

Project 1: Deploying 2-Tier Application on AWS

Scribe 

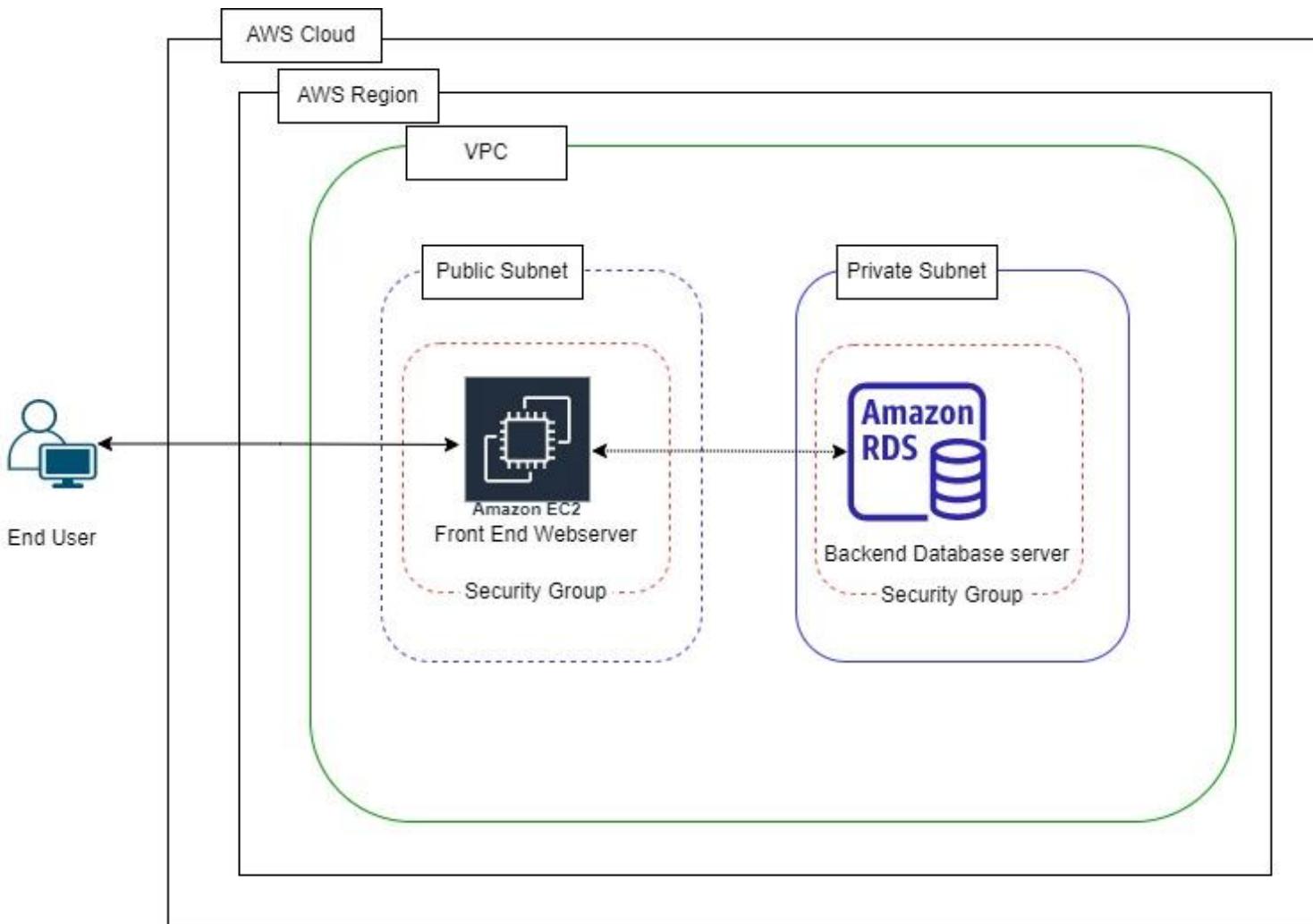


- Deploy a 2-tier application with the following requirements
 - Create custom VPC with public and private subnets.
 - Deploy the frontend UI application in the public subnet.
 - Deploy the backend database (AWS RDS) in a private subnet.
 - Establish a connection between the front-end and the back-end.
 - Demonstrate the database CRUD operation through the front end.

This Document Covers the following sections:

1. Architectural Diagram
2. Creating a VPC
3. Creating Security Group in the new VPC
4. Creating a EC2 instance in the new VPC with user-data
5. Setting up RDS MySQL DB instance in the new VPC
6. Setting up the DB connections and testing the configuration

1. Architecture of 2-Tier Application in AWS



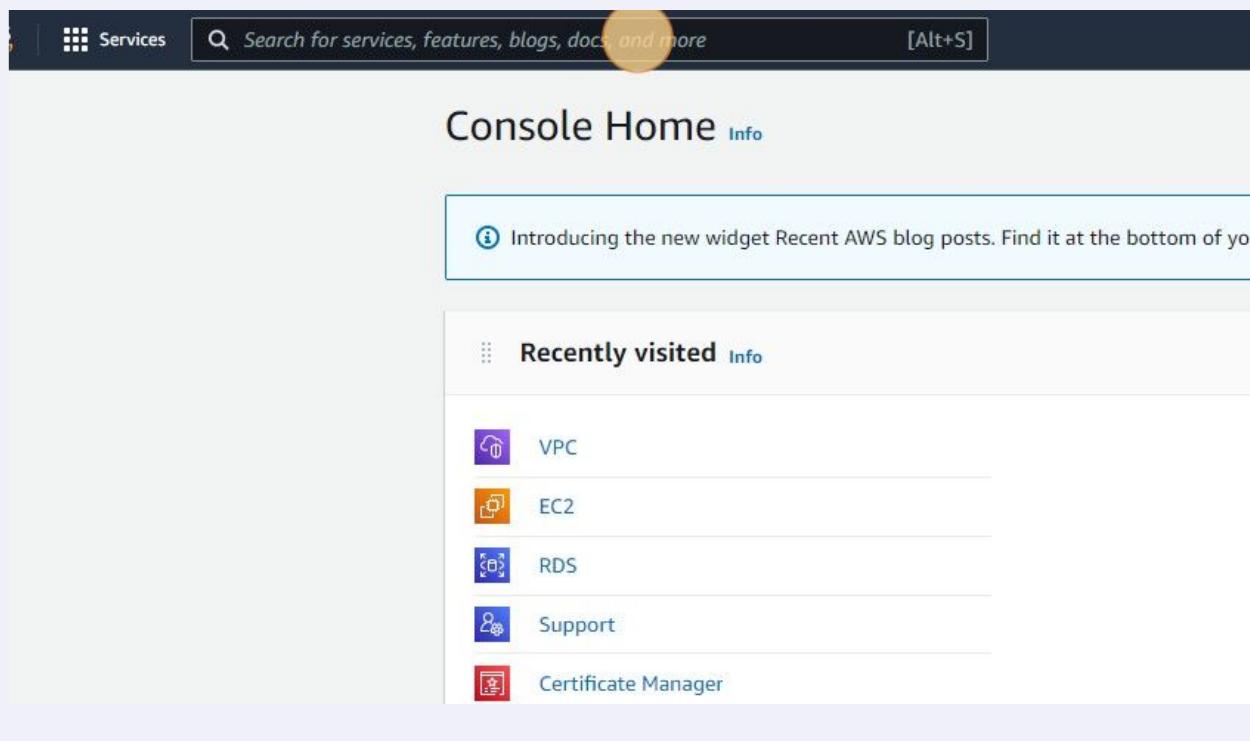
2. Creating a VPC

1

Navigate to
<https://ap-south-1.console.aws.amazon.com/console/home?region=ap-south-1>

2

Click the "Search for services, features, blogs, docs, and more" field.



3

Type "vpc"

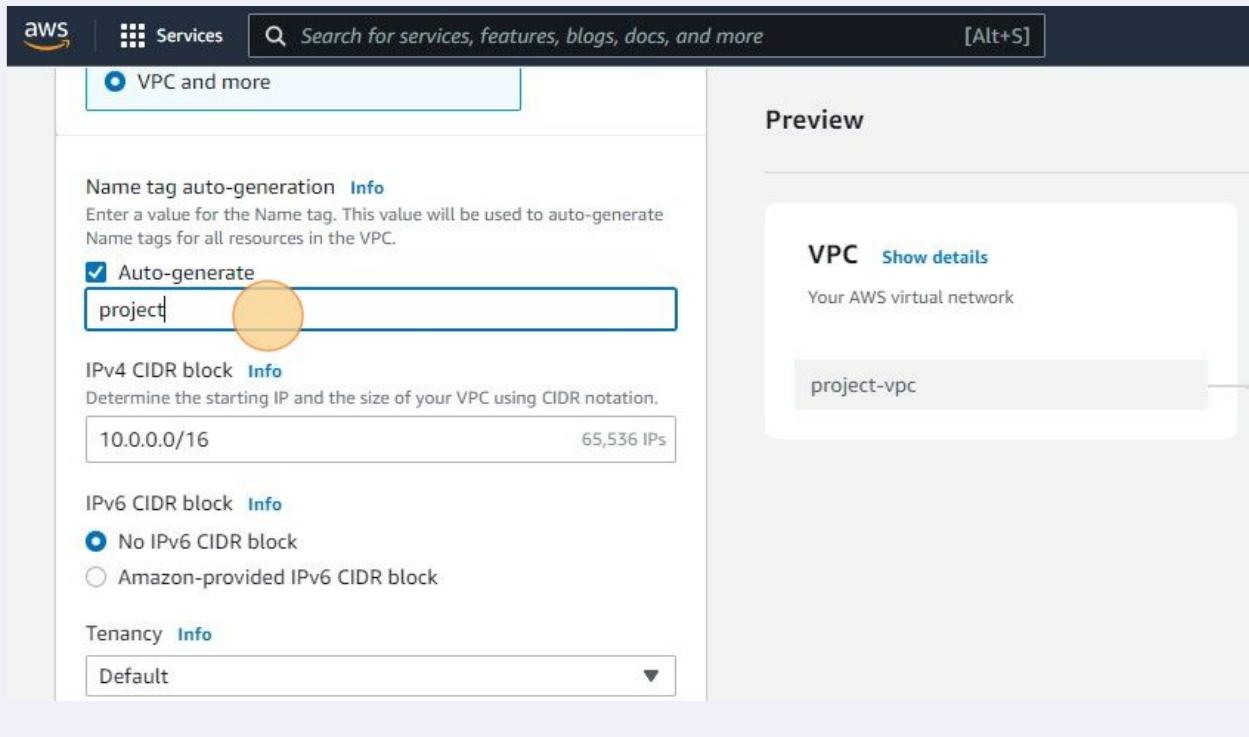
4 Click "VPC"

The screenshot shows the AWS search interface with the query 'vpc'. The search results page displays various services and features. The 'Services' section lists items like Services (10), Features (39), Blogs (631), Documentation (54,625), Knowledge Articles (30), Tutorials (6), Events (13), and Marketplace (379). The main content area shows the 'Services' section with a card for 'VPC' (Isolated Cloud Resources) highlighted with a yellow circle. Below it are cards for 'Amazon VPC IP Address Manager' (Managed IP address management service) and 'AWS Network Firewall' (AWS Network Firewall).

5 Click "Create VPC"

The screenshot shows the AWS VPC dashboard. On the left sidebar, there are sections for 'VPC dashboard', 'EC2 Global View', 'Filter by VPC', 'Virtual private cloud' (with sub-options: Your VPCs, Subnets, Route tables, Internet gateways, Egress-only internet gateways, and Direct Connect), and 'AWS Lambda'. The main content area features a 'Create VPC' button highlighted with a yellow circle. It also includes a note: 'Note: Your Instances will launch in the Asia Pacific region.' Below this is a 'Resources by Region' section with a 'Refresh Resources' button. The resources listed include VPCs (1), NAT Gateways (1), Subnets (3), Route Tables (1), and Network ACLs (1), all under the Asia Pacific region.

- 6 Double-click the "Name tag auto-generationInfo" field.



- 7 Type "my-vpc"

8 Click here.

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

0	2
---	---

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

0	2	4
---	---	---

▶ Customize subnets CIDR blocks

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

None	In 1 AZ	1 per AZ
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VPC endpoints [Info](#)
VPC endpoints can help reduce NAT gateway charges and improve security by using S3 directly from the VPC. By default, full access policy is used.

9 Verify the VPC layout

Preview

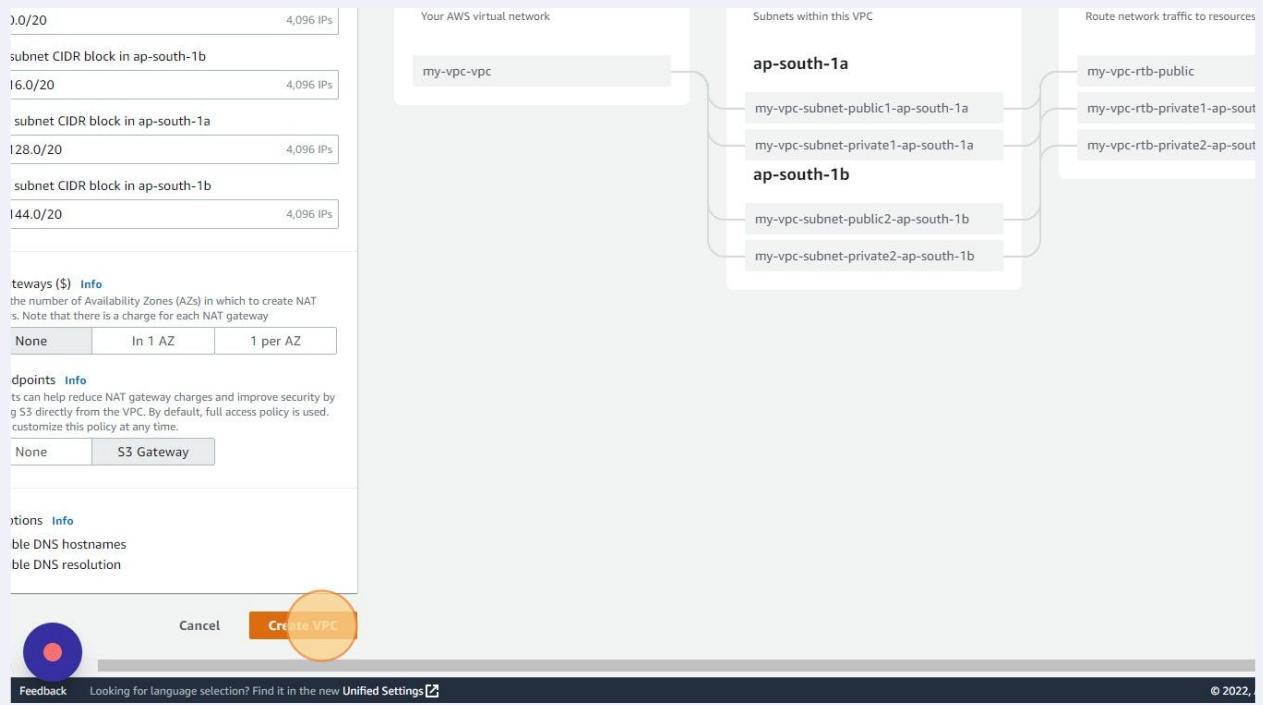
VPC [Show details](#)
Your AWS virtual network
my-vpc-vpc

