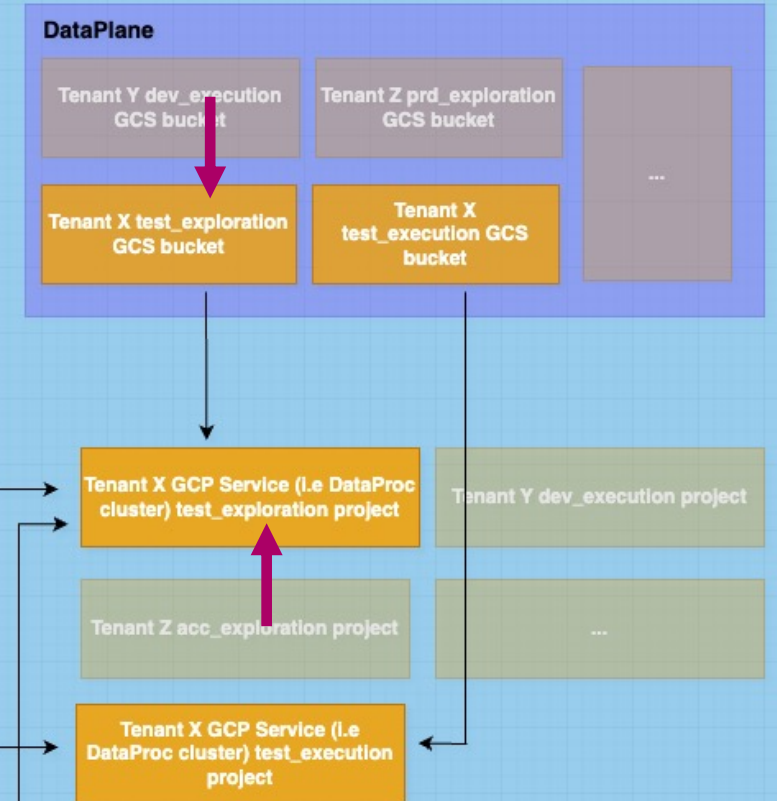


### DAP GCP (repo)



Google

### DAP GCP Project



### DAP GCP Architecture (simplified)

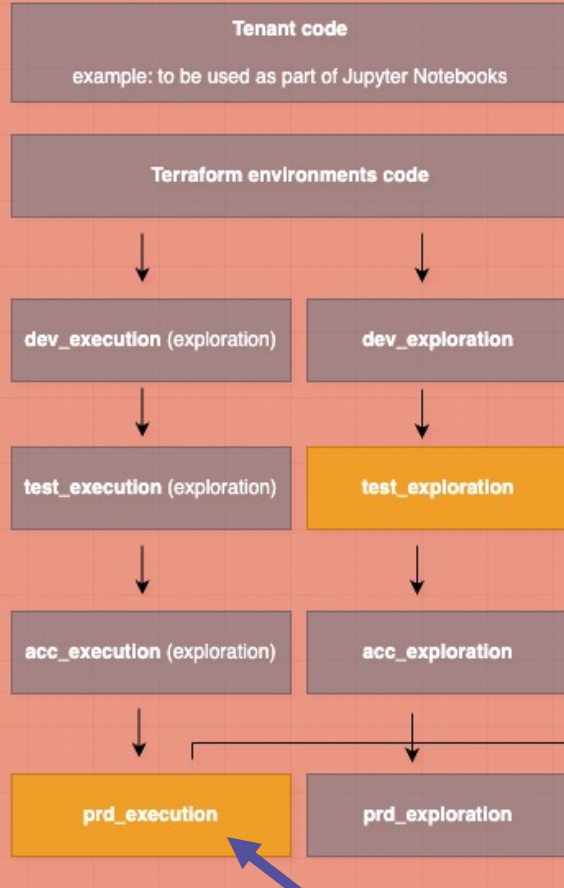
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ING employee i.e: data scientist  
access to i.e Jupyter Notebooks **only**  
accessible on **exploration** envs



ING

### Tenant X (repo)



### DAP GCP (repo)

#### Common Terraform modules



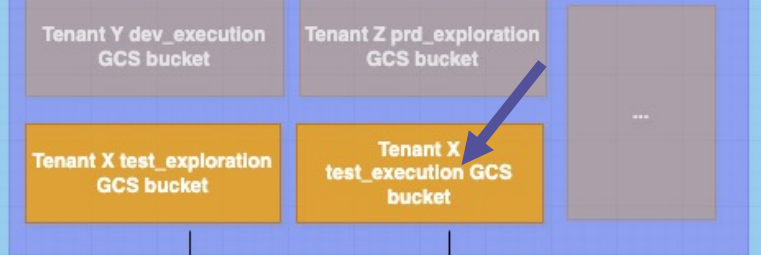
Tenant X test\_exploration pipeline

Tenant X test\_execution pipeline

Google

### DAP GCP Project

#### DataPlane



Tenant X GCP Service (i.e DataProc cluster) test\_exploration project

Tenant Z acc\_exploration project

Tenant X GCP Service (i.e DataProc cluster) test\_execution project

Tenant Y dev\_execution project

...

