



# **Desafío No. 5**

Bootcamp DevOps 63703

Presentado por:  
Marco Vanegas  
2023

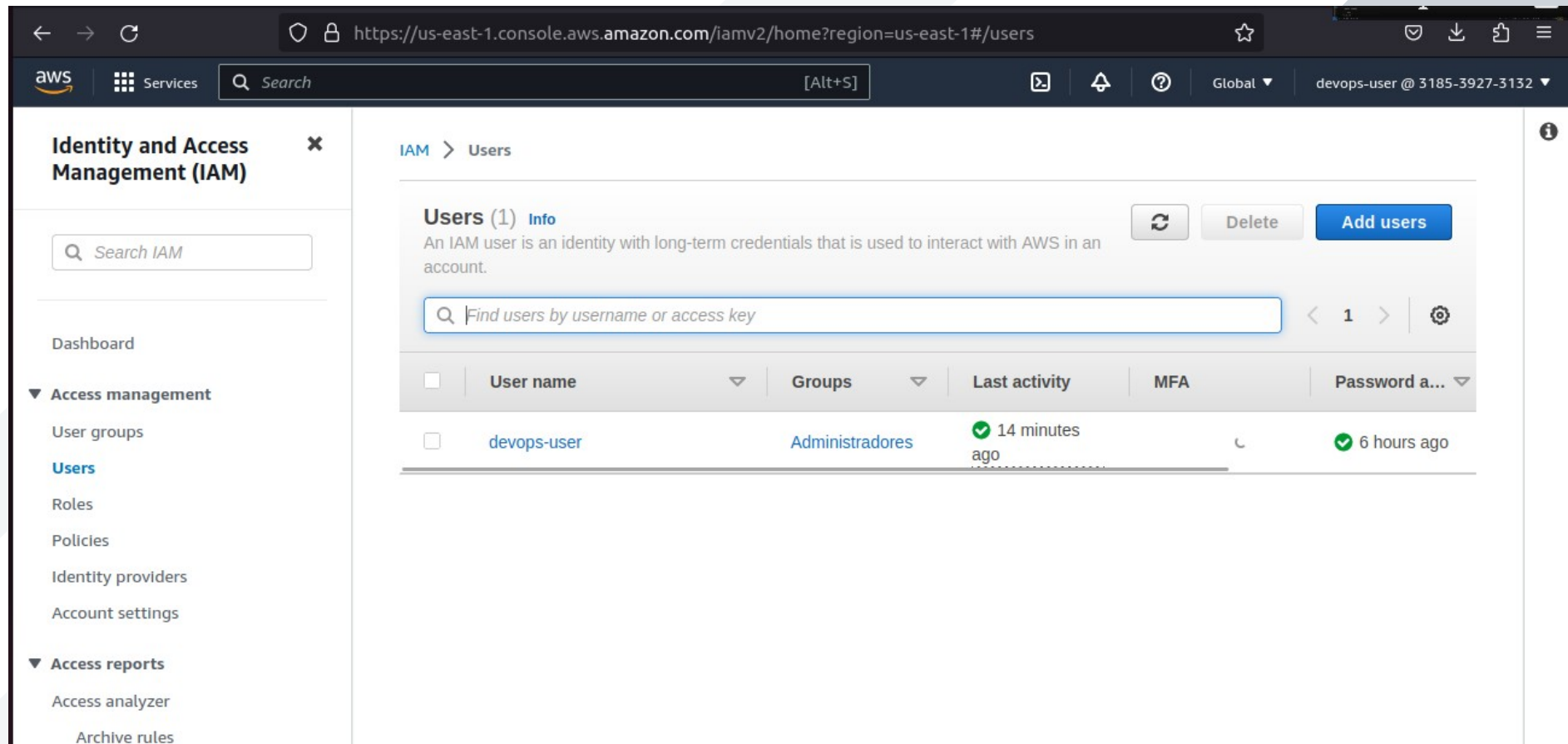
## PARTE I : Creación de una instancia en AWS mediante Terraform.



