

# **Experiment 01**

## **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 programs and track each other'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 programs together. While collaborating, your team members can see each other 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

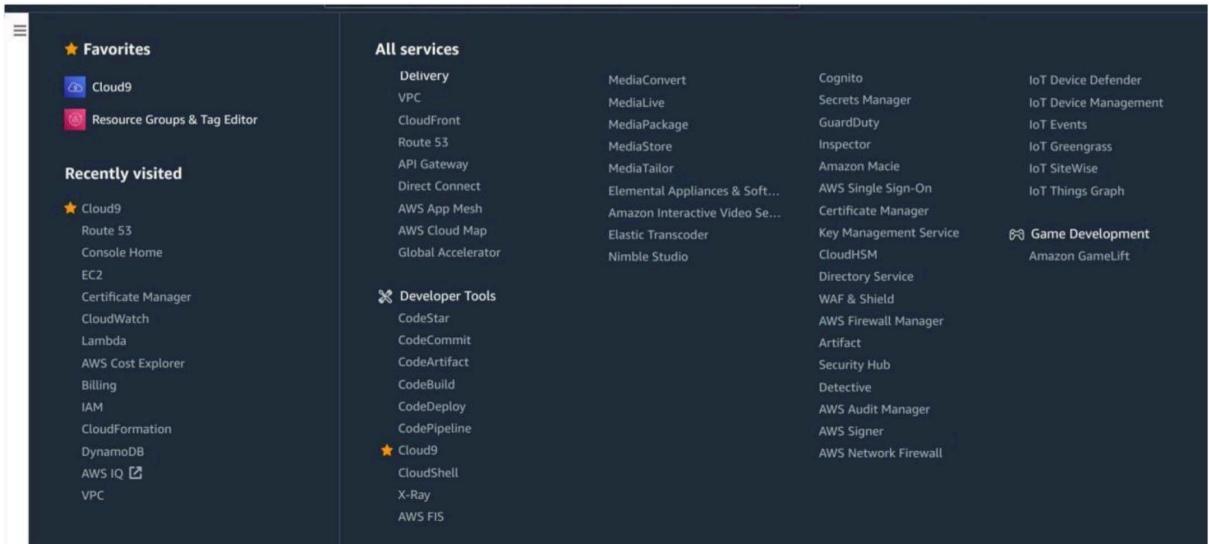
AWS Cloud9 comes with a terminal that includes sudo privileges to the managed Amazon EC2 instance that is hosting your development environment and a preauthenticated AWS Command Line Interface. This makes it easy for you to quickly run commands and directly access AWS services

## 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. **Login with your AWS account.**
2. **Navigate to Cloud 9 service from Developer tools section as below:**



