

Tal y como se refleja en numerosos comentarios y reseñas del Laboratorio, el desafío de Google Labs asociado a la tarea “avanzada” plantea numerosos **problemas a la hora de detectar la creación del clúster**. Dichos problemas también fueron afrontados en el Google Lab asociado a la tarea “básica”, si bien estos se resolvieron indicando una zona distinta a “us-central1-a” a la hora de crear el clúster (desconozco el por qué de esta solución tan poco evidente).

Con todo ello, a continuación, incluyo capturas del Google Shell y las ventanas de Google Cloud, reflejo de los diferentes pasos llevados a cabo para la realización de la **tarea avanzada y extra**:

**1º) Creación del clúster “echo-cluster”, con dos nodos e2-standard-2 en us-central1-a.** La captura despliega mi cuenta personal para probar que se trata de mi pantalla.

The screenshot shows the Google Cloud Console interface. The top navigation bar includes the Google Cloud logo and a search bar. The main content area is titled "Kubernetes Engine" and "Kubernetes clusters". A table lists the clusters, with one cluster named "echo-cluster" in the "us-central1-a" region, having 2 nodes and 4 vCPUs. Below the table, a terminal window shows the command to create the cluster: `gcloud container clusters create echo-cluster --num-nodes 2 --machine-type e2-standard-2 --zone us-central1-a`. The output shows the cluster is being created and is now running.

Status	Name	Location	Number of nodes	Total vCPUs	Total memory	Notifications
Running	echo-cluster	us-central1-a	2	4	16 GB	Low resource

```
student_03_9ec365fed874@cloudshell:~ (qwiklabs-gcp-03-5c04b897eb11) $ gcloud container clusters create echo-cluster \
--num-nodes 2 \
--machine-type e2-standard-2 \
--zone us-central1-a

Default change: VPC-native is the default mode during cluster creation for versions greater than 1.21.0-gke.1500. To create advanced routes bas
s' flag
Note: Your Pod address range ('--cluster-ipv4-cidr') can accommodate at most 1008 node(s).
Creating cluster echo-cluster in us-central1-a... Cluster is being health-checked (master is healthy)...done.
Created [https://container.googleapis.com/v1/projects/qwiklabs-gcp-03-5c04b897eb11/zones/us-central1-a/clusters/echo-cluster].
To inspect the contents of your cluster, go to: https://console.cloud.google.com/kubernetes/workload/_gcloud/us-central1-a/echo-cluster?project=qwiklabs-gcp-03-5c04b897eb11
Kubeconfig entry generated for echo-cluster.
NAME: echo-cluster
LOCATION: us-central1-a
MASTER VERSION: 1.27.3-gke.100
MASTER IP: 34.132.203.10
MACHINE TYPE: e2-standard-2
NODE VERSION: 1.27.3-gke.100
NUM NODES: 2
STATUS: RUNNING
student_03_9ec365fed874@cloudshell:~ (qwiklabs-gcp-03-5c04b897eb11) $
```

**2º) Creación y subida al Container Registry de la imagen docker, con los archivos solicitados en el laboratorio, los cuales fueron descomprimidos y se localizan en el directorio ~/echo-app:**

The screenshot shows the Google Cloud Console interface. The top navigation bar includes the Google Cloud logo and a search bar. The main content area is titled "Container Registry" and "Repositories". A table lists the repositories, with one repository named "echo-app" in the "gcr.io" domain, having a visibility of "Private". Below the table, a terminal window shows the command to push the image: `docker push gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app:v1`. The output shows the image is being pushed and is now available in the registry.

