

# PROJECT : 3-TIER ARCHITECTURE

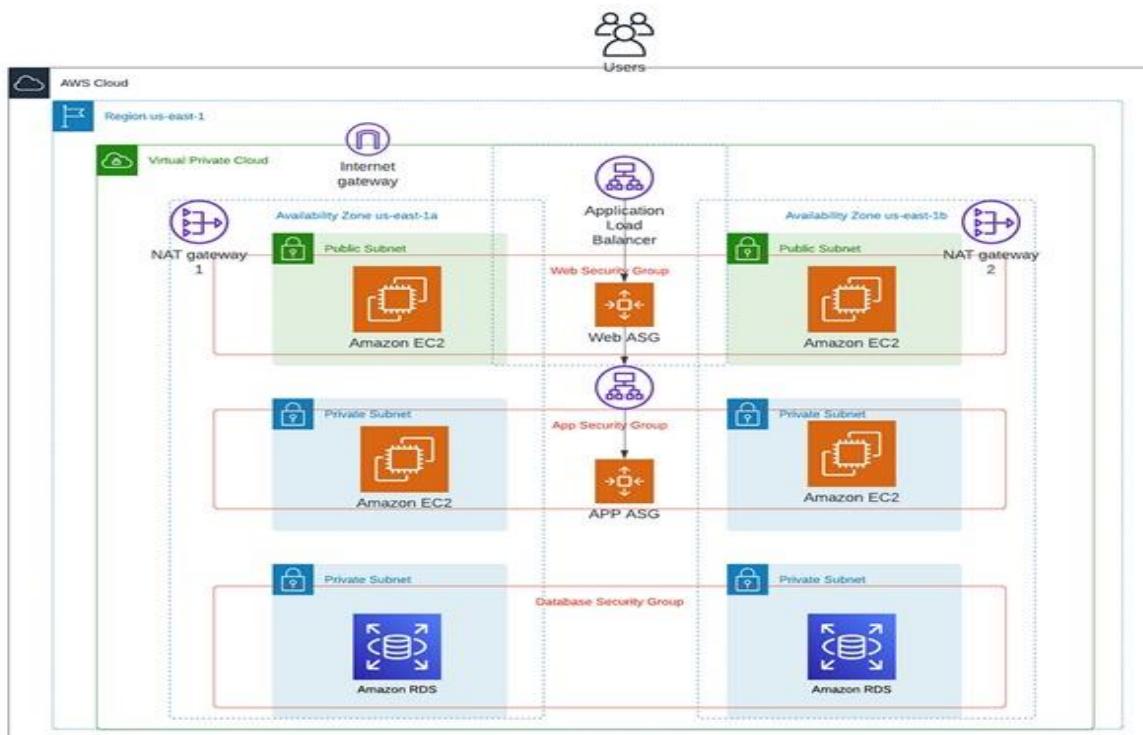
P.VENKAT SAI

PH NO : 9701067480

BATCH – 125 (10 a.m)

**OVERVIEW:** A 3-tier architecture is an architecture that divides application into 3 different layers web/presentation layer, application layer and database layer.

The below image shows the structure of the architecture:



This architecture involves various cloud services like VPC, auto scaling, load balancers, RDS etc.

This can be achieved by following steps:

**STEP 1:** Create a VPC with the option VPC and more, this creates subnets, route tables, internet gateway, nat gateways automatically for 2 availability zones.

**Create VPC** [Info](#)

A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances. Mouse over a resource to highlight the related resources.

### VPC settings

**Resources to create** [Info](#)  
Create only the VPC resource or the VPC and other networking resources.

VPC only  VPC and more

**Name tag auto-generation** [Info](#)  
Enter a value for the Name tag. This value will be used to auto-generate Name tags for all resources in the VPC.

Auto-generate  
3tierarc-project

**IPv4 CIDR block** [Info](#)  
Determine the starting IP and the size of your VPC using CIDR notation.

10.0.0.0/16 65,536 IPs  
CIDR block size must be between /16 and /28.

**IPv6 CIDR block** [Info](#)  
 No IPv6 CIDR block  Amazon-provided IPv6 CIDR block

### Preview

**VPC** [Show details](#)  
Your AWS virtual network  
3tierarc-project-vpc

**Subnets (6)**  
Subnets within this VPC

- eu-north-1a**
  - 3tierarc-project-subnet-public1-eu-[Edit](#)
  - 3tierarc-project-subnet-private1-eu-[Edit](#)
  - 3tierarc-project-subnet-private3-eu-[Edit](#)
- eu-north-1b**
  - 3tierarc-project-subnet-public2-eu-[Edit](#)
  - 3tierarc-project-subnet-private2-eu-[Edit](#)
  - 3tierarc-project-subnet-private4-eu-[Edit](#)

**Route tables (5)**  
Route network traffic to

- 3tierarc-project-rtb-p-[Edit](#)
- 3tierarc-project-rtb-p-[Edit](#)
- 3tierarc-project-rtb-p-[Edit](#)
- 3tierarc-project-rtb-p-[Edit](#)
- 3tierarc-project-rtb-p-[Edit](#)

**VPC dashboard** [X](#)

**Subnets (1/6) Info**

Name	Subnet ID	State	VPC	IPv4 CIDR
public1a	subnet-093826dc52b5e9145	Available	vpc-077ec0dabb9e05c7b   3tier...	10.0.0.0/20
<b>db1b</b>	<b>subnet-0484803602a3f50ae</b>	Available	<b>vpc-077ec0dabb9e05c7b   3tier...</b>	<b>10.0.176.0/20</b>
private1a	subnet-0f077bda6bd44838	Available	vpc-077ec0dabb9e05c7b   3tier...	10.0.128.0/20
private1b	subnet-0235a1aa4da81c136	Available	vpc-077ec0dabb9e05c7b   3tier...	10.0.144.0/20
public1b	subnet-05e807345f621ab3e	Available	vpc-077ec0dabb9e05c7b   3tier...	10.0.16.0/20
db1a	subnet-0f1609db3d30b3424	Available	vpc-077ec0dabb9e05c7b   3tier...	10.0.160.0/20

**subnet-0484803602a3f50ae / db1b**

[Details](#) [Flow logs](#) [Route table](#) [Network ACL](#) [CIDR reservations](#) [Sharing](#) [Tags](#)

