

BHARATI VIDYAPEETH COLLEGE OF ENGINEERING, NAVI MUMBAI  
DEPARTMENT OF INFORMATION TECHNOLOGY  
ACADEMIC YEAR 2021-22

SUB: ADVANCED DEVOPS LAB

SEM: V R2019



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**COLLEGE OF ENGINEERING**  
DEPARTMENT OF INFORMATION TECHNOLOGY  
ACADEMIC YEAR: 2021-2022



**COURSE NAME: Advance DevOps Lab**

COURSE CODE	ITL504						
EXPERIMENT NO.	02						
EXPERIMENT TITLE.	To build your application using AWS Codebuild and deploy on S3 / SEBS using AWS Codepipeline, deploy sample application on EC2 instance using AWS CodeDeploy						
NAME OF STUDENT	SNEHAL RAI						
ROLL NO.	58						
CLASS	TE-IT						
SEMESTER	V						
GIVEN DATE	29/07/2021						
SUBMISSION DATE	4/08/2021						
CORRECTION DATE							
REMARK							
TIMELY SUBMISSION		PRESENTATION		UNDERSTANDING		TOTAL MARKS	
	04		04		07		15
NAME & SIGN. OF FACULTY		Dr. S. M. Patil					

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**EXPERIMENT NO. 02**

**Aim: To build your application using AWS CodeBuild and deploy on S3 / SEBS using AWS Codepipeline, deploy sample application on EC2 instance using AWS CodeDeploy.**

**Theory:**

AWS CodeBuild is a fully managed continuous integration service that compiles source code, runs tests, and produces software packages that are ready to deploy. With CodeBuild, you don't need to provision, manage, and scale your own build servers. CodeBuild scales continuously and processes multiple builds concurrently, so your builds are not left waiting in a queue. You can get started quickly by using prepackaged build environments, or you can create custom build environments that use your own build tools. With CodeBuild, you are charged by the minute for the compute resources you use.

**Benefits:**

**FULLY MANAGED BUILD SERVICE**

AWS CodeBuild eliminates the need to set up, patch, update, and manage your own build servers and software. There is no software to install or manage.

**EXTENSIBLE**

You can bring your own build tools and programming runtimes to use with AWS CodeBuild by creating customized build environments in addition to the prepackaged build tools and runtimes supported by CodeBuild.

**CONTINUOUS SCALING**

AWS CodeBuild scales up and down automatically to meet your build volume. It immediately processes each build you submit and can run separate builds concurrently, which means your builds are not left waiting in a queue.

### **ENABLES CONTINUOUS INTEGRATION AND DELIVERY**

AWS CodeBuild belongs to a family of AWS Code Services, which you can use to create complete, automated software release workflows for continuous integration and delivery (CI/CD). You can also integrate CodeBuild into your existing CI/CD workflow. For example, you can use CodeBuild as a worker node for your existing Jenkins server setup for distributed builds.

### **PAY AS YOU GO**

With AWS CodeBuild, you are charged based on the number of minutes it takes to complete your build. This means you no longer have to worry about paying for idle build server capacity.

### **SECURE**

With AWS CodeBuild, your build artifacts are encrypted with customer-specific keys that are managed by the AWS Key Management Service (KMS). CodeBuild is integrated with AWS Identity and Access Management (IAM), so you can assign user-specific permissions to your build projects.

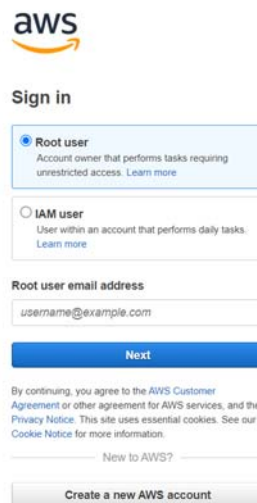
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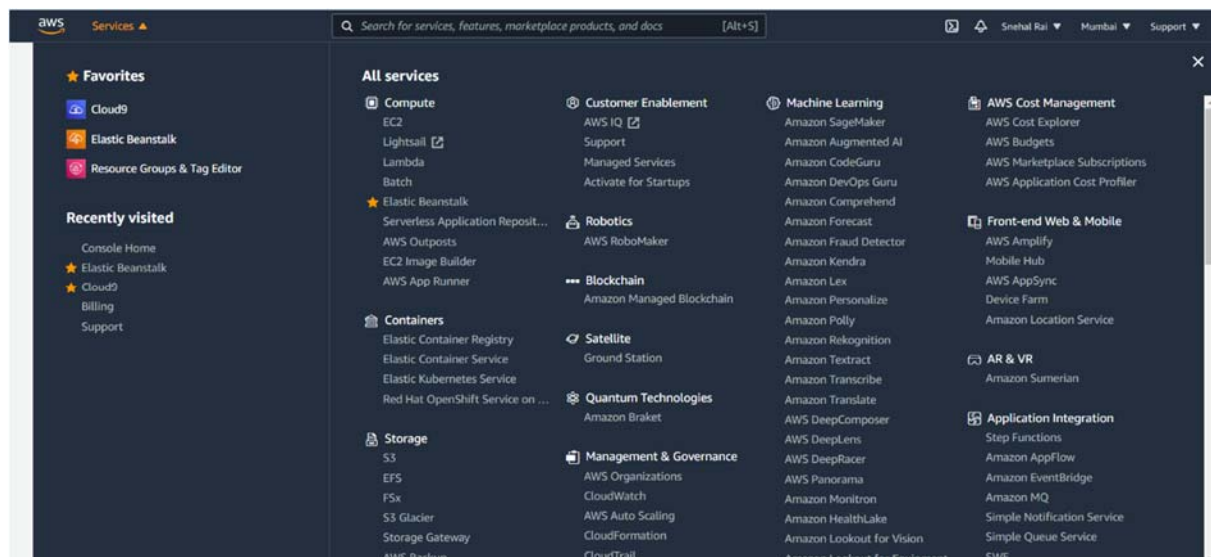
**Steps:**

**1. Login with your AWS account.**



The image shows the AWS Sign in page. At the top is the AWS logo. Below it is the 'Sign in' heading. There are two radio buttons: 'Root user' (selected) and 'IAM user'. The 'Root user' option has a description: 'Account owner that performs tasks requiring unrestricted access. Learn more'. The 'IAM user' option has a description: 'User within an account that performs daily tasks. Learn more'. Below these is a text input field for 'Root user email address' with the placeholder 'username@example.com'. A blue 'Next' button is below the input field. At the bottom, there is a link 'New to AWS?' and a button 'Create a new AWS account'.

