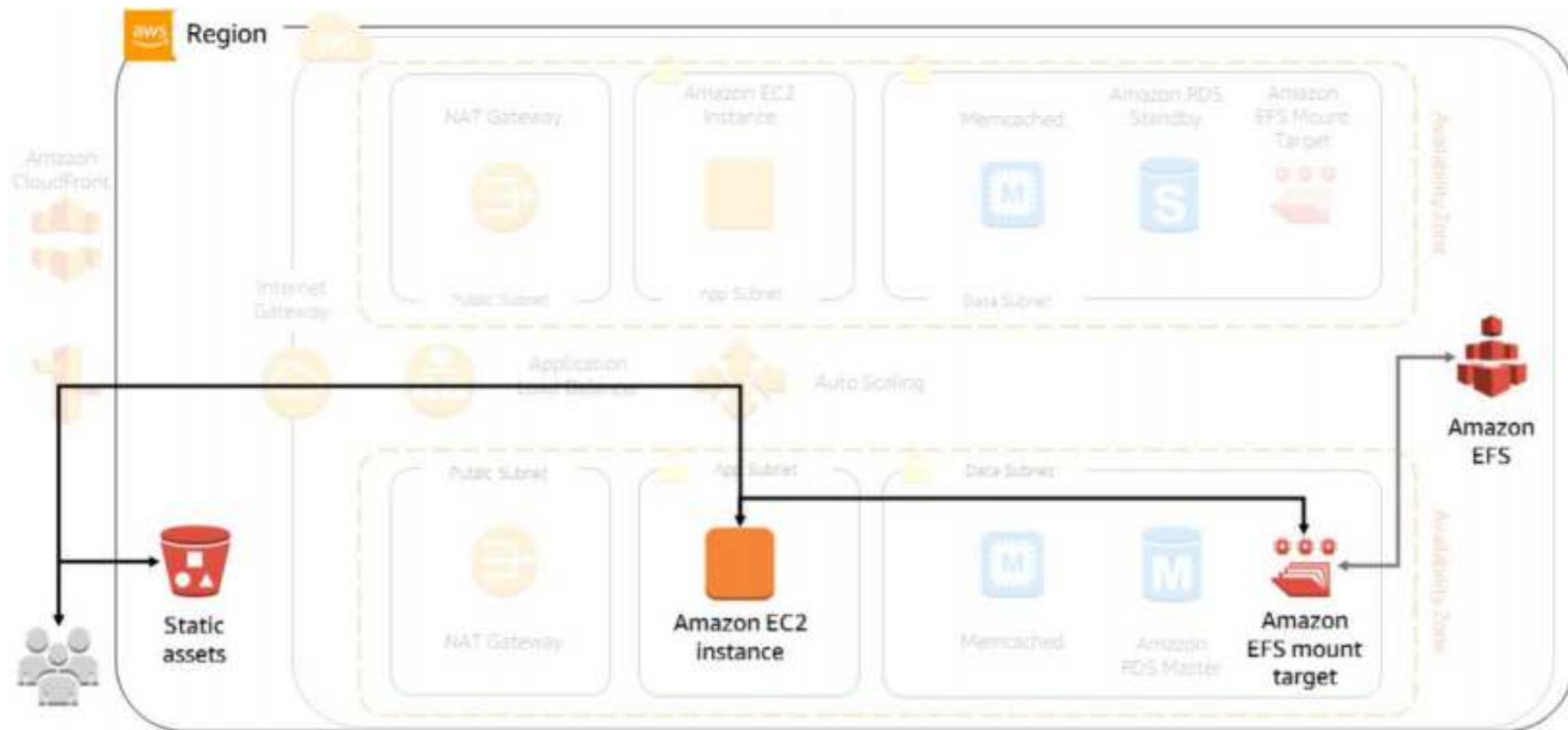


2.3

Capa de computación EC2

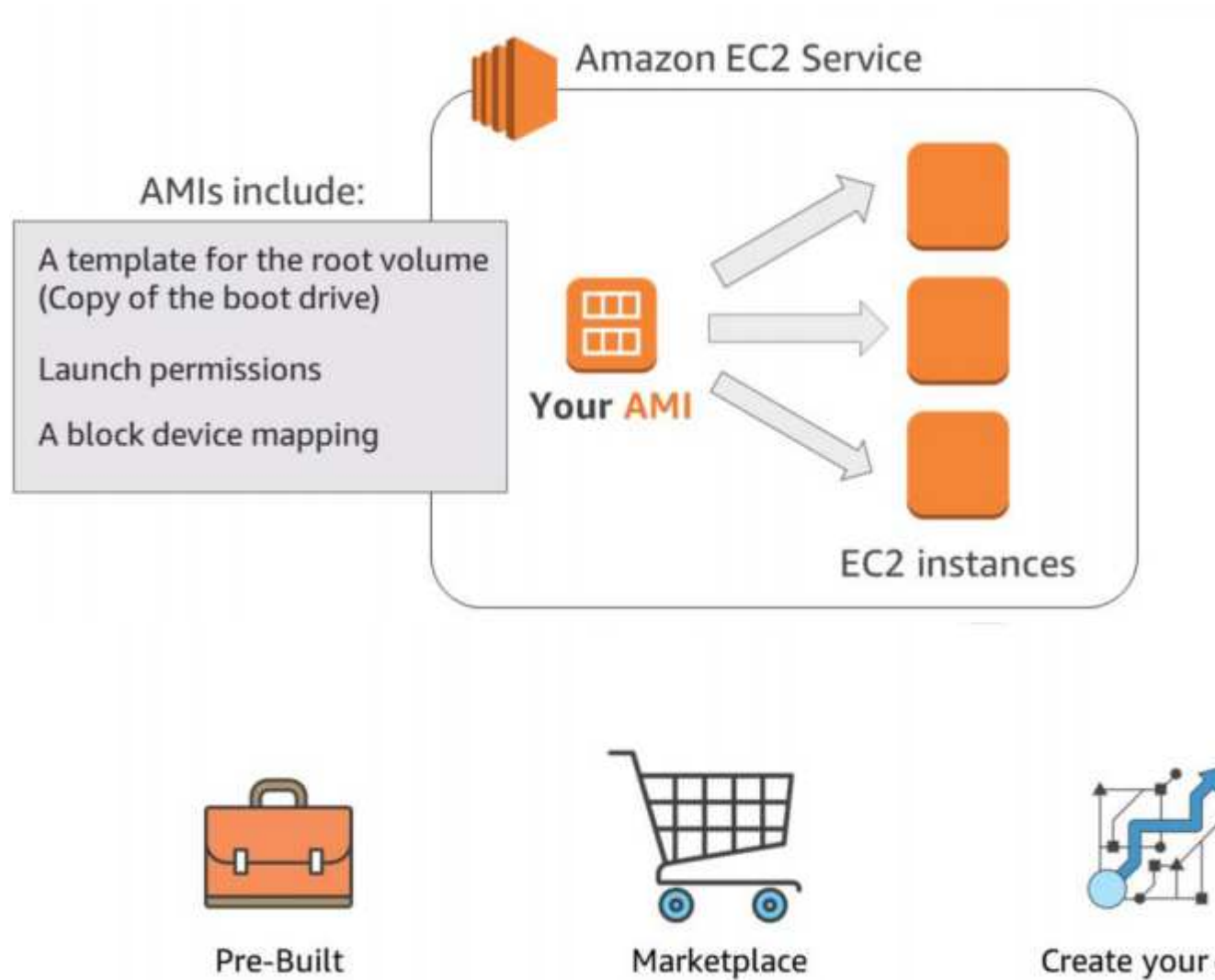
2.3 Capa de computación EC2



2.3 Capa de computación EC2

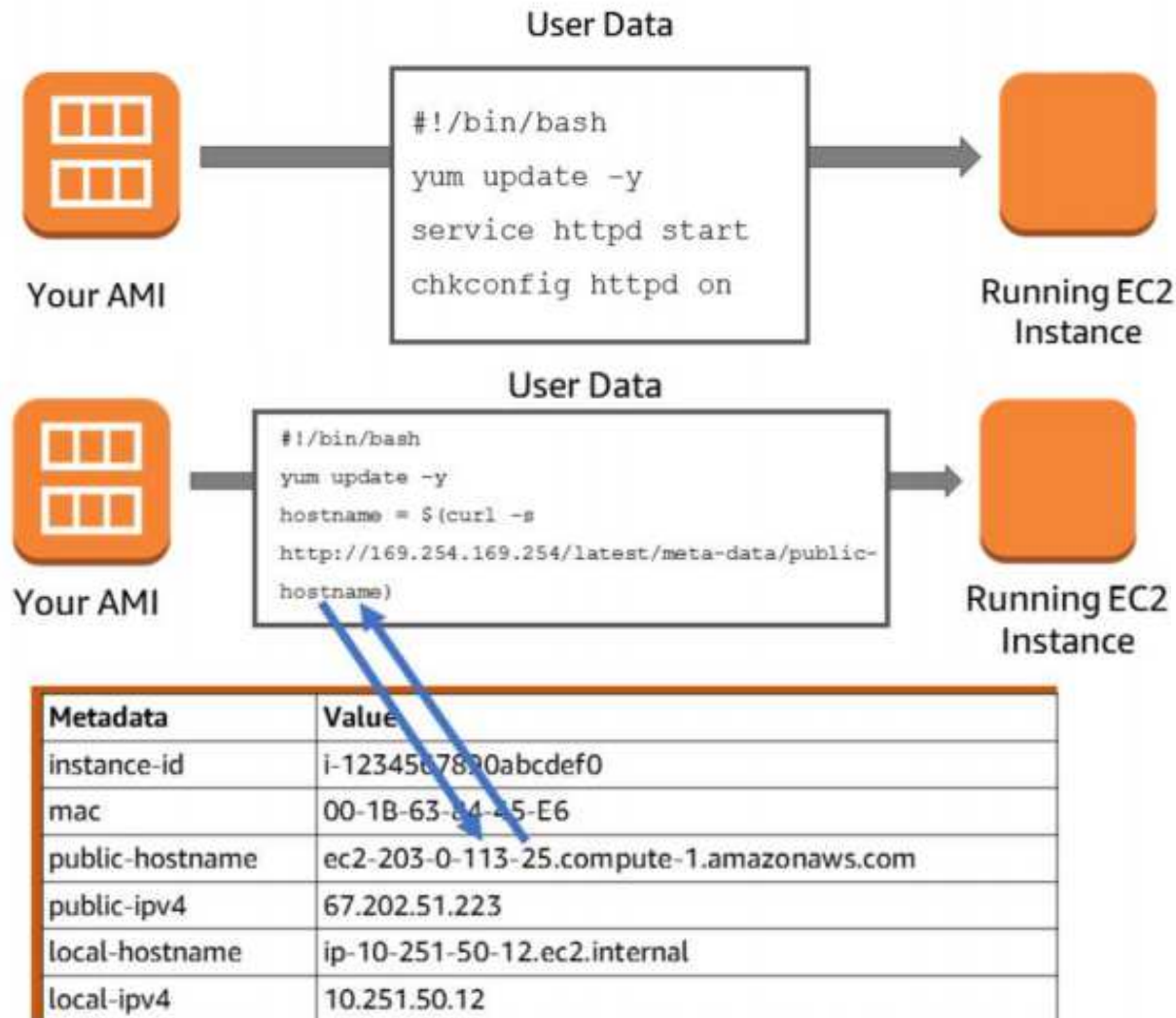


2.3 Capa de computación EC2



2.3 Capa de computación EC2

- Utilizando Script de arranque cloud-init



2.3 Capa de computación EC2

- Tipo de Almacenamiento



Application needs
block level storage



Instance storage is
ephemeral



Need data to persist
through shutdowns



Need to be able to
back up data volumes

Solid-State Backed

Volume Type	General Purpose SSD	Provisioned IOPS SSD
Description	General purpose SSD volume that balances price and performance for a wide variety of workloads	Highest-performance SSD volume for mission-critical low-latency or high-throughput workloads
Use Cases	<ul style="list-style-type: none"> Recommended for most workloads 	<ul style="list-style-type: none"> Critical business applications that require sustained IOPS performance Large database workloads

