SISTEMAS DE ARCHIVOS DISTRIBUIDOS

SISTEMAS OPERATIVOS

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21/05/2019

Amazon Elastic File System

Amazon Elastic File System (Amazon EFS) proporciona almacenamiento de archivos sencillo.

Con Amazon EFS, la capacidad de almacenamiento es elástica y aumenta o se reduce automáticamente a medida que agrega o elimina archivos.

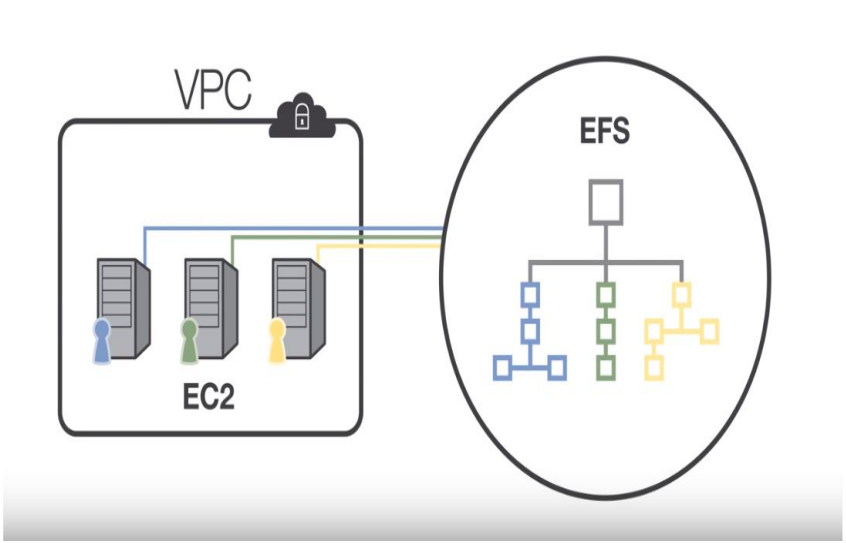
El servicio se encarga de administrar toda la infraestructura de almacenamiento de archivos, es decir la complejidad de implementación, aplicación de parches y mantenimiento de configuraciones complejas de sistemas de archivos.

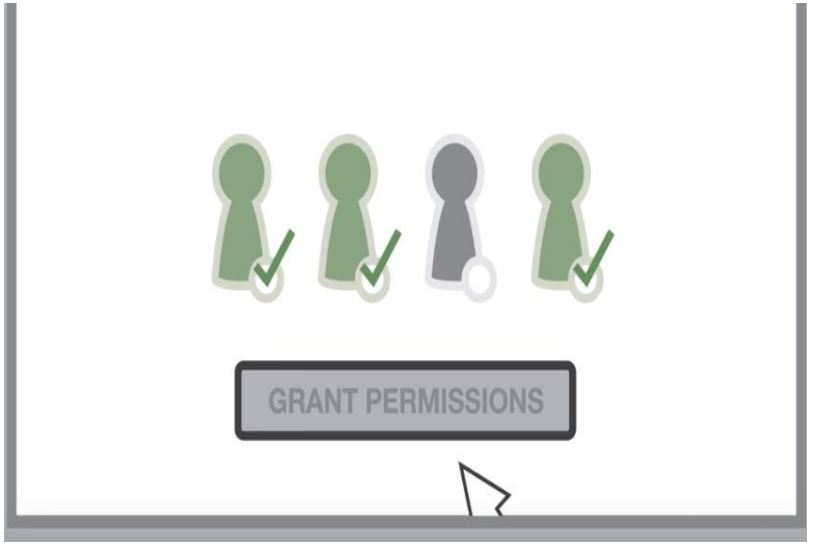
Amazon Elastic File System

Amazon EFS es compatible con la versión 4 (NFSv4.1 y NFSv4.0) del protocolo Network File System.

Los archivos y directorios del sistema de archivos de EFS admiten los permisos de lectura, escritura y ejecución estándar de tipo Unix basados en el ID de usuario y de grupo certificado al montar el cliente NFSv4.1.

Amazon Elastic File System





Ceph

Proyecto de open source solución para almacenamiento distribuido.

Alto desempeño.

Sin punto único de fallo (Single point of failure).

Altamente escalable al nivel del exabyte.

Adecuado para despliegues en la nube de IaaS (Infraestructure as a Service) y PaaS (Platform as a Service).

A implementar en hardware básico (commodity hardware).

Acerca de la arquitectura de Ceph I

La solución debe ser basada en software y código abierto.

Cada componente debe ser escalable.

Ningún proceso, servidor u otro componente individual puede ser punto único de fallo.

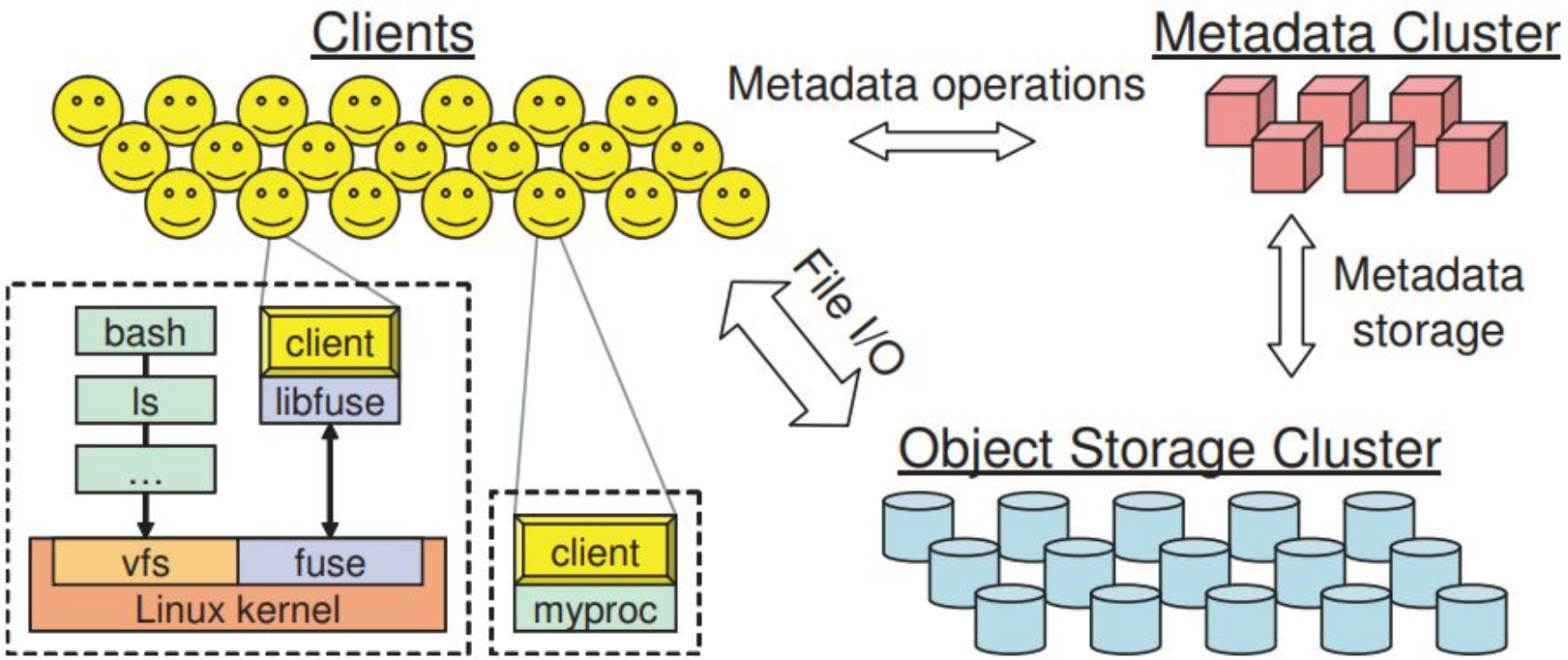
Ceph debería poder ejecutarse en hardware básico, no especializado.

Ceph Filesystem

Sistema de archivos distribuido compatible con POSIX.

Maximiza la separación entre el manejo de datos y metadatos.

Tres componentes principales: cliente, cluster de dispositivos de almacenamiento basado en objetos (Object Storage Devices - OSD) y cluster de servidores de metadatos.


Clients
Metadata Cluster
Metadata operations
File I/O
Metadata storage
Object Storage Cluster
bash
ls
...
client
libfuse
vfs
fuse
Linux kernel
client
myproc

Acerca de la arquitectura de Ceph II

Objetivos de la arquitectura:

1. Escalabilidad
2. Desempeño
3. Confiabilidad

Características fundamentales de diseño

Datos y Metadatos desacoplados.

Administración de metadatos distribuidos.

Almacenamiento autónomo de objetos distribuidos.

Gluster File System

Gluster es un sistema de archivos distribuido y escalable que agrega recursos de almacenamiento en disco de varios servidores en un único espacio de nombres global.

1. Compatible con POSIX
2. Accesible utilizando protocolos estándar de la industria como NFS.
3. Permite la optimización de diferentes cargas de trabajo.
4. Fuente abierta

Gluster File System

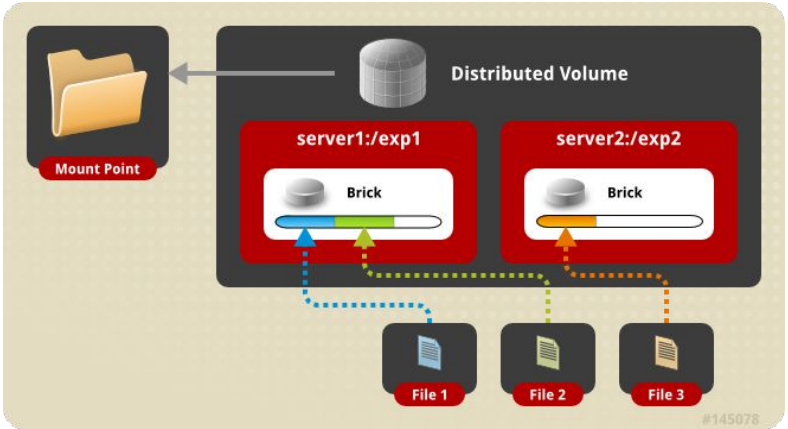
Innovación: elimina los metadatos y puede mejorar drásticamente el rendimiento, lo que nos ayudará a unificar datos y objetos.

Elasticidad: adaptada al crecimiento y la reducción del tamaño de los datos.

