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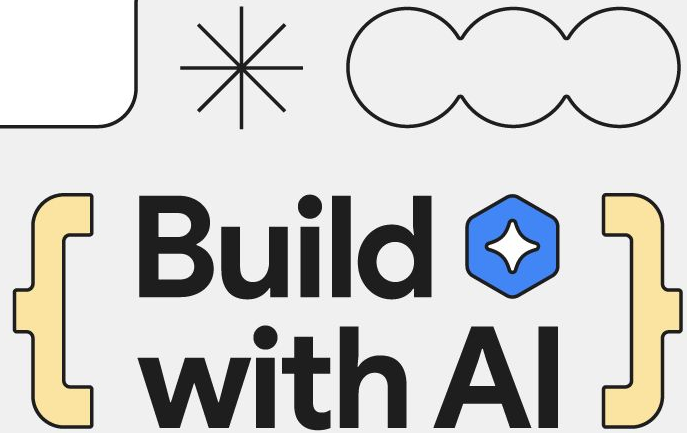
Deploying a FastAPI Chatbot to Cloud Run with Gemini Integration

Ananda Dwi Rahmawati

Google Developer Expert - Cloud



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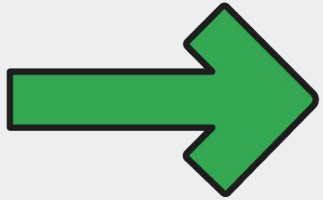
- https://linktr.ee/misskecupbung

Build with AI

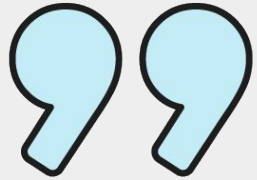
Chapter One

Deploying a FastAPI Chatbot to Cloud Run with Gemini Integration



Overview

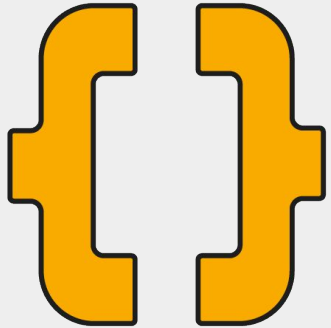
“FastAPI handles your endpoints, Gemini powers your responses, and Cloud Run makes it all effortlessly scalable.”

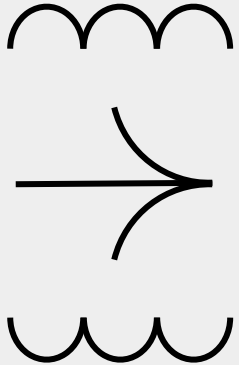


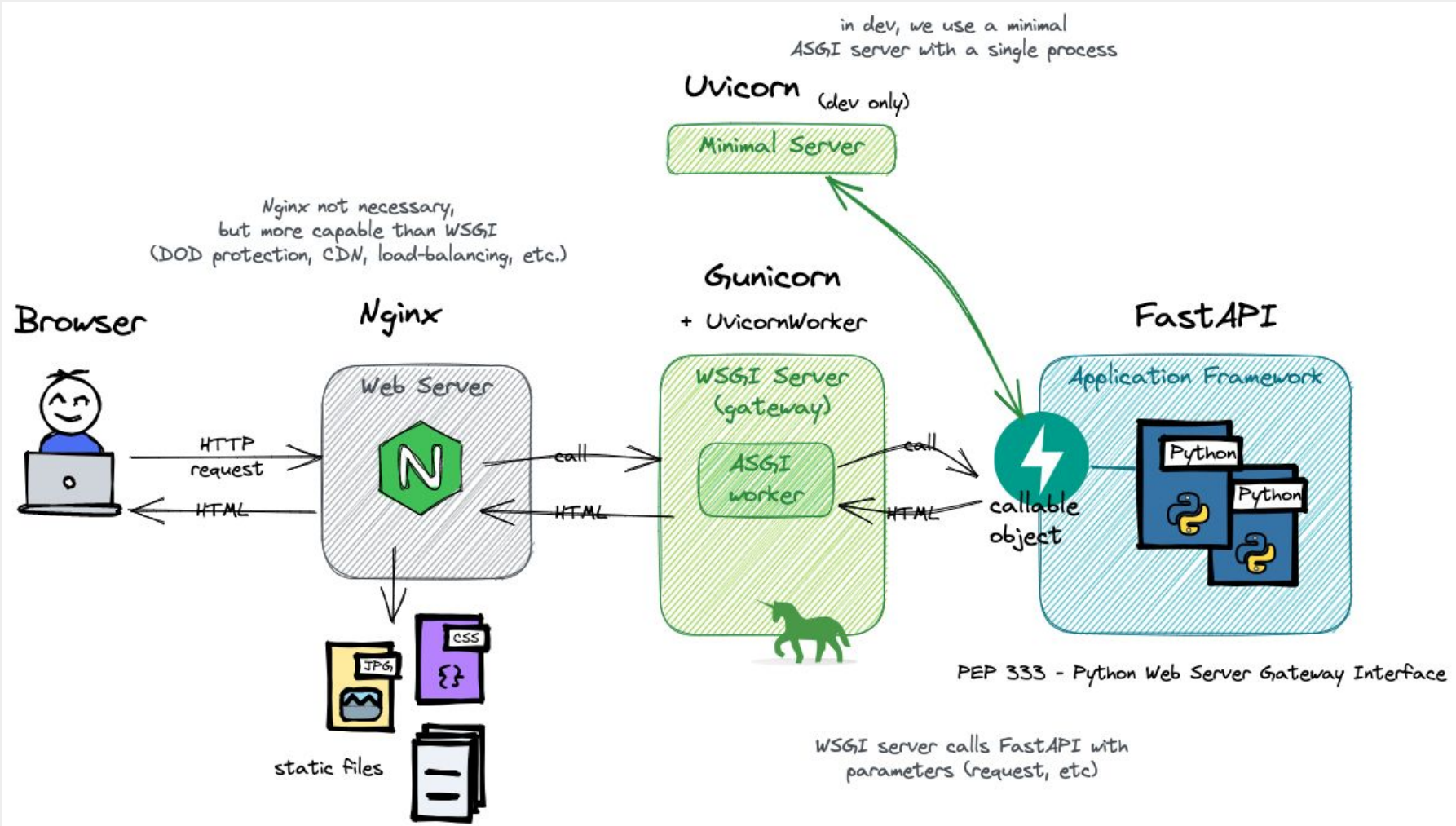
What is FastAPI

FastAPI is a modern, high-performance web framework for building APIs with Python 3.7+.

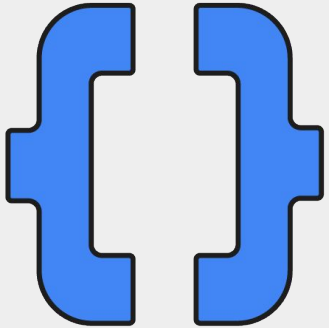
- **Fast**: Built on Starlette and Pydantic—optimized for speed.
- **Easy to Use**: Automatic validation, docs generation (Swagger, ReDoc).
- **Asynchronous**: Supports async/await for high concurrency.
- Great for ML/AI services, microservices, and REST APIs.