Hard-Disk Backed

Volume Type	Throughput Optimized HDD	Cold HDD
Description	Low cost HDD volume designed for frequently accessed, throughput-intensive workloads	Lowest cost HDD volume designed for less frequently accessed workloads
Use Cases	<ul style="list-style-type: none"> Streaming workloads Big data Data warehouses Log processing Cannot be a boot volume 	<ul style="list-style-type: none"> Throughput-oriented storage for large volumes of data that is infrequently accessed Scenarios where the lowest storage cost is important Cannot be a boot volume

2.3 Capa de computación EC2

- Y si quiero compartir datos entre instancias



Amazon EBS
only attaches to
one instance



Amazon S3 is
an option but
is not ideal



Amazon EFS and
FSx are perfect for
this task

Amazon EFS
(Linux Workloads)
NFSv4 file system

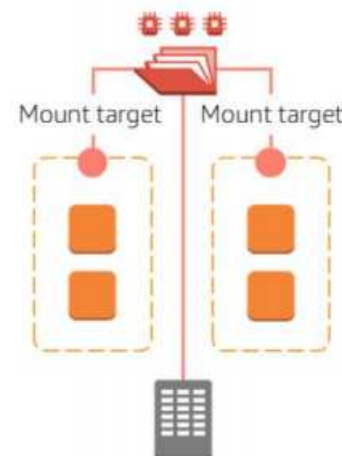
Shared Across

- Availability Zones
- Regions
- VPCs
- Account

Amazon FSx
(Windows Workloads)
NTFS file system

Shared Across

- Availability Zones

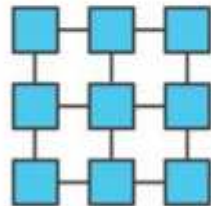


2.3 Capa de computación EC2

- Tipo de instancias

Choosing the correct type is very important for:

Efficient utilization of
your instances



Reducing
unnneeded cost



2.3 Capa de computación EC2

- Tipo de instancias

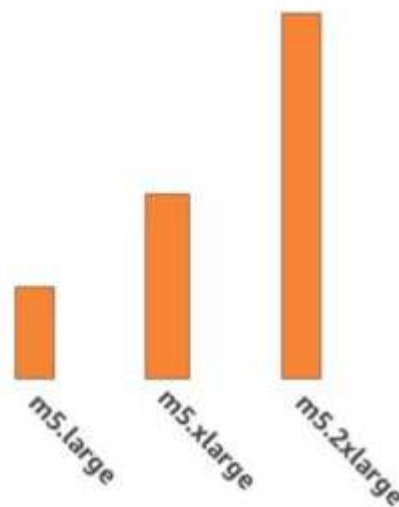
Type family	Member types	Focus
T	T2	Baseline general purpose (<i>burstable performance</i>) ^a
M	M3, M4	General purpose: balance between compute, memory, and network
C	C3, C4	Computer optimized: high-performance processors
X	X1	Memory optimized for enterprise-class, in-memory applications
R	R3, R4	Memory optimized for memory-intensive applications
P	P2	Graphics accelerated for GPU-intensive applications
G	G2	Graphics-heavy processing
F	F1	Hardware acceleration with field-programmable arrays (FPGAs)
I	I2, I3	Storage optimized: very fast storage volumes for efficient I/O operations
D	D2	Storage optimized: high disk throughput for very large data stores

2.3 Capa de computación EC2

- Tipos de instancias
 - Escalado vertical

Model	vCPU
m5.large	2
m5.xlarge	4
m5.2xlarge	8
m5.4xlarge	16
m5.12xlarge	48
m5.24xlarge	96

Scaling Vertically

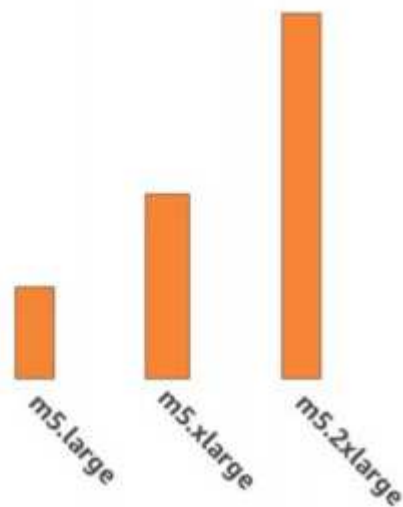


2.3 Capa de computación EC2

- Tipos de instancias
 - Escalado vertical

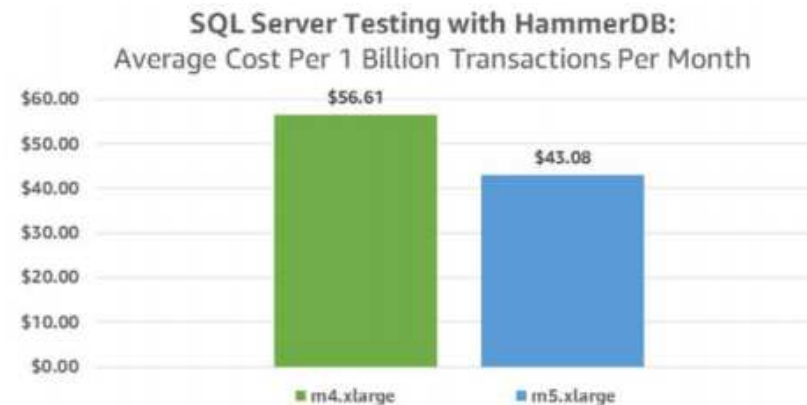
Model	vCPU
m5.large	2
m5.xlarge	4
m5.2xlarge	8
m5.4xlarge	16
m5.12xlarge	48
m5.24xlarge	96