**Details**

Subnet ID	Subnet ARN	State	IPv4 CIDR
subnet-0484803602a3f50ae	arn:aws:ec2:eu-north-1:730353480963:subnet/subnet-0484803602a3f50ae	Available	10.0.176.0/20
Available IPv4 addresses		Availability Zone	Availability Zone ID
4091		eu-north-1b	eun1-az2

**VPC dashboard** [X](#)

**Route tables (1/7) Info**

Name	Route table ID	Explicit subnet associ...	Edge associations	Main	VPC
-	rtb-0f590b6ca4f63ee5d	-	-	Yes	vpc-077ec0dabb9e05c7b   3tier...
3tierarc-project-rtb-private4-eu-north-1b	rtb-063e0522973552bdf	subnet-0484803602a3f5...	-	No	vpc-077ec0dabb9e05c7b   3tier...
-	rtb-0e311f3c3757a4b45	-	-	Yes	vpc-0b91a4a86fb93cf9
3tierarc-project-rtb-private1-eu-north-1a	rtb-0hd4450eb60f37b33	subnet-0f077bda6bd44...	-	No	vpc-077ec0dabb9e05c7b   3tier...
3tierarc-project-rtb-private2-eu-north-1b	rtb-0d3feba46cbe50d5b	subnet-0235a1aa4da81c...	-	No	vpc-077ec0dabb9e05c7b   3tier...
<b>rtb-public</b>	<b>rtb-08f9c813bd64e1486</b>	<b>2 subnets</b>	-	No	<b>vpc-077ec0dabb9e05c7b   3tier...</b>
3tierarc-project-rtb-private3-eu-north-1a	rtb-0820566f28a6ab0ea	subnet-0f1609db3d30b3...	-	No	vpc-077ec0dabb9e05c7b   3tier...

**rtb-08f9c813bd64e1486 / rtb-public**

[Details](#) [Routes](#) [Subnet associations](#) [Edge associations](#) [Route propagation](#) [Tags](#)

**Details**

**STEP 2: Create a security group named project security this controls the traffic depending on some protocols/rules. Add some inbound rules like SSH, HTTP and mysql/aurora.**

Name	Security group rule...	IP version	Type	Protocol	Port range	Source
-	sgr-04c857f5463212520	IPv4	SSH	TCP	22	0.0.0.0/0
-	sgr-0bf6b7b8af2e345f5	IPv4	HTTP	TCP	80	0.0.0.0/0

**STEP 3: Create an instance for the web tier through which we can connect. And select the network settings to the VPC we created earlier and also select the public subnet.**

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EC2 > Instances Launch an instance

### Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

**Name and tags Info**

Name  Add additional tags

**Application and OS Images (Amazon Machine Image) Info**

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Search our full catalog including 1000s of application and OS images

**Quick Start**

**Summary**

Number of instances Info 1

Software Image (AMI)  
Canonical, Ubuntu, 24.04 LTS, ...read more  
ami-0705384c0b33c194c

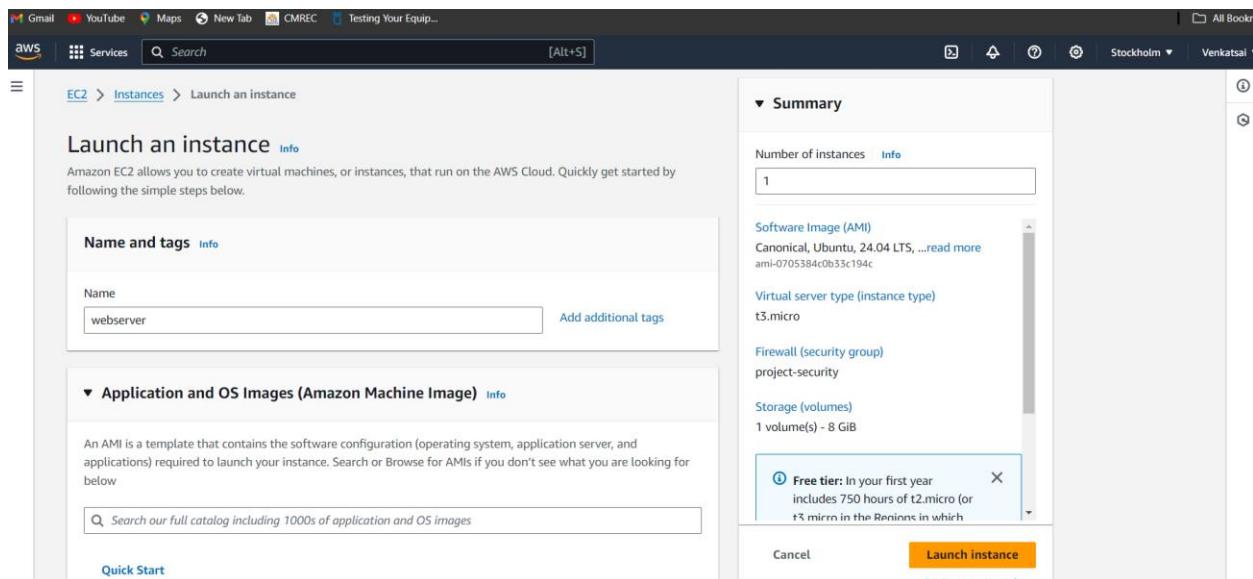
Virtual server type (instance type)  
t3.micro

Firewall (security group)  
project-security

Storage (volumes)  
1 volume(s) - 8 GiB

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

Cancel Launch instance Review commands



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EC2 > Instances Launch an instance

### Instance type Info | Get advice

Instance type

t3.micro Free tier eligible  
Family: t3 2 vCPU 1 GiB Memory Current generation: true  
On-Demand RHEL base pricing: 0.0708 USD per Hour  
On-Demand SUSE base pricing: 0.0108 USD per Hour  
On-Demand Linux base pricing: 0.0108 USD per Hour  
On-Demand Windows base pricing: 0.02 USD per Hour

All generations  Compare instance types

Additional costs apply for AMIs with pre-installed software

**Key pair (login) Info**

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - **required** 3tier-project-vcube

**Network settings Info**

**Summary**

Number of instances Info 1

Software Image (AMI)  
Canonical, Ubuntu, 24.04 LTS, ...read more  
ami-0705384c0b33c194c

