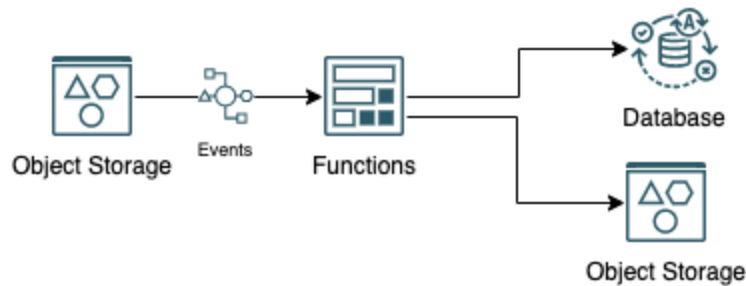


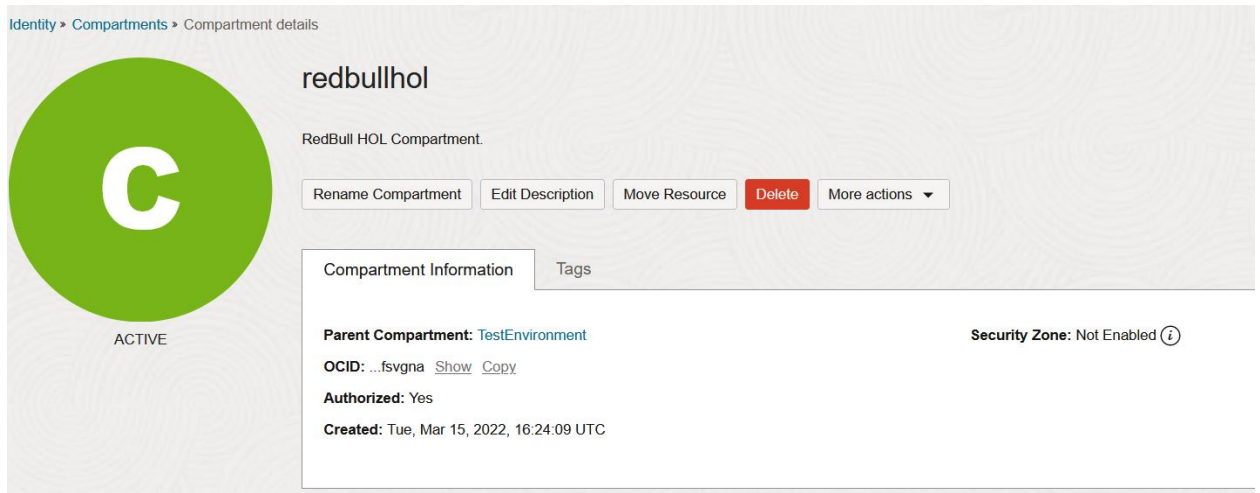
# LABORATORIO CONSTRUCCIÓN DE APLICACIONES ORACLE CLOUD SERVERLESS

Este laboratorio esta enfocado a que puedas construir una aplicación Serverless en tu cuenta de Oracle cloud, el objetivo es construir una aplicación que realice la lectura, procesamiento y guardado de un archivo separado por comas(\*.csv) en una base de datos autonomos creada previamente, chicha apliacion tendra la siguiente aquitectura:



## PRE-REQUISITOS

1. Crear o usar un compartment existente para agrupar los recursos del laboratorio



2. Crear o usar una base de datos autónoma existente

3. Creación o validación de existencias de la capa de red, debe existir una VCN y una subred, si ya tienes creada una VCN puedes usar la existente.

## Start VCN Wizard

[Help](#)

☒ Create VCN with Internet Connectivity

☐ Add Internet Connectivity and Site-to-Site VPN to a VCN

Creates a VCN with a public subnet that can be reached from the internet. Also creates a private subnet that can connect to the internet through a NAT gateway, and also privately connect to the Oracle Services Network.

**Includes:** VCN, public subnet, private subnet, internet gateway (IG), NAT gateway (NAT), service gateway (SG).

Start VCN Wizard

[Cancel](#)

## Configuration

Resource availability checked successfully.