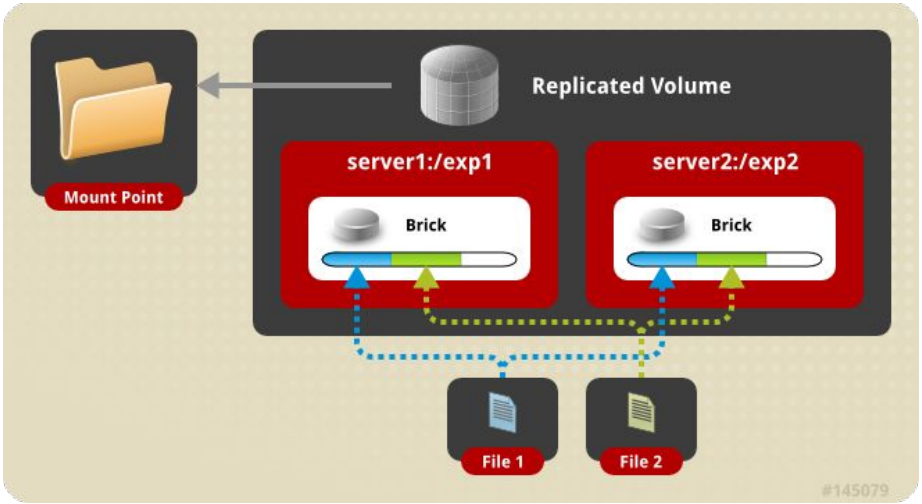
Simplicidad: es fácil de administrar e independiente del kernel mientras se ejecuta en el espacio de usuario.

Tipos de volúmenes

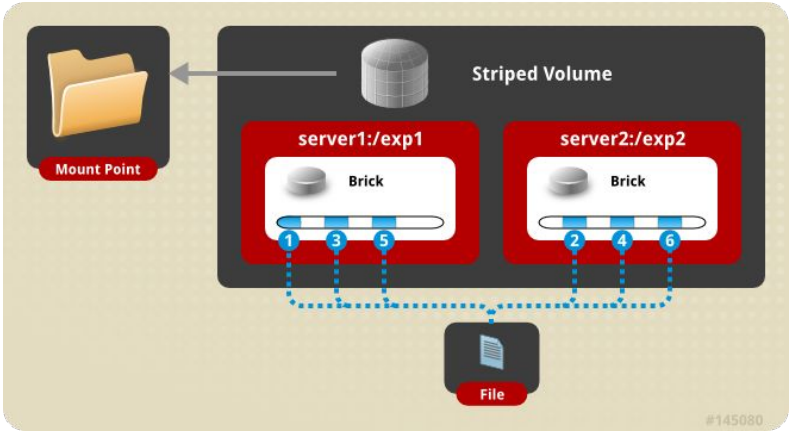
Volumen distribuido de Glusterfs : Aquí, los archivos se distribuyen a través de varios ladrillos en el volumen. Por lo tanto, el archivo 1 se puede almacenar sólo en brick1 o brick2, pero no en ambos.



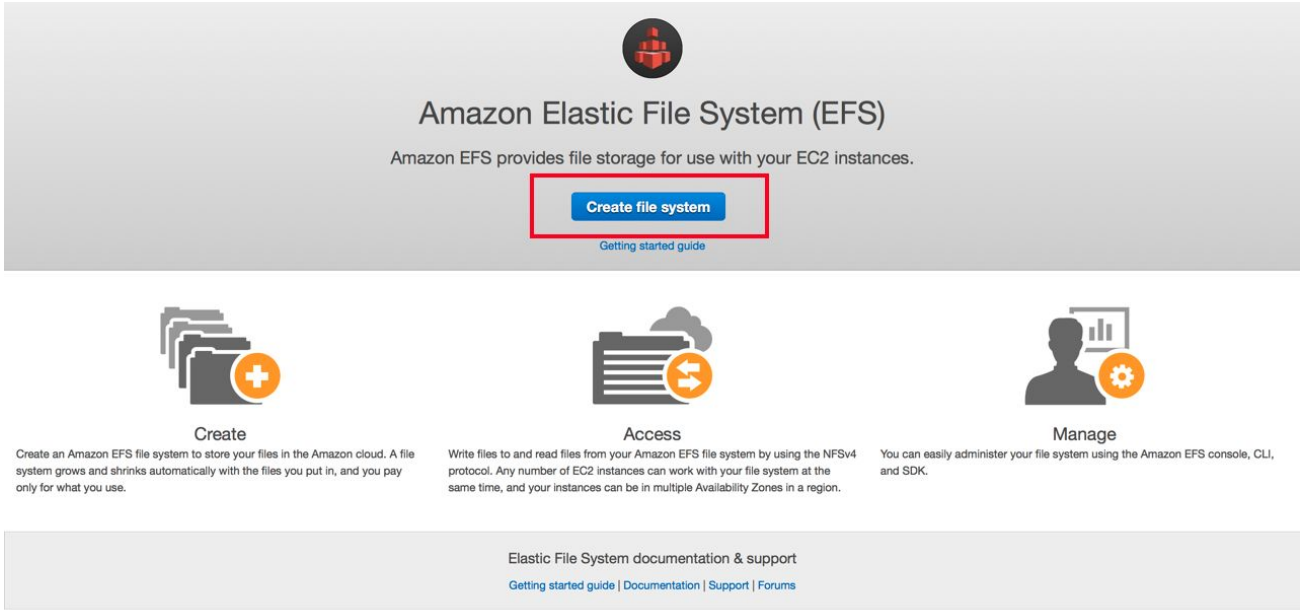
Volumen de Glusterfs replicado : Aquí se mantienen copias exactas de los datos en todos los ladrillos. Se necesita tener al menos dos ladrillos para crear un volumen con 2 réplicas o un mínimo de tres ladrillos para crear un volumen de 3 réplicas.



Volumen de Glusterfs rayado : en este caso se considera un archivo muy pesado al cual quieren acceder varios usuarios, si se carga en un solo lugar esto causará demasiada carga en un solo ladrillo y reduciría el rendimiento. Para evitar eso este tipo de volumen divide al archivo en trozos más pequeños cada trozo se almacena en un ladrillo. Ahora la carga se distribuye y el archivo se puede recuperar más rápido pero no se proporciona redundancia de datos.



Montar Amazon Elastic File System



Create file system

- **Step 1: Configure file system access**
- Step 2: Configure optional settings
- Step 3: Review and create

Configure file system access

An Amazon EFS file system is accessed by EC2 instances running inside one of your VPCs. Instances connect to a file system by using a network interface called a mount target. Each mount target has an IP address, which we assign automatically or you can specify.

VPC vpc-ce2cc7ab (default)

Create mount targets

Instances connect to a file system by using mount targets you create. We recommend creating a mount target in each of your VPC's Availability Zones so that EC2 instances across your VPC can access the file system.

Availability Zone	Subnet	IP address	Security groups
eu-west-1a	subnet-b7676ef1 (default)	Automatic	sg-5337ff36 - default
eu-west-1b	subnet-2eea264b (default)	Automatic	sg-5337ff36 - default
eu-west-1c	subnet-c08a61b7 (default)	Automatic	sg-5337ff36 - default

Cancel **Next Step**

Create file system

Step 1: Configure file system access

Step 2: Configure optional settings

Step 3: Review and create

Configure optional settings

Add tags

You can add tags to describe your file system. A tag consists of a case-sensitive key-value pair. (For example, you can define a tag with key-value pair with key = Corporate Department and value = Sales and Marketing.) At a minimum, we recommend a tag with key = Name.

Key	Value	Remove
Name	Add New Value	
Add New Key		

Choose performance mode

We recommend **General Purpose** performance mode for most file systems. **Max I/O** performance mode is optimized for applications where tens, hundreds, or thousands of EC2 instances are accessing the file system — it scales to higher levels of aggregate throughput and operations per second with a tradeoff of slightly higher latencies for file operations.

- (•) **General Purpose (default)**
- ( ) **Max I/O**

Enable encryption

If you enable encryption for your file system, all data on your file system will be encrypted at rest. You can select a KMS key from your account to protect your file system, or you can provide the ARN of a key from a different account. Encryption can only be enabled during file system creation. Learn more

- [ ] **Enable encryption**

Cancel | Previous | **Next Step**

Create file system

Step 1: Configure file system access

Step 2: Configure optional settings

Step 3: Review and create

Review and create

Review the configuration below before proceeding to create your file system.

File system access

VPC	Availability Zone	Subnet	IP address	Security groups
vpc-78cecc1e (default)	us-west-2a	subnet-1c42087a (default)	Automatic	sg-1b5bbf67 - default
	us-west-2b	subnet-36355f7e (default)	Automatic	sg-1b5bbf67 - default
	us-west-2c	subnet-74c9c02f (default)	Automatic	sg-1b5bbf67 - default

