Experiment no 1

Aim: To understand the benefits of Cloud Infrastructure and Setup AWS Cloud9 IDE, Launch AWS Cloud9 IDE and Perform Collaboration Demonstration.

Theory:
AWS Cloud9 is a cloud-based integrated development environment (IDE) that lets you write, run, and debug your code with just a browser. It includes a code editor, debugger, and terminal. Cloud9 comes prepackaged with essential tools for popular programming languages, including JavaScript, Python, PHP, and more, so you don’t need to install files or configure your development machine to start new projects. Since your Cloud9 IDE is cloud-based, you can work on your projects from your office, home, or anywhere using an internet-connected machine. Cloud9 also provides a seamless experience for developing serverless applications enabling you to easily define resources, debug, and switch between local and remote execution of serverless applications. With Cloud9, you can quickly share your development environment with your team, enabling you to pair program and track each other&#39;s inputs in real time.

Benefits:

CODE WITH JUST A BROWSER
AWS Cloud9 gives you the flexibility to run your development environment on a managed Amazon EC2 instance or any existing Linux server that supports SSH. This means that you can write, run, and debug applications with just a browser, without needing to install or maintain a local IDE. The Cloud9 code editor and integrated debugger include helpful, time-saving features such as code hinting, code completion, and step-through debugging. The Cloud9 terminal provides a browser- based shell experience enabling you to install additional software, do a git push, or enter commands.

CODE TOGETHER IN REAL TIME
AWS Cloud9 makes collaborating on code easy. You can share your development environment with your team in just a few clicks and pair program together. While collaborating, your team members can see each other type in real time, and instantly chat with one another from within the IDE.

BUILD SERVERLESS APPLICATIONS WITH EASE

AWS Cloud9 makes it easy to write, run, and debug serverless applications. It preconfigures the development environment with all the SDKs, libraries, and plug-ins needed for serverless development. Cloud9 also provides an environment for locally testing and debugging AWS Lambda functions. This allows you to iterate on your code directly, saving you time and improving the quality of your code.

DIRECT TERMINAL ACCESS TO AWS

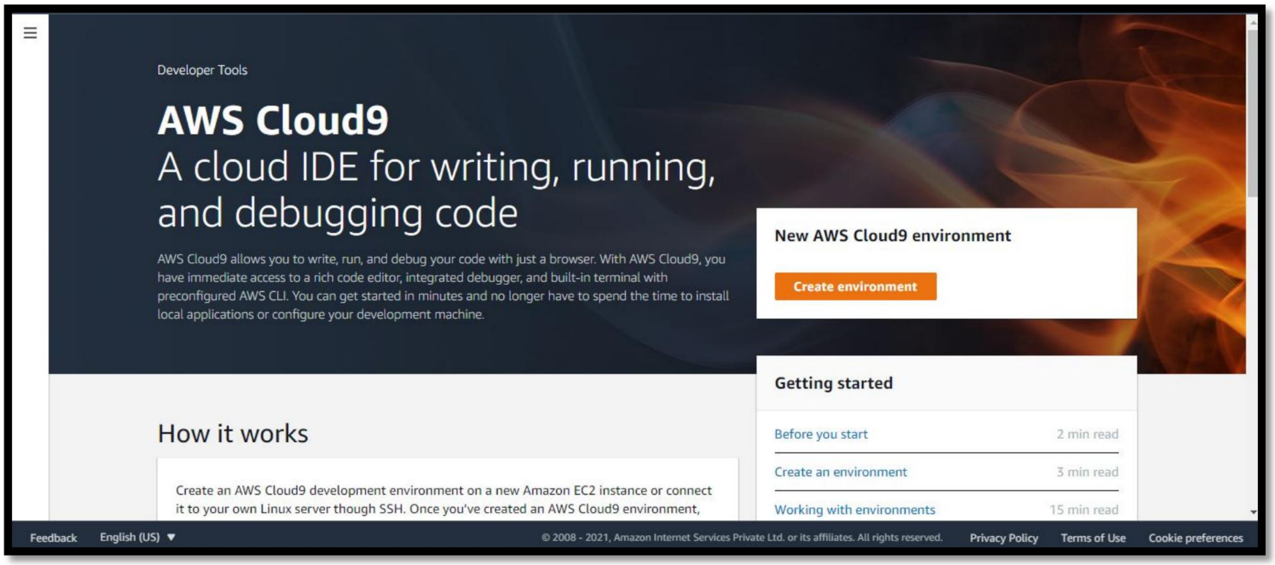
AWS Cloud9 comes with a terminal that includes sudo privileges to the managed Amazon EC2 instance that is hosting your development environment and a preauthenticated AWS Command Line Interface. This makes it easy for you to quickly run commands and directly access AWS services.

START NEW PROJECTS QUICKLY

AWS Cloud9 makes it easy for you to start new projects. Cloud9's development environment comes prepackaged with tooling for over 40 programming languages, including Node.js, JavaScript, Python, PHP, Ruby, Go, and C++. This enables you to start writing code for popular application stacks within minutes by eliminating the need to install or configure files, SDKs, and plug-ins for your development machine. Because Cloud9 is cloud-based, you can easily maintain multiple development environments to isolate your project's resources.

Steps:

1. Click on Create Environment.


Developer Tools

AWS Cloud9
A cloud IDE for writing, running, and debugging code

AWS Cloud9 allows you to write, run, and debug your code with just a browser. With AWS Cloud9, you have immediate access to a rich code editor, integrated debugger, and built-in terminal with preconfigured AWS CLI. You can get started in minutes and no longer have to spend the time to install local applications or configure your development machine.

New AWS Cloud9 environment

Getting started

Before you start	2 min read
Create an AWS Cloud9 environment	3 min read
Working with environments	15 min read

How it works

Create an AWS Cloud9 development environment on a new Amazon EC2 instance or connect it to your own Linux server though SSH. Once you've created an AWS Cloud9 environment,

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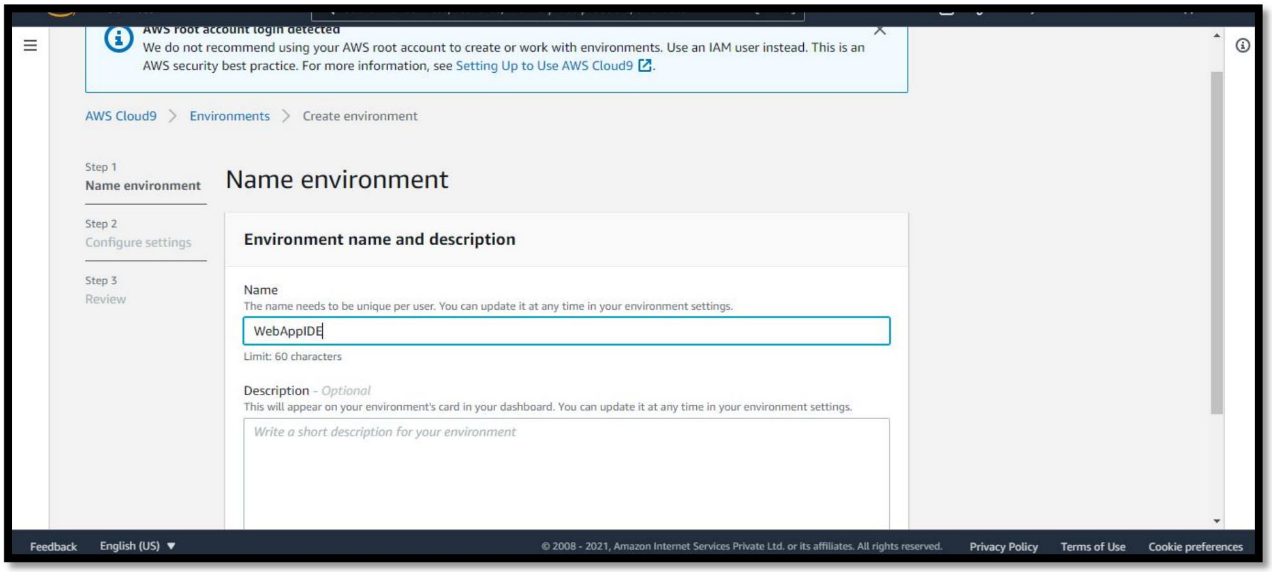
2. Provide name for the Environment and click on next.


AWS root account login detected
We do not recommend using your AWS root account to create or work with environments. Use an IAM user instead. This is an AWS security best practice. For more information, see Setting Up to Use AWS Cloud9.

