

# AWS CAPESTONE PROJECT

Presentation  
BHARATH P

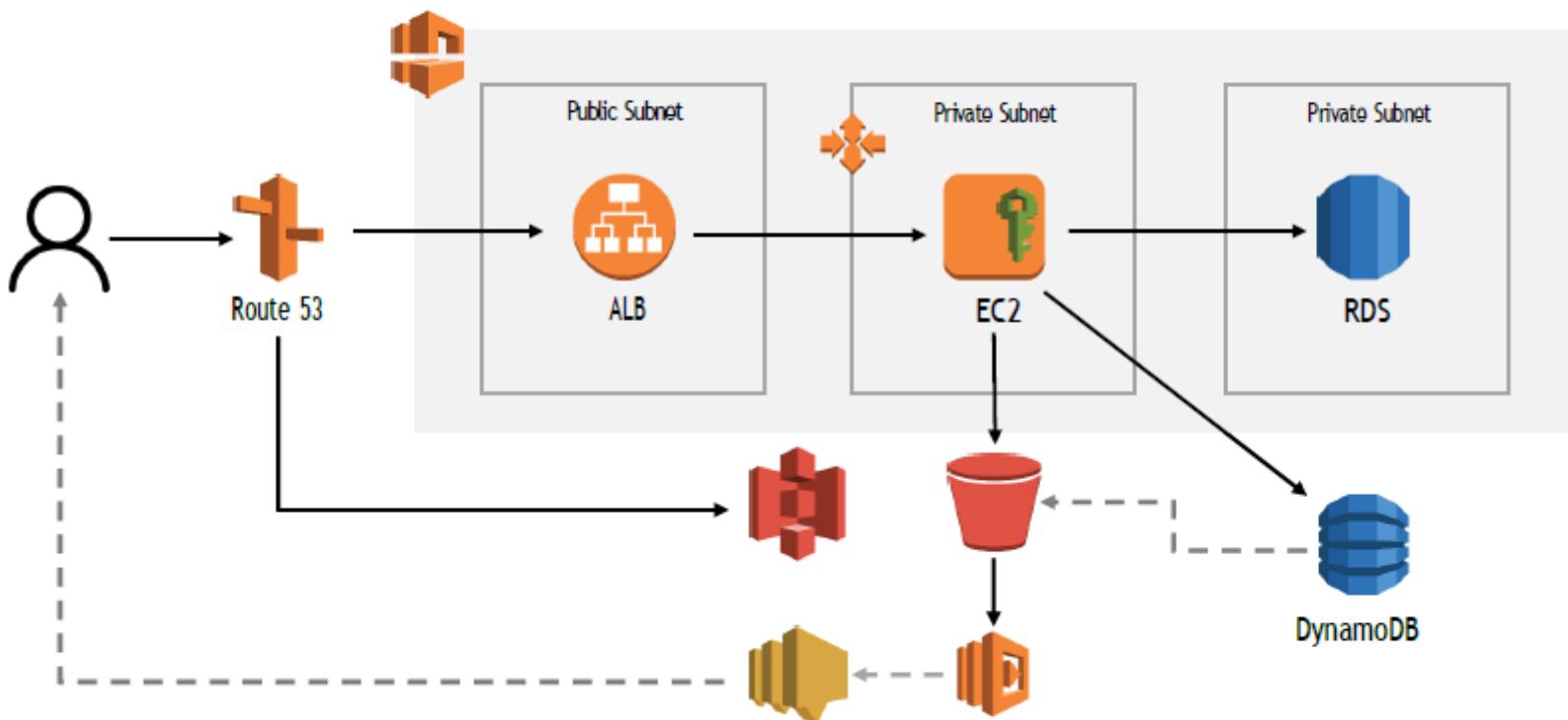
MAY  
2023



## AWS Setup

- Setup VPC for Load Balancer, Application EC2 instance and RDS Database - one public and two private subnets.
- Create Load balancer and Auto Scaling Group.
- Create RDS DB instance and DynamoDB table.
- S3 Bucket
- Get domain name and map it with Load Balancer
- Create instance profile that has to be attached to the EC2 instances being launched. Instance profile should have permission to access RDS, DynamoDB and S3 bucket.
- Lambda function to get triggered when an object is uploaded to the bucket
- SNS Topic for Lambda and user email id subscription

## Technical Architecture



# 1. Creating VPC

The screenshot shows the AWS VPC Management Console dashboard. On the left, there's a sidebar with sections like 'Virtual private cloud' (Your VPCs, Subnets, Route tables, Internet gateways, Egress-only internet gateways, Carrier gateways, DHCP option sets, Elastic IPs, Managed prefix lists, Endpoints, Endpoint services, NAT gateways, Peering connections), 'Security' (AWS Network Manager, Site-to-Site VPN Connections), and 'CloudWatch Metrics'. The main area has sections for 'Service Health' (View complete service health details), 'Settings' (Zones, Console Experiments), and 'Additional Information' (VPC Documentation, All VPC Resources, Forums, Report an Issue). A central box displays 'Resources by Region' with counts for US East 1 and US East 0 across categories like VPCs, Subnets, Route Tables, Internet Gateways, Egress-only Internet Gateways, and DHCP Option Sets. A large orange button at the top left says 'Create VPC'.

Step:1

The screenshot shows the 'Create VPC' wizard. It starts with a summary step: 'A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances.' Below this is a 'VPC settings' section with tabs for 'Info' (selected) and 'Tags'. Under 'Resources to create', 'VPC only' is selected. A 'Name tag - optional' field contains 'aws-project'. Under 'IPv4 CIDR block', 'IPv4 CIDR manual input' is selected, and the value '20.0.0.0/16' is entered. Under 'IPv6 CIDR block', 'No IPv6 CIDR block' is selected. Under 'Tenancy', 'Default' is chosen. At the bottom, there are 'Next Step' and 'Cancel' buttons.

Step:2

The screenshot shows the 'Details' tab for a newly created VPC, 'vpc-07fc5cd7b55959c1 / aws-project'. The VPC ID is 'vpc-07fc5cd7b55959c1', State is 'Available', and it has no subnets or route tables. The DNS resolution is 'Enabled'. The 'Resource map' tab shows the VPC has 0 subnets and 1 route table, both associated with 'aws-project'. The 'Actions' dropdown menu is visible at the top right.

Step:3

## 2. Creating subnet – 2 public and 1 private

The screenshot shows the AWS VPC Subnets list. There are 6 subnets listed:

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
subnet-043de5d8e6fc50bd7	vpc-0c47ba4c813dfd847	Available	172.31.0.0/20	-	
subnet-0dc0a4299e036013c	vpc-0c47ba4c813dfd847	Available	172.31.32.0/20	-	
subnet-08fc4ff06106889b3	vpc-0c47ba4c813dfd847	Available	172.31.16.0/20	-	
subnet-055efad9eb27cc5da	vpc-0c47ba4c813dfd847	Available	172.31.64.0/20	-	
subnet-0931da8cc2be0321f	vpc-0c47ba4c813dfd847	Available	172.31.80.0/20	-	
subnet-0c8d92e632dfb0ca7	vpc-0c47ba4c813dfd847	Available	172.31.48.0/20	-	

**Step:1**

The screenshot shows the AWS Subnet settings page. It is creating two subnets:

- Subnet 1 of 2:** Subnet name: publicsub1, Availability Zone: US East (N. Virginia) / us-east-1a, IPv4 CIDR block: 20.0.0.0/16, Tags: Name: publicsub1.
- Subnet 2 of 2:** Subnet name: my-subnet-01, Availability Zone: US East (N. Virginia) / us-east-1b, IPv4 CIDR block: 20.0.1.0/24, Tags: Name: publicsub2.

**Step:2**

The screenshot shows the AWS Subnet creation form for Subnet 2 of 2. The subnet name is publicsub2, Availability Zone is US East (N. Virginia) / us-east-1b, and the IPv4 CIDR block is 20.0.1.0/24. A tag named Name: publicsub2 is added.

**Step:3**

The screenshot shows the AWS Subnets list after creation. There are now 2 subnets:

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
publicsub2	subnet-0f59183f503b8867e	Available	vpc-07fd5cd7b55959c1   aws...	20.0.1.0/24	-
publicsub1	subnet-0924954380105b8c1	Available	vpc-07fd5cd7b55959c1   aws...	20.0.0.0/24	-

**Step:4**

## 2. Creating subnet – 2 public and 1 private

The screenshot shows the AWS VPC Subnet settings page. A new subnet is being created with the following details:

- Subnet name:** privatesub
- Availability Zone:** US East (N. Virginia) / us-east-1c
- IPv4 CIDR block:** 20.0.2.0/24
- Tags - optional:** A single tag named "privatesub" is added.

At the bottom, there are "Cancel" and "Create subnet" buttons.

Step:1

The screenshot shows the AWS VPC Subnets page. A success message indicates a subnet has been created. The table lists the following subnets:

Name	Subnet ID	State	VPC	IPv4 CIDR	IPv6 CIDR
subnet-043de5d8e6fc50bd7	Available	vpc-0c47ba4c813df847	172.31.0.0/20	-	-
subnet-0dc0a4299e036013c	Available	vpc-0c47ba4c813df847	172.31.32.0/20	-	-
subnet-08fc4ff0106889b3	Available	vpc-0c47ba4c813df847	172.31.16.0/20	-	-
subnet-055efad9eb27cc5da	Available	vpc-0c47ba4c813df847	172.31.64.0/20	-	-
subnet-0931da8cc2be0321f	Available	vpc-0c47ba4c813df847	172.31.80.0/20	-	-
subnet-0c8d92e632dfb0ca7	Available	vpc-0c47ba4c813df847	172.31.48.0/20	-	-
privatesub	subnet-0ab99790aae4a2ee3	Available	vpc-07fd5cd7b55959c1   aws...	20.0.2.0/24	-
publicsub1	subnet-0924954380105bb8c1	Available	vpc-07fd5cd7b55959c1   aws...	20.0.0.0/24	-
publicsub2	subnet-0f59183f503b8867e	Available	vpc-07fd5cd7b55959c1   aws...	20.0.1.0/24	-

Step:2

### 3. Creating IGW

The screenshot shows the AWS VPC service dashboard. In the left sidebar, under 'Virtual private cloud', the 'Internet gateways' section is selected. A table lists one internet gateway: 'igw-047290ad9ed136a3b' with state 'Attached', VPC ID 'vpc-0c47ba4c813df847', and owner '376423310372'. Below the table, a modal window titled 'igw-047290ad9ed136a3b' displays the 'Details' tab, which shows the same information: Internet gateway ID 'igw-047290ad9ed136a3b', State 'Attached', VPC ID 'vpc-0c47ba4c813df847', and Owner '376423310372'. The modal has tabs for 'Details' and 'Tags'. The main page header is 'Internet gateways (1/1)'. The top navigation bar includes 'Search' and 'Actions' with a 'Create internet gateway' button.

Step:1

The screenshot shows the 'Create internet gateway' wizard. Step 1 is 'Internet gateway settings'. It asks for a 'Name tag' with the placeholder 'Creates a tag with a key of 'Name' and a value that you specify.' A text input field contains 'proj-igw'. Below it is a 'Tags - optional' section with a table for adding tags. One tag is listed: 'Key' 'Name' and 'Value - optional' 'proj-igw'. A note says 'You can add 49 more tags.' At the bottom right is a 'Create Internet gateway' button.

Step:2

The screenshot shows the AWS VPC service dashboard. The 'Internet gateways' table now includes a new entry: 'igw-02f792e97740cd3b3 / proj-igw'. The 'State' is 'Detached'. The 'VPC ID' column is empty. The 'Owner' is '376423310372'. Below the table is a modal window for 'igw-02f792e97740cd3b3 / proj-igw'. It shows the 'Details' tab with the same information: Internet gateway ID 'igw-02f792e97740cd3b3', State 'Detached', VPC ID 'vpc-0c47ba4c813df847', and Owner '376423310372'. Below the details is a 'Tags' section with a table showing one tag: 'Name' 'proj-igw'. The main page header is 'Internet gateways (2/1)'. The top navigation bar includes 'Search' and 'Actions' with a 'Attach to a VPC' button.

Step:3

## 4. Attach IGW with VPC

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.

Select a VPC

AWS Command Line Interface command

Cancel **Attach internet gateway**

Step:4

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-07fc5cd7b55959c1

AWS Command Line Interface command

Cancel **Attach internet gateway**

Step:5

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VPC dashboard EC2 Global View New

Filter by VPC: Select a VPC

Virtual private cloud Your VPCs New Subnets Route tables **Internet gateways** Egress-only internet gateways Carrier gateways DHCP option sets Elastic IPs Managed prefix lists Endpoint Endpoint services NAT gateways Peering connections Security Network ACLs Security groups DNS firewall Rule groups

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Internet gateway igw-02f792e97740cd3b3 successfully attached to vpc-07fc5cd7b55959c1

VPC > Internet gateways > igw-02f792e97740cd3b3

**igw-02f792e97740cd3b3 / proj-igw**

Details Info

Internet gateway ID igw-02f792e97740cd3b3	State Attached	VPC ID vpc-07fc5cd7b55959c1   aws-project	Owner 376423310372
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Tags

Key	Value
Name	proj-igw

Actions

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Step:6

# 5. Creating the NAT

This screenshot shows the 'Create NAT gateway' configuration page. It includes fields for 'Name - optional' (proj-nat), 'Subnet' (subnet-0924954380105b8c1 (publicsub1)), 'Connectivity type' (Public selected), and 'Elastic IP allocation ID' (eipalloc-0b3b8e3da404542dc). A 'Tags' section is also present.

**NAT gateway settings**

Name - optional  
Create a tag with a key of 'Name' and a value that you specify.  
proj-nat  
The name can be up to 256 characters long.

Subnet  
Select a subnet in which to create the NAT gateway.  
subnet-0924954380105b8c1 (publicsub1)

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

Elastic IP allocation ID Info  
Assign an Elastic IP address to the NAT gateway.  
Select an Elastic IP

▶ Additional settings Info

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

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Step:1

This screenshot shows the final step of creating the NAT gateway. It displays the allocated Elastic IP address (44.216.111.246) and the 'Create NAT gateway' button.

**Elastic IP address 44.216.111.246 (eipalloc-0b3b8e3da404542dc) allocated.**

The name can be up to 256 characters long.

**Subnet**  
Select a subnet in which to create the NAT gateway.  
subnet-0924954380105b8c1 (publicsub1)

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

**Elastic IP allocation ID Info**  
Assign an Elastic IP address to the NAT gateway.  
eipalloc-0b3b8e3da404542dc

▶ Additional settings Info

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

Key Value - optional  
Name proj-nat   
  
You can add 49 more tags.

Cancel

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Step:2

This screenshot shows the 'nat-0bf59709d00e1b072 / proj-nat' details page. It lists the NAT gateway ID, ARN, connectivity type (Public), state (Pending), and VPC information. The 'Secondary IPv4 addresses' section is empty.

