

Cloud Computing

Experiment No – 1

The screenshot shows the AWS Cloud Computing Services - EC2 console. The main title is "Amazon Elastic Compute Cloud (EC2)" with the subtitle "Create, manage, and monitor virtual servers in the cloud." A call-to-action box on the right says "Launch a virtual server" with buttons for "Launch instance", "View dashboard", "Get started walkthroughs", and "Get started tutorial". The left sidebar lists categories like EC2, Instances, Images, and Elastic Block Store. The bottom right corner shows the date and time as 02-10-2025 at 02:28 PM.

The screenshot shows the "Launch an instance" wizard. It starts with a message: "It seems like you may be new to launching instances in EC2. Take a walkthrough to learn about EC2, how to launch instances and about best practices." Buttons for "Take a walkthrough" and "Do not show me this message again." are shown. Below this, there's a "Name and tags" section where the name "My Web Server" is entered. The "Application and OS Images (Amazon Machine Image)" section shows a search bar and a list of recent AMIs: Amazon, macOS, Ubuntu, Windows, Red Hat, SUSE Linux, and Debian. On the right, a "Summary" panel shows 1 instance, the software image (Amazon Linux 2023.9.2), the virtual server type (t2.micro), a new security group, and storage (1 volume(s) - 8 GiB). A note at the bottom says "Free tier: In your first year of opening an AWS account, you get 750 hours of t2.micro compute usage per month." The bottom right corner shows the date and time as 02-10-2025 at 02:28 PM.

Cloud Computing

Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name

[Add additional tags](#)

▼ Instance type Info | Get advice

Instance type

t2.micro

Family: t2 1 vCPU 1 GiB Memory Current generation: true
On-Demand Windows base pricing: 0.017 USD per Hour
On-Demand RHEL base pricing: 0.0268 USD per Hour On-Demand Linux base pricing: 0.0124 USD per Hour
On-Demand Ubuntu Pro base pricing: 0.0142 USD per Hour
On-Demand SUSE base pricing: 0.0124 USD per Hour

Free tier eligible

All generations

[Compare instance types](#)

[Additional costs apply for AMIs with pre-installed software](#)

Create key pair X

Key pair name

Key pairs allow you to connect to your instance securely.

The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

RSA

RSA encrypted private and public key pair

ED25519

ED25519 encrypted private and public key pair

Private key file format

.pem

For use with OpenSSH

.ppk

For use with PuTTY

⚠ When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance. [Learn more](#) 

[Cancel](#)

[Create key pair](#)

Cloud Computing

▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI contains the operating system, application server, and applications for your instance. If you don't see a suitable AMI below, use the search field or choose [Browse more AMIs](#).

Recents **Quick Start**



 [Browse more AMIs](#)
Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

Amazon Linux 2023 kernel-6.1 AMI
ami-0f9708d1cd2cfee41 (64-bit (x86), uefi-preferred) / ami-00188f6b9773c92af (64-bit (Arm), uefi)
Virtualization: hvm ENA enabled: true Root device type: ebs

☰ [EC2](#) > [Instances](#) > Launch an instance

▼ Network settings [Info](#)

 We have detected that your account has no VPCs in this region. This will lead to an undesirable experience and you will not be able to launch instances. For an improved experience you can [create a new VPC](#) or [create a new default VPC](#). X

Network [Info](#)

-

Subnet [Info](#)

-

Auto-assign public IP [Info](#)

-

Firewall (security groups) [Info](#)
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group Select existing security group

We'll create a new security group called 'launch-wizard' with the following rules:

Allow SSH traffic from Anywhere
0.0.0.0/0

▼ Configure storage [Info](#)

Advanced

1x GiB Root volume, 3000 IOPS, Not encrypted

 Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage X

[Add new volume](#)

 Click refresh to view backup information ⟳
The tags that you assign determine whether the instance will be backed up by any Data Lifecycle Manager policies.

0 x File systems [Edit](#)

Cloud Computing

The screenshot shows the AWS CloudShell interface. On the left, a sidebar navigation includes links for Dashboard, AWS Global View, Events, Instances (selected), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images (AMIs, AMI Catalog), and Elastic Block Store (Volumes). The main content area displays the EC2 Instances page with one instance listed: mynewserverA25 (Instance ID i-012662432aac63fca, Status: Running, Type: t2.micro, Public IP: ec2-65-1-108-235.ap-south-1.compute.amazonaws.com). Below this, the instance details are shown, including its Public IPv4 address (65.1.108.235) and Private IPv4 address (172.31.2.132). The bottom of the screen shows the CloudShell toolbar with icons for CloudShell, Feedback, and a status bar indicating 'Very high UV' and the date '02-10-2025'.

The screenshot shows the AWS CloudShell interface with the EC2 Instance Connect terminal session open. The terminal window displays a welcome message for Amazon Linux 2023 and a URL to download it. The command 'whoami' is run, showing the user is 'ec2-user'. The bottom of the screen shows the CloudShell toolbar with icons for CloudShell, Feedback, and a status bar indicating 'Trending videos' and the date '02-10-2025'.

Cloud Computing

Experiment No - 2

The screenshot shows the AWS VPC Dashboard for the 'ap-south-1' region. The left sidebar includes sections for Virtual private cloud (Your VPCs, Subnets, Route tables, Internet gateways, Egress-only internet gateways, DHCP option sets, Elastic IPs, Managed prefix lists, NAT gateways, Peering connections, Route servers), Security (Network ACLs, Security groups), and PrivateLink and Lattice. The main area displays 'Resources by Region' for Mumbai, including VPCs (1), Subnets (3), Route Tables (1), Internet Gateways (1), Egress-only Internet Gateways (0), NAT Gateways (0), VPC Peering Connections (0), Network ACLs (1), Security Groups (2), and Customer Gateways (0). A note at the top states: 'Note: Your Instances will launch in the Asia Pacific region.' On the right, there are boxes for Service Health, Settings (Block Public Access, Zones, Console Experiments), Additional Information (VPC Documentation, All VPC Resources, Forums, Report an Issue), and AWS Network Manager. The bottom navigation bar includes CloudShell, Feedback, and search.

The screenshot shows the 'Create VPC' wizard. The 'VPC settings' step is active. It includes fields for 'Name tag - optional' (astik-newdemovpc), 'IPv4 CIDR block' (10.0.0.0/24), 'IPv6 CIDR block' (No IPv6 CIDR block selected), and 'Tenancy' (Default). The 'Resources to create' section has 'VPC only' selected. The bottom navigation bar includes CloudShell, Feedback, and search.

Cloud Computing Services - Ap South 1 > vpcs | VPC Console

ap-south-1.console.aws.amazon.com/vpcconsole/home?region=ap-south-1#vpcs:

AWS | Search [Alt+S] Account ID: 123-3372-0978 Asia Pacific (Mumbai) Astik_sp

VPC dashboard < Your VPCs

Virtual private cloud

Your VPCs (1/2) Info

Name	VPC ID	State	Block Public...	IPv4 CIDR	IPv6 CIDR
vpc-0e38f73a12df2de4c	vpc-0e38f73a12df2de4c	Available	Off	172.31.0.0/16	-
astik-newdemovpc	vpc-046e86fe2b22d4489	Available	Off	10.0.0.0/24	-

Last updated less than a minute ago Actions Create VPC

vpc-046e86fe2b22d4489 / astik-newdemovpc

VPC Subnets (1) Route tables (2) Network Connect

Your AWS virtual network Subnets within this VPC Route network traffic to resources

astik-newdemovpc ap-south-1b rtb-037e944661f3d1667

astik25demo astik-25route

CloudShell Feedback © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Type here to search Rain coming 2:34:35 PM ENG US 10/3/2025

Cloud Computing Services - Ap South 1 > VPC | ap-south-1

ap-south-1.console.aws.amazon.com/vpcconsole/home?region=ap-south-1#createSubnet:

AWS | Search [Alt+S] Account ID: 123-3372-0978 Asia Pacific (Mumbai) Astik_sp

VPC > Subnets > Create subnet

Subnet 1 of 1

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

astik25demo

The name can be up to 256 characters long.

