

PIN DEVOPS 2401

Repositorio Solución 1 - <https://github.com/palacioea/Pin-2024>
Repositorio Solución 2 - <https://github.com/dnlbertoni/devops2401-pin>

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Enfoque de la Solución Nro: 1

Resumen

Vamos a desplegar el EC2 desde un pc de salto vía Terraform, además desplegaremos todas las herramientas que se solicitan para poder montar el EKS con un script en Shell para automatizar el despliegue.

Una vez implementado el EC2, procederemos a levantar el EKS desde línea de comandos desde el bastión previamente desplegado.

Terminada todas las capturas de pantalla, se procederá a borrar el EKS desde el bastion y luego con Terraform se destruirá el bastión construido.

Además, utilizaremos una herramienta Cloud-Nuke para poder eliminar también todos los demás recursos que se hayan creado si fuese necesario por otras vías.

Creación de la Instancia EC2 en AWS

Utilizamos Terraform para aprovisionar una instancia EC2 en AWS. En el proceso, se generaron 16 recursos, incluyendo la creación del par de claves (KEY_PAIR) necesario para establecer la conexión SSH. Verificamos exitosamente la creación de la instancia a través de la consola de AWS.

```

+ tenancy                = (known after apply)
+ timeouts               = null
+ user_data              = (known after apply)
+ user_data_base64       = (known after apply)
+ user_data_replace_on_change = false
+ volume_tags            = null
+ vpc_security_group_ids = (known after apply)
}
tls_private_key.devops_key: Creating...
aws_iam_policy.my_policy: Creating...
aws_vpc.main: Creating...
aws_iam_role.my_role: Creating...
tls_private_key.devops_key: Creation complete after 2s [id=82cdcd39434b8e3871752978a6751adee99d5001]
aws_key_pair.devops: Creating...
local_file.private_key: Creating...
local_file.private_key: Creation complete after 0s [id=c6d3abd8dc6da41fe6bfc753e07948e707f4df12]
null_resource.set_permissions: Creating...
null_resource.set_permissions: Provisioning with 'local-exec'...
null_resource.set_permissions (local-exec): Executing: ["/bin/sh" "-c" "chmod 400 ./devops.pem"]
null_resource.set_permissions: Creation complete after 0s [id=635613157551006064]
aws_iam_policy.my_policy: Creation complete after 1s [id=arn:aws:iam::654654500943:policy/MyEC2Policy]
aws_iam_role.my_role: Creation complete after 1s [id=role_admin]
aws_iam_role_policy_attachment.ebs_csi_driver_attachment: Creating...
aws_iam_role_policy_attachment.my_attachment: Creating...
aws_iam_instance_profile.ec2_profile: Creating...
aws_key_pair.devops: Creation complete after 0s [id=devops]
aws_iam_role_policy_attachment.ebs_csi_driver_attachment: Creation complete after 1s [id=role_admin-20241013025325456800000001]
aws_iam_role_policy_attachment.my_attachment: Creation complete after 1s [id=role_admin-20241013025325477400000002]
aws_iam_instance_profile.ec2_profile: Creation complete after 1s [id=ec2_instance_profile]
aws_vpc.main: Creation complete after 3s [id=vpc-0feb3810ed5a6155f]
aws_internet_gateway.main: Creating...
aws_subnet.main: Creating...
aws_security_group.allow_ssh: Creating...
aws_subnet.main: Creation complete after 1s [id=subnet-096b4c61d934cca0b]
aws_internet_gateway.main: Creation complete after 1s [id=igw-08977330d7267be88]
aws_route_table.main: Creating...
aws_security_group.allow_ssh: Creation complete after 3s [id=sg-043da7f3a0768a1e4]
aws_route_table.main: Creation complete after 2s [id=rtb-0d67579d3b66d4d64]
aws_instance.mi_instancia: Creating...
aws_route_table_association.a: Creating...
aws_route_table_association.a: Creation complete after 1s [id=rtbassoc-0404f8deb9b595d01]
aws_instance.mi_instancia: Still creating... [10s elapsed]
aws_instance.mi_instancia: Creation complete after 17s [id=i-084f4a5b67454c87b]

Apply complete! Resources: 16 added, 0 changed, 0 destroyed.

```

```

# Generar una nueva clave privada
resource "tls_private_key" "devops_key" {
  algorithm = "RSA"
  rsa_bits  = 4096
}

# Crear un Key Pair en AWS usando la clave generada
resource "aws_key_pair" "devops" {
  key_name      = "devops"
  public_key    = tls_private_key.devops_key.public_key_openssh
}

# Opcional: Guardar la clave privada en un archivo local
resource "local_file" "private_key" {
  content  = tls_private_key.devops_key.private_key_pem
  filename = "${path.module}/devops.pem"
}

resource "null_resource" "set_permissions" {
  depends_on = [local_file.private_key]

  provisioner "local-exec" {
    command = "chmod 400 ${local_file.private_key.filename}"
  }
}

```

DevOps-Project I-084f4a5b67454c87b t2.micro 2/2 comprobado Ver alarmas us-east-1c 98.81.156.45 disabled allow_ssh de

I-084f4a5b67454c87b (DevOps-Project)

Detalles Estado y alarmas Monitoreo Seguridad Redes Almacenamiento Etiquetas

Resumen de instancia Información

ID de la instancia	Dirección IPv4 pública	Direcciones IPv4 privadas
I-084f4a5b67454c87b (DevOps-Project)	98.81.156.45 dirección abierta	10.0.1.82
Dirección IPv6	Estado de la instancia	DNS de IPv4 pública
-	En ejecución	-
Tipo de nombre de anfitrión	Nombre DNS de IP privada (solo IPv4)	Direcciones IP elásticas
Nombre de IP: ip-10-0-1-82.ec2.internal	ip-10-0-1-82.ec2.internal	-
Responder al nombre DNS de recurso privado	Tipo de instancia	Hallazgo de AWS Compute Optimizer
-	t2.micro	Suscríbete a AWS Compute Optimizer para recibir recomendaciones. Más información
Dirección IP asignada automáticamente	ID de VPC	Nombre del grupo de Auto Scaling
98.81.156.45 [IP pública]	vpc-0f6b3810ed5a8155f [main-vpc]	-
Rol de IAM	ID de subred	
role_admin	subnet-096b4c61d934cca0b [main-subnet]	
IMDSv2	ARN de instancia	
Optional	arn:aws:ec2:us-east-1:654654300943:instance/I-084f4a5b67454c87b	
EC2 recomienda configurar IMDSv2 como obligatorio. Más información		

Detalles de la instancia Información

Plataforma	ID de AMI	Monitoreo
Ubuntu (Inferior)	ami-005f0cf236362e99f	desactivado
Detalles de la plataforma	Nombre de AMI	Protección de terminación
Linux/UNIX	ubuntu/images/hvm-ssd/ubuntu-jammy-22.04-amd64-server-20240927	desactivado
Detener la protección	Hora de lanzamiento	Ubicación de AMI
desactivado	Sat Oct 12 2024 23:53:33 GMT-0300 (Argentina Standard Time) (14 minutes)	amazon/ubuntu/images/hvm-ssd/ubuntu-jammy-22.04-amd64-server-20240927
Recuperación automática de instancias	Ciclo de vida	Comportamiento de detención de hibernación
Predefinida	normal	desactivado
Índice de lanzamiento de AMI	Par de claves asignado en el lanzamiento	Motivo de transición de estado
0	avrogo	-
Especificación de cribo	ID de kernel	Mensaje de transición de estado

Acceso SSH a la Instancia

La clave PEM se descargó oportunamente, se logró la conexión SSH a la instancia de forma exitosa.

.terraform 1 item Today 3:33 PM

devops.pem	3.2 kB	Today 11:53 PM
iam.tf	1.8 kB	Today 12:05 AM
main.tf	756 bytes	Today 4:03 PM
outputs.tf	226 bytes	Today 11:48 PM

```
ubuntu@ip-10-0-1-82: ~  
mhoes@local ..ia/Hdd/Containers/proyectos/Definitivo % ssh -i "devops.pem" ubuntu@98.81.156.45  
The authenticity of host '98.81.156.45 (98.81.156.45)' can't be established.  
ED25519 key fingerprint is SHA256:5dRz3AY4STaqrDaIampZ0VZpHTU3ctBxKe7/0hKFz3yI.  
This key is not known by any other names.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added '98.81.156.45' (ED25519) to the list of known hosts.  
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-1015-aws x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/pro  
  
System information as of Sun Oct 13 03:09:59 UTC 2024  
  
System load:  0.0          Processes:            102  
Usage of /:   21.1% of 7.57GB Users logged in:       0  
Memory usage: 22%          IPv4 address for eth0: 10.0.1.82  
Swap usage:   0%  
  
Expanded Security Maintenance for Applications is not enabled.  
  
0 updates can be applied immediately.  
  
Enable ESM Apps to receive additional future security updates.  
See https://ubuntu.com/esm or run: sudo pro status  
  
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-10-0-1-82:~$
```

Instalación de Aplicaciones

Se creó un script que permite la instalación de todas las aplicaciones requeridas que se aprovisiono directamente desde Terraform.

```
main.tf > resource "aws_iam_instance_profile" "ec2_profile" > role  
1  # Crear el perfil de instancia IAM  
2  resource "aws_iam_instance_profile" "ec2_profile" {  
3    name = "ec2_instance_profile"  
4    role = aws_iam_role.my_role.name  
5  }  
6  
7  # Crear la instancia EC2  
8  resource "aws_instance" "mi_instancia" {  
9    ami = "ami-005fc0f236362e99f"  
10   instance_type = var.ec2_instance_type  
11   iam_instance_profile = aws_iam_instance_profile.ec2_profile.name  
12   subnet_id = aws_subnet.main.id  
13   key_name = aws_key_pair.devops.key_name  
14   vpc_security_group_ids = [aws_security_group.allow_ssh.id]  
15   associate_public_ip_address = true  
16   user_data = file("script/apps_install.sh")  
17  
18   tags = {  
19     Name = var.ec2_name  
20   }  
21 }
```

Creación del Cluster EKS

Iniciamos el proceso de creación del cluster EKS utilizando el siguiente comando:

```
eksctl create cluster \  
  --name eks-mundos-e \  
  --region us-east-1 \  
  --with-oidc \  
  --nodegroup-name testv3 \  
  --node-type t2.large \  
  --nodes 1 \  
  --nodes-min 1 \  
  --nodes-max 3 \  
  --node-volume-size 20 \  
  --ssh-access=false \  
  --managed \  
  --asg-access \  
  --external-dns-access \  
  --full-ecr-access \  
  --appmesh-access \  
  --alb-ingress-access
```

```

ubuntu@ip-10-0-1-33:~$ eksctl create cluster \
--name eks-mundos-e \
--region us-east-1 \
--with-oidc \
--nodegroup-name testv3 \
--node-type t2.large \
--nodes 1 \
--nodes-min 1 \
--nodes-max 3 \
--node-volume-size 20 \
--ssh-access=false \
--managed \
--asg-access \
--external-dns-access \
--full-ecr-access \
--appmesh-access \
--alb-ingress-access
2024-10-13 03:33:27 [i] eksctl version 0.192.0
2024-10-13 03:33:27 [i] using region us-east-1
2024-10-13 03:33:27 [i] setting availability zones to [us-east-1c us-east-1b]
2024-10-13 03:33:27 [i] subnets for us-east-1c - public:192.168.0.0/19 private:192.168.64.0/19
2024-10-13 03:33:27 [i] subnets for us-east-1b - public:192.168.32.0/19 private:192.168.96.0/19
2024-10-13 03:33:27 [i] nodegroup "testv3" will use "" [AmazonLinux2/1.30]
2024-10-13 03:33:27 [i] using Kubernetes version 1.30
2024-10-13 03:33:27 [i] creating EKS cluster "eks-mundos-e" in "us-east-1" region with managed nodes
2024-10-13 03:33:27 [i] will create 2 separate CloudFormation stacks for cluster itself and the initial managed nodegroup
2024-10-13 03:33:27 [i] if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stack --region=us-east-1 --cluster=eks-mundos-e'
2024-10-13 03:33:27 [i] Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster "eks-mundos-e" in "us-east-1"
2024-10-13 03:33:27 [i] CloudWatch logging will not be enabled for cluster "eks-mundos-e" in "us-east-1"
2024-10-13 03:33:27 [i] you can enable it with 'eksctl utils update-cluster-logging --enable-types={SPECIFY-YOUR-LOG-TYPES-HERE (e.g. all)} --region=us-east-1 --cluster=eks-mundos-e'
2024-10-13 03:33:27 [i] default addons vpc-cni, kube-proxy, coredns were not specified, will install them as EKS addons
2024-10-13 03:33:27 [i]
2 sequential tasks: { create cluster control plane "eks-mundos-e",
  2 sequential sub-tasks: {
    5 sequential sub-tasks: {
      1 task: { create addons },
      wait for control plane to become ready,
      associate IAM OIDC provider,
      no tasks,
      update VPC CNI to use IRSA if required,
    },
    create managed nodegroup "testv3",
  },
}
2024-10-13 03:33:27 [i] building cluster stack "eksctl-eks-mundos-e-cluster"
2024-10-13 03:33:28 [i] deploying stack "eksctl-eks-mundos-e-cluster"

