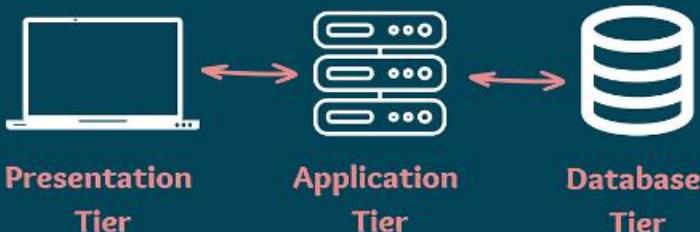


AWS 3 Tier Architecture



The Three layers present are:

Presentation tier: The presentation tier includes the user interface components, such as web pages or mobile apps, that run on the client-side. These user interfaces are typically built using HTML, CSS, JavaScript, and other web technologies.

Application tier: The application tier includes the business logic, middleware, and other services required by the application. In a cloud-based architecture, the application tier is typically deployed on virtual machines (VMs), containers, or serverless platforms provided by cloud providers. This layer can scale up or down based on the workload or demand.

Data tier: The data tier includes the data storage components that manage the application's data. In a cloud-based architecture, the data tier is typically deployed on cloud-based databases, such as Amazon Relational Database Service (RDS), Azure SQL Database, or Google Cloud SQL. These databases can scale up or down based on the amount of data and the demand for the application.

Purpose:

The purpose of this project is to deploy the web applications using 3-tier through cloud.

Why 3 tier a good option for the deployment of web application:

The three-tier architecture is a popular choice for web deployment in the cloud due to its numerous benefits, including scalability, modularity, and maintainability.

- **Scalability:** Each tier can be scaled independently, enabling the application to handle a large number of concurrent users or requests. In a cloud-based deployment, cloud providers offer scalable infrastructure and services, making it easier to scale up or down based on demand.
- **Modularity:** It provides a modular design that separates the presentation, application, and data tiers. In a cloud-based deployment, each tier can be deployed

on separate virtual machines or containers, making it easier to manage and maintain the application.

- **Maintainability:** This provides a clear separation of concerns between the presentation, application, and data tiers. This separation makes it easier to identify and fix issues within each tier. In a cloud-based deployment, cloud providers offer tools and services for monitoring and managing the application, making it easier to maintain and troubleshoot issues.
- **Security:** It provides a separation of concerns between the presentation, application, and data tiers, making it easier to implement security measures at each tier. In a cloud-based deployment, cloud providers offer robust security features, such as network security, identity and access management, and encryption, making it easier to secure the application and its data.

Why cloud?

- We don't need to maintain large physical servers instead we can make use of servers like ec2 which are virtual in nature.

The benefits of using cloud for deployment of web applications:

1. **Cost effective:** This means pay as you go which means we pay for what we use.
2. **Reliability:** Cloud service providers often offer high levels of redundancy and reliability.
3. **Accessibility:** With cloud computing, you can access and manage your web page from anywhere in the world, as long as you have an internet connection.
4. Overall, cloud computing provides a flexible, scalable, and cost-effective option for deploying web pages, making it an ideal choice for businesses and individuals alike.

TOOLS USED:

Programming used:

Frontend:

HTML(Hyper Text markup Language):

1. This is used to create web pages and other information that can be displayed in a web browser.
2. It uses a series of tags and attributes to define the structure and content of a web page.
3. In our project we used it for creation of loginpage.

CSS(Cascading Style Sheets):

1. It is a styling language used to add style, layout, and visual effects to web pages created with HTML.
2. CSS also allows for the creation of more complex visual effects, such as animations, transitions, and gradients.
3. In our project we have used to show how html elements are displayed, simply describing presentation of a document written in a markup language such as html etc.

Backend:

PHP(Hypertext pre-processor):

1. PHP is a server-side scripting language that is used primarily for web development.
2. It is an open-source language and is widely used for building dynamic websites and web applications.
3. In our project we used it for providing response to the user by connecting with backend database.

MySQL:

1. MySQL is a popular open-source relational database management system (RDBMS) that is widely used for web-based applications.
2. MySQL is a client-server system, meaning that it uses a client program to communicate with a server that manages the database.
3. We have used mysql for storing user data in database.

Technologies used:

- We have used the Aws cloud and some of its services which are mentioned below.
- **AWS EC2:** Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable computing capacity—literally, servers in Amazon's data centres that you use to build and host your software systems.
- **AWS VPC:** Amazon Virtual Private Cloud (Amazon VPC) enables you to provision a logically isolated section of the AWS Cloud where you can launch AWS resources in a virtual network that you've defined.
- **AWS RDS:** Amazon Relational Database Service (Amazon RDS) is a web service that makes it easier to set up, operate, and scale a relational database in the cloud. It provides cost-efficient, re-sizeable capacity for an industry-standard relational database and manages common database administration tasks.
- **AUTO SCALING:** Auto Scaling is a service that automatically adjusts the number of instances in a group to match the demand of the application. It allows you to automatically increase or decrease the number of EC2 instances in a group based on the changing needs of your application.
- Auto Scaling works by monitoring the metrics of your application, such as CPU usage, network traffic, and request latency, and then making decisions to add or remove instances based on the defined policies. For example, you might set a policy to add instances when CPU usage is above 80%, and to remove instances when CPU usage is below 30%.
- **LOAD-BALANCER:** Elastic load balancer (ELB) is a managed service that automatically distributes incoming traffic across multiple targets such as EC2 instances, containers, and IP addresses. This helps to ensure that your applications can handle varying levels of traffic and remain available even if individual instances or components fail.
- Using an Elastic Load Balancer can also provide improved availability, scalability and fault tolerance. It can help to reduce costs by allowing to dynamically add or remove instances based on demand.

Step1:Creation of VPC with CIDR (10.0.0.0/16)

Screenshot of the AWS VPC dashboard showing a single VPC entry:

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DH
-	vpc-03b57040e0ba4d9ea	Available	172.31.0.0/16	-	dop

Create VPC

A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances.

VPC settings

- Resources to create**: VPC only VPC and more
- Name tag - optional**: project-vpc
- IPv4 CIDR block**: IPv4 CIDR manual input IPAM-allocated IPv4 CIDR block
- IPv4 CIDR**: 10.0.0.0/16
- IPv6 CIDR block**: No IPv6 CIDR block IPAM-allocated IPv6 CIDR block

Tenancy: Default

Tags: 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
Name	project-vpc

Create VPC

Your VPCs (2) Info						
Actions Create VPC						
<input type="text"/> Filter VPCs						
Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DH	
-	vpc-03b57040e0ba4d9ea	Available	172.31.0.0/16	-	dop	Actions
project-vpc	vpc-0ce68e9e2ef1f7e78	Available	10.0.0.0/16	-	dop	Actions

Select a VPC above

Step 2: Creation of subnets

- Create 2 public and 2 private subnets

Create subnet Info	
VPC <p>VPC ID Create subnets in this VPC.</p> <p>vpc-0ce68e9e2ef1f7e78 (project-vpc)</p> <p>Associated VPC CIDRs</p> <p>IPv4 CIDRs 10.0.0.0/16</p>	
Subnet settings <p>Specify the CIDR blocks and Availability Zone for the subnet.</p> <p>Subnet 1 of 2</p> <p>Subnet name Create a tag with a key of 'Name' and a value that you specify.</p> <p>project-pub-sub</p> <p>The name can be up to 256 characters long.</p> <p>Availability Zone Info Choose the zone in which your subnet will reside, or let Amazon choose one for you.</p> <p>US East (N. Virginia) / us-east-1a</p> <p>IPv4 CIDR block Info 10.0.1.0/24</p>	

VPC Management Console

Subnet 2 of 3

Subnet name: project-pri-sub-1

Availability Zone: US East (N. Virginia) / us-east-1a

IPv4 CIDR block: 10.0.2.0/24

Tags - optional:

Key: Name	Value: project-pri-sub-1
-----------	--------------------------

Add new tag

Remove

Subnet 3 of 3

Subnet name: project-pri-sub-2

Availability Zone: US East (N. Virginia) / us-east-1b

IPv4 CIDR block: 10.0.3.0/24

Tags - optional:

Key: Name	Value: project-pri-sub-2
-----------	--------------------------

Add new tag

Remove

Create subnet

VPC Management Console

Subnet 3 of 3

Subnet name: project-pri-sub-2

Availability Zone: US East (N. Virginia) / us-east-1b

IPv4 CIDR block: 10.0.3.0/24

Tags - optional:

Key: Name	Value: project-pri-sub-2
-----------	--------------------------

Add new tag

Remove

Add new subnet

Cancel Create subnet

The screenshot shows the AWS VPC Management Console with the URL <https://us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#subnets>. The main pane displays a table of subnets with the following data:

Name	Subnet ID	VPC	IPv4 CIDR	IPv6 CIDR	Available IPv4 addresses
project-pri-sub-1	subnet-0516f5e3120627927	vpc-0ce58e9e2ef1f7e78	10.0.2.0/24	-	251
project-pri-sub-2	subnet-088fc7acb025c4d7	vpc-0ce58e9e2ef1f7e78	10.0.3.0/24	-	251
project-pub-sub	subnet-0a64f613c64a72980	vpc-0ce58e9e2ef1f7e78	10.0.1.0/24	-	251

The sidebar on the left includes sections for 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 (Network ACLs, Security groups), and DNS firewall.

Step3:Creation of IGW(Internet Gateway)

- Create a IGW for public subnet and attach to VPC .

The screenshot shows the AWS Internet Gateways Management Console with the URL <https://us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#igws>. The main pane displays a table of internet gateways with the following data:

Name	Internet gateway ID	State	VPC ID	Owner
-	igw-000b54975408d9b47	Attached	vpc-03b57040e0ba4d9ea	533651173383

The sidebar on the left includes sections for Virtual private cloud (Your VPCs, Subnets, Route tables, Internet gateways), Security (Network ACLs, Security groups), and DNS firewall.

Create internet gateway | VPC Management Console

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#CreateInternetGateway:

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aws Services Search [Alt+S]

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 Remove
Add new tag
You can add 49 more tags.

Cancel **Create Internet gateway**

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VPC Management Console

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#InternetGateway:internetGatewayId=igw-0eaa4ac31845793f0

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The following internet gateway was created: igw-0eaa4ac31845793f0 - my-project-igw. You can now attach to a VPC to enable the VPC to communicate with the internet. [Attach to a VPC](#)

VPC > Internet gateways > igw-0eaa4ac31845793f0

igw-0eaa4ac31845793f0 / my-project-igw

Actions

Details [Info](#)