**NAT gateway nat-0bf59709d00e1b072 | proj-nat was created successfully.**

**nat-0bf59709d00e1b072 / proj-nat**

**Details Info**

NAT gateway ID	Connectivity type	State	State message <small>Info</small>
nat-0bf59709d00e1b072	Public	Pending	-
NAT gateway ARN	arn:aws:ec2:us-east-1:376423310372:natgateway/nat-0bf59709d00e1b072	Primary public IPv4 address	Primary private IPv4 address
	-	-	-
VPC	Subnet	Created	Deleted
vpc-07fc5cd7b55959c1 / aws-project	subnet-0924954380105b8c1 / publicsub1	Thursday, May 25, 2023 at 21:21:40 GMT+5:30	-

**Secondary IPv4 addresses**

Filter by secondary IPv4 address

Private IPv4 address Network interface ID Status Failure message

Secondary IPv4 addresses are not available for this nat gateway.

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Step:3

## 6. Edit subnet association and attach IGW in routepublic

Route tables (2) Info

Route table ID	Explicit subnet associations	Edge associations	Main	VPC
rtb-0c5d66d61e80cc8d2	-	-	Yes	vpc-07fd5cd7b55959c1   aws-project
rtb-012df35d15be9ca97	-	-	Yes	vpc-0c47ba4c813dfd847

Select a route table

Step:1

VPC dashboard X Services Search [Alt+S] N. Virginia Bhatpansel

VPC > Route tables > rtb-0c3d66d61e80cc8d2

rtb-0c3d66d61e80cc8d2

Details Info

Route table ID	Main	Explicit subnet associations	Edge associations
rtb-0c3d66d61e80cc8d2	Yes	-	-

Routes Subnet associations Edge associations Route propagation Tags

Explicit subnet associations (0)

No subnet associations You do not have any subnet associations

Subnets without explicit associations (2)

Step:2

VPC > Route tables > rtb-0c3d66d61e80cc8d2 > Edit subnet associations

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (2/2)

Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
publicsub2	subnet-0f59183f503b8867e	20.0.1.0/24	-	Main (rtb-0c3d66d61e80cc8d2)
publicsub1	subnet-0924954380105b8c1	20.0.0.0/24	-	Main (rtb-0c3d66d61e80cc8d2)

Selected subnets

subnet-0924954380105b8c1 / publicsub1 X subnet-0f59183f503b8867e / publicsub2 X

Cancel Save associations

Step:3

VPC > Route tables > rtb-0c3d66d61e80cc8d2 > Edit routes

Edit routes

Destination	Target	Status	Propagated
20.0.0.0/16	local	Active	No
0.0.0.0/0	igw-02f792e97740cd3b3	-	No

Add route Cancel Preview Save changes

Step:4

**aws | Services** Search [Alt+S] N. Virginia Bhatpansel

VPC dashboard EC2 S3 RDS CloudFormation Route 53 IAM CloudWatch

Updated routes for rtb-0c3d66d61e80cc8d2 successfully

VPC > Route tables > rtb-0c3d66d61e80cc8d2

Actions

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

**Details** Info

Route table ID rtb-0c3d66d61e80cc8d2	Main Yes	Explicit subnet associations 2 subnets	Edge associations -
VPC vpc-07fc5cd7b55959c1   aws-project	Owner ID 376423310372		

Routes Subnet associations Edge associations Route propagation Tags

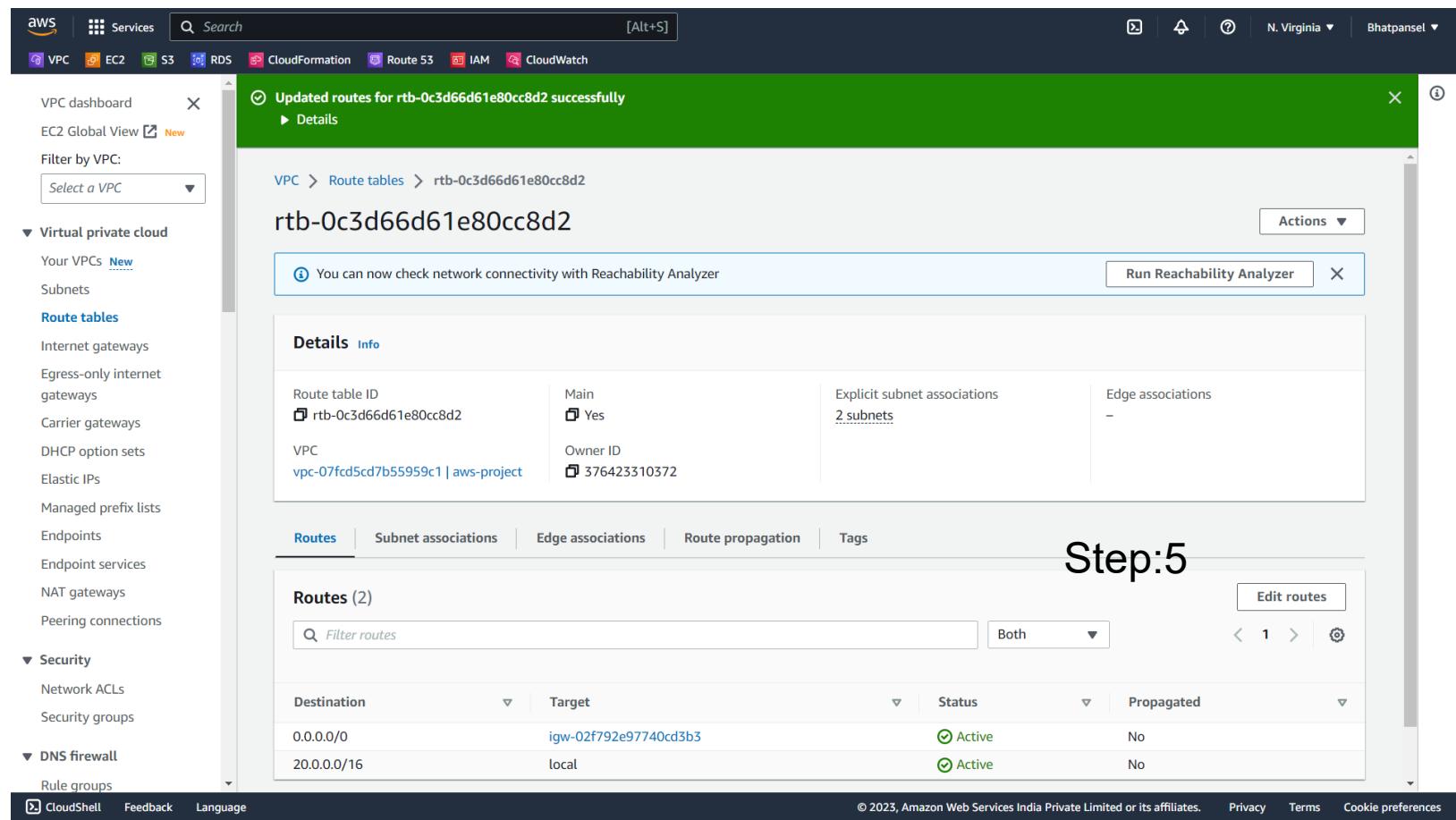
**Step:5**

Routes (2)

Destination	Target	Status	Propagated
0.0.0.0/0	igw-02f792e97740cd3b3	Active	No
20.0.0.0/16	local	Active	No

Filter routes Both < 1 > ⚙️

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## 6. Edit subnet association and attach NAT in routeprivate

This screenshot shows the 'Create route table' wizard. In the 'Route table settings' step, a tag named 'priv-route' is added to a VPC named 'aws-project'. The 'Tags' section shows one tag: 'Name: priv-route'. The 'Create route table' button is highlighted.

Step:1

This screenshot shows the 'rtb-0fb23a382ffc70417 / priv-route' details page. It lists the route table ID, VPC, Main status (No), and Owner ID. The 'Routes' tab shows a single route to '20.0.0.16' with a target of 'local' and an active status.

Step:2

This screenshot shows the 'Edit subnet associations' page for the route table. It lists available subnets: 'privatesub' (selected), 'publicsub2', and 'publicsub1'. The 'Selected subnets' section shows 'privatesub' is selected. The 'Save associations' button is highlighted.

Step:3

This screenshot shows the 'rtb-0fb23a382ffc70417 / priv-route' details page after subnet associations were added. The 'Explicit subnet associations' table now includes 'privatesub'. The 'Subnet associations' tab shows the same route table details as before.

Step:4

**Step:5**

AWS VPC Route Tables interface showing the configuration of a route table. The route table ID is rtb-0fb23a382ffc70417. It contains two routes:

Destination	Target	Status	Propagated
20.0.0.0/16	local	Active	No
0.0.0.0/0	nat-0bf59709d00e1b072	-	No

The 'Save changes' button is highlighted in orange.

**Step:6**

AWS VPC Route Tables interface showing the confirmation of route updates. A green banner at the top states: "Updated routes for rtb-0fb23a382ffc70417 / priv-route successfully".

The route table rtb-0fb23a382ffc70417 / priv-route is displayed with the following details:

Route table ID	Main	Explicit subnet associations	Edge associations
rtb-0fb23a382ffc70417	No	subnet-0ab99790aae4a2ee3 / privatesub	-
VPC	Owner ID		
vpc-07fd5cd7b55959c1   aws-project	376423310372		

The 'Edit routes' button is highlighted in orange.

# 7.Launching the public instance

The screenshot shows the AWS EC2 Dashboard. On the left sidebar, there are sections for EC2 Dashboard, Instances (with sub-options like Instances Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations), Images (AMIs, AMI Catalog), Elastic Block Store (Volumes, Snapshots, Lifecycle Manager), and Network & Security (Info/Health). The main area displays 'Resources' for the US East (N. Virginia) Region, showing 0 instances (running), 0 Auto Scaling Groups, 0 Dedicated Hosts, 1 Elastic IP, 0 instances, 1 Key pairs, 0 Load balancers, 0 Placement groups, 0 Security groups, 1 Snapshots, and 0 Volumes. Below this is a 'Launch instance' section with a 'Launch instance' button and a 'Migrate a server' option. A note says 'Note: Your instances will launch in the US East (N. Virginia) Region'. To the right is a 'Service health' section for AWS Health Dashboard, showing 'Region: US East (N. Virginia)' and 'Status: This service is operating normally'. A 'Zones' table lists 'Zone name' (us-east-1a, us-east-1b) and 'Zone ID' (use1-az6, use1-az1). A 'Explore AWS' sidebar highlights 'Amazon GuardDuty Malware Protection' and 'Enable Best Price-Performance with AWS Graviton2'.

Step:1

The screenshot shows the 'Launch an instance' wizard. Step 1: Set instance details. It asks for a 'Name' (pub-ec2) and 'Software Image (AMI)' (Amazon Linux 2023 AMI 2023.0.2...). It also shows 'Virtual server type (instance type)' (t2.micro), 'Firewall (security group)', and 'Storage (volumes)' (1 volume(s) - 8 GiB). A 'Launch instance' button is at the bottom.

Step:2

The screenshot shows the 'Create key pair' wizard. Step 1: Set key pair details. It asks for a 'Key pair name' (project-key) and 'Key pair type' (RSA). It also shows 'Private key file format' (.pem or .ppk) and a note about storing the private key securely. A 'Create key pair' button is at the bottom.

Step:3

The screenshot shows the 'Launch an instance' wizard. Step 2: Review and launch. It summarizes the configuration: 1 instance, AMI (Amazon Linux 2023 AMI 2023.0.2...), Instance type (t2.micro), and Storage (1 volume(s) - 8 GiB). It includes a 'Launch instance' button and a 'Review commands' link.

Step:4

**Step:5**

AWS CloudFormation console showing the creation of a new EC2 instance. The summary section includes:

- Number of instances: 1
- Software Image (AMI): Canonical, Ubuntu, 20.04 LTS
- Virtual server type (instance type): t2.micro
- Firewall (security group): New security group
- Storage (volumes): 1 volume(s) - 8 GiB

Buttons: Cancel, Launch instance, Review commands.

**Step:6**

AWS CloudFormation console showing the configuration of a security group. The security group rules include:

- Security group rule 1 (TCP, 22, 0.0.0.0/0): Type ssh, Protocol TCP, Port range 22, Source Anywhere.
- Security group rule 2 (All, All, 0.0.0.0/0): Type All traffic, Protocol All, Port range All, Source Anywhere.

Buttons: Cancel, Launch instance, Review commands.

**Step:7**

AWS EC2 Instances console showing the launch of a new instance. Success message: Successfully initiated launch of instance (i-09636a9f44950dbed). Next Steps include:

- Create billing and free tier usage alerts
- Connect to your instance
- Connect an RDS database
- Create EBS snapshot policy
- Manage detailed monitoring
- Create Load Balancer
- Create AWS budget
- Manage CloudWatch alarms

Buttons: Show all.

# 8.Launching the private instance

This screenshot shows the AWS VPC Management Console with the EC2 service selected. A new instance is being launched with the following details:

- Name and tags:** Name is set to "priv-ec2".
- Application and OS Images (Amazon Machine Image):** Software Image (AMI) is set to "Ubuntu Server 22.04 LTS (HVM, SSD Volume Type)".
- Virtual server type (instance type):** t2.micro.
- Storage (volumes):** 1 volume(s) - 8 GiB.
- Launch instance** button is highlighted.

Step:1

This screenshot shows the "Summary" step of the EC2 Instances Launch wizard. The configuration is identical to the previous step:

- Amazon Machine Image (AMI):** Ubuntu Server 20.04 LTS (HVM, SSD Volume Type).
- Virtual server type (instance type):** t2.micro.
- Storage (volumes):** 1 volume(s) - 8 GiB.
- Launch instance** button is highlighted.

Step:2

This screenshot shows the "Network settings" section of the VPC Management Console. The instance has been successfully launched and assigned a private IP address (172.31.10.12). The network configuration includes:

- VPC - required:** vpc-07fd5cd7b55959c1 (aws-project).
- Subnet Info:** subnet-0ab99790aae4a2ee3 (private subnet).
- Auto-assign public IP:** Disable.
- Firewall (security groups):** project-sg.
- Common security groups:** project-sg sg-021db621b4fcfbef0.

Step:3

This screenshot shows the "Next Steps" page after the instance has been successfully launched. It provides several options for managing the instance:

- Create billing and free tier usage alerts**
- Connect to your instance**
- Connect an RDS database**
- Create EBS snapshot policy**
- Manage detailed monitoring**
- Create Load Balancer**
- Create AWS budget**
- Manage CloudWatch alarms**

Step:4

## 9. Creating the s3 bucket

The screenshot shows the 'Create bucket' page in the AWS Management Console. In the 'General configuration' section, the 'Bucket name' is set to 'projects3'. Under 'Object Ownership', the 'ACLs disabled (recommended)' option is selected. The 'Step:1' label is centered below the main form.