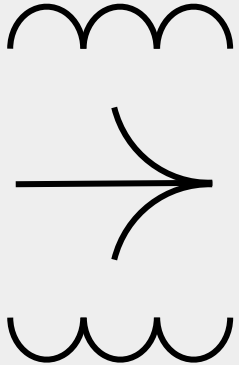

in dev, we use a minimal
ASGI server with a single process
Uvicorn (dev only)
Minimal Server
Nginx not necessary,
but more capable than WSGI
(DOD protection, CDN, load-balancing, etc.)
Gunicorn
+ UvicornWorker
Browser
Nginx
FastAPI
Web Server
WSGI Server
(gateway)
Application Framework
HTTP
request
HTML
call
HTML
ASGI
worker
call
HTML
callable
object
Python
Python
CSS
JPG
static files
PEP 333 - Python Web Server Gateway Interface
WSGI server calls FastAPI with
parameters (request, etc)

What is Gemini Chatbot?



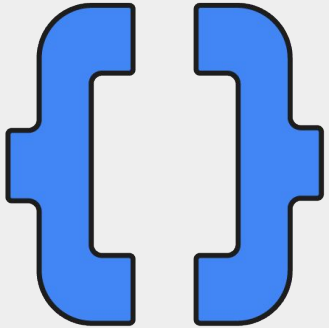
Gemini is Google's family of advanced generative AI models (like GPT).

- **Built by Google DeepMind**, integrated into Google Cloud AI products.
- **Gemini Chatbot** uses these models to understand and generate human-like responses.
- **Supports multi-turn conversations**, code understanding, and contextual reasoning.
- Access via Google's Generative AI SDK or Vertex AI API.



Gemini

Gemini Chatbot?



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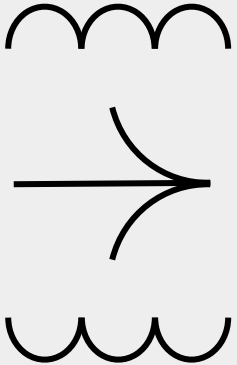
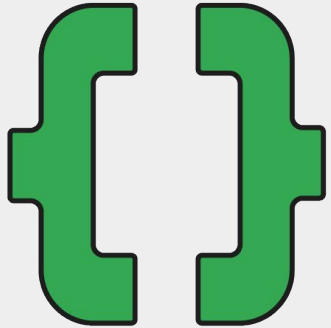


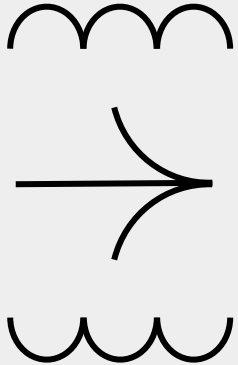
Gemini

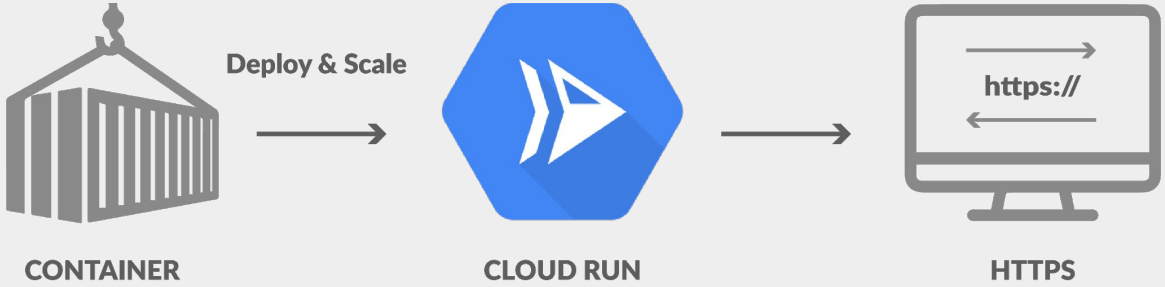
What is Cloud Run?

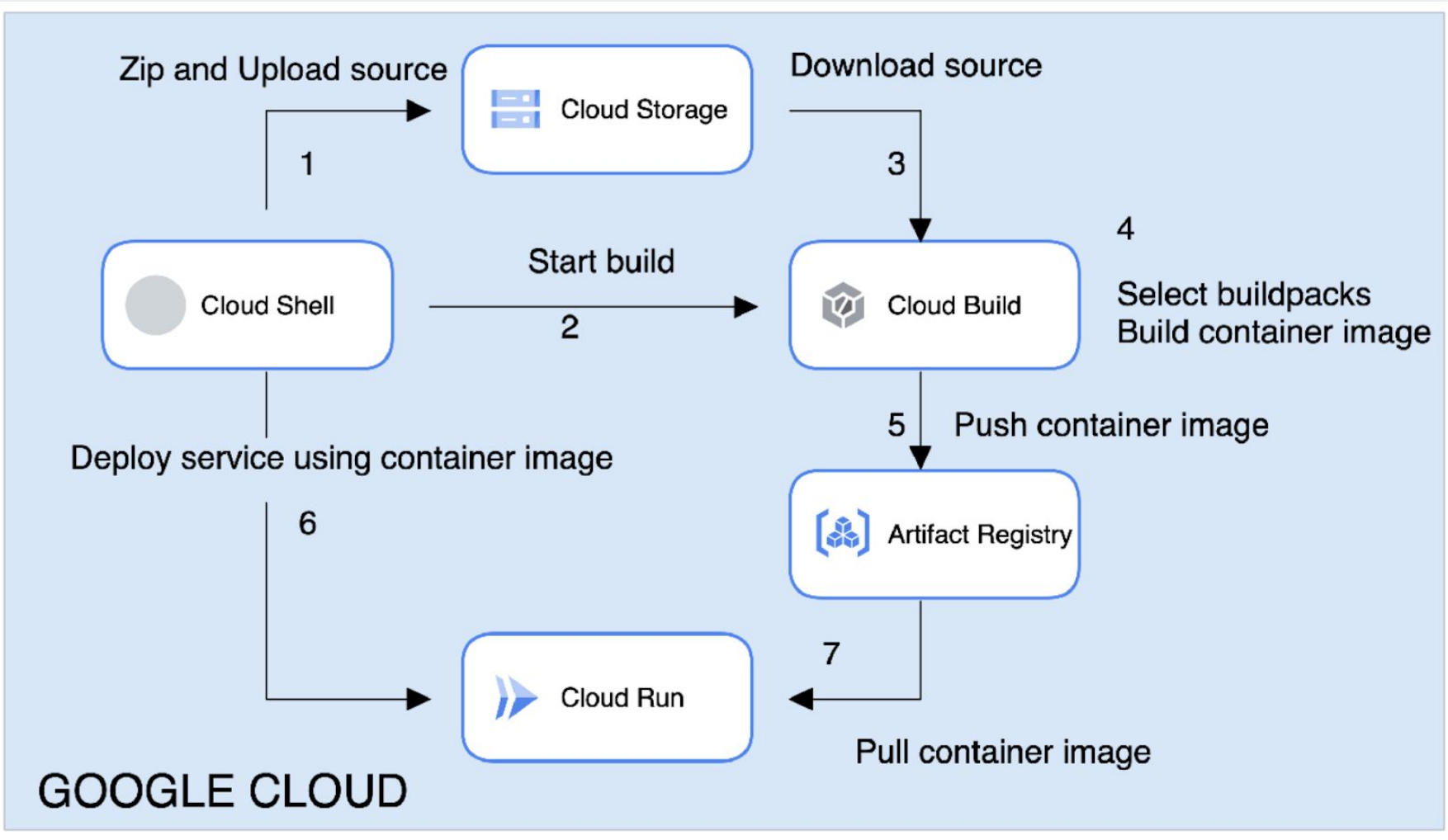


Cloud Run is a fully managed compute platform by Google Cloud for running containerized apps.