Illustrations by [Pixeltrue](#) on [icons8](#)



1. Una vez creada una cuenta gratuita en AWS, se procedió con la creación de un usuario con su respectivo grupo mediante la opción Identity and Access Management (IAM).



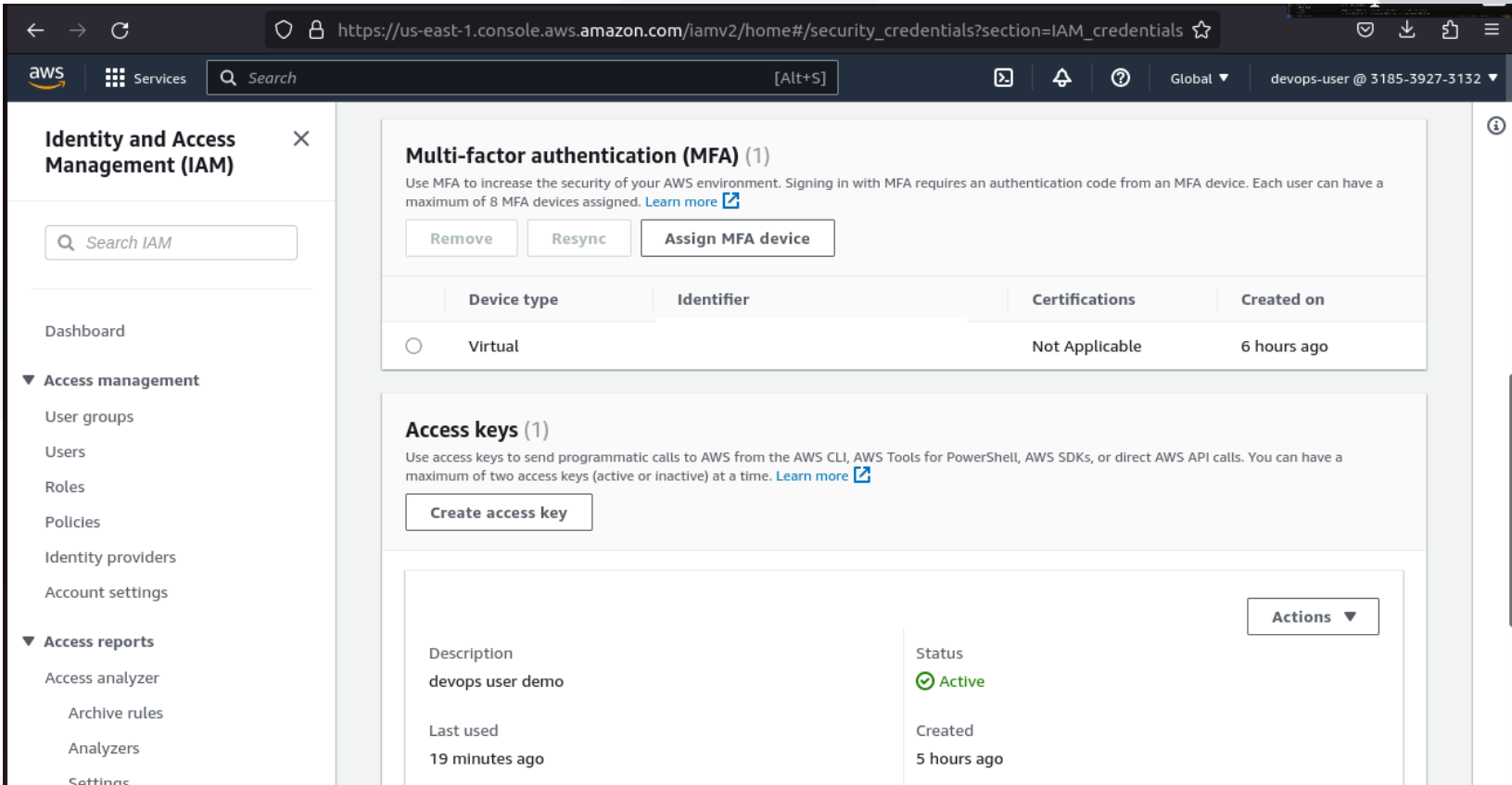
The screenshot shows the AWS IAM console interface. The top navigation bar includes the AWS logo, a search bar, and the user's profile (devops-user @ 3185-3927-3132). The left sidebar contains the IAM navigation menu, with 'Users' selected under 'Access management'. The main content area displays the 'Users' page, which includes a search bar, a table of users, and buttons for 'Add users', 'Delete', and 'Refresh'.

