

Day 44: Relational Database Service in AWS

Maninder Singh

Dear Learners, In Today's article we will explain Amazon Relational Database Service (Amazon RDS) that how RDS work,definitions & Tasks. So now let's start without wasting the time.

RDS:-

Amazon Relational Database Service (Amazon RDS) is a collection of managed services that makes it simple to set up and scale database in the cloud.

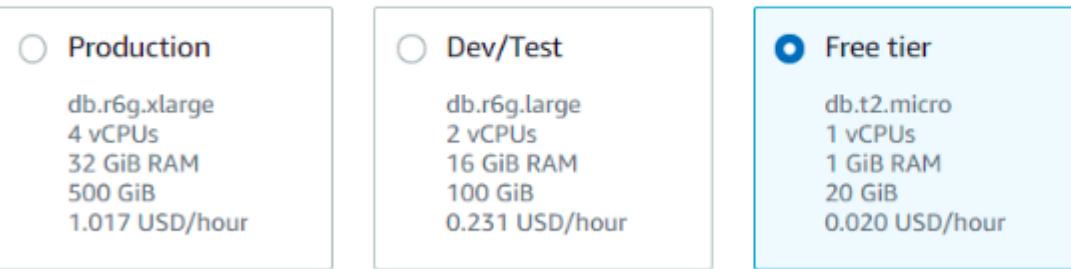
Configuration

Engine type [Info](#)

- Amazon Aurora
- MySQL
- MariaDB
- PostgreSQL
- Oracle
- Microsoft SQL Server

DB instance size

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Relational Database in AWS Types flow Diagram

I will Explain with the help of Tasks:

Prerequisites:-

Task-01

Login to your Amazon Account with username and Password.

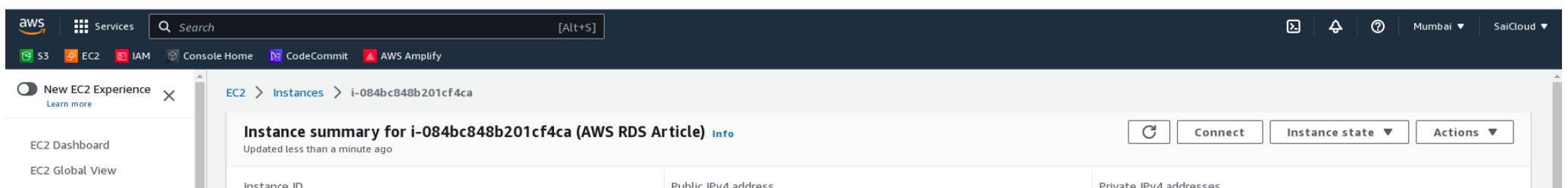
Go to the Amazon EC2 console.

Click on "Launch Instance" on the right side of page. Highlight in orange colour.

Choose a "Linux AMI", give a name to your Ec2 instance.

Choose an instance type according to your need, I have select the t2.micro.

Configure the Security group rules to allow inbound traffic on the Appropriate port for the type of database you are using (e.g port 3306 used for the MySQL).



Events

Limits

Instances

- Instances
- Instance Types
- Launch Templates
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Capacity Reservations

Images

- AMIs
- AMI Catalog

Elastic Block Store

- Volumes
- Snapshots
- Lifecycle Manager

Network & Security

Load Balancing

- Load Balancers

Choose an instance type according to your need, I have select the t2.micro Diagram

The screenshot shows the AWS CloudWatch Metrics interface. On the left, a sidebar lists various AWS services like Events, Limits, Instances, Images, Elastic Block Store, Network & Security, and Load Balancing. The main panel displays detailed metrics for an AWS Lambda function named 'i-084bc848b201cf4ca (AWS RDS Article)'. The metrics include:

- IPv6 address: -
 - Hostname type: IP name: ip-172-31-3-147.ap-south-1.compute.internal
 - Answer private resource DNS name: IPv4 (A)
 - Auto-assigned IP address: 3.110.49.185 [Public IP]
- Instance state: Running
- Private IP DNS name (IPv4 only): ip-172-31-3-147.ap-south-1.compute.internal
- Instance type: t2.micro
- VPC ID: vpc-03db84eb83ec9394d
- Subnet ID: subnet-04a0429aa6ec43c16
- Elastic IP addresses: -
 - AWS Compute Optimizer finding: Opt-in to AWS Compute Optimizer for recommendations.
 - Learn more
- Auto Scaling Group name: -
 - AWS Compute Optimizer finding: Opt-in to AWS Compute Optimizer for recommendations.
 - Learn more

Below the metrics, there are tabs for Details, Security, Networking, Storage, Status checks, Monitoring, and Tags. The Details tab is selected, showing the following instance details:

Detail	Value
Platform	Ubuntu (inferred)
Platform details	Linux/UNIX
Stop protection	Disabled
AMI ID	ami-03a933af70fa97ad2
AMI name	ubuntu/images/hvm-ssd/ubuntu-focal-20.04-amd64-server-20230328
Launch time	Sat May 20 2023 23:43:07 GMT+0530 (India Standard Time) (3 minutes)
Monitoring	disabled
Termination protection	Disabled
AMI location	amazon/ubuntu/images/hvm-ssd/ubuntu-focal-20.04-amd64-server-

