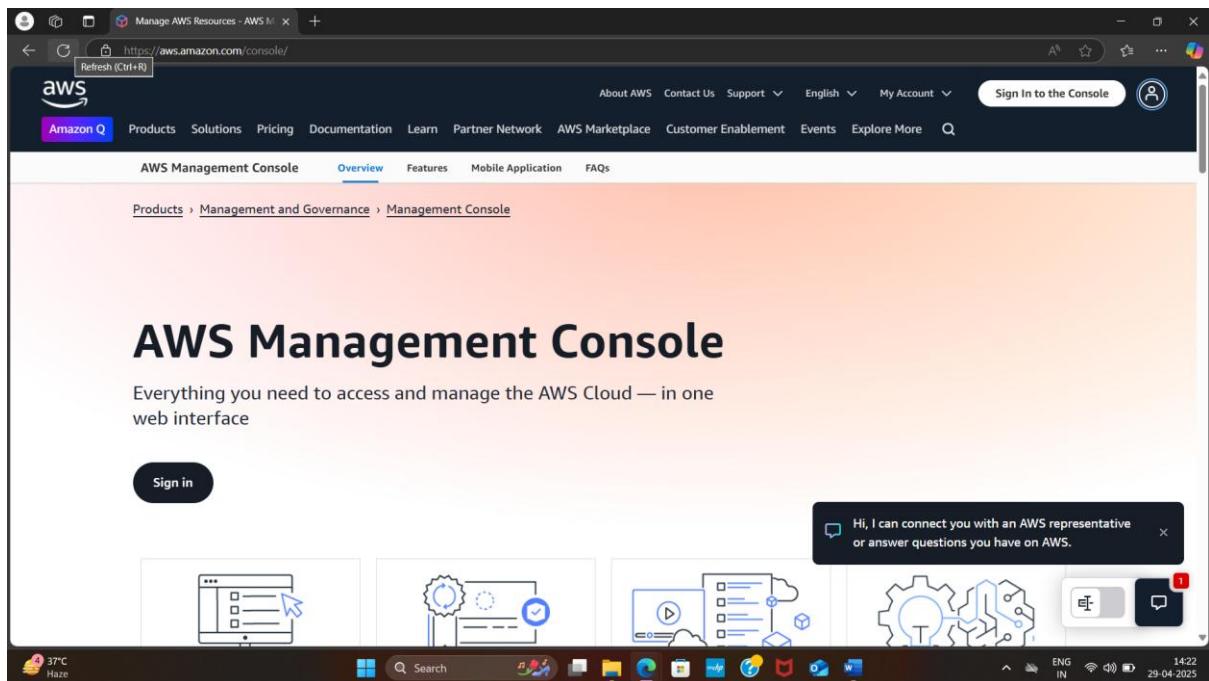


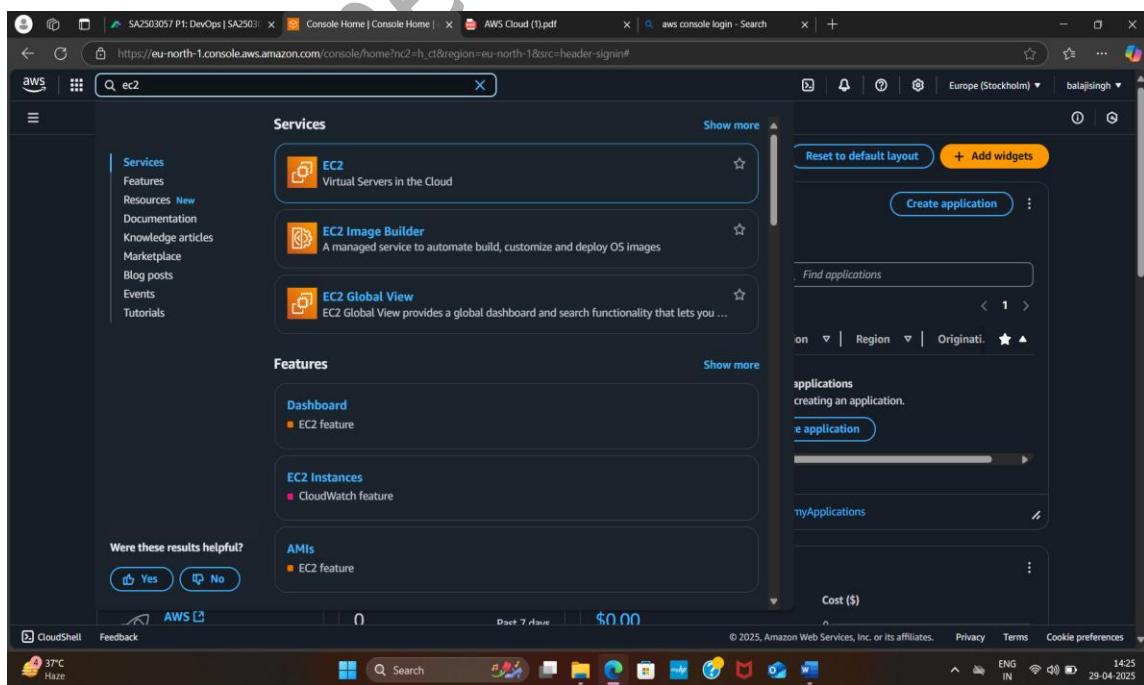
1. L1 - Demonstrate the AWS EC2 Ubuntu Instance Creation steps and connect to EC2 Instance using Mobaxterm/putty agent

Steps:

1. Sign to AWS console by using your login credentials.



2. Now search for EC2 resource in search bar.



- Click on launch instance and select the region in which you want launch your instance

Amazon Elastic Compute Cloud (EC2)
Create, manage, and monitor virtual servers in the cloud.

Amazon Elastic Compute Cloud (Amazon EC2) offers the broadest and deepest compute platform, with over 600 instance types and a choice of the latest processors, storage, networking, operating systems, and purchase models to help you best match the needs of your workload.

Benefits and features

EC2 offers ultimate scalability and control

Fully resizable compute capacity to support virtually any workload. This service is best if you want:

- Highest level of control of the entire technology stack, allowing full integration with all AWS services
- Widest variety of server size options
- Widest availability of operating systems to choose from including Linux, Windows, and macOS
- Global scalability

Instances (1) Info	
Last updated less than a minute ago	
Connect Instant	
Name	Instance ID
server-1	i-0bc23fbcb896e1b19
Instance state	Running
Instance type	t2.micro
Status check	2/2 checks pass

Select an instance

United States

- N. Virginia us-east-1
- Ohio us-east-2
- N. California us-west-1**
- Oregon us-west-2

Asia Pacific

- Mumbai ap-south-1
- Osaka ap-northeast-3
- Seoul ap-northeast-2
- Singapore ap-southeast-1
- Sydney ap-southeast-2
- Tokyo ap-northeast-1

Canada

- Central ca-central-1

Europe

- Frankfurt eu-central-1
- Ireland eu-west-1
- London eu-west-2
- Paris eu-west-3
- Stockholm eu-north-1

Manage Regions | Manage Local Zones

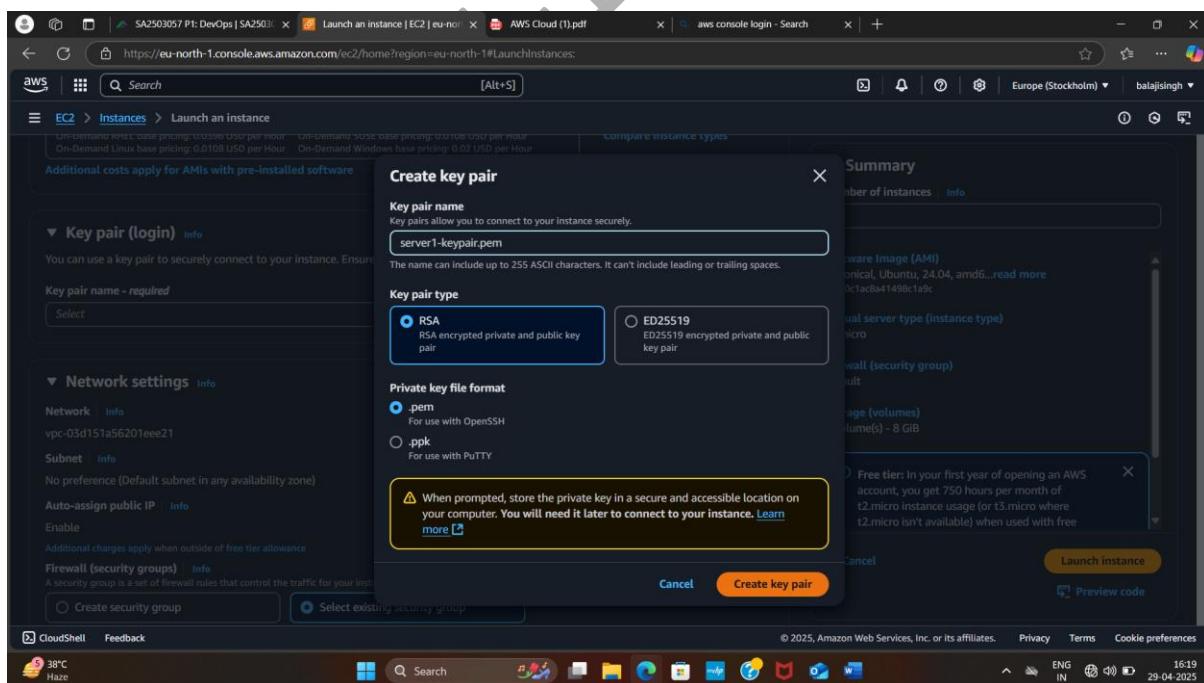
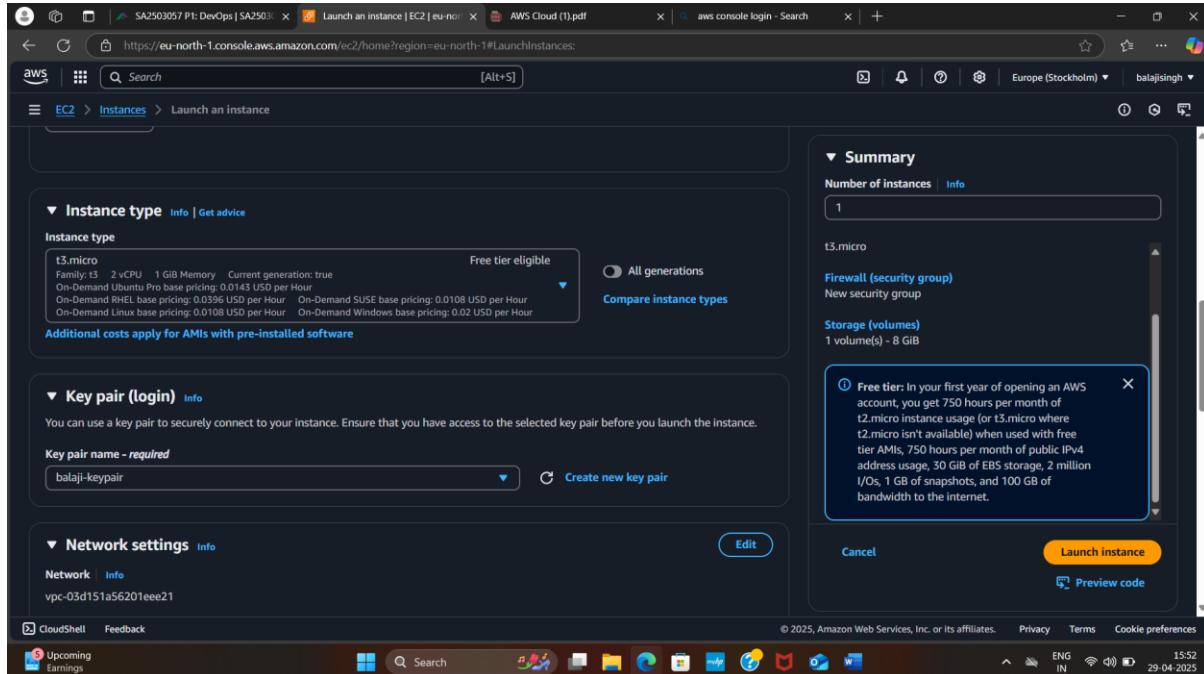
- Give a specific name to the instance and number of instances you want to create.

The screenshot shows the AWS CloudFormation console with the 'Launch an instance' wizard open. The 'Name and tags' section has 'Name' set to 'Server-1'. The 'Application and OS Images (Amazon Machine Image)' section shows a search bar and a grid of operating system icons: Amazon Linux, macOS, Ubuntu, Windows, Red Hat, SUSE Linux, and Debian. A tooltip for the 'Free tier' is visible, stating: 'In your first year of opening an AWS account, you get 750 hours per month of t2.micro instance usage (or t3.micro where t2.micro isn't available) when used with free'. The 'Summary' panel on the right shows 1 instance, using the 'Amazon Linux 2023 AMI 2023.7.2...' image, t3.micro instance type, and a new security group. The storage is 1 volume(s) - 8 GB. The 'Launch instance' button is at the bottom right.

5. Choose your AMI's/Operating system(ubuntu).

The screenshot shows the AWS CloudFormation console with the 'Launch an instance' wizard open. The 'Amazon Machine Image (AMI)' section highlights the 'Ubuntu' icon. Below it, the 'Ubuntu Server 24.04 LTS (HVM), SSD Volume Type' is selected. The 'Description' section shows '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'. The 'Architecture' dropdown is set to '64-bit (x86)'. The 'AMI ID' is 'ami-0c1ac8a41498c1a9c', 'Publish Date' is '2025-05-05', and 'Username' is 'ubuntu'. The 'Summary' panel on the right shows 1 instance, using the 'Canonical, Ubuntu, 24.04, amd64...' image, t3.micro instance type, and a new security group. The storage is 1 volume(s) - 8 GB. The 'Launch instance' button is at the bottom right.

- Choose the type of instance and create key pair and type should be RSA and file should be .PEM (RSA.PEM) or select the existing one if you want to access it remotely.



- Select the network setting you want to work in.

The screenshot shows the AWS CloudFormation Launch an instance wizard. The current step is 'Launch an instance'.

Network settings:

- Network: vpc-03d151a56201ee21
- Subnet: Info (No preference (Default subnet in any availability zone))
- Auto-assign public IP: Info (Enable)
- Firewall (security groups): Info (Create security group or Select existing security group). A selected security group is shown: default sg-0bcd29ef1ff86be8b (VPC: vpc-03d151a56201ee21).
- Common security groups: Info (Select security groups) - default sg-0bcd29ef1ff86be8b (VPC: vpc-03d151a56201ee21).

Summary:

- Number of instances: 1
- Software Image (AMI): Canonical, Ubuntu, 24.04, amd64... (ami-0c1ac8a41498ca9c)
- Virtual server type (instance type): t3.micro
- Firewall (security group): default
- Storage (volumes): 1 volume(s) - 8 GB

Configure storage:

- Root volume: 1x 8 GB gp3 (Root volume, 3000 IOPS, Not encrypted)
- Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage.
- Add new volume: The selected AMI contains more instance store volumes than the instance allows. Only the first 0 instance store volumes from the AMI will be accessible from the instance.
- 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

Advanced details:

Cancel Launch instance Preview code

8. Configure the storage. (Root volume cannot be less than 8gb and once it is assigned cannot be decreased).

The screenshot shows the AWS CloudFormation Launch an instance wizard. The current step is 'Launch an instance'.

