

Creating a Highly Available 3-Tier Architecture for Web Applications in AWS



Creating a VPC and Subnets

How to create and test a web tier, application tier, and database tier for a highly available and scalable architecture.

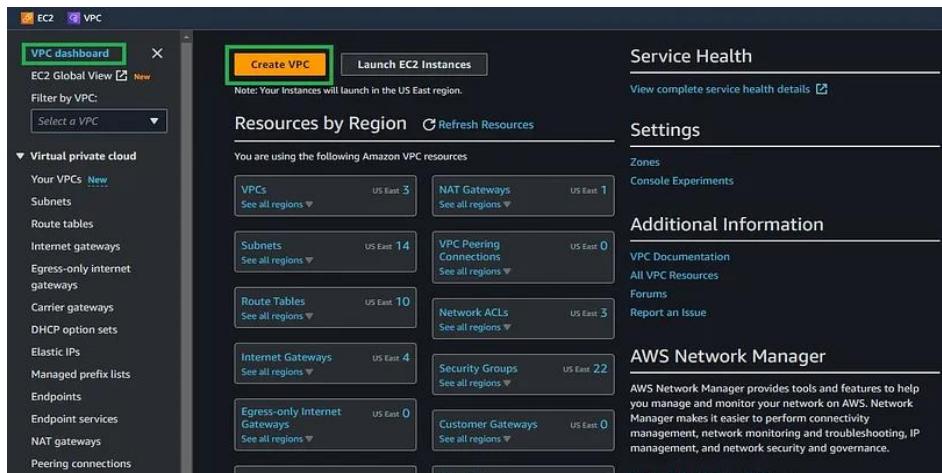
Using the architecture diagram as a reference, we will need to start by creating a new VPC with 2 public subnets and 4 private subnets.

Log into the AWS management console and click the Create VPC button.

>> 1.login to the AWS account select region→go toVPC.

2. click on create VPC . select VPC only & give name & give IPv4 CIDR and then

3. click on create VPC.



Step-1

Creating a New VPC

This screenshot shows the 'Create VPC' configuration page. The top navigation bar includes 'VPC', 'Your VPCs', and 'Create VPC'. The main content area is titled 'Create VPC' with a 'Info' link. It states: 'A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances.' Below this, the 'VPC settings' tab is active. Under 'Resources to create', there are two options: 'VPC only' (selected) and 'VPC and more'. There's also a 'Name tag - optional' field containing 'vpc-1'. Under 'IPv4 CIDR block', there are two options: 'IPv4 CIDR manual input' (selected) and 'IPAM-allocated IPv4 CIDR block'. The 'IPv4 CIDR' field contains '11.0.0.0/16'. At the bottom, there's an 'IPv6 CIDR block' section with a 'Info' link.

Step-2

SUBNETS:

Creating 6 subnets –(2Public & 4Private) as shown below

1. Click on **SUBNETS** & Click on create subnet& Choose VPC ID .
2. give subnet name & select availability zone (2a or 2b).Give IPV4 manual input different for each of subnet creation
3. click on create subnet.
4. create 6 subnets – 2 public subnets in 2a & 2b zone and 4 private subnets – take 2 private subnets in 2a & remaining 2 private subnets in 2b zone.
5. some snapshots of subnets are added below.

Next click on the Subnets tab in the VPC console.
Select one of the new subnets that was created, then under the “Actions” tab, expand the down arrow and select “Edit subnet settings.”

>after selecting [Edit Subnet settings](#) enable the ,Enable -auto assign IP settings.

We need to do the same enabling process to rest of 5 subnets.

Create INTERNET GATEWAY:

1.click on internet gateway &create internet gateway.

2.After creating internet gateway, click on actions & attach it to VPC as shown in below,

aws Services Search [Alt+S]

VPC > Internet gateways > Create internet gateway

Create internet gateway Info

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

Internet gateway settings

Name tag
Creates a tag with a key of 'Name' and a value that you specify.

Tags - optional
A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key	Value - optional
<input type="text" value="Name"/>	<input type="text" value="my-igw-01"/> <input type="button" value="X"/> <input type="button" value="Remove"/>

You can add 49 more tags.

Cancel

VPC dashboard X

VPC > Internet gateways > igw-0a0252ec9af543a68

igw-0a0252ec9af543a68 / my-igw-01

Details <small>Info</small>				Actions ▲					
Internet gateway ID <input type="text" value="igw-0a0252ec9af543a68"/>	State <input type="button" value="Detached"/>	VPC ID -	Owner <input type="text" value="010928"/>	<input type="button" value="Attach to VPC"/>	<input type="button" value="Detach from VPC"/>				
Tags				<input type="button" value="Manage tags"/>	<input type="button" value="Manage tags"/>				
<table border="1"> <thead> <tr> <th>Key</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Name</td> <td>my-igw-01</td> </tr> </tbody> </table>				Key	Value	Name	my-igw-01	<input type="button" value="<"/>	<input type="button" value="1"/>
Key	Value								
Name	my-igw-01								

Create NATGATEWAY:

1.click on Nat gateway & click on create.