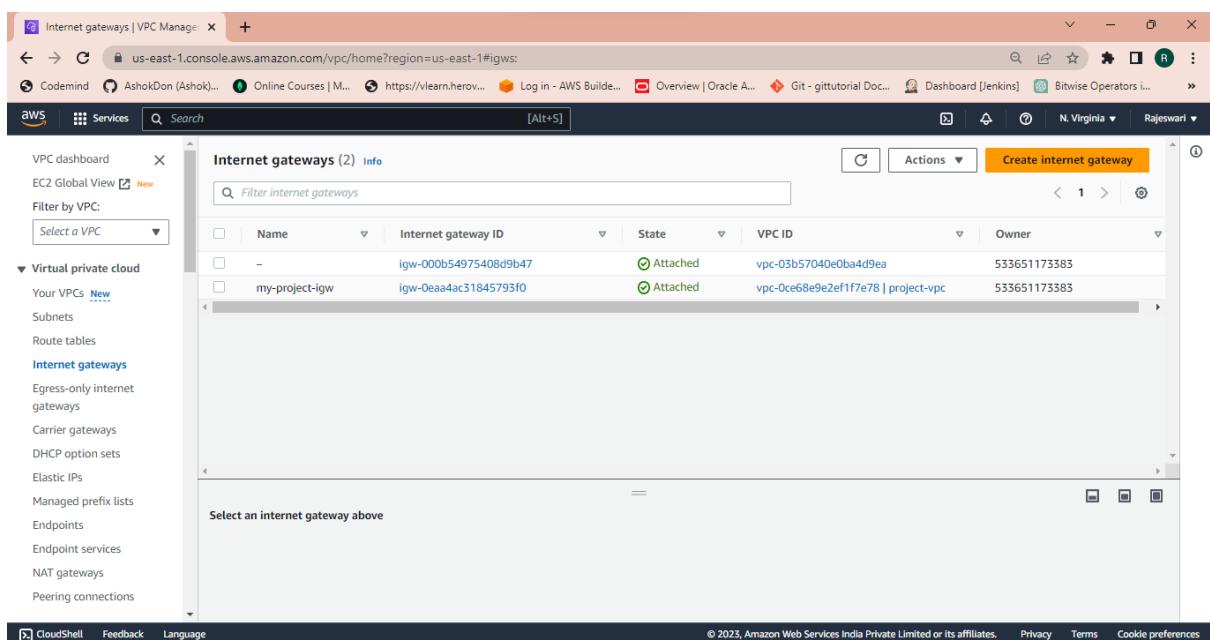
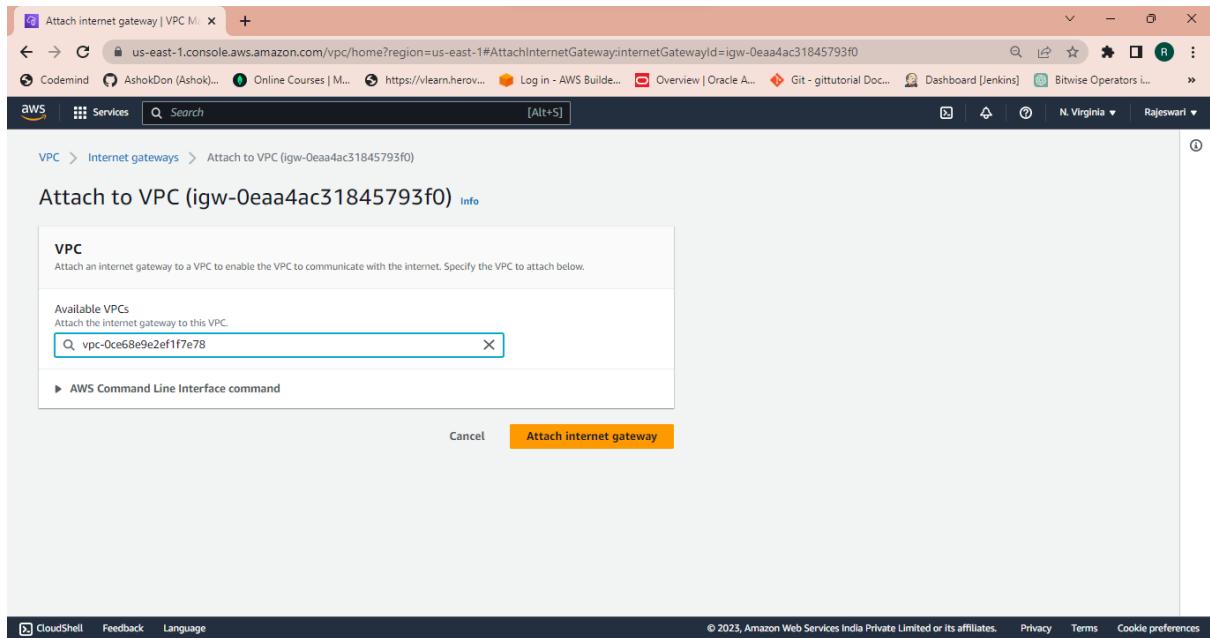
Internet gateway ID igw-0eaa4ac31845793f0	State Detached	VPC ID -	Owner 533651173383
---	--------------------------	-------------	-----------------------

Tags

Key	Value
Name	my-project-igw

Manage tags

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Step4: Creation of NAT (Network Address Translation)

- It should be created for private subnet by creation should be done in public subnet by allocating elastic IP for internet access for NAT.

NAT gateways | VPC Management

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#NatGateways:

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Your VPCs New 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 Network ACLs Security groups

DNS firewall Rule groups

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No NAT gateways

Create NAT gateway

NAT gateways info

Filter NAT gateways

Name NAT gateway ID Connectivit... State State message Primary public IP Primary private IP

Select a NAT gateway

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VPC Management Console us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#CreateNatGateway:

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Elastic IP address 52.206.41.72 (eipalloc-0a2603f9835e48758) allocated.

VPC > NAT gateways > Create NAT gateway

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.

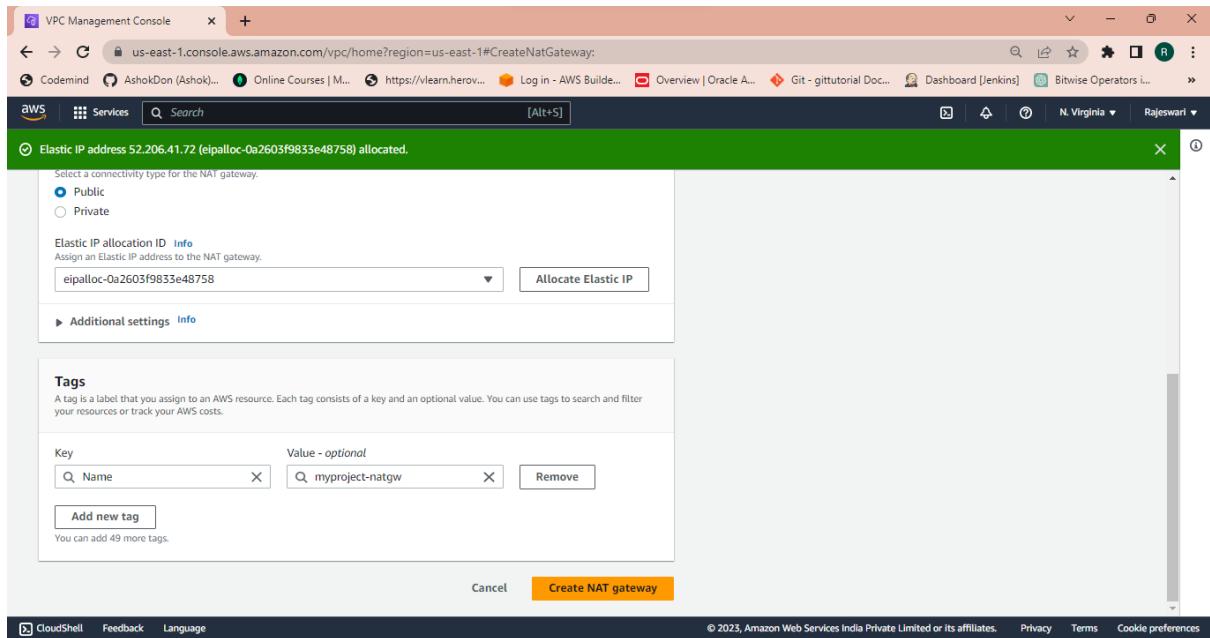
Subnet
Select a subnet in which to create the NAT gateway.

Connectivity type
Select a connectivity type for the NAT gateway.
 Public
 Private

Elastic IP allocation ID - Info

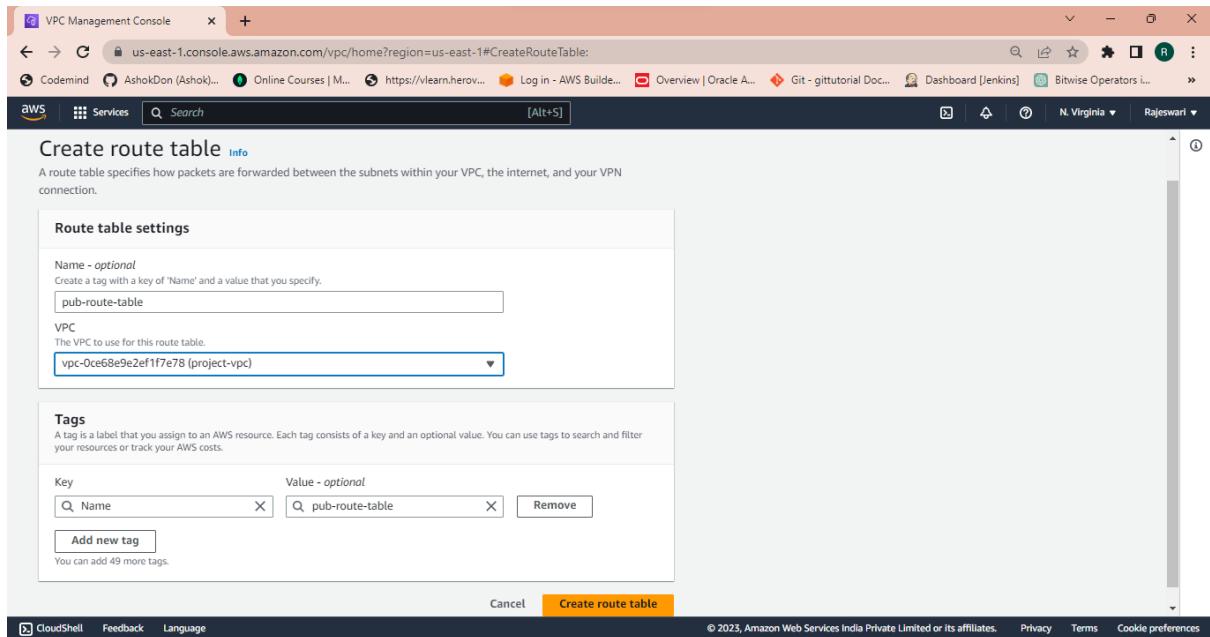
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Step5: Creation of Route tables

- We need to create 2 route tables one for public and another for private subnets.



VPC Management Console + [Alt+S]

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#CreateRouteTable:

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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.
<input type="text" value="private-route-table"/>	
VPC	The VPC to use for this route table.
<input type="text" value="vpc-0ce68e9e2ef1f7e78 (project-vpc)"/>	
Tags	
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"/> X	<input type="text" value="private-route-table"/> X
Remove	
Add new tag	
You can add 49 more tags.	
Cancel Create route table	

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Route tables | VPC Management + [Alt+S]

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#RouteTables:

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Route tables (4) Info							
<input type="text" value="Filter route tables"/>							
	Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC	Options
<input type="checkbox"/>	-	rtb-01aace1af1577ad32	-	-	Yes	vpc-03b57040e0ba4d9ea	53
<input type="checkbox"/>	-	rtb-0258772f972f0d2bc	-	-	Yes	vpc-0ce68e9e2ef1f7e78 proj...	53
<input type="checkbox"/>	private-route-table	rtb-0daa4d0aadbf2b63d	-	-	No	vpc-0ce68e9e2ef1f7e78 proj...	53
<input type="checkbox"/>	pub-route-table	rtb-0c9af46c676a00708	-	-	No	vpc-0ce68e9e2ef1f7e78 proj...	53

Select a route table

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Route tables (1/4) Info

Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC
-	rtb-01aac1af1577ad32	-	-	Yes	vpc-03b57040e0ba4d9ea
-	rtb-0258772f972f0d2bc	-	-	Yes	vpc-0ce68e9e2ef1f7e78 proj...
private-route-table	rtb-0daa4d0aad8f2b63d	-	-	No	vpc-0ce68e9e2ef1f7e78 proj...
pub-route-table	rtb-0c9af46c676a00708	-	-	No	vpc-0ce68e9e2ef1f7e78 proj...

rtb-0c9af46c676a00708 / pub-route-table

Subnet associations

No subnet associations

You have successfully updated subnet associations for rtb-0c9af46c676a00708 / pub-route-table.

Route tables (1/4) Info

Name	Route table ID	Explicit subnet associat...	Edge associations	Main	VPC
-	rtb-01aac1af1577ad32	-	-	Yes	vpc-03b57040e0ba4d9ea
-	rtb-0258772f972f0d2bc	-	-	Yes	vpc-0ce68e9e2ef1f7e78 proj...
private-route-table	rtb-0daa4d0aad8f2b63d	-	-	No	vpc-0ce68e9e2ef1f7e78 proj...
pub-route-table	rtb-0c9af46c676a00708	subnet-0a64f613c64a7...	-	No	vpc-0ce68e9e2ef1f7e78 proj...

rtb-0daa4d0aad8f2b63d / private-route-table

Subnet associations

Explicit subnet associations (0)

Step6: Editing subnet associations

- Click on the public route table and edit subnet associations add public subnets and then same for the private route table but instead add private subnets.