Scaling Vertically



2.3 Capa de computación EC2

- Tipo de instancias
 - <https://aws.amazon.com/es/ec2/instance-types/>



2.3 Capa de computación EC2

- Opciones de compra de computación

On-Demand Instances



Reserved Instances

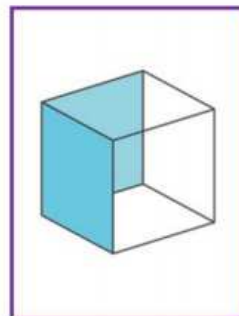


Spot Instances

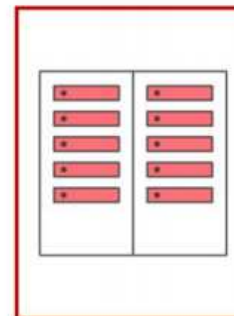


	On-demand	Reserved	Spot
Price	High	Medium	Low
Flexibility	High	Low	Medium
Reliability	Medium	High	Low

Dedicated Instances



Dedicated Hosts



2.3 Capa de computación EC2

- Casos de uso : Ejercicios
 - Cambio de tipo de instancia
 - Cambio de región de instancia
 - IP estática/elástica
 - Creación de servidor por puja
 - Monitorizando el servidor

2.3 Capa de computación EC2

- Ejercicio :Cambio de tipo de instancia, Cambio de región de instancia

The screenshot displays the AWS Management Console interface for an EC2 instance. The instance name is 'i-0ebc2bb3233b0b1cc' and its state is 'running'. The 'Actions' menu is open, showing options like 'Connect', 'Create Template From Instance', and 'Change Instance Type'. The 'Change Instance Type' option is highlighted, and a secondary menu on the right lists various AWS regions, with 'EE.UU. Este (Norte de Virginia)' selected.

Region
EE.UU. Este (Norte de Virginia)
EE.UU. Este (Ohio)
EE.UU. Oeste (Norte de California)
EE.UU. Oeste (Oregón)
Asia Pacífico (Hong Kong)
Asia Pacífico (Mumbai)
Asia Pacífico (Seúl)
Asia Pacífico (Singapur)
Asia Pacífico (Sídney)
Asia Pacífico (Tokio)
Canadá (Central)
UE (Fráncfort)
UE (Irlanda)
UE (Londres)
UE (París)
UE (Estocolmo)
Medio Oriente (Baréin)
América del Sur (São Paulo)

2.3 Capa de computación EC2

- Ejercicio : IP estática/elástica
 - Requiere un costo
 - Se crea la IP y luego se asigna

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces


Allocate new address **Actions**

Filter by tags and attributes or search by keyword


Name	Elastic IP	Allocation ID	Instance	Private IP address	Scope
	3.225.226.6	eipalloc-0dec04035...	-	-	vpc



Associate address


Select the instance OR network interface to which you want to associate this Elastic IP address (3.225.226.6)

Resource type ☒ Instance 

☐ Network interface

Instance 

Private IP  

Reassociation ☐ Allow Elastic IP to be reassociated if already attached 

Public DNS (IPv4) ec2-3-225-226-6.compute-1.amazonaws.com


IPv4 Public IP **3.225.226.6**

IPv6 IPs -

Private DNS ip-172-31-89-109.ec2.internal

Private IPs 172.31.89.109

Secondary private IPs

Public DNS (IPv4) ec2-184-73-115-180.compute-1.amazonaws.com 

IPv4 Public IP **184.73.115.180**

IPv6 IPs -

2.3 Capa de computación EC2

- Ejercicio Creación de servidor por puja

Panel de EC2

Eventos

Etiquetas

Informes

Límites

INSTANCIAS

Instancias

Plantillas de lanzamiento

Solicitudes de spot

Instancias reservadas

Hosts dedicados

Instancias programadas

Reservas de capacidad

IMÁGENES

AMI

Tareas empaquetadas

Solicitar instancias de spot

Acciones ▾

Historial de precios

Savings Summary

Tipo de solicitud: all ▾

Estado: all ▾

Buscar por palabra clave

ID de solicitud	Tipo de solici...	Tipo de instancia	Estado	Capacidad	Estatus	Persistencia	Creado
-----------------	-------------------	-------------------	--------	-----------	---------	--------------	--------

Actualmente no tiene ninguna solicitud de spot en esta r...

Si es la primera vez que usa instancias de spot de EC2, visite la [Pági...](#)

Haga clic en el botón Solicitar instancias de spot para lanzar una ir

Solicitar instancias de spot

Seleccione una solicitud de spot para ver más detalles

2.3 Capa de computación EC2

- Ejercicio Creación de servidor por puja

Solicitar instancias de spot
Acciones
Historial de precios
Savings Summary

Tipo de solicitud: all
Estado: all
Buscar por palabra clave
Mostrando

ID de solicitud	Tipo de solici...	Tipo de instancia	Estado	Capacidad	Estatus	Persistencia	Creado	Precio máximo
<input checked="" type="checkbox"/> sfr-4be61f35-92d6-...	fleet	c3.large,t3a.me...	submitted	0 of 1		request	a few seconds ago	\$0.105

ID de solicitud: sfr-4be61f35-92d6-47b5-8213-d803a1dbf36b

Descripción
Instancias
Historial
Ahorro

ID de solicitud ⓘ	sfr-4be61f35-92d6-47b5-8213-d803a1dbf36b	Precio máximo ⓘ	\$0.105
Tipo de solicitud ⓘ	fleet	Persistencia ⓘ	request
Creado	9/17/2019, 5:01:16 PM	Nombre del par de claves ⓘ	practicas_master
Estado	submitted	Rol de IAM ⓘ	-
Estatus		Optimizado para EBS ⓘ	no
Capacidad de destino total ⓘ	1 (0 realizado)	Monitorización ⓘ	no
Capacidad bajo demanda ⓘ	0 (0 realizado)	Propiedad ⓘ	default
Estrategia de asignación ⓘ	lowestPrice (11 grupos)	Comportamiento de interrupción ⓘ	terminate
Tipos de instancia	c3.large \$0.105, t3a.medium \$0.0376, t3.medium \$0.0416, t2.medium \$0.0464	Balanceadores de carga clásica ⓘ	-
ID de AMI ⓘ	ami-009d6802948d06e52	Grupos de destino ⓘ	-
Subred ⓘ	subnet-d74e2eb0,subnet-b5e6d6ff,subnet-7f3e8a41,subnet-74a4c928,subnet-79b8d757,subnet-fc9bc1f3	Solicitud válida desde ⓘ	9/17/2019, 4:59:34 PM
Rol de flota de IAM ⓘ	aws-ec2-spot-fleet-tagging-role	Solicitud válida hasta ⓘ	9/17/2020, 4:59:34 PM
		Terminar instancias en el vencimiento ⓘ	sí