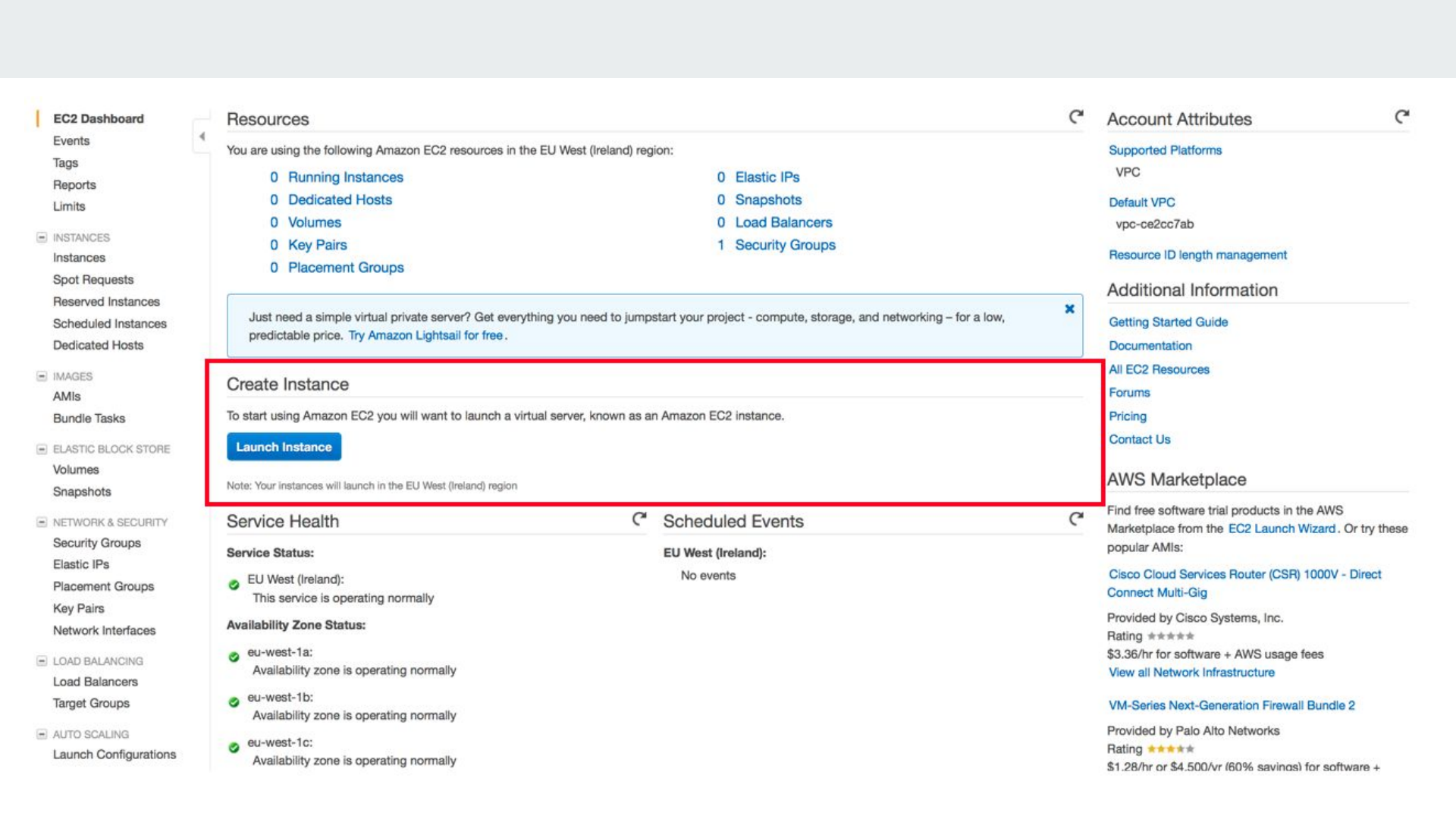
Optional settings

Tags No tags added

Performance mode General Purpose (default)

Encrypted No

Cancel Previous **Create File System**


EC2 Dashboard
Events
Tags
Reports
Limits
INSTANCES
Instances
Spot Requests
Reserved Instances
Scheduled Instances
Dedicated Hosts
IMAGES
AMIs
Bundle Tasks
ELASTIC BLOCK STORE
Volumes
Snapshots
NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
LOAD BALANCING
Load Balancers
Target Groups
AUTO SCALING
Launch Configurations
Resources
You are using the following Amazon EC2 resources in the EU West (Ireland) region:
0 Running Instances
0 Dedicated Hosts
0 Volumes
0 Key Pairs
0 Placement Groups
0 Elastic IPs
0 Snapshots
0 Load Balancers
1 Security Groups
Just need a simple virtual private server? Get everything you need to jumpstart your project - compute, storage, and networking – for a low, predictable price. Try Amazon Lightsail for free.
Create Instance
To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.
Launch Instance
Note: Your instances will launch in the EU West (Ireland) region
Service Health
Service Status:
EU West (Ireland):
This service is operating normally
Availability Zone Status:
eu-west-1a:
Availability zone is operating normally
eu-west-1b:
Availability zone is operating normally
eu-west-1c:
Availability zone is operating normally
Scheduled Events
EU West (Ireland):
No events
Account Attributes
Supported Platforms
VPC
Default VPC
vpc-ce2cc7ab
Resource ID length management
Additional Information
Getting Started Guide
Documentation
All EC2 Resources
Forums
Pricing
Contact Us
AWS Marketplace
Find free software trial products in the AWS Marketplace from the EC2 Launch Wizard. Or try these popular AMIs:
Cisco Cloud Services Router (CSR) 1000V - Direct Connect Multi-Gig
Provided by Cisco Systems, Inc.
Rating
$3.36/hr for software + AWS usage fees
View all Network Infrastructure
VM-Series Next-Generation Firewall Bundle 2
Provided by Palo Alto Networks
Rating
$1.28/hr or $4.500/yr (60% savings) for software +

1. Choose AMI | 2. Choose Instance Type | 3. Configure Instance | 4. Add Storage | 5. Add Tags | 6. Configure Security Group | 7. Review

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.

Quick Start

My AMIs

AWS Marketplace

Community AMIs

Free tier only

1 to 31 of 31 AMIs

Amazon Linux AMI 2016.09.1 (HVM), SSD Volume Type - ami-70edb016

Amazon Linux
Free tier eligible

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root device type: ebs Virtualization type: hvm

Select

64-bit

Red Hat Enterprise Linux 7.3 (HVM), SSD Volume Type - ami-02ace471

Red Hat
Free tier eligible

Red Hat Enterprise Linux version 7.3 (HVM), EBS General Purpose (SSD) Volume Type

Root device type: ebs Virtualization type: hvm

Select

64-bit

SUSE Linux Enterprise Server 12 SP2 (HVM), SSD Volume Type - ami-9186a1e2

SUSE Linux
Free tier eligible

SUSE Linux Enterprise Server 12 Service Pack 2 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.

Root device type: ebs Virtualization type: hvm

Select

64-bit

Ubuntu Server 16.04 LTS (HVM), SSD Volume Type - ami-405f7226

Free tier eligible

Ubuntu Server 16.04 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

Select

64-bit

Microsoft Windows Server 2016 Base - ami-29f7dd5a

Windows
Free tier eligible

Microsoft Windows 2016 Datacenter edition. [English]

Root device type: ebs Virtualization type: hvm

Select

64-bit

1. Choose AMI | 2. Choose Instance Type | 3. Configure Instance | 4. Add Storage | 5. Add Tags | 6. Configure Security Group | 7. Review

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)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
☐	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
☑	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
☐	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
☐	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
☐	General purpose	m4.large	2	8	EBS only	Yes	Moderate	Yes
☐	General purpose	m4.xlarge	4	16	EBS only	Yes	High	Yes
☐	General purpose	m4.2xlarge	8	32	EBS only	Yes	High	Yes

Cancel | Previous | Review and Launch | Next: Configure Instance Details

1. Choose AMI | 2. Choose Instance Type | 3. Configure Instance | 4. Add Storage | 5. Add Tags | 6. Configure Security Group | 7. Review

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

⚠ Improve your instances' security. Your security group, launch-wizard-1, is open to the world.

Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.

You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. Edit security groups

AMI Details

Edit AMI

Amazon Linux AMI 2016.09.1 (HVM), SSD Volume Type - ami-70edb016

Free tier eligible

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root Device Type: ebs Virtualization type: hvm

Instance Type

Edit instance type

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

Security Groups

Edit security groups

Security group name launch-wizard-1

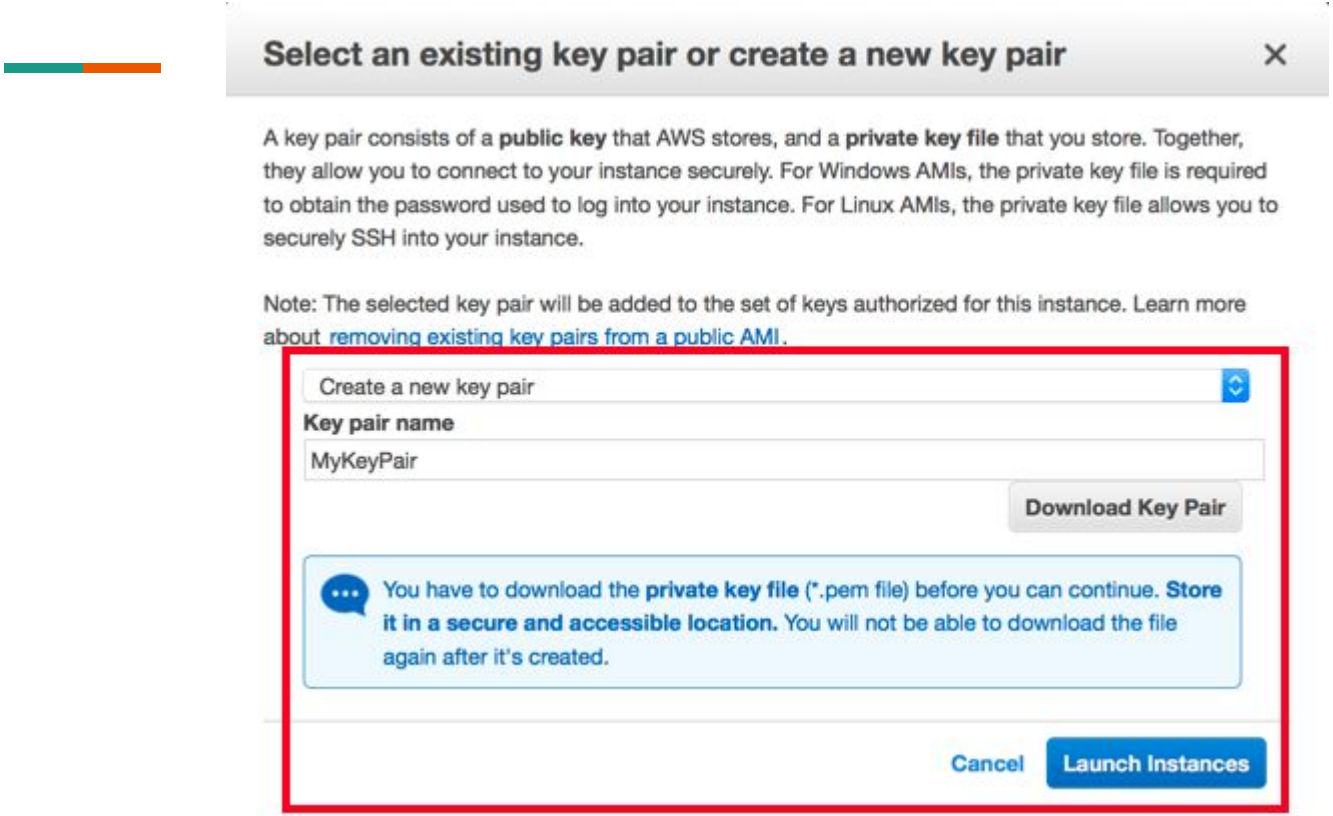
Description launch-wizard-1 created 2017-03-02T17:14:45.508-05:00

Type	Protocol	Port Range	Source
SSH	TCP	22	0.0.0.0/0

Instance Details

Edit instance details

Cancel | Previous | Launch


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
MyKeyPair
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

Launch Status

Your instances are now launching
The following instance launches have been initiated: i-0caf92613ecf8bc41 View launch log

Get notified of estimated charges
Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

How to connect to your instances

Your instances are launching, and it may take a few minutes until they are in the **running** state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances.

Click **View Instances** to monitor your instances' status. Once your instances are in the **running** state, you can **connect** to them from the Instances screen. Find out how to connect to your instances.

