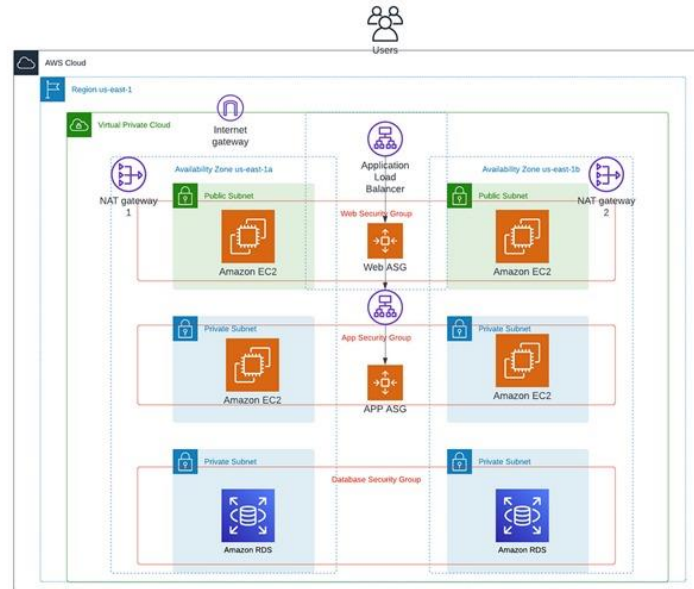


AWS 3- Tier Architecture:-



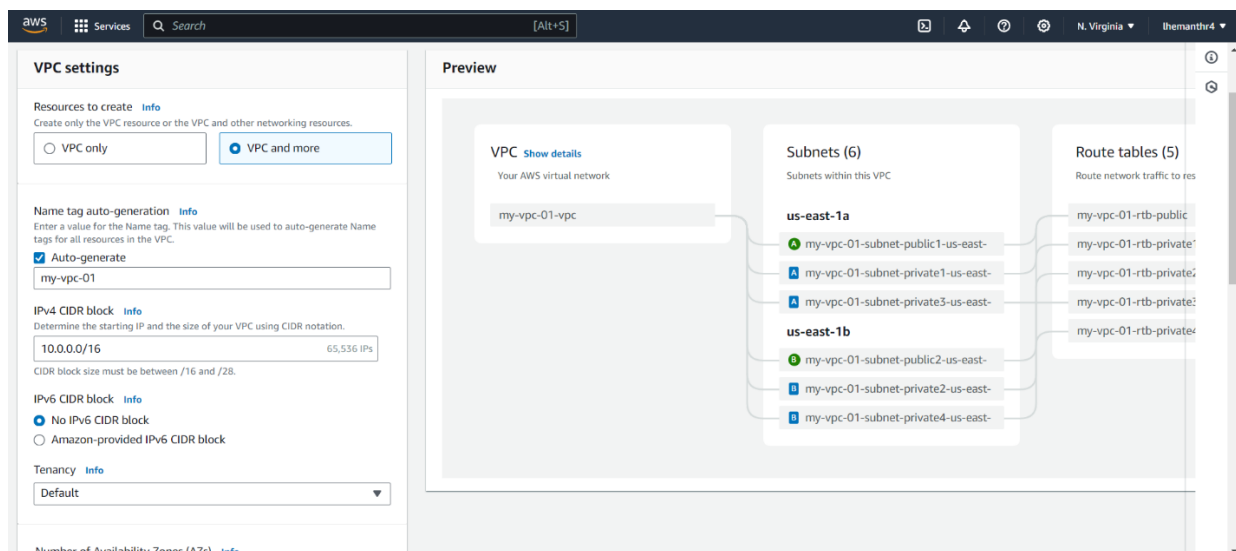
A three-tier architecture in AWS (Amazon Web Services) involves structuring applications into three distinct layers: Presentation, Application, and Data. Each tier has specific responsibilities and can be implemented using various AWS services to ensure scalability, security, and manageability.

