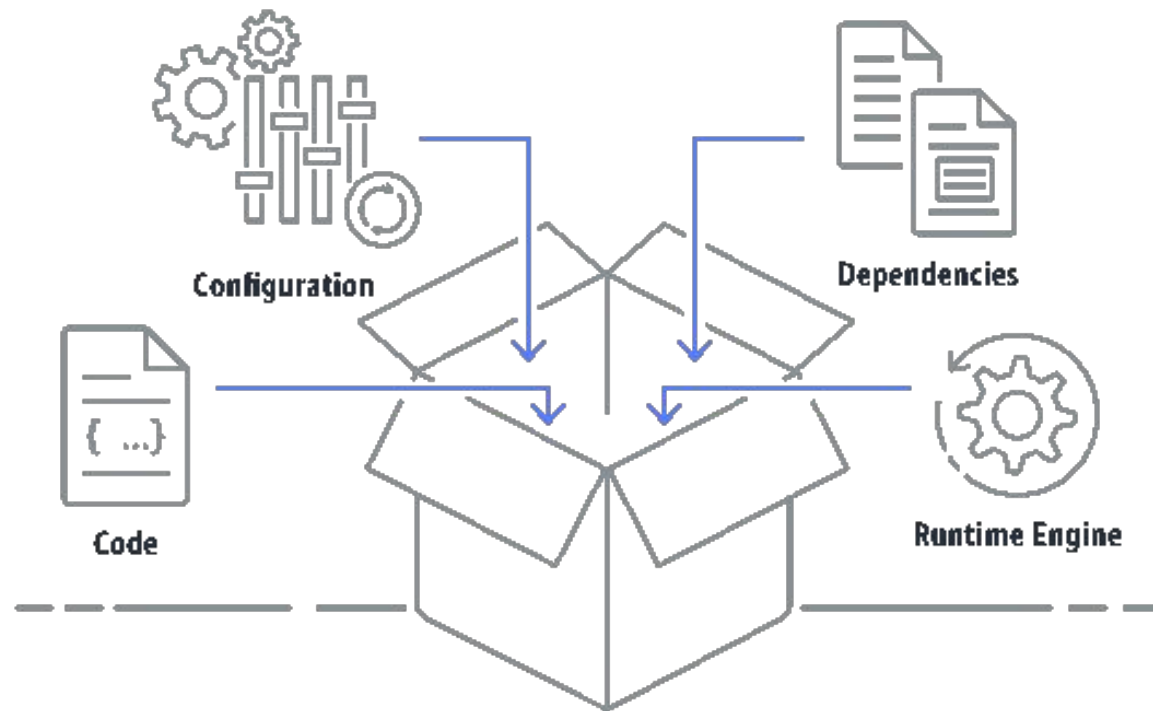
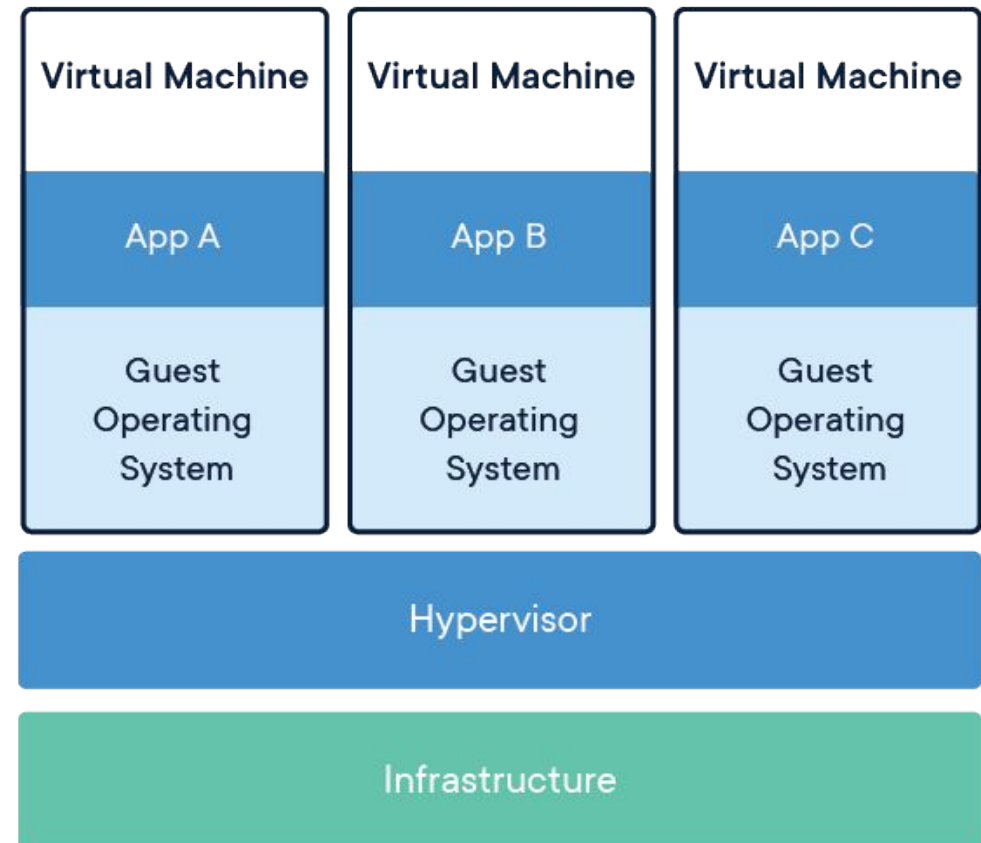
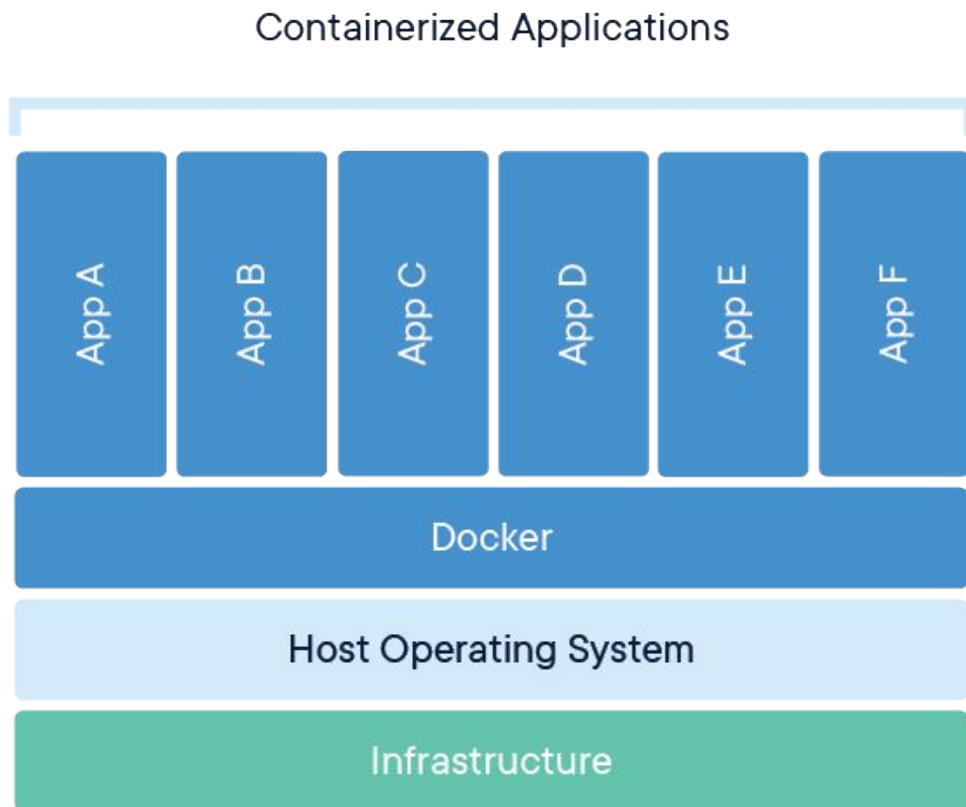


# ¿Qué es un contenedor?



# Contenedores vs. Máquinas virtuales



# Azure Container Registry



# Crear registro contenedor



## Crear Registro de contenedor ...

Datos básicos   Redes   Cifrado   Etiquetas   Revisar y crear

Azure Container Registry permite compilar, almacenar y administrar artefactos e imágenes de contenedor en un registro privado para todos los tipos de implementación de contenedor. Use registros de contenedor de Azure con sus canalizaciones de desarrollo e implementación de contenedores actuales. Use Azure Container Registry Tasks para compilar imágenes de contenedor en Azure a petición, o bien automatizar compilaciones desencadenadas por actualizaciones del código fuente, actualizaciones de la imagen base de un contenedor o temporizadores. [Más información](#)

### Detalles del proyecto

Suscripción \*

Azure for Students

Grupo de recursos \*

(Nuevo) contenedor-recurso

[Crear nuevo](#)

### Detalles de instancia

Nombre del Registro \*

contenedoruah

.azurecr.io

Ubicación \*

Centro de Francia

Zonas de disponibilidad ⓘ

☐ Habilitado



La característica Availability Zones está habilitada en los registros Premium y en las regiones que admiten zonas de disponibilidad. [Más información](#)

SKU \* ⓘ

Estándar

# Dockerfile

DockerFile

```
1 FROM node:9-alpine
2 ADD https://raw.githubusercontent.com/Azure-Samples/acr-build-helloworld-node/master/package.json /
3 ADD https://raw.githubusercontent.com/Azure-Samples/acr-build-helloworld-node/master/server.js /
4 RUN npm install
5 EXPOSE 80
6 CMD ["node", "server.js"]
```

<https://docs.docker.com/engine/reference/builder/>  
<https://github.com/Azure-Samples/acr-build-helloworld-node>

# Compilar en Azure Container Registry

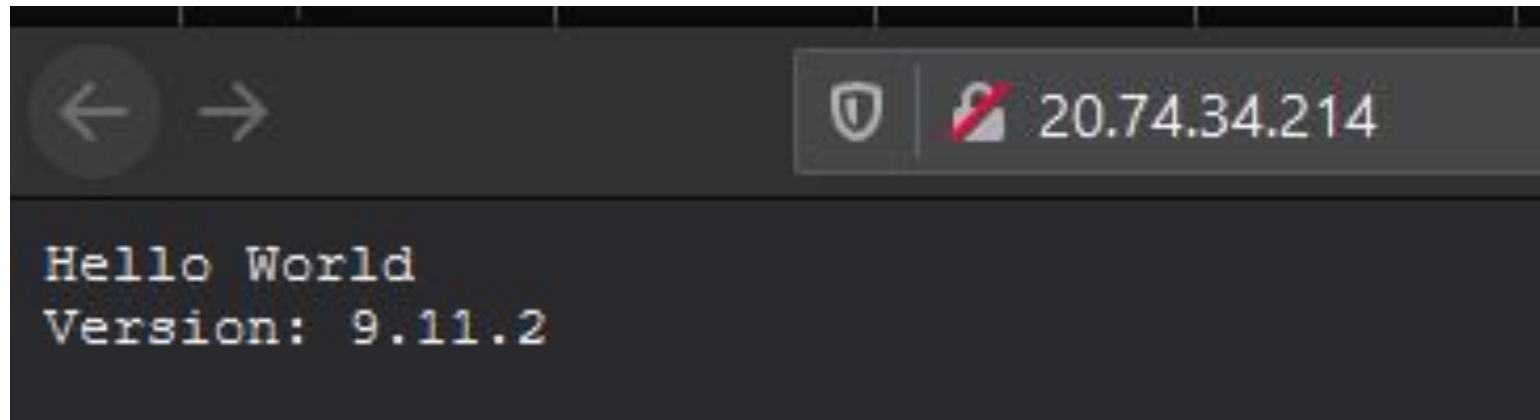
```
az acr build --registry repositoriouah --image helloacrtasks:v1 .
```

\* El punto al final del comando hará que busque el archivo llamado Dockerfile en el directorio actual

# Implementar instancia contenedor

```
az container create \  
  --resource-group contenedor-recurso \  
  --name acr-tasks \  
  --image contenedoruah.azurecr.io/helloacrtasks:v1 \  
  --registry-login-server contenedoruah.azurecr.io \  
  --ip-address Public \  
  --location francecentral \  
  --registry-username contenedoruah \  
  --registry-password +KwFXAfW0Z6GZqrLAcNv+5S5Bg8aRHIB
```