Choose an instance type according to your need, I have select the t2.micro Diagram

The screenshot shows the AWS EC2 Security Groups interface. At the top, there's a navigation bar with links for S3, EC2, IAM, Console Home, CodeCommit, and AWS Amplify. The main area shows the path: EC2 > Security Groups > sg-0a45af3a9c37bb633 - launch-wizard-19 > Edit inbound rules. Below this, the title is "Edit inbound rules". A note says "Inbound rules control the incoming traffic that's allowed to reach the instance." The "Inbound rules" table has the following data:

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-0d03cc434eccde96e	HTTP	TCP	80	Custom	0.0.0.0/0 X
sgr-06c3271b3679dde9d	HTTPS	TCP	443	Custom	0.0.0.0/0 X

The screenshot shows the AWS Security Groups interface. At the top, there's a search bar and a delete button. Below it, two rules are listed:

- Rule 1: SSH (TCP port 22) - Custom (0.0.0.0/0)
- Rule 2: MYSQL/Aurora (TCP port 3306) - Anywhere... (0.0.0.0/0) - Note: For Mysql Port Connectivity

At the bottom right, there are buttons for Cancel, Preview changes, and Save rules.

In Our Security Group, I will allow the port 3306 used for the MySQL

Launch the instance.

The screenshot shows the AWS EC2 Instances page. On the left, a sidebar lists navigation options like EC2 Dashboard, Global View, Events, Limits, Instances (selected), Images, and Elastic Block Store. The main area displays a table of instances:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
AWS RDS Article	i-084bc848b201cf4ca	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1b	ec2-3-110-49-185.ap...

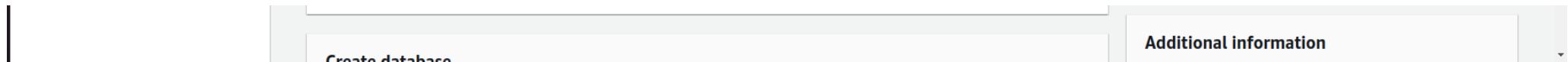
A modal window titled "Select an instance" is open at the bottom, showing the same instance details. The modal has a close button (X) in the top right corner.

Launch the instance mention a tag on your instance Diagram

2 Create a Free tier RDS instance of MySQL.

Go to the Amazon RDS console. Click on "Create Database option" highlight in orange colour.

The screenshot shows the Amazon RDS console interface. On the left, there's a sidebar with navigation links like Dashboard, Databases, Query Editor, etc. The main area has a callout box with the text: "Try the new Amazon RDS Multi-AZ deployment option for MySQL and PostgreSQL. For your Amazon RDS for MySQL and PostgreSQL workloads, improve transactional commit latencies by 2x, experience faster failover typically less than 35 seconds and, get read scalability with two readable standby DB instances by deploying the Multi-AZ DB cluster. Learn more". Below this, there's a "Create database" button and a link to "Or, Restore Multi-AZ DB Cluster from Snapshot". The central part of the screen is titled "Resources" and shows various resource counts: DB Instances (0/20), DB Clusters (0/40), Reserved instances (0/20), Snapshots (0), Parameter groups (0), Option groups (0), Subnet groups (0/20), Supported platforms (VPC), and Default network vpc-03db84eb83ec9394d. To the right, there's a "Recommended for you" section with links to "Implementing Cross-Region DR", "Test Your DR Strategy in Minutes", "Time-Series Tables in PostgreSQL", and "Migrate SSRS to RDS for SQL Server".



Click on "Create Database option" highlight in orange colour Diagram

In the Database creation method choose the Standard Create.

In Engine option:- I will select the MySQL, you can select according to your need like:- MariaDB, Oracle & PostgreSQL etc.

choose the Standard Create select the MySQL Diagram.

Choose the "Free tier" template for "DB instance class" no charges for the "free tier"

Choose the "Free tier" template for "DB instance Diagram".

Next Step:- Enter a unique name for the "DB instance identifier".

Set the "Master username" & "Master Password" for the database, It will used while login the database from the terminal, I will explain in it in Today Task.

The screenshot shows the 'Create database' step of the AWS RDS wizard. The 'DB instance identifier' field is highlighted with a red border. The field contains the value 'database-1'. Above the field, there is a dropdown menu set to '8.0.32'. Other fields shown include 'New master password' and 'Confirm master password', both with placeholder text '*****'. A note at the bottom states: 'Some features from RDS won't be supported if you want to manage the master credentials in Secrets Manager. Learn more'.

DB instance identifier [Info](#)
Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.
database-1
⚠ This field is required
The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

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.

Some features from RDS won't be supported if you want to manage the master credentials in Secrets Manager. [Learn more](#)

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

New 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](#)

Enter a unique name for the "DB instance Set the "Master username" & "Master Password" Diagram.

Set the "Virtual Private Cloud" and "Subnet group" to create the instance in.

Leave the other settings at their default values.