- **Deploy any Docker container**—no server management needed.
- **Scales automatically:** from zero to thousands of instances.
- Pay only when in use.
- **Ideal for microservices**, APIs, or event-driven apps.



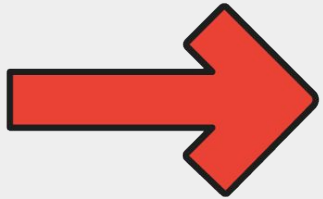


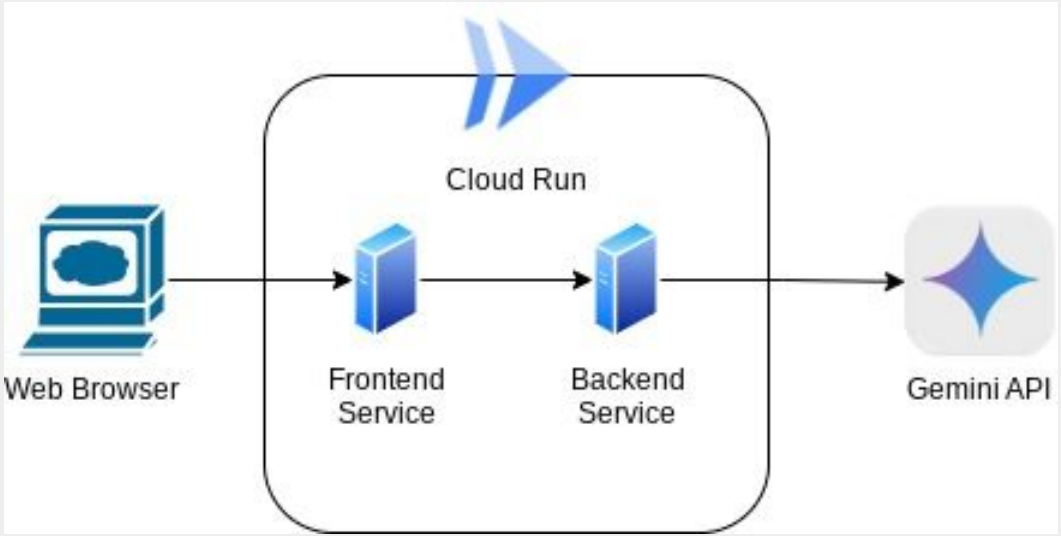

Zip and Upload source
Cloud Storage
Download source
1
3
4
Cloud Shell
Start build
2
Cloud Build
Select buildpacks
Build container image
5
Push container image
Deploy service using container image
6
Artifact Registry
7
Cloud Run
Pull container image
GOOGLE CLOUD

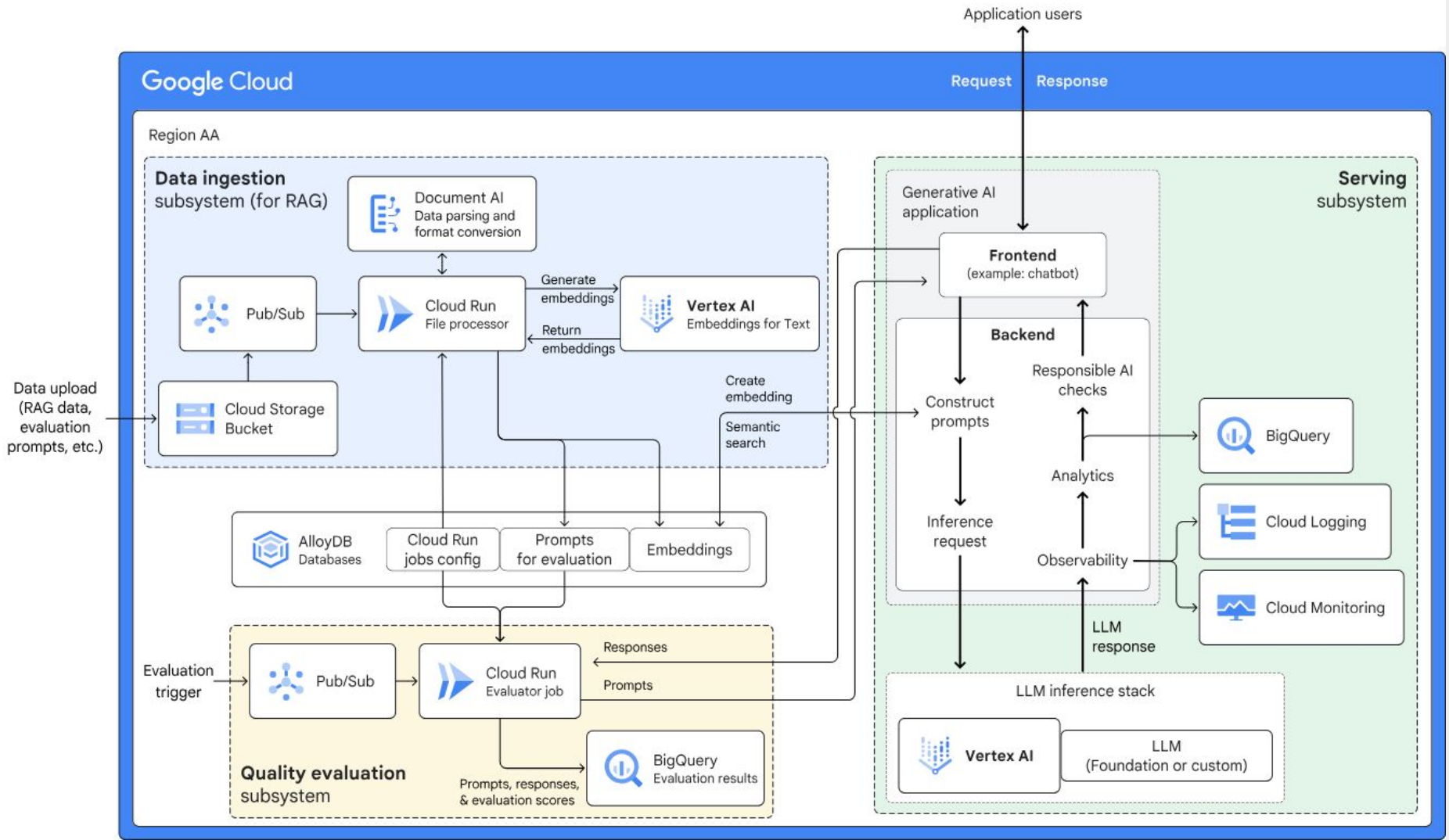
Chapter Two

Let’s Demo!