# ¡Funciona!



\* La dirección IP se obtiene de la instancia contenedor de Azure



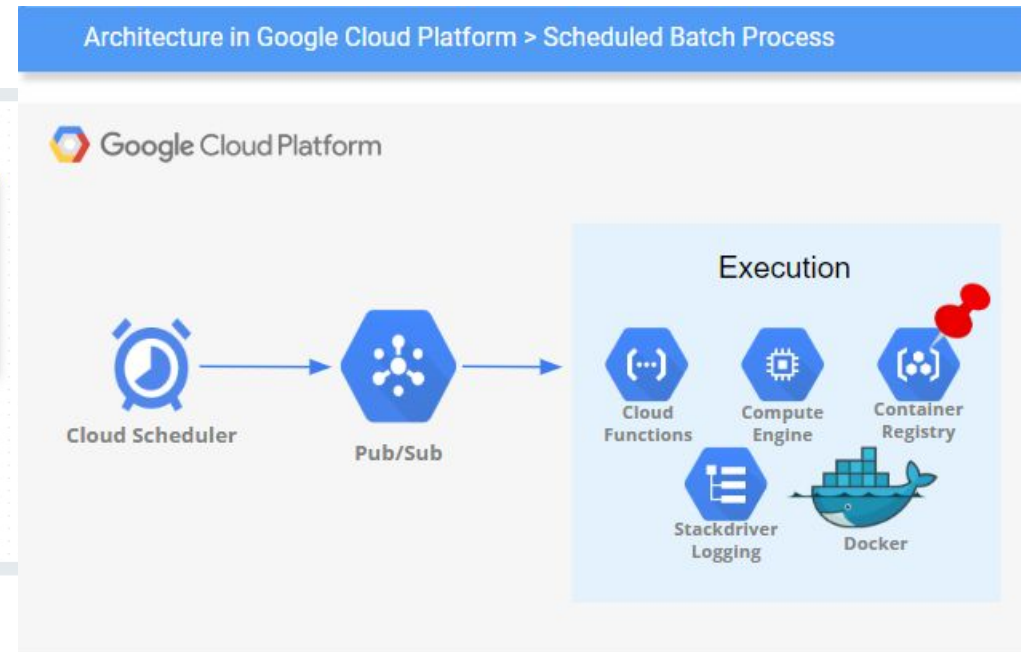
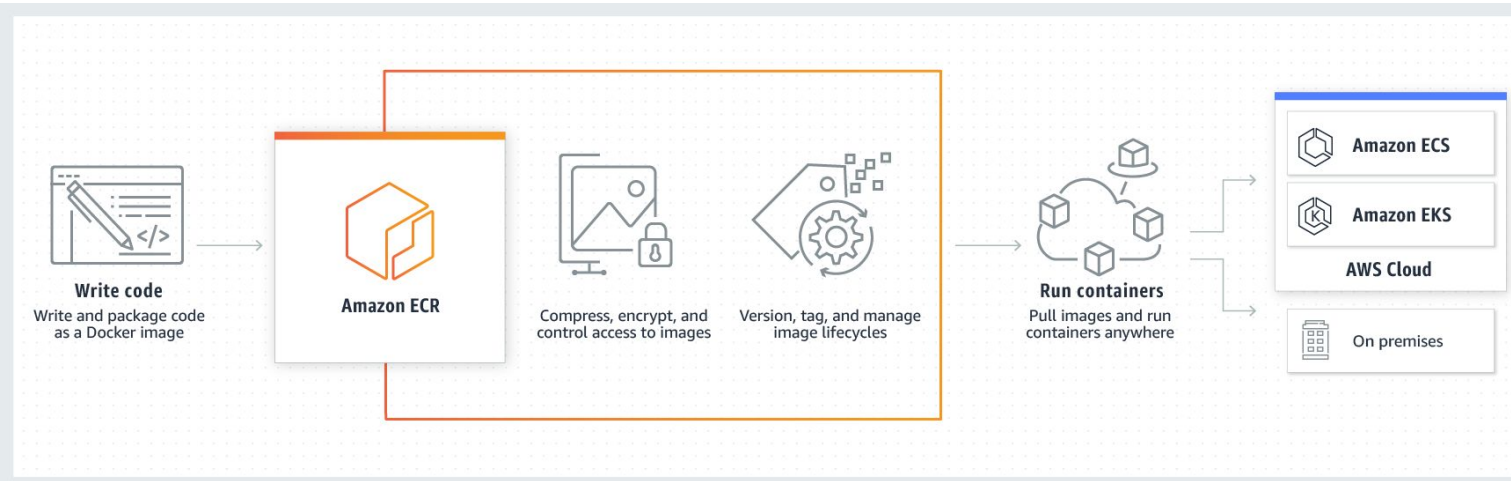
# Replicación



 Filtrar por nombre

Nombre ↑↓	Ubicación ↑↓	Estado de aprovisionamiento ↑↓	Estado ↑↓
<a href="#">northeurope</a>	Europa del Norte	Succeeded	Ready
<a href="#">francecentral</a>	Centro de Francia	Succeeded	Ready

# Azure vs. Google Cloud vs. AWS



Es la misma idea, pero...

# Azure vs. Google Cloud vs. AWS

Resource	Limit
Standard sku container groups per region per subscription	100 <sup>1</sup>
Dedicated sku container groups per region per subscription	0 <sup>1</sup>
Number of containers per container group	60
Number of volumes per container group	20

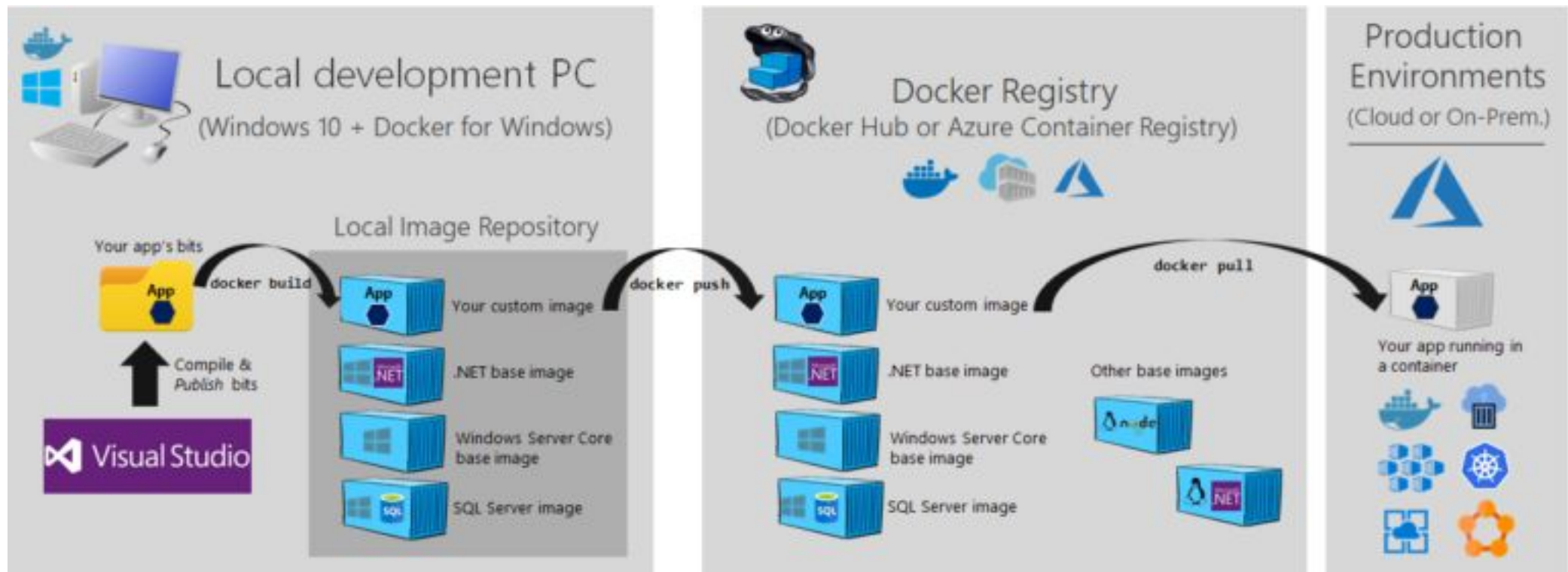
Service quota	Description	Default quota value
Registered repositories	The maximum number of repositories that you can create per Region.	10,000
Image per repository	The maximum number of images per repository.	10,000

Any request sent to a Container Registry host in the `gcr.io` domain has a 2 hour timeout limit.

The fixed rate limits per client IP address are:

- 50,000 HTTP requests every 10 minutes
- 1,000,000 HTTP requests per day

# Conclusiones



# Azure Container Instances



# Ejecución de Azure Container Instances

```
a_cortesc@Azure:~$ az group create --name learn-deploy-aci-rg --location eastus
{
  "id": "/subscriptions/77f3f862-fea1-4862-ada8-d9898292c902/resourceGroups/learn-deploy-aci-rg",
  "location": "eastus",
  "managedBy": null,
  "name": "learn-deploy-aci-rg",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
```

Grupo de recursos

```
a_cortesc@Azure:~$ az container show \
> --resource-group learn-deploy-aci-rg \
> --name mycontainer \
> --query "{FQDN:ipAddress.fqdn,ProvisioningState:provisioningState}" \
> --out table
FQDN                                ProvisioningState
-----
aci-demo-9021.eastus.azurecontainer.io Succeeded
```

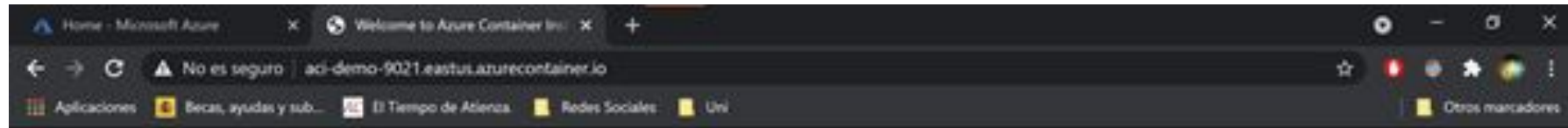
Comprobar su estado

```
a_cortesc@Azure:~$ az container create \
> --resource-group learn-deploy-aci-rg \
> --name mycontainer \
> --image microsoft/aci-helloworld \
> --ports 80 \
> --dns-name-label $DNS_NAME_LABEL \
> --location eastus
[Progress bar] - Running ..
```

Instancia de contenedor



# Vista desde un explorador...



Welcome to Azure Container Instances!



# Control del comportamiento de reinicio

```
a_cortesc@Azure:~$ az container create \  
> --resource-group learn-deploy-aci-rg \  
> --name mycontainer-restart-demo \  
> --image microsoft/aci-wordcount:latest \  
> --restart-policy OnFailure \  
> --location eastus  
[...]/ Running ..
```

Iniciar el contenedor

```
a_cortesc@Azure:~$ az container logs \  
> --resource-group learn-deploy-aci-rg \  
> --name mycontainer-restart-demo  
[('the', 990),  
 ('and', 702),  
 ('of', 628),  
 ('to', 610),  
 ('I', 544),  
 ('you', 495),  
 ('a', 453),  
 ('my', 441),  
 ('in', 399),  
 ('HAMLET', 386)]
```

Registros del contenedor



# Establecimiento de variables de entorno

```
a_cortesc@Azure:~$ COSMOS_DB_ENDPOINT=$(az cosmosdb create \
> --resource-group learn-deploy-aci-rg \
> --name $COSMOS_DB_NAME \
> --query documentEndpoint \
> --output tsv)
```

Crear instancia de Cosmos DB

```
a_cortesc@Azure:~$ COSMOS_DB_MASTERKEY=$(az cosmosdb keys list \
> --resource-group learn-deploy-aci-rg \
> --name $COSMOS_DB_NAME \
> --query primaryMasterKey \
> --output tsv)
```