2.select PRIVATE SUBNET & choose connecvity type as PUBLIC & Allocate ELASTIC IP.

3.Click on create NAT GATEWAY.

AWS Services Search [Alt+S]

Elastic IP address 34.235.245.166 (eipalloc-089efa47f485fea3a) allocated.

Create NAT gateway Info

A highly available, managed Network Address Translation (NAT) service that instances in private subnets can use to connect to services in other VPCs, on-premises networks, or the internet.

NAT gateway settings

Name - *optional*
Create a tag with a key of 'Name' and a value that you specify.

The name can be up to 256 characters long.

Subnet
Select a subnet in which to create the NAT gateway.

Connectivity type
Select a connectivity type for the NAT gateway.

Public
 Private

Elastic IP allocation ID Info
Assign an Elastic IP address to the NAT gateway.

AWS Services Search [Alt+S]

NAT gateway nat-057c6da972383543b | my-ngw-01 was created successfully.

VPC dashboard EC2 Global View Filter by VPC

VPC > NAT gateways > nat-057c6da972383543b

nat-057c6da972383543b / my-ngw-01

Details			
NAT gateway ID	nat-057c6da972383543b	Connectivity type	Public
NAT gateway ARN	arn:aws:ec2:us-east-1:010928185144:natgateway/nat-057c6da972383543b	Primary public IPv4 address	-
VPC	vpc-0d06022cba87624ef / my-vpc-01	Subnet	subnet-0507ce4548af0cf24 / private-subnet-01
			Created Saturday 24 August 2024 15:29:00 GMT+5:30

Create ROUTE TABLES:

1.we have to create 2 route tables – one is public & another is private.

2.goto route table – click on create route- select VPC & create route table.

VPC > Route tables > Create route table

Create route table Info

A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

Route table settings

Name - optional
Create a tag with a key of 'Name' and a value that you specify.

VPC
The VPC to use for this route table.

3. click on route- actions-edit subnet associations-select PUBLIC SUBNETS – save associations.

VPC dashboard > Route table rtb-0da51a73654360b02 | public-route-table was created successfully.

VPC > Route tables > rtb-0da51a73654360b02 / public-route-table

Details <small>Info</small>		Actions <small>▲</small>	
Route table ID	Main	Explicit subnet associations	Edge associations
rtb-0da51a73654360b02	No	-	-
VPC	Owner ID	Edit main route table	
vpc-0d06022cba87624ef my-vpc-01	010928185144	Edit subnet associations	
Edit edge associations Edit route propagation Edit routes Manage tags Delete			
Set main route table Edit main route table Edit edge associations Edit route propagation Edit routes Manage tags Delete			

Routes Subnet associations Edge associations Route propagation Tags

Routes (1)

Destination	Target	Status	Propagated
10.0.0.0/16	local	Active	No

VPC > Route tables > rtb-0da51a73654360b02 > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (2/6)

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
public-subnet-02	subnet-0e9d00f8477fd5282	10.0.2.0/24	-	Main (rtb-05fdb860fc1e8baae)
public-subnet-01	subnet-0fb30c664548ed663	10.0.1.0/24	-	Main (rtb-05fdb860fc1e8baae)
private-subnet-01	subnet-0507ce4548af0cf24	10.0.3.0/24	-	Main (rtb-05fdb860fc1e8baae)
private-subnet-02	subnet-0021fbe703d99afcd	10.0.4.0/24	-	Main (rtb-05fdb860fc1e8baae)
private-subnet-rds-01	subnet-0cf588f8fc0b6921b	10.0.5.0/24	-	Main (rtb-05fdb860fc1e8baae)
private-subnet-rds-02	subnet-0dal6a45712cb2338	10.0.6.0/24	-	Main (rtb-05fdb860fc1e8baae)

Selected subnets

[Cancel](#) [Save associations](#)

4. create another route table as PRIVATE.

5. Select VPC – edit subnet associations – select 4 private subnets – save associations.

6. snapshots are attached below

The screenshot shows the AWS VPC Route Tables creation interface. At the top, there's a search bar and a keyboard shortcut [Alt+S]. Below it, the breadcrumb navigation shows 'VPC > Route tables > Create route table'. The main title is 'Create route table' with an 'Info' link. A descriptive text explains that a route table specifies packet forwarding between subnets, the internet, and VPN connections. The 'Route table settings' section contains fields for 'Name - optional' (set to 'private-route-table') and 'VPC' (set to 'vpc-0d06022cba87624ef (my-vpc-01)').

The screenshot shows the 'rtb-06b464d48b1dc1188 / private-route-table' details page. It includes a 'Details' section with route table ID, VPC, and owner information, and a 'Routes' tab showing one route. On the right, a context menu for 'Actions' is open, with 'Edit subnet associations' highlighted. Below this, the 'Edit subnet associations' screen lists available subnets (public-subnet-02, public-subnet-01, private-subnet-01, private-subnet-02, private-subnet-rds-01, private-subnet-rds-02) and selected subnets (private-subnet-01, private-subnet-02, private-subnet-rds-01). The 'Route tables' list at the bottom shows four entries: public-route-table (2 subnets), private-route-table (4 subnets), and two unnamed entries.