Name environment

Environment name and description

Name
The name needs to be unique per user. You can update it at any time in your environment settings.
WebAppIDE
Limit: 60 characters

Description - *Optional*
This will appear on your environment's card in your dashboard. You can update it at any time in your environment settings.
Write a short description for your environment

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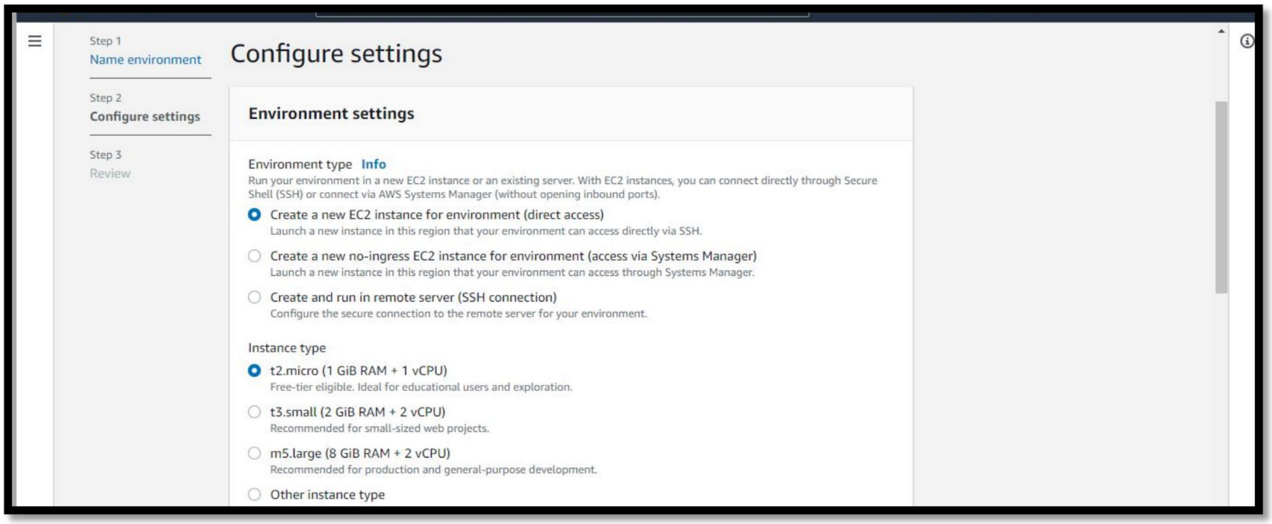
3. Keep all the Default settings as shown in below:



Step 1
Name environment

Step 2
Configure settings

Step 3
Review

Configure settings

Environment settings

Environment type Info
Run your environment in a new EC2 instance or an existing server. With EC2 instances, you can connect directly through Secure Shell (SSH) or connect via AWS Systems Manager (without opening inbound ports).

● Create a new EC2 instance for environment (direct access)
Launch a new instance in this region that your environment can access directly via SSH.

○ Create a new no-ingress EC2 instance for environment (access via Systems Manager)
Launch a new instance in this region that your environment can access through Systems Manager.

○ Create and run in remote server (SSH connection)
Configure the secure connection to the remote server for your environment.

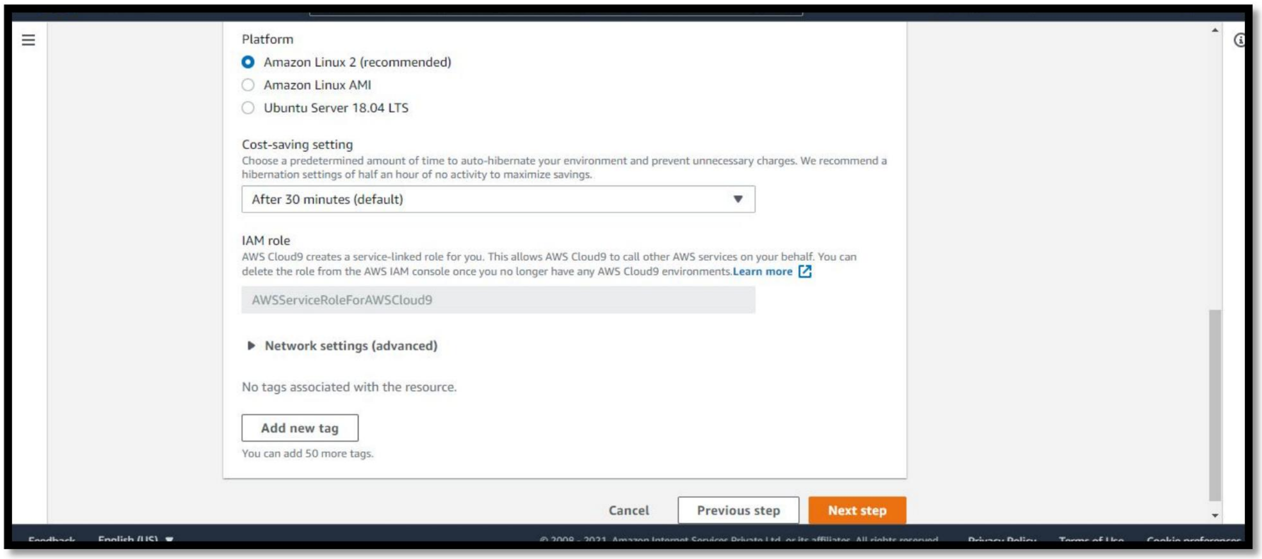
Instance type

● t2.micro (1 GiB RAM + 1 vCPU)
Free-tier eligible. Ideal for educational users and exploration.

○ t3.small (2 GiB RAM + 2 vCPU)
Recommended for small-sized web projects.

○ m5.large (8 GiB RAM + 2 vCPU)
Recommended for production and general-purpose development.

○ Other instance type



Platform

● Amazon Linux 2 (recommended)

○ Amazon Linux AMI

○ Ubuntu Server 18.04 LTS

Cost-saving setting
Choose a predetermined amount of time to auto-hibernate your environment and prevent unnecessary charges. We recommend a hibernation settings of half an hour of no activity to maximize savings.

After 30 minutes (default) ▼

IAM role
AWS Cloud9 creates a service-linked role for you. This allows AWS Cloud9 to call other AWS services on your behalf. You can delete the role from the AWS IAM console once you no longer have any AWS Cloud9 environments.Learn more

AWSServiceRoleForAWSCloud9

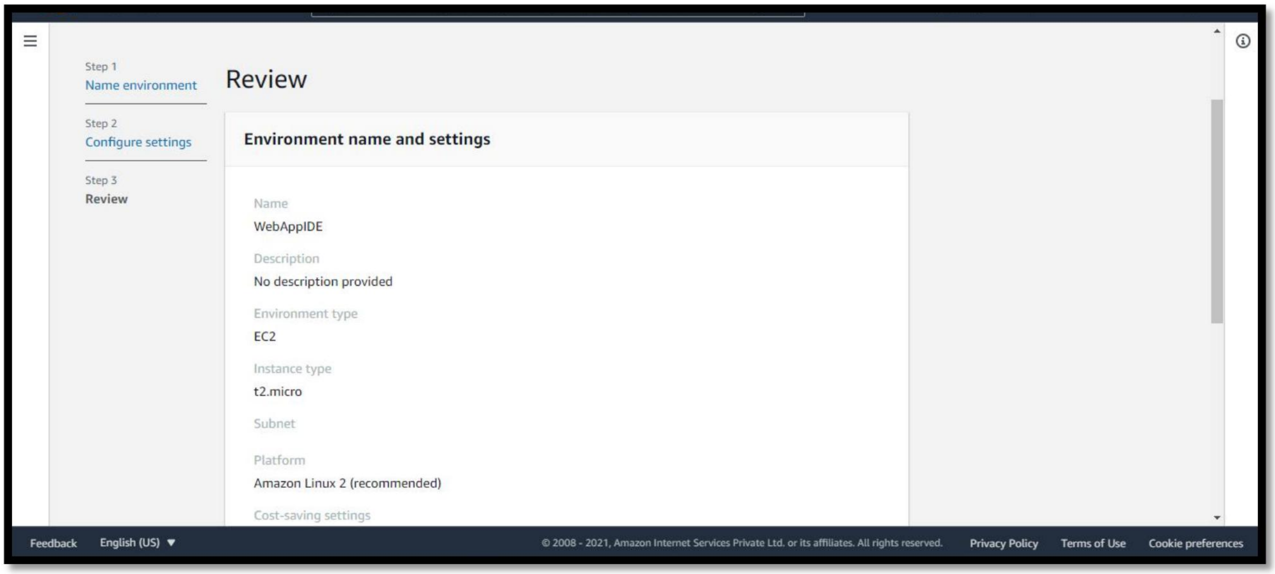
▶ Network settings (advanced)

No tags associated with the resource.

Add new tag

You can add 50 more tags.

