727723EUCY046

Sakthi Sri Santh M

Design and Implementation of a Centralized Cloud-Based IT Infrastructure Using Amazon Web Services

Problem Statement

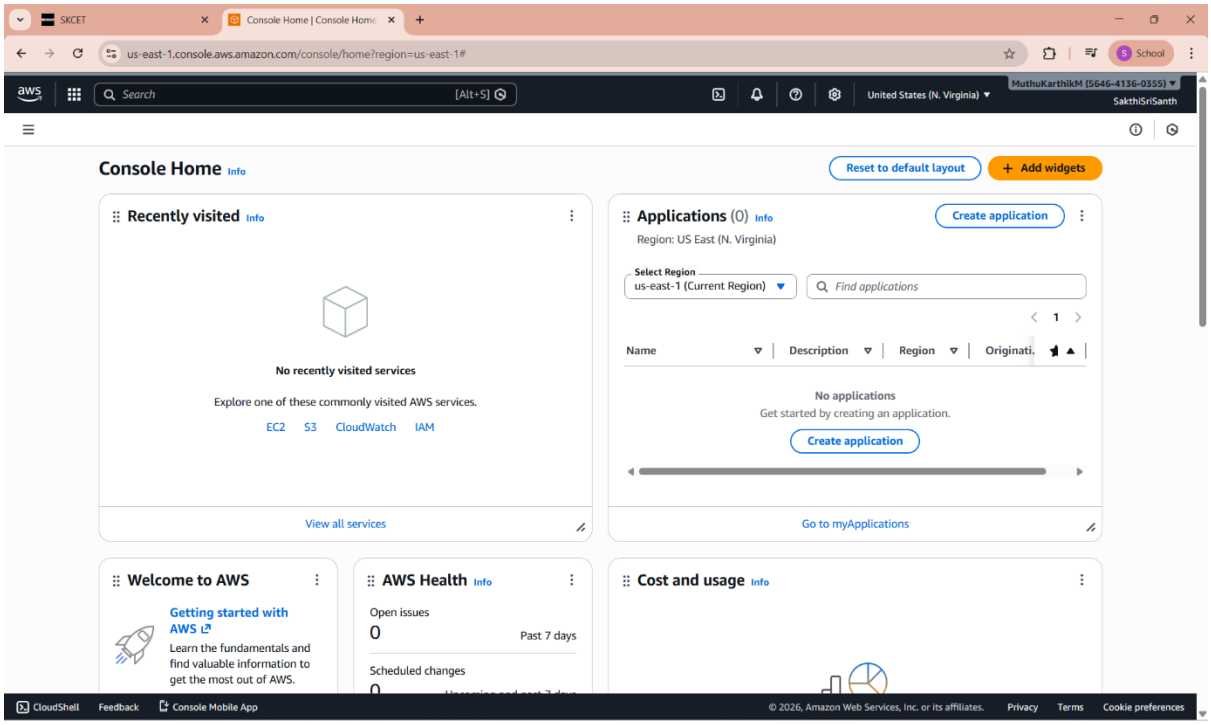
A small enterprise with twenty-five employees was facing frequent system downtime and difficulty in managing organizational data due to the absence of a centralized IT infrastructure. All applications and files were stored on individual employee systems, which resulted in unstructured data storage, lack of backup mechanisms, and no secure method for remote access. The organization also had limited control over user access and system maintenance, making it difficult for the IT team to manage resources efficiently. To overcome these challenges, the company required a stable, secure, and centralized infrastructure that could be managed remotely without increasing operational complexity.

Proposed Solution

To address the identified problems, a centralized cloud-based infrastructure was designed and implemented using Amazon Web Services. A cloud-hosted virtual machine was created using AWS EC2 to act as a central server for the organization. Secure remote access was enabled using SSH with key-based authentication. Centralized file storage and user management were configured within the server to ensure controlled access. A snapshot-based backup and recovery mechanism was implemented using AWS AMI to ensure data safety and business continuity. The entire setup was performed manually using free-tier resources to simulate real-world system administration tasks.

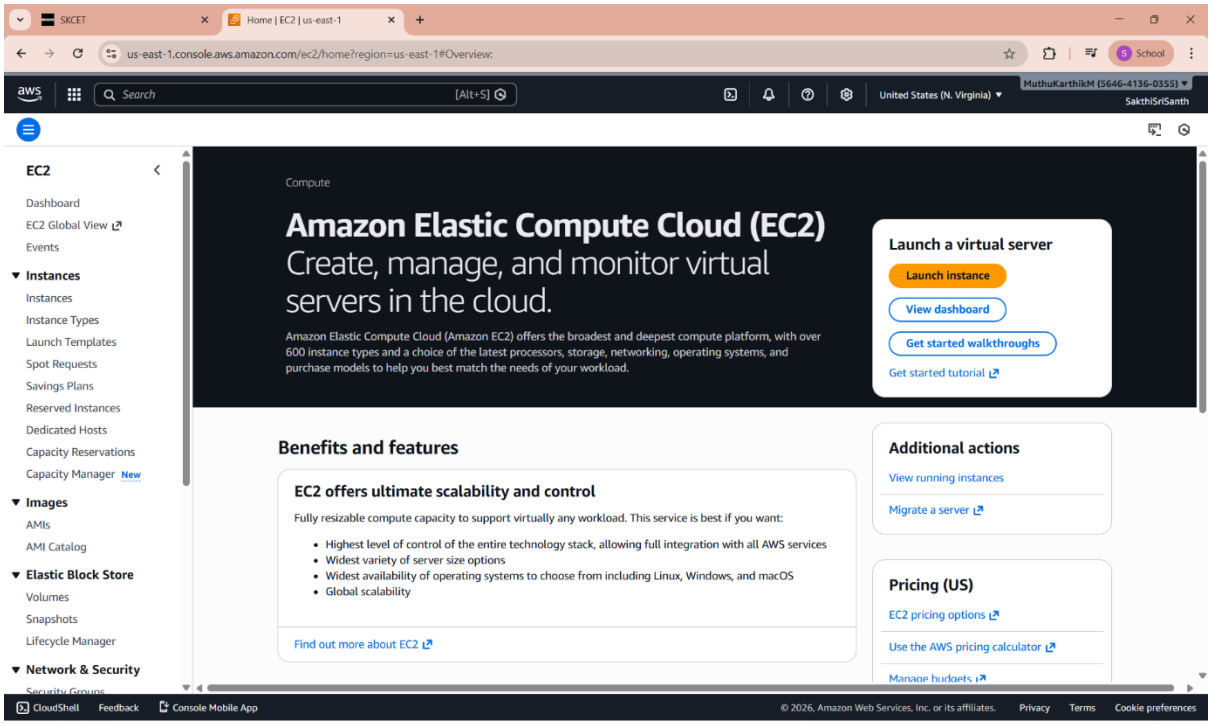
Step 1: Accessing the AWS Management Console

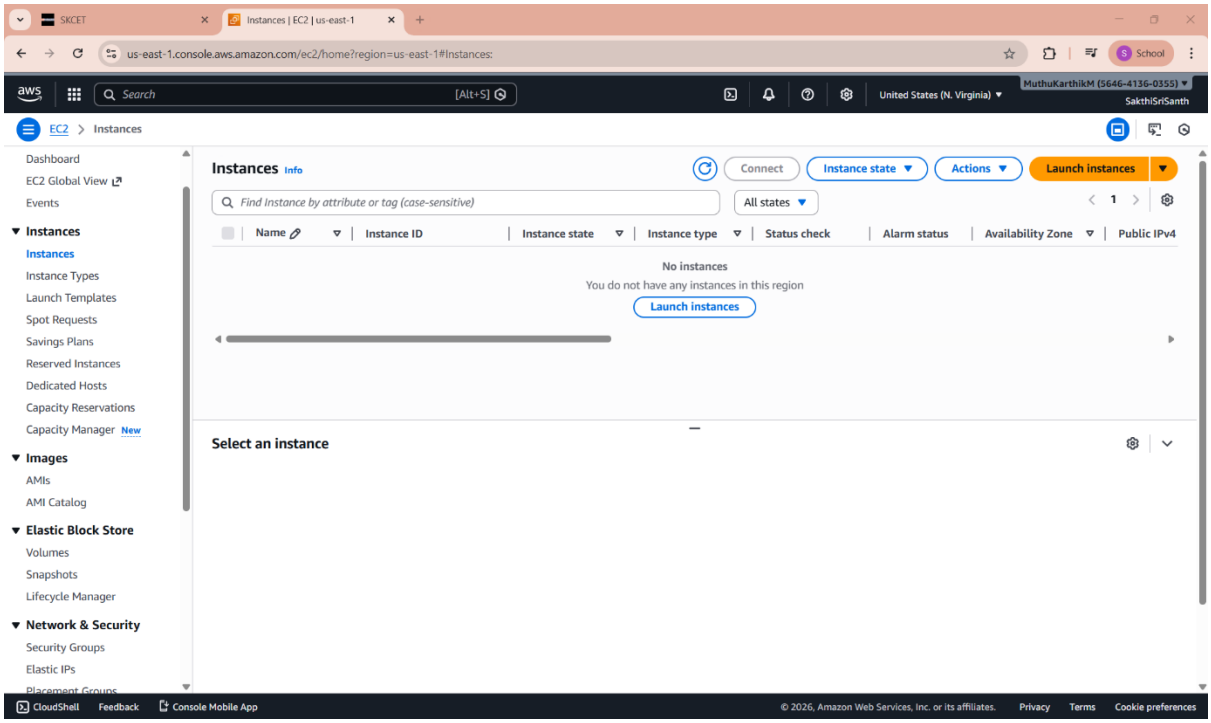
The AWS Management Console was accessed using a web browser to manage and monitor cloud resources. The EC2 service was selected from the console to begin the virtual machine setup process.

