



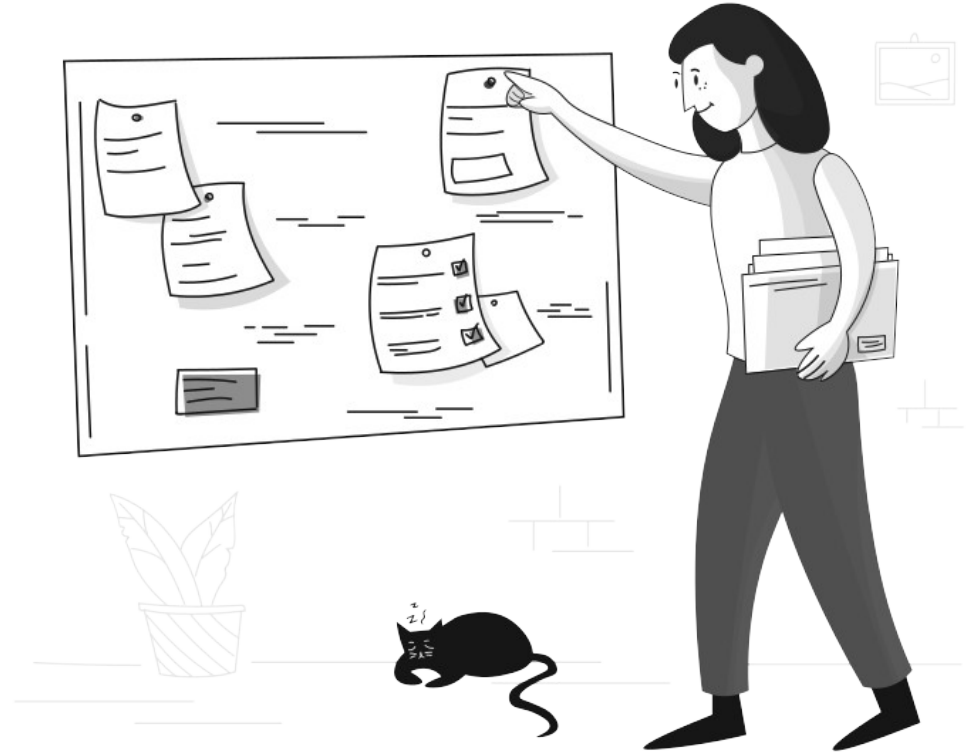
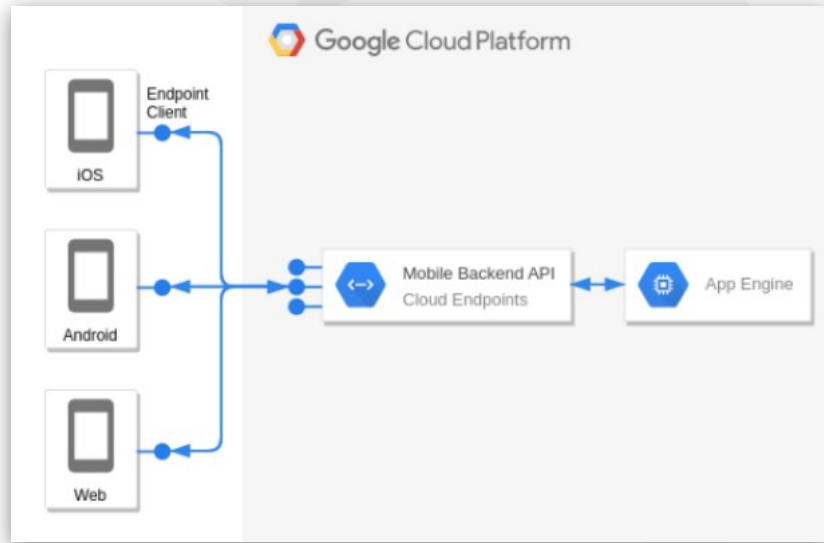
# **Desafío No. 7**

