

Cloud Computing

Name: Khushi Jain

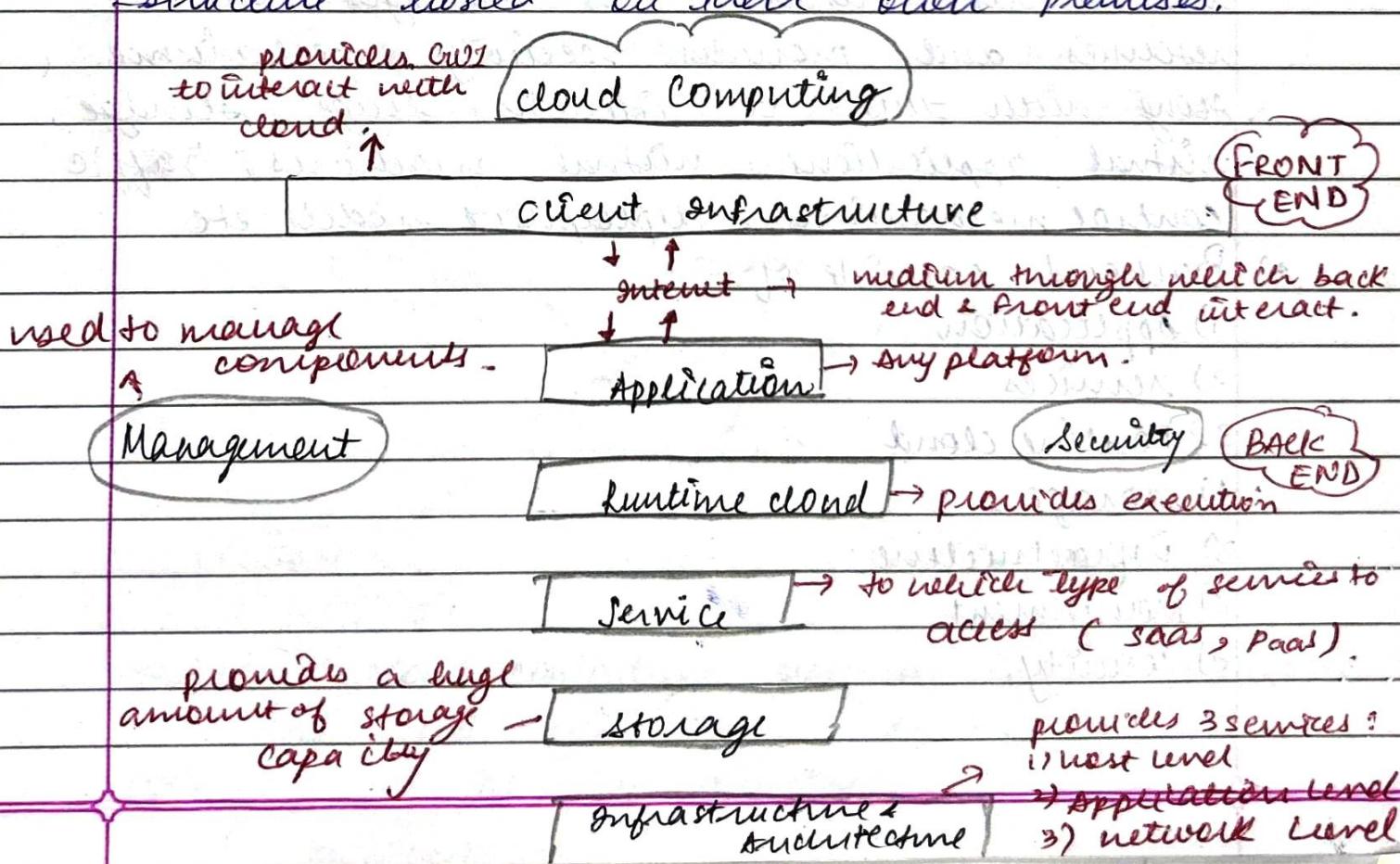
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* Writeup:

1. Cloud computing Architecture:

Cloud computing architecture is a hybrid design that combines service oriented architecture (SOA) and Event driven architecture (EDA). It refers to various components and subcomponents that work together to create the system's overall architecture. It offers higher bandwidth to its client, due to which stored data in the cloud can be accessed from wherever they are in the world at any point of time. It allows businesses to lessen or eliminate their dependency on servers, storage, and networking infrastructure hosted on their own premises.



