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Project : terraform command cli

Github: <https://github.com/shadymh10/terraform->

Description :

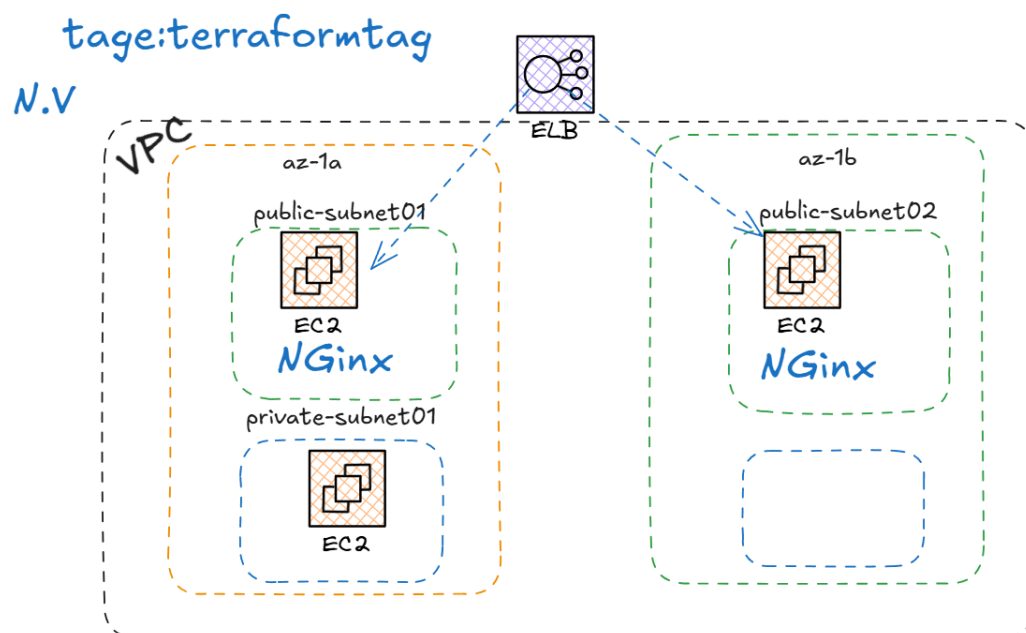
AWS Infrastructure Description — Created with Terraform

This architecture represents a highly available web application environment deployed on AWS using Terraform for Infrastructure as Code (IaC).

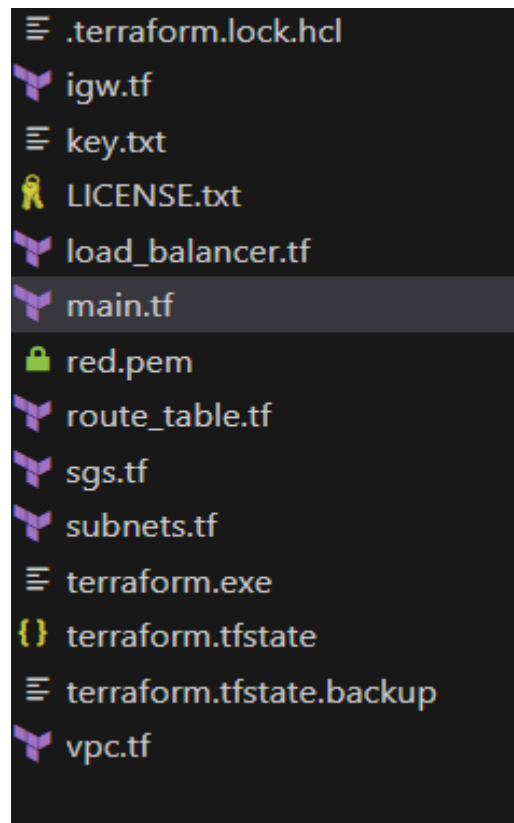
Key Benefits:

- ✓ High availability across multiple AZs
- ✓ Secure public/private network separation
- ✓ Scalable web tier using Load Balancer
- ✓ Infrastructure fully automated via Terraform

My project diagram:



structure of project to build :



1- terraform initialization (install plugins and modules and create state file in backend)

```
PS E:\terraform> terraform init
Initializing the backend...
Initializing provider plugins...
- Reusing previous version of hashicorp/aws from the dependency lock file
- Using previously-installed hashicorp/aws v6.17.0

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
```