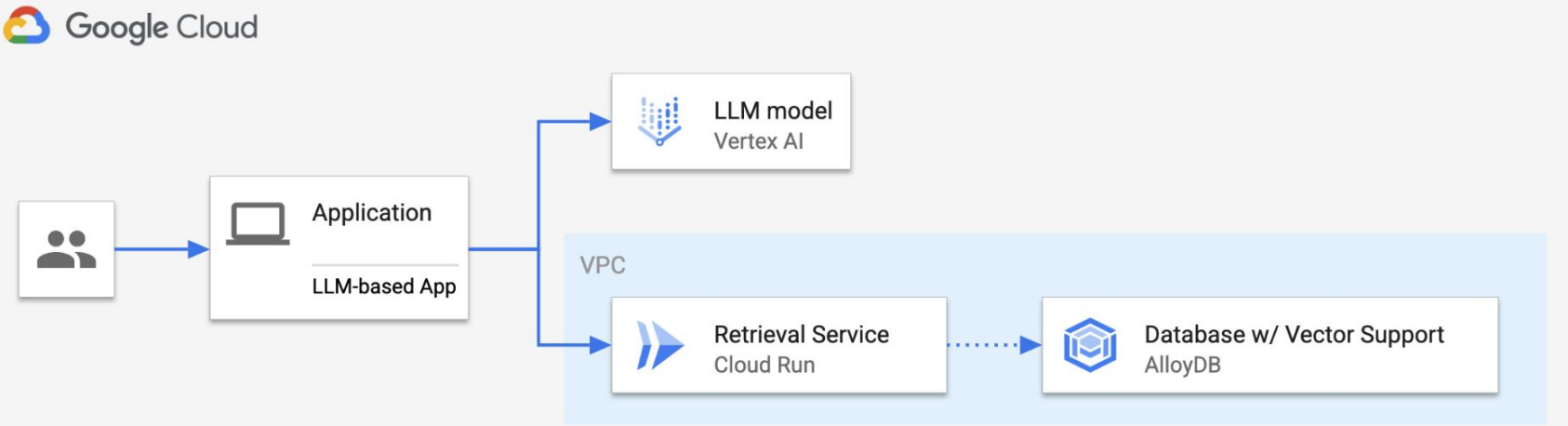
Are you ready?




Cloud Run
Web Browser
Frontend Service
Backend Service
Gemini API

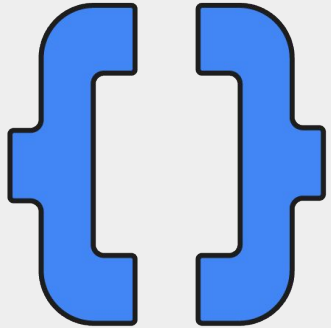

Application users
Google Cloud
Request
Response
Region AA
Data ingestion
subsystem (for RAG)
Document AI
Data parsing and
format conversion
Pub/Sub
Cloud Run
File processor
Generate
embeddings
Return
embeddings
Vertex AI
Embeddings for Text
Data upload
(RAG data,
evaluation
prompts, etc.)
Cloud Storage
Bucket
Create
embedding
Semantic
search
AlloyDB
Databases
Cloud Run
jobs config
Prompts
for evaluation
Embeddings
Evaluation
trigger
Pub/Sub
Cloud Run
Evaluator job
Responses
Prompts
Quality evaluation
subsystem
BigQuery
Evaluation results
Prompts, responses,
& evaluation scores
Generative AI
application
Frontend
(example: chatbot)
Backend
Construct
prompts
Responsible AI
checks
Analytics
Inference
request
Observability
Serving
subsystem
BigQuery
Cloud Logging
Cloud Monitoring
LLM
response
LLM inference stack
Vertex AI
LLM
(Foundation or custom)

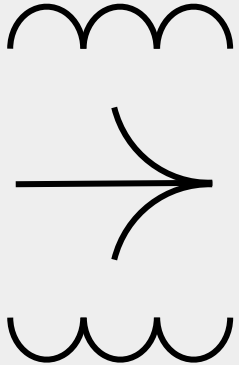
GenAI Database Retrieval



Prerequisites

- A basic understanding of Generative AI, Gemini on Google Cloud
- A basic understanding of Cloud Run and Vertex AI Concepts

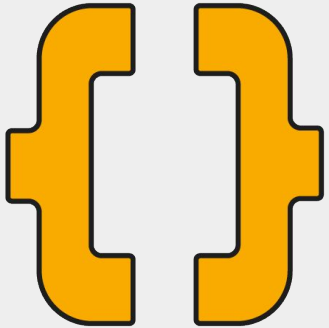


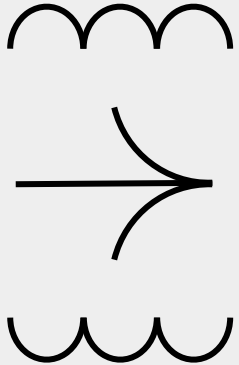


What you will learn

In this lab, you'll learn:

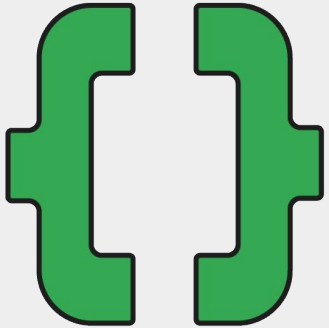
- How to deploy FastAPI to Cloud Run
- Prompt Gemini from Cloud Run in python using a Google client library

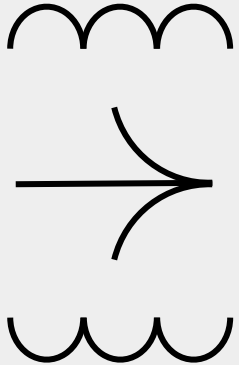


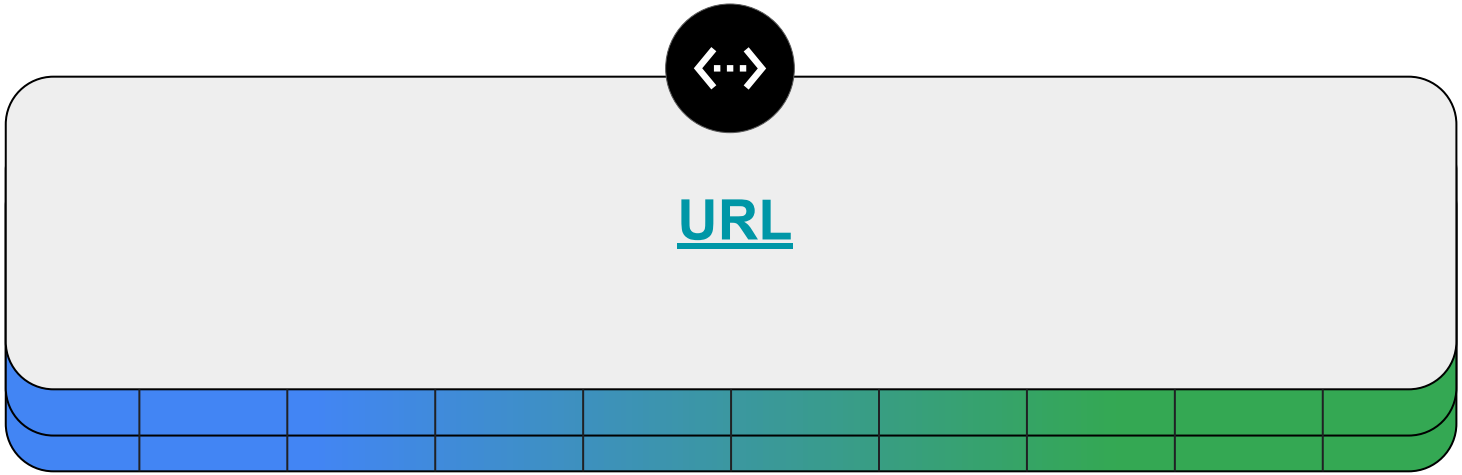


What you will need

- A curious mind
- A working computer and reliable wifi
- A Google Cloud project with billing attached.