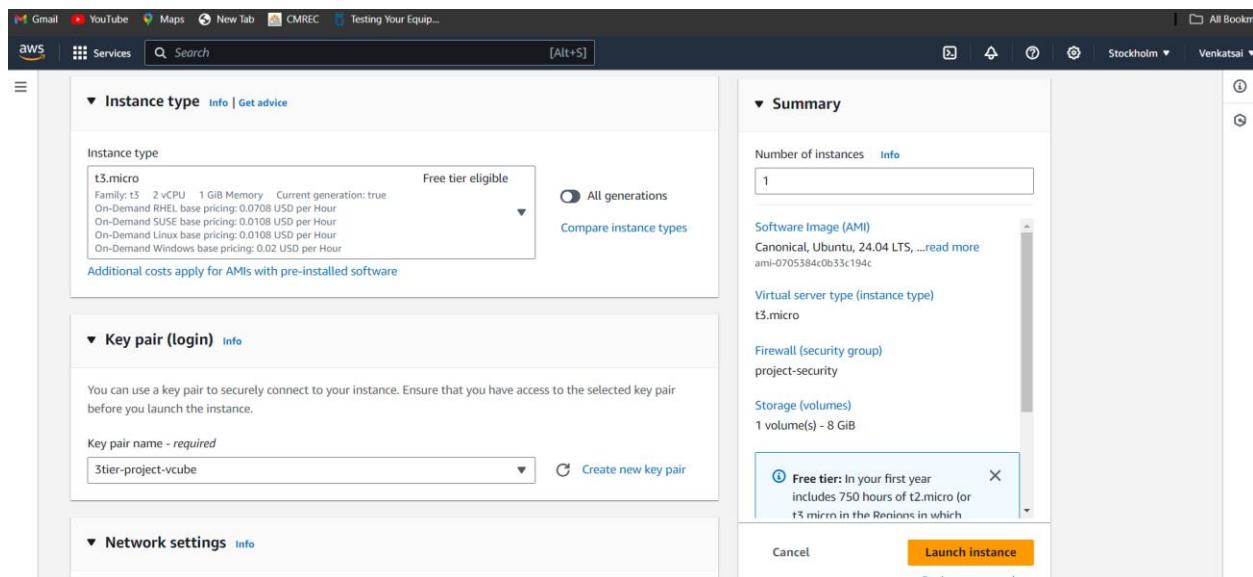
Virtual server type (instance type)  
t3.micro

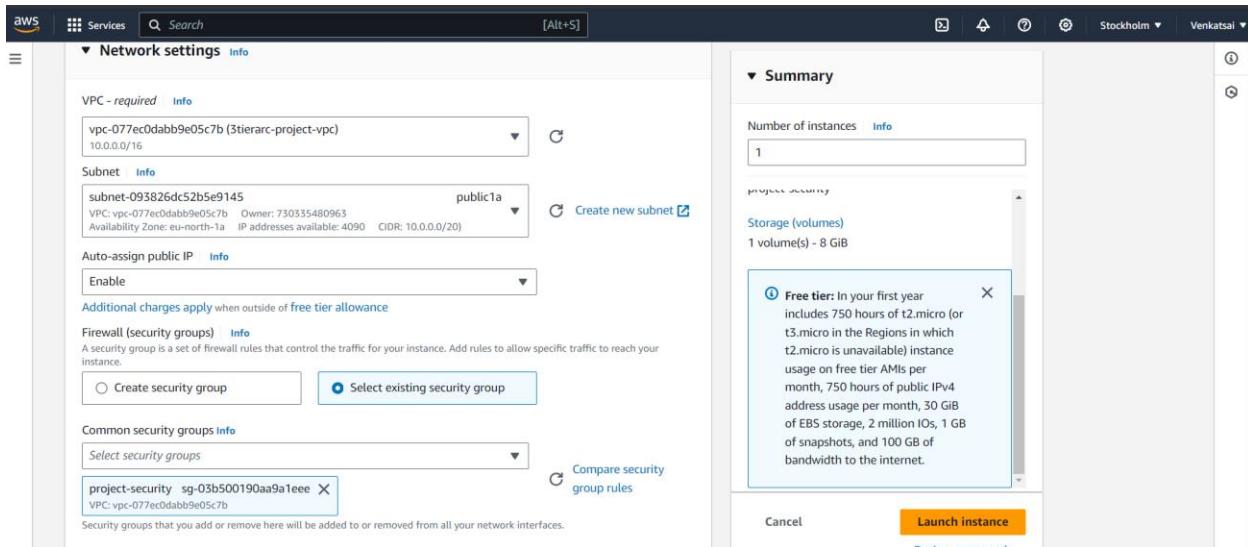
Firewall (security group)  
project-security