Configure storage:

- Root volume: 1x 8 GB gp3 (Root volume, 3000 IOPS, Not encrypted)
- Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage.
- Add new volume: The selected AMI contains more instance store volumes than the instance allows. Only the first 0 instance store volumes from the AMI will be accessible from the instance.
- 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

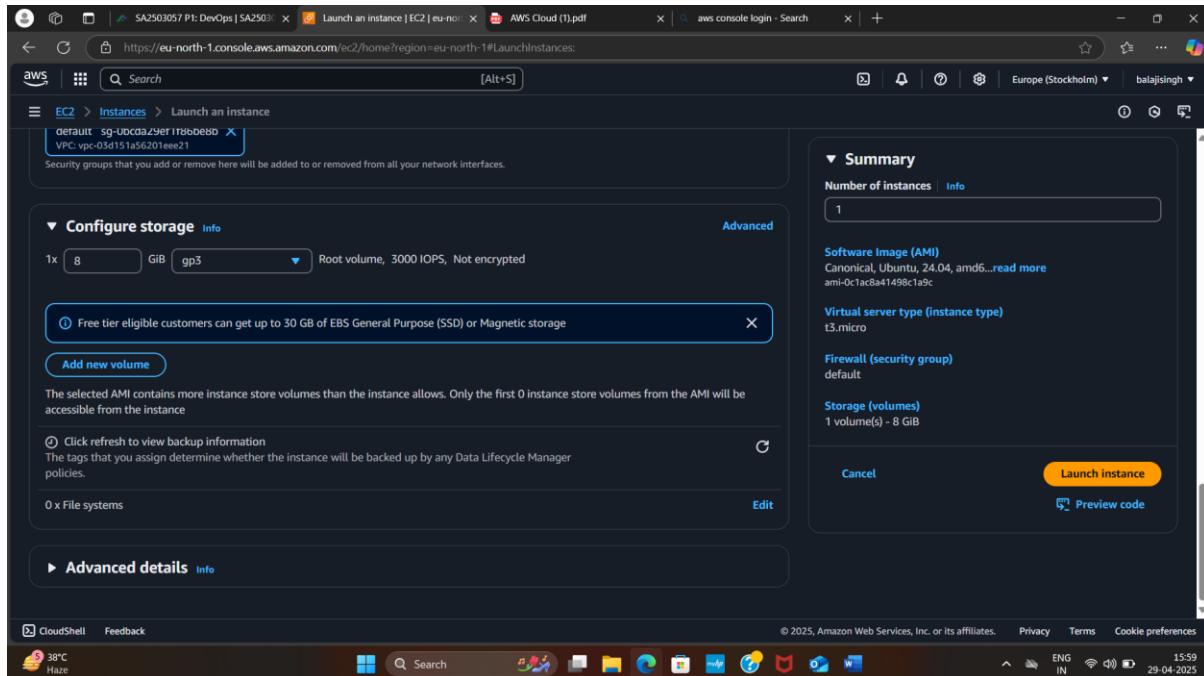
Summary:

- Number of instances: 1
- Software Image (AMI): Canonical, Ubuntu, 24.04, amd64... (ami-0c1ac8a41498ca9c)
- Virtual server type (instance type): t3.micro
- Firewall (security group): default
- Storage (volumes): 1 volume(s) - 8 GB

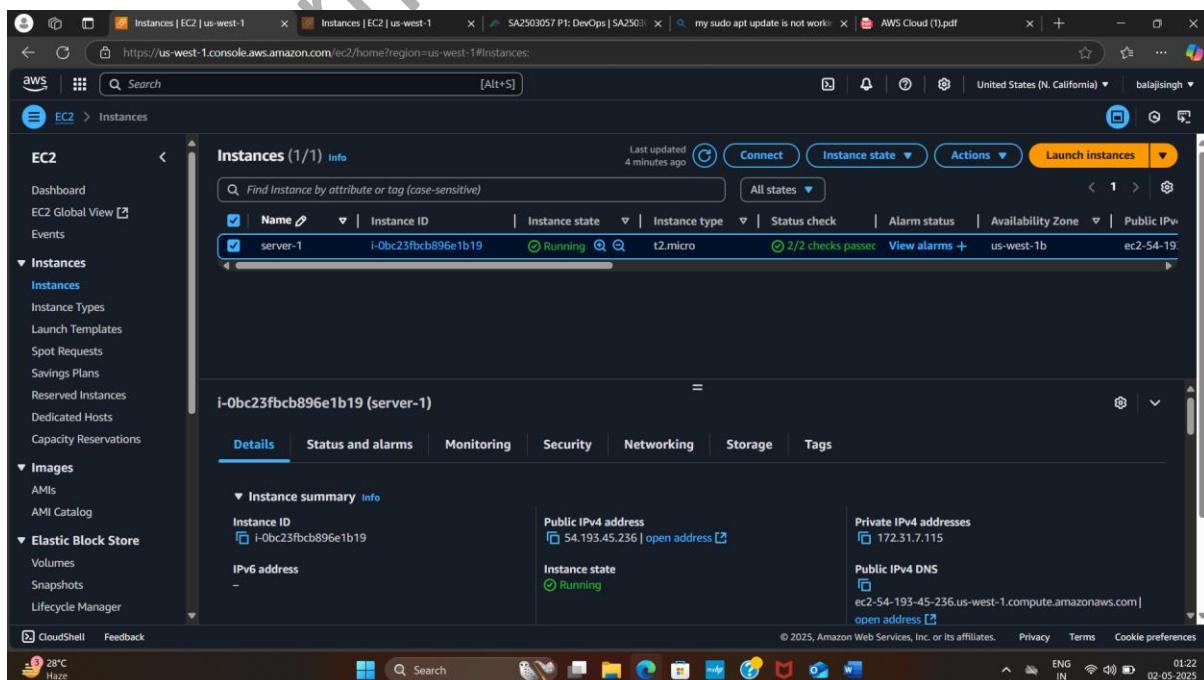
Advanced details:

Cancel Launch instance Preview code

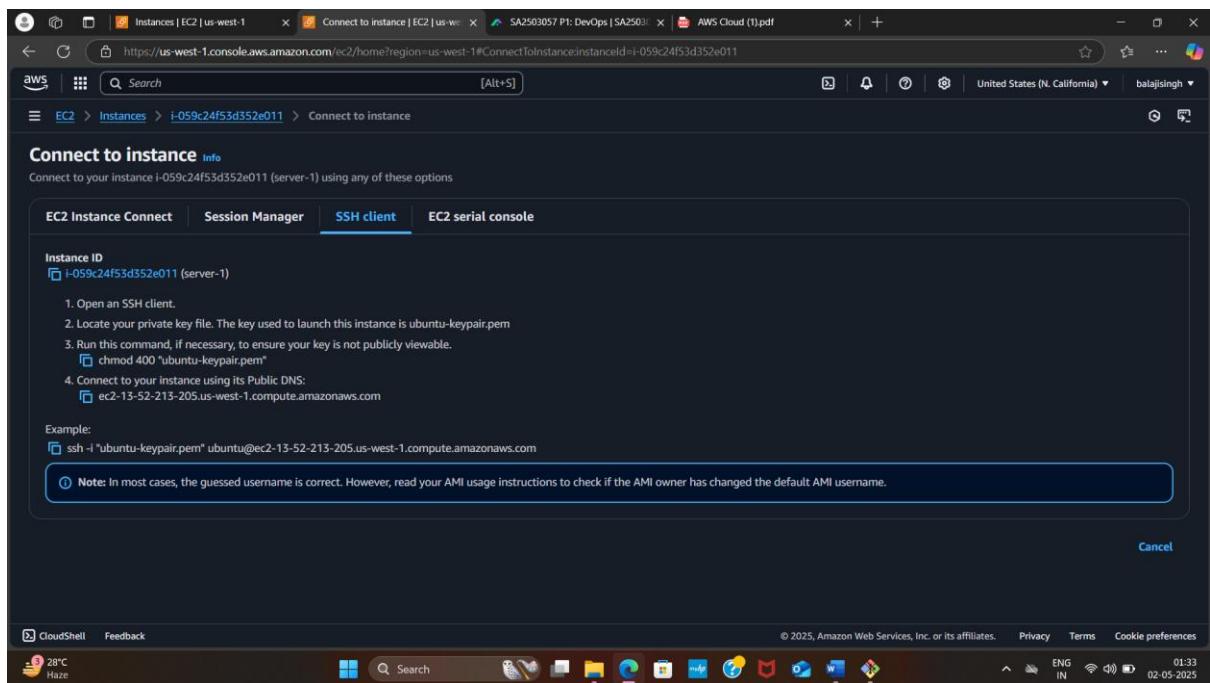
9. Now again click the launch instance to launch the instance.



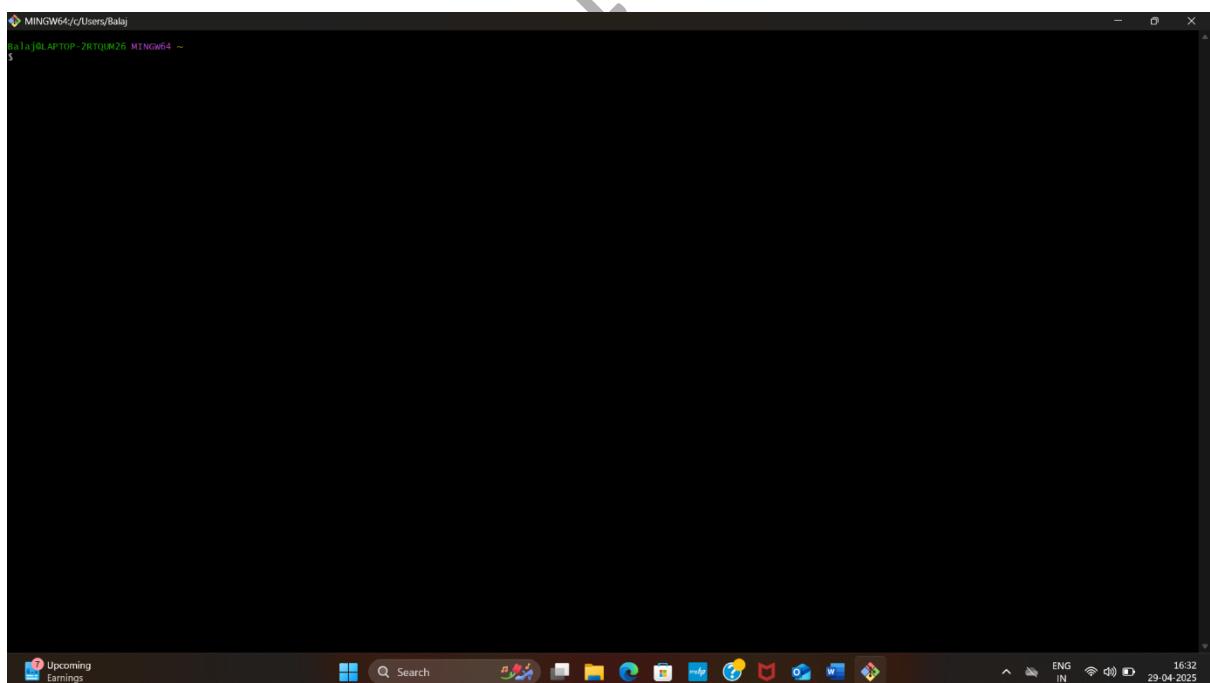
10. The instance is created.



11. Now click on connect and go to SSH client



12. Now open any command line tool mobaxterm/putty agent/git bash.



13. Now connect to the instance.

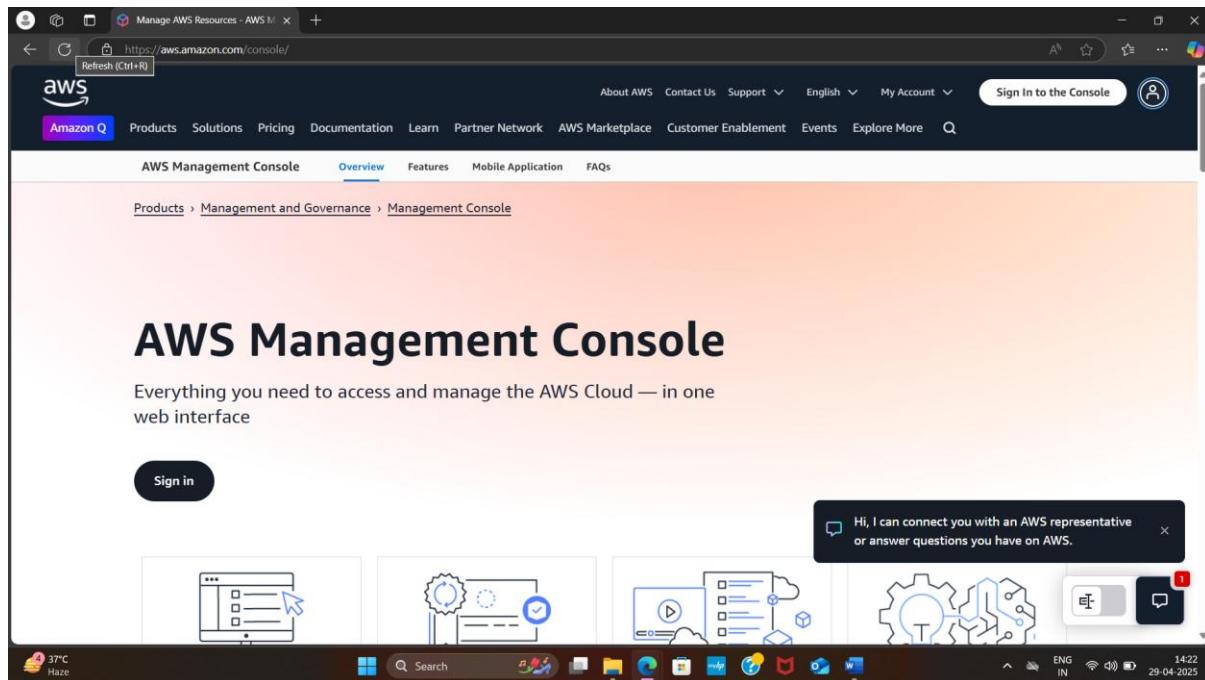
```
ubuntu@ip-172-31-2-89:~  
$ ./keypair.sh  
ubuntu@BLAPTOP-ZR7QUN0S: MINGW64 ~  
$ ./keypair.sh  
ubuntu@BLAPTOP-ZR7QUN0S: MINGW64 ~  
$ cd downloads  
ubuntu@BLAPTOP-ZR7QUN0S: MINGW64 ~/downloads  
$ chmod 400 "ubuntu-keypair.pem"  
ubuntu@BLAPTOP-ZR7QUN0S: MINGW64 ~  
$ ssh -i "ubuntu-keypair.pem" ubuntu@ec2-13-52-213-205.us-west-1.compute.amazonaws.com  
The authenticity of host 'ec2-13-52-213-205.us-west-1.compute.amazonaws.com (13.52.213.205)' can't be established.  
ED25519 key fingerprint is SHA256:wT2d1VtIGWkN5hepfJ7rkf6f8BWWl7aq89dfT4A.  
This key is not known by the user.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added 'ec2-13-52-213-205.us-west-1.compute.amazonaws.com' (ED25519) to the list of known hosts.  
Welcome to Ubuntu 24.04.2 LTS (GNU/Linux 6.8.0-1024-aws x86_64)  
  
* Documentation: https://help.ubuntu.com  
* Management: https://landscape.canonical.com  
* Support: https://ubuntu.com/pro  
  
System information as of Thu May 1 20:08:16 UTC 2025  
System load: 0.08 Processes: 105  
Usage of /: 25.0% of 6.71GB Users logged in: 0  
Memory usage: 8% IPv4 address for enx0: 172.31.2.89  
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-172-31-2-89:~ |
```

L1 is completed.

