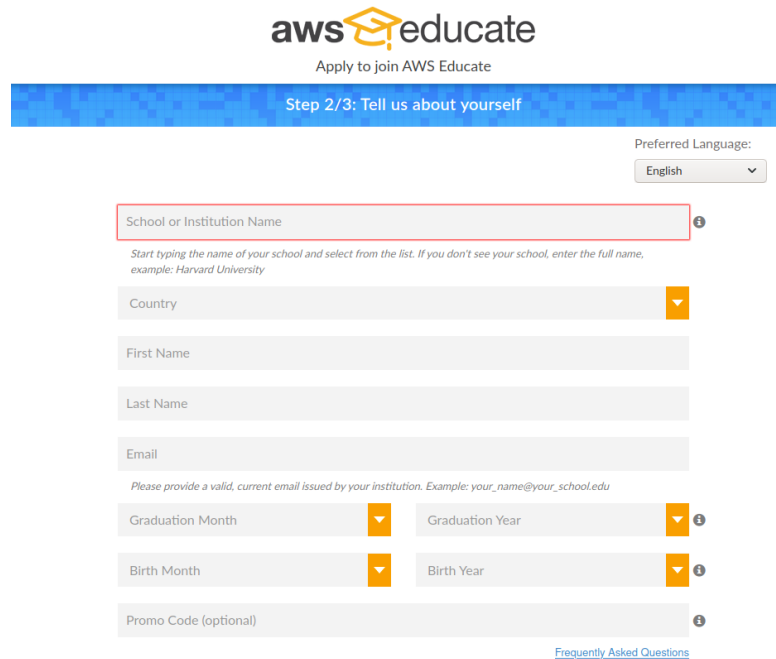


## Práctica 5. Creación de máquinas virtuales en AWS.

Nombre: Luis Miguel Aguilar González

1.- Capturas de la creación de las máquinas virtuales de las distintas formas presentadas en la práctica.

Creamos una cuenta de AWS Educate:



The screenshot shows the AWS Educate registration interface. At the top is the 'aws educate' logo with the tagline 'Apply to join AWS Educate'. Below this is a blue banner with the text 'Step 2/3: Tell us about yourself'. On the right, there is a 'Preferred Language:' dropdown menu set to 'English'. The main form area contains several input fields: 'School or Institution Name' (with a red border and a help icon), 'Country' (a dropdown menu), 'First Name', 'Last Name', and 'Email' (with a note: 'Please provide a valid, current email issued by your institution. Example: your\_name@your\_school.edu'). Below these are 'Graduation Month' and 'Graduation Year' (both dropdowns with help icons), and 'Birth Month' and 'Birth Year' (both dropdowns with help icons). At the bottom is a 'Promo Code (optional)' field with a help icon. A link for 'Frequently Asked Questions' is located at the bottom right of the form.

Tras rellenar todos los apartados tendremos que esperar un día para que Amazon confirme la veracidad de los datos y nos de acceso.



