

Cloud and Big Data Architectures

Capstone-project

Screenshot of the AWS RDS console showing the creation of a new MariaDB database instance.

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

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed- InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

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

rds-ca-2019 (default)

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

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

MariaDB

MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

- 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.
- Supports global transaction ID (GTID) and thread pooling.
- Developed and supported by the MariaDB open source community.

Data Dashboard

Screenshot of the Amazon QuickSight Data Dashboard interface.

Filtres

Veuillez sélectionner une représentation visuelle pour créer des filtres

Visualisation

Sélecteurs de champs

Feuille 1

Somme de Revenue par Admit Date

Date	Revenue
Jan 2015	~1.5M
Feb 2015	~1.4M
Mar 2015	~1.3M
Apr 2015	~1.2M
May 2015	~1.1M
Jun 2015	~1.0M
Jul 2015	~1.1M
Aug 2015	~1.0M
Sep 2015	~1.1M
Oct 2015	~1.0M
Nov 2015	~1.1M
Dec 2015	~1.0M
Jan 2016	~1.1M
Feb 2016	~1.0M
Mar 2016	~1.1M
Apr 2016	~1.0M
May 2016	~1.1M
Jun 2016	~1.0M
Jul 2016	~1.1M
Aug 2016	~1.0M
Sep 2016	~1.1M
Oct 2016	~1.0M
Nov 2016	~1.1M
Dec 2016	~1.0M
Jan 2017	~1.1M
Feb 2017	~1.0M
Mar 2017	~1.1M
Apr 2017	~1.0M
May 2017	~1.1M
Jun 2017	~1.0M
Jul 2017	~1.1M
Aug 2017	~1.0M
Sep 2017	~1.1M
Oct 2017	~1.0M
Nov 2017	~1.1M
Dec 2017	~1.0M
Jan 2018	~1.1M
Feb 2018	~1.0M
Mar 2018	~1.1M
Apr 2018	~1.0M
May 2018	~1.1M
Jun 2018	~1.0M
Jul 2018	~1.1M
Aug 2018	~1.0M
Sep 2018	~1.1M
Oct 2018	~1.0M

Somme de Profit par Region

Region	Profit
South	~50%
West	~25%
East	~15%
Central	~10%

Nombre de Revenue
839 200 %

Classé en haut

Top 3 Region for total Profit are:

- South with 505,689.52
- West with 422,923.02
- East with 297,802.52

Période par rapport à la période

Total Cost for janv. 1, 2018 12:00am increased by 8.55% (**2,132.77**) from 24,941.53 to 27,074.3.

Actions

Communauté

The screenshot shows the AWS RDS (Relational Database Service) console for creating a new database instance. The interface is divided into several sections:

- VPC security group (firewall) Info**: A section where you can choose existing VPC security groups or create a new one. It includes a note that Amazon RDS will add a new VPC security group named `rds-ec2-1`.
- Additional VPC security group**: A dropdown menu showing the selected VPC security group: `aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU`.
- Certificate authority - optional Info**: A section for selecting a certificate authority, with `rds-ca-2019 (default)` selected.
- Availability Zone Info**: Set to `us-east-1d`.
- Database authentication**: A section for database authentication options, with `Password authentication` selected.
- MariaDB**: A detailed description of MariaDB Community Edition, listing its features such as support for MySQL-compatible database, various instance classes, automated backup, and global transaction ID support.

At the bottom, there are links for CloudShell, Feedback, Language, Privacy, Terms, and Cookie preferences.

Schéma de la structure

Screenshot of the AWS RDS setup wizard for creating a MariaDB database instance.

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

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

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

rds-ca-2019 (default)

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

Additional configuration

Database authentication

Database authentication options Info

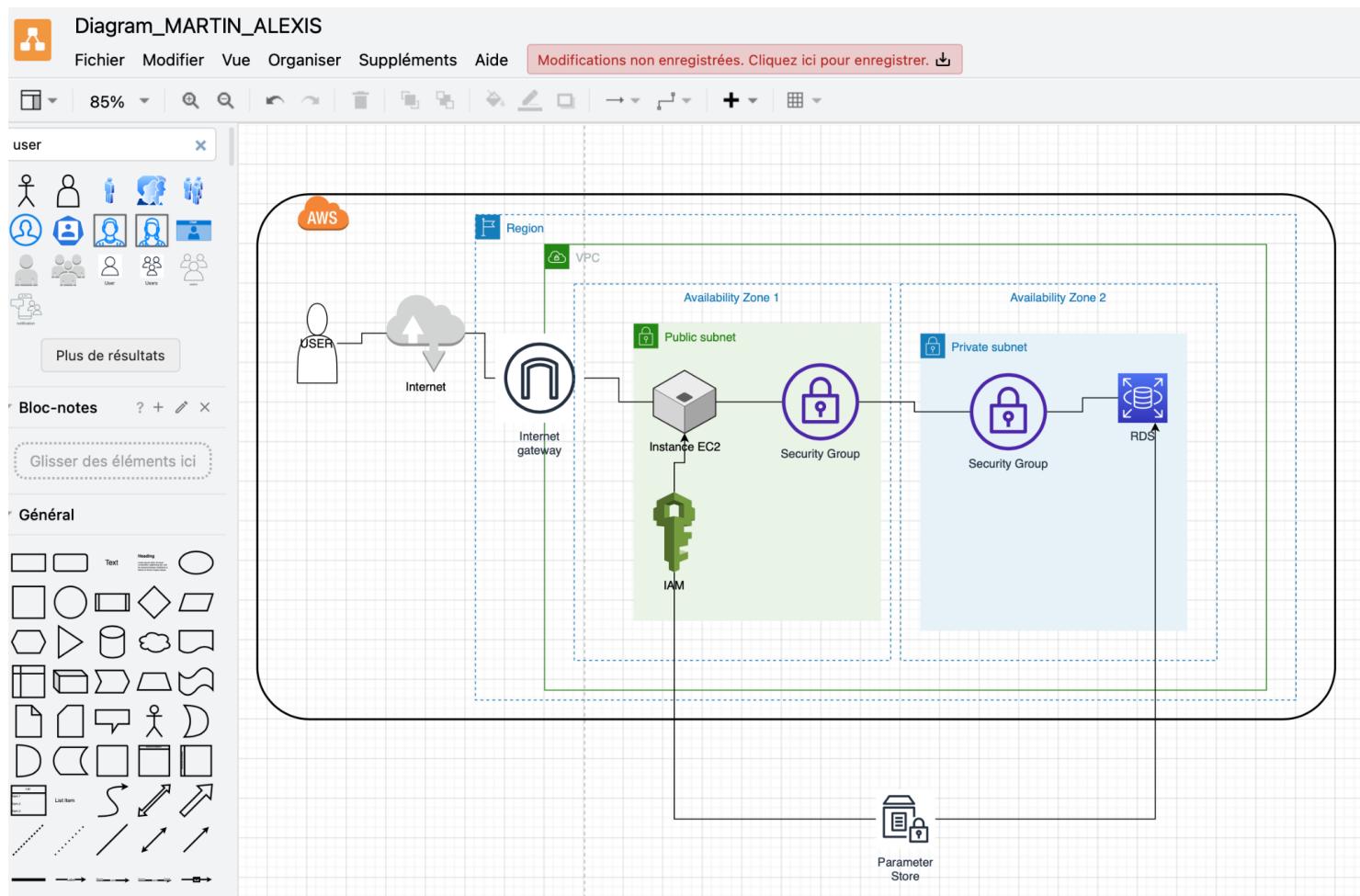
- Password authentication

MariaDB

MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

- 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.
- Supports global transaction ID (GTID) and thread pooling.
- Developed and supported by the MariaDB open source community.