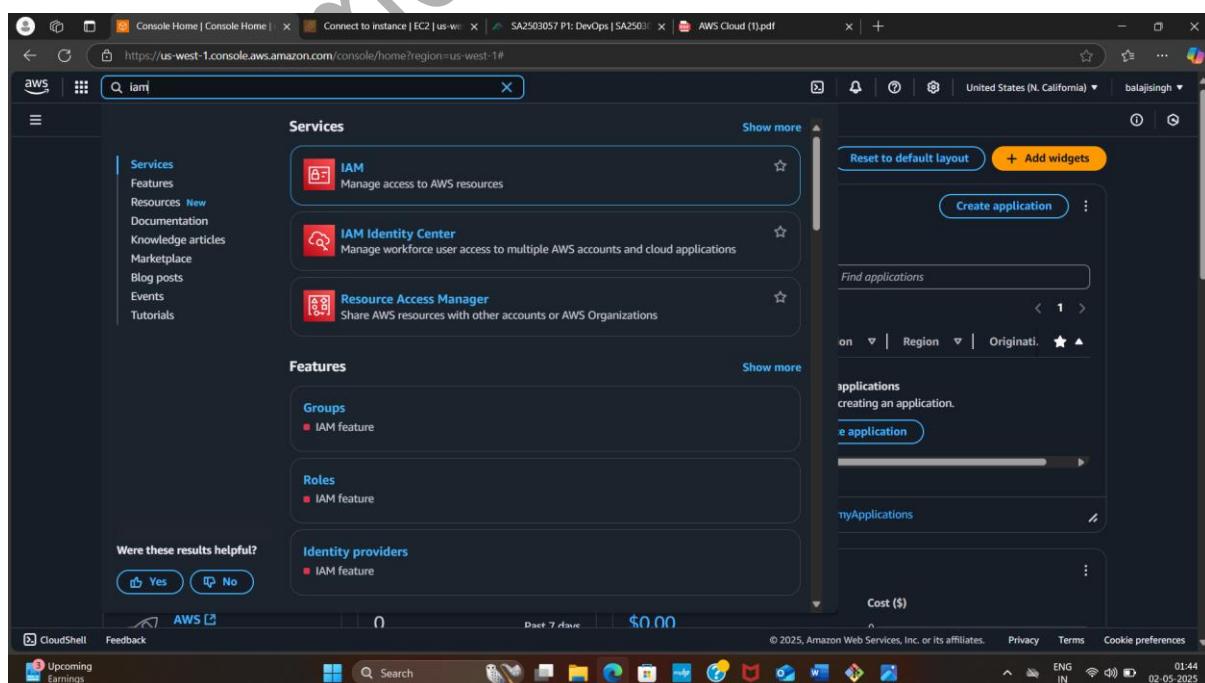
L2 - Login to AWS Console and Create IAM User, Role, and Group.

Steps:

1. Login to AWS console.



2. Now search for the IAM service.



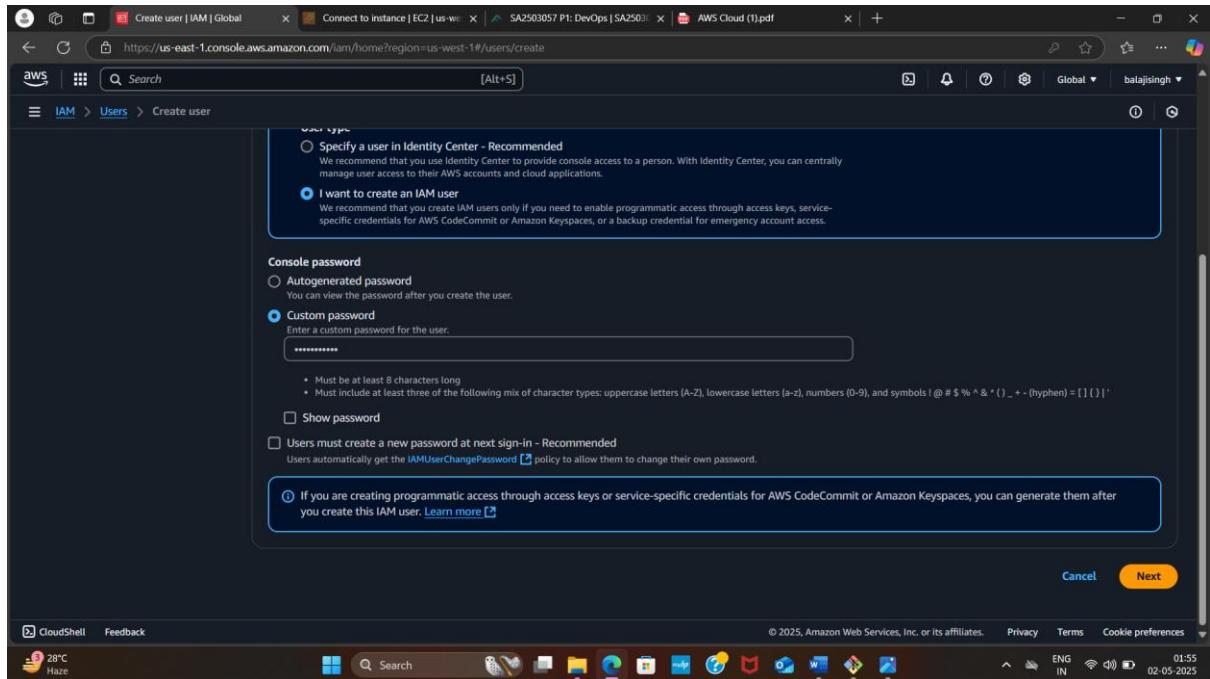
3. Now create a IAM user by going to access management and click on “create user”.

The screenshot shows the AWS IAM service in the AWS Management Console. The left sidebar is titled "Identity and Access Management (IAM)" and includes sections for "Access management" (User groups, Users, Roles, Policies, Identity providers, Account settings, Root access management), "Access reports" (Access Analyzer, External access, Unused access, Analyzer settings, Credential report, Organization activity), and "CloudShell" and "Feedback" links. The main content area is titled "Users (0) Info" and contains a search bar and a table header with columns: User name, Path, Group, Last activity, MFA, Password age, Console last sign-in, and Actions. A message at the top states: "An IAM user is an identity with long-term credentials that is used to interact with AWS in an account." Below the table, it says "No resources to display". The bottom of the screen shows the Windows taskbar with various pinned icons like File Explorer, Edge, and File Manager.

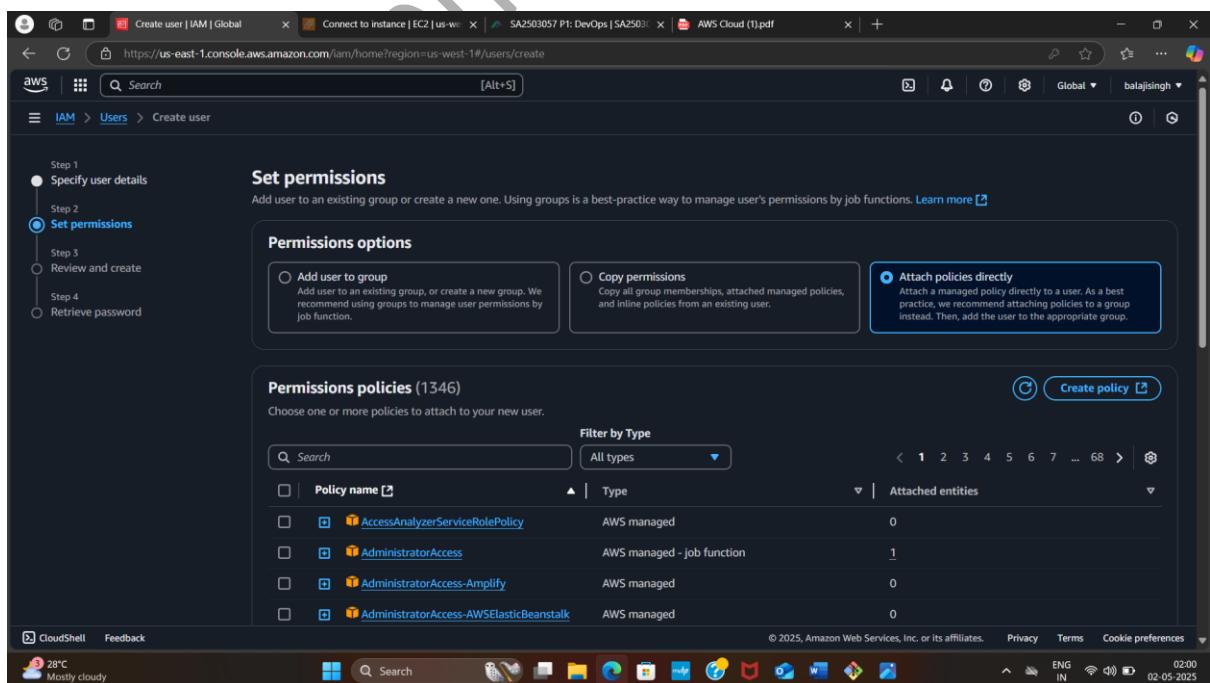
4. Now give a name which should not contain space and create a password for it either auto generated or custom password.

The screenshot shows the "Create user" wizard in the AWS IAM service, currently on "Step 3: Review and create". The left sidebar shows "Step 3: Review and create" and "Step 4: Retrieve password". The main form has a "User name" field set to "balaji-dev". Below it is a note: "The user name can have up to 64 characters. Valid characters: A-Z, a-z, 0-9, and + = , . @ _ - (hyphen)". A checked checkbox says "Provide user access to the AWS Management Console - optional". A callout box highlights the "User type" section, where the "I want to create an IAM user" option is selected. Below this, the "Console password" section shows the "Custom password" field with the placeholder "Enter a custom password for the user." A dropdown menu is open over the password field, showing "Saved passwords" with an entry for "balajichaudri29@gmail.com" and ".....". Other options include "Autogenerated password" and "Users". The bottom of the screen shows the Windows taskbar with various pinned icons.

5. Click on user must create a new password at next sign, this allows user to create his own password. Then click on next.



6. Now set the permissions by attaching policies i,e the specific access to the services that you want to give to the user.



7. Review and click on “create user”.

User details

User name	balaji-dev	Console password type	Custom password
		Require password reset No	

Permissions summary

Name	Type	Used as
No resources		

Tags - optional

No tags associated with the resource.

Add new tag

You can add up to 50 more tags.

Create user

8. User has been created.

Identity and Access Management (IAM)

Users (1) Info

User name	Path	Group	Last activity	MFA	Password age	Console last sign-in	Actions
balaji-dev	/	0	-	-	Now	-	

balaji-dev

CloudShell Feedback

9. Now to create to role go to access management, click on roles and then click on “create roles”.

The screenshot shows the AWS IAM Roles page. On the left, there's a sidebar with 'Identity and Access Management (IAM)' selected. The main area displays a table titled 'Roles (5)'. The table has columns for 'Role name', 'Trusted entities', and 'Last activity'. The roles listed are: 'AWSServiceRoleForAmazonElasticFileSystem', 'AWSServiceRoleForBackup', 'AWSServiceRoleForSupport', 'AWSServiceRoleForTrustedAdvisor', and 'balaji-temporaryaccess'. Below the table, there are sections for 'Roles Anywhere' and 'Temporary credentials'. A large arrow points from the text in step 10 towards the 'Create role' button at the top right of the page.

10. Select the trusted entity type and click on next.

The screenshot shows the 'Create role' wizard, Step 3: Trusted entity type. It lists four options: 'AWS service', 'AWS account', 'SAML 2.0 federation', and 'Custom trust policy'. The 'AWS account' option is selected and highlighted. Below this, there's a section titled 'An AWS account' with a radio button for 'This account (325502796958)' which is also selected. There are also 'Options' checkboxes for 'Require external ID' and 'Require MFA'. At the bottom right, there are 'Cancel' and 'Next' buttons.

11.Add permission policies that you want give the access of and click on next by scrolling down.

Step 1
Select trusted entity

Step 2
Add permissions

Step 3
Name, review, and create

Add permissions

Permissions policies (1045) Info

Choose one or more policies to attach to your new role.

Filter by Type

Search All types

Policy name	Type	Description
AdministratorAccess	AWS managed - job function	Provides full access to AWS services an...
AdministratorAccess-Amplify	AWS managed	Grants account administrative permisi...
AdministratorAccess-AWSElasticBeanstalk	AWS managed	Grants account administrative permisi...
AIOpsAssistantPolicy	AWS managed	Provides ReadOnly permissions requir...
AIOpsConsoleAdminPolicy	AWS managed	Grants full access to Amazon AI Opera...
AIOpsOperatorAccess	AWS managed	Grants access to the Amazon AI Opera...
AIOpsReadOnlyAccess	AWS managed	Grants ReadOnly permissions to the A...
AlexaForBusinessDeviceSetup	AWS managed	Provide device setup access to AlexaFo...
AlexaForBusinessFullAccess	AWS managed	Grants full access to AlexaForBusiness ...

12.Now name the role and add a description about the role and scroll down and click on next.

Step 1
Select trusted entity

Step 2
Add permissions

Step 3
Name, review, and create

Name, review, and create

Role details

Role name

Enter a meaningful name to identify this role.

balaji-role

Description

Add a short explanation for this role.

to test the services of AWS

Step 1: Select trusted entities

Trust policy

```
1: [
2:   "Version": "2012-10-17",
3:   "Statement": [
4:     {
5:       "Effect": "Allow",
6:       "Action": "sts:AssumeRole",
7:       "Principal": [
8:         "AWS": "323502796958"
9:       ],
10:      }
11:    ]
12:  ]
```

13.The role has been created.

The screenshot shows the AWS IAM Roles page. On the left, there's a sidebar with 'Identity and Access Management (IAM)' selected. The main area displays the 'balaji-role' details. The 'Summary' section includes the ARN (arn:aws:iam::323502796958:role/balaji-role). Below it, the 'Permissions' tab is active, showing one policy named 'AdministratorAccess'. There are tabs for 'Trust relationships', 'Tags', 'Last Accessed', and 'Revoke sessions'. A 'Permissions policies (1)' section lists the attached policy. The bottom right corner shows the date as 02-05-2025 and the time as 02:23.

14.Now copy the arn of the role and go to trust relationship and click on edit trust policy to the it from root user to the role.

The screenshot shows the same AWS IAM Roles page, but the 'Trust relationships' tab is now active. It displays the JSON code for the trust policy:

```
1 - [ { 2 - "Version": "2012-10-17", 3 - "Statement": [ 4 - { 5 - "Effect": "Allow", 6 - "Principal": { 7 - "AWS": "arn:aws:iam::323502796958:root" 8 - }, 9 - "Action": "sts:AssumeRole", 10 - "Condition": {} 11 - } 12 - ] 13 - }
```

The rest of the interface is identical to the previous screenshot, showing the role's summary and other tabs.

15.Now copy the ARN of the role and paste it in trusted entities and update the policy.

The screenshot shows the AWS IAM 'Edit trust policy' interface. On the left, there is a code editor displaying the following JSON trust policy:

```
1 = [ { "Version": "2012-10-17", "Statement": [ { "Effect": "Allow", "Principal": { "AWS": "arn:aws:iam::323502796958:role/balaji-role" }, "Action": "sts:AssumeRole", "Condition": {} } ] } ]
```

On the right, there is a sidebar titled 'Edit statement' with the sub-section 'Select a statement'. It contains the instruction 'Select an existing statement in the policy or add a new statement' and a button '+ Add new statement'.