**2. Navigate to Elastic Beanstalk service from Developer tools section as below:**

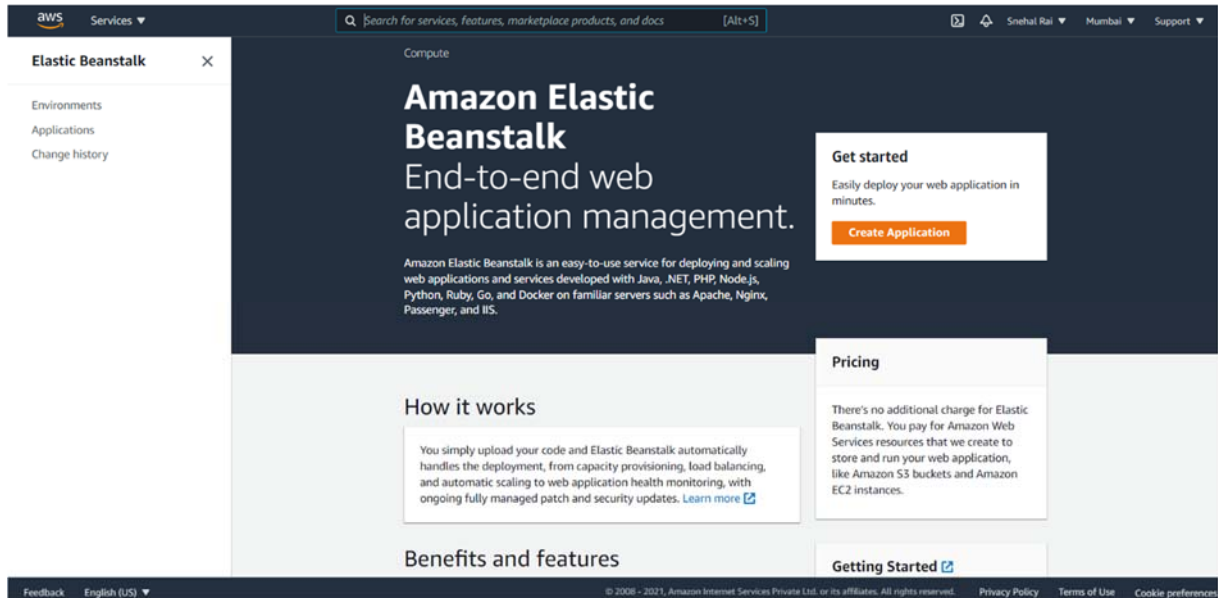


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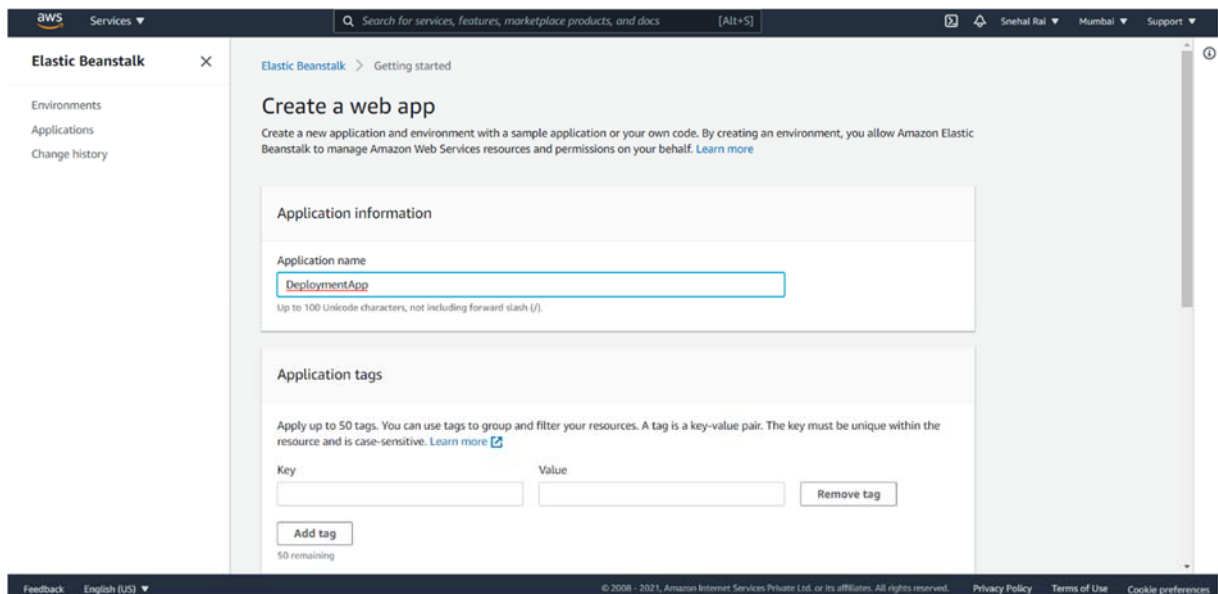
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**3. Click on Create Application:**