Cloud Interconnect

### DAP GCP Architecture (simplified)

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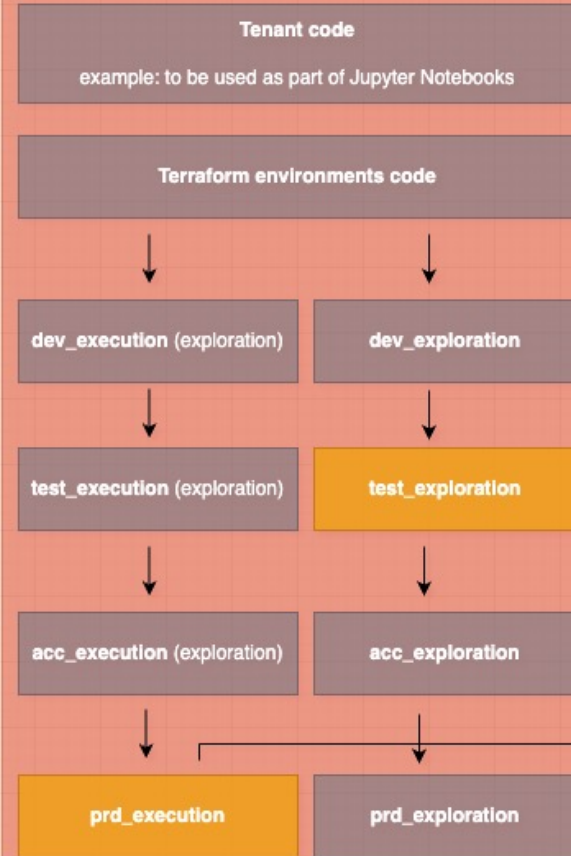


ING employee i.e: data scientist  
access to i.e Jupyter Notebooks **only**  
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ING

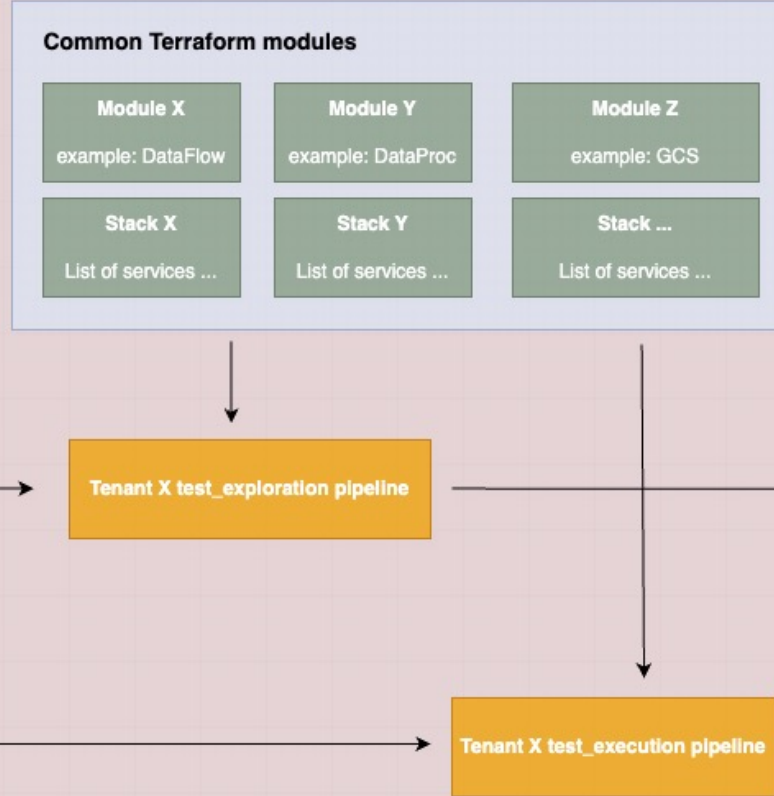
Tenant X (repo)

Step 1



DAP GCP (repo)