4. Review the Environment name and Settings and click on Create Environment:



Review

Environment name and settings

Name
WebAppIDE

Description
No description provided

Environment type
EC2

Instance type
t2.micro

Subnet

Platform
Amazon Linux 2 (recommended)

Cost-saving settings

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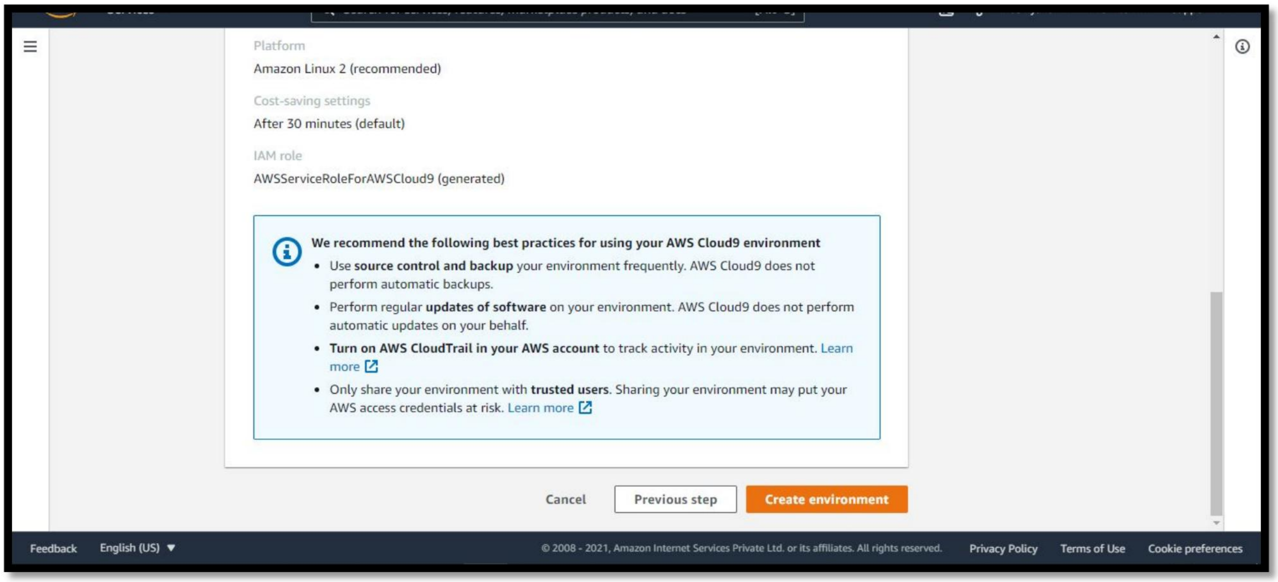


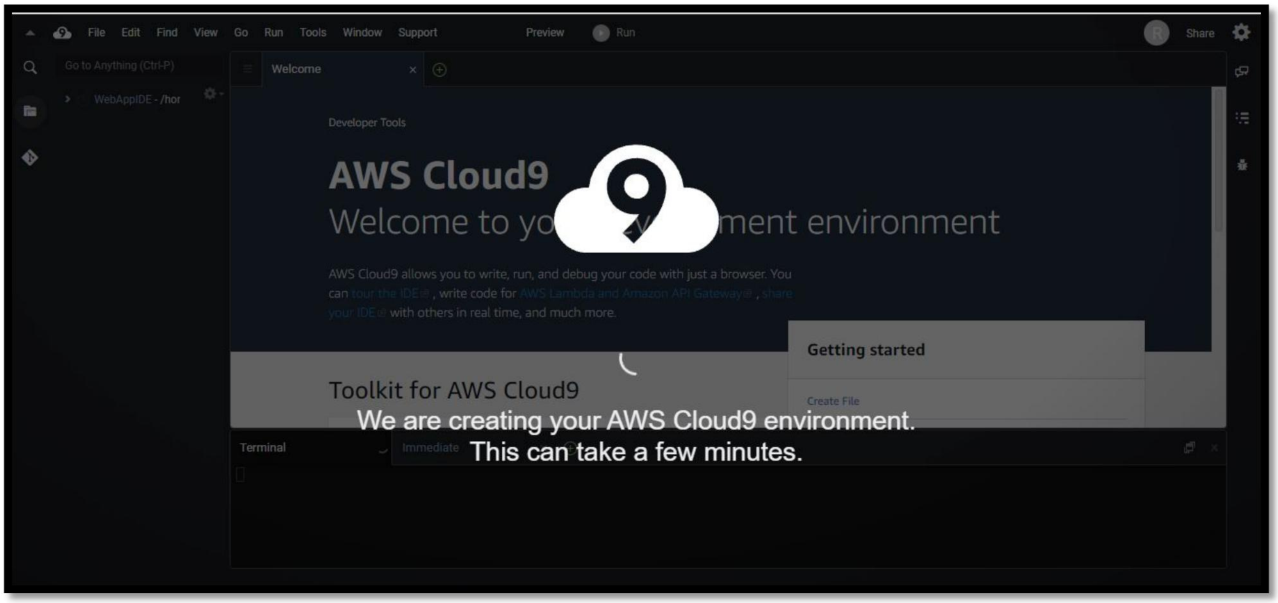
Platform
Amazon Linux 2 (recommended)

Cost-saving settings
After 30 minutes (default)

IAM role
AWSServiceRoleForAWSCloud9 (generated)

We recommend the following best practices for using your AWS Cloud9 environment

- Use **source control and backup** your environment frequently. AWS Cloud9 does not perform automatic backups.
- Perform regular **updates of software** on your environment. AWS Cloud9 does not perform automatic updates on your behalf.
- **Turn on AWS CloudTrail in your AWS account** to track activity in your environment. Learn more
- Only share your environment with **trusted users**. Sharing your environment may put your AWS access credentials at risk. Learn more



Developer Tools

AWS Cloud9

Welcome to yo ment environment

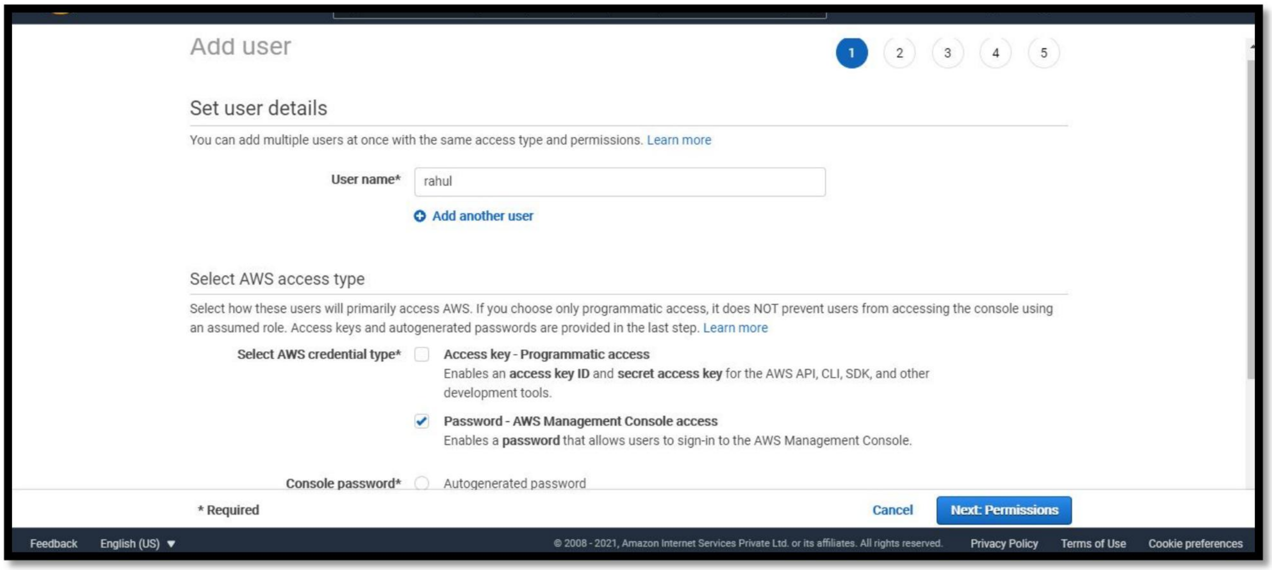
AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.

Toolkit for AWS Cloud9

We are creating your AWS Cloud9 environment.
This can take a few minutes.

It will take few minutes to create aws instance for your Cloud 9 Environment.

5. Till that time open IAM Identity and Access Management in order to Add user In other tab.
6. Add user provide manual password if you want and click on Next permission tab.