Subnets (4)
Subnets within this VPC
ap-south-1a
my-vpc-subnet-public1-ap-south-1a
my-vpc-subnet-private1-ap-south-1a
ap-south-1b
my-vpc-subnet-public2-ap-south-1b
my-vpc-subnet-private2-ap-south-1b

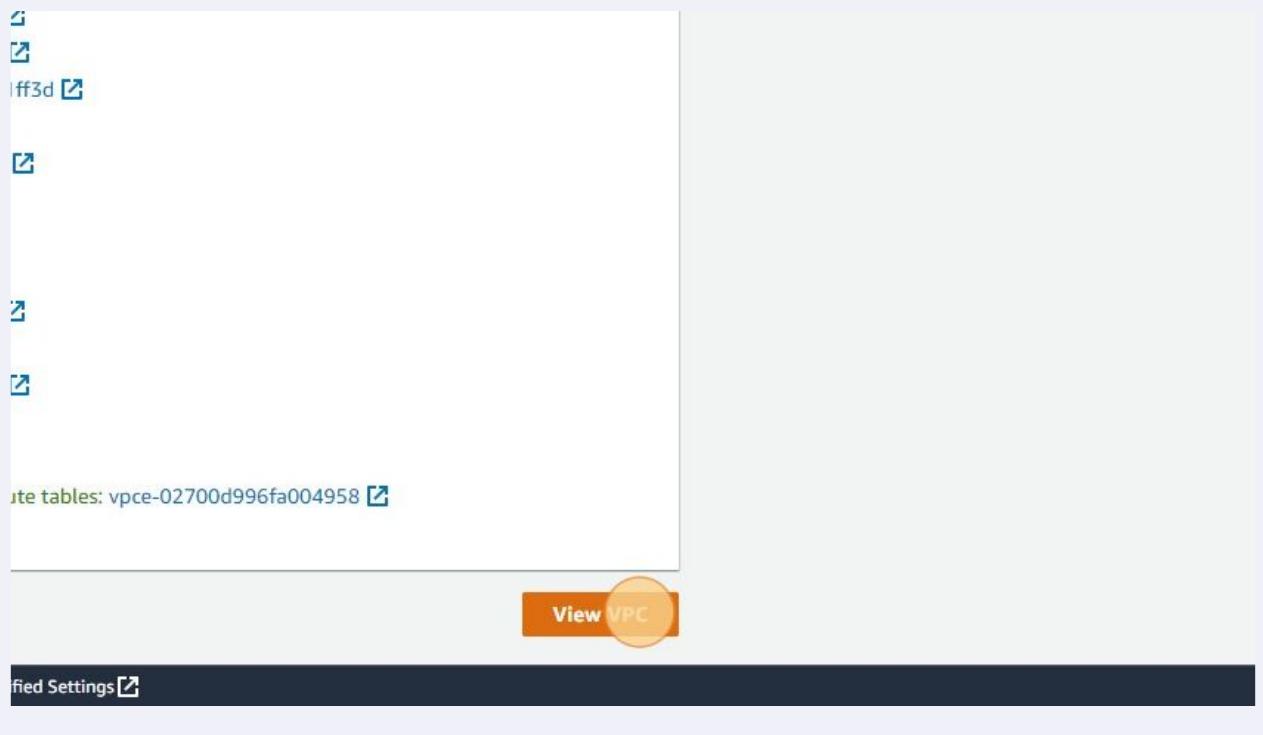
Route tables (3)
Route network traffic to resources
my-vpc-rtb-public
my-vpc-rtb-private1-ap-south-1a
my-vpc-rtb-private2-ap-south-1b

Network connections (2)
Connections to other networks
my-vpc-igw
my-vpc-vpc-s3

10 Click "Create VPC"



11 Click "View VPC"



12 Click "Your VPCs"

The screenshot shows the AWS VPC Details page for a VPC named "my-vpc-vpc". The URL in the browser is `vpc-07be6bc6091d1dc14 / my-vpc-vpc`. The left sidebar shows the navigation path: VPC > Your VPCs > vpc-07be6bc6091d1dc14. The main content area displays the "Details" section with the following information:

VPC ID	State
vpc-07be6bc6091d1dc14	Available
Tenancy	DHCP option set
Default	dopt-004b76c6e1c5efda1
Default VPC	IPv4 CIDR
No	10.0.0.0/16
Route 53 Resolver DNS Firewall rule groups	
Owner ID	

13 Click "my-vpc-vpc"

The screenshot shows the "Your VPCs (1/2)" list page. The URL in the browser is `Your VPCs (1/2)`. The left sidebar shows the navigation path: VPC > Your VPCs. The main content area displays a table of VPCs:

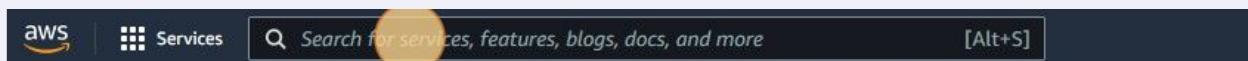
Name	VPC ID	Status
-	vpc-06260e2e0884cf32	✓
my-vpc-vpc	vpc-07be6bc6091d1dc14	✓

3. Creating Security Group in the new VPC



- 1 Navigate to <https://ap-south-1.console.aws.amazon.com/console/home?region=ap-south-1>

- 2 Click the "Search for services, features, blogs, docs, and more" field.



Console Home Info

Introducing the new widget Recent AWS blog posts. Find it at the bottom

Recently visited Info

- VPC
- EC2
- RDS
- Support
- Certificate Manager

- 3 Type "vpc"

4 Click "VPC"

The screenshot shows the AWS search results for the term 'vpc'. The search bar at the top contains 'vpc'. Below it, a sidebar on the left lists various categories: Services (10), Features (39), Blogs (631), Documentation (54,625), Knowledge Articles (30), Tutorials (6), Events (13), and Marketplace (379). The main content area is titled 'Services' and features a card for 'VPC' (Isolated Cloud Resources), which is highlighted with a yellow circle. Other cards shown include 'Amazon VPC IP Address Manager' (Managed IP address management service) and 'AWS Network Firewall' (AWS Network Firewall).

5 Click "Security groups"

The screenshot shows the AWS VPC service page. On the left, there is a navigation sidebar with sections like DHCP Option Sets, Elastic IPs, Managed prefix lists, Endpoints, Endpoint services, NAT gateways, Peering connections, Security (Network ACLs, Security groups), Network Analysis (Reachability Analyzer, Network Access Analyzer), and Firewall. The 'Security groups' link is highlighted with a yellow circle. The main content area displays several service cards: Internet Gateways (Asia Pacific 2), Egress-only Internet Gateways (Asia Pacific 0), DHCP option sets (Asia Pacific 1), Elastic IPs (Asia Pacific 0), Endpoints (Asia Pacific 1), and Endpoint Services (Asia Pacific 0). A feedback link at the bottom left says 'Feedback'.

- 6 Click "Create security group"

	Description	Owner	Inbound rules count	Outbound rules co
4	new security group in ...	170838198394	0 Permission entries	4 Permission entries
2	security group for MCA	170838198394	2 Permission entries	1 Permission entry
4	default VPC security gr...	170838198394	1 Permission entry	1 Permission entry
2	default VPC security gr...	170838198394	1 Permission entry	1 Permission entry

- 7 Click the "Security group name Info" field.

VPC > Security Groups > Create security group

Create security group Info

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security gro

Basic details

Security group name Info

MyWebServer Group

Name cannot be edited after creation.

Description Info

Allows SSH access to developers

VPC Info

vpc-06260e2e0884cf32

8 Type "my-vpc-security-group"

9 Click the "Description Info" field.

A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security gro

Basic details

Security group name [Info](#)
my-vpc-security-group

Name cannot be edited after creation.

Description [Info](#)
Allows ~~SSH~~ access to developers

VPC [Info](#)
vpc-06260e2e0884cfe32

Inbound rules [Info](#)

This secu

10 Type "security group for my vpc"

11 Click the "VPC Info" field.

The screenshot shows the AWS Lambda function configuration page. In the 'Handler' section, the 'Handler' dropdown is set to 'lambda_function.lambda_handler'. Below it, the 'Role' dropdown is set to 'Lambda execution role'. Under the 'Environment' section, there is a 'Variables' table with one entry: 'AWS_LAMBDA_FUNCTION_NAME' with the value 'lambda-function'. At the bottom, there is a 'Create Function' button.

Security group name [Info](#)
my-vpc-security-group
Name cannot be edited after creation.

Description [Info](#)
security group for my vpc

VPC [Info](#)
vpc-06260e2e0884cfef32

Inbound rules [Info](#)
Add rule

12 Click here.

The screenshot shows the AWS Lambda function configuration page. In the 'Handler' section, the 'Handler' dropdown is set to 'lambda_function.lambda_handler'. Below it, the 'Role' dropdown is set to 'Lambda execution role'. Under the 'Environment' section, there is a 'Variables' table with one entry: 'AWS_LAMBDA_FUNCTION_NAME' with the value 'lambda-function'. At the bottom, there is a 'Create Function' button.

Inbound rules [Info](#)
This security group has no inbound rules.

13 Click here.

The screenshot shows the AWS Security Groups console. A new security group is being created with the following details:

- Name:** security group for my vpc
- Description:** security group for my vpc
- VPC:** (default) vpc-06260e2e0884cf32 (172.31.0.0/16)
- Search bar:** vpc-07be6bc6091d1dc14 (my-vpc-vpc) 10.0.0.0/16
- Add rule button:** Add rule

A yellow circle highlights the "Add rule" button.

14 Click "Add rule"

The screenshot shows the AWS Security Groups console with the "Inbound rules" section selected. The "Add rule" button is highlighted with a yellow circle.

Inbound rules

Add rule

Outbound rules

Type	Protocol	Port range	Destination
All traffic	All	All	Custom

15 Click "Custom TCP"

VPC [Info](#)

vpc-07be6bc6091d1dc14 [X](#)

Inbound rules [Info](#)

Type	Protocol	Port range	Source
Custom TCP	TCP	0	Custom

[Add rule](#)

Outbound rules [Info](#)

Type	Protocol	Port range	Destination
All traffic	All	All	Custom

16 Type "htt"

17 Click here.

The screenshot shows the 'Inbound rules' section of the AWS VPC configuration. A search bar at the top contains the text 'vpc-07be6bc6091d1dc14'. Below the search bar, the title 'Inbound rules' is followed by a 'Info' link. The main area displays two tables of inbound rules.

Type [Info](#) **Protocol** [Info](#) **Port range** [Info](#) **Source** [Info](#)

Type	Protocol	Port range	Source
Custom TCP	TCP	0	Custom
HTTP	All	All	Custom
HTTPS	All	All	Custom
WinRM-HTTP	All	All	Custom
WinRM-HTTPS	All	All	Custom

Type [Info](#) **Protocol** [Info](#) **Port range** [Info](#) **Destination** [Info](#)

Type	Protocol	Port range	Destination
All traffic	All	All	Custom

18 Click "Custom"

The screenshot shows the configuration dialog for an inbound rule. At the top, there is a search bar with the placeholder 'Search' and a dropdown menu showing 'Custom'.

Protocol [Info](#) **Port range** [Info](#) **Source** [Info](#) **Destination** [Info](#)

Protocol	Port range	Source	Destination
TCP	80	Custom	Custom

Protocol [Info](#) **Port range** [Info](#) **Destination** [Info](#)

Protocol	Port range	Destination
All	All	Custom

19 Click "Anywhere-IPv4"

The screenshot shows two panels for configuring network rules. The top panel is for the 'Source' rule, which has a port range of '80' and a source set to 'Custom'. A dropdown menu is open, showing options: 'Custom' (selected), 'Anywhere-IPv4' (highlighted with a yellow circle), 'Anywhere-IPv6', and 'My IP'. The bottom panel is for the 'Destination' rule, which has a port range of 'All' and a destination set to 'Custom'. A dropdown menu is open, showing options: 'Custom' (selected) and '0.0.0.0/0'.

20 Click "Add rule"

The screenshot shows two sections for managing network rules. The top section is 'Inbound rules' with a single rule: Type 'HTTP', Protocol 'TCP', Port range '80', and Source 'Anywhere'. Below this is a button labeled 'Add rule' with a yellow circle around it. The bottom section is 'Outbound rules' with a single rule: Type 'All traffic', Protocol 'All', Port range 'All', and Destination 'Custom'.

21 Click "Custom TCP"

The screenshot shows the 'Inbound rules' section of a network configuration interface. At the top, there are four main filter categories: Type, Protocol, Port range, and Source. Under 'Type', 'HTTP' is selected. Under 'Protocol', 'TCP' is selected. Under 'Port range', the value '80' is entered. Under 'Source', 'Anywhere' is selected. Below these, there is a dropdown menu labeled 'Custom TCP' with a yellow circular highlight around it, indicating the step to click. To the right of this dropdown are fields for 'TCP' and '0'. At the bottom left is a 'Add rule' button.

Inbound rules

Type	Protocol	Port range	Source
HTTP	TCP	80	Anywhere

Custom TCP

Add rule

Outbound rules

Type	Protocol	Port range	Destination
All traffic	All	All	Custom

22 Type "https"

23 Click here.

The screenshot shows the AWS VPC Inbound rules configuration page. At the top, there is a search bar with the query "vpc-07be6bc6091d1dc14". Below the search bar, the title "Inbound rules" is followed by a "Type" column containing "https", "HTTPS", "WinRM-HTTPS", and "Custom TCP". To the right of the type column are "Protocol" (TCP), "Port range" (80), and "Source" (Anywhere). A large orange circle highlights the "HTTPS" entry in the Type column. Below the table is a "Add rule" button.

24 Click "Custom"

The screenshot shows the AWS VPC Outbound rules configuration page. It displays two rows of rules. The first row has a port range of 80 and a source of "Anywhere-...". The second row has a port range of 443 and a source of "Custom". The "Custom" source is highlighted with an orange circle. Below these rows is another section with a port range of "All" and a destination of "Custom".

25 Click "Anywhere-IPv4"

The screenshot shows two panels of a network configuration interface. The top panel is titled 'Port range' and 'Info'. It contains two entries: one for port 80 with a source of 'Anywhere...' and a destination of '0.0.0.0/0', and another for port 443 with a source of 'Custom' (selected) and a destination of '0.0.0.0/0'. A dropdown menu for the source of the second entry is open, showing options: 'Custom' (highlighted with a blue border), 'Anywhere-IPv4' (highlighted with a yellow circle), 'Anywhere-IPv6', and 'My IP'. The bottom panel is also titled 'Port range' and 'Info', showing an entry for 'All' with a source of 'Custom' and a destination of '0.0.0.0/0'.