Availability Zone Info Choose the zone in which your subnet will reside, or let Amazon choose one for you.

No preference

IPv4 VPC CIDR block Info Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.

10.0.0.0/24

IPv4 subnet CIDR block

10.0.0.0/24 256 IPs

Tags - optional

Key Value - optional

Name astik25demo Remove

Add new tag You can add 49 more tags.

Remove

CloudShell Feedback © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Type here to search Rain coming 2:31:53 PM ENG US 10/3/2025

Cloud Computing Services - An VPC | ap-south-1

ap-south-1.console.aws.amazon.com/vpcconsole/home?region=ap-south-1#CreateRouteTable:

aws Search [Alt+S] Account ID: 1723-3372-0978 Asia Pacific (Mumbai) Astik_sp

VPC > Route tables > Create route table

Create route table Info

A route table specifies how packets are forwarded between the subnets within your VPC, the internet, and your VPN connection.

Route table settings

Name - optional
Create a tag with a key of 'Name' and a value that you specify.

VPC
The VPC to use for this route table.

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
<input type="text" value="Name"/>	<input type="text" value="astik-25route"/> X Remove

Add new tag
You can add 49 more tags.

Cancel Create route table

CloudShell Feedback © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Type here to search Address 30°C Mostly cloudy ENG US 2:32:13 PM 10/3/2025

Cloud Computing Services - An VPC | ap-south-1

ap-south-1.console.aws.amazon.com/vpcconsole/home?region=ap-south-1#CreateInternetGateway:

aws Search [Alt+S] Account ID: 1723-3372-0978 Asia Pacific (Mumbai) Astik_sp

VPC > Internet gateways > Create internet gateway

Create internet gateway Info

An internet gateway is a virtual router that connects a VPC to the internet. To create a new internet gateway specify the name for the gateway below.

Internet gateway settings

Name tag
Creates a tag with a key of 'Name' and a value that you specify.

Tags - optional

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
<input type="text" value="Name"/>	<input type="text" value="astik25-gateway"/> X Remove

Add new tag
You can add 49 more tags.

Cancel Create internet gateway

CloudShell Feedback © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Type here to search Address Singapore GP Label... ENG US 2:32:34 PM 10/3/2025

Cloud Computing Services - Amazon VPC | vpc | VPC Console

ap-south-1.console.aws.amazon.com/vpcconsole/home?region=ap-south-1#vpcs:

aws Search [Alt+S] Account ID: 1723-3372-0978 Asia Pacific (Mumbai) Astik_sp

VPC dashboard < Your VPCs

AWS Global View Filter by VPC

Virtual private cloud Your VPCs Subnets Route tables Internet gateways Egress-only internet gateways DHCP option sets Elastic IPs Managed prefix lists NAT gateways Peering connections Route servers New

Security Network ACLs Security groups

PrivateLink and Lattice Getting started CloudShell Feedback Type here to search Address Rain coming ENG US 23:35 PM 10/3/2025

Your VPCs (1/2) Info Last updated less than a minute ago Actions Create VPC

Name	VPC ID	State	Block Public...	IPv4 CIDR	IPv6 CIDR
yhc-0e38f73a12df2de4c	Available	Off	172.31.0.0/16	-	-
astik-newdemovpc	Available	Off	10.0.0.0/24	-	-

vpc-046e86fe2b22d4489 / astik-newdemovpc

VPC Your AWS virtual network astik-newdemovpc

Subnets (1) Subnets within this VPC ap-south-1b astik25demo

Route tables (2) Route network traffic to resources rtb-037e944661f3d1667 astik-25route