1. Frontend :

Frontend of the cloud architecture refers to the client side of cloud computing system. Means it contains all the user interfaces and applications which are used by the client to access the cloud computing services / resources. for example, use of a web browser to access the cloud platform.

-) front end consists of
 - 1) client infrastructure
 - 2) internet.

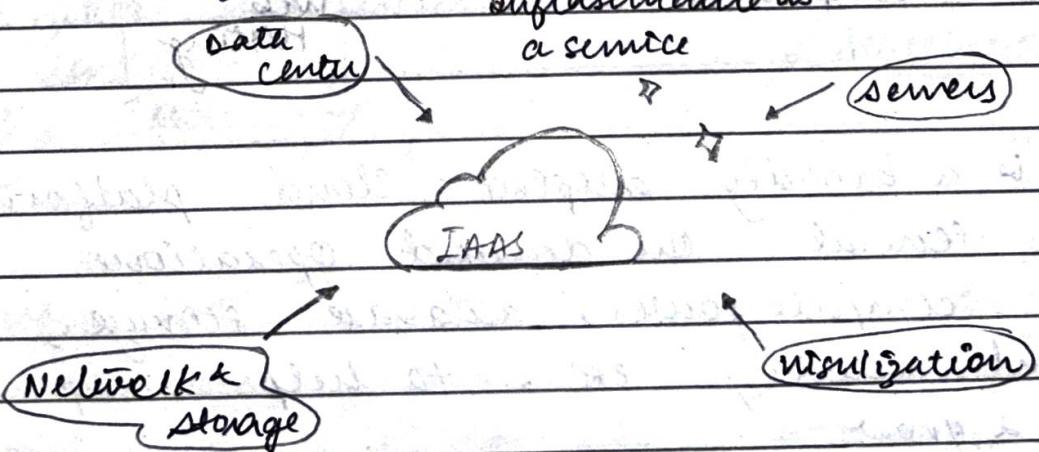
2. Backend :

Backend refers to the cloud itself which is used by the service provider. It contains the resources as well as manages the resources and provides security mechanisms. Along with this, it includes huge storage, virtual applications, virtual machines, traffic control mechanisms, deployment models etc.

-) Backend consists of
 - 1) application
 - 2) services
 - 3) private cloud
 - 4) storage
 - 5) infrastructure
 - 6) management
 - 7) security.

Q. IAAS :

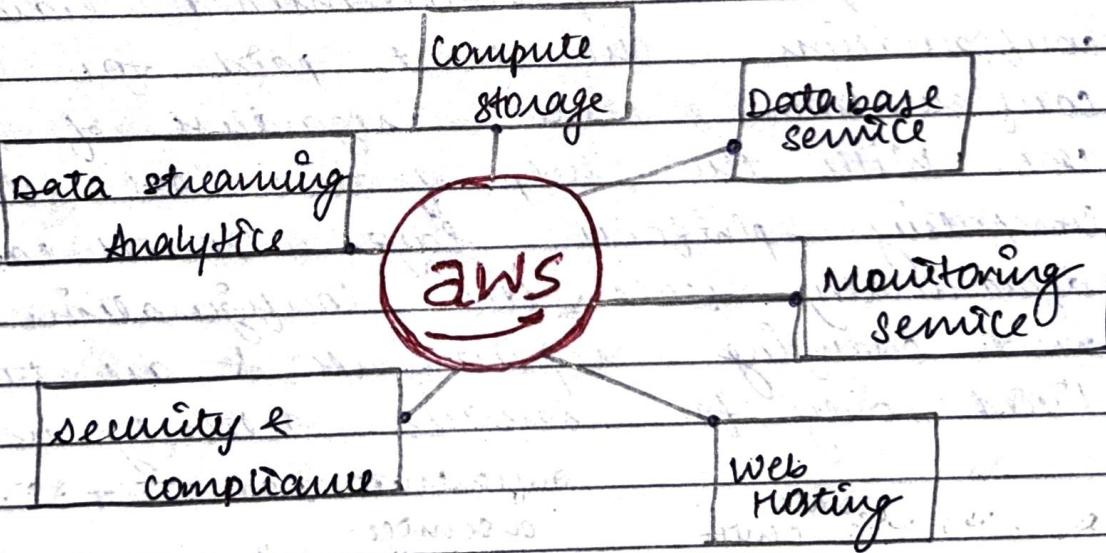
- IAAS is also known as hardware as a service (HaaS). It is one of the layers of the cloud computing platform. It allows customers to outsource their IT infrastructures, such as servers, networking, processing, storage, virtual machines, and other resources. Customers access these resources on the internet using pay-as-per-use model.
- In traditional hosting services, the infrastructure was rented out for a specific period of time, with pre-determined hardware configuration. The client paid for the configuration & time, regardless of actual use. With the help of the IAAS cloud computing platform layer, clients can dynamically scale the configuration to meet changing requirements & are charged only for services actually used.