Storage (volumes)  
1 volume(s) - 8 GiB

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which

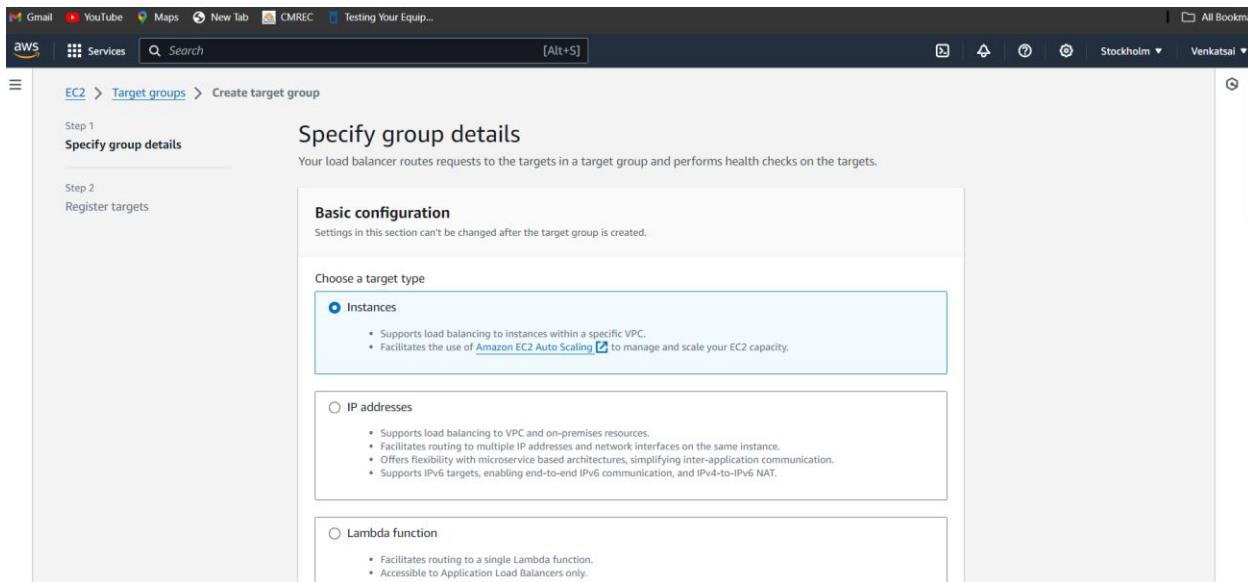
Cancel Launch instance Review commands





**Now click on launch instance, the instance is created.**

**STEP 4: Now create a target group to target instance and connect to the load balancers to distribute the traffic.**



Target group name  
web-TG

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Protocol : Port

Choose a protocol for your target group that corresponds to the Load Balancer type that will route traffic to it. Some protocols now include anomaly detection for the targets and you can set mitigation options once your target group is created. This choice cannot be changed after creation

HTTP 80 1-65535

IP address type

Only targets with the indicated IP address type can be registered to this target group.

IPv4

Each instance has a default network interface (eth0) that is assigned the primary private IPv4 address. The instance's primary private IPv4 address is the one that will be applied to the target.

IPv6

Each instance you register must have an assigned primary IPv6 address. This is configured on the instance's default network interface (eth0). [Learn more](#)

VPC

Select the VPC with the instances that you want to include in the target group. Only VPCs that support the IP address type selected above are available in this list.

3tierarc-project-vpc  
vpc-077ec0dabb9e05c7b  
IPv4 VPC CIDR: 10.0.0.0/16

Protocol version

## Select the target instances.

EC2 > Target groups > Create target group

Step 1: Specify group details

Step 2: Register targets

Register targets

This is an optional step to create a target group. However, to ensure that your load balancer routes traffic to this target group you must register your targets.

Available instances (1)

Instance ID	Name	State	Security groups
i-05714b730782d8416	webserver	Running	project-security

0 selected

Ports for the selected instances

Ports for routing traffic to the selected instances.  
80  
1-65535 (separate multiple ports with commas)

Include as pending below

1 selection is now pending below. Include more or register targets when ready.

## Now click create target group.

## STEP 5: Now create an external load balancer which is used to distribute traffic equally to instances.

Create Application Load Balancer [Info](#)

The Application Load Balancer distributes incoming HTTP and HTTPS traffic across multiple targets such as Amazon EC2 instances, microservices, and containers, based on request attributes. When the load balancer receives a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.

▶ How Application Load Balancers work

Basic configuration

Load balancer name  
external-loadbalancer

Name must be unique within your AWS account and can't be changed after the load balancer is created.

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Scheme [Info](#)  
Scheme can't be changed after the load balancer is created.

Internet-facing

An internet-facing load balancer routes requests from clients over the Internet to targets. Requires a public subnet. [Learn more](#)

Internal

An internal load balancer routes requests from clients to targets using private IP addresses. Compatible with the IPv4 and Dualstack IP address types.

IP address type [Info](#)  
Select the type of IP addresses that your subnets use. Public IPv4 addresses have an additional cost.

IPv4

## Select the subnets you need to distribute the traffic

The screenshot shows the 'Network mapping' section of the AWS CloudFront configuration. It lists two subnets under 'Mappings': 'eu-north-1a (eun1-az1)' and 'eu-north-1b (eun1-az2)'. Both subnets are associated with 'public1a' and 'public1b' respectively.

The screenshot shows the 'Security groups' section of the AWS CloudFront configuration. A security group named 'project-security' is selected, which is associated with VPC 'vpc-077ec0dabb9e05c7b'.

**Click on create load balancer and the application load balancer is created.**

**STEP 6: Create a launch template for the web-tier instance.**

**Create launch template**

Creating a launch template allows you to create a saved instance configuration that can be reused, shared and launched at a later time. Templates can have multiple versions.

**Launch template name and description**

Launch template name - *required*  
web-LT  
Must be unique to this account. Max 128 chars. No spaces or special characters like '&', '<', '@':

Template version description  
web tier launch template  
Max 255 chars

Auto Scaling guidance [Info](#)  
Select this if you intend to use this template with EC2 Auto Scaling  
 Provide guidance to help me set up a template that I can use with EC2 Auto Scaling

► Template tags  
► Source template

**Summary**

Software Image (AMI)  
Virtual server type (instance type)  
Firewall (security group)  
Storage (volumes)

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GB of FRS storage, 2 million IOPS, 1 GB

**Create launch template**

**Application and OS Images (Amazon Machine Image)** [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

**Recent** **Quick Start**

Don't include in launch template **Amazon Linux** **macOS** **Ubuntu** **Windows** **Red Hat** [Browse more AMIs](#) Including AMIs from AWS, Marketplace and the Community

**Amazon Machine Image (AMI)**  
Ubuntu Server 24.04 LTS (HVM), SSD Volume Type  
ami-0705584c0b33c194c  
Virtualization: HVM | ENA enabled: true | Root device type: ebs

Description Canonical, Ubuntu, 24.04 LTS, amd64 noble image build on 2024-04-23

Architecture **AMI ID**

**Summary**

Software Image (AMI)  
Canonical, Ubuntu, 24.04 LTS, ...read more  
ami-0705584c0b33c194c  
Virtual server type (instance type)  
t3.micro  
Firewall (security group)  
project-security  
Storage (volumes)  
1 volume(s) - 8 GiB

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GB

**Create launch template**

**Network settings** [Info](#)

Subnet [Info](#)  
Don't include in launch template [Create new subnet](#)

Firewall (security groups) [Info](#)  
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.  
 Select existing security group  Create security group

Security groups [Info](#)  
Select security groups  
project-security sg-03b500190aa9a1eee X  
VPC: vpc-077ec0dabb9e05c7b