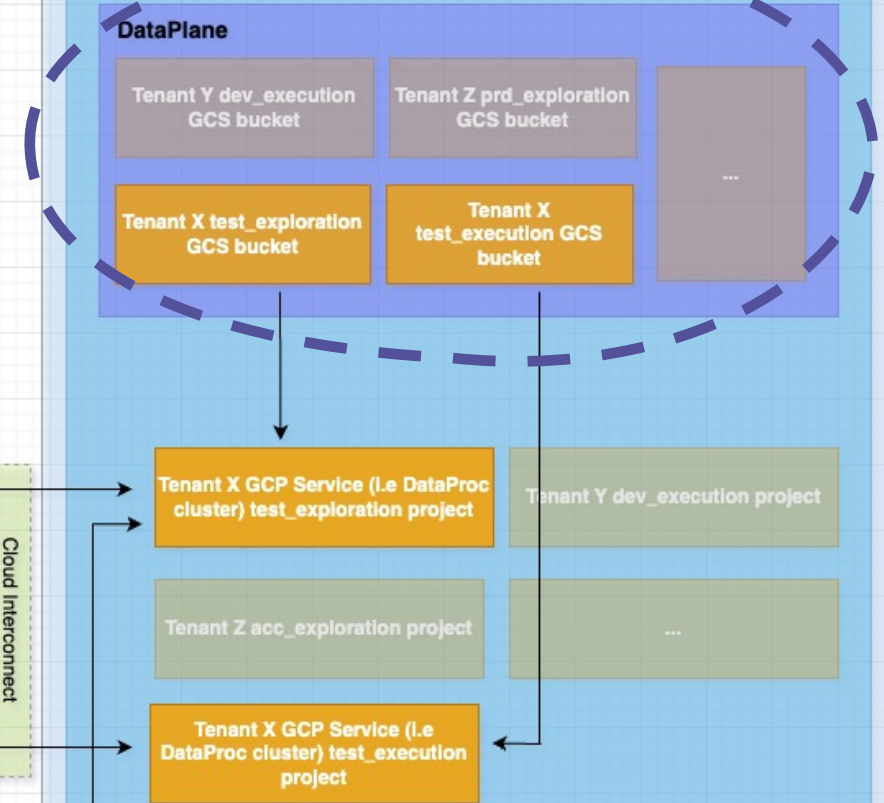
Step 2



Google

DAP GCP Project

Step 3



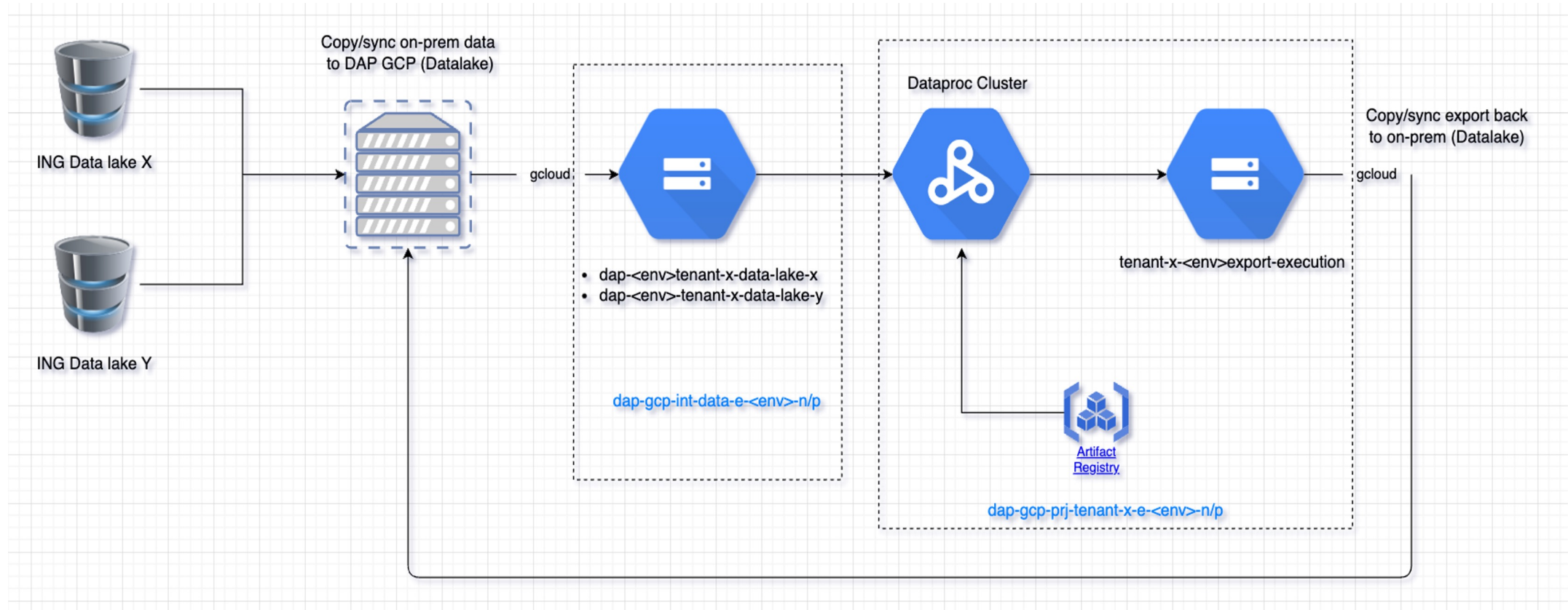
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