16. Now share the link to switch the roles.

The screenshot shows the AWS IAM 'balaji-role' summary page. In the 'Trust relationships' tab, there is a section titled 'Link to switch roles in console' which contains a link:

<https://signin.aws.amazon.com/switchrole?roleName=balaji-role&account=323502796958>

17. Now to create “user group” go to the access management again and click on “create groups”.

The screenshot shows the AWS IAM User Groups page. The left sidebar is titled "Identity and Access Management (IAM)" and includes sections for "User groups", "Users", "Roles", "Policies", "Identity providers", "Account settings", and "Root access management". The main content area is titled "User groups (0) info" and contains a search bar and a table header with columns for "Group name", "Users", "Permissions", and "Creation time". A message at the top states, "A user group is a collection of IAM users. Use groups to specify permissions for a collection of users." Below the table, it says "No resources to display". The bottom of the screen shows the Windows taskbar with various icons and the system tray.

18. Now give a meaningful name to identify the group and select the user that you want to add in the group.

The screenshot shows the "Create user group" page. The left sidebar is identical to the previous screenshot. The main form has a section titled "Name the group" with a "User group name" input field containing "team-staragile". Below it is a section titled "Add users to the group - Optional (2/4) Info" with a search bar and a list of IAM users. Three users are selected: "balaji-dev" (checked), "lucy-manage-ec2" (unchecked), "ruby-manage-access" (unchecked), and "sagar-test" (checked). At the bottom, there is a section titled "Attach permissions policies - Optional (1045) Info". The bottom of the screen shows the Windows taskbar and system tray.

19. Now attach the permission policies that you want give to the “user group” and scroll down and click on “create user group”.

The screenshot shows the AWS IAM console with the URL <https://us-east-1.console.aws.amazon.com/iam/home?region=us-west-1#/groups/create>. The left sidebar is open, showing 'Access management' with 'User groups' selected. The main content area is titled 'Attach permissions policies - Optional (1/1045)'. It displays a table of AWS managed policies, with the first policy, 'AdministratorAccess', selected. A tooltip for 'AdministratorAccess' states: 'Provides full access to AWS services and resources'. The table includes columns for Policy name, Type, Used as, and Description.

20. User group has been created.

The screenshot shows the AWS IAM console with the URL <https://us-east-1.console.aws.amazon.com/iam/home?region=us-west-1#/groups>. The left sidebar is open, showing 'Access management' with 'User groups' selected. The main content area is titled 'User groups (1)'. It displays a table with one row for 'team-staragile'. A green success message at the top says 'team-staragile user group created.' The table includes columns for Group name, Users, Permissions, and Creation time.

The screenshot shows the AWS IAM User Groups page for the 'team-staragile' group. The left sidebar is titled 'Identity and Access Management (IAM)' and includes sections for Dashboard, Access management (User groups, Roles, Policies, Identity providers, Account settings, Root access management), and Access reports (Access Analyzer, External access, Unused access, Analyzer settings, Credential report, Organization activity). The main content area is titled 'team-staragile info' and contains a 'Summary' section with the user group name 'team-staragile', creation time 'May 02, 2025, 02:53 (UTC+05:30)', and ARN 'arn:aws:iam::323502796958:group/team-staragile'. Below this is a 'Users' tab showing two users: 'balaji-dev' and 'sagar-test'. A large watermark 'Assignment' is diagonally across the page.

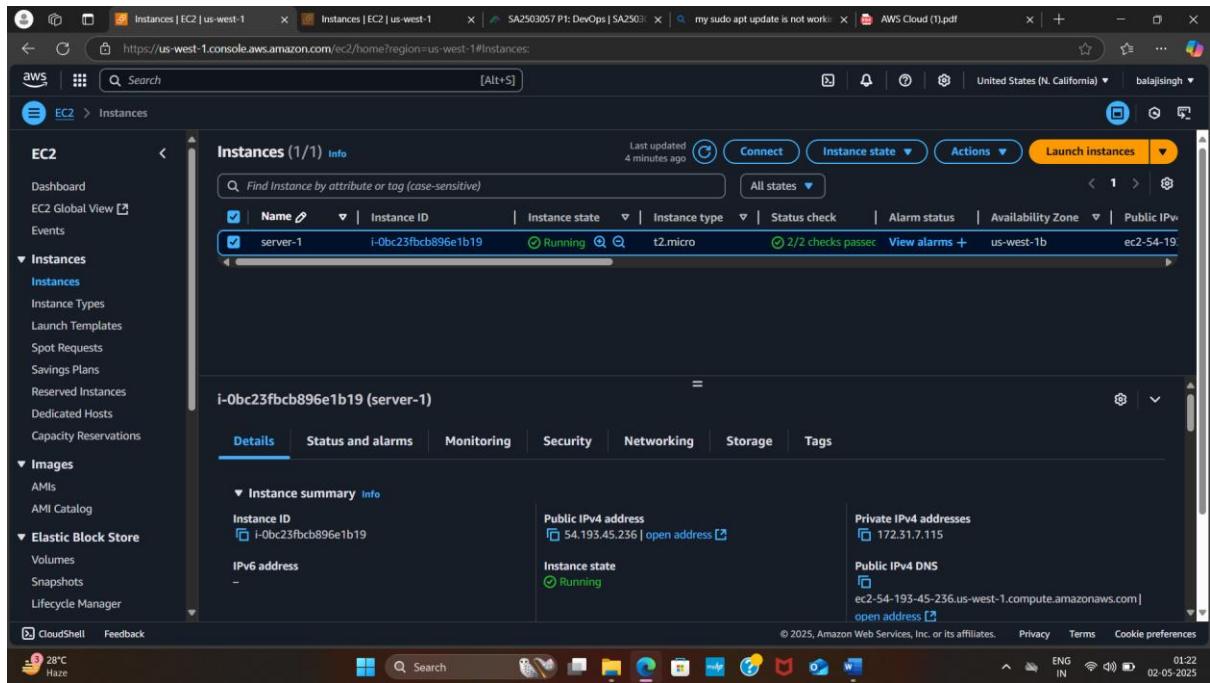
User Name	Groups	Last Activity	Creation Time
balaji-dev	1	None	48 minutes ago
sagar-test	1	None	19 minutes ago

L2 is completed

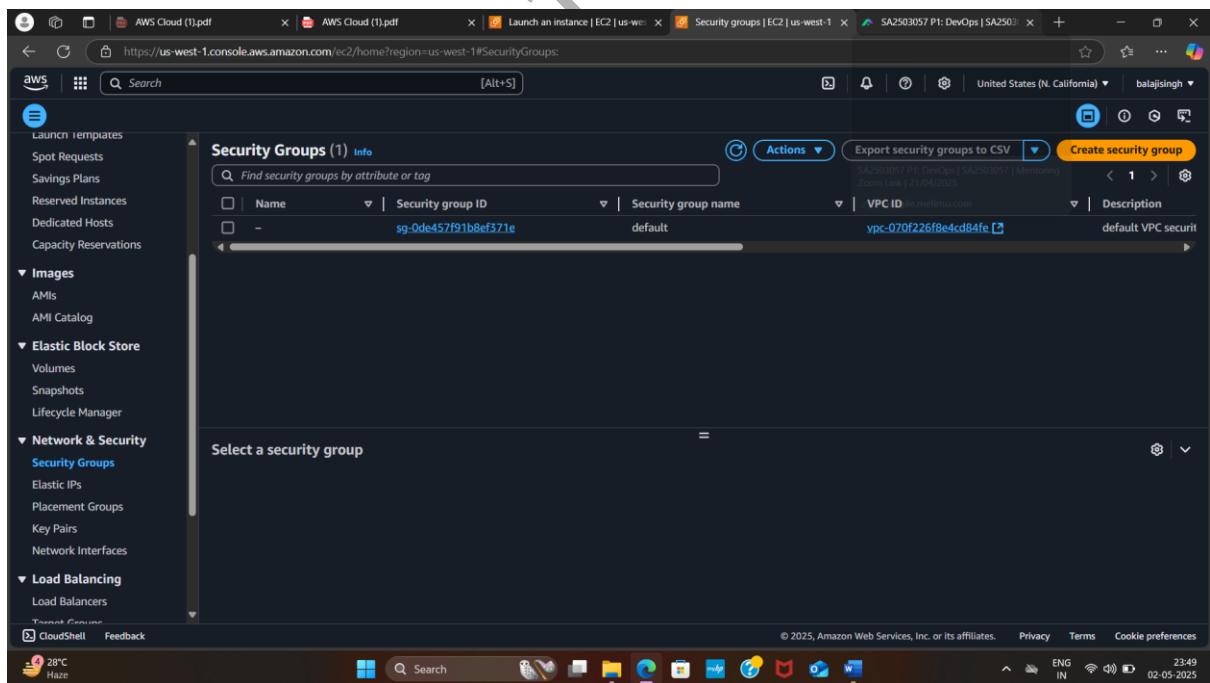
L3 - Launch AWS EC2 Ubuntu Instance and configure the Security Group - Inbound Rule: 8080. Justify the usage of Inbound Rules

Steps:

1. Launch a EC2 instance.



2. Now go to the network and security and click on security groups.



3. Now select the existing security group and go to the inbound rules and click on “edit inbound rules”.

The screenshot shows the AWS CloudWatch Metrics console. On the left, there's a navigation pane with links like 'Metrics Home', 'Metrics Overview', 'Metrics Data', 'Metrics Insights', 'Metrics Metrics Insights', and 'Metrics Metrics Insights'. The main area displays a table of metrics for the 'HelloWorld' function. The columns include 'Metric Name', 'Value', 'Unit', 'Period', 'Time Range', and 'Approximate Metrics'. One row is highlighted, showing 'HelloWorld:InvokeEvent' with a value of 1, Unit of 'Count', and a Period of 1 minute.

4. After clicking on edit inbound rules this page will open and then click on add rule and select the rule type and keep custom TCP and type 8080 in port range and keep the rule source as anywhere IPV4 and save

The screenshot shows the AWS CloudWatch Metrics console. On the left, there's a navigation pane with links like 'Metrics Home', 'Metrics Overview', 'Metrics Data', 'Metrics Insights', 'Metrics Metrics Insights', and 'Metrics Metrics Insights'. The main area displays a table of metrics for the 'HelloWorld' function. The columns include 'Metric Name', 'Value', 'Unit', 'Period', 'Time Range', and 'Approximate Metrics'. One row is highlighted, showing 'HelloWorld:InvokeEvent' with a value of 1, Unit of 'Count', and a Period of 1 minute.

5. Now to justify the usage of inbound rules. By changing the adding the new rule. For example, if we want to access the tomcat so we have to keep the port number as 8080.

Inbound rules

Security group rule ID: sgr-0d58f7e9e03f2a9a6

Type	Info	Protocol	Info	Port range	Info	Source	Info	Description - optional
All traffic		All		All		Custom		0.0.0.0/0 X
-		Custom TCP		TCP		8080		Anywhere... X
								0.0.0.0/0 X

Add rule

⚠ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel Preview changes Save rules

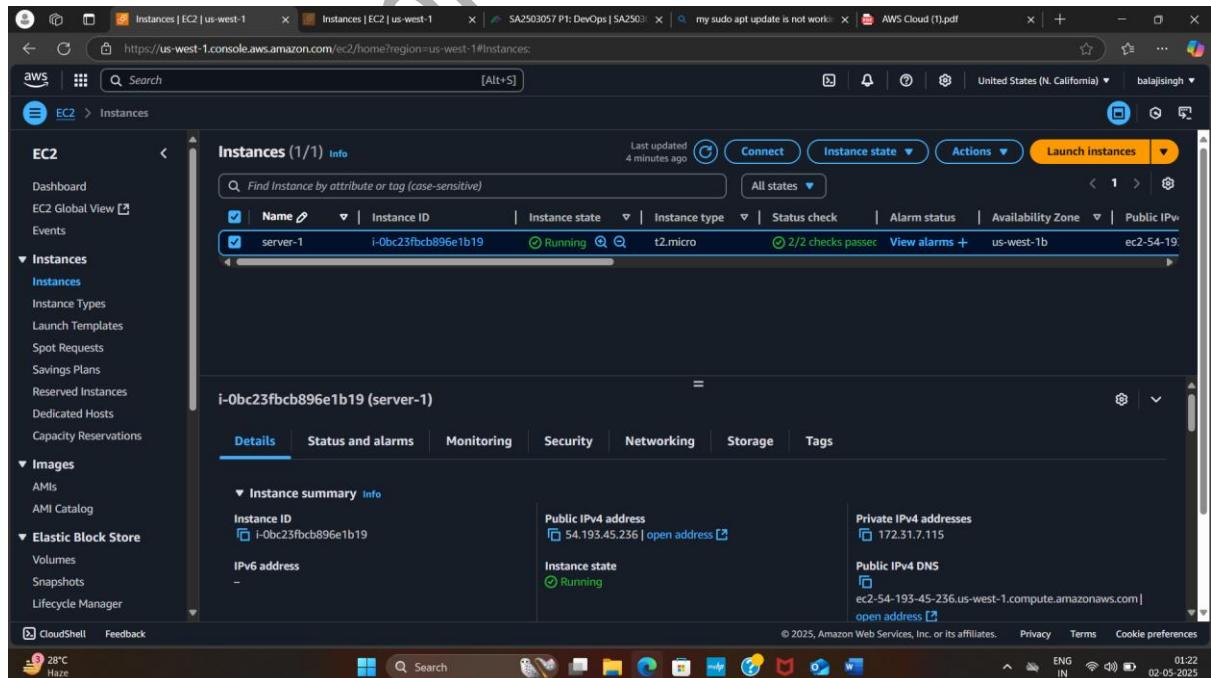
AWS Assignment-1

L3 completed

L4 - Connect to the AWS EC2 Ubuntu Instance and Update default packages, install JDK, Maven, Git, and validate the versions.