The IAAS cloud computing platform layer eliminates the need for every organization to maintain its IT infrastructure.

3. AWS:

- AWS stands for Amazon web services.
- the AWS service is provided by the Amazon that uses distributed IT infrastructure to provide different IT resources available on demand. It provides different services such as Infrastructure as a service (IaaS), Platform as a service (PaaS) & packaged software as a service (SaaS).
- Amazon launched AWS, a cloud computing platform to allow the different organisation to take advantage of reliable IT infrastructure.



- AWS is a broadly adopted cloud platform that offers general on-demand operations like compute power, database storage, content delivery etc. to help cooperates scale & grow.

4. EC2:

→ Amazon Web Services (AWS) Elastic Compute Cloud (EC2) is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers by offering a wide array of virtual servers, known as instances, which can be easily launched, configured, & managed. Below, I will provide a detailed overview of AWS EC2, covering its features, instance type, use cases, pricing models & a brief guide on how to get started with EC2.

→ AWS EC2 is a cloud computing service that allows you to create & manage virtual machines on the AWS cloud. It offers scalable computing capacity, meaning you can increase or decrease resources based on your needs. With EC2, you can run applications on virtual machines in the cloud, eliminating the need for investing in physical hardware.

Amazon CloudWatch
for monitoring
instances.

Monitoring

AWS EC2

Scalability
Automatically
adjust the no.
of instances on
demand.

Flexible computing

A wide variety of
instance types

Tailored for

different use

cases

Networking
Elastic IP addresses
for static cloud
computing IP
addresses.

Networking

Storage
Amazon Simple
Storage Service

for object storage

Security

network isolation
using virtual private
cloud

CREATING INSTANCE WITH PEM

The screenshot shows the AWS EC2 Dashboard. On the left, there's a sidebar with various navigation options like EC2 Dashboard, Instances, Images, and Elastic Block Store. The main area is titled 'Resources' and displays statistics for running instances, Auto Scaling Groups, Dedicated Hosts, Elastic IPs, Instances, Key pairs, Load balancers, Placement groups, Security groups, Snapshots, and Volumes. Below this, there's a 'Launch instance' section with a large orange 'Launch instance' button and a smaller 'Migrate a server' button. A note says 'Note: Your instances will launch in the US East (N. Virginia) Region'. To the right, there's a 'Service health' section showing 'AWS Health Dashboard' and 'Region: US East (N. Virginia)', with a status message 'This service is operating normally.' Further right is the 'EC2 Free Tier Info' section, which is currently empty ('0 EC2 free tier offers in use'). At the bottom, there's an 'Account attributes' section and a footer with copyright information and language settings.