### 3. Click on Create Environment :

**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.

**How it works**

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

**Getting started**

- Before you start
- Create an environment
- Working with environments

**Create environment**

**4. Provide the name for the Environment (WebAppIDE) and click on next.**

AWS Cloud9 > Environments > Create environment

Step 1  
Name environment

Step 2  
Configure settings

Step 3  
Review

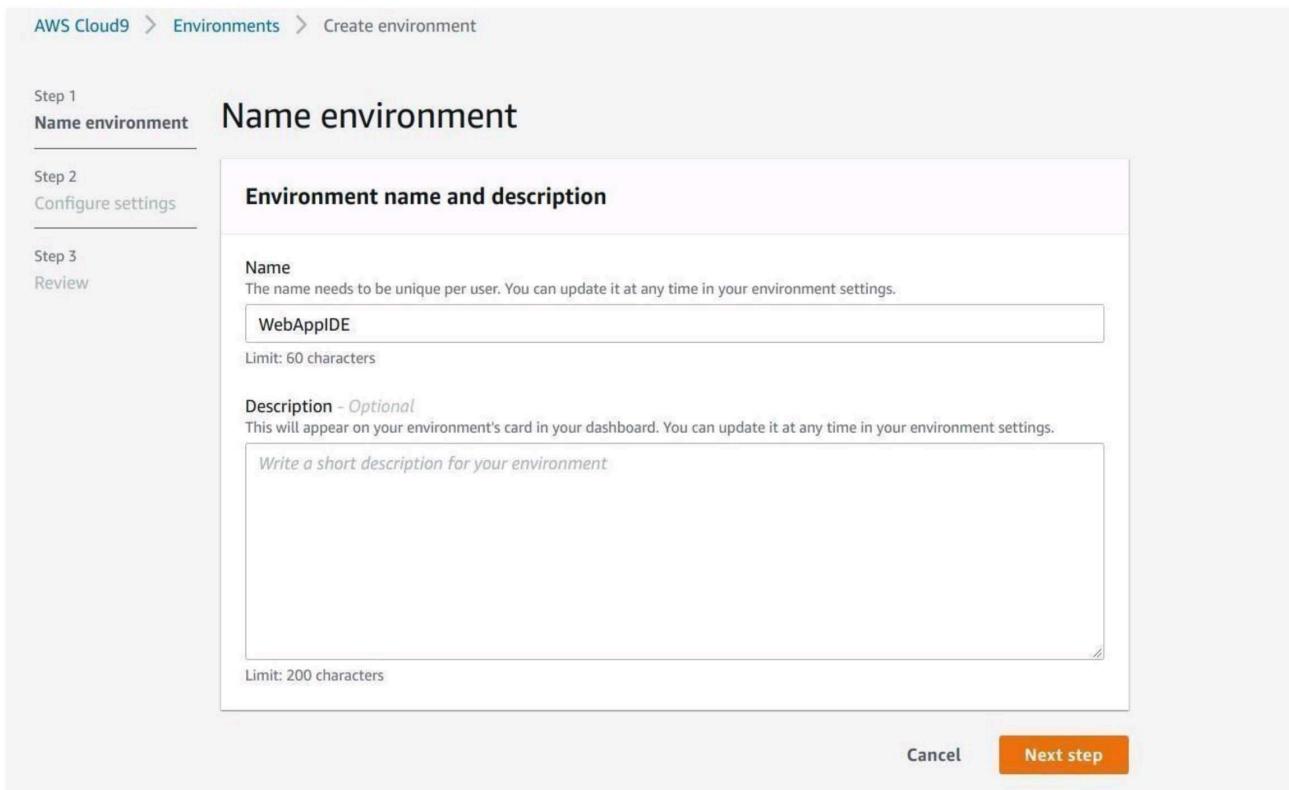
## Name environment

### 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.  
  
Limit: 200 characters

**Cancel** **Next step**



**5. Keep all the Default settings as shown in below:**

**AWS Cloud9**

AWS Cloud9 > Environments > Create environment.

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**  
Select an 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 setting 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.

Cancel Previous step Next step

**6. Review the Environment name and Settings and click on Create Environment**

**AWS Cloud9**

AWS Cloud9 > Environments > Create environment

Step 1  
Name environment

Step 2  
Configure settings

Step 3  
Review

### 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: 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 [\[?\]](#)

Cancel Previous step **Create environment**

**AWS Cloud9**

Welcome to your development environment

AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can use the editor, write code for AWS Lambda, or interact with others in real time; and much more.

Developer Tools

Toolkit for AWS Cloud9

The AWS Toolkit for Cloud9 is an IDE extension that simplifies accessing and interacting with resources from services such as AWS Lambda, AWS CloudFormation, and AWS API Gateway. With the toolkit, developers can also develop, debug, and deploy applications using the AWS Serverless Application Model (SAM). Learn more [\[?\]](#)

Support

If you have any questions or experience issues, refer to our documentation or reach us to get help.