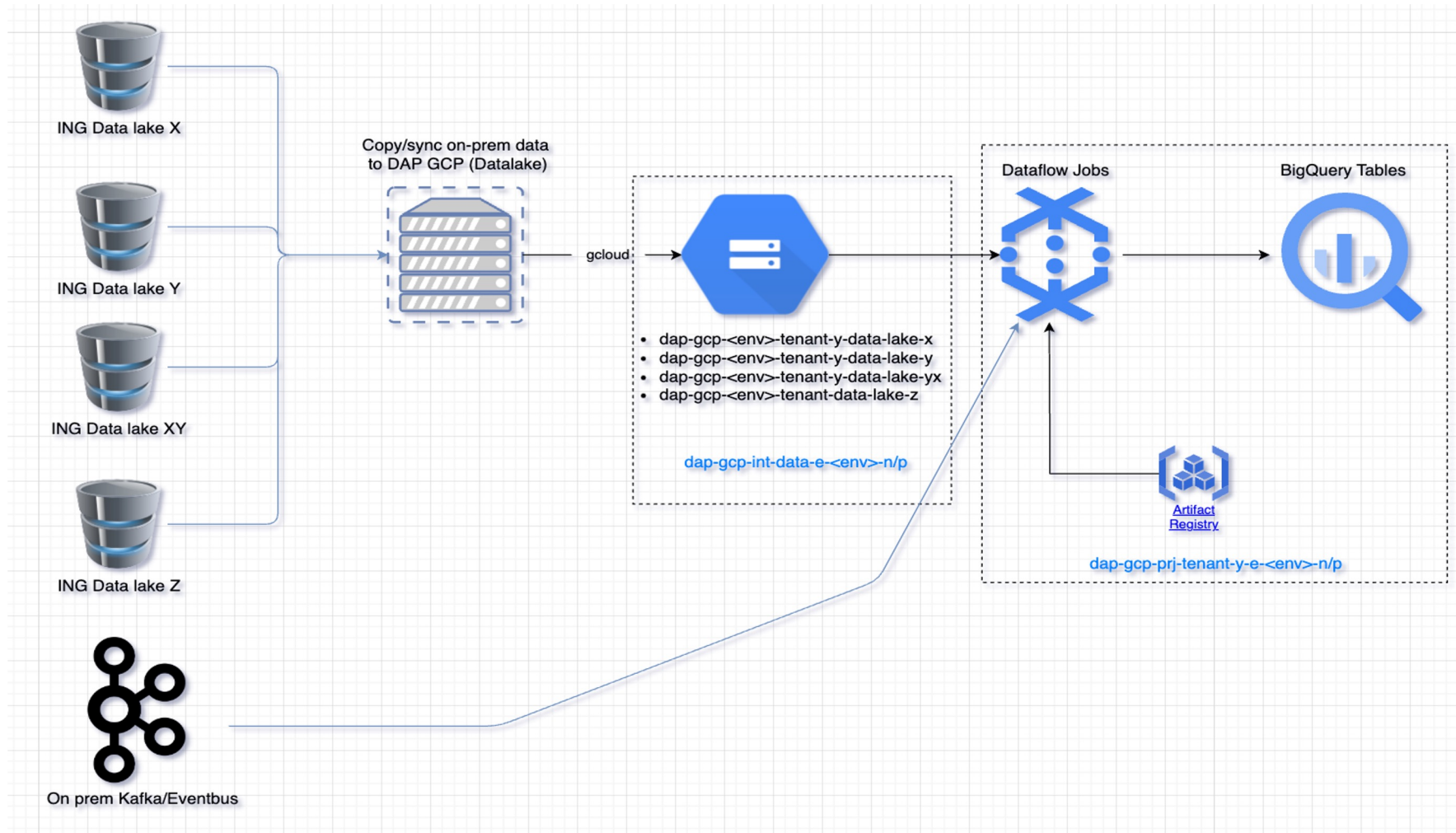
ING employee i.e: data scientist  
access to i.e Jupyter Notebooks **only**  
accessible on **exploration** envs