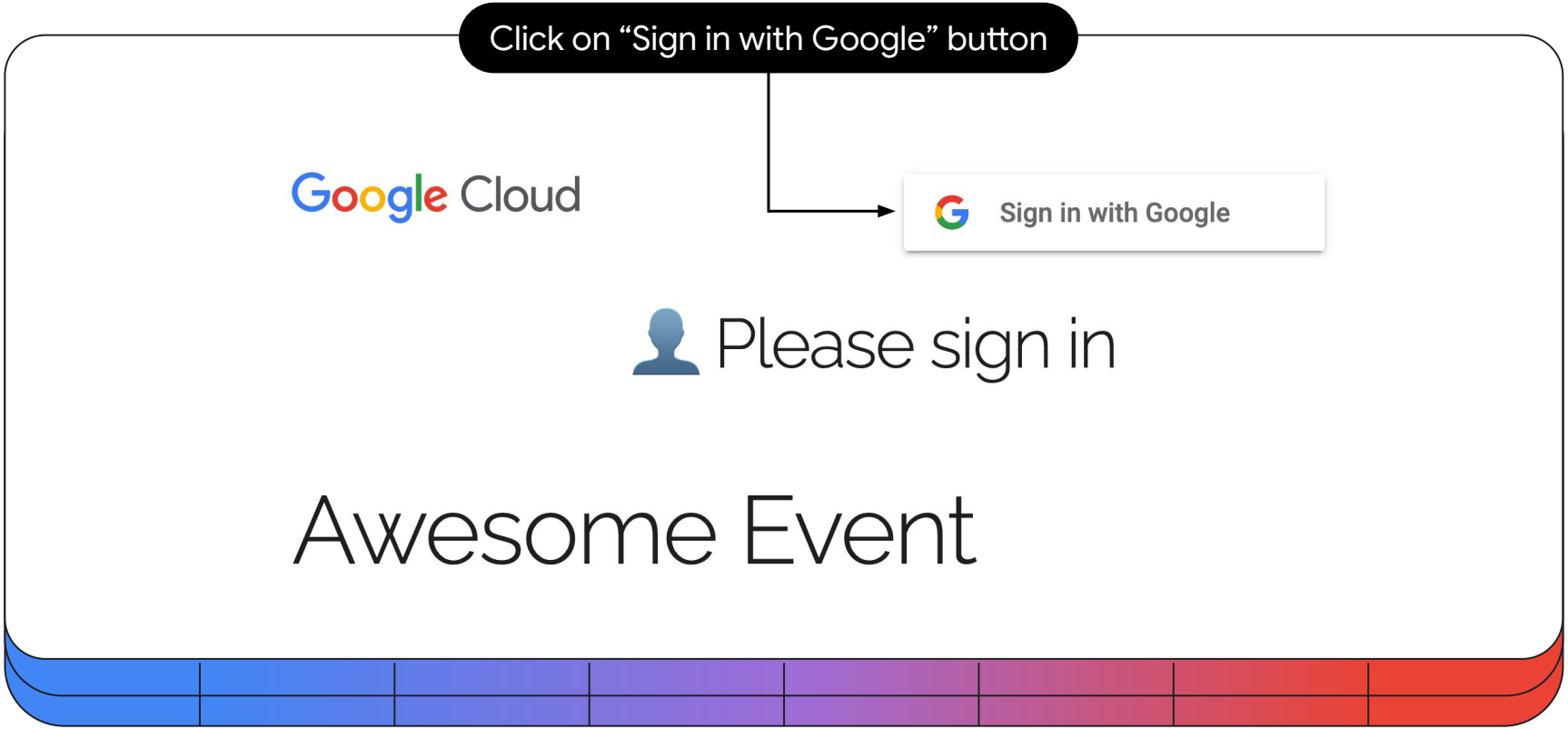




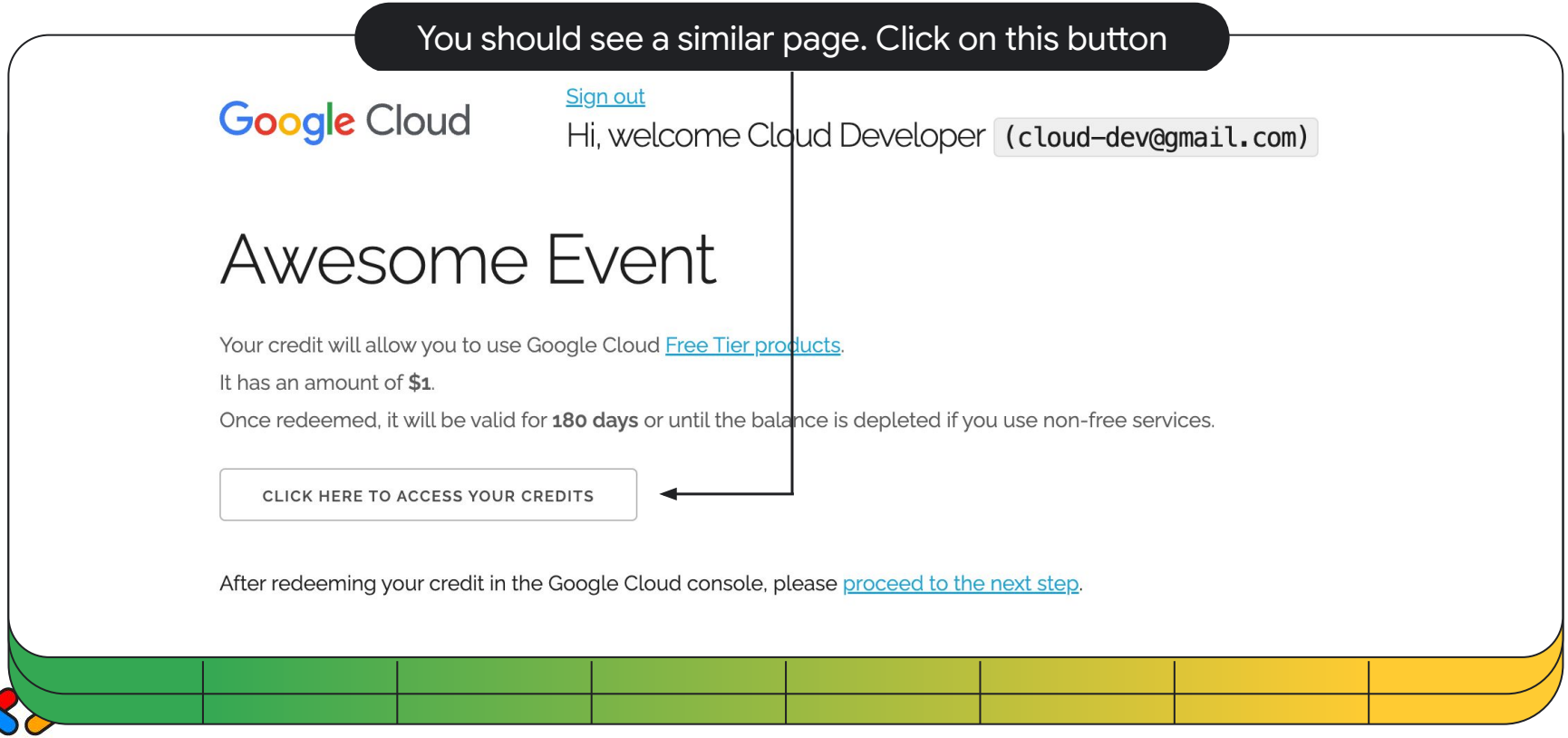


Open this URL

You will need to be signed in

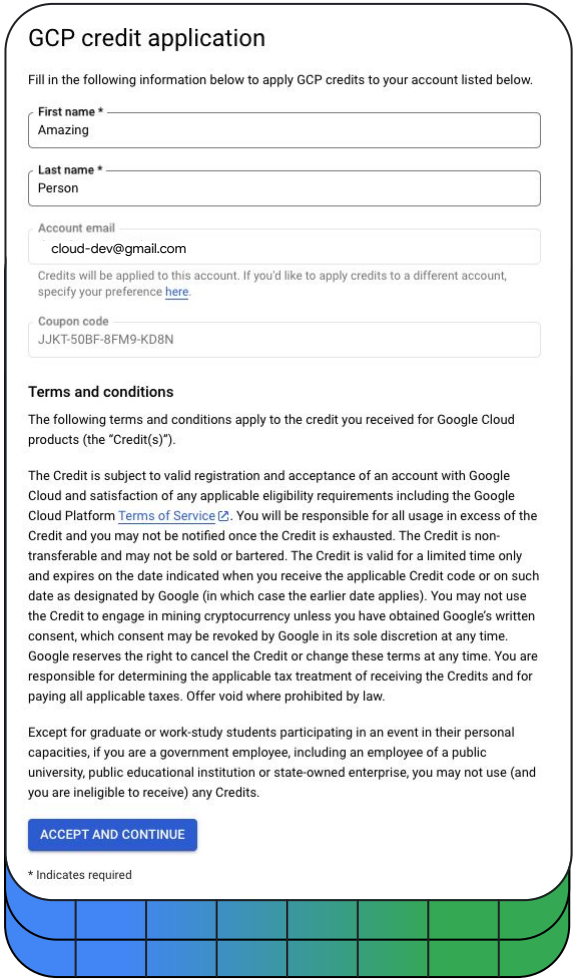


You will need to be signed in



Make sure that you are applying for the correct account