Steps:

1. Launch a Ec2 instance.



2. Now connect to your server.

```

System load: 0.0      Processes: 104
Usage of /: 25.0% of 6.71GB  Users logged in: 0
Memory usage: 20%      IPv4 address for enX0: 172.31.15.159
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-172-31-15-159:~ $
```

i-02524e35e573ae36 (server-1)
Public IPs: 54.153.29.177 Private IPs: 172.31.15.159

CloudShell Feedback © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences ENG IN 00:20 03-05-2025

3. Now run sudo apt update to update the default packages.

```

Get:34 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [16.5 kB]
Get:35 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [16.4 kB]
Get:36 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1304 B]
Get:37 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [212 B]
Get:38 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
Get:39 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:40 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:41 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [782 kB]
Get:42 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [147 kB]
Get:43 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]
Get:44 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [7068 B]
Get:45 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [833 kB]
Get:46 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [181 kB]
Get:47 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
Get:48 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [17.0 kB]
Get:49 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [931 kB]
Get:50 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [191 kB]
Get:51 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:52 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [468 B]
Get:53 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [17.6 kB]
Get:54 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [3792 B]
Get:55 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Get:56 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [380 B]
Fetched 33.8 MB in 14s (2496 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
82 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-15-159:~ $
```

i-02524e35e573ae36 (server-1)
Public IPs: 54.153.29.177 Private IPs: 172.31.15.159

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4. Now to install the jdk run “java –version to see the versions which are available in ubuntu.

```

Get:47 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
Get:48 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [17.0 kB]
Get:49 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [931 kB]
Get:50 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [191 kB]
Get:51 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:52 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [468 B]
Get:53 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [17.6 kB]
Get:54 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [3792 B]
Get:55 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Get:56 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [380 B]
Fetched 33.8 MB in 14s (2496 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
82 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-15-159:~$ ^C
ubuntu@ip-172-31-15-159:~$ ^C
ubuntu@ip-172-31-15-159:~$ ^C
ubuntu@ip-172-31-15-159:~$ java --version
Command 'java' not found, but can be installed with:
sudo apt install openjdk-17-jre-headless # version 17.0.14+7-1~24.04, or
sudo apt install openjdk-21-jre-headless # version 21.0.6+7-1~24.04.1
sudo apt install default-jre # version 21.17-75
sudo apt install openjdk-11-jre-headless # version 11.0.26+4~ubuntul-24.04
sudo apt install openjdk-8-jre-headless # version 8u442-b06-usb1-0ubuntul-24.04
sudo apt install openjdk-19-jre-headless # version 19.0.2+7-4
sudo apt install openjdk-20-jre-headless # version 20.0.2+9-1
sudo apt install openjdk-22-jre-headless # version 22-22ea-1
ubuntu@ip-172-31-15-159:~$ ■

i-02524e35e573eae36 (server-1)
Public IPs: 54.153.29.177 Private IPs: 172.31.15.159

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28°C Haze ENG IN 00:29 03-05-2025

```

5. Now choose the version which you want to install (`sudo apt install openjdk-17-jre-headless # version 17.0.14+7-1~24.04`) and type Y to give the permission to use the additional disk space.

```

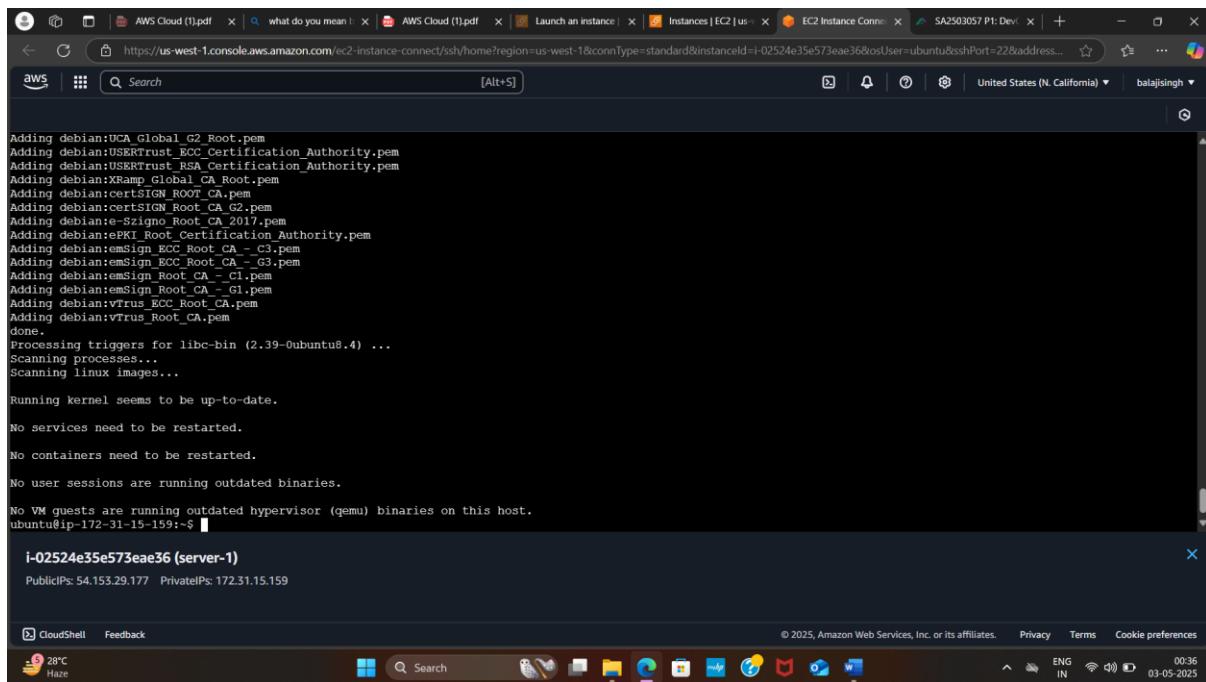
sudo apt install openjdk-21-jre-headless # version 21.0.6+7-1~24.04.1
sudo apt install default-jre # version 21.17-75
sudo apt install openjdk-11-jre-headless # version 11.0.26+4~ubuntul-24.04
sudo apt install openjdk-8-jre-headless # version 8u442-b06-usb1-0ubuntul-24.04
sudo apt install openjdk-19-jre-headless # version 19.0.2+7-4
sudo apt install openjdk-20-jre-headless # version 20.0.2+9-1
sudo apt install openjdk-22-jre-headless # version 22-22ea-1
ubuntu@ip-172-31-15-159:~$ apt install openjdk-17-jre-headless
E: Could not open lock file /var/lib/dpkg/lock-frontend - open (13: Permission denied)
E: Unable to acquire the dpkg frontend lock (/var/lib/dpkg/lock-frontend), are you root?
ubuntu@ip-172-31-15-159:~$ sudo apt install openjdk-17-jre-headless
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
alsa-topology-conf alsavu-ucm-conf ca-certificates-java fontconfig-config fonts-dejavu-core fonts-dejavu-mono java-common libasound2-data libasound2t64
libavahi-client3 libavahi-common-data libavahi-common3 libcurl5 libfontconfig1 libgraphite2-3 libharfbuzz0b libjpeg-turbo8 libjpeg8 liblcms2-2 libpcslite1
Suggested packages:
default-jre alsavu-alsavu-utils libasound2-plugins cups-common liblcms2-utils pscd libnss-mdns fonts-dejavu-extra fonts-ipafont-gothic fonts-ipafont-mincho
fonts-wqy-microhei1 fonts-wqy-zhenhei fonts-indic
The following NEW packages will be installed:
alsa-topology-conf alsavu-ucm-conf ca-certificates-java fontconfig-config fonts-dejavu-core fonts-dejavu-mono java-common libasound2-data libasound2t64
libavahi-client3 libavahi-common-data libavahi-common3 libcurl5 libfontconfig1 libgraphite2-3 libharfbuzz0b libjpeg-turbo8 libjpeg8 liblcms2-2 libpcslite1
openjdk-17-jre-headless
0 upgraded, 21 newly installed, 0 to remove and 82 not upgraded.
Need to get 51.2 MB of additional disk space.
After this operation, 203 MB of additional disk space will be used.
Do you want to continue? [Y/n] ■

i-02524e35e573eae36 (server-1)
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28°C Haze ENG IN 00:34 03-05-2025

```

6. JDK is installed.



```
Adding debian:UCA_Global_G2_Root.pem
Adding debian:USERTrust_ECC_Certification_Authority.pem
Adding debian:USERTrust_RSA_Certification_Authority.pem
Adding debian:X509_Global_CA_Root.pem
Adding debian:certSIGN_ROOT_CA.pem
Adding debian:certSIGN_Root_CA_G2.pem
Adding debian:e-Sign_Root_CA_2017.pem
Adding debian:ePKI_Root_Certification_Authority.pem
Adding debian:emSign_ECC_Root_CA_G3.pem
Adding debian:emSign_ECC_Root_CA_G4.pem
Adding debian:emSign_Root_CA_G1.pem
Adding debian:vTRUS_ECC_Root_CA.pem
Adding debian:vTRUS_Root_CA.pem
done.
Processing triggers for libc-bin (2.39-0ubuntu8.4) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

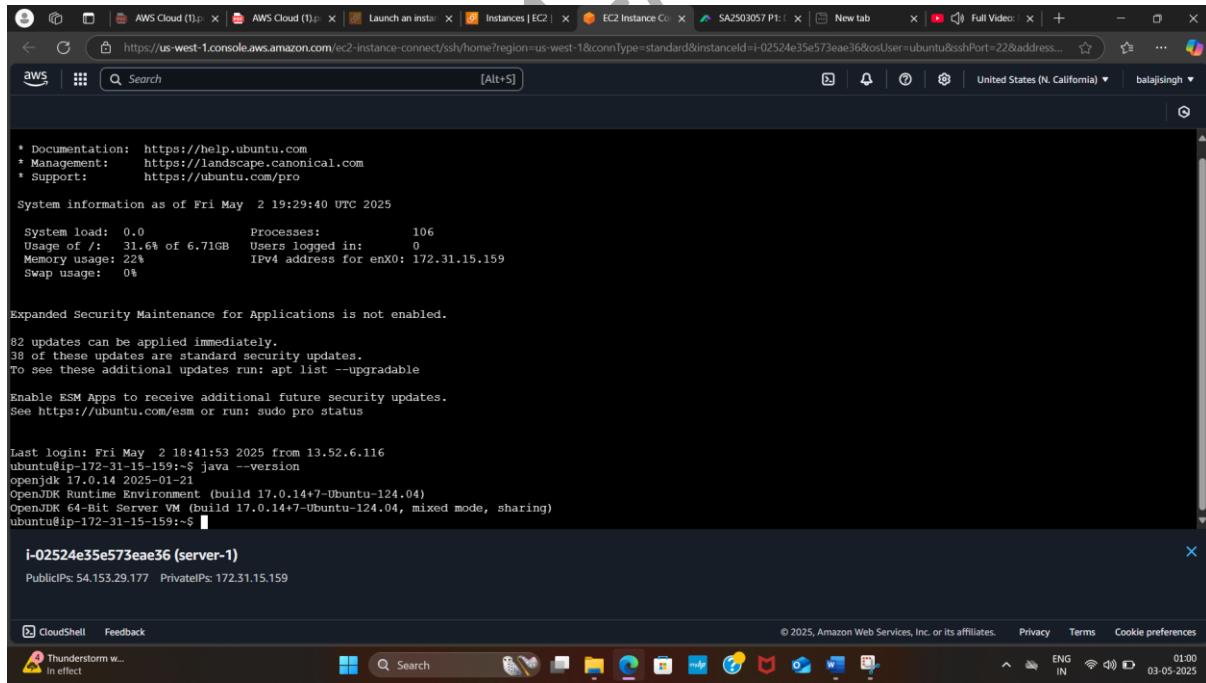
No VM guests are running outdated hypervisor (qemu) binaries on this host.

ubuntu@ip-172-31-15-159:~$
```

i-02524e35e573ae36 (server-1)
PublicIPs: 54.153.29.177 PrivateIPs: 172.31.15.159

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28°C Haze ENG IN 00:36 03-05-2025

7. Now to validate the version of java again type “java –version”.



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

System information as of Fri May 2 19:29:40 UTC 2025

System load: 0.0 Processes: 106
Usage of /: 31.6% of 6.71GB Users logged in: 0
Memory usage: 22% IPv4 address for enX0: 172.31.15.159
Swap usage: 0%
```

Expanded Security Maintenance for Applications is not enabled.

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

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

Last login: Fri May 2 18:41:53 2025 from 13.52.6.116
ubuntu@ip-172-31-15-159:~\$ java --version
openjdk 17.0.14 2025-01-21
OpenJDK Runtime Environment (build 17.0.14+7-Ubuntu-124.04)
OpenJDK 64-Bit Server VM (build 17.0.14+7-Ubuntu-124.04, mixed mode, sharing)
ubuntu@ip-172-31-15-159:~\$

i-02524e35e573ae36 (server-1)
PublicIPs: 54.153.29.177 PrivateIPs: 172.31.15.159

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Thunderstorm w... In effect ENG IN 01:00 03-05-2025

8. Now install maven in the same way as you done JDK and validate the version by typing “mvn --version”.

```
Setting up libguava-java (32.0.1-1) ...
Setting up liberror-prone-java (2.18.0-1) ...
Setting up libguice-java (4.2.3-2) ...
Setting up libmaven3-core-java (3.8.7-2) ...
Setting up maven (3.8.7-2) ...
update-alternatives: using /usr/share/maven/bin/mvn to provide /usr/bin/mvn (mvn) in auto mode
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.

ubuntu@ip-172-31-15-159:~$ maven --version
Command 'maven' not found, did you mean:
  command 'aven' from deb survex-aven (1.4.4-1build1)
Try: sudo apt install <deb name>
ubuntu@ip-172-31-15-159:~$ mvn --version
Apache Maven 3.8.7
Maven home: /usr/share/maven
Java version: 17.0.14, vendor: Ubuntu, runtime: /usr/lib/jvm/java-17-openjdk-amd64
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "6.3.0-1024-aws", arch: "amd64", family: "unix"
ubuntu@ip-172-31-15-159:~$ 
```

9. Now install git in ubuntu and validate the version.

```
Hit:1 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble InRelease  
Hit:2 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease  
Hit:3 http://us-west-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  
82 packages can be upgraded. Run 'apt list --upgradable' to see them.  
ubuntu@ip-172-31-15-159:~$ sudo apt install git  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
git is already the newest version (1:2.43.0-lubuntu7.2).  
0 upgraded, 0 newly installed, 0 to remove and 82 not upgraded.  
ubuntu@ip-172-31-15-159:~$ git :latest  
git: ':latest' is not a git command. See 'git --help'.  
ubuntu@ip-172-31-15-159:~$ git latest  
git: latest: command not found  
ubuntu@ip-172-31-15-159:~$ git clone https://github.com/git/git  
Cloning into 'git'...  
remote: Enumerating objects: 390165, done.  
remote: Counting objects: 100% (20/20), done.  
remote: Compressing objects: 100% (7/7), done.  
remote: Total 390165 (delta 15), reused 13 (delta 13), pack-reused 390145 (from 2)  
Receiving objects: 100% (390165/390165), 263.78 MiB | 19.86 MiB/s, done.  
Resolving deltas: 100% (294623/294623), done.  
ubuntu@ip-172-31-15-159:~$ git --version  
git version 2.43.0  
ubuntu@ip-172-31-15-159:~$ █
```

i-02524e35e573eae36 (server-1)

PublicIPs: 54.153.29.177 PrivateIPs: 172.31.15.159

L4 completed

L5 - Install Tomcat web application server in AWS EC2 Ubuntu Instance and access Tomcat using a web browser.

Steps:

1. Launch an Ec2 instance.

The screenshot shows the AWS CloudShell interface with the EC2 Instances page open. A single instance named "server-tomcat" is listed as "Running". The interface includes a sidebar with navigation links like Dashboard, EC2 Global View, and Launch Templates.

2. Now connect to the instance and update the default packages.

```

get:33 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [27.1 kB]
get:34 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [16.5 kB]
get:35 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [16.4 kB]
get:36 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1304 B]
get:37 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
get:38 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
get:39 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
get:40 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
get:41 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [782 kB]
get:42 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [147 kB]
get:43 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.6 kB]
get:44 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [7068 B]
get:45 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [833 kB]
get:46 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [181 kB]
get:47 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
get:48 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [17.0 kB]
get:49 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [931 kB]
get:50 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [191 kB]
get:51 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
get:52 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [468 B]
get:53 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [17.6 kB]
get:54 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [3792 B]
get:55 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
get:56 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [380 B]
Fetched 33.8 MB in 14s (2429 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
82 packages can be upgraded. Run 'apt list --upgradable' to see them.

i-09623470ee41c5d5b (server-tomcat)
PublicIPs: 18.144.90.101 PrivateIPs: 172.31.7.180

```

The screenshot shows the AWS CloudShell interface with the EC2 Instance Connect terminal window open. It displays the output of an "apt update" command, showing a list of packages being fetched and updated.

3. Now run tomcat –version command to see which version is available to install. (tomcat –version).