Add user

Set user details

You can add multiple users at once with the same access type and permissions. Learn more

User name* rahul

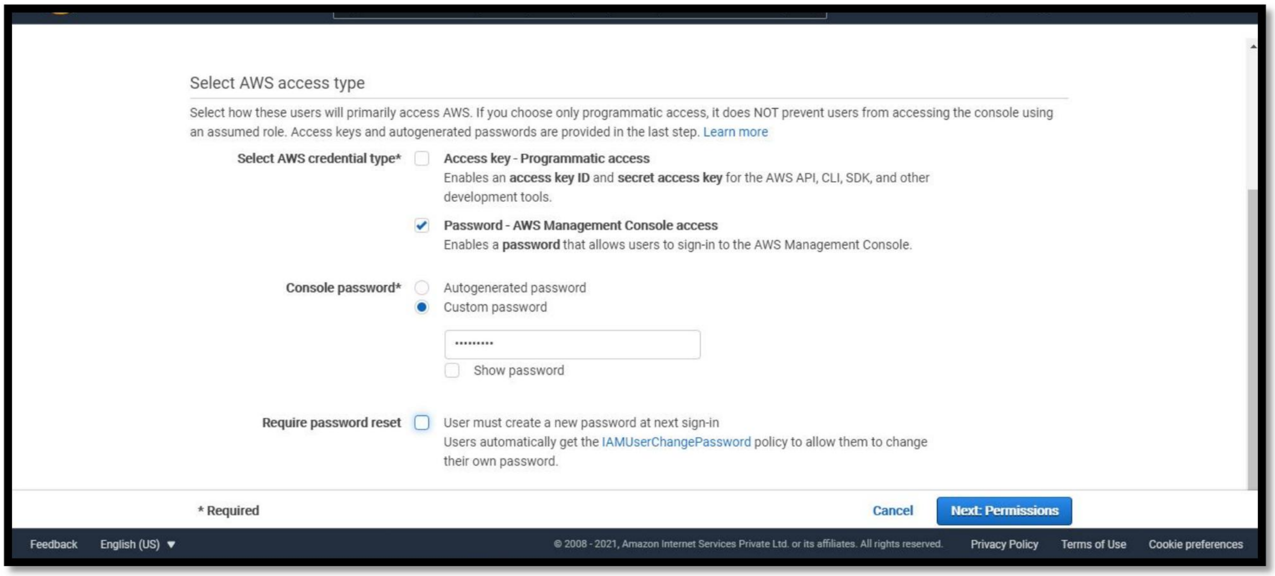
Select AWS access type

Select how these users will primarily access AWS. If you choose only programmatic access, it does NOT prevent users from accessing the console using an assumed role. Access keys and autogenerated passwords are provided in the last step. Learn more

Select AWS credential type* □ Access key - Programmatic access
Enables an **access key ID** and **secret access key** for the AWS API, CLI, SDK, and other development tools.

☑ Password - AWS Management Console access
Enables a **password** that allows users to sign-in to the AWS Management Console.

Console password* ○ Autogenerated password



Select AWS access type

Select how these users will primarily access AWS. If you choose only programmatic access, it does NOT prevent users from accessing the console using an assumed role. Access keys and autogenerated passwords are provided in the last step. Learn more

Select AWS credential type* □ Access key - Programmatic access
Enables an **access key ID** and **secret access key** for the AWS API, CLI, SDK, and other development tools.

☑ Password - AWS Management Console access
Enables a **password** that allows users to sign-in to the AWS Management Console.

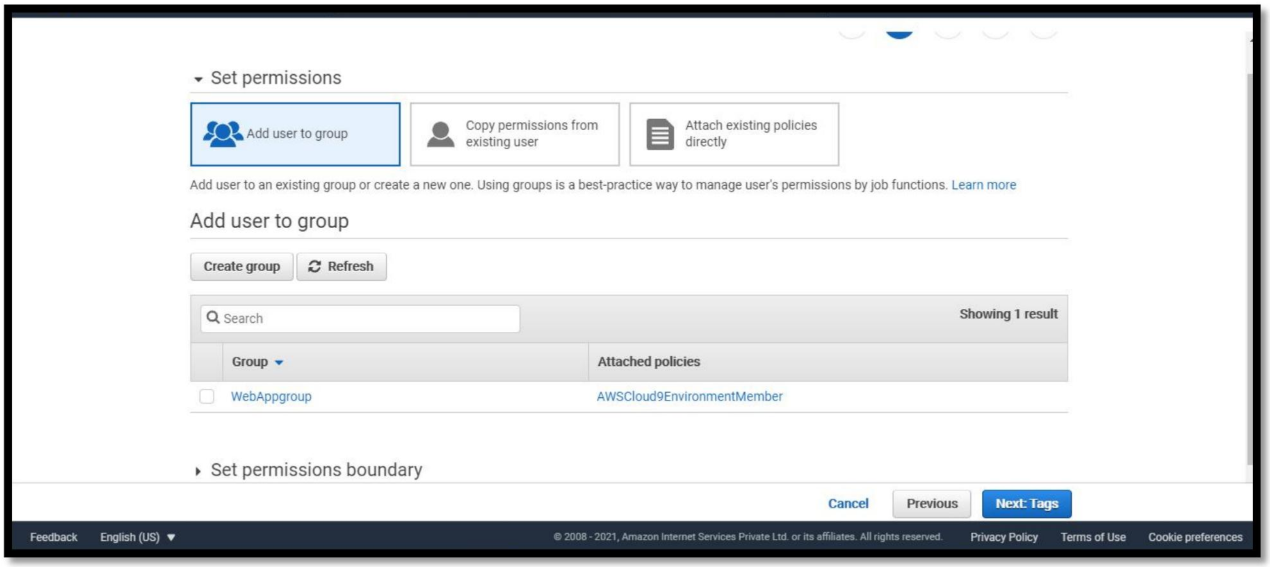
Console password* ○ Autogenerated password
● Custom password

•••••••••

□ Show password

Require password reset □ User must create a new password at next sign-in
Users automatically get the IAMUserChangePassword policy to allow them to change their own password.

7. Click on Create group



Set permissions

Add user to group | Copy permissions from existing user | Attach existing policies directly

Add user to an existing group or create a new one. Using groups is a best-practice way to manage user's permissions by job functions. Learn more

Add user to group

Create group | Refresh

Search — Showing 1 result

	Group	Attached policies
□	WebAppgroup	AWSCloud9EnvironmentMember

Set permissions boundary

Cancel | Previous | Next: Tags

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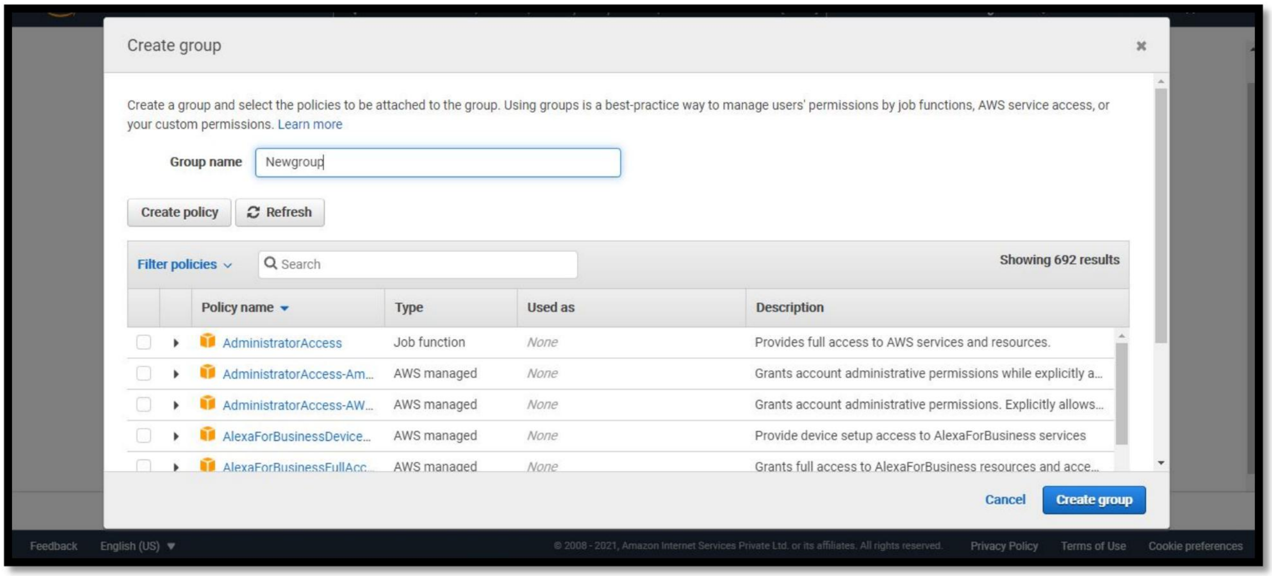
8. Provide group name and click on create group.