### Basic Information

VCN Name

RedBullVCN

Compartment

redbullhol

cmteamcom (root)/TestEnvironment/redbullhol

### Configure VCN and Subnets

VCN CIDR Block

10.0.0.0/16

If you plan to peer this VCN with another VCN, the VCNs must not have overlapping CIDRs. [Learn more](#).

Public Subnet CIDR Block

10.0.0.0/24

The subnet CIDR blocks must not overlap.

Private Subnet CIDR Block

10.0.1.0/24

The subnet CIDR blocks must not overlap.

DNS Resolution

☒ Use DNS hostnames in this VCN

Required for Instance hostname assignment if you plan to use VCN DNS or a third-party DNS. This choice cannot be changed after the VCN is created. [Learn more](#).

[Show Tagging Options](#)

- Creación de grupo dinámico y políticas de seguridad para manipulación de la infraestructura OCI por parte de la función serverless.

Identity > Domains > Default domain > Dynamic groups > Dynamic group details

## FunctionGroup

Edit dynamic group Add tags Delete

Dynamic group information

Tags

**OCID:** ...42krva [Show](#) [Copy](#) **Description:**

**Created:** Sun, May 22, 2022, 19:30:03 UTC

Resources

Matching rules

Matching rules

Domain roles

Application roles

Edit all matching rules

Instances that meet the following criteria will be included in the dynamic group: criteria defined by any of these rules

ALL {resource.type = 'fnfunc', resource.compartment.id = 'ocid1.compartment.oc1..aaaaaaaou64zt6xlbw3f4x5ckbkdcrcn5cfuxrapljwqjo553kd5kpa'}

Estableciendo la siguiente regla para el grupo dinámico con el respectivo OCID del compartment donde se encuentre localizada la función serverless

ALL {resource.type = 'fnfunc', resource.compartment.id =  
'ocid1.compartment.xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx' }

- Definición de políticas IAM para la para manipulación de la infraestructura OCI por parte de la función serverless.

### Create Policy

Name

FunctionPolicies

No spaces. Only letters, numerals, hyphens, periods, or underscores.

Description

Permisos Serverless

Compartment

cxmteamcrn (root)

Policy Builder ☒ Show manual editor

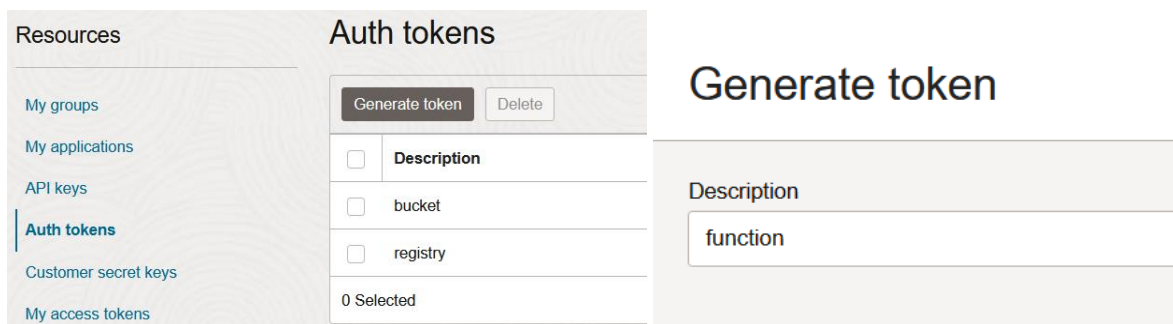
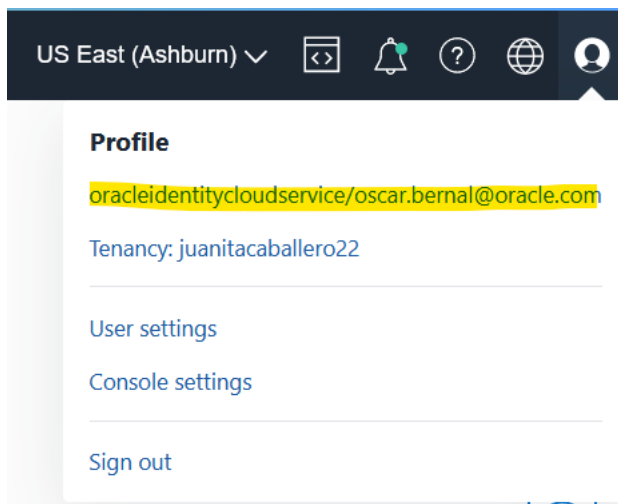
Allow dynamic-group FunctionGroup to manage functions-family in tenancy  
Allow dynamic-group FunctionGroup to use virtual-network-family in tenancy  
Allow dynamic-group FunctionGroup to manage repos in tenancy  
Allow dynamic-group FunctionGroup to inspect object-family in tenancy  
Allow dynamic-group FunctionGroup to manage objects in tenancy  
Allow dynamic-group FunctionGroup to manage autonomous-database-family in tenancy