This network consists of:

- A VPC.
- Two (2) public subnets spread across two availability zones (Web Tier).
- Two (2) private subnets spread across two availability zones (Application Tier).
- Two (2) private subnets spread across two availability zones (Database Tier).
- One (1) public route table that connects the public subnets to an internet gateway.
- One (1) private route table that will connect the Application Tier private subnets and a NAT gateway.
- Load Balancers, Auto-Scaling Groups and Database.

Steps for creating 3- Tier Architecture:

- Create VPC, Subnets, Route tables.



- Create 2 public subnets and 4 private subnets.

us-east-1.console.aws.amazon.com/vpcconsole/home?region=us-east-1#CreateVpccreateMode=vpcWithResources

Default

Number of Availability Zones (AZs) [Info](#)
Choose the number of AZs in which to provision subnets. We recommend at least two AZs for high availability.

1 2 3

► Customize AZs

Number of public subnets [Info](#)
The number of public subnets to add to your VPC. Use public subnets for web applications that need to be publicly accessible over the Internet.

0 2

Number of private subnets [Info](#)
The number of private subnets to add to your VPC. Use private subnets to secure backend resources that don't need public access.

0 2 4

► Customize subnets CIDR blocks

NAT gateways (\$) [Info](#)
Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway.

None In 1 AZ 1 per AZ

VPC endpoints [Info](#)

VPC dashboard

EC2 Global View

Filter by VPC

Virtual private cloud

Your VPCs

Subnets

Route tables

Internet gateways

Egress-only internet gateways

Carrier gateways

DHCP option sets

Elastic IPs

Managed prefix lists

Subnets (7) [Info](#)

Last updated 1 minute ago

Actions Create subnet

Find resources by attribute or tag

<input type="checkbox"/>	Name	Subnet ID	State	VPC	IPv4 CIDR
<input type="checkbox"/>	subnet-private4-us-east-1b	subnet-0f17dddb88e4f28ba	Available	vpc-02d505a8aaee9858a my-...	10.0.176.0/20
<input type="checkbox"/>	subnet-private1-us-east-1a	subnet-07b0dabee65a199e8	Available	vpc-02d505a8aaee9858a my-...	10.0.128.0/20
<input type="checkbox"/>	subnet-private3-us-east-1a	subnet-04077ca77e9b5ae60	Available	vpc-02d505a8aaee9858a my-...	10.0.160.0/20
<input type="checkbox"/>	subnet-public2-us-east-1b	subnet-05708dc65786e543e	Available	vpc-02d505a8aaee9858a my-...	10.0.16.0/20
<input type="checkbox"/>	subnet-public1-us-east-1a	subnet-0bd7588c8c4168e4d	Available	vpc-02d505a8aaee9858a my-...	10.0.0.0/20
<input type="checkbox"/>	subnet-private2-us-east-1b	subnet-00bc080b94dd56e53	Available	vpc-02d505a8aaee9858a my-...	10.0.144.0/20
<input type="checkbox"/>	subnet-03	subnet-0a3c9036a7a409a19	Available	vpc-02d505a8aaee9858a my-...	10.0.72.0/24

Select a subnet

- Create one Internet gateway and attach with VPC.

VPC dashboard

EC2 Global View

Filter by VPC

Virtual private cloud

Your VPCs

Subnets

Route tables

Internet gateways

Egress-only internet gateways

Carrier gateways

DHCP option sets

Elastic IPs

Managed prefix lists

Endpoints

Endpoint services

NAT gateways

Peering connections

Security

Internet gateways (2) [Info](#)

Search

Actions Create internet gateway

<input type="checkbox"/>	Name	Internet gateway ID	State	VPC ID	Owner
<input type="checkbox"/>	-	igw-0b86d0dc7058475c5	Attached	vpc-0cffb329988bb1030 default	011528282354
<input type="checkbox"/>	my-vpc-01-igw	igw-0e93f4bc0cb39fcf3	Attached	vpc-02d505a8aaee9858a my-vpc-01-...	011528282354

Select an internet gateway above

- Create EC2 Instances 2 public and 2 private Instances in **us-east-1a** and **us-east-1b** regions.