Create group

Create a group and select the policies to be attached to the group. Using groups is a best-practice way to manage users' permissions by job functions, AWS service access, or your custom permissions. Learn more

Group name: Newgroup

Create policy | Refresh

Filter policies | Search — Showing 692 results

		Policy name	Type	Used as	Description
□	▸	AdministratorAccess	Job function	None	Provides full access to AWS services and resources.
□	▸	AdministratorAccess-Am...	AWS managed	None	Grants account administrative permissions while explicitly a...
□	▸	AdministratorAccess-AW...	AWS managed	None	Grants account administrative permissions. Explicitly allows...
□	▸	AlexaForBusinessDevice...	AWS managed	None	Provide device setup access to AlexaForBusiness services
□	▸	AlexaForBusinessFullAcc...	AWS managed	None	Grants full access to AlexaForBusiness resources and acce...

Cancel | Create group

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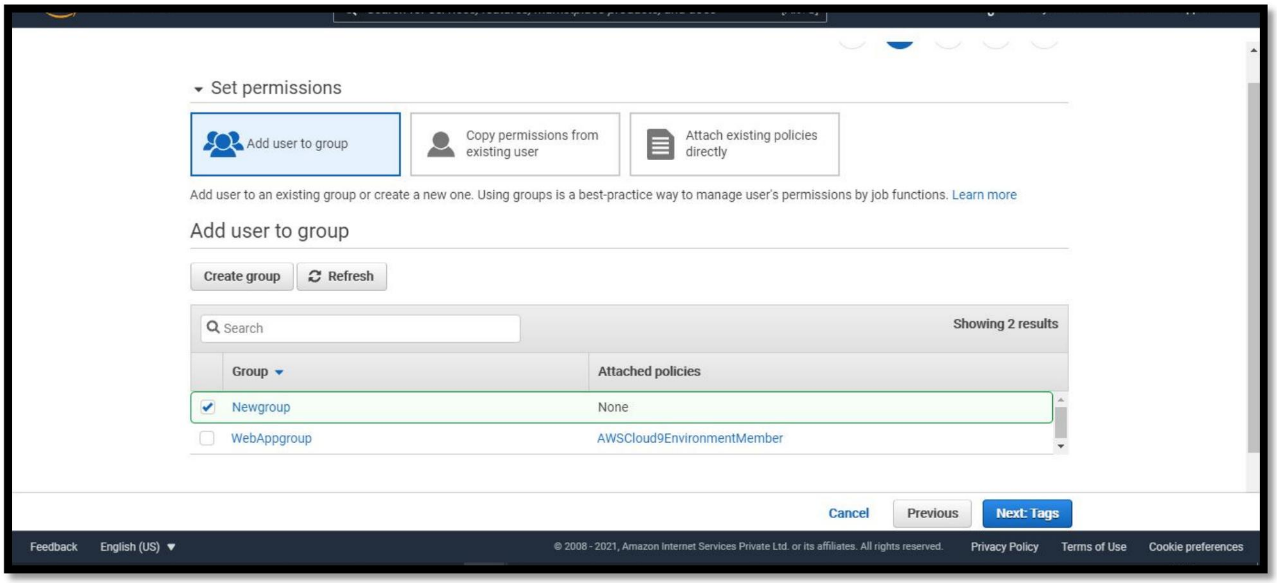
9. After that group is created click on next if u want to provide tag else click on Review for user settings and click on create user as shown in fig.



▾ Set permissions

Add user to group
Copy permissions from existing user
Attach existing policies directly

Add user to an existing group or create a new one. Using groups is a best-practice way to manage user's permissions by job functions. Learn more

Add user to group

Create group
Refresh
Search

Showing 2 results

	Group	Attached policies
☑	Newgroup	None
□	WebAppgroup	AWSCloud9EnvironmentMember

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Next: Tags
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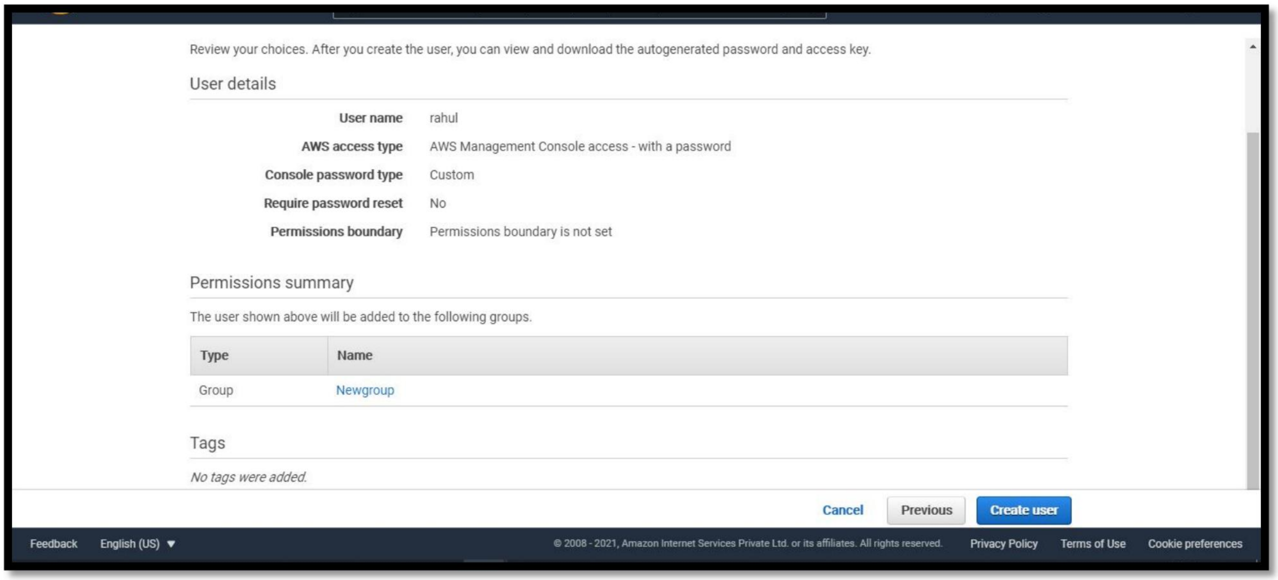

Review your choices. After you create the user, you can view and download the autogenerated password and access key.

User details

User name	rahul
AWS access type	AWS Management Console access - with a password
Console password type	Custom
Require password reset	No
Permissions boundary	Permissions boundary is not set

Permissions summary

The user shown above will be added to the following groups.

Type	Name
Group	Newgroup

Tags

No tags were added.

Cancel
Previous
Create user
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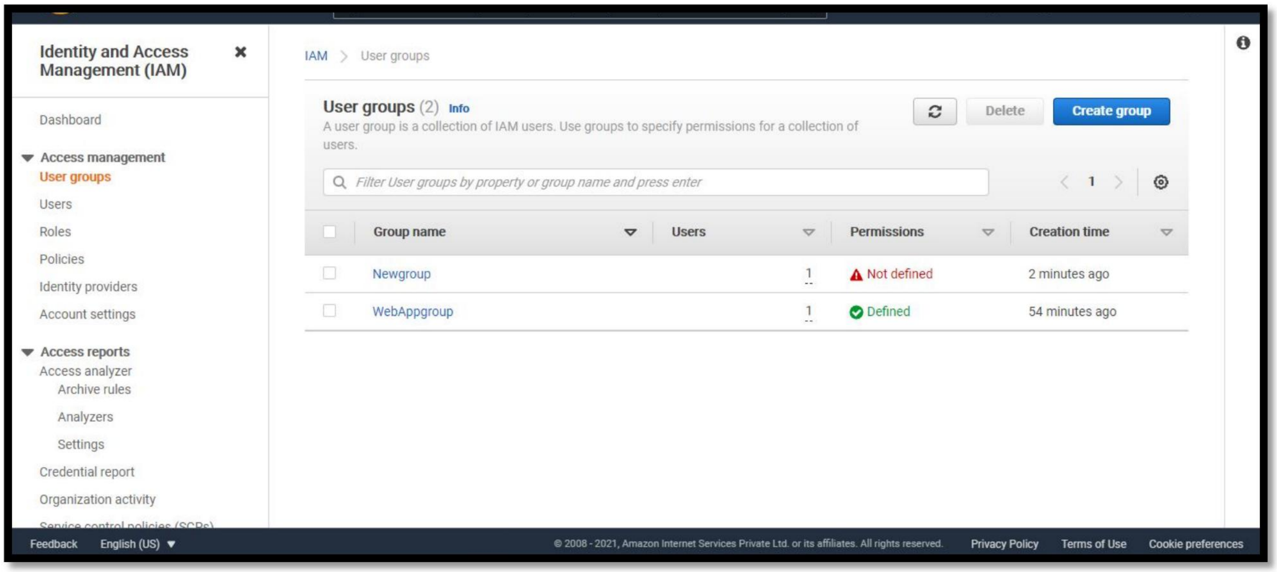
10. Now close that window and Navigate to user Groups from left pane in IAM.