### I'd like to use an AWS Educate Starter Account

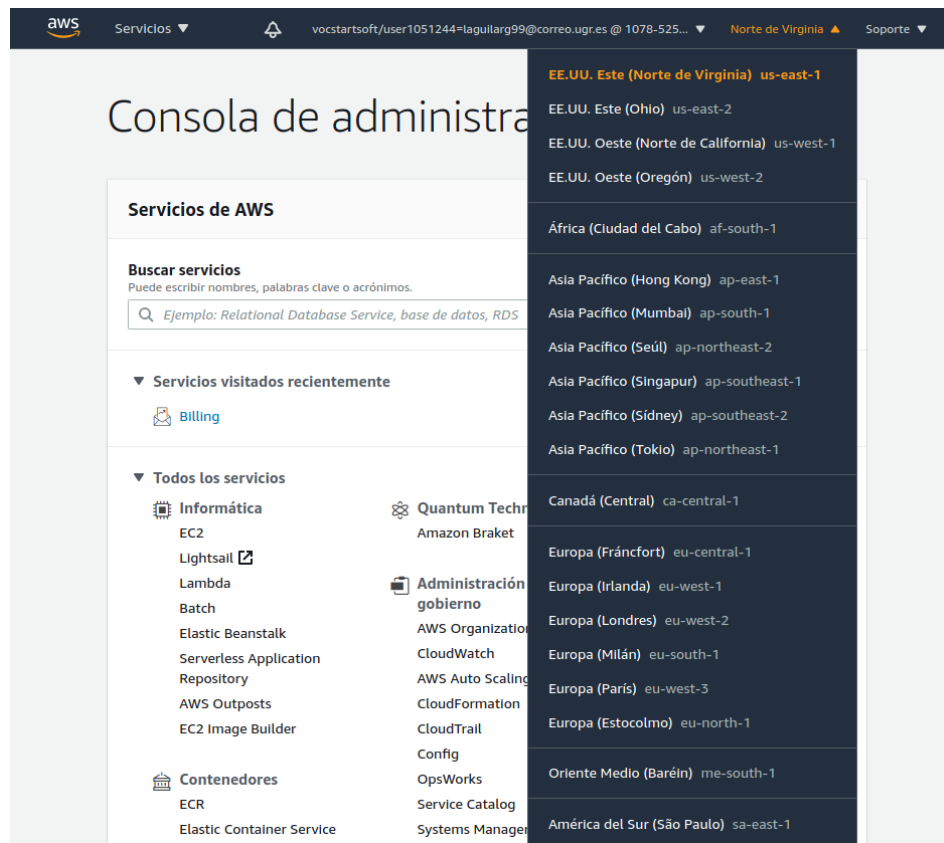
Choose an AWS Educate Starter Account to get access to an AWS account with a preset limit on your spend on AWS services. An AWS Educate Starter Account is run and managed by a third party (Vocareum, Inc.) and the Starter Account runs in Vocareum's environment on AWS. Starter Accounts are subject to a separate agreement between you and Vocareum under separate terms and conditions.

The AWS Educate Starter Account provides access to most but not all AWS services. Students at an AWS Educate member institution will receive up to \$100 (USD) of AWS credit per year in their AWS Educate Starter Account, and students at non-member institution will receive up to \$30 (USD) of AWS credit per year.

You don't need a credit card to use a Starter Account because AWS promotional credits are already available in the account. When your usage of AWS services exceeds the balance on the account, the account is closed and any running services or other resources on the account are lost.

Create Starter Account

Seleccionamos la región eu-west-1(Irlanda):



Tras seleccionar el servicio EC2, creamos un par de claves:

## Crear par de claves

**Par de claves**

Un par de claves, compuesto por una clave privada y una clave pública, es un conjunto de credenciales de seguridad que se utilizan para demostrar su identidad cuando se conecta a una instancia.

**Nombre**

El nombre puede incluir hasta 255 caracteres ASCII. No puede incluir espacios al principio ni al final.

**Formato de archivo**

☒ **pem**  
Para usar con OpenSSH

☐ **ppk**  
Para usar con PuTTY

**Etiquetas (opcional)**

No hay etiquetas asociadas a este recurso.

Puede agregar 50 más etiquetas

En un principio da error porque no tenemos las credenciales necesarias, sólo es necesario instalar el cliente de AWS y añadir las keys que nos proporciona la web.



### Necesita permisos.

No tiene permiso para acceder a la información de facturación de esta cuenta. Contacte al administrador de AWS si necesita ayuda. Si usted es administrador de AWS, puede otorgar permisos a sus usuarios o grupos asegurándose de que (1) [esta cuenta permite que los usuarios federados y de IAM accedan a la información de facturación](#) y (2) [usted tiene los permisos de IAM necesarios](#).