**4. Provide name for the web app .**

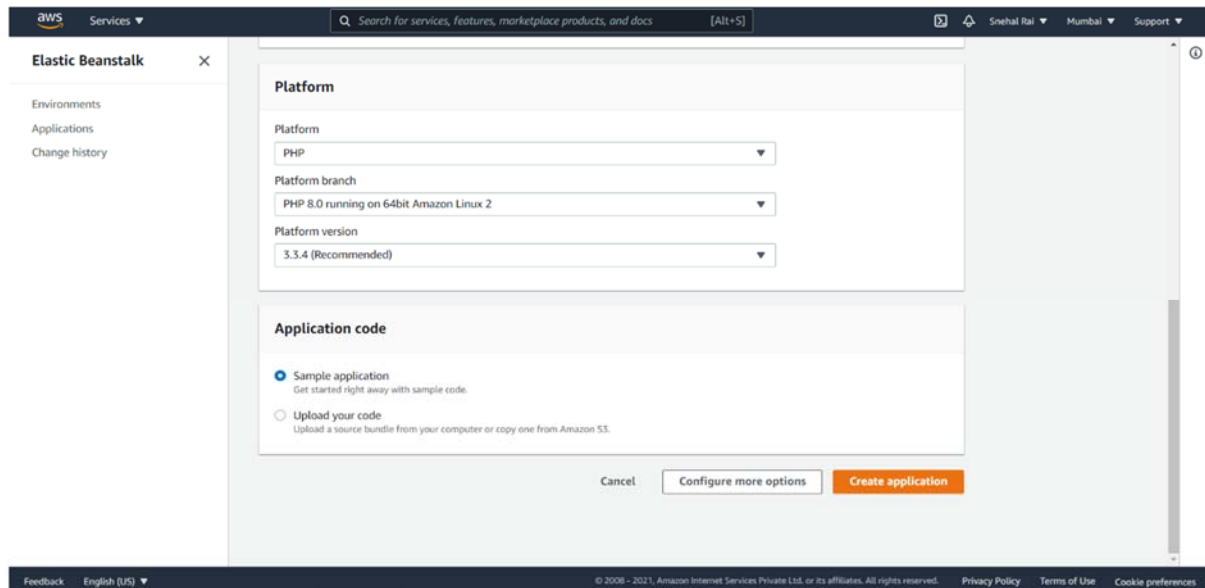


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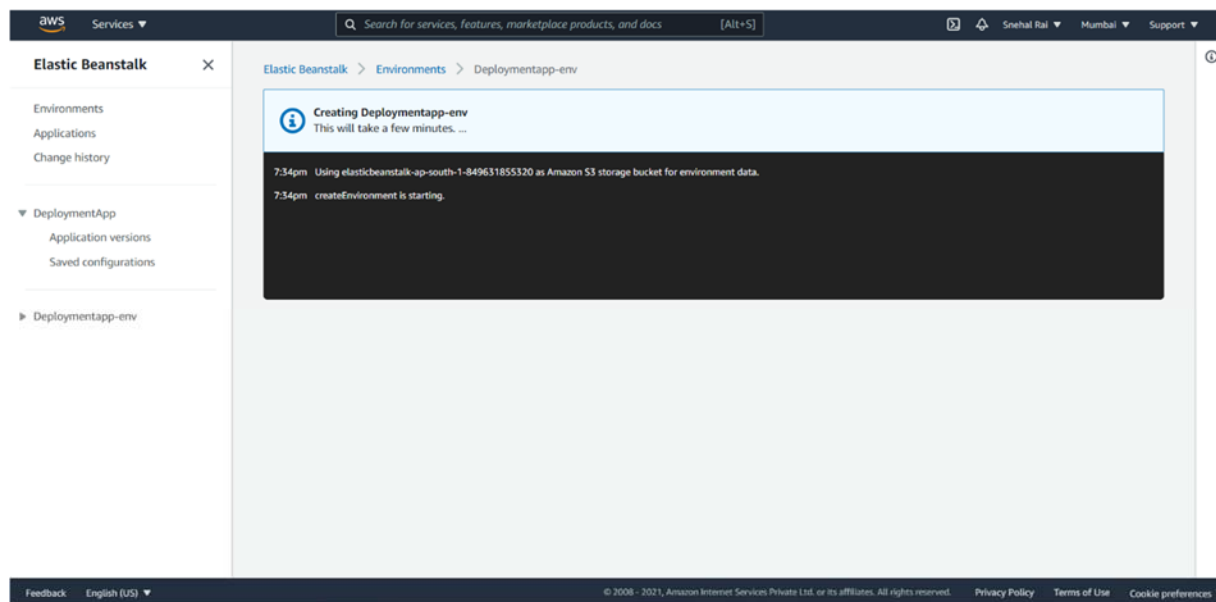
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**5. Select PHP as platform and click on create application:**