2- terraform apply changes and push to aws cloud

```
PS E:\terraform> terraform apply
aws_instance.data: Still destroying... [id=i-0b03aa5b465c584d2, 00m20s elapsed]
aws_instance.app02: Still destroying... [id=i-0f90a10fa5ce4f0dc, 00m30s elapsed]
aws_instance.app01: Still destroying... [id=i-04ef1f9a6dd5a0d45, 00m30s elapsed]
aws_instance.data: Still destroying... [id=i-0b03aa5b465c584d2, 00m30s elapsed]
aws_instance.app02: Still destroying... [id=i-0f90a10fa5ce4f0dc, 00m40s elapsed]
aws_instance.app01: Still destroying... [id=i-04ef1f9a6dd5a0d45, 00m40s elapsed]
aws_instance.data: Still destroying... [id=i-0b03aa5b465c584d2, 00m40s elapsed]
aws_instance.app01: Still destroying... [id=i-04ef1f9a6dd5a0d45, 00m50s elapsed]
aws_instance.data: Still destroying... [id=i-0b03aa5b465c584d2, 00m50s elapsed]
aws_instance.app02: Still destroying... [id=i-0f90a10fa5ce4f0dc, 00m50s elapsed]
aws_instance.app01: Destruction complete after 53s
aws_instance.app01: Creating...
aws_instance.app02: Still destroying... [id=i-0f90a10fa5ce4f0dc, 01m00s elapsed]
aws_instance.data: Still destroying... [id=i-0b03aa5b465c584d2, 01m00s elapsed]
aws_instance.app01: Still creating... [00m10s elapsed]
aws_instance.app01: Creation complete after 16s [id=i-002ee4df19272acd4]
aws_instance.data: Still destroying... [id=i-0b03aa5b465c584d2, 01m10s elapsed]
aws_instance.app02: Still destroying... [id=i-0f90a10fa5ce4f0dc, 01m10s elapsed]
aws_instance.app02: Destruction complete after 1m13s
aws_instance.app02: Creating...
aws_instance.data: Still destroying... [id=i-0b03aa5b465c584d2, 01m20s elapsed]
aws_instance.app02: Still creating... [00m10s elapsed]
aws_instance.data: Destruction complete after 1m24s
aws_instance.data: Creating...
aws_instance.app02: Creation complete after 16s [id=i-02f7c4e0c34892b8b]
aws_instance.data: Still creating... [00m10s elapsed]
aws_instance.data: Creation complete after 15s [id=i-08fea7fae453f9062]

Apply complete! Resources: 3 added, 0 changed, 3 destroyed.
PS E:\terraform>
```

3- created of 3 ec2 in Gui of AWS

1 instance of ec2 instance of my (us-east-1) region								
running								
<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
<input type="checkbox"/>	my-app01	i-05c19987db43378a3	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1a	ec2-44-202-252-10.co...
<input type="checkbox"/>	my-private-app	i-0eff0c084193fa312	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1a	-
<input type="checkbox"/>	my-app02	i-0784fd5014d8b4e43	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1b	ec2-52-201-233-89.co...

Connected to my-app02 in az-1b and ping to my-app01 in az-1a

```
[root@ip-10-0-0-115 ec2-user]# client_loop: send disconnect: Connection reset  
PS C:\Users\SHADV\Documents> ssh -i "red.pem" ec2-user@ec2-52-201-233-89.compute-1.amazonaws.com  
The authenticity of host 'ec2-52-201-233-89.compute-1.amazonaws.com (52.201.233.89)' can't be established.  
ED25519 key fingerprint is SHA256:szU9bJajLEByZ5g/C32AHBiYGFwYNM0SnMXDg69ns8I.  
This key is not known by any other names.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added 'ec2-52-201-233-89.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
```

```
#  
#####  
      #####  
     /#####  
    /#####  
   /#####  
  /#####  
 /#####  
/#####  
#####
```

Amazon Linux 2023

```
https://aws.amazon.com/linux/amazon-linux-2023
```

```
[ec2-user@ip-10-0-3-90 ~]$ sudo -s  
[root@ip-10-0-3-90 ec2-user]# systemctl status nginx
```