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Acceder via ssh y ejecutar comando *top*
 - *Comparar rendimiento CPU al cargar una página de wordpress*

```
top - 12:07:29 up 4 min, 1 user, load average: 0.01, 0.05, 0.02
Tasks: 101 total, 1 running, 63 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.3 sy, 0.0 ni, 99.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 1007644 total, 76884 free, 347980 used, 582780 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 489716 avail Mem
```

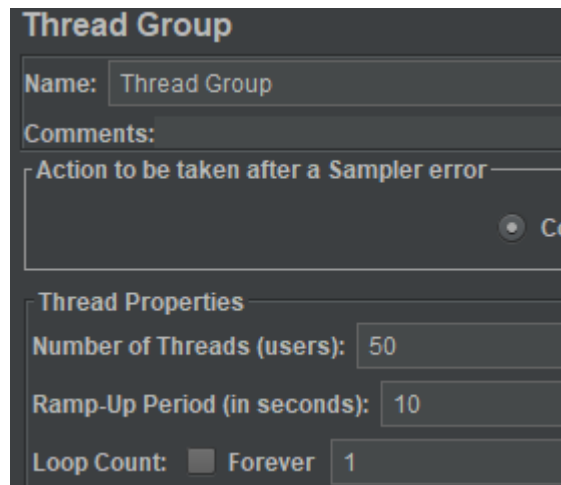
PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1	root	20	0	159624	9036	6836	S	0.0	0.9	0:02.26	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H
5	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u30:0
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
7	root	20	0	0	0	0	S	0.0	0.0	0:00.05	ksoftirqd/0

```
top - 12:09:57 up 7 min, 1 user, load average: 0.00, 0.02, 0.00
Tasks: 99 total, 1 running, 63 sleeping, 0 stopped, 0 zombie
%Cpu(s): 1.7 us, 0.3 sy, 0.0 ni, 98.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 1007644 total, 282980 free, 368384 used, 356280 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 471108 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
2144	www-data	20	0	503948	46328	32096	S	1.7	4.6	0:00.10	apache2
1051	mysql	20	0	1155176	193776	15136	S	0.3	19.2	0:00.48	mysqld
2088	ubuntu	20	0	108088	4156	3112	S	0.3	0.4	0:00.13	sshd
2148	ubuntu	20	0	44576	3984	3340	R	0.3	0.4	0:00.23	top
1	root	20	0	159624	9036	6836	S	0.0	0.9	0:02.27	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Ejecutar Test de stress (carga) mediante JMeter
 - Instalar JMeter
 - Primero configurar un sencillo Test Plan
 - 1 Thread Group (50 hilos en 10 segundos)
 - 1 Sampler HTTP Request
 - 1 Viewer Results in Table
 - Resultados correctos



Thread Group

Name: Thread Group

Comments:

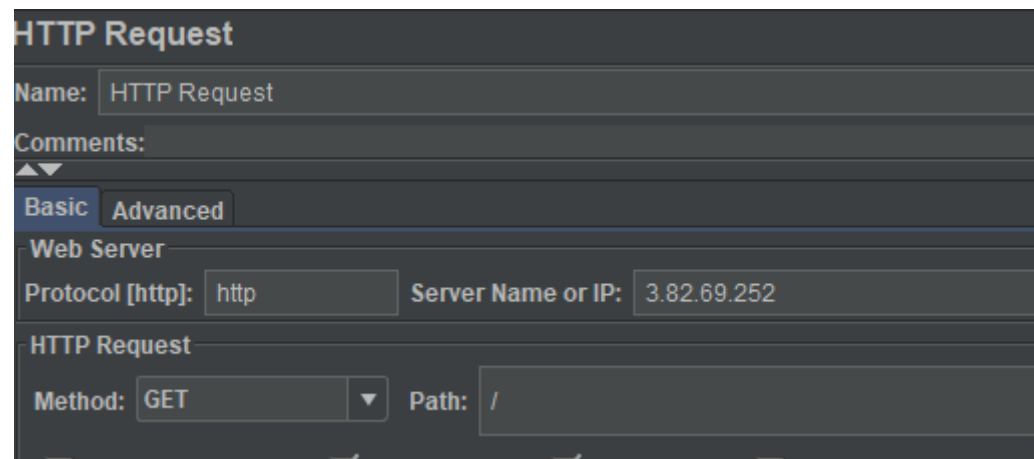
Action to be taken after a Sampler error

Thread Properties

Number of Threads (users): 50

Ramp-Up Period (in seconds): 10

Loop Count: ☐ Forever 1



HTTP Request

Name: HTTP Request

Comments:

Basic Advanced

Web Server

Protocol [http]: http Server Name or IP: 3.82.69.252

HTTP Request

Method: GET Path: /

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - 1 Thread Group (50 hilos en 10 segundos)
 - 1 Sampler HTTP Request
 - 1 Viewer Results in Table
 - Resultados correctos

Sam...	Start Time	Thread ...	Label	Sam...	Status	Connect ...	Latency	Bytes
1425	15:24:16.6...	Thread...	HTT...	254	✓	108	254	11751
1426	15:24:16.8...	Thread...	HTT...	254	✓	112	254	11751
1427	15:24:17.0...	Thread...	HTT...	270	✓	119	270	11751
1428	15:24:17.2...	Thread...	HTT...	258	✓	115	258	11751
1429	15:24:17.4...	Thread...	HTT...	264	✓	109	264	11751
1430	15:24:17.6...	Thread...	HTT...	258	✓	111	258	11751
1431	15:24:17.8...	Thread...	HTT...	261	✓	111	261	11751
1432	15:24:18.0...	Thread...	HTT...	249	✓	110	249	11751
1433	15:24:18.2...	Thread...	HTT...	249	✓	109	249	11751