26 Click "Add rule"

The screenshot shows a network configuration interface with two main sections. The top section is titled 'Inbound rules' and contains two entries: one for HTTP (Protocol: TCP, Port range: 80, Source: Anywhere) and one for HTTPS (Protocol: TCP, Port range: 443, Source: Anywhere). Below these entries is a button labeled 'Add rule' with a yellow circle around it. The bottom section is titled 'Outbound rules' and contains one entry: 'All traffic' (Protocol: All, Port range: All, Destination: Custom).

27 Click "Custom TCP"

The screenshot shows a network configuration interface with three main sections: Inbound rules, Outbound rules, and Firewall rules.

Inbound rules:

- HTTP:** Type: HTTP, Protocol: TCP, Port range: 80, Source: Anywhere.
- HTTPS:** Type: HTTPS, Protocol: TCP, Port range: 443, Source: Anywhere.
- Custom TCP:** Type: Custom TCP, Protocol: TCP, Port range: 0, Source: Custom.

Add rule button is present.

Outbound rules:

- All traffic:** Type: All traffic, Protocol: All, Port range: All, Destination: Custom.

28 Type "ssh"

29 Click "SSH"

Inbound rules [Info](#)

Type Info	Protocol Info	Port range Info	Source Info
HTTP	TCP	80	Anywhere
HTTPS	TCP	443	Anywhere
SSH	TCP	0	Custom
Custom TCP			

[Add rule](#)

Outbound rules [Info](#)

Type Info	Protocol Info	Port range Info	Destination Info
---------------------------	-------------------------------	---------------------------------	----------------------------------

30 Click here.

Port range Info	Source Info	Description -
80	Anywhere-... ▾	<input type="text"/> 0.0.0.0/0 X
443	Anywhere-... ▾	<input type="text"/> 0.0.0.0/0 X
22	Custom ▾	<input type="text"/>

[Add rule](#)

Port range Info	Destination Info	Description -
All	Custom ▾	<input type="text"/>

31 Click "Anywhere-IPv4"

The screenshot shows a port configuration interface with three rows. Row 1: Port 80, Destination: Anywhere..., Value: 0.0.0.0/0. Row 2: Port 443, Destination: Anywhere..., Value: 0.0.0.0/0. Row 3: Port 22, Destination: Custom, Value: 0.0.0.0/0. A dropdown menu is open for Port 22, listing "Custom", "Anywhere-IPv4" (which is highlighted with a yellow circle), "Anywhere-IPv6", and "My IP". Below the table, there are three sections: "Port range" (Info: All), "Destination" (Info: Custom), and "Description" (Value: 0.0.0.0/0).

32 Click "Add rule"

The screenshot shows an "Outbound rules" section. It lists two rules: "HTTPS" (Protocol: TCP, Port range: 443, Destination: Anywhere) and "SSH" (Protocol: TCP, Port range: 22, Destination: Anywhere). Below the rules is a blue "Add rule" button, which is highlighted with a yellow circle.

Outbound rules Info

Type Info



All traffic

Protocol Info

All

Port range Info

All

Destination

Custom

Feedback

Looking for language selection? Find it in the new [Unified Settings](#).

33 Click "Custom TCP"

The screenshot shows a network configuration interface with several port rules listed:

- HTTP: Protocol TCP, Port range 80, Destination Anywhere
- HTTPS: Protocol TCP, Port range 443, Destination Anywhere
- SSH: Protocol TCP, Port range 22, Destination Anywhere
- Custom TCP: Protocol TCP, Port range 0, Destination Custom (highlighted with a yellow circle)

An "Add rule" button is visible below the list. The interface also includes sections for "Outbound rules" and "Protocol" settings.

34 Type "mys"

35 Click here.

The screenshot shows the AWS Network Firewall Rule Editor interface. In the top left, there's a search bar with the placeholder "Search" and a dropdown menu with options like "HTTP", "HTTPS", "SSH", "Custom TCP", and "MySQL/Aurora". The "MySQL/Aurora" option is highlighted with a yellow circle. Below the search bar are four rule cards:

- HTTP: TCP port 80 to Anywhere.
- HTTPS: TCP port 443 to Anywhere.
- SSH: TCP port 22 to Anywhere. This row has a search bar above it containing "mys" and a dropdown menu with "SSH" selected.
- MySQL/Aurora: TCP port 0 to Custom. This row also has a search bar above it containing "mys" and a dropdown menu with "MySQL/Aurora" selected.

At the bottom left is a button labeled "Add rule".

Outbound rules Info

36 Click "Custom"

The screenshot shows the AWS Network Firewall Rule Editor interface. In the top left, there's a search bar with the placeholder "Search" and a dropdown menu with options like "Protocol", "Port range", and "Destination". The "Port range" option is highlighted with a yellow circle. Below the search bar are four rule cards:

- Protocol: Anywhere to 0.0.0.0/0.
- Port range: 443 to Anywhere. This row has a search bar above it containing "443" and a dropdown menu with "Anywhere..." selected.
- Port range: 22 to Anywhere. This row has a search bar above it containing "22" and a dropdown menu with "Anywhere..." selected.
- Port range: 3306 to Custom. This row has a search bar above it containing "3306" and a dropdown menu with "Custom" selected.

At the bottom left is a button labeled "Add rule".

37 Click "Anywhere-IPv4"

The screenshot shows the AWS CloudFormation console with a stack named "CloudFront-Stack". The "Resources" section lists three resources: "CloudFront Distribution", "CloudFront Origin Access Identity", and "AWS Lambda Function". The "Outputs" section shows three outputs: "CloudFront Distribution ARN", "CloudFront Origin Access Identity ARN", and "Lambda Function ARN". The "Actions" section includes "Edit", "Delete", and "Details" buttons. A dropdown menu for selecting a destination is open, with "Anywhere-IPv4" highlighted and circled in orange.

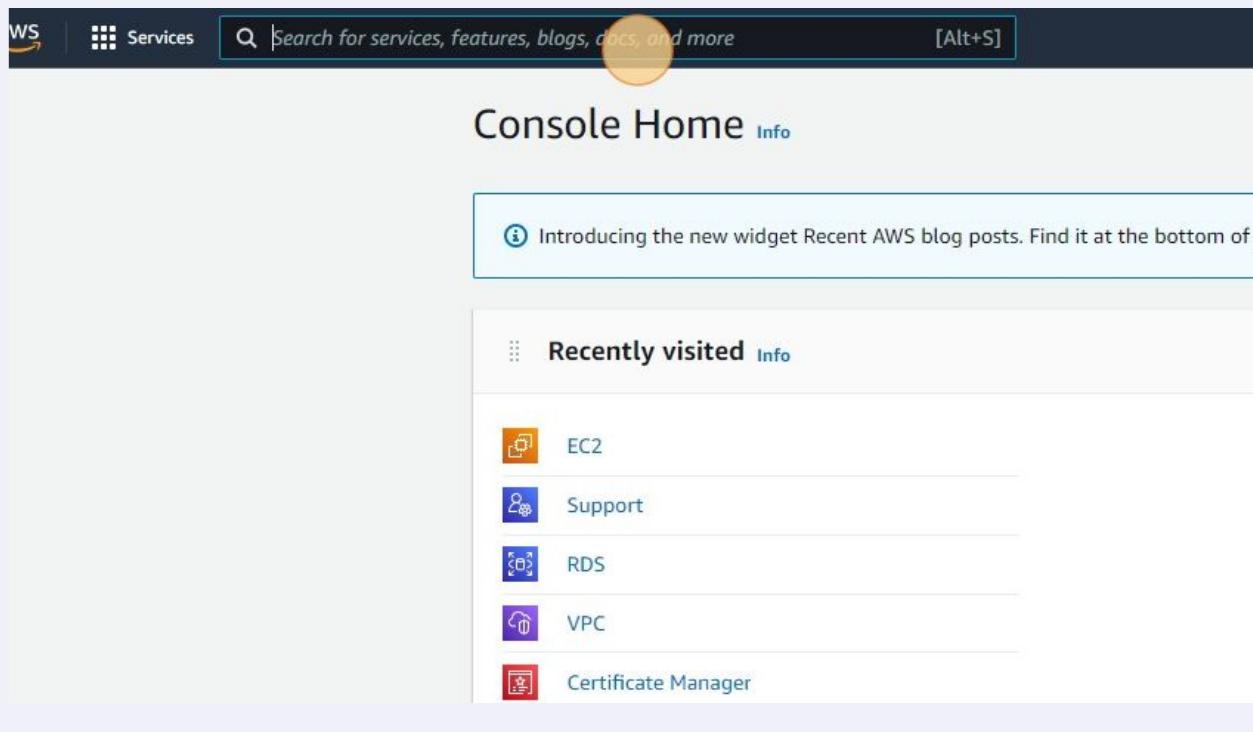
38 Click "Create security group"

The screenshot shows the AWS CloudFormation console with a stack named "CloudFront-Stack". The "Outputs" section shows three outputs: "CloudFront Distribution ARN", "CloudFront Origin Access Identity ARN", and "Lambda Function ARN". The "Actions" section includes "Edit", "Delete", and "Details" buttons. A modal dialog box is open, prompting for a security group name. The "Create security group" button is highlighted and circled in orange.

4. Creating a EC2 instance Scribe in the new VPC with user-data

- 1 Navigate to <https://ap-south-1.console.aws.amazon.com/console/home?region=ap-south-1>

- 2 Click the "Search for services, features, blogs, docs, and more" field.



- 3 Search for "ece"

4 Click "EC2"

The screenshot shows the AWS search interface with the query 'ec2'. The search results page displays various services and features. On the left, there's a sidebar with links like 'Services (92)', 'Features (182)', 'Blogs (16,219)', etc. The main area shows the 'Services' section with the EC2 service card highlighted. The EC2 card includes the icon, the name 'EC2', a star icon, and the description 'Virtual Servers in the Cloud'. Below it, there's a 'Top features' section with cards for 'Direct Connect' and 'Inspector'.

5 Click "Launch instance"

The screenshot shows the 'Launch instance' page for Amazon EC2. On the left, there's a sidebar with sections like 'Instance types', 'Images', 'Elastic Block Store', and 'Network & Security'. The main content area has a callout box highlighting the 'Launch instance' button. Below it, there's a note about launching in the Asia Pacific (Mumbai) Region. Further down, there's a 'Scheduled events' section indicating no scheduled events.

6 Click "Launch instance"

The screenshot shows the AWS EC2 console. On the left, there's a sidebar with navigation links like 'Launch templates', 'Spot Requests', 'Savings Plans', 'Reserved Instances', 'Dedicated Hosts', 'Capacity Reservations', 'Images' (with 'AMIs' and 'AMI Catalog'), 'Elastic Block Store' (with 'Volumes' and 'Snapshots'), 'Lifecycle Manager', and 'Network & Security'. The main area has a header 'Launch instance' with a sub-header 'To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.' Below this are two buttons: 'Launch instance' (highlighted with a yellow circle) and 'Migrate a server'. Further down are 'Launch instance from template' and 'Region' dropdown set to 'Asia Pacific (Mumbai) Region'. To the right, there's a 'Scheduled events' section showing 'No scheduled events'.

7 Click the "Name" field.

Launch an instance Info

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

This screenshot shows the 'Launch an instance' wizard. It starts with a 'Name and tags' step. The 'Name' field contains 'e.g. My Web Server' and has a yellow circle around it. There's also a 'Add additional tags' link. Below this is a 'Application and OS Images (Amazon Machine Image)' step, which includes a sub-section for 'Amazon Linux AMI' with a note about using it for web servers. The bottom of the screen shows a progress bar with a large yellow circle indicating the current step.

8 Type "my-server"

9 Click this icon.

The screenshot shows the AWS Marketplace search results for the query "my-server". The search bar at the top contains the text "Search our full catalog including 1000s of application and OS images". Below the search bar, there are two tabs: "Recents" and "Quick Start", with "Quick Start" being the active tab. The results section displays several OS images in cards:

- Amazon Linux: Card includes the AWS logo and a yellow circular icon.
- macOS: Card includes the Mac logo.
- Ubuntu: Card includes the Ubuntu logo.
- Windows: Card includes the Microsoft logo.
- Red Hat: Card includes the Red Hat logo.
- S: Card is partially visible.

Below the cards, a message says "Amazon Machine Image (AMI)". A detailed card for "Amazon Linux 2 AMI (HVM) - Kernel 5.10, SSD Volume Type" is shown, listing the AMI ID as ami-06489866022e12a14, the volume type as SSD, and noting it is "Free tier eligible". The card also lists virtualization as hvm, ENA enabled as true, and root device type as ebs. The description below the card states: "Amazon Linux 2 Kernel 5.10 AMI 2.0.20220805.0 x86_64 HVM gp2". At the bottom, there are links for "Architecture" and "AMI ID". To the right of the card, there is a "Browse more AMIs" button with a magnifying glass icon and a note: "Including AMIs from AWS, Marketplace and the Community".