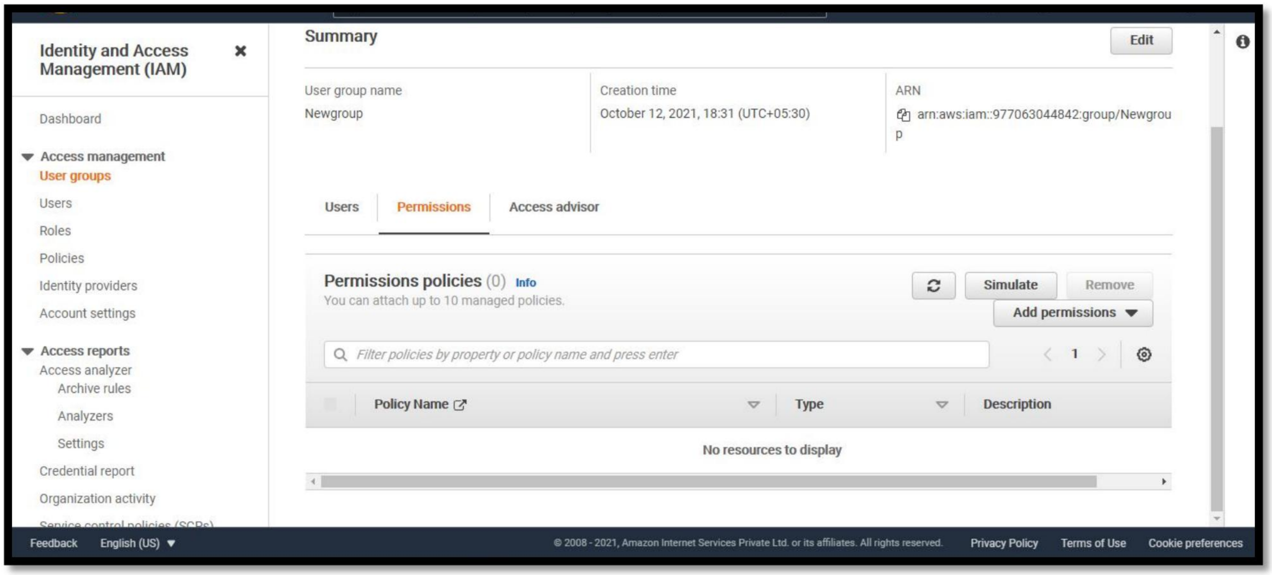
User groups (2) Info

A user group is a collection of IAM users. Use groups to specify permissions for a collection of users.

Filter User groups by property or group name and press enter

Group name	Users	Permissions	Creation time
Newgroup	1	Not defined	2 minutes ago
WebAppgroup	1	Defined	54 minutes ago

11. click on your group name which you have created and navigate to permission tab as shown:



Summary

User group name: Newgroup

Creation time: October 12, 2021, 18:31 (UTC+05:30)

ARN: arn:aws:iam::977063044842:group/Newgroup

Permissions policies (0) Info

You can attach up to 10 managed policies.

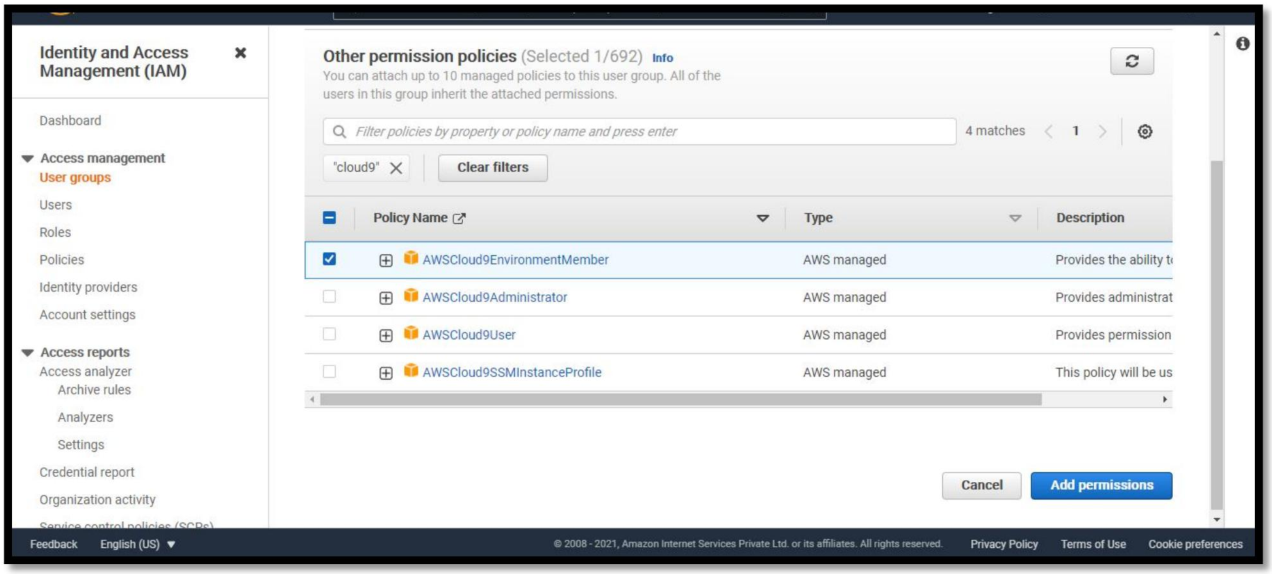
Filter policies by property or policy name and press enter

Policy Name	Type	Description

No resources to display

12. Now click on Add permission and select Attach Policy after that search for

Cloud9 related policy and select Awscloud9EnviornmentMember policy and add it.



Other permission policies (Selected 1/692) Info

You can attach up to 10 managed policies to this user group. All of the users in this group inherit the attached permissions.

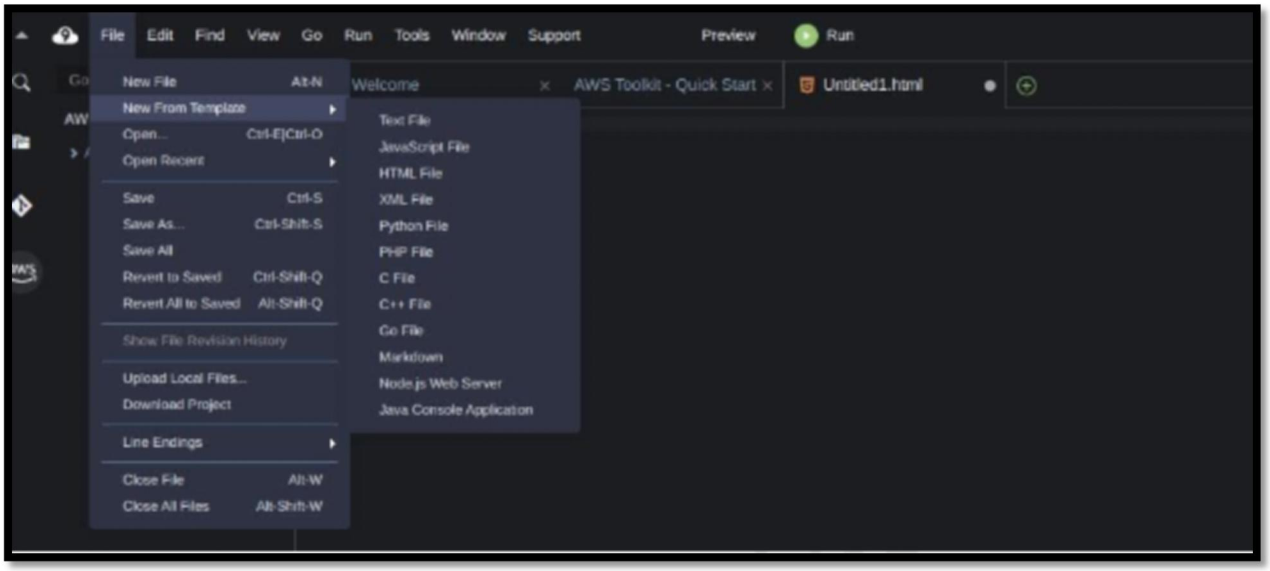
Filter policies by property or policy name and press enter — 4 matches