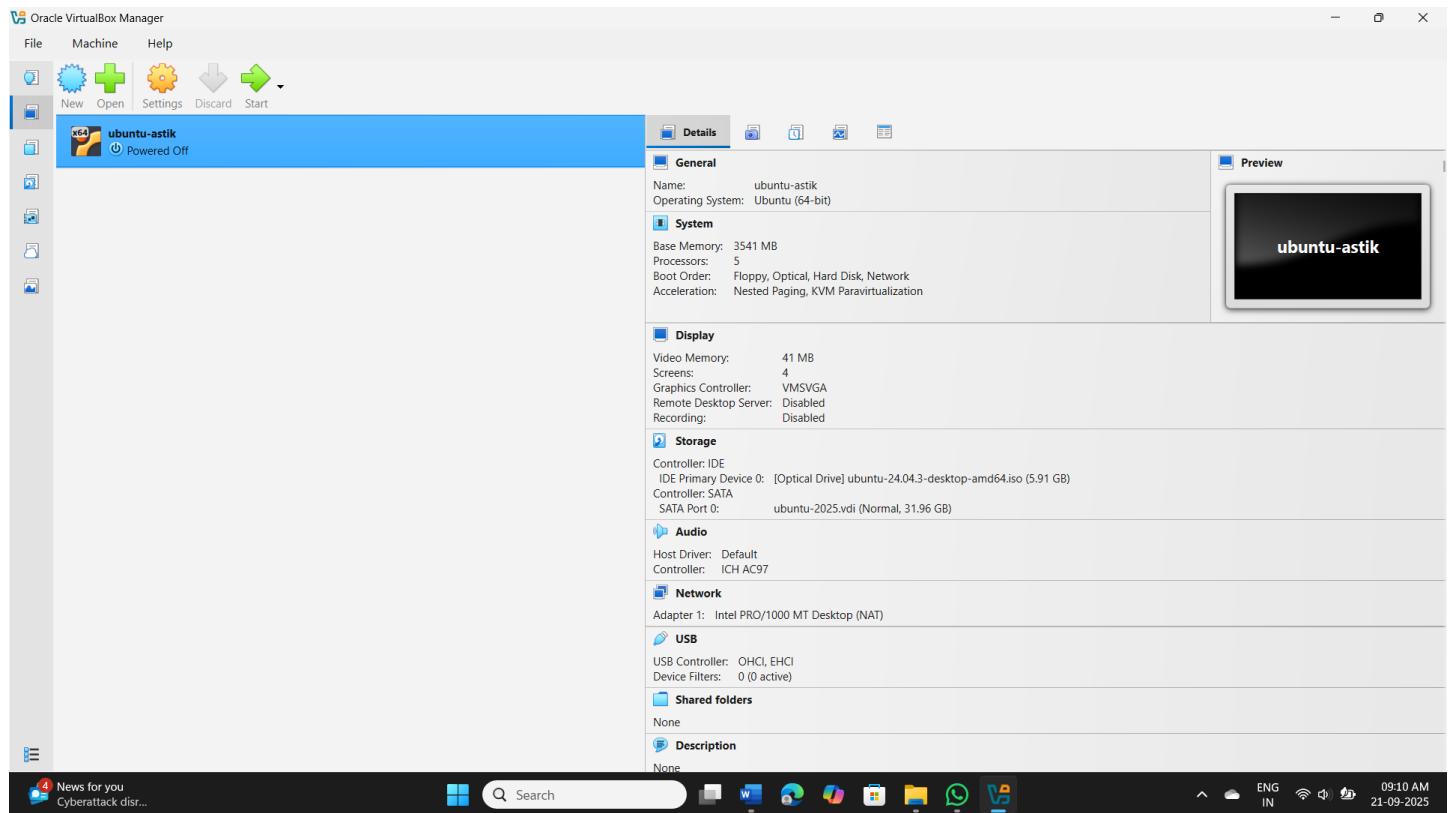
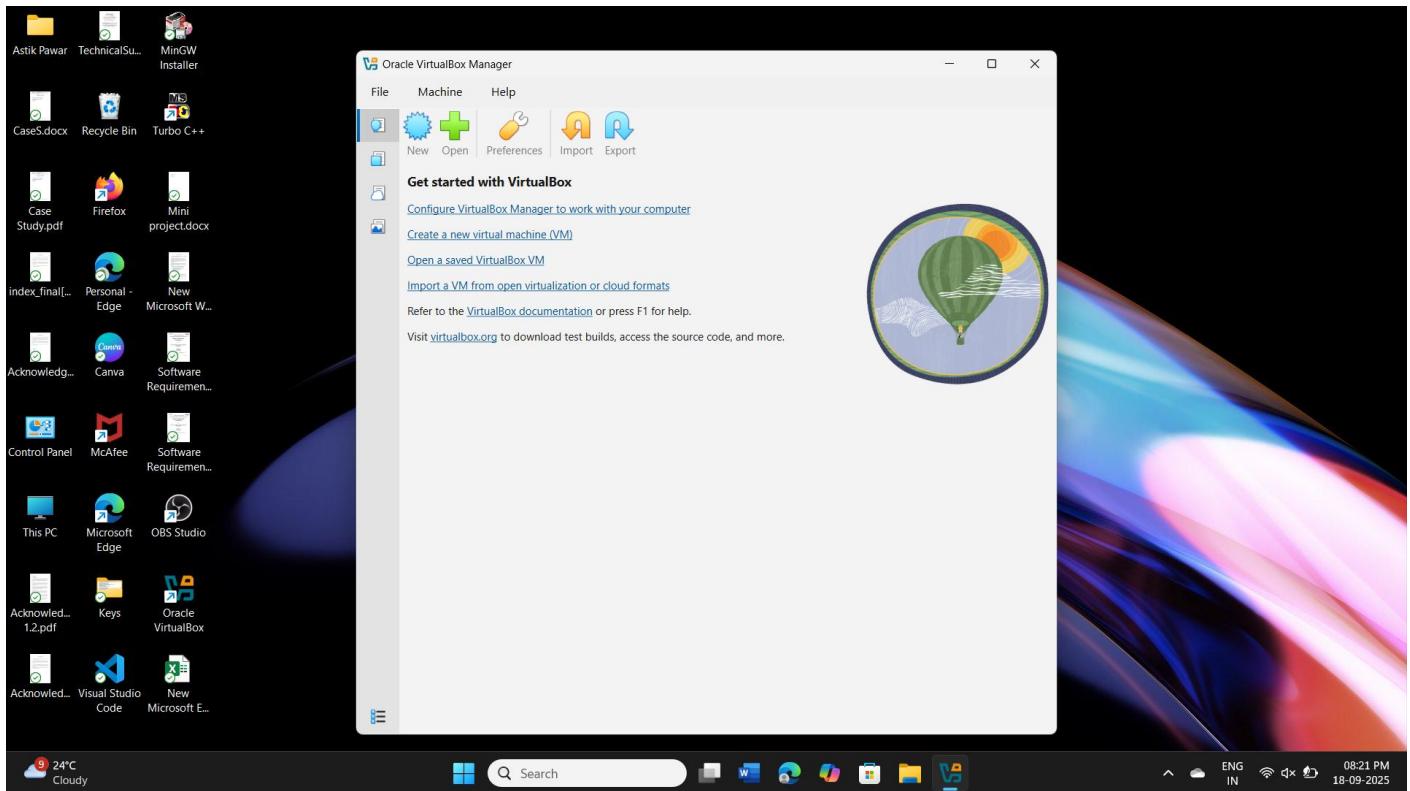
Network Connect

© 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

The screenshot shows the AWS VPC console interface. On the left, there's a navigation sidebar with sections like 'VPC dashboard', 'AWS Global View', 'Virtual private cloud', 'Security', and 'PrivateLink and Lattice'. The main area displays 'Your VPCs (1/2)' with a table showing two VPCs: one with ID 'yhc-0e38f73a12df2de4c' and another selected one named 'astik-newdemovpc' with ID 'vpc-046e86fe2b22d4489'. The selected VPC's details are shown in a large panel on the right, including its name, subnets ('ap-south-1b' and 'astik25demo'), and route tables ('rtb-037e944661f3d1667' and 'astik-25route'). The bottom of the screen includes a footer with copyright information and language/region settings.