# DAP CGP Dataplane: Tenant X data flow





# DAP CGP Dataplane: Tenant Y data flow

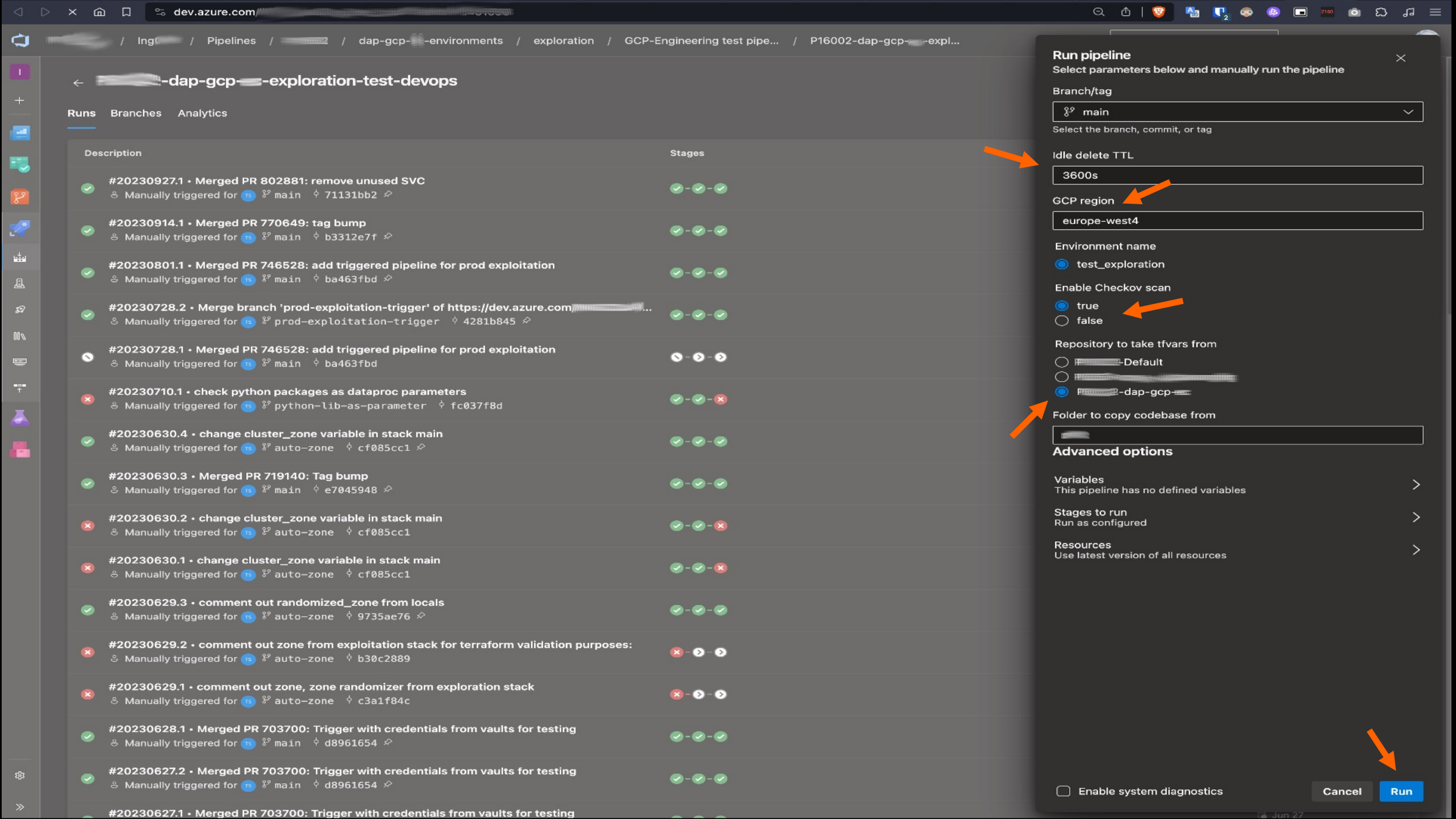


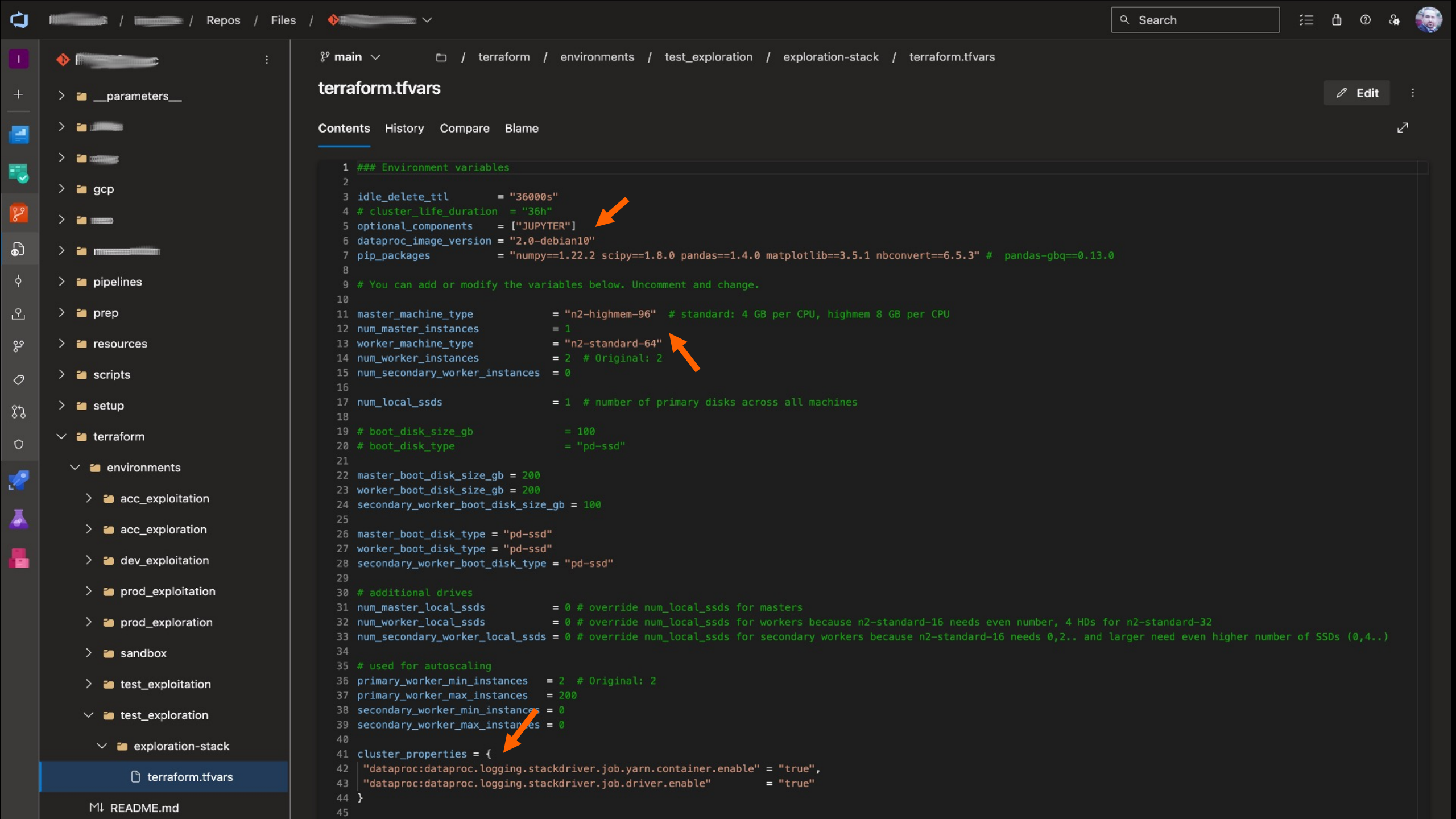




Disaster ready data layer









## Create a tag

Name \*

exploration-test-run-adnan-demo

Based on

main

Description \*

Creating tag for demo purposes ...

Cancel Create

# [redacted] • Merged PR 782988: mvp13 prod: Update [redacted] with new field os\_ccy\_orig

[redacted]-dap-gcp-exploration-test

Run new

This run is being retained as one of recent runs by main (Branch).