Clave de conexión

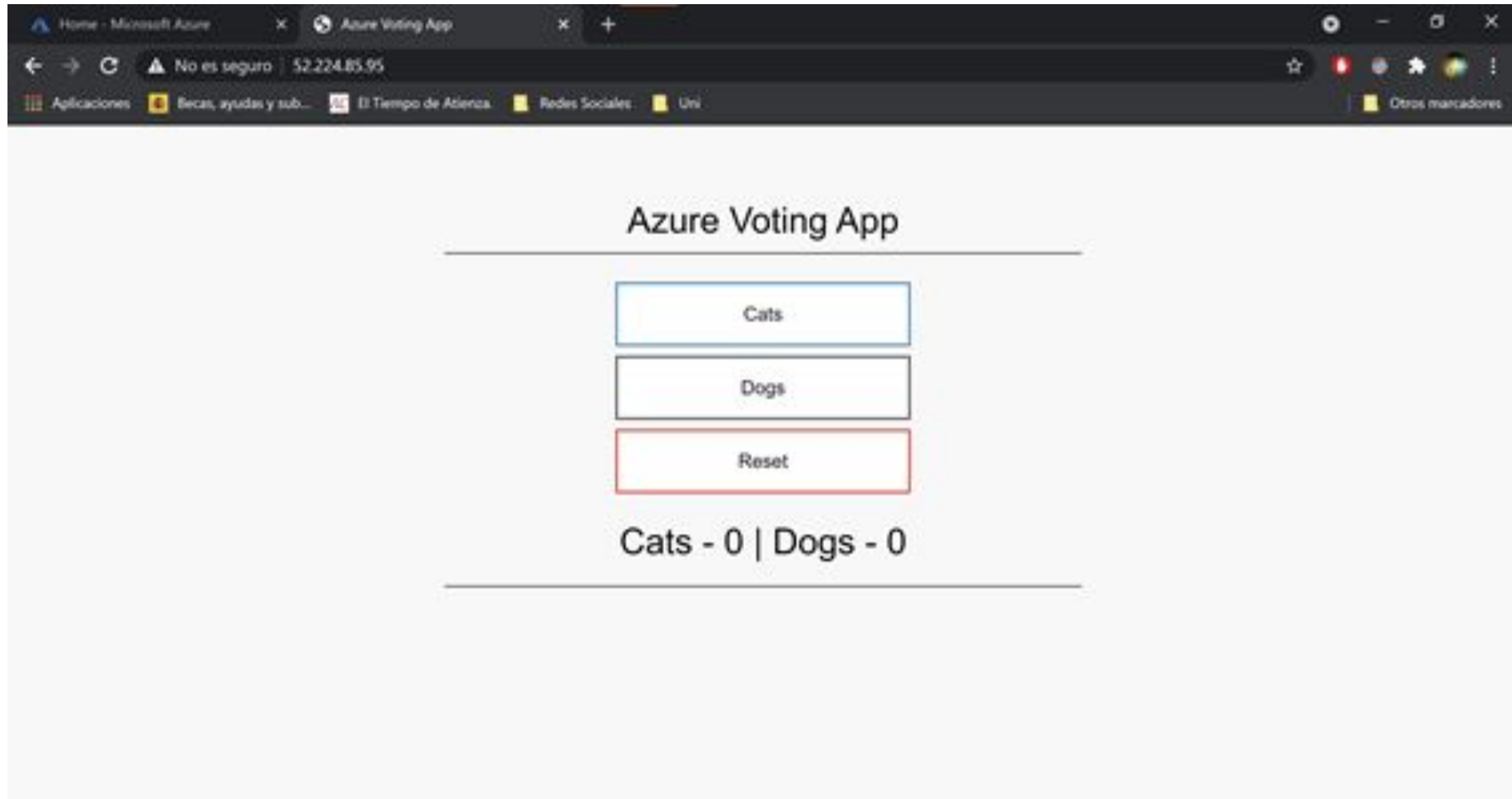
```
a_cortesc@Azure:~$ az container create \
> --resource-group learn-deploy-aci-rg \
> --name aci-demo \
> --image microsoft/azure-vote-front:cosmosdb \
> --ip-address Public \
> --location eastus \
> --environment-variables \
>   COSMOS_DB_ENDPOINT=$COSMOS_DB_ENDPOINT \
>   COSMOS_DB_MASTERKEY=$COSMOS_DB_MASTERKEY
█- Running ..
```

Crear contenedor

```
a_cortesc@Azure:~$ az container show \
> --resource-group learn-deploy-aci-rg \
> --name aci-demo \
> --query ipAddress.ip \
> --output tsv
52.224.85.95
```

Obtener dirección IP

# Vista desde un explorador...



# Uso de volúmenes de datos

```
a_cortesc@Azure:~$ az storage account create \  
> --resource-group learn-deploy-aci-rg \  
> --name $STORAGE_ACCOUNT_NAME \  
> --sku Standard_LRS \  
> --location eastus  
█- Running ..
```

Crear cuenta de almacenamiento

```
a_cortesc@Azure:~$ az container create \  
> --resource-group learn-deploy-aci-rg \  
> --name aci-demo-files \  
> --image microsoft/aci-hellofiles \  
> --location eastus \  
> --ports 80 \  
> --ip-address Public \  
> --azure-file-volume-account-name $STORAGE_ACCOUNT_NAME \  
> --azure-file-volume-account-key $STORAGE_KEY \  
> --azure-file-volume-share-name aci-share-demo \  
> --azure-file-volume-mount-path /aci/logs/  
█- Running ..
```

Crear contenedor

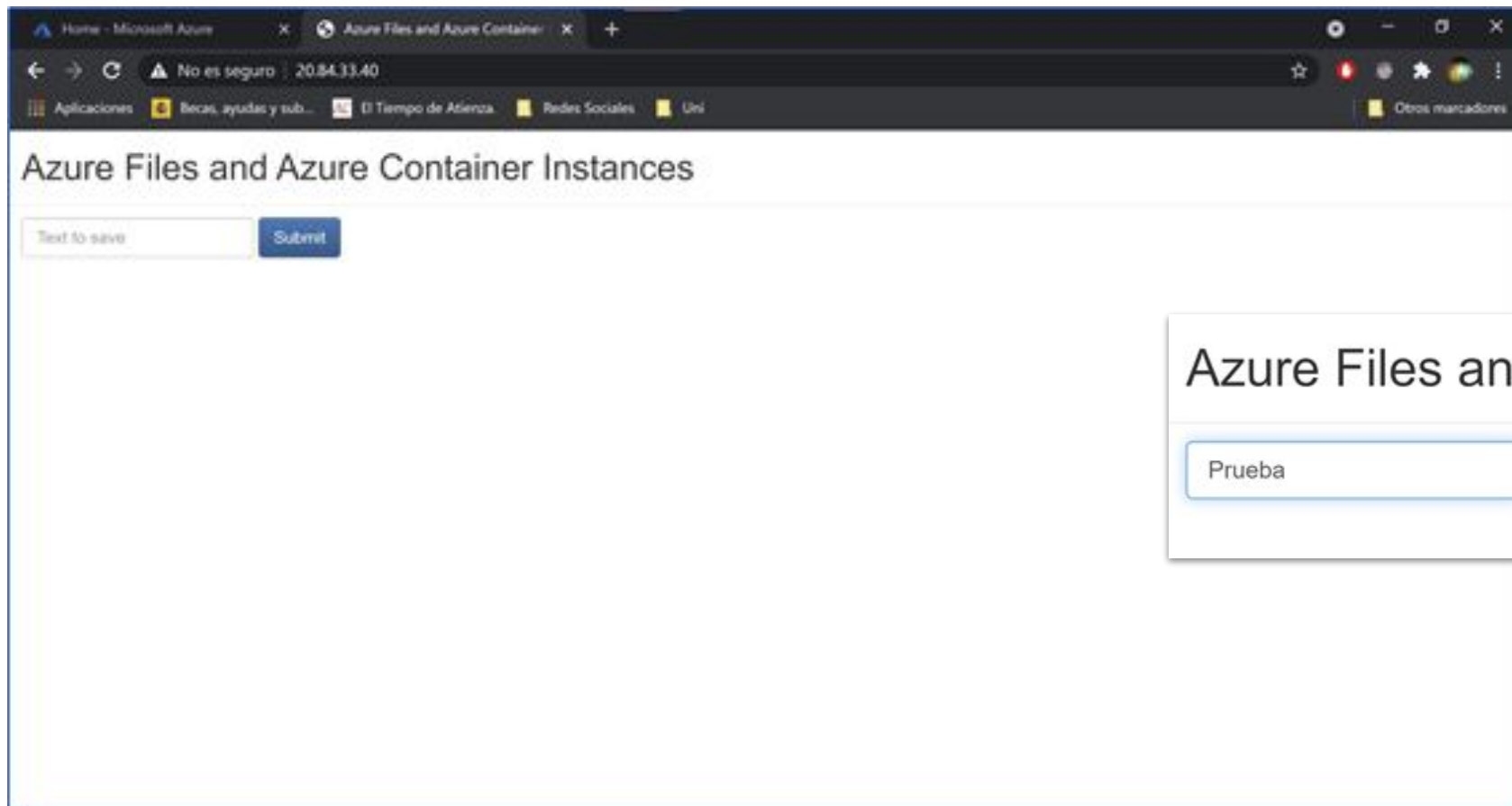
```
a_cortesc@Azure:~$ az storage share create --name aci-share-demo  
{  
  "created": true  
}
```

Crear recurso compartido de archivos

```
a_cortesc@Azure:~$ az container show \  
> --resource-group learn-deploy-aci-rg \  
> --name aci-demo-files \  
> --query ipAddress.ip \  
> --output tsv  
20.84.33.40
```

Obtener IP

# Vista desde un explorador...



Azure Files and Azure Container Instances

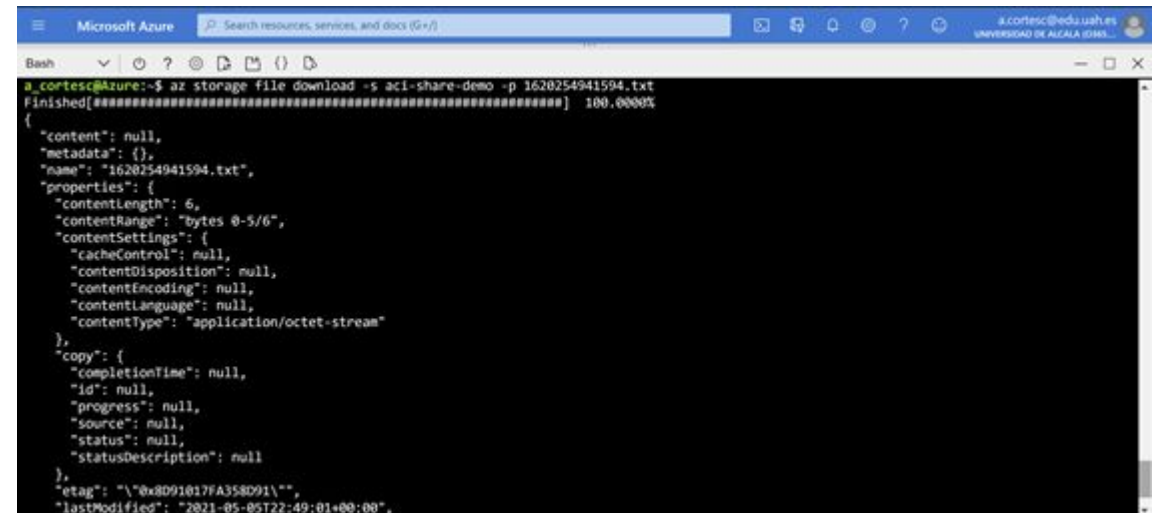
Prueba

Submit

# Mostrar contenido del archivo

```
a_cortesc@Azure:~$ az storage file list -s aci-share-demo -o table
Name                               Content Length  Type    Last Modified
-----
1620254941594.txt                 6              file
```

Archivos en el recurso compartido



```
Microsoft Azure
a_cortesc@Azure:~$ az storage file download -s aci-share-demo -p 1620254941594.txt
Finished[#####] 100.0000%
{
  "content": null,
  "metadata": {},
  "name": "1620254941594.txt",
  "properties": {
    "contentLength": 6,
    "contentRange": "bytes 0-5/6",
    "contentSettings": {
      "cacheControl": null,
      "contentDisposition": null,
      "contentEncoding": null,
      "contentLanguage": null,
      "contentType": "application/octet-stream"
    },
    "copy": {
      "completionTime": null,
      "id": null,
      "progress": null,
      "source": null,
      "status": null,
      "statusDescription": null
    },
    "etag": "\"0x091017FA358091\"",
    "lastModified": "2021-05-05T22:49:01+00:00",
  }
}
```

Descarga del archivo

```
a_cortesc@Azure:~$ cat 1620254941594.txt
Pruebaa_cortesc@Azure:~$
```