The screenshot shows the AWS RDS MySQL instance configuration page. In the top right corner, there is a modal window titled "MySQL" with the following content:

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

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

The main configuration area has two tabs: "Instance configuration" and "Storage".

Instance configuration: This tab shows the following settings:

- Amazon RDS Optimized Writes:** A callout box highlights the "Show Instance classes that support Amazon RDS Optimized Writes" option.
- DB Instance class:** "Burstable classes (includes t classes)" is selected. A dropdown menu shows "db.t3.micro" with details: 2 vCPUs, 1 GiB RAM, Network: 2,085 Mbps.
- Include previous generation classes:** This option is turned off.

Storage: This tab shows the following settings:

- Storage type:** "General Purpose SSD (gp2)" is selected. A note says "Baseline performance determined by volume size".
- Allocated storage:** The input field shows "20" GiB. A note says "The minimum value is 20 GiB and the maximum value is 6,144 GiB".

"Virtual Private Cloud" and "Subnet group" Diagram.

This screenshot shows the same AWS RDS MySQL instance configuration page, but the "VPC and Subnet group" section is visible at the bottom of the configuration pane. The "MySQL" modal window is still present in the top right.

Storage

Storage type [Info](#)

General Purpose SSD (gp2)
Baseline performance determined by volume size

Allocated storage [Info](#)

20 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.

Maximum storage threshold [Info](#)
Charges will apply when your database autoscales to the specified threshold

1000 GIB
The minimum value is 22 GIB and the maximum value is 6,144 GIB

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

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

Connectivity

[C](#)

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

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

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

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

Default VPC (vpc-03db84eb83ec9394d)
3 Subnets, 3 Availability Zones

Select the Storage Type Diagram.

Select EC2 instance.

[aws](#) | [Services](#) | [Alt+S] | [Mumbai](#) | [SaiCloud](#)

S3 | EC2 | IAM | [Console Home](#) | [CodeCommit](#) | [AWS Amplify](#)

The minimum value is 22 GIB and the maximum value is 6,144 GIB

MySQL [X](#)

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

Connectivity [Info](#)

[C](#)

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

Connect to an EC2 compute resource

Compute resource

- 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.

I-084bc848b201cf4ca [AWS RDS Article](#)

Some VPC settings can't be changed when a compute resource is added
Adding an EC2 compute resource automatically selects the VPC, DB subnet group, and public access settings for this database. To allow the EC2 instance to access the database, a VPC security group rds-ec2-X is added to the database and another called ec2-rds-X to the EC2 instance. You can remove the new security group for the database only by removing the compute resource.

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

Default VPC (vpc-03db84eb83ec9394d)
3 Subnets, 3 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

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

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

Capacity for your database

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

Select EC2 instance Diagram.

Choose VPC Security Group:-

DB subnet group name
rds-ec2-db-subnet-group-1

New DB subnet group created.

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

MySQL

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

- Supports database size up to 64 TiB.
- Supports General Purpose, Memory Optimized, and Burstable Performance Instance classes.

The screenshot shows the 'Additional VPC security group' section of the RDS instance creation wizard. It includes a dropdown menu labeled 'Choose one or more options' and a note stating: 'Amazon RDS will add a new VPC security group `rds-ec2-1` to allow connectivity with your compute resource.' Below this, the 'Availability Zone' is set to 'ap-south-1b'. The 'Certificate authority - optional' section notes that using a server certificate provides an extra layer of security by validating the connection. The selected certificate authority is 'rds-ca-2019 (default)'. A note below says, 'If you don't select a certificate authority, RDS chooses one for you.' There is also a collapsed section titled 'Additional configuration'.

- Supports automated backup and point-in-time recovery.
- Supports up to 15 Read Replicas per instance, within a single Region or 5 read replicas cross-region.

Choose VPC Security Group Diagram.

Click on the "Create database" to start the instance creation.

The screenshot shows the 'Database authentication' and 'Monitoring' sections of the RDS MySQL instance configuration page. In the 'Database authentication' section, 'Password authentication' is selected. The 'Monitoring' section includes an unchecked checkbox for 'Enable Enhanced monitoring' with the note: 'Enabling Enhanced monitoring metrics are useful when you want to see how different processes or threads use the CPU.' To the right, there is a summary card for MySQL, which states: 'MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.' It also lists several benefits:

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

► Additional configuration

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

Estimated Monthly costs

DB Instance	18.25 USD
Storage	2.62 USD
Total	20.87 USD

This billing estimate is based on on-demand usage as described in [Amazon RDS Pricing](#). Estimate does not include costs for backup storage, IOs (if applicable), or data transfer.

Click on the "Create database" Diagram.