Instances (6) Info

Find Instance by attribute or tag (case-sensitive) All states

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
public-instance-01	i-0c921a7321895a32f	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a
private-instance-01	i-06dfff45792a3216f	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a
private-instance-02	i-0c90cb39425cd313	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1b
public-instance-02	i-0aeaa0b891506b74c	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1b
private-instance-03	i-09d5b1eadd4c36286	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1a
private-instance-04	i-0db8b26b9f7f6be7d	Running	t2.micro	2/2 checks passed	View alarms +	us-east-1b

Select an instance

- Create 2 NAT gateways for 2 regions.

NAT gateways (3) Info

Find resources by attribute or tag

Name	NAT gateway ID	Connectivity type	State	Stat...	Primary public IPv4 address	Primary privat
Nat	nat-0dd035d843ca52328	Public	Failed	Elastic I...	-	10.0.150.227
Nat-01	nat-0d126f19143160395	Public	Available	-	18.209.149.218	10.0.138.66
Nat-02	nat-0c88a8b4eaa99b1dc	Public	Available	-	3.226.216.78	10.0.150.205

Select a NAT gateway

- Create Target groups.

Target groups (1/1) Info

Filter target groups

Name	ARN	Port	Protocol	Target type	Load balancer
my-target-group-01	arn:aws:elasticloadbalancing...	80	HTTP	Instance	None associated

Target group: my-target-group-01

Details

arn:aws:elasticloadbalancing:us-east-1:011528282354:targetgroup/my-target-group-01/d04399581446106b

Target type	Protocol : Port	Protocol version	VPC
Instance	HTTP: 80	HTTP1	vpc-02d505a8aaee9858a
IP address type	Load balancer		

- Create Load balancers, Launch 2 templets and create Auto- Scaling.

aws Services Search [Alt+S] N. Virginia themanthr4

EC2 Dashboard EC2 Global View Events Console-to-Code [Preview](#)

▼ Instances

- Instances
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Capacity
- Reservations [New](#)

▼ Images

- AMIs
- AMI Catalog

▼ Elastic Block Store

- Volumes

EC2 > Load balancers

Load balancers (1) [Refresh](#) [Actions](#) [Create load balancer](#)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

Filter load balancers

<input type="checkbox"/>	Name	DNS name	State	VPC ID	Availability Zones	Type
<input type="checkbox"/>	my-lb-01	my-lb-01-2132513940.us-...	Active	vpc-02d505a8aaee98...	2 Availability Zones	application

0 load balancers selected

Select a load balancer above.

aws Services Search [Alt+S] N. Virginia themanthr4

EC2 Dashboard EC2 Global View Events Console-to-Code [Preview](#)

▼ Instances

- Instances
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Capacity
- Reservations [New](#)

▼ Images

- AMIs
- AMI Catalog

▼ Elastic Block Store

- Volumes

EC2 > Launch Templates (2) [Info](#) [Refresh](#) [Actions](#) [Create launch template](#)

Search

<input type="checkbox"/>	Launch Template ID	Launch Template Name	Default Version	Latest Version	Create Time	Created ...
<input type="checkbox"/>	lt-0fe0d7cc4a502738b	My-Template-01	1	1	2024-08-27T12:09:20.000Z	arn:aws:ia...
<input type="checkbox"/>	lt-094cac6480a859964	My-Template-02	1	1	2024-08-27T12:10:13.000Z	arn:aws:ia...

Select a launch template

aws Services Search [Alt+S] N. Virginia themanthr4

AMI Catalog

▼ Elastic Block Store

- Volumes
- Snapshots
- Lifecycle Manager

▼ Network & Security

- Security Groups
- Elastic IPs
- Placement Groups
- Key Pairs
- Network Interfaces

▼ Load Balancing

- Load Balancers
- Target Groups
- Trust Stores [New](#)

▼ Auto Scaling

- Auto Scaling Groups

Settings

EC2 > Auto Scaling groups

Auto Scaling groups (2) [Info](#) [Refresh](#) [Launch configurations](#) [Launch templates](#) [Actions](#) [Create Auto Scaling group](#)

Search your Auto Scaling groups

<input type="checkbox"/>	Name	Launch template/configuration	Instances	Status	Desired capacity	Min
<input type="checkbox"/>	Auto-scaling-o2	My-Template-02 Version Default	2	-	2	2
<input type="checkbox"/>	Auto-scaling-01	My-Template-01 Version Default	2	-	2	2

0 Auto Scaling groups selected

- Add remaining 2 private subnets to the RDS subnet group.