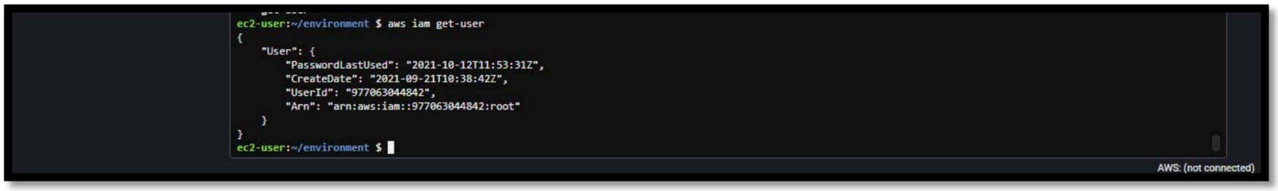
"cloud9" ✕ Clear filters

	Policy Name	Type	Description
☑	AWSCloud9EnvironmentMember	AWS managed	Provides the ability t
□	AWSCloud9Administrator	AWS managed	Provides administrat
□	AWSCloud9User	AWS managed	Provides permission
□	AWSCloud9SSMInstanceProfile	AWS managed	This policy will be us

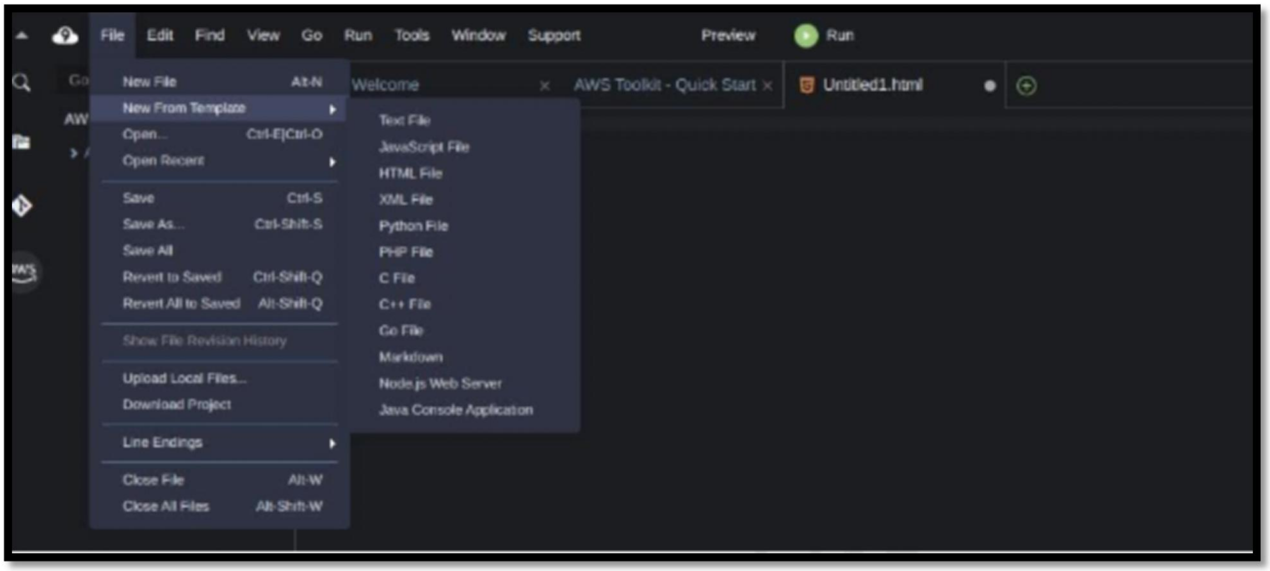
Cancel Add permissions

13. If you check at bottom side Cloud9 IDE also giving you and aws CLI for command operations: as we here checked git version, iam user details and

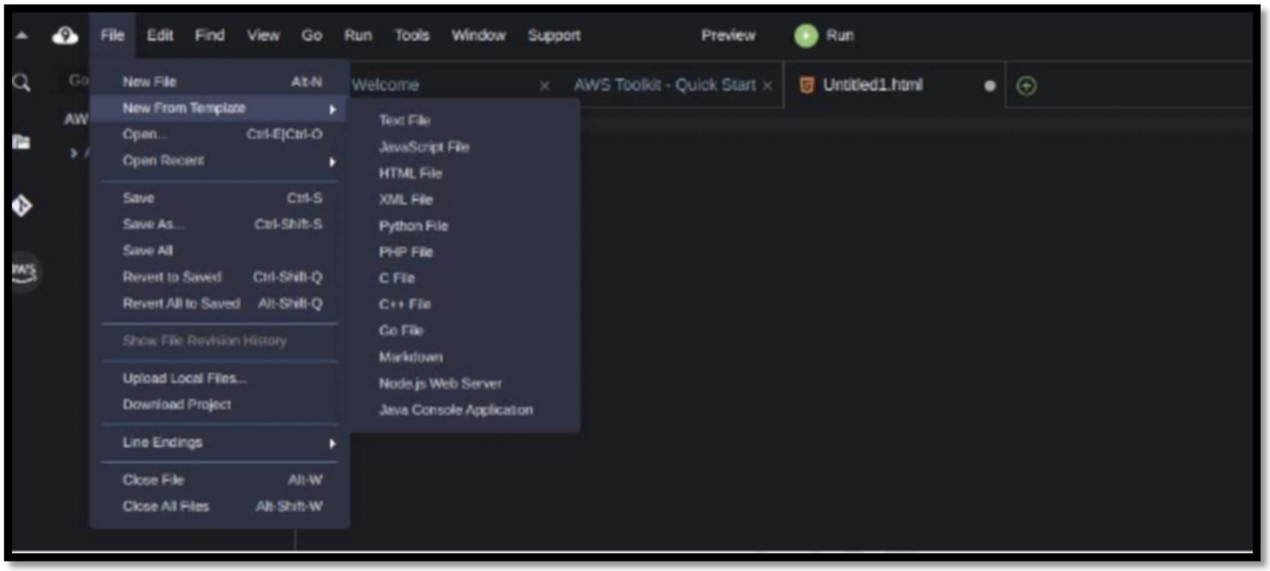



```
ec2-user:~/environment $ aws iam get-user
{
    "User": {
        "PasswordLastUsed": "2021-10-12T11:53:31Z",
        "CreateDate": "2021-09-21T10:38:42Z",
        "UserId": "977063044842",
        "Arn": "arn:aws:iam::977063044842:root"
    }
}
ec2-user:~/environment $ 
```

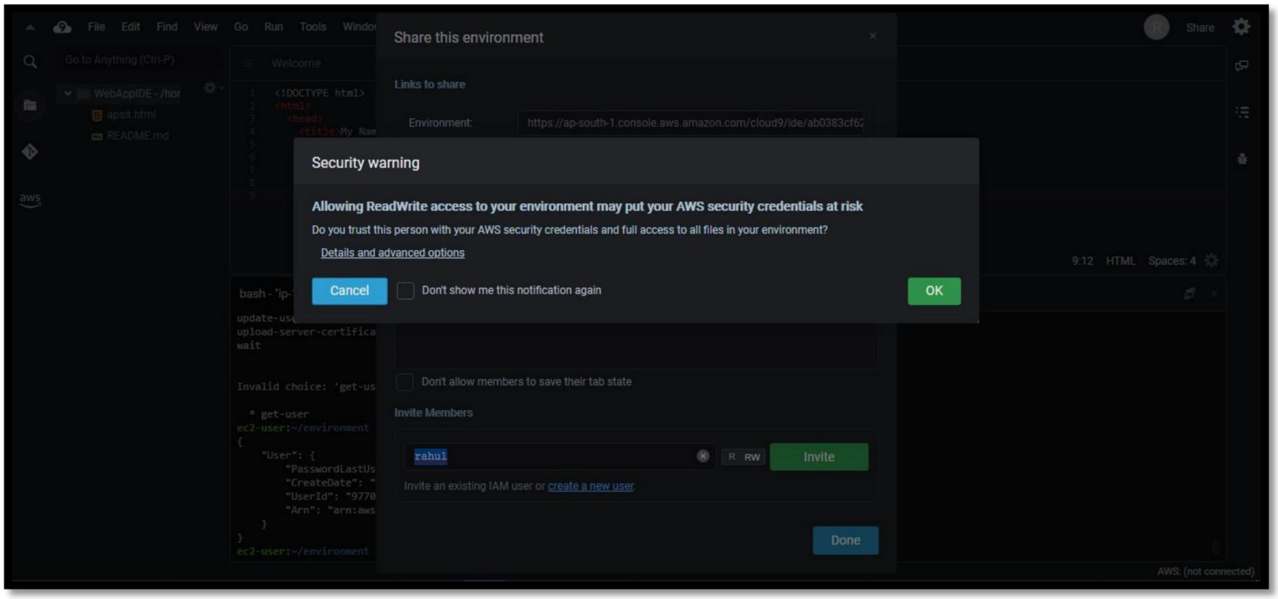
14. Now we will setup collaborative environment Click on File you can create new file or choose from template, here m opting HTML file to collaborate.