Click on “Accept and Continue” to proceed



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Step 1

Claim credits

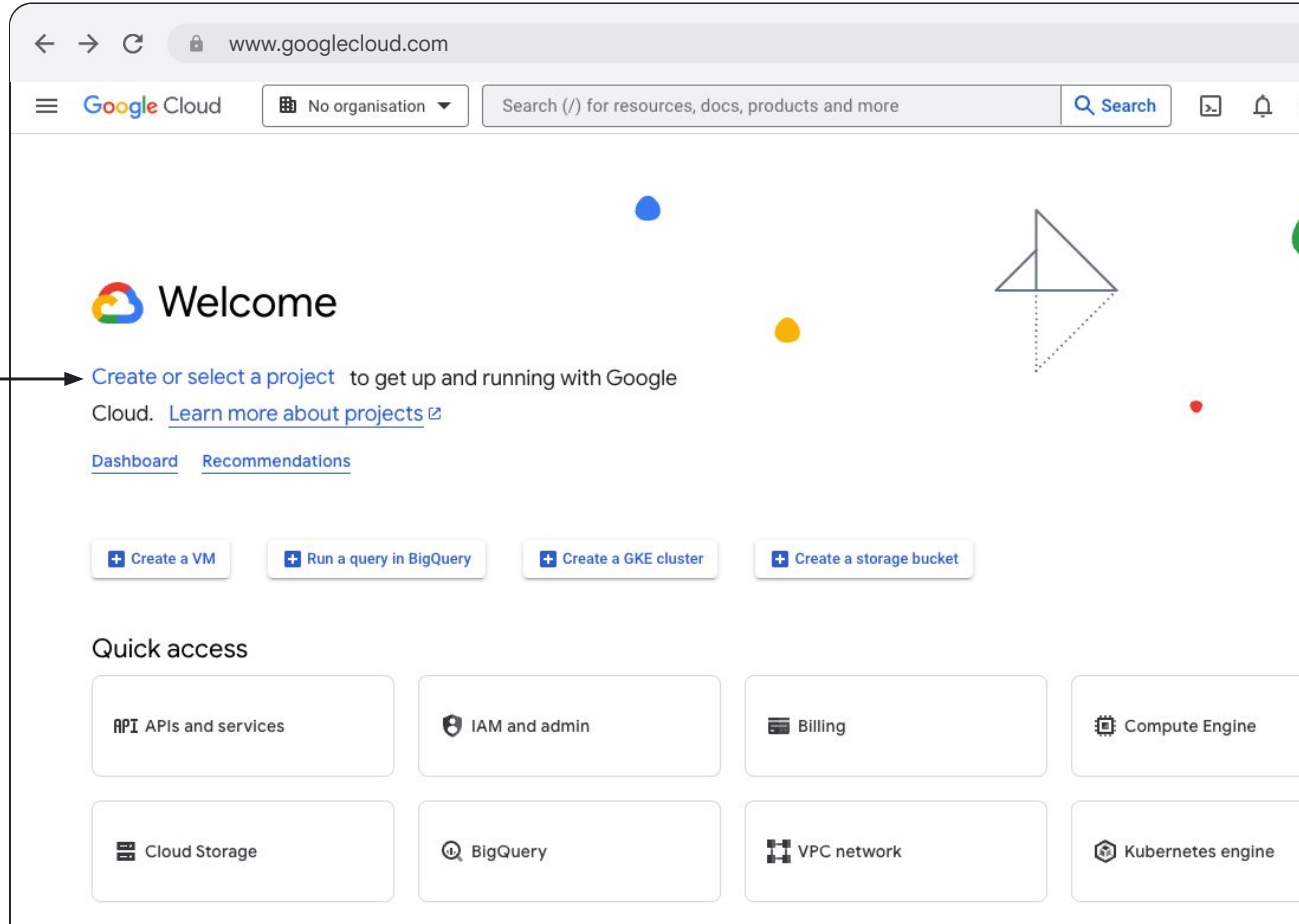
Step2

Create a Google Cloud project

Go to:

console.cloud.google.com

Click on “Create or select a project”