Screenshot of the AWS VPC Management Console showing the "Edit subnet associations" dialog for route table `rtb-0daa4d0aad8f2b63d`. The "Selected subnets" section contains two subnets: `subnet-088fcfd7acb025c4d7 / project-pri-sub-2` and `subnet-0516f5e3120627927 / project-pri-sub-1`. The "Save associations" button is highlighted.

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
<input type="checkbox"/> project-pub-sub	subnet-0a64f613c64a72980	10.0.1.0/24	-	rtb-0c9af46c676a00708 / pub-route-table
<input checked="" type="checkbox"/> project-pri-sub-2	subnet-088fcfd7acb025c4d7	10.0.3.0/24	-	Main (rtb-0258772f972f0d2bc)
<input checked="" type="checkbox"/> project-pri-sub-1	subnet-0516f5e3120627927	10.0.2.0/24	-	Main (rtb-0258772f972f0d2bc)

Screenshot of the AWS VPC Management Console showing the "Route tables" page. A success message indicates subnet associations have been updated for route table `rtb-0daa4d0aad8f2b63d / private-route-table`. The "Routes" tab is selected for route table `rtb-0c9af46c676a00708 / pub-route-table`, showing one route entry.

Step7: Edit routes for both public and private route tables.

- In the public route table add a route i.e IGW as shown below.
- In the private route table add a route i.e NAT as shown below.

VPC Management Console

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#EditRoutes:RouteTableId=rtb-0c9af46c676a00708

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aws Services Search [Alt+S]

VPC > Route tables > rtb-0c9af46c676a00708 > Edit routes

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/16	Q local	Active	No
Q 0.0.0.0/0	Q igw-0eaa4ac31845793f0	-	No

Add route

Cancel Preview Save changes

VPC Management Console

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#RouteTableDetails:RouteTableId=rtb-0c9af46c676a00708

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Updated routes for rtb-0c9af46c676a00708 / pub-route-table successfully

Details

VPC > Route tables > rtb-0c9af46c676a00708

rtb-0c9af46c676a00708 / pub-route-table

You can now check network connectivity with Reachability Analyzer

Run Reachability Analyzer

Actions

Details	Info
Route table ID rtb-0c9af46c676a00708	Main No
VPC vpc-0ce68e9e2ef1f7e78 project-vpc	Owner ID 533651173383
	Explicit subnet associations subnet-0a64f13c64a72980 / project-pub-sub
	Edge associations -

Details Subnet associations Edge associations Route propagation Tags

Routes (2)

Filter routes Both < 1 > @

Edit routes

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Route tables | VPC Management

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#RouteTables:

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VPC dashboard EC2 Global View New

Filter by VPC: Select a VPC

Virtual private cloud Your VPCs New 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

Route tables (1/4) Info

Filter route tables

Name Route table ID Explicit subnet associations Edge associations Main VPC

Name	Route table ID	Explicit subnet associations	Edge associations	Main	VPC
-	rtb-01aac1af1577ad32	-	-	Yes	vpc-03b57040e0ba4d9ea
-	rtb-0258772f972f0d2bc	-	-	Yes	vpc-0ce68e9e2ef1f7e78 proj...
private-route-table	rtb-0daa4d0aad8f2b63d	2 subnets	-	No	vpc-0ce68e9e2ef1f7e78 proj...
pub-route-table	rtb-0c9af46c676a00708	subnet-0a64f613c64a7...	-	No	vpc-0ce68e9e2ef1f7e78 proj...

Create route table

rtb-0daa4d0aad8f2b63d / private-route-table

Details Routes Subnet associations Edge associations Route propagation Tags

Routes (1)

Edit routes

Filter routes Both

Destination	Target	Status	Propagated
10.0.0.16	local	Active	No

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VPC Management Console

us-east-1.console.aws.amazon.com/vpc/home?region=us-east-1#EditRoutes:RouteTableId=rtb-0daa4d0aad8f2b63d

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VPC > Route tables > rtb-0daa4d0aad8f2b63d > Edit routes

Edit routes

Destination	Target	Status	Propagated
10.0.0.16	local	Active	No
0.0.0.0	nat-0f18e3373c41e552b	-	No

Add route

Cancel Preview Save changes

CloudShell Feedback Language

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Route tables (1/4) Info

Name	Route table ID	Explicit subnet associations	Edge associations	Main	VPC	Owner
-	rtb-01aac1af1577ad32	-	-	Yes	vpc-03b57040e0ba4d9ea	53
-	rtb-025877f972f0d2bc	-	-	Yes	vpc-0ce68e9e2ef1f7e78 proj...	53
<input checked="" type="checkbox"/> private-route-table	rtb-0daa4d0aad8f2b63d	2 subnets	-	No	vpc-0ce68e9e2ef1f7e78 proj...	53
-	pub-route-table	subnet-0a64f613c64a7...	-	No	vpc-0ce68e9e2ef1f7e78 proj...	53

rtb-0daa4d0aad8f2b63d / private-route-table

Details

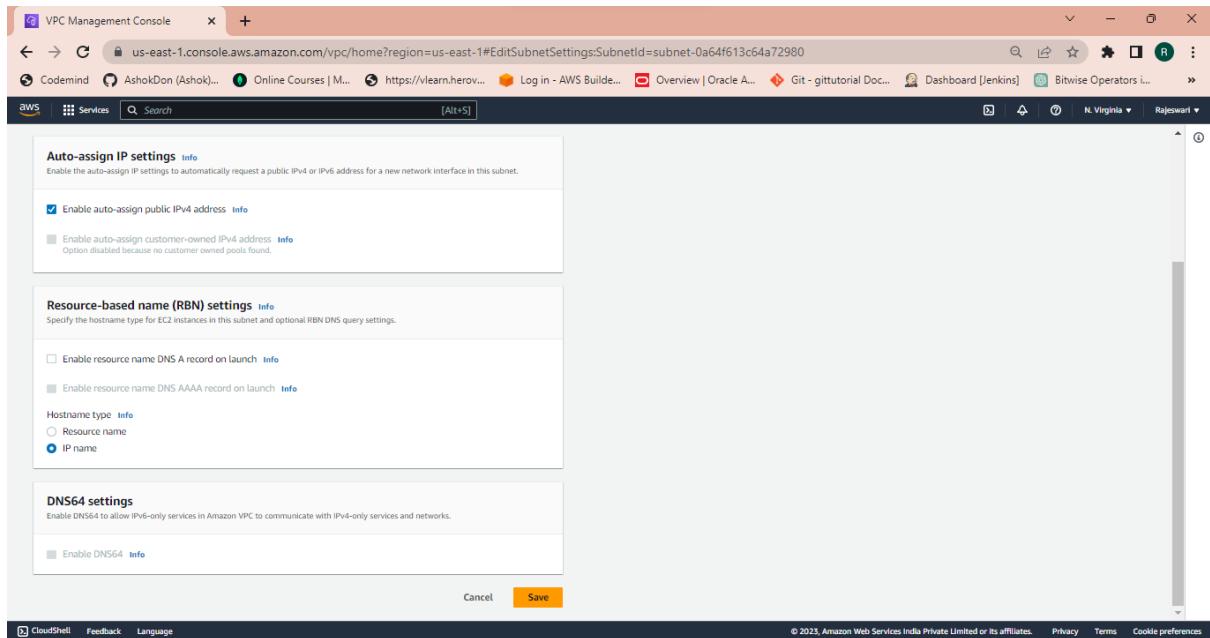
You can now check network connectivity with Reachability Analyzer Run Reachability Analyzer

Subnets (1/9) Info

Name	Subnet ID	State	VPC	IP range	Action
-	subnet-07e7a401bb00d9	Available	vpc-03b57040e0ba4d9ea	17	View details
-	subnet-052bc16cb5fb5b69	Available	vpc-03b57040e0ba4d9ea	17	Create flow log
-	subnet-0941ba884ebcc67b	Available	vpc-03b57040e0ba4d9ea	17	Edit subnet settings
-	subnet-0ed80de716402ec4a	Available	vpc-03b57040e0ba4d9ea	17	Edit IPv6 CIDRs
-	subnet-01eb08a832b2d14ad	Available	vpc-03b57040e0ba4d9ea	17	Edit network ACL association
-	subnet-04a2a8564835a8d74	Available	vpc-03b57040e0ba4d9ea	17	Edit route table association
-	project-pri-sub-1	Available	vpc-0ce68e9e2ef1f7e78 proj...	10	Edit CIDR reservations
-	project-pri-sub-2	Available	vpc-0ce68e9e2ef1f7e78 proj...	10.0.3.0/24	Share subnet
<input checked="" type="checkbox"/> project-pub-sub	subnet-0a64f613c64a72980	Available	vpc-0ce68e9e2ef1f7e78 proj...	10.0.1.0/24	Manage tags

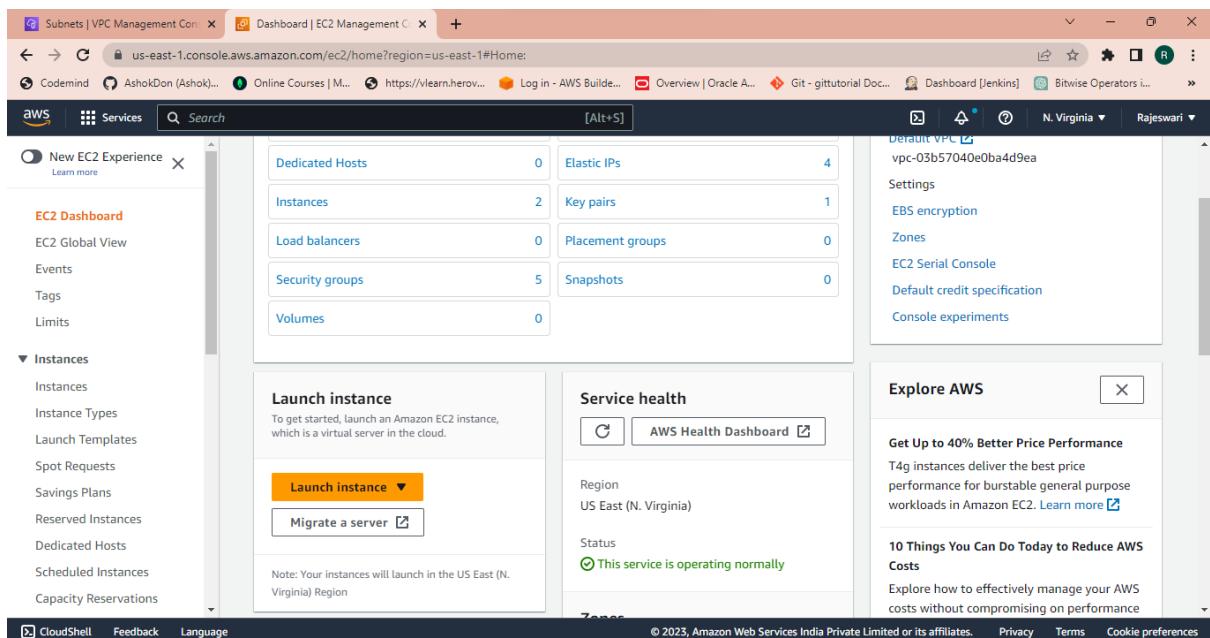
Step8: Enabling auto-assign IP address

Since it is a public subnet we will be requiring the public ip address hence we need to enable it as shown below.



Step10: Creation of Instances

- Create 2 instances(public and private)
- Select AMI-Ubuntu
- Create security group with SSH and all traffic and assign everywhere for public instance.
- Create security group with SSH from only source i.e public server security group because private server can be accessed only through the public server and mysql traffic from only the database security group which we will be creating in the further steps because we need to access data from database.



Screenshots illustrating the AWS EC2 instance launch process.

The first screenshot shows the initial configuration step:

- Name and tags**: A single instance named "project-instance".
- Software Image (AMI)**: Amazon Linux 2 Kernel 5.10 AMI.
- Virtual server type (instance type)**: t2.micro.
- Firewall (security group)**: New security group.
- Storage (volumes)**: 1 volume(s) - 8 GB.