10 Click "Free tier eligible"

64-bit (x86) ami-06489866022e12a14 Verified provider

▼ Instance type [Info](#)

Instance type

t2.micro	Free tier eligible
Family: t2	1 vCPU 1 GiB Memory
On-Demand Linux pricing:	0.0124 USD per Hour
On-Demand Windows pricing:	0.017 USD per Hour

Compare instance types

▼ Key pair (login) [Info](#)

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

Key pair name - required

11 Click "Free tier eligible"

On-Demand Windows pricing: 0.017 USD per Hour

t2.small	On-Demand Windows pricing: 0.034 USD per Hour
Family: t2	1 vCPU 2 GiB Memory
On-Demand Linux pricing:	0.0248 USD per Hour
On-Demand Windows pricing:	0.034 USD per Hour

t2.medium	On-Demand Windows pricing: 0.0676 USD per Hour
Family: t2	2 vCPU 4 GiB Memory
On-Demand Linux pricing:	0.0496 USD per Hour
On-Demand Windows pricing:	0.0676 USD per Hour

t2.large	On-Demand Windows pricing: 0.0992 USD per Hour
Family: t2	2 vCPU 8 GiB Memory

t2.micro	Free tier eligible
Family: t2	1 vCPU 1 GiB Memory
On-Demand Linux pricing:	0.0124 USD per Hour
On-Demand Windows pricing:	0.017 USD per Hour

der

Compare instance types

▼ Key pair (login) [Info](#)

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

Key pair name - required

12 Click "Select"

Family: t2 1 vCPU 1 GiB Memory
On-Demand Linux pricing: 0.0124 USD per Hour
On-Demand Windows pricing: 0.017 USD per Hour

Compare instance types

▼ Key pair (login) [Info](#)
You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - required

Select

Create new key pair

▼ Network settings [Info](#)

Network [Info](#)
vpc-06260e2e0884fce32

Subnet [Info](#)

Edit

13 Select the key-pair you created earlier

▼ Key pair (login) [Info](#)
You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - required

Select

Create new key pair

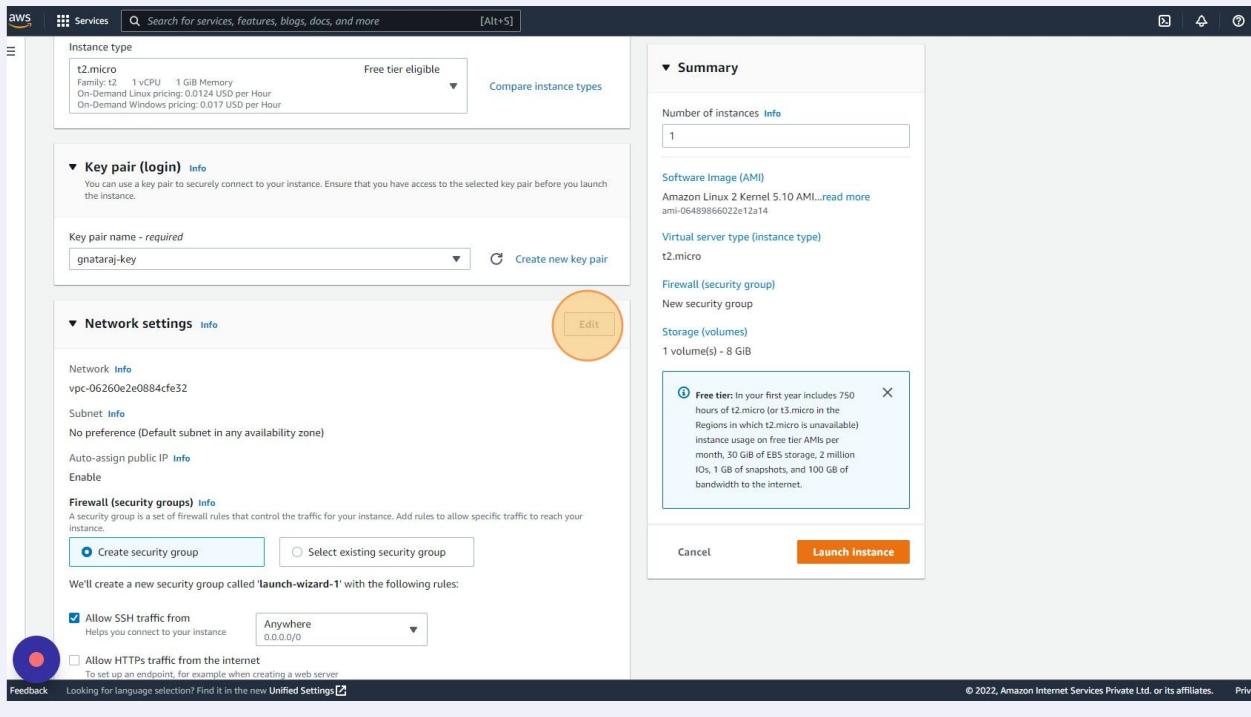
Proceed without a key pair (Not recommended)	Default value
gnataraj-key	Type: rsa
my-ssh-keypair	Type: rsa
sit-mca-demo	Type: rsa
Subnet Info	

No preference (Default subnet in any availability zone)

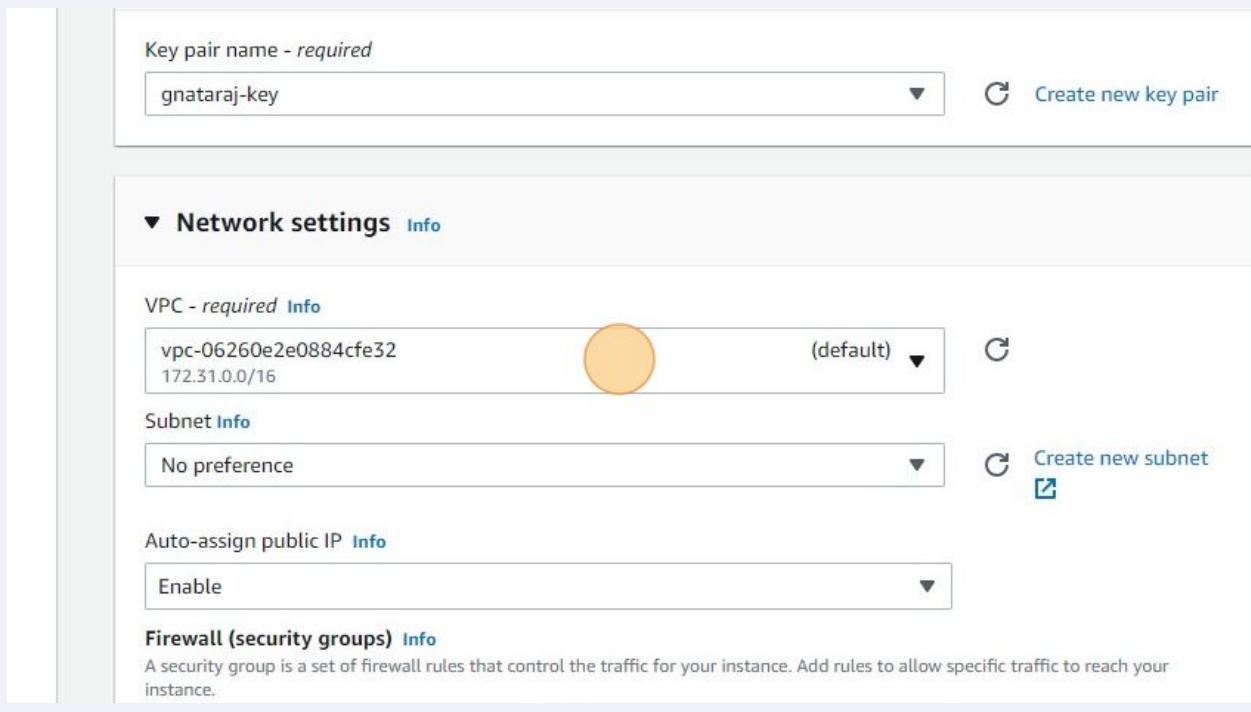
Auto-assign public IP [Info](#)

Enable

14 In the "Network Setting" Click "Edit"



15 Click on the drop-down menu



16 Select the previously created VPC

VPC - required [Info](#)

vpc-06260e2e0884cfe32 (default) 172.31.0.0/16

vpc-06260e2e0884cfe32 (default) 172.31.0.0/16

vpc-07be6bc6091d1dc14 (my-vpc-vpc) 10.0.0.0/16

Enable

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.

Create security group Select existing security group

Security group name - required

launch-wizard-1

17 In the Subnet dropdown,

gnataraj-key

t2.micro

Firewall (security groups)

New security group

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first 72 hours of t2.micro usage in India Regions, get up to 100 instance hours per month, 30 GiB of storage per month, 1000 I/Os, 1 GB of snapshot bandwidth to t2.micro instances.

Cancel

VPC - required [Info](#)

vpc-07be6bc6091d1dc14 (my-vpc-vpc) 10.0.0.0/16

Subnet [Info](#)

subnet-0ec173eb86923b1e my-vpc-subnet-private1 ap-south-1a

VPC: vpc-07be6bc6091d1dc14 Owner: 170838198394

Availability Zone: ap-south-1a IP addresses available: 4091 CIDR: 10.0.128.0/20

Auto-assign public IP [Info](#)

Disable

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.

Create security group Select existing security group

Security group name - required

18 Select any of the Public Subnets

vpc-07be6bc6091d1dc14 Owner: 170838198394 Availability Zone: ap-south-1a
IP addresses available: 4091 CIDR: 10.0.128.0/20

subnet-08e3c4e34575df5a7 RDS-Pvt-subnet-2
vpc-07be6bc6091d1dc14 Owner: 170838198394 Availability Zone: ap-south-1b
IP addresses available: 251 CIDR: 10.0.33.0/24

subnet-0c9eef13f2a1cff4 my-vpc-subnet-public2-ap-south-1b
vpc-07be6bc6091d1dc14 Owner: 170838198394 Availability Zone: ap-south-1b
IP addresses available: 4091 CIDR: 10.0.16.0/20

subnet-0ffd798581e44da2d RDS-Pvt-subnet-3
vpc-07be6bc6091d1dc14 Owner: 170838198394 Availability Zone: ap-south-1c
IP addresses available: 251 CIDR: 10.0.34.0/24

subnet-00bf2e5d99767deea my-vpc-subnet-public1-ap-south-1a
vpc-07be6bc6091d1dc14 Owner: 170838198394 Availability Zone: ap-south-1a
IP addresses available: 4091 CIDR: 10.0.0.0/20

subnet-06142ba0d104027be my-vpc-subnet-private2-ap-south-1b
vpc-07be6bc6091d1dc14 Owner: 170838198394 Availability Zone: ap-south-1b
IP addresses available: 4091 CIDR: 10.0.144.0/20

subnet-0977f9e5be3113a3e RDS-Pvt-subnet-1
vpc-07be6bc6091d1dc14 Owner: 170838198394 Availability Zone: ap-south-1a
IP addresses available: 250 CIDR: 10.0.32.0/24

subnet-0ec173ebe86923b1e my-vpc-subnet-private1-ap-south-1a
vpc-07be6bc6091d1dc14 Owner: 170838198394 Availability Zone: ap-south-1a
IP addresses available: 4091 CIDR: 10.0.128.0/20

Actions Public IP Info

Software Images

Amazon Linux ami-06489866

Virtual servers t2.micro

Firewall (security groups) New security group

Storage (volumes) 1 volume(s) -

Free tier hours Region instance month IOs, 1 bandw

19 Select "Enable" for the Auto-Assign public IP

VPC - required info

vpc-07be6bc6091d1dc14 (my-vpc-vpc)
10.0.0.0/16

Subnet info

subnet-00bf2e5d99767deea my-vpc-subnet-public1-ap-south-1a
VPC: vpc-07be6bc6091d1dc14 Owner: 170838198394
Availability Zone: ap-south-1a IP addresses available: 4091 CIDR: 10.0.0.0/20

Auto-assign public IP Info

Disable
Enable
Disable

Create security group
Select existing security group

Security group name - required

launch-wizard-1

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 _-:/()#,@[]+=&;!\$*

Description - required info

20 Click "Select security groups" In the Firewall selection

The screenshot shows the 'Firewall (security groups)' section of the EC2 instance configuration. It includes an 'Auto-assign public IP' dropdown set to 'Enable', a 'Firewall (security groups)' section with 'Create security group' and 'Select existing security group' options (the latter is selected), and a 'Common security groups' dropdown menu. The 'Compare security group rules' link is also visible.

Common security groups Info

Select security groups ▾

Compare security group rules

Security groups that you add or remove here will be added to or removed from all your network interfaces.

► Advanced network configuration

▼ Configure storage Info Advanced

1x 8 GiB gp2 ▾ Root volume

21 Click the previously created security group.

The screenshot shows the 'Select security groups' dropdown menu. It lists several security groups: 'my-security-group', 'ec2-rds-2', 'rds-ec2-1', 'ec2-rds-1', 'rds-ec2-2', 'my-vpc-security-group', 'default', and 'Add new volume'. The 'my-vpc-security-group' entry is highlighted with a yellow circle. The 'Compare security group rules' link is visible on the right.

Select security groups

my-security-group sg-00d9499a7774f56a4
VPC: vpc-07be6bc6091d1dc14

ec2-rds-2 sg-0167c0d68736fa680
VPC: vpc-07be6bc6091d1dc14

rds-ec2-1 sg-0493ce8a21a7cc707
VPC: vpc-07be6bc6091d1dc14

ec2-rds-1 sg-0a249e529dfb5c3cf
VPC: vpc-07be6bc6091d1dc14

rds-ec2-2 sg-0ab7e57564a9a1faa
VPC: vpc-07be6bc6091d1dc14

my-vpc-security-group sg-0eef0e0fe68cc8a96
VPC: vpc-07be6bc6091d1dc14

default sg-0f0da901445a8c445
VPC: vpc-07be6bc6091d1dc14

Add new volume

or Magnetic storage X

0 x File systems Edit

Feedback Looking for language selection? Find it in the new Unified Settings

22 Click "Advanced details"

▼ Configure storage [Info](#) Advanced

1x GiB Root volume

i Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage X

[Add new volume](#)

0 x File systems [Edit](#)

► Advanced details [Info](#)

Feedback Looking for language selection? Find it in the new [Unified Settings](#)

23 Click this field.

Select

User data [Info](#)

User data has already been base64 encoded

24 On a different tab, access the <https://github.com/gnataraj/php-mysql> in a

25 Click "user-data.txt"

 create.php	initial commit
 delete.php	initial commit
 error.php	initial commit
 index.php	initial commit
 read.php	initial commit
 update.php	initial commit
 user-data.txt	Update user-data.txt

Help people interested in this repository understand your project by adding a

26 Copy the complete content

```
12 lines (12 sloc) | 375 Bytes

1 #!/bin/bash
2 yum update -y
3 amazon-linux-extras install -y php8.0 mariadb10.5
4 yum install -y httpd git
5 systemctl start httpd
6 systemctl enable httpd
7 usermod -a -G apache ec2-user
8 chown -R ec2-user:apache /var/www
9 chmod 2775 /var/www
10 find /var/www -type d -exec chmod 2775 {} \;
11 find /var/www -type f -exec chmod 0664 {} \;
12 echo "<?php phpinfo(); ?>" > /var/www/html/phpinfo.php
```



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Status

Docs

Contact GitHub

27 Paste the content in the user data

Metadata response hop limit [Info](#)

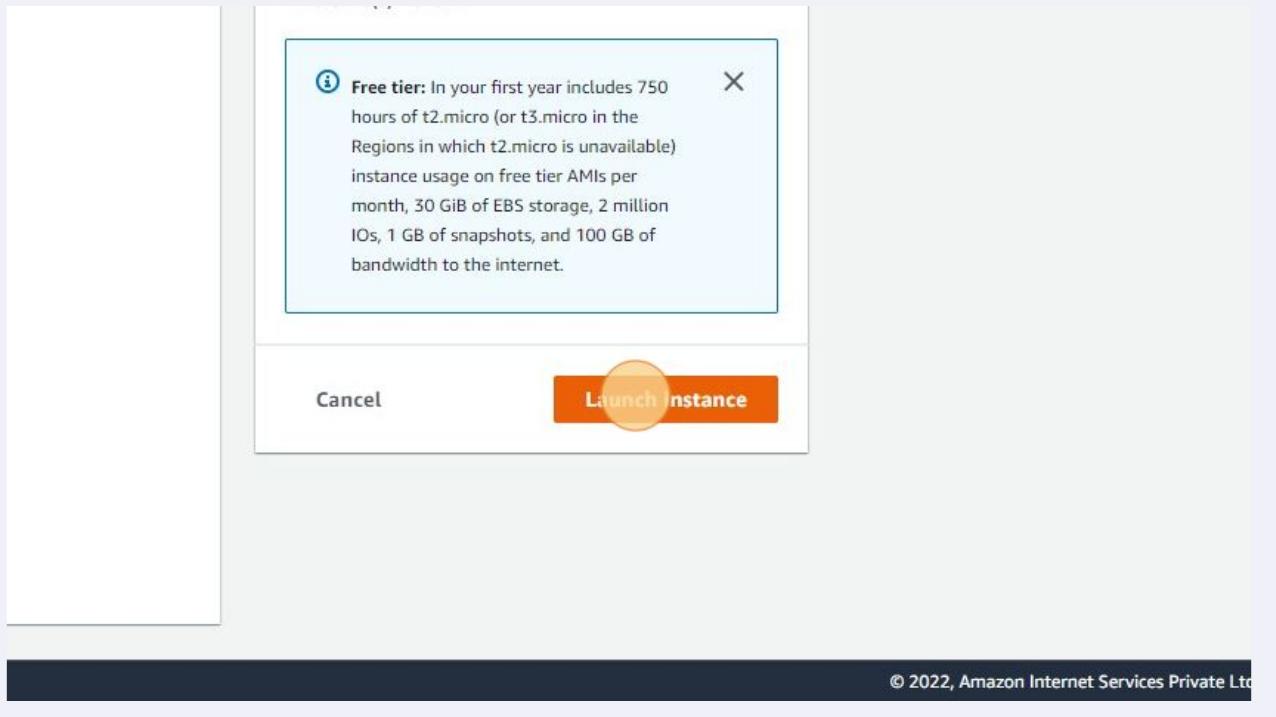
Select

Allow tags in metadata [Info](#)