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The screenshot shows the AWS RDS console for creating a new database instance. The main panel is titled 'MariaDB' and provides an overview of the service, stating it's a MySQL-compatible database with strong support from the open source community. It lists several features: supports database sizes 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, and supports global transaction ID (GTID) and thread pooling. It also mentions it's developed and supported by the MariaDB open source community.

The configuration steps shown include:

- VPC security group (firewall)**: Offers two options: "Choose existing" (selected) or "Create new".
- Additional VPC security group**: A dropdown menu showing "aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU".
- Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.**
- Availability Zone**: Set to "us-east-1d".
- Certificate authority - optional**: Set to "rds-ca-2019 (default)".
- Database authentication**: Set to "Password authentication".

The bottom navigation bar includes CloudShell, Feedback, Language, Privacy, Terms, and Cookie preferences.

Creation of VPC

The screenshot shows the AWS VPC console for creating a new VPC. The main panel is titled "Create VPC" and provides an overview of what a VPC is: an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances.

The configuration steps shown include:

- VPC settings**:
 - Resources to create**: Set to "VPC only" (selected).
 - Name tag - optional**: Set to "VPC_Martin_Alexis".
 - IPv4 CIDR block**: Set to "10.0.0.0/24".
 - IPv6 CIDR block**: Set to "No IPv6 CIDR block" (selected).
 - Tenancy**: Set to "Default".
- Tags**: A note explaining tags are labels assigned to AWS resources.

The bottom navigation bar includes CloudShell, Feedback, Language, Privacy, Terms, and Cookie preferences.

Create Public Subnet

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

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed X
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

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

rds-ca-2019 (default)
If you don't select a certificate authority, RDS chooses one for you.

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

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Create subnets in this VPC.
vpc-02ce2969307c8d00a (VPC_Martin_Alexis)

Associated VPC CIDRs
IPv4 CIDRs
10.0.0.0/24

Subnet settings
Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 1

Subnet name
Create a tag with a key of 'Name' and a value that you specify.
public_subnet

The name can be up to 256 characters long.

Availability Zone Info
Choose the zone in which your subnet will reside, or let Amazon choose one for you.
No preference

IPv4 CIDR block Info
10.0.0.0/25

Tags - optional
Key Value - optional
Name public_subnet Remove
Add new tag
You can add 49 more tags.
Remove

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Create router (internet gateway)

The screenshot shows the AWS RDS console for creating a new database instance. The main panel is titled 'MariaDB' and contains the following sections:

- VPC security group (firewall) Info**: A note stating "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." It includes two options: "Choose existing" (selected) and "Create new".
- Additional VPC security group**: A dropdown menu showing "Choose one or more options" and a specific entry: "aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU".
- Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.**
- Availability Zone Info**: Set to "us-east-1d".
- Certificate authority - optional Info**: A note about using a server certificate for security. It shows "rds-ca-2019 (default)" selected.
- Additional configuration**: A link to further configuration options.
- Database authentication**: A section for setting database authentication options, currently set to "Password authentication".

The right sidebar provides a detailed description of the MariaDB Community Edition and its features:

- MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.
- 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.
- Supports global transaction ID (GTID) and thread pooling.
- Developed and supported by the MariaDB open source community.

At the bottom, there are links for CloudShell, Feedback, Language, Privacy, Terms, and Cookie preferences.

The screenshot shows the AWS VPC console for creating an Internet Gateway. The main panel is titled "Create internet gateway" and contains the following sections:

- Internet gateway settings**:
 - Name tag**: A note about creating a tag with a key of 'Name' and a value. The input field contains "project_router".
 - Tags - optional**: A note about tags being labels for AWS resources. It shows a single tag "Name: project_router".
- Create internet gateway**: A large orange button at the bottom right.

The right sidebar shows the status of the "Create internet gateway" process: "In Progress".

At the bottom, there are links for CloudShell, Feedback, Language, Privacy, Terms, and Cookie preferences.

Attache to VPC

Screenshot of the AWS RDS console showing the creation of a new MariaDB database instance.

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 ▾

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-
InstanceSecurityGroup-3IY3QZPUL4EU X

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

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

rds-ca-2019 (default)
If you don't select a certificate authority, RDS chooses one for you.

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

MariaDB

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Screenshot of the AWS VPC console showing the attachment of an internet gateway to a VPC.

VPC > Internet gateways > Attach to VPC (igw-06310553474b2cdb0)

Attach to VPC (igw-06310553474b2cdb0) Info

VPC
Attach an internet gateway to a VPC to enable the VPC to communicate with the internet. Specify the VPC to attach below.

Available VPCs
Attach the internet gateway to this VPC.

vpc-02ce2969307c8d00a X

AWS Command Line Interface command

Cancel **Attach internet gateway**

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VPC security group (firewall) Info

Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

Choose existing
Choose existing VPC security groups

Create new
Create new VPC security group

Additional VPC security group

Choose one or more options

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info

us-east-1d

Certificate authority - optional Info

Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.

rds-ca-2019 (default)

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

Additional configuration

Database authentication

Database authentication options Info

Password authentication

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Internet gateway igw-06310553474b2cdb0 successfully attached to vpc-02ce2969307c8d00a

igw-06310553474b2cdb0 / project_router

Details Info

Internet gateway ID	State	VPC ID	Owner
igw-06310553474b2cdb0	Attached	vpc-02ce2969307c8d00a VPC_Martin_Alexis	890467074997

Tags

Manage tags

Key	Value
Name	project_router

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Edit route of VPC

The screenshot shows the 'Choose VPC' step in the AWS RDS MariaDB setup wizard. It includes fields for selecting a VPC security group (choosing existing), specifying an additional VPC security group, choosing an availability zone (us-east-1d), and selecting a certificate authority (rds-ca-2019). A note indicates that Amazon RDS will add a new VPC security group. The right panel displays information about the MariaDB Community Edition.

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
aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group *rds-ec2-1* to allow connectivity with your compute resource.

Availability Zone **Info**
us-east-1d

Certificate authority - optional **Info**
Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.
rds-ca-2019 (default)
If you don't select a certificate authority, RDS chooses one for you.

► Additional configuration

Database authentication

Database authentication options **Info**
 Password authentication

MariaDB
MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

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The screenshot shows the 'Edit routes' page for a specific route table. It lists two routes: one to 'local' and another to 'igw-06310553474b2cdb0'. The 'Add route' button is visible at the bottom left, and the 'Save changes' button is at the bottom right.