The second screenshot shows the "Application and OS Images (Amazon Machine Image)" step, where the Canonical, Ubuntu, 22.04 LTS AMI is selected:

- Recent OS Images**: Includes Amazon Linux, macOS, Ubuntu, Windows, and Red Hat.
- Quick Start**: Shows the selected Canonical, Ubuntu, 22.04 LTS AMI.
- Description**: Canonical, Ubuntu, 22.04 LTS, amd64, image build on 2023-03-25.

Both screenshots include a "Launch instance" button at the bottom right.

The third screenshot shows the continuation of the instance launch process, specifically the "Summary" step:

- Number of instances**: 1.
- Software Image (AMI)**: Canonical, Ubuntu, 22.04 LTS, ...read more.
- Virtual server type (instance type)**: t2.micro.
- Firewall (security group)**: New security group.
- Storage (volumes)**: 1 volume(s) - 8 GB.

The fourth screenshot shows the final "Summary" step before launching the instance:

- Number of instances**: 1.
- Software Image (AMI)**: Canonical, Ubuntu, 22.04 LTS, ...read more.
- Virtual server type (instance type)**: t2.micro.
- Firewall (security group)**: New security group.
- Storage (volumes)**: 1 volume(s) - 8 GB.

The "Launch instance" button is prominently displayed at the bottom right of both summary screens.

The screenshot shows the AWS EC2 'Launch instance' wizard. The top navigation bar includes tabs for Subnets, VPC Management, and Launch an instance. The main page displays the following configuration steps:

- Instance type**: t2.micro selected. Details: Family: t2, 1 vCPU, 1 GiB Memory. Pricing: On-Demand Windows pricing: 0.0162 USD per Hour, On-Demand SUSE pricing: 0.0116 USD per Hour, On-Demand RHEL pricing: 0.0716 USD per Hour, On-Demand Linux pricing: 0.0116 USD per Hour. Status: Free tier eligible. Generation: All generations.
- Key pair (login)**: jenkins selected. Option to Create new key pair.
- Network settings**: Edit button available.
- Summary**: Number of instances: 1. Software Image (AMI): Canonical, Ubuntu, 22.04 LTS. Virtual server type (instance type): t2.micro. Firewall (security group): New security group. Storage (volumes): 1 volume(s) - 8 GiB.
- Launch commands**: Buttons for Cancel, Launch instance (highlighted in orange), and Review commands.

The screenshot shows the AWS EC2 Launch Instances wizard. The left sidebar has 'Subnets | VPC Management Con...' as the active tab. The main content area is titled 'Launch an instance | EC2 Manager'.

Network settings

- VPC - required**: A dropdown menu is open, showing 'vpc-0ce68e9e2ef1f7e8 (project-vpc)' and its CIDR range '10.0.0.0/16'. To the right is a 'Create new subnet' button.
- Subnet Info**: Shows 'subnet-0a4f613c64a72980' and its details: 'project-pub-sub', 'Owner: 533651173383', 'Availability Zone: us-east-1a', and 'IP addresses available: 250 / CIDR: 10.0.1.0/24'.
- Auto-assign public IP**: A dropdown menu is open, showing 'Enable'.
- Firewall (security groups)**: A note says '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.' Below are two buttons: 'Create security group' (selected) and 'Select existing security group'.
- Security group name - required**: An input field contains 'launch-wizard-4'.
- Note**: 'This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and _-/.@#&=&[]\$*.'

Summary

- Number of instances**: A dropdown menu is open, showing '1'.
- Software Image (AMI)**: 'Canonical, Ubuntu, 22.04 LTS, ...' with a 'read more' link and ID 'ami-007855ac79b5175e'.
- Virtual server type (instance type)**: 't2.micro'.
- Firewall (security group)**: 'New security group'.
- Storage (volumes)**: '1 volume(s) - 8 GiB'.

Buttons

- Cancel
- Launch instance (highlighted in orange)
- Review commands

Screenshots of the AWS EC2 Management Console showing the configuration of security group rules and instance launch parameters.

Security Group Rules:

- Security group rule 1 (TCP, 22, 0.0.0.0/0):** Type: ssh, Protocol: TCP, Port range: 22. Source type: Anywhere. Description: e.g. SSH for admin desktop.
- Security group rule 2 (All, All, 0.0.0.0/0):** Type: All traffic, Protocol: All, Port range: All. Source type: Anywhere. Description: e.g. SSH for admin desktop.

Summary:

- Number of instances: 1
- Software Image (AMI): Canonical, Ubuntu, 22.04 LTS, ami-007855ac798b5175e
- Virtual server type (instance type): t2.micro
- Firewall (security group): New security group
- Storage (volumes): 1 volume(s) - 8 GiB

Launch Instance Buttons:

- Cancel
- Launch instance (highlighted)
- Review commands

Screenshots of the AWS EC2 Management Console showing the configuration of storage volumes and instance launch parameters.

Configure Storage:

- Root volume (Not encrypted): 1x 8 GiB gp2
- Add new volume
- The selected AMI contains more instance store volumes than the instance allows. Only the first 0 instance store volumes from the AMI will be accessible from the instance.
- 0 x File systems

Summary:

- Number of instances: 1
- Software Image (AMI): Canonical, Ubuntu, 22.04 LTS, ami-007855ac798b5175e
- Virtual server type (instance type): t2.micro
- Firewall (security group): New security group
- Storage (volumes): 1 volume(s) - 8 GiB

Launch Instance Buttons:

- Cancel
- Launch instance (highlighted)
- Review commands

Screenshots showing the AWS EC2 Management Console interface.

The top screenshot displays the Instances (3) Info page. The table shows three instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability
project-instance	i-0550a3879ce28ff5f	Running	t2.micro	Initializing	No alarms	us-east-1a
my-ins-1st	i-01772bcadae39a970	Terminated	t2.micro	-	No alarms	us-east-1a
my-ins-2nd	i-08e2b117ea763fe29	Terminated	t2.micro	-	No alarms	us-east-1a

A modal window titled "Select an instance" is open, listing the same three instances.

The bottom screenshot shows the Instances (1/3) Info page for the selected instance "project-instance".

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability
project-instance	i-0550a3879ce28ff5f	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a
my-ins-1st	i-01772bcadae39a970	Terminated	t2.micro	-	No alarms	us-east-1a
my-ins-2nd	i-08e2b117ea763fe29	Terminated	t2.micro	-	No alarms	us-east-1a

The "Security" tab is selected in the details view, showing the security group "sg-0271b071a1d83b78d (launch-wizard-4)" has been copied.

Screenshots illustrating the AWS EC2 Management Console interface for launching a new instance.

The first screenshot shows the "Launch an instance" wizard. The "Name and tags" step has a name of "project-instance-2". The "Application and OS Images (Amazon Machine Image)" step shows a search bar and a list of recent AMIs. The summary panel on the right shows 1 instance, using the Amazon Linux 2023 AMI, t2.micro instance type, and a new security group. A yellow "Launch instance" button is prominent.

The second screenshot shows the "Launch an instance" wizard with the "Quick Start" tab selected. It displays a grid of recent AMIs (Amazon Linux, macOS, Ubuntu, Windows, Red Hat) and a search bar. The summary panel on the right shows 1 instance, using the Canonical, Ubuntu, 22.04 LTS AMI, t2.micro instance type, and a new security group. A yellow "Launch instance" button is present.

Screenshots of the AWS EC2 Management Console showing the launch instance process.

The first screenshot shows the "Instance type" section where a t2.micro instance is selected. It includes details like 1 vCPU, 1 GiB Memory, and On-Demand Windows pricing. A "Compare instance types" link is also present.

The second screenshot shows the "Network settings" section. Under "VPC - required", the project-vpc is selected. Under "Subnet", the project-pri-sub-1 subnet is selected. Under "Auto-assign public IP", "Disable" is chosen. Under "Firewall (security groups)", the "Create security group" option is selected. A security group name "launch-wizard-5" is entered in the "Security group name - required" field.

The third screenshot shows the "Summary" section of the launch wizard. It displays the following configuration:

- Number of instances:** 1
- Software Image (AMI):** Canonical, Ubuntu, 22.04 LTS, ami-007855ac798b5175e
- Virtual server type (instance type):** t2.micro
- Firewall (security group):** New security group
- Storage (volumes):** 1 volume(s) - 8 GiB

The "Launch instance" button is prominently displayed at the bottom right of the summary panel.

VPC Management Console EC2 Management Console

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

Codemind AshokDon (Ashok)... Online Courses | M... https://vlearn.herokuapp.com/ Log in - AWS Build... Overview | Oracle A... Git - gittutorial Doc... Dashboard [Jenkins] Bitwise Operators i...

aws Services Search [Alt+S]

Inbound security groups rules

Security group rule 1 (TCP, 22, sg-070cd8ff4ba590c46)

Type Info: ssh, Protocol Info: TCP, Port range Info: 22

Source type Info: Custom, Source Info: Add CIDR, prefix list or security, Description - optional Info: e.g. SSH for admin desktop, sg-070cd8ff4ba590c46 X

Remove

Security group rule 2 (TCP, 80, 0.0.0.0/0)

Type Info: HTTP, Protocol Info: TCP, Port range Info: 80

Source type Info: Anywhere, Source Info: Add CIDR, prefix list or security, Description - optional Info: e.g. SSH for admin desktop, 0.0.0.0/0 X

Remove

Security group rule 3 (TCP, 3306, 0.0.0.0/0)

Type Info: MySQL/Aurora, Protocol Info: TCP, Port range Info: 3306

Source type Info: Custom, Source Info: Add CIDR, prefix list or security, Description - optional Info: e.g. SSH for admin desktop, 0.0.0.0/0 X

Remove

Summary

Number of instances Info: 1

Software Image (AMI): Canonical, Ubuntu, 22.04 LTS, ...read more ami-007855ac798b5175e

Virtual server type (instance type): t2.micro

Firewall (security group): New security group

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

Free tier: In your first year includes 750 X

Cancel Launch instance Review commands

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VPC Management Console EC2 Management Console

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:

Codemind AshokDon (Ashok)... Online Courses | M... https://vlearn.herokuapp.com/ Log in - AWS Build... Overview | Oracle A... Git - gittutorial Doc... Dashboard [Jenkins] Bitwise Operators i...

aws Services Search [Alt+S]

Inbound security groups rules

Security group rule 1 (TCP, 22, sg-0271b071a1d83b78d)

Type Info: ssh, Protocol Info: TCP, Port range Info: 22

Source type Info: Custom, Source Info: Add CIDR, prefix list or security, Description - optional Info: e.g. SSH for admin desktop, sg-0271b071a1d83b78d X

Remove

Security group rule 2 (TCP, 3306, 0.0.0.0/0)

Type Info: MySQL/Aurora, Protocol Info: TCP, Port range Info: 3306

Source type Info: Custom, Source Info: Add CIDR, prefix list or security, Description - optional Info: e.g. SSH for admin desktop, 0.0.0.0/0 X

Remove

Summary

Number of instances Info: 1

Software Image (AMI): Canonical, Ubuntu, 22.04 LTS, ...read more ami-007855ac798b5175e

Virtual server type (instance type): t2.micro

Firewall (security group): New security group

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

Cancel Launch instance Review commands

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Configure storage

- Root volume (Not encrypted): 1x 8 GiB gp2
- Add new volume
- The selected AMI contains more instance store volumes than the instance allows. Only the first 0 instance store volumes from the AMI will be accessible from the instance.
- 0 x File systems

Advanced details

Summary

- Number of instances: 1
- Software Image (AMI): Canonical, Ubuntu, 22.04 LTS, ami-007855ac798b5175e
- Virtual server type (instance type): t2.micro
- Firewall (security group): New security group
- Storage (volumes): 1 volume(s) - 8 GiB

Launch instance

Instances (4)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability zone
project-instance-2	i-0a7ce75ef88a8d127	Running	t2.micro	Initializing	No alarms	us-east-1a
project-instance	i-0550a3879ce28ff5f	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a
my-ins-2nd	i-08e2b117ea763fe29	Terminated	t2.micro	-	No alarms	us-east-1a
my-ins-1st	i-01772bcadae39a970	Terminated	t2.micro	-	No alarms	us-east-1a

Select an instance

Inbound rules

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-037d30506305da2c5	SSH	TCP	22	Custom	sg-070cd8ff4ba590c46
sgr-0e9d770cf1e32db0d	HTTP	TCP	80	Custom	0.0.0.0/0
sgr-0a0277ff02643d53b	MySQL/Aurora	TCP	3306	Custom	0.0.0.0/0

Edit inbound rules

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

Add rule

Save rules

Step11: Creation of RDS

- Create the database with below steps mentioned.