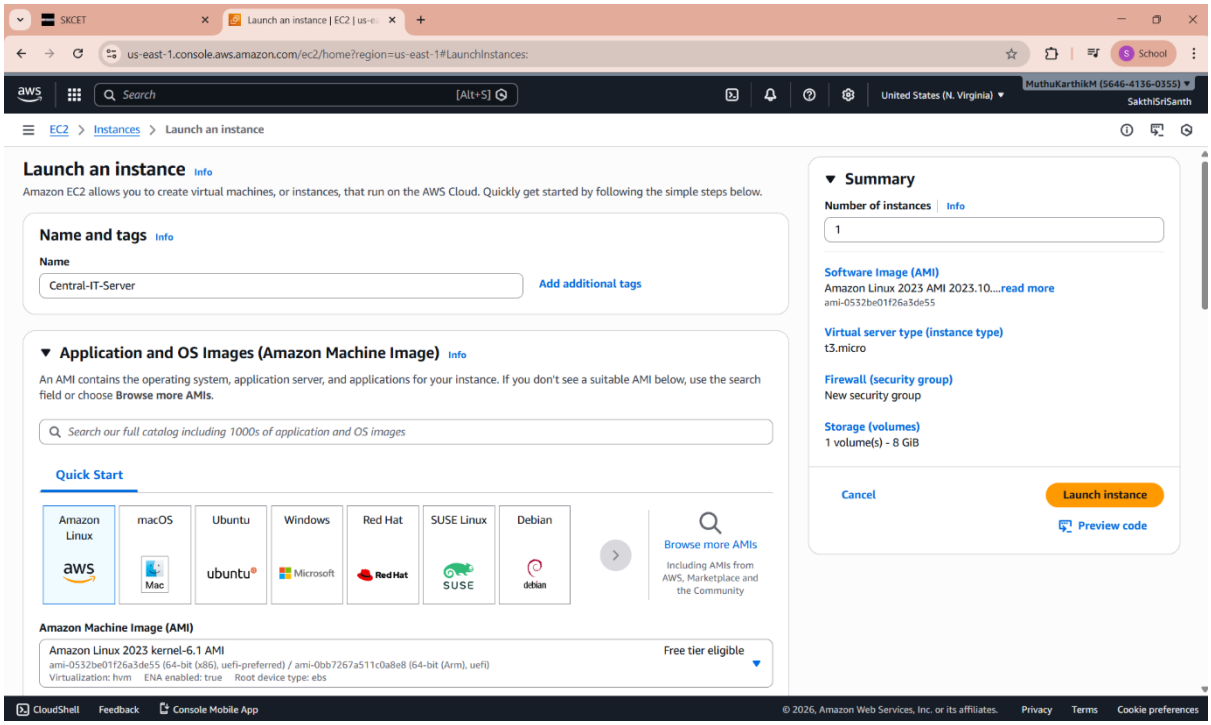


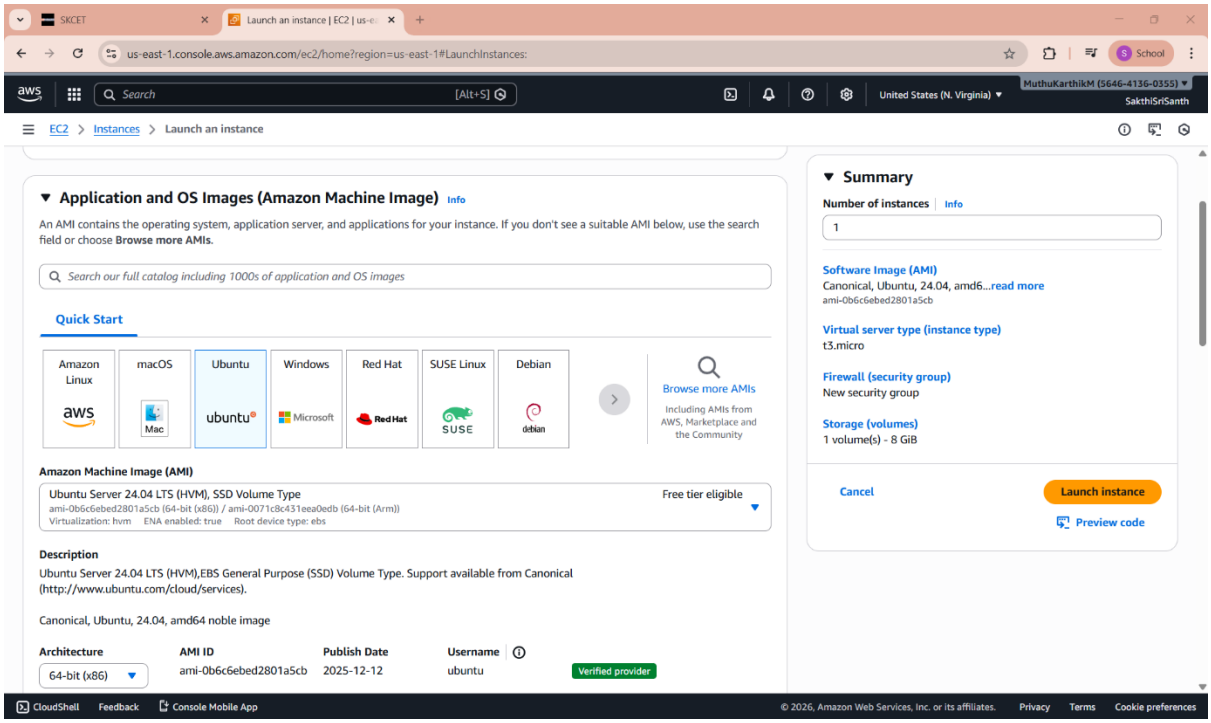
Step 2: Launching the EC2 Virtual Machine

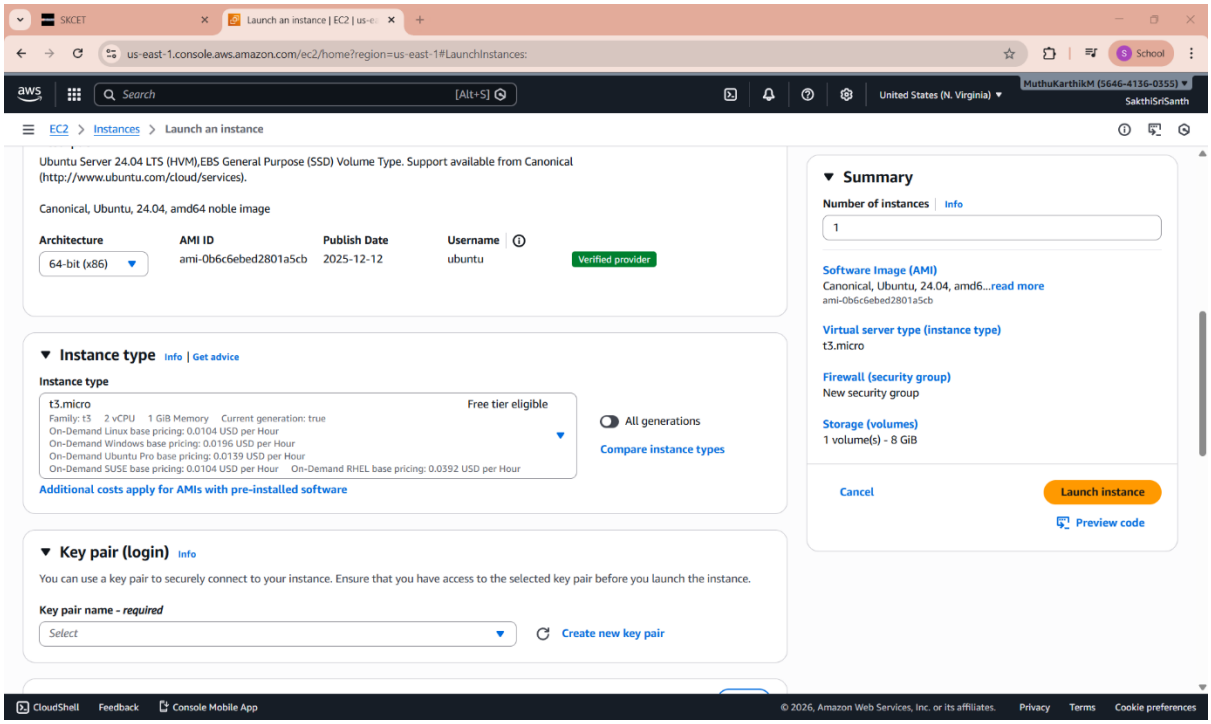
A new EC2 instance was launched by selecting Ubuntu Server as the operating system and choosing a free-tier eligible instance type. The instance was configured manually to ensure simplicity and stability.