Step:1

The screenshot shows the 'Object Ownership' section of the 'Create bucket' page. It highlights the 'ACLs enabled' option, which is recommended for controlling access to objects. A note at the bottom states: 'If you want to enforce object ownership for new objects only, your bucket policy must specify that the bucket-owner-full-control canned ACL is required for object uploads.' The 'Step:2' label is centered below this section.

Step:2

The screenshot shows the 'Bucket Versioning' and 'Default encryption' sections. Under 'Bucket Versioning', 'Enable' is selected. Under 'Default encryption', 'Amazon S3 managed keys (SSE-S3)' is selected. The 'Step:3' label is centered below these settings.

Step:3

The screenshot shows the 'Buckets' list page. It displays two buckets: 'awsprojectbhat' (created on May 25, 2023) and 'elasticbeanstalk-us-east-1-376423310372' (created on May 23, 2023). The 'Step:4' label is centered below the bucket list.

Step:4

## 10. Upload index and error html file in s3

The screenshot shows the AWS S3 Management Console. The URL is <https://s3.console.aws.amazon.com/s3/buckets/awsprojectbhat?region=us-east-1&tab=objects>. The page title is "awsprojectbhat". The top navigation bar includes "VPC Management Console", "Instances | EC2 Management Con...", "awsprojectbhat - S3 bucket", "Start Course | Intellipaat", and other tabs. The main content area is titled "Objects (0)" and contains a message: "Objects are fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more". Below this are buttons for "Copy S3 URI", "Copy URL", "Download", "Open", "Delete", "Actions", "Create folder", and "Upload". A search bar says "Find objects by prefix". A table header includes "Name", "Type", "Last modified", "Size", and "Storage class". A message at the bottom says "No objects" and "You don't have any objects in this bucket." A large "Upload" button is at the bottom.

Step:5

The screenshot shows the AWS S3 Management Console upload interface. The URL is <https://s3.console.aws.amazon.com/s3/upload/awsprojectbhat?region=us-east-1>. The page title is "awsprojectbhat". The top navigation bar includes "VPC Management Console", "Instances | EC2 Management Con...", "S3 Management Console", "Start Course | Intellipaat", and other tabs. The main content area is titled "Upload" and contains a message: "Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. Learn more". Below this is a large text input field with the placeholder "Drag and drop files and folders you want to upload here, or choose Add files, or Add folder". A table titled "Files and folders (2 Total, 273.0 B)" lists two files: "aboutus.html" (text/html, 126.0 B) and "error.html" (text/html, 147.0 B). Buttons for "Remove", "Add files", and "Add folder" are available. A "Destination" section shows "Destination" and "s3://awsprojectbhat".

Step:6

The screenshot shows the AWS S3 Management Console after files have been uploaded. The URL is <https://s3.console.aws.amazon.com/s3/buckets/awsprojectbhat?region=us-east-1&tab=objects>. The page title is "awsprojectbhat". The top navigation bar includes "VPC Management Console", "Instances | EC2 Management Con...", "awsprojectbhat - S3 bucket", "Start Course | Intellipaat", and other tabs. The main content area is titled "Objects (2)". A context menu is open over the first object, showing options like "Initiate restore", "Query with S3 Select", "Edit actions", "Rename object", "Edit storage class", "Edit server-side encryption", "Edit metadata", "Edit tags", and "Make public using ACL". The "Actions" button is highlighted. The table lists two objects: "aboutus.html" (html, May 25, 2023, 22:08:25 (UTC+05:30), 126.0 B, Standard) and "error.html" (html, May 25, 2023, 22:08:24 (UTC+05:30), 147.0 B, Standard). A search bar says "Find objects by prefix". A table header includes "Name", "Type", "Last modified", "Size", and "Storage class".

Step:7

Make public Info

The make public action enables public read access in the object access control list (ACL) settings. [Learn more](#)

**Specified objects**

Name	Type	Last modified	Size
aboutus.html	html	May 25, 2023, 22:08:25 (UTC+05:30)	126.0 B
error.html	html	May 25, 2023, 22:08:24 (UTC+05:30)	147.0 B

Cancel **Make public**

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Step:8

**Successfully edited public access**  
View details below.

**Make public: status**

The information below will no longer be available after you navigate away from this page.

**Summary**

Source	Successfully edited public access	Failed to edit public access
s3://awsprojectbhat	2 objects, 273.0 B	0 objects

[Failed to edit public access](#) Configuration

**Failed to edit public access (0)**

Name	Folder	Type	Last modified	Size	Error
No objects failed to edit					

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Step:9

# 11. Enable the static website hosting in S3 bucket

Amazon S3

Transfer acceleration  
Disabled

**Object Lock**  
Store objects using a write-once-read-many (WORM) model to help you prevent objects from being deleted or overwritten for a fixed amount of time or indefinitely. Learn more [\[Info\]](#)

Object Lock  
Disabled

Amazon S3 currently does not support enabling Object Lock after a bucket has been created. To enable Object Lock for this bucket, contact Customer Support [\[Info\]](#)

**Requester pays**  
When enabled, the requester pays for requests and data transfer costs, and anonymous access to this bucket is disabled. Learn more [\[Info\]](#)

Requester pays  
Disabled

**Static website hosting**  
Use this bucket to host a website or redirect requests. Learn more [\[Info\]](#)

Static website hosting  
Disabled

Step:1

Amazon S3

Buckets

Access Points  
Object Lambda Access Points  
Multi-Region Access Points  
Batch Operations  
IAM Access Analyzer for S3

Block Public Access settings for this account

Storage Lens

Dashboards  
AWS Organizations settings

Feature spotlight [\[Info\]](#)

AWS Marketplace for S3

**Edit static website hosting** [\[Info\]](#)

**Static website hosting**  
Use this bucket to host a website or redirect requests. Learn more [\[Info\]](#)

Static website hosting  
 Enable  
 Disable

Hosting type  
 Host a static website  
Use the bucket endpoint as the web address. Learn more [\[Info\]](#)  
 Redirect requests for an object  
Redirect requests to another bucket or domain. Learn more [\[Info\]](#)

For your customers to access content at the website endpoint, you must make all your content publicly readable. To do so, you can edit the S3 Block Public Access settings for the bucket. For more information, see Using Amazon S3 Block Public Access [\[Info\]](#)

Index document  
Specify the home or default page of the website.  
aboutus.html

Error document - optional  
This is returned when an error occurs.  
error.html

Redirection rules - optional  
Redirection rules, written in JSON, automatically redirect webpage requests for specific content. Learn more [\[Info\]](#)

Step:2

CloudShell Feedback Language

aws Services Search [Alt+S]

Amazon S3

Successfully edited static website hosting.

Amazon S3 > Buckets > awsprojectbhat

**awsprojectbhat** [\[Info\]](#)

Objects Properties Permissions Metrics Management Access Points

**Bucket overview**

AWS Region US East (N. Virginia) us-east-1	Amazon Resource Name (ARN) arn:aws:s3:::awsprojectbhat	Creation date May 25, 2023, 22:00:04 (UTC+05:30)
---	---	---

**Bucket Versioning**  
Versioning is a means of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. Learn more [\[Info\]](#)

Bucket Versioning  
Enabled

Multi-factor authentication (MFA) delete  
An additional layer of security that requires multi-factor authentication for changing Bucket Versioning settings and permanently deleting object versions. To modify MFA delete settings, use the AWS CLI, AWS SDK, or the Amazon S3 REST API. Learn more [\[Info\]](#)

Disabled

Step:3

This is my Application Page  
About Us

https://docs.aws.amazon.com/console/s3/hostingstaticwebsite

VPC Management Console Instances | EC2 Management Con awsprojectbhat - S3 bucket awsprojectbhat.s3-website-us-east-1.amazonaws.com Not secure awsprojectbhat.s3-website-us-east-1.amazonaws.com Inbox (671) - bharathsmart486@ 26-05-2023

29°C Partly sunny

Step:4

# 12.Creating RDS database instance

The screenshot shows the Amazon RDS Dashboard. At the top, there's a banner about Multi-AZ deployment. Below it, the 'Resources' section lists DB Instances (0/40), Parameter groups (4), DB Clusters (0/40), Reserved instances (0/40), Snapshots (0), and various automated and manual tasks. A 'Recommended for you' sidebar includes links for Cross-Region DR, Backup, and Migrating SSRS to RDS.

This is the third step of the RDS instance creation process. It shows the 'Engine' section where 'MySQL Community' is selected. Other options like Aurora MySQL, Aurora PostgreSQL, MariaDB, PostgreSQL, Oracle, and Microsoft SQL Server are shown with their respective icons.

Step:3

This is the second step of the RDS instance creation process. It asks to choose a database creation method, with 'Standard create' selected. It also shows engine options for MySQL, Aurora MySQL, Aurora PostgreSQL, MariaDB, PostgreSQL, Oracle, and Microsoft SQL Server.

Step:2

This is the fourth step of the RDS instance creation process. It asks for the DB instance identifier, which is set to 'project-database'. It also includes sections for Master username (set to 'admin'), Credentials Settings (with a note about Secrets Manager support), and password configuration.

Step:4

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.t2.micro

1 vCPUs 1 GiB RAM Not EBS Optimized

Include previous generation classes

## Step:5

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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

**Existing VPC security groups**

Choose one or more options

project-sg X

**Availability Zone Info**

us-east-1a

**RDS Proxy**

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

Create an RDS Proxy Info

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

**Certificate authority - optional Info**

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

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

## Step:7

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.

aws-project (vpc-07fc5cd7b55959c1)  
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.

Create new DB Subnet Group

**Public access Info**

Yes  
RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.

No  
RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

**VPC security group (firewall) Info**

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

## Step:6

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**CloudShell Feedback Language**

**Option group Info**

default:mysql-8-0

**Backup**

Enable automated backups  
Creates a point-in-time snapshot of your database

**Log exports**

Select the log types to publish to Amazon CloudWatch Logs

Audit log

Error log

General log

Slow query log

**IAM role**

The following service-linked role is used for publishing logs to CloudWatch Logs.

RDS service-linked role

Ensure that general, slow query, and audit logs are turned on. Error logs are enabled by default. Learn more

**Maintenance**

Auto minor version upgrade Info

Enable auto minor version upgrade  
Enabling auto minor version upgrade will automatically upgrade to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the database.

**Maintenance window Info**

Select the period you want pending modifications or maintenance applied to the database by Amazon RDS.

## Step:8

The screenshot shows the Amazon RDS Databases page. The left sidebar includes options like Dashboard, Databases (which is selected), Query Editor, Performance insights, Snapshots, Exports in Amazon S3, Automated backups, Reserved instances, Proxies, Subnet groups, Parameter groups, Option groups, Custom engine versions, Events, and Event subscriptions. The main content area displays a table titled 'Databases' with one row for 'project-database'. The table columns include DB identifier, Role, Engine, Region & AZ, Size, Status, and Actions. The database details are: DB identifier: project-database, Role: Instance, Engine: MySQL Community, Region & AZ: us-east-1a, Size: db.t2.micro, Status: Available, and Actions: 4 Actions. A 'Create database' button is also present.

Step:10

The screenshot shows the Amazon RDS Database Details page for 'project-database'. The left sidebar is identical to the previous screenshot. The main content area has a 'Summary' section with details: DB identifier: project-database, CPU usage: 4.68%, Status: Available, Class: db.t2.micro, Role: Instance, Current activity: 0 Connections, Engine: MySQL Community, and Region & AZ: us-east-1a. Below the summary are tabs for Connectivity & security, Monitoring, Logs & events, Configuration, Maintenance & backups, and Tags. The 'Connectivity & security' tab is selected, showing the Endpoint & port section with details: Endpoint: project-database.c1neyfdusxih.us-east-1.rds.amazonaws.com, Networking: Availability Zone: us-east-1a, VPC: VPC security groups: project-sg (sg-021db621b4fcfbef0), and Security status: Active.

Step:11

## **13.Creating dynamoDB**

**Step:1**

The screenshot shows the Amazon DynamoDB home page. The main heading is "Amazon DynamoDB: A fast and flexible NoSQL database service for any scale". Below it, a sub-headline states: "DynamoDB is a fully managed, key-value, and document database that delivers single-digit-millisecond performance at any scale." To the right, there's a "Get started" section with a "Create table" button. On the left, there's a sidebar for "DAX" and "Tables" settings.

**Step:2**

The screenshot shows the "Create table" wizard. It displays a table with configuration details:

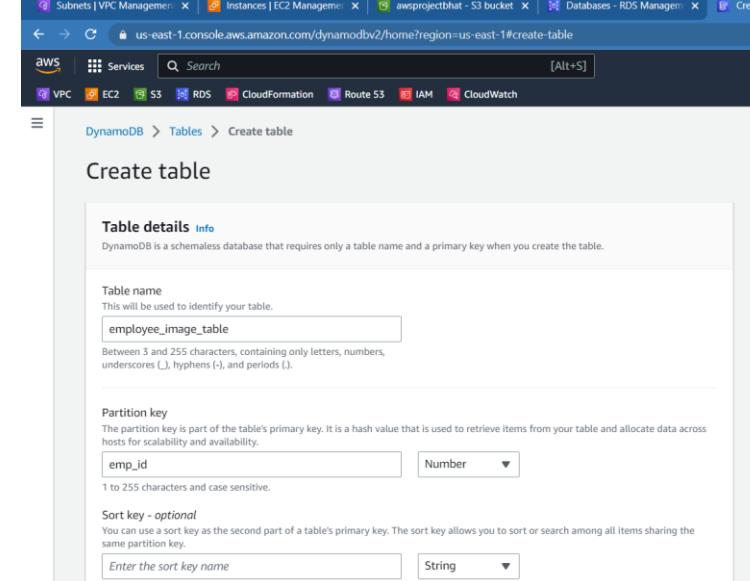
Setting	Value	Status
Provisioned read capacity	5 RCU	Yes
Provisioned write capacity	5 WCU	Yes
Auto scaling	On	Yes
Local secondary indexes	-	No
Global secondary indexes	-	Yes
Encryption key management	Owned by Amazon DynamoDB	Yes
Table class	DynamoDB Standard	Yes
Deletion protection	Off	Yes

Below the table, there's a "Tags" section with a note about AWS resource tags and a "Add new tag" button. At the bottom, there are "Cancel" and "Create table" buttons.

