



INTERNSHIP PROGRAM 2023

PROJECT REPORT

CLOUD COMPUTING

Backup of MongoDB database

Created By:	Ishita kapoor	Approved By:	
Created On:	29-9-2023	Approved On:	

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ABSTRACT

Cloud Counselage Private Limited is an unlisted private company incorporated on 14 February, 2015. It is classified as a private limited company and is located in Mumbai City, Maharashtra. Cloud Counselage Private Limited has two directors – Namita chetan Natekar and Harshada Tushar Topale.

The social cause of this company is to make students job ready, in time by providing them industry exposure, career vision and guidance, work experience at no cost to them or their colleges.

The goal which was in this cloud computing internship to build a method that automatically take backup of MongoDB database using AWS. As, taking backup manually is time consuming and also there is risk of failures.

Through this internship, I get exposure on various concepts of cloud computing.

Figure 1.1 : DIRECTOR - Harshada Tushar Topale



HARSHADA TOPALE
Co-Founder & Director
Cloud Counselage Pvt. Ltd.

Vision is to bring her professional experience to provide exponential growth to the students, professionals and companies to help them perform at global level.

- Management professional with 17+ years experience
- Worked in multiple countries, industries, organizations
- Delivered Programs & Projects across by 80+ countries.
- Areas of expertise: Service Delivery, Leadership & Strategic Management,, Operations, Partnerships
- Involved in student activities during her MBA program in London and thereafter, during which she has interacted with members of UK parliament, Indian politician, bureaucrat, renowned Indian personalities
- Engaged with 26,000+ students to help them vis-à-vis their Professional Development



INTRODUCTION

It was an online internship which was carried by home. As the main aim of this company is to make students job ready, so firstly different workshops took place from 4pm to 5pm on the alternate days. These workshops were on the topics usiness communication, corporate etiquettes, business ethics and values, github, cloud computing, project management, new product development, data and analytics and industry training. These all topics helped me a lot to learn that how work has done in the corporate life.

There was a site provided by them,

URL : [Active Courses \(industryacademiacommunity.com\)](https://industryacademiacommunity.com)

in which we can see recording of all workshop for our reference. All notifications and the courses were available on this site. At the end of every workshop, quiz has been held related to that workshop to check our knowledge regarding that. Quiz consist of 7-8 questions with passing percentage of 60%.

Telegram link : <https://t.me/+uXmD1vTLpttjN2VI>

FIGURE 1.2 AIM OF THE CLOUD COUNSELAGE (To bridge the gap between academia and industry)



TRAINING DESCRIPTION

The project was based on the cloud computing which I had completed using various services of AWS Cloud like EC2 instance, S3 bucket and MongoDB database, command prompt and nano editor to run the script. Using all these components, development of automated backup of MongoDB database has become possible.

Meetings were held for doubt sessions.

Some certificates of various workshop

- 1. Business communication** – Types of communication (Verbal, non-verbal, written includes emails, letters, memos etc., business communication which includes internal upwards, internal downwards, internal lateral, external)

FIGURE 1. 3



- 2. Corporate etiquettes** – Seminar/meeting etiquette, Do's and Don't, social media etiquette, office etiquette and personal etiquette.

FIGURE 1.4



3. Business ethics and values – Ethics and values, ethical dilemma, responsibility(planning your time, taking control of your money, showing maturity in relationships) , respect(Use “sorry”, “thank you” generously, respond in timely manner), integrity(make promises and keep them, practice what you preach), accountability(develop the passion and own it, exercising the means to do it) and fairness(avoid any unconscius biases).

FIGURE 1.5



PROBLEM STATEMENT OF PROJECT

FIGURE 1.6

The figure consists of two main parts. On the left is a white document titled 'INTERNSHIP PROGRAM 2023' with the 'ioo' logo. It includes sections for 'Problem Statement Document', 'INDIVIDUAL PROJECT', 'PROJECT DURATION 2/4/8 WEEKS', and 'Cloud Computing' with associated icons. On the right is a yellow box containing text about Mr. John Doe's backup needs and a note about AWS account credentials.

INTERNSHIP PROGRAM 2023

Problem Statement Document

INDIVIDUAL PROJECT PROJECT DURATION 2/4/8 WEEKS

Cloud Computing

Cloud Counselage

Mr. John Doe is an employee at Cloud Counselage. He works in the IT department. He works on the Cloud technology. Cloud counselage has many Business division and as well many domains hosted on the cloud. Mr. John is hosted a website on AWS EC2 instance along with MongoDB database. But taking backups of the database manually is time-consuming.

So Mr. John wants to automate taking database Backup continuously without getting bogged down in different backup and failure scenarios in MongoDB database systems. He wants to utilize the time he spends on the backup task to do more productive work.

So, we want you guys to create a POC [proof of Concept] on the effective Automatic MongoDB backup Method. So that Mr. John will no longer need to spend hours on that process.

We want you guys to come up with a solution and create POC [Proof of Concept] for the same.

Note:
You are free to use any technology, tool and programming language of your choice.
We won't be providing any AWS account credentials; you can create and use your own free tier AWS account for PoC purpose.

This figure defines us the problem which was facing by the Mr. John Doe, an employee at Cloud Counselage. He works on the Cloud technology in the company.

Following steps which were included in the project of internship :

Step-1 Login to the AWS account

Step-2 Search for the AWS EC2 instance service of the AWS cloud in the AWS console

Step-3 Launch EC2 instance, it includes name of the EC2 instance, AMI (Amazon machine image), instance type (t2.micro - free-tier), network settings and key-pair