Imprimir contenido

# Solución de problemas de Azure Container Instances

```
Microsoft Azure Search resources, services, and docs (G+Y) a_cortesc@edu.uah.es UNIVERSIDAD DE ALICIA (ON)
Bash
a_cortesc@Azure:~$ az container logs \
> --resource-group learn-deploy-aci-rg \
> --name mycontainer
Checking for script in /app/prestart.sh
Running script /app/prestart.sh
Running inside /app/prestart.sh, you could add migrations to this file, e.g.:

#!/usr/bin/env bash

# Let the DB start
sleep 10;
# Run migrations
alembic upgrade head

/usr/lib/python2.7/dist-packages/supervisor/options.py:298: UserWarning: Supervisor is running as root and it is searching for its configuration
file in default locations (including its current working directory); you probably want to specify a "-c" argument specifying an absolute path to
a configuration file for improved security.
  "Supervisord is running as root and it is searching "
2021-05-05 22:58:40,994 CRIT Supervisor running as root (no user in config file)
2021-05-05 22:58:40,994 INFO Included extra file "/etc/supervisor/conf.d/supervisord.conf" during parsing
2021-05-05 22:58:41,014 INFO RPC interface 'supervisor' initialized
2021-05-05 22:58:41,014 CRIT Server 'unix_http_server' running without any HTTP authentication checking
2021-05-05 22:58:41,014 INFO supervisord started with pid 26
2021-05-05 22:58:42,017 INFO spawned: 'nginx' with pid 29
2021-05-05 22:58:42,021 INFO spawned: 'uwsgi' with pid 30
[uwsgi] getting INI configuration from /app/uwsgi.ini
```

Obtención de registros de una instancia de contenedor

```
Microsoft Azure Search resources, services, and docs (G+Y) a_cortesc@edu.uah.es UNIVERSIDAD DE ALICIA (ON)
Bash
a_cortesc@Azure:~$ az container attach \
> --resource-group learn-deploy-aci-rg \
> --name mycontainer
Container 'mycontainer' is in state 'Running'...
(count: 1) (last timestamp: 2021-05-04 17:26:34+00:00) pulling image "microsoft/aci-helloworld@sha256:565dba8ce20ca1a311c2d9485089d7ddc935dd50140510050345a1b0ea4ffa6e"
(count: 1) (last timestamp: 2021-05-04 17:26:35+00:00) Successfully pulled image "microsoft/aci-helloworld@sha256:565dba8ce20ca1a311c2d9485089d7ddc935dd50140510050345a1b0ea4ffa6e"
(count: 1) (last timestamp: 2021-05-04 17:26:49+00:00) Started container
(count: 1) (last timestamp: 2021-05-05 22:57:27+00:00) Killing container with id 40215f6835d5f2520ba16da7ddf0aa116416981c246141e9eeef13439cef474d
(count: 1) (last timestamp: 2021-05-05 22:57:51+00:00) pulling image "microsoft/aci-helloworld@sha256:565dba8ce20ca1a311c2d9485089d7ddc935dd50140510050345a1b0ea4ffa6e"
(count: 1) (last timestamp: 2021-05-05 22:57:53+00:00) Successfully pulled image "microsoft/aci-helloworld@sha256:565dba8ce20ca1a311c2d9485089d7ddc935dd50140510050345a1b0ea4ffa6e"
(count: 1) (last timestamp: 2021-05-05 22:58:05+00:00) Started container
(count: 1) (last timestamp: 2021-05-05 22:58:23+00:00) pulling image "microsoft/sample-aks-helloworld@sha256:fb47732ef36b285b1f3fbd69ab8411a430b1dc41823ae33d5992f0295c945f4"
(count: 1) (last timestamp: 2021-05-05 22:58:25+00:00) Successfully pulled image "microsoft/sample-aks-helloworld@sha256:fb47732ef36b285b1f3fbd69ab8411a430b1dc41823ae33d5992f0295c945f4"
(count: 1) (last timestamp: 2021-05-05 22:58:35+00:00) Killing container with id 786194c87c1761a7d798c6369be183b08514cf3d1f785532eb1b4a83b6f63ac5
(count: 1) (last timestamp: 2021-05-05 22:58:39+00:00) Started container
Start streaming logs:
Checking for script in /app/prestart.sh
```

Obtención de eventos de contenedor

```
a_cortesc@Azure:~$ az container exec \
> --resource-group learn-deploy-aci-rg \
> --name mycontainer \
> --exec-command /bin/sh
# ls
__pycache__  main.py  prestart.sh  static  templates  uwsgi.ini
# exit
```

Ejecución de un comando en el contenedor



# Supervisión del uso de CPU y memoria en su contenedor

```
Microsoft Azure Search resources, services, and docs
Bash
a_cortesc@Azure:~$ az monitor metrics list \
> --resource $CONTAINER_ID \
> --metric CPUUsage \
> --output table
```

Timestamp	Name	Average
2021-05-05 22:24:00	CPU Usage	0.0
2021-05-05 22:25:00	CPU Usage	0.0
2021-05-05 22:26:00	CPU Usage	0.0
2021-05-05 22:27:00	CPU Usage	0.0
2021-05-05 22:28:00	CPU Usage	0.0
2021-05-05 22:29:00	CPU Usage	0.0
2021-05-05 22:30:00	CPU Usage	0.0
2021-05-05 22:31:00	CPU Usage	0.0
2021-05-05 22:32:00	CPU Usage	0.0
2021-05-05 22:33:00	CPU Usage	0.0
2021-05-05 22:34:00	CPU Usage	0.0
2021-05-05 22:35:00	CPU Usage	0.0
2021-05-05 22:36:00	CPU Usage	0.0
2021-05-05 22:37:00	CPU Usage	0.0
2021-05-05 22:38:00	CPU Usage	0.0
2021-05-05 22:39:00	CPU Usage	0.0
2021-05-05 22:40:00	CPU Usage	0.0
2021-05-05 22:41:00	CPU Usage	0.0
2021-05-05 22:42:00	CPU Usage	0.0
2021-05-05 22:43:00	CPU Usage	0.0

```
Microsoft Azure Search resources, services, and docs (G+/f)
Bash
a_cortesc@Azure:~$ az monitor metrics list \
> --resource $CONTAINER_ID \
> --metric MemoryUsage \
> --output table
```

Timestamp	Name	Average
2021-05-05 22:28:00	Memory Usage	19011584.0
2021-05-05 22:29:00	Memory Usage	19052544.0
2021-05-05 22:30:00	Memory Usage	19089408.0
2021-05-05 22:31:00	Memory Usage	19130368.0
2021-05-05 22:32:00	Memory Usage	19181696.0
2021-05-05 22:33:00	Memory Usage	19208192.0
2021-05-05 22:34:00	Memory Usage	18741248.0
2021-05-05 22:35:00	Memory Usage	18208768.0
2021-05-05 22:36:00	Memory Usage	18184192.0
2021-05-05 22:37:00	Memory Usage	18221056.0
2021-05-05 22:38:00	Memory Usage	18262016.0
2021-05-05 22:39:00	Memory Usage	18298880.0
2021-05-05 22:40:00	Memory Usage	18339840.0
2021-05-05 22:41:00	Memory Usage	18376704.0
2021-05-05 22:42:00	Memory Usage	18417664.0
2021-05-05 22:43:00	Memory Usage	18454528.0
2021-05-05 22:44:00	Memory Usage	18495488.0
2021-05-05 22:45:00	Memory Usage	18532352.0
2021-05-05 22:46:00	Memory Usage	18573312.0
2021-05-05 22:47:00	Memory Usage	18608128.0

# Limpieza de recursos

Microsoft Azure

Search resources, services, and docs (G+/I)

4.cortesc@edu.uah.es  
UNIVERSIDAD DE ALCALÁ 10361...

Home > Resource groups >

**learn-deploy-aci-rg**  
Resource group

Search (Ctrl+I)

+ Add Edit columns **Delete resource group** Refresh Export to CSV Open query Assign tags Move

Overview

Activity log

Access control (IAM)

Tags

Events

Settings

Deployments

Security

Policies

Properties

Locks

Cost Management

Essentials

Subscription (change)  
Azure for Students

Subscription ID  
77f3f862-fea1-4862-ada8-d9898292c902

Tags (change)  
Click here to add tags

Deployments  
No deployments

Location  
East US

Filter for any field...

Type == all X Location == all X Add filter

Showing 1 to 7 of 7 records. ☐ Show hidden types

No grouping List view

<input type="checkbox"/> Name ↑	Type ↑	Location ↑
<input type="checkbox"/> aci-cosmos-db-26619	Azure Cosmos DB account	East US
<input type="checkbox"/> ...	Container instances	East US

< Previous Page 1 of 1 Next >



# Azure vs. Google Cloud vs. AWS

## Azure: Container Instances

Ejecución de contenedores sin administrar servidores.



## AWS: AWS Fargate

Cómputo sin servidor para contenedores.



AWS Fargate

## Google Cloud: Cloud Run

Desarrollo y despliegue de aplicaciones en contenedores en una plataforma sin servidor totalmente gestionada.

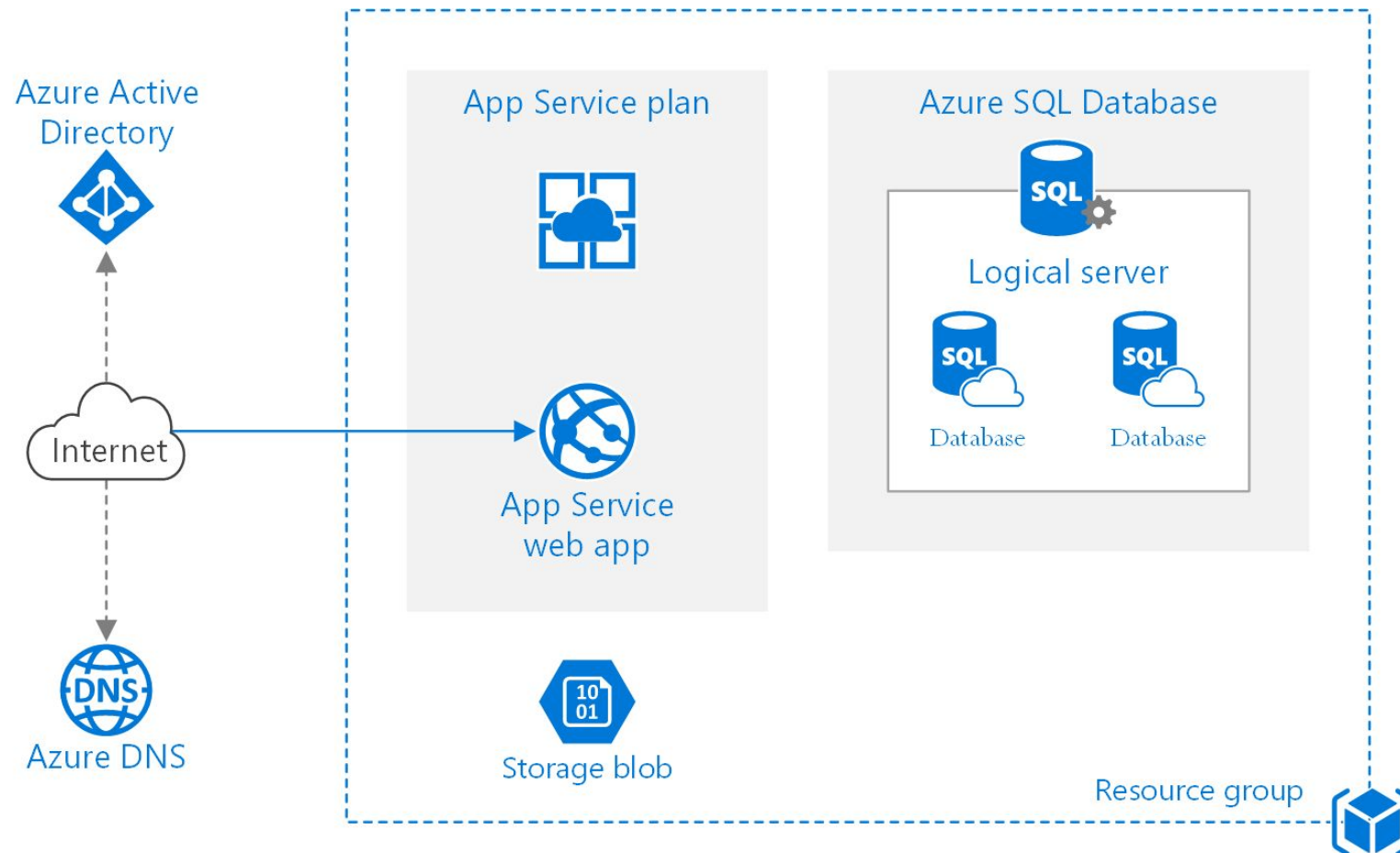


Cloud Run

# Conclusiones



# Hospedaje de una aplicación web con Azure App Service



# Creación de una aplicación web

The screenshot displays the Microsoft Azure portal interface for a specific App Service resource named 'WebAppDiego'. The top navigation bar includes the 'Microsoft Azure' logo, a search bar, and user information for 'diego.fernandezr@edu...'. The breadcrumb trail shows the path from 'Home' to the specific resource. The left-hand navigation pane lists various management options such as 'Overview', 'Activity log', 'Access control (IAM)', 'Tags', 'Diagnose and solve problems', 'Security', 'Events (preview)', 'Deployment', 'Quickstart', and 'Deployment slots'. The main content area, titled 'Essentials', provides key details about the resource: its resource group ('DefaultResourceGroup-WEU'), status ('Running'), location ('West Europe'), subscription ('Azure for Students'), and subscription ID. It also includes a 'URL' field with the value 'https://webappdiego.azurewebsites.net'. Below this information, three recommendation boxes are visible: 'Diagnose and solve problems' (with a wrench icon), 'Application Insights' (with a lightbulb icon), and 'App Service Advisor' (with a ribbon icon). The top of the main content area features a toolbar with actions like 'Browse', 'Stop', 'Swap', 'Restart', 'Delete', 'Refresh', 'Get publish profile', 'Reset publish profile', 'Share to mobile', and 'Send us your feedback'.