```

tasks: 98 total, 1 running, 63 sleeping, 0 stopped, 0 zombie
Cpu(s): 8.0 us, 0.3 sy, 0.0 ni, 91.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 1007644 total, 263376 free, 386876 used, 357392 buff/cache
Mem Swap: 0 total, 0 free, 0 used, 452512 avail Mem
  
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1051	mysql	20	0	1155176	194568	15136	S	1.3	19.3	0:02.29	mysqld
1055	www-data	20	0	503940	48548	34656	S	1.0	4.8	0:00.47	apache2
1054	www-data	20	0	503956	44692	31048	S	0.7	4.4	0:00.41	apache2
1058	www-data	20	0	503948	48768	34872	S	0.7	4.8	0:00.50	apache2
1948	www-data	20	0	578808	52024	37260	S	0.7	5.2	0:00.57	apache2
2139	www-data	20	0	504100	49952	35456	S	0.7	5.0	0:00.59	apache2
2142	www-data	20	0	579464	55012	39484	S	0.7	5.5	0:00.66	apache2
2143	www-data	20	0	503620	42208	28948	S	0.7	4.2	0:00.35	apache2
2144	www-data	20	0	504012	46860	32480	S	0.7	4.7	0:00.44	apache2
2231	www-data	20	0	503620	42292	29064	S	0.7	4.2	0:00.37	apache2
2148	ubuntu	20	0	44576	3984	3340	R	0.3	0.4	0:04.32	top
1	root	20	0	159624	9036	6836	S	0.0	0.9	0:02.29	systemd

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - 4 Thread Group en secuencia
 1. 50 hilos en 10 segundos (ok)
 2. 200 hilos en 10 segundos (ok)
 3. 500 hilos en 10 segundos (errores , requiere reinicio)
 4. 700 hilos en 10 segundos (errores, requiere reinicio)

390	15:24:31.414	Thread Group 2-...	HTTP Request	263	✓	263
391	15:24:31.465	Thread Group 2-...	HTTP Request	253	✓	253
392	15:24:31.515	Thread Group 2-...	HTTP Request	253	✓	253
393	15:24:31.572	Thread Group 2-...	HTTP Request	255	✓	255
394	15:24:31.621	Thread Group 2-...	HTTP Request	253	✓	253
395	15:24:31.672	Thread Group 2-...	HTTP Request	259	✓	259
396	15:24:31.721	Thread Group 2-...	HTTP Request	248	✓	248
397	15:24:31.768	Thread Group 2-...	HTTP Request	250	✓	250
398	15:24:31.815	Thread Group 2-...	HTTP Request	254	✓	254
399	15:24:31.864	Thread Group 2-...	HTTP Request	253	✓	253
400	15:24:29.715	Thread Group 2-...	HTTP Request	3091	✓	3091

Sample #	Start Time	Thread Name	Label	Sample Time(ms)	Status	Latency	Connect Time(ms)
756	15:24:38.131	Thread Group 3-...	HTTP Request	3936	✓	3936	112
757	15:24:38.072	Thread Group 3-...	HTTP Request	4021	✓	4021	110
758	15:24:37.172	Thread Group 3-...	HTTP Request	4924	✓	4924	110
759	15:24:37.332	Thread Group 3-...	HTTP Request	4918	✓	4918	111
760	15:24:37.313	Thread Group 3-...	HTTP Request	4954	✓	4954	111
761	15:24:37.295	Thread Group 3-...	HTTP Request	5014	✓	5014	112
762	15:24:38.258	Thread Group 3-...	HTTP Request	4297	✓	4297	111
763	15:24:37.412	Thread Group 3-...	HTTP Request	5177	✓	5177	110
764	15:24:41.211	Thread Group 3-...	HTTP Request	21004	✗	0	21004
765	15:24:41.231	Thread Group 3-...	HTTP Request	21006	✗	0	21006
766	15:24:41.251	Thread Group 3-...	HTTP Request	21002	✗	0	21002
767	15:24:41.271	Thread Group 3-...	HTTP Request	21003	✗	0	21003
768	15:24:41.291	Thread Group 3-...	HTTP Request	21003	✗	0	21003

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Monitorización básica EC2

CloudWatch metrics: Basic monitoring. [Enable Detailed Monitoring](#)

Below are your CloudWatch metrics for the selected resources (a maximum of 10). Click

CPU Utilization (Percent)



Disk Reads (Bytes)



CPU Credit Usage (Count)