Documentation

Get Help

Security Best Practices

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

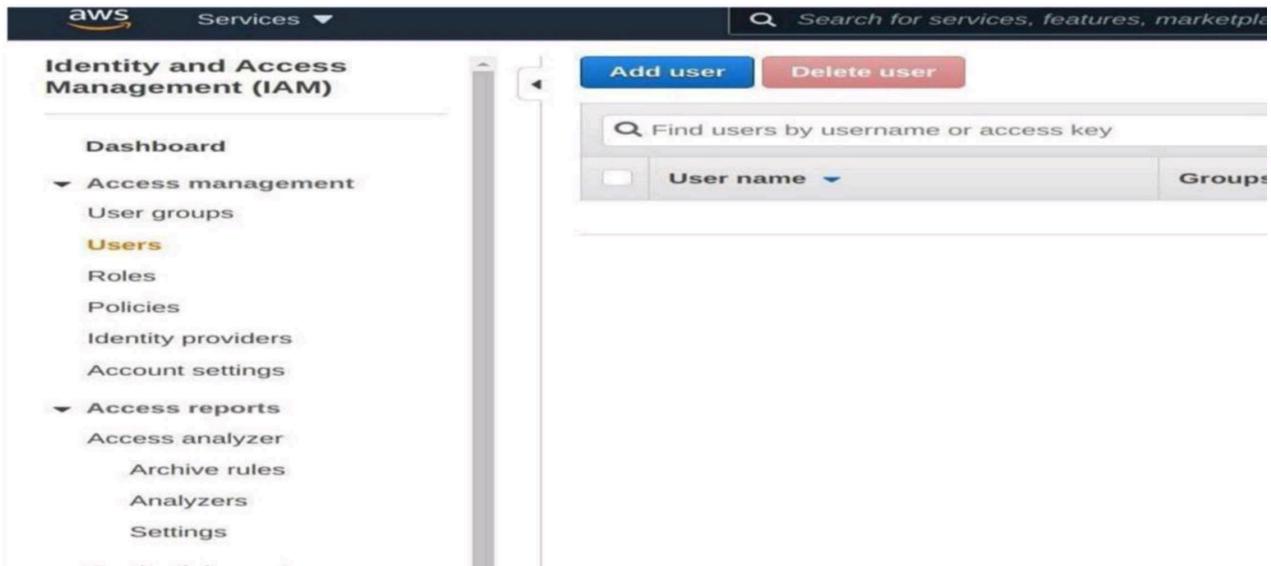
Main Theme: jet-dark

Editor Theme: Jet

More Settings...

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

7. Till that time open **IAM Identity and Access Management** in order to **Add user In another tab**.



8. Add the user provided manual password if you want and click on Next permission tab.

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: WebAppapsitgroup

Create policy Refresh

Filter policies Search Showing 669 results

| Policy name                             | Type         | Used as | Description   |
|---|--------------|---------|---|
| AdministratorAccess                     | Job function | None    | Provides full access to AWS services and resources.   |
| AdministratorAccess-Amplify             | AWS managed  | None    | Grants account administrative permissions while explicitly allowing direct access to resources. |
| AdministratorAccess-AWSElasticBeanstalk | AWS managed  | None    | Grants account administrative permissions. Explicitly allows developers and administrators...   |
| AlexaForBusinessDeviceSetup             | AWS managed  | None    | Provide device setup access to AlexaForBusiness services  |
| AlexaForBusinessFullAccess              | AWS managed  | None    | Grants full access to AlexaForBusiness resources and access to related AWS Services             |
| AlexaForBusinessGatewayExecution        | AWS managed  | None    | Provide gateway execution access to AlexaForBusiness services                                   |
| AlexaForBusinessLifesizeDelegatedAccess | AWS managed  | None    | Provide access to Lifesize AVS devices  |

Cancel Create group

Add user

Review

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

User details

|                        |   |
|------------------------|---|
| User name              | apsit   |
| 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 | WebAppapsitgroup |

Tags

No tags were added.

Cancel Previous Create user

11. After that group is created click on next if u want to provide tag else click on Review for

10. Provide group name and click on create group. user settings and click on create user as shown in fig.

12. Now close that window and Navigate to user Groups from the left pane in IAM.

| Other permission policies (Selected 1/669) <a href="#">Info</a>   |  |             |             |
|---|--|-------------|-------------|
| You can attach up to 10 managed policies to this user group. All of the users in this group inherit the attached permissions.   |  |             |             |
| <input type="text"/> Filter policies by property or policy name and press enter   |  | 4 matches   | Cancel      |
| <input checked="" type="checkbox"/> "Cloud9" X Clear filters  |  |             | Add filters |
| <span style="float: left;"><input type="checkbox"/></span> <span style="float: left;">Policy Name</span> <span style="float: right;">Type</span> <span style="float: right;">Attached entities</span> |  |             |             |
| <input checked="" type="checkbox"/> AWSCloud9EnvironmentMember  |  | AWS managed | 0           |
| <input type="checkbox"/> AWSCloud9Administrator   |  | AWS managed | 0           |
| <input type="checkbox"/> AWSCloud9User  |  | AWS managed | 0           |
| <input type="checkbox"/> AWSCloud9SSMInstanceProfile  |  | AWS managed | 0           |