The screenshot shows the 'Route tables (4)' list page. It displays route tables based on their association status: Main (rtb-0da51a73654360b02), Main (rtb-05fd860fc1e8baae), Main (rtb-05fd860fc1e8baae), and Main (rtb-05fd860fc1e8baae). Below this, the 'Edit routes' screen for the public-route-table shows a table of routes with columns for Destination CIDR, Target, and Actions. One route is listed: '0.0.0.0/0' with target 'rtb-05fd860fc1e8baae'.

7.click on public route table →edit routes→add rules→attach internet gateway→ save changes.

8. For private route table→attach internet gateway & Nat gateway→ save changes.

VPC > Route tables > rtb-0da51a73654360b02 > Edit routes

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	Active	No
<input type="text" value="Q_ 0.0.0.0/0"/> X	Internet Gateway	-	No
	<input type="text" value="Q_ igw-0a0252ec9af543a68"/> X		

[Add route](#) [Remove](#)

[Cancel](#) [Preview](#) [Save changes](#)

VPC > Route tables > rtb-06b464d48b1dc1188 > Edit routes

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	local	Active	No
<input type="text" value="Q_ local"/> X			
<input type="text" value="Q_ 0.0.0.0/8"/> X	Internet Gateway	Active	No
	<input type="text" value="Q_ igw-0a0252ec9af543a68"/> X		
<input type="text" value="Q_ 0.0.0.0/0"/> X	NAT Gateway	Active	No
	<input type="text" value="Q_ nat-057c6da972383543b"/> X		

[Add route](#) [Remove](#)

[Cancel](#) [Preview](#) [Save changes](#)

Create SECURITY GROUPS:

1. create **TWO** security groups.
2. Goto security groups > click on create security groups> select VPC > add INBOUND (SSH & HTTP) & OUTBOUND RULES (All traffic) > click on create security group.

Inbound rules [Info](#)

Type Info	Protocol Info	Port range Info	Source Info	Description - optional Info
SSH	TCP	22	Anywhere... <input type="text" value="Q_ 0.0.0.0/0"/> 0.0.0.0/0 X	<input type="text"/> Delete
HTTP	TCP	80	Anywhere... <input type="text" value="Q_ 0.0.0.0/0"/> 0.0.0.0/0 X	<input type="text"/> Delete

[Add rule](#)

Outbound rules [Info](#)

Type Info	Protocol Info	Port range Info	Destination Info	Description - optional Info
All traffic	All	All	Custom <input type="text" value="Q"/> <input type="text"/> Delete	

[Add rule](#)

Security group (sg-0f3c062b62b867bae | my-security-3tier) was created successfully

Details

Security group name my-security-3tier	Security group ID sg-0f3c062b62b867bae	Description nothing	VPC ID vpc-0ab0f5d47602ee40f
Owner 989076622686	Inbound rules count 2 Permission entries	Outbound rules count 1 Permission entry	

Inbound rules (2)

Security Groups (4) Info

Name	Security group ID	Security group name	VPC ID	Description
-	sg-0b2619763f0cd5f7	default	vpc-09cc650406d26621	default VPC security group
-	sg-055bd315193a365f1	my-sg-01	vpc-0d06022cba87624ef	allow
-	sg-0d5b9a0b92bf98ee	default	vpc-0d06022cba87624ef	default VPC security group
-	sg-09c632cb1e1be7b2b	my-sg-02	vpc-0d06022cba87624ef	allow

→ LAUNCH TWO TEMPLATES (Public & Private):

PUBLIC TEMPLATE:

1. Search EC2 – Click on **LAUNCH TEMPLATES** – Click on **CREATE LAUNCH TEMPLATES**.
2. Select **AMI – UBUNTU** & instance type – t2.micro(1GB- Free Tier).
3. Select KEY PAIR .
4. In Network settings select security group and VPC you have created .
5. Snapshots of Public Template are attached below.

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
my-public-template

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

Template version description
allow

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

Summary

Software Image (AMI)
Canonical, Ubuntu, 24.04, amd64...read more
ami-0e86e20ddac9224db8

Virtual server type (instance type)
t2.micro

Firewall (security group)
my-sg-01

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

Create launch template

Launch template contents

Specify the details of your launch template below. Leaving a field blank will result in the field not being included in the 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.

Recents	Quick Start					
Don't include in launch template	Amazon Linux	macOS	Ubuntu	Windows	Red Hat	🔍
						Browse more AMIs <small>Including AMIs from AWS, Marketplace and the Community</small>

Amazon Machine Image (AMI)

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type Free tier eligible

ami-0e86e20dae9224db8 (64-bit (x86)) / ami-096ca6a12ea24a797 (64-bit (Arm))
 Virtualization: hvm ENA enabled: true Root device type: ebs

Description

Ubuntu Server 24.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

Architecture **AMI ID**

64-bit (x86) ami-0e86e20dae9224db8 Verified provider

▼ Summary

Software Image (AMI)
 Canonical, Ubuntu, 24.04, amd6...read more
 ami-0e86e20dae9224db8

Virtual server type (instance type)
 t2.micro

Firewall (security group)
 my-sg-01

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

Cancel Create launch template

▼ Network settings Info

Subnet Info

Don't include in launch template

Create new subnet 🔗

When you specify a subnet, a network interface is automatically added to your template.