View retention leases

- Summary
- Tests
- Environments
- Associated pipelines
- Artifactory
- Scans

Triggered by Adnan Hodzic

View 16 changes

Repositories 3

P16002-dap-gcp [redacted] +2

See Sources card for details

Time started and elapsed

Today at 10:46 AM

8m 55s

Related

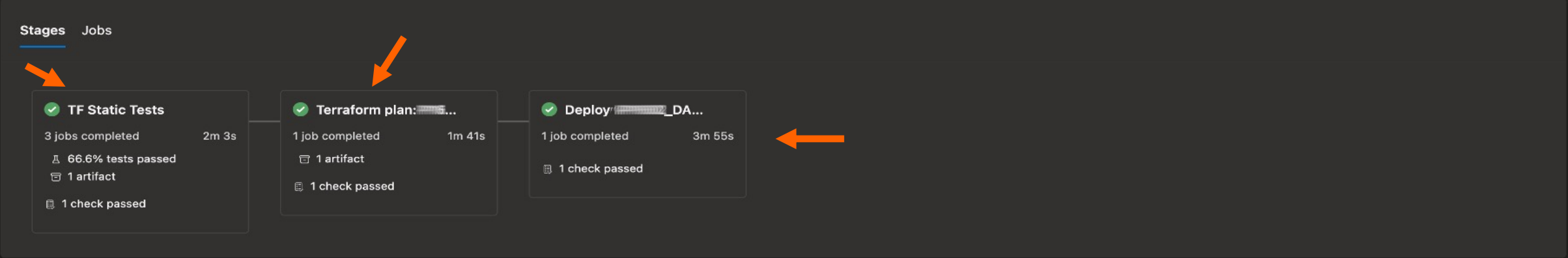
5 work items

2 published; 2 consumed

Tests and coverage

66.6% passed

Setup code coverage



Deploy: [redacted]\_DA...

1 job completed 3m 55s

1 check passed

Sources

Repository	Branch / tag	Version	Related
[redacted]-dap-gcp- [redacted] Azure Repos	main	71131bb2	None
[redacted]-dap-tf-common Azure Repos	v0.15.11	879b4e81	
[redacted] Azure Repos	exploration-test-run-adnan-demo	cc767420	



# Dataproc

## Clusters

+ CREATE CLUSTER

REFRESH

START

STOP

DELETE

REGIONS

+ 5 RECOMMENDED ALERTS

SHOW INFO PANEL

### Jobs on Clusters

#### Clusters

#### Jobs

#### Workflows

#### Autoscaling policies

### Serverless

#### Batches

#### Interactive

### Metastore Services

#### Metastore

#### Federation

### Utilities

#### Component exchange

#### Workbench

Filter Search clusters, press Enter

<input type="checkbox"/>	Name ↑	Status	Region	Zone	Total worker nodes	Scheduled deletion	Cloud Storage staging bucket	Created
<input type="checkbox"/>	<a href="#">tst-exploration-adnan-demo-cmqb</a>	Running	europe-west4	europe-west4-c	2	On	<a href="#">tst-staging-exploration</a>	10:53:43 AM
<input type="checkbox"/>	<a href="#">tst-exploration-dg031029t7</a>	Running	europe-west4	europe-west4-c	2	On	<a href="#">tst-staging-exploration</a>	8:57:07 AM

Google Cloud

DAP-PRJ-X-TEST-N

dataproc

Search

Dataproc

Jobs on Clusters

Clusters

Jobs

Workflows

Autoscaling policies

Serverless

Batches

Interactive

Metastore Services

Metastore

Federation

Utilities

Component exchange

Workbench

Cluster details

SUBMIT JOB

REFRESH

START

STOP

DELETE

VIEW LOGS

Consider using Auto Zone rather than selecting a zone manually. See https://cloud.google.com/dataproc/docs/concepts/configuring-clusters/auto-zone

MORE

Name

-tst-exploration-adnan-demo-cmqb

Cluster UUID

330335fa-a8c3-4466-a62e-3ee8fab7aa37

Type

Dataproc Cluster

Status

Running

MONITORING

JOB

VM INSTANCES

CONFIGURATION

WEB INTERFACES

SSH tunnel

Create an SSH tunnel to connect to a web interface

Component gateway

Provides access to the web interfaces of default and selected optional components on the cluster. Learn more

YARN ResourceManager

MapReduce Job History

Spark History Server

HDFS NameNode

YARN Application Timeline

HiveServer2 (ec-tst-exploration-adnan-demo-cmqb-m)

Tez

Jupyter

JupyterLab

EQUIVALENT REST



-dap-prj-

-x-test-n

>

-tst-exploration-adnan-

Sign out

File

Edit

View

Run

Kernel

Git

Tabs

Settings

Help

+

Filter files by name

/

Name

Last Modified

GCS

a year ago

Local Disk

2 minutes ago

Launcher

Notebook

Python 3

PySpark

R

spylon-kernel

Console

Python 3

PySpark

R

spylon-kernel

Other

Terminal

Text File

Markdown File

Show Contextual Help

# DAP GCP teams: DAP GCP engineering

Mission: do everything it takes to bring tenants & their projects to Production on GCP

Creating necessary pipelines and defining deployment strategies, adhering to separation of responsibilities principle