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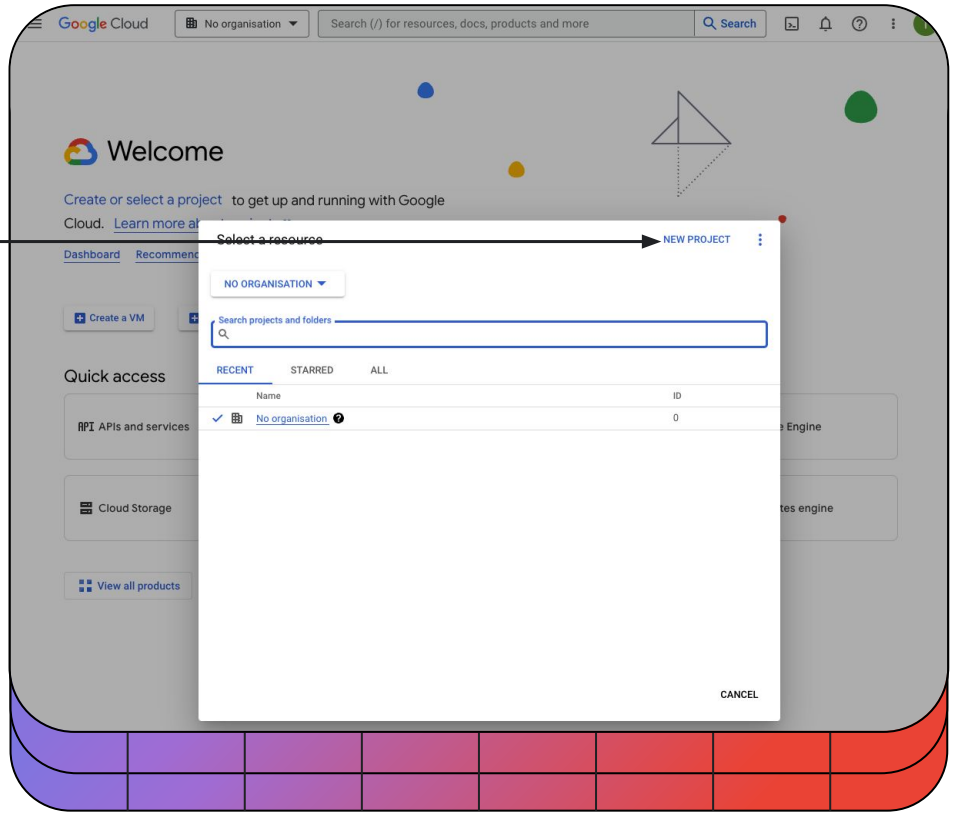
Creating a new project

Click on “New Project”



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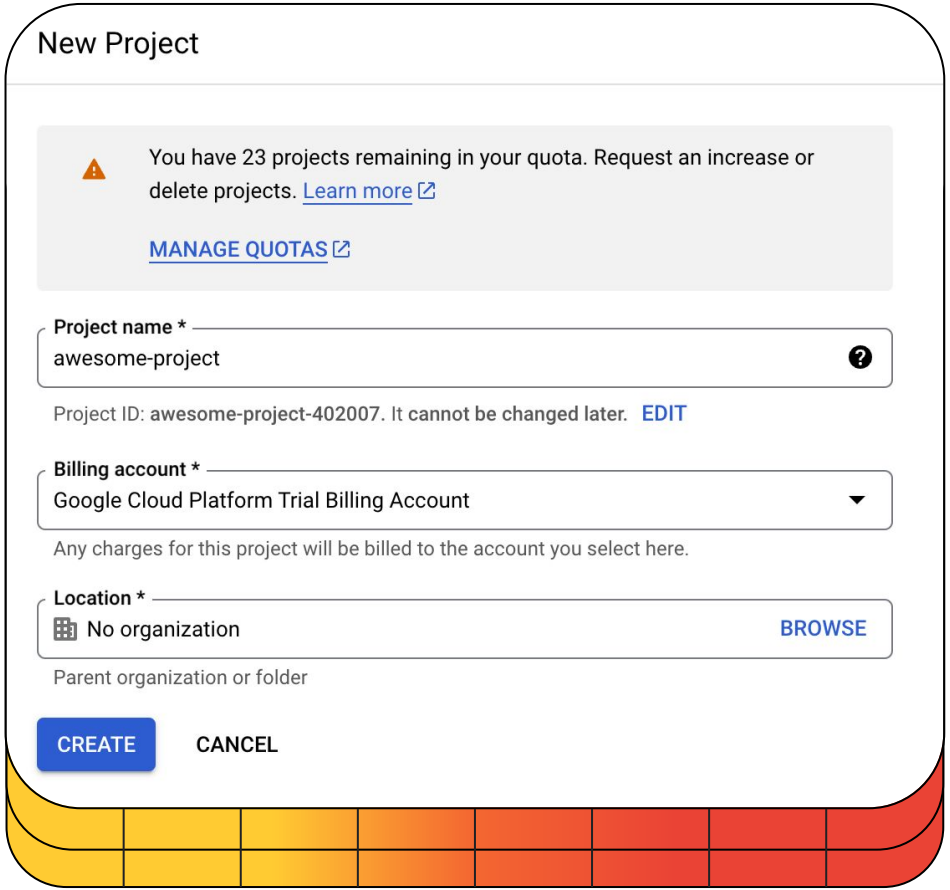
Creating a new project

Name your project

IF you see a billing account, make sure to select the “Trial Billing Account”. If NOT, still create the project and go to next slide

Click “CREATE”



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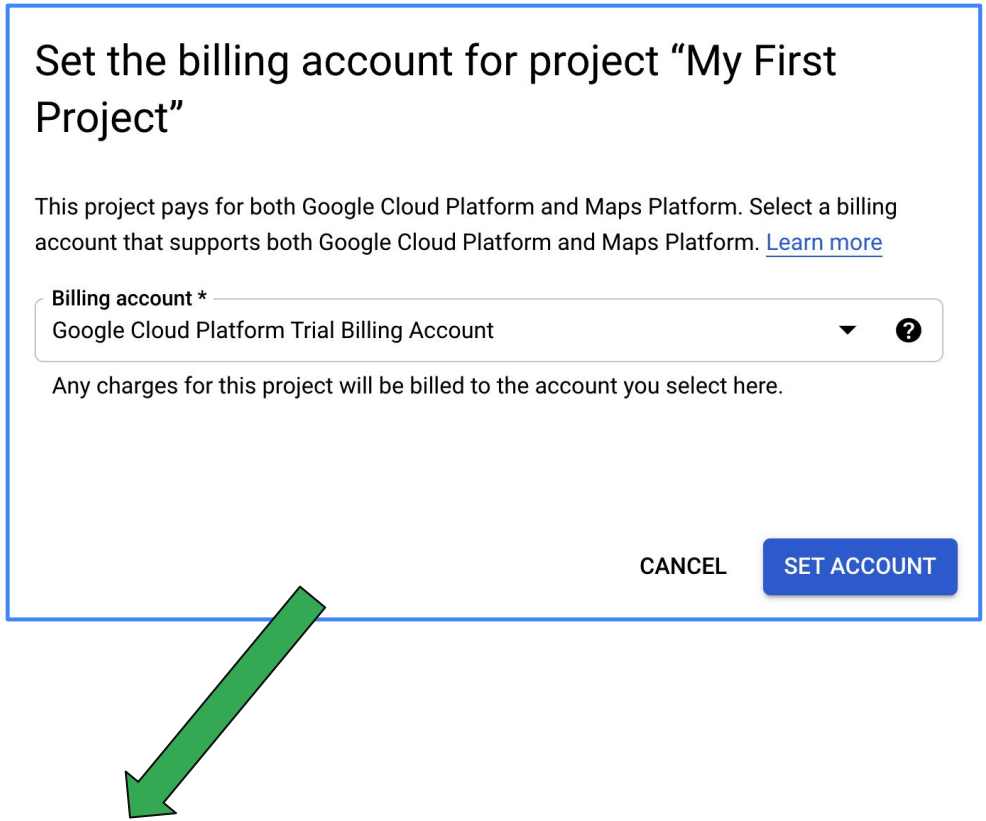
If you don't see a billing account in the previous step:

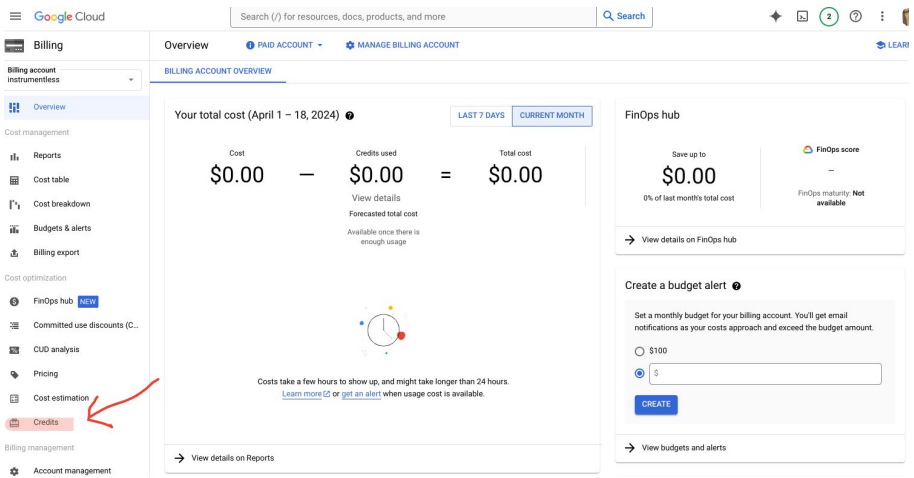
1) Go to Billing from Google Cloud Console and

2) Set your project's billing account to **Google Cloud Platform Trial Billing Account**

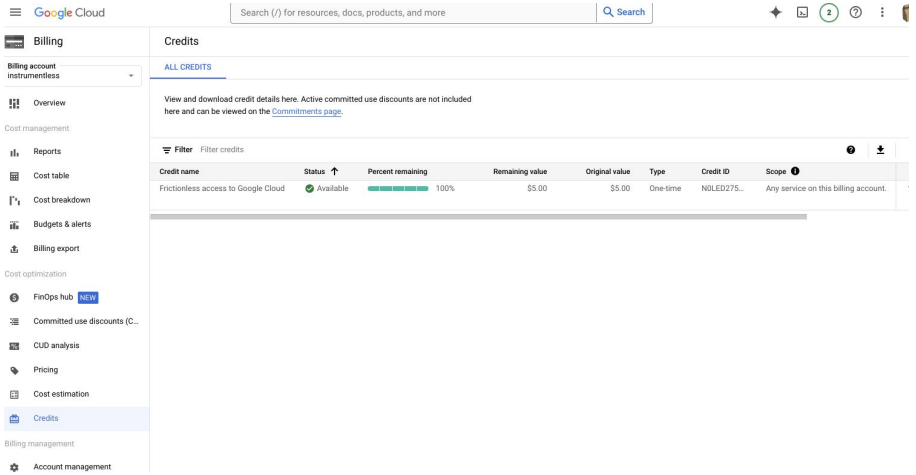


Issues When attempting to redeem credits

It may be unclear where the credits land. If you users are confused, have them navigate to the Credits tab on the page on of the console

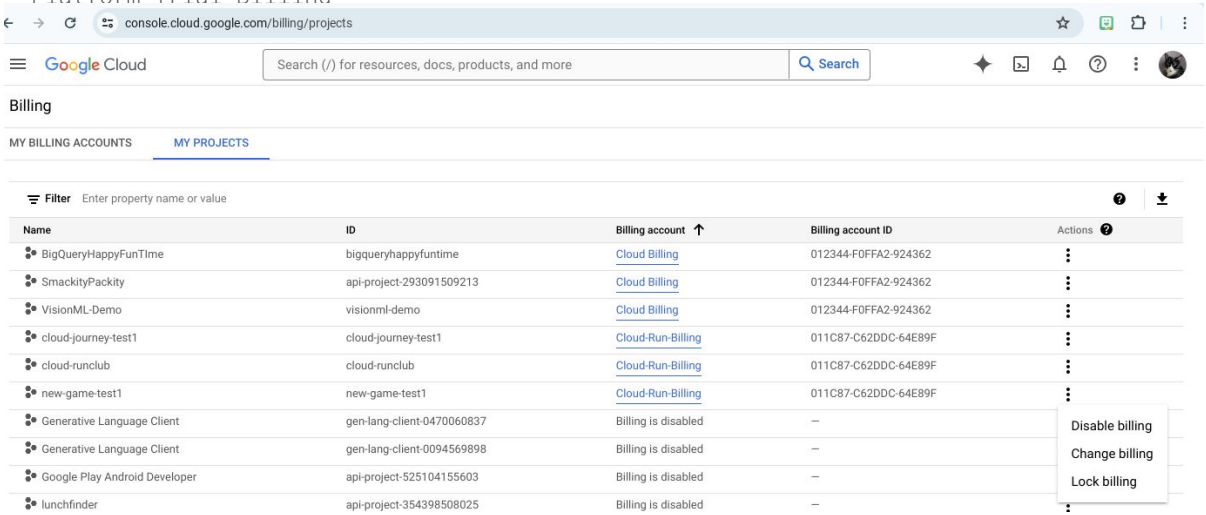


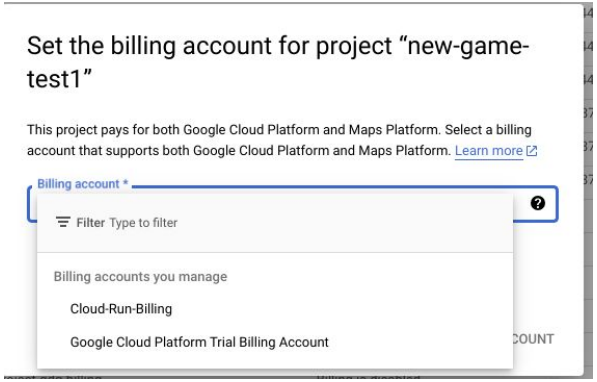
That is where they will see the credits



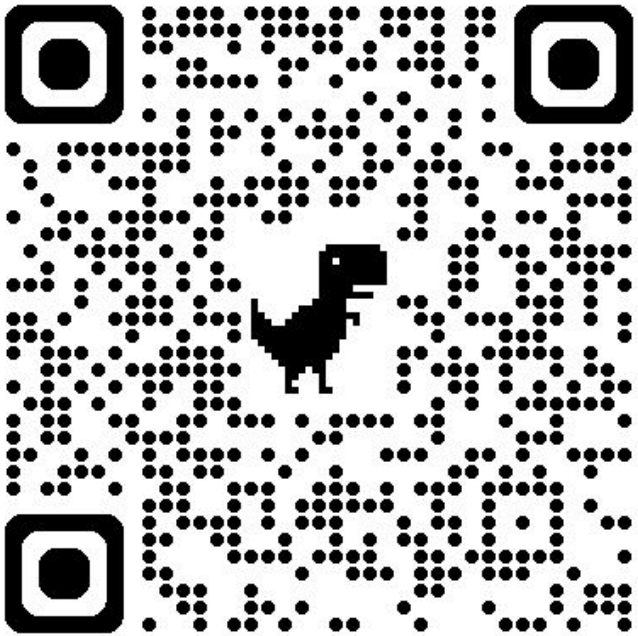
Issues if the user ALREADY has a existing billing account make sure they use the correct one

Click on the 3 Dot menu on the project, and select “Change Billing,” from the drop down select that Google Cloud Platform Trial Billing





Learn more about **Google Cloud** at goo.gle/clouddevs



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References

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- https://ai.google.dev/gemini-api/docs