- sudo apt install awscli
- Añadir a ~/.aws/credentials las claves de acceso necesarias

```
GNU nano 4.8 /home/luis/.aws/credentials Modificado
[default]
aws_access_key_id=ASIARSHEDQWSNDNSONHP
aws_secret_access_key=yMsAfwezpetSXP4YCYChTHGzZ+rkdIudMEGgjnBH
2Urn1M4+I91BH777vo9Kf56EoVhuUpZmtnYgtiKkBm40i
```

Ahora nos deja crear las claves de forma correcta:

vocstartsoft/user1051244=laguilarg99@correo.ugr.es @ 1078-525... Norte de Virginia Soporte

✓ El par de claves se ha creado correctamente

Pares de claves (1)

Acciones

Crear par de claves

< 1 >

<input type="checkbox"/>	Nombre	Huella digital	ID
<input type="checkbox"/>	clave_aws_m1	eb:cf:2e:cc:e0:d2:d2:05:69:83:dd:f1:9e:...	key-03i

A continuación, podemos lanzar las instancias necesarias con ubuntu 20.04 LTS,

**Ubuntu Server 20.04 LTS (HVM), SSD Volume Type -**  
ami-0dba2cb6798deb6d8 (64-bit x86) /  
ami-0ea142bd244023692 (64-bit Arm)

Free tier eligible

Select

Ubuntu Server 20.04 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)

☐ 64-bit (Arm)

Seleccionamos la configuración t2.micro:

Currently selected: t2.micro (- ECUs, 1 vCPUs, 2.5 GHz, -, 1 GiB memory, EBS only)

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

Cambiamos la fuente de la conexión a cualquiera:

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ
SSH ▾	TCP	22	Anywher ▾	0.0.0.0/0, ::/0
e.g. SSH for Adr				

Como se puede observar la instancia está creada correctamente:

<input checked="" type="checkbox"/>	Name ▾	ID de la instancia	Estado de la i... ▾	Tipo de inst... ▾	Comprobació... ▾	Estado de ... ▾	Zona de dispo... ▾	DNS de IPv4 pública ▾	Dirección IP... ▾	Ip elástica
<input checked="" type="checkbox"/>	-	i-0573dd14348e6d1be	En ejecu... 🔍	t2.micro	-	Sin alar... +	us-east-1a	ec2-3-83-130-21.com...	3.83.130.21	-

Instancia: i-0573dd14348e6d1be

Detalles

Seguridad

Redes

Almacenamiento

Comprobaciones de estado

Monitoreo

Etiquetas

▼ Resumen de instancia Información

ID de la instancia

i-0573dd14348e6d1be

Estado de la instancia

En ejecución

Tipo de instancia

t2.micro

Rol de IAM

-

Dirección IPv4 pública

3.83.130.21 | dirección abierta 🔗

DNS de IPv4 pública

ec2-3-83-130-21.compute-1.amazonaws.com | dirección abierta 🔗

Direcciones IP elásticas

-

ID de subred

subnet-392c9218 🔗

Direcciones IPv4 privadas

172.31.93.52

DNS IPv4 privado

ip-172-31-93-52.ec2.internal

ID de VPC

vpc-9e66aae3 🔗

Concedemos los permisos necesarios a la clave privada:

```
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5$ chmod 400 clave_aws_m1.pem
```

y nos conectamos por ssh:

```
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5$ chmod 400 clave_aws_m1.pem (base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5$ ssh -i "clave_aws_m1.pem" ubuntu@ec2-3-83-130-21.compute-1.amazonaws.com
The authenticity of host 'ec2-3-83-130-21.compute-1.amazonaws.com (3.83.130.21)' can't be established.
ECDSA key fingerprint is SHA256:YsvJk33XvvxV0odV3yt2e/rxe6cFd1PY6/lSFY3a1IE.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-83-130-21.compute-1.amazonaws.com,3.83.130.21' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 20.04.1 LTS (GNU/Linux 5.4.0-1024-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Wed Oct 28 16:06:31 UTC 2020

System load:  0.0          Processes:      99
Usage of /:   16.7% of 7.69GB Users logged in: 0
Memory usage: 19%         IPv4 address for eth0: 172.31.93.52
Swap usage:   0%

1 update can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

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.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-93-52:~$
```