```

```

2024-10-13 03:40:29 [i] creating addon
2024-10-13 03:40:29 [i] successfully created addon
2024-10-13 03:40:30 [i] creating addon
2024-10-13 03:40:30 [i] successfully created addon
2024-10-13 03:40:30 [i] creating addon
2024-10-13 03:40:31 [i] successfully created addon
2024-10-13 03:42:32 [i] deploying stack "eksctl-eks-mundos-e-addon-vpc-cni"
2024-10-13 03:42:32 [i] waiting for CloudFormation stack "eksctl-eks-mundos-e-addon-vpc-cni"
2024-10-13 03:43:02 [i] waiting for CloudFormation stack "eksctl-eks-mundos-e-addon-vpc-cni"
2024-10-13 03:43:02 [i] updating addon
2024-10-13 03:43:12 [i] addon "vpc-cni" active
2024-10-13 03:43:13 [i] building managed nodegroup stack "eksctl-eks-mundos-e-nodegroup-testv3"
2024-10-13 03:43:13 [i] deploying stack "eksctl-eks-mundos-e-nodegroup-testv3"
2024-10-13 03:43:13 [i] waiting for CloudFormation stack "eksctl-eks-mundos-e-nodegroup-testv3"
2024-10-13 03:43:43 [i] waiting for CloudFormation stack "eksctl-eks-mundos-e-nodegroup-testv3"
2024-10-13 03:44:25 [i] waiting for CloudFormation stack "eksctl-eks-mundos-e-nodegroup-testv3"
2024-10-13 03:45:55 [i] waiting for CloudFormation stack "eksctl-eks-mundos-e-nodegroup-testv3"
2024-10-13 03:45:55 [i] waiting for the control plane to become ready
2024-10-13 03:45:56 [✓] saved kubeconfig as "/home/ubuntu/.kube/config"
2024-10-13 03:45:56 [i] no tasks
2024-10-13 03:45:56 [✓] all EKS cluster resources for "eks-mundos-e" have been created
2024-10-13 03:45:56 [✓] created 0 nodegroup(s) in cluster "eks-mundos-e"
2024-10-13 03:45:56 [i] nodegroup "testv3" has 1 node(s)
2024-10-13 03:45:56 [i] node "ip-192-168-9-221.ec2.internal" is ready
2024-10-13 03:45:56 [i] waiting for at least 1 node(s) to become ready in "testv3"
2024-10-13 03:45:56 [i] nodegroup "testv3" has 1 node(s)
2024-10-13 03:45:56 [i] node "ip-192-168-9-221.ec2.internal" is ready
2024-10-13 03:45:56 [✓] created 1 managed nodegroup(s) in cluster "eks-mundos-e"
2024-10-13 03:45:57 [i] kubectl command should work with "/home/ubuntu/.kube/config", try 'kubectl get nodes'
2024-10-13 03:45:57 [✓] EKS cluster "eks-mundos-e" in "us-east-1" region is ready
ubuntu@ip-10-0-1-33:~$

```


Configuración de kubectl

Configuramos `kubectl` para interactuar con el cluster EKS recién creado utilizando el siguiente comando:

```
aws eks update-kubeconfig --name eks-mundos-e --region us-east-1
```

```
2024-10-13 03:45:56 [✓] created 1 managed nodegroup(s) in cluster "eks-mundos-e"
2024-10-13 03:45:57 [i] kubectl command should work with "/home/ubuntu/.kube/config", try 'kubectl get nodes'
2024-10-13 03:45:57 [✓] EKS cluster "eks-mundos-e" in "us-east-1" region is ready
ubuntu@ip-10-0-1-33:~$ aws eks update-kubeconfig --name eks-mundos-e --region us-east-1
Added new context arn:aws:eks:us-east-1:654654500943:cluster/eks-mundos-e to /home/ubuntu/.kube/config
ubuntu@ip-10-0-1-33:~$
```

Verificación de la conexión con el cluster

```
2024-10-13 03:45:58 [i] node ip-192-168-9-221.ec2.internal is ready
2024-10-13 03:45:56 [✓] created 1 managed nodegroup(s) in cluster "eks-mundos-e"
2024-10-13 03:45:57 [i] kubectl command should work with "/home/ubuntu/.kube/config", try 'kubectl get nodes'
2024-10-13 03:45:57 [✓] EKS cluster "eks-mundos-e" in "us-east-1" region is ready
ubuntu@ip-10-0-1-33:~$ aws eks update-kubeconfig --name eks-mundos-e --region us-east-1
Added new context arn:aws:eks:us-east-1:654654500943:cluster/eks-mundos-e to /home/ubuntu/.kube/config
ubuntu@ip-10-0-1-33:~$ kubectl get nodes
NAME                                STATUS    ROLES    AGE    VERSION
ip-192-168-9-221.ec2.internal      Ready    <none>    3m42s  v1.30.4-eks-a737599
ubuntu@ip-10-0-1-33:~$
```

Instalación del EBS Driver

Para habilitar el soporte de volúmenes EBS, aplicamos el controlador EBS driver con los siguientes comandos:

```
kubectl apply -k "github.com/kubernetes-sigs/aws-ebs-csi-driver/deploy/kubernetes/overlays/stable/?ref=release-1.35"
eksctl create iamserviceaccount \
  --name ebs-csi-controller-sa \
  --region us-east-1 \
  --namespace kube-system \
  --cluster eks-mundos-e \
  --attach-policy-arn arn:aws:iam::aws:policy/service-role/AmazonEBSCSIDriverPolicy \
  --approve \
  --role-only \
  --role-name AmazonEKS_EBS_CSI_DriverRole
eksctl create addon \
  --name aws-ebs-csi-driver
  --cluster eks-mundos-e
  --service-account-role-arn arn:aws:iam::xxxxxxx:role/AmazonEKS_EBS_CSI_DriverRole
  --force
```

```
ubuntu@ip-10-0-1-33:~$ kubectl apply -k "github.com/kubernetes-sigs/aws-ebs-csi-driver/deploy/kubernetes/overlays/stable/?ref=release-1.35"
serviceaccount/ebs-csi-controller-sa created
serviceaccount/ebs-csi-node-sa created
role.rbac.authorization.k8s.io/ebs-csi-leases-role created
clusterrole.rbac.authorization.k8s.io/ebs-csi-node-role created
clusterrole.rbac.authorization.k8s.io/ebs-external-attacher-role created
clusterrole.rbac.authorization.k8s.io/ebs-external-provisioner-role created
clusterrole.rbac.authorization.k8s.io/ebs-external-resizer-role created
clusterrole.rbac.authorization.k8s.io/ebs-external-snapshotter-role created
rolebinding.rbac.authorization.k8s.io/ebs-csi-leases-rolebinding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-attacher-binding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-node-getter-binding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-provisioner-binding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-resizer-binding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-snapshotter-binding created
deployment.apps/ebs-csi-controller created
poddisruptionbudget.policy/ebs-csi-controller created
daemonset.apps/ebs-csi-node created
csidriver.storage.k8s.io/ebs.csi.aws.com created
ubuntu@ip-10-0-1-33:~$
```

```
ubuntu@ip-10-0-1-33:~$ eksctl create iamserviceaccount \
  --name ebs-csi-controller-sa \
  --region us-east-1 \
  --namespace kube-system \
  --cluster eks-mundos-e \
  --attach-policy-arn arn:aws:iam::aws:policy/service-role/AmazonEBSCSIDriverPolicy \
  --approve \
  --role-only \
  --role-name AmazonEKS_EBS_CSI_DriverRole
2024-10-13 03:59:26 [i] 1 iamserviceaccount (kube-system/ebs-csi-controller-sa) was included (based on the include/exclude rules)
2024-10-13 03:59:26 [!] serviceaccounts in Kubernetes will not be created or modified, since the option --role-only is used
2024-10-13 03:59:26 [i] 1 task: { create IAM role for serviceaccount "kube-system/ebs-csi-controller-sa" }
2024-10-13 03:59:26 [i] building iamserviceaccount stack "eksctl-eks-mundos-e-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-13 03:59:26 [i] deploying stack "eksctl-eks-mundos-e-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-13 03:59:26 [i] waiting for CloudFormation stack "eksctl-eks-mundos-e-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-13 03:59:57 [i] waiting for CloudFormation stack "eksctl-eks-mundos-e-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
ubuntu@ip-10-0-1-33:~$
```

```
ubuntu@ip-10-0-1-33:~$ eksctl create addon --name aws-ebs-csi-driver --region us-east-1 --cluster eks-mundos-e --service-account-role-arn arn:aws:iam::654654500943:role/AmazonEKS_EBS_CSI_DriverRole --force
2024-10-13 04:05:15 [i] Kubernetes version "1.30" in use by cluster "eks-mundos-e"
2024-10-13 04:05:15 [i] IRSA is set for "aws-ebs-csi-driver" addon; will use this to configure IAM permissions
2024-10-13 04:05:15 [!] IRSA has been deprecated; the recommended way to provide IAM permissions for "aws-ebs-csi-driver" addon is via pod identity associations; after addon creation is completed, run `eksctl utils migrate-to-pod-identity`
2024-10-13 04:05:15 [i] using provided ServiceAccountRoleARN "arn:aws:iam::654654500943:role/AmazonEKS_EBS_CSI_DriverRole"
2024-10-13 04:05:15 [i] creating addon
ubuntu@ip-10-0-1-33:~$
```

Despliegue de Nginx

Para desplegar Nginx, aplicamos el manifiesto `nginx.yaml` usando el comando:

```
kubectl apply -f nginx.yaml
```

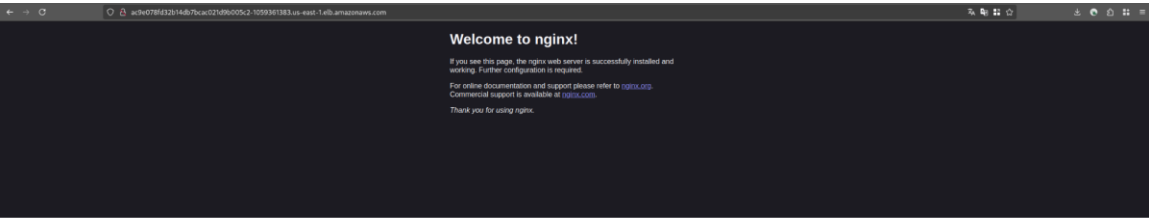
```
ubuntu@ip-10-0-1-33:~$ kubectl get all
NAME                                READY    STATUS    RESTARTS   AGE
pod/nginx-deployment-576c6b7b6-6w57l 1/1      Running   0           2m9s
pod/nginx-deployment-576c6b7b6-tlcmh 1/1      Running   0           2m9s

NAME                                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
service/kubernetes                  ClusterIP           10.100.0.1      <none>            443/TCP          22m
service/nginx-service               LoadBalancer       10.100.43.237   ac9e078fd32b14db7bcac021d9b005c2-1059361383.us-east-1.elb.amazonaws.com 80:31797/TCP     2m9s

NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/nginx-deployment    2/2      2              2            2m9s

NAME                                DESIRED    CURRENT    READY    AGE
replicaset.apps/nginx-deployment-576c6b7b6 2          2          2        2m9s
```

Luego, verificamos el acceso a Nginx desde el navegador.