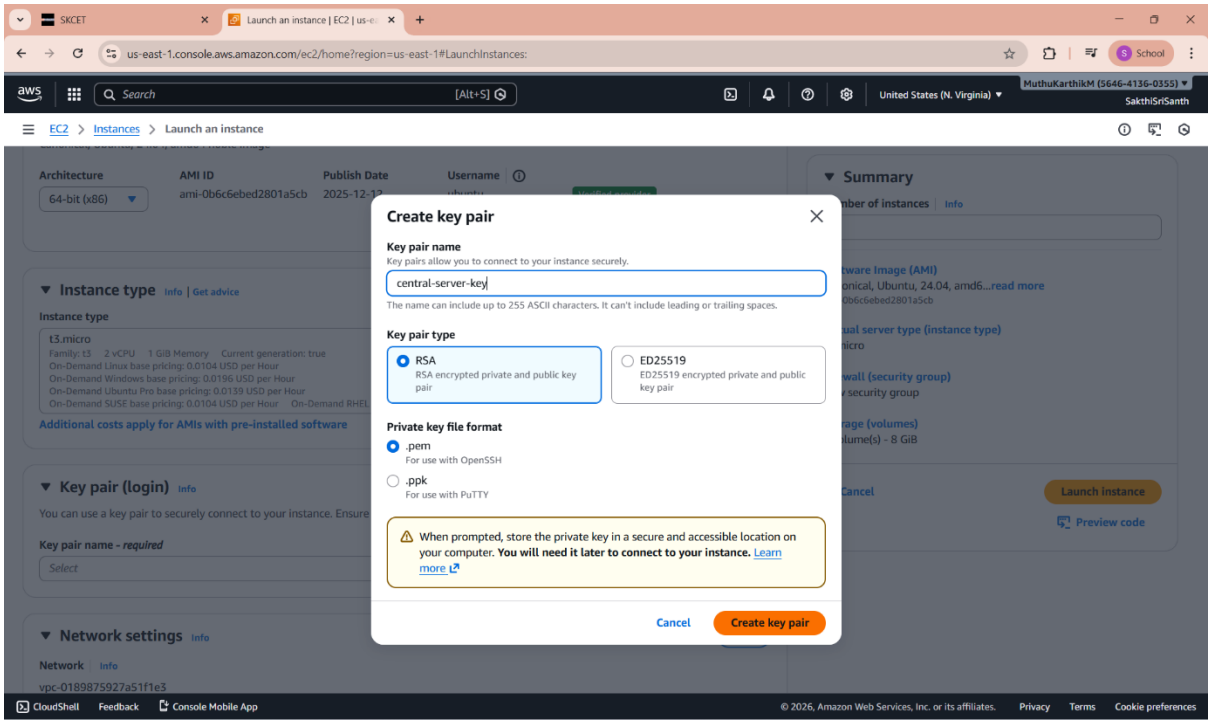


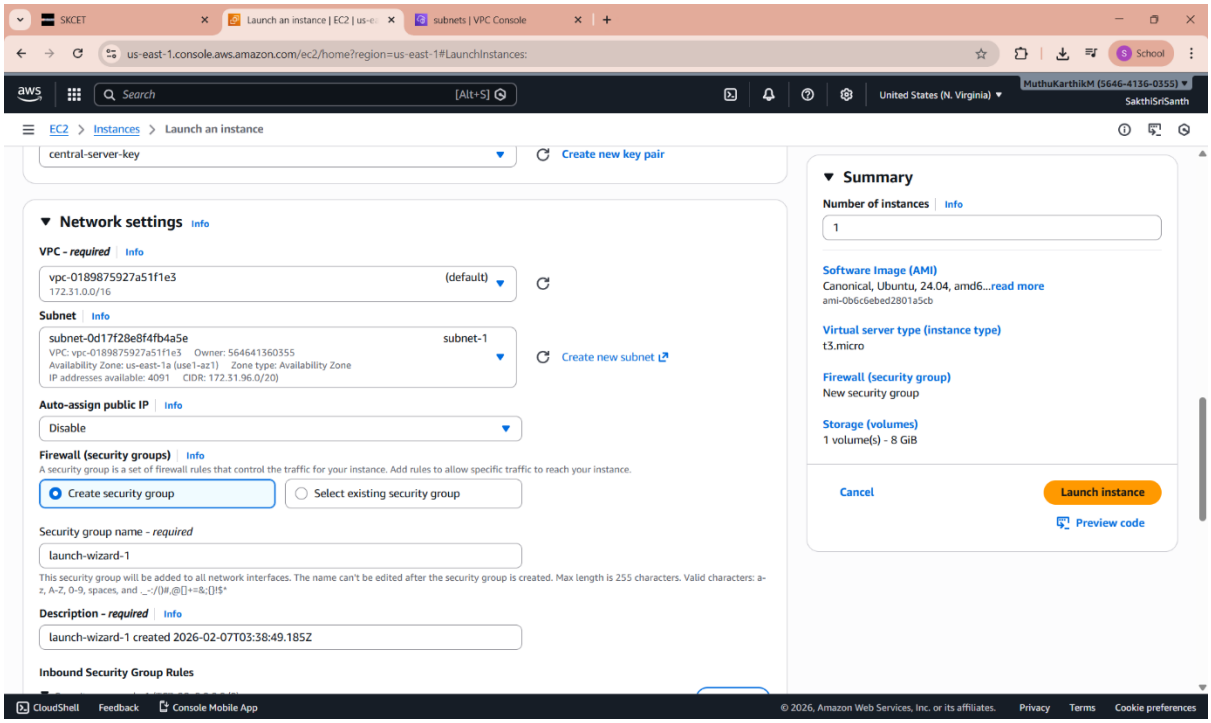

SKCET
Instances | EC2 | us-east-1
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:
School
aws
Search
[Alt+S]
United States (N. Virginia)
MuthuKarthikM (5646-4136-0355)
SakthiSriSanth
EC2 > Instances
Dashboard
EC2 Global View
Events
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Capacity Manager New
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Network & Security
Security Groups
Elastic IPs
Instances Info
Connect
Instance state
Actions
Launch instances
Find Instance by attribute or tag (case-sensitive)
All states
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4
No instances
You do not have any instances in this region
Launch instances
Select an instance
CloudShell
Feedback
Console Mobile App
© 2026, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

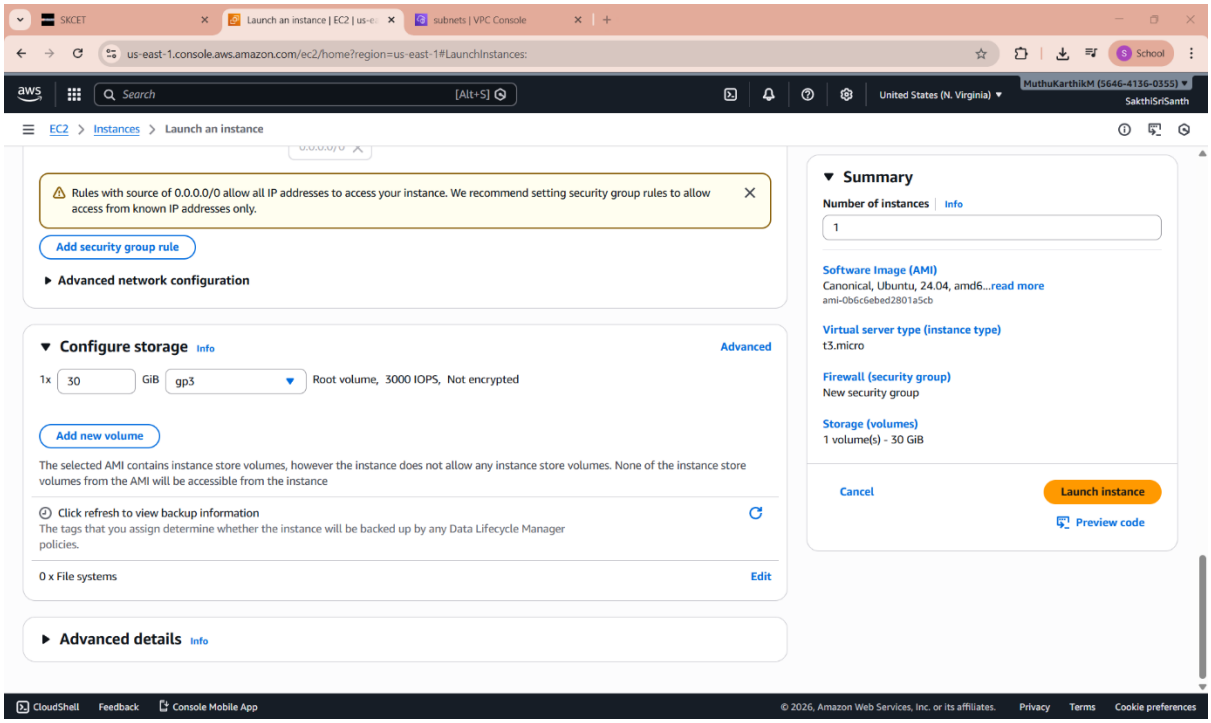

SKCET
Launch an instance | EC2 | us-e
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:
School
aws
Search
[Alt+S]
United States (N. Virginia)
MuthuKarthikM (5646-4136-0355)
SakthiSriSanth
EC2 > Instances > Launch an instance
Launch an instance Info
Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.
Name and tags Info
Name
Central-IT-Server
Add additional tags
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.
Search our full catalog including 1000s of application and OS images
Quick Start
Amazon Linux
macOS
Ubuntu
Windows
Red Hat
SUSE Linux
Debian
Browse more AMIs
Including AMIs from AWS, Marketplace and the Community
Amazon Machine Image (AMI)
Amazon Linux 2023 kernel-6.1 AMI
ami-0532be01f26a3de55 (64-bit (x86), uefi-preferred) / ami-0bb7267a511c0a8e8 (64-bit (Arm), uefi)
Virtualization: hvm ENA enabled: true Root device type: ebs
Free tier eligible
Summary
Number of instances Info
1
Software Image (AMI)
Amazon Linux 2023 AMI 2023.10....read more
ami-0532be01f26a3de55
Virtual server type (instance type)
t3.micro
Firewall (security group)
New security group
Storage (volumes)
1 volume(s) - 8 GiB
Cancel
Launch instance
Preview code
CloudShell
Feedback
Console Mobile App
© 2026, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