The screenshot shows the AWS RDS MySQL creation wizard. The top navigation bar includes AWS logo, Services (selected), Search, and [Alt+S]. Below the navigation are links for S3, EC2, IAM, Console Home, CodeCommit, and AWS Amplify. The main content area has a sidebar with 'Additional configuration' (expanded) and 'Estimated monthly costs' sections. The 'Additional configuration' section contains a note about free tier usage and a link to the Amazon RDS Pricing page. The 'Estimated monthly costs' section shows a breakdown of charges: DB Instance (18.25 USD), Storage (2.62 USD), and Total (20.87 USD). A note states the estimate is based on on-demand usage and does not include costs for backup storage, IOs, or data transfer. It also links to the AWS Simple Monthly Calculator. The right side of the screen displays the MySQL service details, including its popularity as the most popular open-source database, its features (supporting various instance classes, automated backups, and up to 15 read replicas), and a list of benefits. At the bottom, there's a note about third-party rights and a link to learn more about the AWS Free Tier.

► Additional configuration

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

Estimated Monthly costs

DB Instance	18.25 USD
Storage	2.62 USD
Total	20.87 USD

This billing estimate is based on on-demand usage as described in [Amazon RDS Pricing](#). Estimate does not include costs for backup storage, IOs (if applicable), or data transfer.

Estimate your monthly costs for the DB Instance using the [AWS Simple Monthly Calculator](#).

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](#).

MySQL

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

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

Important You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services.

Cancel **Create database**

Click on the "Create database" Diagram.

Database is created.

Database is created Diagram.

After completing the Point 1 & Point 2, Move forward to Point to no 3:-

3. Create an IAM role for with RDS access.

Go to the IAM console in AWS. Click on "Roles". click on "Create Role" show in blue colour right side.

The screenshot shows the AWS IAM Roles page. The left sidebar has 'Identity and Access Management (IAM)' selected. The main area displays a table of 25 IAM roles. The columns are 'Role name', 'Trusted entities', and 'Last activity'. The 'Create role' button is visible at the top right of the table area.

Role name	Trusted entities	Last activity
Admin	AWS Service: ec2	-
amplify-login-lambda-04c5d977	AWS Service: lambda	67 days ago
amplify-m123-staging-83639-authRole	None	-
amplify-m123-staging-83639-unauthRole	None	-
ap-south-1_LPPN9GtZK-authRole	Identity Provider: cognito-identity.amazonaws.com	-
ap-south-1_LPPN9GtZK_Full-access	Identity Provider: cognito-identity.amazonaws.com, and 1 more....	-
ap-south-1_LPPN9GtZK_Manage-only	Identity Provider: cognito-identity.amazonaws.com	-
aws-ec2-spot-fleet-tagging-role	AWS Service: spotfleet	-
AWSApplicationMigrationAgentRole	AWS Service: mgn	-
AWSApplicationMigrationConversionServerRole	AWS Service: ec2	-
AWSApplicationMigrationLaunchInstanceWithDrsRole	AWS Service: ec2	-
AWSApplicationMigrationLaunchInstanceWithSsmRole	AWS Service: ec2	-
AWSApplicationMigrationMGHRole	AWS Service: mgn	-
AWSApplicationMigrationReplicationServerRole	AWS Service: ec2	-
AWSServiceRoleForApplicationMigrationService	AWS Service: mgn (Service-Linked Role)	15 minutes ago

<input type="checkbox"/>	AWSserviceRoleForAutoScaling	AWS Service: autoscaling (Service-Linked Role)	24 minutes ago
<input type="checkbox"/>	AWSserviceRoleForElasticLoadBalancing	AWS Service: elasticloadbalancing (Service-Linked Role)	3 days ago
<input type="checkbox"/>	AWSserviceRoleForGlobalAccelerator	AWS Service: globalaccelerator (Service-Linked Role)	-