Amazon RDS

Dashboard

Databases
Query Editor
Performance insights
Snapshots
Exports in Amazon S3
Automated backups
Reserved instances
Proxies

Subnet groups
Parameter groups
Option groups
Custom engine versions

Create database

Or, Restore Multi-AZ DB Cluster from Snapshot

Resources

You are using the following Amazon RDS resources in the US East (N. Virginia) region (used/quota)

DB Instances (0/40)	Parameter groups (1)
Allocated storage (0 TB/100 TB)	Default (1) Custom (0/100)
Increase DB instances limit	
DB Clusters (0/40)	Option groups (1)
Reserved instances (0/40)	Default (1) Custom (0/20)
Snapshots (4)	Subnet groups (1/50)
Manual	

Recommended for you

Time-Series Tables in PostgreSQL
Step-by-step guide to design high-performance time series data tables on Amazon RDS for PostgreSQL. [Learn more](#)

Amazon RDS Backup and Restore using AWS Backup
Learn how to backup and restore Amazon RDS databases using AWS Backup in just 10 minutes. [Learn more](#)

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RDS > Create database

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](#)

Aurora (MySQL Compatible)

Aurora (PostgreSQL Compatible)

MySQL

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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.

Availability and durability

Deployment options [Info](#)

The deployment options below are limited to those supported by the engine you selected above.

Multi-AZ DB Cluster - new
Creates a DB cluster with a primary DB instance and two readable standby DB instances, with each DB instance in a different Availability Zone (AZ). Provides high availability, data redundancy and increases capacity to serve read workloads.

Multi-AZ DB instance (not supported for Multi-AZ DB cluster snapshot)
Creates a primary DB instance and a standby DB instance in a different AZ. Provides high availability and data redundancy, but the standby DB instance doesn't support connections for read workloads.

Single DB instance (not supported for Multi-AZ DB cluster snapshot)

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Credentials Settings

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

1 to 16 alphanumeric characters. First character must be a letter.

Manage master credentials in AWS Secrets Manager
Manage master user credentials in Secrets Manager. RDS can generate a password for you and manage it throughout its lifecycle.

If you manage the master user credentials in Secrets Manager, some RDS features aren't supported.
[Learn more](#)

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

Master password [Info](#)

Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), '(single quote), "(double quote) and @ (at sign).

Confirm master password [Info](#)

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Storage

Storage type [Info](#)

Baseline performance determined by volume size

Allocated storage [Info](#)
 GiB
The minimum value is 20 GiB and the maximum value is 6,144 GiB

Storage autoscaling [Info](#)
Provides dynamic scaling support for your database's storage based on your application's needs.

Enable storage autoscaling
Enabling this feature will allow the storage to increase after the specified threshold is exceeded.

Connectivity [Info](#)

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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.

Network type [Info](#)
To use dual-stack mode, make sure that you associate an IPv6 CIDR block with a subnet in the VPC you specify.

IPv4
Your resources can communicate only over the IPv4 addressing protocol.

Dual-stack mode
Your resources can communicate over IPv4, IPv6, or both.

Virtual private cloud (VPC) [Info](#)
Choose the VPC. The VPC defines the virtual networking environment for this DB instance.

Only VPCs with a corresponding DB subnet group are listed.

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

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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.

[Create new DB Subnet Group](#)

Public access [Info](#)
 Yes
 RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.
 No
 RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

VPC security group (firewall) [Info](#)
 Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

Choose existing
 Choose existing VPC security groups

Create new
 Create new VPC security group

New VPC security group name

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VPC security group (firewall) [Info](#)
 Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

Choose existing
 Choose existing VPC security groups

Create new
 Create new VPC security group

New VPC security group name

Availability Zone [Info](#)

RDS Proxy
 RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and security.

[Create an RDS Proxy](#) [Info](#)
 RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see [Amazon RDS Proxy pricing](#).

Certificate authority - optional [Info](#)
 Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.

If you don't select a certificate authority, RDS chooses one for you.

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Amazon RDS

[Dashboard](#)

Databases

[Query Editor](#)

[Performance insights](#)

[Snapshots](#)

[Exports in Amazon S3](#)

[Automated backups](#)

[Reserved instances](#)

[Proxies](#)

[Subnet groups](#)

[Parameter groups](#)

[Option groups](#)

[Custom engine versions](#)

RDS > Databases

Consider creating a Blue/Green Deployment to minimize downtime during upgrades
 You may want to consider using Amazon RDS Blue/Green Deployments and minimize your downtime during upgrades. A Blue/Green Deployment provides a staging environment for changes to production databases. [RDS User Guide](#) [Aurora User Guide](#)

Databases					
<input checked="" type="radio"/> Group resources		<input type="button" value="C"/>	<input type="button" value="Modify"/>	<input type="button" value="Actions ▾"/>	<input type="button" value="Restore from S3"/>
<input type="text" value="Filter by databases"/>					
<input type="checkbox"/> DB identifier ▾ Role ▾ Engine ▾ Region & AZ ▾ Size ▾ Stat ▾					
<input checked="" type="radio"/> database-1 Instance MySQL Community us-east-1a db.t3.micro					

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Step12: Editing inbound rules

- Now we need to give particular database security group in the route of private security group.

Screenshot of the AWS EC2 Inbound Rules page.

Owner: 533651173383

Inbound rules count: 2 Permission entries

Outbound rules count: 1 Permission entry

Inbound rules (2)

Name	Security group rule...	IP version	Type	Protocol
-	sgr-0984fdcd1c0755a9e	-	SSH	TCP
-	sgr-0f428e75c3eca8572	IPv4	MYSQL/Aurora	TCP

Run Reachability Analyzer

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Inbound security group rules successfully modified on security group (sg-0db5902e56650f866 | launch-wizard-5)

Details

EC2 > Security Groups > sg-0db5902e56650f866 - launch-wizard-5

sg-0db5902e56650f866 - launch-wizard-5

Actions

Details

Security group name: launch-wizard-5	Security group ID: sg-0db5902e56650f866	Description: launch-wizard-5 created 2023-04-05T13:24:34.797Z	VPC ID: vpc-0ce68e9e2ef1f7e78
Owner: 533651173383	Inbound rules count: 2 Permission entries	Outbound rules count: 1 Permission entry	

Inbound rules | Outbound rules | Tags

You can now check network connectivity with Reachability Analyzer

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EC2 > Security Groups > sg-09ac2d2fb754b13ca - project-security-group > 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 <small>Info</small>	Protocol <small>Info</small>	Port range <small>Info</small>	Source <small>Info</small>	Description - optional <small>Info</small>
sgr-0a767d49f0f39f52c	MYSQL/Aurora	TCP	3306	Anywhere	0.0.0.0/0 <small>X</small>

Add rule

Cancel Preview changes Save rules

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The screenshot shows the AWS EC2 Instances page. The left sidebar includes options like EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations, and Images. The main content area displays two instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
project-instance	i-0550a3879ce28ff5f	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	-
project-instance-2	i-0a7ce75ef88a8d127	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	-

Details for the first instance (i-0550a3879ce28ff5f) are expanded, showing it was created on Wed Apr 05 2023 18:47:07 GMT+0530 (India Standard Time). It is associated with security group sg-0271b071a1d83b78d (launch-wizard-4) and has two inbound rules:

Name	Security group rule ID	Port range	Protocol	Source	Security groups
-	sgr-0b98af82ebf3509c9	All	All	0.0.0.0/0	launch-wizard-4
-	sgr-03d48d95c4c5d71c5	22	TCP	0.0.0.0/0	launch-wizard-4

Step13: Connect to the public server.

Follow below commands

- sudo apt update
- sudo apt install apache2
- sudo apt install php libapache2-mod-php-mysql
- sudo systemctl restart apache2
- sudo systemctl status apache2

```

See https://ubuntu.com/esm or run: sudo pro status

*** System restart required ***
Last login: Thu Apr  6 12:56:27 2023 from 18.206.107.29
ubuntu@ip-10-0-1-215:~$ sudo apt update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [990 kB]
Fetched 1327 kB in 1s (1406 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
4 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-10-0-1-215:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.52-1ubuntu4.4).
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
ubuntu@ip-10-0-1-215:~$ 
```

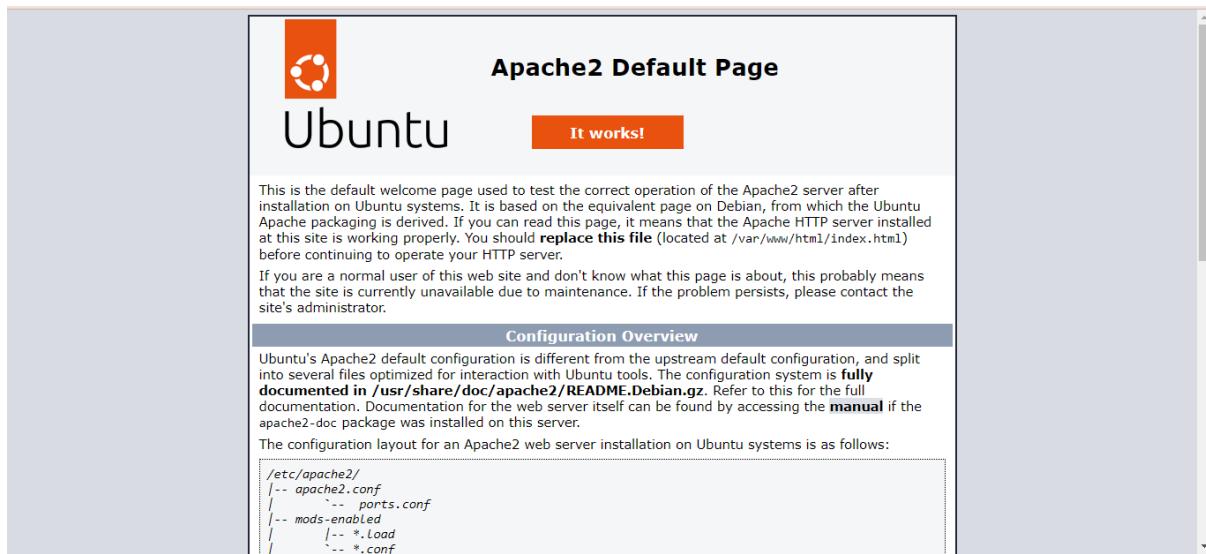
i-0c0b40966927c2518 (project-instance)
Public IPs: 18.234.49.252 Private IPs: 10.0.1.215

```

Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [990 kB]
Fetched 1327 kB in 1s (1406 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
4 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-10-0-1-215:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.52-1ubuntu4.4).
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
ubuntu@ip-10-0-1-215:~$ sudo apt install php libapache2-mod-php php-mysql
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
libapache2-mod-php is already the newest version (2:8.1+92ubuntu1).
php is already the newest version (2:8.1+92ubuntu1).
php-mysql is already the newest version (2:8.1+92ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
ubuntu@ip-10-0-1-215:~$ 
```

i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215

By copying the public IP of the instance we get the default ubuntu page



```

https://ubuntu.com/aws/pro
* Introducing Expanded Security Maintenance for Applications.
  Receive updates to over 25,000 software packages with your
  Ubuntu Pro subscription. Free for personal use.

https://ubuntu.com/aws/pro
Expanded Security Maintenance for Applications is not enabled.

3 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

*** System restart required ***
Last login: Thu Apr  6 13:57:41 2023 from 18.206.107.28
ubuntu@ip-10-0-1-215:~$ sudo nano /etc/apache2/mods-enabled/dir.conf
ubuntu@ip-10-0-1-215:~$ 
```

i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215

```

ubuntu@ip-10-0-1-215:~$ sudo nano /etc/apache2/mods-enabled/dir.conf
ubuntu@ip-10-0-1-215:~$ sudo systemctl restart apache2
ubuntu@ip-10-0-1-215:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
    Loaded: loaded ('/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
      Active: active (running) since Thu 2023-04-06 14:58:45 UTC; 16s ago
        Docs: https://httpd.apache.org/docs/2.4/
       Process: 23000 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
      Main PID: 23004 (apache2)
         Tasks: 6 (limit: 1141)
        Memory: 10.7M
          CPU: 45ms
        CGroup: /system.slice/apache2.service
                └─23004 /usr/sbin/apache2 -k start
                  ├─23005 /usr/sbin/apache2 -k start
                  ├─23006 /usr/sbin/apache2 -k start
                  ├─23007 /usr/sbin/apache2 -k start
                  ├─23008 /usr/sbin/apache2 -k start
                  └─23009 /usr/sbin/apache2 -k start

Apr 06 14:58:45 ip-10-0-1-215 systemd[1]: apache2.service: Deactivated successfully.
Apr 06 14:58:45 ip-10-0-1-215 systemd[1]: Stopped The Apache HTTP Server.

i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215