**Users (1)** [Info](#)

An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.

<input type="checkbox"/>	User name	Groups	Last activity	MFA	Password a...
<input type="checkbox"/>	devops-user	Administradores	✓ 14 minutes ago		✓ 6 hours ago

2. También mediante la opción Security Credentials se añadió doble factor de autenticación - Multi-factor authentication (MFA) para el usuario principal y el segundo usuario creado. Posteriormente, se crearon los Access Keys para acceder mediante terminal.



The screenshot displays the AWS IAM console interface. The left sidebar shows the navigation menu with 'Identity and Access Management (IAM)' selected. The main content area is divided into two sections: 'Multi-factor authentication (MFA) (1)' and 'Access keys (1)'. The MFA section includes a table with one entry for a 'Virtual' device, which is 'Not Applicable' for certifications and was created '6 hours ago'. The Access keys section shows a single 'Active' key for the user 'devops user demo', created '5 hours ago' and last used '19 minutes ago'.

**Multi-factor authentication (MFA) (1)**

Use MFA to increase the security of your AWS environment. Signing in with MFA requires an authentication code from an MFA device. Each user can have a maximum of 8 MFA devices assigned. [Learn more](#)

[Remove](#) [Resync](#) [Assign MFA device](#)

Device type	Identifier	Certifications	Created on
<input type="radio"/> Virtual		Not Applicable	6 hours ago