Create Cancel ☐ Create Another Policy

- Allow dynamic-group FunctionGroup to manage functions-family in tenancy
- Allow dynamic-group FunctionGroup to use virtual-network-family in tenancy
- Allow dynamic-group FunctionGroup to manage repos in tenancy
- Allow dynamic-group FunctionGroup to inspect object-family in tenancy
- Allow dynamic-group FunctionGroup to manage objects in tenancy
- Allow dynamic-group FunctionGroup to manage autonomous-database-family in tenancy

## GENERAR AUTH TOKEN

En la esquina superior derecha del portal encontremos el profile del usuario donde podremos generar el token de autenticación:



Guardar el valor generado por la consola el cual debemos usar en los pasos posteriores

Ejemplo: v#1iD<8Ycx+)Z+XUR5av

# Generate token



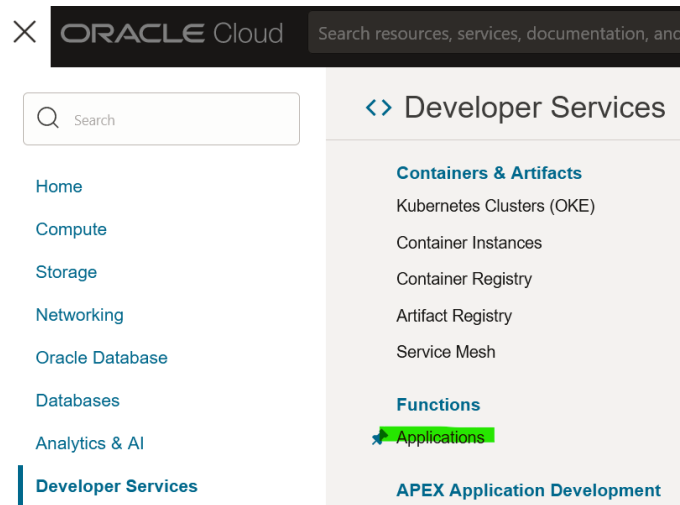
## Generated token

Copy this token for your records. It will not be shown again.

\*\*\*\*\* [Show](#) [Copy](#)

# CREACION APLICACIÓN SERVERLESS & SETUP CLOUD SHELL ENVIROMENT

## 1. Creación de Aplicación Serverless



## Create application

Name

OCI-Lab

VCN in **redbullhol** ([Change Compartment](#))

RedBullVCN

subnets in **redbullhol** ([Change Compartment](#))