Name	Hostname	Visibility
echo-app	gcr.io	Private

```
student_03_9ec365fed874@cloudshell:~ (qwiklabs-gcp-03-5c04b897eb11) $ docker push gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app:v1
The push refers to repository [gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app]
a86aff730098: Pushed
5af4f8f59b76: Layer already exists
v1: digest: sha256:942ec88edfd919362bc0f4ac5f3ce821fc4bf2409c0def9148155efca5f6a61d size: 739
student_03_9ec365fed874@cloudshell:~ (qwiklabs-gcp-03-5c04b897eb11) $
```

### 3º) Creación del deployment:

```
CLOUD SHELL
Terminal (qwiklabs-gcp-03-5c04b897eb11) x + ▾
[Open]

student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl create deployment echo-web \
--image=gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app:v1
deployment.apps/echo-web created
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl get deployments
NAME READY UP-TO-DATE AVAILABLE AGE
echo-web 1/1 1 1 10s
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl get pods
NAME READY STATUS RESTARTS AGE
echo-web-699f4dbbfc-nxht4 1/1 Running 0 17s
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl cluster-info
Kubernetes control plane is running at https://34.132.203.10
Kubelet is running at https://34.132.203.10/api/v1/namespaces/kube-system/services/default-http-backend:http/proxy
KubeDNS is running at https://34.132.203.10/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy
Metrics-server is running at https://34.132.203.10/api/v1/namespaces/kube-system/services/https:metrics-server:/proxy

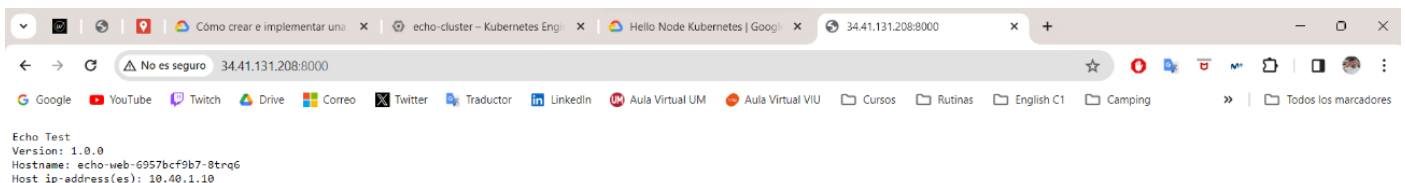
To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl config view
apiVersion: v1
clusters:
- cluster:
    certificate-authority-data: DATA+OMITTED
    server: https://34.132.203.10
```

### 4º) Haciendo público el deployment y obteniendo IP externa:

```
CLOUD SHELL
Terminal (qwiklabs-gcp-03-5c04b897eb11) x + ▾
[Open Editor]

current-context: gke_qwiklabs-gcp-03-5c04b897eb11_us-central1-a_echo-cluster
kind: Config
preferences: {}
users:
- name: gke_qwiklabs-gcp-03-5c04b897eb11_us-central1-a_echo-cluster
  user:
    exec:
      apiVersion: client.authentication.k8s.io/v1beta1
      args: null
      command: gke-gcloud-auth-plugin
      env: null
      installHint: Install gke-gcloud-auth-plugin for use with kubectl by following
        https://cloud.google.com/blog/products/containers-kubernetes/kubectl-auth-changes-in-gke
      interactiveMode: IfAvailable
      provideClusterInfo: true
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl expose deployment echo-web --type="LoadBalancer" --port=8080
service/echo-web exposed
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl get services
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
echo-web LoadBalancer 10.44.2.63 34.41.131.208 8080:31274/TCP 73s
kubernetes ClusterIP 10.44.0.1 <none> 443/TCP 19m
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$
```

### 5º) Resultado:



6º) De cara a la actividad extra, se modificó el Dockerfile:

```
CLOUD SHELL
Terminal (qwiklabs-gcp-03-5c04b897eb11) X + ▾

FROM golang:1.8-alpine
ADD . /go/src/echo-app
RUN go install echo-app

FROM alpine:latest
COPY --from=0 /go/bin/echo-app .
ENV PORT 8000
CMD echo "Esta es una versión 2.0 de la imagen"
~
~
```