Cloud computing

Experiment NO – 4



Cloud computing

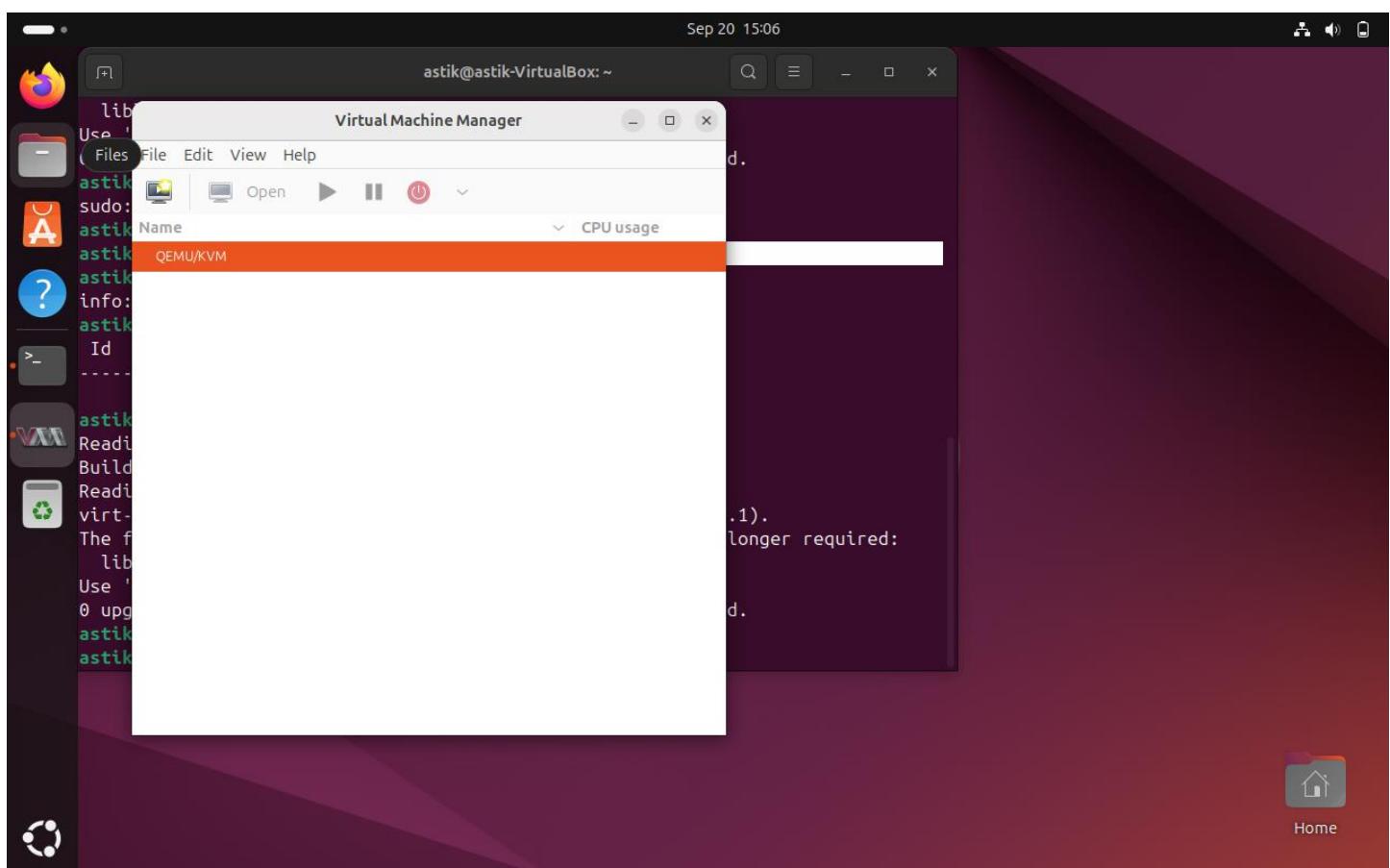
```
Sep 20 15:05  
astik@astik-VirtualBox:~  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
astik@astik-VirtualBox:~$ sudo apt install libvirt-daemon-system  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
libvirt-daemon-system is already the newest version (10.0.0-2ubuntu8.8).  
The following package was automatically installed and is no longer required:  
 liblvm19  
Use 'sudo apt autoremove' to remove it.  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
astik@astik-VirtualBox:~$ sudo systemctl enable libvirtd  
sudo: systemctl-enable: command not found  
astik@astik-VirtualBox:~$ sudo systemctl enable libvirtd  
astik@astik-VirtualBox:~$ sudo systemctl start libvirtd  
astik@astik-VirtualBox:~$ sudo adduser $USER kvm  
info: The user 'astik' is already a member of 'kvm'.  
astik@astik-VirtualBox:~$ virsh list --all  
Id  Name      State  
----  
  
astik@astik-VirtualBox:~$ sudo apt install virt-manager  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done
```

```
Sep 20 15:04  
astik@astik-VirtualBox:~  
[sudo] password for astik:  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following package was automatically installed and is no longer required:  
 liblvm19  
Use 'sudo apt autoremove' to remove it.  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
astik@astik-VirtualBox:~$ sudo apt update  
Hit:1 http://security.ubuntu.com/ubuntu noble-security InRelease  
Hit:2 http://in.archive.ubuntu.com/ubuntu noble InRelease  
Hit:3 http://in.archive.ubuntu.com/ubuntu noble-updates InRelease  
Hit:4 http://in.archive.ubuntu.com/ubuntu noble-backports InRelease  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
All packages are up to date.  
astik@astik-VirtualBox:~$ sudo apt install qemu-kvm  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
Note, selecting 'qemu-system-x86' instead of 'qemu-kvm'  
qemu-system-x86 is already the newest version (1:8.2.2+ds-0ubuntu1.10).
```

Cloud computing

A screenshot of an Ubuntu desktop environment. A terminal window titled "astik@astik-VirtualBox:~" is open, showing command-line history related to KVM setup. The desktop dock on the left contains icons for Dash, Home, Applications, and other system tools. The desktop background is a dark purple gradient.

```
libllvm19
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
astik@astik-VirtualBox: $ sudo systemctl enable libvirdt
sudo: systemctl-enable: command not found
astik@astik-VirtualBox: $ sudo systemctl enable libvirdt
astik@astik-VirtualBox: $ sudo systemctl start libvirdt
astik@astik-VirtualBox: $ sudo adduser $USER kvm
info: The user 'astik' is already a member of 'kvm'.
astik@astik-VirtualBox: $ virsh list --all
  Id  Name   State
  ----
astik@astik-VirtualBox: $ sudo apt install virt-manager
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
virt-manager is already the newest version (1:4.1.0-3ubuntu0.1).
The following package was automatically installed and is no longer required:
  libllvm19
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
astik@astik-VirtualBox: $ virt-manager
astik@astik-VirtualBox: $
```



Cloud Computing

Experiment No – 5

The screenshot shows the 'Create bucket' configuration page in the AWS S3 console. The 'General configuration' section is active, showing the 'AWS Region' set to 'Asia Pacific (Mumbai) ap-south-1'. Under 'Bucket type', 'General purpose' is selected, with a note that it's recommended for most use cases. The 'Bucket name' field contains 'myawsbucket'. The 'Object Ownership' section is also visible.

The screenshot shows the 'General purpose buckets' list page. It displays one bucket named 'myawsbucket-a25' created on October 2, 2025. The page also includes sections for 'Account snapshot' and 'External access summary'.

The screenshot shows the 'Upload objects' page for the 'myawsbucket-a25' bucket. A green success message states 'Upload succeeded' and 'For more information, see the Files and folders table.' Below this, a note says 'After you navigate away from this page, the following information is no longer available.' The 'Summary' section shows a total of 1 file uploaded. The 'Files and folders' table lists a single file named 'student.csv' with a size of 8.4 KB and a status of 'Succeeded'.

Cloud Computing

The screenshot shows the AWS S3 console with the following details:

- General purpose buckets (2)**:
 - [myawsbucket-a25athena-result](#) (Selected)
 - [myawsbucket-a25athena-result](#)
- Buckets are containers for data stored in S3.**
- Actions:** Copy ARN, Empty, Delete, Create bucket.
- Account snapshot**: Updated daily. Storage Lens provides visibility into storage usage and activity trends.
- External access summary - new**: Updated daily. External access findings help you identify bucket permissions that allow public access or access from other AWS accounts.

The screenshot shows the Amazon Athena Query editor with the following interface:

- Editor** tab selected.
- Data** panel:
 - Data source: AwsDataCatalog
 - Catalog: None
 - Database: default
 - Tables and views:
 - Tables (0)
 - Views (0)
- Query 2 :** SQL query editor area with placeholder "1".
- SQL** button, Ln 1, Col 1.
- Actions:** Run, Explain, Cancel, Clear, Create.
- Workgroup**: primary.
- Feedback** and **CloudShell** buttons.
- Footer:** © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences. Weather: 28°C Mostly cloudy. Date: 02-10-2025.

Manage settings

Query result location and encryption

Location of query result - optional

Enter an S3 prefix in the current region where the query result will be saved as an object.

[View](#)[Browse S3](#)

The screenshot shows the Amazon Athena Query editor with the following interface:

- Settings** tab selected.
- Query result encryption** section:
 - Query result location**: s3://myawsbucket-a25athena-result/
 - Encrypt query results**: SSE_S3
 - Expected bucket owner**: -
 - Assign bucket owner full control over query results**: Turned on
- Actions:** Manage.