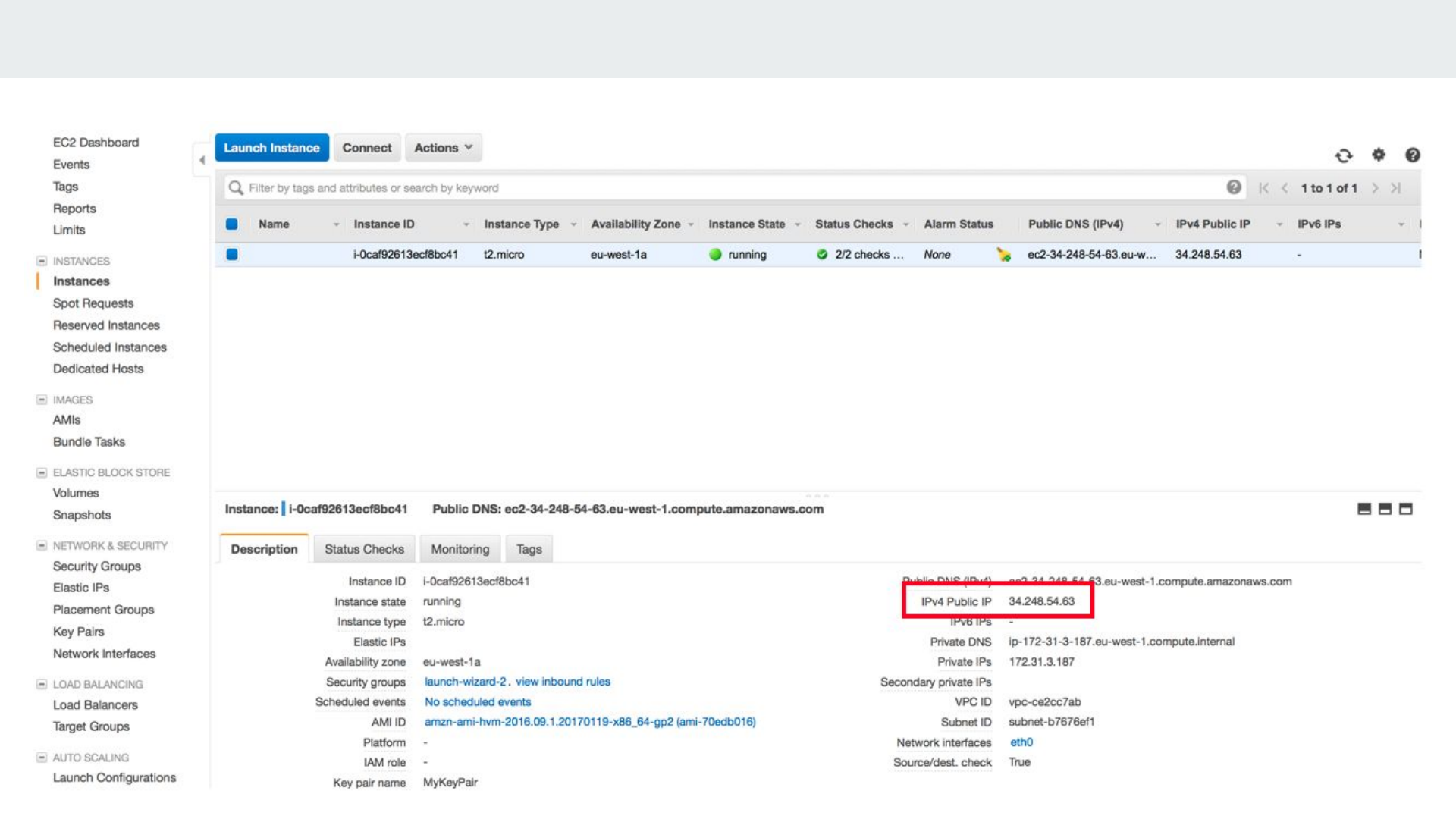
Here are some helpful resources to get you started

- How to connect to your Linux instance
- Learn about AWS Free Usage Tier
- Amazon EC2: User Guide
- Amazon EC2: Discussion Forum

While your instances are launching you can also

- Create status check alarms to be notified when these instances fail status checks. (Additional charges may apply)
- Create and attach additional EBS volumes (Additional charges may apply)
- Manage security groups

