

Introducción a Amazon AWS



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Introducción al entorno de prácticas

Entramos en la consola de desarrolladores AWS perteneciente a CDA:

`https://cdaesei.signin.aws.amazon.com/console`

Una vez dentro, nos logueamos con los siguientes datos:

Cuenta cdaesei

Usuario censurado

Contraseña censurado

Trabajaremos siempre sobre el servidor **EU (Ireland)**. Por otra parte, todas las instancias que levantemos serán **"Free tier eligible"** y **"Shutdown behaviour: Terminate"**.

Por último, incluirán obligatoriamente el prefijo **CDA2018_**.

Seguir cualquier indicación mostrada en [esta página](#) en caso de duda o error.

Creación de una instancia UBUNTU 14.04 LTS(HVM)

Lo primero entrar en los servicios **EC2** de AWS.

Una vez dentro, nos aparecerá el panel de control con todos los recursos disponibles:

Resources



You are using the following Amazon EC2 resources in the EU West (Ireland) region:

6 Running Instances
0 Dedicated Hosts
33 Volumes
57 Key Pairs
0 Placement Groups

0 Elastic IPs
41 Snapshots
7 Load Balancers
58 Security Groups

Seleccionaremos **Running Instances**. De esta forma podemos ver todas las instancias anteriormente creadas y podremos configurar nuevas:

Launch Instance

Connect

Actions

Filter by tags and attributes or search by keyword

1 to 25 of 25

<input type="checkbox"/>	Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4
<input type="checkbox"/>	CDA2018_xi...	i-008faedb301e9165	t2.micro	eu-west-1a	stopped		None		-
<input type="checkbox"/>	CDA2018_aa...	i-00fb926bde2a2c70b	t2.micro	eu-west-1a	stopped		None		-
<input type="checkbox"/>	CDA2018_aa...	i-029b250da33c39f37	t2.micro	eu-west-1a	running	2/2 checks ...	None	ec2-34-245-176-101.eu-...	34.7
<input type="checkbox"/>	CDA2018_m...	i-0503f217612019df3	t2.micro	eu-west-1b	stopped		None		-
<input type="checkbox"/>	CDA2018_vd...	i-057c899d6ea7b6657	t2.micro	eu-west-1b	stopped		None		-
<input type="checkbox"/>	CDA2018_aa...	i-05a7c9d907684961b	t2.micro	eu-west-1a	running	2/2 checks ...	None	ec2-54-77-80-82.eu-we...	54.7
<input type="checkbox"/>	CDA2018_jm...	i-05bbef6158faaa44d	t2.micro	eu-west-1a	stopped		None		-
<input type="checkbox"/>	CDA2018_m...	i-0659fcb61a930e78b	t2.micro	eu-west-1a	stopped		None		-
<input type="checkbox"/>	CDA2018_vd...	i-06c48708c2dc8ba8c	t2.micro	eu-west-1a	stopped		None		-

Select an instance above

Pulsaremos en **Launch Instance** y procederemos a crear una nueva instancia.

En nuestro caso deseamos que sea un **Ubuntu Server 14.04 LTS**, así que buscaremos la AMI correspondiente.

Cuestión1 Una *Amazon Machine Image* o *AMI* es un máquina virtual preconfigurada que será usada por *Amazon EC2* para crear instancias, es decir, máquinas virtuales clon de las *AMI* usadas por el usuario.

De esta forma, una misma *AMI* sirve para crear múltiples instancias.

Como se puede observar, es necesario marcar la casilla **Free tier only** para evitar costes imprevistos.

Step 1: Choose an Amazon Machine Image (AMI)

Cancel and Exit

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Ubuntu Server 14.04

Quick Start (1)

My AMIs (0)

AWS Marketplace (8)

Community AMIs (31861)

☒ Free tier only

Free tier eligible

Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-02699dba41e68180a

Ubuntu Server 14.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

64-bit (x86)

Select

The following results for "Ubuntu Server 14.04" were found in other catalogs:
8 results in AWS Marketplace
AWS Marketplace provides partnered Software that is pre-configured to run on AWS

De esta misma forma, escogeremos el tipo de instancia **t2.micro**, dado que es aquella perteneciente al **Free tier**, y pulsamos **Next: Configure Instance Details**.