VPC > Route tables > rtb-0ce1e1b2e905d647d > Edit routes

Edit routes

Destination	Target	Status	Propagated
10.0.0.0/24	local	Active	No
0.0.0.0/0	igw-06310553474b2cdb0	-	No

Add route Cancel Preview Save changes

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Enabled auto-assign

The screenshot shows the AWS RDS console for creating a new database instance. The main panel is titled 'MariaDB' and contains the following sections:

- VPC security group (firewall) Info**: A note stating "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." It includes two options: "Choose existing" (selected) and "Create new".
- Additional VPC security group**: A dropdown menu showing "aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU".
- Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.**
- Availability Zone Info**: Set to "us-east-1d".
- Certificate authority - optional Info**: A note about using a server certificate for security. It shows "rds-ca-2019 (default)" selected.
- Additional configuration**: A link to further configuration options.
- Database authentication**: A section for database authentication options, currently set to "Password authentication".

A modal window titled "MariaDB" provides detailed information about the MariaDB Community Edition database.

MariaDB

MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

- 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.
- Supports global transaction ID (GTID) and thread pooling.
- Developed and supported by the MariaDB open source community.

Auto-assign IP settings Info

Enable the auto-assign IP settings to automatically request a public IPv4 or IPv6 address for a new network interface in this subnet.

- Enable auto-assign public IPv4 address Info**
- Enable auto-assign customer-owned IPv4 address Info**
Option disabled because no customer owned pools found.

Creation of environment cloud9

Screenshot of the AWS RDS console showing the creation of a MariaDB database instance.

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

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

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

rds-ca-2019 (default)

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

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

MariaDB

MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

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Screenshot of the AWS Cloud9 IDE "Create environment" wizard.

Create environment Info

Details

Name
project-cloud

Limit of 60 characters, alphanumeric, and unique per user.

Description - optional

Limit 200 characters.

Environment type Info
Determines what the Cloud9 IDE will run on.

New EC2 instance
Cloud9 creates an EC2 instance in your account. The configuration of your EC2 instance cannot be changed by Cloud9 after creation.

Existing compute
You have an existing instance or server that you'd like to use.

New EC2 instance

Instance type Info
The memory and CPU of the EC2 instance that will be created for Cloud9 to run on.

t2.micro (1 GiB RAM + 1 vCPU)
Free-tier eligible. Ideal for educational users and exploration.

t3.small (2 GiB RAM + 2 vCPU)
Recommended for small web projects.

m5.large (8 GiB RAM + 2 vCPU)
Recommended for production and most general-purpose development.

Additional instance types
Explore additional instances to fit your need.

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AWS Services Search [Option+S] N. Virginia Alexis

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 aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info us-east-1d

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

rds-ca-2019 (default) If you don't select a certificate authority, RDS chooses one for you.

► Additional configuration

Database authentication

Database authentication options Info Password authentication

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Platform Info This will be installed on your EC2 instance. We recommend Amazon Linux 2.

Amazon Linux 2

Timeout How long Cloud9 can be inactive (no user input) before auto-hibernating. This helps prevent unnecessary charges.

30 minutes

Network settings Info

Connection How your environment is accessed.

AWS Systems Manager (SSM) Accesses environment via SSM without opening inbound ports (no ingress).

Secure Shell (SSH) Accesses environment directly via SSH, opens inbound ports.

▼ VPC settings Info

Amazon Virtual Private Cloud (VPC) The VPC that your environment will access. To allow the AWS Cloud9 environment to connect to its EC2 instance, attach an internet gateway (IGW) to your VPC. [Create new VPC](#)

vpc-02ce2969307c8d00a Name - VPC_Martin_Alexis

Subnet Used to setup your VPC configuration. To use a private subnet, select AWS Systems Manager (SSM) as the connection type. [Create new subnet](#)

subnet-08c658c18631c3de2 Name - public_subnet

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

CloudShell Feedback Language © 2023, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

The screenshot shows the AWS RDS console for creating a new database instance. The service selected is MariaDB. The configuration steps are as follows:

- VPC security group (firewall) Info**: Choose existing VPC security groups. A note says "Amazon RDS will add a new VPC security group `rds-ec2-1` to allow connectivity with your compute resource."
- Additional VPC security group**: A dropdown menu shows "Choose one or more options" with "aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU" selected.
- Availability Zone**: Info dropdown set to "us-east-1d".
- Certificate authority - optional**: Info dropdown set to "rds-ca-2019 (default)". Note: "If you don't select a certificate authority, RDS chooses one for you."
- Database authentication**: Info dropdown set to "Password authentication".

At the bottom, the status bar includes CloudShell, Feedback, Language, and links to Privacy, Terms, and Cookie preferences.

The screenshot shows the AWS Cloud9 console with a success message: "Successfully created project-cloud. To get the most out of your environment, see Best practices for using AWS Cloud9".

The main interface displays the "Environments" section with the following details:

Name	Cloud9 IDE	Environment type	Connection	Permission	Owner ARN
project-cloud	Open	EC2 Instance	Secure Shell (SSH)	Owner	arn:aws:iam::890467074997:root

At the bottom, the status bar includes CloudShell, Feedback, Language, and links to Privacy, Terms, and Cookie preferences.

Established the environment

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

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed X
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

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

rds-ca-2019 (default)
If you don't select a certificate authority, RDS chooses one for you.

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

MariaDB

MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

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- Supports global transaction ID (GTID) and thread pooling.
- Developed and supported by the MariaDB open source community.

File Edit Find Go Run Tools Window Support Preview Run

Go to Anything (% P)

Welcome

Developer Tools

AWS Cloud9

Welcome to your development environment

AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.

Toolkit for AWS Cloud9

The AWS Toolkit for Cloud9 is an IDE extension that simplifies accessing and interacting with resources from services such as AWS Lambda, AWS CloudFormation, and AWS API Gateway. With the toolkit, developers can also develop, debug, and deploy applications using the AWS Serverless Application Model (SAM). [Learn more](#)

Support

If you have any questions or experience issues, refer to our documentation or reach us to get help.

Getting started

- Create File
- Upload Files...
- Clone from GitHub

Configure AWS Cloud9

Main Theme: jett-dark

Editor Theme: Jett

Keyboard Mode: Default

bash - *ip-10-0-0-13.ec2.ir x Immediate

```
Cannot write to 'Example.zip' (success)
ec2-user@ip-10-0-0-13: ~ $ unzip Example.zip -d /var/www/html/
unzip:  cannot find or open Example.zip, Example.zip.zip or Example.zip.ZIP.
ec2-user@ip-10-0-0-13: ~ $ chown -R ec2-user:ec2-user /var/www/html
chown: changing ownership of '/var/www/html': Operation not permitted
ec2-user@ip-10-0-0-13: ~ $ sudo chown -R ec2-user:ec2-user /var/www/html
ec2-user@ip-10-0-0-13: ~ $
```

Edit inbound

AWS Services Search [Option+S] N. Virginia Alexis

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 aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed- InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info us-east-1d

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

rds-ca-2019 (default) If you don't select a certificate authority, RDS chooses one for you.

► Additional configuration

Database authentication

Database authentication options Info Password authentication

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EC2 > Security Groups > sg-060d09a4b48087bfa - aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU > Edit inbound rules

Edit inbound rules Info

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

Inbound rules Info						
Security group rule ID	Type	Protocol	Port range	Source	Description - optional	
Info						
sgr-0d0264d8e7230ee5d	SSH	TCP	22	Custom	35.172.155.96 /27	<input type="button" value="Delete"/>
sgr-051e9cf20ac24171e	SSH	TCP	22	Custom	35.172.155.19 /27	<input type="button" value="Delete"/>
sgr-0757106c4a3558f5	HTTP	TCP	80	Custom	0.0.0.0 /0	<input type="button" value="Delete"/>

Add rule Cancel Preview changes Save rules

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Screenshot of the AWS RDS console showing the configuration of a MariaDB database instance.