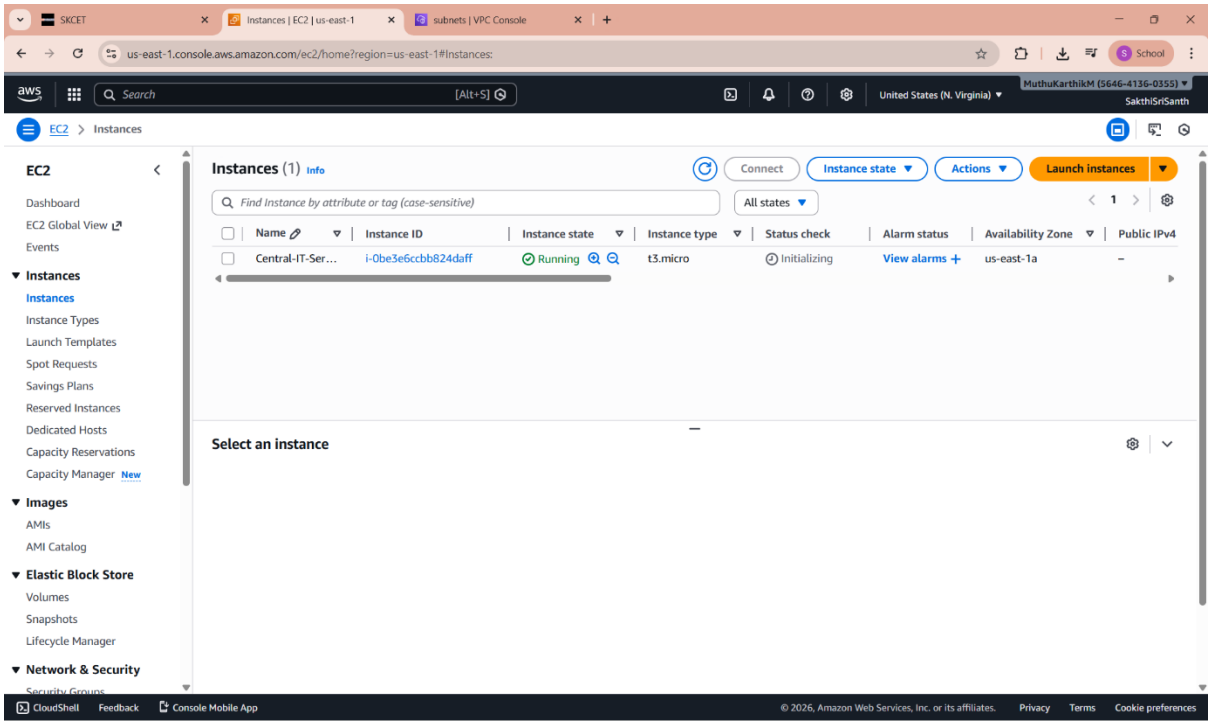

SKCET
Launch an instance | EC2 | us-e
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:
School
aws
Search
[Alt+S]
United States (N. Virginia)
MuthuKarthikM (5646-4136-0355)
SakthiSriSanth
EC2 > Instances > Launch an instance
Application and OS Images (Amazon Machine Image) Info
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.
Search our full catalog including 1000s of application and OS images
Quick Start
Amazon Linux
macOS
Ubuntu
Windows
Red Hat
SUSE Linux
Debian
Browse more AMIs
Including AMIs from AWS, Marketplace and the Community
Amazon Machine Image (AMI)
Ubuntu Server 24.04 LTS (HVM), SSD Volume Type
ami-0b6c6ebed2801a5cb (64-bit (x86)) / ami-0071c8c431eea0edb (64-bit (Arm))
Virtualization: hvm ENA enabled: true Root device type: ebs
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).
Canonical, Ubuntu, 24.04, amd64 noble image
Architecture
AMI ID
Publish Date
Username
64-bit (x86)
ami-0b6c6ebed2801a5cb
2025-12-12
ubuntu
Verified provider
Summary
Number of instances Info
1
Software Image (AMI)
Canonical, Ubuntu, 24.04, amd6...read more
ami-0b6c6ebed2801a5cb
Virtual server type (instance type)
t3.micro
Firewall (security group)
New security group
Storage (volumes)
1 volume(s) - 8 GiB
Cancel
Launch instance
Preview code
CloudShell
Feedback
Console Mobile App
© 2026, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences


SKCET
Launch an instance | EC2 | us-e
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:
School
aws
Search
[Alt+S]
United States (N. Virginia)
MuthuKarthikM (5646-4136-0355)
SakthiSriSanth
EC2 > Instances > Launch an instance
Ubuntu Server 24.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).
Canonical, Ubuntu, 24.04, amd64 noble image
Architecture
AMI ID
Publish Date
Username
64-bit (x86)
ami-0b6c6ebed2801a5cb
2025-12-12
ubuntu
Verified provider
Instance type Info | Get advice
Instance type
t3.micro
Free tier eligible
Family: t3 2 vCPU 1 GiB Memory Current generation: true
On-Demand Linux base pricing: 0.0104 USD per Hour
On-Demand Windows base pricing: 0.0196 USD per Hour
On-Demand Ubuntu Pro base pricing: 0.0139 USD per Hour
On-Demand SUSE base pricing: 0.0104 USD per Hour On-Demand RHEL base pricing: 0.0392 USD per Hour
All generations
Compare instance types
Additional costs apply for AMIs with pre-installed software
Key pair (login) Info
You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.
Key pair name - required
Select
Create new key pair
Summary
Number of instances Info
1
Software Image (AMI)
Canonical, Ubuntu, 24.04, amd6...read more
ami-0b6c6ebed2801a5cb
Virtual server type (instance type)
t3.micro
Firewall (security group)
New security group
Storage (volumes)
1 volume(s) - 8 GiB
Cancel
Launch instance
Preview code
CloudShell
Feedback
Console Mobile App
© 2026, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences


Launch an instance | EC2 | us-east-1
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:
Search
[Alt+S]
United States (N. Virginia)
MuthuKarthikM (5646-4136-0355)
SakthiSriSanth
EC2 > Instances > Launch an instance
Architecture
64-bit (x86)
AMI ID
ami-0b6c6ebed2801a5cb
Publish Date
Username
Summary
Number of instances
Info
Instance type
Info | Get advice
Instance type
t3.micro
Family: t3 2 vCPU 1 GiB Memory Current generation: true
On-Demand Linux base pricing: 0.0104 USD per Hour
On-Demand Windows base pricing: 0.0196 USD per Hour
On-Demand Ubuntu Pro base pricing: 0.0139 USD per Hour
On-Demand SUSE base pricing: 0.0104 USD per Hour On-Demand RHEL
Additional costs apply for AMIs with pre-installed software
Key pair (login)
Info
You can use a key pair to securely connect to your instance. Ensure
Key pair name - required
Select
Network settings
Info
Network
Info
vpc-0189875927a51f1e3
Cancel
Launch instance
Preview code
Create key pair
Key pair name
Key pairs allow you to connect to your instance securely.
central-server-key
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
CloudShell
Feedback
Console Mobile App
© 2026, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

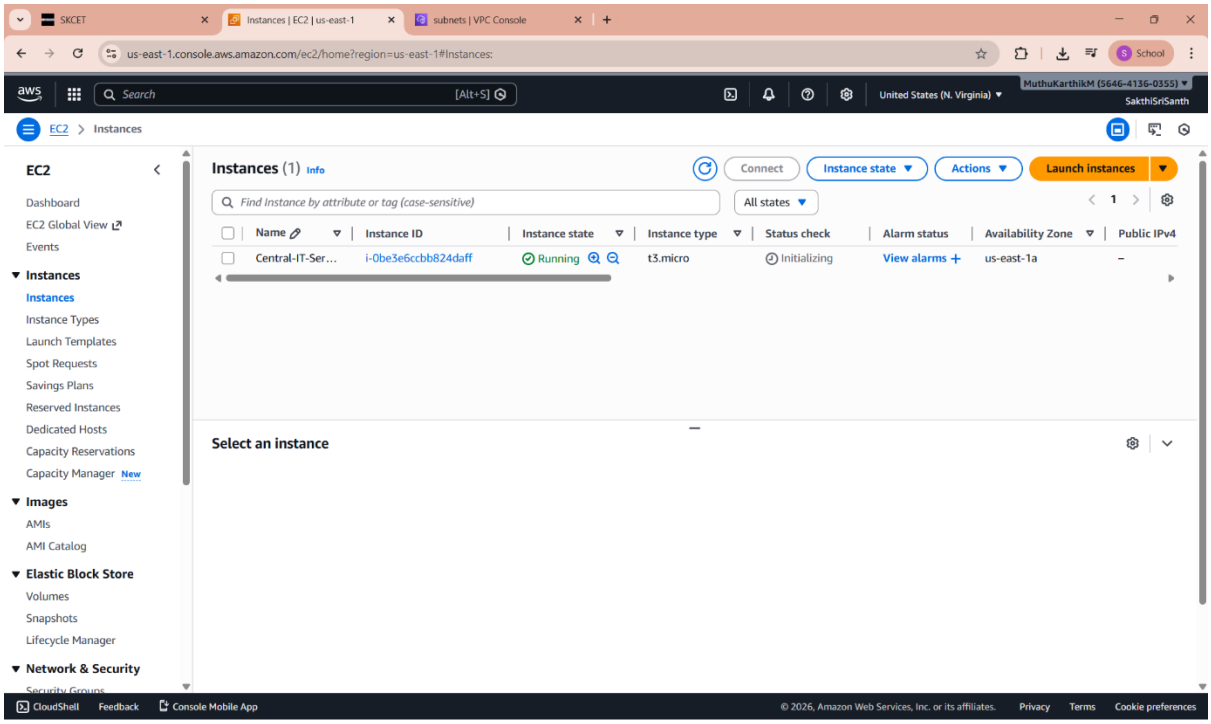

Launch an instance | EC2 | us-east-1
subnets | VPC Console
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#LaunchInstances:
Search
[Alt+S]
United States (N. Virginia)
MuthuKarthikM (5646-4136-0355)
SakthiSriSanth
EC2 > Instances > Launch an instance
central-server-key
Create new key pair
Network settings
Info
VPC - required
Info
vpc-0189875927a51f1e3
172.31.0.0/16
(default)
Subnet
Info
subnet-0d17f28e8f4fb4a5e
VPC: vpc-0189875927a51f1e3 Owner: 564641360355
Availability Zone: us-east-1a (use1-az1) Zone type: Availability Zone
IP addresses available: 4091 CIDR: 172.31.96.0/20)
subnet-1
Create new subnet
Auto-assign public IP
Info
Disable
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
Security group name - required
launch-wizard-1
This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and ._-:/()#,@[]+=&;{}!$*
Description - required
Info
launch-wizard-1 created 2026-02-07T03:38:49.185Z
Inbound Security Group Rules
Summary
Number of instances
Info
1
Software Image (AMI)
Canonical, Ubuntu, 24.04, amd6...read more
ami-0b6c6ebed2801a5cb
Virtual server type (instance type)
t3.micro
Firewall (security group)
New security group
Storage (volumes)
1 volume(s) - 8 GiB
Cancel
Launch instance
Preview code
CloudShell
Feedback
Console Mobile App
© 2026, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences





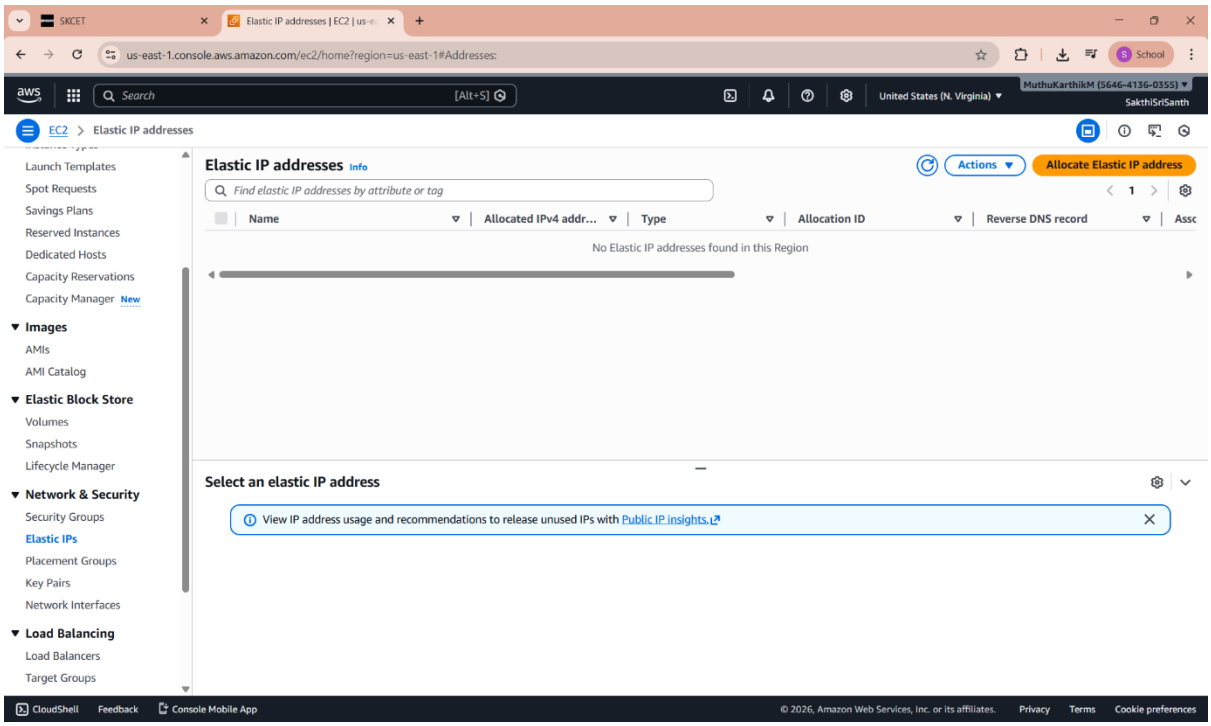
Step 3: Verifying EC2 Instance Status

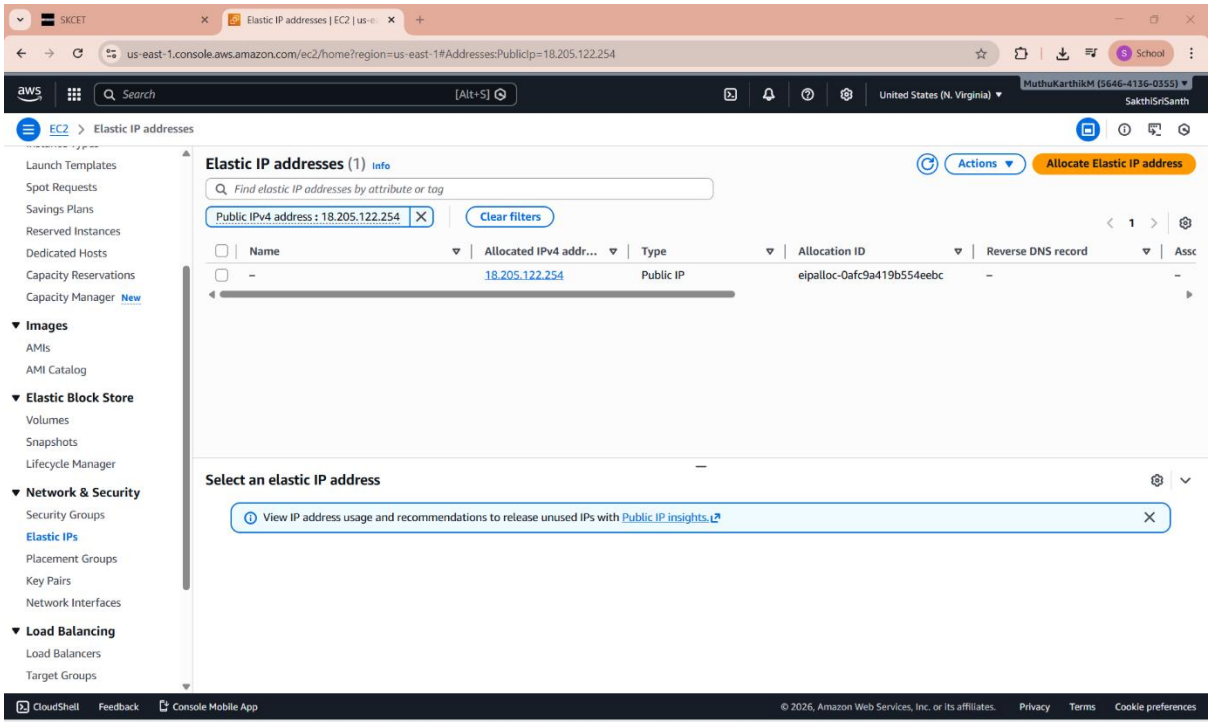
After launching the instance, its status was verified to ensure that it was running successfully and had passed all system health checks.

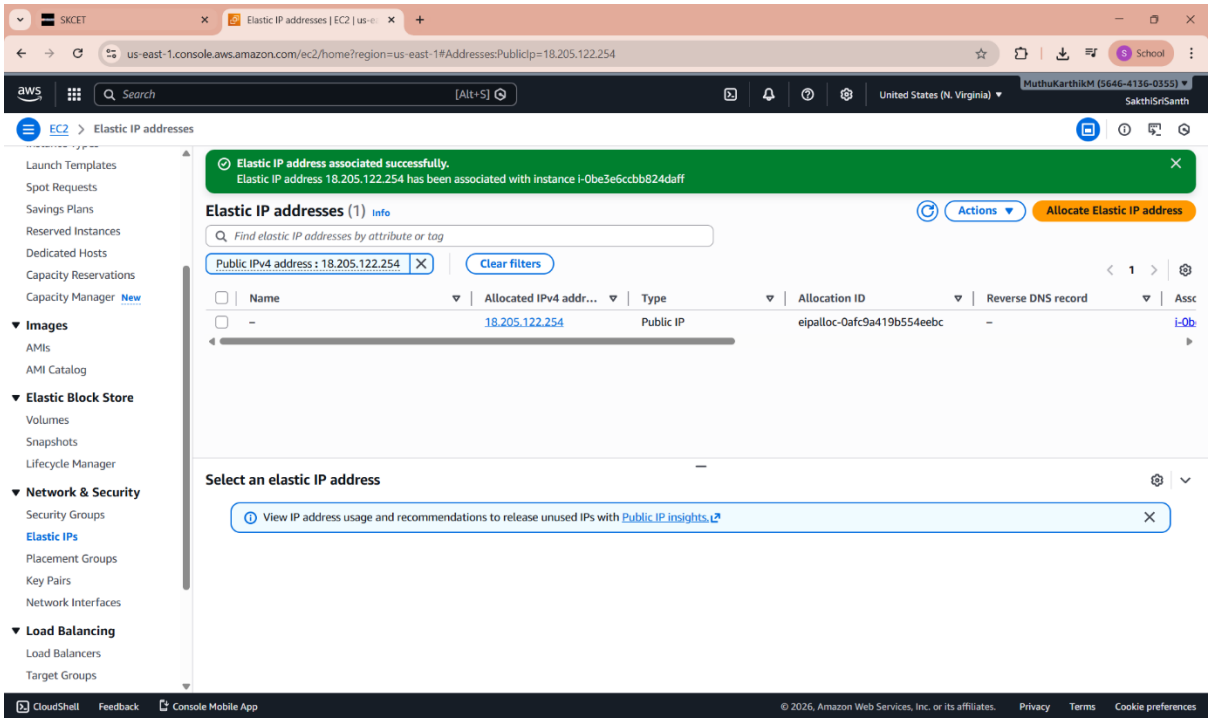


Step 4: Assigning a Public IP Address

An Elastic IP address was allocated and associated with the EC2 instance to enable secure remote access from external networks.