Cloud Computing

The screenshot shows the AWS CloudShell interface with multiple tabs open. The current tab is the 'Query editor | Athena | ap-south-1#/' tab. The query pane displays the following SQL code:

```
1 CREATE EXTERNAL TABLE IF NOT EXISTS student (
2   id INT,
3   name STRING,
4   dept STRING,
5   marks INT
6 )
7 ROW FORMAT SERDE 'org.apache.hadoop.hive.serde2.lazy.LazySimpleSerDe'
8 WITH SERDEPROPERTIES (
9   'serialization.format' = ',',
10   'field.delim' = ','
11 )
12 LOCATION 's3://myawsbucket-a25/student/'
13 TBLPROPERTIES ('has_encrypted_data'= 'false');
```

The sidebar on the left shows the 'Data' section with 'Tables and views' expanded, listing 'student' as a table. Below the tables is a search bar for 'Filter tables and views'.

This screenshot shows the same AWS CloudShell environment. The query pane now contains a single line of SQL:

```
1 SELECT * FROM student;
```

The screenshot shows the 'Query results' tab of the Athena Query Editor. The results table displays 18,863 rows of data from the 'student' table. The columns are: #, id, name, dept, and marks. The data is as follows:

#	id	name	dept	marks
1		name	dept	
2	101	Rahul	IT	85
3	102	ROHIT	CS	77
4	103	Vikas	DS	81
5	104	Shubham	AI	65
6	105	Nihal	AI	58
7	106	Lalit	DS	67
8				
9				

Experiment No. 06

Step 1: Prepare Source Data in S3

Notepad -->

```
id,name,dept,marks
1,Pratik,CS,85
2,Shreyash,IT,78
```

students.csv -->

A	B	C	D
id	name	dept	marks
1	Pratik	CS	85
2	Shreyash	IT	78

⌚ Upload succeeded
For more information, see the [Files and folders](#) table.

Upload: status Close

⌚ After you navigate away from this page, the following information is no longer available.

Destination	Succeeded	Failed
s3://pratik-terraform-demo-bucket-1234/source-data/	⌚ 1 file, 42.0 B (100.00%)	⌚ 0 files, 0 B (0%)

Summary

Files and folders Configuration

Files and folders (1 total, 42.0 B)

Name	Folder	Type	Size
students.csv [i]	-	text/csv	42.0 B

Step 2: Create Target Database (RDS MySQL)

⌚ Successfully created database studentdb[View connection details](#) X

RDS has generated your database master password during the database creation and it will be displayed in the connection details. The only way to view your master password is to choose View connection details during database creation. You can modify your DB instance to create a new password at any time.

You can use settings from studentdb to simplify configuration of suggested database add-ons while we finish creating your DB for you.

Databases (1)

 Group resources [Modify](#)

Actions ▾

[Create database](#) ▾

< 1 > ⌂

Filter by databases:

<input type="checkbox"/> DB identifier	Status	Role	Engine	Region ...
<input type="radio"/> studentdb	Config...	Instance	MySQL Co...	ap-south-1a

Step 3: Create a Replication Instance in DMS

▶ How it works

Use either serverless or a provisioned replication instance to migrate a database or configure ongoing replication.

Replication instances (1)



Actions ▾

[Create replication instance](#)

< 1 > ⌂

Find replication instance

<input type="checkbox"/> Name	Status	VPC	Class	Engine ...	Availab...	Networ...	Publ...
<input type="radio"/> dms-demo	Available	vpc-074d...	dms.t3.mi...	5.5.3	ap-south-1b	IPv4	Yes

Step 4: Create Source & Target Endpoints

Table structure

A JSON document describing the structure of the tables and columns in the CSV files.

```
{  
  "TableCount": "1",  
  "Tables": [  
    {  
      "TableName": "students",  
      "TablePath": "students.csv",  
      "TableOwner": "dbo",  
      "TableColumns": [  
        { "ColumnName": "id", "ColumnType": "int8" },  
        { "ColumnName": "name", "ColumnType": "string" },  
        { "ColumnName": "dept", "ColumnType": "string" },  
        { "ColumnName": "marks", "ColumnType": "int8" }  
      ]  
    }  
  ]  
}
```

▼ Test endpoint connection - optional

Choose the replication instance to test the network and database connectivity for migration.

Replication instance

A replication instance performs the database migration.

dms-demo
Version: 3.5.3 Public accessible: Yes VPC: vpc-074db18f4e9df5525

[Run test](#)

Endpoint Identifier	Replication instance	Status	Message
s3-source	dms-demo	✓ Successful	

Source endpoint (S3) & Target endpoint (RDS MySQL):

Endpoints (2)							Actions	Create endpoint		
<input type="text"/> Find endpoint							<	1	>	⑧
	Name	Type	Status	Engine	Server name	Port	Migration Hub Mapping			
<input type="checkbox"/>	mysql-target	Target	✓ Active	MySQL	studentdb.crwac8i62ybu.ap-south-1.rds.amazonaws.com	3306				
<input type="checkbox"/>	s3-source	Source	✓ Active	Amazon S3	-	-				

Step 5: Create Migration Task

Database migration tasks (1) [Info](#)

Actions ▾ Quick view and compare Create database migration task

Find database migration tasks

Identifier	Status	Migration progress	Type	Premigration assessment	Source	Target
s3-to-mysql-task	Created	0%	Full load	Not assessed	s3-source	my... target

Step 6: Verify Data in RDS

DESCRIBE students;

	Field	Type	Null	Key	Default	Extra
▶	id	int	NO	PRI	HULL	
	name	varchar(50)	YES		HULL	
	dept	varchar(50)	YES		HULL	
	marks	int	YES		HULL	

SELECT * FROM students;

	id	name	dept	marks
▶	1	Pratik	CS	85
	2	Shreyash	IT	78
◀	NULL	HULL	HULL	HULL

SELECT * FROM students WHERE marks > 80;