Compare security group rules

Advanced network configuration

**Storage (volumes)** [Info](#)

**Summary**

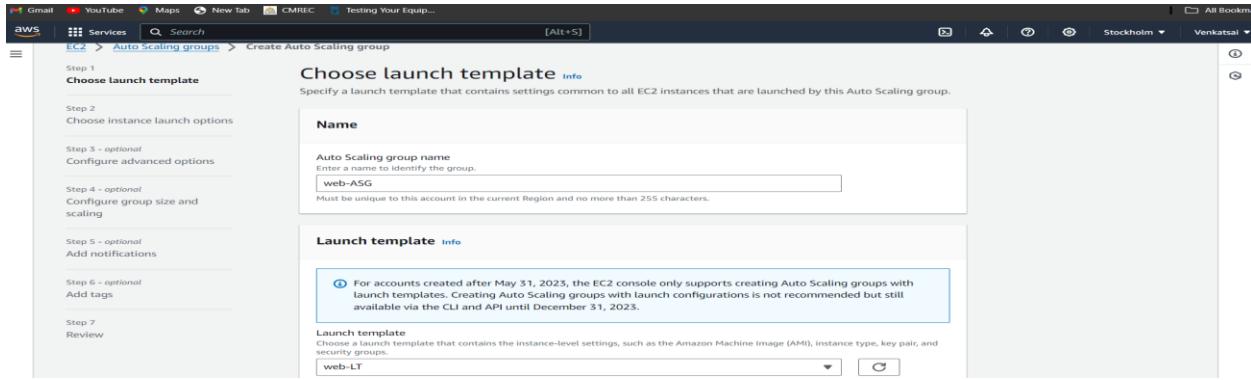
Software Image (AMI)  
Canonical, Ubuntu, 24.04 LTS, ...read more  
ami-0705584c0b33c194c  
Virtual server type (instance type)  
t3.micro  
Firewall (security group)  
project-security  
Storage (volumes)  
1 volume(s) - 8 GiB

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GB

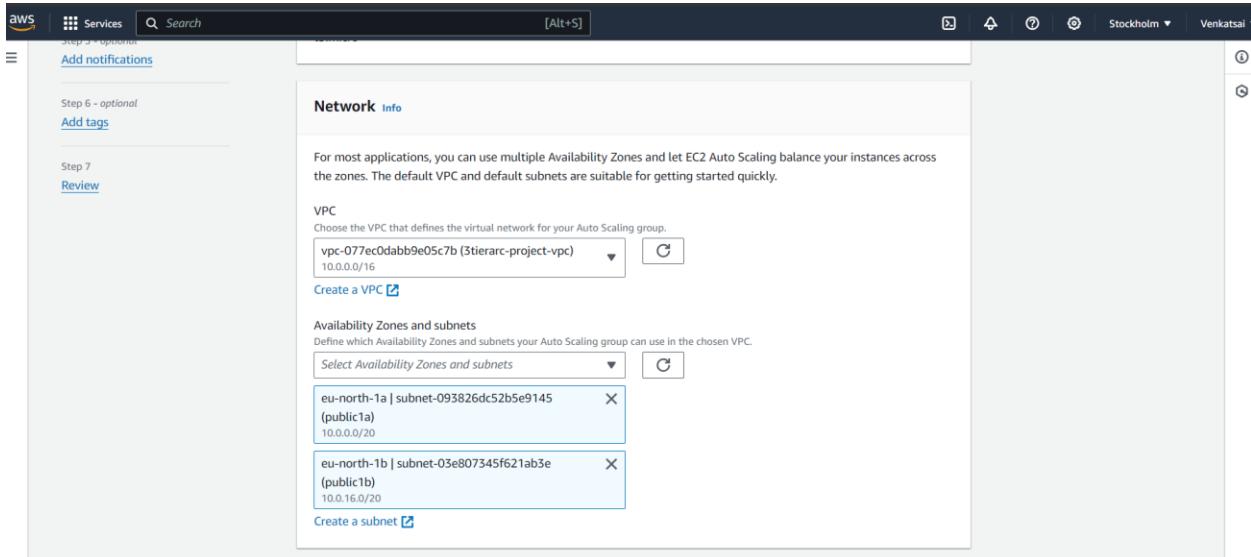
**Create launch template**

**Click on create launch template.**

**STEP 7: Now we have to create an auto-scaling group which is used to maintain the traffic in the servers without crashing the servers. This increases or decreases the no.of servers depending on the usage of the cpu percentage of the server.**