**Access keys (1)**

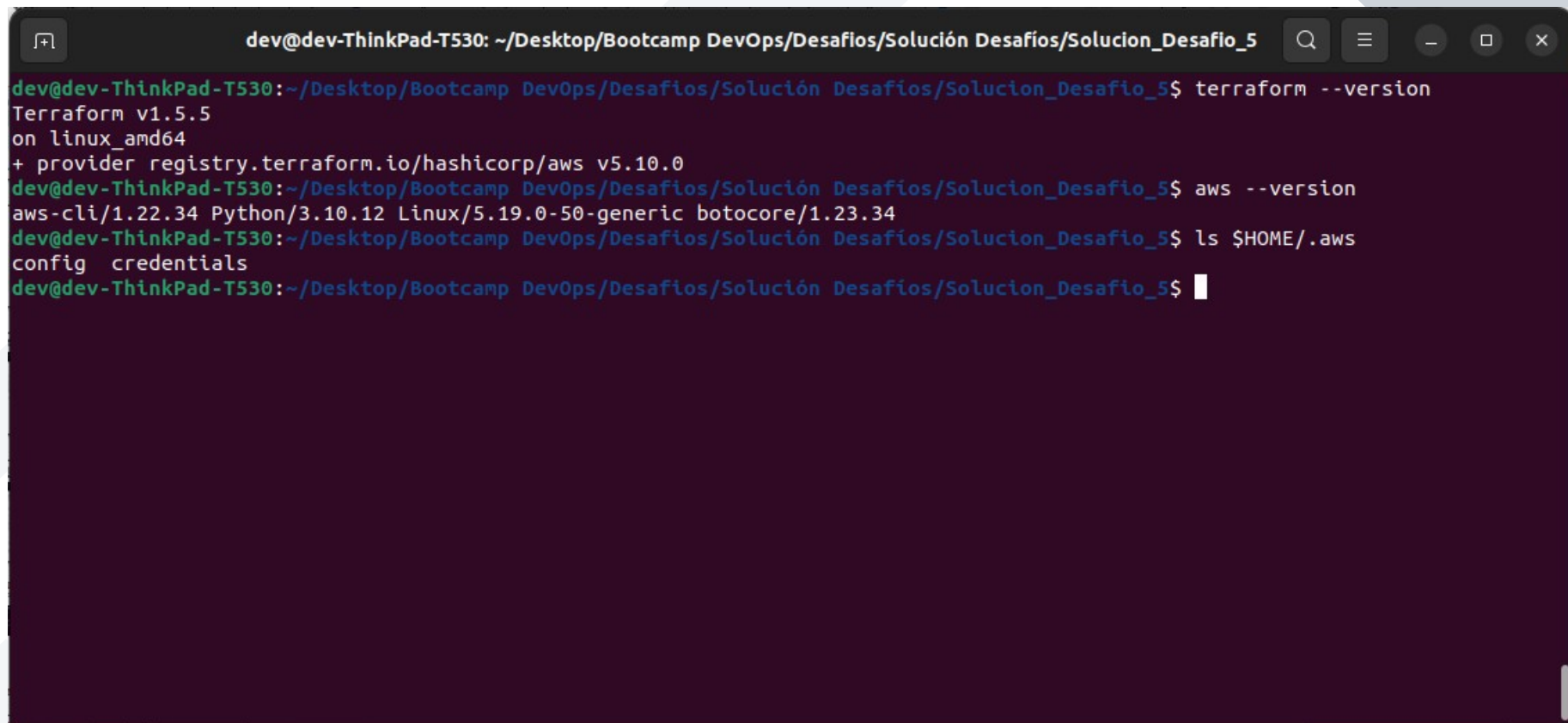
Use access keys to send programmatic calls to AWS from the AWS CLI, AWS Tools for PowerShell, AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time. [Learn more](#)

[Create access key](#)

Description	Status	Created
devops user demo	<span>✔ Active</span>	5 hours ago

Last used: 19 minutes ago

3. Luego se instaló Terraform y AWS-CLI en la máquina local, e igualmente se configuró AWS mediante el comando `aws configure`.



```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion_Desafio_5
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion_Desafio_5$ terraform --version
Terraform v1.5.5
on linux_amd64
+ provider registry.terraform.io/hashicorp/aws v5.10.0
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion_Desafio_5$ aws --version
aws-cli/1.22.34 Python/3.10.12 Linux/5.19.0-50-generic botocore/1.23.34
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion_Desafio_5$ ls $HOME/.aws
config  credentials
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion_Desafio_5$
```

4. En este paso se procedió a estructurar el archivo de Terraform con el código necesario para crear y configurar mediante el proveedor de AWS, lo siguiente:

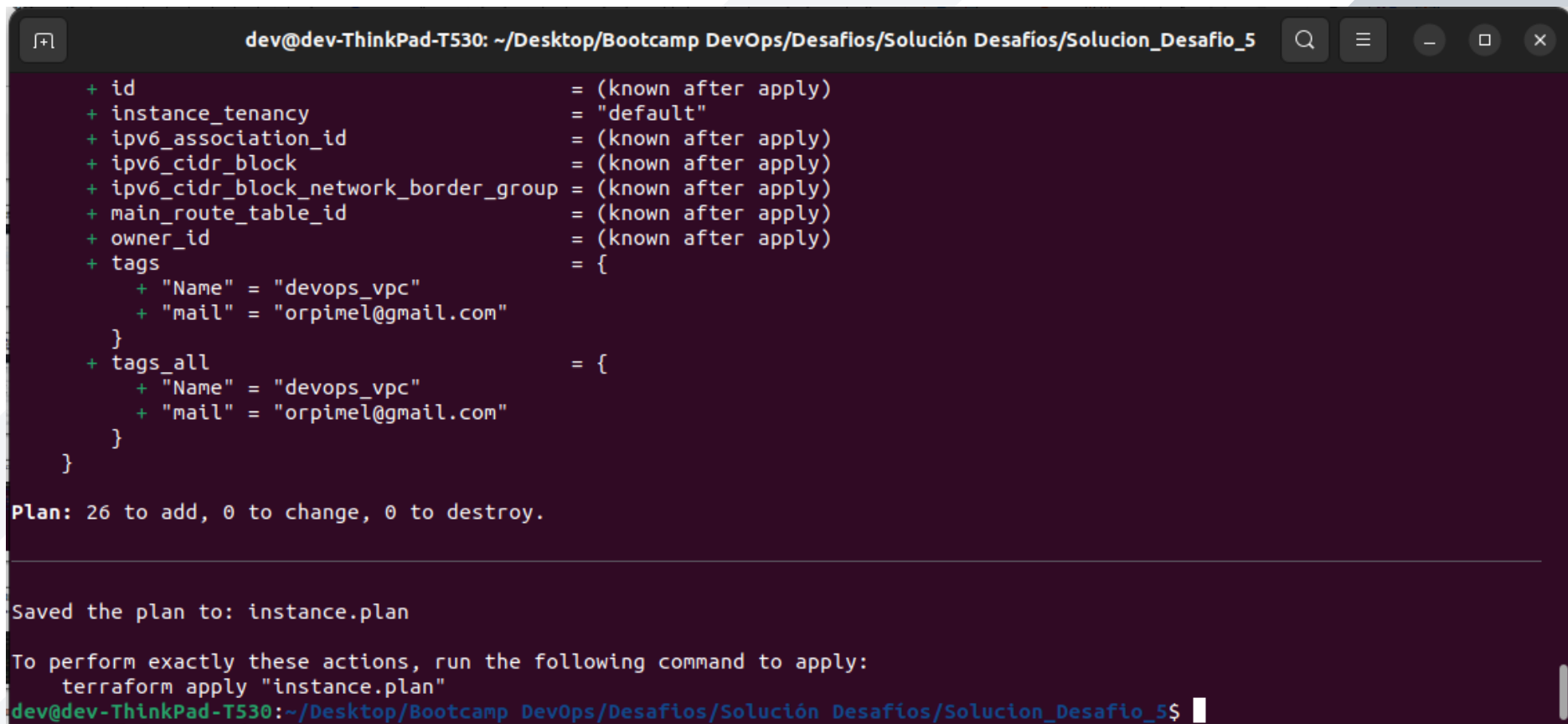
1. Creación de una Ip elástica.
2. Asociación de la Ip elástica con la instancia de Windows.
3. Creación de una VPC.
4. Creación de un Security Group.
5. Creación de una instancia.



The screenshot shows a code editor with a dark theme. On the left, the 'EXPLORER' sidebar displays a file tree for a project named 'SOLUCION\_DESAFIO\_5'. The files listed are '.terraform', '.terraform.lock.hcl', 'instance.plan', 'main.tf' (selected), 'README.md', 'terraform.tfstate', and 'terraform.tfstate.backup'. The main editor area shows the content of 'main.tf'. The code defines the AWS provider and creates an Elastic IP resource. The Terraform resource block for 'aws\_instance' is partially visible at the top.

```
main.tf > resource "aws_instance" "windows_server_ins"
1 terraform {
2   required_providers {
3     aws = {
4       source = "hashicorp/aws"
5       version = "5.10.0"
6     }
7   }
8 }
9
10 # Configure the AWS Provider
11 provider "aws" {
12   region = "us-east-1"
13 }
14
15 # Create a Resource - Elastic IP
16 resource "aws_eip" "devops_eip" {
17   tags = {
18     mail = "orpimel@gmail.com"
19 }
```