Select ▾

User data [Info](#)

28 Click "Launch instance"



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29 Click on the instance

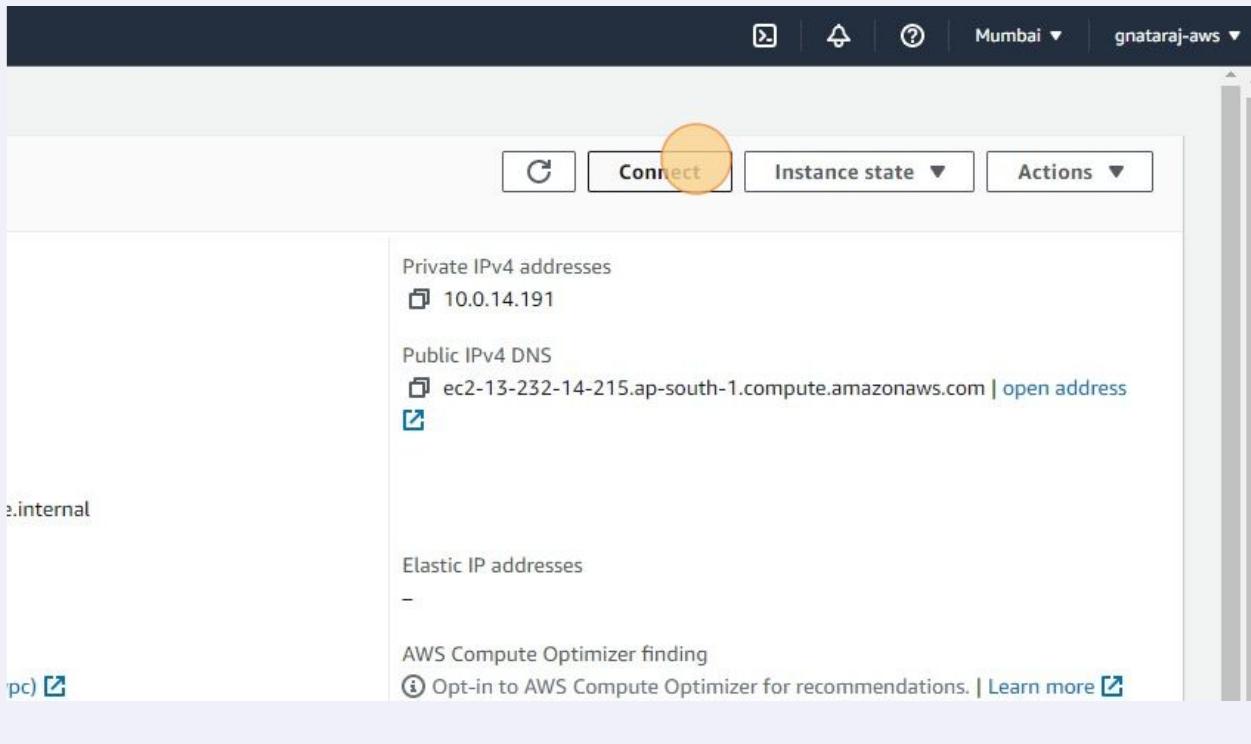
A screenshot of the AWS Lambda console showing the success message for launching an instance. The message reads: "Successfully initiated launch of instance ([i-052cca3322663eb68](#))". The URL is highlighted with a yellow circle. Below the message is a link "▶ Launch log".

Next Steps

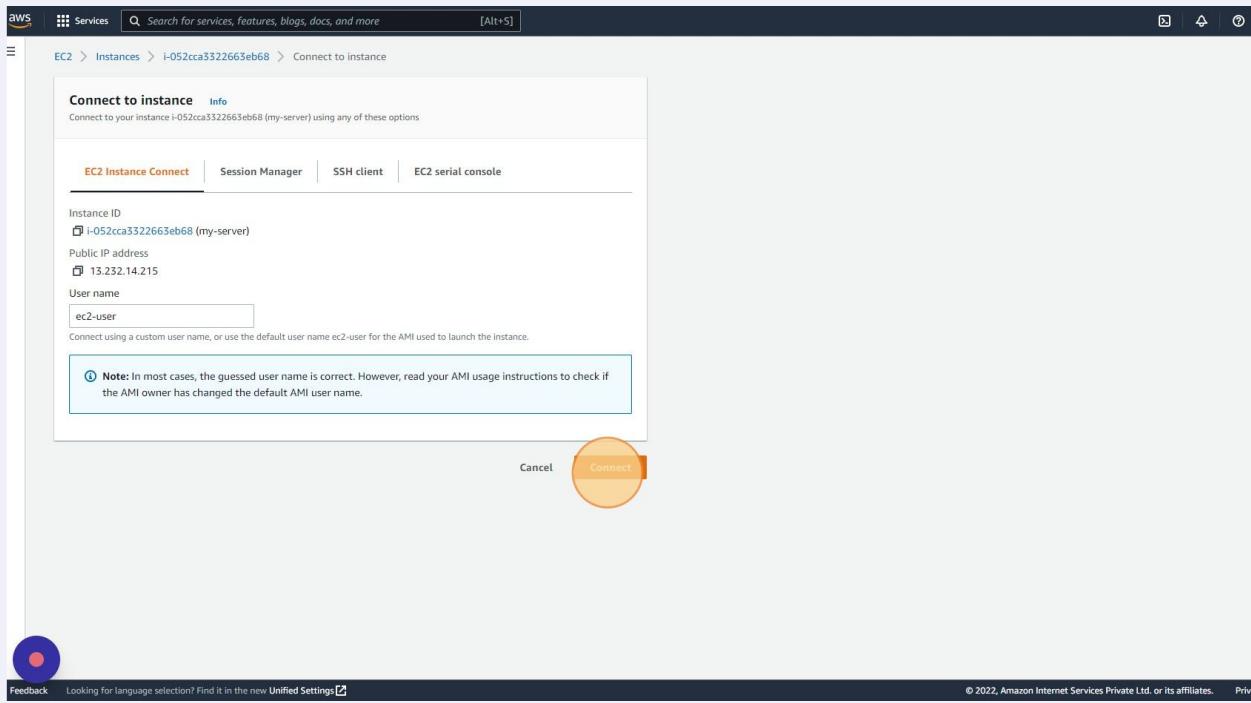
Get notified of estimated charges

Create [billing alerts](#) to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, \$100).

30 Click "Connect"



31 Select the EC2 Instance Connect and click Connect



32 You will be provided with the EC2 instance Shell

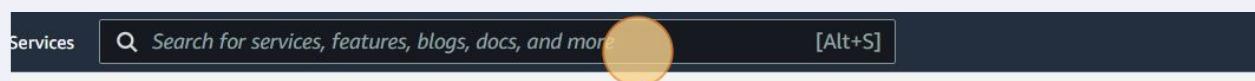
```
  _\|_(_|_/_ ) Amazon Linux 2 AMI  
  _\|\_\_|_||  
s://aws.amazon.com/amazon-linux-2/  
-user@ip-10-0-14-191 ~]$ █
```

5. Setting up RDS MySQL DB instance in the new VPC

Scribe 

- 1 Navigate to <https://ap-south-1.console.aws.amazon.com/console/home?region=ap-south-1>

- 2 Click the "Search for services, features, blogs, docs, and more" field.



Console Home [Info](#)

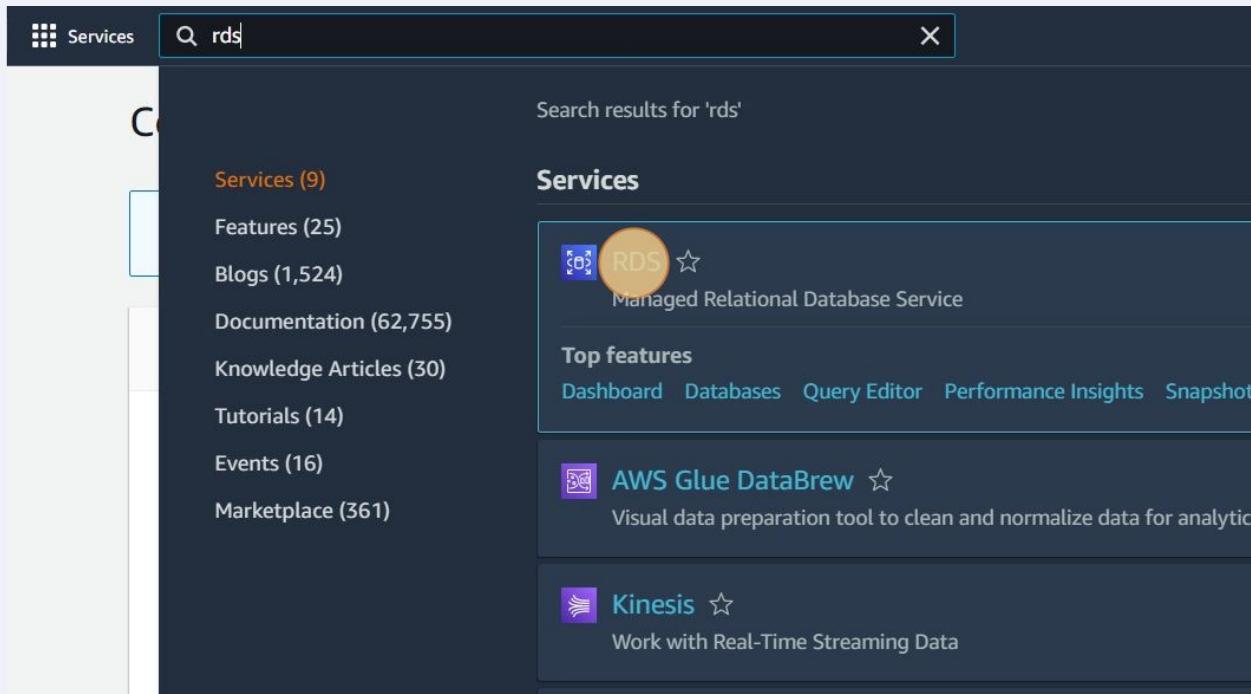
 Introducing the new widget Recent AWS blog posts. Find it at the bottom of your Console Home.

Recently visited [Info](#)

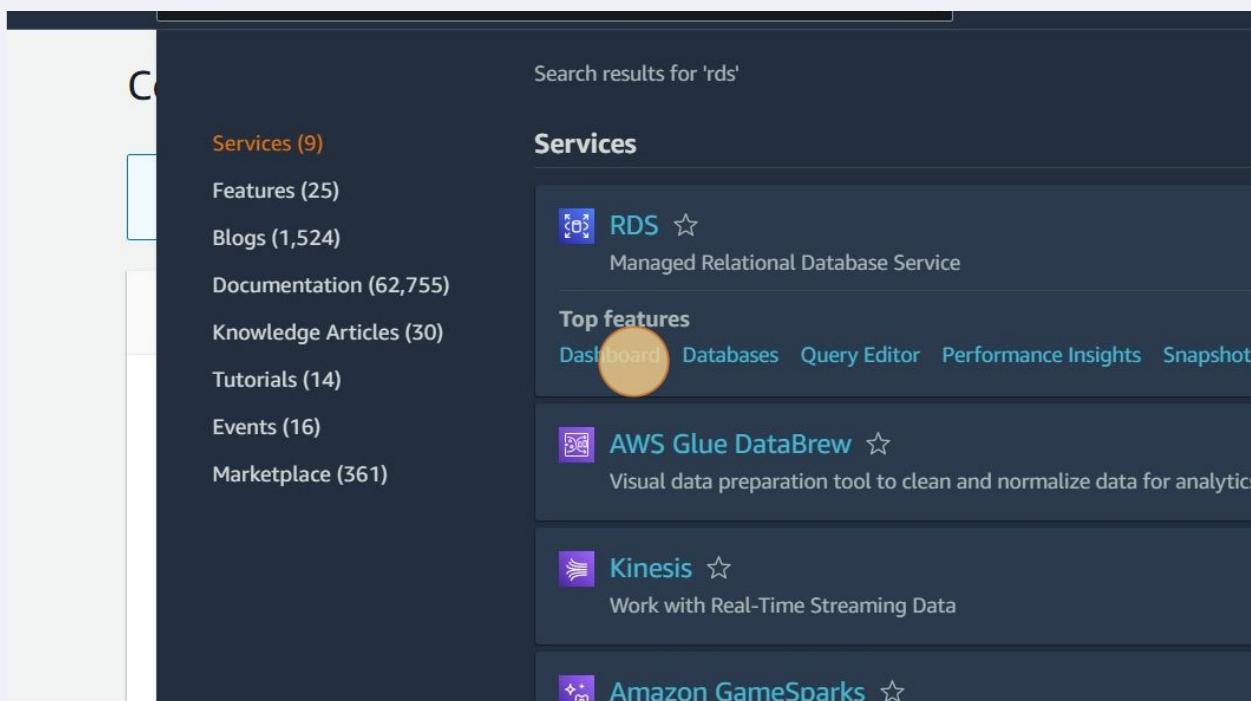
-  EC2
-  VPC
-  Support
-  RDS
-  Certificate Manager

- 3 Type "rds"

4 Click "RDS"



5 Click "Dashboard"



6 Click "Databases"

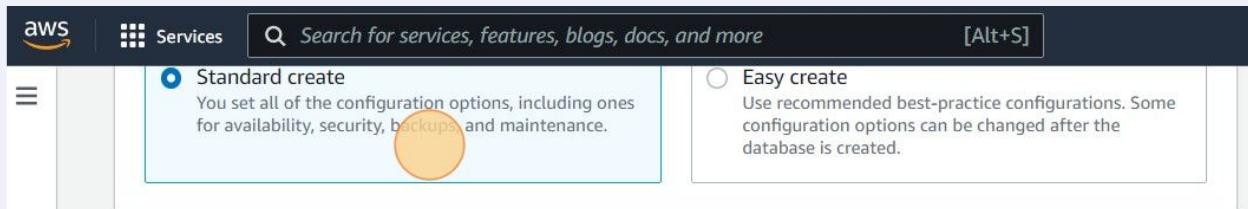
The screenshot shows the AWS RDS Dashboard. On the left, there is a sidebar with the following menu items: Dashboard (highlighted with a yellow circle), Databases (highlighted with a yellow circle), Query Editor, Performance Insights, Snapshots, Automated backups, Reserved instances, Proxies, Subnet groups, Parameter groups, Option groups, and Custom endpoints. The main content area is titled "Amazon Aurora" and contains the following text: "Amazon Aurora is a MySQL- and PostgreSQL-compatible enterprise-class database service that provides automatic backups, monitoring, and scaling. It offers up to 10x performance improvement, 10x storage capacity, 6-way replication across three availability zones, and 15 low-latency endpoints." Below this text are two buttons: "Create database" and "Or, Restore Aurora DB cluster from S3". At the bottom of the main content area, there is a section titled "Resources" with the following information: "You are using the following Amazon RDS resources in the Asia Pacific (Mumbai) region." It lists DB Instances (0/20), Parameter groups (2), Allocated storage (0 TB/100 TB), Increase DB instances limit (checkbox checked), DB Clusters (0/40), and Option groups (1).