Step-4 Click on the launch instance

FIGURE 1.7

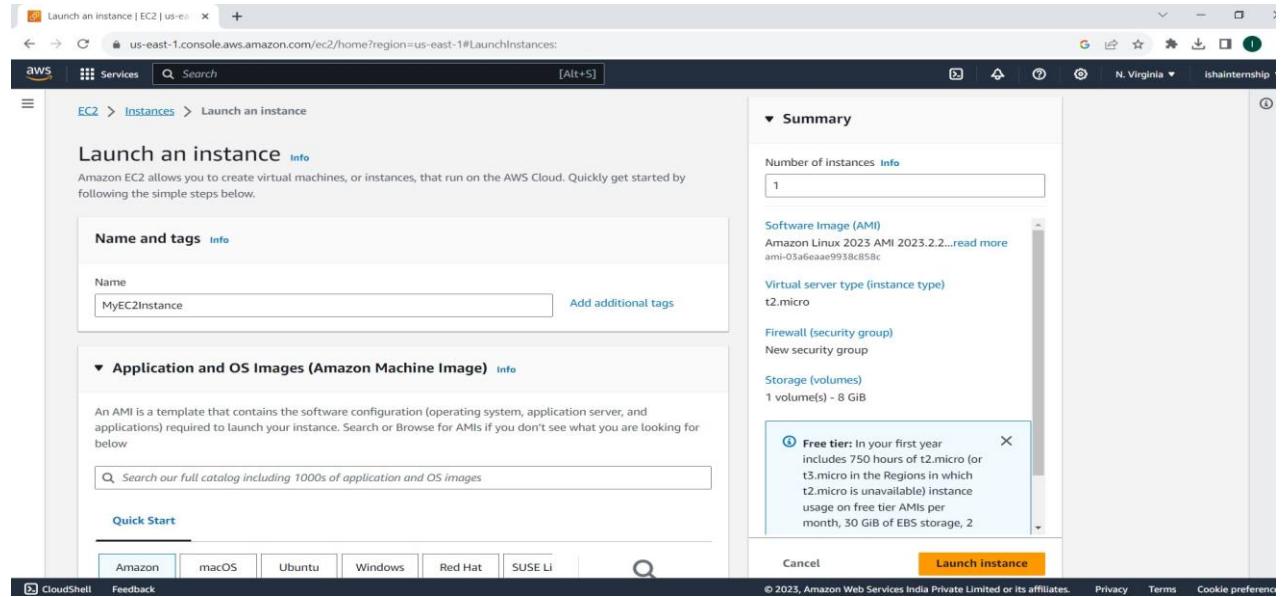


FIGURE 1.8

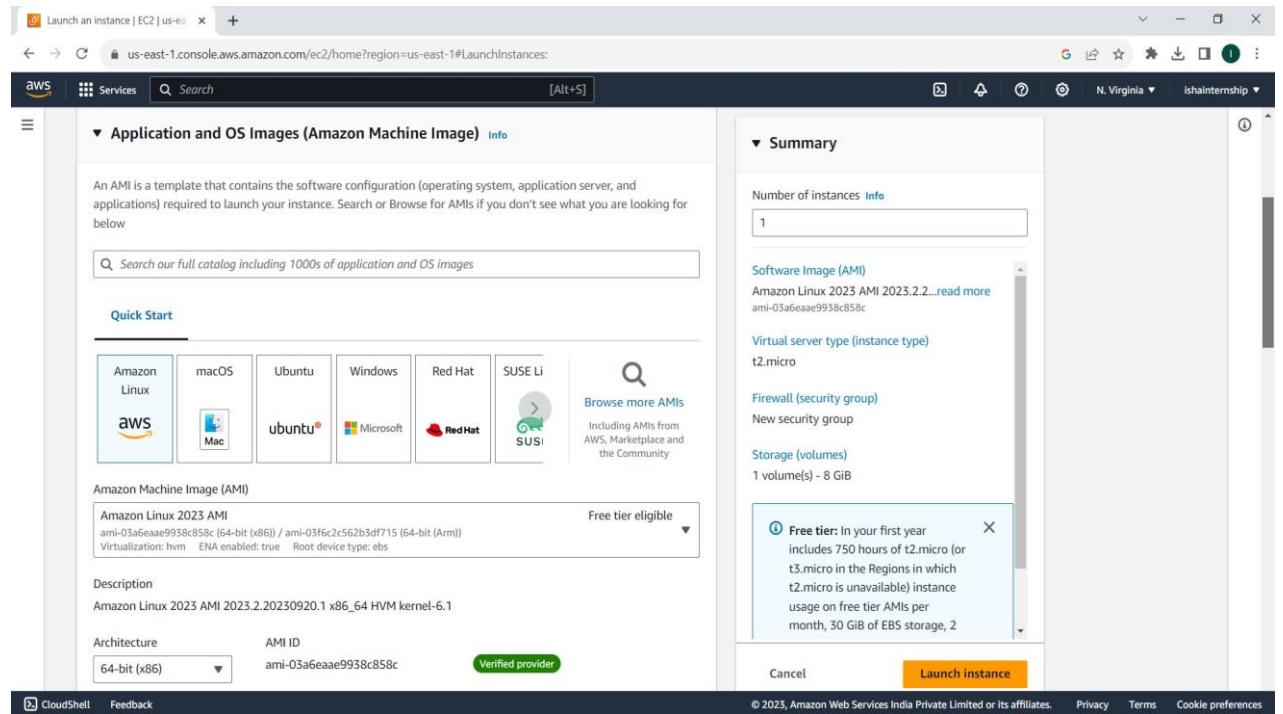


FIGURE 1.9

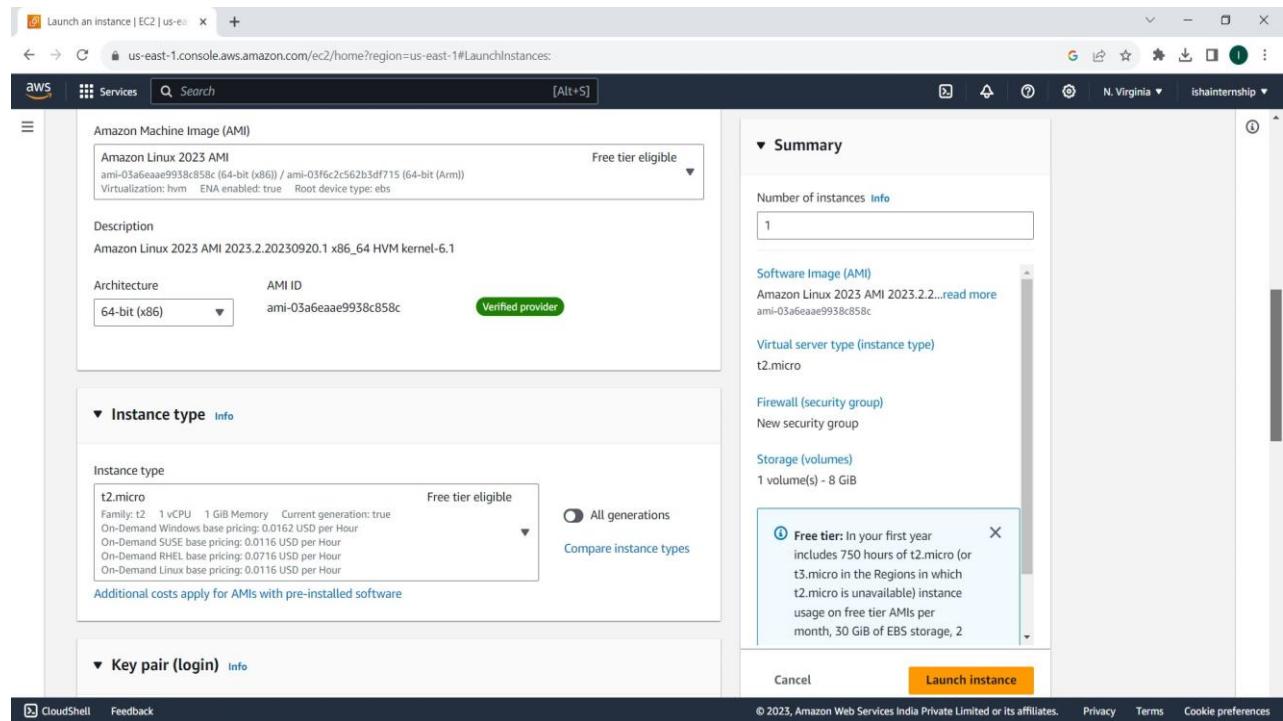


FIGURE 2.1

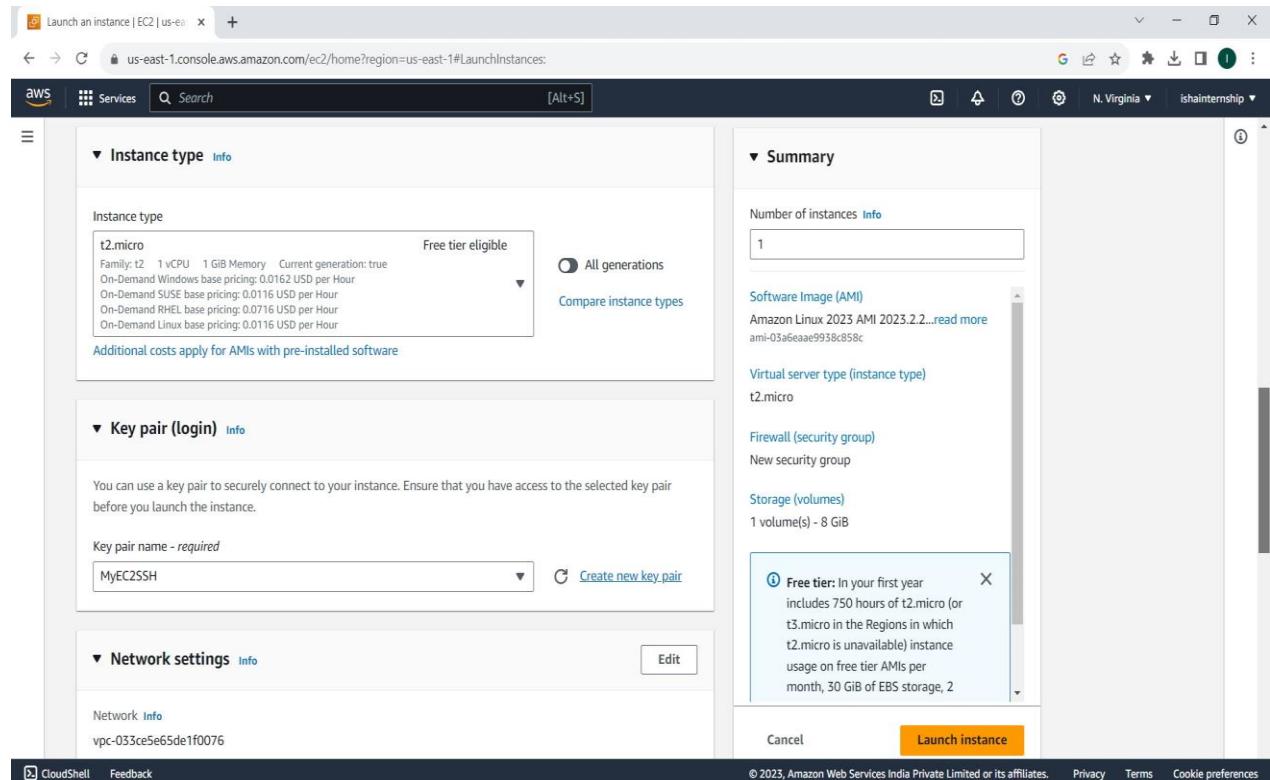


FIGURE 2.2

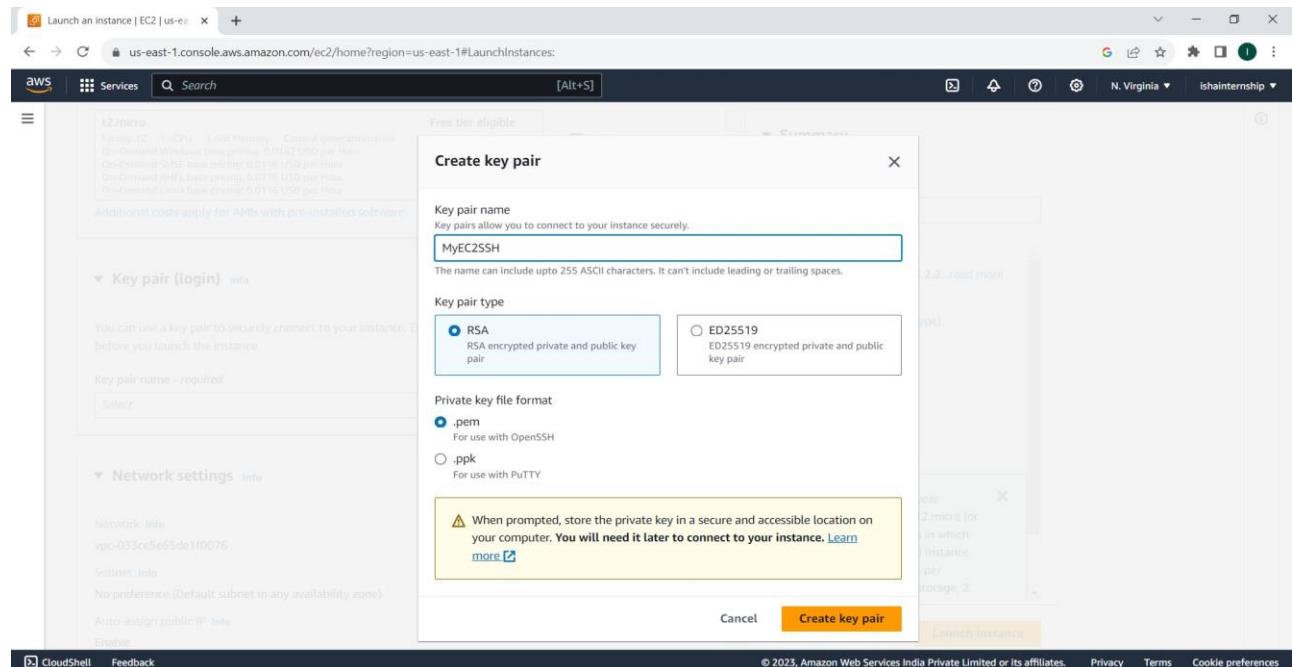


FIGURE 2.3

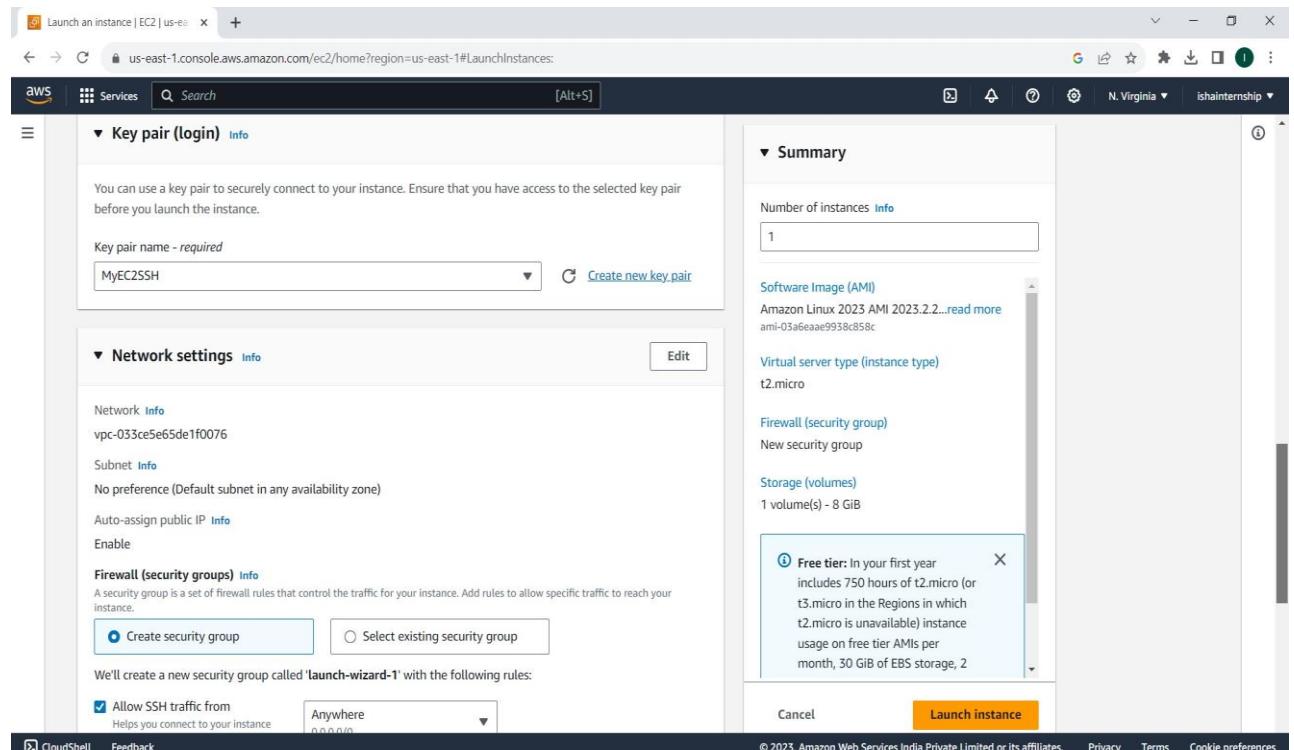


FIGURE 2.4

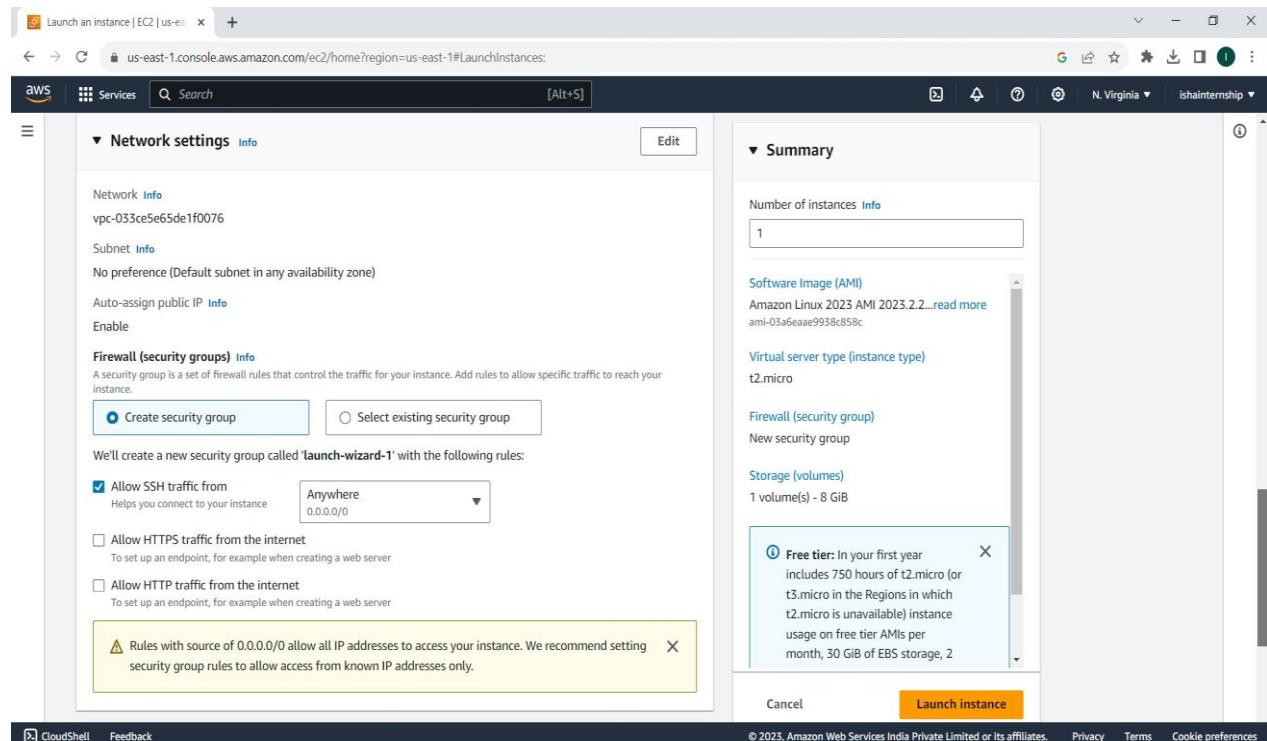


FIGURE 2.5

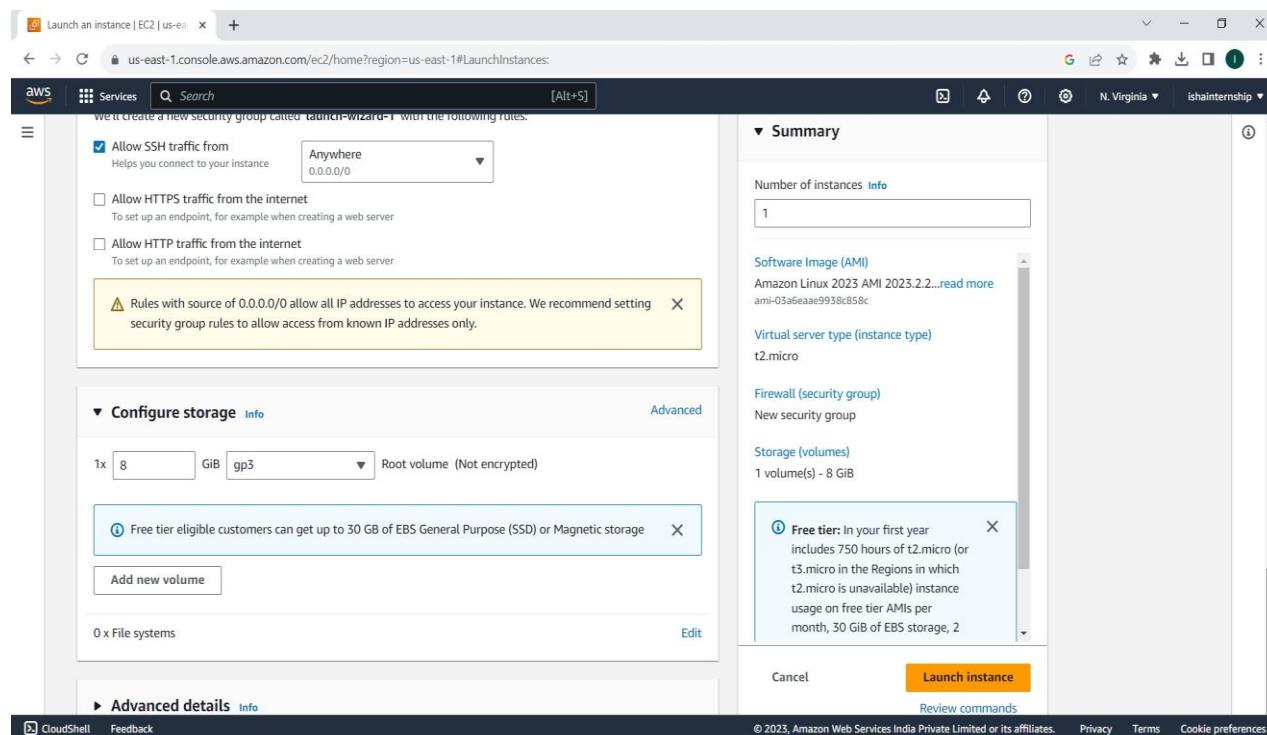


FIGURE 2.6

The screenshot shows the AWS EC2 'Launch an instance' success page. At the top, there is a green success message: 'Successfully initiated launch of instance (i-04b666a42cd961bf8)'. Below this, there is a 'Launch log' link. A 'Next Steps' section contains several options: 'Create billing and free tier usage alerts', 'Connect to your instance', 'Connect an RDS database', and 'Create EBS snapshot policy'. There are also links for 'Manage detailed monitoring', 'Create Load Balancer', 'Create AWS budget', and 'Manage CloudWatch alarms'. The bottom of the page includes standard AWS navigation links like CloudShell, Feedback, and Copyright information.

FIGURE 2.7

The screenshot shows the AWS EC2 Instances page. On the left, a sidebar lists various services: New EC2 Experience, EC2 Dashboard, EC2 Global View, Events, Instances (selected), Instances Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, AMI Catalog, and Elastic Block Store. The main content area displays a table titled 'Instances (1) Info' with one row: MyEC2Instance, i-04b666a42cd961bf8, Running, t2.micro, Initializing, No alarms, us-east-1a. Below the table, a 'Select an instance' dropdown menu is open, showing the same item: MyEC2Instance. The bottom of the page includes standard AWS navigation links like CloudShell, Feedback, and Copyright information.

FIGURE 2.8