5. Después se ejecutó el comando “terraform plan - -out instance.plan”.

A terminal window with a dark background and light-colored text. The window title is "dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion\_Desafio\_5". The output shows a Terraform plan for an AWS VPC resource. It lists various attributes like id, instance\_tenancy, ipv6\_association\_id, etc., and their planned values. At the bottom, it says "Plan: 26 to add, 0 to change, 0 to destroy." and "Saved the plan to: instance.plan". It also provides the command to apply the plan: "terraform apply \"instance.plan\"". The prompt at the bottom is "dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion\_Desafio\_5\$".

```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion_Desafio_5

+ id                                     = (known after apply)
+ instance_tenancy                     = "default"
+ ipv6_association_id                  = (known after apply)
+ ipv6_cidr_block                      = (known after apply)
+ ipv6_cidr_block_network_border_group = (known after apply)
+ main_route_table_id                  = (known after apply)
+ owner_id                             = (known after apply)
+ tags                                 = {
    + "Name" = "devops_vpc"
    + "mail" = "orpimel@gmail.com"
  }
+ tags_all                             = {
    + "Name" = "devops_vpc"
    + "mail" = "orpimel@gmail.com"
  }
}

Plan: 26 to add, 0 to change, 0 to destroy.

Saved the plan to: instance.plan

To perform exactly these actions, run the following command to apply:
  terraform apply "instance.plan"
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solución Desafios/Solucion_Desafio_5$
```

6. Finalmente se procede con la ejecución del comando “terraform apply” para la creación de los recursos en AWS.

```
dev@dev-ThinkPad-T530: ~/Desktop/Bootcamp DevOps/Desafios/Solución Desafíos/Solucion_Desafio_5
module.vpc.aws_route_table_association.private[0]: Creating...
module.vpc.aws_route_table_association.private[1]: Creating...
module.vpc.aws_subnet.public[0]: Creation complete after 3s [id=subnet-054c80971e5cf6cc8]
module.vpc.aws_route_table_association.public[0]: Creating...
module.vpc.aws_route_table_association.public[1]: Creating...
module.vpc.aws_route_table_association.public[2]: Creating...
aws_security_group.server_windows_rdp_sg: Creation complete after 5s [id=sg-0e24e5a1214efc3cc]
module.vpc.aws_route_table_association.private[1]: Creation complete after 1s [id=rtbassoc-09eb571143e5b8b7f]
aws_instance.windows_server_ins: Creating...
module.vpc.aws_route_table_association.private[2]: Creation complete after 1s [id=rtbassoc-0ed00d54f84b7843c]
module.vpc.aws_route_table_association.public[0]: Creation complete after 1s [id=rtbassoc-0b1fe2f0024f7d6ce]
module.vpc.aws_route_table_association.public[2]: Creation complete after 1s [id=rtbassoc-0be6df702cb3b1db4]
module.vpc.aws_route_table_association.public[1]: Creation complete after 1s [id=rtbassoc-05d15ffd481673163]
module.vpc.aws_default_network_acl.this[0]: Creation complete after 6s [id=acl-0e83576f35c32edb3]
module.vpc.aws_route_table_association.private[0]: Creation complete after 2s [id=rtbassoc-07a9d46c6ba3a9d46]
module.vpc.aws_route.public_internet_gateway[0]: Creation complete after 2s [id=r-rtb-00d18f4e03a7b84a61080289494]
aws_instance.windows_server_ins: Still creating... [10s elapsed]
aws_instance.windows_server_ins: Still creating... [20s elapsed]
aws_instance.windows_server_ins: Still creating... [30s elapsed]
aws_instance.windows_server_ins: Still creating... [40s elapsed]
aws_instance.windows_server_ins: Creation complete after 49s [id=i-0f0a5fc6905430ff4]
aws_eip_association.windows_server_eip: Creating...
aws_eip_association.windows_server_eip: Creation complete after 2s [id=eipassoc-03960f0933ef1f755]

Apply complete! Resources: 26 added, 0 changed, 0 destroyed.
dev@dev-ThinkPad-T530:~/Desktop/Bootcamp DevOps/Desafios/Solución Desafíos/Solucion_Desafio_5$
```



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https://us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#vpcs:

☆

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aws

Services

🔍 Search [Alt+S]

📄 ⬆️ ?