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance types Current generation Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

T2 instances are VPC-only. Your T2 instance will launch into your VPC. [Learn more](#) about T2 and VPC.

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	-
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	-
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	-

Cancel Previous Review and Launch Next: Configure Instance Details

Entre todas las opciones disponibles, nos aseguramos de que **Shutdown behaviour** esté en **Terminate**.

[1. Choose AMI](#) [2. Choose Instance Type](#) [3. Configure Instance](#) [4. Add Storage](#) [5. Add Tags](#) [6. Configure Security Group](#) [7. Review](#)

Step 3: Configure Instance Details

Purchasing option Request Spot instances

Network vpc-b6beb3d1 Create new VPC

Subnet subnet-c52610a2 | eu-west-1a Create new subnet
224 IP Addresses available

Auto-assign Public IP Use subnet setting (Enable)

Placement group Add instance to placement group.

Capacity Reservation Open Create new Capacity Reservation

IAM role None Create new IAM role
You do not have permissions to list instance profiles. Contact your administrator, or check your IAM permissions.

Shutdown behavior Terminate

Enable termination protection Protect against accidental termination.

Cancel Previous Review and Launch Next: Add Storage

Pulsaremos en **Next: Add Storage** y seguido en **Next: Add tags**, dado que nos sirve la opción por defecto de almacenamiento.

En los tags añadiremos la etiqueta **Name** con el valor **CDA2018_usuario**:

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.

A copy of a tag can be applied to volumes, instances or both.

Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key (127 characters maximum)	Value (255 characters maximum)	Instances	Volumes
Name	CDA2018_dflorenzo17	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Add another tag (Up to 50 tags maximum)

Por último configuraremos los **Security Groups** de tal forma que sólo nos podamos conectar desde nuestro equipo.

Seleccionaremos un tipo de conexión SSH(22/TCP) desde nuestra IP:

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group ☐ Select an existing security group

Security group name: CDA2018_dflorenzo17

Description: ssh dflorenzo17

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom xxxxxxxx	SSH DFLorenzo17

Add Rule

Cuestión2 Un *Security Group* es un conjunto de reglas que forman un firewall virtual para poder controlar el tráfico de una o varias instancias.

Aceptamos todo y lanzamos nuestra instancia.

Si no tenemos un par de claves creados, los generaremos de la siguiente forma:

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Create a new key pair

Key pair name

CDA2018_dflorenzo17

Download Key Pair

You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

Cancel Launch Instances

Cuestión3 El par de llaves de AWS es un método criptográfico de clave pública que nos permite cifrar ciertos datos para realizar las pertinentes conexiones, como la contraseña. Por otro lado, el destinatario utiliza la clave privada para descifrar dichos datos.

¡Y ya estaría! Nuestra instancia de un Ubuntu Server 14.04 LTS estaría siendo ejecutada ahora mismo:

Launch Status

✓

Your instances are now launching
The following instance launches have been initiated: i-0caa78aa07ed57026 [View launch log](#)

Uso de la instancia creada

Para conectarnos a nuestra nueva instancia, usaremos el siguiente comando:

```
ssh -i <archivo .pem> <usuario>@<EC2 DNS (IPv4)>
# En mi caso:
ssh -i Downloads/CDA2018_dflorenzo17.pem ubuntu@ec2-34-240-246-60.eu-west-1.compute.amazonaws.com
```

Al entrar deberíamos ver la siguiente salida:

```
Welcome to Ubuntu 14.04.5 LTS (GNU/Linux 3.13.0-161-generic x86_64)

* Documentation:  https://help.ubuntu.com/
```

System information as of Sun Dec 30 15:49:12 UTC 2018

System load: 0.0 Processes: 98
Usage of /: 10.3% of 7.74GB Users logged in: 0
Memory usage: 5% IP address for eth0: 172.30.0.171
Swap usage: 0%

Graph this data and manage this system at:
<https://landscape.canonical.com/>

Get cloud support with Ubuntu Advantage Cloud Guest:
<http://www.ubuntu.com/business/services/cloud>

0 packages can be updated.
0 updates are security updates.