The screenshot shows the AWS EC2 Instance Details page for instance `i-04b666a42cd961bf8`. The instance is named `MyEC2Instance` and is currently running. Key details include:

- Instance ID:** `i-04b666a42cd961bf8` (`MyEC2Instance`)
- Public IPv4 address:** `3.84.45.131` [open address]
- Private IPv4 addresses:** `172.31.89.134`
- Instance state:** Running
- Public IPv4 DNS:** `ec2-3-84-45-131.compute-1.amazonaws.com` [open address]
- Instance type:** `t2.micro`
- VPC ID:** `vpc-033ce5e65de1f0076`
- Subnet ID:** `subnet-07a961e80524365ad`

The left sidebar shows the EC2 navigation menu, and the bottom includes CloudShell, Feedback, and copyright information.

FIGURE 2.9

The screenshot shows the AWS VPC Dashboard. A single VPC is listed:

Name	VPC ID	State	IPv4 CIDR	IPv6 CIDR	DHCP options
-	<code>vpc-033ce5e65de1f0076</code>	Available	<code>172.31.0.0/16</code>	-	<code>dopt-05</code>

The left sidebar shows the VPC navigation menu, and the bottom includes CloudShell, Feedback, and copyright information.

FIGURE 3.1

The screenshot shows the AWS VPC Route Table Details page for a specific route table. The left sidebar includes sections for VPC dashboard, EC2 Global View, and various VPC-related options like Subnets, Route tables, Internet gateways, Egress-only internet gateways, Carrier gateways, DHCP option sets, Elastic IPs, Managed prefix lists, Endpoints, Endpoint services, NAT gateways, and Peering connections. The main content area displays the details of the route table, including its ID (rtb-013fd945f69b78be9), Main status, and owner information (VPC: vpc-033ce5e65de1f0076, Owner ID: 882898631426). Below this, the 'Routes' tab is selected, showing two routes: one for destination 0.0.0.0/0 targeting igw-0a8d786623abc2c53 (Status: Active, Propagated: No) and another for 172.31.0.16 targeting local (Status: Active, Propagated: No). The bottom of the screen shows standard AWS navigation and footer links.