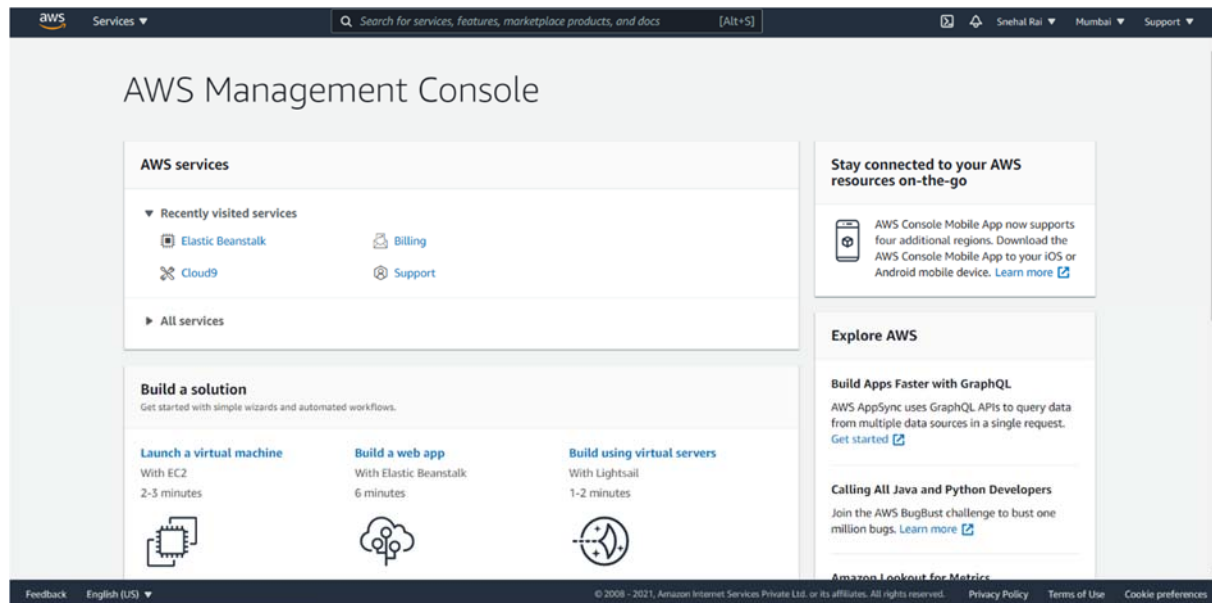
**6. It will take few minutes for the creation of web app environment, till that time open amazon console in new window:**



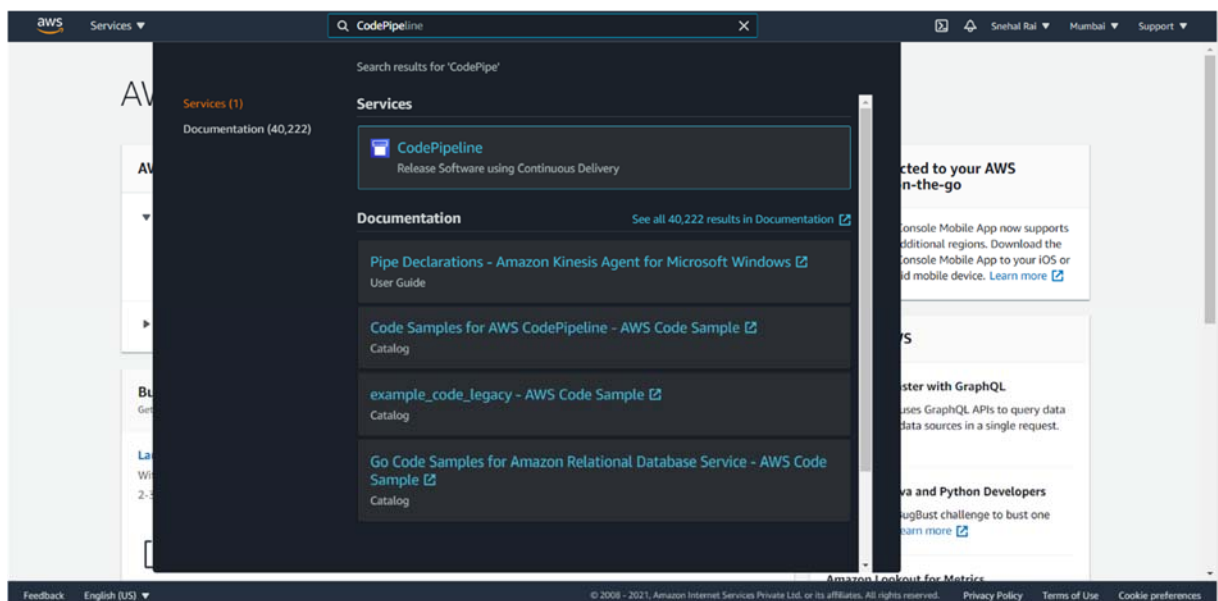
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7. Search for CodePipeline in services search box.