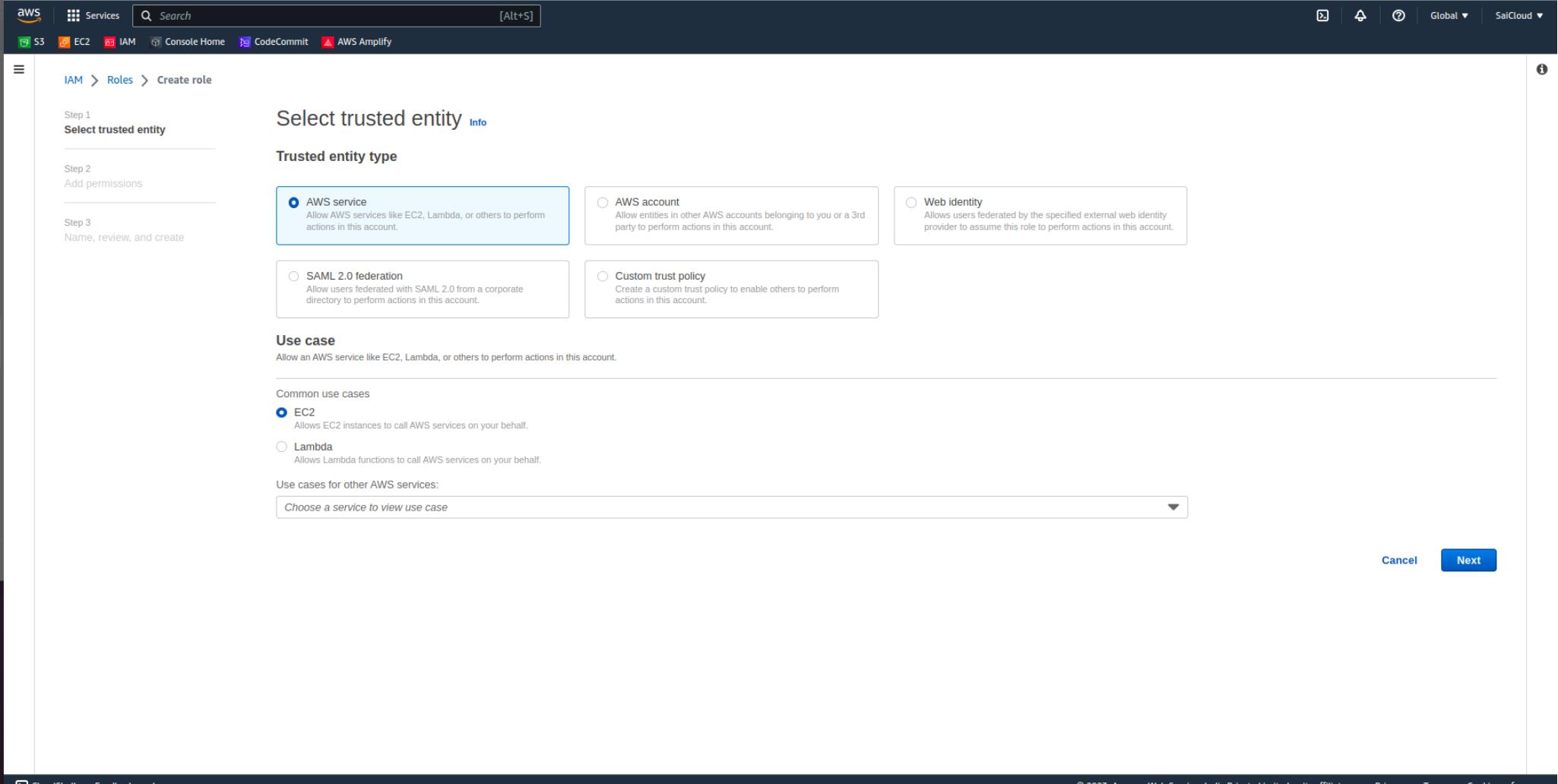
CloudShell Feedback Language

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Create an IAM role for with RDS access Diagram.

Choose the "AWS Service"

Choose "Allows Ec2 instance to call AWS Services on your behalf".



The screenshot shows the AWS IAM 'Create role' wizard, Step 1: Select trusted entity. The 'AWS service' option is selected under 'Trusted entity type'. The 'EC2' option is selected under 'Common use cases'.

Select trusted entity

Trusted entity type

- AWS service: Allow AWS services like EC2, Lambda, or others to perform actions in this account.
- AWS account: Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
- Web identity: Allows users federated by the specified external web identity provider to assume this role to perform actions in this account.
- SAML 2.0 federation: Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
- Custom trust policy: Create a custom trust policy to enable others to perform actions in this account.

Use case

Allow an AWS service like EC2, Lambda, or others to perform actions in this account.

Common use cases

- EC2: Allows EC2 instances to call AWS services on your behalf.
- Lambda: Allows Lambda functions to call AWS services on your behalf.

Use cases for other AWS services:

Choose a service to view use case

Cancel Next

Choose the "AWS Service" Diagram.

Need to be attached the "AmazonRDSFullAccess" policy.

The screenshot shows the AWS IAM 'Create role' wizard. The left sidebar shows 'Identity and Access Management (IAM)' with sections like 'Access management', 'Access reports', and 'Related consoles'. The main panel is titled 'Add permissions' and shows a table of policies. A search bar at the top right filters results for 'rds' and 'AmazonRDSFullAccess'. The 'AmazonRDSFullAccess' policy is listed with a checkmark next to it. Below the table, there's a section for 'Set permissions boundary - optional' with a note about controlling maximum permissions. At the bottom right are 'Cancel', 'Previous', and 'Next' buttons.

Need to be attached the "AmazonRDSFullAccess" policy. Diagram

Enter a Unique name for the role.

The screenshot shows the 'Enter a Unique name for the role' step of the wizard. The role name 'SaiCloud' is entered in the input field. The rest of the interface is identical to the previous screenshot, showing the 'Add permissions' step with the 'AmazonRDSFullAccess' policy selected.

S3 EC2 IAM Console Home CodeCommit AWS Amplify

Identity and Access Management (IAM)

Search IAM

Dashboard

Access management

- User groups
- Users
- Roles**
- Policies
- Identity providers
- Account settings

Access reports

- Access analyzer
- Archive rules
- Analyzers
- Settings
- Credential report
- Organization activity
- Service control policies (SCPs)

Related consoles

- IAM Identity Center New
- AWS Organizations

IAM > Roles > Create role

Step 1 Select trusted entity

Step 2 Add permissions

Step 3 Name, review, and create

Name, review, and create

Role details

Role name
Enter a meaningful name to identify this role.

Maximum 64 characters. Use alphanumeric and '+,-,@,_' characters.