New release '16.04.5 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

ubuntu@ip-172-30-0-171:~\$

Instalación de un servidor web con PHP

Ejecutaremos los siguientes comandos para instalar el servidor web:

```
sudo apt-get update -y  
sudo apt-get install -y apache2  
sudo service apache2 restart
```

Si intentamos acceder a la dirección DNS(IPv4) desde el navegador, no obtendremos respuesta.

Para ello deberemos añadir la regla HTTP al Security Group:

Edit inbound rules

Type	Protocol	Port Range	Source	Description
HTTP	TCP	80	Custom xxxxxxxxxx	HTTP DFLorenzo17
SSH	TCP	22	Custom xxxxxxxxxx	SSH DFLorenzo17


Add Rule

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic that depends on that rule to be dropped for a very brief period of time until the new rule can be created.

Cancel Save

De esta forma ya podemos acceder al servidor web a través de nuestro navegador:

ec2-34-240-246-60.eu-west-1.compute.amazonaws.com



Apache2 Ubuntu Default Page

ubuntu

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/
|-- apache2.conf
|   |-- ports.conf
|-- mods-enabled
|   |-- *.load
|   |-- *.conf
|-- conf-enabled
|   |-- *.conf
|-- sites-enabled
|   |-- *.conf
```

- `apache2.conf` is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.

Ahora sólo falta instalar PHP ejecutando el comando:

```
sudo apt-get install -y php5
```

Crearemos un archivo **phpinfo** con la siguiente instrucción:

```
echo "<?php phpinfo(); ?>" | sudo tee /var/www/html/index.php
```

Si intentamos acceder desde el navegador a la página `index.php` , deberíamos ver algo similar a esto:

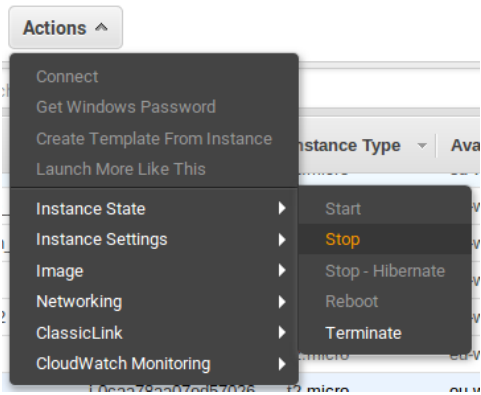
ec2-34-240-246-60.eu-west-1.compute.amazonaws.com/index.php

PHP Version 5.5.9-1ubuntu4.26

System	Linux ip-172-30-0-171 3.13.0-161-generic #211-Ubuntu SMP Wed Oct 3 14:52:35 UTC 2018 x86_64
Build Date	Sep 17 2018 13:46:12
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php5/apache2
Loaded Configuration File	/etc/php5/apache2/php.ini
Scan this dir for additional .ini files	/etc/php5/apache2/conf.d
Additional .ini files parsed	/etc/php5/apache2/conf.d/05-opcache.ini, /etc/php5/apache2/conf.d/10-pdo.ini, /etc/php5/apache2/conf.d/20-json.ini, /etc/php5/apache2/conf.d/20-readline.ini
PHP API	20121113
PHP Extension	20121212
Zend Extension	220121212
Zend Extension Build	API220121212,NTS
PHP Extension Build	API20121212,NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	disabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring
IPv6 Support	enabled
DTrace Support	enabled
Registered PHP	https, ftps, compress.zlib, compress.bzip2, oho, file, glob, data, http, ftp, ohar, zip

Detención de la instancia

Para detener la instancia, la seleccionaremos en el Panel de Control de Amazon EC2 y en **Actions** pulsaremos la opción **Stop**:



Creación de varias instancias

Esta vez crearemos la instancia con la opción **Shutdown behaviour** en **Stop**:

Step 3: Configure Instance Details

Placement group ⓘ

☐ Add instance to placement group.

Capacity Reservation ⓘ

Open

Create new Capacity Reservation

IAM role ⓘ

None

Create new IAM role

Shutdown behavior ⓘ

Stop

Enable termination protection ⓘ

☐ Protect against accidental termination

Monitoring ⓘ

☐ Enable CloudWatch detailed monitoring

Additional charges apply.

Tenancy ⓘ

Shared - Run a shared hardware instance

Additional charges will apply for dedicated tenancy.

Elastic Inference ⓘ

☐ Add an Elastic Inference accelerator

Additional charges apply.

Además le agregaremos un disco **SSD de 16Gbi**:

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MB/s) ⓘ	Delete on Termination ⓘ	Encrypted ⓘ
Root	/dev/sda1	snap-063b78eeac000362	8	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted
EBS	/dev/sdb	<input type="text" value="Search (case-insensitive)"/>	16	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encryp
Add New Volume								

Una vez creada, accedemos a ella a través del puerto 22 (SSH) y comprobamos la presencia de los dos discos duros con `cat /proc/partitions` :