The screenshot shows the 'Launch an instance' wizard. The user has selected the 'Instances' tab and is on the 'Launch an instance' step. In the 'Summary' section, the user has specified 1 instance. Under 'Software Image (AMI)', they have chosen 'Amazon Linux 2023 AMI 2023.5.2...' with the ID 'ami-0ba9883b710b05ac6'. The 'Virtual server type (instance type)' is set to 't2.micro'. In the 'Free tier' tooltip, it states: 'In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance'. The 'Launch instance' button is highlighted in orange at the bottom right of the summary section. The footer includes standard AWS links and a date/time stamp.

Launch an instance | EC2 | us-east-1

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

Amazon Services Search [Alt+S]

N. Virginia khushi1709

Amazon Linux macOS Ubuntu Windows Red Hat SUSE Linux

Amazon Machine Image (AMI)

Ubuntu Server 24.04 LTS (HVM), SSD Volume Type Free tier eligible

Description

Ubuntu Server 24.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

Architecture

AMI ID ami-04a81a99f5ec58529 Verified provider

Instance type

t2.micro Family: t2 1 vCPU 1 GiB Memory Current generation: true Free tier eligible All generations

CloudShell Feedback 81°F Light rain

CloudSearch Search

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Summary

Number of instances 1

Software Image (AMI)

Canonical, Ubuntu, 24.04 LTS, ...read more

Virtual server type (instance type)

t2.micro

Firewall (security group)

New security group

Storage (volumes)

1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance

Cancel Launch instance Review commands

Launch an instance | EC2 | us-east-1

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

aws Services Search [Alt+S]

N. Virginia khushi1709

Instance type

t2.micro Family: t2 1 vCPU 1 GiB Memory Current generation: true Free tier eligible All generations

Key pair name

khushi_1709

Key pair type RSA ED25519

Private key file format .pem .ppk

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

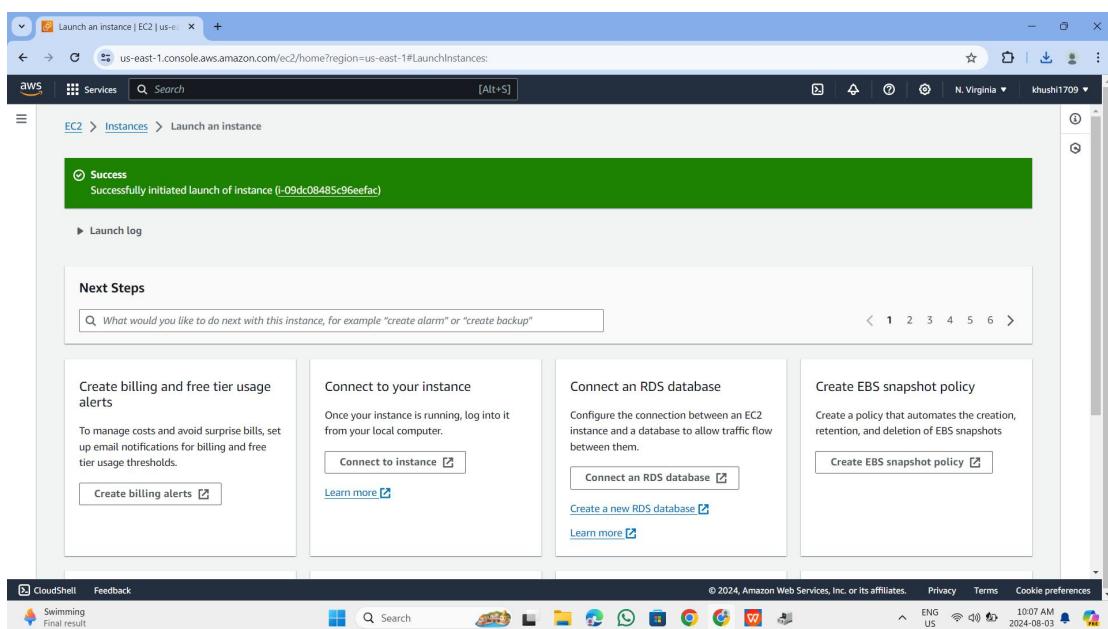
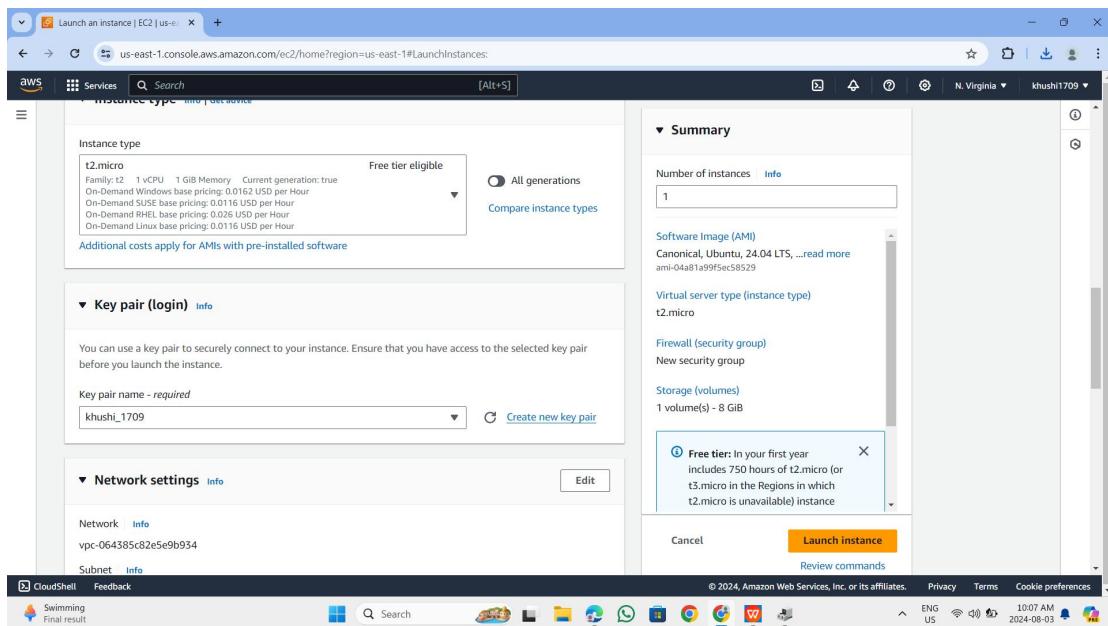
Network settings