Description
Add a short explanation for this role.

Maximum 1000 characters. Use alphanumeric and '+,-,@,_' characters.

Step 1: Select trusted entities

`1 [{ "Version": "2012-10-17",
2 "Statement": [
3 { "Effect": "Allow",
4 "Action": [
5 "sts:AssumeRole"
6],
7 "Principal": [
8 "AWS": [
9 "ec2.amazonaws.com"
10]
11]
12 }
13 }]
14]
15]
16 }`

Edit

Step 2: Add permissions

Edit

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Enter a Unique name for the role Diagram.

Click on "Create role"

S3 EC2 IAM Console Home CodeCommit AWS Amplify

Identity and Access Management (IAM)

Search IAM

IAM > Roles > Create role

Step 1 Select trusted entity

Step 2 Add permissions

Name, review, and create

Role details

Screenshot of the AWS IAM Role creation process:

Step 3: Name, review, and create

Role name: RoleforRD

Description: Allows EC2 instances to call AWS services on your behalf.

Step 1: Select trusted entities

Policy document (JSON):

```
1  {
2    "Version": "2012-10-17",
3    "Statement": [
4      {
5        "Effect": "Allow",
6        "Action": [
7          "sts:AssumeRole"
8        ],
9        "Principal": {
10          "Service": [
11            "ec2.amazonaws.com"
12          ]
13        }
14      }
15    ]
16 }
```

Step 2: Add permissions

Bottom navigation bar:

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- Terms
- Cookie preferences

Click on "Create role" Diagram

IAM Role is Successfully created, I will highlight in Blu Tick.

Screenshot of the AWS IAM Roles list:

Identity and Access Management (IAM)

Success message: Role RoleforRD created.

Roles (Selected 1/26) Info: An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Search bar: rolefor

Role name	Trusted entities	Last activity
AWSServiceRoleForApplicationMigrationService	AWS Service: mgn (Service-Linked Role)	18 minutes ago
AWSServiceRoleForAutoScaling	AWS Service: autoscaling (Service-Linked Role)	27 minutes ago

Account settings

Access reports

Access analyzer

Archive rules

Analyzers

Settings

Credential report

Organization activity

Service control policies (SCPs)

Related consoles

IAM Identity Center New

AWS Organizations

CloudShell Feedback Language

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<input type="checkbox"/> AWSServiceRoleForElasticLoadBalancing	AWS Service: elasticloadbalancing (Service-Linked Role)	3 days ago
<input type="checkbox"/> AWSServiceRoleForGlobalAccelerator	AWS Service: globalaccelerator (Service-Linked Role)	-
<input type="checkbox"/> AWSServiceRoleForRDS	AWS Service: rds (Service-Linked Role)	19 minutes ago
<input type="checkbox"/> AWSServiceRoleForSupport	AWS Service: support (Service-Linked Role)	-
<input type="checkbox"/> AWSServiceRoleForTrustedAdvisor	AWS Service: trustedadvisor (Service-Linked Role)	-
<input checked="" type="checkbox"/> RoleforRD	AWS Service: ec2	-

Roles Anywhere Info

Authenticate your non AWS workloads and securely provide access to AWS services.

Manage

Access AWS from your non AWS workloads

Operate your non AWS workloads using the same authentication and authorization strategy that you use within AWS.

X.509 Standard

Use your own existing PKI Infrastructure or use [AWS Certificate Manager Private Certificate Authority](#) to authenticate identities.

Temporary credentials

Use temporary credentials with ease and benefit from the enhanced security they provide.

Point No 4 is very Important:-

4 Assign the role to EC2 so that your EC2 instance can connect with RDS.

Go to the Ec2 console.

Select the instance you just created.

Click on "Actions" option then "Instance Settings", then "Attach/Replace IAM Role".

AWS Services Search [Alt+S]

S3 EC2 IAM Console Home CodeCommit AWS Amplify

New EC2 Experience Learn more

EC2 Dashboard EC2 Global View Events Limits Instances Instances Instance Types

Instances (1/1) Info

Find instance by attribute or tag (case-sensitive)

Instance state = running Clear filters

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Z
AWS RDS Article	i-084bc848b201cf4ca	Running	t2.micro	2/2 checks passed	No alarms	ap-south-1b

Actions ▾ Launch instances ▾

- Connect
- View details
- Manage instance state
- Instance settings ▾ Public IPv4
- Networking ▾ 3.110.49.1
- Security ▾
- Image and templates ▾
- Monitor and troubleshoot ▾

Change security groups
Get Windows password
Modify IAM role

Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations

Images

- AMIs
- AMI Catalog

Elastic Block Store

- Volumes
- Snapshots
- Lifecycle Manager

Network & Security

Load Balancing

- Load Balancers
- Target Groups

IMDSv2

CloudShell Feedback Language

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Instance: i-084bc848b201cf4ca (AWS RDS Article)

Details Security Networking Storage Status checks Monitoring Tags

Instance summary Info

Instance ID I-084bc848b201cf4ca (AWS RDS Article)	Public IPv4 address 3.110.49.185 open address	Private IPv4 addresses 172.31.3.147
IPv6 address -	Instance state Running	Public IPv4 DNS ec2-3-110-49-185.ap-south-1.compute.amazonaws.com open address
Hostname type IP name: ip-172-31-3-147.ap-south-1.compute.internal	Private IP DNS name (IPv4 only) ip-172-31-3-147.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 3.110.49.185 [Public IP]	VPC ID vpc-03db84eb83ec9394d	Auto Scaling Group name -
IAM Role -	Subnet ID subnet-04a0429aa6ec43c16	

Click on "Actions" option then "Instance Settings", then "Attach/Replace IAM Role" Diagram

Choose the IAM role you just created.