N. Virginia ▾

devops-user @ 3185-3927-3132 ▾

VPC dashboard ✕

EC2 Global View 🗨️ New

Filter by VPC:  

Select a VPC ▾

▼ Virtual private cloud

Your VPCs New

Subnets

Route tables

Internet gateways

Egress-only Internet gateways

Carrier gateways

DHCP option sets

Elastic IPs

Managed prefix lists

Endpoints

Endpoint services

NAT gateways

Your VPCs (1) Info

🔄

Actions ▾

Create VPC

🔔

🔍 Find resources by attribute or tag

< 1 > ⚙️

<input type="checkbox"/>	Name ▾	VPC ID ▾	State ▾	IPv4 CIDR ▾	IPv6 CIDR
<input type="checkbox"/>	devops_vpc	vpc-01487cc25836e4c4b	🟢 Available	10.0.0.0/16	-

Select a VPC above

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🔒 https://us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#subnets:

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VPC dashboard ✕

EC2 Global View 🗺️ New

Filter by VPC:  

Select a VPC ▾

▼ Virtual private cloud

Your VPCs New

**Subnets**

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NAT gateways

Subnets (6) Info

🔄

Actions ▾

Create subnet

🔍 Find resources by attribute or tag

< 1 > ⚙️

<input type="checkbox"/>	Name ▾	Subnet ID ▾	State ▾	VPC ▾
<input type="checkbox"/>	devops_vpc-public-us-east-1b	subnet-00163d37438a6b325	✔️ Available	vpc-01487cc25836e4c4b   devo...
<input type="checkbox"/>	devops_vpc-public-us-east-1c	subnet-0d80afb64748ee36e	✔️ Available	vpc-01487cc25836e4c4b   devo...
<input type="checkbox"/>	devops_vpc-private-us-east-1c	subnet-0ac3701a53e4c7e3e	✔️ Available	vpc-01487cc25836e4c4b   devo...
<input type="checkbox"/>	devops_vpc-public-us-east-1a	subnet-054c80971e5cf6cc8	✔️ Available	vpc-01487cc25836e4c4b   devo...
<input type="checkbox"/>	devops_vpc-private-us-east-1b	subnet-061af775416c9eced	✔️ Available	vpc-01487cc25836e4c4b   devo...
<input type="checkbox"/>	devops_vpc-private-us-east-1a	subnet-058c337b7b24032b9	✔️ Available	vpc-01487cc25836e4c4b   devo...

Select a subnet

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https://us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#SecurityGroups:

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Managed prefix lists

Endpoints

Endpoint services

NAT gateways

Peering connections

▼ Security

Network ACLs

Security groups

▼ DNS firewall

Rule groups

Domain lists

▼ Network Firewall

Firewalls

Firewall policies

Network Firewall rule groups

TLS inspection configurations

New

Security Groups (2) Info

🔄

Actions ▼

Export security groups to CSV ▼

Create security group

📄

🔍 Filter security groups

< 1 > ⚙️

<input type="checkbox"/>	Name ▼	Security group ID ▼	Security group name ▼	VPC ID ▼	Description
<input type="checkbox"/>	devops_vpc-default	sg-077739b9cb6e90b59	default	vpc-01487cc25836e4c4b	default VPC secur
<input type="checkbox"/>	-	sg-0e24e5a1214efc3cc	server_windows_rdp_sg	vpc-01487cc25836e4c4b	RPD access to win

← → ↺

🔒 https://us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#Addresses:

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Select a VPC

▼ Virtual private cloud

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Security groups

Elastic IP addresses (1/1)