7º) Debido a varias pruebas y errores (derivadas de intentar que el Google Labs validara la creación del clúster y el resto de tareas) se generó un deployment llamado echo-web2, escalado a tres réplicas:

```
CLOUD SHELL
Terminal (qwiklabs-gcp-03-5c04b897eb11) X + ▾

student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ ^C
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl scale deployment echo-web2 --replicas=3
deployment.apps/echo-web2 scaled
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl get deployment
NAME          READY   UP-TO-DATE   AVAILABLE   AGE
echo-web      1/1     1            1           6m50s
echo-web2     3/3     3            3           5m18s
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl get pods
FROM golang:1.8-alpine
NAME          READY   STATUS    RESTARTS   AGE
echo-web-699f4dbbfc-rskfk  1/1     Running   0          7m3s
echo-web2-6957bcf9b7-8trq6  1/1     Running   0          5m31s
echo-web2-6957bcf9b7-gdllx  1/1     Running   0          37s
echo-web2-6957bcf9b7-sdqms  1/1     Running   0          37s
```

8º) El deployment echo-web2 se modificó para incluir una versión llamada v3 de la imagen:

```
CLOUD SHELL
Terminal (qwiklabs-gcp-03-5c04b897eb11) X + ▾

spec:
  progressDeadlineSeconds: 600
  replicas: 3
  revisionHistoryLimit: 10
  selector:
    matchLabels:
      app: echo-web2
  strategy:
    rollingUpdate:
      maxSurge: 25%
      maxUnavailable: 25%
    type: RollingUpdate
  template:
    metadata:
      creationTimestamp: null
      labels:
        app: echo-web2
    spec:
      containers:
      - image: gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app:v3
```

9º) Tras ello, se procedió del mismo modo que en la tarea básica:

CLOUD SHELL  
Terminal (qwiklabs-gcp-03-5c04b897eb11) x +

Open Editor

```
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ vi Dockerfile
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ docker build -t gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app:v3 .
[+] Building 0.9s (11/11) FINISHED
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 225B
=> [internal] load metadata for docker.io/library/alpine:latest
=> [internal] load metadata for docker.io/library/golang:1.8-alpine
=> [stage-1 1/2] FROM docker.io/library/alpine:latest@sha256:51b67269f354137895d43f3b3d810bfacd3945438e94dc5ac55fdac340352f48
=> CACHED [stage-0 1/3] FROM docker.io/library/golang:1.8-alpine@sha256:693568f2ab0dae1e19f44b41628d2aea148fac65974cfd18f83cb9863ab1a177
=> [internal] load build context
=> => transferring context: 483B
=> [stage-0 2/3] ADD . /go/src/echo-app
=> [stage-0 3/3] RUN go install echo-app
=> CACHED [stage-1 2/2] COPY --from=0 /go/bin/echo-app .
=> exporting to image
=> => exporting layers
=> => writing image sha256:6a74e5a8e8041532d85509c9b665c50d46498167a167f095a2ece08c6613e85b
=> => naming to gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app:v3
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ docker push gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app:v3
The push refers to repository [gcr.io/qwiklabs-gcp-03-5c04b897eb11/echo-app]
a86aff730098: Layer already exists
5af4f8f59b76: Layer already exists
v3: digest: sha256:21fbb2f4f920c381847b8bfc762cb62d66ee88274451929909eb2e85c492c28f size: 739
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl edit deployment echo-web2
deployment.apps/echo-web2 edited
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl get deployments
NAME      READY   UP-TO-DATE   AVAILABLE   AGE
echo-web   1/1      1             1           21m
echo-web2  2/3      1             2           19m
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$ kubectl get services
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
echo-web2    LoadBalancer  10.44.7.122   34.41.131.208  8000:30722/TCP   19m
kubernetes   ClusterIP     10.44.0.1     <none>         443/TCP          44m
student_03_9ec365fed874@cloudshell:~/echo-web (qwiklabs-gcp-03-5c04b897eb11)$
```