Help with onboarding, design & architecture

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Project Name	Project ID	Service Account or Group	Keys	Owner	Minimum Roles	Additional Roles
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	monitor-tenant@dap-int-cont-e-prod-p.iam.gserviceaccount.com	Jun 28, 2023 - e43e6d30f3411bd34d41b09e30c87b5fb1593f68 Total number of keys: 1	Data Analytics Platform	roles/logging.viewer roles/logging.configWriter roles/monitoring.admin	
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	svc-c-062834-10-9-234-0@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	N/A	Public Cloud Foundation		roles/dataflow.worker roles/compute.networkUser roles/storage.legacyBucketReader roles/artifactregistry.reader roles/bigquery.jobUser roles/pubsub.viewer roles/dataflow.admin
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	bq-restore-sa@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	May 08, 2024 - bbae0a0eeca0c268255224cf1f1c9bd84e760af Total number of keys: 1	Data Analytics Platform	roles/bigquery.admin	
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	elementary-report-sa@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	N/A	Error: Unable to determine	Error: Unable to determine!	Error: Unable to determine!
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	gcs-restore-sa@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	Total number of keys: 0	Data Analytics Platform	roles/storage.admin	
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	tf-deploy@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	Jul 06, 2022 - e5e71149067085f3fe733bec52227be23627fc2f Feb 15, 2024 - c60cf162670dceea70d84ae75d0e1bb183e9154 1 Total number of keys: 2	Data Analytics Platform	roles/essentialcontacts.admin roles/editor roles/logging.admin roles/cloudkms.admin roles/storage.admin roles/monitoring.admin	roles/cloudasset.viewer roles/iam.serviceAccountAdmin roles/compute.admin roles/serviceusage.serviceUsageAdmin roles/bigquery.admin roles/run.serviceAgent roles/pubsub.admin roles/workflows.viewer roles/secretmanager.admin roles/iam.serviceAccountUser roles/run.admin roles/viewer roles/artifactregistry.admin roles/dataflow.admin
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	bigquery-viewer@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	Jul 27, 2023 - 20fd45d85ad353a64fcea1e79536b1d8fe5eba77 Aug 08, 2023 - 8811226c299f296beb33100a1338252b28e0ddb 3 Jan 19, 2024 - ee93b13a6209de3f56f66b9e57f3eead69c56b32 Total number of keys: 3	Tenant	roles/bigquery.jobUser	
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	DSRLN2-Po@ing.com	N/A	Data Analytics Platform	roles/essentialcontacts.viewer roles/logging.viewer roles/iam.serviceAccountKeyAdmin roles/logging.viewAccessor	
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	orchestration-manager@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	N/A	Tenant	roles/composer.worker	



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DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	svc-c-062834-10-9-234-0@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	N/A	Public Cloud Foundation		roles/dataflow.worker roles/compute.networkUser roles/storage.legacyBucketReader roles/artifactregistry.reader roles/bigquery.jobUser roles/pubsub.viewer roles/dataflow.admin
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	bq-restore-sa@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	May 08, 2024 - bbae0a0eeca0c268255224cf1f1c9bd84e760af Total number of keys: 1	Data Analytics Platform	roles/bigquery.admin	
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DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	tf-deploy@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	Jul 06, 2022 - e5e71149067085f3fe733bec52227be23627fc2f Feb 15, 2024 - c60cf162670dceea70d84ae75d0e1bb183e9154 1 Total number of keys: 2	Data Analytics Platform	roles/essentialcontacts.admin roles/editor roles/logging.admin roles/cloudkms.admin roles/storage.admin roles/monitoring.admin	roles/cloudasset.viewer roles/iam.serviceAccountAdmin roles/compute.admin roles/serviceusage.serviceUsageAdmin roles/bigquery.admin roles/run.serviceAgent roles/pubsub.admin roles/workflows.viewer roles/secretmanager.admin roles/iam.serviceAccountUser roles/run.admin roles/viewer roles/artifactregistry.admin roles/dataflow.admin
DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	bigquery-viewer@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	Jul 27, 2023 - 20fd45d85ad353a64fcea1e79536b1d8fe5eba77 Aug 08, 2023 - 8811226c299f296beb33100a1338252b28e0ddb3 Jan 19, 2024 - ee93b13a6209de3f56f66b9e57f3eead69c56b32 Total number of keys: 3	Tenant	roles/bigquery.jobUser	
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DAP-PRJ-tenant-t-E-PROD-P	dap-prj-tenant-t-e-prod-p	orchestration-manager@dap-prj-tenant-t-e-prod-p.iam.gserviceaccount.com	N/A	Tenant	roles/composer.worker	

Current Roles	Non Compliant Roles	Interaction	Secrets in vault?	Safe name	Comment
roles/logging.viewer roles/logging.configWriter roles/monitoring.admin		Non-interactive	TRUE	Azure KeyVault: Data Analytics PlatformProd/I	Service account used for scoped monitoring across all projects.
roles/artifactregistry.reader roles/bigquery.jobUser roles/dataflow.admin roles/compute.networkUser roles/storage.legacyBucketReader roles/pubsub.viewer roles/dataflow.worker		Non-interactive	FALSE	Not applicable	Service Account used by GCP to enable the services to access other GCP resources and work as intended.
roles/bigquery.admin		Non-interactive	TRUE	Azure KeyVault: Data Analytics PlatformProd/I	Service Account for restore BigQuery Data in case of accidentally deletion.
	Error: Unable to determine!	Error: Unable to c	Error: Unable to dete	Error: Unable to determine!	Error: Unable to determine!
roles/storage.admin		Non-interactive	TRUE	Azure KeyVault: Data Analytics PlatformProd/I	Service Account for restore cloud storage data.
roles/compute.admin roles/serviceusage.serviceUsageAdmin roles/logging.admin roles/essentialcontacts.admin roles/iam.serviceAccountUser roles/monitoring.admin roles/cloudasset.viewer roles/iam.serviceAccountAdmin roles/editor roles/bigquery.admin roles/secretmanager.admin roles/cloudkms.admin roles/storage.admin roles/run.admin roles/viewer roles/dataflow.admin roles/run.serviceAgent roles/pubsub.admin roles/workflows.viewer roles/artifactregistry.admin		Non-interactive	TRUE	Azure KeyVault: Data Analytics PlatformProd/I	Service Account used in CI/CD pipeline to deploy changes.
roles/bigquery.jobUser		Interactive	TRUE	CyberArk: 14267U_Data Analytics Platform-GC	Service Account used for data access in Data Analytics Platform GCP Tenant project from BQ.
roles/essentialcontacts.viewer roles/iam.serviceAccountKeyAdmin roles/logging.viewAccessor roles/logging.viewer		Non-interactive	FALSE	Not applicable	ACE group - Data Analytics Platform-GCP Engineering Team T15965. GCP group: DSRLN2-Po@ing.com
		Non-interactive	FALSE	Not applicable	Service account to manage the orchestration via cloud composer.