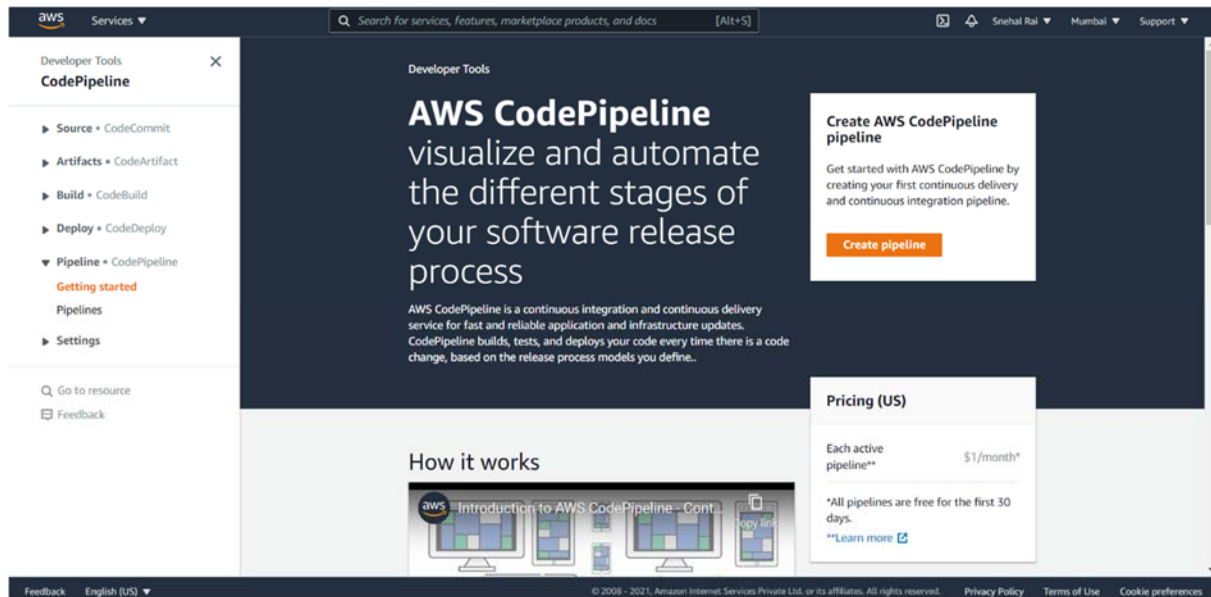


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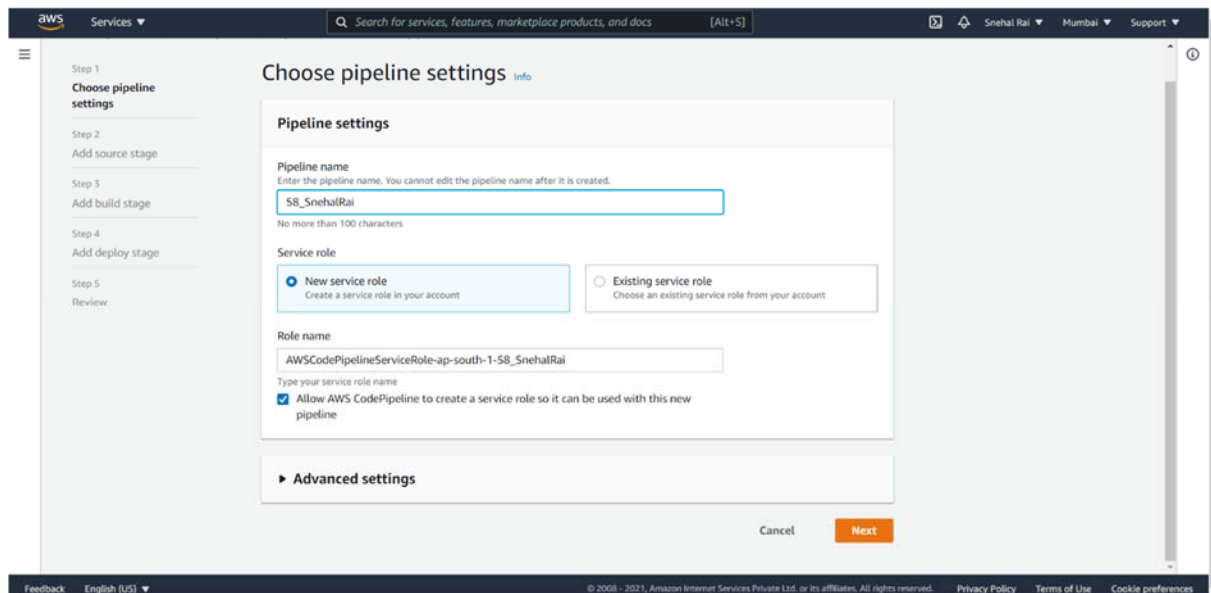
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**8. Click on create pipeline.**