Click on the "Updated IAM role"

Services Search [Alt+S]

S3 EC2 IAM Console Home CodeCommit AWS Amplify

Mumbai ▾ SaiCloud ▾

EC2 > Instances > i-084bc848b201cf4ca > Modify IAM role

Modify IAM role [Info](#)

Attach an IAM role to your instance.

Instance ID
[I-084bc848b201cf4ca \(AWS RDS Article\)](#)

IAM role

Select an IAM role to attach to your instance or create a new role if you haven't created any. The role you select replaces any roles that are currently attached to your instance.

RoleforRD [Create new IAM role](#)

Cancel [Update IAM role](#)

Choose the IAM role you just created Click on the "Updated IAM role" Diagram.

5 Once the RDS instance is up and running, get the Credentials and connect your EC2 instance using a MySQL client.

Go to RDS console in AWS.

Select the Instance you just created.

Click "Configuration" and note the endpoint address.

The screenshot shows the AWS RDS console interface. The top navigation bar includes the AWS logo, a services menu, a search bar, and links for CloudShell, Feedback, Language, Privacy, Terms, and Cookie preferences. Below the navigation is a dark sidebar with the Amazon RDS logo and a list of options: Dashboard, Databases (which is selected and highlighted in orange), Query Editor, Performance Insights, Snapshots, Exports in Amazon S3, Automated backups, Reserved Instances, and Proxies. A Subnet groups link is also visible at the bottom of the sidebar. The main content area displays the 'database-1' instance under the 'Databases' section. The instance name 'database-1' is shown in large text. To the right are two buttons: 'Modify' and 'Actions ▾'. Below the instance name is a 'Summary' card with the following details:

DB Identifier	CPU	Status	Class
database-1	2.41%	Available	db.t3.micro
Role	Current activity	Engine	Region & AZ
Instance	0 Connections	MySQL Community	ap-south-1b

At the bottom of the summary card, there are tabs for Connectivity & security (which is selected and highlighted in orange), Monitoring, Logs & events, Configuration, Maintenance & backups, and Tags.

Parameter groups
Option groups
Custom engine versions
Events
Event subscriptions
Recommendations 2
Certificate update

Connectivity & security		
Endpoint & port	Networking	Security
Endpoint database-1.c4mwnlabtvvh.ap-south-1.rds.amazonaws.com	Availability Zone ap-south-1b	VPC security groups rds-ec2-1 (sg-0175f1aeb3760cdda) Active
Port 3306	VPC vpc-03db84eb83ec9394d	Publicly accessible No
	Subnet group rds-ec2-db-subnet-group-1	Certificate authority Info rds-ca-2019
	Subnets subnet-07aa9f9d6f0be6d5d subnet-096308b99a7f872ad subnet-0914c635013f85493	Certificate authority date August 22, 2024, 22:38 (UTC+05:30)
	Network type	DB instance certificate expiration date August 22, 2024, 22:38 (UTC+05:30)

Click "Configuration" and note the endpoint address Diagram.

Click "Security" and note the username and Password.

Amazon RDS		Instance	
Dashboard Databases Query Editor Performance insights Snapshots Exports in Amazon S3 Automated backups Reserved instances Proxies		Configuration DB instance ID database-1 Engine version 8.0.32 DB name - License model General Public License Option groups default:mysql-8-0 In sync Amazon Resource Name (ARN)  arn:aws:rds:ap-south-1:1:414310061589:db:database-1 Resource ID db-D4WG6TS6PW5SV426RT2FCSKCLA	Instance class Instance class db.t3.micro vCPU 2 RAM 1 GB Availability Master username admin Master password ***** IAM DB authentication Not enabled Multi-AZ - Storage Encryption Enabled AWS KMS key aws/rds Storage type General Purpose SSD (gp2) Storage 20 GiB Provisioned IOPS - Storage throughput - Storage autoscaling Enabled Maximum storage threshold
Subnet groups Parameter groups Option groups Custom engine versions			Performance Insights Performance Insights enabled Turned off

The screenshot shows the AWS RDS MySQL instance configuration page. On the left, there's a sidebar with 'Recommendations (2)' and 'Certificate update'. The main area displays instance details: Created time (May 21, 2023, 00:02 (UTC+05:30)), Secondary Zone (-), and Storage (1000 GiB). Below this, under 'Recommendations (2)', are two items: 'DB Instance parameter group default.mysql8.0 In sync' and 'Deletion protection Disabled'. At the bottom right of the recommendations section are 'Dismiss', 'Schedule', and 'Apply now' buttons.