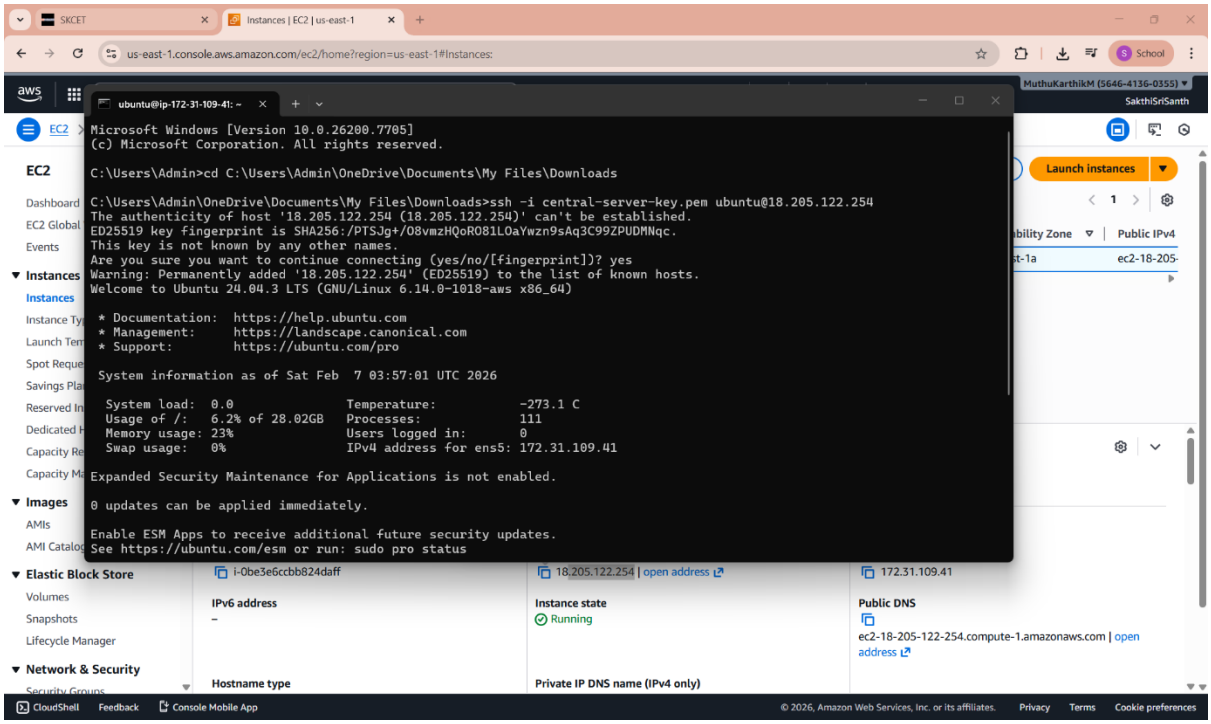


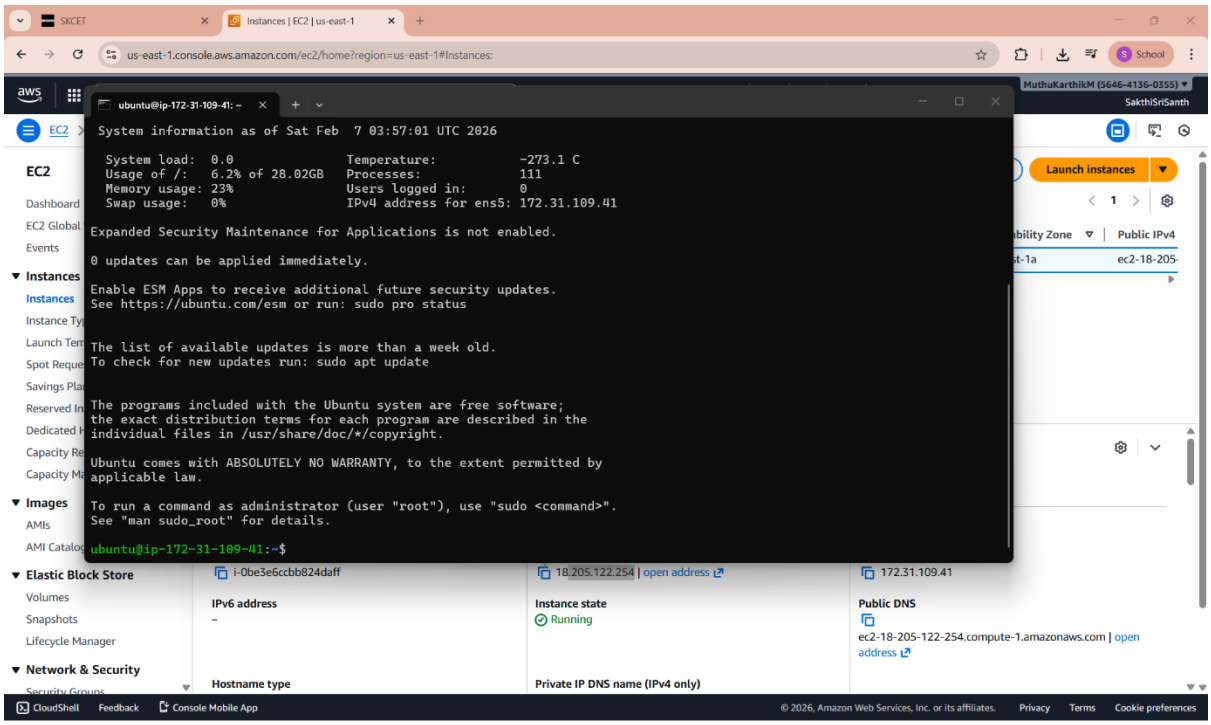


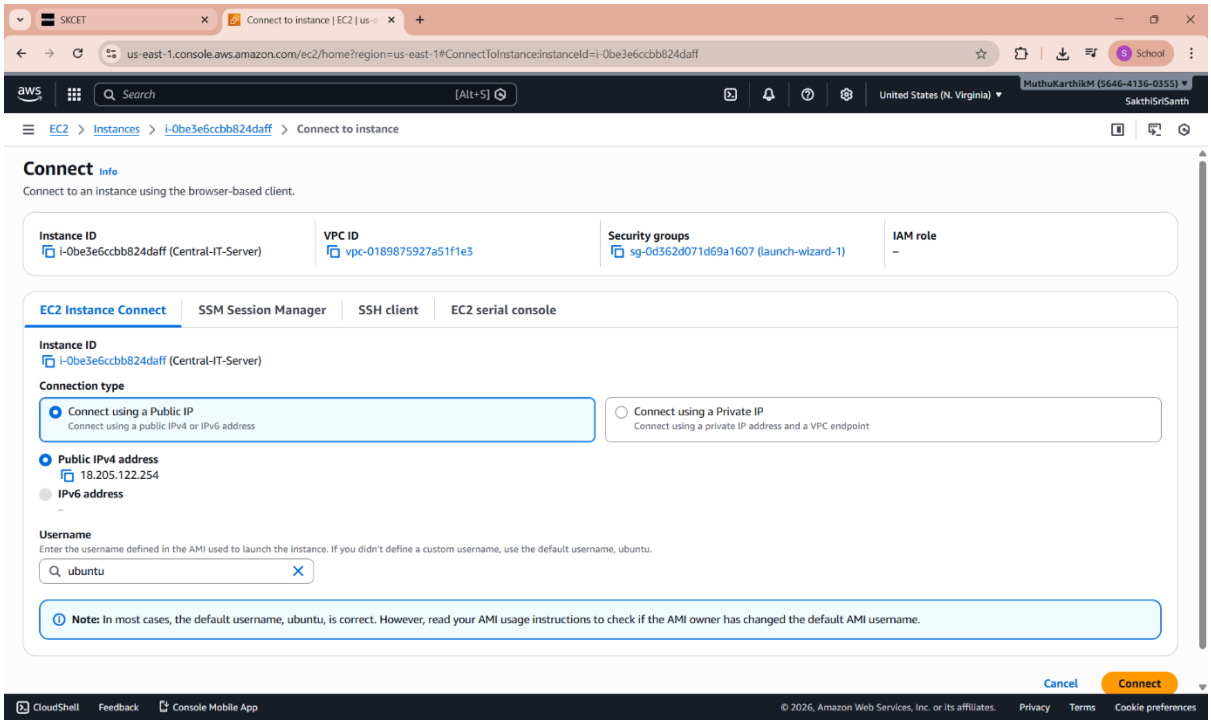


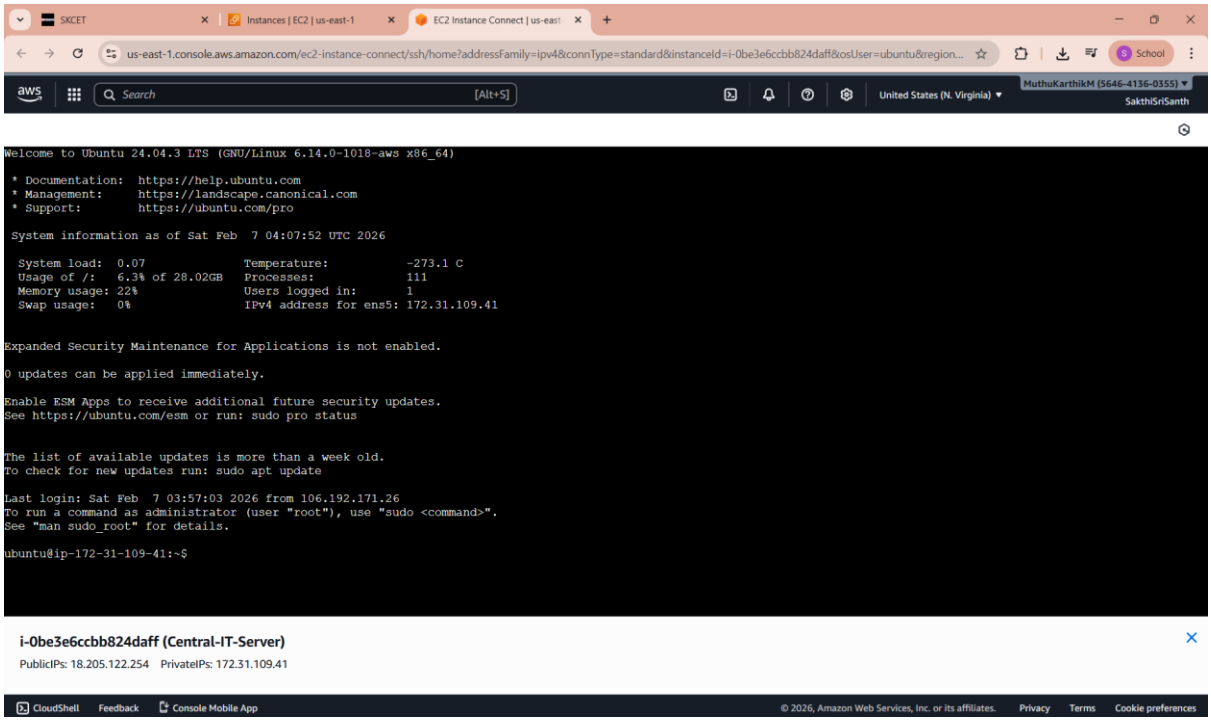
Step 5: Connecting to the Server Using SSH

A secure SSH connection was established from a Windows system to the EC2 instance using key-based authentication, allowing administrative access to the server.


SKCET
Instances | EC2 | us-east-1
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:
ubuntu@ip-172-31-109-41: ~
Microsoft Windows [Version 10.0.26200.7705]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Admin>cd C:\Users\Admin\OneDrive\Documents\My Files\Downloads
C:\Users\Admin\OneDrive\Documents\My Files\Downloads>ssh -i central-server-key.pem ubuntu@18.205.122.254
The authenticity of host '18.205.122.254 (18.205.122.254)' can't be established.
ED25519 key fingerprint is SHA256:/PTSJg+/O8vmzHQoRO81LOaYwzn9sAq3C99ZPUDMNqc.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '18.205.122.254' (ED25519) to the list of known hosts.
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-1018-aws x86_64)
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/pro
System information as of Sat Feb 7 03:57:01 UTC 2026
System load: 0.0 Temperature: -273.1 C
Usage of /: 6.2% of 28.02GB Processes: 111
Memory usage: 23% Users logged in: 0
Swap usage: 0% IPv4 address for ens5: 172.31.109.41
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
EC2
Launch instances
Dashboard
EC2 Global
Events
Instances
Images
Elastic Block Store
Network & Security
i-0be3e6ccbb824daff
18.205.122.254 | open address
172.31.109.41
IPv6 address
Instance state
Running
Public DNS
ec2-18-205-122-254.compute-1.amazonaws.com | open address
Hostname type
Private IP DNS name (IPv4 only)
CloudShell
Feedback
Console Mobile App
© 2026, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