Step-5 Download and copy the path of pem file

FIGURE 3.2

The screenshot shows a Windows Command Prompt window titled 'Command Prompt' running on a Microsoft Windows 10 system. The prompt shows the command 'H:\MyEC2SSH.pem Properties' being run. A file properties dialog box is open over the command line, displaying the following details for 'MyEC2SSH.pem': Type of file: PEM File (.pem); Opens with: Pick an app; Location: C:\Users\DELL\Downloads; Size: 1.63 KB (1,574 bytes); Size on disk: 4.00 KB (4,096 bytes); Created: 27 September 2023, 10:37:12; Modified: 27 September 2023, 10:37:13; Accessed: 27 September 2023, 10:43:43. The Attributes section shows 'Read-only' and 'Hidden' checkboxes. The Security section notes that the file came from another computer and might be blocked to help protect this computer, with an 'Unblock' checkbox. The background of the screenshot shows the AWS EC2 Instances page with a list of instances and their details.

Step-6 Use SSH to access your MongoDB EC2 instance. Replace [YourkeyName] and [YourInstanceIP] with your key name and instance IP address

Command : ssh -i [YourKeyName].pem ec2-user@[YourInstanceIP]

FIGURE 3.3



```
ec2-user@ip-172-31-89-134:~ Microsoft Windows [Version 10.0.19045.3324]
(c) Microsoft Corporation. All rights reserved.

C:\Users\DELL\ssh -i C:\Users\DELL\Downloads\MyEC2SSH.pem ec2-user@3.84.45.131
The authenticity of host '3.84.45.131 (3.84.45.131)' can't be established.
ED25519 key fingerprint is SHA256:nbcm1jCDb/xjTDcQF1kkS0iWfhApEhpAqC0oWqsH#%J.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '3.84.45.131' (ED25519) to the list of known hosts.

Amazon Linux 2023
https://aws.amazon.com/linux/amazon-linux-2023

[ec2-user@ip-172-31-89-134 ~]$
```