```

Get:43 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.6 kB]
Get:44 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [7069 B]
Get:45 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [833 kB]
Get:46 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [181 kB]
Get:47 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
Get:48 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [17.0 kB]
Get:49 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [931 kB]
Get:50 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [191 kB]
Get:51 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 kB]
Get:52 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [468 B]
Get:53 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [17.6 kB]
Get:54 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [3792 B]
Get:55 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Get:56 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [380 B]
Fetched 33.8 MB in 14s (2429 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
82 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-7-180:~$ tomcat
Command 'tomcat' not found, did you mean:
  command 'topcat' from deb topcat (4.9-1)
Try: sudo apt install <deb name>
ubuntu@ip-172-31-7-180:~$ sudo apt tomcat9
E: Invalid operation tomcat9
ubuntu@ip-172-31-7-180:~$ sudo apt install tomcat9
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
i-09623470ee41c5d5b (server-tomcat)
PublicIPs: 18.144.90.101 PrivateIPs: 172.31.7.180

```

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The versions are not available!

- Now to install it manually go to chrome and search for tomcat and click in the official page of tomacat.

Apache Tomcat
Java web application server

Apache Tomcat® - Welcome!

Apache Tomcat is an open source software that implements Jakarta EE specifications for web applications. Learn about the latest releases, features, migration tools, and how to get involved...

Home
Tomcat 9 and earlier implement specifications developed as part of Java...

Taglibs
Apache Taglibs provides open source implementations of Tag Libraries for us...

Maven Plugin
The Apache Tomcat Maven Plugin provides goals to manipulate WAR proj...

Which version
Apache Tomcat 3.x is available for download from the archives. All Apache ...

Tomcat 11 (beta)
Welcome to the Apache Tomcat @ 11.x software download page. This page pro...

Tomcat 10
Welcome to the Apache Tomcat @ 10.x software download page. This page pro...

Apache Tomcat - Wikipedia
Java web application server

Apache Tomcat is a free and open-source implementation of the Jakarta Servlet, Jakarta Expression Language, and WebSocket technologies. It provides a "pure Java" HTTP web server environment in...

See more on Wikipedia

How to Install Apache Tomcat on Windows (Step-by-Step) ...

Learn to install the Apache Tomcat web server and servlet...

phoenixNAP

- Now after opening the page go to the downloads and choose the version that you want to download.

The Apache Tomcat® software is an open source implementation of the Jakarta Servlet, Jakarta Pages, Jakarta Expression Language, Jakarta WebSocket, Jakarta Annotations and Jakarta Authentication specifications. These specifications are part of the Jakarta EE platform.

The Jakarta EE platform is the evolution of the Java EE platform. Tomcat 10 and later implement specifications developed as part of Jakarta EE. Tomcat 9 and earlier implement specifications developed as part of Java EE.

The Apache Tomcat software is developed in an open and participatory environment and released under the Apache License version 2. The Apache Tomcat project is intended to be a collaboration of the best-of-breed developers from around the world. We invite you to participate in this open development project. To learn more about getting involved, click here.

Apache Tomcat software powers numerous large-scale, mission-critical web applications across a diverse range of industries and organizations. Some of these users and their stories are listed on the PoweredBy wiki page.

Apache Tomcat, Tomcat, Apache, the Apache feather, and the Apache Tomcat project logo are trademarks of the Apache Software Foundation.

6. Now after choosing the version then choose [tar.gz \(pgp, sha512\)](#) for linux or ububtu and copy the link address.

You must verify the integrity of the downloaded files. We provide OpenPGP signatures for every release file. This signature should be matched against the [KEYS](#) file which contains the OpenPGP keys of Tomcat's Release Managers. We also provide SHA-512 checksums for every release file. After you download the file, you should calculate a checksum for your download, and make sure it is the same as ours.

Other mirrors: <https://dlcdn.apache.org/> | Change

Please see the [README](#) file for packaging information. It explains what every distribution contains.

Core:

- [zip \(pgp, sha512\)](#)
- [tar.gz \(pgp, sha512\)](#) Open link in new tab Open link in new window Open link in InPrivate window Open link in split screen window Save link as Copy link Add to Collections Share Inspect
- [32-bit Windows](#)
- [64-bit Windows](#)
- [32-bit/64-bit Windows](#)

Full documentation:

- [tar.gz \(pgp, sha512\)](#)

Deployer:

- [zip \(pgp, sha512\)](#)
- [tar.gz \(pgp, sha512\)](#)

Embedded:

- [tar.gz \(pgp, sha512\)](#)
- [zip \(pgp, sha512\)](#)

7. Now paste this link in you server with wget command which is used to download packages from the web/ internet which should be open source.

```

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

Last login: Sat May  3 08:18:07 2025 from 13.52.6.115
ubuntu@ip-172-31-7-180:~$ sudo apt update
Hit:1 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-west-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
82 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-7-180:~$ https://downloads.apache.org/tomcat/tomcat-9/v9.0.104/bin/apache-tomcat-9.0.104.tar.gz.asc
--2025-05-03 08:51:19-- https://downloads.apache.org/tomcat/tomcat-9/v9.0.104/bin/apache-tomcat-9.0.104.tar.gz.asc
Resolving downloads.apache.org (downloads.apache.org) ... 135.181.214.104, 88.99.208.237, 2a01:4f8:10a:39da::2, ...
Connecting to downloads.apache.org (downloads.apache.org) |135.181.214.104|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 833 [text/plain]
Saving to: 'apache-tomcat-9.0.104.tar.gz.asc'

apache-tomcat-9.0.104.tar.gz.asc      100%[=====]     833  --.-KB/s   in 0s

2025-05-03 08:51:19 (400 MB/s) - 'apache-tomcat-9.0.104.tar.gz.asc' saved [833/833]
ubuntu@ip-172-31-7-180:~$ █

```

i-09623470ee41c5d5b (server-tomcat)
PublicIPs: 18.144.90.101 PrivateIPs: 172.31.7.180

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8. Now type ls to list the to show what are in your present directory.

```

Last login: Sat May  3 08:18:07 2025 from 13.52.6.115
ubuntu@ip-172-31-7-180:~$ sudo apt update
Hit:1 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-west-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-west-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
82 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-7-180:~$ https://downloads.apache.org/tomcat/tomcat-9/v9.0.104/bin/apache-tomcat-9.0.104.tar.gz.asc
--2025-05-03 08:51:19-- https://downloads.apache.org/tomcat/tomcat-9/v9.0.104/bin/apache-tomcat-9.0.104.tar.gz.asc
Resolving downloads.apache.org (downloads.apache.org) ... 135.181.214.104, 88.99.208.237, 2a01:4f8:10a:39da::2, ...
Connecting to downloads.apache.org (downloads.apache.org) |135.181.214.104|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 833 [text/plain]
Saving to: 'apache-tomcat-9.0.104.tar.gz.asc'

apache-tomcat-9.0.104.tar.gz.asc      100%[=====]     833  --.-KB/s   in 0s

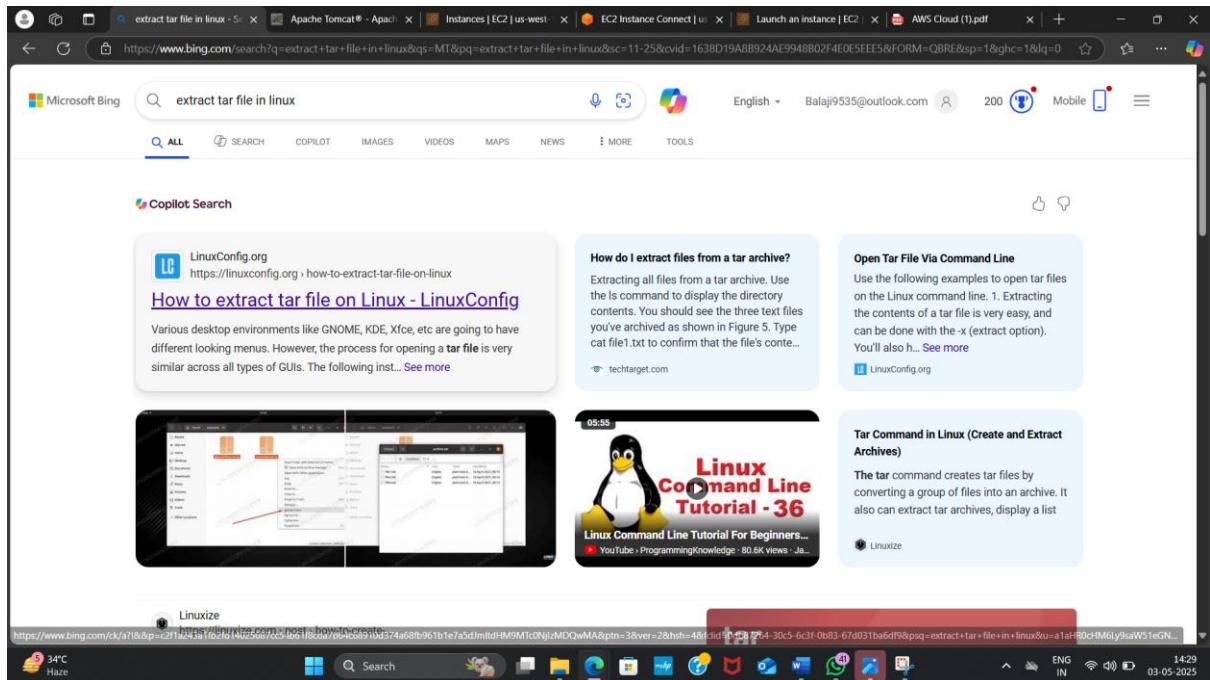
2025-05-03 08:51:19 (400 MB/s) - 'apache-tomcat-9.0.104.tar.gz.asc' saved [833/833]
ubuntu@ip-172-31-7-180:~$ ls
apache-tomcat-9.0.104.tar.gz.asc
ubuntu@ip-172-31-7-180:~$ █

```

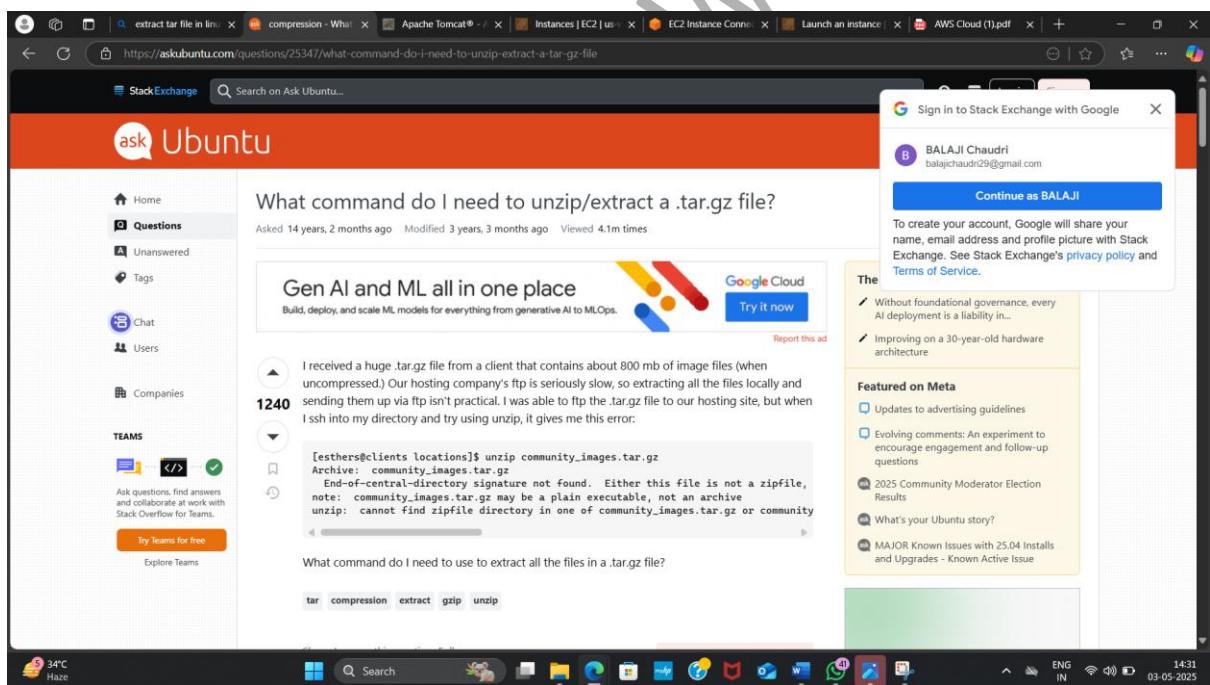
i-09623470ee41c5d5b (server-tomcat)
PublicIPs: 18.144.90.101 PrivateIPs: 172.31.7.180

Air: Moderate Now CloudShell Feedback © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences ENG IN 14:26 03-05-2025

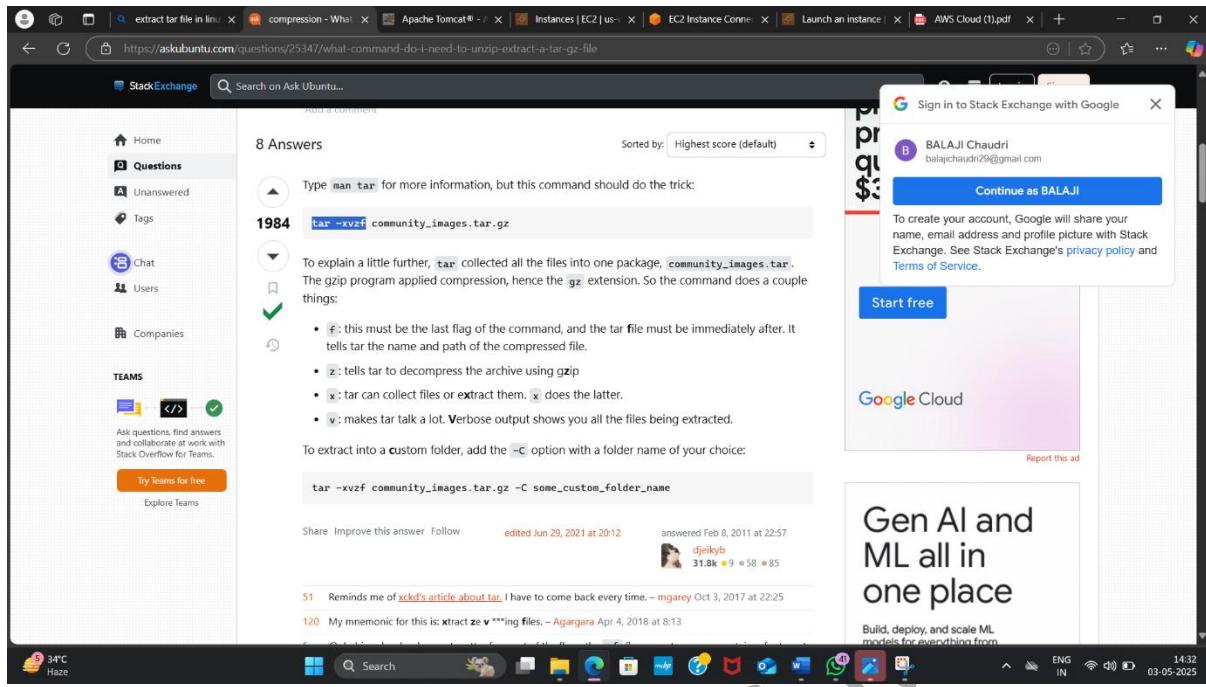
9. Now we need to extract this if you know the command, or go to google and search for extract tar file in linux.



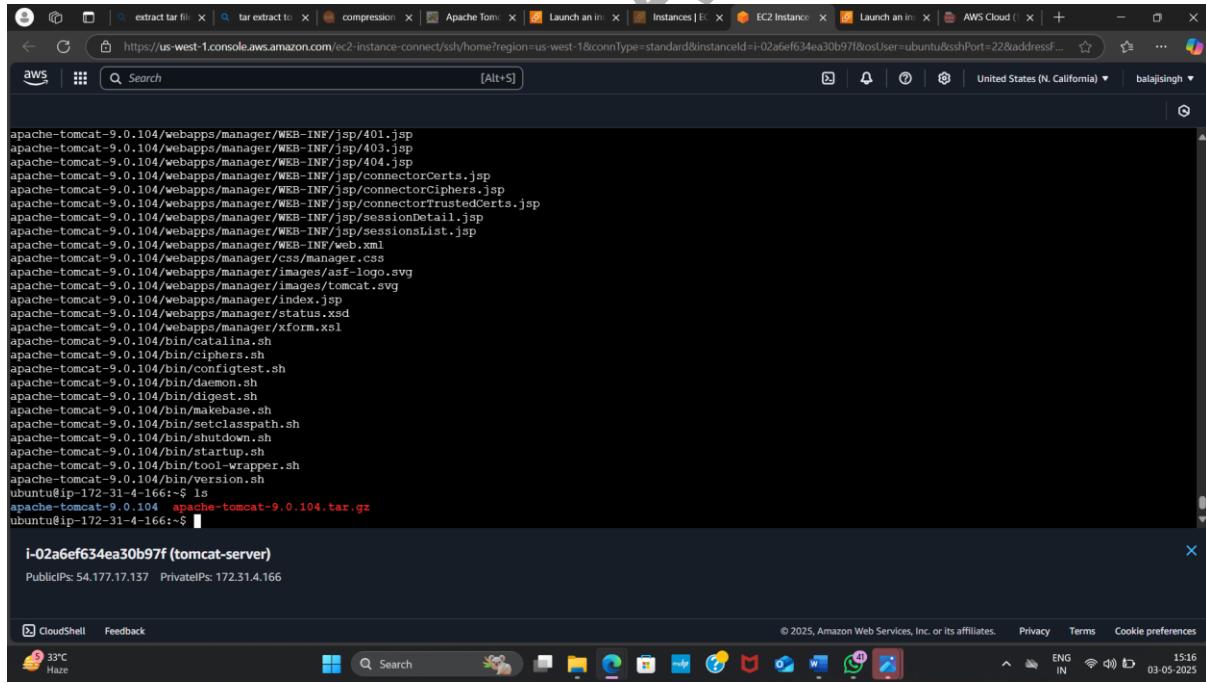
10. Now go to askubuntu or any website.



11. Now copy the command to extract the file.



12. Now copy it you instance and extract it.



13. Now go inside the folder by typing cd apa and press tab.