Bootcamp DevOps 63703

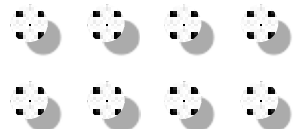
Presentado por:  
Marco Vanegas  
2023

## Objetivos

Se necesita crear una infraestructura como código que siga las directivas del siguiente diagrama:



Illustrations by [Pixeltrue](#) on [icons8](#)



# 1. Se crea una cuenta gratuita en Google Cloud.

The screenshot shows the Google Cloud console interface. At the top, the browser address bar displays the URL `console.cloud.google.com/welcome/new?hl=es-419&project=prueba-398917`. The Google Cloud logo is on the left, and a search bar with the text 'build api' and a 'Buscar' button is on the right. The main heading reads 'Te damos la bienvenida, admin sistemas' with a 'VISTA PREVIA' button. Below this, there are three main sections: 1. 'Estás usando la prueba gratuita' (You are using the free trial) which includes a progress indicator showing '\$0 de \$300 créditos usados' (0 of \$300 credits used) and a deadline 'Vence el 12 de diciembre de 2023'. It also has a '¿Qué sucede cuando finaliza la prueba?' link and an 'ACTIVAR LA CUENTA COMPLETA' button. 2. 'Estás trabajando en el proyecto Prueba' (You are working on the project Prueba) which shows the project number '100342387987' and ID 'prueba-398917', along with links to 'Agregar personas a tu proyecto', 'Configurar alertas de presupuesto', and 'Revisar la inversión en productos'. 3. 'Explora recursos seleccionados para crear e implementar tu primer proyecto' (Explore selected resources to create and implement your first project) with a right-pointing arrow.

← → ↻ console.cloud.google.com/welcome/new?hl=es-419&project=prueba-398917

Google Cloud Prueba build api Buscar

Te damos la bienvenida, admin sistemas VISTA PREVIA

Estás usando la prueba gratuita

\$0 de \$300 créditos usados

Vence el 12 de diciembre de 2023

¿Qué sucede cuando finaliza la prueba?

ACTIVAR LA CUENTA COMPLETA

Estás trabajando en el proyecto Prueba

Número: 100342387987 ID: prueba-398917

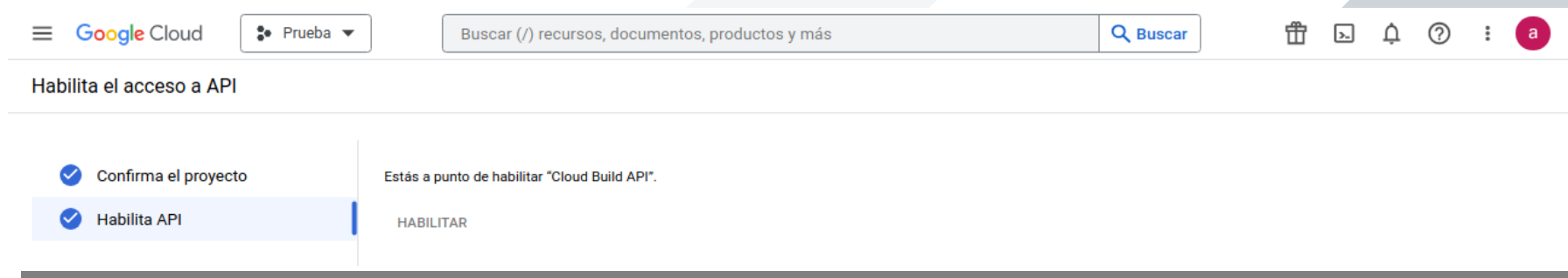
[Agregar personas a tu proyecto](#)

[Configurar alertas de presupuesto](#)

[Revisar la inversión en productos](#)