- nginx.service - The nginx HTTP and reverse proxy server
 - Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: disabled)
 - Active: active (running) since Wed 2025-10-22 22:24:54 UTC; 3min 2s ago
 - Main PID: 2864 (nginx)
 - Tasks: 3 (limit: 1053)
 - Memory: 3.2M
 - CPU: 54ms
 - CGroup: /system.slice/nginx.service
 - 2864 "nginx: master process /usr/sbin/nginx"
 - 2866 "nginx: worker process"
 - 2867 "nginx: worker process"

```
Oct 22 22:24:54 ip-10-0-3-90.ec2.internal systemd[1]: Starting nginx.service - The nginx HTTP and reverse proxy server...  
Oct 22 22:24:54 ip-10-0-3-90.ec2.internal nginx[2791]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok  
Oct 22 22:24:54 ip-10-0-3-90.ec2.internal nginx[2791]: nginx: configuration file /etc/nginx/nginx.conf test is successful  
Oct 22 22:24:54 ip-10-0-3-90.ec2.internal systemd[1]: Started nginx.service - The nginx HTTP and reverse proxy server.  
[root@ip-10-0-3-90 ec2-user]# ping 44.202.252.10  
PING 44.202.252.10 (44.202.252.10) 56(84) bytes of data:  
64 bytes from 44.202.252.10: icmp_seq=1 ttl=126 time=0.526 ms  
64 bytes from 44.202.252.10: icmp_seq=2 ttl=126 time=0.568 ms  
64 bytes from 44.202.252.10: icmp_seq=3 ttl=126 time=0.583 ms  
64 bytes from 44.202.252.10: icmp_seq=4 ttl=126 time=0.561 ms
```

connected to my-app01 and connected to my private-app from ssh

change permission of my key because make success connection from inner public subnet

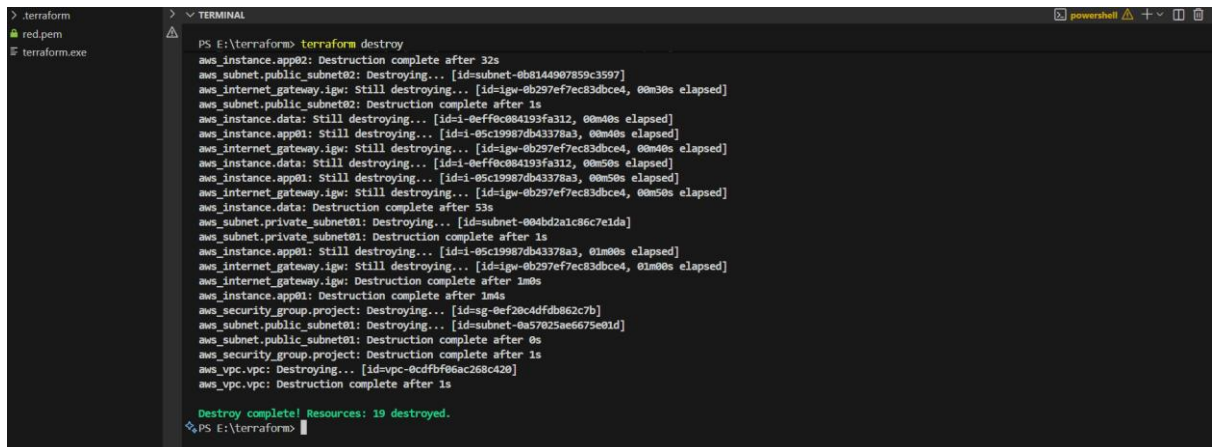
```
[ec2-user@ip-10-0-1-14 ~]$ sudo -s
[root@ip-10-0-1-14 ec2-user]# systemctl status nginx
Unit nginx.service could not be found.
[root@ip-10-0-1-14 ec2-user]# systemctl status nginx
● nginx.service - The nginx HTTP and reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; preset: disabled)
   Active: active (running) since Wed 2025-10-22 22:25:56 UTC; 52s ago
     Main PID: 3083 (nginx)
       Tasks: 3 (limit: 1053)
      Memory: 3.2M
         CPU: 67ms
    CGroup: /system.slice/nginx.service
            └─3083 "nginx: master process /usr/sbin/nginx"
              └─3090 "nginx: worker process"
                └─3091 "nginx: worker process"

Oct 22 22:25:55 ip-10-0-1-14.ec2.internal systemd[1]: Starting nginx.service - The nginx HTTP and reverse proxy server...
Oct 22 22:25:55 ip-10-0-1-14.ec2.internal nginx[2948]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
Oct 22 22:25:55 ip-10-0-1-14.ec2.internal nginx[2948]: nginx: configuration file /etc/nginx/nginx.conf test is successful
Oct 22 22:25:56 ip-10-0-1-14.ec2.internal systemd[1]: Started nginx.service - The nginx HTTP and reverse proxy server.
[root@ip-10-0-1-14 ec2-user]# ssh -i "red.pem" ec2-user@10.0.2.194
Warning: Identity file red.pem not accessible: No such file or directory.
The authenticity of host '10.0.2.194 (10.0.2.194)' can't be established.
ED25519 key fingerprint is SHA256:UVb5L36xWbiUwJGVV00qJ7NNGZWcWp+VTao0FTCQgw.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.2.194' (ED25519) to the list of known hosts.
ec2-user@10.0.2.194: Permission denied (publickey,gssapi-keyex,gssapi-with-mic).
[root@ip-10-0-1-14 ec2-user]# vim red.pem
[root@ip-10-0-1-14 ec2-user]# chmod 400 "red.pem"
[root@ip-10-0-1-14 ec2-user]# ssh -i "red.pem" ec2-user@10.0.2.194
```