Microsoft Azure

Search resources, services, and docs (G+)

Home > Microsoft.Web-WebApp-Portal-99b22314-9034 >

**WebAppDiego**  
App Service

Search (Ctrl+)

⏏ Browse □ Stop ⇄ Swap ↺ Restart 🗑 Delete | ↻ Refresh ⬇ Get publish profile ↺ Reset publish profile 📱 Share to mobile 💙 Send us your feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Security

Events (preview)

Deployment

Quickstart

Deployment slots

Essentials

JSON View

Resource group (change) : DefaultResourceGroup-WEU

URL : https://webappdiego.azurewebsites.net

Status : Running

Location : West Europe

Subscription (change) : Azure for Students

Subscription ID : 3e378ef1-01d5-4ca8-91aa-672a094708dc

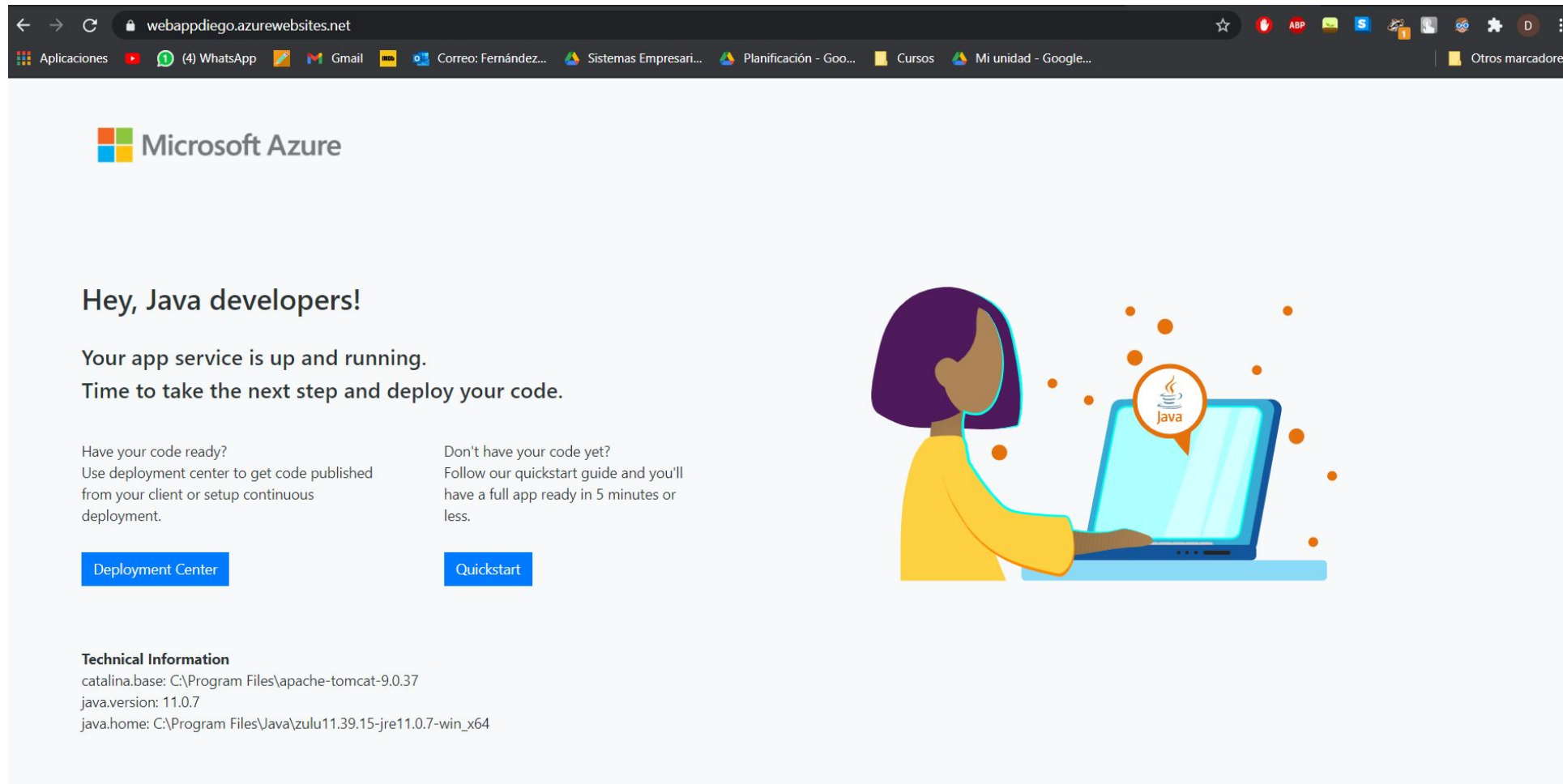
Tags (change) : Click here to add tags

**Diagnose and solve problems**  
Our self-service diagnostic and troubleshooting experience helps you identify and resolve issues with your web app.

**Application Insights**  
Application Insights helps you detect and diagnose quality issues in your apps, and helps you understand what your users actually do with it.

**App Service Advisor**  
App Service Advisor provides insights for improving app experience on the App Service platform. Recommendations are sorted by freshness, priority and impact to your app.

# Comprobación de la URL



The screenshot shows a web browser window with the address bar displaying `webappdiego.azurewebsites.net`. The browser's address bar and tabs are visible at the top. The main content area of the browser shows the Microsoft Azure portal interface. At the top left of the portal is the Microsoft Azure logo. Below the logo, the text "Hey, Java developers!" is displayed in a large, bold font. Underneath this, a message states: "Your app service is up and running. Time to take the next step and deploy your code." To the right of this text is an illustration of a person with short purple hair, wearing a yellow shirt, sitting at a desk and using a laptop. A speech bubble with the Java logo is coming from the laptop screen, and several small orange dots are floating around it. Below the main text, there are two columns of text. The left column is titled "Have your code ready?" and contains the text: "Use deployment center to get code published from your client or setup continuous deployment." Below this text is a blue button labeled "Deployment Center". The right column is titled "Don't have your code yet?" and contains the text: "Follow our quickstart guide and you'll have a full app ready in 5 minutes or less." Below this text is a blue button labeled "Quickstart". At the bottom left of the page, there is a section titled "Technical Information" which lists the following details: "catalina.base: C:\Program Files\apache-tomcat-9.0.37", "java.version: 11.0.7", and "java.home: C:\Program Files\Java\zulu11.39.15-jre11.0.7-win\_x64".

Microsoft Azure

## Hey, Java developers!

Your app service is up and running.  
Time to take the next step and deploy your code.

Have your code ready?  
Use deployment center to get code published from your client or setup continuous deployment.

Deployment Center

Don't have your code yet?  
Follow our quickstart guide and you'll have a full app ready in 5 minutes or less.

Quickstart

**Technical Information**  
catalina.base: C:\Program Files\apache-tomcat-9.0.37  
java.version: 11.0.7  
java.home: C:\Program Files\Java\zulu11.39.15-jre11.0.7-win\_x64

# Iniciación y uso de Git

```
diego_fernandezr@Azure:~$ git init
Initialized empty Git repository in /home/diego_fernandezr/.git/
diego_fernandezr@Azure:~$ git add .

^C
diego_fernandezr@Azure:~$ git add .
^Z
[1]+  Stopped                  git add .
diego_fernandezr@Azure:~$ git init
Reinitialized existing Git repository in /home/diego_fernandezr/.git/
diego_fernandezr@Azure:~$ git add .
fatal: Unable to create '/home/diego_fernandezr/.git/index.lock': File exists.
```



# Empaquetado de contenidos de la app

```
Downloaded from central: https://repo.maven.apache.org/maven2/com/ibm/ibm-common-ibm-common/1.0.0/ibm-common-1.0.0.jar
[INFO] Packaging webapp
[INFO] Assembling webapp [helloworld] in [/home/diego_fernandezr/helloworld/target/helloworld]
[INFO] Processing war project
[INFO] Copying webapp resources [/home/diego_fernandezr/helloworld/src/main/webapp]
[INFO] Webapp assembled in [60 msecs]
[INFO] Building war: /home/diego_fernandezr/helloworld/target/helloworld.war
[INFO] WEB-INF/web.xml already added, skipping
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 7.657 s
[INFO] Finished at: 2021-05-06T13:54:31Z
[INFO] -----
diego_fernandezr@Azure:~/helloworld$
```

```
diego_fernandezr@Azure:~/helloworld$ cd target
diego_fernandezr@Azure:~/helloworld/target$ ls
classes helloworld helloworld.war maven-archiver
diego_fernandezr@Azure:~/helloworld/target$
```

# Creación de credenciales

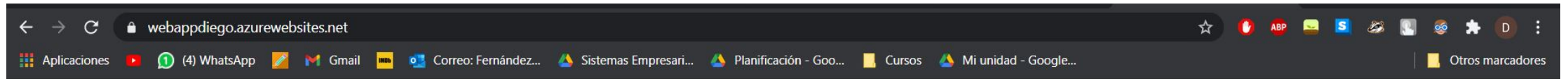
```
{
  "id": null,
  "kind": null,
  "name": "web",
  "publishingPassword": null,
  "publishingPasswordHash": null,
  "publishingPasswordHashSalt": null,
  "publishingUserName": "Diego1999",
  "scmUri": null,
  "systemData": null,
  "type": "Microsoft.Web/publishingUsers/web"
}
diego_fernandezr@Azure:~/helloworld/target$
```



# Traspaso de contenidos a la web hospedada

```
Microsoft Azure Search resources, services, and docs (G+/) diego.fernandezr@edu.... UNIVERSIDAD DE ALCALA (0365....)
Bash
* expire date: Sep 28 19:00:01 2021 GMT
* subjectAltName: host "webappdiego.scm.azurewebsites.net" matched cert's "*.scm.azurewebsites.net"
* issuer: C=US; O=Microsoft Corporation; CN=Microsoft RSA TLS CA 01
* SSL certificate verify ok.
* Server auth using Basic with user 'Diego1999'
> POST /api/wardeploy HTTP/1.1
> Host: webappdiego.scm.azurewebsites.net
> Authorization: Basic RG1lZ28xOTk5OjRwZDZvNjY2Ng==
> User-Agent: curl/7.64.0
> Accept: */*
> Content-Length: 2160
> Content-Type: application/x-www-form-urlencoded
> Expect: 100-continue
>
* Expire in 1000 ms for 0 (transfer 0x55b062ffef50)
* Done waiting for 100-continue
* We are completely uploaded and fine
< HTTP/1.1 200 OK
< Cache-Control: no-cache
< Pragma: no-cache
< Expires: -1
< Server: Microsoft-IIS/10.0
< x-ms-request-id: b1ae858e-cf7e-4ff7-9351-fc64255d0fef
< X-AspNet-Version: 4.0.30319
< X-Powered-By: ASP.NET
< Set-Cookie: ARRAffinity=a6e48b9e9d2653435be7b61998d8624b44115214104213d6c8b8c526cc56dc70;Path=/;HttpOnly;Secure;Domain=webappdiego.scm.azurewebsites.net
< Set-Cookie: ARRAffinitySameSite=a6e48b9e9d2653435be7b61998d8624b44115214104213d6c8b8c526cc56dc70;Path=/;HttpOnly;SameSite=None;Secure;Domain=webappdiego.scm.azurewebsites.net
< Date: Thu, 06 May 2021 14:08:24 GMT
< Content-Length: 0
<
* Connection #0 to host webappdiego.scm.azurewebsites.net left intact
diego_fernandezr@Azure:~/helloworld/target$
```