**9. Provide name for Pipeline and click on next**



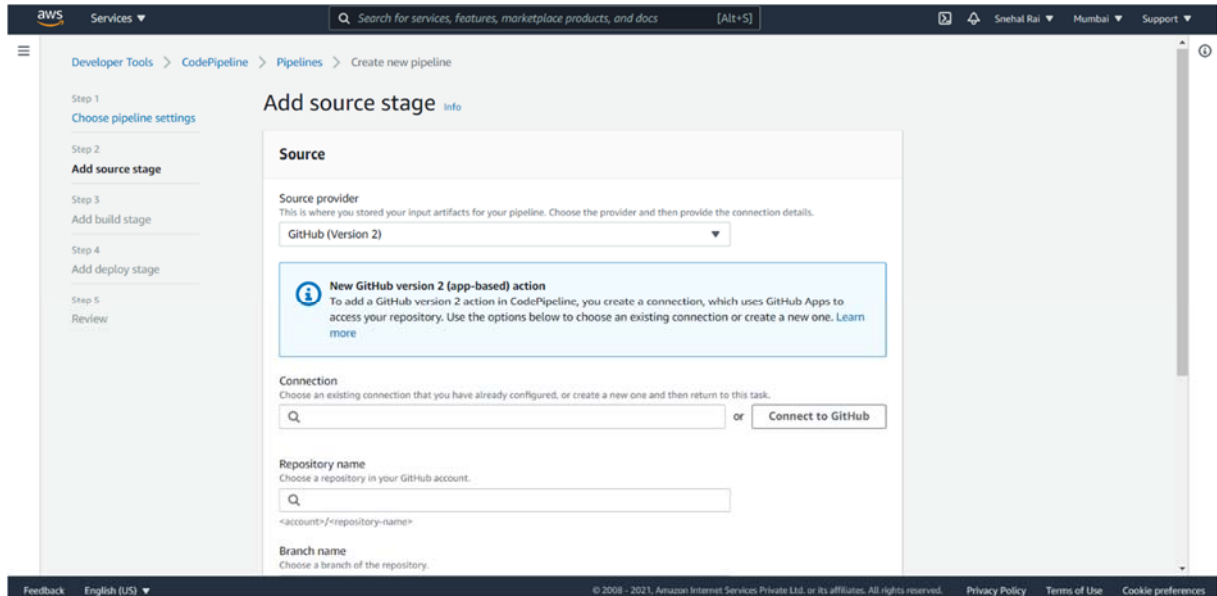


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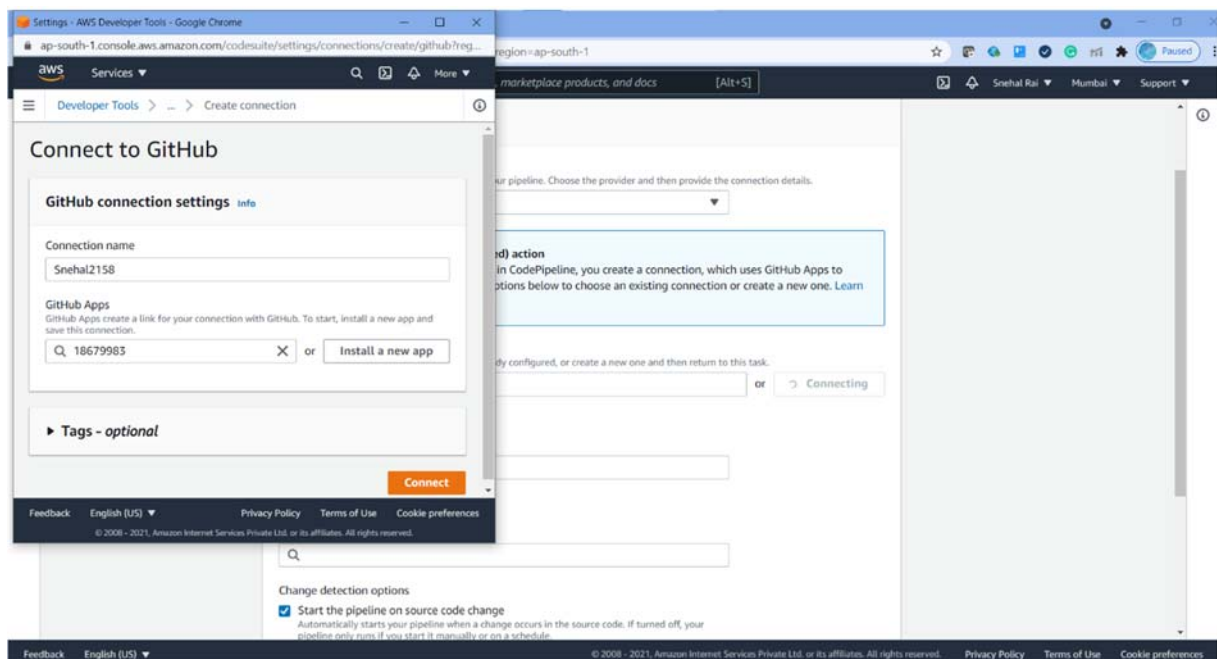
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**10. Select GitHub (Version 2) as the source provider.**



**11. Connect your GitHub account to AWS .**



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12. Once your GitHub connection is set-up, provide a repository name and select the default master as branch name and click on next.

The screenshot shows the AWS CodePipeline console interface. At the top, there's a search bar and navigation links. The main content area is titled 'Ready to connect' and indicates that the GitHub connection is ready for use. Below this, there are fields for 'Repository name' and 'Branch name'. The repository name is 'Snehal2158/aws-codepipeline-s3-codedeploy-linux-1' and the branch name is 'master'. There are also checkboxes for 'Change detection options' and 'Output artifact format'. The 'Start the pipeline on source code change' checkbox is checked. The 'Output artifact format' is set to 'CodePipeline default'. At the bottom, there are 'Cancel', 'Previous', and 'Next' buttons.

13. Click on Skip build stage:

The screenshot shows the AWS CodePipeline console interface. The main content area is titled 'Add build stage' and shows a 'Build - optional' stage. Below this, there's a 'Build provider' dropdown menu. At the bottom, there are 'Cancel', 'Previous', 'Skip build stage', and 'Next' buttons. The 'Skip build stage' button is highlighted.

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**14. Select AWS Elastic Beanstalk as deploy provider and type the application name you provided before and click on next.**

The screenshot shows the AWS IAM console interface for adding a deployment stage. The left sidebar lists steps: Step 2 (Add source stage), Step 3 (Add build stage), Step 4 (Add deployment stage), and Step 5 (Review). The main content area is titled 'Add deployment stage' and includes a warning message: 'You cannot skip this stage. Pipelines must have at least two stages. Your second stage must be either a build or deployment stage. Choose a provider for either the build stage or deployment stage.' Below this, the 'Deploy' section is active, showing the following configuration: 'Deploy provider' set to 'AWS Elastic Beanstalk', 'Region' set to 'Asia Pacific (Mumbai)', 'Application name' set to 'DeploymentApp', and 'Environment name' set to 'Deploymentapp-emi'. At the bottom, there are 'Cancel', 'Previous', and 'Next' buttons.

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**15. Review the settings and click on create Pipeline:**

The screenshot shows the AWS CodePipeline console in the 'Review' step of creating a new pipeline. The left sidebar lists the steps: Step 1: Choose pipeline settings, Step 2: Add source stage, Step 3: Add build stage, Step 4: Add deployment stage, and Step 5: Review. The main content area shows the 'Review' step with the following configurations:

- Step 1: Choose pipeline settings**
  - Pipeline settings**
    - Pipeline name: SB\_SnehalRai
    - Artifact location: A new Amazon S3 bucket will be created as the default artifact store for your pipeline
    - Service role name: AWSCodePipelineServiceRole-ap-south-1-SB\_SnehalRai
- Step 2: Add source stage**
  - Source action provider**
    - Source action provider: GitHub (Version 2)
    - OutputArtifactFormat: CODE\_ZIP
    - ConnectionArn: arn:aws:codestar-connections:ap-south-1:849631855320:connection/2f1a5ab4-3dca-40e7-9802-0bedfea856bb
    - FullRepositoryId: Snehal2158/aws-codepipeline-s3-codedeploy-linux-1
    - BranchName: master
- Step 3: Add build stage**
  - Build action provider**
    - Build stage: No build
- Step 4: Add deployment stage**
  - Deploy action provider**
    - Deploy action provider: AWS Elastic Beanstalk
    - ApplicationName
    - DeploymentApp
    - EnvironmentName
    - Deploymentapp-env