Describe of load-balancer from cli command by terraform

```
PS E:\terraform> aws elbv2 describe-load-balancers
LOADBALANCERS    Z35SX0TRQ7X7K  2025-10-17T21:57:23.243000+00:00  alb-1179537314.us-east-1.elb.amazonaws.com  off  ipv4  arn:aws:elasticloadbalancing:us-ea
st-1:163511165976:loadbalancer/app/alb/cb8202ec23fb2f0e  alb  internet-facing application  vpc-0103bd166b03af128
AVAILABILITYZONES  subnet-05ab4ea6fbdcc8791  us-east-1b
AVAILABILITYZONES  subnet-096159c52c4e4acdf  us-east-1a
SECURITYGROUPS     sg-0889b1f3bb1fdadea2
STATE             active
LOADBALANCERS    Z35SX0TRQ7X7K  2025-10-19T23:15:03.309000+00:00  my-alb-1161160674.us-east-1.elb.amazonaws.com  off  ipv4  arn:aws:elasticloadbalancing:us-ea
st-1:163511165976:loadbalancer/app/my-alb/d9b84fb0a98111a6  my-alb  internet-facing application  vpc-0cdffb06ac268c420
AVAILABILITYZONES  subnet-0a57025ae6675e01d  us-east-1a
AVAILABILITYZONES  subnet-0b8144907859c3597  us-east-1b
SECURITYGROUPS     sg-0ce1c4f9531878545
STATE             active
```

finally destroy of project files :



```
PS E:\terraform> terraform destroy
aws_instance.app02: Destruction complete after 32s
aws_subnet.public_subnet02: Destroying... [id=subnet-0b8144907859c3597]
aws_internet_gateway.igw: Still destroying... [id=igw-0b297ef7ec83dbce4, 00m30s elapsed]
aws_subnet.public_subnet02: Destruction complete after 1s
aws_instance.data: Still destroying... [id=i-0eff0c084193fa312, 00m40s elapsed]
aws_instance.app01: Still destroying... [id=i-05c19987db43378a3, 00m40s elapsed]
aws_internet_gateway.igw: Still destroying... [id=igw-0b297ef7ec83dbce4, 00m40s elapsed]
aws_instance.data: Still destroying... [id=i-0eff0c084193fa312, 00m50s elapsed]
aws_instance.app01: Still destroying... [id=i-05c19987db43378a3, 00m50s elapsed]
aws_internet_gateway.igw: Still destroying... [id=igw-0b297ef7ec83dbce4, 00m50s elapsed]
aws_instance.data: Destruction complete after 53s
aws_subnet.private_subnet01: Destroying... [id=subnet-004bd2a1c86c7e1da]
aws_subnet.private_subnet01: Destruction complete after 1s
aws_instance.app01: Still destroying... [id=i-05c19987db43378a3, 01m00s elapsed]
aws_internet_gateway.igw: Still destroying... [id=igw-0b297ef7ec83dbce4, 01m00s elapsed]
aws_internet_gateway.igw: Destruction complete after 1m0s
aws_instance.app01: Destruction complete after 1m4s
aws_security_group.project: Destroying... [id=sg-0ef20c4d4fdb862c7b]
aws_subnet.public_subnet01: Destroying... [id=subnet-0a57025ae6675e01d]
aws_subnet.public_subnet01: Destruction complete after 0s
aws_security_group.project: Destruction complete after 1s
aws_vpc.vpc: Destroying... [id=vpc-0cdffb06ac268c420]
aws_vpc.vpc: Destruction complete after 1s

Destroy complete! Resources: 19 destroyed.
PS E:\terraform>
```