Private Subnet-RedBullVCN (Regional) ✕

**Tagging options**

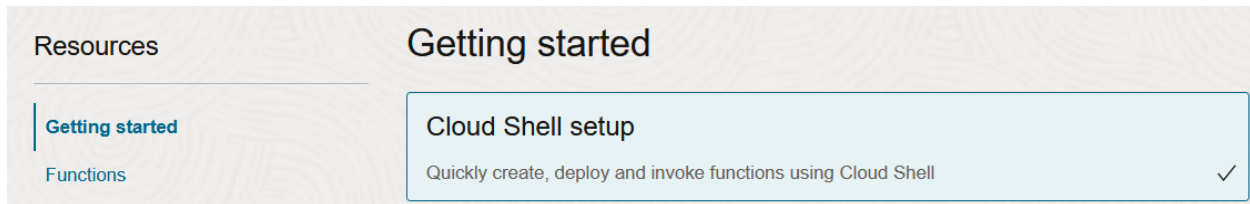
Add tags to organize your resources. [What can I](#)

Tag namespace

None (add a free-form tag) ▾

Create Save as stack Cancel

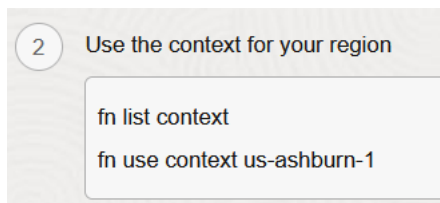
2. Setup del ambiente cloud Shell para esto se deben seguir las instrucciones dadas en la consola en el siguiente apartado:



Aquí un ejemplo de los comandos y el resultado de cada una de las ejecuciones en CloudShell:



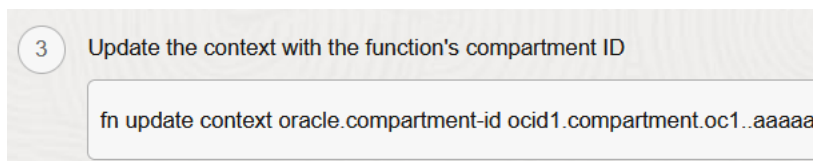
Listar los diferentes contextos serverless correspondientes a cada una de las regiones que se esten usando



```
Your Cloud Shell machine comes with 5GB of storage for your home directory. Your Cloud Shell (machine and home directory) are located in: US East (Ashburn).
You are using Cloud Shell in tenancy cxteammcn as an OCI Local user oscar.bernal@oracle.com

Type 'help' for more info.
oscar_bern@cloudshell:~ (us-ashburn-1)$ fn list context
CURRENT NAME      PROVIDER  API URL                                     REGISTRY
default           oracle-cs
* us-ashburn-1     oracle-cs https://functions.us-ashburn-1.oci.oraclecloud.com iad.ocir.io/idikzonisftg/consumption
us-phoenix-1      oracle-cs https://functions.us-phoenix-1.oci.oraclecloud.com  phx.ocir.io/idikzonisftg/javierBM
oscar_bern@cloudshell:~ (us-ashburn-1)$ fn use context us-ashburn-1
Fn: Context us-ashburn-1 currently in use
```

Setear el contexto para ser usado



```
oscar_bern@cloudshell:~ (us-ashburn-1)$ fn update context oracle.compartment-id ocid1.compartment.oc1..aaaaa...
Current context updated oracle.compartment-id with ocid1.compartment.oc1..aaaaa...76tr4yeb6...
```

## Establecer un pre-fijo para el contexto del repositorio de imágenes Docker

4

Provide a unique repository name prefix to distinguish your function images from other people's. For example, with 'jdoe' as the prefix, the image path for a 'hello' function image is '<region-key>.ocir.io/<tenancy-name>/jdoe/hello:0.0.1'

fn update context registry iad.ocir.io/idikzonisftg/[repo-name-prefix]

Copy

Para este caso ingresamos el prefijo **redbull**

```
oscar_bern@cloudshell:~ (us-ashburn-1)$ fn update context registry iad.ocir.io/idikzonisftg/redbull
Current context updated registry with iad.ocir.io/idikzonisftg/redbull
oscar_bern@cloudshell:~ (us-ashburn-1)$
```

Como en los pre-requisitos ya tenemos generado el token de autorización el paso 5 lo **omitiremos**

5

[Generate an Auth Token](#)