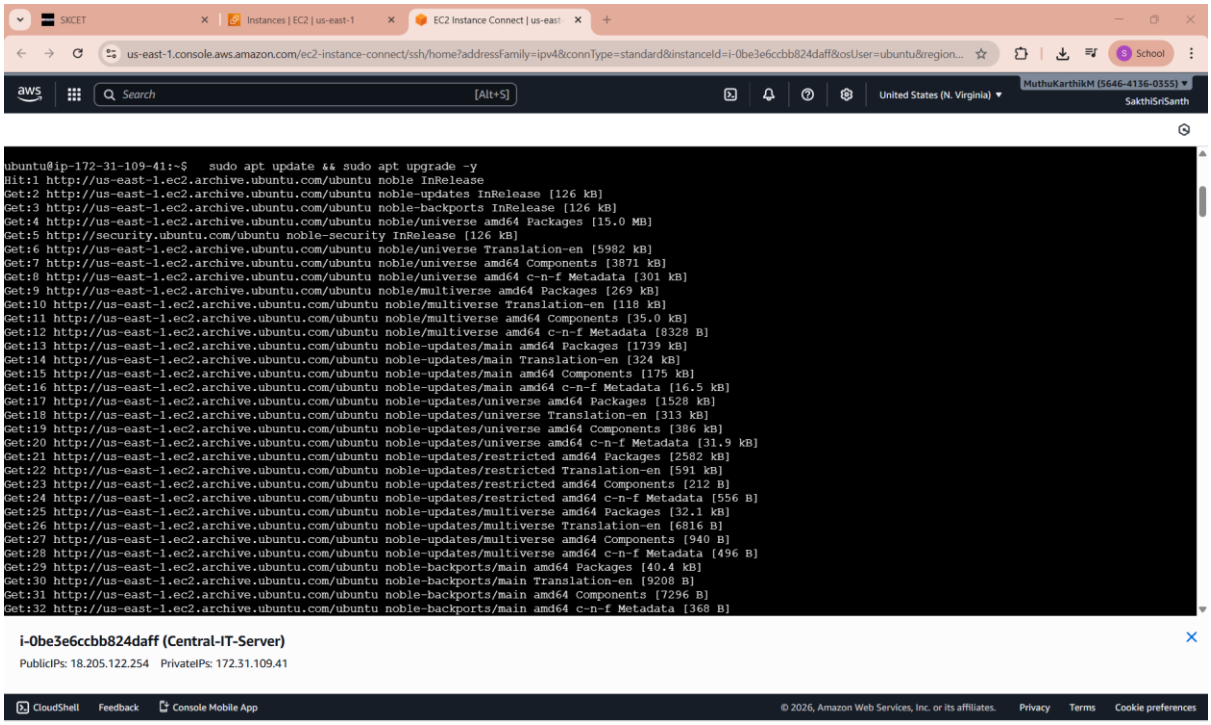

SKCET
Instances | EC2 | us-east-1
us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:
ubuntu@ip-172-31-109-41: ~
System information as of Sat Feb 7 03:57:01 UTC 2026
System load: 0.0 Temperature: -273.1 C
Usage of /: 6.2% of 28.02GB Processes: 111
Memory usage: 23% Users logged in: 0
Swap usage: 0% IPv4 address for ens5: 172.31.109.41
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-172-31-109-41:~$
EC2
Launch instances
Dashboard
EC2 Global
Events
Instances
Images
Elastic Block Store
Network & Security
i-0be3e6ccbb824daff
18.205.122.254 | open address
172.31.109.41
IPv6 address
Instance state
Running
Public DNS
ec2-18-205-122-254.compute-1.amazonaws.com | open address
Hostname type
Private IP DNS name (IPv4 only)
CloudShell
Feedback
Console Mobile App
© 2026, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

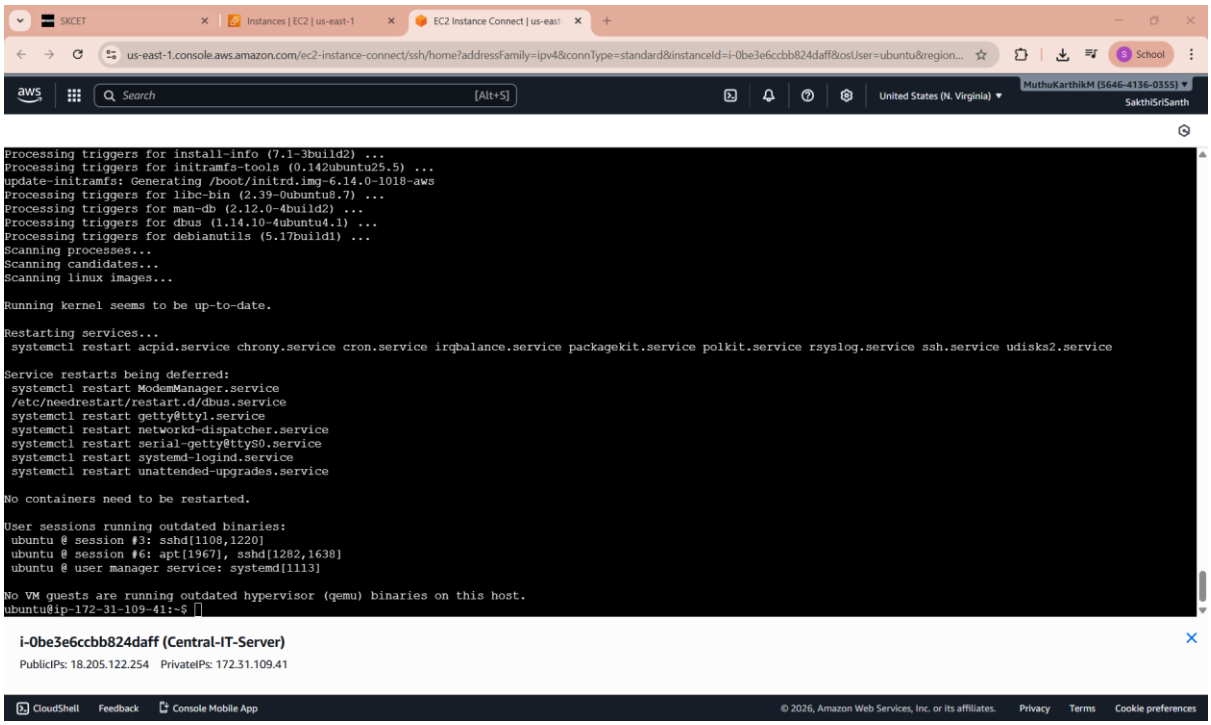




Step 6: Updating the Server System

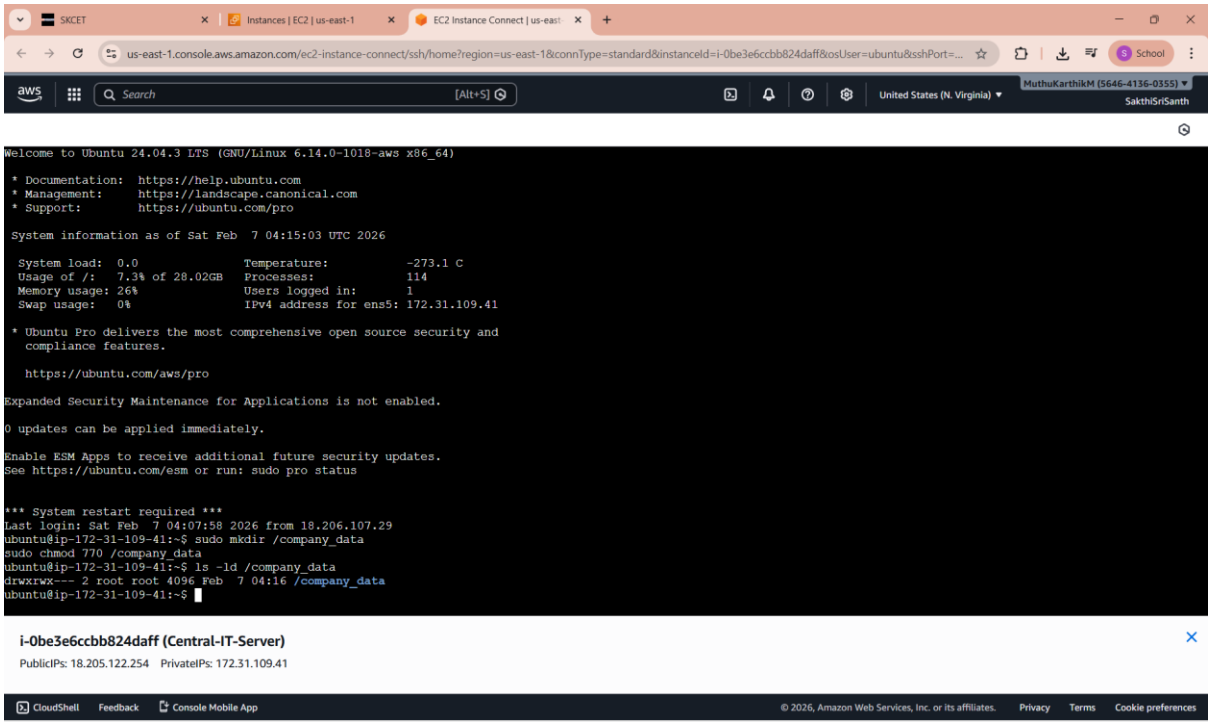
System packages were updated inside the EC2 instance to ensure that the operating system was secure and up to date before further configuration.