View Instances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Tags
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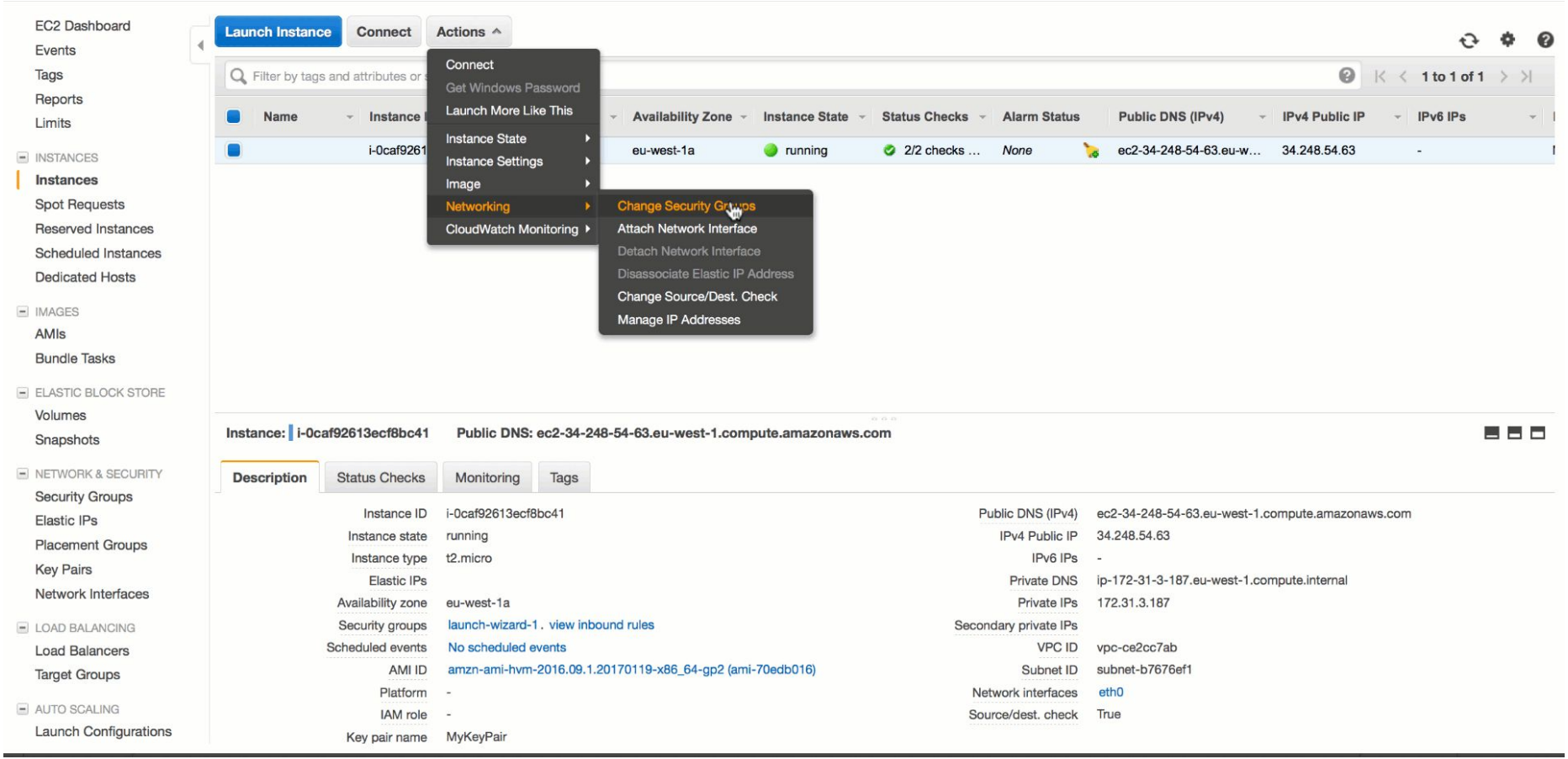
AUTO SCALING
Launch Configurations
Launch Instance
Connect
Actions
Filter by tags and attributes or search by keyword
1 to 1 of 1
Name
Instance ID
Instance Type
Availability Zone
Instance State
Status Checks
Alarm Status
Public DNS (IPv4)
IPv4 Public IP
IPv6 IPs
i-0caf92613ecf8bc41
t2.micro
eu-west-1a
running
2/2 checks ...
None
ec2-34-248-54-63.eu-w...
34.248.54.63
-
Instance: i-0caf92613ecf8bc41
Public DNS: ec2-34-248-54-63.eu-west-1.compute.amazonaws.com
Description
Status Checks
Monitoring
Tags
Instance ID
i-0caf92613ecf8bc41
Instance state
running
Instance type
t2.micro
Elastic IPs
Availability zone
eu-west-1a
Security groups
launch-wizard-2. view inbound rules
Scheduled events
No scheduled events
AMI ID
amzn-ami-hvm-2016.09.1.20170119-x86_64-gp2 (ami-70edb016)
Platform
-
IAM role
-
Key pair name
MyKeyPair
Public DNS (IPv4)
ec2-34-248-54-63.eu-west-1.compute.amazonaws.com
IPv4 Public IP
34.248.54.63
IPv6 IPs
-
Private DNS
ip-172-31-3-187.eu-west-1.compute.internal
Private IPs
172.31.3.187
Secondary private IPs
VPC ID
vpc-ce2cc7ab
Subnet ID
subnet-b7676ef1
Network interfaces
eth0
Source/dest. check
True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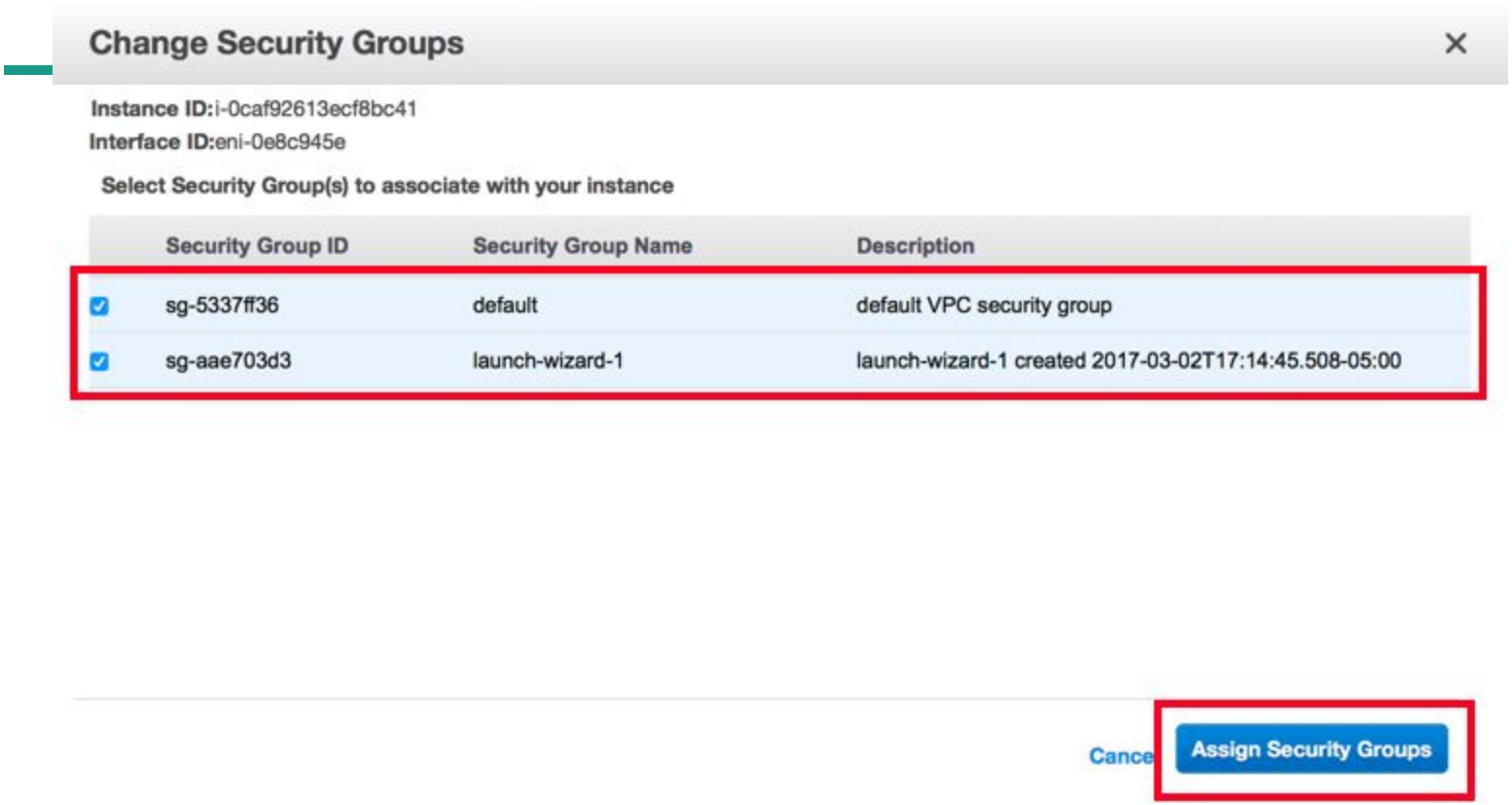
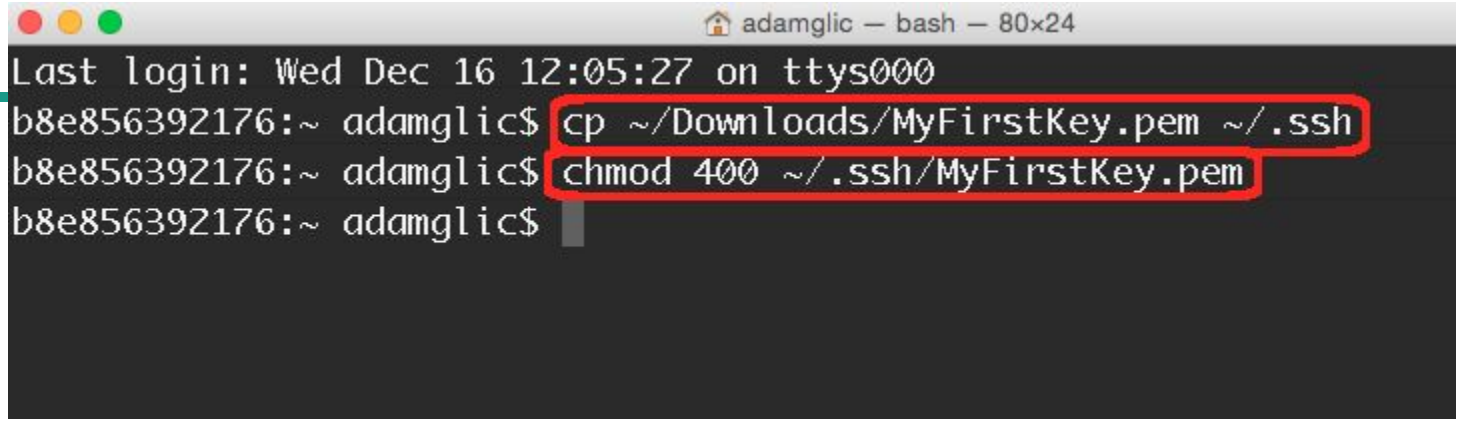
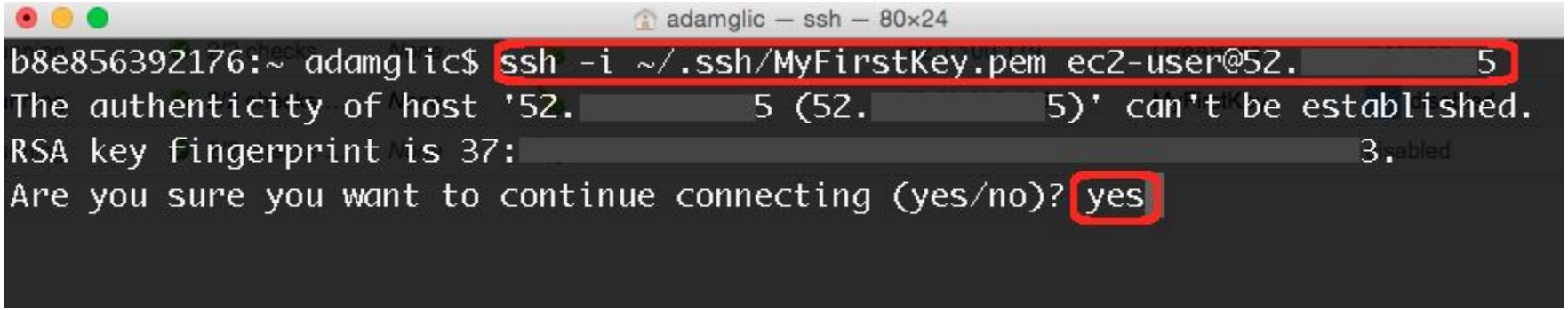
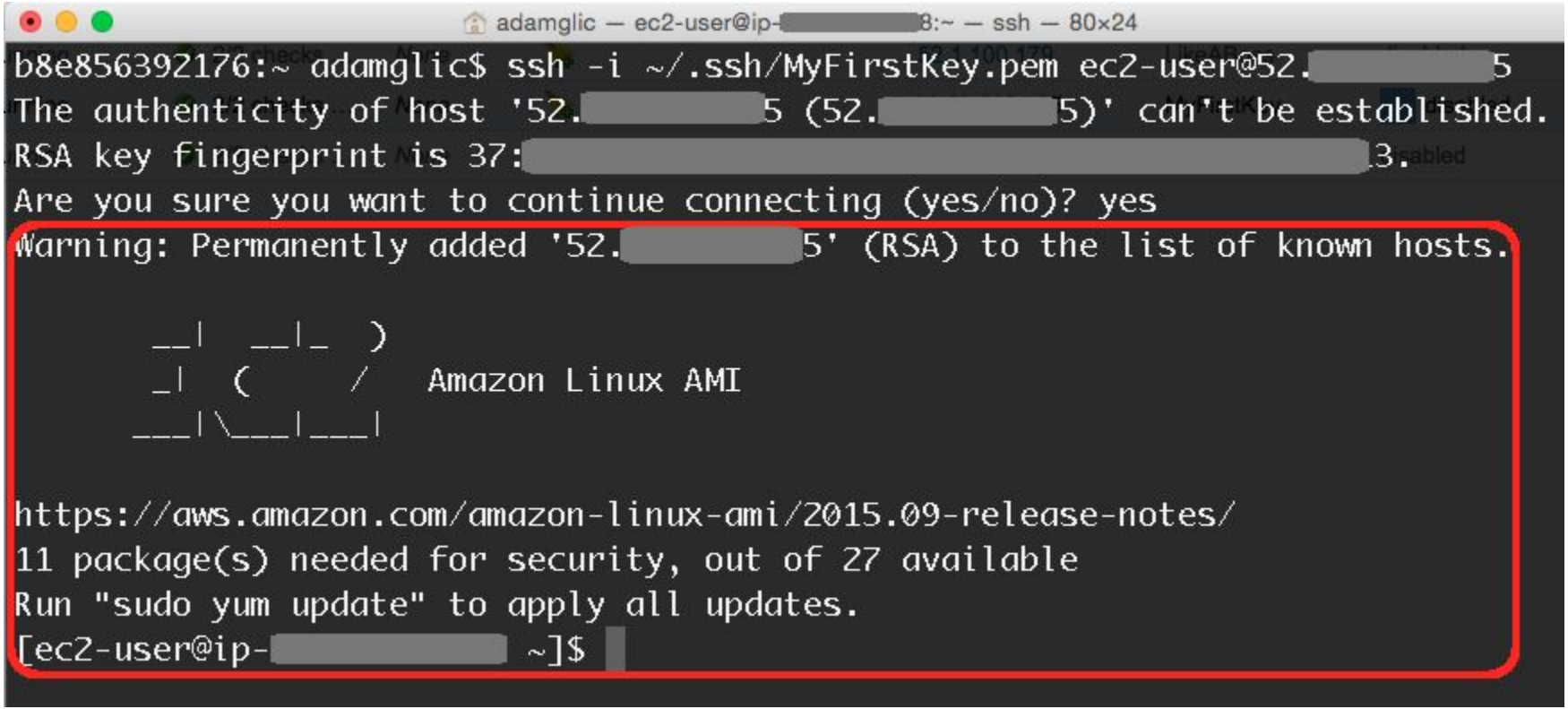
Load Balancers
Target Groups
AUTO SCALING
Launch Configurations
Launch Instance
Connect
Actions
Connect
Get Windows Password
Launch More Like This
Instance State
Instance Settings
Image
Networking
CloudWatch Monitoring
Change Security Groups
Attach Network Interface
Detach Network Interface
Disassociate Elastic IP Address
Change Source/Dest. Check
Manage IP Addresses
Filter by tags and attributes or
1 to 1 of 1
Name
Availability Zone
Instance State
Status Checks
Alarm Status
Public DNS (IPv4)
IPv4 Public IP
IPv6 IPs
i-0caf9261
eu-west-1a
running
2/2 checks ...
None
ec2-34-248-54-63.eu-w...
34.248.54.63
-
Instance: i-0caf92613ecf8bc41
Public DNS: ec2-34-248-54-63.eu-west-1.compute.amazonaws.com
Description
Status Checks
Monitoring
Tags
Instance ID
i-0caf92613ecf8bc41
Instance state
running
Instance type
t2.micro
Elastic IPs
Availability zone
eu-west-1a
Security groups
launch-wizard-1. view inbound rules
Scheduled events
No scheduled events
AMI ID
amzn-ami-hvm-2016.09.1.20170119-x86_64-gp2 (ami-70edb016)
Platform
-
IAM role
-
Key pair name
MyKeyPair
Public DNS (IPv4)
ec2-34-248-54-63.eu-west-1.compute.amazonaws.com
IPv4 Public IP
34.248.54.63
IPv6 IPs
-
Private DNS
ip-172-31-3-187.eu-west-1.compute.internal
Private IPs
172.31.3.187
Secondary private IPs
VPC ID
vpc-ce2cc7ab
Subnet ID
subnet-b7676ef1
Network interfaces
eth0
Source/dest. check
True