Configuración de Helm y Despliegue de Prometheus

Agregamos los repositorios de Prometheus utilizando Helm:

```
helm repo add prometheus-community https://prometheus-community.github.io/helm-charts
helm repo update
kubectl create namespace prometheus
helm install prometheus prometheus-community/prometheus \
  --namespace prometheus \
  --set alertmanager.persistentVolume.storageClass="gp2" \
  --set server.persistentVolume.storageClass="gp2"
kubectl patch svc prometheus-server -n prometheus -p '{"spec": {"type": "NodePort"}}'
```

```
replicaset.apps/prometheus-server-79cfff87cb      1      1      0      24s
ubuntu@ip-10-0-1-33:~$ kubectl get all -n prometheus
NAME                                     READY   STATUS    RESTARTS   AGE
pod/prometheus-kube-state-metrics-74cdb59bff-b2q2z  1/1     Running   0           80s
pod/prometheus-prometheus-node-exporter-ftkhr      1/1     Running   0           80s
pod/prometheus-prometheus-pushgateway-66fc55f8d-9mL4t  1/1     Running   0           80s
pod/prometheus-server-79cfff87cb-s9tj9            2/2     Running   0           80s

NAME                                     TYPE          CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
service/prometheus-kube-state-metrics  ClusterIP     10.100.174.71    <none>           8080/TCP         80s
service/prometheus-prometheus-node-exporter  ClusterIP     10.100.146.48    <none>           9100/TCP         80s
service/prometheus-prometheus-pushgateway  ClusterIP     10.100.247.254   <none>           9091/TCP         80s
service/prometheus-server               ClusterIP     10.100.126.91    <none>           80/TCP           80s

NAME                                     DESIRED   CURRENT   READY   UP-TO-DATE   AVAILABLE   NODE SELECTOR   AGE
daemonset.apps/prometheus-prometheus-node-exporter  1          1          1          1             1             kubernetes.io/os=linux  80s

NAME                                     READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/prometheus-kube-state-metrics  1/1      1             1           80s
deployment.apps/prometheus-prometheus-pushgateway  1/1      1             1           80s
deployment.apps/prometheus-server               1/1      1             1           80s

NAME                                     DESIRED   CURRENT   READY   AGE
replicaset.apps/prometheus-kube-state-metrics-74cdb59bff  1          1          1       80s
replicaset.apps/prometheus-prometheus-pushgateway-66fc55f8d  1          1          1       80s
replicaset.apps/prometheus-server-79cfff87cb  1          1          1       80s
```

Instalación de Grafana

Instalamos Grafana utilizando Helm, creando previamente el namespace:

```
kubectl create namespace grafana
helm install grafana grafana/grafana \
  --namespace grafana \
  --set adminPassword='EKS!sAWSome' \
  --values grafana.yaml \
  --set service.type=LoadBalancer
```

```
ubuntu@ip-10-0-1-33:~$ kubectl get all -n grafana
NAME                                     READY   STATUS    RESTARTS   AGE
pod/grafana-77c6fb8d5d-bcvpq           1/1     Running   0           14m

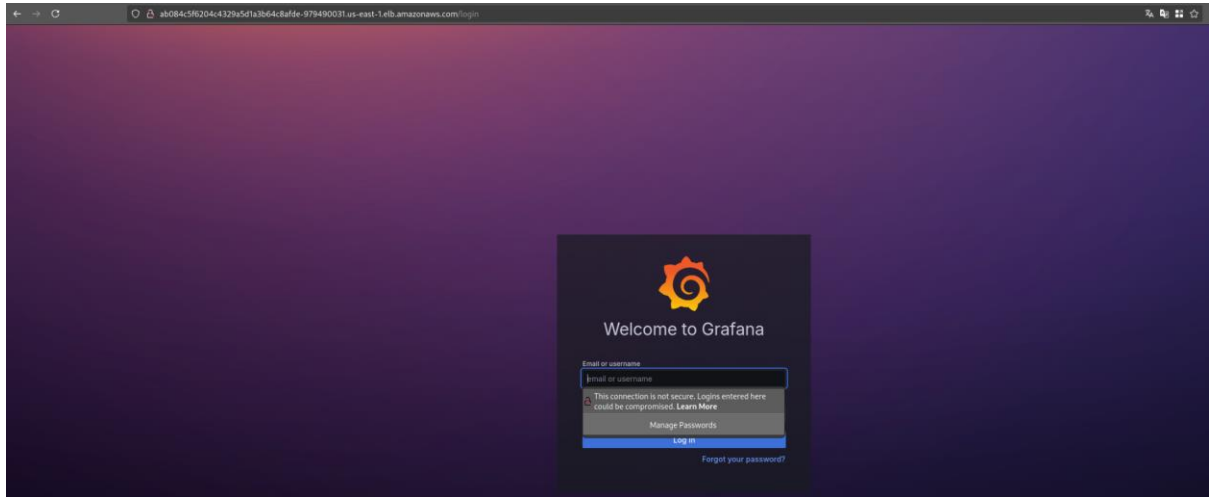
NAME                                     TYPE          CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
service/grafana                         LoadBalancer  10.100.61.238    ab084c5f6204c4329a5d1a3b64c8afde-979490031.us-east-1.elb.amazonaws.com  80:31133/TCP  14m

NAME                                     READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/grafana                 1/1      1             1           14m

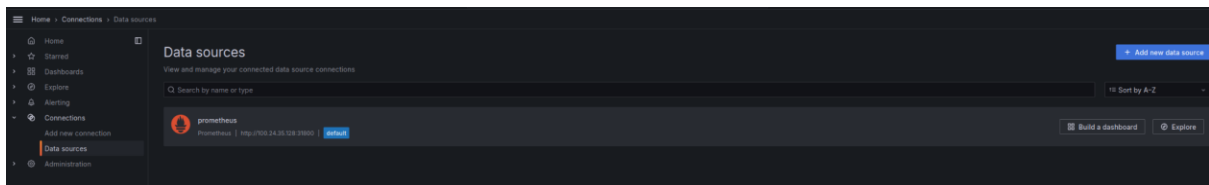
NAME                                     DESIRED   CURRENT   READY   AGE
replicaset.apps/grafana-77c6fb8d5d      1          1          1       14m
```

Monitoreo

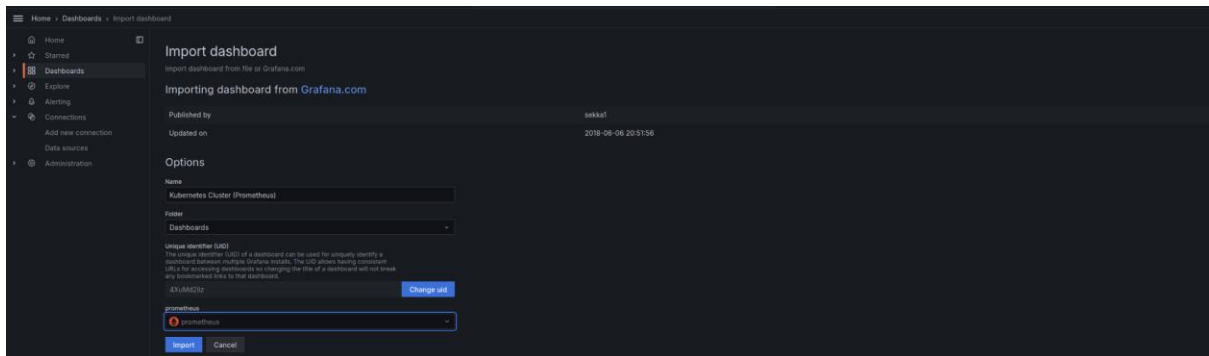
Accedemos al external-ip

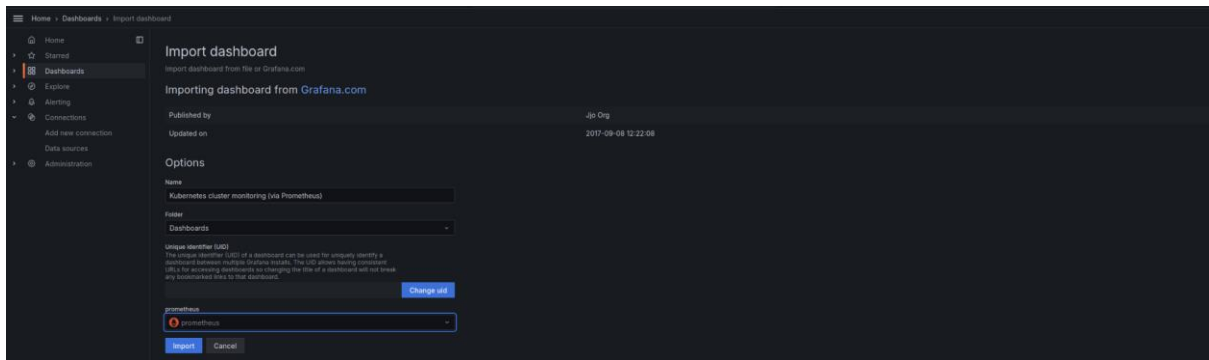


Agregamos Prometheus como datasource:

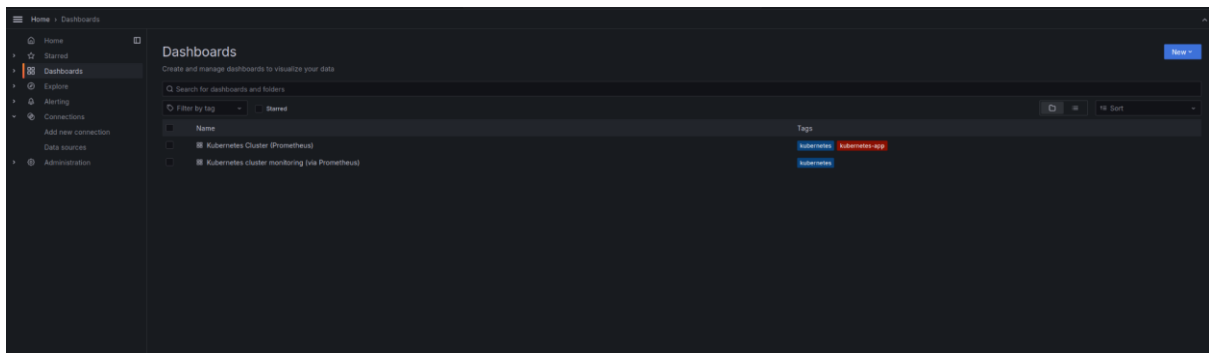


importamos los dashboards 6417 y 3119 en la carpeta Dashboard y configuramos el prometheus que creamos en el datasource.