Amazon RDS Subnet groups (1)

Filter by subnet group

Name	Description	Status	VPC
aws-project-1	sub	Complete	vpc-02d505a8aaee9858a

Buttons: Create DB subnet group, Edit, Delete

- Create a MySQL database cluster.

Amazon RDS Databases

Filter by databases

DB identifier	Status	Role	Engine	Region & AZ	Size	Recommend
database-1	Available	Multi-AZ DB cluster	MySQL Community	us-east-1	3 instances	
database-1-instance-1	Available	Writer instance	MySQL Community	us-east-1c	db.m5d.8xlarge	
database-1-instance-2	Available	Reader instance	MySQL Community	us-east-1b	db.m5d.8xlarge	
database-1-instance-3	Available	Reader instance	MySQL Community	us-east-1a	db.m5d.8xlarge	

Buttons: Connectivity & security, Monitoring, Logs & events, Configuration, Maintenance & backups, Tags, Recommendations

Endpoints (2)

Find resources

Endpoint name	Status	Type	Port
database-1.cluster-cvmo6s6w05t9.us-east-1.rds.amazonaws.com	Available	Writer	3306
database-1.cluster-ro-cvmo6s6w05t9.us-east-1.rds.amazonaws.com	Available	Reader	3306

- Connecting System to the instance(ubuntu) and attaching database to an Instance.

```
HEMANTH@kittu MINGW64 ~/OneDrive/Desktop
$ ssh -i "project.pem" ubuntu@ec2-54-144-219-177.compute-1.amazonaws.com
The authenticity of host 'ec2-54-144-219-177.compute-1.amazonaws.com (54.144.219.177)' can't be established.
ED25519 key fingerprint is SHA256:X9cQJcC6L+M9rlv1cGeGsLMockAVALW/E/N/b8+1iE8.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:47: ec2-54-90-255-141.compute-1.amazonaws.com
  ~/.ssh/known_hosts:53: ec2-54-234-169-157.compute-1.amazonaws.com
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-54-144-219-177.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1012-aws x86_64)

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

System information as of Tue Aug 27 16:45:34 UTC 2024

System load:  0.44      Processes:           105
Usage of /:   30.8% of 6.71GB   Users logged in:    0
Memory usage: 57%      IPv4 address for enx0: 10.0.4.123
Swap usage:   0%

 * Ubuntu Pro delivers the most comprehensive open source security and
 * compliance features.
 * https://ubuntu.com/aws/pro

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
```

```

root@ip-10-0-4-123:~# mysql -h database-1.cluster-cvmo6s6w05t9.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 67
Server version: 8.0.35 Source distribution

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.00 sec)

mysql>

```

- Create a database, Use Database and create a table in database and Insert data into it..

```

mysql> create database Anvay;
Query OK, 1 row affected (0.00 sec)

mysql> use Anvay;
Database changed

```

```

mysql> create table students (id int NOT NULL, Fname varchar(50) NOT NULL, Lname varchar(50) NOT NULL, Class varchar(5) NOT NULL, Age int NOT NULL, PRIMARY KEY(id));
Query OK, 0 rows affected (0.01 sec)

```

```

mysql> select * from students;
+----+-----+-----+-----+-----+
| id | Fname  | Lname  | Class | Age |
+----+-----+-----+-----+-----+
| 1  | Hemanth | Reddy  | V     | 16  |
| 2  | sai     | kumar  | IV    | 15  |
| 3  | Rajini  | kanth  | VII   | 17  |
+----+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> |

```