Explora recursos seleccionados para crear e implementar tu primer proyecto →

## 2. Se habilita Cloud Build API (cloudbuild.googleapis.com).



Google Cloud

Prueba ▾

Buscar (/) recursos, documentos, productos y más

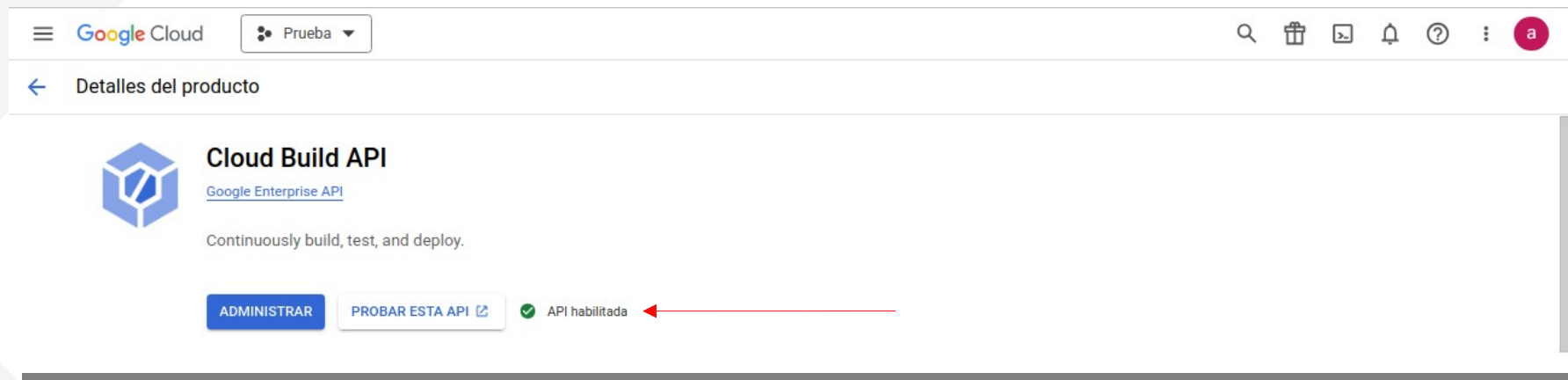
Buscar

Habilita el acceso a API

- ✓ Confirma el proyecto
- ✓ **Habilita API**

Estás a punto de habilitar "Cloud Build API".


HABILITAR



Google Cloud

Prueba ▾

← Detalles del producto

 **Cloud Build API**

[Google Enterprise API](#)

Continuously build, test, and deploy.

ADMINISTRAR

PROBAR ESTA API [↗](#)

✓ API habilitada ←

3. En el ambiente local se instala Google Cloud CLI (<https://cloud.google.com/sdk/docs/install-sdk?hl=es-419#deb>).

```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$ sudo apt-get update
[sudo] password for dev:
Hit:1 http://co.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://co.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]

dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$ sudo apt-get install apt-transport-https ca-certificates gnupg curl sudo
Reading package lists... Done
Building dependency tree... Done

dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$ echo "deb [signed-by=/usr/share/keyrings/cloud.google.gpg] https://packages.cloud.google.com/apt cloud-sdk main" | sudo tee -a /etc/apt/sources.list.d/google-cloud-sdk.list
deb [signed-by=/usr/share/keyrings/cloud.google.gpg] https://packages.cloud.google.com/apt cloud-sdk main

dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$ curl https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key --keyring /usr/share/keyrings/cloud.google.gpg add -
% Total    % Received % Xferd  Average Speed   Time    Time     Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0  --:--:-- --:--:-- --:--:--    0Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
100  2659  100  2659    0     0  2191      0  0:00:01  0:00:01 --:--:--  2192
OK

dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$ sudo apt-get update && sudo apt-get install google-cloud-cli
Hit:1 http://co.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://co.archive.ubuntu.com/ubuntu jammy-updates InRelease
```

4. Se inicializa el SDK de Google Cloud, luego se realiza la autenticación mediante el navegador que se abre automáticamente.

```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$ gcloud init
Welcome! This command will take you through the configuration of gcloud.

Your current configuration has been set to: [default]

You can skip diagnostics next time by using the following flag:
  gcloud init --skip-diagnostics

Network diagnostic detects and fixes local network connection issues.
Checking network connection...done.
Reachability Check passed.
Network diagnostic passed (1/1 checks passed).

You must log in to continue. Would you like to log in (Y/n)?  Y

Your browser has been opened to visit:

  https://accounts.google.com/o/oauth2/auth?response_type=code&client_id=32555940559.apps.googleusercontent.com&redirect_uri=http%3A%2F%2Flocalhost%3A8085%2F&scope=openid+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fuserinfo.email+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fcloud-platform+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fappengine.admin+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fsqlservice.login+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Fcompute+https%3A%2F%2Fwww.googleapis.com%2Fauth%2Faccounts.reauth&state=wmYiTI9T9UcIMY6vb0Qt4fzwGwL1ch&access_type=offline&code_challenge=jAaEY930eKRFYV7AxEYH7A10MW81dL6WbZgfuMc3_1A&code_challenge_method=S256
```