**Step:3**

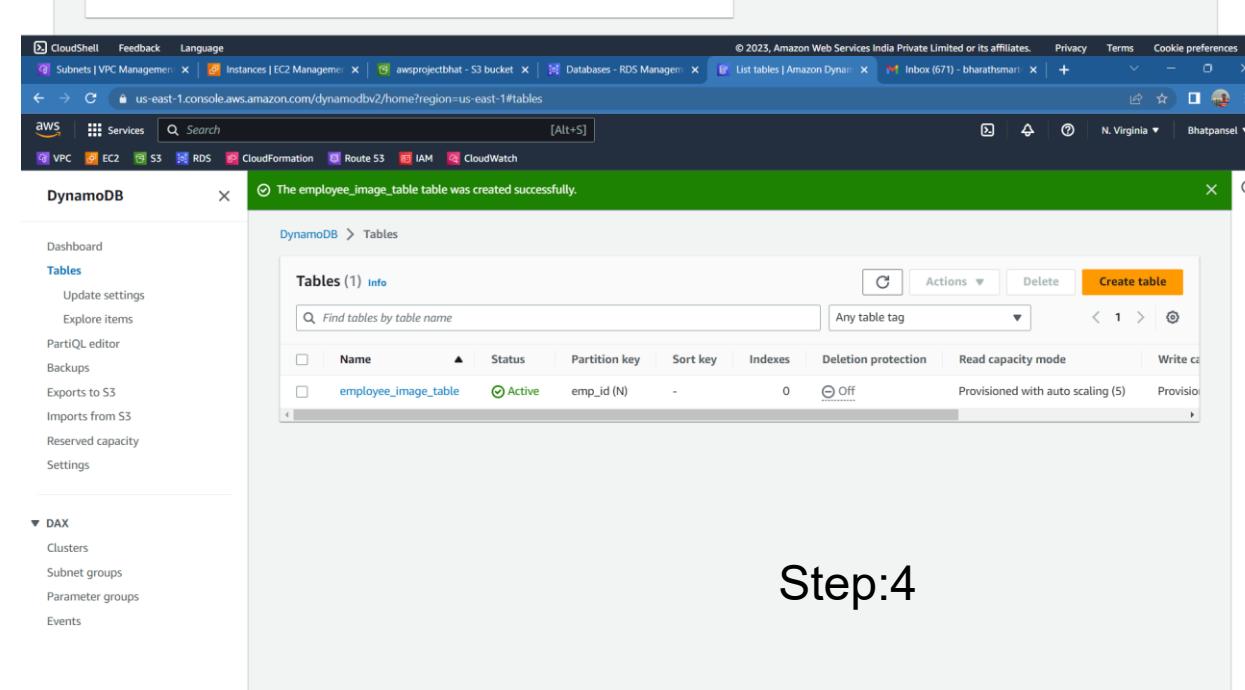
The screenshot shows the final step of the "Create table" wizard. It displays a summary message: "Your table is being created. This may take a few minutes." Below this, there's a "Next Step" button.

## Step:3



**Step:2**

The screenshot shows the 'Create table' wizard in the AWS DynamoDB console. The 'Table details' step is active. The table name is set to 'employee\_image\_table'. The partition key is 'emp\_id' of type Number. A sort key is optional and left empty.



**Step:4**

The screenshot shows the 'Tables' page in the AWS DynamoDB console. The 'employee\_image\_table' is listed with one item: emp\_id (N) is the partition key, and Sort key is '-'.

## Step:4

# 14. Creating the IAM role

The screenshot shows the AWS IAM Roles page. The left sidebar includes sections for Access management, Policies, Identity providers, and Account settings. The main area displays a table of 23 existing IAM roles, each with a role name, trusted entity, and last activity date. A large watermark 'Step:1' is overlaid on the center of the page.

This screenshot shows the 'Add permissions' step of the IAM Role creation wizard. It lists three selected policies: 'AmazonDynamoDBFullAccess', 'AmazonDynamoDBReadOnlyAccess', and 'AWSLambdaInvocation-DynamoDB'. A search bar at the top allows filtering by policy name. A note at the bottom states: 'Set permissions boundary - optional' and 'Set a permissions boundary to control the maximum permissions this role can have. This is not a common setting, but you can use it to delegate permissions to other accounts'. A large watermark 'Step:3' is overlaid on the center of the page.

The screenshot shows the 'Select trusted entity' step of the IAM Role creation wizard. It includes sections for 'Trusted entity type' (radio buttons for AWS service, AWS account, Web identity, SAML 2.0 federation, and Custom trust policy), 'Use case' (radio buttons for EC2 and Lambda), and 'Common use cases' (radio buttons for EC2 and Lambda). A large watermark 'Step:2' is overlaid on the center of the page.

This screenshot shows the 'Name, review, and create' step of the IAM Role creation wizard. It displays 'Role details' with a 'Role name' field containing 'projectrole' and a 'Description' field stating 'Allows EC2 instances to call AWS services on your behalf.' Below this is the 'Step 1: Select trusted entities' section, which contains a JSON policy document. A large watermark 'Step:4' is overlaid on the center of the page.

```
1  {
2    "Version": "2012-10-17",
3    "Statement": [
4      {
5        "Effect": "Allow",
6        "Action": [
7          "sts:AssumeRole"
8        ],
9        "Principal": [
10          {
11            "service": [
12              "ec2.amazonaws.com"
13            ]
14          }
15        ]
16      }
17    ]
18  }
```

**Step:5**

Step 2: Add permissions

Policy name	Type	Attached as
AmazonDynamoDBFullAccess	AWS managed	Permissions policy
AmazonS3FullAccess	AWS managed	Permissions policy
AmazonRDSFullAccess	AWS managed	Permissions policy

Tags

Add tags - optional Info

Tags are key-value pairs that you can add to AWS resources to help identify, organize, or search for resources.

No tags associated with the resource.

Add tag

You can add up to 50 more tags.

Cancel Previous Create role

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**Step:6**

Identity and Access Management (IAM)

Role projectrole created.

IAM > Roles

Roles (24) 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.

Role name	Trusted entities	Last activity
AmazonRedshift-CommandsAccessRole-20230510T093309	AWS Service: redshift-serverless, and 2 more. <small>View</small>	15 days ago
AWSApplicationMigrationConversionServerRole	AWS Service: ec2	-
AWSApplicationMigrationLaunchInstanceWithDrssRole	AWS Service: ec2	-
AWSApplicationMigrationMGHRole	AWS Service: mgn	-
AWSApplicationMigrationReplicationServerRole	AWS Service: ec2	-
AWSBackupDefaultServiceRole	AWS Service: backup	16 days ago
AWSServiceRoleForAmazonElasticFileSystem	AWS Service: elasticfilesystem <small>(Service-Linked Role)</small>	117 days ago
AWSServiceRoleForAmazonSSM	AWS Service: ssm <small>(Service-Linked Role)</small>	1 hour ago
AWSServiceRoleForApplicationAutoScaling_DynamoDBTable	AWS Service: dynamodb.application-autoscaling <small>(Service-Linked Role)</small>	16 days ago
AWSServiceRoleForAutoScaling	AWS Service: autoscaling <small>(Service-Linked Role)</small>	Yesterday
AWSServiceRoleForBackup	AWS Service: backup <small>(Service-Linked Role)</small>	21 hours ago

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# 15. Creating application load balancer and target group

EC2 > Load balancers

No load balancers  
You don't have any load balancers in us-east-1

Create load balancer

0 load balancers selected

Select a load balancer above.

Step:1

EC2 > Load balancers > Create Application Load Balancer

Create Application Load Balancer [Info](#)

The Application Load Balancer distributes incoming HTTP and HTTPS traffic across multiple targets such as Amazon EC2 instances, microservices, and containers, based on request attributes. When the load balancer receives a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.

▶ How Elastic Load Balancing works

**Basic configuration**

Load balancer name  
Name must be unique within your AWS account and can't be changed after the load balancer is created.

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

Scheme [Info](#)  
Scheme can't be changed after the load balancer is created.  
 Internet-facing  
An internet-facing load balancer routes requests from clients over the internet to targets. Requires a public subnet. [Learn more](#)  
 Internal  
An internal load balancer routes requests from clients to targets using private IP addresses.

IP address type [Info](#)  
Select the type of IP addresses that your subnets use.  
 IPv4  
Recommended for internal load balancers.  
 Dualstack  
Includes IPv4 and IPv6 addresses.

Step:3

EC2 > Load balancers > Compare and select load balancer type

Compare and select load balancer type

A complete feature-by-feature comparison along with detailed highlights is also available. [Learn more](#)

**Load balancer types**

**Application Load Balancer** [Info](#)

**Network Load Balancer** [Info](#)

**Gateway Load Balancer** [Info](#)

Choose an Application Load Balancer when you need a flexible feature set for your applications with HTTP and HTTPS traffic.

Choose a Network Load Balancer when you need ultra-high performance, TLS offloading at scale, centralized certificate deployment, and more.

Choose a Gateway Load Balancer when you need to deploy and manage a fleet of third-party virtual appliances that support GENEVE.

Step:2

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

**VPC** [Info](#)  
Select the virtual private cloud (VPC) for your targets or you can [create a new VPC](#). Only VPCs with an internet gateway are enabled for selection. The selected VPC can't be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

aws-project  
vpc-07fc5cd7b55959c  
IPv4: 20.0.0.0/16

**Mappings** [Info](#)  
Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

us-east-1a (use1-az6)

Subnet  
 publicsub1

IPv4 address  
Assigned by AWS

us-east-1b (use1-az1)

Subnet  
 publicsub2

IPv4 address  
Assigned by AWS

us-east-1c (use1-az2)

Step:4

Subnets | VPC M | Load balancers | Target groups | awsprojectbhat | Databases - RDS | View table | Amazon IAM | IAM Management | Start Course | AWS Services | Search [Alt+S] N. Virginia Bhatpanel AWS Services | Search [Alt+S] N. Virginia Bhatpanel

EC2 > Target groups > Create target group

### Specify group details

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

Step 1: Specify group details

Step 2: Register targets

#### Basic configuration

Settings in this section can't be changed after the target group is created.

Choose a target type

Instances

- Supports load balancing to Instances within a specific VPC.
- Facilitates the use of [Amazon EC2 Auto Scaling](#) to manage and scale your EC2 capacity.

IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.
- Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.

Lambda function

- Facilitates routing to a single Lambda function.
- Accessible to Application Load Balancers only.

Target group name: pro-TG

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

Protocol: TCP Port: 80  
1-65535

VPC: Select the VPC with the instances that you want to include in the target group.  
aws-project  
vpc-07fc5cd7b55959c1  
IPv4: 20.0.0.0/16

#### Health checks

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

Health check protocol: HTTP

Health check path: /

Step:5

Step:6

Subnets | VPC M | Load balancers | Target groups | awsprojectbhat | Databases - RDS | View table | Amazon IAM | IAM Management | Start Course | AWS Services | Search [Alt+S] N. Virginia Bhatpanel AWS Services | Search [Alt+S] N. Virginia Bhatpanel

EC2 > Target groups > Create target group

### Register targets

This is an optional step to create a target group. However, to ensure that your load balancer routes traffic to this target group you must register your targets.

Step 1: Specify group details

Step 2: Register targets

#### Available instances (1/2)

Instance ID	Name	Status	Security groups	Zone
i-09636a9f44950dbed	pub-ec2	Running	project-sg	us-east-1
i-0c6f55902d44b836c	priv-ec2	Running	project-sg	us-east-1

1 selected

Ports for the selected instances  
Ports for routing traffic to the selected instances.  
80  
1-65535 (separate multiple ports with commas)  
Include as pending below

Step:7

#### Review targets

Targets (1)

All	Filter resources by property or value							
Remove	Health status	Instance ID	Name	Port	State	Security groups	Zone	Subnet ID
X	Pending	i-0c6f55902d44b836c	priv-ec2	80	Running	project-sg	us-east-1c	subnet-0ab95

1 pending

Step:8

Subnets | VPC M... Load balancers Target groups Target groups awsprojectb... Databases - RDS View table | Ama... IAM Management Start Course | Int... Subnets | VPC Load balancers Target groups Target groups awsprojectb... Databases - RDS View table | A... IAM Manager Start Course | ... N. Virginia Bhatpanse...

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

Successfully created target group: pro-TG

EC2 > Target groups

Target groups (1) info

Find resources by attribute or tag

Name	ARN	Port	Protocol	Target type	Load balancer
pro-TG	arn:aws:elasticloadbalanc...	80	TCP	Instance	None associated

0 target groups selected

Select a target group above.

Step:9

Listeners and routing Info

A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

▼ Listener HTTP:80

Protocol Port Default action Info

HTTP	: 80	Forward to project-tg
------	------	-----------------------

1-65535 Target type: Instance, IPv4

Create target group

Listener tags - optional

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

Add listener tag

You can add up to 50 more tags.

Add listener

▼ Add-on services - optional

Step:10

Subnets | VPC Load balancers Target groups Target groups awsprojectb... Databases - RDS View table | A... IAM Manager Start Course | ... N. Virginia Bhatpanse...

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

Successfully created load balancer: project-alb

Note: It might take a few minutes for your load balancer to be fully set up and ready to route traffic. Targets will also take a few minutes to complete the registration process and pass initial health checks.

EC2 > Load balancers > project-alb > Create Application Load Balancer

Create Application Load Balancer

Suggested next steps

- Review, customize, or configure attributes for your load balancer and listeners using the Description and Listeners tabs within project-alb.
- Discover other services that you can integrate with your load balancer. Visit the Integrated services tab within project-alb.

View load balancer

Step:11

Summary

Review and confirm your configurations. Estimate cost

Basic configuration Edit

project-alb

- Internet-facing
- IPv4

Security groups Edit

- project-sg sg-021db621b4fcfbef0

Network mapping Edit

- VPC vpc-07fd5cd7b55959c1
- aws-project
- us-east-1a subnet-0924954380105b8c1 publicsub1
- us-east-1b subnet-0f59183f503b8867e publicsub2

Listeners and routing Edit

- HTTP:80 defaults to project-tg

Add-on services Edit

Tags Edit

None

Attributes

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

Create load balancer

Step:12

## 16.Attaching the IAM role to the private instance

Instances (1/2) **Info**

Name	Instance ID	Instance state	Instance type	Status check	Alarm status
pub-ec2	i-09636a9f44950dbed	Running	t2.micro	-	No alarms
<b>priv-ec2</b>	i-0c6f55902d44b836c	Running	t2.micro	-	No alarms

Actions ▾ **Launch instances** ▾

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

Find instance by attribute or tag (case-sensitive)

EC2 Dashboard  
EC2 Global View  
Events  
Limits  
Instances  
Instances Types  
Launch Templates  
Spot Requests  
Savings Plans  
Reserved Instances  
Dedicated Hosts  
Scheduled Instances  
Capacity Reservations

Images  
AMIs  
AMI Catalog

Elastic Block Store  
Volumes

Details Security Networking Storage Status checks Monitoring Tags

Instance: i-0c6f55902d44b836c (priv-ec2)

Step:1

Subnets | VPC Manager > Instances > i-0c6f55902d44b836c > Modify IAM role

### Modify IAM role [Info](#)

Attach an IAM role to your instance.