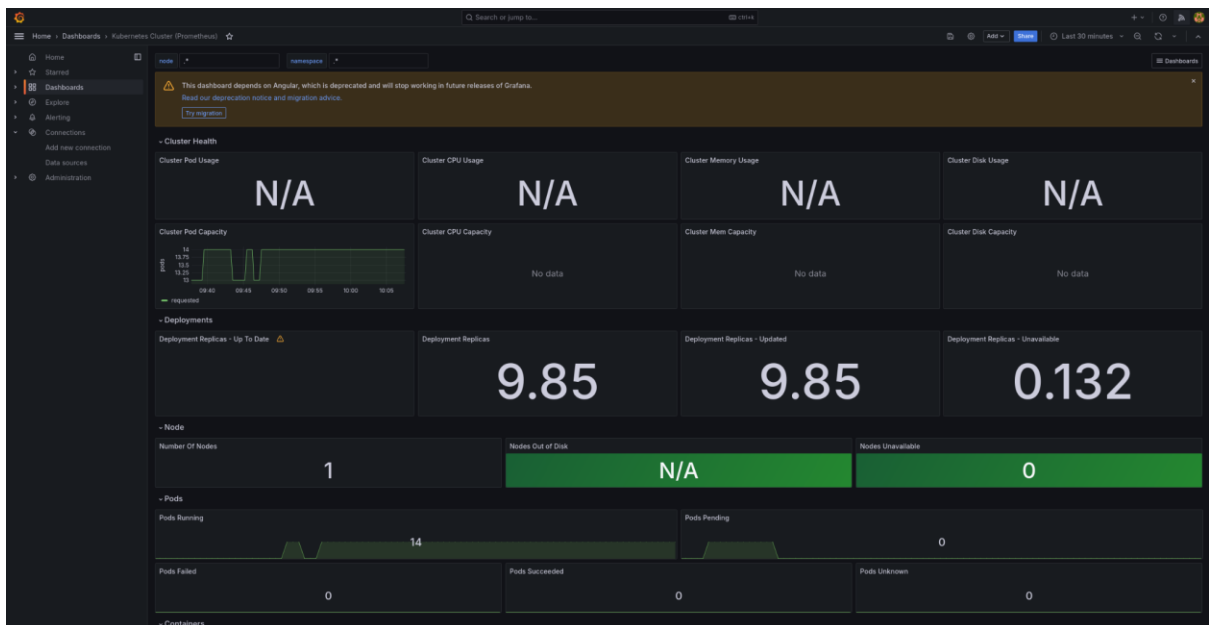




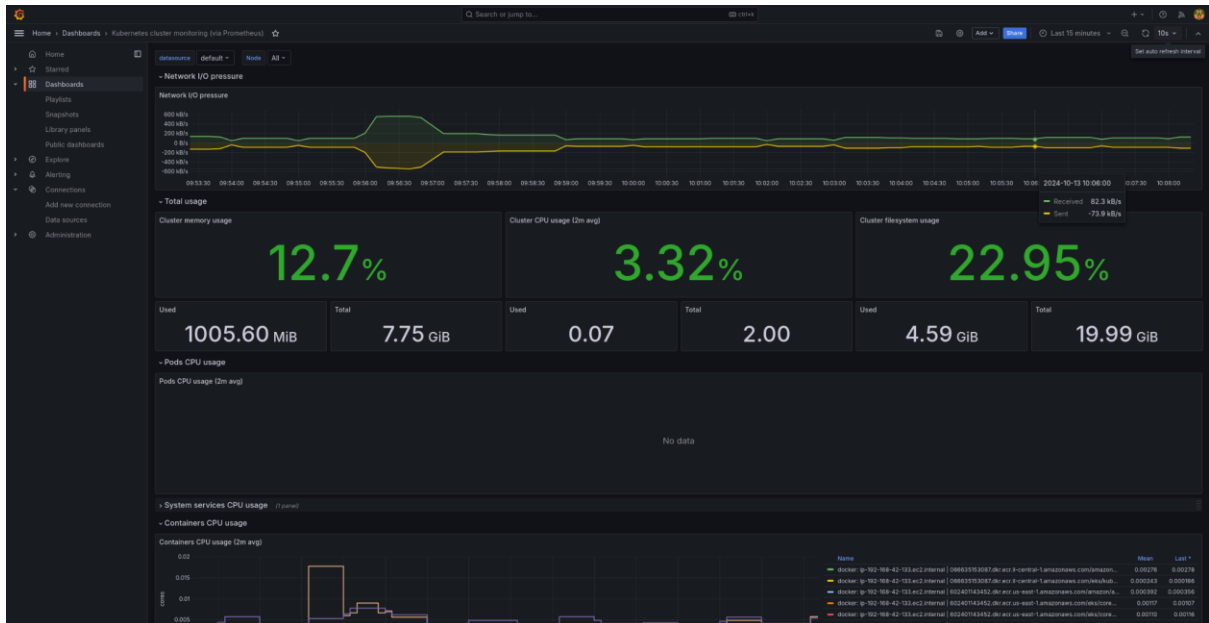
Verificamos importación de ambos



ID 6417:



ID 3119:



Limpieza de Recursos

Procedimos a limpiar todos los recursos desplegados para evitar costos innecesarios.

Desde el bastion (EC2)

```
helm uninstall prometheus --namespace prometheus
kubectl delete ns prometheus
helm uninstall grafana --namespace grafana
eksctl delete cluster --name mundos-e --region us-east-1
```

```

2024-10-13 13:14:29 [i]
4 sequential tasks: { delete nodegroup "mundose",
  2 sequential sub-tasks: {
    2 sequential sub-tasks: {
      delete IAM role for serviceaccount "kube-system/ebs-csi-controller-sa",
      delete serviceaccount "kube-system/ebs-csi-controller-sa",
    },
    delete IAM OIDC provider,
  }, delete addon IAM "eksctl-mundos-e-addon-vcn-cni", delete cluster control plane "mundos-e" [async]
}
2024-10-13 13:14:29 [i] will delete stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:14:29 [i] waiting for stack "eksctl-mundos-e-nodegroup-mundose" to get deleted
2024-10-13 13:14:29 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:14:59 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:15:33 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:16:37 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:17:12 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:18:23 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:20:12 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:21:03 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:21:50 [i] waiting for CloudFormation stack "eksctl-mundos-e-nodegroup-mundose"
2024-10-13 13:21:51 [i] will delete stack "eksctl-mundos-e-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-13 13:21:51 [i] waiting for stack "eksctl-mundos-e-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa" to get deleted
2024-10-13 13:21:51 [i] waiting for CloudFormation stack "eksctl-mundos-e-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-13 13:22:21 [i] waiting for CloudFormation stack "eksctl-mundos-e-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-13 13:22:21 [i] serviceaccount "kube-system/ebs-csi-controller-sa" was not created by eksctl; will not be deleted
2024-10-13 13:22:21 [i] will delete stack "eksctl-mundos-e-addon-vcn-cni"
2024-10-13 13:22:21 [i] will delete stack "eksctl-mundos-e-cluster"
2024-10-13 13:22:21 [✓] all cluster resources were deleted
ubuntu@ip-10-0-1-33:~$

```

Desde el pc de salto:

```
terraform destroy -auto-approve
```

```
devops@devops:/media/Containers/proyectos/Definitivo$ terraform destroy -auto-approve
tls_private_key.devops_key: Refreshing state... [id=095c942864d7376c16a0104c31ae62c70dc3caa2]
local_file.private_key: Refreshing state... [id=4f3d84b57fea148435a3cd64adfeae2200d13afb]
aws_key_pair.devops: Refreshing state... [id=devops]
aws_iam_policy.my_policy: Refreshing state... [id=arn:aws:iam::654654500943:policy/MyEC2Policy]
aws_vpc.main: Refreshing state... [id=vpc-038f4765978c1869c]
aws_iam_role.my_role: Refreshing state... [id=role_admin]
aws_security_group.allow_ssh: Refreshing state... [id=sg-07b7efb01fe4e1e11]
aws_internet_gateway.main: Refreshing state... [id=igw-02cfd9279b9ef2ef2]
aws_subnet.main: Refreshing state... [id=subnet-091a4249188de41b5]
aws_iam_role_policy_attachment.ebs_csi_driver_attachment: Refreshing state... [id=role_admin-20241013065551885100000001]
aws_iam_role_policy_attachment.my_attachment: Refreshing state... [id=role_admin-20241013065551890400000002]
aws_iam_instance_profile.ec2_profile: Refreshing state... [id=ec2_instance_profile]
aws_route_table.main: Refreshing state... [id=rtb-0a6e8b71f9f310cc4]
aws_instance.mi_instancia: Refreshing state... [id=i-03cb1988d6ae8c8e1]
aws_route_table_association.a: Refreshing state... [id=rtbassoc-099674736b2048040]
```

```
local_file.private_key: Destroying... [id=4f3d84b57fea148435a3cd64adfeae2200d13afb]
local_file.private_key: Destruction complete after 0s
tls_private_key.devops_key: Destroying... [id=095c942864d7376c16a0104c31ae62c70dc3caa2]
tls_private_key.devops_key: Destruction complete after 0s
aws_iam_role_policy_attachment.my_attachment: Destroying... [id=role_admin-20241013065551890400000002]
aws_iam_role_policy_attachment.ebs_csi_driver_attachment: Destroying... [id=role_admin-20241013065551885100000001]
aws_iam_instance_profile.ec2_profile: Destroying... [id=ec2_instance_profile]
aws_iam_role_policy_attachment.my_attachment: Destruction complete after 0s
aws_iam_role_policy_attachment.ebs_csi_driver_attachment: Destruction complete after 0s
aws_iam_policy.my_policy: Destroying... [id=arn:aws:iam::654654500943:policy/MyEC2Policy]
aws_iam_instance_profile.ec2_profile: Destruction complete after 0s
aws_iam_role.my_role: Destroying... [id=role_admin]
aws_iam_policy.my_policy: Destruction complete after 1s
aws_iam_role.my_role: Destruction complete after 1s

Destroy complete! Resources: 7 destroyed.
```


Enfoque de la Solución Nro: 2

Resumen

Vamos a desplegar el EC2 desde un pc de salto vía Terraform, además desplegaremos todas las herramientas que se solicitan para poder montar en el futuro el EKS con un script en Shell para automatizar el despliegue y gestionar el cluster.

Una vez implementado el EC2, procederemos a levantar el EKS, el Nginx y las aplicaciones de monitoreo con un script en bash aprovisionado también al EC2 desde Terraform y que solo reste aplicarlo desde el bastión.

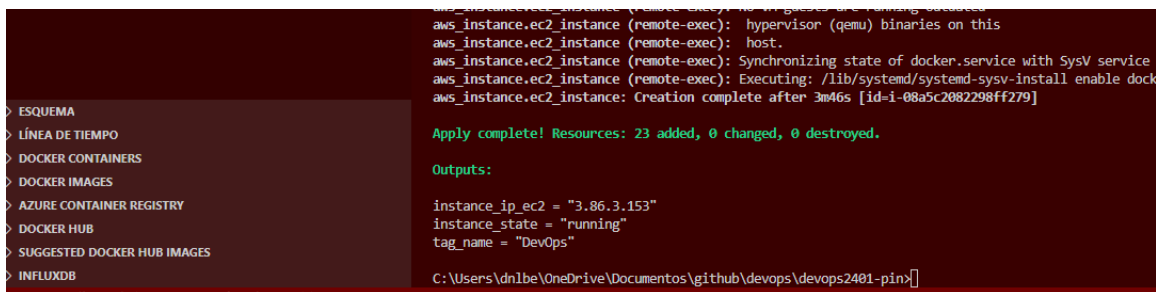
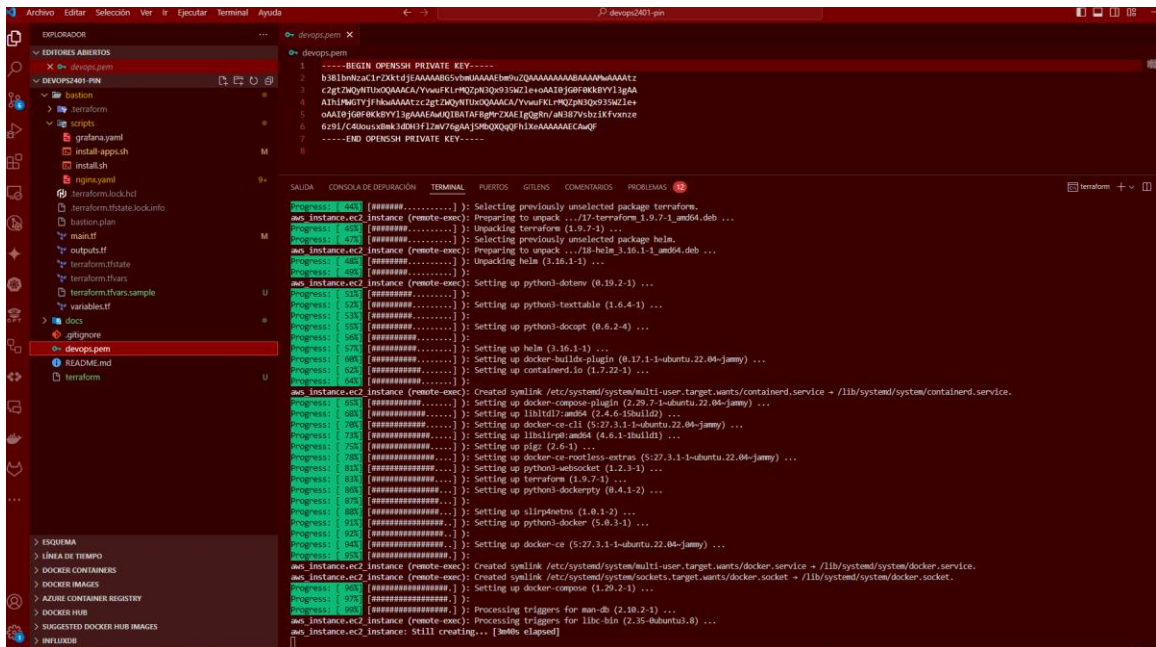
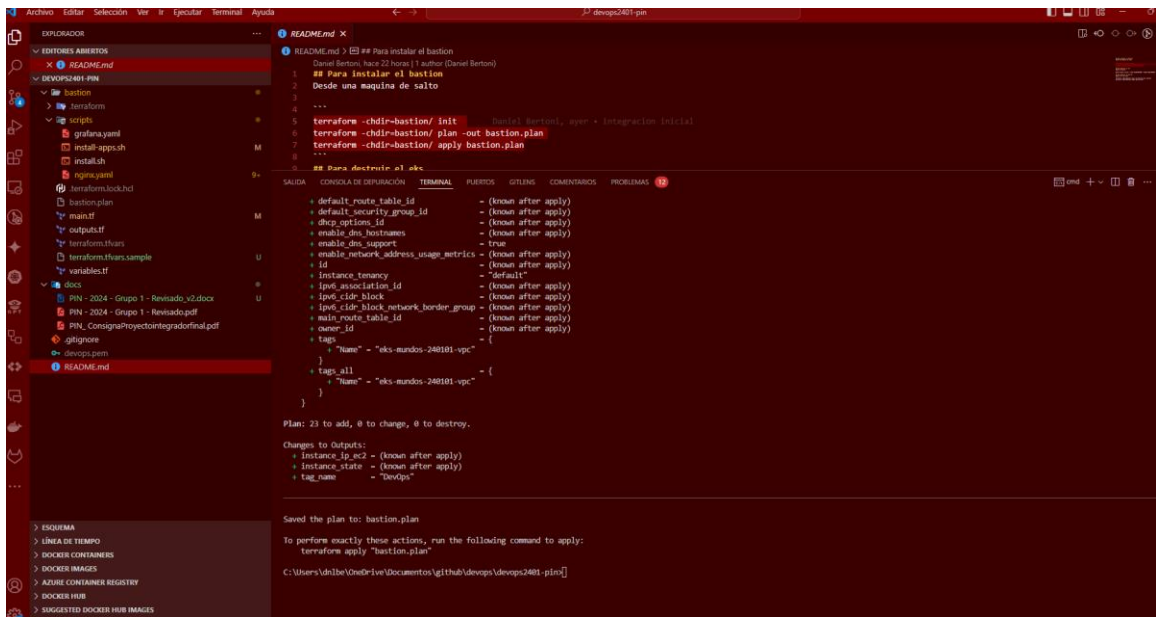
Cabe destacar que cambia es la manera de aprovisionar, ya que en el método anterior usamos **user_data** y con este enfoque estamos usando **file** y **remote-exec** como provisioner desde Terraform