Change Security Groups
Instance ID:i-0caf92613ecf8bc41
Interface ID:eni-0e8c945e
Select Security Group(s) to associate with your instance
Security Group ID
Security Group Name
Description
sg-5337ff36
default
default VPC security group
sg-aae703d3
launch-wizard-1
launch-wizard-1 created 2017-03-02T17:14:45.508-05:00
Cance
Assign Security Groups


adamglic — bash — 80×24
Last login: Wed Dec 16 12:05:27 on ttys000
b8e856392176:~ adamglic$ cp ~/Downloads/MyFirstKey.pem ~/.ssh
b8e856392176:~ adamglic$ chmod 400 ~/.ssh/MyFirstKey.pem
b8e856392176:~ adamglic$


adamglic — ssh — 80×24
b8e856392176:~ adamglic$ ssh -i ~/.ssh/MyFirstKey.pem ec2-user@52.
5
The authenticity of host '52.
5 (52.
5)' can't be established.
RSA key fingerprint is 37:
3.
Are you sure you want to continue connecting (yes/no)? yes


adamglic — ec2-user@ip- 8:~ — ssh — 80×24
b8e856392176:~ adamglic$ ssh -i ~/.ssh/MyFirstKey.pem ec2-user@52. 5
The authenticity of host '52. 5 (52. 5)' can't be established.
RSA key fingerprint is 37: 3.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '52. 5' (RSA) to the list of known hosts.
__| __|_)
_| (/ Amazon Linux AMI
___|___|___|
https://aws.amazon.com/amazon-linux-ami/2015.09-release-notes/
11 package(s) needed for security, out of 27 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip- ~]$

File systems

File systems

Create file system | Actions

	Name	File system ID	Metered size	Number of mount targets	Creation date
◉		fs-534e8f9a	6.0 KiB	3	2017-03-03T05:35:51Z

Other details

Owner ID 755558867027
Life cycle state Available
Performance mode General Purpose

Tags

Manage tags

No tags added

File system access

Manage file system access

DNS name fs-534e8f9a.efs.eu-west-1.amazonaws.com

Amazon EC2 mount instructions
AWS Direct Connect mount instructions

Mount targets

VPC	Availability Zone	Subnet	IP address	Mount target ID	Network interface ID	Security groups	Life cycle state
vpc-ce2cc7ab (default)	eu-west-1a	subnet-b7676ef1 (default)	172.31.0.84	fsmt-480cc081	eni-29697279	sg-5337ff36 - default	Available
	eu-west-1c	subnet-c08a61b7 (default)	172.31.41.62	fsmt-4a0cc083	eni-d67f7797	sg-5337ff36 - default	Available
	eu-west-1b	subnet-2eea264b (default)	172.31.23.206	fsmt-4b0cc082	eni-53fb512c	sg-5337ff36 - default	Available

Amazon EC2 mount instructions

Setting up your EC2 instance

1. Using the Amazon EC2 console, associate your EC2 instance with a VPC security group that enables access to your mount target. For example, if you assigned the "default" security group to your mount target, you should assign the "default" security group to your EC2 instance. Learn more
2. Open an SSH client and connect to your EC2 instance. (find out how to connect)
3. Install the nfs client on your EC2 instance.
   - On an Amazon Linux, Red Hat Enterprise Linux, or SuSE Linux instance:
     ```
     sudo yum install -y nfs-utils
     ```
   - On an Ubuntu instance:
     ```
     sudo apt-get install nfs-common
     ```

Mounting your file system

1. Open an SSH client and connect to your EC2 instance. (find out how to connect)
2. Create a new directory on your EC2 instance, such as "efs".
   - `sudo mkdir efs`
3. Mount your file system using the DNS name. Mounting considerations

Close

Amazon EC2 mount instructions

group to your EC2 instance. Learn more

2. Open an SSH client and connect to your EC2 instance. (find out how to connect)
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   - On an Amazon Linux, Red Hat Enterprise Linux, or SuSE Linux instance:

     ```
     sudo yum install -y nfs-utils
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   - On an Ubuntu instance:

     ```
     sudo apt-get install nfs-common
     ```

Mounting your file system

1. Open an SSH client and connect to your EC2 instance. (find out how to connect)
2. Create a new directory on your EC2 instance, such as "efs".
   - `sudo mkdir efs`
3. Mount your file system using the DNS name. Mounting considerations
   - `sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2`

     `fs-ee498827.efs.eu-west-1.amazonaws.com:/ efs`

If you are unable to connect, please see our troubleshooting documentation.

Close

```
[redacted]:~ [redacted]$ ssh -i ~/.ssh/MyKeyPair.pem ec2-user@34.248.54.63
The authenticity of host '34.248.54.63 (34.248.54.63)' can't be established.
ECDSA key fingerprint is SHA256:[redacted].
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '34.248.54.63' (ECDSA) to the list of known hosts.

       __|  __|_  )
       _|  (     /   Amazon Linux AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-ami/2016.09-release-notes/
4 package(s) needed for security, out of 8 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-3-187 ~]$     sudo mkdir efs
[ec2-user@ip-172-31-3-187 ~]$
```

Amazon EC2 mount instructions

group to your EC2 instance. Learn more

2. Open an SSH client and connect to your EC2 instance. (find out how to connect)
3. Install the nfs client on your EC2 instance.
   - On an Amazon Linux, Red Hat Enterprise Linux, or SuSE Linux instance:

     ```
     sudo yum install -y nfs-utils
     ```

   - On an Ubuntu instance:

     ```
     sudo apt-get install nfs-common
     ```

Mounting your file system

1. Open an SSH client and connect to your EC2 instance. (find out how to connect)
2. Create a new directory on your EC2 instance, such as "efs".
   - `sudo mkdir efs`
3. Mount your file system using the DNS name. Mounting considerations
   - `sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,timeo=600,retrans=2 fs-ee498827.efs.eu-west-1.amazonaws.com:/ efs`

If you are unable to connect, please see our troubleshooting documentation.