7 Click "Create database"

The screenshot shows the "Create database" page in the AWS RDS console. At the top, there is a toolbar with the following buttons: Group resources (with a blue circle icon), Modify, Actions (dropdown), Restore from S3, and Create database (highlighted with a yellow circle). Below the toolbar, there is a search bar and a navigation bar with icons for back, forward, and refresh. The main content area has a table header with columns: Role (dropdown), Engine (dropdown), Region & AZ (dropdown), Size (dropdown), Status (dropdown), CPU, and Current activity. The table body displays the message "No instances found".

8

Click Standard Create - "You set all of the configuration options, including ones for availability, security, backups, and maintenance."



Engine options

Engine type [Info](#)

Amazon Aurora



MySQL



MariaDB



PostgreSQL



Oracle



Microsoft SQL Server



9

Select "MySQL"

Engine options

Engine type [Info](#)

Amazon Aurora



MySQL



MariaDB



PostgreSQL



Oracle

ORACLE

Microsoft SQL Server



Edition

10 Click "MySQL 8.0.28"

Edition

MySQL Community



Known issues/limitations

Review the [Known issues/limitations](#) to learn about potential compatibility issues with specific database versions.

Version

MySQL 8.0.28



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.

11 Click here.

MySQL 5.7.33

MySQL 5.7.34

MySQL 5.7.37

MySQL 5.7.38

MySQL 8.0.23

MySQL 8.0.25

MySQL 8.0.26

MySQL 8.0.27

MySQL 8.0.28



MySQL 8.0.30

MySQL 8.0.28



Templates

Choose a sample template to meet your use case.

Production

Dev/Test

Free tier

12 Select - Free Tier

issues/limitations

the Known issues/limitations [\[2\]](#) to learn about potential compatibility issues with specific versions.

nplate to meet your use case.

'or high availability
istent

Dev/Test

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

Free tier

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

selection? Find it in the new [Unified Settings](#) [2]

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13 Set "admin" as the Master username

▼ Credentials Settings

Master username [Info](#)

Type a login ID for the master user of your DB instance.

admin

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

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 password [Info](#)

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

14 Click the "Master password" field.

▼ 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.
 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 password [Info](#)

Instance configuration
The DB instance configuration options below are limited to those supported by the engine that you selected above.

15 Type some password for Master Password and retype the password

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.
 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 password [Info](#)

Instance configuration
The DB instance configuration options below are limited to those supported by the engine that you selected above.

[Feedback](#)

Looking for language selection? Find it in the new [Unified Settings](#)

16 Select the DB Instance Class

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class [Info](#)

- Standard classes (includes m classes)
- Memory optimized classes (includes r and x classes)
- Burstable classes (includes t classes)

db.t3.micro
2 vCPUs 1 GiB RAM Network: 2,085 Mbps

Include previous generation classes

Storage

Storage type [Info](#)

General Purpose SSD (gp2)

Baseline performance determined by volume size

17 Click here.

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class [Info](#)

- Standard classes (includes m classes)
- Memory optimized classes (includes r and x classes)
- Burstable classes (includes t classes)

db.t3.micro
2 vCPUs 1 GiB RAM Network: 2,085 Mbps

Q

db.t3.micro
2 vCPUs 1 GiB RAM Network: 2,085 Mbps

db.t3.small
2 vCPUs 2 GiB RAM Network: 2,085 Mbps

db.t3.medium
2 vCPUs 4 GiB RAM Network: 2,085 Mbps

db.t3.large
2 vCPUs 8 GiB RAM Network: 2,780 Mbps

18 Choose the VPC created.

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.

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.

Default VPC (vpc-06260e2e0884cf32)

Default VPC (vpc-06260e2e0884cf32)

my-vpc-vpc (vpc-00d15623f78401a1a)

Create new VPC

DB Subnet group [Info](#)

Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.

back

Looking for language selection? Find it in the new [Unified Settings](#)

19

Click the "Connect to an EC2 compute resource" field.

Services [Alt+S]

Connectivity [Info](#)

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

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

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

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](#)

20 Click the "Connect to an EC2 compute resource" field.

source

er to set up a connection to a compute resource for this database. Setting up a connection will automatically change settings so that the compute resource can connect to this database.

Connect to an EC2 compute resource

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.

Info

instance to add as the compute resource for this database. A VPC security group is added to this EC2 instance. A VPC is also added to the database with an inbound rule that allows the EC2 instance to access the database.

instances



Info

In Dual-stack mode, make sure that you associate an IPv6 CIDR block with a subnet in the VPC you specify.

ources 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

The VPC defines the virtual networking environment for this DB instance.

(vpc-00d15623f78401a1a)



21 In the EC2 Instance drop down, select the server you created before.

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.

EC2 Instance Info

Choose the EC2 instance to add as the compute resource for this database. A VPC security group is added to this EC2 instance. A VPC security group is also added to the database with an inbound rule that allows the EC2 instance to access the database.

Choose EC2 instances



my-server



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.

my-vpc-vpc (vpc-00d15623f78401a1a)



Only VPCs with a corresponding DB subnet group are listed.

22 In the VPC Security group, select the "Choose Existing"

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

Additional VPC security group

Choose one or more options



 A new VPC security group *rds-ec2-1* will be added to enable connectivity with your compute resource.

Availability Zone [Info](#)
ap-south-1a

▶ Additional configuration

23 Select the previously created VPC Security Group

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

Additional VPC security group

Choose one or more options

 |

default

my-vpc-security-group



with your compute

Availability Zone [Info](#)
ap-south-1a

▶ Additional configuration

 Database authentication

24 Click here.

Ses Search for services, features, blogs, docs, and more [Alt+S]

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.

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.

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

VPC security group
Use one or more options

A new VPC security group rds-ec2-1 will be added to enable connectivity with your compute resource.

Availability Zone Info
ap-south-1a

Additional configuration

Looking for language selection? Find it in the new [Unified Settings](#)

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25 For Database Authentication, choose Password authentication.

A new VPC security group rds-ec2-1 will be added to enable connectivity with your compute resource.

Availability Zone Info
ap-south-1a

Additional configuration

Database authentication

Database authentication options Info

Password authentication
Authenticates using database passwords.

Password and IAM database authentication
Authenticates using the database password and user credentials through AWS IAM users and roles.

Password and Kerberos authentication
Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos Authentication.

Looking for language selection? Find it in the new [Unified Settings](#)

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26 Review the Estimated monthly costs of the DB Instance

► Additional configuration

Enhanced Monitoring

► Additional configuration

Database options, encryption turned on, backup turned on, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.

Estimated monthly costs

The Amazon RDS Free Tier is available to you for 12 months. Each calendar month, the free tier will allow you to use the Amazon RDS resources listed below for free:

- 750 hrs of Amazon RDS in a Single-AZ db.t2.micro, db.t3.micro or db.t4g.micro Instance.
- 20 GB of General Purpose Storage (SSD).
- 20 GB for automated backup storage and any user-initiated DB Snapshots.

[Learn more about AWS Free Tier.](#)

When your free usage expires or if your application use exceeds the free usage tiers, you simply pay standard, pay-as-you-go service rates as described in the [Amazon RDS Pricing page](#).

27 Click "Create database"

you for 12 months. Each calendar month, the free tier will allow you to

ow for free:

(db.t2.micro, db.t3.micro or db.t4g.micro Instance.

D).

and any user-initiated DB Snapshots.

application use exceeds the free usage tiers, you simply pay standard, in the [Amazon RDS Pricing page](#).

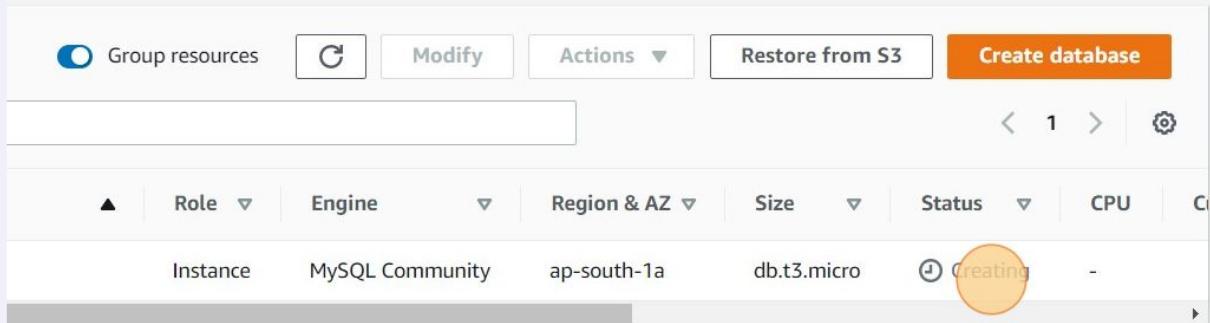
Cancel

Create database

[Unified Settings](#)

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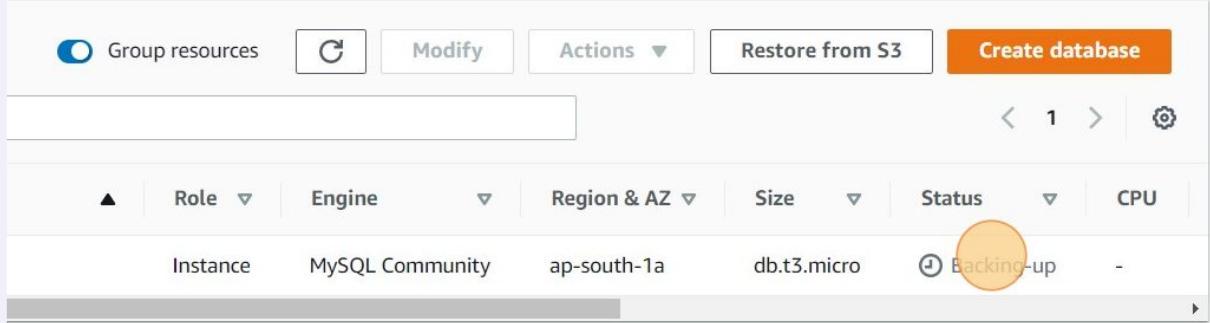
28 Double-click "Creating"



A screenshot of the AWS RDS console. At the top, there are buttons for 'Group resources', 'C' (Create), 'Modify', 'Actions', 'Restore from S3', and a prominent orange 'Create database' button. Below these are navigation controls for pages and a settings gear icon. The main area shows a table with columns: Role, Engine, Region & AZ, Size, Status, CPU, and Cost. A single row is visible, representing an instance named 'Instance'. The 'Status' column shows the value 'Creating' with a small circular icon containing a question mark. This entire status cell is highlighted with a yellow circle.

Role	Engine	Region & AZ	Size	Status	CPU	Cost
Instance	MySQL Community	ap-south-1a	db.t3.micro	Creating	-	

29 Click "Backing-up"



A screenshot of the AWS RDS console, identical to the previous one but with a different status. The 'Status' column now displays 'Backing-up' with a small circular icon containing a question mark. This entire status cell is highlighted with a yellow circle.

Role	Engine	Region & AZ	Size	Status	CPU	Cost
Instance	MySQL Community	ap-south-1a	db.t3.micro	Backing-up	-	

30 Double-click "Backing-up"

A screenshot of the AWS RDS MySQL database instance list. The interface includes a toolbar with 'Group resources', 'Modify', 'Actions', 'Restore from S3', and 'Create database' buttons. Below the toolbar is a search bar and navigation controls (< 1 > and a gear icon). A table lists database instances with columns: Role, Engine, Region & AZ, Size, Status, and CPU. One instance is shown: Instance (MySQL Community), Region & AZ (ap-south-1a), Size (db.t3.micro), Status (Backing-up), and CPU (-). The 'Backing-up' status cell is highlighted with a yellow circle.

Role	Engine	Region & AZ	Size	Status	CPU
Instance	MySQL Community	ap-south-1a	db.t3.micro	Backing-up	-

31 Click "Backing-up"

32 Double-click "Available"

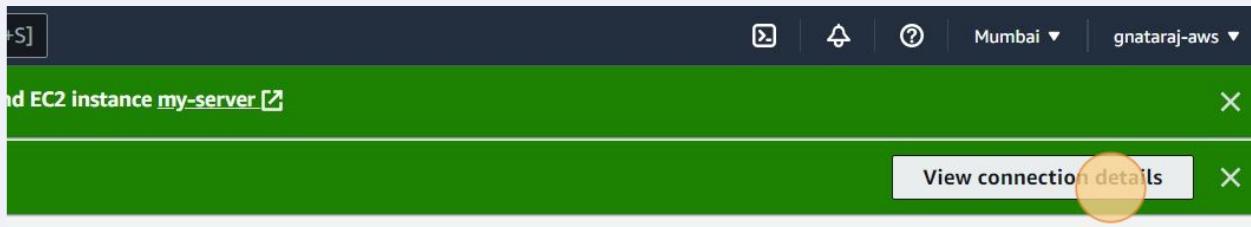
Instance	Engine	Region & AZ	Size	Status	CPU	Storage
Instance Name	MySQL Community	ap-south-1a	db.t3.micro	Available	-	100 GB

33 Click here.

Instance	Engine	Region & AZ	Size	Status	CPU	Storage
Instance Name	MySQL Community	ap-south-1a	db.t3.micro	Available	-	100 GB

34

Click "View connection details"



Group resources

Modify

Actions ▾

Restore from S3

Create database

< 1 > ⚙

▲ Role ▾ Engine ▾ Region & AZ ▾ Size ▾ Status ▾ CPU ▾ C

Instance	Engine	Region & AZ	Size	Status	CPU
MySQL Community	ap-south-1a	db.t3.micro	Available	-	

35

Click "Copy"

This is the only time you will be able to view this password. Copy and save the pass for your reference, otherwise you will need to modify the database to change it. You can use a SQL client application or utility to connect to your database.