Network vpc-06e4385c82e5e9b934

CloudShell Feedback Swimming Final result

CloudSearch Search

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Instances | EC2 | us-east-1

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

EC2 Dashboard
EC2 Global View
Events
Console-to-Code [Preview](#)

Instances (1) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
khushi_1709	i-09dc08485c96eefac	Running	t2.micro	Initializing	View alarms +	us-east-1b	ec2-52-14-11-193.eca

Select an instance

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Connect to instance | EC2 | us-east-1

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#ConnectToInstance\$instanceId=i-09dc08485c96eefac

⚠ Port 22 (SSH) is open to all IPv4 addresses
Port 22 (SSH) is currently open to all IPv4 addresses, indicated by 0.0.0.0/0 in the inbound rule in your [security group](#). For increased security, consider restricting access to only the EC2 Instance Connect service IP addresses for your Region: 18.206.107.24/29. [Learn more](#).

Instance ID
i-09dc08485c96eefac (khushi_1709)

Connection Type

Connect using EC2 Instance Connect
Connect using the EC2 Instance Connect browser-based client, with a public IPv4 address.

Connect using EC2 Instance Connect Endpoint
Connect using the EC2 Instance Connect browser-based client, with a private IPv4 address and a VPC endpoint.

Public IP address
52.91.70.224

Username
Enter the username defined in the AMI used to launch the instance. If you didn't define a custom username, use the default username, ubuntu.
ubuntu

>Note: In most cases, the default username, ubuntu, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username.

Cancel Connect

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```
Instances | EC2 | us-east-1 EC2 Instance Connect | us-east-1
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-09dc08485c96eefac&osUser=ubuntu&region=us-east-1&sshPort=22#/
N. Virginia khushi1709

System load: 0.59 Processes: 107
Usage of /: 22.7% of 6.71GB Users logged in: 0
Memory usage: 21% IPv4 address for enX0: 172.31.84.183
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

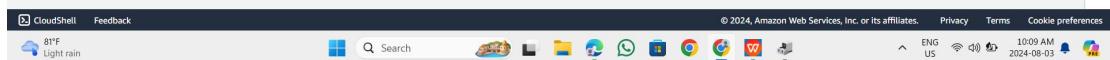
The list of available updates is more than a week old.
To check for new updates run: sudo apt update

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.