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

my-sg-01 sg-055bd315193a365f1 X

VPC: vpc-0d06022ca87624ef

Advanced network configuration

▼ Summary

Software Image (AMI)
 Canonical, Ubuntu, 24.04, amd6...read more
 ami-0e86e20dae9224db8

Virtual server type (instance type)
 t2.micro

Firewall (security group)
 my-sg-01

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

Cancel Create launch template

★Create PRIVATE TEMPLATE:

1.Create same as previous template, but at SECURITY GROUP select as SECURITY GROUP -2 , to make easy recognition.

2.Snapshots of PRIVATE TEMPLATE as attached below.

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

Summary

Software Image (AMI)

Virtual server type (instance type)

Firewall (security group)

Storage (volumes)

Cancel

Create launch template

Launch template contents

Specify the details of your launch template below. Leaving a field blank will result in the field not being included in the 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

Recents | Quick Start



Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type
ami-0e86e20dae9224db8 (64-bit (x86)) / ami-096eda12ca242797 (64-bit (Arm))
Virtualization: hvm
ENI enabled: true
Root device type: ebs

Free tier eligible

Description

Ubuntu Server 24.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

Architecture

AMI ID
64-bit (x86) | ami-0e86e20dae9224db8

[Verified provider](#)

Summary

Software Image (AMI)

Canonical, Ubuntu, 24.04, amd6...read more
ami-0e86e20dae9224db8

Virtual server type (instance type)

Firewall (security group)

Storage (volumes)

1 volume(s) - 8 GiB

Cancel

Create launch template

▼ Instance type [Info](#) | [Get advice](#)

Advanced

Instance type

t2.micro
Family: t2 1 vCPU 1 GB Memory Current generation: true
On-Demand Windows base pricing: 0.0162 USD per Hour
On-Demand SUSE base pricing: 0.0116 USD per Hour
On-Demand RHEL base pricing: 0.026 USD per Hour
On-Demand Linux base pricing: 0.0116 USD per Hour

Free tier eligible

All generations

[Compare instance types](#)

Additional costs apply for AMIs with pre-installed software

Summary

Software Image (AMI)

Canonical, Ubuntu, 24.04, amd6...read more
ami-0e86e20dae9224db8

Virtual server type (instance type)

t2.micro

Firewall (security group)

Storage (volumes)

1 volume(s) - 8 GiB

Cancel

Create launch template

▼ 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

[Create new key pair](#)

The screenshot shows the AWS EC2 Launch Template creation process. On the left, under 'Network settings', there's a dropdown for 'Key pair name' set to 'asg-02'. Below it, 'Subnet' is set to 'Don't include in launch template'. Under 'Firewall (security groups)', the 'Select existing security group' option is selected, showing 'my-sg-02'. Under 'Storage (volumes)', it shows '1 volume(s) - 8 GiB'. On the right, the 'Summary' section includes 'Software Image (AMI)' (Canonical, Ubuntu, 24.04), 'Virtual server type (instance type)' (t2.micro), and 'Storage (volumes)' (1 volume(s) - 8 GiB). At the bottom right are 'Cancel' and 'Create launch template' buttons.

After Launching TWO templates successfully .

The screenshot shows the 'Launch Templates' list in the AWS EC2 console. It displays two entries:

Launch Template ID	Launch Template Name	Default Version	Latest Version	Create Time	Created By
lt-0c1bf6d0a4f6c736f	my-private-template	1	1	2024-08-27T05:29:49.000Z	arn:aws:iam::010928185144:user/usha
lt-046e07efb806113a7	my-public-template	1	1	2024-08-27T05:28:11.000Z	arn:aws:iam::010928185144:user/usha

Create TWO AUTOSCALING GROUPS (Public & Private):

- 1.In EC2, go to autoscaling group – click on create autoscaling group.
- 2.Give name to ASG > Select **PUBLIC TEMPLATE** (which is already created)
- 3.In network settings> choose VPC > choose 2 public subnets.
4. click on NEXT.

EC2 > Auto Scaling groups > Create Auto Scaling group

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

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. <input type="text" value="auto-scaling-public"/>
Must be unique to this account in the current Region and no more than 255 characters.

Launch template Info

① 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.

<input type="text" value="my-public-template"/>	<input type="button" value="▼"/>	<input type="button" value="C"/>
Create a launch template <input checked="" type="checkbox"/>		
Version	<input type="button" value="Default (1) ▼"/>	<input type="button" value="C"/>
Create a launch template version <input checked="" type="checkbox"/>		
Description	Launch template	Instance type
allow	<input "="" type="checkbox" value="my-public-template <input checked="/> lt-046e07efb806113a7"/>	t2.micro

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.