Instance ID: [i-0c6f55902d44b836c](#) (priv-ec2)

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.

projectrole [Create new IAM role](#)

Cancel **Update IAM role**

Step:2

Subnets | VPC Manager > Instances > i-0c6f55902d44b836c > Instances (2) **Info**

Successfully attached projectrole to instance i-0c6f55902d44b836c

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS
pub-ec2	i-09636a9f44950dbed	Running	t2.micro	2/2 checks passed	No alarms	+ us-east-1a	-
<b>priv-ec2</b>	i-0c6f55902d44b836c	Running	t2.micro	2/2 checks passed	No alarms	+ us-east-1c	-

Select an instance

Step:3

EC2 Dashboard  
EC2 Global View  
Events  
Limits  
Instances  
Instances Types  
Launch Templates  
Spot Requests  
Savings Plans  
Reserved Instances  
Dedicated Hosts  
Scheduled Instances  
Capacity Reservations

Images  
AMIs  
AMI Catalog

Elastic Block Store  
Volumes

08:31 26-05-2023 ENG IN

# 17.Creating the SNS topic

Amazon Simple Notification Service

Pub/sub messaging for microservices and serverless applications.

Reliably deliver messages with durability

Amazon SNS uses cross availability zone message storage to provide high message durability. Amazon SNS reliably delivers messages to valid AWS endpoints, such as Amazon SQS queues and AWS Lambda functions.

Automatically scale your workload

Amazon SNS leverages the proven AWS cloud to dynamically scale with your application. Amazon SNS is a fully managed service, taking care of the heavy lifting related to capacity planning, provisioning, monitoring, and scaling.

Pricing

Amazon SNS has no upfront costs. You pay based on the number of messages you publish, the number of messages you deliver, and any additional API calls for managing topics and subscriptions. Delivery pricing varies by endpoint type.

Create topic

Topic name

MyTopic

Next step

Start with an overview

Step:1

Amazon SNS > Topics > Create topic

Create topic

Details

Type: Info

FIFO (first-in, first-out)

- Strictly-preserved message ordering
- Exactly-once message delivery
- High throughput, up to 300 publishes/second
- Subscription protocols: SQS, Lambda, HTTP, SMS, email, mobile application endpoints

Standard

- Best-effort message ordering
- At-least once message delivery
- Highest throughput in publishes/second
- Subscription protocols: SQS, Lambda, HTTP, SMS, email, mobile application endpoints

Name

project-sns

Display name - optional

My Topic

Encryption - optional

Amazon SNS provides in-transit encryption by default. Enabling server-side encryption adds at-rest encryption to your topic.

Step:2

CloudShell Feedback Language

Services Q Search [Alt+S]

CloudFormation Route 53 IAM CloudWatch

Display name - optional

My Topic

Encryption - optional

Access policy - optional

Choose method

Basic

Advanced

Publishers

Only the topic owner

Subscribers

Only the topic owner

JSON preview

```
{ "Version": "2008-10-17", "Id": "__default_policy_ID", "Statement": [ { "Sid": "__default_statement_ID", "Effect": "Allow", "Principal": { "AWS": "*" }, "Action": [ "SQS:Publish", "SQS:RemovePermission" ] } ] }
```

Step:3

CloudShell Feedback Language

Services Q Search [Alt+S]

CloudFormation Route 53 IAM CloudWatch

Topic project-sns created successfully.

Amazon SNS > Topics > project-sns

project-sns

Details

Name

project-sns

Display name

ARN

Topic owner

376423310372

Type

Standard

Subscriptions

Subscriptions (0)

No subscriptions found

You don't have any subscriptions to this topic.

Step:4

**Step:5**

Amazon SNS > Subscriptions > Create subscription

### Create subscription

**Details**

Topic ARN: arn:aws:sns:us-east-1:376423310372:project-sns

Protocol: Email

Endpoint: bharathsmart486@gmail.com

After your subscription is created, you must confirm it.

**Important changes for sending text messages (SMS) to US destinations**  
US mobile carriers have recently changed their regulations, and will require that all toll-free numbers (TFNs) complete a registration process with a regulatory body before September 30, 2022. If you currently have a toll-free number you must register your toll-free number by September 30, 2022 or you will no longer be able to use the toll-free number. [Learn more](#)

**Amazon SNS**

Dashboard Topics Subscriptions Mobile Push notifications Text messaging (SMS) Origination numbers

**Subscription to project-sns created successfully.**  
The ARN of the subscription is arn:aws:sns:us-east-1:376423310372:project-sns:03c7678e-9c2e-466e-96bc-f0aed6b5aecd.

**Subscription: 03c7678e-9c2e-466e-96bc-f0aed6b5aecd**

**Details**

ARN: arn:aws:sns:us-east-1:376423310372:project-sns:03c7678e-9c2e-466e-96bc-f0aed6b5aecd

Status: Pending confirmation

Protocol: EMAIL

Endpoint: bharathsmart486@gmail.com

Topic: project-sns

Subscription Principal: arn:aws:iam::376423310372:root

**Subscription filter policy** **Redrive policy (dead-letter queue)**

**Step:6**

**Step:7**

Gmail

AWS Notification - Subscription Confirmation

AWS Notifications <no-reply@sns.amazonaws.com> to me

You have chosen to subscribe to the topic: arn:aws:sns:us-east-1:376423310372:project-sns

To confirm this subscription, click or visit the link below (If this was in error no action is necessary)  
[Confirm subscription](#)

Please do not reply directly to this email. If you wish to remove yourself from receiving all future SNS subscription confirmation requests please send an email to [sns-opt-out](#)

[Reply](#) [Forward](#)

<https://sns.us-east-1.amazonaws.com/confirmation.html?TopicArn=arn:aws:sns:us-east-1:376423310372:project-sns&Token=2336412B7fb6875d51e6e2425c464de0761d145e88e6318596ab7facd1254...>

**Step:8**

aws Simple Notification Service

**Subscription confirmed!**

You have successfully subscribed.

Your subscription's id is: arn:aws:sns:us-east-1:376423310372:project-sns:03c7678e-9c2e-466e-96bc-f0aed6b5aecd

If it was not your intention to subscribe, [click here to unsubscribe](#).

# 18.Creating the lambda function

The screenshot shows the AWS Lambda dashboard for the US East (N. Virginia) region. It displays account-level metrics for Lambda functions. There are 0 Lambda functions, 0 byte of code storage, 10 full account concurrency, and 10 unreserved account concurrency. The dashboard also includes a section for account-level metrics with charts for Error count and success rate, Throttles, Invocations, Duration, Total concurrent executions, and Unreserved concurrent executions. A watermark 'Step:1' is overlaid on the bottom right.

The screenshot shows the Lambda function details page for 'projectlambda'. A green success message at the top states: 'Successfully created the function projectlambda. You can now change its code and configuration. To invoke your function with a test event, choose "Test".' Below this, the 'Function overview' section shows the function name 'projectlambda', a placeholder icon for code, 0 layers, and a 'Copy ARN' button. The 'Actions' dropdown menu is open, showing options like 'Throttle', 'Copy ARN', and 'Actions'. A watermark 'Step:3' is overlaid on the bottom right.

The screenshot shows the 'Basic information' step in the AWS Lambda 'Create function' wizard. It asks for a function name ('projectlambda'), runtime ('Python 3.10'), and architecture ('x86\_64'). It also includes sections for permissions and advanced settings. A watermark 'Step:2' is overlaid on the bottom right.

The screenshot shows the 'Add trigger' step in the AWS Lambda 'Create function' wizard. It allows selecting an S3 bucket ('awsprojectbhat') as the event source. It includes sections for 'Trigger configuration', 'Event types' (set to 'All object create events'), and 'Prefix - optional' (with a placeholder 'e.g. images/'). A watermark 'Step:4' is overlaid on the bottom right.

**Step:5**

The screenshot shows the AWS Lambda function configuration page for 'projectlambda'. In the 'Triggers' section, there is one trigger named 'Trigger' associated with an S3 bucket. The 'Configuration' tab is selected.

**Step:6**

The screenshot shows the 'Add destination' configuration dialog. It is set to 'Asynchronous invocation' and 'On success'. The destination type is 'SNS topic' with the name 'project-sns'. The 'Save' button is highlighted.

**Step:7**

The screenshot shows the AWS Lambda function configuration page for 'projectlambda'. In the 'Destinations' section, there is one destination named 'Amazon SNS'. The 'Configuration' tab is selected.

**Step:8**

The screenshot shows the AWS Lambda code editor for the 'lambda\_function' file. The code is as follows:

```
1 import json
2 import boto3
3 import urllib
4
5 def lambda_handler(event, context):
6     s3_client = boto3.client('s3')
7     bucket_name = event['Records'][0]['s3']['bucket']['name']
8     key = event['Records'][0]['s3']['object']['key']
9     key = urllib.parse.unquote_plus(key, encoding='utf-8')
10
11     message = 'File ' + key + ' is successfully uploaded in bucket ' + bucket_name
12     print(message)
13
14     response = s3_client.get_object(Bucket=bucket_name, Key=key)
15     contents = response['Body'].read().decode()
16     contents = json.loads(contents)
17
18     print("The data in the file is: " + str(contents))
```

The screenshot shows the AWS Lambda console with the function configuration page for 'projectlambda'. At the top, there are buttons for '+ Add trigger' and '+ Add destination'. Below that, a 'Function URL' and 'Info' button are visible. The main area has tabs for 'Code', 'Test', 'Monitor', 'Configuration', 'Aliases', and 'Versions'. Under the 'Code' tab, there is a code editor window titled 'lambda\_function' containing Python code. The code imports json, boto3, and urllib, defines a lambda handler, and handles an S3 event to print a message and read object contents. The AWS navigation bar at the top includes VPC, EC2, S3, RDS, CloudFormation, Route 53, IAM, and CloudWatch.

```
1 import json
2 import boto3
3 import urllib
4
5 def lambda_handler(event, context):
6     s3_client = boto3.client('s3')
7     bucket_name = event['Records'][0]['s3']['bucket']['name']
8     key = event['Records'][0]['s3']['object']['key']
9     key = urllib.parse.unquote_plus(key, encoding='utf-8')
10
11     message = 'File' + key + ' is successfully uploaded in bucket ' + bucket_name
12     print(message)
13
14     response = s3_client.get_object(Bucket=bucket_name, Key=key)
15     contents = response['Body'].read().decode()
16     contents = json.loads(contents)
17
18     print("The data in the file is: \n", contents)
```

Step:9

The screenshot shows the AWS Lambda console with the function overview page for 'projectlambda'. It displays the function name 'projectlambda', its ARN, and a description. It also shows the last modified time (2 minutes ago) and the function ARN. A 'Layers' section indicates no layers are attached. Below this, a 'Triggers' section shows an S3 trigger named 'S3' and an Amazon SNS trigger named 'Amazon SNS'. Buttons for '+ Add trigger' and '+ Add destination' are present. The bottom of the screen shows the AWS navigation bar and the AWS logo.