**Now select the vpc created and the two public subnets in the subnets options**

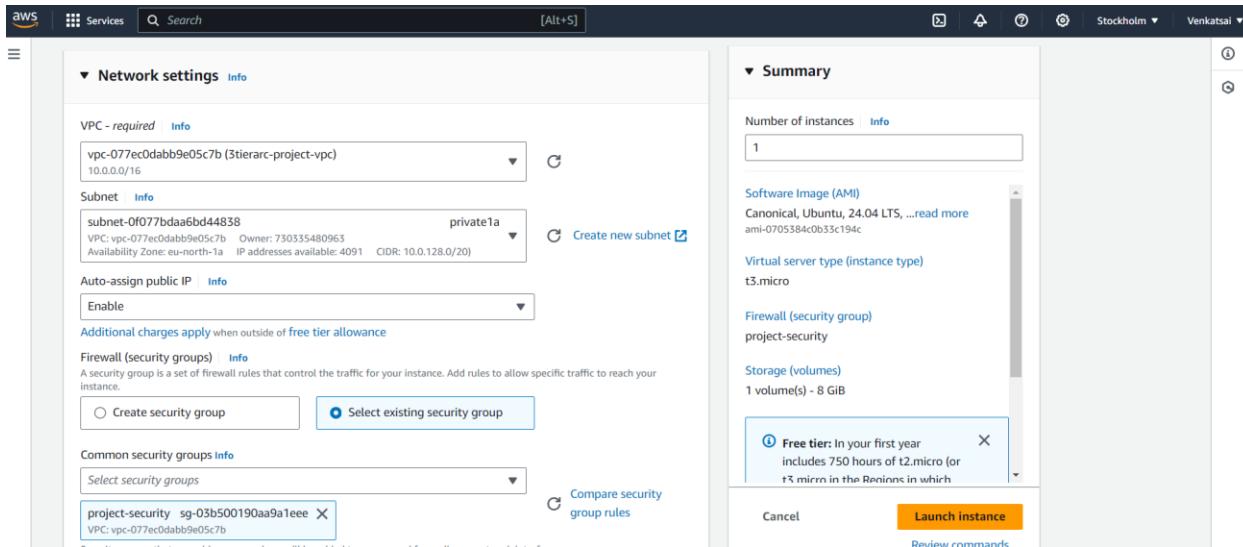


**Attach the target group created for the web tier and the external loadbalancer.**

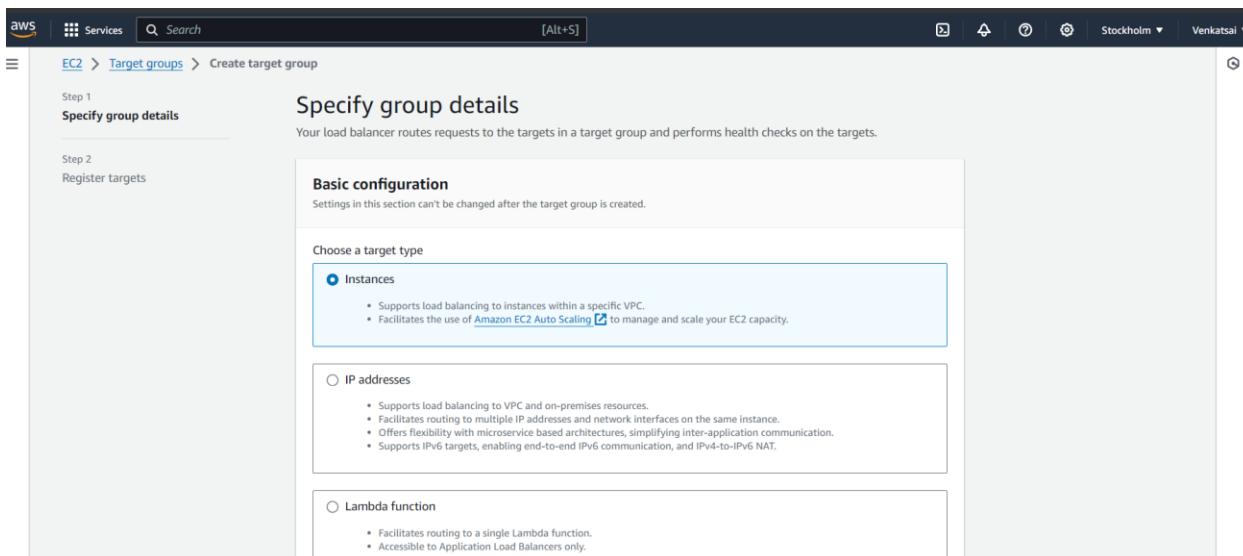
**Now select the no.of desired capacity, min capacity and maximum capacity for the instances**

**Now click on create autoscaling group.**

**STEP 8: Create an instance for the app tier through which we can connect. And select the network settings to the VPC we created earlier and also select the private subnet.**



## STEP 9: Now create a target group to target instance and connect to the load balancers to distribute the traffic.



AWS Services Search [Alt+S] Stockholm Venkatsai

**Target group name**  
app-TG  
A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

**Protocol : Port**  
Choose a protocol for your target group that corresponds to the Load Balancer type that will route traffic to it. Some protocols now include anomaly detection for the targets and you can set mitigation options once your target group is created. This choice cannot be changed after creation

HTTP	80
1-65535	

**IP address type**  
Only targets with the indicated IP address type can be registered to this target group.

**IPv4**  
Each instance has a default network interface (eth0) that is assigned the primary private IPv4 address. The instance's primary private IPv4 address is the one that will be applied to the target.

**IPv6**  
Each instance you register must have an assigned primary IPv6 address. This is configured on the instance's default network interface (eth0). [Learn more](#)

**VPC**  
Select the VPC with the instances that you want to include in the target group. Only VPCs that support the IP address type selected above are available in this list.

3tierarc-project-vpc  
vpc-077ac0dab9b9d5c7b  
IPv4 VPC CIDR: 10.0.0.0/16

**Protocol version**  
 **HTTP1**

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EC2 > Target groups > Create target group

Step 1 Specify group details

Step 2 Register targets

### Register targets

This is an optional step to create a target group. However, to ensure that your load balancer routes traffic to this target group you must register your targets.

**Available instances (3)**

<input type="checkbox"/>	Instance ID	Name	State	Security groups
<input type="checkbox"/>	i-0547c9854f81ab3f2	appserver	<span>Running</span>	project-security
<input type="checkbox"/>	i-06f0c75f52dafb94a		<span>Running</span>	project-security
<input type="checkbox"/>	i-05714b730782d8416	webserver	<span>Running</span>	project-security

0 selected

Ports for the selected instances  
Ports for routing traffic to the selected instances.

80
1-65535 (separate multiple ports with commas)

Here check the instance created for the app-tier.

In the network mapping select the vpc and and the two private subnets from 2 regions 2a and 2b.

**Network mapping** [Info](#)

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

**VPC** [Info](#)

Select the virtual private cloud (VPC) for your targets or you can [create a new VPC](#). The selected VPC can't be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

3tierarc-project-vpc	vpc-077ec0dabb9e05c7b	IPv4 VPC CIDR: 10.0.0.0/16
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**Mappings** [Info](#)

Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

eu-north-1a (eun1-az1)

Subnet: subnet-0f077bdcaa6bd44838 private1a

IPv4 address: Assigned from CIDR 10.0.128.0/20

eu-north-1b (eun1-az2)

Subnet: subnet-0235a1aa4da81c136 private1b

IPv4 address: Assigned from CIDR 10.0.144.0/20

**Select the security group and target group created for this project and app tier respectively.**

**Security groups** [Info](#)

A security group is a set of firewall rules that control the traffic to your load balancer. Select an existing security group, or you can [create a new security group](#).

Security groups: Select up to 5 security groups

project-security	VPC: vpc-077ec0dabb9e05c7b	X
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**Listeners and routing** [Info](#)

A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

▼ Listener HTTP:80

Protocol: HTTP Port: 80 Default action: [Info](#)

Forward to: app-TG	Target type: Instance, IPv4	HTTP
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Create target group [Create](#)

**Listener tags - optional**

Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

Step 3 - optional  
Configure advanced options

Step 4 - optional  
Configure group size and scaling

Step 5 - optional  
Add notifications

Step 6 - optional  
Add tags

Step 7  
Review

**Load balancing** Info

Use the options below to attach your Auto Scaling group to an existing load balancer, or to a new load balancer that you define.