Cancel Add permissions

**Identity and Access Management (IAM)**

- Go to Anything (Ctrl-P)
- AWS Explorer
- Asia Pacific (Mumbai)

**User groups**

- Dashboard
- Access management
- Users
- Roles
- Policies
- Identity providers
- Account settings

**Access reports**

- Access analyzer
- Archive rules
- Analyzers
- Settings
- Credential report
- Organization activity
- Service control policies

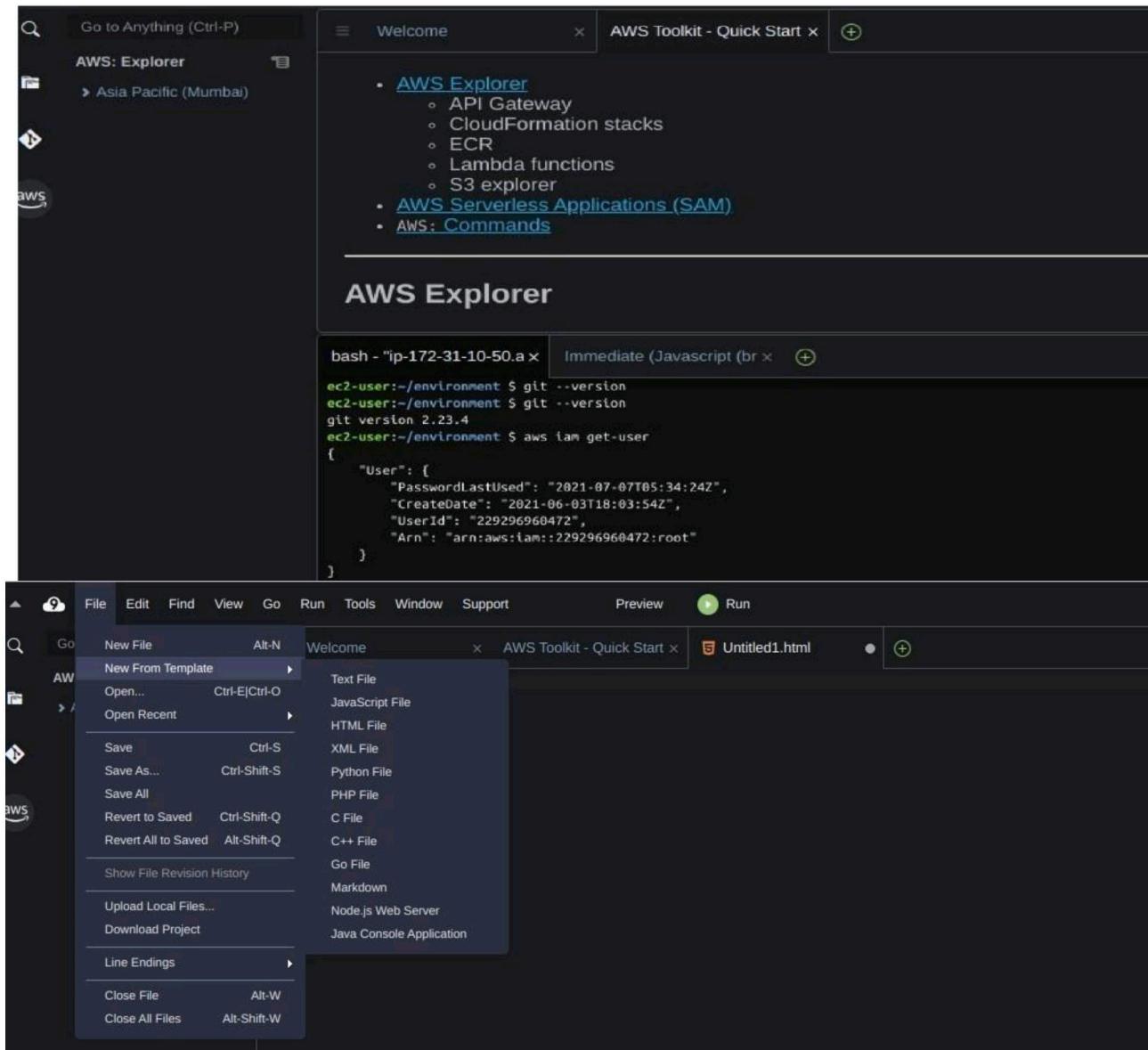
**13. cli**

**15. Now we move towards our cloud9 IDE Environment tab it shows as shown**

**14. Now click on Add permission and select Attach Policy after that search for Cloud9 related policy and select Aws cloud9 Environment Member policy**

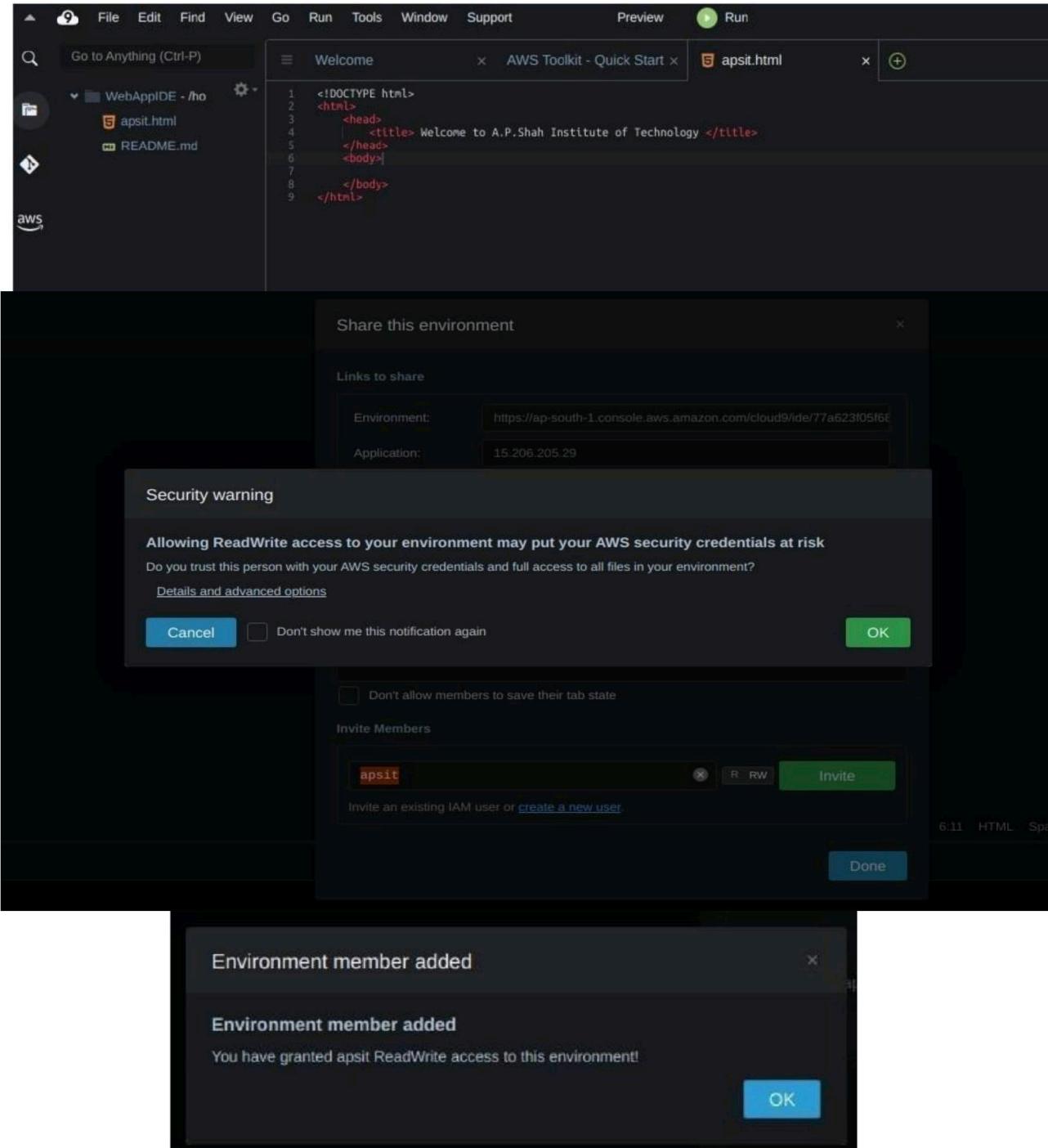
**16. If you check at bottom side Cloud9 IDE also giving you and aws CLI for command operations:**