Step-7 Install MongoDB and run command mongosh

URL : <https://www.mongodb.com/try/download/community>

FIGURE 3.4

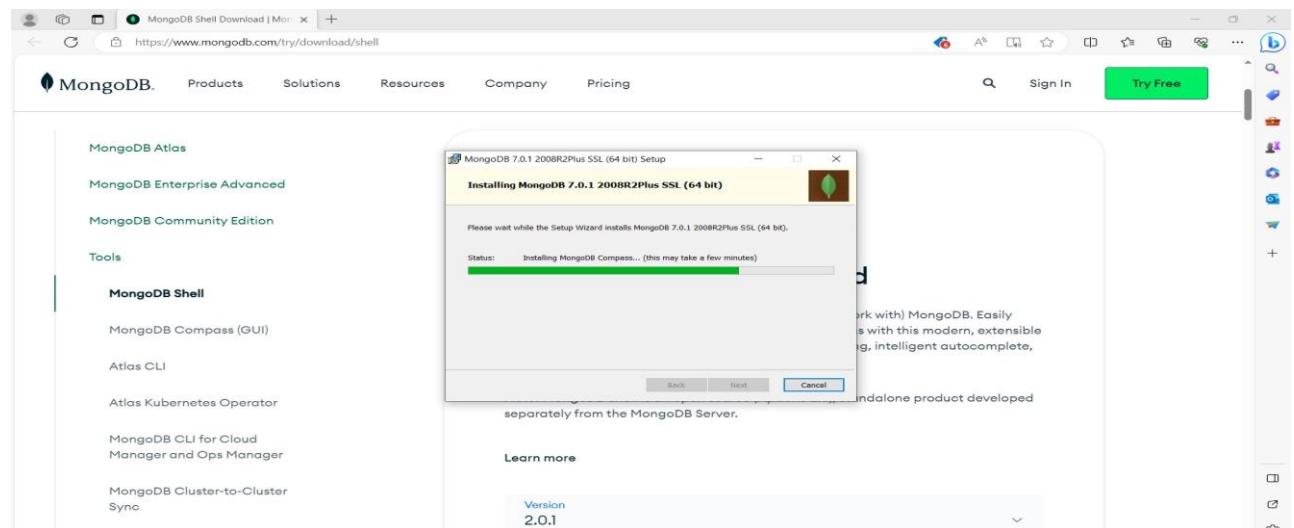


FIGURE 3.5

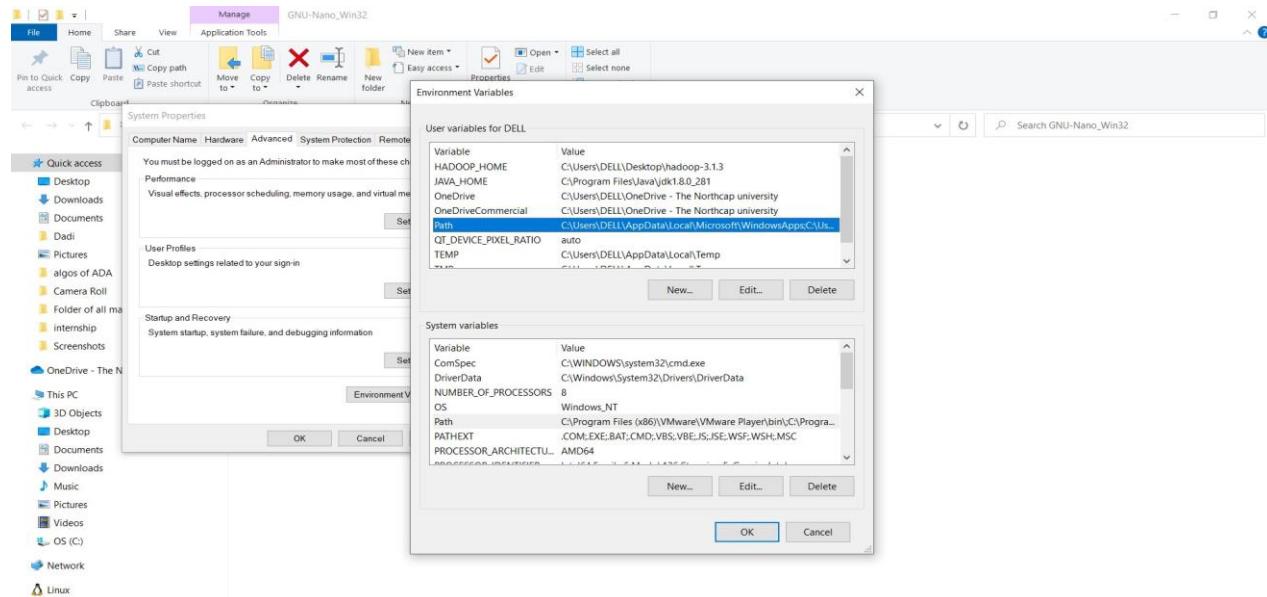
```
c:\Users\DELL>mongosh
MongoDB shell version: 2.0.1
connecting to: mongodb://127.0.0.1:27017/?directConnection=true&serverSelectionTimeoutMS=2000
MongoDB server version: 2.0.1
Using Mongosh: 2.0.1
For mongosh info see: https://docs.mongodb.com/mongosh-shell/
To help improve our products, anonymous usage data is collected and sent to MongoDB periodically (https://www.mongodb.com/legal/privacy-policy).
You can opt-out by running the disableTelemetry() command.

-----
The server generated these startup warnings when booting
2023-09-27T11:06:05.431+05:30: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
-----
Warning: Found ~/.mongorc.js, but not ~/.mongoshrc.js. ~/.mongorc.js will not be loaded.
You may want to copy or rename ~/.mongorc.js to ~/.mongoshrc.js.

test>
```

Step-8 Install nano editor and set its path in the settings->edit environment variables

FIGURE 3.6



Step-9 Open S3 service in AWS and create bucket (name: bucketofbackup) and create folder (name: backup) inside the bucket

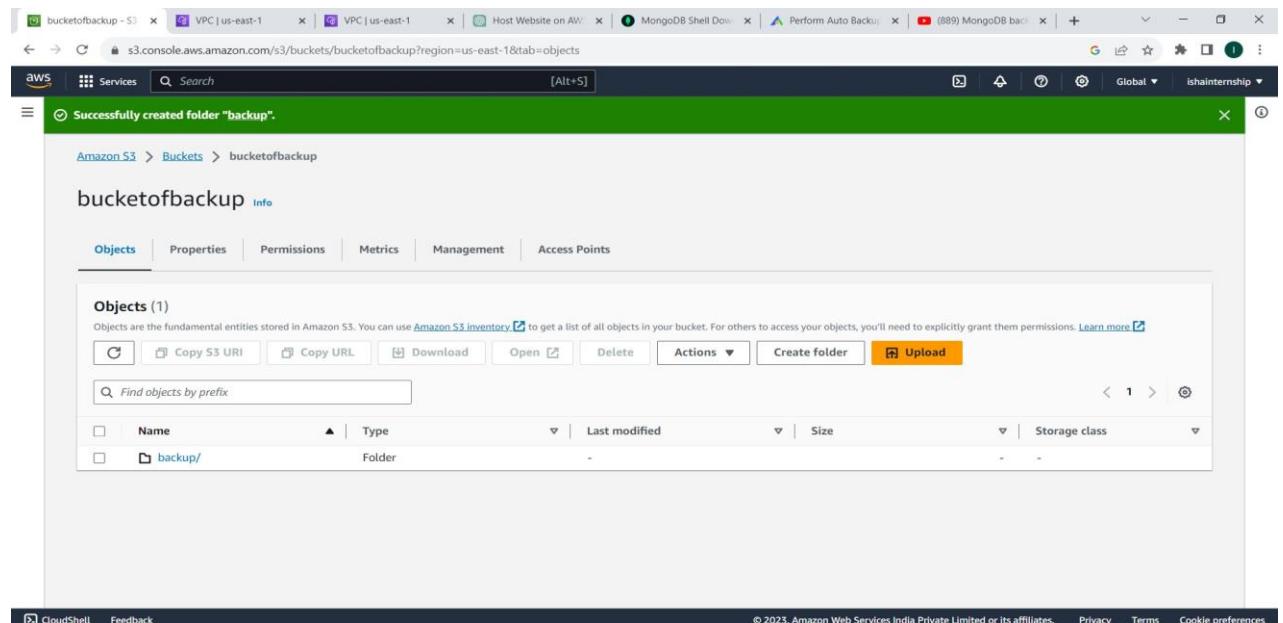
FIGURE 3.7

The screenshot shows the 'Create bucket' configuration page in the AWS S3 console. The 'General configuration' section is visible, featuring fields for 'Bucket name' (set to 'bucketofbackup') and 'AWS Region' (set to 'US East (N. Virginia) us-east-1'). Below these, there's a note about copy settings from existing buckets and a 'Choose bucket' button. The 'Object Ownership' section follows, with a note about controlling ownership from other accounts and two options: 'ACLs disabled (recommended)' (selected) and 'ACLs enabled'. At the bottom of the page, there are links for CloudShell, Feedback, and a footer with copyright information.

FIGURE 3.8

The screenshot shows the 'Buckets' list page in the AWS S3 console. A green banner at the top indicates that a bucket named 'bucketofbackup' has been successfully created. Below the banner, the 'Account snapshot' section provides storage usage information. The main table lists one bucket: 'bucketofbackup' (1 item). The table includes columns for Name, AWS Region, Access, and Creation date. The bucket details show it is in the 'us-east-1' region, has 'Bucket and objects not public' access, and was created on September 27, 2023, at 17:48:24 (UTC+05:30). The bottom of the page includes CloudShell, Feedback, and footer links.