Press F11 to exit full screen

projectlambda

Function overview

Description

Last modified  
2 minutes ago

Function ARN  
arn:aws:lambda:us-east-1:576423310372:function:projectlambda

Function URL

S3

Amazon SNS

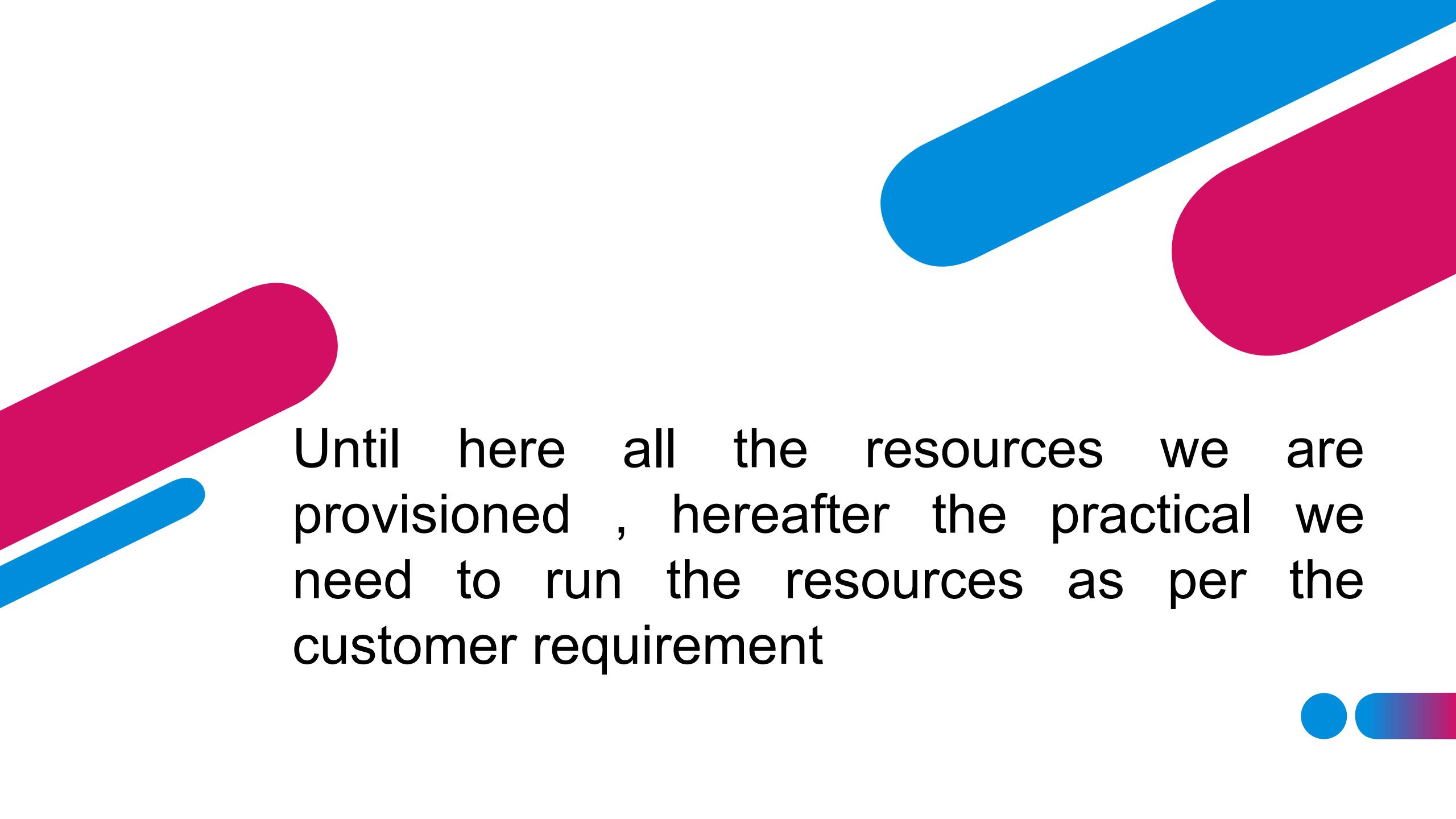
+ Add trigger

+ Add destination

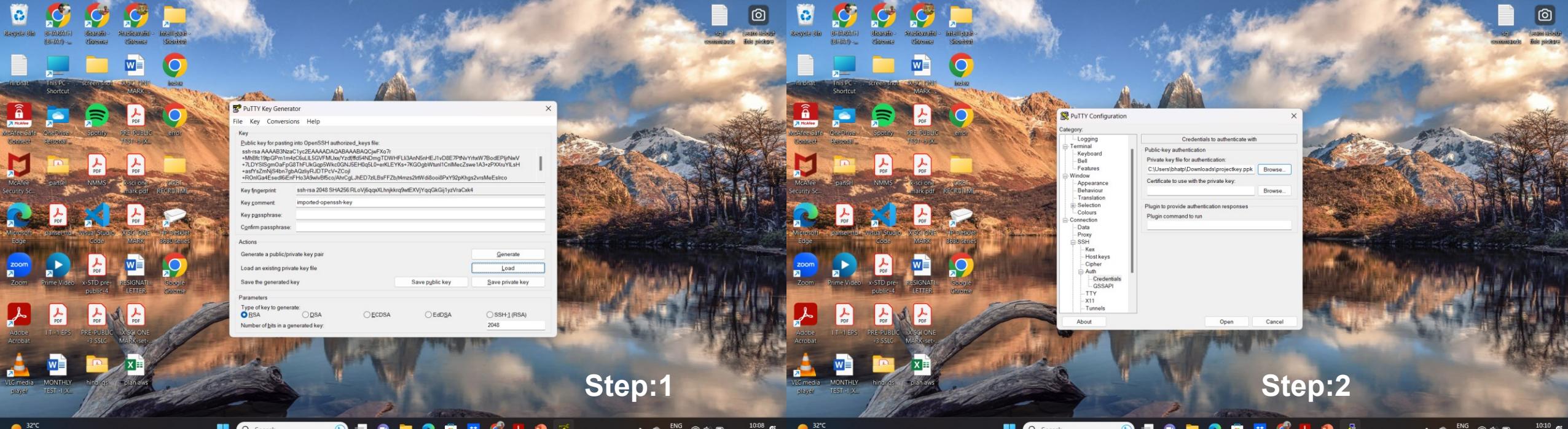
Code Test Monitor Configuration Aliases Versions

```
1 import json
```

Step:10

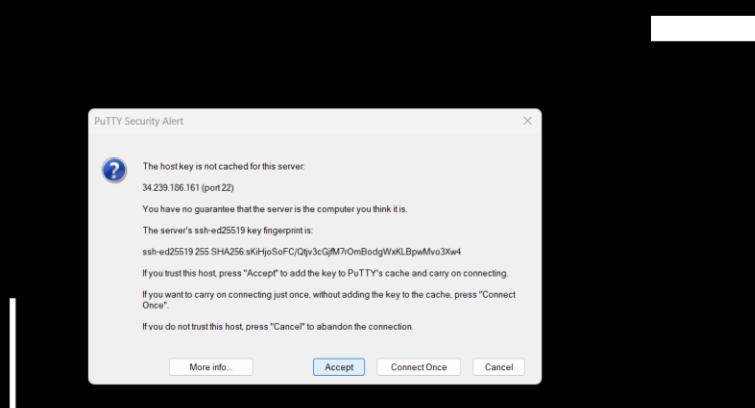


Until here all the resources we are provisioned , hereafter the practical we need to run the resources as per the customer requirement



Step:1

Step:2



Step:3

The image shows a terminal session on an Ubuntu 20.04.6 LTS system. The user logs in with the public key 'imported-openssh-key'. The terminal displays the welcome message, system documentation links, and system information as of Fri May 26 04:41:04 UTC 2023. It also shows a note about Ubuntu Pro features and expanded security maintenance. The terminal ends with a standard Ubuntu copyright notice and a prompt for sudo root access.

```
ubuntu@ip-20-0-0-101:~$
```

```
Login as: ubuntu
Authenticating with public key "imported-openssh-key"
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1036-aws x86_64)

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

System information as of Fri May 26 04:41:04 UTC 2023

System load: 0.0          Processes:           98
Usage of /: 23.3% of 7.57GB   Users logged in: 0
Memory usage: 22%          IPv4 address for eth0: 20.0.0.101
Swap usage: 0%             
```

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

  https://ubuntu.com/aws/pro

Expanded Security Maintenance for Applications is not enabled.

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

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

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-20-0-0-101:~$
```

Step:4

**Step:5**

```
ubuntu@ip-20-0-0-101:~$ ssh -i projectkey ubuntu@20.0.2.15
The authenticity of host '20.0.2.15 (20.0.2.15)' can't be established.
ECDSA key fingerprint is SHA256:VxSRgP/gc/pzty/gR0LTPBbyndw/7iHrPSM/cItQ.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '20.0.2.15' (ECDSA) to the list of known hosts.
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1036-aws x86_64)

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

 System information as of Fri May 26 04:49:08 UTC 2023

 System load: 0.0 Processes: 98
 Usage of /: 20.8% of 7.57GB Users logged in: 0
 Memory usage: 19% IPv4 address for eth0: 20.0.2.15
 Swap usage: 0% 

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

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

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-20-0-2-15:~$
```

**Step:6**

```
ubuntu@ip-20-0-0-101:~$ sudo apt update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:4 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Fetched 336 kB in 1s (493 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
8 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-20-0-0-101:~$ ls
ubuntu@ip-20-0-0-101:~$ nano projectkey
ubuntu@ip-20-0-0-101:~$ cat projectkey
-----BEGIN RSA PRIVATE KEY-----
MIIEowIBAAKCAQEAo8BV606/jIQX3nfbaRj5tuMwuriyC+RlRTFMcf2M3X/333e
eDq5oEw1hxS5YtwJzezxzcdBw/B0z/TB2k4cvuwaHRS5y6zcFFuyw2Ep0ojmhAR
vE4RVBqgevPHNbjseRB9kus9PnqyixGcrPuyhjog1rbp5dqp5TnHgbMhtQn/sz1
167mcC7B/mRH2LGzjy0UG5+4GWEMyIsksQ0z2FmQqiyPkTp5RmuBLHnzeh0jxr6
NWPcJbwX+XKPWIAwoocyRA+85SwbBRWw/7ej5/nik7VnyvKKIVD8WpdqsoYLNr67
DHNLCKPhf6Erhgm5aa4e1tsVV5xTihuxgwIDAQABaoIBAGAGyIpuw6fwn8R
NNnLS6GRUM5eaZgM+ogFkzNKeijxjVkmZnnzI3p9Poaa1j24rEcYFeSrUAT3R0BG
ryxB93yEmEuSiLMkUX9QLev30rox2c/rooFsilwomPjfhfH14iPUshVAKw88
j1fbxyjewuksIvLmkUx9QLev30rox2c/rooFsilwomPjfhfH14iPUshVAKw88
rq4sa8qthcEXT/k061e2pgd/vhMOHL92sp7z4dawLInbugkfzQzbeg0Y2rwuw
hcsipdzv2ee35o3M5Kwnhpvc9H3o584bpM934yDmfz3YMcj9k2EjptuffvB7u
o1uzbwEcgyEA6h/lnwzuftGwbbeyp4d99Ubh0tOnDjs4CrSPUMAXV32fcBu2Y+e
cx4rjAvz0z4m10pvjy2clkog/+r5d+E6V0oRyAaxmlAahITvgsv1dhw1bc+9
7dwqdpTuBzox7vv0peya9fmqocgsAkqfnt1/5V5dydSPtC15xGat&cgyeAt2G
7dwqdpTuBzox7vv0peya9fmqocgsAkqfnt1/5V5dydSPtC15xGat&cgyeAt2G
ojaPSPM26S1q7H1GfJnvtrppfx2B1wsAFJuke1/LKDLubdAPRh0u+/QraZOGOx
+r12Mmb2+0TcElq9zzr89+ohb24MtorCMGxDizimv81hz6ujPFUj7omys
bhUEFGzjku/9a3f6qhy9bmeFrUCFzrt27jhuvmfHD2fVYP7trwdLckvcn7zpo16
wmnsK0K8gCun9pi2ksf1A3jeuauns91zqbwtctjxjpTpwa-hs09zh3tws816GRP
zh+ufG3vxJLhoZf0tccBXC/xUPRwc3MLITfyinEluu56u51ra/mC1PiAxxkshw
JmfglTjl1aNLyMe6Mlq2p9msotBphqlscs3Aj4dlzFTzIYUK9kv
-----END RSA PRIVATE KEY-----
```

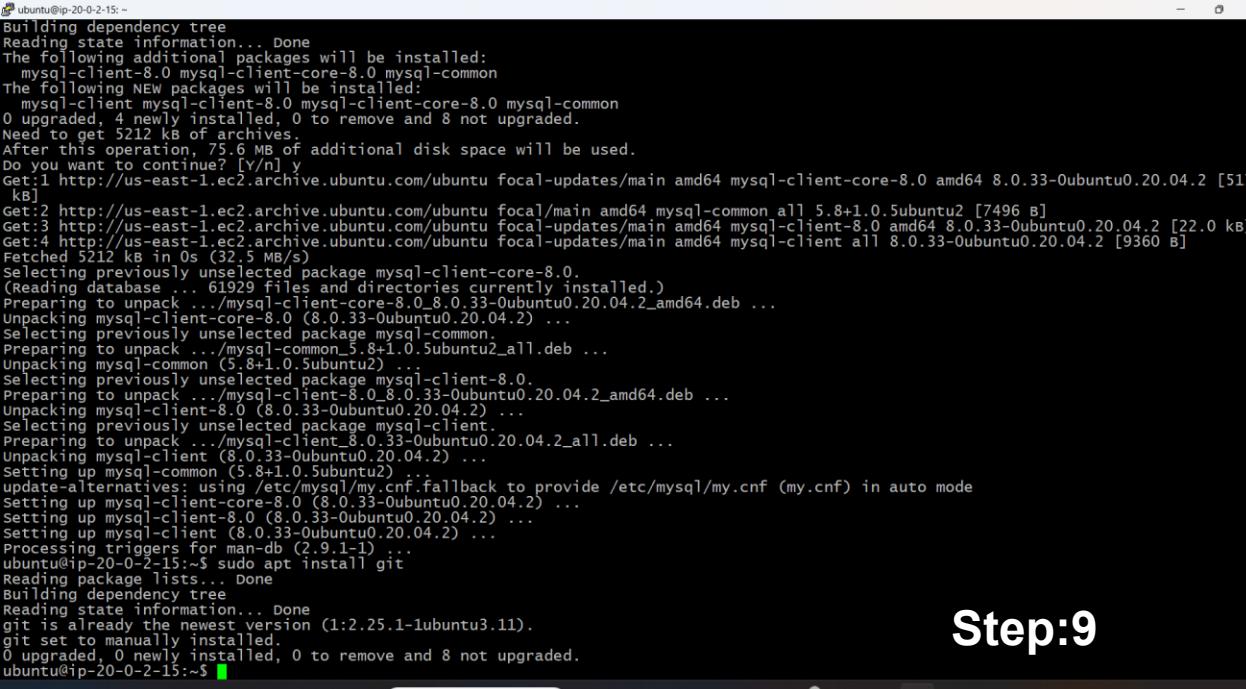
**Step:7**

```
ubuntu@ip-20-0-2-15:~$ sudo apt install mysql-client
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  mysql-client-8.0 mysql-client-core-8.0 mysql-common
The following NEW packages will be installed:
  mysql-client mysql-client-8.0 mysql-client-core-8.0 mysql-common
0 upgraded, 4 newly installed, 0 to remove and 8 not upgraded.
Need to get 5212 kB of archives.
After this operation, 75.6 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-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]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 mysql-common all 5.8+1.0.5ubuntu2 [7496 B]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-8.0 amd64 8.0.33-0ubuntu0.20.04.2 [22.0 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client all 8.0.33-0ubuntu0.20.04.2 [9360 B]
Fetched 5212 kB in 0s (32.5 MB/s)
Selecting previously unselected package mysql-client-core-8.0.
(Reading database ... 61929 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) ...
Selecting previously unselected package mysql-common.
Preparing to unpack .../mysql-common_5.8+1.0.5ubuntu2_all.deb ...
Unpacking mysql-common (5.8+1.0.5ubuntu2) ...
Selecting previously unselected package mysql-client-8.0.
Preparing to unpack .../mysql-client-8.0_8.0.33-0ubuntu0.20.04.2_amd64.deb ...
Unpacking mysql-client-8.0 (8.0.33-0ubuntu0.20.04.2) ...
Selecting previously unselected package mysql-client.
Preparing to unpack .../mysql-client_8.0.33-0ubuntu0.20.04.2_all.deb ...
Unpacking mysql-client (8.0.33-0ubuntu0.20.04.2) ...
Setting up mysql-common (5.8+1.0.5ubuntu2) ...
Setting up mysql-client-core-8.0 (8.0.33-0ubuntu0.20.04.2) ...
Setting up mysql-client-8.0 (8.0.33-0ubuntu0.20.04.2) ...
Setting up mysql-client (8.0.33-0ubuntu0.20.04.2) ...
Processing triggers for man-db (2.9.1-1) ...
```

**Step:8**