[Learn about connecting to your database](#)

Master username

admin

Master password

password

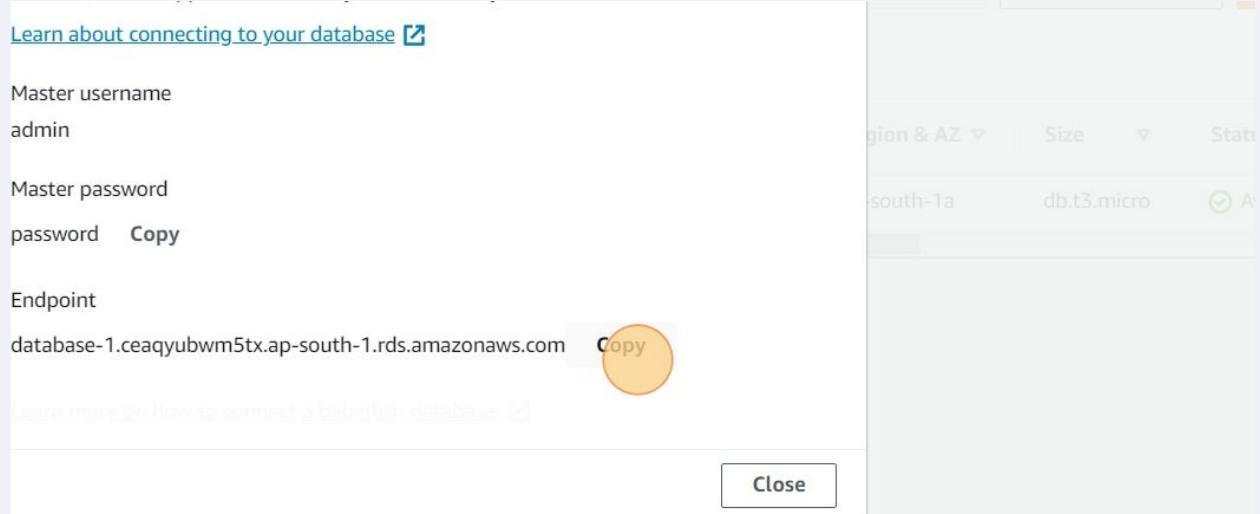
[Copy](#)

Endpoint

database-1.ceaqyubwm5tx.ap-south-1.rds.amazonaws.com [Copy](#)

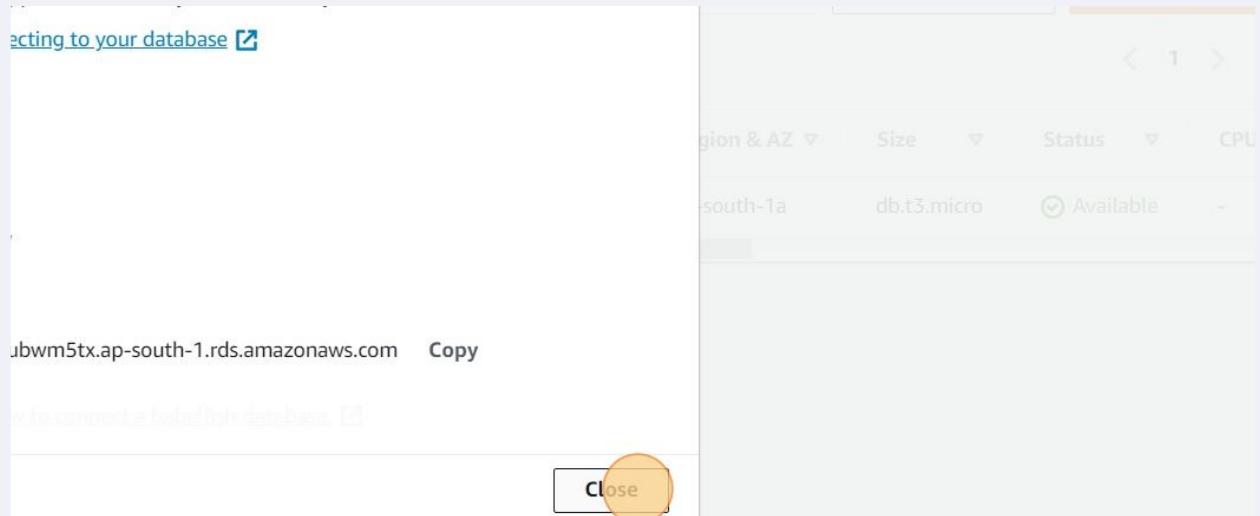
[Close](#)

36 Click "Copy"



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37 Click "Close"



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38 Click here.

RDS > Databases

Databases

Filter by databases

DB identifier	Role	Engine
database-1	Instance	MySQL Commun

39 Click this radio button.

Databases

- Query Editor
- Performance Insights
- Snapshots
- Automated backups
- Reserved instances
- Proxies
- Subnet groups
- Parameter groups
- Option groups
- Custom engine versions
- Events
- Event subscriptions
- Recommendations

RDS > Databases

Databases

Filter by databases

DB identifier	Role	Engine
database-1	Instance	MySQL Commun

40 Click "database-1"

The screenshot shows the AWS RDS Databases page. On the left, there's a sidebar with various navigation links like 'Editor', 'Performance Insights', 'Logs', 'Rotated backups', 'Used instances', etc. The main area is titled 'Databases' and shows a list of databases. A search bar at the top says 'Filter by databases'. Below it, there's a table header with columns 'DB identifier', 'Instance', and 'MyS'. The first row in the table is highlighted with a yellow circle around the 'DB identifier' column, which contains the value 'database-1'.

41 Click "No"

The screenshot shows the 'Networking & Security' section of the AWS RDS DB instance configuration page. It's divided into two tabs: 'Networking' and 'Security'. In the 'Networking' tab, you can see the 'Availability Zone' (ap-south-1a), 'VPC' (my-vpc-vpc), 'Subnet group' (rds-ec2-db-subnet-group-2), 'Subnets' (three subnet IDs), and 'Network type' (IPv4). In the 'Security' tab, it shows 'VPC security groups' (rds-ec2-1, my-vpc-security-group), both marked as 'Active'. Under 'Publicly accessible', the value 'No' is highlighted with a yellow circle. Other security-related fields include 'Certificate authority' (rds-ca-2019) and 'Certificate authority date' (August 22, 2024, 22:38 (UTC+05:30)).

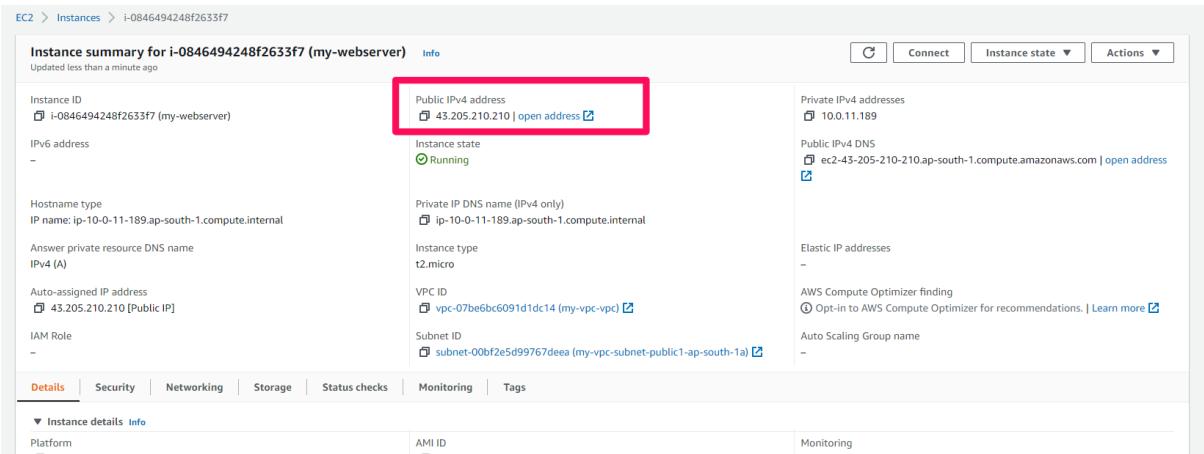
42 Click here.

lity Zone	VPC security groups
h-1a	rds-ec2-1 (sg-089df9ecc8248f6d5) <input checked="" type="checkbox"/> Active
·vpc (vpc-23f78401a1a)	my-vpc-security-group (sg-038e35c47f2cdbe33) <input checked="" type="checkbox"/> Active
group	Publicly accessible
·db-subnet-group-2	<input type="checkbox"/> No
;	Certificate authority
060234b19c77f3b68	rds-ca-2019
008f095320d83e54f	Certificate authority date
096d5dcf5aabff90	August 22, 2024, 22:38 (UTC+05:30)
↳ type	



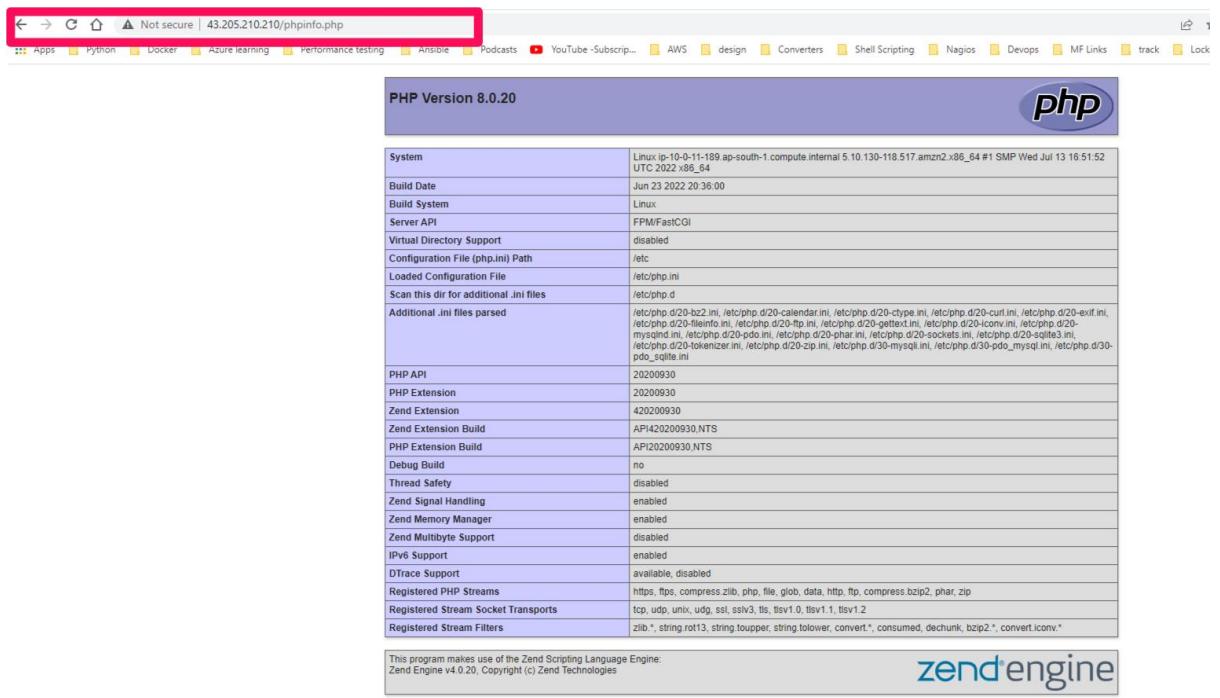
6. Setting up the DB connections and testing the configuration

1. Access the EC2 Instance you created and copy the Public IPv4 Address



The screenshot shows the AWS EC2 Instances page. In the center, there's a detailed view of an instance named "my-webserver". The "Public IPv4 address" field is highlighted with a red box and contains the value "43.205.210.210 | open address". Other visible details include the instance ID (i-0846494248f2633f7), IP name (ip-10-0-11-189.ap-south-1.compute.internal), VPC ID (vpc-07be6bc6091d1dc14), and Subnet ID (subnet-00bf2e5d99767deea).

2. Access the phpinfo.php page from the browser with the Public IPv4 address



The screenshot shows a web browser window with the URL "43.205.210.210/phpinfo.php" in the address bar. The page itself is a PHP configuration report titled "PHP Version 8.0.20". It contains a large table with various PHP configuration settings. At the bottom of the page, it says "This program makes use of the Zend Scripting Language Engine: Zend Engine v4.0.20, Copyright (c) Zend Technologies" and features the "zend engine" logo.

System	
Build Date	Jun 23 2022 20:36:00
Build System	Linux
Server API	FPM/FastCGI
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc
Loaded Configuration File	/etc/php.ini
Scan this dir for additional .ini files	/etc/php.d
Additional .ini files parsed	/etc/php.d/20-bz2.ini, /etc/php.d/20-calendar.ini, /etc/php.d/20-ctype.ini, /etc/php.d/20-curl.ini, /etc/php.d/20-exif.ini, /etc/php.d/20-fileno.ini, /etc/php.d/20-fp.ini, /etc/php.d/20-gettext.ini, /etc/php.d/20-conv.ini, /etc/php.d/20-mbstring.ini, /etc/php.d/20-pdo.ini, /etc/php.d/20-phar.ini, /etc/php.d/20-sockets.ini, /etc/php.d/20-sqlite3.ini, /etc/php.d/20-tokenizer.ini, /etc/php.d/20-zip.ini, /etc/php.d/30-mysqli.ini, /etc/php.d/30-pdo_mysqli.ini, /etc/php.d/30-pdo_sqlite.ini
PHP API	20200930
PHP Extension	20200930
Zend Extension	420200930
Zend Extension Build	API420200930.NTS
PHP Extension Build	API20200930.NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	disabled
IPv6 Support	enabled
DTrace Support	available, disabled
Registered PHP Streams	https, ftps, compress.zlib, php, file, glob, data, http, ftp, compress.bzip2, phar, zip
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, sslv3, tls, tlsv1.0, tlsv1.1, tlsv1.2
Registered Stream Filters	zlib, string.rot13, string.toupper, string.tolower, convert*, consumed, dechunk, bzip2*, convert.iconv*

Configuration

bz2

3. Connect to the EC2 instance:

EC2 > Instances > i-0846494248f2633f7

Instance summary for i-0846494248f2633f7 (my-webserver) [Info](#)

Updated less than a minute ago

Instance ID	i-0846494248f2633f7 (my-webserver)	Public IPv4 address	43.205.210.210 open address	Private IPv4 addresses	10.0.11.189
IPv6 address	-	Instance state	Running	Public IPv4 DNS	ec2-43-205-210-210.ap-south-1.compute.amazonaws.com open address
Hostname type	IP name: ip-10-0-11-189.ap-south-1.compute.internal	Private IP DNS name (IPv4 only)	ip-10-0-11-189.ap-south-1.compute.internal	Elastic IP addresses	-
Answer private resource DNS name	IPv4 (A)	Instance type	t2.micro	AWS Compute Optimizer finding	Opt-in to AWS Compute Optimizer for recommendations. Learn more
Auto-assigned IP address	43.205.210.210 [Public IP]	VPC ID	vpc-07be6bc6091d1dc14 (my-vpc-vpc)	Auto Scaling Group name	-
IAM Role	-	Subnet ID	subnet-00bf2e5d9976deea (my-vpc-subnet-public1-ap-south-1a)		

[Details](#) [Security](#) [Networking](#) [Storage](#) [Status checks](#) [Monitoring](#) [Tags](#)

[Instance details](#) [Info](#)

Platform	AMI ID	Monitoring
----------	--------	------------

4.