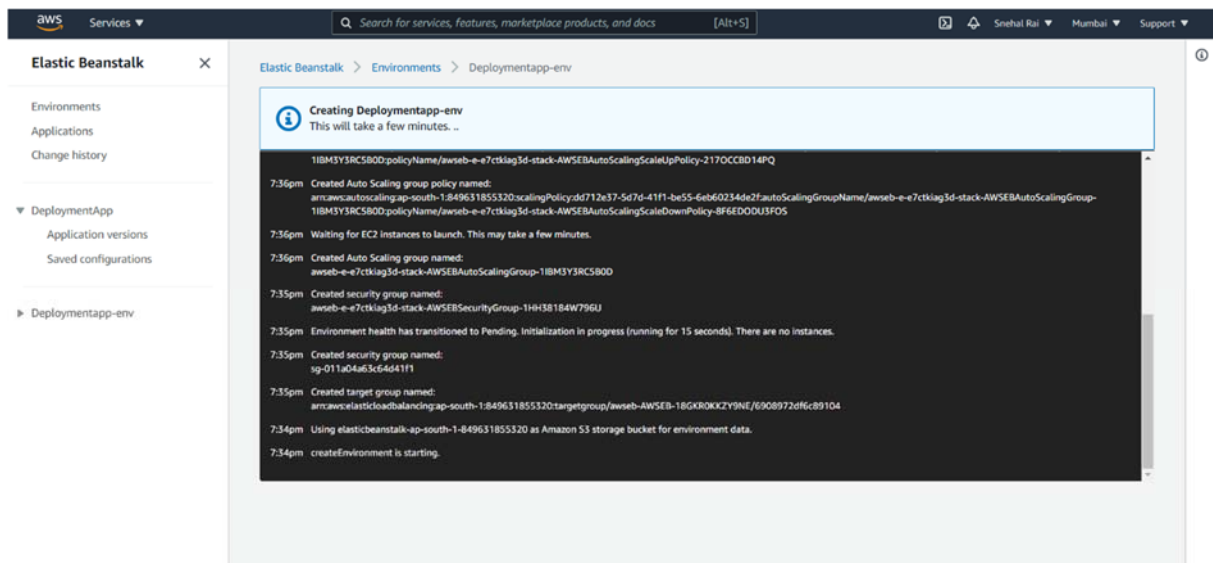
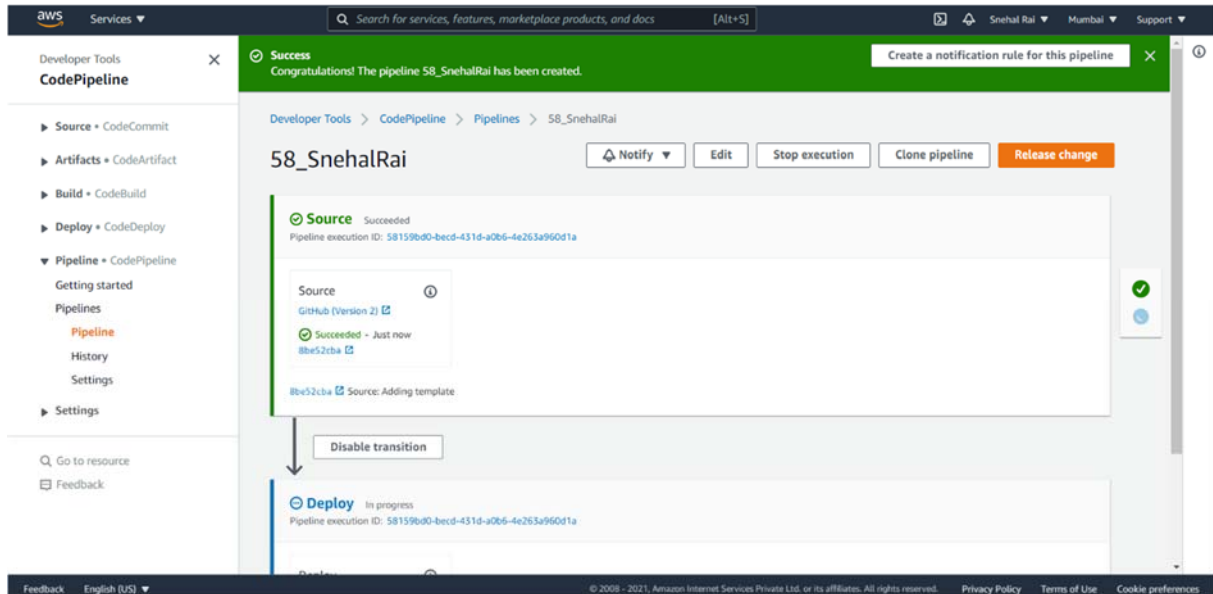
At the bottom of the console, there are three buttons: 'Cancel', 'Previous', and 'Create pipeline'.