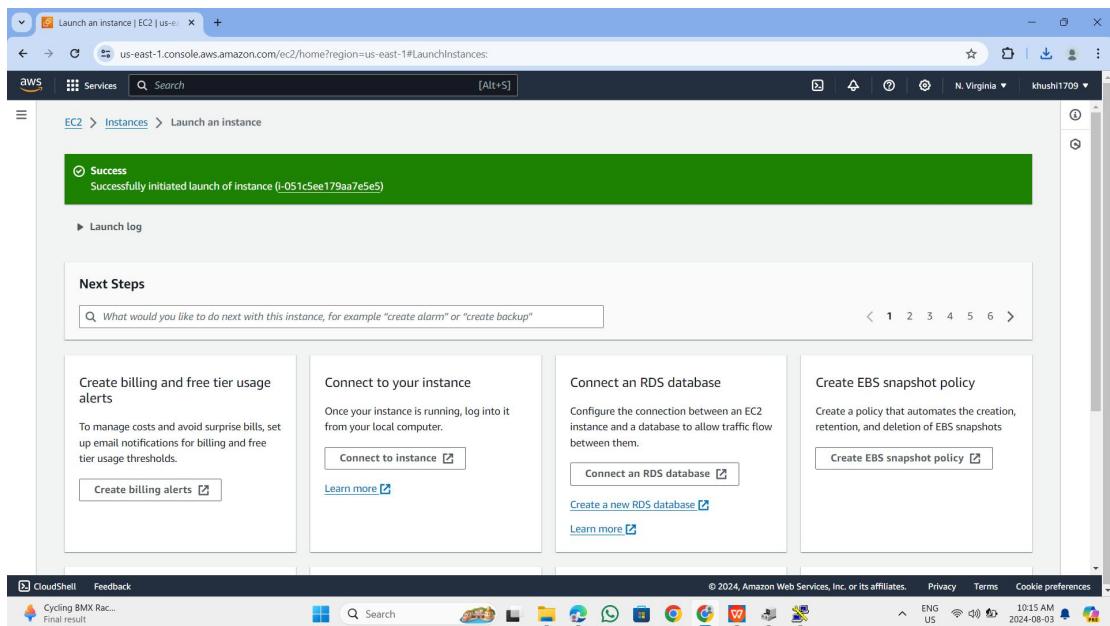
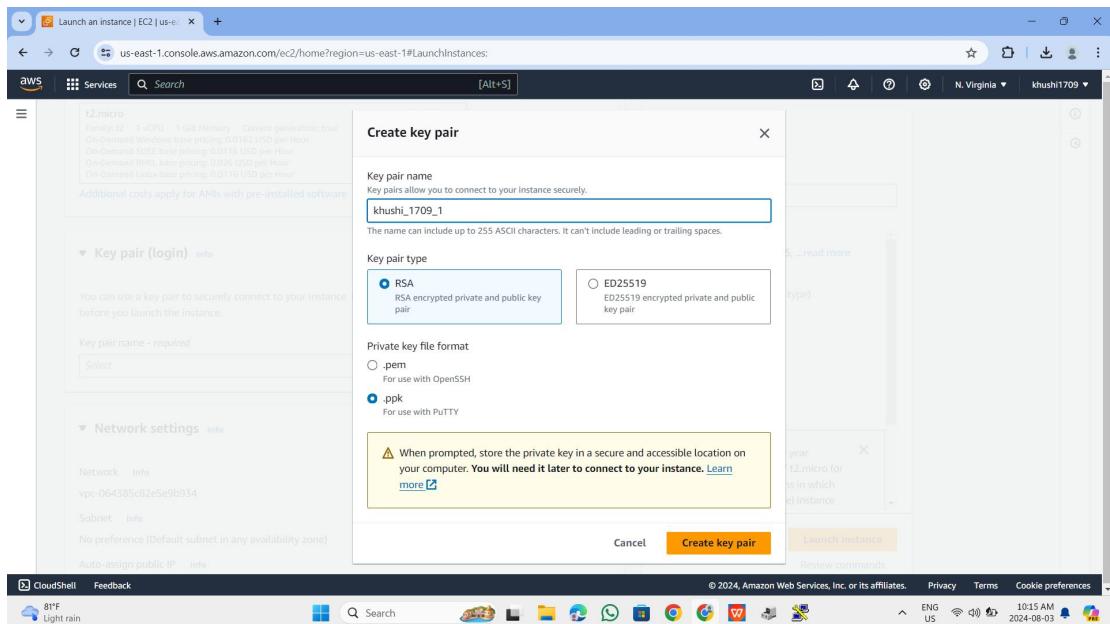
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-84-183:~$ i-09dc08485c96eefac (khushi_1709)
PublicIPs: 52.91.70.224 PrivateIPs: 172.31.84.183
```



The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with navigation links like EC2 Dashboard, EC2 Global View, Events, Console-to-Code Preview, 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, Snapshots). The main content area displays a table titled "Instances (1/1) Info". The table has columns for Name, Instance ID, Instance state, and Instance type. One row is selected, showing "khushi_1709" as the Name, "i-09dc08485c96eefac" as the Instance ID, "Running" as the Instance state, and "t2.micro" as the Instance type. To the right of the table, there's a "Actions" dropdown menu with options: Stop instance, Start instance, Reboot instance, Hibernate instance, and Terminate instance. Below the table, there's a detailed view for the selected instance "i-09dc08485c96eefac (khushi_1709)". It shows the Details tab selected, with sections for Instance summary (Instance ID: i-09dc08485c96eefac (khushi_1709), Public IPv4 address: 52.91.70.224, Instance state: Running, Hostname type: IP name: in-172-31-84-183.ec2.internal), and Private IP DNS name (IPv4 only: in-172-31-84-183.ec2.internal). The bottom of the screen shows a Windows taskbar with various icons.

CREATING INSTANCE WITH PUTTY



Instances | EC2 | us-east-1

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

EC2 Dashboard
EC2 Global View
Events
Console-to-Code [Preview](#)

Instances

Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations

Images

AMIs
AMI Catalog

Elastic Block Store

Volumes
Snapshots

CloudShell Feedback

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Instances (2) Info

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
khushi_1709	i-09dc08485c96efac	Terminated	t2.micro	-	View alarms	us-east-1b	-
khushi_1709_1	i-051c5ee179aa7e5e5	Running	t2.micro	Initializing	View alarms	us-east-1b	ec2-3-9-

Select an instance

Cycling BMX Rec... Final result

Instance details | EC2 | us-east-1

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#instanceDetails instanceId=i-051c5ee179aa7e5e5

EC2 Dashboard
EC2 Global View
Events
Console-to-Code [Preview](#)

Instances

Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
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Images

AMIs
AMI Catalog

Elastic Block Store

Volumes
Snapshots

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Instance summary for i-051c5ee179aa7e5e5 (khushi_1709_1)

Updated less than a minute ago

Instance ID	i-051c5ee179aa7e5e5 (khushi_1709_1)	Public IPv4 address	3.94.54.109 open address
IPv6 address	-	Instance state	Running
Hostname type	IP name: ip-172-31-81-185.ec2.internal	Private IP DNS name (IPv4 only)	ip-172-31-81-185.ec2.internal
Answer private resource DNS name	IPv4 (A)	Instance type	t2.micro
Auto-assigned IP address	3.94.54.109 [Public IP]	VPC ID	vpc-064385c82e5e9b934
IAM Role	-	Subnet ID	subnet-011c236a22601a7a3
IMDSv2	Required	Instance ARN	arn:aws:ec2:us-east-1:381492121747:instance/i-051c5ee179aa7e5e5

AWS Compute Optimizer finding
[Opt-in to AWS Compute Optimizer for recommendations.](#)

Learn more