Ahora creamos otra instancia con el agente AWS CLI:

```
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5$ sudo aws ec2 run-instances
--image-id ami-0dba2cb6798deb6d8 --key-name clave_aws_m1 --count 1 --region us-east-1 --instance-type t2.micro
```

Como se puede ver la instancia está correctamente creada:

<input type="checkbox"/>	Name ▾	ID de la instancia	Estado de la i... ▾	Tipo de inst... ▾
<input type="checkbox"/>	-	i-07358bbaf3a7eb6b3	En ejecu... 🔍	t2.micro
<input type="checkbox"/>	-	i-0573dd14348e6d1be	En ejecu... 🔍	t2.micro

Ahora intentaremos crear la instancia mediante Vagrant:

```
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5$ vagrant plugin install vagrant-aws
Installing the 'vagrant-aws' plugin. This can take a few minutes...
```

Instalaremos una box “dummy”:

```
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5/vagrant$ vagrant box add dummy https://github.com/mitchellh/vagrant-aws/raw/master/dummy.box
==> box: Box file was not detected as metadata. Adding it directly...
==> box: Adding box 'dummy' (v0) for provider:
      box: Downloading: https://github.com/mitchellh/vagrant-aws/raw/master/dummy.box
==> box: Successfully added box 'dummy' (v0) for 'aws'!
```

crearemos un fichero vagrant:

```
class Hash
  def slice(*keep_keys)
    h = {}
    keep_keys.each { |key| h[key] = fetch(key) if has_key?(key) }
    h
  end unless Hash.method_defined?(:slice)

  def except(*less_keys)
    slice(*keys - less_keys)
  end unless Hash.method_defined?(:except)
end

Vagrant.configure("2") do |config|
  config.vm.box = "dummy"
  config.ssh.keys_only = false
  config.vm.synced_folder ".", "/vagrant", disabled: true

  config.vm.provider :aws do |aws, override|
    aws.access_key_id = "ASIARSHEDQWSLUYY20XN"
    aws.secret_access_key = "GBEYEpZdpHSj5hZ8LNjDKgsMc16b+DeSgeo20Xw2"
    aws.session_token = "FwoGZXIvYXZlE0////////wEaDHB7swzq/OaChe3BaCLJAZ/-aHJ2rjByAlBfqXjBonvMwpTq7X/-LKEg1lJHTiUZuLsHx+IJLcjMqhd0Da3Fo098lToMjgmFcPJStG2yKfnCyDK4ZnOxTAFIhzqdgFgmXmpWyD8dqNiz9i63zJAaq5SjCKXEBtEaeomSZBM2NelZKBohvQkSwcZr+9mZY0WvNQXmxUhitHGGuKhljxv+f8BTItXHcdqNkOzLNxVCRhixIQy0vhdlHoaUVrv/-gmr098+nTcJLVzRi5dLtzncJ7M"
    aws.keypair_name = "clave_aws_m1"
    aws.instance_type = "t2.micro"
    aws.ami = "ami-0dba2cb6798deb6d8"
    aws.block_device_mapping = [{ 'DeviceName' => '/dev/sda1', 'Ebs.VolumeSize' =>
10 }]

    aws.region = "us-east-1"
    override.ssh.username = "ubuntu"
    override.ssh.private_key_path = "../clave_aws_m1.pem"
  end
end
```

- vagrant up --provider=aws

```
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5/vagrant$ vagrant up --provider=aws
```

Ahora podemos ver que efectivamente se ha creado la nueva máquina:

<input type="checkbox"/>	Name ▾	ID de la instancia	Estado de la i... ▾	Tipo de inst...
<input type="checkbox"/>	-	<a href="#">i-07358bbaf3a7eb6b3</a>	✓ En ejecu... 🔍	t2.micro
<input type="checkbox"/>	-	<a href="#">i-0573dd14348e6d1be</a>	✓ En ejecu... 🔍	t2.micro
<input type="checkbox"/>	-	<a href="#">i-0c3ca398e64081334</a>	✓ En ejecu... 🔍	t2.micro

Por último instalaremos terraform para crear la última máquina en aws:

- sudo snap install terraform

```
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5/terraform$ terraform init

Initializing provider plugins...
- Checking for available provider plugins on https://releases.hashicorp.com...
- Downloading plugin for provider "aws" (2.70.0)...

The following providers do not have any version constraints in configuration,
so the latest version was installed.

To prevent automatic upgrades to new major versions that may contain breaking
changes, it is recommended to add version = "..." constraints to the
corresponding provider blocks in configuration, with the constraint strings
suggested below.

* provider.aws: version = "~> 2.70"

Terraform has been successfully initialized!

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

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5/terraform$ cat main.tf
provider "aws" {
    region = "us-east-1"
}
```

Tras modificar main.tf de forma apropiada:

```
provider "aws" {
  region = "us-east-1"
  access_key = "ASIARSHEDQWSAP6ZPPF5"
  secret_key = "ncNpuHT2q0RwWvnHsSFdytGnAbGcom/T2nAmD/tH"
  token = "FwoGZXIvYXdzEP3////////wEADPagJO2Bm8VtLJixHiLJAdmPFwDSwUuNYIpHJETL/26PNbqmyzn5Ly2/-
l1JWh0IUo2sC/K458qUE0HtQpR7MH769IafHWNk9tYgiriVQmIkIf+XZmqdUMWuzXi34A1J9IXDwAzd1mcJfNRRN4Qmz6gF6Dm/-
1kJfHPTKDeI7U7LLmJVrc21W/M+tbIgY1/WzhlnzLQhtDTmPmoYdn5oaYhEmaoPAnEdhqht3XkWA8G/5K0xoVSJjp0ltFHaFkh363g/-
BhdGtBDxqBjYtEoIHRtF54Ruh4GVDJSiie2er8BTity3aQ+ps9Ipu5QF3bGQpaw3ZoBmVNmtbxP4hRIeVgj1grUuWIfs4ir0a7TP0+|"
}

resource "aws_instance" "ejemploCPD" {
  ami = "ami-0dba2cb6798deb6d8"
  instance_type = "t2.micro"
  associate_public_ip_address = true
  key_name = "clave_aws_m1"
}
```

Aplicamos los cambios:

```
(base) luis@luis-MS-7B86:~/UNI/4/1/CPD/Prácticas/P5/terraform$ terraform apply

An execution plan has been generated and is shown below.
Resource actions are indicated with the following symbols:
  + create

Terraform will perform the following actions:

+ aws_instance.ejemploCPD
  id: <computed>
  ami: "ami-0dba2cb6798deb6d8"
  arn: <computed>
  associate_public_ip_address: "true"
  availability_zone: <computed>
  cpu_core_count: <computed>
  cpu_threads_per_core: <computed>
  ebs_block_device.#: <computed>
  ephemeral_block_device.#: <computed>
  get_password_data: "false"
  host_id: <computed>
  instance_state: <computed>
  instance_type: "t2.micro"
  ipv6_address_count: <computed>
  ipv6_addresses.#: <computed>
  key_name: "clave_aws_m1"
  metadata_options.#: <computed>
  network_interface.#: <computed>
  network_interface_id: <computed>
  outpost_arn: <computed>
  password_data: <computed>
  placement_group: <computed>
  primary_network_interface_id: <computed>
  private_dns: <computed>
  private_ip: <computed>
  public_dns: <computed>
  public_ip: <computed>
  root_block_device.#: <computed>
  security_groups.#: <computed>
  source_dest_check: "true"
  subnet_id: <computed>
  tenancy: <computed>
  volume_tags.%: <computed>
  vpc_security_group_ids.#: <computed>
```