Click "Security" and note the username and Password Diagram.

SSH into your EC2 instance using a Terminal or remote access tool.

The screenshot shows the 'Connect to instance' page for an EC2 instance. The top navigation bar includes 'Services', a search bar, and account information for 'Mumbai' and 'SaiCloud'. The breadcrumb path is 'EC2 > Instances > i-084bc848b201cf4ca > Connect to instance'. The main content area has tabs for 'EC2 Instance Connect', 'Session Manager', 'SSH client' (which is selected), and 'EC2 serial console'. Under 'SSH client', the 'Instance ID' is listed as 'i-084bc848b201cf4ca (AWS RDS Article)'. Below it are four numbered steps: 1. Open an SSH client., 2. Locate your private key file. The key used to launch this instance is apache1.pem, 3. Run this command, if necessary, to ensure your key is not publicly viewable. `chmod 400 apache1.pem`, and 4. Connect to your instance using its Public DNS: `ssh -i "apache1.pem" ubuntu@ec2-3-110-49-185.ap-south-1.compute.amazonaws.com`. A green box highlights the command and shows a tooltip 'Command copied'. A note at the bottom states: '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.' A 'Cancel' button is at the bottom right.

SSH into your EC2 instance Diagram.

Successfully login in account with SSH Key Diagram.

Need to be install the MySQL Client, such as "mysql". I will share the commands it will helpful for you for the installation.

Syntax:-

sudo apt install mysql-client-core-8.0

mysql --version

install the MySQL Client, such as "mysql" & Version check Diagram.

Connect to the RDS instance using the MySQL client and the endpoint address username, and Password.

Enter the password when prompter and press enter:-

you should now be connected to the MySQL database on the RDS instance.

Syntax:-

sudo mysql -h database-1.c4mwnlabtvwh.ap-south-1.rds.amazonaws.com -P 3306 -u admin -p

Enter the Password:- <>

you are enter in the mysql:-

mysql>

show databases;

```
Last login: Fri May 19 18:18:19 2023 from 106.204.197.71
ubuntu@s3bucket:~$ 
ubuntu@s3bucket:~$ sudo apt install mysql-client mysql-testsuite
mysql-client          mysql-testsuite
mysql-client-8.0        mysql-testsuite-8.0
mysql-client-core-8.0   mysqltcl
```

```

mysql-client-core-8.0      mysqltuner
mysql-common                mysqltuner
mysql-router                mysqmail
mysql-sandbox               mysqmail-courier-logger
mysql-server                mysqmail-dovecot-logger
mysql-server-8.0             mysqmail-postfix-logger
mysql-server-core-8.0        mysqmail-pure-ftpd-logger
mysql-source-8.0

ubuntu@s3bucket:~$ sudo apt install mysql-client
mysql-client                mysql-testsuite
mysql-client-8.0              mysql-testsuite-8.0
mysql-client-core-8.0          mysqltcl
mysql-common                  mysqltuner
mysql-router                  mysqmail
mysql-sandbox                 mysqmail-courier-logger
mysql-server                  mysqmail-dovecot-logger
mysql-server-8.0               mysqmail-postfix-logger
mysql-server-core-8.0          mysqmail-pure-ftpd-logger
mysql-source-8.0

ubuntu@s3bucket:~$ sudo apt install mysql-client-core-8.0
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  mysql-client-core-8.0
0 upgraded, 1 newly installed, 0 to remove and 17 not upgraded.
Need to get 5173 kB of archives.
After this operation, 75.5 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-core-8.0 amd64 8.0.33-0ubuntu0.20.04.2 [5173 kB]
Fetched 5173 kB in 1s (6318 kB/s)
Selecting previously unselected package mysql-client-core-8.0.
(Reading database ... 91438 files and directories currently installed.)
Preparing to unpack .../mysql-client-core-8.0_8.0.33-0ubuntu0.20.04.2_amd64.deb ...
Unpacking mysql-client-core-8.0 (8.0.33-0ubuntu0.20.04.2) ...
Setting up mysql-client-core-8.0 (8.0.33-0ubuntu0.20.04.2) ...
Processing triggers for man-db (2.9.1-1) ...
ubuntu@s3bucket:~$ mysql --version
mysql Ver 8.0.33-0ubuntu0.20.04.2 for Linux on x86_64 ((Ubuntu))
ubuntu@s3bucket:~$ 

```

sudo mysql -h database-1.c4mwnlabtvwh.ap-south-1.rds.amazonaws.com -P 3306 -u admin -p Diagram

(Note) if your RDS are not access please check the Endpoint address in RDS. It will take one or 2 min for access.

In this blog, I have discussed RDS Definition, create a database, attach with the IAM Role . If you have any questions or would like to share your experiences, feel free to leave a comment below. Don't forget to read my blogs and connect with me on LinkedIn and let's have a conversation.

Thank you for reading !! I hope you find this article helpful!!

Happy Learning!!

Next Topic:

Day 45: Deploy Wordpress Website on AWS