No load balancer  
Traffic to your Auto Scaling group will not be fronted by a load balancer.

Attach to an existing load balancer  
Choose from your existing load balancers.

Attach to a new load balancer  
Quickly create a basic load balancer to attach to your Auto Scaling group.

**Attach to an existing load balancer**

Select the load balancers that you want to attach to your Auto Scaling group.

Choose from your load balancer target groups  
This option allows you to attach Application, Network, or Gateway Load Balancers.

Choose from Classic Load Balancers

Existing load balancer target groups  
Only instance target groups that belong to the same VPC as your Auto Scaling group are available for selection.

Select target groups

app-TG | HTTP X  
Application Load Balancer: app-loadbalancer

**Create launch template**

Creating a launch template allows you to create a saved instance configuration that can be reused, shared and launched at a later time. Templates can have multiple versions.

**Launch template name and description**

Launch template name - **required**

Must be unique to this account. Max 128 chars. No spaces or special characters like '&', ',', '@'.

Template version description

Max 255 chars

Auto Scaling guidance Info  
Select this if you intend to use this template with EC2 Auto Scaling

Provide guidance to help me set up a template that I can use with EC2 Auto Scaling

► Template tags  
► Source template

**Summary**

Software Image (AMI)

Virtual server type (instance type)

Firewall (security group)

Storage (volumes)

**Free tier:** In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 750 hours of public IPv4 address usage per month, 30 GB of EBS storage, 2 million IOPS, 1 GByte

Cancel **Create launch template**

**STEP 10: Now we have to create an auto-scaling group which is used to maintain the traffic in the servers without crashing the servers. This increases or decreases the no.of servers depending on the usage of the cpu percentage of the server.**

**Choose launch template** Info

Specify a launch template that contains settings common to all EC2 instances that are launched by this Auto Scaling group.

**Name**

Auto Scaling group name  
Enter a name to identify the group.  
  
Must be unique to this account in the current Region and no more than 255 characters.

**Launch template** Info

For accounts created after May 31, 2023, the EC2 console only supports creating Auto Scaling groups with launch templates. Creating Auto Scaling groups with launch configurations is not recommended but still available via the CLI and API until December 31, 2023.

Launch template  
Choose a launch template that contains the instance-level settings, such as the Amazon Machine Image (AMI), instance type, key pair, and security groups.

Step 1 Choose launch template

Step 2 Choose instance launch options

Step 3 - optional Configure advanced options

Step 4 - optional Configure group size and scaling

Step 5 - optional Add notifications

Step 6 - optional Add tags

Step 7 Review

**Network** Info

For most applications, you can use multiple Availability Zones and let EC2 Auto Scaling balance your instances across the zones. The default VPC and default subnets are suitable for getting started quickly.

**VPC**  
Choose the VPC that defines the virtual network for your Auto Scaling group.

**Availability Zones and subnets**  
Define which Availability Zones and subnets your Auto Scaling group can use in the chosen VPC.

eu-north-1a | subnet-0f077bdaa6bd44838 (private1a)  
10.0.0.0/16

eu-north-1b | subnet-0235a1aa4da81c136 (private1b)  
10.0.144.0/20

**Load balancing** Info

Use the options below to attach your Auto Scaling group to an existing load balancer, or to a new load balancer that you define.

No load balancer  
Traffic to your Auto Scaling group will not be fronted by a load balancer.

Attach to an existing load balancer  
Choose from your existing load balancers.

Attach to a new load balancer  
Quickly create a basic load balancer to attach to your Auto Scaling group.

**Attach to an existing load balancer**

Select the load balancers that you want to attach to your Auto Scaling group.

Choose from your load balancer target groups  
This option allows you to attach Application, Network, or Gateway Load Balancers.

Existing load balancer target groups  
Only instance target groups that belong to the same VPC as your Auto Scaling group are available for selection.

app-TG | HTTP  
Application Load Balancer: app-loadbalancer

Step 3 - optional Configure advanced options

Step 4 - optional Configure group size and scaling

Step 5 - optional Add notifications

Step 6 - optional Add tags

Step 7 Review

**Group size** Info  
Set the initial size of the Auto Scaling group. After creating the group, you can change its size to meet demand, either manually or by using automatic scaling.

Desired capacity type  
Choose the unit of measurement for the desired capacity value. vCPUs and Memory(GiB) are only supported for mixed instances groups configured with a set of instance attributes.

Units (number of instances)

Desired capacity  
Specify your group size.

1

**Scaling** Info  
You can resize your Auto Scaling group manually or automatically to meet changes in demand.

Scaling limits  
Set limits on how much your desired capacity can be increased or decreased.

Min desired capacity	Max desired capacity
1	1

Equal or less than desired capacity      Equal or greater than desired capacity

Automatic scaling - optional

**Now click create auto scaling group and the group is created.**

## **STEP 11: Now go to RDS services and create a subnet group and add the database subnets.**

**Create DB subnet group**

To create a new subnet group, give it a name and a description, and choose an existing VPC. You will then be able to add subnets related to that VPC.

**Subnet group details**

**Name**  
You won't be able to modify the name after your subnet group has been created.

Must contain from 1 to 255 characters. Alphanumeric characters, spaces, hyphens, underscores, and periods are allowed.

**Description**

**VPC**  
Choose a VPC identifier that corresponds to the subnets you want to use for your DB subnet group. You won't be able to choose a different VPC identifier after your subnet group has been created.

**Add subnets**

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aws Services Search [Alt+S]

Availability Zones  
Choose the Availability Zones that include the subnets you want to add.  
Choose an availability zone ▾  
eu-north-1a X eu-north-1b X

Subnets  
Choose the subnets that you want to add. The list includes the subnets in the selected Availability Zones.  
Select subnets ▾  
subnet-0f1609db3d30b3424 (10.0.160.0/20) X  
subnet-0484803602a3f50ae (10.0.176.0/20) X

For Multi-AZ DB clusters, you must select 3 subnets in 3 different Availability Zones.