Finalmente contamos con las 4 máquinas creadas con los distintos métodos:

<input type="checkbox"/>	Name ▾	ID de la instancia	Estado de la i... ▾	Tipo de inst... ▾
<input type="checkbox"/>	-	<a href="#">i-07358bbaf3a7eb6b3</a>	✓ En ejecu... 🔍	t2.micro
<input type="checkbox"/>	-	<a href="#">i-0573dd14348e6d1be</a>	✓ En ejecu... 🔍	t2.micro
<input type="checkbox"/>	-	<a href="#">i-0c3ca398e64081334</a>	✓ En ejecu... 🔍	t2.micro
<input type="checkbox"/>	-	<a href="#">i-077dc07cbaab71ae2</a>	✓ En ejecu... 🔍	t2.micro

2.- Para el apartado de GlusterFS, incluir los ficheros utilizados para la creación del entorno virtualizado y capturas de las distintas etapas de instalación y ejecución de GlusterFS.









Creamos 2 instancias correctamente inicializadas con Centos e instalamos glusterfs en las 2:

```
[centos@ip-172-31-83-166 ~]$ sudo yum -y install centos-release-gluster7
CentOS-8 - AppStream                14 MB/s | 5.8 MB    00:00
CentOS-8 - Base                     6.7 MB/s | 2.2 MB    00:00
CentOS-8 - Extras                   68 kB/s | 8.1 kB     00:00
Dependencias resueltas.
=====
Paquete                               Arq.      Versión      Repo        Tam.
=====
Instalando:
centos-release-gluster7               noarch    1.0-2.el8    extras      9.5 k
Instalando dependencias:
centos-release-storage-common         noarch    2-2.el8      extras      9.4 k
```

Tras terminar la instalación en ambas máquinas comprobamos que la conexión es adecuada:

```
[centos@ip-172-31-83-166 ~]$ sudo gluster peer probe ec2-52-70-162-115.compute-1
.amazonaws.com
peer probe: success. Host ec2-52-70-162-115.compute-1.amazonaws.com port 24007 a
lready in peer list
```

Es necesario crear los volúmenes necesarios en aws:

Create Volume														Actions					
Filter by tags and attributes or search by keyword																			
<input type="checkbox"/>	Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availability Zone	State	Alarm Status	Attachment Information	Monitoring	Volume Status	Encryption					
<input checked="" type="checkbox"/>		vol-026c47e...	10 GiB	gp2	100		October 30, 2020 at...	us-east-1a	<span>●</span> in-use	None	 i-04a9828d894bb539...		<span>✔</span> Okay	Not Encryp					
<input type="checkbox"/>		vol-090803e...	10 GiB	gp2	100		October 30, 2020 at...	us-east-1a	<span>●</span> in-use	None	 i-05e2098e1c808245...		<span>✔</span> Okay	Not Encryp					
<input type="checkbox"/>		vol-0d8e947...	10 GiB	gp2	100	snap-0d5f1b7...	October 30, 2020 at...	us-east-1a	<span>●</span> in-use	None	 i-04a9828d894bb539...		<span>✔</span> Okay	Not Encryp					
<input type="checkbox"/>		vol-04d5b64f...	10 GiB	gp2	100	snap-0d5f1b7...	October 30, 2020 at...	us-east-1a	<span>●</span> in-use	None	 i-05e2098e1c808245...		<span>✔</span> Okay	Not Encryp					