```
ubuntu@ip-172-30-0-24:~$ cat /proc/partitions
major minor #blocks name

202      0   8388608 xvda
202      1   8377897 xvda1
202     16  16777216 xvdb
```

Como podemos observar, tenemos un dispositivo `xvda` formateado como `xvda1` , el cual contiene el sistema operativo, y otro dispositivo `xvdb` de 16Gbi que es el añadido.

Ahora formatearemos el disco `xvdb` con el comando:

```
sudo mkfs.ext4 /dev/xvdb
```

Esta será la salida:

```
mke2fs 1.42.9 (4-Feb-2014)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
1048576 inodes, 4194304 blocks
209715 blocks (5.00%) reserved for the super user
```



```

First data block=0
Maximum filesystem blocks=4294967296
128 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

```

Para comprobar el correcto funcionamiento del nuevo disco, vamos a montarlo

```

# Montamos el disco
sudo mkdir /cda2018
sudo mount /dev/xvdb /cda2018
# Comprobamos el punto de montaje
df -Th /cda2018

```

Veremos la siguiente salida:

```

Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/xvdb       ext4   16G   44M   15G   1% /cda2018

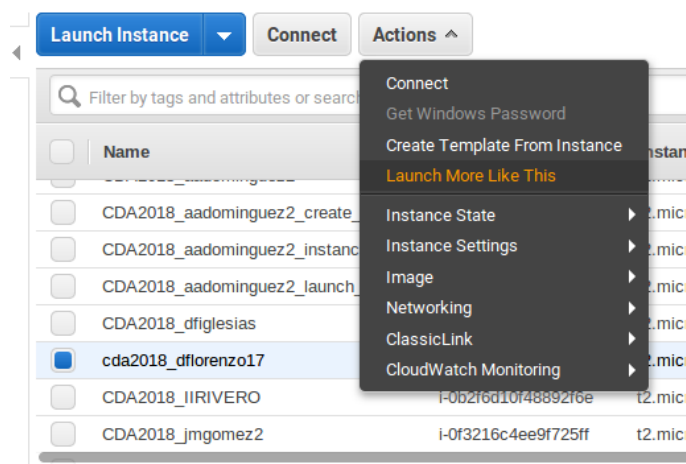
```

Por último añadimos la línea `/dev/xvdb /cda2018 ext4 noatime 0 0` al archivo `/etc/fstab`

y crearemos un archivo de texto en `/cda2018` con la frase `CDA2018_tarea3`.

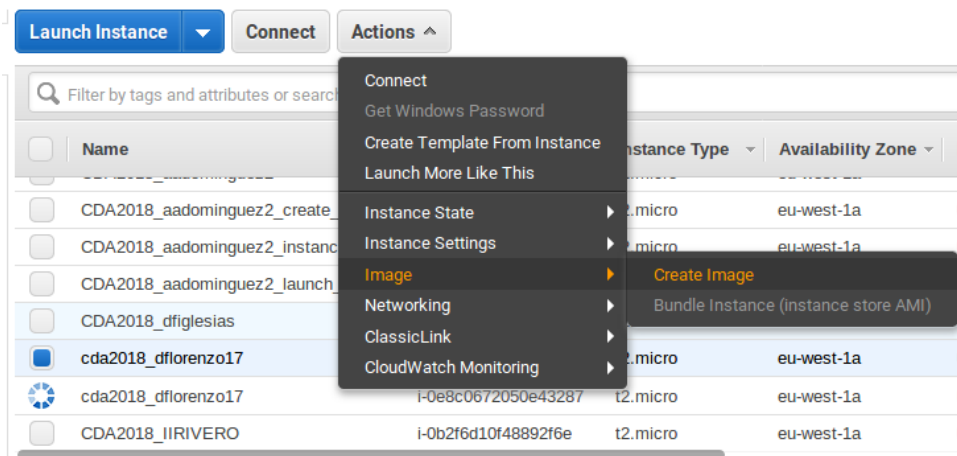
Duplicaremos la instancia de las siguientes maneras:

- Actions > Launch More Like This



Cuestión4 El método *Launch More Like This* nos permite duplicar una instancia, la cual será usada como plantilla, para poder desplegar muchas similares haciendo que AWS copie los datos de configuración de esta, pero no clonándola directamente.

- Actions > Image > Create Image