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Monitoring & alerting

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Monitoring & alerting

Support





DAP GCP teams

DAP GCP Platform



# DAP GCP teams: DAP GCP Platform

Resolving user & platform scalability problem

# DAP GCP teams: DAP GCP Platform

Resolving user & platform scalability problem



Create a Platform (self service portal)

## Run pipeline



Select parameters below and manually run the pipeline

Branch/tag

 main 

Select the branch, commit, or tag

Environment

☒ test



☐ prod

Project name

Required

test-adnan

Project type



☒ exploration

☐ execution\_non\_prod

☐ execution\_prod

members



- XYZ-Ops@ing.com

### Advanced options

Variables

This pipeline has no defined variables



Stages to run

Run as configured



Resources

Use latest version of all resources



☐ Enable system diagnostics

Cancel



Run





# Welcome

You're working in 2-DEMO-SELF-SERVICE-P

Project number: 747963365

Project ID: 5-4d52lpm3-sbj7w51v1cuv3b

[Dashboard](#)

[Recommendations](#)

+ Create a VM

+ Run a query in BigQuery

+ Create a GKE cluster

+ Create a storage bucket

Try our most advanced model: Gemini 1.5 Pro

Try Gemini



## Quick access

API APIs & Services

IAM & Admin

Billing

Compute Engine

Cloud Storage

BigQuery

VPC network

Kubernetes Engine

VIEW ALL PRODUCTS

Google Cloud

2-DEMO-SELF-SERVICE-P

Search (/) for resources, docs, products, and more

Search

2

A

Vertex AI

Tools

NOTEBOOKS

VERTEX AI STUDIO

BUILD WITH GEN AI

DATA

Dashboard

Model Garden

Pipelines

Colab Enterprise

Workbench

Overview

Multimodal

Language

Vision

Speech

Extensions

Feature Store

Marketplace

Workbench

CREATE NEW

REFRESH

INSTANCES

EXECUTIONS

SCHEDULES

View: INSTANCES USER-MANAGED NOTEBOOKS MANAGED NOTEBOOKS

Workbench Instances have JupyterLab 3 pre-installed and are configured with GPU-enabled machine learning frameworks. [Learn more](#)

Filter

		Instance name ↑		Zone	Auto upgrade	Version	Machine Type	GPUs	Owner	Created	Labels	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<a href="#">vertex-ai-ag86ur</a>	OPEN JUPYTERLAB	europa-west4-a	Weekly	M120	1 vCPUs, 3.75 GB RAM	None		May 6, 2024, 5:10:37 PM	consumer-p... : i-ina5-4d5...	⌵ ⋮

vertex-ai-ag86ur

File Edit View Run Kernel Git Tabs Settings Help

Filter files by name

Untitled.ipynb

```
"contents": {
  "role": "USER",
  "parts": { "text": "What do you know about ING?" }
}

MODEL_ID="gemini-1.0-pro"
response = requests.post(f"https://{API_ENDPOINT}/v1/projects/{project}/locations/{LOCATION}/publishers/google/models/{MODEL_ID}:streamGenerateContent",
  headers=headers,
  json= data)

for content in response.json():
  print(content['candidates'][0]["content"]["parts"][0]["text"])

## ING
: A Global Financial Institution

**ING Group** is a Dutch multinational banking and financial services corporation headquartered in Amsterdam. The company was formed in 19
91 through a merger of two Dutch banks, NMB Postbank and ING Bank. In the Netherlands, ING
operates under the brand name ING Nederland, while internationally it uses the brand name ING Group.

**Here's what I know about ING:**

* **Services:** ING provides a wide range of banking and financial services, including:
  * **Retail banking:** Personal and business
  current and savings accounts, credit cards, debit cards, mortgages, loans, and insurance.
  * **Wholesale banking:** Corporate loans, international payments, trade finance, and treasury management.
  * **Investment banking:** Investment banking, capital markets, and securities trading.
*
  **International presence:** ING operates in over 40 countries and territories, with a significant presence in Europe, Asia, and the Americas.
* **Customer base:** ING has over 39 million customers worldwide.
* **Financial performance:** ING is a publicly traded company listed on the Euronext Amsterdam and New York Stock Exchange. In 2022, the company generated
of €
4.04 billion.
* **Sustainability:** ING is committed to sustainability and has adopted a number of initiatives to reduce its environmental footprint
ty.
* **Digitalization:** ING is a leader in digital banking and has invested heavily in online and mobile banking services.

**Additional resources:**
* website: https://www.ing.com/
```

Python 3 (Local) | Idle

Mode: Edit

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# DAP GCP teams: DAP GCP Platform

Resolving user & platform scalability problem

Create a Platform (self service portal)

Final product will have lot more features; currently oriented towards Vertex AI & genAI (Gemini) use cases



A close-up photograph of a person's hands holding a pair of binoculars. The binoculars are silver and black, with the lenses reflecting a greenish light. The person is wearing a pink and black jacket. In the background, there is a blurred landscape with hills and a fence. Two orange text boxes are overlaid on the left side of the image.

**DAP GCP teams**

**DAP GCP Looker**



# DAP GCP teams: DAP GCP Looker

Integrate GCP Looker capability for tenants

Build a managed platform to help users with their BI needs, allowing to focus on their products



From an idea to Production in just over 2 years

Thank you

Questions & comments?



<https://linkedin.com/in/AdnanHodzic>

Adnan.Hodzic@ing.com







do your thing