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

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone [Info](#)
us-east-1d

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

rds-ca-2019 (default)
If you don't select a certificate authority, RDS chooses one for you.

Additional configuration

Database authentication

Database authentication options [Info](#)
 Password authentication

MariaDB

MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

- 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.
- Supports global transaction ID (GTID) and thread pooling.
- Developed and supported by the MariaDB open source community.

Screenshot of a web browser showing a data query site for a social research organization.

Example Social Research Organization

[About Us](#) [Contact Us](#) [Query](#)

Welcome to our data query site. You can get data from countries all over the world to use in your research.

We provide data for a variety of areas including basic demographics and development statistics.

About Us



Shirley Rodriguez

Our site got started when Shirley Rodriguez found that she was frequently looking up data from a variety of databases. Shirley decided to start sharing some of this data with other social researchers.

Contact Us



Configuration of RDS

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

Choose existing Choose existing VPC security groups

Create new Create new VPC security group

Additional VPC security group Choose one or more options aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed- InstanceSecurityGroup-3IY3QZPUL4EU

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rds-ca-2019 (default) If you don't select a certificate authority, RDS chooses one for you.

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Database authentication

Database authentication options Info Password authentication

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Choose a database creation method Info Standard create You set all of the configuration options, including ones for availability, security, backups, and maintenance.

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

Engine options

Engine type Info

Aurora (MySQL Compatible)

Aurora (PostgreSQL Compatible)

MySQL

MariaDB

PostgreSQL

Oracle

Microsoft SQL Server

MariaDB

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Availability Zone Info us-east-1d

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

rds-ca-2019 (default)

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

► Additional configuration

Database authentication

Database authentication options Info Password authentication

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Templates Choose a sample template to meet your use case.

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

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

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

Settings

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

database-1

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

▼ Credentials Settings

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

admin

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

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

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

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Screenshot of the AWS RDS console showing the creation of a new MariaDB database instance.

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
aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

Certificate authority - optional Info
Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.
rds-ca-2019 (default)

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

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

MariaDB

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- Supports global transaction ID (GTID) and thread pooling.
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Screenshot of the AWS RDS console showing the creation of a new MariaDB database instance.

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.
VPC_Martin_Alexis (vpc-02ce2969507c8d00a)
1 Subnets, 1 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

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DB subnet group Info
Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.
 Choose existing
Choose existing DB subnet group
 Automatic setup
RDS creates a new subnet group for you or reuses an existing subnet 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.

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

Choose existing Choose existing VPC security groups

Create new Create new VPC security group

Additional VPC security group Choose one or more options aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info us-east-1d

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

rds-ca-2019 (default)

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

► Additional configuration

Database authentication

Database authentication options Info Password authentication

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

Amazon RDS Optimized Writes - new Info Show instance classes that support Amazon RDS Optimized Writes

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

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

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

Choose existing
Choose existing VPC security groups

Create new
Create new VPC security group

Additional VPC security group
Choose one or more options

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

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

rds-ca-2019 (default)

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

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

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- Supports global transaction ID (GTID) and thread pooling.
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Availability & durability

Multi-AZ deployment Info
 Create a standby instance (recommended for production usage)
Creates a standby in a different Availability Zone (AZ) to provide data redundancy, eliminate I/O freezes, and minimize latency spikes during system backups.

Do not create a standby instance

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.

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-0e3600d0428f80bd2
aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed

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.

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.

MariaDB

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The screenshot shows the AWS RDS console for creating a new database instance. The 'MariaDB' engine is selected. In the 'VPC security group (firewall)' section, the 'Choose existing' option is selected, showing an existing VPC security group named 'aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU'. A note indicates that Amazon RDS will add a new VPC security group named 'rds-ec2-1'. The 'Availability Zone' is set to 'us-east-1d'. The 'Certificate authority - optional' section shows 'rds-ca-2019 (default)' selected. The 'Database authentication' section shows 'Password authentication' selected. The bottom navigation bar includes CloudShell, Feedback, Language, Privacy, Terms, and Cookie preferences.

The screenshot shows the AWS RDS console after a database instance has been successfully created. A green success banner displays two messages: 'Successfully set up a connection between database-1 and EC2 instance i-0335590f27edeef8d' and 'Successfully created database database-1'. It also includes a link to 'View connection details'. Below the banner, a blue info box introduces 'Aurora I/O-Optimized' with a note about cost savings. The main 'Databases' table shows one entry: 'database-1' (Status: Backing-up, Instance: MariaDB, Region & AZ: us-east-2a, Size: db.t3.micro). The bottom navigation bar includes CloudShell, Feedback, Language, Privacy, Terms, and Cookie preferences.

import 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

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed- InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d

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

rds-ca-2019 (default)
If you don't select a certificate authority, RDS chooses one for you.

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

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Go to Anything (⌘ P)

Welcome

Developer Tools

AWS Cloud9

Welcome to your development environment

AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.

Getting started

```
root@ip-172-31-12-105:/x  Immediate  +
```

```
MariaDB [(none)]> use projectDB;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [projectDB]> select * from countrydata_final;
+-----+-----+-----+-----+-----+-----+-----+
| name | mobilephones | mortalityunder5 | healthexpenditurepercapita | healthexpenditurepercentGDP | populationurban | birthrate | lifeexpectancy | GDP |
+-----+-----+-----+-----+-----+-----+-----+
| Afghanistan | 0 | 150 | 11 | 9 | 266
| 97430 | 5771984 | 50 | 46 | 2461666315 | 29791 | 75 | | |
| Albania | 1280964 | 17 | 74 | 3686649387 | 86000 | 63 |
| Algeria | 33827 | 18259229 | 21 | 70 | 5479065957 | 1992 | 0 |
| American Samoa | 51171 | 0 | 0 | 8 | 1289 |
| Andorra | 59722 | 11 | 0 | 1133644295 | 23543 | 5 |
| Angola | 26373 | 6823923 | 50 | 46 | 9129180361 | 25886 | 200 |
| Antigua and Barbuda | 24928 | 21 | 0 | 411 |
| Argentina | 38709 | 33274569 | 19 | 74 | 284204000000 | 6487950 | 15 |
| Armenia | 76998 | 2002540 | 13 | 71 | 1911563665 | 17486 | 33 |
| Aruba | 1 | 1000 | a | a | a | a | a | a |
```

✓ CodeWhisperer AWS profile:default

Parameter store connect to endpoints

Screenshot of the AWS RDS console showing the creation of a new MariaDB database instance.

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 ▾
aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed- InstanceSecurityGroup-3IY3QZPUL4EU X

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone Info
us-east-1d ▾

Certificate authority - optional Info
Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.
rds-ca-2019 (default) ▾
If you don't select a certificate authority, RDS chooses one for you.

Additional configuration

Database authentication

Database authentication options Info
 Password authentication

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Screenshot of the AWS Parameter Store console showing the creation of a new parameter.

Create parameter

Parameter details

Name
/example/endpoint X

Description — Optional

Tier
Parameter Store offers standard and advanced parameters.
 Standard
Limit of 10,000 parameters. Parameter value size up to 4 KB. Parameter policies are not available. No additional charge.
 Advanced
Can create more than 10,000 parameters. Parameter value size up to 8 KB. Parameter policies are available. Charges apply

Type
 String
Any string value.
 StringList
Separate strings using commas.
 SecureString
Encrypt sensitive data using KMS keys from your account or another account.

Data type
text ▾
Value
database-1.cei2jeaygl7e.us-east-2.rds.amazonaws.com

Maximum length 4096 characters.

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The screenshot shows the AWS RDS console for creating a new database instance. The main panel is titled 'MariaDB' and provides an overview of the service, mentioning MySQL compatibility and various features like automated backups and global transaction ID support. On the left, there are sections for VPC security group configuration (with 'Choose existing' selected), additional VPC security groups, and availability zones ('us-east-1d'). A note indicates that Amazon RDS will create a new VPC security group. Below these, there's a section for certificate authorities ('rds-ca-2019 (default)'). At the bottom, there's an 'Additional configuration' section and a summary of database authentication options ('Password authentication' selected). The top navigation bar includes services like IAM, EC2, and VPC.

The screenshot shows the AWS Systems Manager Parameter Store. A green header bar indicates a 'Create parameter request succeeded'. The main area displays a table of parameters under the 'My parameters' tab. The table has columns for Name, Tier, Type, and Last modified. Four parameters are listed: '/example/database' (String, Standard tier, last modified Fri, 21 Jul 2023 10:36:20 GMT), '/example/endpoint' (String, Standard tier, last modified Fri, 21 Jul 2023 10:35:06 GMT), '/example/password' (String, Standard tier, last modified Fri, 21 Jul 2023 10:35:53 GMT), and '/example/username' (String, Standard tier, last modified Fri, 21 Jul 2023 10:35:32 GMT). The top navigation bar includes services like IAM, EC2, and VPC.

create a new role to watch

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

aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed X
InstanceSecurityGroup-3IY3QZPUL4EU

Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.

Availability Zone [Info](#)
us-east-1d

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

rds-ca-2019 (default)
If you don't select a certificate authority, RDS chooses one for you.

Additional configuration

Database authentication

Database authentication options [Info](#)
 Password authentication

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Identity and Access Management (IAM)

Allows EC2 instances to call AWS services on your behalf.

ProjUser

Summary

Creation date	ARN	Instance profile ARN
July 21, 2023, 12:38 (UTC+02:00)	arn:aws:iam::8904670474997:role/ProjUser	arn:aws:iam::8904670474997:instance-profile/ProjUser
Last activity	Maximum session duration	
None	1 hour	

Permissions [Edit](#) [Delete](#)

Permissions policies (1) Info
You can attach up to 10 managed policies.

Policy name	Type	Description
AmazonSSMReadOnlyAccess	AWS managed	Provides read only access to Amazon SSM.

Permissions boundary - (not set) Info
Set a permissions boundary to control the maximum permissions this role can have. This is not a common setting but can be used to delegate permission management to others.

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modify IAM role in EC2

The screenshot shows the 'Create a new database' step in the AWS RDS setup wizard for a MariaDB instance. The 'VPC security group (firewall)' section is open, showing two options: 'Choose existing' (selected) and 'Create new'. A note indicates that Amazon RDS will add a new VPC security group. The 'Additional VPC security group' dropdown is set to 'Choose one or more options'. An 'aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU' entry is listed. The 'Availability Zone' is set to 'us-east-1d'. The 'Certificate authority - optional' section shows 'rds-ca-2019 (default)' selected. A note states that if no certificate authority is selected, RDS chooses one. The 'Database authentication' section is visible at the bottom.

The screenshot shows the 'Modify IAM role' dialog for an EC2 instance. The 'IAM role' dropdown is set to 'ProjectUser'. A 'Create new IAM role' button is available. The 'Update IAM role' button is highlighted in orange. The navigation bar shows the path: EC2 > Instances > i-0335590f27edeef8d > Modify IAM role.

Queries work !

MariaDB

MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

- 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.
- Supports global transaction ID (GTID) and thread pooling.
- Developed and supported by the MariaDB open source community.

Country	Number of mobile phone providers
Afghanistan	0
Albania	29791
Algeria	86000
American Samoa	1992
Andorra	23543
Angola	25806
Antigua and Barbuda	22000
Argentina	6487950
Armenia	17486
Aruba	15000
Australia	8562000
Austria	6117000
Azerbaijan	420400
Bahamas, The	31524
Bahrain	205727
Bangladesh	279000
Barbados	28467
Belarus	49353
Belgium	5629000
Belize	16812
Benin	55476
Bermuda	13000
Bhutan	0
Bolivia	582620
Bosnia and Herzegovina	93386
Botswana	222190
Brazil	23188171
Brunei Darussalam	95000
Bulgaria	738000
Burkina Faso	25245
Burundi	16320
Cambodia	130547
Cameroon	103279
Canada	8727000
Cape Verde	19729
Cayman Islands	10700
Central African Republic	4967
Chad	5500
Channel Islands	0

Questions :

Please evaluate below IAM policies

```
{
  "Version": "2012-10-17",
  "Statement": [
```

The screenshot shows the AWS RDS setup wizard for creating a new database instance. On the left, under 'VPC security group (firewall)', the 'Choose existing' option is selected, showing a dropdown menu with 'aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU'. A note indicates that Amazon RDS will add a new VPC security group. Below this, the 'Additional VPC security group' dropdown is set to 'Choose one or more options' with 'us-east-1d' selected. Under 'Certificate authority - optional', the 'rds-ca-2019 (default)' is chosen. At the bottom, the 'Database authentication' section is visible, with 'Password authentication' selected.

MariaDB

MariaDB Community Edition is a MySQL-compatible database with strong support from the open source community, and extra features and performance optimizations.

- 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.
- Supports global transaction ID (GTID) and thread pooling.
- Developed and supported by the MariaDB open source community.

```
{
  "Sid": "AllowEC2AndS3",
  "Effect": "Allow",
  "Action": [
    "ec2:RunInstances",
    "ec2:TerminateInstances",
    "s3:GetObject",
    "s3:PutObject"
  ],
  "Resource": [
    "arn:aws:ec2:us-east-1:123456789012:instance/*",
    "arn:aws:s3:::example-bucket/*"
  ]
}
```

Answer

This policy gives permissions to launch and terminate any EC2 instances in the 'us-east-1' region of the specified account and to get and put objects in the 'example-bucket' S3 bucket.

Question: What actions are allowed for EC2 instances and S3 objects based on this policy? What specific resources are included?

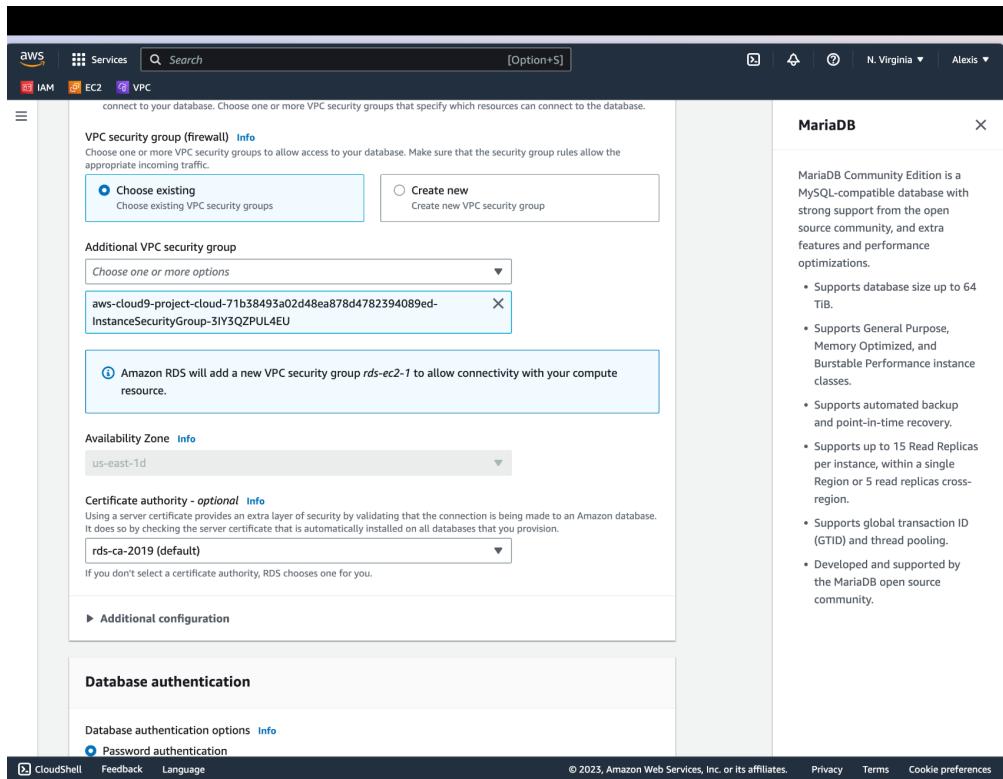
The screenshot shows the AWS RDS console for creating a new database. In the 'VPC security group (firewall)' section, the 'Choose existing' option is selected, showing a dropdown menu with 'aws-cloud9-project-cloud-71b38493a02d48ea878d4782394089ed-InstanceSecurityGroup-3IY3QZPUL4EU'. A note below states: 'Amazon RDS will add a new VPC security group rds-ec2-1 to allow connectivity with your compute resource.' The 'MariaDB' details pane on the right describes the MariaDB Community Edition as a MySQL-compatible database with strong support from the open source community and extra features like automated backups and point-in-time recovery.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "AllowVPCAccess",
      "Effect": "Allow",
      "Action": [
        "ec2:DescribeVpcs",
        "ec2:DescribeSubnets",
        "ec2:DescribeSecurityGroups"
      ],
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "aws:RequestedRegion": "us-west-2"
        }
      }
    }
  ]
}
```

Answer :

This policy permits certain actions for EC2 instances, namely "DescribeVpcs," "DescribeSubnets," and "DescribeSecurityGroups." These actions primarily provide read access to details related to VPCs, subnets, and security groups.

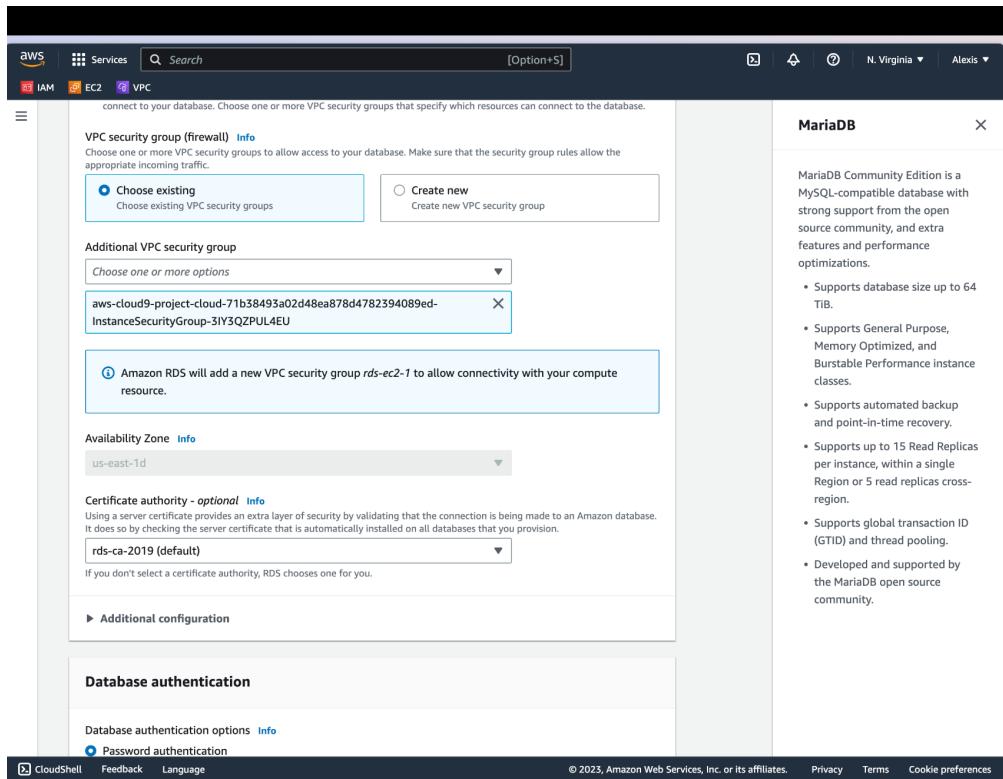
The resources covered by this policy are all resources, denoted by the wildcard "*", indicating that the actions are allowed on any EC2 resource. However, there is an additional condition applied. The policy's actions are only allowed if the request originates from the "us-west-2" region. This means that the described access to EC2 instance information is



restricted to the specified region, ensuring access control is limited to that particular region only.

Question: Under what condition does this policy allow access to VPC-related information? Which AWS region is specified?

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "AllowS3ReadWrite",
      "Effect": "Allow",
      "Action": ["s3:GetObject", "s3:PutObject", "s3>ListBucket"],
      "Resource": [
        "arn:aws:s3:::example-bucket",
        "arn:aws:s3:::example-bucket/*"
      ],
      "Condition": {
        "StringLike": {
          "s3:prefix": ["documents/*", "images/*"]
        }
      }
    }
  ]
}
```



ANSWER :

This policy grants permissions for specific actions on the S3 bucket called "example-bucket" and its objects. The allowed actions are "s3:GetObject", "s3:PutObject", and "s3>ListBucket".

However, these actions are only permitted when the object key starts with either "documents/" or "images/". This condition ensures that access is limited to objects within the "example-bucket" with object keys beginning with either "documents/" or "images/". Other objects outside of these prefixes will not be accessible under this policy.

Question: What actions are allowed on the "example-bucket" and its objects based on this policy? What specific prefixes are specified in the condition?

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "AllowIAMUserCreation",
      "Effect": "Allow",
      "Action": "iam>CreateUser",
      "Resource": "arn:aws:iam::123456789012:user/${aws:username}"
    },
    {
      "Sid": "AllowIAMUserDeletion",
      "Effect": "Allow",
      "Action": "iam>DeleteUser",
    }
  ]
}
```

The screenshot shows the AWS IAM console interface. In the 'Permissions' tab, a policy named 'Allow IAM users to create and delete IAM users' is being edited. The JSON code for the policy is displayed:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": ["iam:Get*", "iam>List*"],
            "Resource": "*"
        }
    ]
}
```

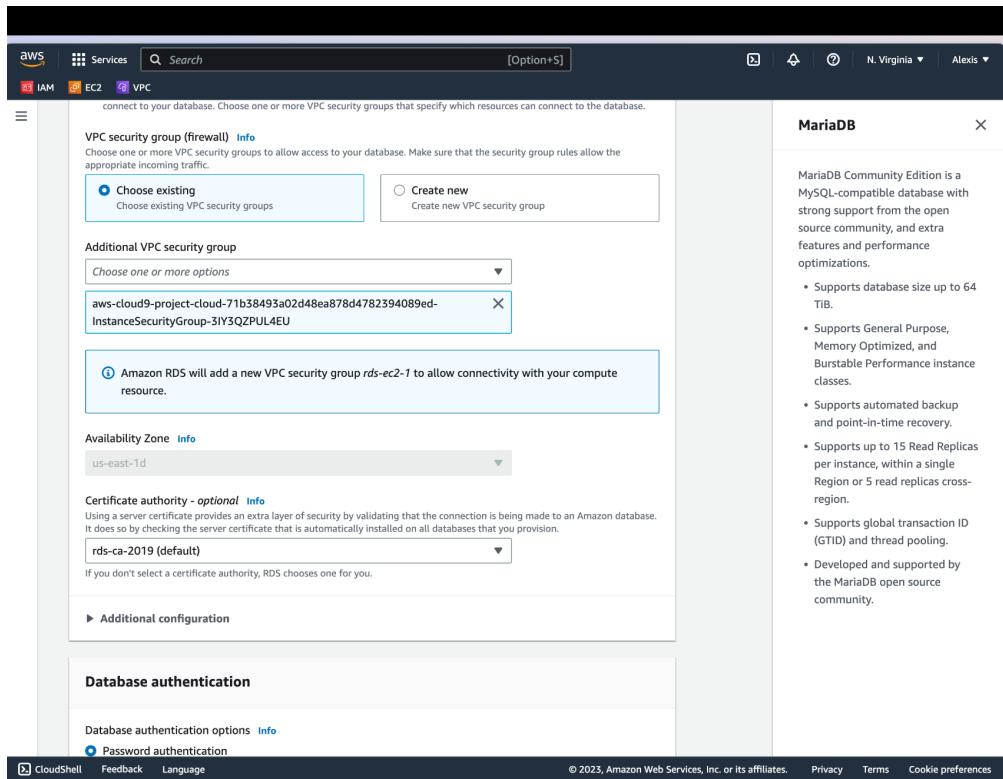
ANSWER :

In this policy, IAM users are permitted to perform two specific actions: create and delete users. The unique aspect of this policy is that the resource ARNs (Amazon Resource Names) are dynamically generated based on the username of the user who is executing the action.

To clarify, the policy allows IAM users to create and delete users, and the resources they can act upon are determined dynamically based on the username of the user performing the action. This means that each IAM user can only create and delete their own IAM user account, ensuring a user can only modify their own identity and not other users'.

Question: What actions are allowed for IAM users based on this policy? How are the resource ARNs constructed?

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": ["iam:Get*", "iam>List*"],
            "Resource": "*"
        }
    ]
}
```



ANSWER :

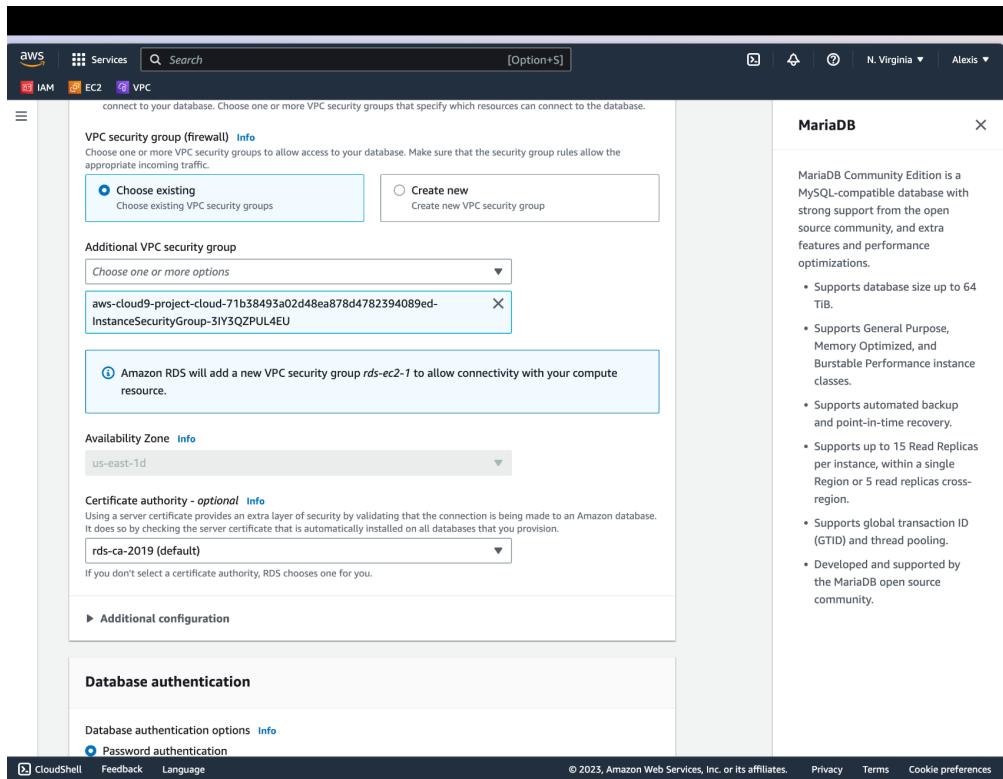
This policy strictly restricts the creation, modification, and deletion of IAM resources. However, it does grant permission for reading IAM resources, specifically allowing the actions of "getting" and "listing" IAM resources.

In summary, this policy provides read-only access to IAM resources, allowing users to retrieve and list information about IAM resources, but it explicitly prohibits any actions that would create, modify, or delete IAM resources.

Questions:

- Which AWS service does this policy grant you access to?
- Does it allow you to create an IAM user, group, policy, or role?
- Go to <https://docs.aws.amazon.com/IAM/latest/UserGuide/> and in the left navigation expand Reference > Policy Reference > Actions, Resources, and Condition Keys. Choose Identity And Access Management. Scroll to the Actions Defined by Identity And Access Management list.◆◆Name at least three specific actions that the iam:Get* action allows.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Condition": {
        "StringEquals": {
          "ec2:InstanceType": ["t2.micro", "t2.small"]
        }
      }
    }
  ]
}
```



```

        },
        },
        "Resource": "arn:aws:ec2:*:*:instance/*",
        "Action": ["ec2:RunInstances", "ec2:StartInstances"],
        "Effect": "Deny"
    }
]
}

```

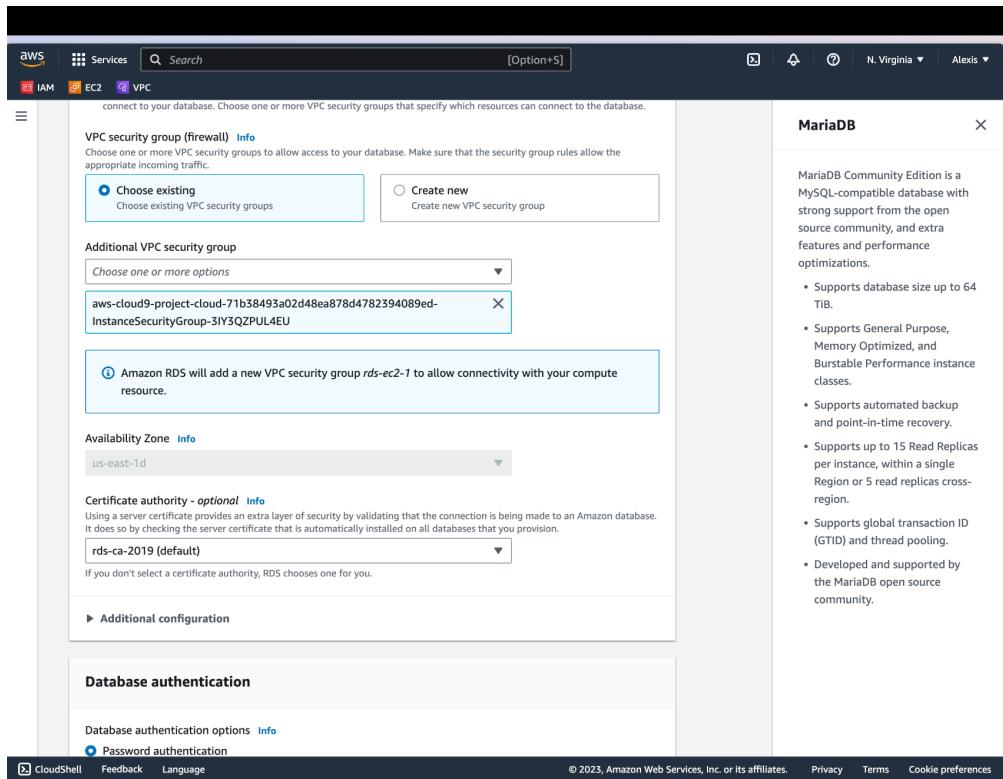
ANSWER :

This policy grants access to the AWS Identity and Access Management (IAM) service. However, it enforces restrictions on certain actions to ensure read-only access to IAM resources. You are not allowed to create IAM users, groups, policies, or roles. Instead, you can perform actions that begin with "Get" and "List" (e.g., iam:GetUser, iam>ListUsers) on IAM resources, which are limited to read operations, excluding write or create actions.

The "iam:Get*" action encompasses several specific operations, including:

- iam:GetUser: Retrieves information about the specified IAM user.
- iam:GetGroup: Returns a list of IAM users that belong to the specified IAM group.
- iam:GetRole: Retrieves information about the specified IAM role.

The policy includes a "Deny" effect that explicitly restricts the user or role from launching and starting EC2 instances of types t2.micro and t2.small. Even if other policies seem to allow



these actions, the "Deny" effect takes precedence and overrides any "Allow" effect. Consequently, users or roles covered by this policy would be unable to initiate or run t2.micro and t2.small EC2 instances.

Questions:

- What actions does the policy allow?
- Say that the policy included an additional statement object, like this example:

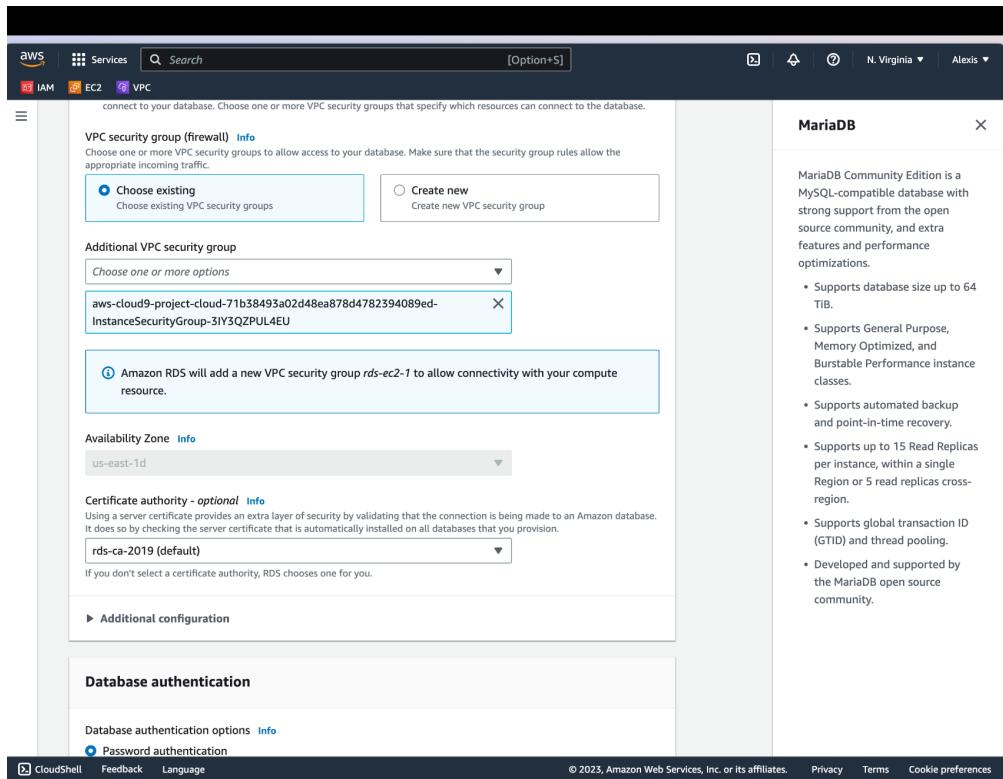
```
{
  "Effect": "Allow",
  "Action": "ec2:/*"
}
```

- How would the policy restrict the access granted to you by this additional statement?
- If the policy included both the statement on the left and the statement in question 2, could you terminate an m3.xlarge instance that existed in the account?

ANSWER :

The provided policy allows unrestricted access to all actions related to Amazon EC2 (EC2:*) based on the additional statement included. This means that users or roles covered by this policy are granted permission to perform any action on EC2 instances without any explicit restrictions.

However, since there is no "statement on the left" for comparison, we cannot assess any specific restrictions or allowances without that information.



With both statements combined, the policy grants permissions for all EC2 actions and does not explicitly deny any specific action, such as "TerminateInstances." As a result, users or roles covered by this policy would indeed have the ability to terminate any EC2 instance, including an m3.xlarge instance, within the AWS account due to the unrestricted "ec2:*" permission.

Answer for the quiz test :

IAM Quiz test :

Image 1: Option 3

Image 2: Option 1

Image 3: Option 3,4

Image 4: Option 4

Image 5: Option 2

Image 6: Option 3

Network Quiz test:

Image 1: Option 3

Image 2: Option 3

Image 3: Option 1, 3, 5

Image 4: Option 4