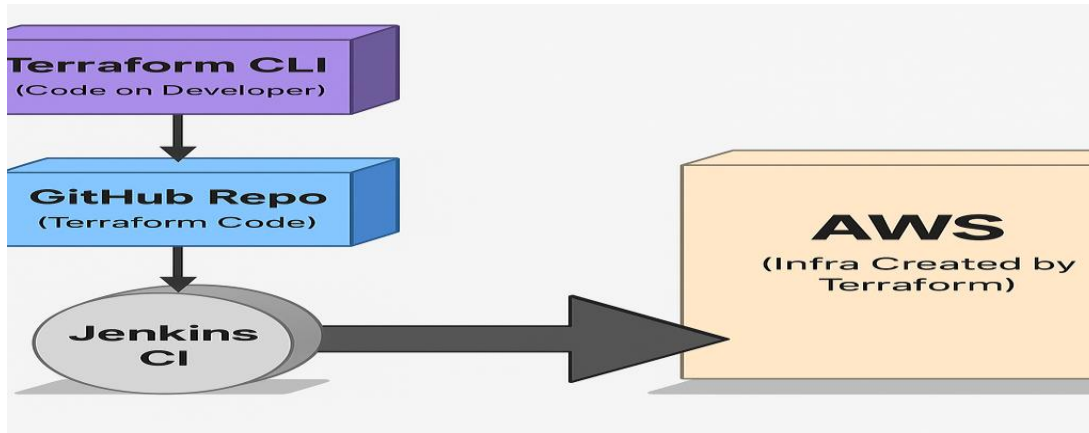


## CI-CD-Pipeline-Automation-for-Infrastructure-Deployment



### **Problem Statement:**

Manually creating and updating infrastructure each time is time-consuming, and inefficient.

This is where **Infrastructure as Code (IaC)** with **Terraform** becomes useful. Terraform allows you to define and automate your AWS infrastructure (through code).

However, manually running Terraform every time isn't scalable either. To solve this:

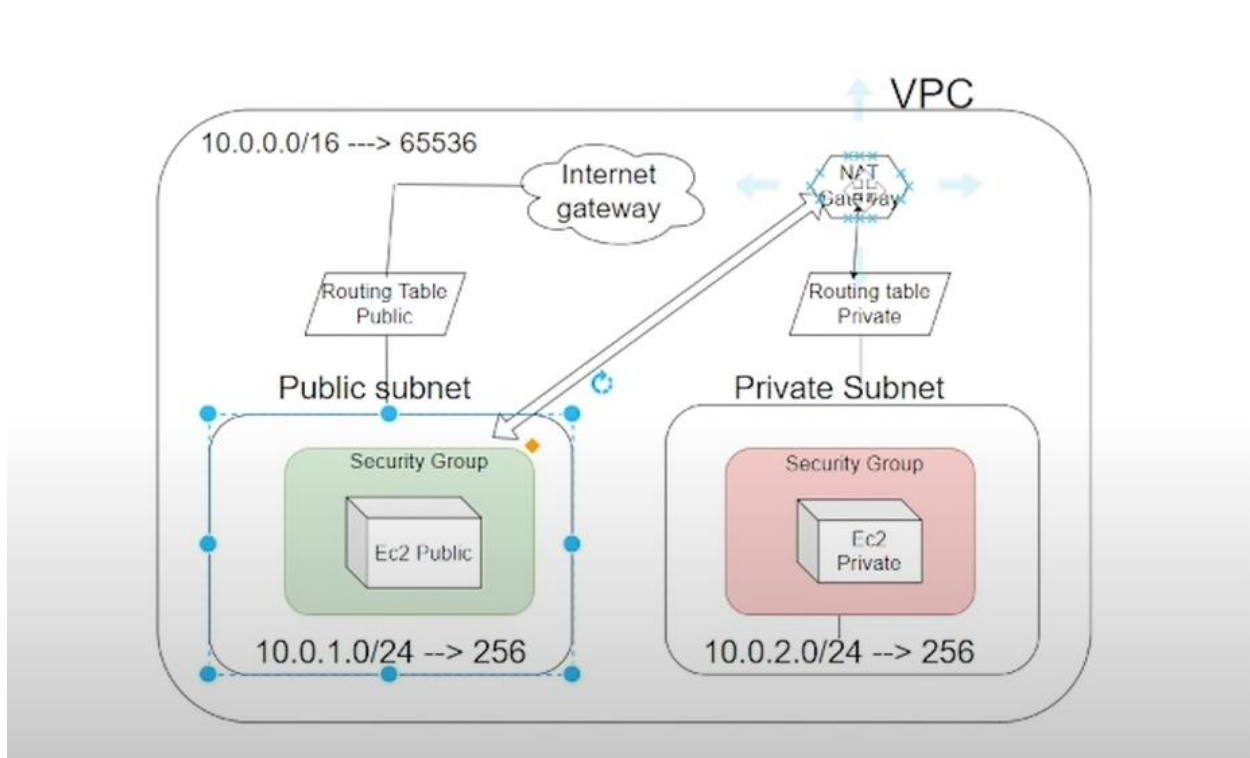
### **Solution:**

We introduce **CI/CD automation using Jenkins and GitHub**:

- **Terraform code** is stored and version-controlled in **GitHub**.
- A **GitHub webhook** is integrated with **Jenkins** to trigger pipeline jobs automatically when changes are pushed to the repo.
- **Jenkins** runs the pipeline, which executes terraform init, plan, and apply commands.
- This process **automatically provisions EC2 instances** (or any AWS resources) here we deployed entire infra without manual intervention. **Summary:**

“Using **Terraform**, **GitHub**, and **Jenkins**, we automate the provisioning of infrastructure on **AWS**. Every time new Terraform code is pushed to GitHub, Jenkins gets triggered and deploys the infrastructure automatically—ensuring consistent, fast, and repeatable infrastructure delivery.”

## Infrastructure:



## Webhook:

Repository > Settings > Webhooks

### Webhooks

Webhooks allow external services to be notified when certain events happen. When the specified events happen, we'll send a POST request to each of the URLs you provide. Learn more in our [Webhooks Guide](#).

[Add webhook](#)

URL	Events	Last delivery	Actions
✓ <a href="http://13.233.229.250:8080/github-...">http://13.233.229.250:8080/github-...</a> (push)		Last delivery was successful.	<a href="#">Edit</a> <a href="#">Delete</a>

[Add webhook](#)

**General**

- Access
  - Collaborators
  - Moderation options
- Code and automation
  - Branches
  - Tags
  - Rules
  - Actions
  - Models [Preview](#)
  - Webhooks**
  - Copilot
  - Environments
  - Codespaces
  - Pages

# Output

Pipeline :