**Subnets selected (2)**

Availability zone	Subnet ID	CIDR block
eu-north-1a	subnet-0f1609db3d30b3424	10.0.160.0/20
eu-north-1b	subnet-0484803602a3f50ae	10.0.176.0/20

Cancel Create

**click on create.**

## STEP 12: Now create a database and add the subnet group in the data base.

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aws Services Search [Alt+S]

Create database

Choose a database creation method [Info](#)

Standard create  
You set all of the configuration options, including ones for availability, security, backups, and maintenance.

Easy create  
Use recommended best-practice configurations. Some configuration options can be changed after the database is created.

Engine options

Engine type [Info](#)

<input type="radio"/> Aurora (MySQL Compatible) 	<input type="radio"/> Aurora (PostgreSQL Compatible) 
<input checked="" type="radio"/> MySQL 	<input type="radio"/> MariaDB 

MySQL

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

- Supports database size up to 64 TiB.
- Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
- Supports automated backup and point-in-time recovery.
- Supports up to 15 Read Replicas per instance, within a single Region or 5 read replicas cross-region.

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**Hide filters**

Show versions that support the Multi-AZ DB cluster [Info](#)  
Create a Multi-AZ DB cluster with one primary DB instance and two readable standby DB instances. Multi-AZ DB clusters provide up to 2x faster transaction commit latency and automatic failover in typically under 35 seconds.

Show versions that support the Amazon RDS Optimized Writes [Info](#)  
Amazon RDS Optimized Writes improves write throughput by up to 2x at no additional cost.

**Engine Version**  
MySQL 8.0.35

Enable RDS Extended Support [Info](#)  
Amazon RDS Extended Support is a paid offering. By selecting this option, you consent to being charged for this offering if you are running your database major version past the RDS end of standard support date for that version. Check the end of standard support date for your major version in the [RDS for MySQL documentation](#).

**Templates**  
Choose a sample template to meet your use case.

Production  
Use defaults for high availability and fast, consistent performance.

Dev/Test  
This instance is intended for development use outside of a production environment.

Free tier  
Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS.  
[Info](#)

**aws Services Search [Alt+S]**

**Settings**

**DB instance identifier** [Info](#)  
Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

**Credentials Settings**

**Master username** [Info](#)  
Type a login ID for the master user of your DB instance.

1 to 16 alphanumeric characters. The first character must be a letter.

**Credentials management**  
You can use AWS Secrets Manager or manage your master user credentials.

Managed in AWS Secrets Manager - **most secure**  
RDS generates a password for you and manages it throughout its lifecycle using AWS Secrets Manager.

Self managed  
Create your own password or have RDS create a password that you manage.

Auto generate password  
Amazon RDS can generate a password for you, or you can specify your own password.

**Master password** [Info](#)

**MySQL**

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- Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
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- Supports up to 15 Read Replicas per instance, within a single Region or 5 read replicas cross-region.

**aws Services Search [Alt+S]**

**Connectivity** [Info](#)

**Compute resource**  
Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.

Don't connect to an EC2 compute resource  
Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.

Connect to an EC2 compute resource  
Set up a connection to an EC2 compute resource for this database.

**Virtual private cloud (VPC)** [Info](#)  
Choose the VPC. The VPC defines the virtual networking environment for this DB instance.  
  
6 Subnets, 2 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

**After a database is created, you can't change its VPC.**

**DB subnet group** [Info](#)  
Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.  
  
2 Subnets, 2 Availability Zones

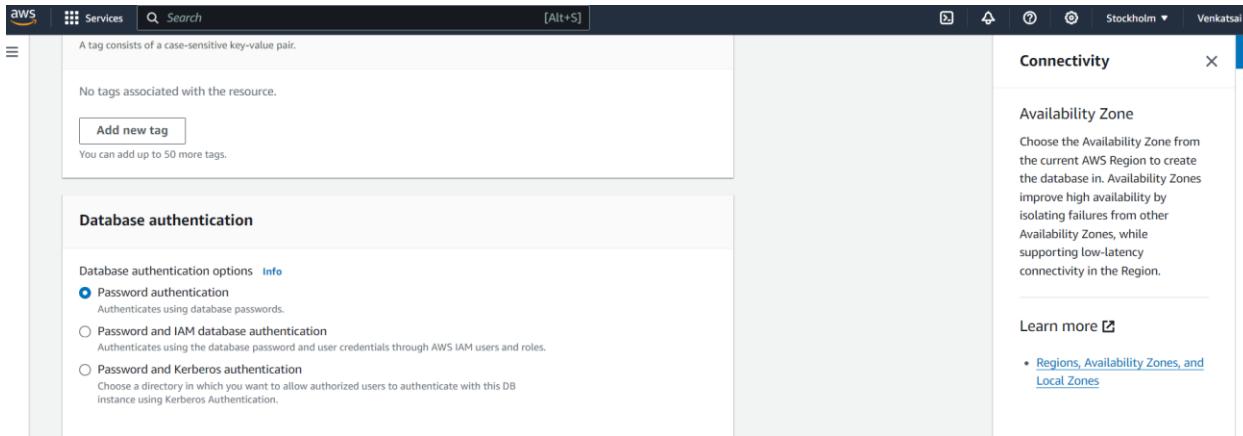
**Public access** [Info](#)  
 Yes

**Connectivity**

**Availability Zone**  
Choose the Availability Zone from the current AWS Region to create the database in. Availability Zones improve high availability by isolating failures from other Availability Zones, while supporting low-latency connectivity in the Region.

**Learn more** [Info](#)

- [Regions, Availability Zones, and Local Zones](#)



**Now click on create database below.**

## STEP 13: CONNECTING DATABASE TO EC2 INSTANCE

- Now go to the web server created in the ec2 instances.
- Connect the instance with ssh key in the git.
- Type sudo -i to become the root user.
- Install the my sql server using the command - sudo apt install mysql-server

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-10-0-7-222:~# sudo systemctl start mysql.service
root@ip-10-0-7-222:~# mysql -h database-3tier.cfkkzsmebj8d.eu-north-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 27
Server version: 8.0.35 Source distribution

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owners.

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

mysql> |
```

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

mysql> |
```

**THE DATABASES AVAILABLE ARE SHOWN IN THE INSTANCE.**