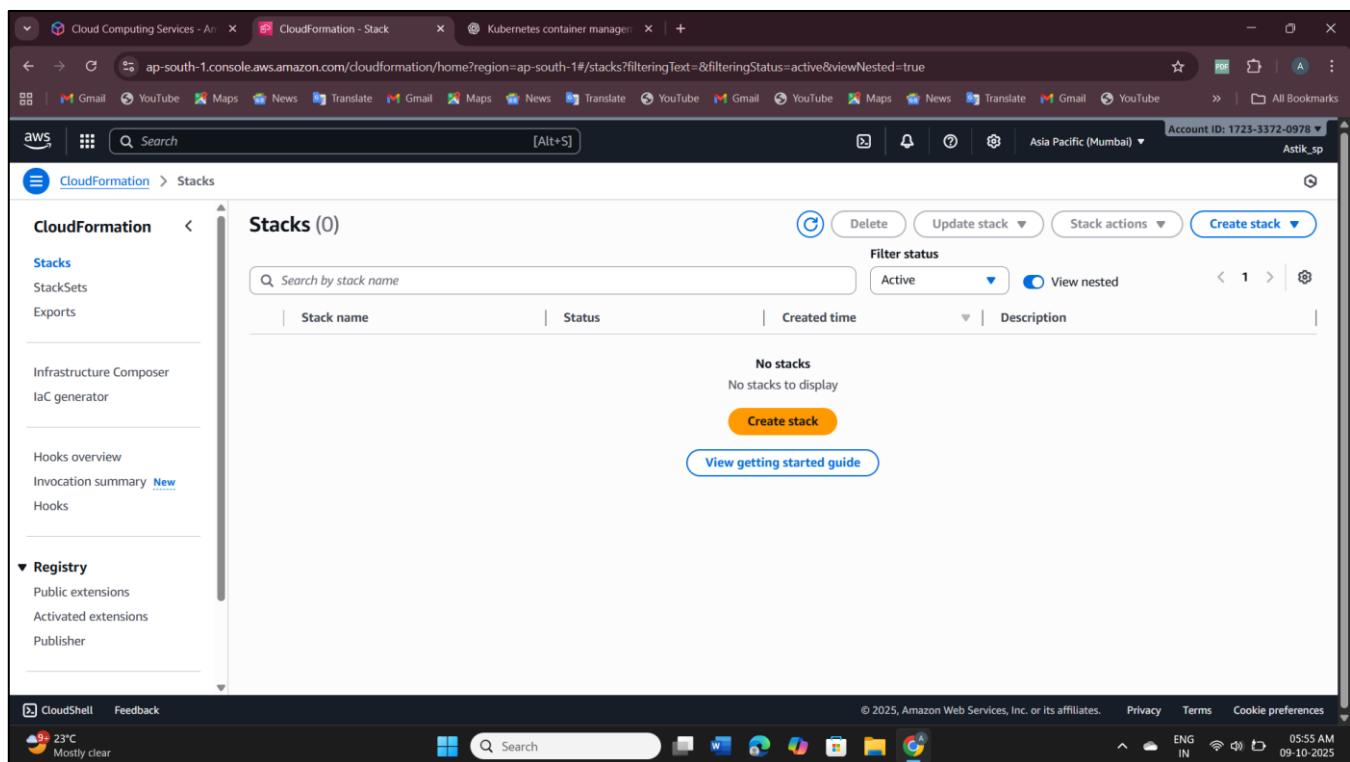
	id	name	dept	marks
▶	1	Pratik	CS	85
◀	NULL	HULL	HULL	HULL

Cloud Computing

Experiment No –7

```
! s3-sample.yaml ×

C: > Users > Astik > OneDrive > Desktop > ! s3-sample.yaml
1 AWSTemplateFormatVersion: "2010-09-09"
2 Description: Simple CloudFormation template to create an S3 bucket (free-tier safe)
3
4 Resources:
5   MyS3Bucket:
6     Type: AWS::S3::Bucket
7     Properties:
8       BucketName: !Sub my-cloudformation-bucket-${AWS::AccountId}-${AWS::Region}
9
```



Specify template Info

This GitHub repository [\[\]](#) contains sample CloudFormation templates that can help you get started on new infrastructure projects. [Learn more \[\]](#)

Template source

Selecting a template generates an Amazon S3 URL where it will be stored. A template is a JSON or YAML file that describes your stack's resources and properties.

Amazon S3 URL
Provide an Amazon S3 URL to your template.

Upload a template file
Upload your template directly to the console.

Sync from Git
Sync a template from your Git repository.

Upload a template file

[Choose file](#)

s3-sample.yaml

JSON or YAML formatted file

S3 URL: <https://s3.ap-south-1.amazonaws.com/cf-templates-nde5twrnetpg-ap-south-1/2025-10-09T003614.427Zwn5-s3-sample.yaml> [View in Infrastructure Composer](#)

[Cancel](#) [Next](#)

Cloud Computing

The screenshot shows the 'Specify stack details' step in the CloudFormation wizard. The left sidebar lists steps: Step 1 (Create stack), Step 2 (Specify stack details, highlighted with a blue circle), Step 3 (Configure stack options), Step 4 (Review and create). The main area is titled 'Specify stack details' and contains two sections: 'Provide a stack name' (stack name: myfirststack) and 'Parameters' (No parameters defined). At the bottom are 'Cancel', 'Previous', and 'Next' buttons.

The screenshot shows the 'Events' tab for the 'myfirst-stack' stack. The left sidebar shows the stack is in 'CREATE_IN_PROGRESS' status. The main area displays one event: '2025-10-09 06:25:22 UTC+0530' with logical ID 'myfirst-stack' and status 'CREATE_IN_PROGRESS'. A 'User Initiated' reason is noted. Buttons for 'Table view' and 'Timeline view' are at the top right.

The screenshot shows the AWS S3 console. The left sidebar lists bucket types: General purpose buckets, Directory buckets, Table buckets, Vector buckets, Access Grants, Access Points (General Purpose Buckets, FSx file systems), Access Points (Directory Buckets), Object Lambda Access Points, Multi-Region Access Points, Batch Operations, and IAM Access Analyzer for S3. The main area shows 'General purpose buckets (2)' with buckets 'cf-templates-nde5twnrnetpg-ap-south-1' and 'my-cloudformation-bucket-172333720978-ap-south-1'. An 'Account snapshot' and 'External access summary - new' card are on the right.

The screenshot shows the 'Events' tab for the 'myfirst-stack' stack. The main area displays five events: 1. '2025-10-09 06:25:40 UTC+0530' with logical ID 'myfirst-stack' and status 'CREATE_COMPLETE'. 2. '2025-10-09 06:25:39 UTC+0530' with logical ID 'MyS3Bucket' and status 'CREATE_COMPLETE'. 3. '2025-10-09 06:25:25 UTC+0530' with logical ID 'MyS3Bucket' and status 'CREATE_IN_PROGRESS'. 4. '2025-10-09 06:25:24 UTC+0530' with logical ID 'MyS3Bucket' and status 'CREATE_IN_PROGRESS'. 5. '2025-10-09 06:25:22 UTC+0530' with logical ID 'myfirst-stack' and status 'CREATE_IN_PROGRESS'. A 'View root cause' button is at the top right.

The screenshot shows the Docker Desktop settings interface. On the left, a sidebar lists various options: General, Resources, Docker Engine, Builders, AI, Kubernetes (which is selected and highlighted in grey), Software updates, Extensions, Beta features, and Notifications. The main panel is titled "Kubernetes". It has a "Search settings" bar at the top. Below it, there's a section titled "Cluster" which shows a running cluster named "docker-desktop" (kind, 2 nodes, v1.31.1). A "Reset cluster" button is visible next to the status. Under "Cluster settings", there are two provisioning methods: "Kubeadm" (disabled) and "kind" (selected). The "kind" method is described as creating a cluster with kind, requiring a containerd image store, and noting that changing the version resets the cluster. A "Kubernetes version" dropdown is shown. At the bottom right are "Close" and "Apply" buttons.

The screenshot shows the main Docker Desktop interface. The sidebar on the left includes "Ask Gordon" (BETA), Containers, Images, Volumes, Kubernetes (selected and highlighted in grey), Builds, Models, MCP Toolkit (BETA), Docker Hub, Docker Scout, and Extensions. The central area has tabs for "Kubernetes" (selected) and "Give feedback". A "namespace" dropdown is set to "default". The "Cluster" section shows one active cluster with 2 nodes and v1.31.1 version. Below it are sections for "Deployments" (No deployments) and "Pods" (No pods). At the bottom, there's a terminal window titled "Terminal" with the command "kubectl version" run, showing client version v1.34.1 and server version v1.31.1. The terminal also displays a warning about the version difference. The status bar at the bottom indicates "Engine running" and "Kubernetes running" with resource usage details.