Terminada todas las capturas de pantalla, se procederá a borrar el EKS desde el bastión y luego con Terraform se destruirá el bastión construido.

Creación de la Instancia EC2 en AWS

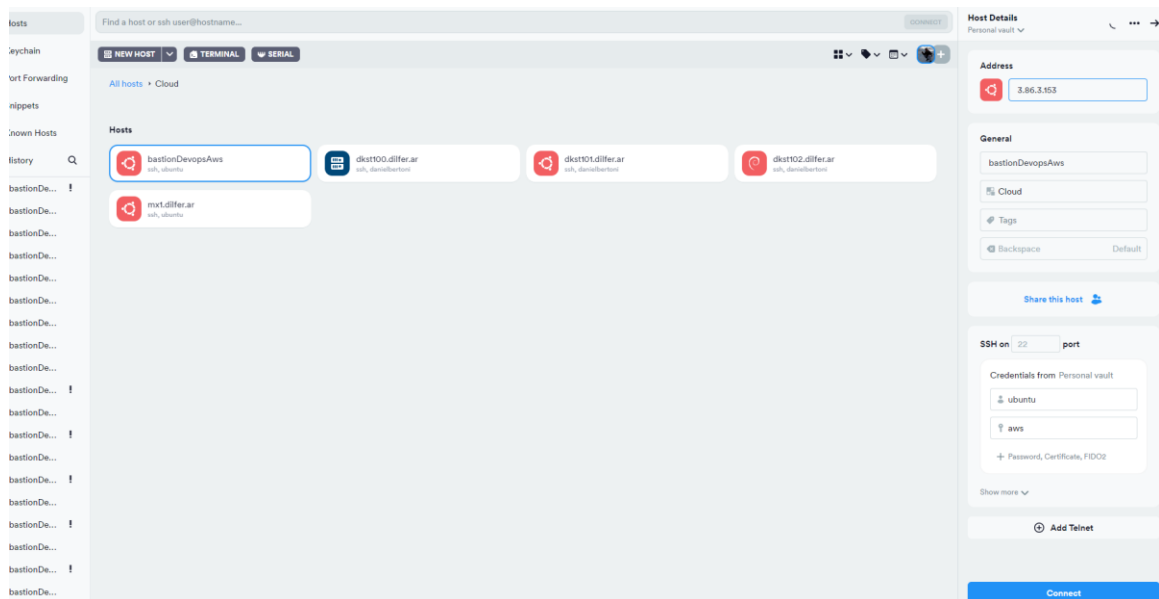
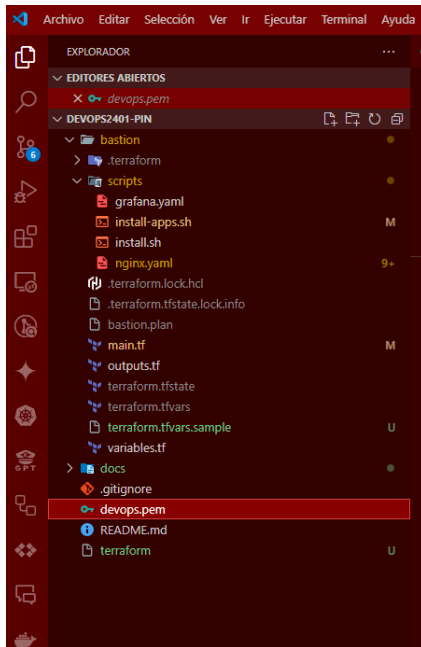
Utilizamos Terraform para aprovisionar una instancia EC2 en AWS. En el proceso, se generaron 16 recursos, incluyendo la creación del par de claves (KEY_PAIR) necesario para establecer la conexión SSH.

```
terraform -chdir=bastion/ init
terraform -chdir=bastion/ plan -out bastion.plan
terraform -chdir=bastion/ apply bastion.plan
```



Acceso SSH a la Instancia

La clave PEM se descargó oportunamente, se logró la conexión SSH a la instancia de forma exitosa.

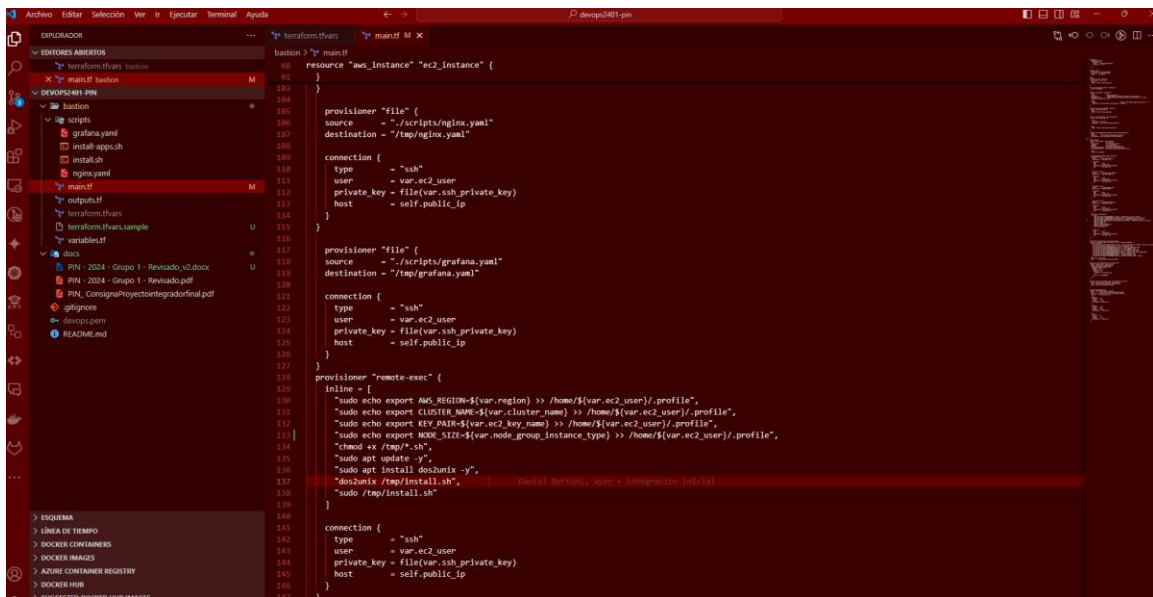




Aprovisionamiento de scripts

Aquí usamos la misma llave que vamos a usar para conectarnos al bastión , para transferirle los archivo de script al directorio /tmp del bastión y así poder controlar de manera versionada los cambios que vayamos haciendo en los script de despliegue.

Ademas es requerido pasarle las variable de Terraform al Sistema Operativo mediante variables de entorno.



Instalación de las aplicaciones

Iniciamos el proceso de instalación utilizando el siguiente comando:

```
cd /tmp  
./installApps.sh
```

```
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-1015-aws x86_64)

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

System information as of Mon Oct 14 20:52:42 UTC 2024

System load:  0.0          Processes:    106
Usage of /:   40.6% of 7.57GB   Users logged in:  0
Memory usage: 20%          IPv4 address for eth0: 10.0.0.55
Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

14 updates can be applied immediately.
14 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

New release '24.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Mon Oct 14 20:50:40 2024 from 106.0.205.152
ubuntu@ip-10-0-0-55:~$ curl checkip.amazonaws.com
3.86.2.153
ubuntu@ip-10-0-0-55:~$
```

Instalación del EKS

En el script de instalación se ejecutara esta parte

```
install-apps.sh M X
bastion > scripts > install-apps.sh
You, hace 6 minutos | 2 authors (Daniel Bertoni and one other)
1  #!/bin/bash
2
3  ## Grafana y Prometheus
4  export NAMESPACE="monitoring"
5
6  ## Instalacion del EKS
7  aws sts get-caller-identity >> /dev/null
8
9  eksctl create cluster \
10 --name $CLUSTER_NAME \
11 --region $AWS_REGION \
12 --nodes 3 \
13 --node-type $NODE_SIZE \
14 --with-oidc \
15 --ssh-access \
16 --ssh-public-key $KEY_PAIR \
17 --managed \
18 --full-ecr-access \
19 --zones us-east-1a,us-east-1b,us-east-1c
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```
install-apps M X
bastion > scripts > install-apps.sh
9   eksctl create cluster \
17  --managed \
18  --full-ecr-access \
19  --zones us-east-1a,us-east-1b,us-east-1c
20
21  ## Actualizar kubeconfig
22  aws eks update-kubeconfig --name $CLUSTER_NAME --region $AWS_REGION
23
```

```
2024-10-14 21:10:08 [i]   node ip-192-168-8-235.ec2.internal is ready
2024-10-14 21:10:08 [✓]   created 1 managed nodegroup(s) in cluster "eks-mundos-240101"
2024-10-14 21:10:09 [i]   kubectl command should work with "/home/ubuntu/.kube/config", try 'kubectl get nodes'
2024-10-14 21:10:09 [✓]   EKS cluster "eks-mundos-240101" in "us-east-1" region is ready
Added new context arn:aws:eks:us-east-1:714317586335:cluster/eks-mundos-240101 to /home/ubuntu/.kube/config
```