Close

```
[redacted]:~ [redacted]$ ssh -i ~/.ssh/MyKeyPair.pem ec2-user@34.248.54.63
The authenticity of host '34.248.54.63 (34.248.54.63)' can't be established.
ECDSA key fingerprint is SHA256:[redacted].
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '34.248.54.63' (ECDSA) to the list of known hosts.

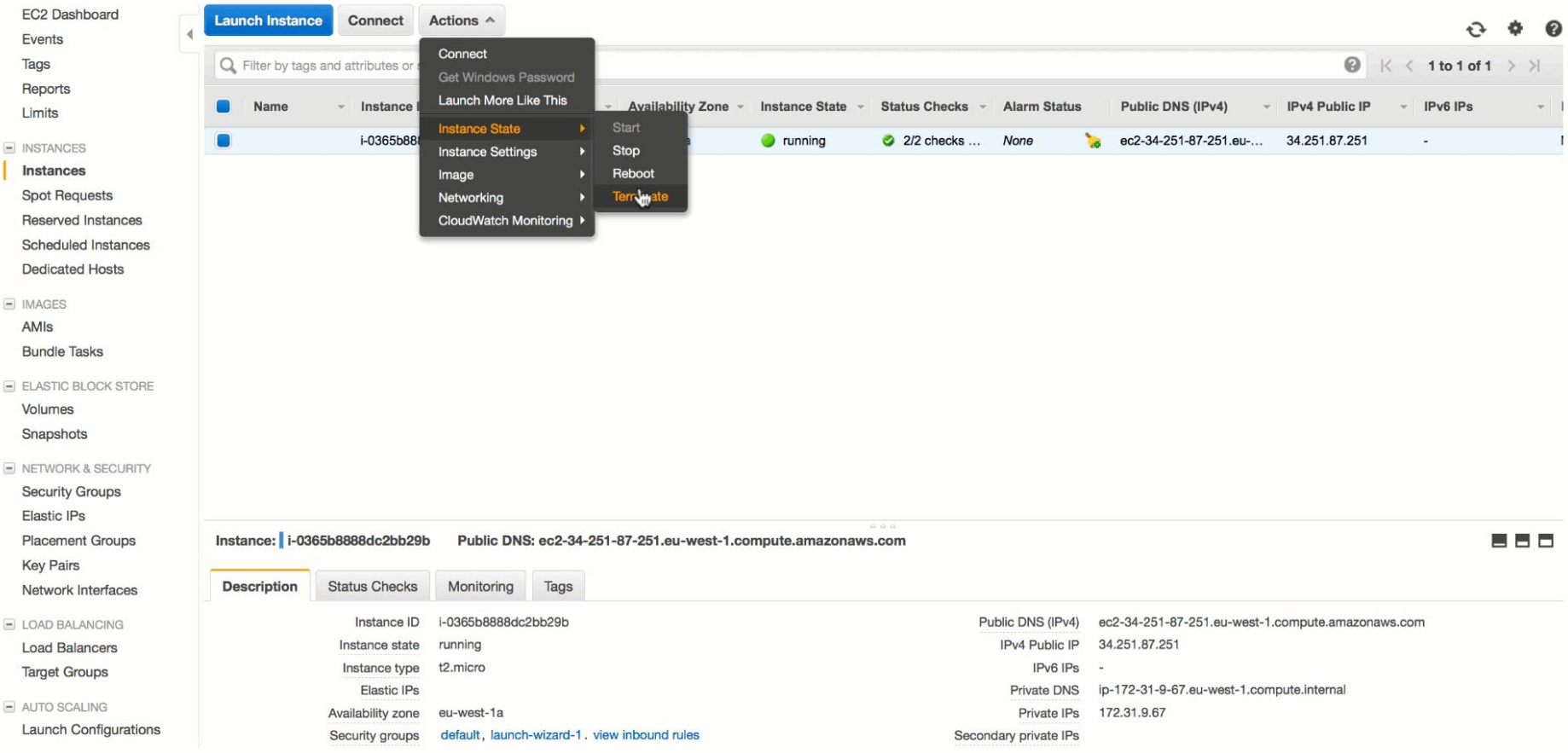
       __|  __|_  )
       _|  (     /   Amazon Linux AMI
      ___|\___|___|

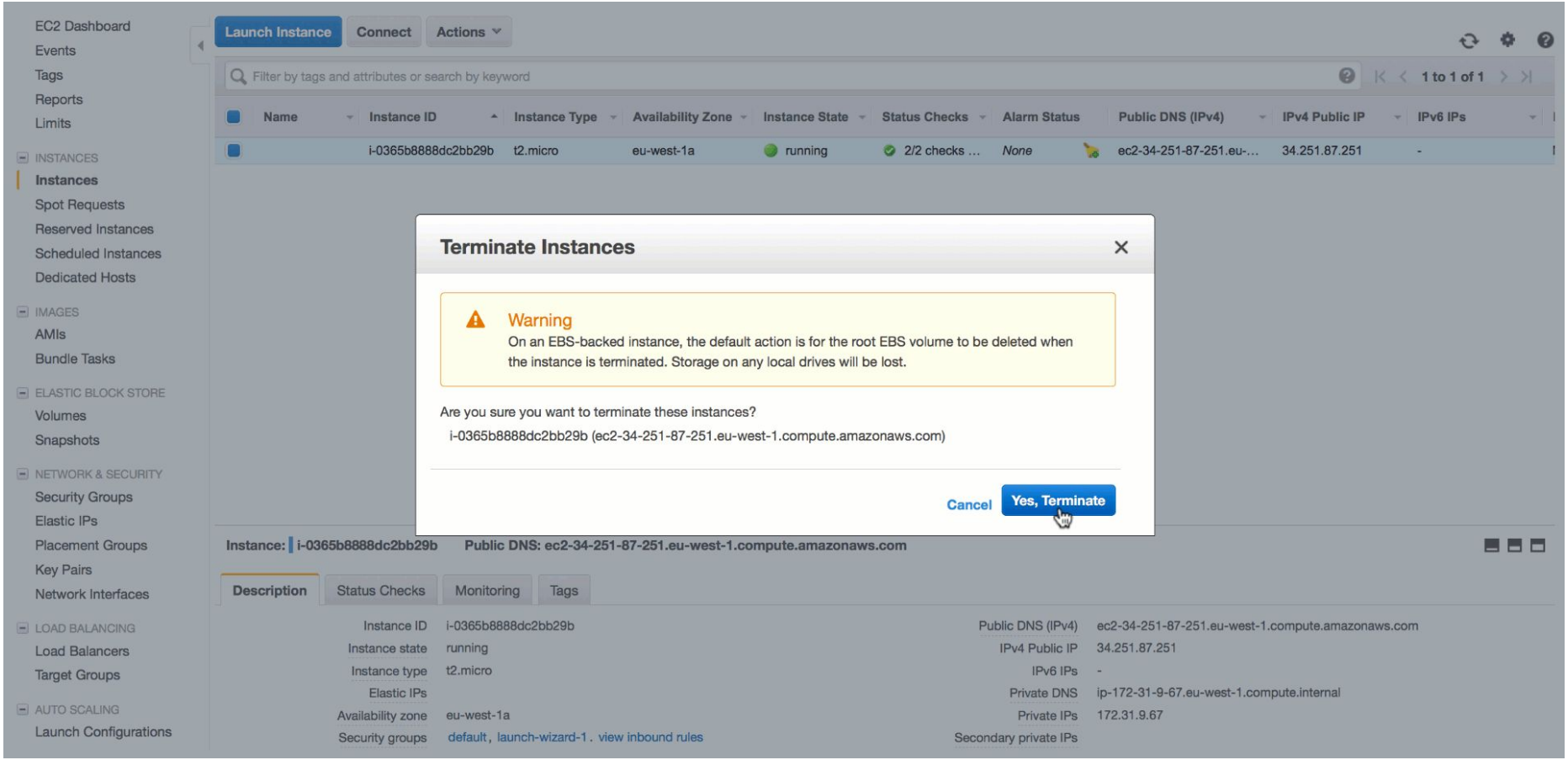
https://aws.amazon.com/amazon-linux-ami/2016.09-release-notes/
4 package(s) needed for security, out of 8 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-3-187 ~]$     sudo mkdir efs
[ec2-user@ip-172-31-3-187 ~]$     sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,
timeo=600,retrans=2 fs-534e8f9a.efs.eu-west-1.amazonaws.com:/ efs
[ec2-user@ip-172-31-3-187 ~]$
```

```
[redacted]:~ [redacted]$ ssh -i ~/.ssh/MyKeyPair.pem ec2-user@34.248.54.63
The authenticity of host '34.248.54.63 (34.248.54.63)' can't be established.
ECDSA key fingerprint is SHA256:[redacted].
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '34.248.54.63' (ECDSA) to the list of known hosts.

       __|  __|_  )
       _|  (     /   Amazon Linux AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-ami/2016.09-release-notes/
4 package(s) needed for security, out of 8 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-3-187 ~]$     sudo mkdir efs
[ec2-user@ip-172-31-3-187 ~]$     sudo mount -t nfs4 -o nfsvers=4.1,rsize=1048576,wsize=1048576,hard,
timeo=600,retrans=2 fs-534e8f9a.efs.eu-west-1.amazonaws.com:/ efs
[ec2-user@ip-172-31-3-187 ~]$ df -h
Filesystem                                Size  Used Avail Use% Mounted on
devtmpfs                                  488M   60K  488M   1% /dev
tmpfs                                     498M     0  498M   0% /dev/shm
/dev/xvda1                                7.8G  986M  6.7G  13% /
fs-534e8f9a.efs.eu-west-1.amazonaws.com:/  8.0E     0  8.0E   0% /home/ec2-user/efs
[ec2-user@ip-172-31-3-187 ~]$
```


EC2 Dashboard
Events
Tags
Reports
Limits
INSTANCES
Instances
Spot Requests
Reserved Instances
Scheduled Instances
Dedicated Hosts
IMAGES
AMIs
Bundle Tasks
ELASTIC BLOCK STORE
Volumes
Snapshots
NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
LOAD BALANCING
Load Balancers
Target Groups
AUTO SCALING
Launch Configurations
Launch Instance
Connect
Actions
Connect
Get Windows Password
Launch More Like This
Instance State
Instance Settings
Image
Networking
CloudWatch Monitoring
Start
Stop
Reboot
Terminate
Filter by tags and attributes or
1 to 1 of 1
Name
Availability Zone
Instance State
Status Checks
Alarm Status
Public DNS (IPv4)
IPv4 Public IP
IPv6 IPs
running
2/2 checks ...
None
ec2-34-251-87-251.eu-...
34.251.87.251
-
Instance: i-0365b8888dc2bb29b
Public DNS: ec2-34-251-87-251.eu-west-1.compute.amazonaws.com
Description
Status Checks
Monitoring
Tags
Instance ID
i-0365b8888dc2bb29b
Instance state
running
Instance type
t2.micro
Elastic IPs
Availability zone
eu-west-1a
Security groups
default, launch-wizard-1. view inbound rules
Public DNS (IPv4)
ec2-34-251-87-251.eu-west-1.compute.amazonaws.com
IPv4 Public IP
34.251.87.251
IPv6 IPs
-
Private DNS
ip-172-31-9-67.eu-west-1.compute.internal
Private IPs
172.31.9.67
Secondary private IPs