Cuestión4 El método *Create Image* sí que clona la instancia, haciendo a partir de ella una imagen que será igual a la original.

Vinculando volúmenes

Crearemos un *snapshot* del volumen de nuestra imagen usando el **Dashboard EC2**:

Create Snapshot

Volume*

Description

Encrypted ☐ Not Encrypted

Key (127 characters maximum)

Value (255 characters maximum)

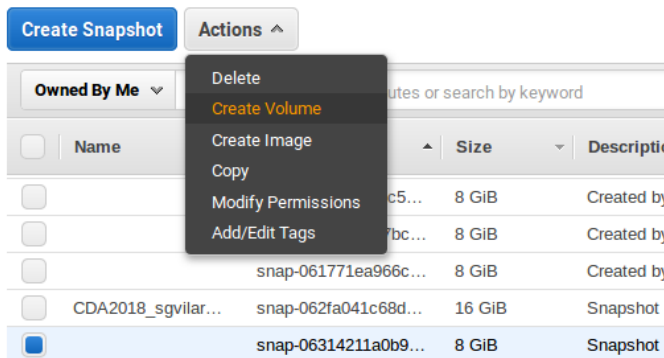
This resource currently has no tags

Choose the Add tag button or [click to add a Name tag](#)

50 remaining (Up to 50 tags maximum)

Cuestión5 Los *snapshots* son una forma de poder preservar el estado actual de los volúmenes de una instancia (o dispositivos). De esta forma, podremos compartir o restaurar el estado de una instancia.

Una vez creado el *snapshot* lo usaremos para crear otro volumen:



Y lo vinculamos a una de las instancias ya creadas (en este caso **launch_more**):

Attach Volume

Volume ⓘ

vol-0fbcc9b7c14bdc56 (volume_dflorenzo17) in eu-west-1a

Instance ⓘ

i-0d834d65584a6264c

in eu-west-1a

Device ⓘ

/dev/sdf

Linux Devices: /dev/sdf through /dev/sdp

Note: Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvdp internally, even when the device name entered here (and shown in the details) is /dev/sdf through /dev/sdp.

Cancel

Attach

Ahora modificamos el texto de nuestro fichero alojado en `/cda2018` y vinculamos el volumen a la instancia `create_image`.

Bibliografía

- ✓ <https://github.com/Student-Puma/HomeLab>
- ✓ <https://www.dev-metal.com/install-setup-php-5-6-ubuntu-14-04-lts/>
- ✓ https://docs.aws.amazon.com/es_es/AWSEC2/latest/UserGuide/ec2-key-pairs.html
- ✓ <https://www.digitalocean.com/community/tutorials/como-instalar-linux-apache-mysql-php-lamp-en-ubuntu-16-04-es>
- ✓ https://cursos.faitic.uvigo.es/tema1819/claroline/document/goto/index.php/2018-2019/AWS-EC2_2018.pdf