```
ubuntu@ip-20-0-2-15:~ Building dependency tree
Reading state information... done
The following additional packages will be installed:
  mysql-client-8.0 mysql-client-core-8.0 mysql-common
The following NEW packages will be installed:
  mysql-client mysql-client-core-8.0 mysql-common
0 upgraded, 4 newly installed, 0 to remove and 8 not upgraded.
Need to get 5212 kB of archives.
After this operation, 75.6 MB of additional disk space will be used.
Do you want to continue? [y/n] y
Get:1 http://us-east-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]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 mysql-common all 5.8+1.0.5ubuntu2 [7496 B]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-8.0 amd64 8.0.33-0ubuntu0.20.04.2 [22.0 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client all 8.0.33-0ubuntu0.20.04.2 [9360 B]
Fetched 5212 kB in 0s (32.5 MB/s)
Selecting previously unselected package mysql-client-core-8.0.
(Reading database ... 61929 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) ...
Selecting previously unselected package mysql-common.
Preparing to unpack .../mysql-common_5.8+1.0.5ubuntu2_all.deb ...
Unpacking mysql-common (5.8+1.0.5ubuntu2) ...
Selecting previously unselected package mysql-client-8.0.
Preparing to unpack .../mysql-client-8.0_8.0.33-0ubuntu0.20.04.2_amd64.deb ...
Unpacking mysql-client-8.0 (8.0.33-0ubuntu0.20.04.2) ...
Selecting previously unselected package mysql-client.
Preparing to unpack .../mysql-client_8.0.33-0ubuntu0.20.04.2_all.deb ...
Unpacking mysql-client (8.0.33-0ubuntu0.20.04.2) ...
Setting up mysql-common (5.8+1.0.5ubuntu2)
update-alternatives: using /etc/mysql/my.cnf to provide /etc/mysql/my.cnf (my.cnf) in auto mode
Setting up mysql-client-core-8.0 (8.0.33-0ubuntu0.20.04.2) ...
Setting up mysql-client-8.0 (8.0.33-0ubuntu0.20.04.2) ...
Setting up mysql-client (8.0.33-0ubuntu0.20.04.2) ...
Processing triggers for man-db (2.9.1-1) ...
ubuntu@ip-20-0-2-15:~$ sudo apt install git
Reading package lists... done
Building dependency tree
Reading state information... done
git is already the newest version (1:2.25.1-1ubuntu3.11).
git set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 8 not upgraded.
ubuntu@ip-20-0-2-15:~$
```

## Step:9

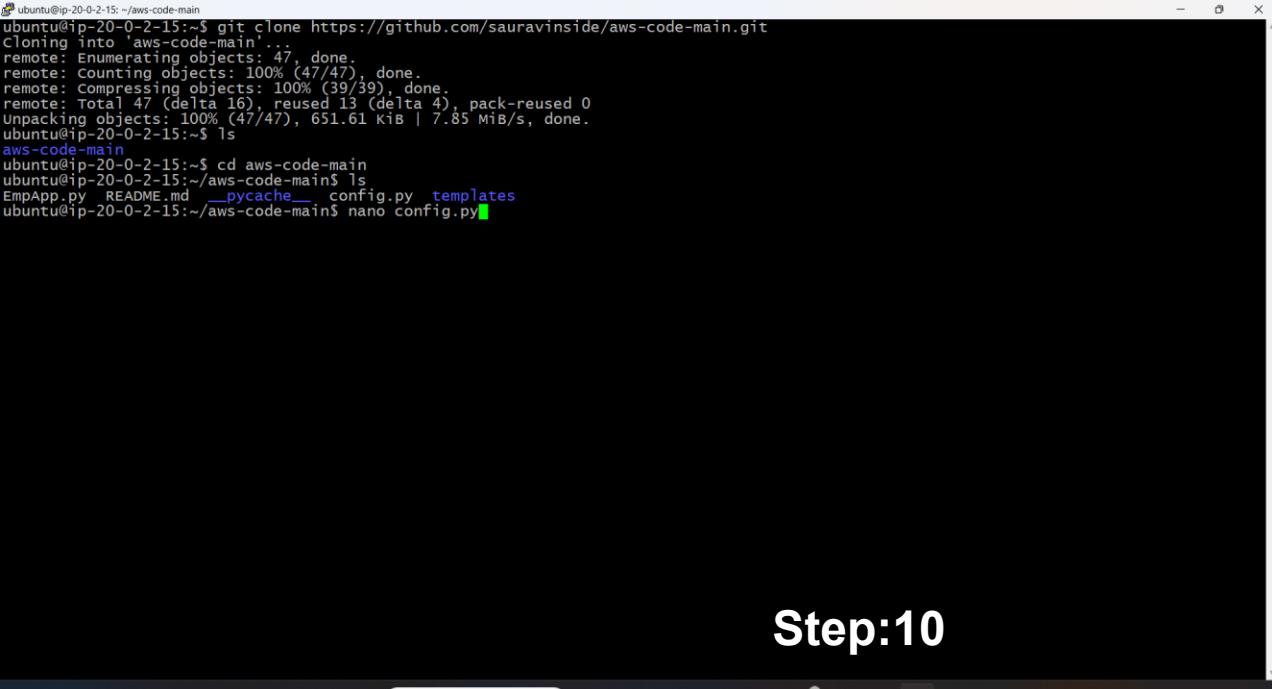


A screenshot of a Linux desktop environment. At the top, there's a system tray with icons for battery (32°C), signal strength, and date/time (26-05-2023). Below it is a dock with various application icons. In the center, there's a terminal window titled 'ubuntu@ip-20-0-2-15:~/aws-code-main' showing the command-line steps from Step 9. To the right of the terminal is a file editor window titled 'config.py' with the following code:

```
GNU nano 4.8 config.py Modified
customhost = "project-database.cineyfdusxih.us-east-1.rds.amazonaws.com"
customuser = "admin"
custompass = "admin123"
customdb = "employee_image_table"
custombucket = "awsprojectbhat"
customregion = "us-east-1"
```

```
ubuntu@ip-20-0-2-15:~$ git clone https://github.com/sauravinside/aws-code-main.git
Cloning into 'aws-code-main'...
remote: Enumerating objects: 47, done.
remote: Counting objects: 100% (47/47), done.
remote: Compressing objects: 100% (39/39), done.
remote: Total 47 (delta 16), reused 13 (delta 4), pack-reused 0
Unpacking objects: 100% (47/47), 651.61 KiB | 7.85 MiB/s, done.
ubuntu@ip-20-0-2-15:~$ ls
aws-code-main
ubuntu@ip-20-0-2-15:~$ cd aws-code-main
ubuntu@ip-20-0-2-15:~/aws-code-main$ ls
EmpApp.py README.md __pycache__ config.py templates
ubuntu@ip-20-0-2-15:~/aws-code-main$ nano config.py
```

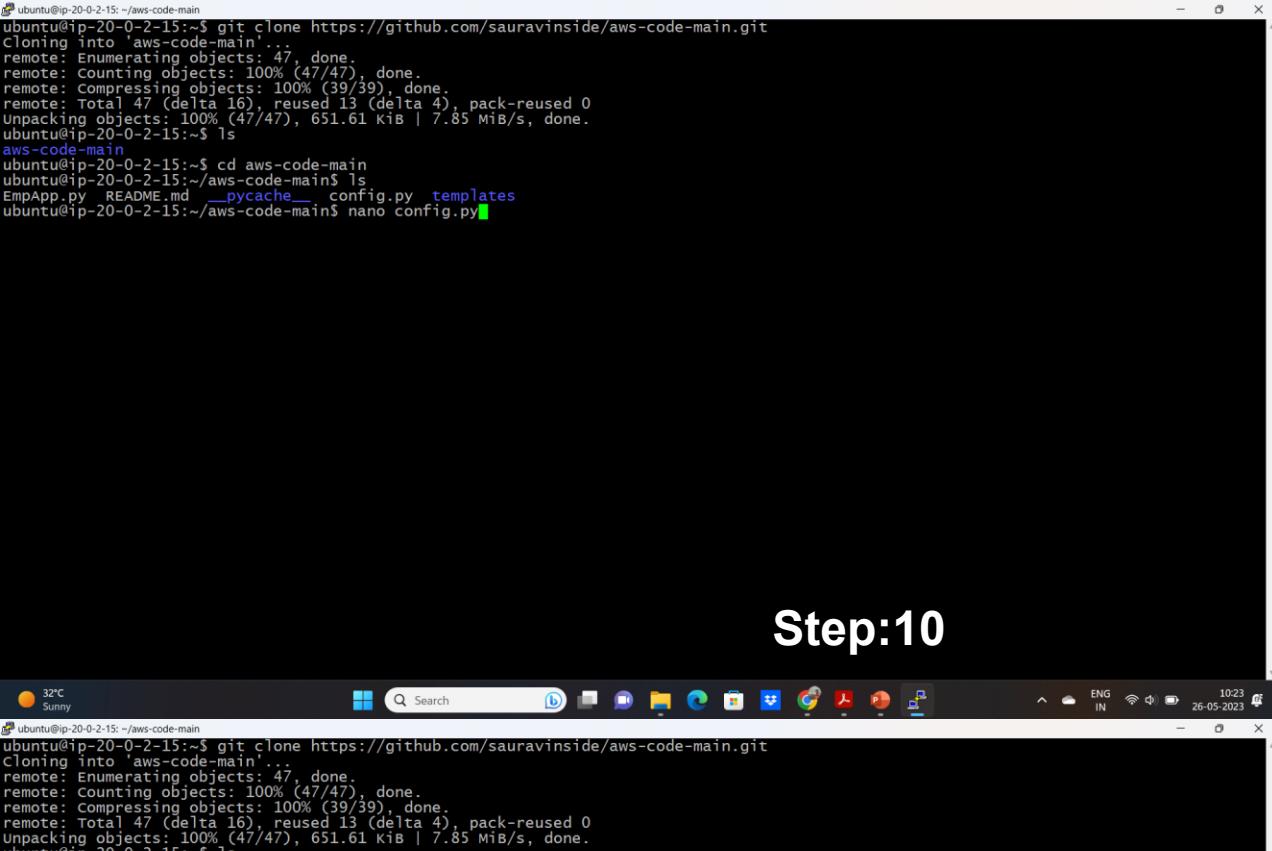
## Step:10



A screenshot of a Linux desktop environment. The terminal window shows the continuation of the git clone command and the listing of files in the 'aws-code-main' directory. The file editor window 'config.py' now contains the following updated code:

```
ubuntu@ip-20-0-2-15:~$ git clone https://github.com/sauravinside/aws-code-main.git
Cloning into 'aws-code-main'...
remote: Enumerating objects: 47, done.
remote: Counting objects: 100% (47/47), done.
remote: Compressing objects: 100% (39/39), done.
remote: Total 47 (delta 16), reused 13 (delta 4), pack-reused 0
Unpacking objects: 100% (47/47), 651.61 KiB | 7.85 MiB/s, done.
ubuntu@ip-20-0-2-15:~$ ls
aws-code-main
ubuntu@ip-20-0-2-15:~$ cd aws-code-main
ubuntu@ip-20-0-2-15:~/aws-code-main$ ls
EmpApp.py README.md __pycache__ config.py templates
ubuntu@ip-20-0-2-15:~/aws-code-main$ nano config.py
```

## Step:11



A screenshot of a Linux desktop environment. The terminal window shows the command 'nano config.py' being run, indicated by the '[1]+ stopped' status. The file editor window 'config.py' shows the code from Step 10. The terminal then displays the contents of the file:

```
Use "fg" to return to nano.
[1]+  stopped                  nano config.py
ubuntu@ip-20-0-2-15:~/aws-code-main$ nano config.py
ubuntu@ip-20-0-2-15:~/aws-code-main$ cat config.py
customhost = "project-database.cineyfdusxih.us-east-1.rds.amazonaws.com"
customuser = "admin"
custompass = "admin123"
customdb = "employee_image_table"
custombucket = "awsprojectbhat"
customregion = "us-east-1"
ubuntu@ip-20-0-2-15:~/aws-code-main$
```

## Step:12

```

ubuntu@ip-20-0-2-15:~/.aws-code-main
ubuntu@ip-20-0-2-15:~/.aws-code-main$ git clone https://github.com/sauravinside/aws-code-main.git
Cloning into 'aws-code-main'...
remote: Enumerating objects: 47, done.
remote: Counting objects: 100% (47/47), done.
remote: Compressing objects: 100% (39/39), done.
remote: Total 47 (delta 16), reused 13 (delta 4), pack-reused 0
Unpacking objects: 100% (47/47), 651.61 KiB | 7.85 MiB/s, done.
ubuntu@ip-20-0-2-15:~/.aws-code-main$ ls
aws-code-main
ubuntu@ip-20-0-2-15:~/.aws-code-main$ cd aws-code-main
ubuntu@ip-20-0-2-15:~/aws-code-main$ ls
EmpApp.py README.md __pycache__ config.py templates
ubuntu@ip-20-0-2-15:~/aws-code-main$ nano config.py
Use "fg" to return to nano.

[1]+ Stopped                  nano config.py
ubuntu@ip-20-0-2-15:~/aws-code-main$ nano config.py
ubuntu@ip-20-0-2-15:~/aws-code-main$ cat config.py
customhost = "project-database.clneyfdusxih.us-east-1.rds.amazonaws.com"
customuser = "admin"
custompass = "admin123"
customdb = "employee_image_table"
custombucket = "awsprojectbhat"
customregion = "us-east-1"
ubuntu@ip-20-0-2-15:~/aws-code-main$ nano EmpApp.py
ubuntu@ip-20-0-2-15:~/aws-code-main$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Hit:4 http://security.ubuntu.com/ubuntu focal-security InRelease
Fetched 222 kB in 1s (319 kB/s)
Reading package lists... done
ubuntu@ip-20-0-2-15:~/aws-code-main$ sudo apt-get install python3
Reading package lists... Done
Building dependency tree
Reading state information... Done
python3 is already the newest version (3.8.2-0ubuntu2).
python3 set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 8 not upgraded.
ubuntu@ip-20-0-2-15:~/aws-code-main$ 

```

## Step:13

```

ubuntu@ip-20-0-2-15:~/.aws-code-main
ubuntu@ip-20-0-2-15:~/.aws-code-main$ sudo apt-get install python3-pymysql
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  python-pymysql-doc
The following NEW packages will be installed:
  python3-pymysql
0 upgraded, 1 newly installed, 0 to remove and 8 not upgraded.
Need to get 38.9 kB of additional disk space.
After this operation, 179 kB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 python3-pymysql all 0.9.3-2ubuntu3 [38.9 kB]
Fetched 38.9 kB in 0s (1282 kB/s)
Selecting previously unselected package python3-pymysql.
(Reading database ... 62166 files and directories currently installed.)
Preparing to unpack .../python3-pymysql_0.9.3-2ubuntu3_all.deb ...
Unpacking python3-pymysql (0.9.3-2ubuntu3) ...
Setting up python3-pymysql (0.9.3-2ubuntu3) ...
ubuntu@ip-20-0-2-15:~/.aws-code-main$ 

```

## Step:15