🔄

Actions ▾

Allocate Elastic IP address

🔍 Filter Elastic IP addresses

< 1 > ⚙️

☑️	Name ▾	Allocated IPv4 add... ▾	Type ▾	Allocation ID ▾
☑️	-	34.203.171.207	Public IP	eipalloc-0d388b5048b028298

☰

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📘 View IP address usage and recommendations to release unused IPs with [Public IP Insights](#). 🔗

✕

34.203.171.207

Summary | Tags

← → ↺

🔒 https://us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#Addresses:

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Select a VPC

▼

▼ Virtual private cloud

Your VPCs [New](#)

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Peering connections

▼ Security

Network ACLs

Security groups

Elastic IP addresses (1/1)

🔄

Actions ▾

Allocate Elastic IP address

📘

🔍 Filter Elastic IP addresses

< 1 > ⚙️

☑️	Name ▾	Allocated IPv4 add... ▾	Type ▾	Allocation ID ▾
☑️	–	34.203.171.207	Public IP	eipalloc-0d388b5048b028298

☰

☐ ☐ ☐

📘 View IP address usage and recommendations to release unused IPs with [Public IP Insights](#). 🔗

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34.203.171.207

Summary | Tags

←

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↺

https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:v=3;\$case=tags:true

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New EC2 Experience

Tell us what you think

×

EC2 Dashboard

EC2 Global View

Events

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Instance Types

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Reserved Instances

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Scheduled Instances

Capacity Reservations

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AMIs

AMI Catalog

Instances (2) Info

🔄

Connect

Instance state ▼

Actions ▼

Launch instances

▼

🔍 Find instance by attribute or tag (case-sensitive)

< 1 > ⚙️

<input type="checkbox"/>	Name ▼	Instance ID	Instance state ▼	Instance type ▼	Status check	Alarm status	Availability
<input type="checkbox"/>	-	i-0e7fbb26599fef224	⊖ Terminated 🔍	t2.micro	-	No alarms +	us-east-
<input type="checkbox"/>	-	i-0f0a5fc6905430ff4	✔ Running 🔍	t2.micro	✔ 2/2 checks passed	No alarms +	us-east-

Select an instance

=

⚙️ ×

← → ↻

https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-0f

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aws

Services

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Tell us what you think

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AMI Catalog

Details | Security | Networking | Storage | Status checks | Monitoring | Tags

▼ Instance details Info

Platform

📄 windows

Platform details

📄 Windows

Stop protection

Disabled

Instance auto-recovery

Default

AMI Launch Index

0

Credit specification

standard

Usage operation

📄 RunInstances:0002

AMI ID

📄 ami-069c45f40acdfe41e

AMI name

📄 Windows\_Server-2019-English-Full-Base-2023.07.12

Launch time

📄 Wed Aug 09 2023 19:52:11 GMT-0500 (Colombia Standard Time) (5 minutes)

Lifecycle

normal

Key pair assigned at launch

📄 devops

Kernel ID

—

RAM disk ID

—

Monitoring

disabled

Termination protection

Disabled

AMI location

📄 amazon/Windows\_Server-2019-English-Full-Base-2023.07.12

Stop-hibernate behavior

disabled

State transition reason

—

State transition message

—

Owner

📄 318539273132

←

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↺

https://us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-0f

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aws

Services

🔍

Search

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New EC2 Experience

Tell us what you think

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IMDSv2  
Optional

Details

Security

Networking

Storage

Status checks

Monitoring

Tags

▼ Root device details

Root device name

Root device type

EBS optimization

📁 /dev/sda1

EBS

disabled

▼ Block devices

🔍 Filter block devices

Volume ID	Device name	Volume size (GiB)	Attachment status	Attachment time	Encry
vol-020c11f9efa618c6c	/dev/sda1	30	🟢 Attached	2023/08/09 19:52 GMT-5	No

▼ Recent root volume replacement tasks

🔍 Filter tasks

Replace root volume

Task ID	Task state	Start time	Completion time
No recent replace root volume tasks			