EC2 > Instances > i-052cca3322663eb68 > Connect to instance

Connect to instance [Info](#)

Connect to your instance i-052cca3322663eb68 (my-server) using any of these options

[EC2 Instance Connect](#) [Session Manager](#) [SSH client](#) [EC2 serial console](#)

Instance ID
i-052cca3322663eb68 (my-server)

Public IP address
13.232.14.215

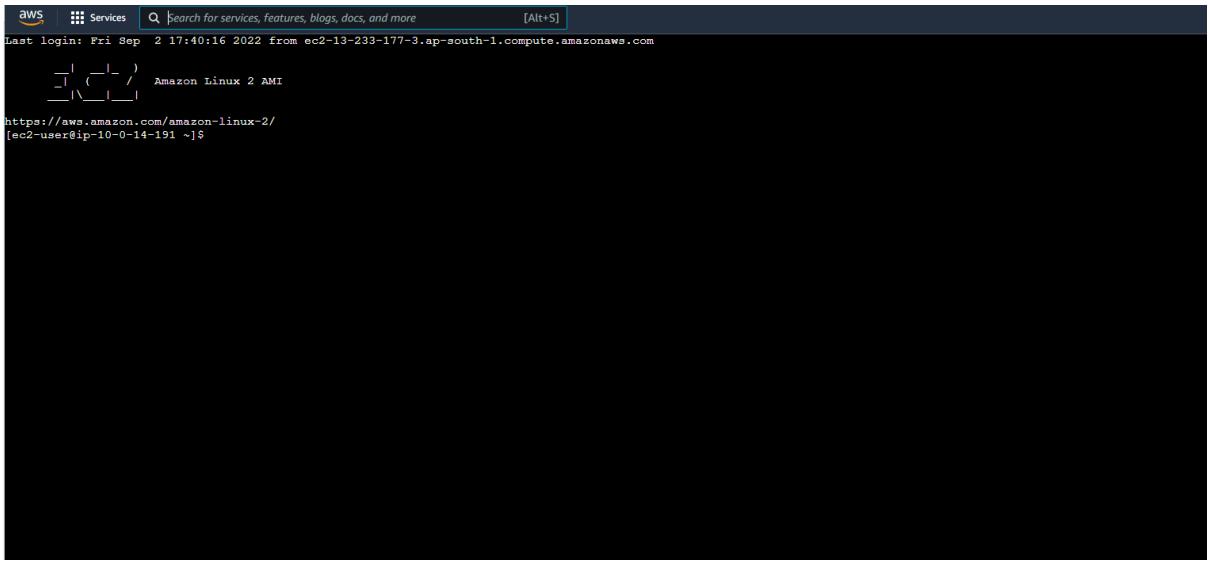
User name
ec2-user

Connect using a custom user name, or use the default user name ec2-user for the AMI used to launch the instance.

Note: In most cases, the guessed user name is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.

[Cancel](#) [Connect](#)

5.



A screenshot of an AWS CloudShell terminal window. The title bar says "aws Services [Alt+S]". The search bar contains "Search for services, features, blogs, docs, and more". Below the title bar, it says "Last login: Fri Sep 2 17:40:16 2022 from ec2-13-233-177-3.ap-south-1.compute.amazonaws.com". The terminal prompt shows a stylized tree logo followed by "Amazon Linux 2 AMI" and the path "[ec2-user@ip-10-0-14-191 ~]\$". The rest of the window is blacked out.

6. Connect to the SQL server and create the database and table:

```
[ec2-user@ip-10-0-14-191 ~]$ mysql -u admin -p'password' -h database-1.ceaqyubwm5tx.ap-south-1.rds.amazonaws.com
```

Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MySQL connection id is 50
Server version: 8.0.28 Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c'

7. Create the database

```
MySQL [(none)]> create database employees_db;  
Query OK, 1 row affected (0.005 sec)
```

8. Check the database

```
MySQL [(none)]> show databases;
```

```
+-----+  
| Database |  
+-----+  
| employees_db |  
| information_schema |  
| mysql |  
| performance_schema |
```

```
| sys |
+-----+
5 rows in set (0.001 sec)
```

9. Change to the database:

```
MySQL [(none)]> use employees_db;
```

Database changed

```
MySQL [employees_db]>
```

10. Create table:

```
MySQL [employees_db]> CREATE TABLE employees (
-> id INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
-> name VARCHAR(100) NOT NULL,
-> address VARCHAR(255) NOT NULL,
-> salary INT(10) NOT NULL
-> );
```

Query OK, 0 rows affected, 1 warning (0.033 sec)

For copy and paste, use the below:

```
CREATE TABLE employees (
id INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
name VARCHAR(100) NOT NULL,
address VARCHAR(255) NOT NULL,
salary INT(10) NOT NULL
);
```

11. Check the tables:

```
MySQL [employees_db]> show tables;
```

```
+-----+
| Tables_in_employees_db |
+-----+
| employees |
+-----+
1 row in set (0.001 sec)
```

11.a -> *Exit the mysql prompt by typing exit command.*

12. Fork the Github repo to your Github account and update the dB detail:

- a. Navigate to github.com/gnataraj/php-mysql
- b. Click on Fork

A screenshot of a GitHub repository page. At the top, there are buttons for 'Watch' (1), 'Fork' (0), and 'Star' (0). The 'Fork' button is highlighted with a yellow circle. Below the header, there are tabs for 'Add file' and 'Code'. The 'Code' tab is selected. On the left, there's a sidebar with commit history: '1 hour ago ⏲ 3 commits', '5 hours ago', '5 hours ago', '5 hours ago', '5 hours ago', and '5 hours ago'. To the right of the sidebar, under the 'About' section, it says 'No description, website, or topics provided.' and shows statistics: '0 stars', '1 watching', and '0 forks'. Under the 'Releases' section, it says 'No releases published'.

c. Click on Create fork

A screenshot of the 'Create fork' dialog box on GitHub. It has fields for 'Description (optional)' and 'Copy the main branch only' (which is checked). A note below says 'Contribute back to gnataraj/php-mysql by adding your own branch. Learn more.' There is also a note '(i) You are creating a fork in your personal account.' At the bottom is a large green 'Create fork' button, which is highlighted with a yellow circle.

- d. This will create the fork of this project in your account (Next steps have to be performed in your account)
e. Open the "config.php" file

This branch is up to date with gnataraj/php-mysql:main.

gnataraj	Update user-data.txt
config.php	initial commit
create.php	initial commit
delete.php	initial commit
error.php	initial commit
index.php	initial commit
read.php	initial commit
update.php	initial commit
user-data.txt	Update user-data.txt

f. Edit the file by clicking on Edit icon

/ config.php / < Jump to [Go to file](#) ...

Latest commit b67c0db 5 hours ago [History](#)

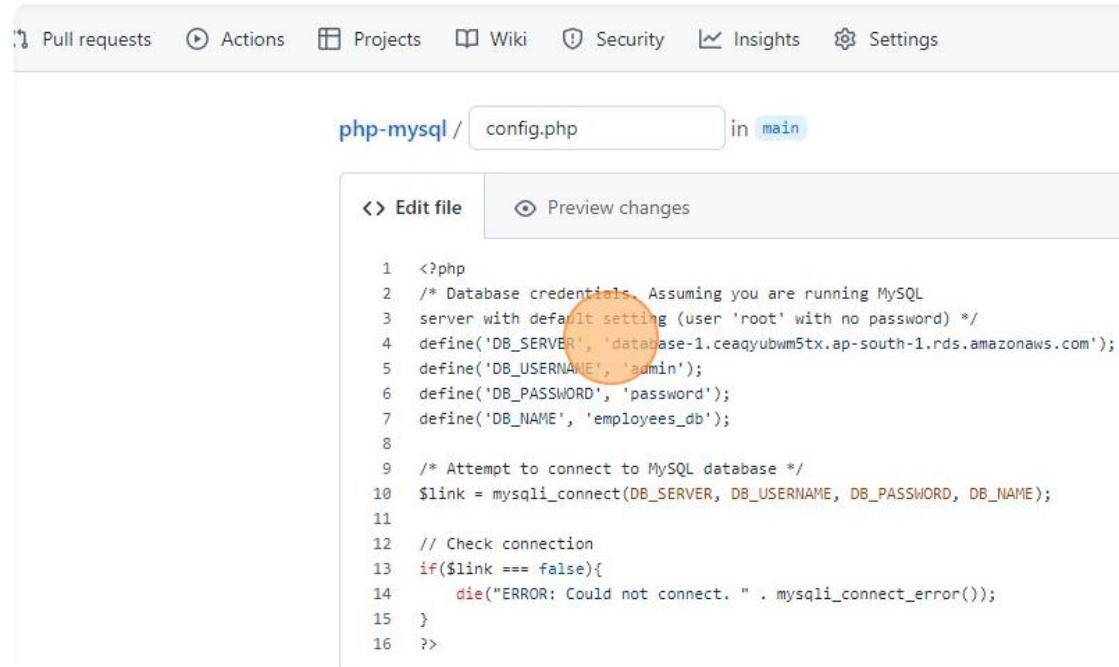
Raw Black [Edit](#) [Copy](#)

```
atis. Assuming you are running MySQL
setting (user 'root' with no password) */
'database=1.ceadqvwm5tx.ap-south-1.rds.amazonaws.com';
, 'admin');
, 'password');
employees_db");
```

t to MySQL database */
ct(DB_SERVER, DB_USERNAME, DB_PASSWORD, DB_NAME);

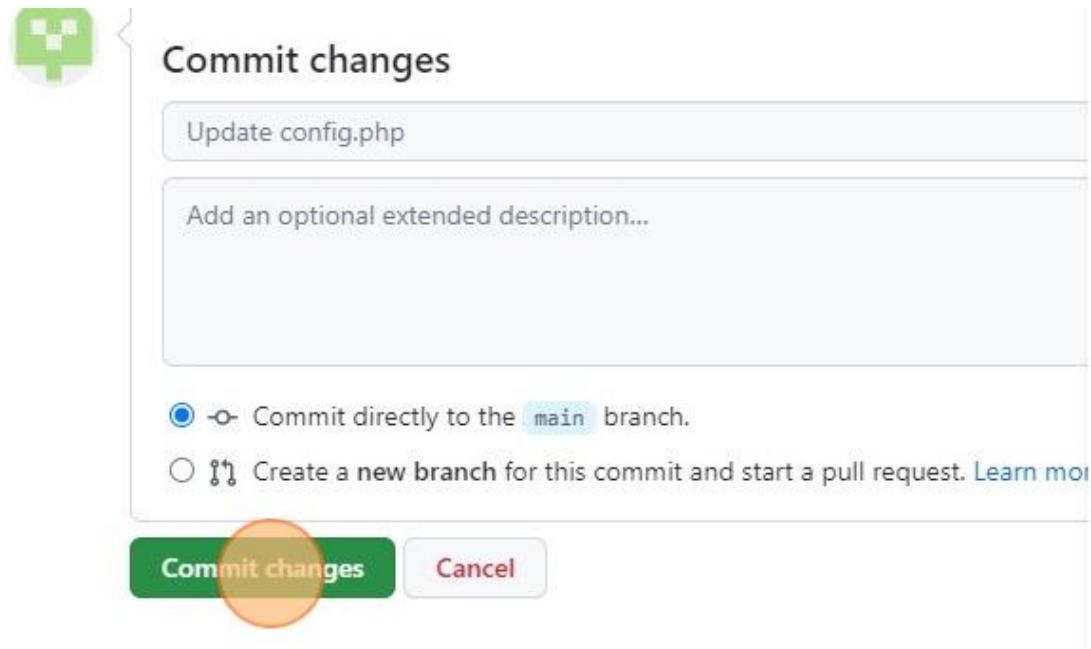
d not connect. " . mysqli_connect_error());

g. Update the value 'DB_SERVER' of with your db_server



```
1 <?php
2 /* Database credentials. Assuming you are running MySQL
3 server with default setting (user 'root' with no password) */
4 define('DB_SERVER', 'database-1.ceaqyubwm5tx.ap-south-1.rds.amazonaws.com');
5 define('DB_USERNAME', 'admin');
6 define('DB_PASSWORD', 'password');
7 define('DB_NAME', 'employees_db');
8
9 /* Attempt to connect to MySQL database */
10 $link = mysqli_connect(DB_SERVER, DB_USERNAME, DB_PASSWORD, DB_NAME);
11
12 // Check connection
13 if($link === false){
14     die("ERROR: Could not connect. " . mysqli_connect_error());
15 }
16 ?>
```

- h. Commit the changes in to github in your project.



13. Updating the EC2 instance with the PHP project (Below steps have to be performed in EC2 instance.)

- a. Remove the phpinfo.php

```
ec2-user@ip-10-0-14-191 ~]$ rm /var/www/html/phpinfo.php
rm: remove write-protected regular file '/var/www/html/phpinfo.php'? Y
```

- b. Clone your git project to /var/www/html folder (replace gnataraj-mf with your github account(step number 12))

```
[ec2-user@ip-10-0-14-191 ~]$ git clone https://github.com/gnataraj-mf/php-mysql.git /var/www/html/
Cloning into '/var/www/html'...
remote: Enumerating objects: 21, done.
remote: Counting objects: 100% (21/21), done.
remote: Compressing objects: 100% (21/21), done.
remote: Total 21 (delta 9), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (21/21), 9.00 KiB | 3.00 MiB/s, done.
Resolving deltas: 100% (9/9), done.
```

14. Testing the configuration:

- a. Access the public IPv4 IP address of the EC2 instance.

The screenshot shows a web browser window with the following details:

- Address Bar:** Not secure | 13.233.162.234
- Toolbar:** Includes back, forward, refresh, home, and search icons.
- Bookmark Bar:** Apps, Python, Docker, Azure learning, Performance testing, and Other bookmarks.
- Content Area:**
 - Title:** Employees Details
 - Buttons:** + Add New Employee (highlighted with an orange circle)
 - Message:** No records were found.

- b. Click on Add New Employee

The screenshot shows the same 'Employees Details' page as before, but the '+ Add New Employee' button has been clicked. The button is now highlighted with an orange circle, indicating it has been selected.

- c. Create few employees with details

Create Record

Please fill this form and submit to add employee record to the database.

Name

Address

Salary

Submit **Cancel**



- d.

Employees Details **+ Add New Employee**

#	Name	Address	Salary	Action
3	Nataraj	Bangalore	5000	 

- e. Verify the db updated using mysql command:

```
MySQL [employees_db]> select * from employees;
+----+-----+-----+
| id | name | address | salary |
+----+-----+-----+
| 3 | Nataraj | Bangalore | 5000 |
+----+-----+-----+
1 row in set (0.001 sec)
```

Repeat the above steps a to e to Create/Read/Update and Delete (CRUD) operations.