✔ Infra\_pipeline

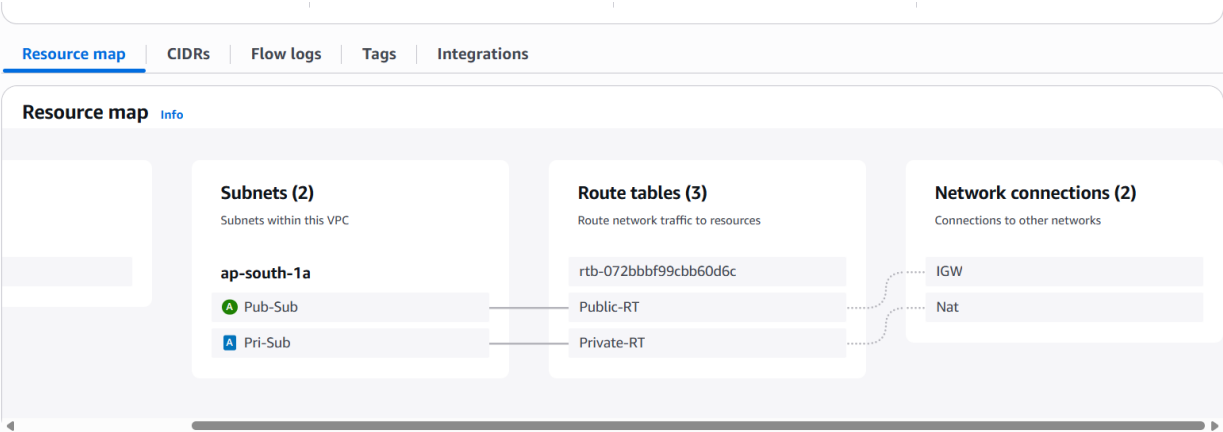
## Stage View

		Declarative: Checkout SCM	checkout	init	plan	apply
Average stage times: (full run time: ~2min 57s)		905ms	967ms	11s	8s	2min 33s
#1	Jul 27 23:20 No Changes	905ms	967ms	11s	8s	2min 33s