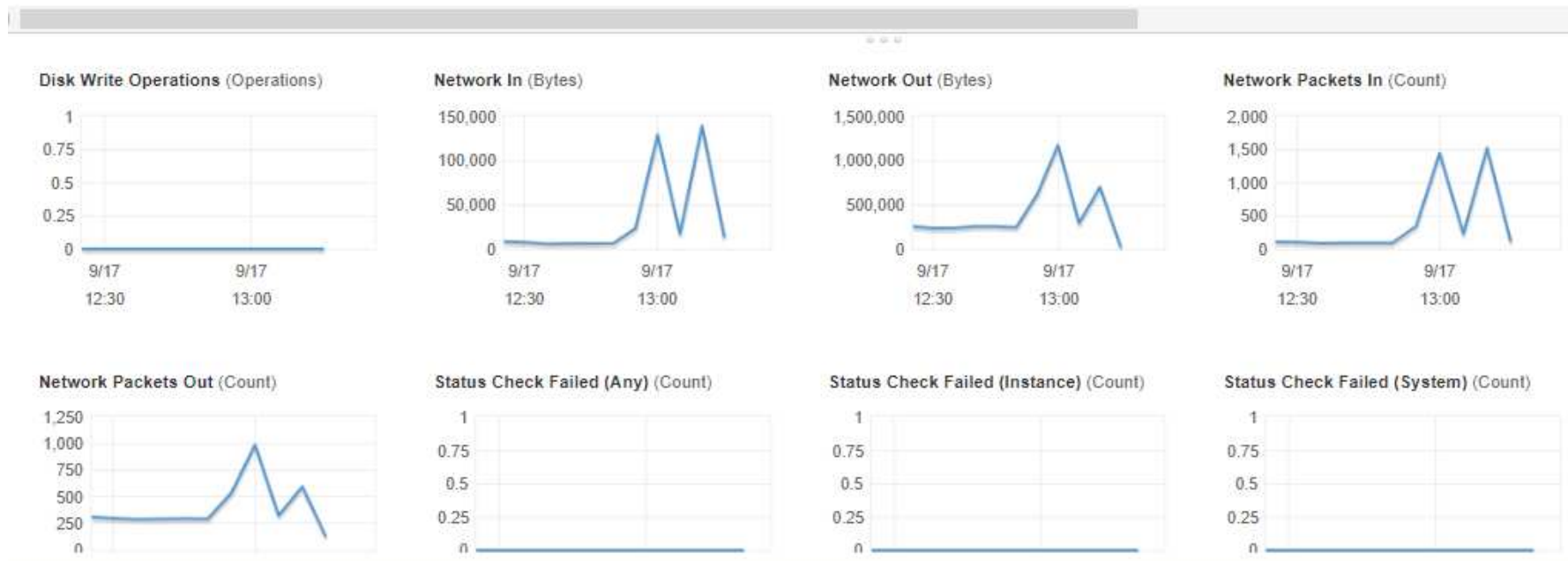


CPU Credit Balance (Count)



2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Monitorización básica EC2

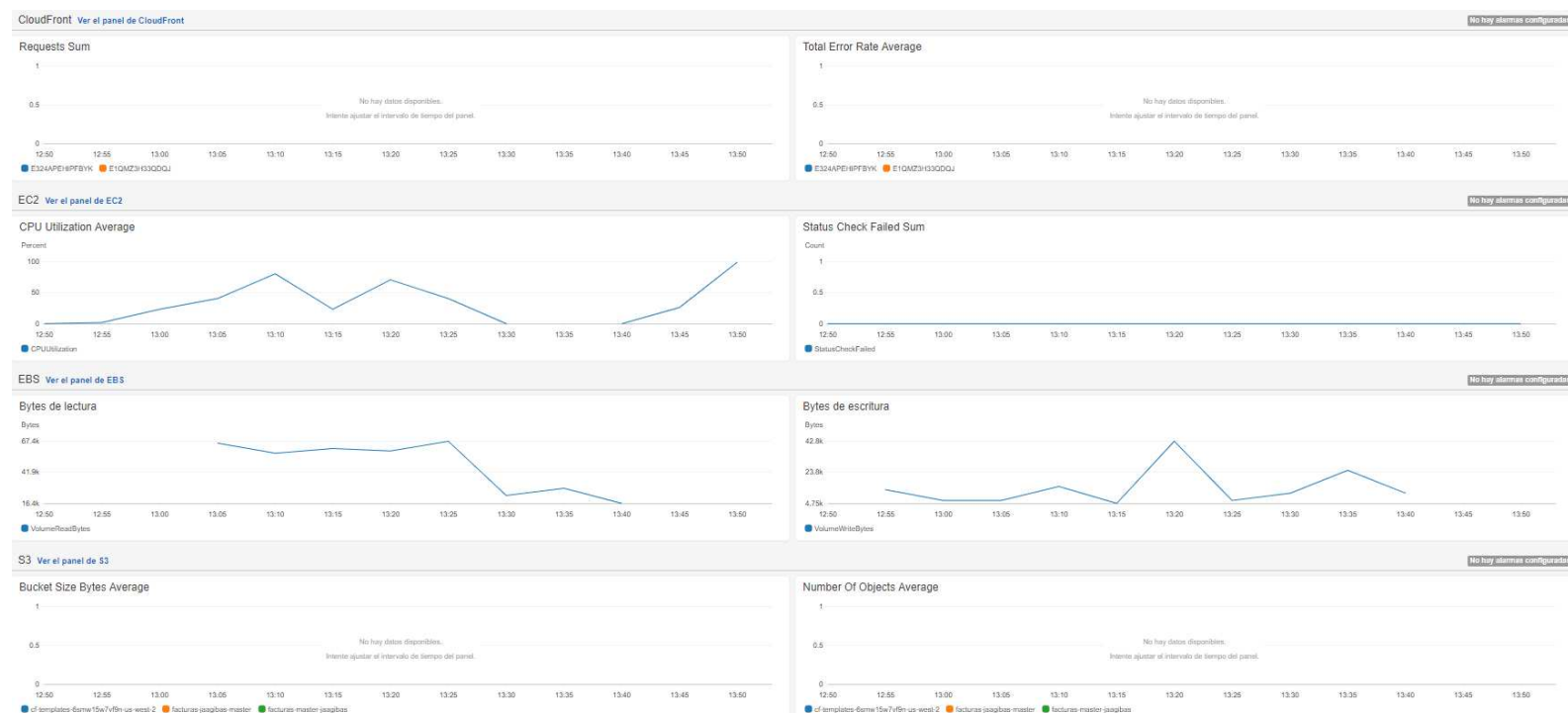


2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Probar con otro tipos de instancias

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Monitorización CLOUDWATCH
 - Requiere un gasto activarlo
 - Agregar métrica de coste al CLOUDWATCH al panel del servidor
 - Solo para explorar , este tema se trabajará más adelante
 - Permite actualizaciones a frecuencia altas



2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Monitorización CLOUDWATCH
 - Alarma : De uso de CPU

Create Alarm

You can use CloudWatch alarms to be notified automatically whenever metric data reaches a level you define.

To edit an alarm, first choose whom to notify and then define when the notification should be sent.

☒ **Send a notification to:** [cancel](#)

With these recipients:

☒ **Take the action:** ☐ Recover this instance ⓘ
☐ Stop this instance ⓘ
☐ Terminate this instance ⓘ
☒ Reboot this instance ⓘ

AWS will create the following Service Linked Role in your account to perform this EC2 action. [Learn more.](#)
AWSServiceRoleForCloudWatchEvents([show IAM policy document](#))

Whenever: of

Is: Percent

For at least: consecutive period(s) of

Name of alarm:


[Cancel](#) [Create Alarm](#)

CPU Utilization Percent

i-0ebc2bb3233b0b1cc

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Alarmas mediante el Servicio de notificación de Amazon SNS

AWS Notification - Subscription Confirmation  Sarrera-ontzia x



AWS Notifications <no-reply@sns.amazonaws.com>

hartzaileak: ni ▾

You have chosen to subscribe to the topic:

arn:aws:sns:us-east-1:420693608596:Error-Servidor-Ec2-wordpress

To confirm this subscription, click or visit the link below (If this was in error no action is necessary):

[Confirm subscription](#)



Simple Notification Service

Subscription confirmed!

You have subscribed jaagibas@gmail.com to the topic:

Error-Servidor-Ec2-wordpress.

Your subscription's id is:

arn:aws:sns:us-east-1:420693608596:Error-Servidor-Ec2-wordpress:f937ca12-2cc6-4a56-a380-490eb9f42bfd

If it was not your intention to subscribe, [click here to unsubscribe](#).

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Monitorización CLOUDWATCH
 - Alarmas de estado

Create Alarm

You can use CloudWatch alarms to be notified automatically whenever metric data reaches a level you define.
To edit an alarm, first choose whom to notify and then define when the notification should be sent.

☒ **Send a notification to:** Error-Servidor-Ec2-wordpress (jaagibas@ create topic)

☒ **Take the action:**

- ☐ Recover this instance ⓘ
- ☐ Stop this instance ⓘ
- ☐ Terminate this instance ⓘ
- ☒ Reboot this instance ⓘ

AWS will use the existing Service Linked Role to perform this EC2 action.
[Learn more.](#)
[AWSServiceRoleForCloudWatchEvents \(show IAM policy document\)](#)

Whenever: Status Check Failed (Any)

Is: Failing

For at least: 2 consecutive period(s) of 1 Minute

Name of alarm: awsec2-i-0ebc2bb3233b0b1cc-Status-Check-Fa

[Cancel](#) [Create Alarm](#)

Status Check Failed (Any) Count

Time	Count
9/17 10:00	0
9/17 12:00	1
9/17 14:00	0

2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Alarmas
 - Volver a ejecutar los tests
 - Comprobar la alarma
 - Comprobar la recuperación

Description Status Checks Monitoring Tags

CloudWatch alarms: 1 of 2 in ALARM

Below are your CloudWatch alarms for the selected resources. Click on an

State	Name
ALARM	awsec2-i-0ebc2bb3233b0b1cc-CPU-Utilization
OK	awsec2-i-0ebc2bb3233b0b1cc-Status-Check-Failed-Any-

AWS Notifications <no-reply@sns.amazonaws.com>
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You are receiving this email because your Amazon CloudWatch Alarm "awsec2-i-0ebc2bb3233b0b1cc-CPU-Utilization" in the US East (N. Virginia) region has crossed the threshold (70.0)." at "Tuesday 17 September, 2019 14:33:54 UTC".

View this alarm in the AWS Management Console:

<https://us-east-1.console.aws.amazon.com/cloudwatch/home?region=us-east-1#s=Alarms&alarm=awsec2-i-0ebc2bb3233b0b1cc-CPU-Utilization>

Alarm Details:

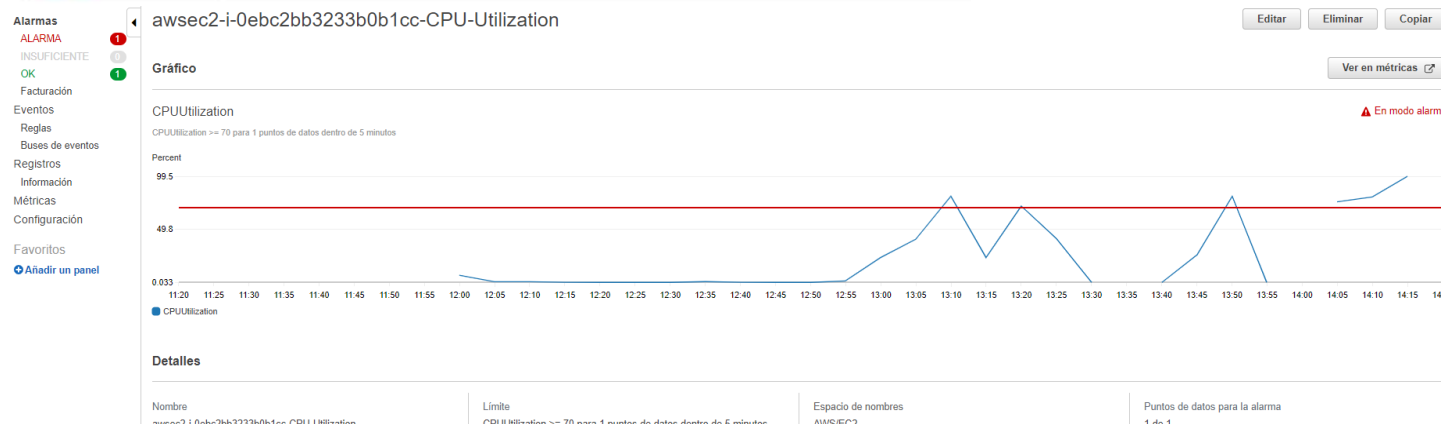
- Name: awsec2-i-0ebc2bb3233b0b1cc-CPU-Utilization

- Description: Created from EC2 Console

- State Change: OK -> ALARM

- Reason for State Change: Threshold Crossed: 1 datapoint [99.46719459109013 (17/09/19 14:28:00)] was greater than or equal to the threshold (70.0).

- Timestamp: Tuesday 17 September, 2019 14:33:54 UTC



2.3 Capa de computación EC2

- Ejercicio : Monitorizando el servidor
 - Alarmas
 - Recuperación