EC2 Dashboard
Events
Tags
Reports
Limits
INSTANCES
Instances
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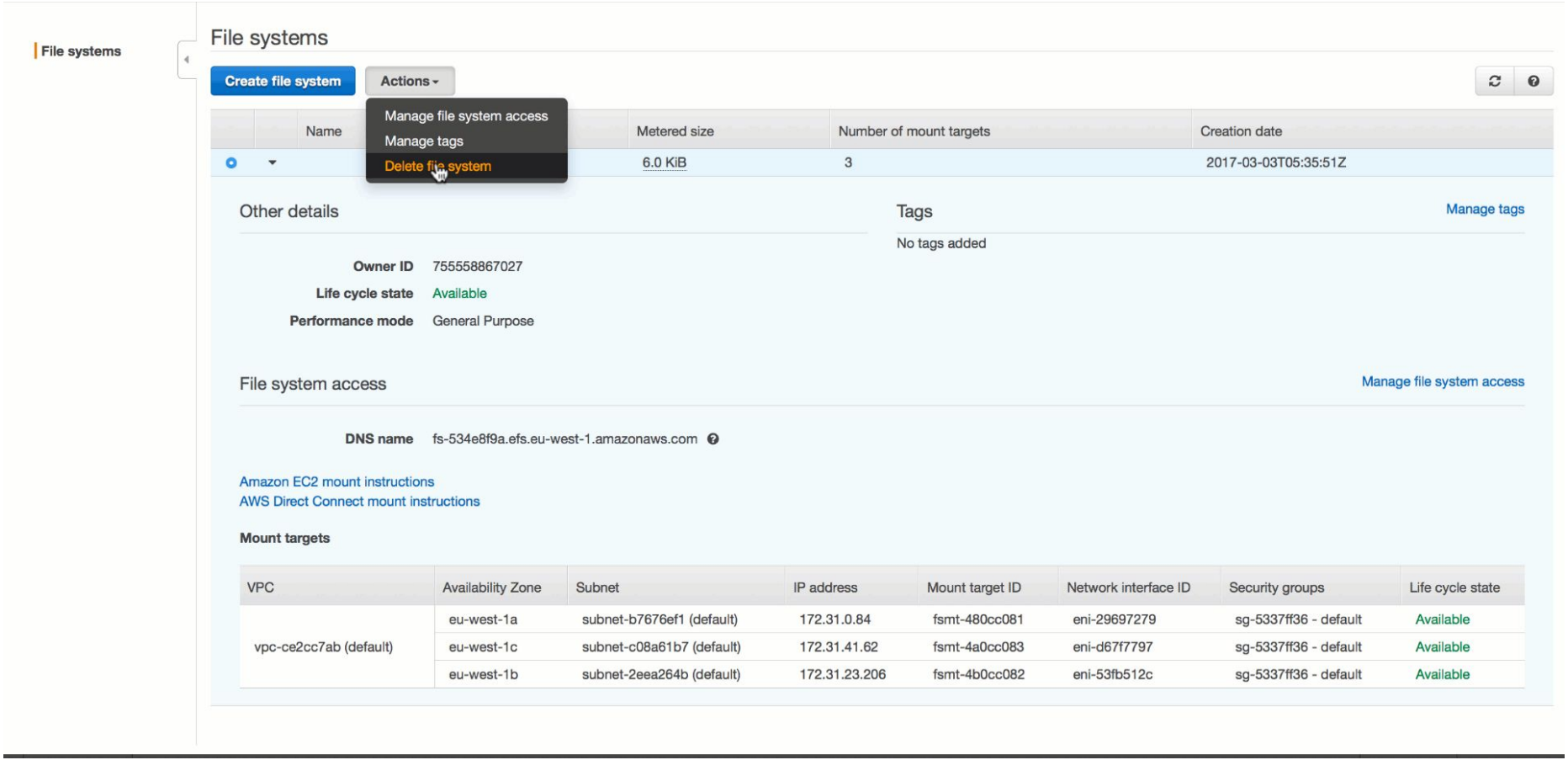
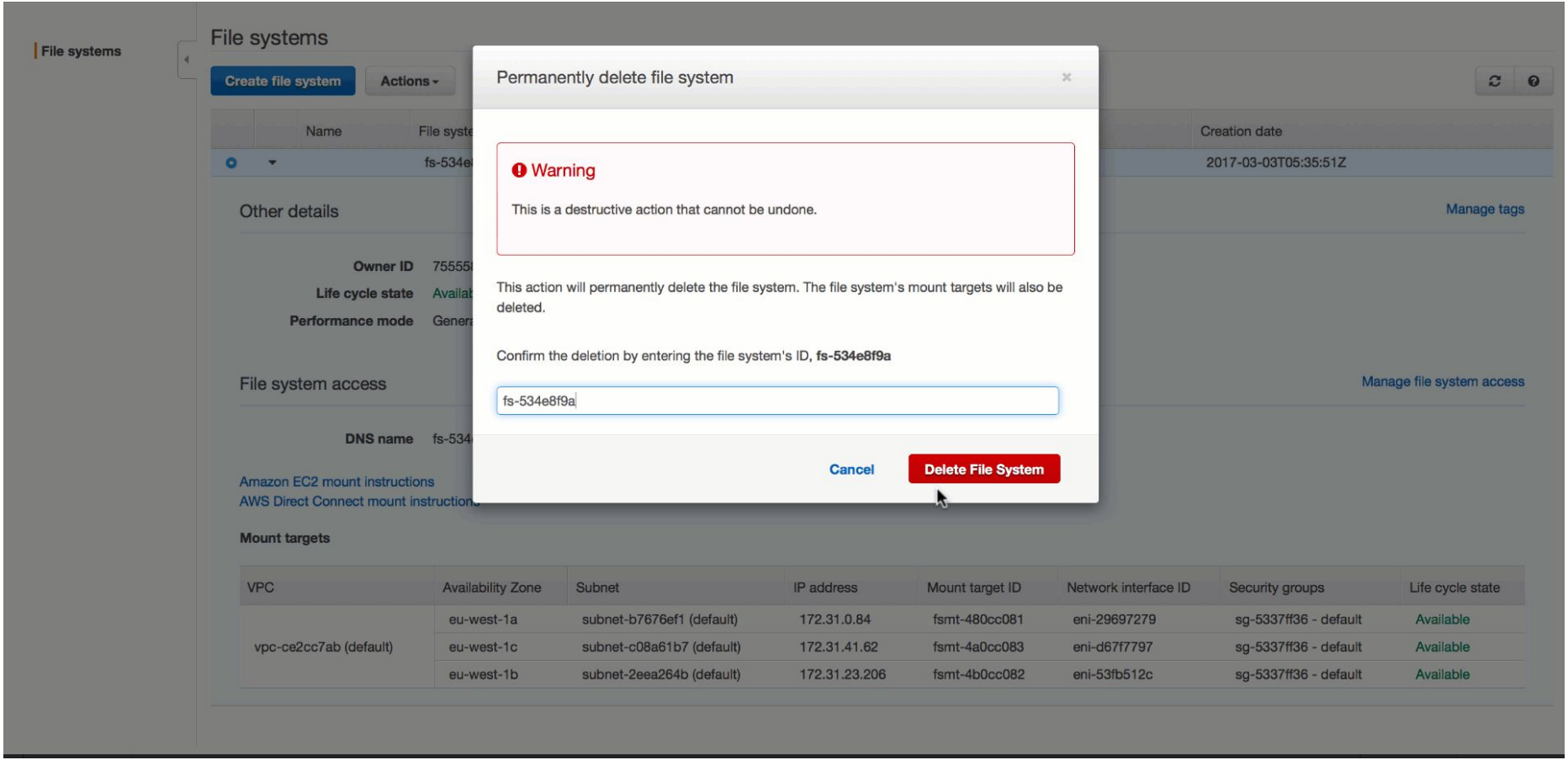
IMAGES
AMIs
Bundle Tasks
ELASTIC BLOCK STORE
Volumes
Snapshots
NETWORK & SECURITY
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
LOAD BALANCING
Load Balancers
Target Groups
AUTO SCALING
Launch Configurations
Launch Instance
Connect
Actions
Filter by tags and attributes or search by keyword
1 to 1 of 1
Name
Instance ID
Instance Type
Availability Zone
Instance State
Status Checks
Alarm Status
Public DNS (IPv4)
IPv4 Public IP
IPv6 IPs
i-0365b8888dc2bb29b
t2.micro
eu-west-1a
running
2/2 checks ...
None
ec2-34-251-87-251.eu-...
34.251.87.251
-
Terminate Instances
Warning
On an EBS-backed instance, the default action is for the root EBS volume to be deleted when the instance is terminated. Storage on any local drives will be lost.
Are you sure you want to terminate these instances?
i-0365b8888dc2bb29b (ec2-34-251-87-251.eu-west-1.compute.amazonaws.com)
Cancel
Yes, Terminate
Instance: i-0365b8888dc2bb29b
Public DNS: ec2-34-251-87-251.eu-west-1.compute.amazonaws.com
Description
Status Checks
Monitoring
Tags
Instance ID
i-0365b8888dc2bb29b
Instance state
running
Instance type
t2.micro
Elastic IPs
Availability zone
eu-west-1a
Security groups
default, launch-wizard-1. view inbound rules
Public DNS (IPv4)
ec2-34-251-87-251.eu-west-1.compute.amazonaws.com
IPv4 Public IP
34.251.87.251
IPv6 IPs
-
Private DNS
ip-172-31-9-67.eu-west-1.compute.internal
Private IPs
172.31.9.67
Secondary private IPs


File systems
File systems
Create file system
Actions
Manage file system access
Manage tags
Delete file system
Name
Metered size
Number of mount targets
Creation date
6.0 KiB
3
2017-03-03T05:35:51Z
Other details
Owner ID 755558867027
Life cycle state Available
Performance mode General Purpose
Tags
Manage tags
No tags added
File system access
Manage file system access
DNS name fs-534e8f9a.efs.eu-west-1.amazonaws.com
Amazon EC2 mount instructions
AWS Direct Connect mount instructions
Mount targets
VPC
Availability Zone
Subnet
IP address
Mount target ID
Network interface ID
Security groups
Life cycle state
vpc-ce2cc7ab (default)
eu-west-1a subnet-b7676ef1 (default) 172.31.0.84 fsmt-480cc081 eni-29697279 sg-5337ff36 - default Available
eu-west-1c subnet-c08a61b7 (default) 172.31.41.62 fsmt-4a0cc083 eni-d67f7797 sg-5337ff36 - default Available
eu-west-1b subnet-2eea264b (default) 172.31.23.206 fsmt-4b0cc082 eni-53fb512c sg-5337ff36 - default Available


File systems
File systems
Create file system
Actions
Name
File syste
Creation date
fs-534e
2017-03-03T05:35:51Z
Other details
Manage tags
Owner ID
Life cycle state
Performance mode
File system access
Manage file system access
DNS name
Amazon EC2 mount instructions
AWS Direct Connect mount instruction
Mount targets
VPC
Availability Zone
Subnet
IP address
Mount target ID
Network interface ID
Security groups
Life cycle state
vpc-ce2cc7ab (default)
eu-west-1a
subnet-b7676ef1 (default)
172.31.0.84
fsmt-480cc081
eni-29697279
sg-5337ff36 - default
Available
eu-west-1c
subnet-c08a61b7 (default)
172.31.41.62
fsmt-4a0cc083
eni-d67f7797
sg-5337ff36 - default
Available
eu-west-1b
subnet-2eea264b (default)
172.31.23.206
fsmt-4b0cc082
eni-53fb512c
sg-5337ff36 - default
Available
Permanently delete file system
Warning
This is a destructive action that cannot be undone.
This action will permanently delete the file system. The file system's mount targets will also be deleted.
Confirm the deletion by entering the file system's ID, fs-534e8f9a
fs-534e8f9a
Cancel
Delete File System

BIBLIOGRAFÍA

Documentación de Amazon Elastic File System. Archivo PDF recuperado de: https://docs.aws.amazon.com/es_es/efs/latest/ug/whatisefs.html el 12 de mayo de 2019.

Tanenbaum A. S. (2008). *Sistemas de ficheros distribuidos. Principios y Paradigmas.* Segunda Edición. México: Pearson.

Documentación de Gluster File System. Archivo PDF recuperado de: https://docs.gluster.org/en/latest/Quick-Start-Guide/Architecture/ el 13 de mayo del 2019.

Weil S. A., Brandt S. A., Miller E. L., Long D. D. E. (2007). *Ceph: A Scalable, High-Performance Distributed File System*. Santa Cruz: University of California.

D'Atri A., Bhembre V. Singh K. (2017). *Learning Ceph: Unified, scalable, and reliable open source storage solution.* Segunda Edición. UK: Packt Publishing.

Red Hat Inc. (2016). *RED HAT CEPH STORAGE*. Archivo PDF recuperado de: https://www.redhat.com/cms/managed-files/st-ceph-storage-datasheet-inc0399312lw-201605-es-a4.pdf el 14 de mayo de 2019.

Documentación de Ceph. *Ceph: Architecture*. Sitio web disponible en : http://docs.ceph.com/docs/master/architecture/ consultado el 15 de mayo de 2019.

Jones T. (2010). Ceph: A Linux petabyte-scale distributed file system. Archivo PDF recuperado de: https://www.ibm.com/developerworks/linux/library/l-ceph/l-ceph-pdf.pdf el 15 de mayo de 2019.