<input type="text" value="vpc-0d06022cba87624ef (my-vpc-01) 10.0.0.0/16"/>	<input type="button" value="▼"/>	<input type="button" value="C"/>
Create a VPC <input checked="" type="checkbox"/>		

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

<input type="button" value="Select Availability Zones and subnets"/>	<input type="button" value="C"/>
<input type="text" value="us-east-1a subnet-0fb30c664548ed663 (public-subnet-01) 10.0.1.0/24"/>	
<input type="text" value="us-east-1b subnet-0e9d00f8477fd5282 (public-subnet-02) 10.0.2.0/24"/>	
Create a subnet <input checked="" type="checkbox"/>	

5. We have to attach **LOAD BALANCER** to ASG.

6.Attach load balancer- choose application load balancer> LB name should be same as ASG you can also edit it.

7.select subnets > give PORT NO: **80** for HTTP – Select TARGET GROUP (new or existing).

8.Give HEALTH CHECK GRACE PERIOD as you go.

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

Configure advanced options - optional Info

Integrate your Auto Scaling group with other services to distribute network traffic across multiple servers using a load balancer or to establish service-to-service communications using VPC Lattice. You can also set options that give you more control over health check replacements and monitoring.

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 a new load balancer

Define a new load balancer to create for attachment to this Auto Scaling group.

Load balancer type
Choose from the load balancer types offered below. Type selection cannot be changed after the load balancer is created. If you need a different type of load balancer than those offered here, visit the Load Balancing console. [\[?\]](#)

Application Load Balancer
HTTP, HTTPS

Network Load Balancer
TCP, UDP, TLS

Load balancer name
Name cannot be changed after the load balancer is created.
auto-scaling-public-1

Load balancer scheme
Scheme cannot be changed after the load balancer is created.
 Internal Internet-facing

Add tags

Attach to a new load balancer

Define a new load balancer to create for attachment to this Auto Scaling group.

Load balancer type
Choose from the load balancer types offered below. Type selection cannot be changed after the load balancer is created. If you need a different type of load balancer than those offered here, visit the Load Balancing console. [\[?\]](#)

Application Load Balancer
HTTP, HTTPS

Network Load Balancer
TCP, UDP, TLS

Load balancer name
Name cannot be changed after the load balancer is created.
auto-scaling-public-1

Load balancer scheme
Scheme cannot be changed after the load balancer is created.
 Internal Internet-facing

Network mapping
Your new load balancer will be created using the same VPC and Availability Zone selections as your Auto Scaling group. You can select different subnets and add subnets from additional Availability Zones.

VPC
vpc-0d06022cba87624ef [\[?\]](#) my-vpc-01

Availability Zones and subnets
You must select a single subnet for each Availability Zone enabled. Only public subnets are available for selection to support DNS resolution.

<input checked="" type="checkbox"/> us-east-1a	subnet-0fb30c664548ed663	▼
<input checked="" type="checkbox"/> us-east-1b	subnet-0e9d00f8477fd5282	▼

Listeners and routing
If you require secure listeners, or multiple listeners, you can configure them from the Load Balancing console [\[?\]](#) after your load balancer is created.

Protocol	Port	Default routing (forward to)
HTTP	80	auto-scaling-public-1-tg HTTP

Tags - optional

Health checks

Health checks increase availability by replacing unhealthy instances. When you use multiple health checks, all are evaluated, and if at least one fails, instance replacement occurs.

EC2 health checks

Always enabled

Additional health check types - optional | [Info](#)

- Turn on Elastic Load Balancing health checks Recommended
 - Elastic Load Balancing monitors whether instances are available to handle requests. When it reports an unhealthy instance, EC2 Auto Scaling can replace it on its next periodic check.
- Turn on VPC Lattice health checks
 - VPC Lattice can monitor whether instances are available to handle requests. If it considers a target as failed a health check, EC2 Auto Scaling replaces it after its next periodic check.
- Turn on Amazon EBS health checks
 - EBS monitors whether an instance's root volume or attached volume stalls. When it reports an unhealthy volume, EC2 Auto Scaling can replace the instance on its next periodic health check.

Health check grace period | [Info](#)

This time period delays the first health check until your instances finish initializing. It doesn't prevent an instance from terminating when placed into a non-running state.

seconds

9. Select Group size We want to set a minimum and maximum number of instances as the ASG can provision:

- Desired capacity: 2
- Minimum capacity: 2
- Maximum capacity: 5

10. click on next ->next -> create auto scaling group.

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.

Desired capacity

Specify your group size.

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
<input type="text" value="2"/>	<input type="text" value="5"/>
Equal or less than desired capacity	Equal or greater than desired capacity

Automatic scaling - optional

Choose whether to use a target tracking policy | [Info](#)

You can set up other metric-based scaling policies and scheduled scaling after creating your Auto Scaling group.

No scaling policies
Your Auto Scaling group will remain at its initial size and will not dynamically resize to meet demand.