5. En esta parte, se inicializa Terraform (terraform init).



```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$ terraform init

Initializing the backend...

Initializing provider plugins...
- Finding hashicorp/google versions matching "4.82.0"...
- Installing hashicorp/google v4.82.0...
- Installed hashicorp/google v4.82.0 (signed by HashiCorp)

Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$
```

## 6. Ahora, se crea el plan de Terraform (terraform plan).

```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7
+ resource "google_endpoints_service" "openapi_service" {
+   apis           = (known after apply)
+   config_id      = (known after apply)
+   dns_address    = (known after apply)
+   endpoints      = (known after apply)
+   id             = (known after apply)
+   openapi_config = <<-EOT
      swagger: "2.0"
      info:
        version: 1.0.0
        title: API Express Swagger 2.0
        description: Simple API with Express using Swagger 2.0
        host: api-name.endpoints.prueba-398917.cloud.goog
        schemes:
          - http
        paths:
          /:
            get:
              summary: Get greeting
              description: Returns a greeting "Hello World!"
              operationId: getGreeting
              responses:
                200:
                  description: Successful response
                  schema:
                    type: string
      EOT
+   project      = "prueba-398917"
+   service_name = "api-name.endpoints.prueba-398917.cloud.goog"
}

Plan: 2 to add, 0 to change, 0 to destroy.
```

---

Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly these actions if you run "terraform apply" now.

```
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$
```



7. A continuación, se crean los recursos en Google Cloud con Terraform (terraform apply), que son específicamente un **App Engine** y un **Cloud Endpoint**.

```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7
type: string
EOT
+ project      = "prueba-398917"
+ service_name = "api-name.endpoints.prueba-398917.cloud.goog"
}

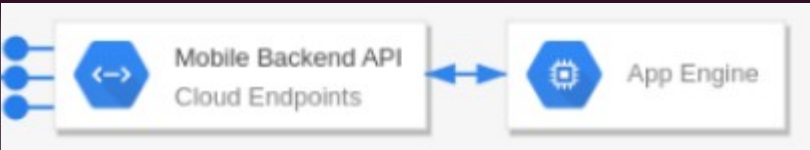
Plan: 2 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

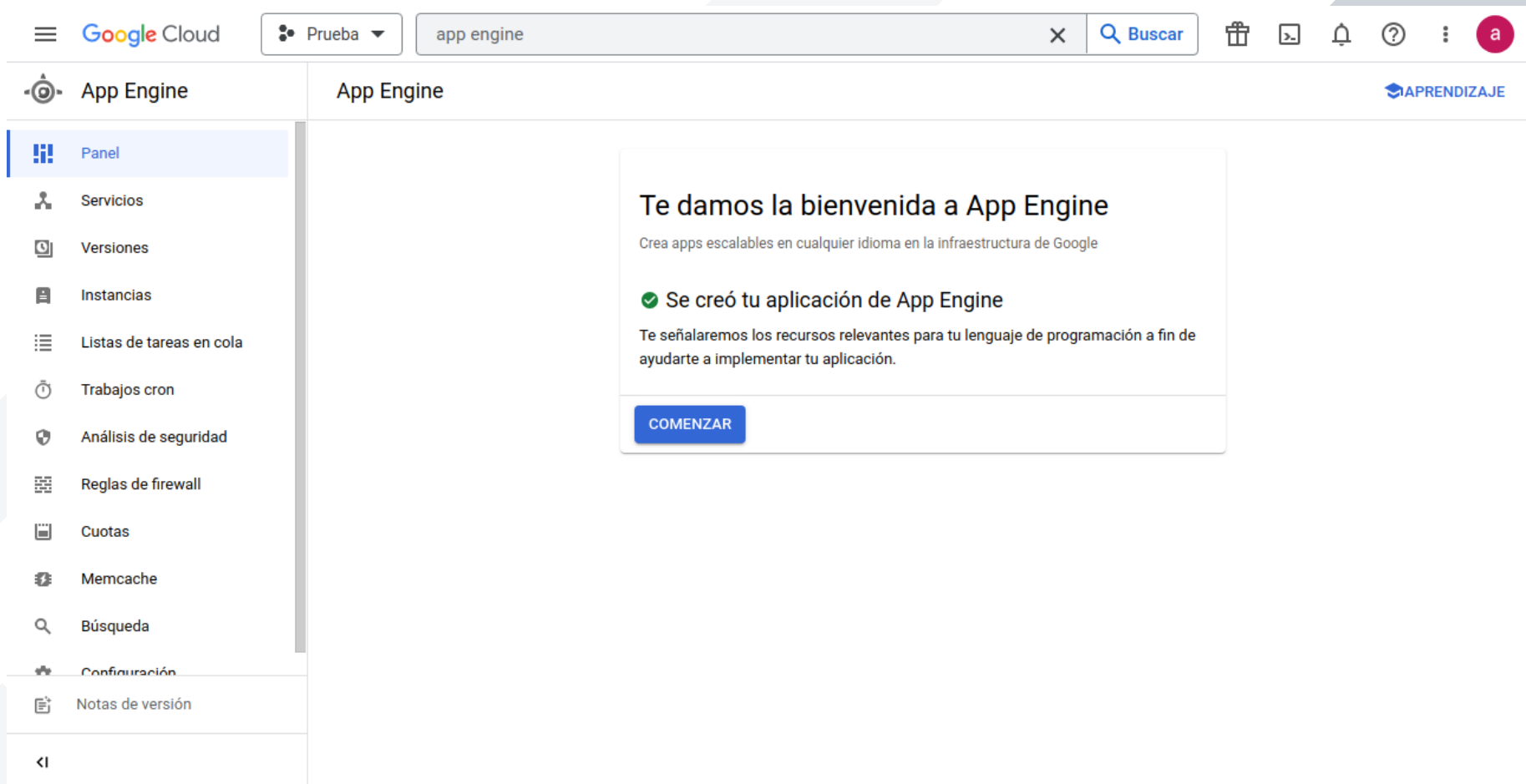
Enter a value: yes

google_endpoints_service.openapi_service: Creating...
google_app_engine_application.app: Creating...
google_endpoints_service.openapi_service: Still creating... [10s elapsed]
google_app_engine_application.app: Still creating... [10s elapsed]
google_app_engine_application.app: Creation complete after 13s [id=prueba-398917]
google_endpoints_service.openapi_service: Still creating... [20s elapsed]
google_endpoints_service.openapi_service: Still creating... [30s elapsed]
google_endpoints_service.openapi_service: Still creating... [40s elapsed]
google_endpoints_service.openapi_service: Still creating... [50s elapsed]
google_endpoints_service.openapi_service: Still creating... [1m0s elapsed]
google_endpoints_service.openapi_service: Still creating... [1m10s elapsed]
google_endpoints_service.openapi_service: Still creating... [1m20s elapsed]
google_endpoints_service.openapi_service: Still creating... [1m30s elapsed]
google_endpoints_service.openapi_service: Still creating... [1m40s elapsed]
google_endpoints_service.openapi_service: Still creating... [1m50s elapsed]
google_endpoints_service.openapi_service: Still creating... [2m0s elapsed]
google_endpoints_service.openapi_service: Still creating... [2m10s elapsed]
google_endpoints_service.openapi_service: Still creating... [2m20s elapsed]
google_endpoints_service.openapi_service: Still creating... [2m30s elapsed]
google_endpoints_service.openapi_service: Still creating... [2m40s elapsed]
google_endpoints_service.openapi_service: Creation complete after 2m42s [id=api-name.endpoints.prueba-398917.cloud.goog]

Apply complete! Resources: 2 added, 0 changed, 0 destroyed.
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7$
```