as we here checked git version, iam user details



17. 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.

18. Edit html file and save it



19. 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.

20. 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**  
229296960472

Remember this account

**Next**

By continuing, you agree to the [AWS Customer Agreement](#) or other agreement for AWS services, and the [Privacy Notice](#). This site uses essential cookies. See our [Cookie Notice](#) for more information.

— New to AWS? —

**Create a new AWS account**

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

The screenshot shows the AWS Cloud9 interface. On the left, there's a sidebar with links: 'Your environments', 'Shared with you' (which is highlighted in orange), and 'Account environments'. Below that is a 'How-to guide' section. The main area is titled 'AWS Cloud9 > Shared with you'. It lists one environment: 'Shared with you (1)'. The environment details for 'WebAppIDE' are shown: Type EC2, Permissions Read-write, Description No description available, and Owner Arn arm:aws:iam::229296960472:root. At the bottom of this card is a button labeled 'Open IDE' with a code icon.

**22. 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:**

The image consists of three side-by-side screenshots of the AWS Toolkit IDE. Each screenshot shows a file named 'apsit.html' with the following content:

```

<!DOCTYPE html>
<html>
<head>
<title> Welcome to A.P.Shah Institute of Technology </title>
</head>
<body>
    hello mundo!
</body>
</html>

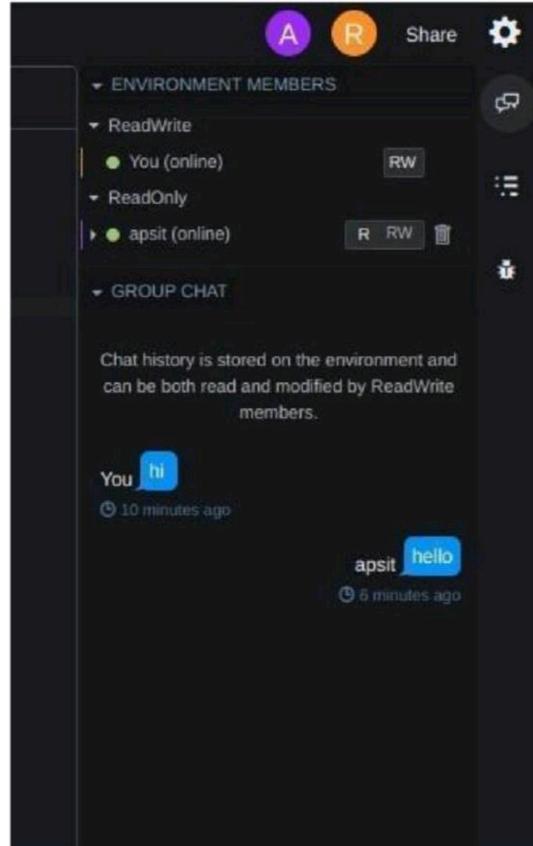
```

**Screenshot 1 (Left):** Shows the 'ReadWrite' permission level for the environment member 'am.awslam.229269...'.

**Screenshot 2 (Middle):** Shows the 'ReadWrite' permission level for the environment member 'apsit (online)'.

**Screenshot 3 (Right):** Shows the 'Read Only' permission level for the environment member 'apsit (online)'.

**23.you can also explore settings where you can update permissions of your teammates as from RW to R only or you can remove users too.**



## Conclusion

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