Target tracking scaling policy
Choose a CloudWatch metric and target value and let the scaling policy adjust the desired capacity in proportion to the metric's value.

Add notifications - optional [Info](#)

Send notifications to SNS topics whenever Amazon EC2 Auto Scaling launches or terminates the EC2 instances in your Auto Scaling group.

Add notification

Step 1
[Choose launch template or configuration](#)

Step 2
[Choose instance launch options](#)

Step 3 - optional
[Configure advanced options](#)

Cancel **Skip to review** **Previous** **Next**

EC2 > Auto Scaling groups > Create Auto Scaling group

Step 1
Choose launch template or configuration

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

Add tags - optional Info

Add tags to help you search, filter, and track your Auto Scaling group across AWS. You can also choose to automatically add these tags to instances when they are launched.

ⓘ You can optionally choose to add tags to instances (and their attached EBS volumes) by specifying tags in your launch template. We recommend caution, however, because the tag values for instances from your launch template will be overridden if there are any duplicate keys specified for the Auto Scaling group.

Tags (0)		
<input type="button" value="Add tag"/> 50 remaining		

Cancel Previous Next

Instance maintenance policy

Replacement behavior	Min healthy percentage	Max healthy percentage
No policy	-	-

Instance scale-in protection

Instance scale-in protection

Enable instance protection from scale in

Step 5: Add notifications

Notifications

No notifications

Edit

Step 6: Add tags

Tags (0)		
Key	Value	Tag new instances
No tags		

Cancel Previous Create Auto Scaling group

CREATE ANOTHER ASG AS PRIVATE:

- 1.Follow all the steps as above mentioned.
- 2.At network settings, choose 4 private subnets.
- 3.snapshots of private ASG are attached below.

EC2 > Auto Scaling groups > Create Auto Scaling group

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

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.

Version
Default (1)

Create a launch template

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.

Create a VPC

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

us-east-1a | subnet-0507ce4548af0cf24 (private-subnet-01)
10.0.0.0/16

us-east-1b | subnet-0021fbe703d99afcd (private-subnet-02)
10.0.4.0/24

us-east-1a | subnet-0cf588f8fc0b6921b (private-subnet-rds-01)
10.0.5.0/24

us-east-1b | subnet-0dab6a45712cb2338 (private-subnet-rds-02)
10.0.6.0/24

Create a subnet

Cancel **Skip to review** **Previous** **Next**

Load balancer type
Choose from the load balancer types offered below. Type selection cannot be changed after the load balancer is created. If you need a different type of load balancer than those offered here, visit the Load Balancing console.

Application Load Balancer
HTTP, HTTPS

Network Load Balancer
TCP, UDP, TLS

Load balancer name
Name cannot be changed after the load balancer is created.

auto-scaling-private-1-lb

Load balancer scheme
Scheme cannot be changed after the load balancer is created.

Internal

Internet-facing

Network mapping
Your new load balancer will be created using the same VPC and Availability Zone selections as your Auto Scaling group. You can select different subnets and add subnets from additional Availability Zones.

VPC
vpc-0d06022cba87624ef

Availability Zones and subnets
You must select a single subnet for each Availability Zone enabled. Only public subnets are available for selection to support DNS resolution.

<input checked="" type="checkbox"/> us-east-1a	subnet-0cf588f8fc0b6921b	
<input checked="" type="checkbox"/> us-east-1b	subnet-0021fbe703d99afcd	

Listeners and routing
If you require secure listeners, or multiple listeners, you can configure them from the Load Balancing console after your load balancer is created.

Protocol	Port	Default routing (forward to)
HTTP	80	Create a target group New target group name: auto-scaling-private-1-lb

Health checks
Health checks increase availability by replacing unhealthy instances. When you use multiple health checks, all are evaluated, and if at least one fails, instance replacement occurs.

EC2 health checks
 Always enabled

Additional health check types - optional

- Turn on Elastic Load Balancing health checks Elastic Load Balancing monitors whether instances are available to handle requests. When it reports an unhealthy instance, EC2 Auto Scaling replaces it with a healthy instance.
- Turn on VPC Lattice health checks VPC Lattice can monitor whether instances are available to handle requests. If it considers a target as failed a health check, EC2 Auto Scaling replaces it with a healthy instance.
- Turn on Amazon EBS health checks EBS monitors whether an instance's root volume or attached volume stalls. When it reports an unhealthy volume, EC2 Auto Scaling can replace the instance on its next periodic health check.

Health check grace period
This time period delays the first health check until your instances finish initializing. It doesn't prevent an instance from terminating when placed into a non-running state.
30 seconds

Group size
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.