Instalación del EBS Driver

En el script de instalacion se ejecutara en esta parte

```
uda
install-apps M X
bastion > scripts > install-apps.sh
24  ##Instalacion el EBS CSI Driver
25  kubectl apply -k "github.com/kubernetes-sigs/aws-ebs-csi-driver/deploy/kubernetes/overlays/stable/?ref=release-1.30"
26
27  eksctl create iamserviceaccount \
28  --name ebs-csi-controller-sa \
29  --region $AWS_REGION \
30  --namespace kube-system \
31  --cluster $CLUSTER_NAME \
32  --attach-policy-arn arn:aws:iam::aws:policy/service-role/AmazonEBSCSIDriverPolicy \
33  --approve \
34  --role-only \
35  --role-name AmazonEKS_EBS_CSI_DriverRole
36
37  # Obtener el ID de la cuenta y almacenarlo en una variable
38  ACCOUNT_ID=$(aws sts get-caller-identity --query Account --output text)
39
40  # Ejecutar el comando eksctl con la variable ACCOUNT_ID
41  eksctl create addon \
42  --name aws-ebs-csi-driver \
43  --cluster $CLUSTER_NAME \
44  --service-account-role-arn arn:aws:iam::$ACCOUNT_ID:role/AmazonEKS_EBS_CSI_DriverRole \
45  --force
46  ##Instalacion el EBS CSI Driver
Added new context arn:aws:eks:us-east-1:714317586335:cluster/eks-mundos-240101 to /home/ubuntu/.kube/config
serviceaccount/ebs-csi-controller-sa created
serviceaccount/ebs-csi-node-sa created
role.rbac.authorization.k8s.io/ebs-csi-leases-role created
clusterrole.rbac.authorization.k8s.io/ebs-csi-node-role created
clusterrole.rbac.authorization.k8s.io/ebs-external-attacher-role created
clusterrole.rbac.authorization.k8s.io/ebs-external-provisioner-role created
clusterrole.rbac.authorization.k8s.io/ebs-external-resizer-role created
clusterrole.rbac.authorization.k8s.io/ebs-external-snapshotter-role created
rolebinding.rbac.authorization.k8s.io/ebs-csi-leases-rolebinding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-attacher-binding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-node-getter-binding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-provisioner-binding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-resizer-binding created
clusterrolebinding.rbac.authorization.k8s.io/ebs-csi-snapshotter-binding created
deployment.apps/ebs-csi-controller created
poddisruptionbudget.policy/ebs-csi-controller created
daemonset.apps/ebs-csi-node created
csidriver.storage.k8s.io/ebs.csi.aws.com created
2024-10-14 21:10:13 [i]   1 iamserviceaccount (kube-system/ebs-csi-controller-sa) was included (based on the include/exclude rules)
2024-10-14 21:10:13 [i]   serviceaccounts in Kubernetes will not be created or modified, since the option --role-only is used
2024-10-14 21:10:13 [i]   1 task: [ create IAM role for serviceaccount "kube-system/ebs-csi-controller-sa" ]
2024-10-14 21:10:13 [i]   building iamserviceaccount stack "eksctl-eks-mundos-240101-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-14 21:10:13 [i]   deploying stack "eksctl-eks-mundos-240101-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-14 21:10:13 [i]   waiting for CloudFormation stack "eksctl-eks-mundos-240101-addon-iamserviceaccount-kube-system-ebs-csi-controller-sa"
2024-10-14 21:10:44 [i]   Kubernetes version "1.30" in use by cluster "eks-mundos-240101"
2024-10-14 21:10:45 [i]   IRSA is set for "aws-ebs-csi-driver" addon; will use this to configure IAM permissions
2024-10-14 21:10:45 [i]   IRSA has been deprecated; the recommended way to provide IAM permissions for "aws-ebs-csi-driver" addon is via pod identity associations; after addon creation is completed, run "eksctl utils migrate-to-pod-identity"
2024-10-14 21:10:45 [i]   using provided ServiceAccountRoleARN "arn:aws:iam:714317586335:role/AmazonEKS_EBS_CSI_DriverRole"
2024-10-14 21:10:45 [i]   creating addon
```

Despliegue de Nginx

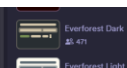
En el script de instalacion se ejecutara en esta parte

```
install-apps.sh M x
bastion > scripts > install-apps.sh
41 eksctl create addon \
46     Daniel Bertoni, ayer • separacion de eks del aprovisionamiento de her...
47 ## Instalacion de NGINX
48 kubectl apply -f /tmp/nginx.yaml
49
```

El deployment es el siguiente:

```
apiVersion: v1
kind: Namespace
metadata:
  name: devops2401
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
  namespace: devops2401
  labels:
    app: nginx
spec:
  replicas: 2
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
        - name: nginx
          image: nginx:1.21.6
          ports:
            - containerPort: 80
---
apiVersion: v1
kind: Service
metadata:
  name: nginx-service
  namespace: devops2401
  labels:
    app: nginx
spec:
  type: LoadBalancer
  ports:
    - port: 80
      targetPort: 80
  selector:
    app: nginx
---
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: nginx-ingress
  namespace: devops2401
  annotations:
    nginx.ingress.kubernetes.io/rewrite-target: /
spec:
  rules:
    - host: nginx.local
      http:
        paths:
          - path: /
            pathType: Prefix
        backend:
          service:
            name: nginx-service
            port:
              number: 80
```

```
2024-10-14 21:18:45 [1] - using previous serviceaccountname - <[REDACTED]>
2024-10-14 21:18:45 [1] - creating addon
namespace/devops2401 created
deployment.apps/nginx-deployment created
service/nginx-service created
ingress.networking.k8s.io/nginx-ingress created
```




```
ubuntu@ip-10-0-0-55:/tmp$ kubectl get all -n devops2481
```

NAME	READY	STATUS	RESTARTS	AGE
pod/nginx-deployment-6f894d6c97-24b6v	1/1	Running	0	13m
pod/nginx-deployment-6f894d6c97-2hsxr	1/1	Running	0	13m
pod/nginx-deployment-6f894d6c97-t26s6	1/1	Running	0	13m

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/nginx-service	LoadBalancer	10.100.250.158	a11ad52303b1f4316a99ea31ef475578-2017000061.us-east-1.elb.amazonaws.com	80:32267/TCP	13m

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/nginx-deployment	3/3	3	3	13m

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/nginx-deployment-6f894d6c97	3	3	3	13m

```
ubuntu@ip-10-0-0-55:/tmp$
```

Luego, verificamos el acceso a Nginx desde el navegador.



Despliegue de Prometheus

En el script de instalacion se ejecutara en esta parte

```
# Agregar repo de prometheus
helm repo add prometheus-community https://prometheus-community.github.io/helm-charts

# Agregar repo de grafana
helm repo add grafana https://grafana.github.io/helm-charts

helm repo update

# Crear el namespace prometheus
kubectl create namespace prometheus

# Desplegar prometheus en EKS

helm install prometheus prometheus-community/prometheus \
--namespace prometheus \
--set alertmanager.persistentVolume.storageClass="gp2" \
--set server.persistentVolume.storageClass="gp2"

# Verificar la instalación
kubectl get all -n prometheus

# Exponer prometheus en la instancia de EC2 en el puerto 8080
kubectl port-forward -n prometheus deploy/prometheus-server 8080:9090 --address 0.0.0.0
```

```
ubuntu@ip-10-0-0-55: /tmp$ kubectl get all -n prometheus
```

NAME	READY	STATUS	RESTARTS	AGE
pod/prometheus-alertmanager-0	0/1	Pending	0	14m
pod/prometheus-kube-state-metrics-74cd59ff-6mpj	1/1	Running	0	14m
pod/prometheus-prometheus-node-exporter-2hr	1/1	Running	0	14m
pod/prometheus-prometheus-node-exporter-fb5pc	1/1	Running	0	14m
pod/prometheus-prometheus-node-exporter-ghrt	1/1	Running	0	14m
pod/prometheus-prometheus-pushgateway-6fcd5fd-gdt84	1/1	Running	0	14m
pod/prometheus-server-d484fd9-q4pc5	2/2	Running	0	14m

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/prometheus-alertmanager	ClusterIP	10.100.229.150	<none>	9093/TCP	14m
service/prometheus-alertmanager-headless	ClusterIP	None	<none>	9093/TCP	14m
service/prometheus-kube-state-metrics	ClusterIP	10.100.148.108	<none>	8080/TCP	14m
service/prometheus-prometheus-node-exporter	ClusterIP	10.100.90.150	<none>	9100/TCP	14m
service/prometheus-prometheus-pushgateway	ClusterIP	10.100.161.240	<none>	9091/TCP	14m
service/prometheus-server	ClusterIP	10.100.100.90	<none>	80/TCP	14m

NAME	DESIRED	CURRENT	READY	UP-TO-DATE	AVAILABLE	NODE SELECTOR	AGE
daemonset.apps/prometheus-prometheus-node-exporter	3	3	3	3	3	kubernetes.io/os=linux	14m

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/prometheus-kube-state-metrics	1/1	1	1	14m
deployment.apps/prometheus-prometheus-pushgateway	1/1	1	1	14m
deployment.apps/prometheus-server	1/1	1	1	14m

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/prometheus-kube-state-metrics-74cd59ff	1	1	1	14m
replicaset.apps/prometheus-prometheus-pushgateway-6fcd5fd	1	1	1	14m
replicaset.apps/prometheus-server-d484fd9	1	1	1	14m

NAME	READY	AGE
statefulset.apps/prometheus-alertmanager	0/1	14m

Instalación de Grafana

En el proceso de instalacion de grafana se utiliza un archivo grafana.yaml que sera donde se configura el datasource de prometheus que se despliega en el paso anterior.

En el script de instalacion se ejecutara en esta parte

```
kubectl create namespace grafana

helm install grafana grafana/grafana \
  --namespace grafana \
  --set persistence.storageClassName="gp2" \
  --set persistence.enabled=true \
  --set adminPassword='EKS!sAwSome' \
  --values /tmp/grafana.yaml \
  --set service.type=LoadBalancer
```

```
ubuntu@ip-10-0-0-55: /tmp$ kubectl get all -n grafana
```

NAME	READY	STATUS	RESTARTS	AGE
pod/grafana-b4757b775-rnhn6	1/1	Running	0	15m

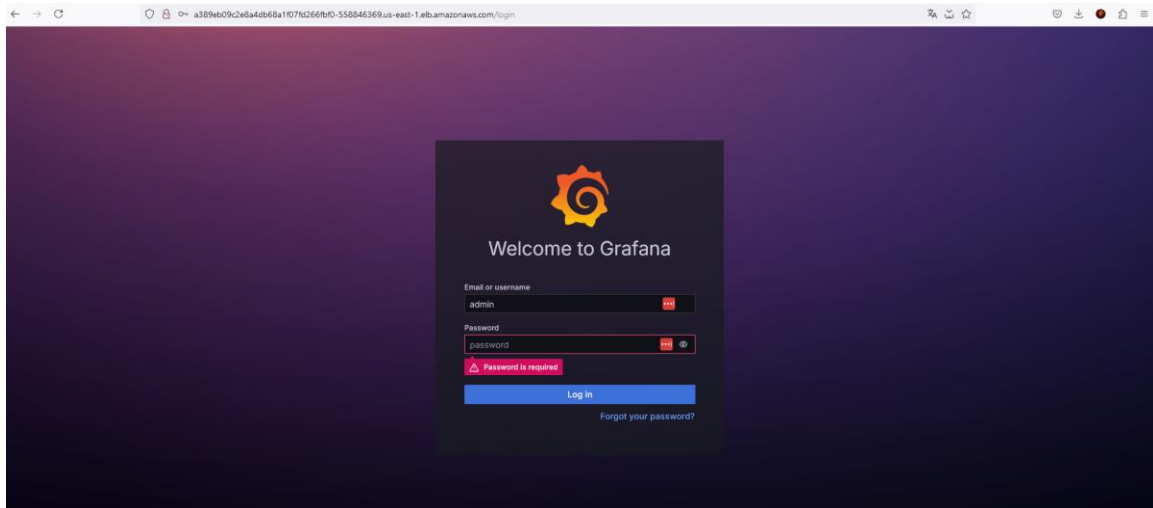
NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/grafana	LoadBalancer	10.100.229.210	a389eb89c2e8a4db68a1f07fd266fbf0-558846389.us-east-1.elb.amazonaws.com	80:31049/TCP	15m