The screenshot shows the Docker Desktop application interface. The left sidebar has 'Kubernetes' selected. The main area displays Kubernetes information: Cluster (Active, kind), Nodes (2), and Kubernetes version (v1.31.1). Below this are sections for Deployments ('No deployments') and Pods ('No pods'). A terminal window is open at the bottom, showing the output of running `kubectl` commands. The terminal shows the client version (v1.34.1) and the server version (v1.31.1), a warning about version skew, and the result of switching contexts.

```
PS C:\Users\student> kubectl version
Client Version: v1.34.1
Kustomize Version: v5.7.1
Server Version: v1.31.1
Warning: version difference between client (1.34) and server (1.31) exceeds the supported minor version skew of +/-1
PS C:\Users\student> kubectl config get-contexts
>>> kubectl config use-context docker-desktop
CURRENT NAME CLUSTER AUTHINFO NAMESPACE
* docker-desktop docker-desktop docker-desktop
Switched to context "docker-desktop".
PS C:\Users\student>
```

This screenshot is similar to the one above, but it includes a command in the terminal window: `kubectl create deployment my-app --image nginx`. The terminal also shows the execution of `CategoryInfo` and `FullyQualifiedErrorId` errors, followed by the output of `kubectl get nodes`, which lists two nodes: 'desktop-control-plane' and 'desktop-worker', both ready.

```
PS C:\Users\student> ^C
+ CategoryInfo : ObjectNotFound: (docker-desktop:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\Users\student> kubectl get nodes
>>
NAME STATUS ROLES AGE VERSION
desktop-control-plane Ready control-plane 20m v1.31.1
desktop-worker Ready <none> 20m v1.31.1
PS C:\Users\student>
```

The screenshot shows the Docker Desktop interface on a Windows system. The main window displays the Docker Hub search results for the user 'shwetadumbare24'. A terminal window is open, showing the following PowerShell session:

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\student> cd C:\Users\student\Downloads
PS C:\Users\student\Downloads> kubectl apply -f myapp.yaml
pod/lint-demo configured
PS C:\Users\student\Downloads>
```

The taskbar at the bottom shows the Docker Engine is running, and the system status indicates it's 29°C and partly sunny. The system tray shows the date and time as 07/10/2025.

The Docker Desktop interface includes a sidebar with various tools and services such as Ask Gordon, Containers, Images, Volumes, Kubernetes, Builds, Models, MCP Toolkit, Docker Hub, Docker Scout, and Extensions.

Cloud Computing

Experiment No – 9

The screenshot shows the AWS CloudShell interface with the following details:

- EC2 Instances** tab is selected.
- Instances (1) Info** section displays one instance:
 - Name: astikaws-ec2
 - Instance ID: i-0103e1fed71a659a3
 - Instance state: Running
 - Instance type: t2.micro
 - Status check: Initializing
 - Alarm status: View alarms +
 - Availability Zone: ap-south-1b
 - Public IP: ec2-3-111
- Select an instance** section is present below the table.
- Left sidebar:**
 - Dashboard
 - AWS Global View
 - Events
 - Instances** (selected):
 - Instances
 - Instance Types
 - Launch Templates
 - Spot Requests
 - Savings Plans
 - Reserved Instances
 - Dedicated Hosts
 - Capacity Reservations
 - Images
 - AMIs
 - AMI Catalog
- Elastic Block Store**: Volumes

At the bottom, the CloudShell interface shows the following information:

- CloudShell Feedback
- CloudShell 24°C Partly cloudy
- Search bar
- File, Home, Recent, Applications, System icons
- CloudShell 08:12 PM 08-10-2025

The screenshot shows the AWS CloudShell interface with the following details:

- IAM Roles Create role** tab is selected.
- Step 1 Select trusted entity** (radio button selected):
 - Step 2 Add permissions
 - Step 3 Name, review, and create
- Select trusted entity Info** section:
 - Trusted entity type**:
 - AWS service: Allow AWS services like EC2, Lambda, or others to perform actions in this account.
 - AWS account: Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
 - SAML 2.0 federation: Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
 - Custom trust policy: Create a custom trust policy to enable others to perform actions in this account.
 - Use case**: Allow an AWS service like EC2, Lambda, or others to perform actions in this account.
 - Service or use case**: EC2
 - Choose a use case for the specified service. Use case:
- Bottom CloudShell interface**:
 - CloudShell Feedback
 - CloudShell 24°C Partly cloudy
 - Search bar
 - File, Home, Recent, Applications, System icons
 - CloudShell 08:12 PM 08-10-2025

Cloud Computing

The screenshot shows the AWS IAM Roles page. A green banner at the top indicates that the role 'ec2-fullaccess-aws' has been created. Below this, the 'Roles (3)' section is displayed, showing a table with one row for 'ec2-fullaccess-aws'. The table columns are 'Role name', 'Trusted entities', and 'Last activity'. The 'Role name' column shows 'ec2-fullaccess-aws', 'Trusted entities' shows 'AWS Service: ec2', and 'Last activity' shows a timestamp. To the right of the table, there are sections for 'Roles Anywhere' and 'Temporary credentials'. The 'Roles Anywhere' section includes links for 'Access AWS from your non AWS workloads' and 'X.509 Standard'. The 'Temporary credentials' section includes a link for 'Manage'. On the left sidebar, the 'Access management' section is expanded, showing 'User groups', 'Users', 'Roles' (which is selected), 'Policies', 'Identity providers', 'Account settings', and 'Root access management'. The 'Access reports' section is also partially visible.

This screenshot is identical to the one above, showing the AWS IAM Roles page with the 'ec2-fullaccess-aws' role created. The interface, table structure, and sidebar navigation are the same.

The screenshot shows the AWS Instances page. It displays a single instance named 'astikaws-ec2' with the ID 'i-0103e1fed71a659a3'. The instance is listed as 'Running' and 't2.micro'. On the right side, a context menu is open over the instance, showing options like 'Connect', 'Instance state', 'Actions', and 'Launch instances'. The 'Actions' dropdown is expanded, showing 'Instance diagnostics', 'Instance settings', 'Networking', 'Security' (which is highlighted with a yellow background), 'Image and templates', and 'Monitor and troubleshoot'. The 'Security' option is currently selected. The top of the page shows the AWS logo, a search bar, and a toolbar with various icons. The bottom right corner shows the account ID '1723-3372-0978' and the region 'Asia Pacific (Mumbai)'.

The screenshot shows the 'Modify IAM role' page for the EC2 instance 'astikaws-ec2'. The instance ID 'i-0103e1fed71a659a3' is selected. The 'IAM role' section contains a dropdown menu where 'Ec2readonlyaccess' is chosen. There is also a button to 'Create new IAM role'. The top of the page shows the AWS logo, a search bar, and a toolbar with various icons. The bottom right corner shows the account ID '1723-3372-0978' and the region 'Asia Pacific (Mumbai)'.

Cloud Computing

The screenshot shows the AWS Cloud Computing Services console with the URL ap-south-1.console.aws.amazon.com/ec2/home?region=ap-south-1#ConnectToInstance:instanceId=i-0103e1fed71a659a3. The page title is "Connect to instance | EC2". The navigation bar includes tabs for "EC2", "Instances", and "i-0103e1fed71a659a3". The main content area is titled "Connect info" and contains fields for "Instance ID" (i-0103e1fed71a659a3), "Connection type" (selected "Public IPv4 address" with IP 3.110.49.185), and "Username" (ec2-user). A note at the bottom states: "Note: In most cases, the default username, ec2-user, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username." The browser toolbar at the top shows multiple tabs and the AWS logo.

The screenshot shows the AWS CloudShell session for the instance i-0103e1fed71a659a3. The terminal window displays the AWS CloudShell interface and an SSH session. The session starts with a welcome message for Amazon Linux 2023, followed by the command `aws iam list-users`. The output shows that there are no users listed. The terminal prompt is [ec2-user@ip-172-31-7-243 ~]\$. The status bar at the bottom indicates the instance ID (i-0103e1fed71a659a3) and private IP (172.31.7.243). The browser toolbar at the top shows multiple tabs and the AWS logo.

Experiment No - 10

The screenshot shows the AWS CloudShell interface for launching a new Amazon Machine Image (AMI). The 'Quick Start' tab is selected. A search bar at the top allows for searching the full catalog of application and OS images. Below it, a grid of recent and quick-start AMIs includes options like Amazon Linux, macOS, Ubuntu, Windows, Red Hat, SUSE Linux, and Debian. To the right, a summary panel shows the selected AMI (Canonical, Ubuntu, 24.04, amd64), the instance type (t2.micro), a new security group, and storage volumes (1 volume(s) - 8 GiB). The 'Launch instance' button is prominently displayed.

The screenshot shows the AWS CloudShell terminal window. It displays system information for an Ubuntu Server 24.04 LTS instance. The terminal output includes:

- Documentation: <https://help.ubuntu.com>
- Management: <https://landscape.canonical.com>
- Support: <https://ubuntu.com/pro>

System information as of Mon Oct 27 14:52:15 UTC 2025:

```
System load: 0.0      Processes:          109
Usage of /: 65.0% of 6.71GB  Users logged in: 0
Memory usage: 24%           IPv4 address for enX0: 172.31.2.52
Swap usage: 0%
```

Expanded Security Maintenance for Applications is not enabled.

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

1 additional security update can be applied with ESM Apps.
Learn more about enabling ESM Apps service at <https://ubuntu.com/esm>

Last login: Mon Oct 27 14:15:18 2025 from 13.233.177.5
ubuntu@ip-172-31-2-52:~\$ who am i?
ubuntu pts/0 2025-10-27 14:52 (13.233.177.5)
ubuntu@ip-172-31-2-52:~\$

- sudo apt update -y

```
Last login: Mon Oct 27 14:15:18 2025 from 13.233.177.5
ubuntu@ip-172-31-2-52:~$ who am i?
ubuntu pts/0 2025-10-27 14:52 (13.233.177.5)
ubuntu@ip-172-31-2-52:~$ sudo apt update -y
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
55 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

- sudo apt install docker.io -y

```
ubuntu@ip-172-31-2-52:~$ sudo apt install docker.io -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
docker.io is already the newest version (28.2.2-0ubuntu1~24.04.1).
0 upgraded, 0 newly installed, 0 to remove and 55 not upgraded.
```

- sudo systemctl start docker
- sudo systemctl enable docker

```
ubuntu@ip-172-31-2-52:~$ sudo systemctl start docker
ubuntu@ip-172-31-2-52:~$ sudo systemctl enable docker
ubuntu@ip-172-31-2-52:~$ █
```

- sudo apt install curl -y
- curl -sfL https://raw.githubusercontent.com/aquasecurity/trivy/main/contrib/install.sh | sudo sh
- sudo mv ./bin/trivy /usr/local/bin/

```
ubuntu@ip-172-31-2-52:~$ sudo apt install curl -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
curl is already the newest version (8.5.0-2ubuntu0.6).
0 upgraded, 0 newly installed, 0 to remove and 55 not upgraded.
ubuntu@ip-172-31-2-52:~$ curl -sfL https://raw.githubusercontent.com/aquasecurity/trivy/main/contrib/install.sh | sudo sh
aquasecurity/trivy info checking GitHub for latest tag
aquasecurity/trivy info found version: 0.67.2 for v0.67.2/Linux/64bit
aquasecurity/trivy info installed ./bin/trivy
ubuntu@ip-172-31-2-52:~$ sudo mv ./bin/trivy /usr/local/bin/
ubuntu@ip-172-31-2-52:~$ █
```

- trivy --version

```
ubuntu@ip-172-31-2-52:~$ trivy --version
Version: 0.67.2
```

- trivy image nginx:latest

```
ubuntu@ip-172-31-2-52:~$ trivy image nginx:latest
2025-10-27T14:59:45Z INFO [vuln] Vulnerability scanning is enabled
2025-10-27T14:59:45Z INFO [secret] Secret scanning is enabled
2025-10-27T14:59:45Z INFO [secret] If your scanning is slow, please try '--scanners vuln' to disable secret scanning
2025-10-27T14:59:45Z INFO [secret] Please see https://trivy.dev/v0.67/docs/scanner/secret#recommendation for faster secret detection
2025-10-27T14:59:47Z INFO Detected OS family="debian" version="13.1"
2025-10-27T14:59:47Z INFO Detecting vulnerabilities... os_version="13" pkg_num=150
2025-10-27T14:59:47Z INFO Number of language-specific files num=0
2025-10-27T14:59:47Z WARN Using severities from other vendors for some vulnerabilities. Read https://trivy.dev/v0.67/docs/scanner/vulnerability#severity-selection for details.
```

- Excepted Output

ubuntu@ip-172-31-2-52:~\$ trivy image nginx:latest

```
2025-10-27T14:59:45Z    INFO  [vuln] Vulnerability scanning is enabled
2025-10-27T14:59:45Z    INFO  [secret] Secret scanning is enabled
2025-10-27T14:59:45Z    INFO  [secret] If your scanning is slow, please try '--scanners vuln' to disable secret scanning
2025-10-27T14:59:45Z    INFO  [secret] Please see https://trivy.dev/v0.67/docs/scanner/secret#recommendation for faster secret detection
2025-10-27T14:59:47Z    INFO  Detected OS      family="debian" version="13.1"
2025-10-27T14:59:47Z    INFO  [debian] Detecting vulnerabilities...  os_version="13" pkg_num=150
2025-10-27T14:59:47Z    INFO  Number of language-specific files      num=0
2025-10-27T14:59:47Z    WARN  Using severities from other vendors for some vulnerabilities. Read https://trivy.dev/v0.67/docs/scanner/vulnerability#severity-selection for details.
```

Report Summary

Target	Type	Vulnerabilities	Secrets
nginx:latest (debian 13.1)	debian	94	-

Legend:

- '-': Not scanned
- '0': Clean (no security findings detected)

nginx:latest (debian 13.1)

Total: 94 (UNKNOWN: 0, LOW: 82, MEDIUM: 11, HIGH: 1, CRITICAL: 0)

nginx:latest (debian 13.1)

Total: 94 (UNKNOWN: 0, LOW: 82, MEDIUM: 11, HIGH: 1, CRITICAL: 0)

Library	Vulnerability	Severity	Status	Installed Version	Fixed Version	Title
apt	CVE-2011-3374	LOW	affected	3.0.3		It was found that apt-key in apt, all versions, do not correctly...
						https://avd.aquasec.com/nvd/cve-2011-3374
bash	TEMP-0841856-B10BAF			5.2.37-2+b5		[Privilege escalation possible to other user than root]
/TEMP-0841856-B1-						https://security-tracker.debian.org/tracker/TEMP-0841856-B1-0BAF

i-0e891dc3fd370e2 (mynew-aws-server)

Public IPs: 13.201.23.241 Private IPs: 172.31.2.52

[CloudShell](#) [Feedback](#) © 2025, Amazon Web Services, Inc. or its affiliates. [Privacy](#) [Terms](#) [Cookie preferences](#)