```

- cd /var/www/html
- sudo nano index.html
- now we can create a html file

```

lines 1-22
[1]+  Stopped                  sudo systemctl status apache2
ubuntu@ip-10-0-1-215:~$ cd /var/www/html
ubuntu@ip-10-0-1-215:/var/www/html$ ls
authenticate.php  index.html
ubuntu@ip-10-0-1-215:/var/www/html$ cat index.html
<!DOCTYPE html>
<html>
<head>
<title>Login Page</title>
</head>
<body>
<h1>Login Page</h1>
<form action="authenticate.php" method="post">
<label for="username">Username:</label>
<input type="text" id="username" name="username"><br><br>
<label for="password">Password:</label>
<input type="password" id="password" name="password"><br><br>
<input type="submit" value="Submit">
</form>
</body>
</html>
ubuntu@ip-10-0-1-215:/var/www/html$ 

```

i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215

Now we need to create a PHP file , PHP is a server-side scripting language that is used primarily for web development

PHP CODE:

```

<?php
// Retrieve user input
$username = $_POST['username'];
$password = $_POST['password'];

// Connect to RDS
$servername = "database-1.cxycc96jpe13k.ap-southeast-1.rds.amazonaws.com";
$db_username = "admin";
$db_password = "password";
$dbname = "mydb";
$conn = new mysqli($servername, $db_username, $db_password, $dbname);

// Check connection
if ($conn->connect_error) {

```

```

die("Connection failed: " . $conn->connect_error);
}

// Prepare SQL statement
$stmt = $conn->prepare("SELECT * FROM users WHERE username=? AND password=?");
$stmt->bind_param("ss", $username, $password);
$stmt->execute();
$result = $stmt->get_result();
// Check if user exists
if ($result->num_rows > 0) {
    echo "Welcome " . $username . "!";
} else {
    echo "Invalid username or password.";
}

// Close connection
$stmt->close();
$conn->close();
?>

```

This screenshot shows the AWS Lambda function code editor. The code is identical to the one above, up to the closing brace of the if-else block. The browser tab title is 'aws' and the URL is 'Services'. The status bar at the bottom shows 'i-0c0b40966927c2518 (project-instance)' and 'Public IPs: 18.234.49.252 Private IPs: 10.0.1.215'.

This screenshot shows the AWS Lambda function code editor with the full PHP script pasted. The code includes the connection setup, preparation of the SQL statement, execution, result retrieval, and user existence check. The browser tab title is 'aws' and the URL is 'Services'. The status bar at the bottom shows 'i-0c0b40966927c2518 (project-instance)' and 'Public IPs: 18.234.49.252 Private IPs: 10.0.1.215'.

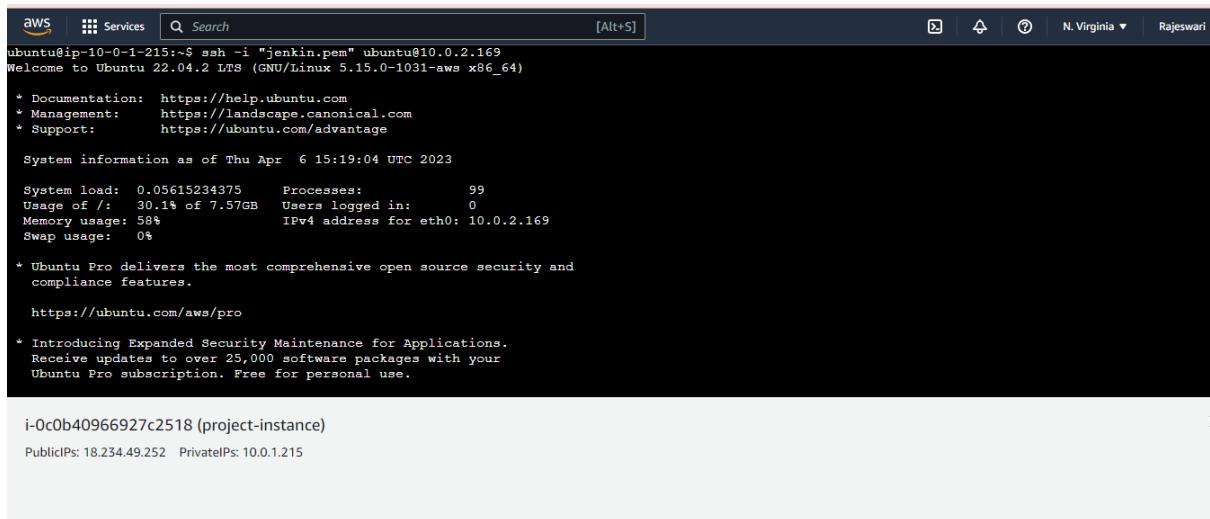
Now we will connect to the private server using its keypair

Commands used:

- chmod 400 jenkin.pem
- ssh -i "jenkin.pem" ubuntu@10.0.2.169

The screenshot shows the AWS CloudShell interface. At the top, it displays the AWS logo, services menu, search bar, and user information (N. Virginia, Rajeswari). Below the header, there is a command-line area with the following text:
A long string of characters representing the SSH session key.
-- INSERT --
i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215
At the bottom of the command-line area, there are links for CloudShell, Feedback, Language, and a copyright notice: © 2023, Amazon Web Services India Private Limited or its affiliates. Privacy Terms Cookie preferences.

The screenshot shows the AWS CloudShell interface. At the top, it displays the AWS logo, services menu, search bar, and user information (N. Virginia, Rajeswari). Below the header, there is a command-line area with the following text:
* Introducing Expanded Security Maintenance for Applications.
Receive updates to over 25,000 software packages with your
Ubuntu Pro subscription. Free for personal use.
<https://ubuntu.com/aws/pro>
Expanded Security Maintenance for Applications is not enabled.
3 updates can be applied immediately.
To see these additional updates run: apt list --upgradable
Enable ESM Apps to receive additional future security updates.
See <https://ubuntu.com/esm> or run: sudo pro status
*** System restart required ***
Last login: Thu Apr 6 14:56:12 2023 from 18.206.107.28
ubuntu@ip-10-0-1-215:~\$ ls
jenkin.pem
ubuntu@ip-10-0-1-215:~\$ chmod 400 jenkin.pem
ubuntu@ip-10-0-1-215:~\$
i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215
At the bottom of the command-line area, there are links for CloudShell, Feedback, Language, and a copyright notice: © 2023, Amazon Web Services India Private Limited or its affiliates. Privacy Terms Cookie preferences.



```

ubuntu@ip-10-0-1-215:~$ ssh -i "jenkin.pem" ubuntu@10.0.2.169
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.15.0-1031-aws x86_64)

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

System information as of Thu Apr  6 15:19:04 UTC 2023

System load: 0.05615234375   Processes:      99
Usage of /: 30.1% of 7.57GB  Users logged in:     0
Memory usage: 58%           IPv4 address for eth0: 10.0.2.169
Swap usage:  0%

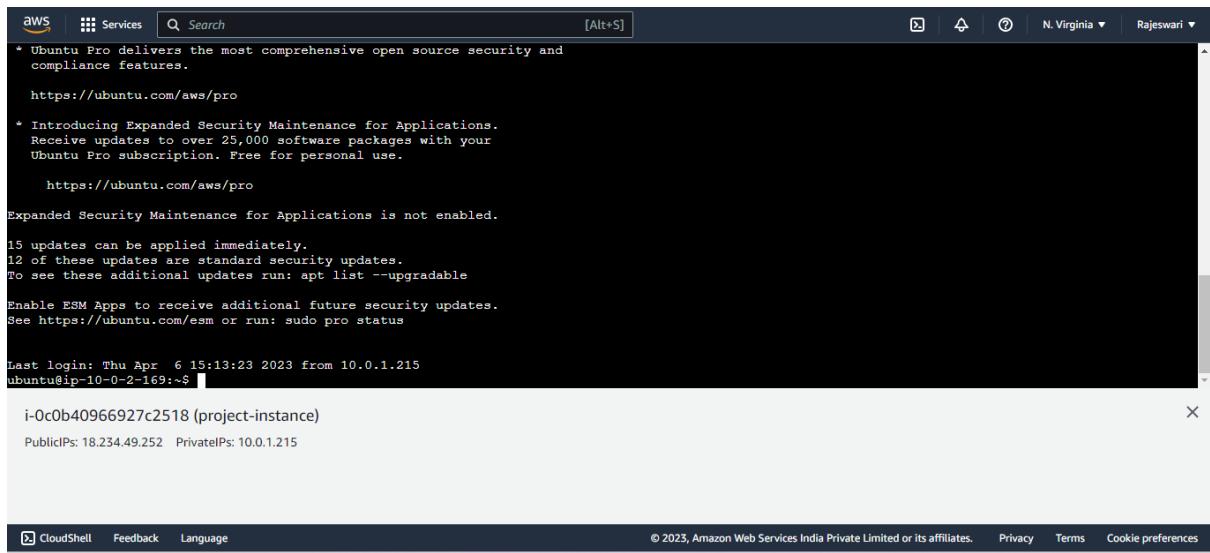
* Ubuntu Pro delivers the most comprehensive open source security and
  compliance features.

  https://ubuntu.com/aws/pro

* Introducing Expanded Security Maintenance for Applications.
  Receive updates to over 25,000 software packages with your
  Ubuntu Pro subscription. Free for personal use.

i-0c0b40966927c2518 (project-instance)
Public IPs: 18.234.49.252  Private IPs: 10.0.1.215

```

```

ubuntu@ip-10-0-2-169:~$ 
* Ubuntu Pro delivers the most comprehensive open source security and
  compliance features.

  https://ubuntu.com/aws/pro

* Introducing Expanded Security Maintenance for Applications.
  Receive updates to over 25,000 software packages with your
  Ubuntu Pro subscription. Free for personal use.

  https://ubuntu.com/aws/pro

Expanded Security Maintenance for Applications is not enabled.

15 updates can be applied immediately.
12 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Thu Apr  6 15:13:23 2023 from 10.0.1.215
ubuntu@ip-10-0-2-169:~$ 