# Resultado y comparación con otros servicios

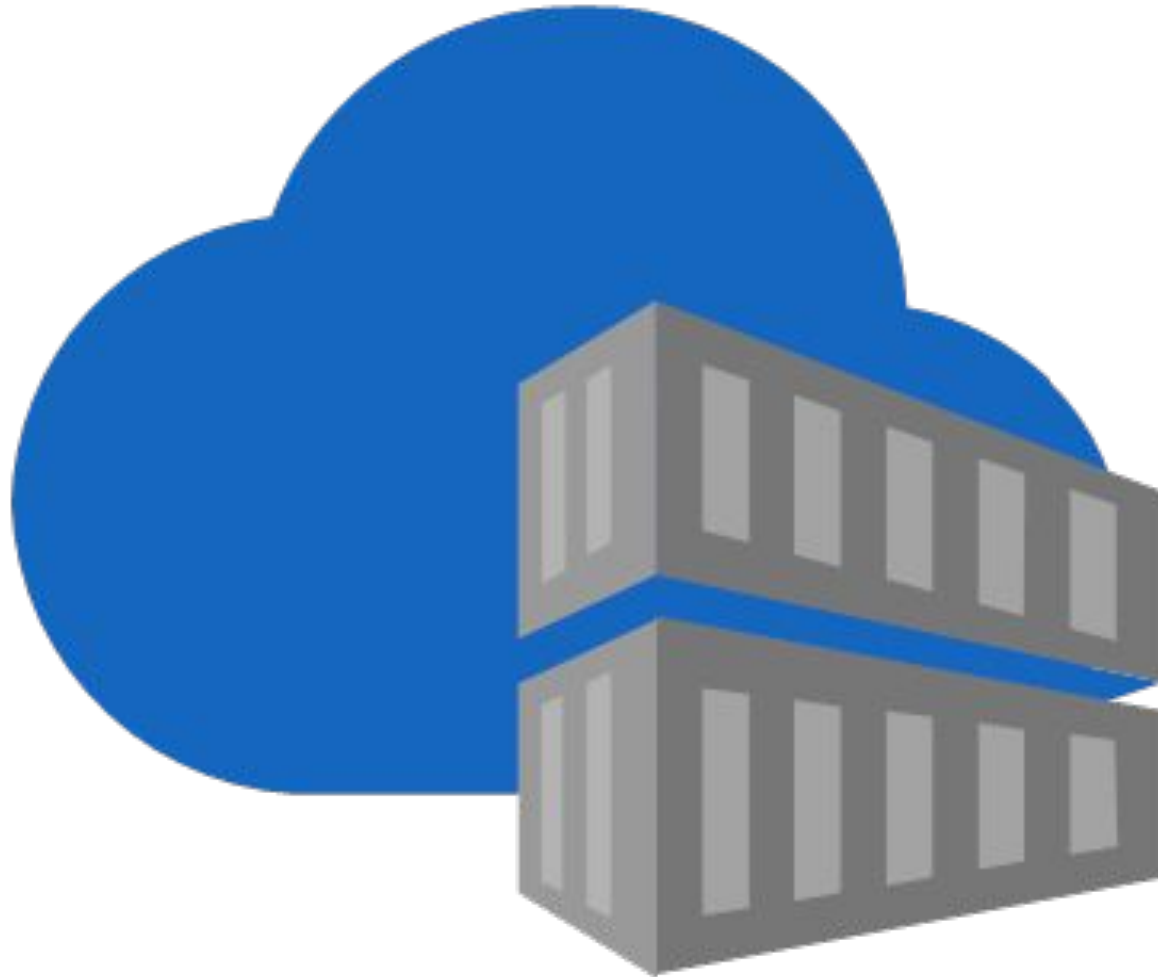


**Hello World!**

# Conclusiones



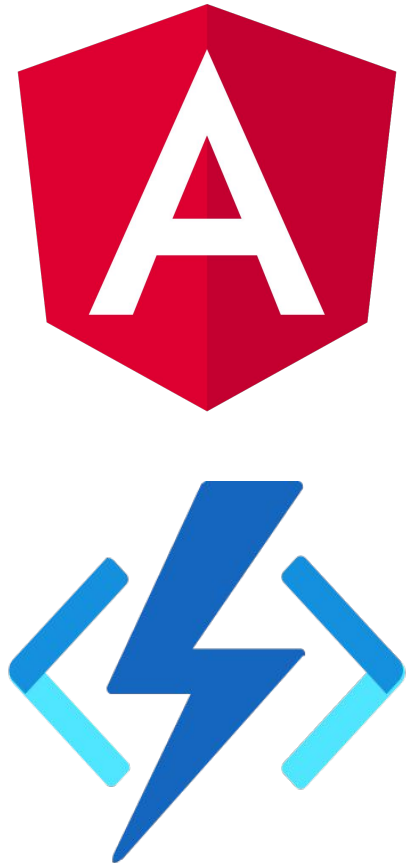
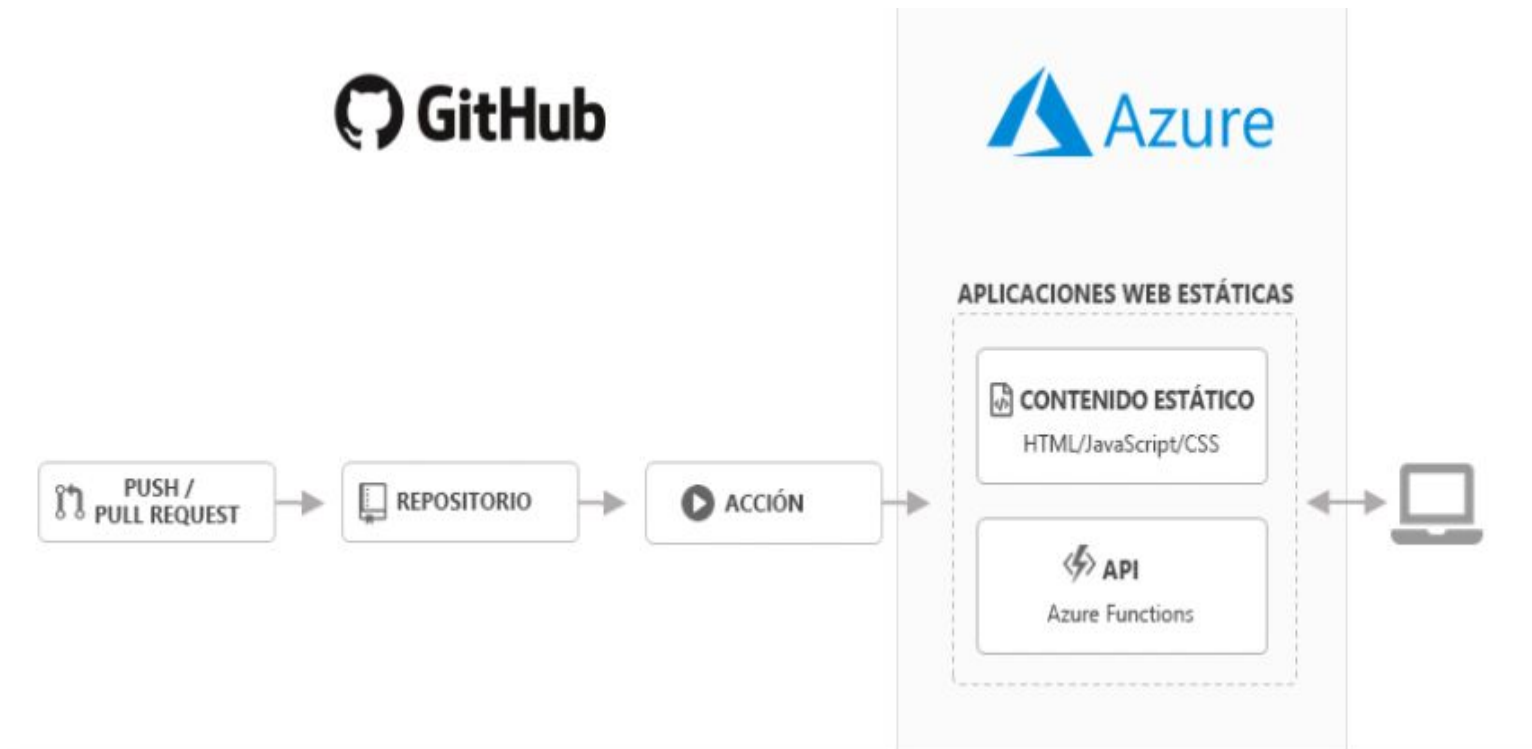
# Contenedores y Api



# Api Apps



# Azure Static Web Apps



# Aplicación de lista de la compra

## Ejecución de la aplicación localmente

```
C:\Users\pacoc\my-static-web-app\angular-app>npm start
> angular-app@0.0.0 start C:\Users\pacoc\my-static-web-app\angular-app
> ng serve --proxy-config proxy.conf.json --open

? Would you like to share anonymous usage data about this project with the Angular Team at
  Google under Google's Privacy Policy at https://policies.google.com/privacy? For more
  details and how to change this setting, see https://angular.io/analytics. Yes

Thank you for sharing anonymous usage data. Would you change your mind, the following
command will disable this feature entirely:

  ng analytics project off

Compiling @angular/core : es2015 as esm2015
Compiling @angular/common : es2015 as esm2015
Compiling @ngrx/store : es2015 as esm2015
Compiling @angular/platform-browser : es2015 as esm2015
Compiling @angular/platform-browser-dynamic : es2015 as esm2015
Compiling @angular/common/http : es2015 as esm2015
Compiling @angular/forms : es2015 as esm2015
Compiling @angular/router : es2015 as esm2015
Compiling @ngrx/entity : es2015 as esm2015
Compiling @ngrx/effects : es2015 as esm2015
Compiling @ngrx/store-devtools : es2015 as esm2015
Compiling @ngrx/data : es2015 as esm2015
✓ Browser application bundle generation complete.

Initial Chunk Files | Names | Size
vendor.js | vendor | 3.28 MB
styles.css, styles.js | styles | 1.03 MB
polyfills.js | polyfills | 486.51 kB
main.js | main | 34.22 kB
runtime.js | runtime | 9.02 kB
| Initial Total | 4.83 MB

Lazy Chunk Files | Names | Size
products-products-module.js | products-products-module | 342.13 kB

Build at: 2021-05-03T17:36:22.663Z - Hash: 78875486e714c09a2e75 - Time: 19269ms

** Angular Live Development Server is listening on localhost:4200, open your browser on http://localhost:4200/ **

✓ Compiled successfully.
✓ Browser application bundle generation complete.

Initial Chunk Files | Names | Size
styles.css, styles.js | styles | 1.03 MB

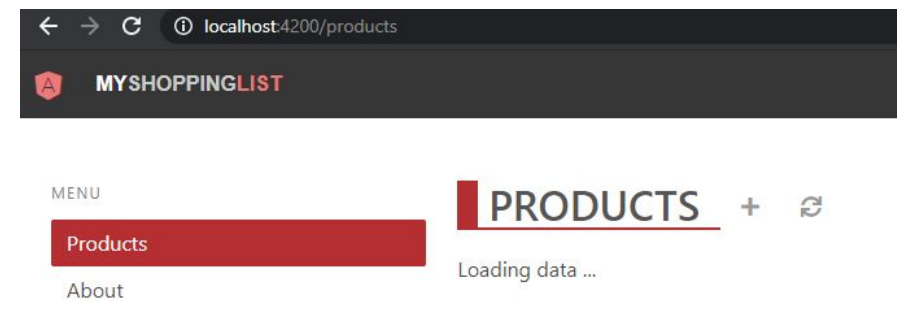
5 unchanged chunks

Build at: 2021-05-03T17:36:25.169Z - Hash: 56737364bdea7add9880 - Time: 2064ms
✓ Compiled successfully.
```

## Repositorio local de la aplicación

equipo > Disco local (C:) > Usuarios > pacoc > my-static-web-app >

Nombre	Fecha de modificación	Tipo	Tamaño
.vscode	03/05/2021 19:15	Carpeta de archivos	
angular-app	03/05/2021 19:15	Carpeta de archivos	
api-starter	03/05/2021 19:15	Carpeta de archivos	
react-app	03/05/2021 19:15	Carpeta de archivos	
svelte-app	03/05/2021 19:15	Carpeta de archivos	
vue-app	03/05/2021 19:15	Carpeta de archivos	
.gitignore	03/05/2021 19:15	Documento de te...	7 KB
CODE_OF_CONDUCT.md	03/05/2021 19:15	Archivo MD	1 KB
LICENSE	03/05/2021 19:15	Archivo	19 KB
LICENSE-CODE	03/05/2021 19:15	Archivo	2 KB
README.md	03/05/2021 19:15	Archivo MD	7 KB
SECURITY.md	03/05/2021 19:15	Archivo MD	3 KB