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/grafana	1/1	1	1	15m

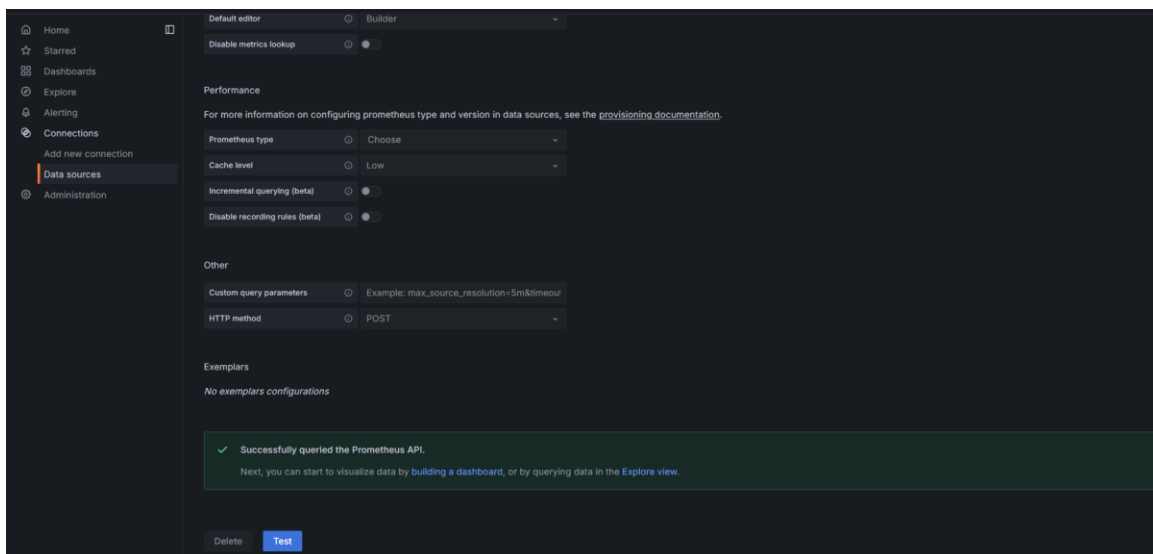
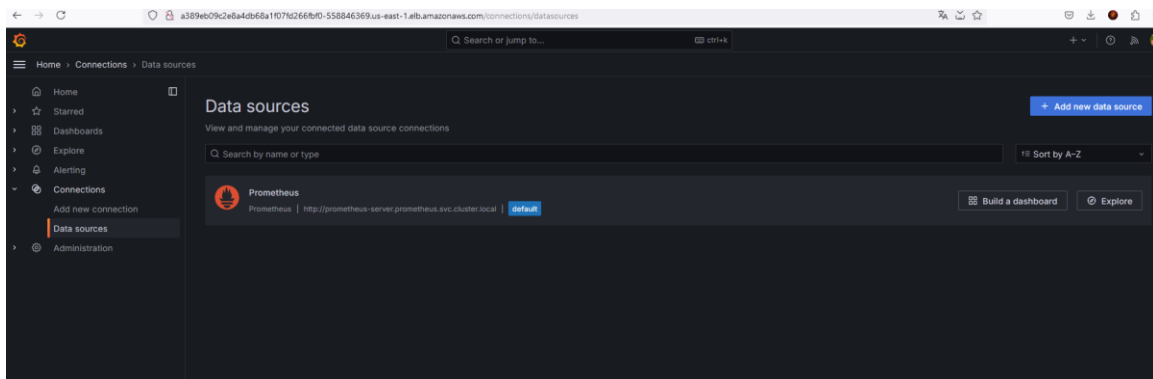
NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/grafana-b4757b775	1	1	1	15m

Monitoreo

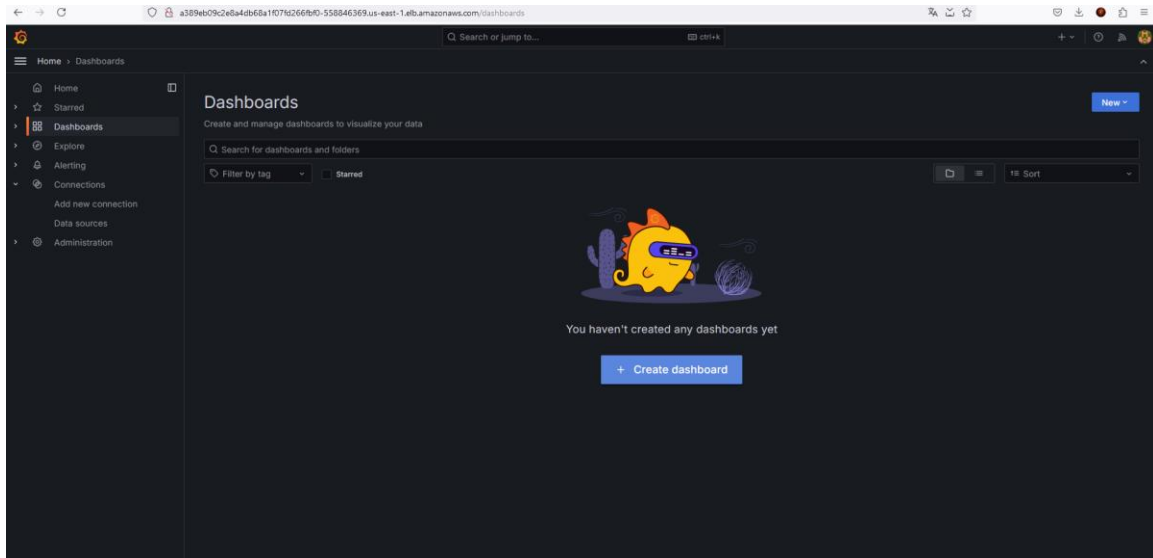
Accedemos al external-ip



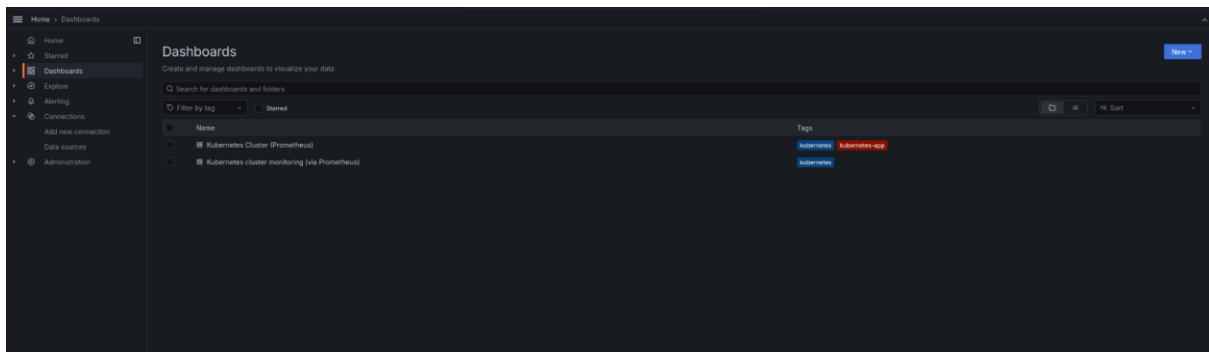
Verificamos que exista el datasource



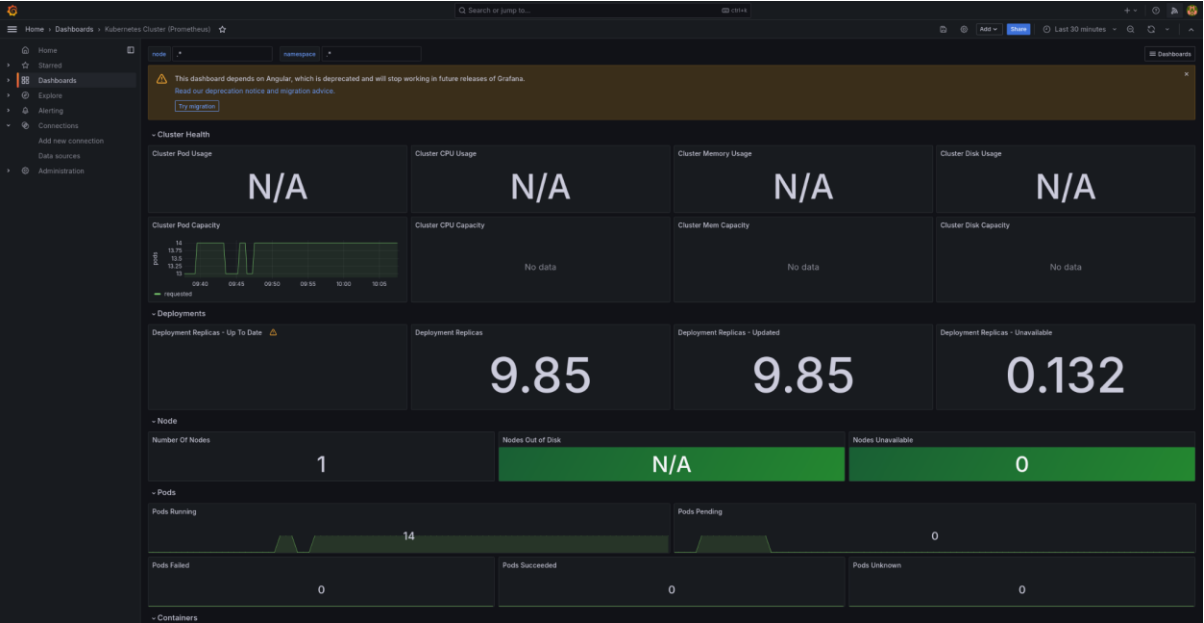
Importamos los dashboards 6417 y 3119 en la carpeta Dashboard



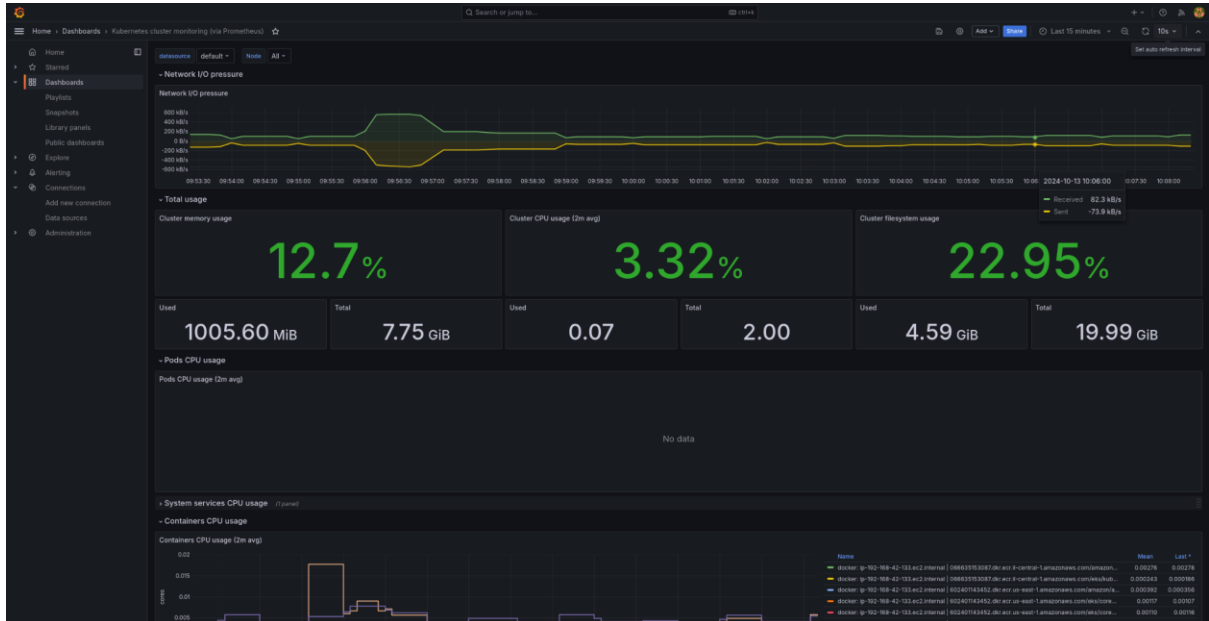
Verificamos importación de ambos



ID 6417:



ID 3119:



Limpieza de Recursos

Procedimos a limpiar todos los recursos desplegados para evitar costos innecesarios.