```

i-0c0b40966927c2518 (project-instance) X

Public IPs: 18.234.49.252 Private IPs: 10.0.1.215

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- Now we need to install the mysql server because we will be accessing the database from the private server
- sudo apt install mysql-server
- sudo systemctl start mysql
- sudo systemctl status mysql
- Now connect to the database by using this command-> mysql -h database-1.cxy96jpe13k.ap-southeast-1.rds.amazonaws.com -P 3306 -u admin -p

```
aws Services Search [Alt+S] N. Virginia ▾ Rajeswari ▾
Receive updates to over 25,000 software packages with your Ubuntu Pro subscription. Free for personal use.
https://ubuntu.com/aws/pro
Expanded Security Maintenance for Applications is not enabled.
15 updates can be applied immediately.
12 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Thu Apr  6 15:13:23 2023 from 10.0.1.215
ubuntu@ip-10-0-2-169:~$ sudo apt install mysql-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
mysql-server is already the newest version (8.0.32-0ubuntu0.22.04.2).
0 upgraded, 0 newly installed, 0 to remove and 12 not upgraded.
ubuntu@ip-10-0-2-169:~$
```

i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215

```
aws Services Search [Alt+S] N. Virginia ▾ Rajeswari ▾
ubuntu@ip-10-0-1-215:~$ sudo apt install mysql-server
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
mysql-server is already the newest version (8.0.32-0ubuntu0.22.04.2).
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
ubuntu@ip-10-0-1-215:~$ sudo systemctl start mysql
ubuntu@ip-10-0-1-215:~$ sudo systemctl status mysql
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2023-04-06 05:52:49 UTC; 9h ago
       Process: 12049 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
      Main PID: 12057 (mysqld)
        Status: "Server is operational"
          Tasks: 38 (limit: 1141)
         Memory: 352.5M
            CPU: 2min 9.070s
           CGroup: /system.slice/mysql.service
                   └─12057 /usr/sbin/mysqld

Apr 06 05:52:49 ip-10-0-1-215 systemd[1]: Starting MySQL Community Server...
Apr 06 05:52:49 ip-10-0-1-215 systemd[1]: Started MySQL Community Server.
ubuntu@ip-10-0-1-215:~$
```

i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215

Now we can create databases and tables with the below commands

- Create database mydb;
- Use mydb;
- Create table users(username VARCHAR(50) NOT NULL,password VARCHAR(50) NOT NULL);
- Insert into users(username,password)VALUES('himma','1234');
- Select * from users;

AWS Services Search [Alt+S] N. Virginia ▾ Rajeswari ▾

```

Tasks: 38 (limit: 1141)
Memory: 352.5M
CPU: 2min 9.070s
CGroup: /system.slice/mysql.service
└─12057 /usr/sbin/mysql

Apr 06 05:52:49 ip-10-0-1-215 systemd[1]: Starting MySQL Community Server...
Apr 06 05:52:49 ip-10-0-1-215 systemd[1]: Started MySQL Community Server.
ubuntu@ip-10-0-1-215:~$ mysql -h database-3.cyrfwf5vjaq.us-east-1.rds.amazonaws.com -P 3306 -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 129
Server version: 8.0.32 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> CREATE DATABASE mydb;

```

i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215

AWS Services Search [Alt+S] N. Virginia ▾ Rajeswari ▾

```

ERROR 1007 (HY000): Can't create database 'mydb'; database exists
mysql> INSERT INTO users (username, password) VALUES ('himma', '1234');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO users (username, password) VALUES ('rambo', 'rambo123');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO users (username, password) VALUES ('priyanka', 'pri123');
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM users;
+-----+-----+
| username | password |
+-----+-----+
| john     | password123 |
| raji     | 2002        |
| himma   | 1234        |
| rambo    | rambo123   |
| priyanka | pri123     |
+-----+-----+
5 rows in set (0.00 sec)

mysql> []

```

i-0c0b40966927c2518 (project-instance)
PublicIPs: 18.234.49.252 PrivateIPs: 10.0.1.215

AWS Services Search [Alt+S] N. Virginia ▾ Rajeshwari ▾

EC2 S3 VPC RDS

New EC2 Experience Tell us what you think

Instances (1/4) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm state
publicserver	i-064ca3ad1af472047	Running	t2.micro	2/2 checks passed	No alarm
publicserver	i-06a5f75ac7c91a57c	Terminated	t2.micro	-	No alarm
privateserver	i-098b0d12e9b513cbe	Running	t2.micro	2/2 checks passed	No alarm
demojenkins	i-058be452e9c925538	Stopped	t2.micro	-	-

Instance: i-064ca3ad1af472047 (publicserver)

Details	Security	Networking	Storage	Status checks	Monitoring	Tags
Instance ID i-064ca3ad1af472047 (publicserver)	Public IPv4 address 54.162.237.134 open address	Private IPv4 DNS name (IPv4 only) ip-10-0-1-133.ec2.internal	Private IP address 10.0.1.133			
IPv6 address -	Instance state Running	Instance type t2.micro	Public IPv4 DNS -			
Hostname type IP name: ip-10-0-1-133.ec2.internal	Answer private resource DNS name -	Elastic IP addresses -				
Answer private resource DNS name -						

Actions ▲ Launch instances ▼

- Connect
- View details
- Manage instance state
- Instance settings
- Networking
- Security
- Image and templates
- Monitor and troubleshoot

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Create image Info

An image (also referred to as an AMI) defines the programs and settings that are applied when you launch an EC2 instance. You can create an image from the configuration of an existing instance.

Instance ID
i-064ca3ad1af472047 (publicserver)

Image name
webami

Maximum 127 characters. Can't be modified after creation.

Image description - optional
Image description

Maximum 255 characters

No reboot
 Enable

Instance volumes

Storage type	Device	Snapshot	Size	Volume type	IOPS	Throughput	Delete on termination	Encrypted
--------------	--------	----------	------	-------------	------	------------	-----------------------	-----------

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
aslt

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

Template version description
A prod webserver for MyApp

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

Learn more about tags

① **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, 30 GB of EBS storage, 2 million I/Os, 1 GB of snapshots, and

Summary

Software Image (AMI)
webami
ami-0215ded778ff93a19

Virtual server type (instance type)
-

Firewall (security group)
-

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

Create launch template

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

Recent | My AMIs | Quick Start

Don't include in launch template Owned by me

Shared with me

Amazon Machine Image (AMI)

webami
ami-0215ded778ff93a19
2023-04-08T05:41:02.000Z Virtualization: hvm ENA enabled: true Root device type: ebs

Description

-

Architecture AMI ID

x86_64 ami-0215ded778ff93a19

① **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, 30 GB of EBS storage, 2 million I/Os, 1 GB of snapshots, and

Summary

Software Image (AMI)
webami
ami-0215ded778ff93a19

Virtual server type (instance type)
-

Firewall (security group)
-

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

Create launch template

Screenshot of the AWS EC2 instance creation wizard Step 1: Set instance details.

Instance type: t2.micro (Free tier eligible)

Key pair (login): kp

Summary:

- Software Image (AMI): webami (ami-0215ded778ff93a19)
- Virtual server type (instance type): t2.micro
- Firewall (security group): -
- 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, 30 GiB of EBS storage, 2 million I/Os, 1 GiB of snapshots, and

Create launch template

Screenshot of the AWS EC2 instance creation wizard Step 2: Set network and storage.

Network settings:

- Subnet: Don't include in launch template
- Firewall (security groups): Select existing security group (publicsgforweb)
- Security groups: publicsgforweb sg-08aec7bfaba5d9731

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, 30 GiB of EBS storage, 2 million I/Os, 1 GiB of snapshots, and

Create launch template

Screenshot of the AWS Auto Scaling group creation wizard Step 1: Choose launch template or configuration.

Step 1: Choose launch template or configuration

Name: Auto Scaling group name (asgforweb)

Launch template: asgt

Step 2: Choose instance launch options

Step 3 - optional: Configure advanced options

Step 4 - optional: Configure group size and scaling policies

Step 5 - optional: Add notifications

Step 6 - optional: Add tags

Step 7: Review

Screenshot of the AWS EC2 Auto Scaling Step 3: Choose instance launch options. The 'Network' tab is selected, showing the configuration for the VPC and subnets. A dropdown menu shows 'vpc-0617f89a24a7bf1b (3tiervpc)'. Below it, two subnets are listed: 'us-east-1b | subnet-07468bdd411c1a4b4 (webpublicsubnet2)' and 'us-east-1a | subnet-09f55a6be8ef5e25 (webpublicsubnet1)'. Both have a CIDR range of '10.0.0.0/24'.

Screenshot of the AWS EC2 Auto Scaling Step 4: Configure group size and scaling policies. The 'Group size - optional' section is shown, where the 'Desired capacity' is set to '1'. The 'Scaling policies - optional' section shows that no scaling policy is currently assigned.

Screenshot of the AWS EC2 Auto Scaling Step 7: Review. A green success message at the top says 'asgforweb created successfully'. Below it, the 'Auto Scaling groups (1/1)' table shows one group named 'asgforweb' with a status of 'Updating capacity'. The 'Edit' button is highlighted. At the bottom, the 'Group details' table shows the group name 'asgforweb', desired capacity '1', and status 'Updating capacity'. The ARN is listed as 'arn:aws:autoscaling:us-east-1:115554673506:autoScalingGroup:11adda9-de2c-423f-bb4d-f2'.

AWS Services Search [Alt+S]

New EC2 Experience Tell us what you think X

EC2 S3 VPC RDS

Instances (1/5) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
publicserver	i-064ca5a1af472047	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	-
privateserver	i-098b0d12e9b513cbe	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	-
-	i-0bbe13ce705c27852	Running	t2.micro	Initializing	No alarms	us-east-1a	-
publicserver	i-06a5f75ac7c91a37c	Terminated	t2.micro	-	No alarms	us-east-1a	-

Instance: i-0bbe13ce705c27852

Details Security Networking Storage Status checks Monitoring Tags

Instance summary Instance ID: i-0bbe13ce705c27852 Public IPv4 address copied: 18.208.229.2 | open address

IPv6 address: - Private IP4 addresses: 10.0.1.147

Hostname type: Running Public IP4 DNS: ip-10-0-1-147.ec2.internal

IP name: ip-10-0-1-147.ec2.internal Answer private resource DNS name: -

Instance type: t2.micro Elastic IP addresses: -

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AWS Services Search [Alt+S]

EC2 S3 VPC RDS

Specify group details

Step 2 Register targets

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

Basic configuration

Settings in this section cannot be changed after the target group is created.

Choose a target type

- Instances
 - Supports load balancing to instances within a specific VPC.
 - Facilitates the use of Amazon EC2 Auto Scaling to manage and scale your EC2 capacity.
- IP addresses
 - Supports load balancing to VPC and on-premises resources.
 - Facilitates routing to multiple IP addresses and network interfaces on the same instance.
 - Offers flexibility with microservice based architectures, simplifying inter-application communication.
 - Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.
- Lambda function
 - Facilitates routing to a single Lambda function.
 - Accessible to Application Load Balancers only.
- Application Load Balancer
 - Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.

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AWS Services Search [Alt+S]

EC2 S3 VPC RDS

Application Load Balancer

- Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.
- Facilitates using static IP addresses and PrivateLink with an Application Load Balancer.

Target group name: tgforweb

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

Protocol: Port

HTTP : 80

VPC

Select the VPC with the instances that you want to include in the target group.

3tiervc
vpc-0617189a24a7bf1b
IPv4: 10.0.0.0/16

Protocol version

- HTTP1
 - Send requests to targets using HTTP/1.1. Supported when the request protocol is HTTP/1.1 or HTTP/2.
- HTTP2
 - Send requests to targets using HTTP/2. Supported when the request protocol is HTTP/2 or gRPC, but gRPC-specific features are not available.
- gRPC
 - Send requests to targets using gRPC. Supported when the request protocol is gRPC.

Health checks

The associated load balancer periodically sends requests, per the settings below, to the registered targets to test their status.

Health check protocol: **HTTP**

Health check path: **/**

Advanced health check settings

Attributes

Certain default attributes will be applied to your target group. You can view and edit them after creating the target group.

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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 (2/3)

Instance ID	Name	State	Security groups	Zone	Subnet ID
<input checked="" type="checkbox"/> i-064ca3ad1af472047	publicserver	running	publicsgforweb	us-east-1a	subnet-09f5a6be8ebf3e25
<input type="checkbox"/> i-098b0d12e9b513cbe	privateserver	running	privatesgforapp	us-east-1a	subnet-000665f60752a0413
<input checked="" type="checkbox"/> i-0bbe13ce705c27852		running	publicsgforweb	us-east-1a	subnet-09f5a6be8ebf3e25

2 selected

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

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Review targets

Targets (2)

Remove	Health status	Instance ID	Name	Port	State	Security groups	Zone	Subnet ID
X	Pending	i-0bbe13ce705c27852		80	running	publicsgforweb	us-east-1a	subnet-09f5a6be8ebf3e25
X	Pending	i-064ca3ad1af472047	publicserver	80	running	publicsgforweb	us-east-1a	subnet-09f5a6be8ebf3e25

2 pending

Cancel Create target group

Screenshot of the AWS EC2 Target Groups page.