```

ubuntu@ip-20-0-2-15:~/.aws-code-main
ubuntu@ip-20-0-2-15:~/.aws-code-main$ javascript-common libjs-jquery python3-itsdangerous python3-pyinotify python3-werkzeug
Suggested packages:
  apache2 | lighttpd | httpd python-flask-doc python-pyinotify-doc ipython3 python-werkzeug-doc python3-lxml python3-termcolor
  python3-watchdog
The following NEW packages will be installed:
  javascript-common libjs-jquery python3-flask python3-itsdangerous python3-pyinotify python3-werkzeug
0 upgraded, 6 newly installed, 0 to remove and 8 not upgraded.
Need to get 638 kB of archives.
After this operation, 2296 kB of additional disk space will be used.
Do you want to continue? [y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 javascript-common all 11 [6066 B]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 libjs-jquery all 3.3.1~dfsg-3 [329 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 python3-itsdangerous all 1.1.0-1 [14.6 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-werkzeug all 0.16.1+dfsg1-2ubuntu0.1 [183 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 python3-flask all 1.1.1-2 [80.3 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 python3-pyinotify all 0.9.6-1.2ubuntu1 [24.8 kB]
Fetched 638 kB in 0s (8829 kB/s)
Selecting previously unselected package javascript-common.
(Reading database ... 61983 files and directories currently installed.)
Preparing to unpack .../0-javascript-common_11_all.deb ...
Unpacking javascript-common (11) ...
Selecting previously unselected package libjs-jquery.
Preparing to unpack .../1-libjs-jquery_3.3.1~dfsg-3_all.deb ...
Unpacking libjs-jquery (3.3.1~dfsg-3) ...
Selecting previously unselected package python3-itsdangerous.
Preparing to unpack .../2-python3-itsdangerous_1.1.0-1_all.deb ...
Unpacking python3-itsdangerous (1.1.0-1) ...
Selecting previously unselected package python3-werkzeug.
Preparing to unpack .../3-python3-werkzeug_0.16.1+dfsg1-2ubuntu0.1_all.deb ...
Unpacking python3-werkzeug (0.16.1+dfsg1-2ubuntu0.1) ...
Selecting previously unselected package python3-flask.
Preparing to unpack .../4-python3-flask_1.1.1-2_all.deb ...
Unpacking python3-flask (1.1.1-2) ...
Selecting previously unselected package python3-pyinotify.
Preparing to unpack .../5-python3-pyinotify_0.9.6-1.2ubuntu1_all.deb ...
Unpacking python3-pyinotify (0.9.6-1.2ubuntu1) ...
Setting up javascript-common (11)
Setting up python3-pyinotify (0.9.6-1.2ubuntu1) ...
Setting up python3-itsdangerous (1.1.0-1) ...
Setting up libjs-jquery (3.3.1~dfsg-3) ...
Setting up python3-werkzeug (0.16.1+dfsg1-2ubuntu0.1) ...
Setting up python3-flask (1.1.1-2) ...

```

## Step:14

```

ubuntu@ip-20-0-2-15:~/.aws-code-main
ubuntu@ip-20-0-2-15:~/.aws-code-main$ Setting up libpaper-utils (1.1.28) ...
Setting up libjbig2amf64 (2.1-3.1ubuntu0.20.04.1) ...
Setting up python3-roman (2.0.0-3build1) ...
Setting up python3-pygment (2.3.1~dfsg-1ubuntu2.2) ...
Setting up python3-jmespath (0.9.4-2ubuntu1) ...
Setting up libimagequant0:amd64 (0.2.12.2-1.1) ...
Setting up libwebp6:amd64 (0.6.1-2ubuntu0.20.04.2) ...
Setting up libjpeg-turbo8:amd64 (2.0.3-0ubuntu1.20.04.3) ...
Setting up python3-dateutil (2.7.3-3ubuntu1) ...
Setting up sgml-base (1.29.1) ...
Setting up libwebpmux3:amd64 (0.6.1-2ubuntu0.20.04.2) ...
Setting up libjpeg8:amd64 (8c-2ubuntu8) ...
Setting up libwebpdemux2:amd64 (0.6.1-2ubuntu0.20.04.2) ...
Setting up xml-core (0.18+mu1) ...
Setting up libtiff5:amd64 (4.1.0+git191117-2ubuntu0.20.04.8) ...
Setting up python3-pil:amd64 (7.0.0-4ubuntu0.7) ...
Processing triggers for libc-bin (2.31-0ubuntu9.9) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for shared-mime-info (1.15-1) ...
Processing triggers for sgml-base (1.29.1) ...
Setting up docutils-common (0.16+dfsg-2) ...
Processing triggers for sgml-base (1.29.1) ...
Setting up python3-docutils (0.16+dfsg-2) ...
update-alternatives: using /usr/share/docutils/scripts/python3/rst-buildhtml to provide /usr/bin/rst-buildhtml (rst-buildhtml) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2html to provide /usr/bin/rst2html (rst2html) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2html4 to provide /usr/bin/rst2html4 (rst2html4) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2html5 to provide /usr/bin/rst2html5 (rst2html5) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2latex to provide /usr/bin/rst2latex (rst2latex) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2man to provide /usr/bin/rst2man (rst2man) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2odt to provide /usr/bin/rst2odt (rst2odt) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2odt_prestyles to provide /usr/bin/rst2odt_prestyles (rst2odt_prestyles) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2pseudoxml to provide /usr/bin/rst2pseudoxml (rst2pseudoxml) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2s5 to provide /usr/bin/rst2s5 (rst2s5) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2xetex to provide /usr/bin/rst2xetex (rst2xetex) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rst2xml to provide /usr/bin/rst2xml (rst2xml) in auto mode
update-alternatives: using /usr/share/docutils/scripts/python3/rstpep2html to provide /usr/bin/rstpep2html (rstpep2html) in auto mode
Setting up python3-botocore (1.16.19+repack-1ubuntu0.20.04.1) ...
Setting up python3-s3transfer (0.3.3-1) ...
Setting up python3-boto3 (1.9.253-1) ...
ubuntu@ip-20-0-2-15:~/.aws-code-main$ 

```

## Step:16

ubuntu@ip-20-0-2-15:~/aws-code-main\$ mysql -h project-database.clneyfdusxih.us-east-1.rds.amazonaws.com -u admin -p  
Enter password:  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 49  
Server version: 8.0.32 source distribution  
copyright (c) 2000, 2023, oracle and/or its affiliates.  
oracle is a registered trademark of oracle corporation and/or its  
affiliates. other names may be trademarks of their respective  
owners.  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql>

ubuntu@ip-20-0-2-15:~/aws-code-main\$ mysql -h project-database.clneyfdusxih.us-east-1.rds.amazonaws.com -u admin -p  
Enter password:  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 49  
Server version: 8.0.32 source distribution  
copyright (c) 2000, 2023, oracle and/or its affiliates.  
oracle is a registered trademark of oracle corporation and/or its  
affiliates. other names may be trademarks of their respective  
owners.  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql> show databases;  
+-----+  
| Database |  
+-----+  
| information\_schema |  
| mysql |  
| performance\_schema |  
| projectbhat |  
| sys |  
+-----+  
5 rows in set (0.00 sec)  
  
mysql> use data  
ERROR 1049 (42000): Unknown database 'data'  
mysql> show tables;  
ERROR 1046 (3D000): No database selected  
mysql> use projectbhat  
Database changed  
mysql> show tables;  
Empty set (0.00 sec)  
mysql>

## Step:17

ubuntu@ip-20-0-2-15:~/aws-code-main\$ sudo python3 EmpApp.py  
Traceback (most recent call last):  
File "EmpApp.py", line 19, in <module>  
 db\_conn = connections.Connection(  
 File "/usr/lib/python3/dist-packages/pymysql/connections.py", line 325, in \_\_init\_\_  
 self.connect()  
 File "/usr/lib/python3/dist-packages/pymysql/connections.py", line 599, in connect  
 self.\_request\_authentication()  
 File "/usr/lib/python3/dist-packages/pymysql/connections.py", line 861, in \_request\_authentication  
 auth\_packet = self.\_read\_packet()  
 File "/usr/lib/python3/dist-packages/pymysql/connections.py", line 684, in \_read\_packet  
 packet.check\_error()  
 File "/usr/lib/python3/dist-packages/pymysql/protocol.py", line 220, in check\_error  
 err.raise\_mysql\_exception(self.\_data)  
 File "/usr/lib/python3/dist-packages/pymysql/err.py", line 109, in raise\_mysql\_exception  
 raise errorclass(errno, errval)  
pymysql.err.InternalError: (1049, "Unknown database 'employee\_image\_table'")  
ubuntu@ip-20-0-2-15:~/aws-code-main\$ ls  
EmpApp.py README.md pycache config.py templates  
ubuntu@ip-20-0-2-15:~/aws-code-main\$ nano EmpApp.py  
ubuntu@ip-20-0-2-15:~/aws-code-main\$ nano config.py  
ubuntu@ip-20-0-2-15:~/aws-code-main\$ nano templates  
ubuntu@ip-20-0-2-15:~/aws-code-main\$ nano config.py  
ubuntu@ip-20-0-2-15:~/aws-code-main\$ nano EmpApp.py  
ubuntu@ip-20-0-2-15:~/aws-code-main\$ sudo python3 EmpApp.py  
\* Serving Flask app "EmpApp" (lazy loading)  
\* Environment: production  
WARNING: This is a development server. Do not use it in a production deployment.  
\* Use a production WSGI server instead.  
\* Debug mode: on  
\* Running on http://0.0.0.0:80/ (Press CTRL+C to quit)  
\* Restarting with stat  
\* Debugger is active!  
\* Debugger PIN: 234-357-197

ubuntu@ip-20-0-2-15:~/aws-code-main\$ mysql -h project-database.clneyfdusxih.us-east-1.rds.amazonaws.com -u admin -p  
Enter password:  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 49  
Server version: 8.0.32 source distribution  
copyright (c) 2000, 2023, oracle and/or its affiliates.  
oracle is a registered trademark of oracle corporation and/or its  
affiliates. other names may be trademarks of their respective  
owners.  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql>

## Step:19

ubuntu@ip-20-0-2-15:~/aws-code-main\$ mysql -h project-database.clneyfdusxih.us-east-1.rds.amazonaws.com -u admin -p  
Enter password:  
Welcome to the MySQL monitor. Commands end with ; or \g.  
Your MySQL connection id is 49  
Server version: 8.0.32 source distribution  
copyright (c) 2000, 2023, oracle and/or its affiliates.  
oracle is a registered trademark of oracle corporation and/or its  
affiliates. other names may be trademarks of their respective  
owners.  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql> show databases;  
+-----+  
| Database |  
+-----+  
| information\_schema |  
| mysql |  
| performance\_schema |  
| projectbhat |  
| sys |  
+-----+  
5 rows in set (0.00 sec)  
  
mysql> use data  
ERROR 1049 (42000): unknown database 'data'  
mysql> show tables;  
ERROR 1046 (3D000): No database selected  
mysql> use projectbhat  
Database changed  
mysql> show tables;  
Empty set (0.00 sec)  
  
mysql> CREATE TABLE employee (emp\_id VARCHAR(20), first\_name VARCHAR(20),  
-> last\_name VARCHAR(20), primary\_skills VARCHAR(20), location VARCHAR(20));  
query ok, 0 rows affected (0.05 sec)  
  
mysql> show tables;  
+-----+  
| Tables\_in\_projectbhat |  
+-----+  
| employee |  
+-----+  
1 row in set (0.00 sec)  
  
mysql> describe employee;  
+-----+-----+-----+-----+-----+-----+  
| Field | Type | Null | Key | Default | Extra |  
+-----+-----+-----+-----+-----+-----+  
emp\_id	varchar(20)	YES	NULL	NULL	
first\_name	varchar(20)	YES	NULL	NULL	
last\_name	varchar(20)	YES	NULL	NULL	
primary\_skills	varchar(20)	YES	NULL	NULL	
location	varchar(20)	YES	NULL	NULL	
+-----+-----+-----+-----+-----+-----+  
5 rows in set (0.02 sec)  
  
mysql>

## Step:18

## Step:20

**EMPLOYEE DATABASE**

GET EMPLOYEE INFORMATION

Employee ID:	<input type="text"/>
First Name:	<input type="text"/>
Last Name:	<input type="text"/>
Primary Skills:	<input type="text"/>
Location:	<input type="text"/>

Image:  Choose File No file chosen

**UPDATE DATABASE**

**About Us**

# Step:21

**EMPLOYEE DATABASE**

GET EMPLOYEE INFORMATION

Employee ID:	<input type="text" value="01"/>
First Name:	<input type="text" value="bharath"/>
Last Name:	<input type="text" value="p"/>
Primary Skills:	<input type="text" value="aws project"/>
Location:	<input type="text" value="chennai"/>

Image:  Choose File Bharath.P.jpg

**UPDATE DATABASE**

**About Us**

# Step:22

SENSEX +0.60%

Subnet | Instances | EC2 Instances | awspro | Database | List table | project | Simple | Start CloudWatch Metrics | Add Entry | Inbox | +

Search | [Alt+S]

N. Virginia Bhatpansel

VPC EC2 S3 RDS CloudFormation Route 53 IAM CloudWatch

```
aws Services Search [Alt+S]
```

```
mysql> use projectrds;
Database changed
mysql> show tables;
+-----+
| Tables_in_projectrds |
+-----+
| employee |
+-----+
1 row in set (0.01 sec)

mysql> select * from employee;
+-----+
| emp_id | first_name | last_name | primary_skills | location |
+-----+
| 1      | Saurav     | singh     | AWS           | BNG          |
+-----+
1 row in set (0.00 sec)

mysql> select * from employee;
+-----+
| emp_id | first_name | last_name | primary_skills | location |
+-----+
| 1      | Saurav     | singh     | AWS           | BNG          |
| 12     | bharath    | p         | aws project   | chennai     |
+-----+
2 rows in set (0.00 sec)

mysql> select * from employee;
+-----+
| emp_id | first_name | last_name | primary_skills | location |
+-----+
| 1      | Saurav     | singh     | AWS           | BNG          |
| 12     | bharath    | p         | aws project   | chennai     |
| 14     | chandhan   | p         | aws project   | chennai     |
+-----+
3 rows in set (0.00 sec)
```

i-09636a9f44950dbed (pub-ec2)  
PublicIPs: 34.239.186.161 PrivateIPs: 20.0.0.101

CloudShell Feedback Language

37°C Sunny

# Step:23

Waiting for project-alb-769011853.us-east-1.elb.amazonaws.com...

35°C Sunny

Subnet | Instances | EC2 Instances | awspro | Database | List table | project | Simple | Start CloudWatch Metrics | Add Entry | Inbox | +

Search | [Alt+S]

N. Virginia Bhatpansel

VPC EC2 S3 RDS CloudFormation Route 53 IAM CloudWatch

```
aws Services Search [Alt+S]
```

```
mysql> select * from employee;
+-----+
| emp_id | first_name | last_name | primary_skills | location |
+-----+
| 1      | Saurav     | singh     | AWS           | BNG          |
+-----+
1 row in set (0.00 sec)

mysql> select * from employee;
+-----+
| emp_id | first_name | last_name | primary_skills | location |
+-----+
| 1      | Saurav     | singh     | AWS           | BNG          |
| 12     | bharath    | p         | aws project   | chennai     |
+-----+
2 rows in set (0.00 sec)

mysql> select * from employee;
+-----+
| emp_id | first_name | last_name | primary_skills | location |
+-----+
| 1      | Saurav     | singh     | AWS           | BNG          |
| 12     | bharath    | p         | aws project   | chennai     |
| 14     | chandhan   | p         | aws project   | chennai     |
+-----+
3 rows in set (0.00 sec)
```

i-09636a9f44950dbed (pub-ec2)  
PublicIPs: 34.239.186.161 PrivateIPs: 20.0.0.101

CloudShell Feedback Language

37°C Sunny

# Step:24

# THANK YOU!

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