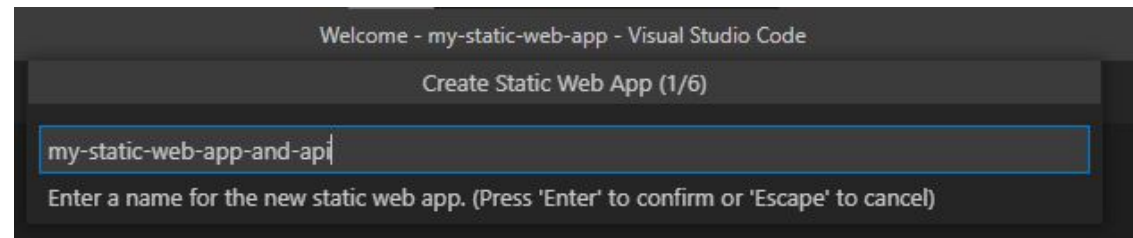


## Aplicación web desde acceso local

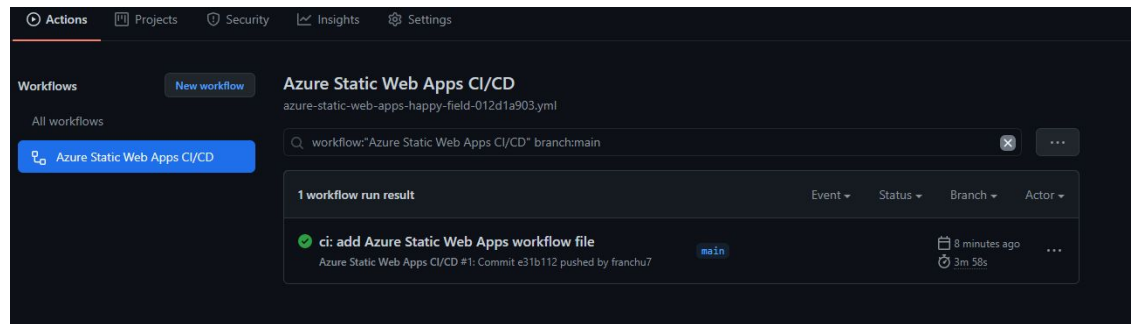
# Creación de la instancia de Static Web Apps



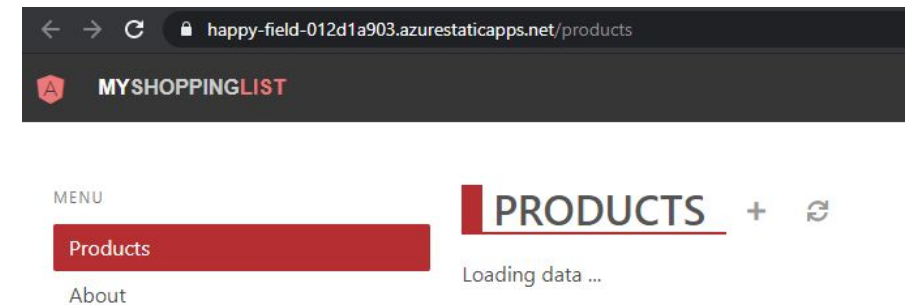
App estática desde VS Code



Acción de GitHub



Aplicación web accedida desde la instancia creada





# Aplicación web estática

Inicio >



my-static-web-app-and-api ...

Aplicación web estática (versión preliminar)

Buscar (Ctrl+/)



Examinar



Eliminar



Administrar token de implementación



Envíenos sus comentarios



Información general



Control de acceso (IAM)



Etiquetas

Configuración



Configuración



Application Insights



Dominios personalizados



Funciones



Gracias por usar Azure Static Web Apps. Aún no hemos recibido ningún contenido para su sitio. Haga clic aquí para comprobar el estado de las ejecuciones de Acciones de GitHub. →

## ^ Información esencial

Grupo de recur... (cambiar) : [learn-2dc6970b-6e11-49a5-94fc-58fc5775c19c](#)

Ubicación : Oeste de Europa

Suscripción (cambiar) : [Concierge Subscription](#)

Id. de suscripción : f500dc0d-177d-4393-87c4-047c5c9ec078

Etiquetas (cambiar) : [Haga clic aquí para agregar etiquetas.](#)

URL : <https://happy-field-012d1a903.azurestaticapps.net>

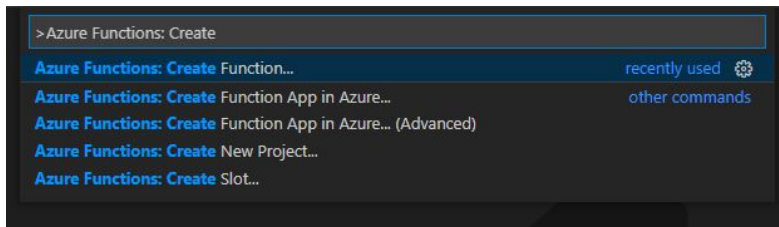
Origen : [main \(GitHub\)](#)

Historial de implementac... : [Ejecuciones de Acciones de GitHub](#)

Editar flujo de trabajo : [azure-static-web-apps-happy-field-012d1a903.yml](#)

# Función products-get

## Creación de la función



Azure Functions



## Configuración de la función

```
function.json
api > products-get > {} function.json > [ ] bindings > {} 1
1  {
2    "bindings": [
3      {
4        "authLevel": "anonymous",
5        "type": "httpTrigger",
6        "direction": "in",
7        "name": "req",
8        "methods": [
9          "get"
10       ],
11       "route": "products"
12     },
13     {
14       "type": "http",
15       "direction": "out",
16       "name": "res"
17     }
18   ]
19 }
20
```

# Ejecución de la API

## Ejecución con Azure Functions Core Tools

```
C:\Users\pacoc\my-static-web-app\api>func start
Can't determine project language from files. Please use one of [--csharp, --javascript, --typescript, --java, --python,
--powershell, --custom]
Can't determine project language from files. Please use one of [--csharp, --javascript, --typescript, --java, --python,
--powershell, --custom]
Can't determine project language from files. Please use one of [--csharp, --javascript, --typescript, --java, --python,
--powershell, --custom]

Azure Functions Core Tools
Core Tools Version:          3.0.3442 Commit hash: 6bfab24b2743f8421475d996402c398d2fe4a9e0 (64-bit)
Function Runtime Version: 3.0.15417.0

Can't determine project language from files. Please use one of [--csharp, --javascript, --typescript, --java, --python,
--powershell, --custom]
Can't determine project language from files. Please use one of [--csharp, --javascript, --typescript, --java, --python,
--powershell, --custom]
[2021-05-03T19:24:10.559Z] File 'C:\Program Files\dotnet\dotnet.exe' is not found, 'dotnet' invocation will rely on the
PATH environment variable.
-
Functions:

    products-delete: [DELETE] http://localhost:7071/api/products/{id}

    products-get: [GET] http://localhost:7071/api/products

    products-post: [POST] http://localhost:7071/api/products

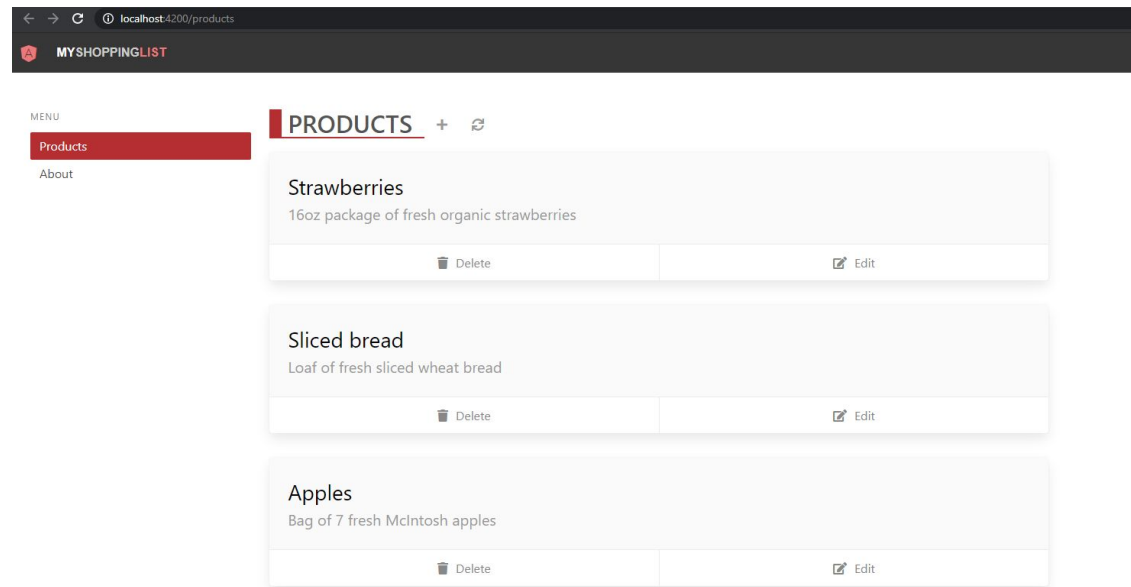
    products-put: [PUT] http://localhost:7071/api/products/{id}

For detailed output, run func with --verbose flag.
[2021-05-03T19:25:47.879Z] Worker process started and initialized.
[2021-05-03T19:25:52.754Z] Host lock lease acquired by instance ID '000000000000000000000000F76AB900'.
```

# Aplicación web local

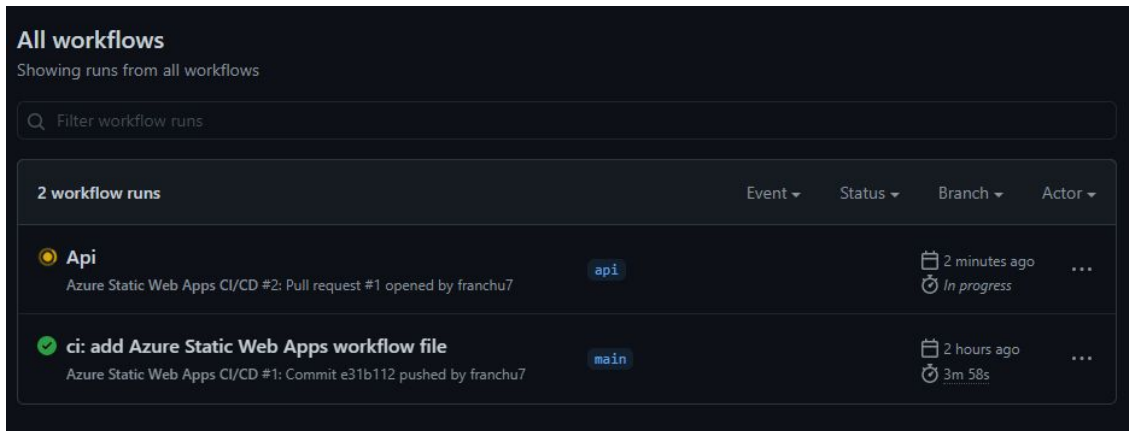
Página web tras ejecutar:

- La aplicación web localmente
- La API con las cuatro funciones



# Publicación de la API

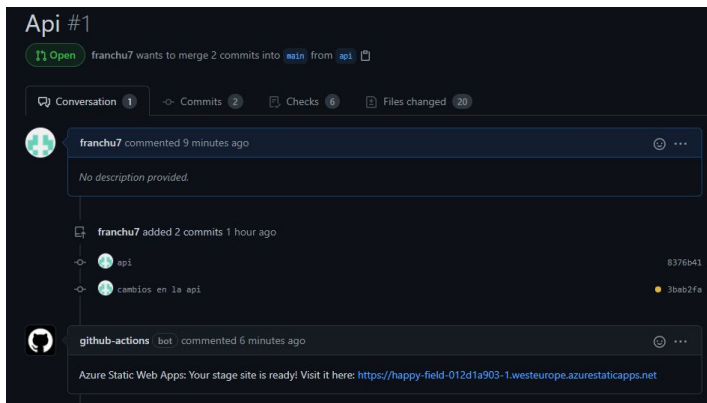
## Acción de la api en GitHub



The screenshot shows the GitHub Actions interface for the 'api' workflow. It displays two workflow runs. The first run, 'ci: add Azure Static Web Apps workflow file', is completed with a green checkmark. The second run, 'Api', is currently in progress, indicated by a yellow circle and the text 'In progress'. The interface includes a search bar, a table of workflow runs with columns for Event, Status, Branch, and Actor, and a list of workflow runs with details about the commit and the actor.