The left sidebar shows navigation categories: Capacity Reservations, Images, AMIs, AMI Catalog, Elastic Block Store, Network & Security, Security Groups, Elastic IPs, Placement Groups, Key Pairs, Network Interfaces, Load Balancing, Load Balancers, Target Groups (highlighted), Auto Scaling, Launch Configurations, Auto Scaling Groups.

The main content area shows a table titled "Target groups (1) Info".

Name	ARN	Port	Protocol	Target type	Load balancer
tgforweb	arn:aws:elasticloadbalancing:us-east-1:123456789012:targetgroup/tgforweb/54321	80	HTTP	Instance	None associated

Below the table, a message says "0 target groups selected" and "Select a target group above."

Screenshot of the AWS Elastic Load Balancing configuration page.

The title is "How Elastic Load balancing works".

Basic configuration

Load balancer name: loadbalanceforweb (highlighted)

Scheme: Internet-facing (selected)

IP address type: IPv4 (selected)

Mappings:

- VPC: 3tiervpc (selected)
- Subnet: subnet-09f55a6be8bf3e25 (selected)
- IPv4 settings: Assigned by AWS

Screenshot of the AWS VPC configuration page.

The title is "VPC Info".

Select the virtual private cloud (VPC) for your targets. Only VPCs with an internet gateway are enabled for selection. The selected VPC cannot be changed after the load balancer is created. To confirm the VPC for your targets, view your target groups.

3tiervpc
vpc-0e617789a24a7bf1b
IPv4: 10.0.0.0/16

Mappings:

- us-east-1a (use1-az6): Subnet: subnet-09f55a6be8bf3e25 (selected)
- us-east-1b (use1-az1): Subnet: subnet-07468bd4d11c1a4b4 (selected)

Screenshot of the AWS VPC configuration page for a subnet in us-east-1b.

Subnet: subnet-07468bdd411c1a4b4 **VPC:** webpublicsubnet2

IPv4 settings:

Assigned by AWS

Security groups Info

A security group is a set of firewall rules that control the traffic to your load balancer.

Security groups

Select up to 5 security groups

Create new security group [+]

publicsgforweb sg-08aec7bfaba5d9731 X
VPC: vpc-0e617f89a24a7bf1b

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Screenshot of the AWS Load Balancers configuration page.

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	Port	Default action
HTTP	: 80 1-65535	Forward to tgforweb Target type: Instance, IPv4 HTTP <small>[+]</small>

Listener tags - optional

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

Add listener tag

You can add up to 50 more tags.

Add listener

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Screenshot of the AWS EC2 Load Balancers page.

Load balancers (1)

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

Name	DNS name	State	VPC ID	Availability Zones	Type	Date c
loadbalancerforweb	loadbalancerforweb-1155...	Provisioning	vpc-0e617f89a24a7bf1b	2 Availability Zones	application	April 8 (UTC+0)

0 load balancers selected

Select a load balancer above.

The screenshot shows the AWS EC2 Load Balancers console. On the left, there's a navigation sidebar with various EC2-related options like Dashboard, Global View, Instances, and Images. The main area displays a table of load balancers. One row is selected, showing details for a load balancer named 'loadbalancerforweb'. The table includes columns for Name, State, VPC ID, Availability Zones, Type, and Date created. Below the table, a detailed view of the selected load balancer is shown, with tabs for Details, Listeners, Network mapping, Security, Monitoring, Integrations, Attributes, and Tags. The 'Details' tab is active, showing the ARN of the load balancer.

This screenshot shows the AWS EC2 Targets console. It displays a table of registered targets for the load balancer 'loadbalancerforweb'. The table has columns for Instance ID, Name, Port, Zone, and Health status. There are two healthy targets listed: 'i-0bbe13ce705c27852' and 'i-064ca3ad1af472047', both assigned to port 80 in the 'us-east-1a' zone.

Now we can copy the public IP of the instance to get the output

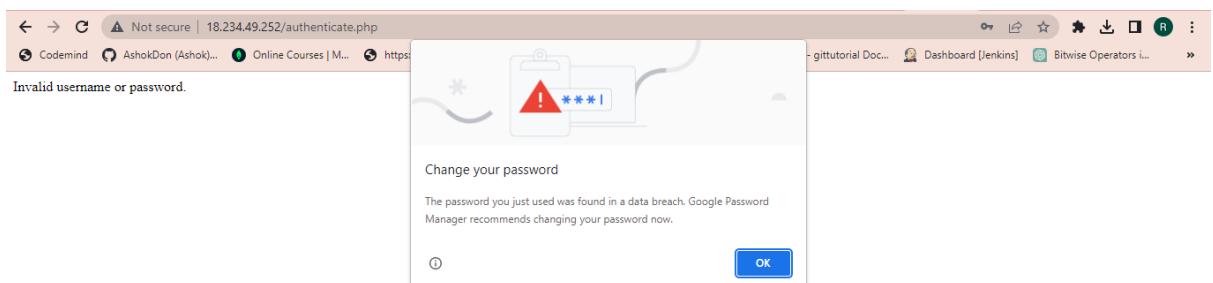
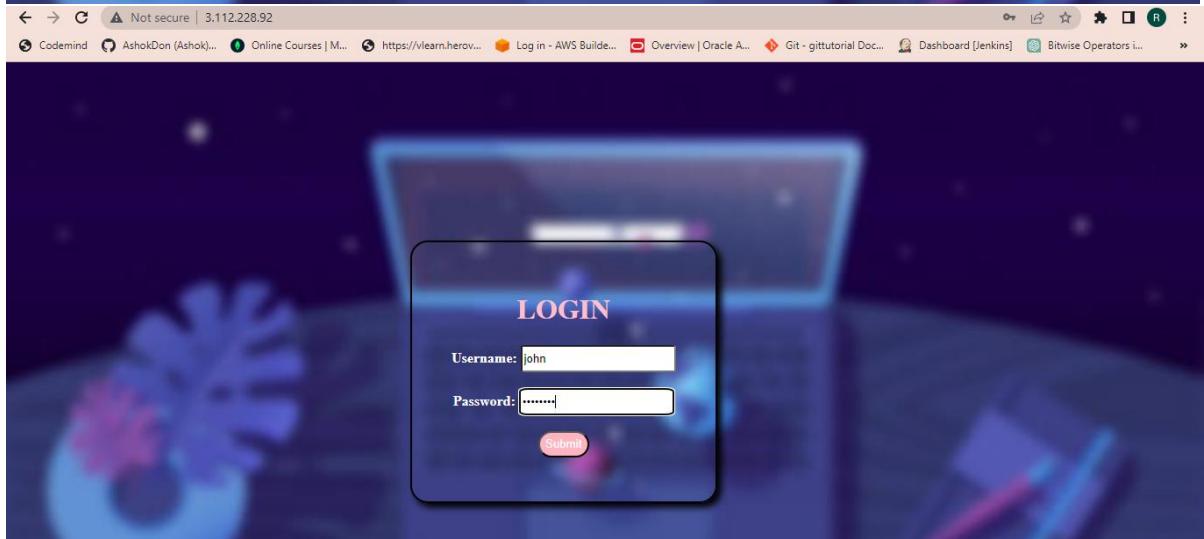
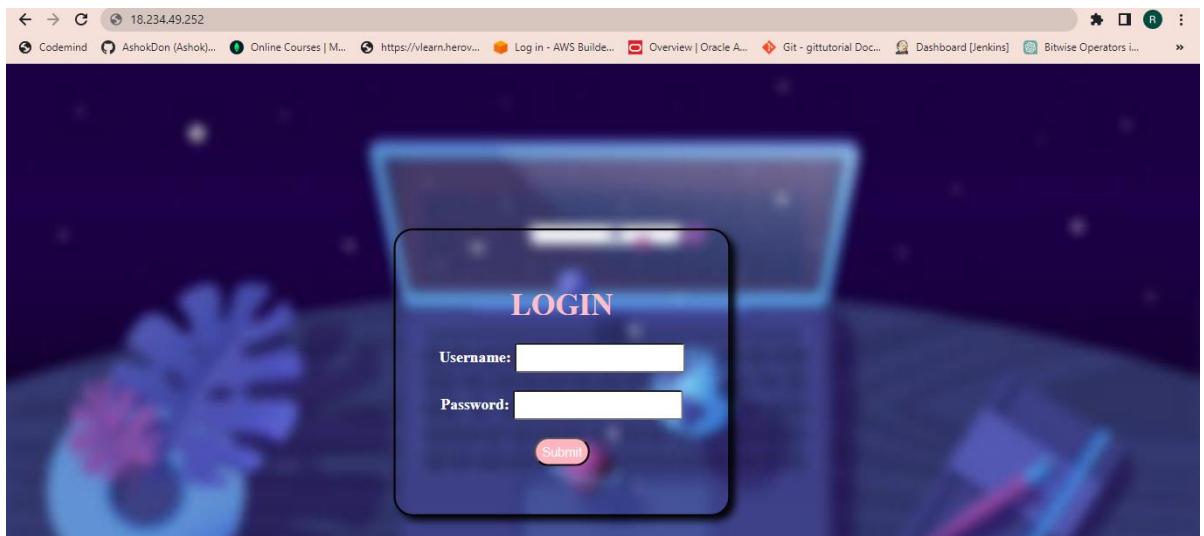
Hence when we give the data/credentials matching to the data in database we get positive response else we would be getting the negative response as shown below.

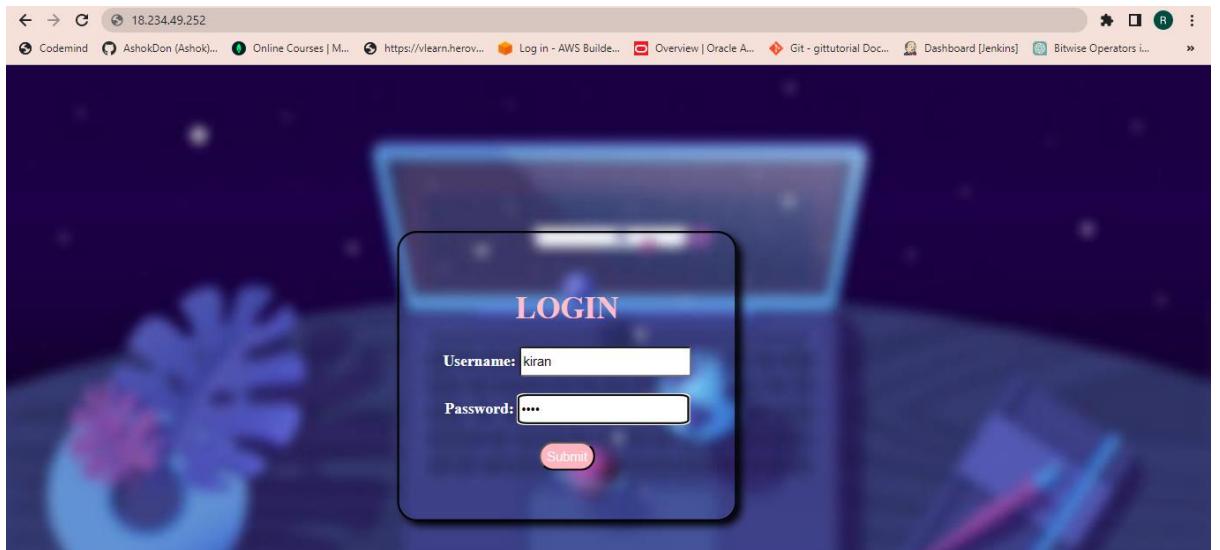
Repository Details:

- We have collected our some project requirements from chatgpt.
- Here are some links which we have used
- https://www.youtube.com/watch?v=JubPv_UkBdG
- [How To Create AWS EC2 Instance And Host PHP Applications \(c-sharpcorner.com\)](http://c-sharpcorner.com)

Outcome:

- ✓ The outcome of this project is to deploy web application with 3-tier through cloud.





CONCLUSION:

- The web applications which are deployed with 3-tier using the cloud are more secure, cost-effective, and friendly for both user and developer.
- Authentication is at-most for web applications which use the 3-tier architecture.