```
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104$ ls
BUILDING.txt CONTRIBUTING.md LICENSE NOTICE README.md RELEASE-NOTES RUNNING.txt bin conf lib logs temp webapps work
```

i-02a6ef634ea30b97f (tomcat-server)
Public IPs: 54.177.17.137 Private IPs: 172.31.4.166

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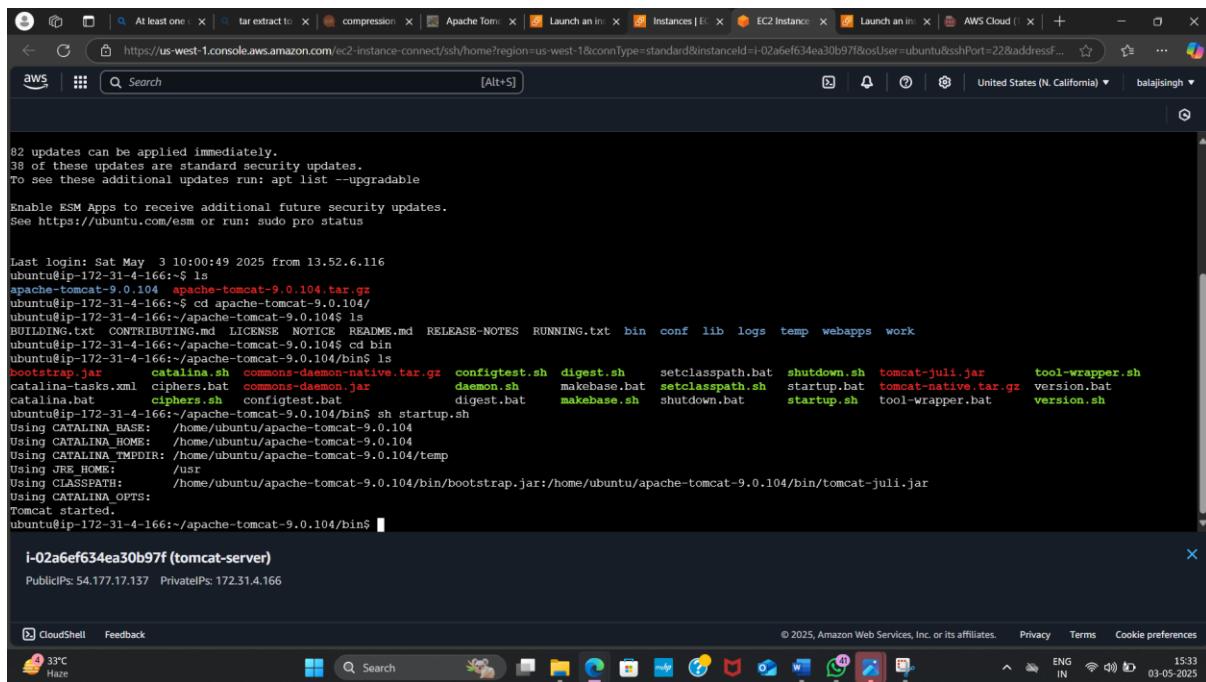
14. To run the tomcat type cd bin.

```
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104$ ls
BUILDING.txt CONTRIBUTING.md LICENSE NOTICE README.md RELEASE-NOTES RUNNING.txt bin conf lib logs temp webapps work
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104$ cd bin
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104/bin$ ls
bootstrap.jar catalina.sh commons-daemon-native.tar.gz configtest.sh digest.sh setclasspath.bat shutdown.sh tomcat-juli.jar tool-wrapper.sh
catalina-tasks.xml ciphers.bat commons-daemon.jar daemon.sh makebase.bat setclasspath.sh startup.bat tomcat-native.tar.gz version.bat
catalina.bat configtest.bat digest.bat makebase.sh shutdown.bat startup.sh tool-wrapper.bat version.sh
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104/bin$
```

i-02a6ef634ea30b97f (tomcat-server)
Public IPs: 54.177.17.137 Private IPs: 172.31.4.166

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15. Now to run/start tomcat the script type sh startup.sh.



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

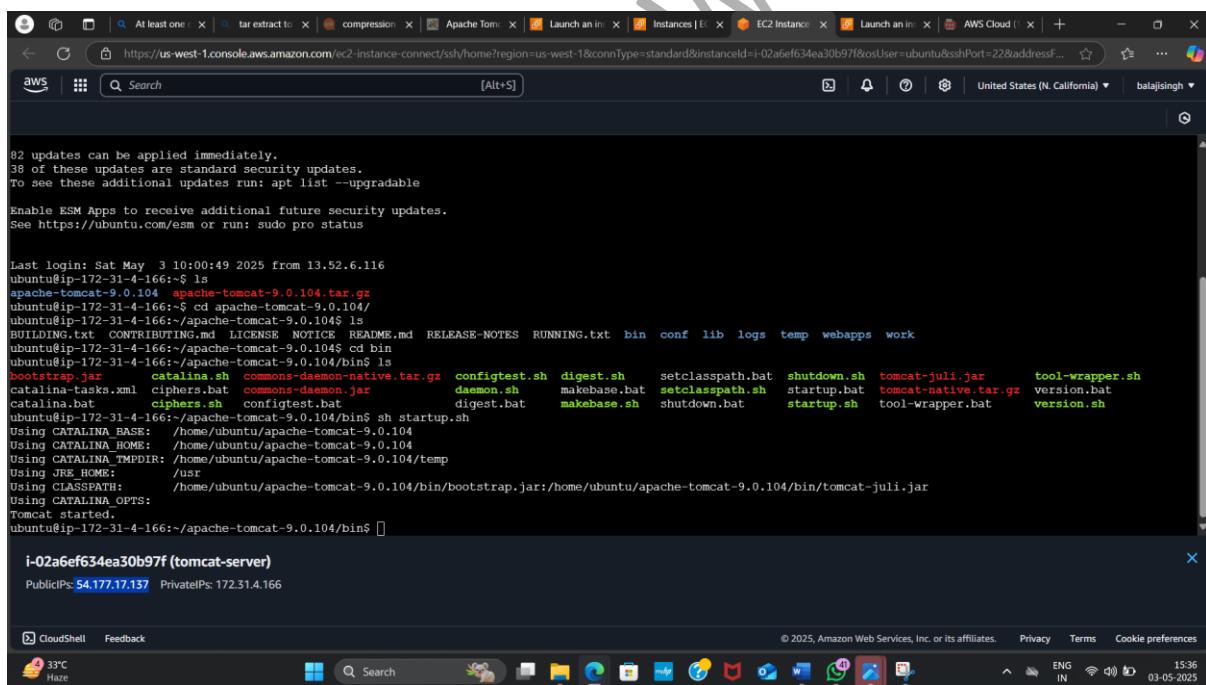
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Sat May  3 10:00:49 2025 from 13.52.6.116
ubuntu@ip-172-31-4-166:~$ ls
apache-tomcat-9.0.104 apache-tomcat-9.0.104.tar.gz
ubuntu@ip-172-31-4-166:~$ cd apache-tomcat-9.0.104/
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104$ ls
BUILDING.txt CONTRIBUTING.md LICENSE NOTICE README.md RELEASE-NOTES RUNNING.txt bin conf lib logs temp webapps work
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104$ cd bin
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104/bin$ ls
bootstrap.jar catalina.sh commons-daemon-native.tar.gz configtest.sh digest.sh setclasspath.bat shutdown.sh tomcat-juli.jar tool-wrapper.sh
catalina-tasks.xml ciphers.bat commons-daemon.jar daemon.sh makebase.bat setclasspath.sh startup.bat tomcat-native.tar.gz version.bat
catalina.bat ciphers.sh configtest.bat digest.bat makebase.sh shutdown.bat startup.sh tool-wrapper.bat version.sh
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104/bin$ sh startup.sh
Using CATALINA_BASE: /home/ubuntu/apache-tomcat-9.0.104
Using CATALINA_HOME: /home/ubuntu/apache-tomcat-9.0.104
Using CATALINA_TMPDIR: /home/ubuntu/apache-tomcat-9.0.104/temp
Using JRE_HOME: /usr
Using CLASSPATH: /home/ubuntu/apache-tomcat-9.0.104/bin/bootstrap.jar:/home/ubuntu/apache-tomcat-9.0.104/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104/bin$ 
```

i-02a6ef634ea30b97f (tomcat-server)