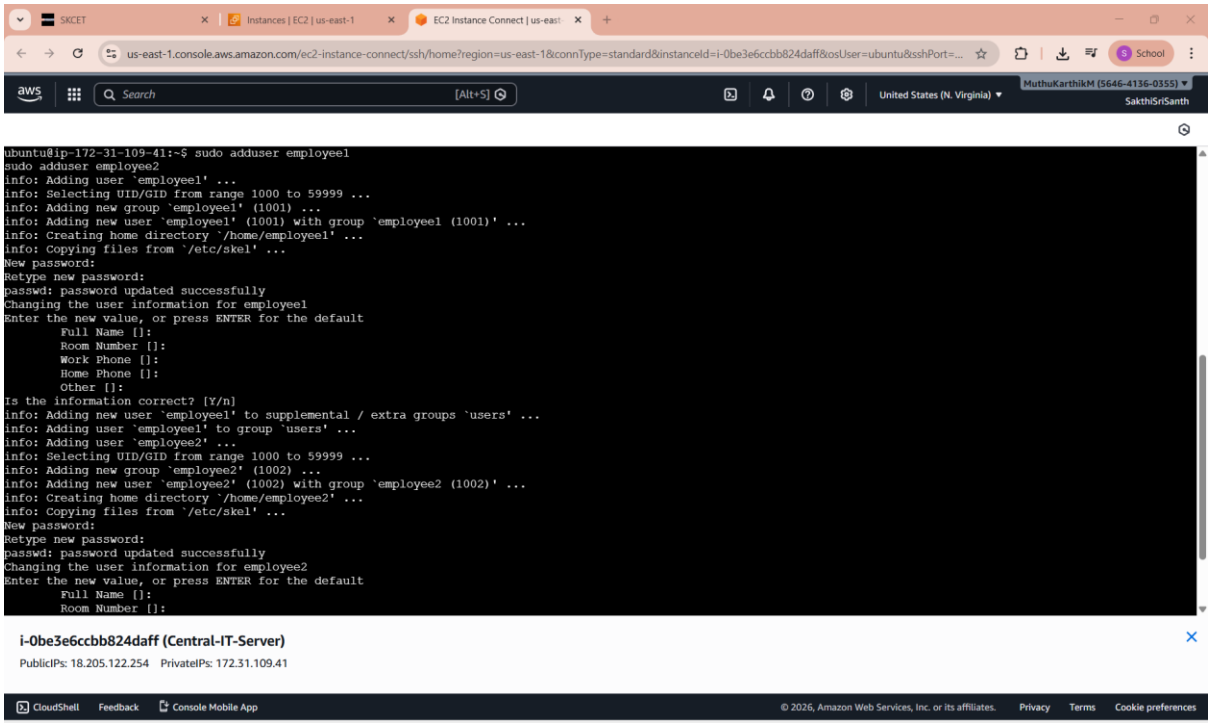
Step 7: Creating Centralized Storage

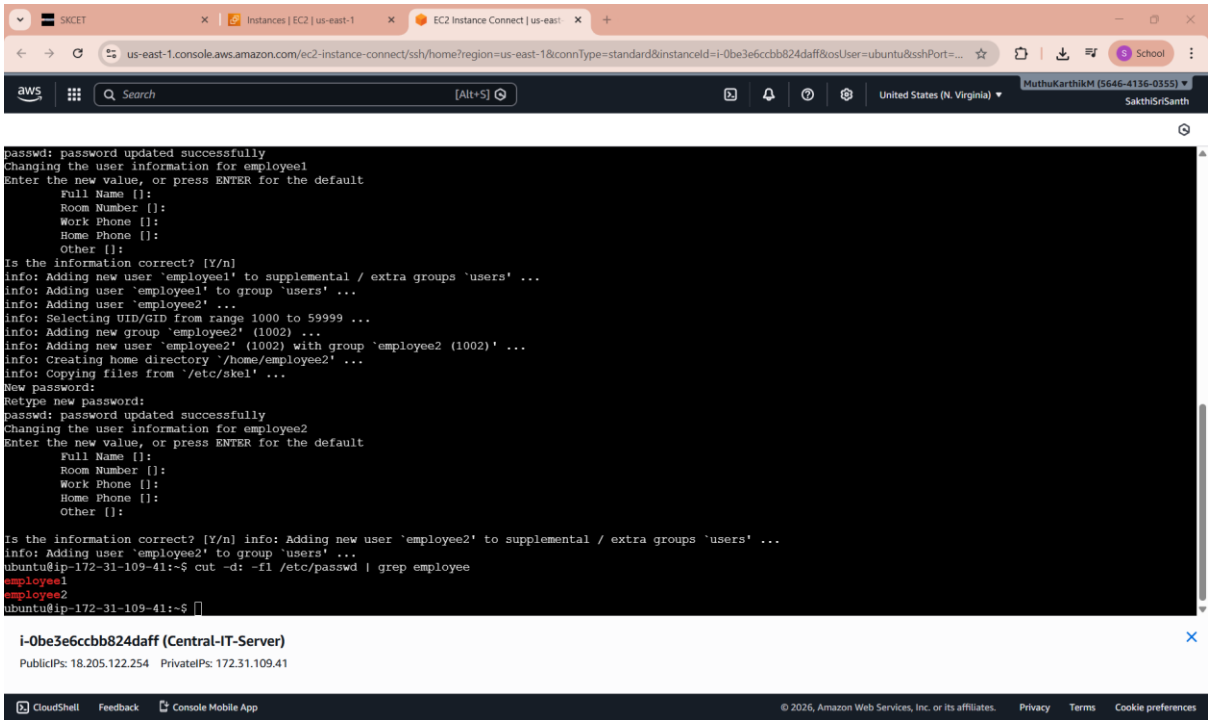
A centralized storage directory was created on the server, and appropriate permissions were assigned to restrict unauthorized access.



Step 8: Creating Employee User Accounts

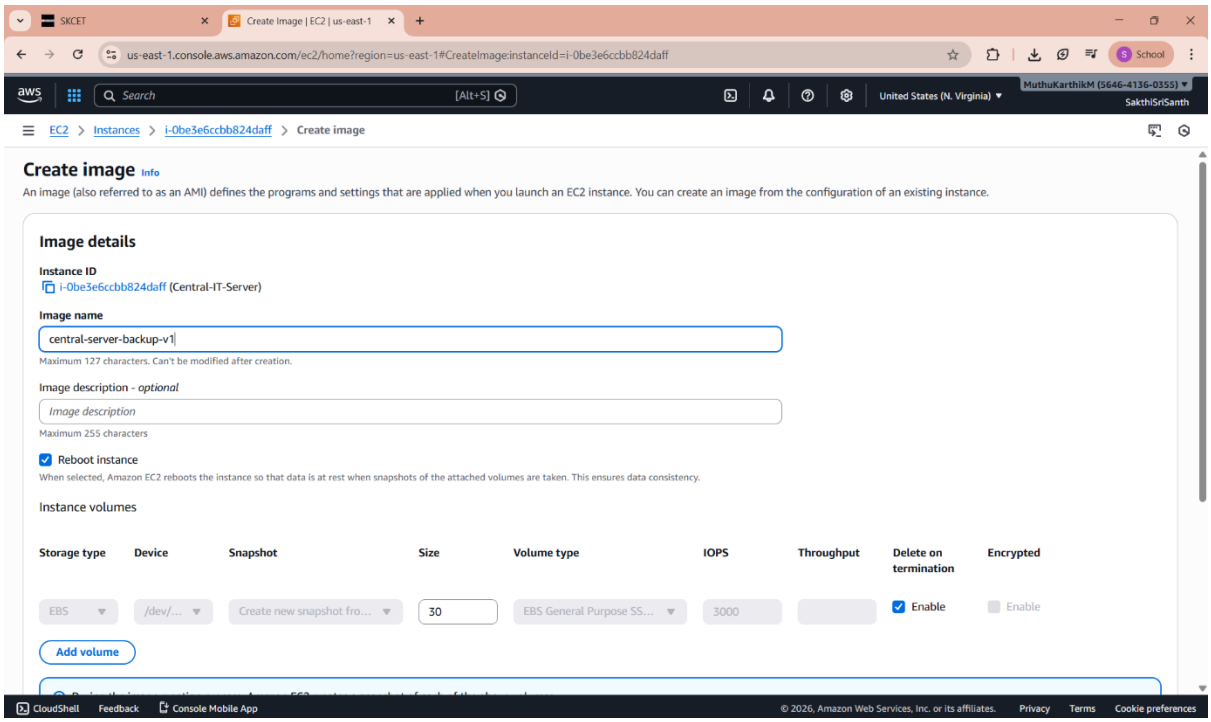
Employee user accounts were created on the server to simulate controlled access for organizational users without administrative privileges.





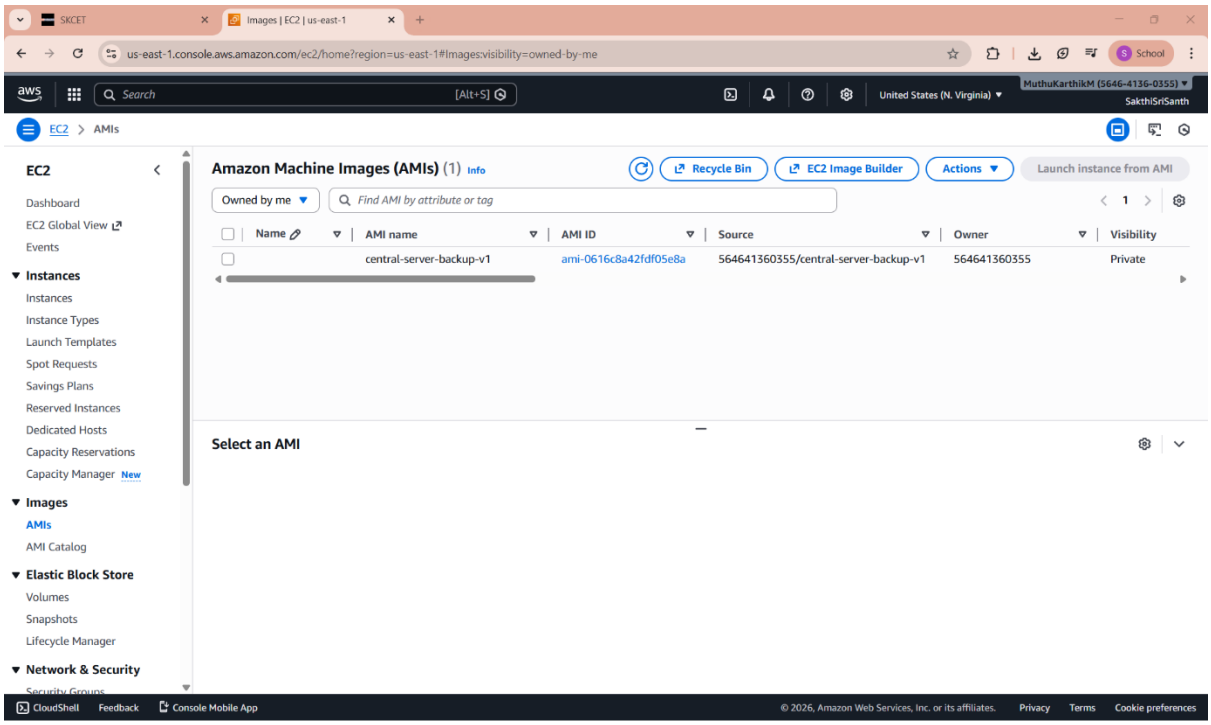
Step 9: Creating Backup Using Snapshot

A snapshot of the EC2 instance was created manually using the AWS Management Console to enable backup and disaster recovery.



Step 10: Verifying Recovery Capability

The created snapshot was verified in the AMI section of AWS to confirm that the system could be restored if required.



Conclusion

The centralized cloud-based infrastructure was successfully implemented using Amazon Web Services. The solution improved data organization, enabled secure remote access, and ensured backup and recovery capabilities. This project demonstrates practical cloud administration skills and provides a scalable solution suitable for small enterprises.