Jenkins / Infra\_pipeline / #1

```
git[0m][1maws_route_table_association.Private_RT_association: Creating...][0m[0m
[0m][1maws_instance.Private_ec2: Still creating... [00m10s elapsed][0m[0m
[0m][1maws_instance.Private_ec2: Still creating... [00m20s elapsed][0m[0m
[0m][1maws_instance.Private_ec2: Still creating... [00m30s elapsed][0m[0m
[0m][1maws_instance.Private_ec2: Still creating... [00m40s elapsed][0m[0m
[0m][1maws_instance.Private_ec2: Creation complete after 41s [id=i-08e0df1fb1411004f][0m
[0m][1m[32m
Apply complete! Resources: 14 added, 0 changed, 0 destroyed.
[0m
[Pipeline] }
[Pipeline] // dir
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withCredentials
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Aws Output:



VPC:

**Your VPCs (1/2)** [Info](#)

Find VPCs by attribute or tag

Last updated less than a minute ago [Actions](#) [Create VPC](#)

<input type="checkbox"/>	Name	VPC ID	State	Block Public...	IPv4 CIDR	IPv6 CIDR
<input checked="" type="checkbox"/>	Infra_vpc	<a href="#">vpc-0c7a690733aa8d18b</a>	Available	Off	10.0.0.0/16	-
<input type="checkbox"/>	-	<a href="#">vpc-0d5aa3ab8b3cb58ea</a>	Available	Off	172.31.0.0/16	-

Subnet

**Subnets (5)** [Info](#)

Find subnets by attribute or tag

Last updated less than a minute ago [Actions](#) [Create subnet](#)

<input type="checkbox"/>	Name	Subnet ID	State	VPC	Block Public...	IPv4 CIDR
<input type="checkbox"/>	Pri-Sub	<a href="#">subnet-0e3dfe72e141d27e5</a>	Available	<a href="#">vpc-0c7a690733aa8d18b</a>   <a href="#">Infra...</a>	Off	10.0.2.0/24
<input type="checkbox"/>	-	<a href="#">subnet-0040cc171e7d4d57a</a>	Available	<a href="#">vpc-0d5aa3ab8b3cb58ea</a>	Off	172.31.0.0/24
<input type="checkbox"/>	-	<a href="#">subnet-082d89611911e5129</a>	Available	<a href="#">vpc-0d5aa3ab8b3cb58ea</a>	Off	172.31.32.0/24
<input type="checkbox"/>	Pub-Sub	<a href="#">subnet-0fe259c0bc1177b64</a>	Available	<a href="#">vpc-0c7a690733aa8d18b</a>   <a href="#">Infra...</a>	Off	10.0.1.0/24

Route Tables:

Find route tables by attribute or tag

< 1 > [Info](#)

<input type="checkbox"/>	Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC
<input type="checkbox"/>	-	<a href="#">rtb-033136daacd6a2d1e</a>	-	-	Yes	<a href="#">vpc-0d5aa3ab8b3cb58ea</a>
<input type="checkbox"/>	-	<a href="#">rtb-072bbbf99cbb60d6c</a>	-	-	Yes	<a href="#">vpc-0c7a690733aa8d18b</a>
<input type="checkbox"/>	Public-RT	<a href="#">rtb-08c03394e544bc967</a>	<a href="#">subnet-0fe259c0bc1177...</a>	-	No	<a href="#">vpc-0c7a690733aa8d18b</a>
<input type="checkbox"/>	Private-RT	<a href="#">rtb-053d2936ab8cc13bc</a>	<a href="#">subnet-0e3dfe72e141d2...</a>	-	No	<a href="#">vpc-0c7a690733aa8d18b</a>

**Internet gateways (2)** [Info](#)

## Security groups:

<input type="checkbox"/>	Name	Security group ID	Security group name
<input type="checkbox"/>	-	<a href="#">sg-0380321f32a970613</a>	ssh-http-https
<input type="checkbox"/>	-	<a href="#">sg-0d707c4aaed1135f1</a>	public-sg
<input type="checkbox"/>	-	<a href="#">sg-093fab67ea56781ac</a>	launch-wizard-17
<input type="checkbox"/>	-	<a href="#">sg-0da7cc47063d8fb02</a>	rds-ec2-1
<input type="checkbox"/>	-	<a href="#">sg-0cb4c49ff05a4926d</a>	launch-wizard-1
<input type="checkbox"/>	-	<a href="#">sg-03016142ce657dbc3</a>	launch-wizard-4
<input type="checkbox"/>	-	<a href="#">sg-021fa298b72f45c4e</a>	private-sg
<input type="checkbox"/>	-	<a href="#">sg-054f61ad09ee2cebd</a>	launch-wizard-20

## Nat gateway:

NAT gateways (2) <a href="#">Info</a>								
<input type="text" value="Find NAT gateways by attribute or tag"/>								
<input type="checkbox"/>	Name	NAT gateway ID	Connectivity...	State	State message	Primary public I...	Primary private	
<input type="radio"/>	Nat	<a href="#">nat-08c1c30264e8f4a9a</a>	Public	Deleted	-	<a href="#">3.6.78.61</a>	10.0.1.212	
<input type="radio"/>	Nat	<a href="#">nat-0a403d0bc4c019c5d</a>	Public	Available	-	<a href="#">65.0.43.96</a>	10.0.1.250	

## Internet gateway:

Internet gateways (2) <a href="#">Info</a>						
<input type="text" value="Find internet gateways by attribute or tag"/>						
<input type="checkbox"/>	Name	Internet gateway ID	State	VPC ID	Owner	
<input type="checkbox"/>	IGW	<a href="#">igw-00c31dee1d38534f5</a>	Attached	<a href="#">vpc-0c7a690733aa8d18b</a>   <a href="#">Infra_vpc</a>	607442009391	
<input type="checkbox"/>	-	<a href="#">igw-0952c88fa3bc8636e</a>	Attached	<a href="#">vpc-0d5aa3ab8b3cb58ea</a>	607442009391	

## Ec2-instances:

Instances (3) <a href="#">Info</a>								
Last updated less than a minute ago <a href="#">Refresh</a> <a href="#">Connect</a> <a href="#">Instance state</a> <a href="#">Actions</a> <a href="#">Launch instances</a>								
<input type="text" value="Find Instance by attribute or tag (case-sensitive)"/>								
<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
<input type="checkbox"/>	Jenkins	<a href="#">i-0e7b7789177adb33f</a>	Running	t2.medium	2/2 checks passed	<a href="#">View alarms</a>	ap-south-1a	ec2-13-2:
<input type="checkbox"/>	Private-EC2	<a href="#">i-08e0df1fb1411004f</a>	Running	t2.micro	Initializing	<a href="#">View alarms</a>	ap-south-1a	-
<input type="checkbox"/>	Public-EC2	<a href="#">i-08e5dc66ece0e5635</a>	Running	t2.micro	2/2 checks passed	<a href="#">View alarms</a>	ap-south-1a	ec2-65-0:

