

EKS Provisioning using Pulumi

- We will provision the EKS using Pulumi as an Infrastructure as Code.
 - We will deploy it in a custom Virtual Private Cloud for isolation.
 - We will also deploy RDS MySQL Instance to store the relational data and connect it to EKS.
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Prerequisites

1. An AWS account with an IAM user having sufficient permissions.
 2. AWS CLI installed and configured with the IAM user.
 3. Pulumi Installed.
 4. Kubectl Installed.
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Write Pulumi Configuration files

First, we will initiate and edit Pulumi configuration files for AWS resources using predefined Pulumi Library available on the internet.

Steps

1. Create a Pulumi Project directory.
2. Open the PowerShell.
3. Change the directory to the above-created Pulumi Project.
4. Run the `pulumi new aws-python` command to initialize the *pulumi*.
5. Provide the appropriate values to prompts such as *project-name*, *project-description*, *stack-name*, *toolchain*, *region-name*, etc.
6. This will generate some Pulumi files in this directory.
7. Now we will install predefined Pulumi modules.
8. Activate the `venv` by running `venv\Scripts\activate`.
9. Run `pip install git+https://github.com/sahilphule/pulumi.git` to install the modules.
10. Deactivate the `venv` by running `deactivate`.
11. Now open the directory in the preferred IDE.
12. Create *commons* folder
13. Inside the folder create *init.py* file.
14. Import the following in the *init.py* file:
 - `from inflection_zone_pulumi.modules.aws.vpc import vpc`
 - `from inflection_zone_pulumi.modules.aws.rds import rds`
 - `from inflection_zone_pulumi.modules.aws.eks import eks`
15. Click [code](#) for reference.
16. Definition of *init.py* is complete.
17. Now create the *values.py* file in the root folder of the above-created project directory.
18. Define the following values:
 - `vpc_properties`

- `rds_properties`
- `bastion_properties`
- `eks_properties`

19. Click [code](#) for reference.

20. The definition of `values.py` is complete.

21. Now navigate to the **`main.py`** file present in the root folder of the above-created project directory.

22. Clear the sample code if present.

23. Import the following:

- `from commons import vpc, rds, eks`
- `values`

24. Define the following objects and pass the values as an argument:

- `VPC`
- `RDS`
- `EKS`

25. Click [code](#) for reference.

26. Definition of **`main.py`** is complete.

Provisioning the Infrastructure

Now we will provision the infrastructure by applying the above-created configuration files.

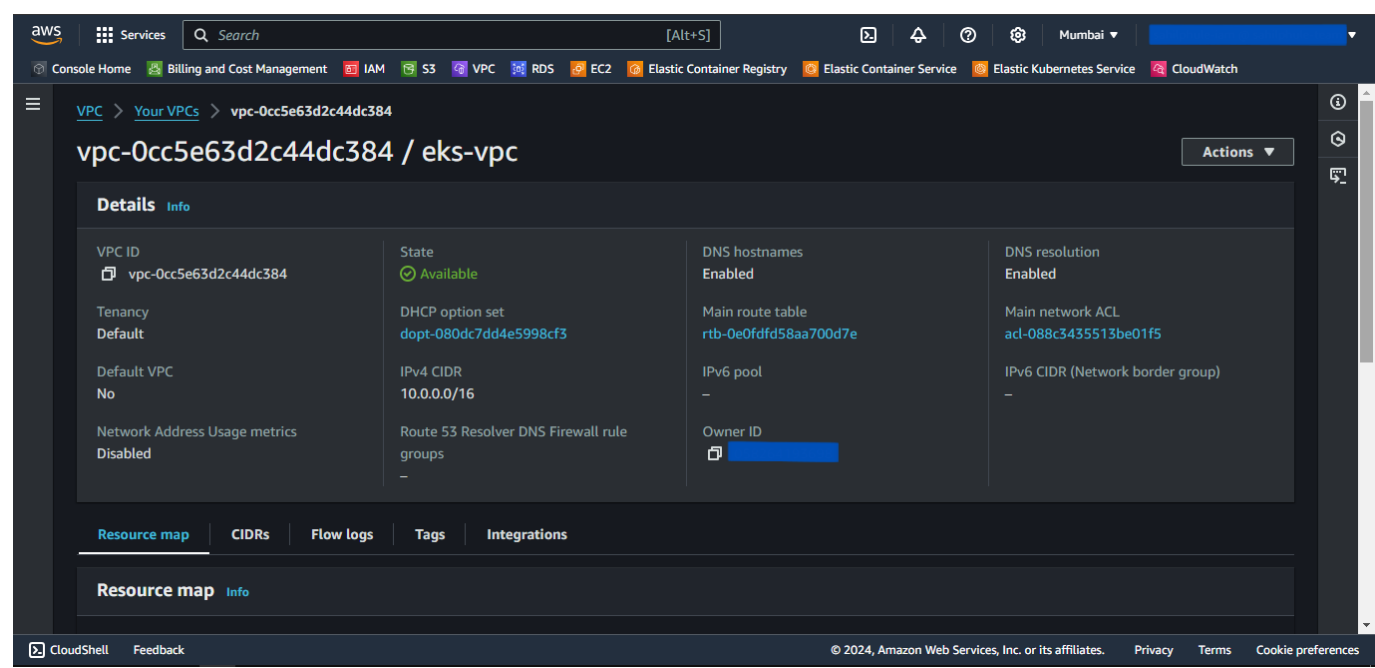
Ensure AWS CLI is configured with appropriate IAM user credentials and enough permissions.

Steps:

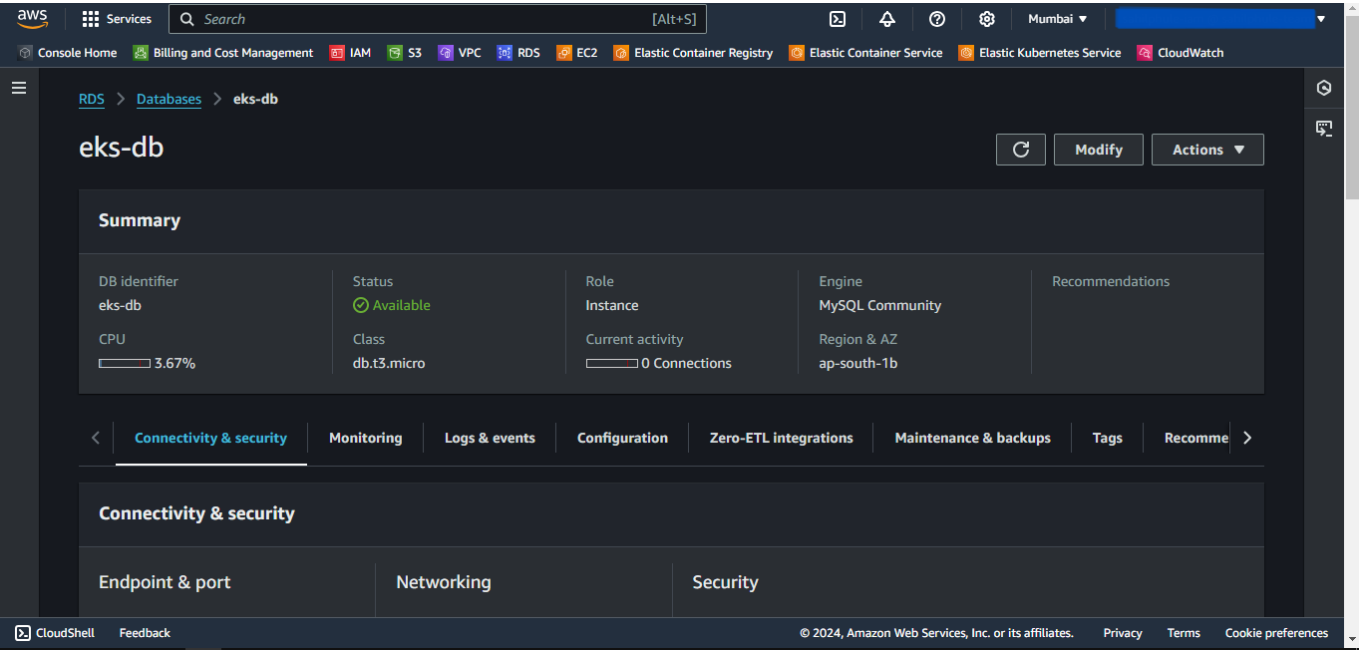
1. Open the PowerShell.
2. Change the directory to the above-created Pulumi Project.
3. Run the `pulumi up` command and if prompted, select **yes** to provision the infrastructure onto the AWS Cloud.
4. Head to the AWS Console, and verify the created resources.

Screenshots of Provisioned Infrastructure

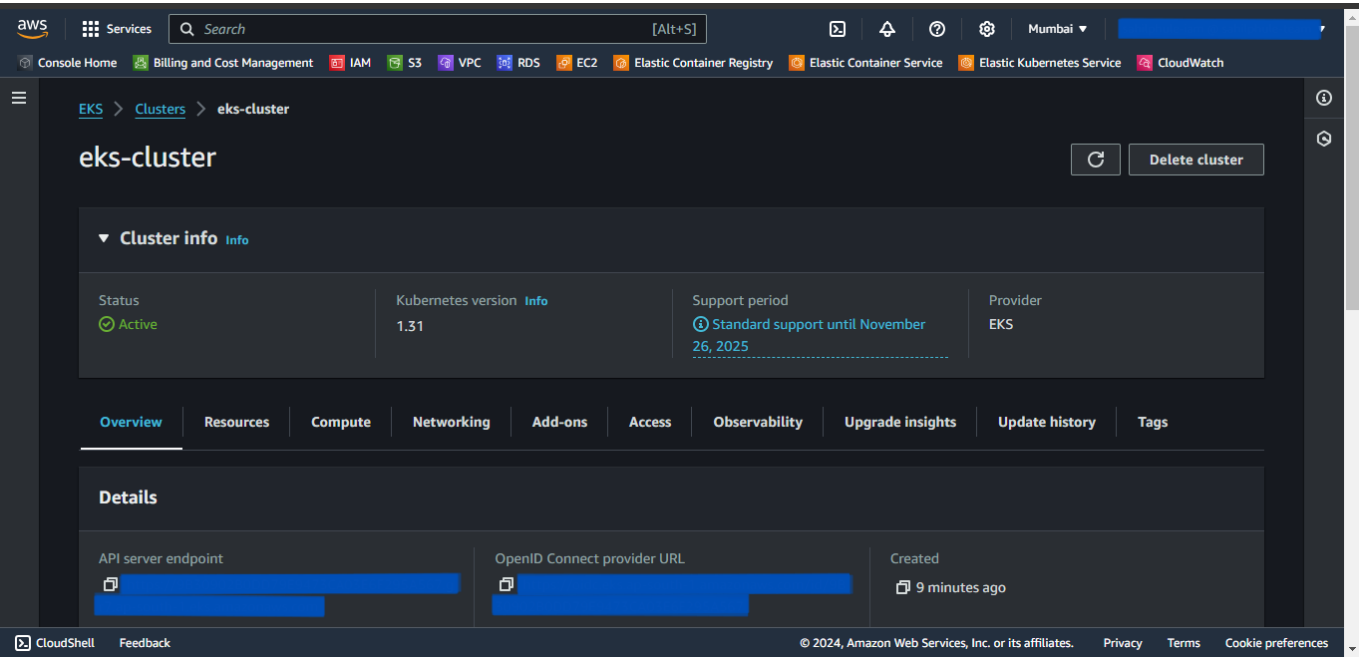
VPC Image



RDS Image



EKS Cluster Image



EKS Node Group Image

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Mumbai

Console Home

Billing and Cost Management

IAM

S3

VPC

RDS

EC2

Elastic Container Registry

Elastic Container Service

Elastic Kubernetes Service

CloudWatch

26, 2025

Overview

Resources

Compute

Networking

Add-ons

Access

Observability

Upgrade insights

Update history

Tags

Nodes (1)

Info

Filter Nodes by property or value

< 1 >

Node name	Instance type	Node group	Created	Status
ip-10-0-1-90.ap-south-1.compute.internal	t2.medium	eks-node-group	Created 3 minutes ago	Ready

Node groups (1)

Info

Edit

Delete

Add node group

Group name	Desired size	AMI release version	Launch template	Status
eks-node-group	1	1.31.0-20241011	-	Active

CloudShell

Feedback

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EKS Nodes Image

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VPC

RDS

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Elastic Kubernetes Service

CloudWatch

Instances (3)

Info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

< 1 >

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public
<input type="checkbox"/>	ip-10-0-1-90.ap-south-1.compute.internal	i-0152ea65dfc7a636b	Running	t2.micro	2/2 checks passed	View alarms	ap-south-1a	ec2-65
<input type="checkbox"/>	ip-10-0-1-90.ap-south-1.compute.internal	i-0155c8899e2a2cbe4	Running	t2.medium	2/2 checks passed	View alarms	ap-south-1a	ec2-13
<input type="checkbox"/>	ip-10-0-1-90.ap-south-1.compute.internal	i-09e5f3610f8adc35f	Running	t2.medium	2/2 checks passed	View alarms	ap-south-1b	ec2-13

Select an instance

CloudShell

Feedback

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Connect to EKS Cluster from Powershell

Steps

1. Open a new Powershell window.
2. Run the following command to configure local kubectl with eks cluster

```
aws eks --region <region-name> update-kubeconfig --name <cluster-name>
```

Substitute *<region-name>* and *<cluster-name>* with the values defined in the above-created *values.py* file.

3. Now, apply the Kubernetes manifest files for the application.
4. To list them all, run **kubectl get all**.

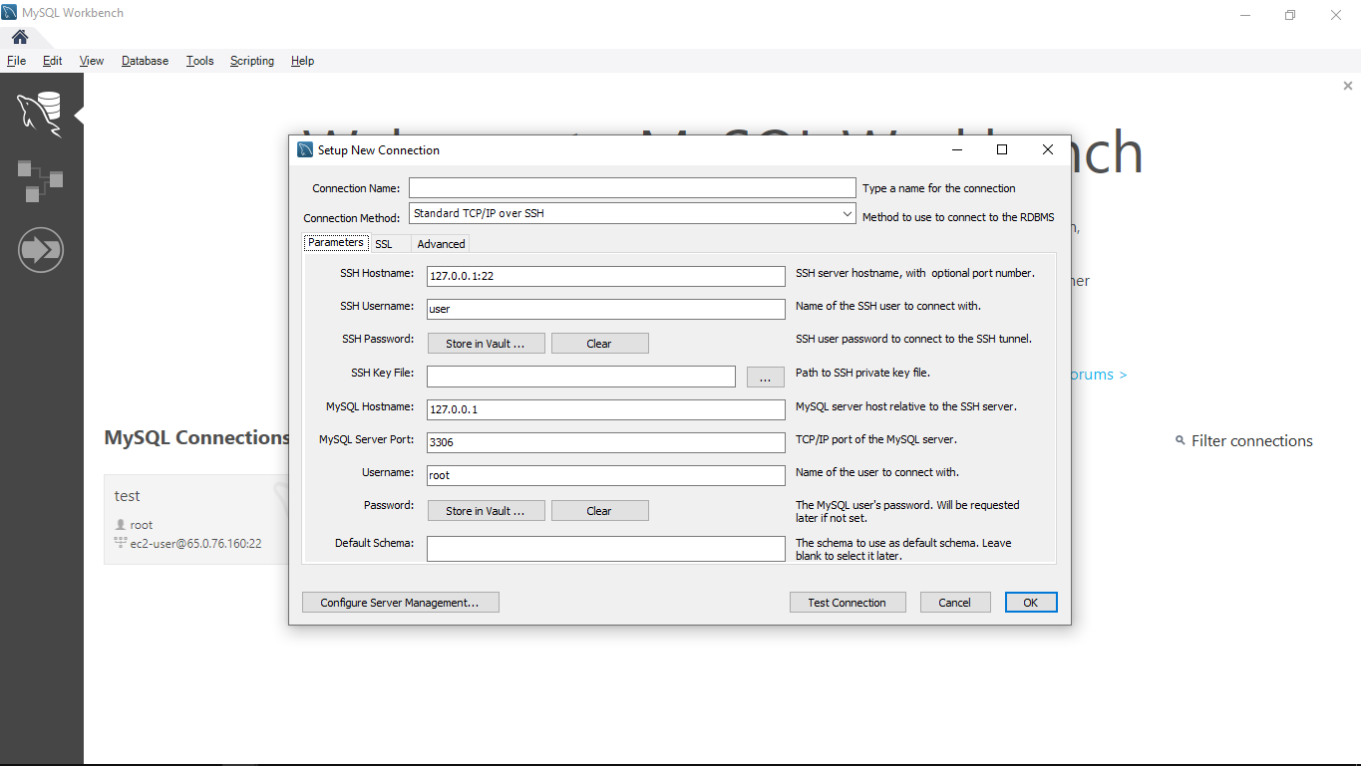
Connection to the RDS database through Bastion Host using MySQL Workbench

Now, we will use MySQL Workbench to connect and access the MySQL RDS Database through above created Bastion Host.

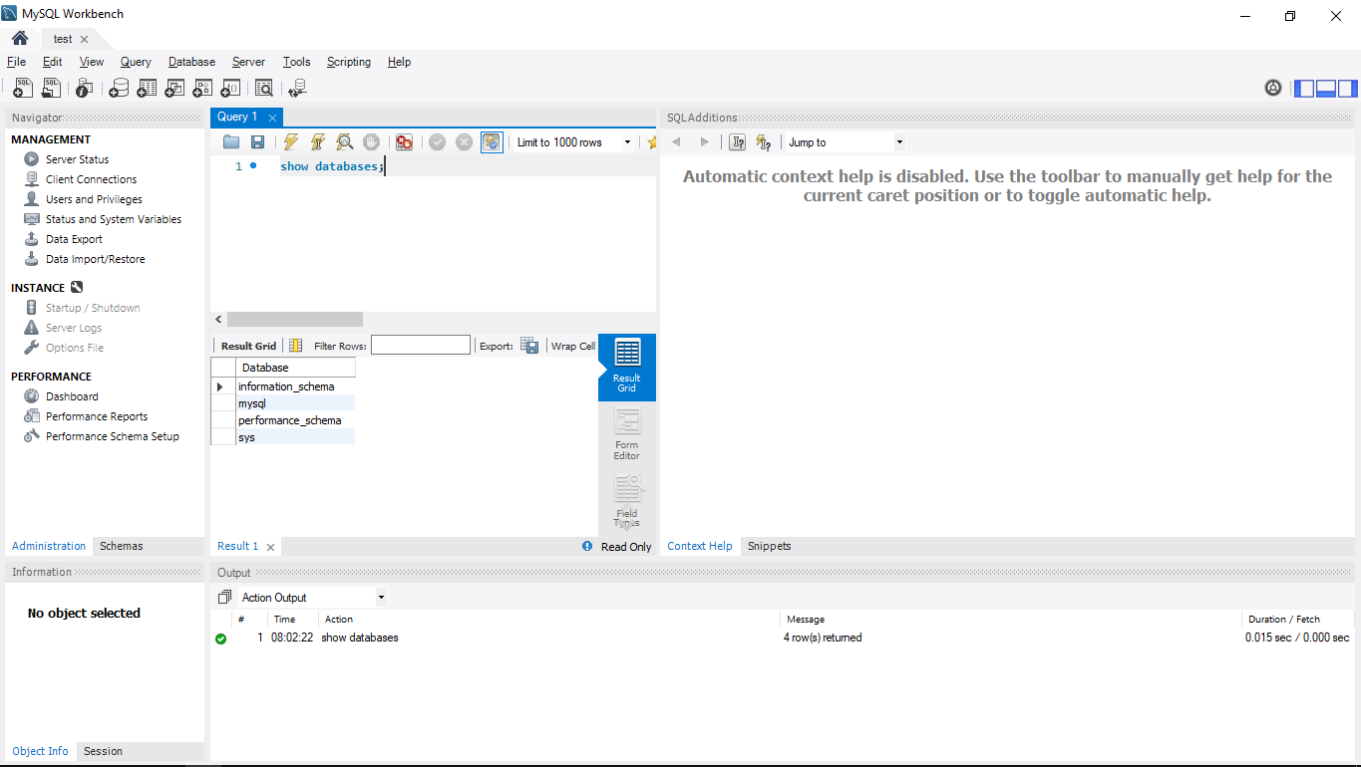
1. Open MySQL Workbench.
 2. Click Add Connection.
 3. Select connection method as **Standard TCP/IP over SSH**.
 4. In SSH Hostname, enter *bastion-host-ip:22* where *bastion-host-ip* is received from **pulumi stack output bastion-host-ip** command.
 5. In SSH Username, enter *ec2-user*.
 6. In SSH Key File, select *bastion-key.pem* file passed in above *values.py* file from your local computer.
 7. In MySQL Hostname, enter *DB_HOST* where *DB_HOST* is received from **pulumi stack output DB_HOST**.
 8. In the Password section, select *Store in Vault*, and enter the password passed in above-created *values.py* file.
 9. Click **OK** and open the connection.
 10. Now you can run MySQL commands to access databases and verify the successful connection of *eks-nodes*.
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Screenshots of MySQL Workbench

Connection Page



Commands Page



Destroy the provisioned infrastructure

Lastly, we will destroy the above-created resources.

Steps

1. First, delete all the Kubernetes Deployments.
 2. To destroy infrastructure, open the Powershell Window and change the directory to the above-created Pulumi Project using the `cd` command.
 3. Run `pulumi destroy` & if prompted, select `yes`.
 4. Infrastructure will be destroyed.
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