## 8. Se verifica la creación de **App Engine**.



The screenshot shows the Google Cloud App Engine console interface. At the top, the Google Cloud logo is on the left, and a search bar with the text "app engine" is on the right. Below the search bar, the "App Engine" title is displayed. On the left side, there is a navigation menu with the following items: "Panel" (highlighted), "Servicios", "Versiones", "Instancias", "Listas de tareas en cola", "Trabajos cron", "Análisis de seguridad", "Reglas de firewall", "Cuotas", "Memcache", "Búsqueda", "Configuración", and "Notas de versión". The main content area on the right displays a welcome message: "Te damos la bienvenida a App Engine" followed by the text "Crea apps escalables en cualquier idioma en la infraestructura de Google". Below this, a green checkmark icon is next to the text "Se creó tu aplicación de App Engine". Underneath, it says "Te señalaremos los recursos relevantes para tu lenguaje de programación a fin de ayudarte a implementar tu aplicación." At the bottom of this section is a blue button labeled "COMENZAR". In the top right corner of the console, there is a link labeled "APRENDIZAJE" with a graduation cap icon.

Google Cloud

Prueba

app engine

Buscar

App Engine

APRENDIZAJE

Panel

Servicios

Versiones

Instancias

Listas de tareas en cola

Trabajos cron

Análisis de seguridad

Reglas de firewall

Cuotas

Memcache

Búsqueda

Configuración

Notas de versión

Te damos la bienvenida a App Engine

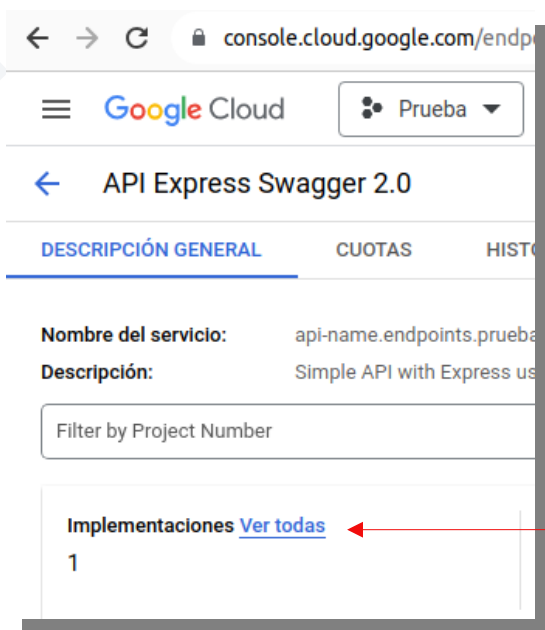
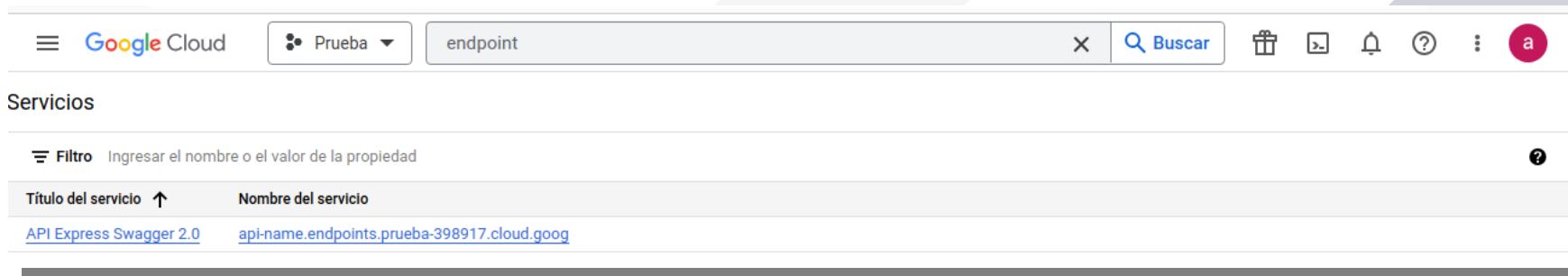
Crea apps escalables en cualquier idioma en la infraestructura de Google

✓ Se creó tu aplicación de App Engine

Te señalaremos los recursos relevantes para tu lenguaje de programación a fin de ayudarte a implementar tu aplicación.