Desde el bastion (EC2)

```
eksctl delete cluster --name $CLUSTER_NAME --region $AWS_REGION
```

```
cat /etc/passwd | grep prometheus-alertmanager | cut -d ':' -f 1,4m
buntufp-10-0-0-55:/tmp$ kubectl get all -n grafana
NAME                                READY    STATUS    RESTARTS   AGE
pod/grafana-b4757b775-rnhw6         1/1     Running   0           15m

NAME                                TYPE          CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
service/grafana                     LoadBalancer 10.100.229.210 a385eb89c2e8a4d68a1f07fd266fbf0-558846369.us-east-1.elb.amazonaws.com 80:31049/TCP    15m

NAME                                READY    UP-TO-DATE    AVAILABLE     AGE
deployment.apps/grafana              1/1      1              1              15m

NAME                                DESIRED    CURRENT    READY    AGE
replicaset.apps/grafana-b4757b775    1          1          1        15m

buntufp-10-0-0-55:/tmp$ eksctl delete cluster --name $CLUSTER_NAME --region $AWS_REGION
024-10-14 21:39:24 [i] deleting EKS cluster "eks-mundos-240101"
024-10-14 21:39:24 [i] will drain 0 unmanaged nodegroup(s) in cluster "eks-mundos-240101"
024-10-14 21:39:24 [i] starting parallel draining, max in-flight of 1
024-10-14 21:39:24 [x] failed to acquire semaphore while waiting for all routines to finish: context canceled
024-10-14 21:39:24 [i] deleted 0 fargate profile(s)
024-10-14 21:39:25 [✓] kubeconfig has been updated
024-10-14 21:39:25 [i] cleaning up AWS load balancers created by Kubernetes objects of Kind Service or Ingress
024-10-14 21:40:32 [i]
sequential tasks: { delete nodegroup "ng-41856748",
2 sequential sub-tasks: {
2 sequential sub-tasks: {
delete IAM role for serviceaccount "kube-system/eks-csi-controller-sa",
delete serviceaccount "kube-system/eks-csi-controller-sa",
},
delete IAM OIDC provider,
}, delete add-on IAM "eksctl-eks-mundos-240101-addon-vc-cni", delete cluster control plane "eks-mundos-240101" [async]
024-10-14 21:40:32 [i] will delete stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:40:32 [i] waiting for stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748" to get deleted
024-10-14 21:40:32 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:41:02 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:41:36 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:42:19 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:43:28 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:44:05 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:45:23 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:46:28 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:47:58 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-nodegroup-ng-41856748"
024-10-14 21:47:59 [i] will delete stack "eksctl-eks-mundos-240101-addon-iam-serviceaccount-kube-system-eks-csi-controller-sa"
024-10-14 21:47:59 [i] waiting for stack "eksctl-eks-mundos-240101-addon-iam-serviceaccount-kube-system-eks-csi-controller-sa" to get deleted
024-10-14 21:47:59 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-addon-iam-serviceaccount-kube-system-eks-csi-controller-sa"
024-10-14 21:48:29 [i] waiting for CloudFormation stack "eksctl-eks-mundos-240101-addon-iam-serviceaccount-kube-system-eks-csi-controller-sa"
024-10-14 21:48:29 [i] serviceaccount "kube-system/eks-csi-controller-sa" was not created by eksctl; will not be deleted
024-10-14 21:48:29 [i] will delete stack "eksctl-eks-mundos-240101-addon-vc-cni"
024-10-14 21:48:29 [i] will delete stack "eksctl-eks-mundos-240101-cluster"
024-10-14 21:48:29 [✓] all cluster resources were deleted
buntufp-10-0-0-55:/tmp$
```

Desde el pc de salto:

```
terraform -chdir=bastion/ plan -out bastion.plan -destroy
terraform -chdir=bastion/ apply bastion.plan
```

```
## Para destruir el eks
12 eksctl delete cluster --name $CLUSTER_NAME --region $AWS_REGION
13
14 ## Para destruir el bastion
15 desde la PC de salto
16
17 terraform -chdir=bastion/ plan -out bastion.plan -destroy
18 terraform -chdir=bastion/ apply bastion.plan
19

Salida CONSOLE DE DEPURACIÓN TERMINAL PUERTOS GITLINS COMENTARIOS PROBLEMAS

arn = "arn:aws:ec2:us-east-1:714317586335:vpw/vpc-007285290c969a315" -> null
assign_generated_ip6_cidr_block = false -> null
cidr_block = "18.0.0.0/16" -> null
default_network_acl_id = "acl-8c530640269f3eed" -> null
default_route_table_id = "rtb-0796a3cfdbdd7035" -> null
default_security_group_id = "sg-0bca22098456bb69" -> null
dhcp_options_id = "dopt-9f4a0ef5" -> null
enable_dns_hostnames = false -> null
enable_dns_support = true -> null
enable_network_address_usage_metrics = false -> null
id = "vpc-007285290c969a315" -> null
instance_tenancy = "default" -> null
ip6_network_length = 0 -> null
main_route_table_id = "rtb-0796a3cfdbdd7035" -> null
owner_id = "714317586335" -> null
Tags = {
  "Name" = "eks-mundo-240101-vpc"
} -> null
Tags_all = {
  "Name" = "eks-mundo-240101-vpc"
} -> null
# (4 unchanged attributes hidden)

Plan: 0 to add, 0 to change, 23 to destroy.

Changes to Outputs:
- instance_ip ec2 = "3.86.3.153" -> null
- instance_state = "running" -> null
- tag_name = "DevOps" -> null

Save the plan to: bastion.plan
To perform exactly these actions, run the following command to apply:
terraform apply "bastion.plan"

C:\Users\shiba\OneDrive\Documents\github\devops\devops2401-plan
```

```
## Para Desplegar el EKS y el monitoreo
12 ./installApps.sh
13
14 ## Para destruir el eks
15 Desde el Bastion
16
Salida CONSOLE DE DEPURACIÓN TERMINAL PUERTOS GITLINS COMENTARIOS PROBLEMAS

aws_iam_role_policy_attachment.ec2_role_policy_attachment[arn:aws:iam::aws:policy/AmazonEC2FullAccess]: Destruction complete after 1s
aws_route_table_association.eks_route_table_assoc[0]: Destroying... [id=rtbassoc-0b3cf3da277a3b0ff]
aws_iam_role_policy_attachment.ec2_role_policy_attachment[arn:aws:iam::aws:policy/AmazonEC2FullAccess]: Destruction complete after 1s
aws_iam_role_policy_attachment.ec2_role_policy_attachment[arn:aws:iam::aws:policy/AmazonEC2FullAccess]: Destroying... [id=eks-mundo-240101-ec2-role-20240101204352937700000000]
aws_iam_role_policy_attachment.ec2_role_policy_attachment[arn:aws:iam::aws:policy/AmazonEC2FullAccess]: Destruction complete after 1s
aws_iam_role_policy_attachment.ec2_role_policy_attachment[arn:aws:iam::aws:policy/CloudWatchLogsFullAccess]: Destruction complete after 1s
aws_iam_role_policy_attachment.ec2_role_policy_attachment[arn:aws:iam::aws:policy/IAMFullAccess]: Destruction complete after 1s
aws_iam_role_policy_attachment.ec2_role_policy_attachment[arn:aws:iam::aws:policy/AmazonS3FullAccess]: Destruction complete after 0s
aws_iam_role_policy_attachment.ec2_role_policy_attachment[arn:aws:iam::aws:policy/AmazonEC2FullAccess]: Destruction complete after 0s
aws_route_table_association.eks_route_table_assoc[1]: Destruction complete after 1s
aws_route_table_association.eks_route_table_assoc[2]: Destruction complete after 1s
aws_route_table.eks_route_table: Destroying... [id=rtb-00829383553071769]
aws_route_table.eks_route_table: Destruction complete after 1s
aws_internet_gateway.eks_igw: Destroying... [id=igw-008fa0fdeba0d4dd]
aws_instance.ec2_instance: Still destroying... [id=i-0ba5c2082298ff729, 10s elapsed]
aws_internet_gateway.eks_igw: Still destroying... [id=igw-008fa0fdeba0d4dd, 30s elapsed]
aws_instance.ec2_instance: Still destroying... [id=i-0ba5c2082298ff729, 20s elapsed]
aws_internet_gateway.eks_igw: Still destroying... [id=igw-008fa0fdeba0d4dd, 30s elapsed]
aws_instance.ec2_instance: Still destroying... [id=i-0ba5c2082298ff729, 40s elapsed]
aws_internet_gateway.eks_igw: Still destroying... [id=igw-008fa0fdeba0d4dd, 40s elapsed]
aws_instance.ec2_instance: Still destroying... [id=i-0ba5c2082298ff729, 50s elapsed]
aws_internet_gateway.eks_igw: Destruction complete after 40s
aws_instance.ec2_instance: Destruction complete after 50s
aws_iam_instance_profile.ec2_profile: Destroying... [id=eks-mundo-240101-ec2-instance-profile]
aws_subnet.eks_subnet[2]: Destroying... [id=subnet-01c74401a96a26]
aws_subnet.eks_subnet[0]: Destroying... [id=subnet-0c510e21c3a0d0e]
aws_security_group.ec2_sg: Destroying... [id=sg-00d246075431b1]
aws_subnet.eks_subnet[1]: Destroying... [id=subnet-001f0eb7201763ad]
aws_iam_instance_profile.ec2_profile: Destruction complete after 1s
aws_iam_role.ec2_iam_role: Destroying... [id=eks-mundo-240101-ec2-role]
aws_subnet.eks_subnet[0]: Destruction complete after 1s
aws_subnet.eks_subnet[2]: Destruction complete after 1s
aws_iam_role.ec2_iam_role: Destruction complete after 0s
aws_subnet.eks_subnet[1]: Destruction complete after 1s
aws_security_group.ec2_sg: Destruction complete after 2s
aws_vpc.eks_vpc: Destroying... [id=vpc-007285290c969a315]
aws_vpc.eks_vpc: Destruction complete after 1s

Apply complete! Resources: 0 added, 0 changed, 23 destroyed.

C:\Users\shiba\OneDrive\Documents\github\devops\devops2401-plan
```

Anexo I - Reaseguro de Limpieza

CLOUD-NUKE - Eliminar otros servicios creado a mano.

```
cloud-nuke_linux_amd64 aws --region us-east-1
```

```
devops@devops:/media/Containers/proyectos$ ./cloud-nuke_linux_amd64 aws --region us-east-1
WARNING This program sends telemetry to Gruntwork. To disable, set DISABLE_TELEMETRY=true as an environment variable

# AWS Resource Query Parameters
+-----+-----+
| Query Parameter | Value |
+-----+-----+
| Target Regions  | us-east-1 |
| Target Resource Types | 108 resource types (too many to list all) |
| List Unaliased KMS Keys | false |
+-----+-----+

INFO Found 1 ec2 resources in us-east-1
INFO Found 1 ec2-keypairs resources in us-east-1
INFO Found 4 vpc resources in us-east-1
INFO Found 1 ec2_dhcp_option resources in us-east-1
INFO Found 3 ec2-subnet resources in us-east-1
INFO Found 1 internet-gateway resources in us-east-1
INFO Found 1 network-interface resources in us-east-1
INFO Found 1 security-group resources in us-east-1
INFO Done searching for resources
INFO Found total of 13 resources

# Found AWS Resources
+-----+-----+-----+-----+
| Resource Type | Region | Identifier | Nukable |
+-----+-----+-----+-----+
| ec2           | us-east-1 | i-03cb1988d6ae8c8e1 | - |
| ec2-keypairs  | us-east-1 | key-04c01435777da509e | ✓ |
| vpc           | us-east-1 | vpc-0bb2406e0ae5c98f9 | ✓ |
| vpc           | us-east-1 | vpc-038f4765978c1869c | ✓ |
| vpc           | us-east-1 | vpc-0b99bf3d9ae6768e5 | ✓ |
| vpc           | us-east-1 | vpc-049d416eabd615d94 | ✓ |
| ec2_dhcp_option | us-east-1 | dopt-07d8408366deb27f9 | ✓ |
| ec2-subnet    | us-east-1 | subnet-0a5813d76e0be588f | ✓ |
| ec2-subnet    | us-east-1 | subnet-091a4249188de41b5 | ✓ |
| ec2-subnet    | us-east-1 | subnet-0fda860b51e5f98b7 | ✓ |
| internet-gateway | us-east-1 | igw-02cfd9279b9ef2ef2 | ✓ |
| network-interface | us-east-1 | eni-050e638ff370dc31d | ✓ |
| security-group | us-east-1 | sg-07b7efb01fe4e1e11 | ✓ |
+-----+-----+-----+-----+

WARNING THE NEXT STEPS ARE DESTRUCTIVE AND COMPLETELY IRREVERSIBLE, PROCEED WITH CAUTION!!!
Are you sure you want to nuke all listed resources? Enter 'nuke' to confirm (or exit with ^C) :
```

Confirmamos

```
WARNING THE NEXT STEPS ARE DESTRUCTIVE AND COMPLETELY IRREVERSIBLE, PROCEED WITH CAUTION!!!
Are you sure you want to nuke all listed resources? Enter 'nuke' to confirm (or exit with ^C) : nuke
Nuking batch of 1 ec2 resource(s) in us-east-1 [0/13] 0% | 14s

Nuking batch of 1 security-group resource(s) in us-east-1 [13/13] 100% | 1m44s2s
```