Event	Status	Branch	Actor
ci: add Azure Static Web Apps workflow file	Completed	main	franchu7
Api	In progress	api	franchu7

## URL de la vista previa de la página



The screenshot shows a GitHub pull request for the 'api' workflow. It includes a conversation with a comment from 'franchu7' and a commit history showing the workflow file being added. The pull request is titled 'Api #1' and is currently open. The commit history shows two commits: 'api' and 'cambios en la api'. The pull request is linked to the 'api' workflow.

franchu7 commented 9 minutes ago

No description provided.

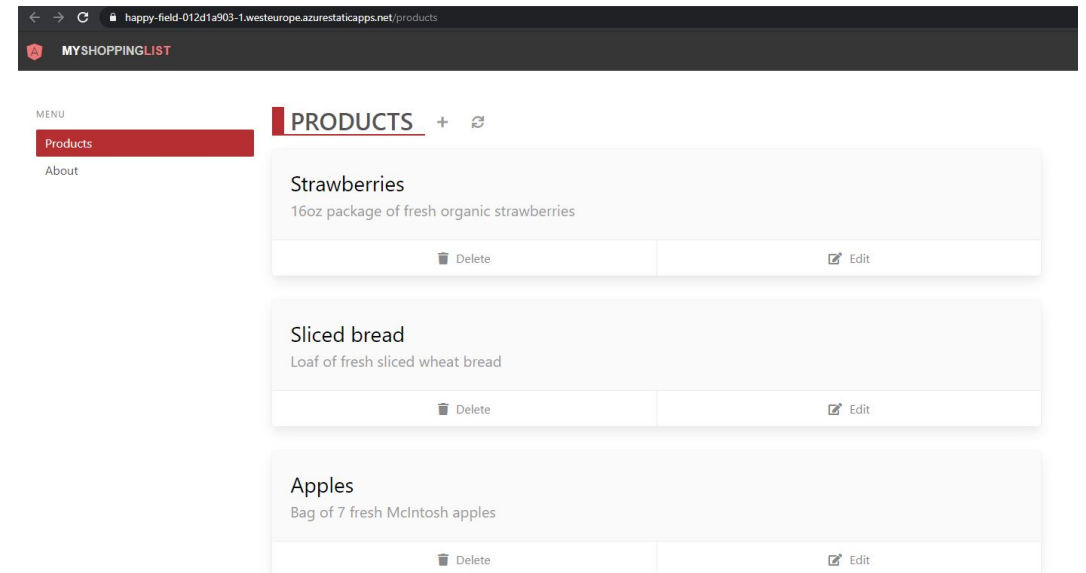
franchu7 added 2 commits 1 hour ago

- api
- cambios en la api

github-actions bot commented 6 minutes ago

Azure Static Web Apps: Your stage site is ready! Visit it here: <https://happy-field-012d1a903-1.westeurope.azurestaticapps.net>

## Página web estática (Versión actual)



The screenshot shows a static web page titled 'MYSHOPPINGLIST'. It features a navigation menu with 'Products' and 'About' links. The main content area displays a list of products: 'Strawberries', 'Sliced bread', and 'Apples'. Each product entry includes a description, a 'Delete' button, and an 'Edit' button. The page is styled with a clean, modern design and a dark header.

happy-field-012d1a903-1.westeurope.azurestaticapps.net/products

MYSHOPPINGLIST

MENU

- Products
- About

PRODUCTS + ↻

Strawberries

16oz package of fresh organic strawberries

Delete Edit

Sliced bread

Loaf of fresh sliced wheat bread

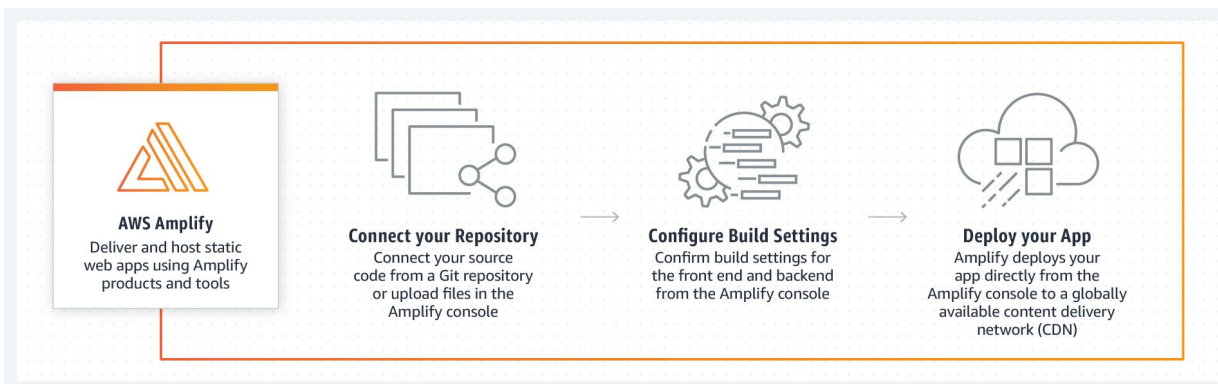
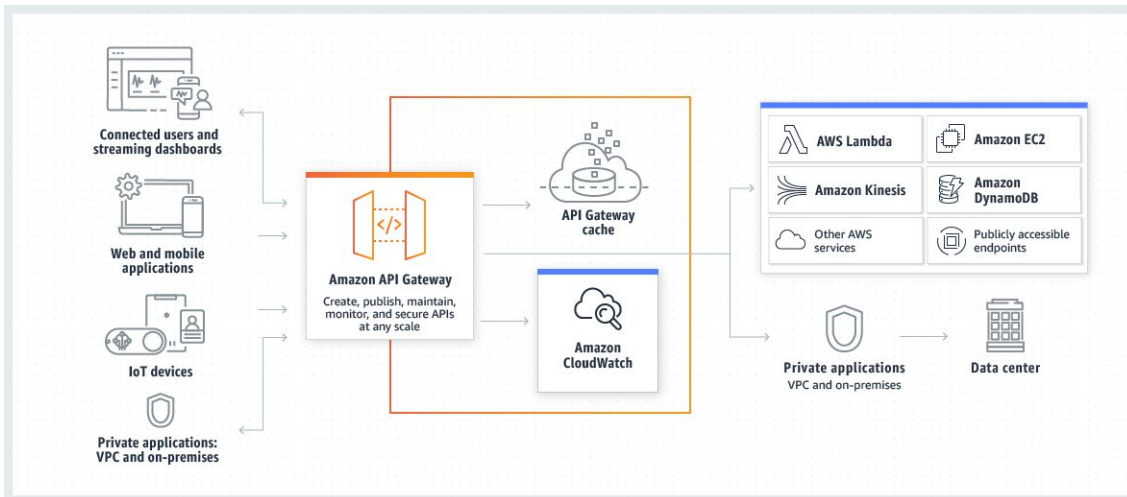
Delete Edit

Apples

Bag of 7 fresh McIntosh apples

Delete Edit

# AWS y Google Cloud



apigee



# Conclusiones





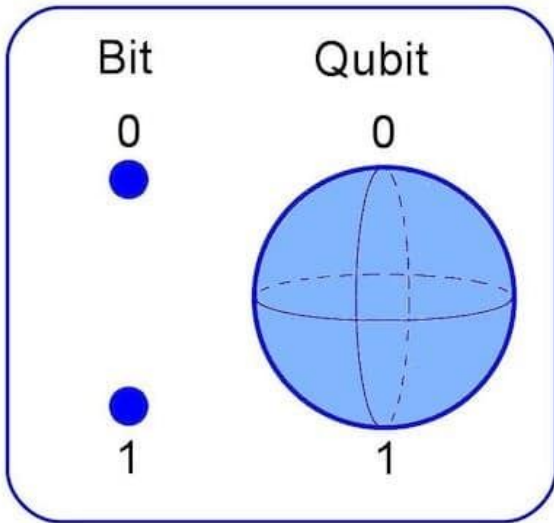
# Azure Quantum



**Honeywell**

# Primer programa de Q# con Quantum Development Kit

QDK

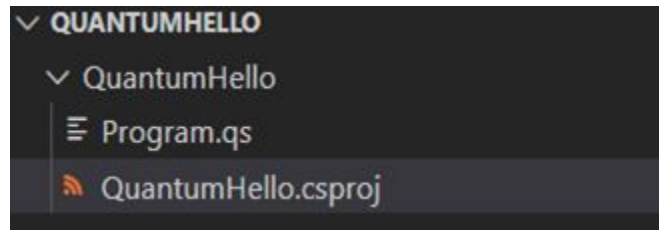


**Q#**



# Programa “Hola mundo”

## Proyecto QuantumHello



## Código

```
QuantumHello > Program.qs
1 namespace QuantumHello {
2
3     open Microsoft.Quantum.Canon;
4     open Microsoft.Quantum.Intrinsic;
5
6     @EntryPoint()
7     operation SayHello() : Unit {
8         Message("Hello quantum world!");
9     }
10 }
11
```

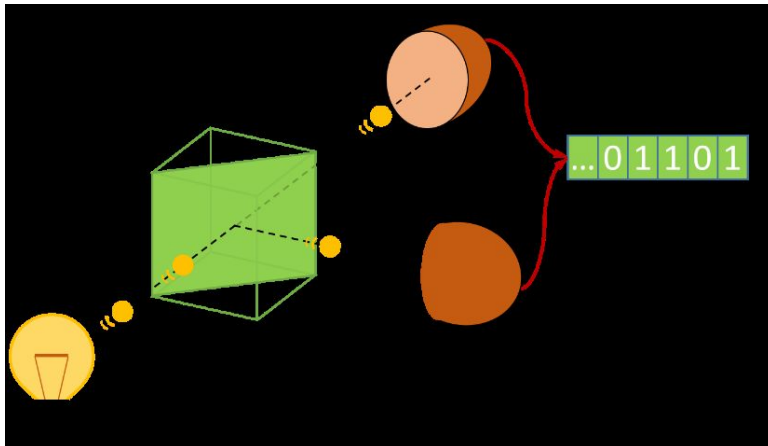
## Ejecución y salida por consola

```
PS C:\QuantumHello\QuantumHello> dotnet run
Hello quantum world!
PS C:\QuantumHello\QuantumHello>
```

# Generador cuántico de un bit aleatorio



QNRG



Ordenador cuántico



Código QuantumRNG

```
namespace QuantumRNG {  
  
    open Microsoft.Quantum.Canon;  
    open Microsoft.Quantum.Intrinsic;  
    open Microsoft.Quantum.Measurement;  
  
    @EntryPoint()  
    operation GenerateRandomBit() : Result {  
        // Allocate a qubit.  
        use q = Qubit();  
        // Put the qubit to superposition.  
        H(q);  
        // It now has a 50% chance of being measured 0 or 1.  
        // Measure the qubit value.  
        return M(q);  
    }  
}
```

Salida por consola

```
PS C:\QuantumRNG\QuantumRNG> dotnet run  
Zero  
PS C:\QuantumRNG\QuantumRNG>  
PS C:\QuantumRNG\QuantumRNG> dotnet run  
One
```

# Generador cuántico de números aleatorios

## Bibliotecas

```
1 namespace QuantumRNG {  
2  
3     open Microsoft.Quantum.Canon;  
4     open Microsoft.Quantum.Intrinsic;  
5     open Microsoft.Quantum.Measurement;  
6     open Microsoft.Quantum.Math;  
7     open Microsoft.Quantum.Convert;  
8 }
```

## Función principal

```
20 operation SampleRandomNumberInRange(max : Int) : Int {  
21     mutable output = 0;  
22     repeat {  
23         mutable bits = new Result[0];  
24         for idxBit in 1..BitSizeI(max) {  
25             set bits += [GenerateRandomBit()];  
26         }  
27         set output = ResultArrayAsInt(bits);  
28     } until (output <= max);  
29     return output;  
30 }
```

## Devolver el número aleatorio entre 0 y el max

```
32 @EntryPoint()  
33 operation SampleRandomNumber():Int{  
34     let max = 50;  
35     Message($"Sampling a random number between 0 and {max}: ");  
36     return SampleRandomNumberInRange(max);  
37 }
```

```
Sampling a random number between 0 and 50:  
42
```

# Comparación con AWS y Google Cloud





# Conclusiones