## Establecer conexión al repositorio de imágenes

6

Log into the Registry using the Auth Token as your password

docker login -u 'idikzonisftg/oscar.bernal@oracle.com' iad.ocir.io

Debemos ingresar el token creado en pasos previos cuando el sistema nos solicite el password

```
oscar_bern@cloudshell:~ (us-ashburn-1)$ docker login -u 'idikzonisftg/oscar.bernal@oracle.com' iad.ocir.io
Password:
WARNING! Your password will be stored unencrypted in /home/oscar_bern/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

Para este ejercicio omitiremos los pasos posteriores ya que en el siguiente repositorio de Gitlab tendremos disponible el código de la aplicación y únicamente tendremos que importarlo y compilarlo en nuestra cuenta cloud.



## CONSTRUCCIÓN DE APLICACIÓN

1. En la sesión de CloudShell vamos importar el código de la aplicación, con el siguiente comando:

`git clone https://gitlab.com/oscarbm7/oci-serverless-python.git`

Cloud Shell

```
oscar_bern@cloudshell:~ (us-ashburn-1)$ git clone https://gitlab.com/oscarbm7/oci-serverless-python.git
Cloning into 'oci-serverless-python'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), 2.79 KiB | 2.79 MiB/s, done.
oscar_bern@cloudshell:~ (us-ashburn-1)$
```

2. Ingresamos a la carpeta importada

```
oscar_bern@cloudshell:~ (us-ashburn-1)$ cd oci-serverless-python/
```

3. Ajustar el archivo de configuración de aplicación de acuerdo a mi ambiente (conexiones, base de datos, passwords), para la cual editaremos el archivo func.yaml con el editor de Linux Nano:

```
oscar_bern@cloudshell:oci-serverless-python (us-ashburn-1)$ nano func.yaml
```

```
GNU nano 2.3.1 File: func.yaml

schema_version: 20180708
name: load-file
version: 0.0.106
runtime: python
build_image: fnproject/python:3.9-dev
run_image: fnproject/python:3.9
entrypoint: /python/bin/fdk /function/func.py handler
memory: 2048
timeout: 300
config:
  ADB_OCID: ocid1.autonomousdatabase.oc1.iad.aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
  DBPWD: YYxxxxxx123***
  DBSVC: XXXYYYhigh
  DBUSER: ADMIN
  TNS_ADMIN: /tmp/dbwallet
```

Despues de editar el archivo basta con guardar los cambios con la combinación de teclas Ctrl +X

4. Validar que el archivo fue actualizado con el comando: `cat func.yaml`

```
oscar_bern@cloudshell:oci-serverless-python (us-ashburn-1)$ cat func.yaml
schema_version: 20180708
name: load-file
version: 0.0.106
runtime: python
build_image: fnproject/python:3.9-dev
run_image: fnproject/python:3.9
entrypoint: /python/bin/fdk /function/func.py handler
memory: 2048
timeout: 300
config:
  ADB_OCID: ocid1.autonomousdatabase.oc1.iad.aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
  DBPWD: YYxxxxxx123***
  DBSVC: XXXYYYY_high
  DBUSER: ADMIN
  TNS_ADMIN: /tmp/dbwallet
```

5. Compilar la aplicación serverless: `fn -v deploy --app RedBullApp`


```
oscar_bern@cloudshell:oci-serverless-python (us-ashburn-1)$ fn -v deploy --app RedBullApp
Deploying load-file to app: RedBullApp
Bumped to version 0.0.97
Using Container engine docker
Building image iad.ocir.io/idikzonisftg/redbull/load-file:0.0.97
Dockerfile content
-----
FROM fnproject/python:3.9-dev as build-stage
WORKDIR /function
ADD requirements.txt /function/