COMENZAR

## 9. Se verifica la creación de un Cloud Endpoint con su respectiva especificación OpenAPI (Swagger).



### Configuration Files

[COMPARE WITH PREVIOUS DEPLOYMENT](#)

```
1 swagger: "2.0"
2 info:
3   version: 1.0.0
4   title: API Express Swagger 2.0
5   description: Simple API with Express using Swagger 2.0
6   host: api-name.endpoints.prueba321-398923.cloud.goog
7   schemes:
8     - http
9     - https
10  paths:
11    /:
12      get:
13        summary: Get greeting
14        description: Returns a greeting "Hello World!"
15        operationId: getGreeting
16        responses:
```

10. En el directorio donde se encuentra la API, se crea el archivo app.yaml.

Referencia: <https://cloud.google.com/appengine/docs/flexible/reference/app-yaml>

```
! app.yaml M X
Solucion_Desafio_7 > api > ! app.yaml
1  # Copyright 2017, Google, Inc.
2  # Licensed under the Apache License, Version 2.0 (the "License");
3  # you may not use this file except in compliance with the License.
4  # You may obtain a copy of the License at
5  #
6  #   http://www.apache.org/licenses/LICENSE-2.0
7  #
8  # Unless required by applicable law or agreed to in writing, software
9  # distributed under the License is distributed on an "AS IS" BASIS,
10 # WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
11 # See the License for the specific language governing permissions and
12 # limitations under the License.
13
14 # [START gae_quickstart_yaml]
15 runtime: nodejs18
16 # [END gae_quickstart_yaml]
```

**app.yaml** especifica el entorno de ejecución que usa la app.

11. Luego se lleva a cabo el despliegue de la API (gcloud app deploy).

```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7/api
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7/api$ gcloud app deploy
Services to deploy:

descriptor:          [/home/dev/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7/api/app.yaml]
source:              [/home/dev/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7/api]
target project:      [prueba321-398923]
target service:      [default]
target version:      [20230913t183938]
target url:          [https://prueba321-398923.uc.r.appspot.com]
target service account: [prueba321-398923@appspot.gserviceaccount.com]

Do you want to continue (Y/n)? Y

Beginning deployment of service [default]...
Created .gcloudignore file. See `gcloud topic gcloudignore` for details.

[Progress bar: Uploading 5 files to Google Cloud Storage]

File upload done.
Updating service [default]...done.
Setting traffic split for service [default]...done.
Deployed service [default] to [https://prueba321-398923.uc.r.appspot.com]

You can stream logs from the command line by running:
$ gcloud app logs tail -s default

To view your application in the web browser run:
$ gcloud app browse
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7/api$
```

\* En el caso que se presenten inconvenientes con los permisos al ejecutar **gcloud app deploy**, una posible solución sería validar la asociación del usuario con el proyecto donde se desea hacer el despliegue. Para ello, se puede ejecutar **gcloud init**, el cual serviría tanto para comprobar los datos como para reiniciar o reconfigurar gcloud.

```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7/api
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solucion_Desafios/Solucion_Desafio_7/api$ gcloud init
Welcome! This command will take you through the configuration of gcloud.

Settings from your current configuration [default] are:
core:
  account: sistemas20170@gmail.com
  disable_usage_reporting: 'True'
  project: prueba321-398923

Pick configuration to use:
[1] Re-initialize this configuration [default] with new settings
[2] Create a new configuration
Please enter your numeric choice: ^[^C

Command killed by keyboard interrupt
```

12. Finalmente, se comprueba el funcionamiento de la API.



Repositorio de GitHub donde se encuentra el código:

[https://github.com/BambooThink/BootcampDevOps2023/tree/main/Solucion\\_Desafio\\_7](https://github.com/BambooThink/BootcampDevOps2023/tree/main/Solucion_Desafio_7)