Creamos las oportunas particiones volúmenes físicos, lógicos y la partición XFS:

```
[centos@ip-172-31-83-226 ~]$ sudo fdisk /dev/xvda2

Bienvenido a fdisk (util-linux 2.32.1).
Los cambios solo permanecerán en la memoria, hasta que decida escribirlos.
Tenga cuidado antes de utilizar la orden de escritura.

La firma antigua xfs se borrará mediante una orden de escritura.

El dispositivo no contiene una tabla de particiones reconocida.
Se ha creado una nueva etiqueta de disco DOS con el identificador de disco 0x187
00afa.

Orden (m para obtener ayuda): n
Tipo de partición
  p primaria (0 primaria(s), 0 extendida(s), 4 libre(s))
  e extendida (contenedor para particiones lógicas)
Seleccionar (valor predeterminado p): p
Número de partición (1-4, valor predeterminado 1):
```

```
Disco /dev/xvdb: 10 GiB, 10737418240 bytes, 20971520 sectores
Unidades: sectores de 1 * 512 = 512 bytes
Tamaño de sector (lógico/físico): 512 bytes / 512 bytes
Tamaño de E/S (mínimo/óptimo): 512 bytes / 512 bytes
Tipo de etiqueta de disco: dos
Identificador del disco: 0xe1aafc2f

Disposit.  Inicio Comienzo  Final Sectores Tamaño Id Tipo
/dev/xvdb1      2048 20971519 20969472    10G 8e Linux LVM
```

```
[centos@ip-172-31-83-226 ~]$ sudo pvcreate /dev/xvdb1
Physical volume "/dev/xvdb1" successfully created.
[centos@ip-172-31-83-226 ~]$ sudo vgcreate vg01 /dev/xvdb1
Volume group "vg01" successfully created
[centos@ip-172-31-83-226 ~]$ sudo lvcreate -l 100%FREE -n lv01 vg01
Logical volume "lv01" created.
[centos@ip-172-31-83-226 ~]$ sudo mkfs.xfs /dev/mapper/vg01-lv01
meta-data=/dev/mapper/vg01-lv01 isize=512    agcount=4, agsize=655104 blks
        =                       sectsz=512   attr=2, projid32bit=1
        =                       crc=1        finobt=1, sparse=1, rmapbt=0
        =                       reflink=1
data      =                       bsize=4096   blocks=2620416, imaxpct=25
        =                       sunit=0      swidth=0 blks
naming    =version 2              bsize=4096   ascii-ci=0, ftype=1
log       =internal log          bsize=4096   blocks=2560, version=2
        =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime  =none                  extsz=4096   blocks=0, rtextents=0
```

Creamos los sistemas de ficheros en las unidades /dev/xvdb:

```
[centos@ip-172-31-83-226 ~]$ sudo gluster volume create glustervol1 replica 2 transport tcp ec2-52-70-162-115.compute-1.amazonaws.com:/gluster/bricks/brick1/vol1 ec2-3-95-183-185.compute-1.amazonaws.com:/gluster/bricks/brick1/vol1
Replica 2 volumes are prone to split-brain. Use Arbiter or Replica 3 to avoid this. See: http://docs.gluster.org/en/latest/Administrator%20Guide/Split%20brain%20and%20ways%20to%20deal%20with%20it/.
Do you still want to continue?
(y/n) y
volume create: glustervol1: success: please start the volume to access data
```

```
[centos@ip-172-31-83-226 ~]$ sudo gluster volume start glustervol1
volume start: glustervol1: success
```

En el gluster cliente creamos un nuevo directorio como punto de montaje:

```
[centos@ip-172-31-83-166 ~]$ sudo mkdir /gdatos1
[centos@ip-172-31-83-166 ~]$ sudo mount -t glusterfs ec2-52-70-162-115.compute-1.amazonaws.com:/glustervol1 /gdatos1
```

Ahora al crear archivos en /gdatos1 los veremos instantáneamente en /gluster/bricks/brick1/vol1.

Servidor:

```
[centos@ip-172-31-83-226 vol1]$ ls
prueba
```

Cliente:

```
[centos@ip-172-31-83-166 gdatos1]$ sudo touch prueba
```