FIGURE 3.9



Step-10 Go to IAM service of AWS Cloud, create user (name: data-backup) and create group (name: For-data-backup) and assign them permission (AmazonS3FullAccess)

FIGURE 4.1

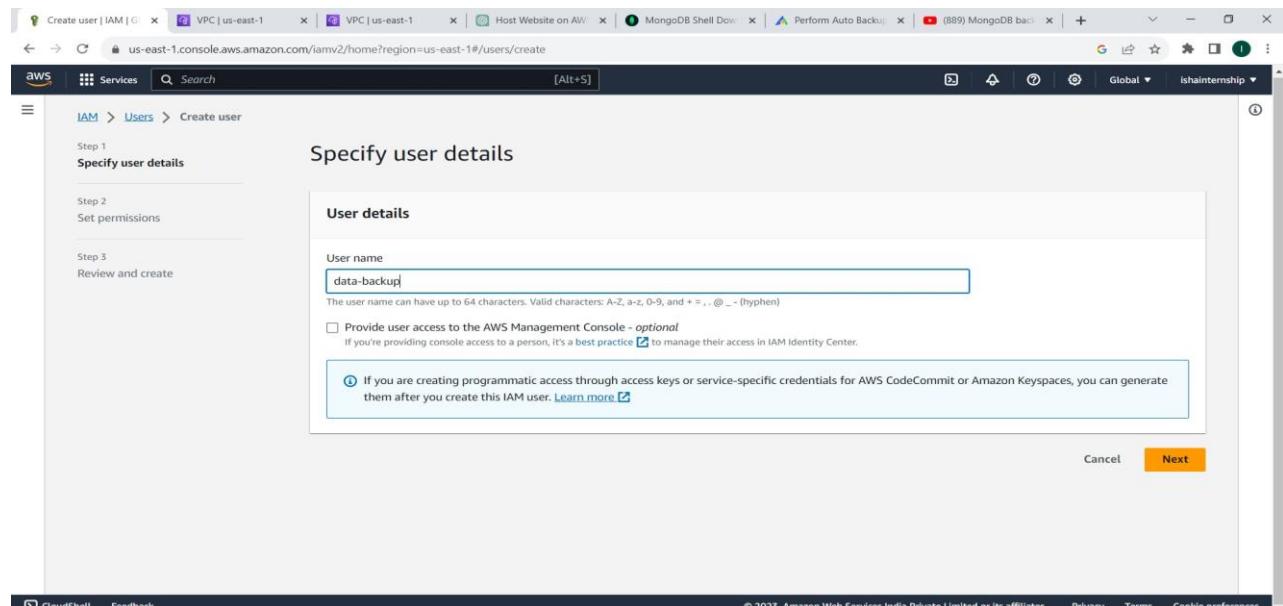


FIGURE 4.2

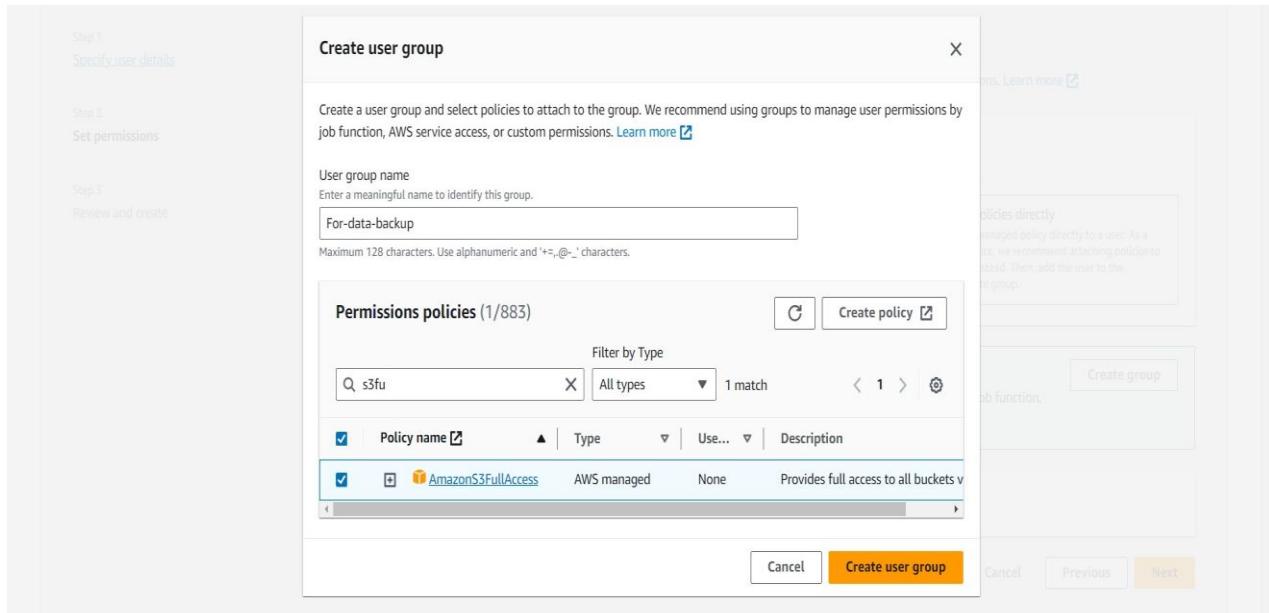


FIGURE 4.3

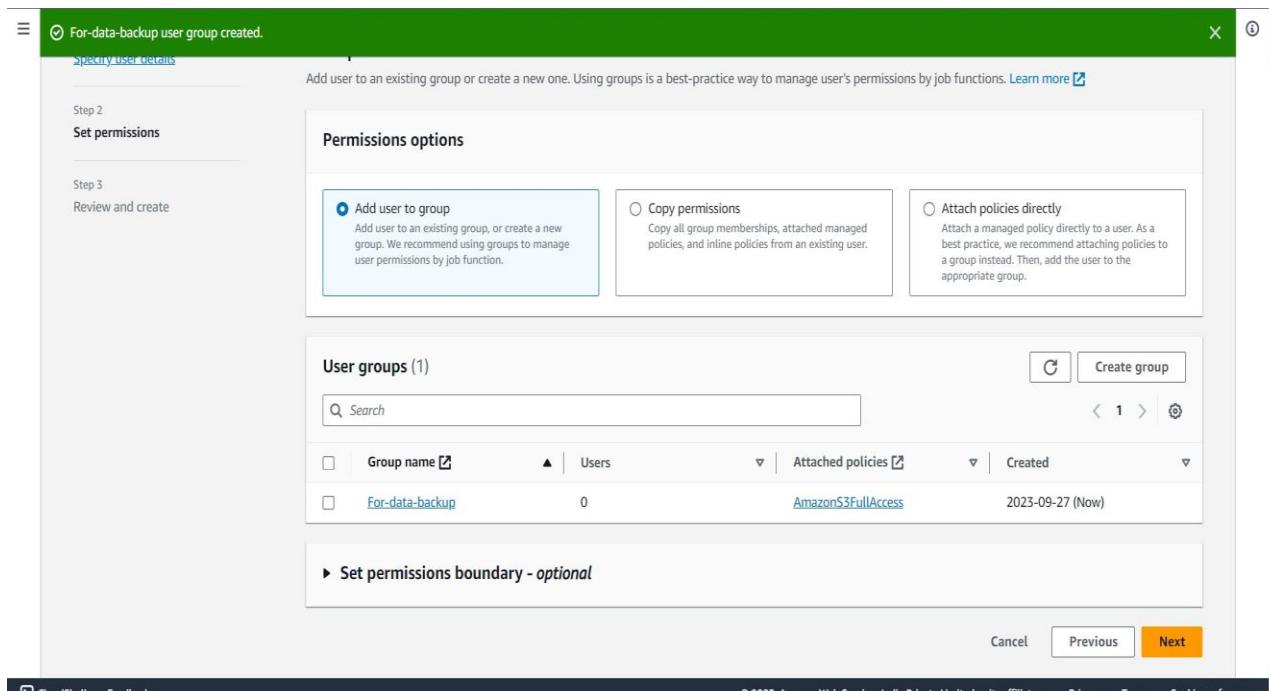


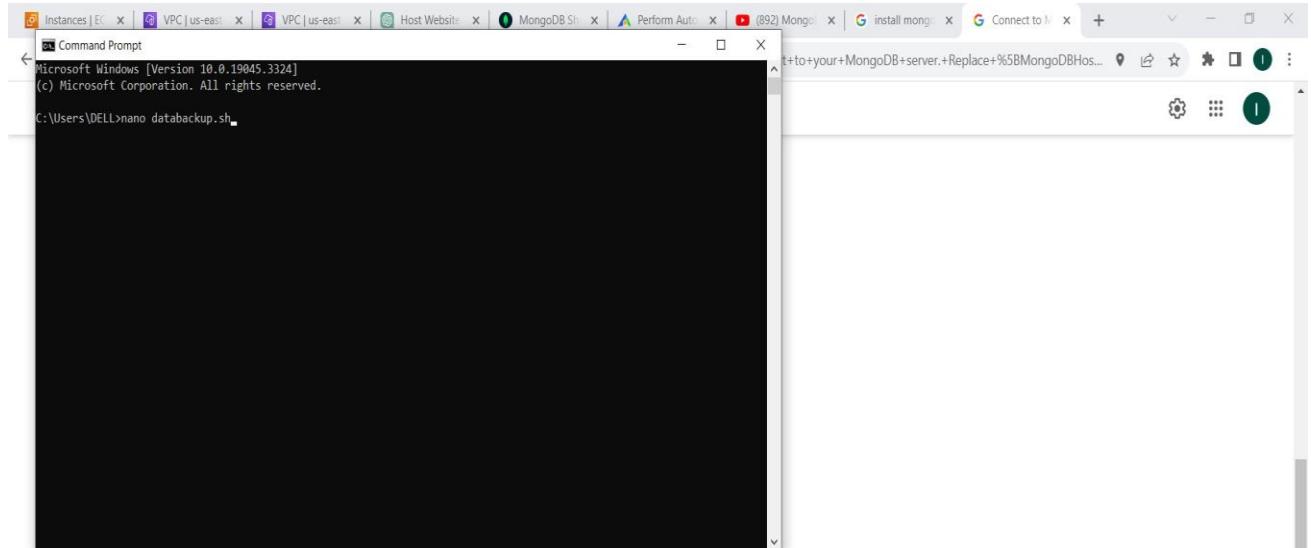
FIGURE 4.4

The screenshot shows the AWS IAM User Groups page. A new user group named 'for-data-backup' is being created. One user, 'data-backup', is added to the group. The 'AmazonS3FullAccess' policy is attached to the group.

Policy name	Type	Used as	Description
AmazonS3FullAccess	AWS managed	None	Provides full access to all buckets via...

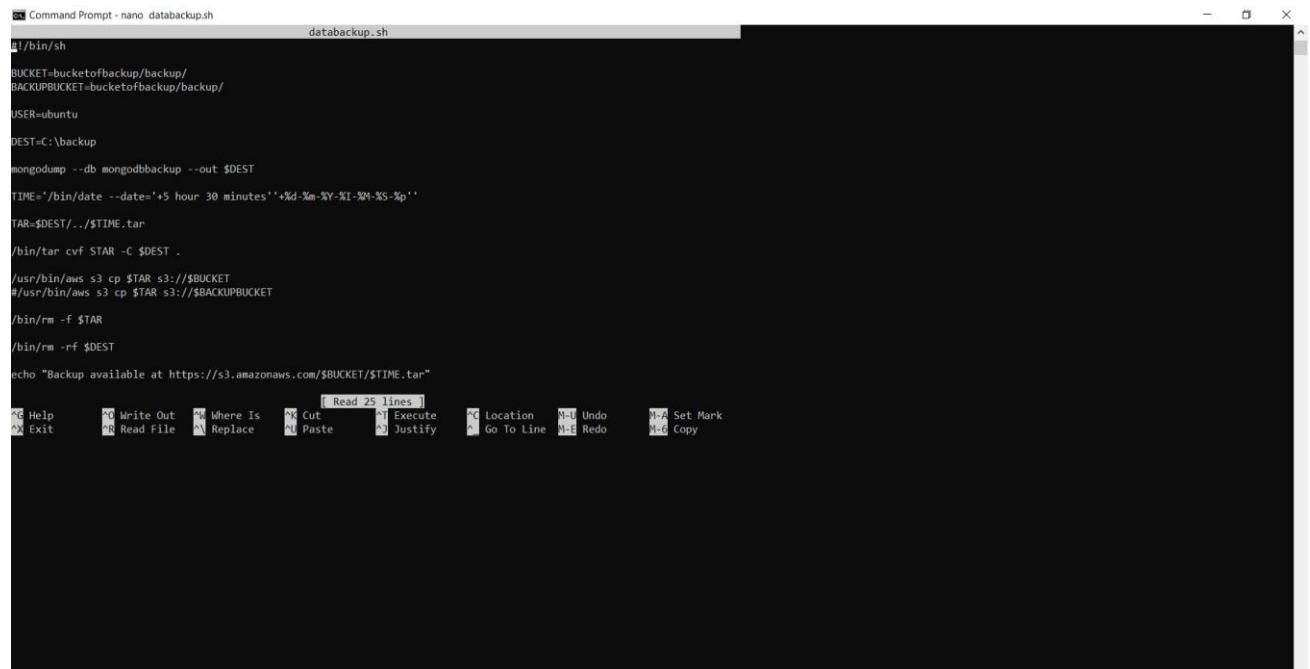
Step-11 Open cmd and write the command nano databackup.sh

FIGURE 4.5



Step-12 Edit the databackup.sh script. Press **ctrl+O** to save, press **enter**,
press **ctrl+X** to exit

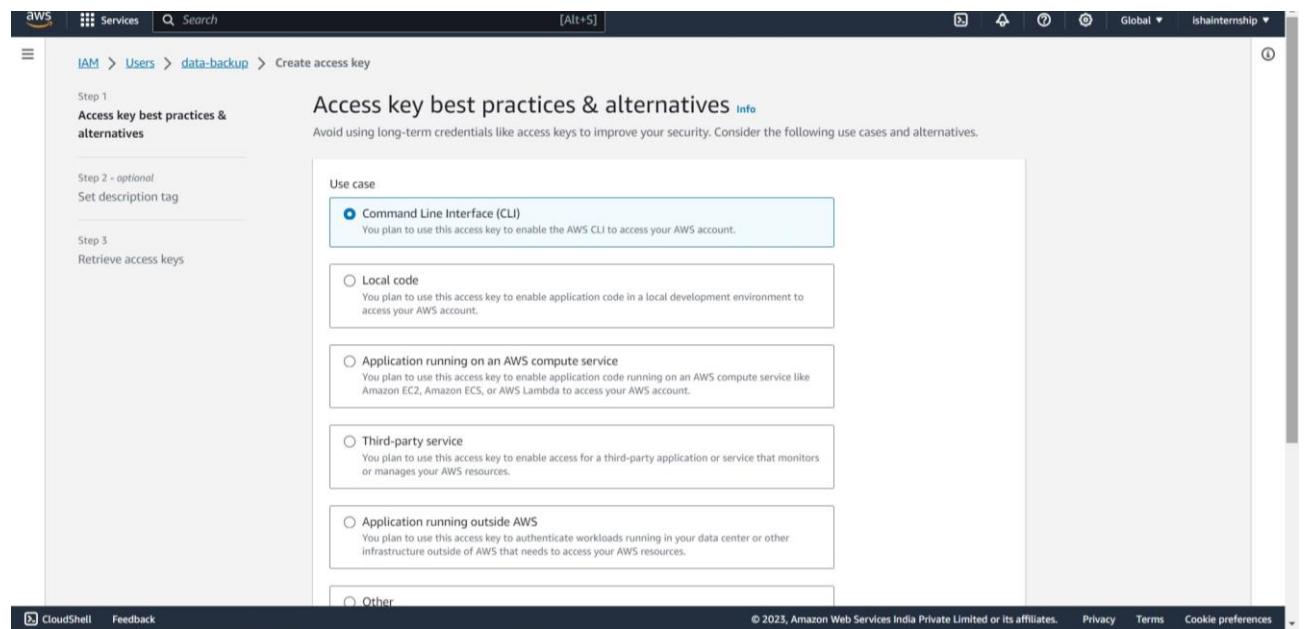
FIGURE 4.6



```
Command Prompt - nano databackup.sh
#!/bin/sh
BUCKET=bucketofbackup/backup/
BACKUPBUCKET=bucketofbackup/backup/
USER=ubuntu
DEST=C:\backup
mongodump --db mongodbsbackup --out $DEST
TIME="/bin/date --date='+5 hour 30 minutes'+'%d-%m-%Y-%H-%M-%S-%p'"
TAR=$DEST/$TIME.tar
/bin/tar cvf STAR -C $DEST .
/usr/bin/aws s3 cp $TAR s3://$BUCKET
#/usr/bin/aws s3 cp $TAR s3://$BACKUPBUCKET
/bin/rm -f $DEST
/bin/rm -rf $DEST
echo "Backup available at https://s3.amazonaws.com/$BUCKET/$TIME.tar"
```

Step-13 Create access keys and download .csv file

FIGURE 4.7



Step 1
Access key best practices & alternatives

Step 2 - optional
Set description tag

Step 3
Retrieve access keys

Use case

Command Line Interface (CLI)
You plan to use this access key to enable the AWS CLI to access your AWS account.

Local code
You plan to use this access key to enable application code in a local development environment to access your AWS account.

Application running on an AWS compute service
You plan to use this access key to enable application code running on an AWS compute service like Amazon EC2, Amazon ECS, or AWS Lambda to access your AWS account.

Third-party service
You plan to use this access key to enable access for a third-party application or service that monitors or manages your AWS resources.

Application running outside AWS
You plan to use this access key to authenticate workloads running in your data center or other infrastructure outside of AWS that needs to access your AWS resources.