RUN pip3 install --target /python/ --no-cache --no-cache-dir -r requirements.txt &&\
    rm -fr ~/.cache/pip /tmp* requirements.txt func.yaml Dockerfile .venv &&\
    chmod -R o+r /python
```

Si todo esta correcto el resultado en el CloudShell debe ser:

***Successfully created function***

## 6. Habilitar LOGS para rastreo de errores e información relevante



ACTIVE

### RedBullApp

[Move application](#) [Add tags](#) [Delete](#)

[Application information](#) [Tags](#)

#### General information

OCID: ...6l5spgtq [Show](#) [Copy](#)

Compartment: redbullhol

Logging policy: None

Trace name: None

Created: Fri, Feb 3, 2023, 18:32:59 UTC

Last updated: Fri, Feb 3, 2023, 18:32:59 UTC

Signature verification: Disabled

#### Network information

Subnets: [Private Subnet-RedBullVCN](#)

Network security groups: None [Add](#)

### Resources

- [Getting started](#)
- [Functions](#)
- [Configuration](#)
- [Signature verification](#)
- [Metrics](#)
- [Logs](#)**

### Logs

Category	Status	Log Name	Log Group	Enable Log
Function Invocation Logs	-	-	-	<input type="checkbox"/> Not Enabled

Showing 1 Item

### Enable Log

For more information about service logs, see [documentation](#).

Compartment

redbullhol

ocmteamman (root)/TestEnvironment/redbullhol

Log Group ⓘ

Select a log group

☒ Auto-create a default Log Group

☐ Create a new Log Group

Log Name

RedBullApp\_invoke

Log Retention

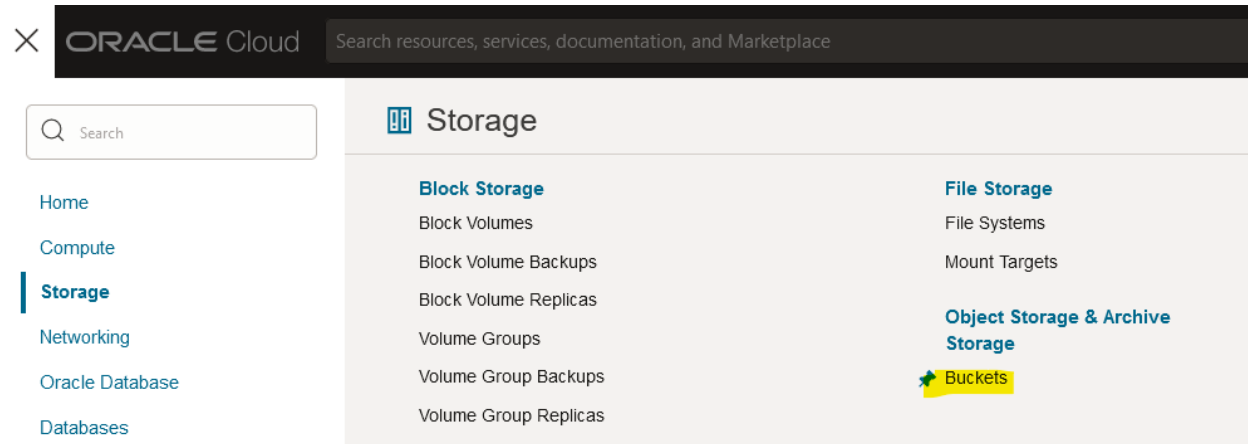
1 month (default)

1 month equals to 30 days

[Enable Log](#) [Cancel](#)

# CREACION BUCKET PARA ARCHIVOS

## 1. Crear Bucket en el servicio de Object storage



**IMPORTANTE:** habilitar la opción de emisión de eventos, ya que esto es lo que ejecutara la función serverless para la carga del respectivo archivo.

### Create Bucket

Bucket Name  
Files

Default Storage Tier  
☒ Standard  
☐ Archive

The default storage tier for a bucket can only be specified during creation. Once set, you cannot change it.

☐ Enable Auto-Tiering  
Automatically move infrequently accessed objects from the Standard tier to less expensive storage tiers.

☐ Enable Object Versioning  
Create an object version when a new object is uploaded, an existing object is overwritten, or an object is deleted.

☒ Emit Object Events  
Create automation based on object state changes using the [Events Service](#).

☐ Uncommitted Multipart Uploads Cleanup  
Create a lifecycle rule to automatically delete uncommitted multipart uploads older than 7 days.

Encryption  
☒ Encrypt using Oracle managed keys  
Leaves all encryption-related matters to Oracle.

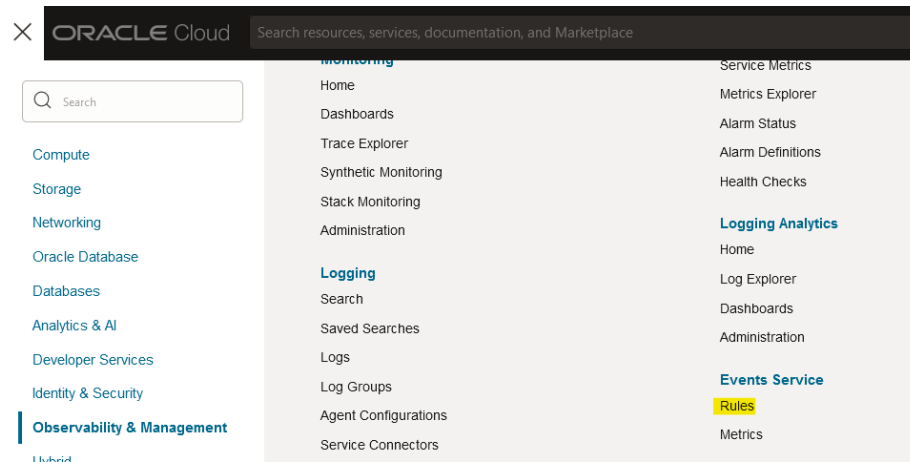
☐ Encrypt using customer-managed keys  
Requires a valid key from a vault that you have access to. [Learn more](#)

Tags

Create Cancel

# CONFIGURACION SERVICE CONNECTOR HUB

En el módulo de Observability



Crear la regla que ejecutara la función cada vez que se cargue el archivo

## Create Rule

[Help](#)

Display Name  
load\_files

Description  
Describe what the rule does. Example: Sends a notification when backups complete.

**Rule Conditions**

Limit the events that trigger actions by defining conditions based on event types, attributes, and filter tags. [Learn more](#)

Condition	Service Name	Event Type
Event Type	Object Storage	Object - Create

To emit events for object state changes, enable Emit Object Events on the bucket details page. [Learn more](#).

Condition	Attribute Name	Attribute Values
Attribute	bucketName	Files

[+ Another Condition](#)

**Rule Logic**