15. Edit html file and save it



16. now in order to share this file to collaborate with other members of your team click on Share option on Right Pane and username which you created in IAM before into Invite members and enable permission as RW (Read and Write) and click on Done. Click OK for Security warning.



```
<!DOCTYPE html>
<html>
  <head>
    <title>My Nam
```

```
update-us
upload-server-certifica
wait


Invalid choice: 'get-us

  * get-user
ec2-user:~/environment
{
    "User": {
        "PasswordLastUs
        "CreateDate": "
        "UserId": "9770
        "Arn": "arn:aws
    }
}
ec2-user:~/environment
```

Share this environment

Links to share

Environment: https://ap-south-1.console.aws.amazon.com/cloud9/ide/ab0383cf62

Security warning

Allowing ReadWrite access to your environment may put your AWS security credentials at risk

Do you trust this person with your AWS security credentials and full access to all files in your environment?

Details and advanced options

Cancel □ Don't show me this notification again OK

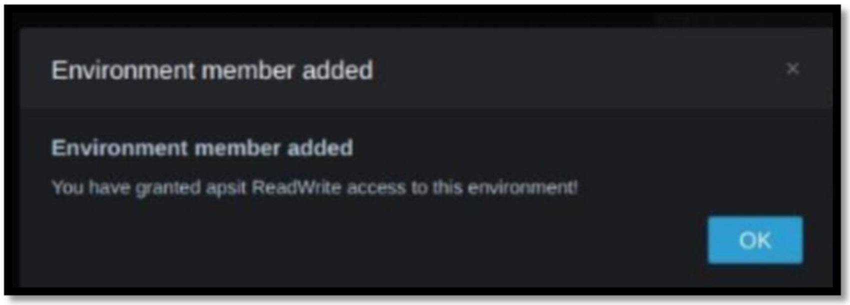
□ Don't allow members to save their tab state

Invite Members

rahul R RW Invite

Invite an existing IAM user or create a new user.

Done



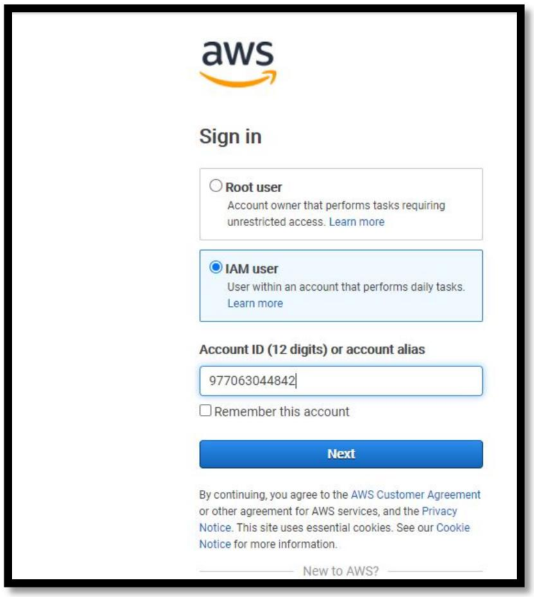
Environment member added

Environment member added

You have granted apsit ReadWrite access to this environment!

OK

17. Now Open your Browsers Incognito Window and login with IAM user which you configured before.



Sign in

○ Root user
Account owner that performs tasks requiring unrestricted access. Learn more

● IAM user
User within an account that performs daily tasks. Learn more

Account ID (12 digits) or account alias
977063044842

□ Remember this account

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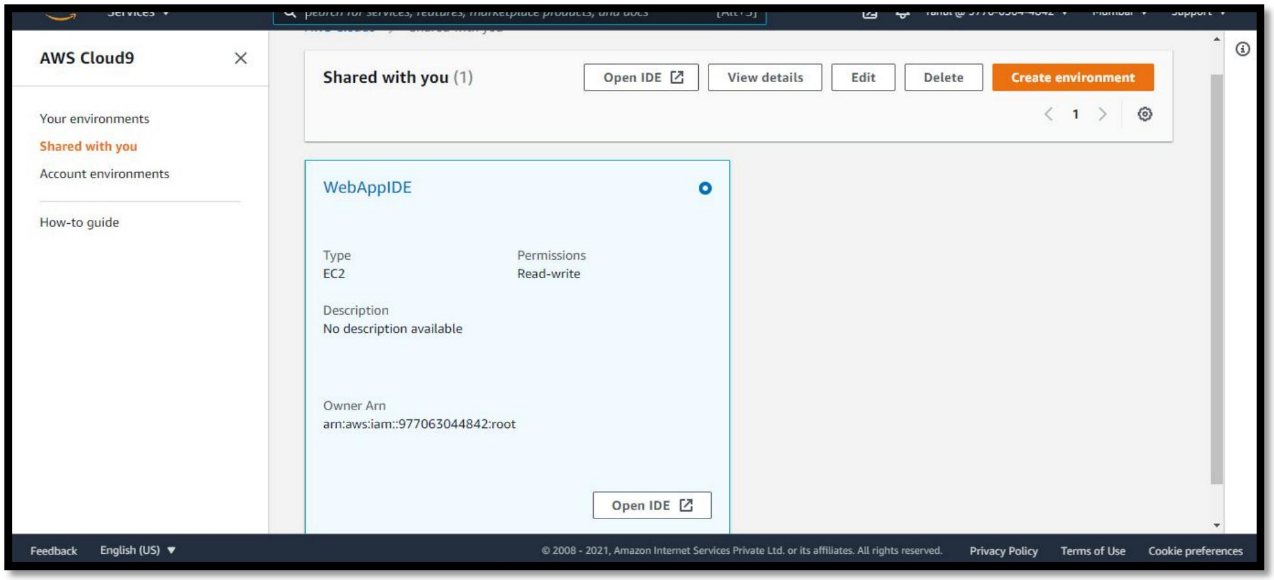
18. After Successful login with IAM user open Cloud9 service from dashboard services and click on shared with you environment to collaborate.



Shared with you (1)

WebAppIDE

Type
EC2

Permissions
Read-write

Description
No description available

Owner Arn
arn:aws:iam::977063044842:root

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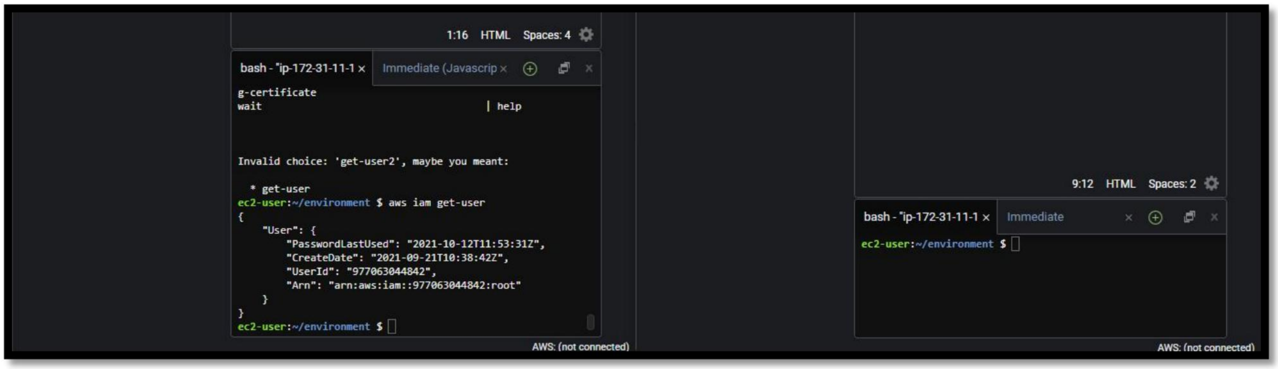
19. Click on Open IDE you will same interface as your other member have to collaborate in real time, also you all within team can do group chats as shown below:



```
g-certificate
wait                                     | help



Invalid choice: 'get-user2', maybe you meant:

  * get-user
ec2-user:~/environment $ aws iam get-user
{
    "User": {
        "PasswordLastUsed": "2021-10-12T11:53:31Z",
        "CreateDate": "2021-09-21T10:38:42Z",
        "UserId": "977063044842",
        "Arn": "arn:aws:iam::977063044842:root"
    }
}
ec2-user:~/environment $
```

```
ec2-user:~/environment $
```

Conclusion:

Hence, We understood the benefits of Cloud Infrastructure and Setup AWS Cloud9 IDE, Launched AWS Cloud9 IDE and Performed Collaboration Demonstration.