Other

FIGURE 4.7

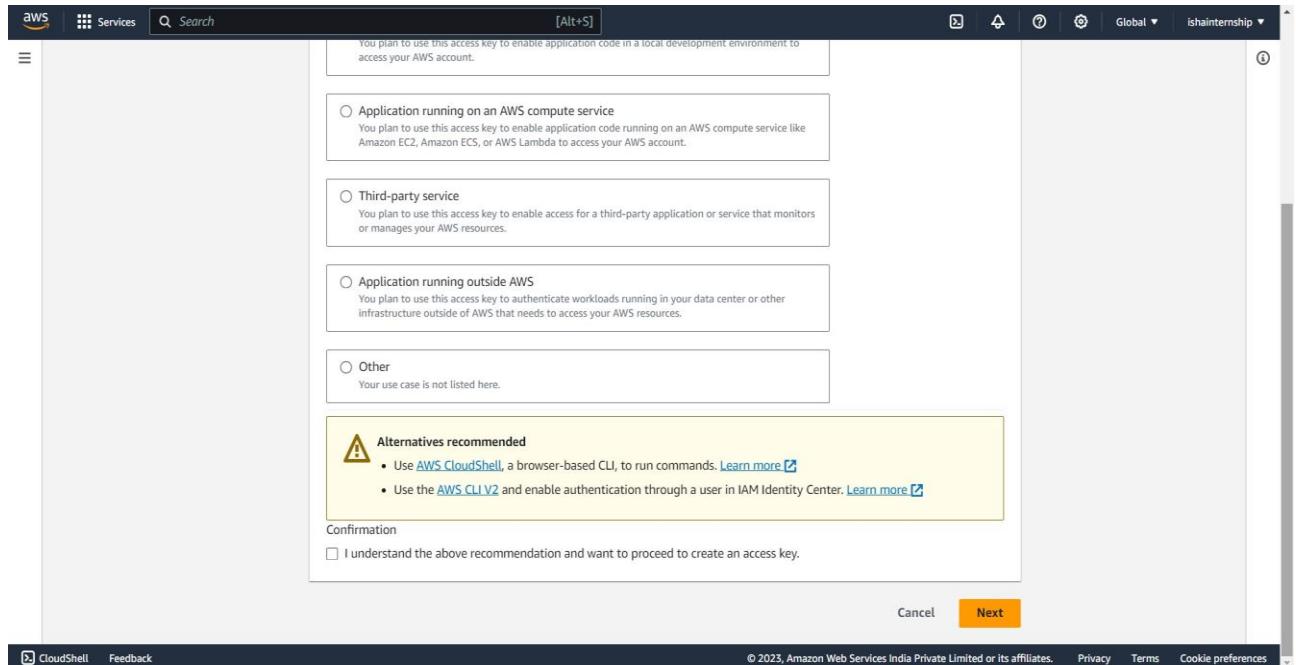


FIGURE 4.8

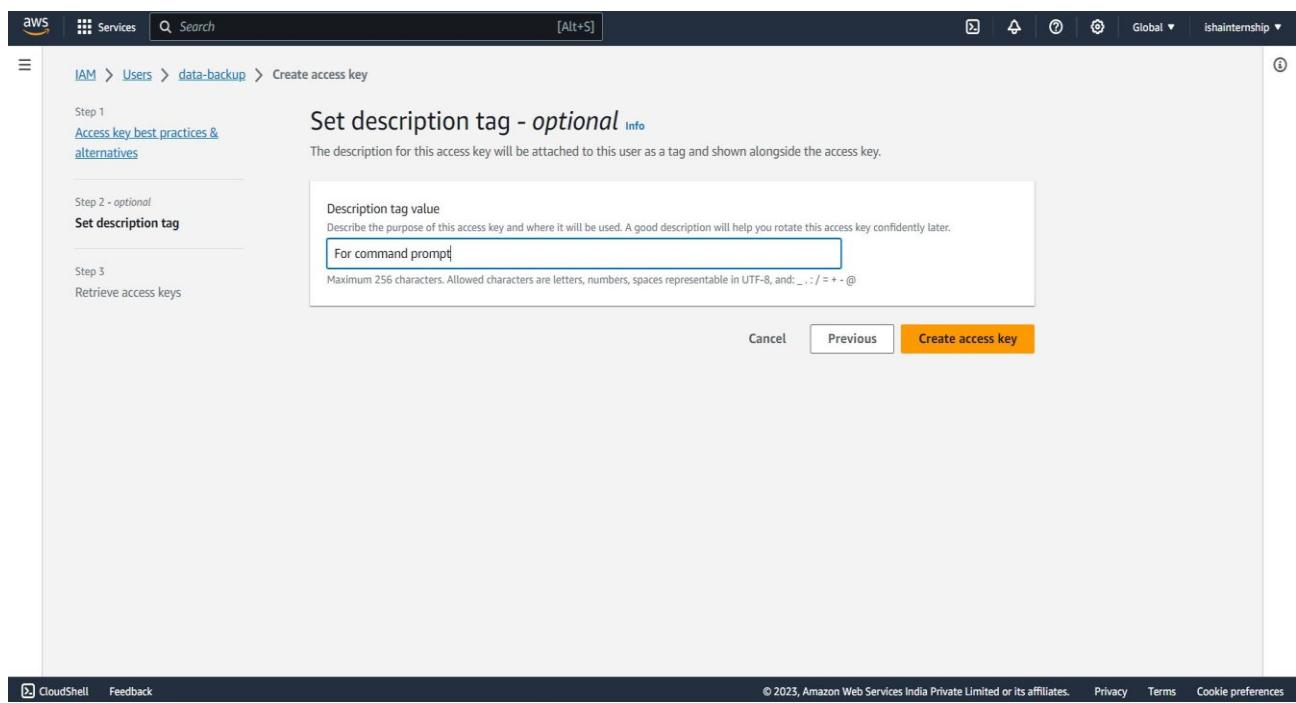


FIGURE 4.9

The screenshot shows the AWS IAM 'Create access key' page. At the top, a green banner says 'Access key created' with a note: 'This is the only time that the secret access key can be viewed or downloaded. You cannot recover it later. However, you can create a new access key any time.' Below the banner, the breadcrumb navigation shows: IAM > Users > data-backup > Create access key. A sidebar on the left lists steps: Step 1 (Access key best practices & alternatives), Step 2 - optional (Set description tag), and Step 3 (Retrieve access keys). The main content area is titled 'Retrieve access keys' and contains an 'Access key' section with fields for 'Access key' (AKIA43EG37MBEK4CPYGT) and 'Secret access key' (*****). It also includes an 'Access key best practices' section with tips like 'Never store your access key in plain text, in a code repository, or in code.' At the bottom right are 'Download .csv file' and 'Done' buttons.

FIGURE 5.1 Give information of AWS access key ID, AWS Secret access key, default region name and default output format

```
C:\Users\DELL>aws configure
AWS Access Key ID [*****VIE6]: AKIA43EG37MBEK4CPYGT
AWS Secret Access Key [*****37t0]: zA5bRN+Bydj4X1joV+8E6EuF3+WqHFkuhNwMgfW
Default region name [us-east-1]: us-east-1
Default output format [None]: json
```

Step-14 Write command : bash databackup.sh, with this backup will be created inside the folder of bucket which you have made

FIGURE 5.2

The screenshot shows the AWS S3 'Objects (1)' list. The objects table has columns for 'Name' and 'Type'. One object is listed: '01-11-2020-09-09-27-AM.tar' of type 'tar'. At the top, there's a 'Feature spotlight' with a '3' badge. The table includes standard S3 actions: 'Delete', 'Actions', and 'Create folder'. A search bar at the top says 'Find objects by prefix'.

Github link :

<https://github.com/Ishita123Kapoor/Mongodbbbackup.git>

ANALYSIS

I learn various things which was a best part of my internship. Through this problem statement I got a chance to solve a real life problem in the field of cloud computing. I was able to explore my knowledge regarding various services which I had used in my project. I also enjoyed my internship. My strengths which were used in it were hard working and interest in learning new things in cloud computing.

CONCLUSION

The internship program was a great opportunity for me to interact with different services of AWS Cloud like EC2 instance, S3 bucket and IAM (Identity and access management). Through real time project I got better understanding. In future I will be capable of working on more projects. It will help me to get knowledge for my career if I want to make it in cloud computing.

APPENDIX

I was provided with a site of this company (Cloud counselage). This was for my reference. Recordings of all workshops were available in it. Weekly meetings were also held using this site.

For any query we could write either in the discussion session or we could do mail to them:

Email id: member@industryacademiacommunity.com

SCHEDULE OF THE INTERNSHIP



BIBLIOGRAPHY

1. https://youtu.be/EXvRwOuGpQo?si=5Ba45z_WPAEZLK_0
2. <https://rajputankit22.medium.com/backup-mongodb-to-amazon-s3-e19bca1bb383>