Scaling
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
<input type="text" value="2"/>	<input type="text" value="5"/>
Equal or less than desired capacity	Equal or greater than desired capacity

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](#)

4.Successfully created **TWO AUTO SCALING GROUPS.**

The screenshot shows the AWS Auto Scaling Groups page. At the top, a green banner indicates: "auto-scaling-private, 1 Load balancer, 1 Target group, 1 Listener created successfully. 1 new target group has been attached to ASG." Below this, the "Auto Scaling groups (2) Info" section lists two groups:

Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max	Availability Zones
auto-scaling-private	my-private-template Version Default	0	Updating capacity...	2	2	5	us-east-1a, us-east-1b
auto-scaling-public	my-public-template Version Default	2	-	2	2	5	us-east-1a, us-east-1b

5. Now go to EC2 dashboard- click on instances.

6. Give names to those instances as > public-1, public-2, private-1&private-2.

The screenshot shows the AWS EC2 Instances page. The left sidebar shows navigation options like EC2 Dashboard, EC2 Global View, Events, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, and Reserved Instances. The main table lists four instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 ...	Elastic IP
private-1	i-0cd688c06212d0497	Running	t2.micro	2/2 checks passed	View alarms +	us-west-1b	-	13.52.182.153	-
public-1	i-0acd8d3bf3f511fc2	Running	t2.micro	2/2 checks passed	View alarms +	us-west-1b	-	18.144.27.219	-
public-2	i-09cf3ff556bb448976	Running	t2.micro	2/2 checks passed	View alarms +	us-west-1c	-	54.153.85.221	-
private-2	i-09855f5345624623b	Running	t2.micro	2/2 checks passed	View alarms +	us-west-1c	-	54.219.251.72	-

7. Click on public -1 instance – click on connect- connect to the EC2 server.

8. After connecting to UBUNTU, give the following commands:

> sudo -i , to become a root user

> apt update -y (to update packages)

> apt install apache2 (to install apache2)

> cd /var/www/html_(path)

> ls _ (list)

> rm index.html, _ (to remove) index.html

> vi index.html >enter >press I (insert),insert date --:x (to save) >enter

> systemctl status apache2 >to check the server status.

> Ping google.com – to check whether the server is pinged or not.

10.screenshots attached below.

```

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 06:22:29 UTC 2024

System load: 0.08      Processes:          102
Usage of /: 22.7% of 6.71GB   Users logged in: 0
Memory usage: 20%          IPv4 address for enx0: 10.0.1.84
Swap usage: 0%          

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

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-10-0-1-84:~$ sudo -i
root@ip-10-0-1-84:~# apt update -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease [126 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [323 kB]

```

```
No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-10-0-1-84:~# cd /var/www/html
root@ip-10-0-1-84:/var/www/html# ls
index.html
root@ip-10-0-1-84:/var/www/html# rm index.html
root@ip-10-0-1-84:/var/www/html# vi index.html
root@ip-10-0-1-84:/var/www/html# systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
   Active: active (running) since Tue 2024-08-27 06:23:43 UTC; 2min 17s ago
     Docs: https://httpd.apache.org/docs/2.4/
Main PID: 2535 (apache2)
   Tasks: 55 (limit: 1130)
  Memory: 6.9M (peak: 7.0M)
    CPU: 55ms
   CGroup: /system.slice/apache2.service
           └─2535 /usr/sbin/apache2 -k start
             ├─2538 /usr/sbin/apache2 -k start
             └─2539 /usr/sbin/apache2 -k start

Aug 27 06:23:43 ip-10-0-1-84 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Aug 27 06:23:43 ip-10-0-1-84 apachectl[2534]: AH00558: apache2: Could not reliably determine
  message
Aug 27 06:23:43 ip-10-0-1-84 systemd[1]: Started apache2.service - The Apache HTTP Server.
root@ip-10-0-1-84:/var/www/html# ping google.com
PING google.com (142.251.179.102) 56(84) bytes of data.
64 bytes from pd-in-f102.1e100.net (142.251.179.102): icmp_seq=1 ttl=105 time=2.77 ms
64 bytes from pd-in-f102.1e100.net (142.251.179.102): icmp_seq=2 ttl=105 time=2.85 ms
64 bytes from pd-in-f102.1e100.net (142.251.179.102): icmp_seq=3 ttl=105 time=2.81 ms
64 bytes from pd-in-f102.1e100.net (142.251.179.102): icmp_seq=4 ttl=105 time=2.82 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3006ms
rtt min/avg/max/mdev = 2.768/2.810/2.848/0.028 ms
root@ip-10-0-1-84:/var/www/html#
```

11.Copy the PUBLIC IP address & paste it in google chrome.

12.It will shows the data we inserted.



this is 3-tier Architecture!!

Now connect to the PRIVATE INSTANCE through PUBLIC INSTANCE:

1.Follow the steps as mentioned in the snapshots.

```
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 06:22:29 UTC 2024

 System load:  0.08      Processes:          102
 Usage of /:   22.7% of 6.71GB   Users logged in:    0
 Memory usage: 20%
 Swap usage:  0%
                                         IPv4 address for enx0: 10.0.1.84

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

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
```

```
Memory usage: 20%           IPv4 address for enX0: 10.0.5.175
Swap usage:   0%

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

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-10-0-5-175:~$ 
--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 1.900/1.920/1.959/0.027 ms
root@ip-10-0-1-84:~# cd /var/www/html
root@ip-10-0-1-84:/var/www/html# ls
asg-1.pem index.html
root@ip-10-0-1-84:/var/www/html# rm index.html
root@ip-10-0-1-84:/var/www/html# vi asg-1.pem
root@ip-10-0-1-84:/var/www/html# systemctl restart apache2
root@ip-10-0-1-84:/var/www/html# chmod 400 "asg-1.pem"
root@ip-10-0-1-84:/var/www/html# ssh -i "asg-1.pem" ubuntu@10.0.5.175
The authenticity of host '10.0.5.175 (10.0.5.175)' can't be established.
ED25519 key fingerprint is SHA256:F/QyKUX+ZJxkKUdLdTICaR/A8tj/juKeVQqW4dfiZVE.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.0.5.175' (ED25519) to the list of known hosts.
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1012-aws x86_64)
```

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

Availability Zones

Choose the Availability Zones that include the subnets you want to add.



VPC identifier after your subnet group has been created.



Add subnets

Availability Zones

Choose the Availability Zones that include the subnets you want to add.



Subnets

Choose the subnets that you want to add. The list includes the subnets in the selected Availability Zones.



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

Subnets selected (2)

Availability zone	Subnet ID	CIDR block
us-east-1b	subnet-0dab6a45712cb2338	10.0.6.0/24
us-east-1a	subnet-0cf588f8fc0b6921b	10.0.5.0/24

Cancel

Create

[Dashboard](#)

[Databases](#)

[Query Editor](#)

[Performance insights](#)

[Snapshots](#)

[Exports in Amazon S3](#)

[Automated backups](#)

[Reserved instances](#)

[Proxies](#)

[EC2 > Security Groups > sg-055bd315193a365f1 - my-sg-01 > Edit inbound rules](#)

Edit inbound rules [Info](#)

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules [Info](#)

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-07894d36a962258ea	SSH	TCP	22	Custom	<input type="text" value="0.0.0.0"/> <input type="button" value="Delete"/>
sgr-0887332be9545b7b5	HTTP	TCP	80	Custom	<input type="text" value="0.0.0.0"/> <input type="button" value="Delete"/>
-	MySQL/Aurora	TCP	3306	Anywhere - I...	<input type="text" value="0.0.0.0"/> <input type="button" value="Delete"/>

[Add rule](#)

[Cancel](#) [Preview changes](#) [Save rules](#)

[RDS > Snapshots > Take snapshot](#)

Take DB Snapshot

Preferences

To take a DB Snapshot, choose a database and name your DB Snapshot.

Snapshot type

- DB instance
- DB cluster

DB instance

DB Instance identifier. This is the unique key that identifies a DB Instance.

Snapshot name

Identifier for the DB Snapshot.

Snapshot identifier is case insensitive, but stored as all lower-case, as in "mysnapshot". Cannot be null, empty, or blank. Must contain from 1 to 255 alphanumeric characters or hyphens. First character must be a letter. Cannot end with a hyphen or contain two consecutive hyphens.

[Cancel](#)

[Take snapshot](#)

[Dashboard](#)

[Databases](#)

[Query Editor](#)

[Performance insights](#)

[Snapshots](#)

[Exports in Amazon S3](#)

[Automated backups](#)

[Reserved instances](#)

[Proxies](#)

[Set groups](#)

[Meter groups](#)

[RDS > Snapshots](#)

Snapshots

[Manual](#) [System](#) [Shared with me](#) [Public](#) [Backup service](#) [Exports in Amazon S3](#)

Manual snapshots (1)

Snapshot name	DB instance or cluster	Snapshot creation time	DB Instance created time	Status
db-snapshot	database-1	August 26, 2024, 11:41 (UTC+05:30)	August 26, 2024, 11:28 (UTC+05:30)	Available

[Actions](#) [Take snapshot](#)

The screenshot shows the Amazon RDS Databases console. On the left, a sidebar lists options like Dashboard, Databases (selected), Query Editor, Performance insights, Snapshots, Exports in Amazon S3, Automated backups, Reserved instances, and Proxies. The main area is titled 'Databases (1)' and shows a table with one row. The row details a database named 'database-1' which is 'Available'. It is an 'Instance' of 'MySQL Community' located in 'us-east-1a' with a 'db.t3.micro' configuration. The table includes columns for DB identifier, Status, Role, Engine, Region & AZ, Size, Recommendations, CPU, Current activity, Maintenance, and VPC. A 'Create database' button is visible at the top right.

```
root@ip-11-0-4-163:~  
root@ip-11-0-4-163:~# sudo systemctl start mysql.service  
root@ip-11-0-4-163:~# mysql --version  
mysql Ver 8.0.39-Ubuntu0.24.04.2 for Linux on x86_64 ((Ubuntu))  
root@ip-11-0-4-163:~# mysql -h database-1.c7icccmazeq.ap-southeast-1.rds.amazonaws.com -u admin -p  
Enter password:  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 26  
Server version: 8.0.35 Source distribution  
Copyright (c) 2000, 2024, Oracle and/or its affiliates.  
Oracle is a registered trademark of Oracle Corporation and/or its  
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>
```

This is how 3-tier Architecture will create.