```
MATCH event WHERE (
  eventType EQUALS ANY OF (
    com.oraclecloud.objectstorage.createobject
  )
  AND (
    bucketName MATCHES ANY OF (
      Files
    )
  )
)
```

[View example events \(JSON\)](#)

[Validate Rule](#)

**Actions**

Actions trigger for the specified event conditions. [Learn more](#).

Action Type	Function Compartment	Function Application	Function
Functions	redbullhol	RedBullApp	load-file

[Create Rule](#) [Save as stack](#) [Cancel](#)

Finalmente puedes probar tu aplicación únicamente cargando el archivo en el bucket del object storage:

<https://objectstorage.us-ashburn-1.oraclecloud.com/p/MSmBkReA-TET1pfUpsvX5ZsC6uTFZpU140p7t7uitURUJ9hwOKOI0z0O5mn7stXJ/n/idikzonisftg/b/DataFile/o/Employees.csv>


## Upload Objects

Object Name Prefix *Optional*

Storage Tier


Standard

Choose Files from your Computer



**Employees.csv** 128 bytes

1 files, 128 bytes total

 Show Optional Response Headers and Metadata

**Upload** [Cancel](#)

**Bibliografía:**

<https://docs.oracle.com/en-us/iaas/Content/Functions/Concepts/functionsoverview.htm>

<https://oracle.github.io/python-oracledb/>

<https://fnproject.io/>

<https://medium.com/oracledocs/an-exploration-using-oci-functions-4c5d4e70d00c>