PublicIPs: 54.177.17.137 PrivateIPs: 172.31.4.166

16. Now copy the ip address.



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

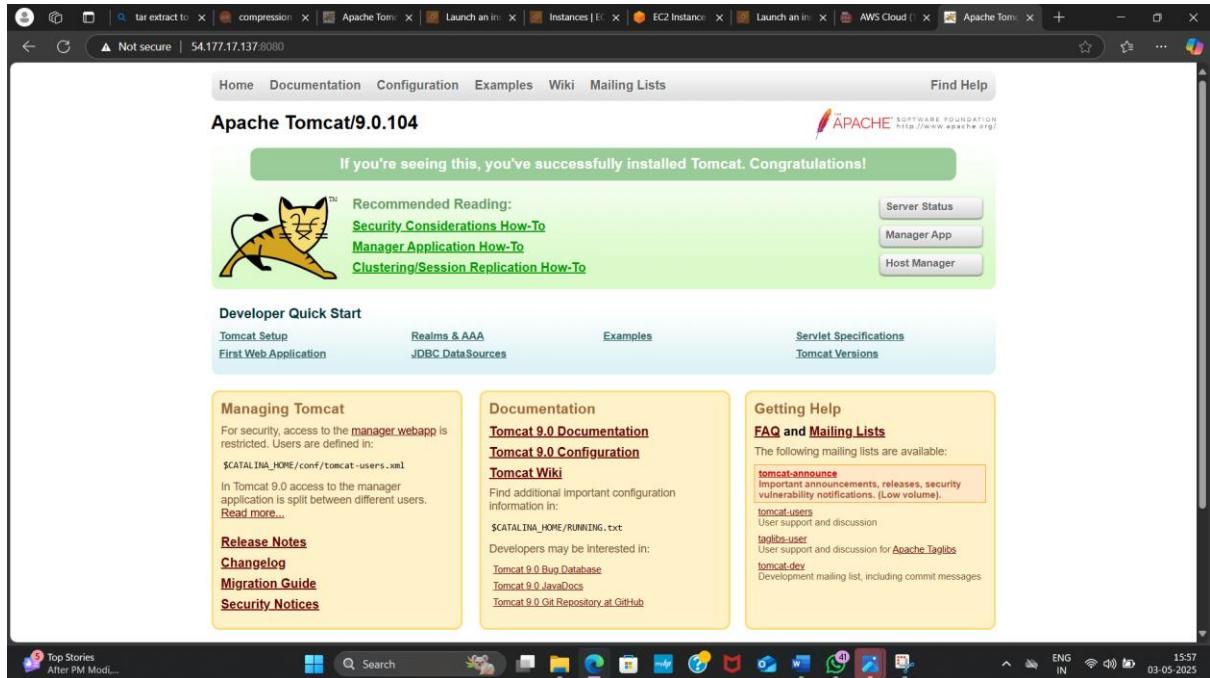
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Sat May  3 10:00:49 2025 from 13.52.6.116
ubuntu@ip-172-31-4-166:~$ ls
apache-tomcat-9.0.104 apache-tomcat-9.0.104.tar.gz
ubuntu@ip-172-31-4-166:~$ cd apache-tomcat-9.0.104/
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104$ ls
BUILDING.txt CONTRIBUTING.md LICENSE NOTICE README.md RELEASE-NOTES RUNNING.txt bin conf lib logs temp webapps work
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104$ cd bin
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104/bin$ ls
bootstrap.jar catalina.sh commons-daemon-native.tar.gz configtest.sh digest.sh setclasspath.bat shutdown.sh tomcat-juli.jar tool-wrapper.sh
catalina-tasks.xml ciphers.bat commons-daemon.jar daemon.sh makebase.bat setclasspath.sh startup.bat tomcat-native.tar.gz version.bat
catalina.bat ciphers.sh configtest.bat digest.bat makebase.sh shutdown.bat startup.sh tool-wrapper.bat version.sh
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104/bin$ sh startup.sh
Using CATALINA_BASE: /home/ubuntu/apache-tomcat-9.0.104
Using CATALINA_HOME: /home/ubuntu/apache-tomcat-9.0.104
Using CATALINA_TMPDIR: /home/ubuntu/apache-tomcat-9.0.104/temp
Using JRE_HOME: /usr
Using CLASSPATH: /home/ubuntu/apache-tomcat-9.0.104/bin/bootstrap.jar:/home/ubuntu/apache-tomcat-9.0.104/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
ubuntu@ip-172-31-4-166:~/apache-tomcat-9.0.104/bin$ 
```

i-02a6ef634ea30b97f (tomcat-server)

PublicIPs: 54.177.17.137 PrivateIPs: 172.31.4.166

17. Paste this IP address in chrome to access the tomcat along with tomcat port number 8080.

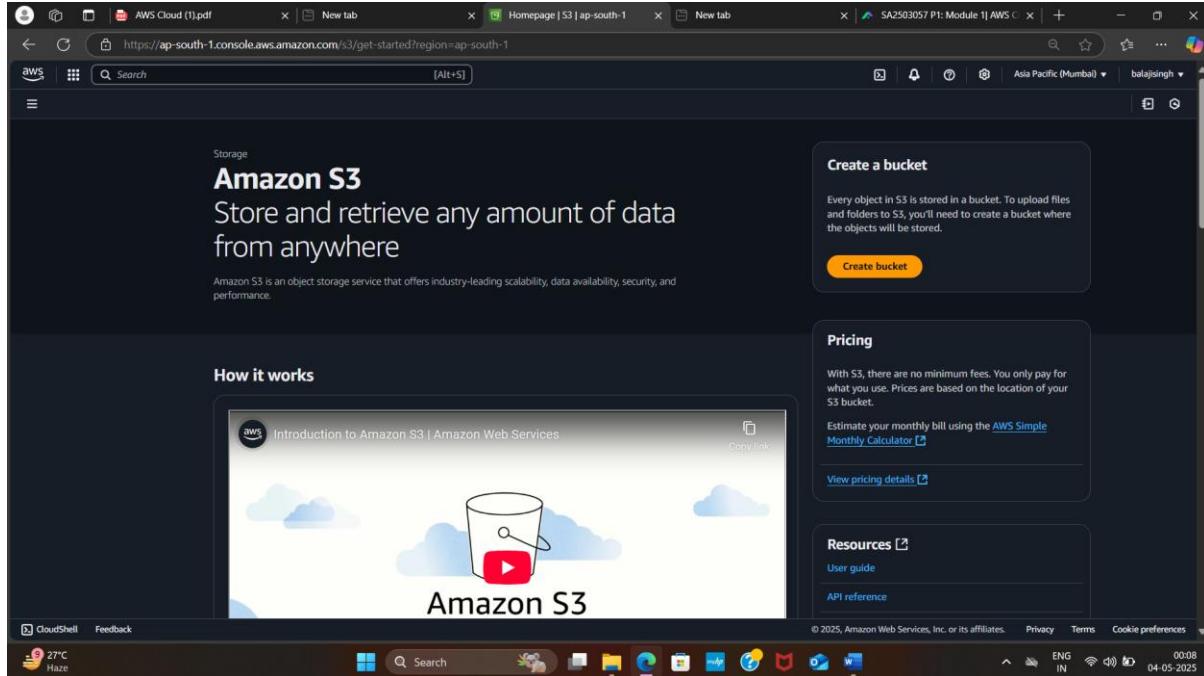


L5 completed

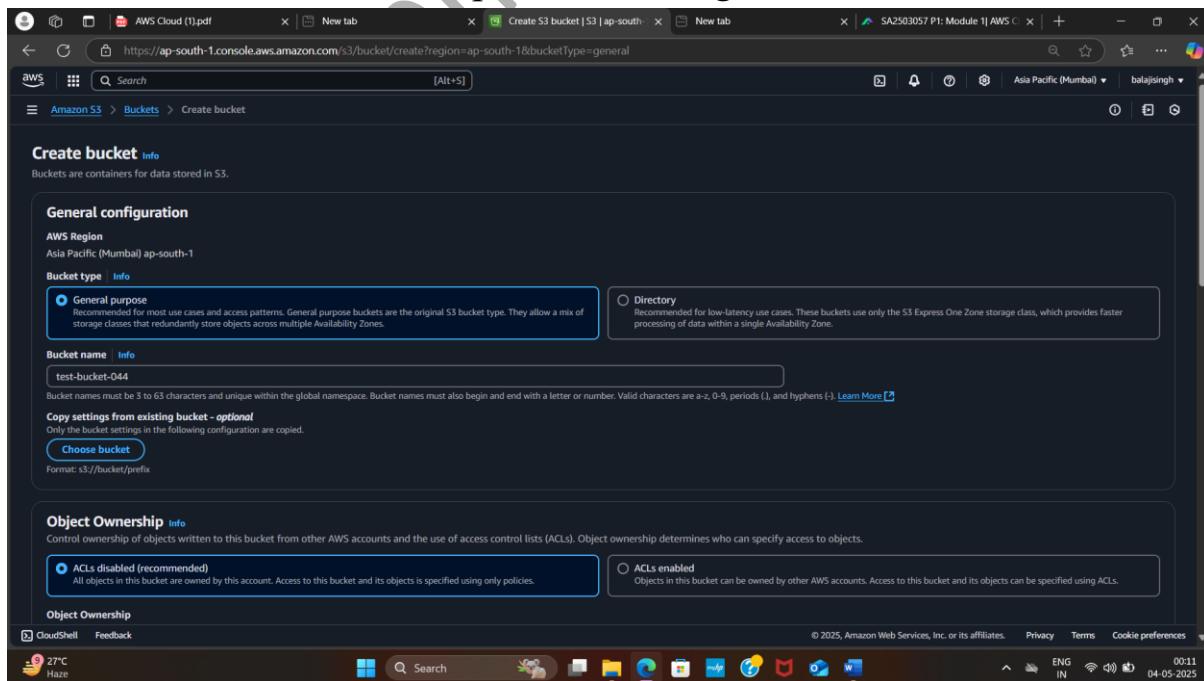
L6 - Create S3 Bucket and add folders and files.

Steps:

1. Search for s3 and open click on create bucket.



2. Now in configuration choose for general purpose and give a unique name to the bucket and keep all the settings default.



3. Bucket has been created.

The screenshot shows the AWS S3 buckets page. At the top, there is an account snapshot message: "Account snapshot - updated every 24 hours" and "Storage lens provides visibility into storage usage and activity trends. Metrics don't include directory buckets." Below this, there are two tabs: "General purpose buckets" (selected) and "Directory buckets". A search bar is present. The main table lists one bucket:

Name	AWS Region	IAM Access Analyzer	Creation date
test-bucket-044	Asia Pacific (Mumbai) ap-south-1	View analyzer for ap-south-1	May 4, 2025, 01:06:29 (UTC+05:30)

At the bottom right of the table, there are buttons for "Copy ARN", "Empty", "Delete", and "Create bucket". The status bar at the bottom indicates "CloudShell Feedback", "27°C Haze", and the system clock "04-05-2025 01:36".

4. Now go into the bucket and click on upload to add the files in bucket.

The screenshot shows the "test-bucket-044" bucket page. The top navigation bar includes tabs for "Objects" (selected), "Properties", "Permissions", "Metrics", "Management", and "Access Points". Below the tabs, there is a search bar and a table header with columns: "Name", "Type", "Last modified", "Size", and "Storage class". The table body displays a message: "No objects" and "You don't have any objects in this bucket.". At the bottom of the table, there is a blue "Upload" button. The status bar at the bottom indicates "CloudShell Feedback", "News for you Chennai-Colom...", and the system clock "04-05-2025 01:07".

5. Now choose the files that you want upload and click on upload.

The screenshot shows a file upload interface. On the left, a file browser window displays a list of files and folders from the 'Downloads' folder, including 'tomcat steps for ubuntu', 'AWS Cloud (1)', 'Module 1 AWS fundamentals', 'server1-keypair.pem', 'ubuntu-keypair.pem', and 'Documents - Shortcut'. On the right, an AWS S3 upload interface is shown. It has a 'Destination' section set to 's3://test-bucket-044'. Below it is a 'Permissions' section. A large central area is for uploading files, with a message stating 'You have not chosen any files or folders to upload.' At the bottom right are 'Remove', 'Add files', and 'Add folder' buttons.

The screenshot shows the AWS S3 console with the URL 'https://ap-south-1.console.aws.amazon.com/s3/upload/test-bucket-044?region=ap-south-1&bucketType=general'. The main area displays the uploaded file 'AWS Cloud (1).pdf' with details: Name (AWS Cloud (1).pdf), Type (application/pdf), and Size (114.7 KB). Below this is a 'Destination' section with the same 's3://test-bucket-044' configuration. A 'Properties' section is also present. At the bottom right are 'Cancel' and 'Upload' buttons. The status bar at the bottom indicates 'CloudShell Feedback' and system information like 'Air: Moderate Now', 'ENG IN', '01:09', and '04-05-2025'.

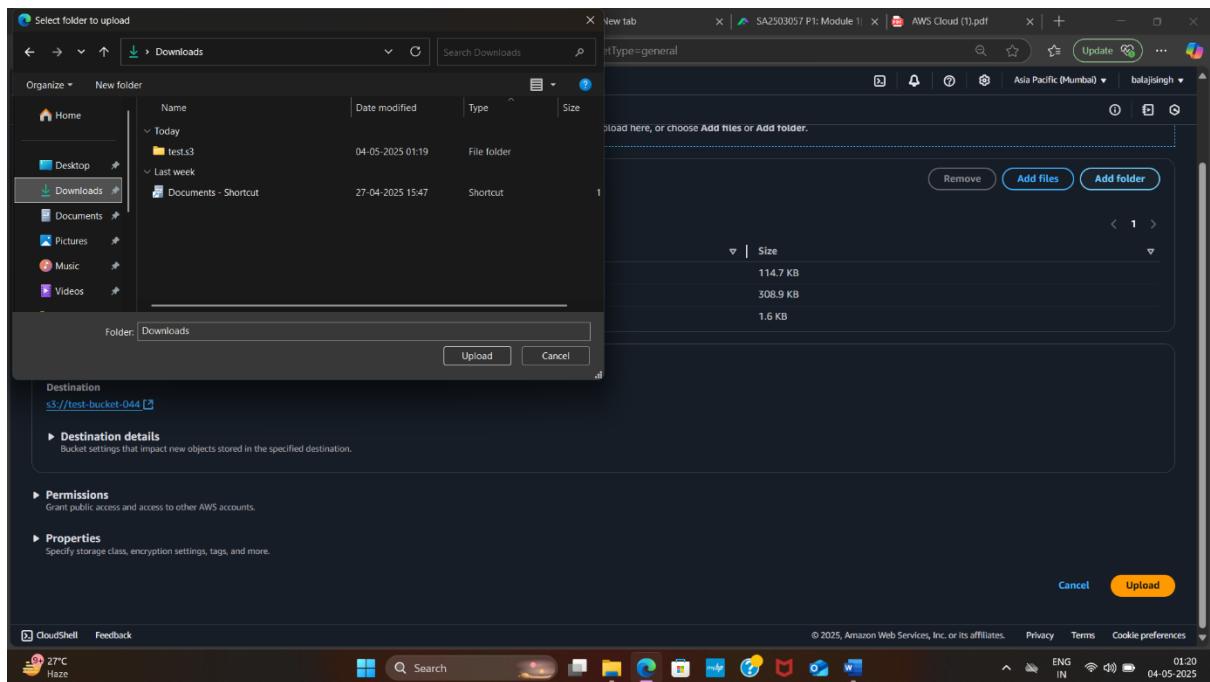
6. Object has been uploaded.

The screenshot shows the AWS S3 console interface. At the top, there are several tabs open, including 'AWS Cloud (1).pdf', 'test-bucket-044 - S3 buck...', 'New tab', 'SA2503057 Pt: Module 1...', and 'AWS Cloud (1).pdf'. The main navigation bar shows 'Amazon S3 > Buckets > test-bucket-044'. Below this, the 'test-bucket-044' page is displayed with the title 'test-bucket-044 info'. The 'Objects' tab is selected, showing one object: 'AWS Cloud (1).pdf'. The file details are: Name: AWS Cloud (1).pdf, Type: pdf, Last modified: May 4, 2025, 01:12:29 (UTC+05:30), Size: 114.7 KB, Storage class: Standard. There are buttons for 'Copy S3 URI', 'Copy URL', 'Download', 'Open', 'Delete', 'Actions', 'Create folder', and 'Upload'. A search bar at the top says 'Find objects by prefix'. The bottom of the screen shows a Windows taskbar with various icons and system status.

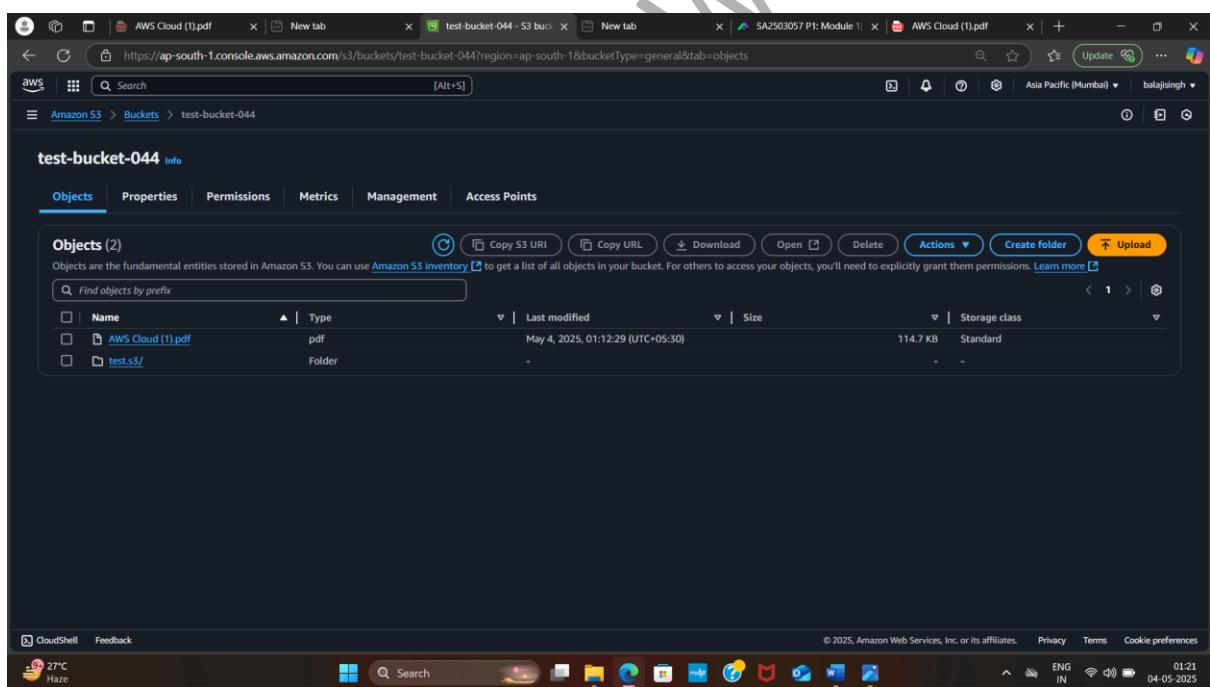
7. Now to add files again go to the bucket and click on upload then click on add folder.

The screenshot shows the 'Upload' page for the 'test-bucket-044' bucket. The title is 'Upload info'. It instructs users to add files and folders to S3. A large dashed box allows dragging and dropping files or choosing them from a file dialog. Below this, the 'Files and folders (0)' section shows a table with columns: Name, Type, and Size. A message indicates 'No files or folders' have been chosen. The 'Destination' section shows the destination as 's3://test-bucket-044'. The 'Destination details' section notes that bucket settings impact new objects stored in the specified destination. The 'Permissions' section grants public access. The bottom of the screen shows a Windows taskbar with various icons and system status.

8. Now choose the folder that you want to add.



9. The folder has been uploaded.



10. To see the object in the folder click on the folder.

The screenshot shows the AWS S3 console interface. At the top, there are several tabs and a search bar. Below the header, the path 'Amazon S3 > Buckets > test-bucket-044 > test.s3/' is visible. On the left, a sidebar has 'Objects (3)' selected. The main area displays a table of objects:

Name	Type	Last modified	Size	Storage class
AWS Cloud (1).pdf	pdf	May 4, 2025, 01:21:47 (UTC+05:30)	114.7 KB	Standard
DevOps PAP Curriculum.pdf	pdf	May 4, 2025, 01:21:48 (UTC+05:30)	308.9 KB	Standard
ubuntu-keypair.pem	pem	May 4, 2025, 01:21:48 (UTC+05:30)	1.6 KB	Standard

At the bottom of the page, there are links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences. The system status bar at the bottom right shows '27°C Haze', 'ENG IN', and the date '04-05-2025'.

L6 completed