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**16. After the successful creation of pipeline, go back to the environment window to check it's status.**

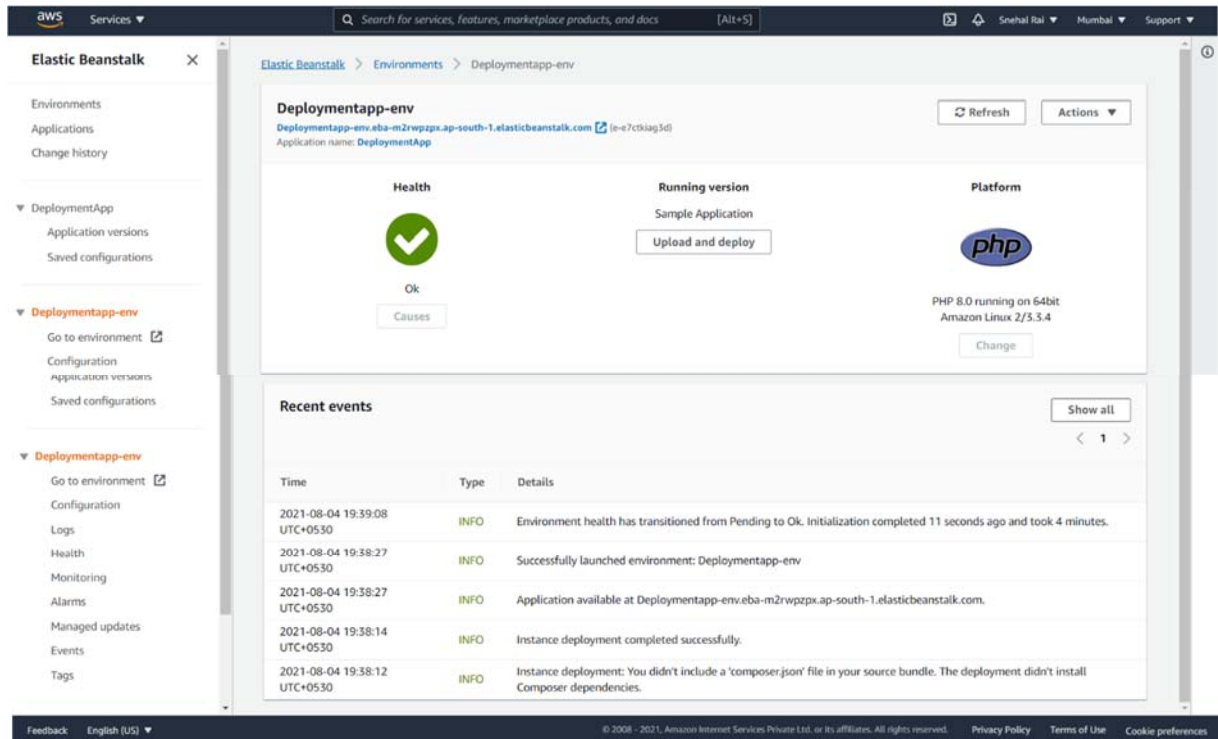


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**17. Click on beanstalk and and check it's running version and recent events.**



The screenshot shows the AWS Elastic Beanstalk console for the environment 'Deploymentapp-env'. The left sidebar contains navigation links for Environments, Applications, and Change history. The main content area shows the environment's details, including its health status (Ok), running version (Sample Application), and platform (PHP 8.0 running on 64bit Amazon Linux 2/3.5.4). Below this, a 'Recent events' table lists several informational events related to the environment's initialization and deployment.

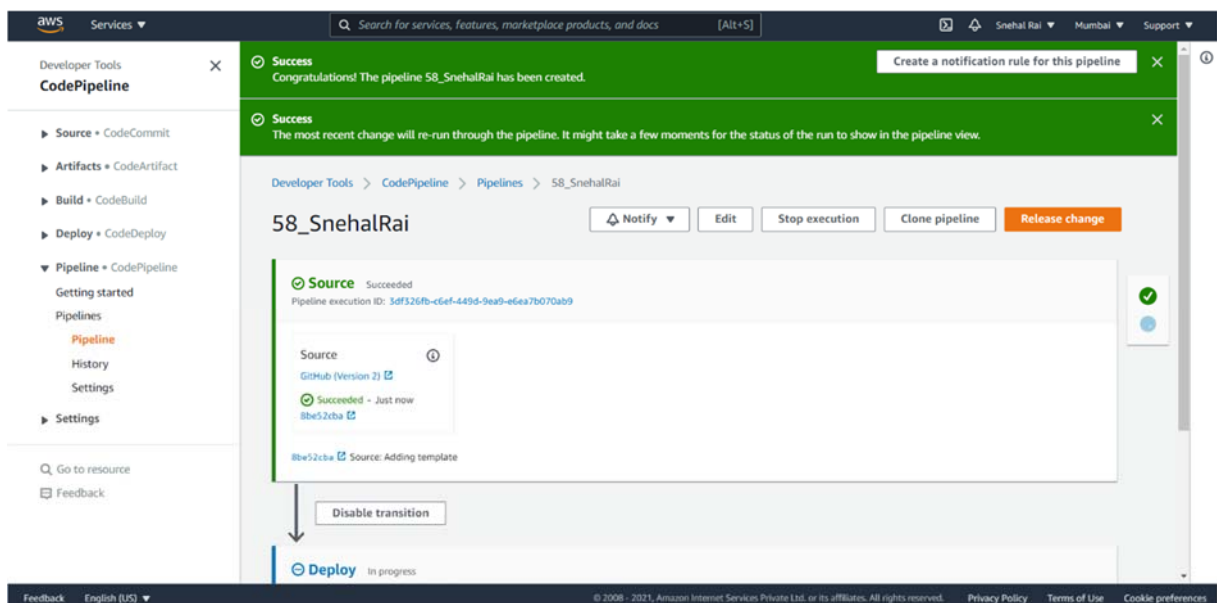
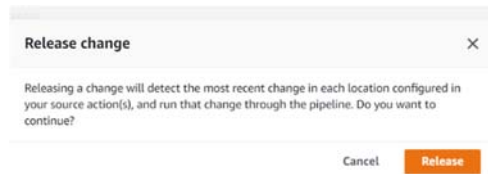
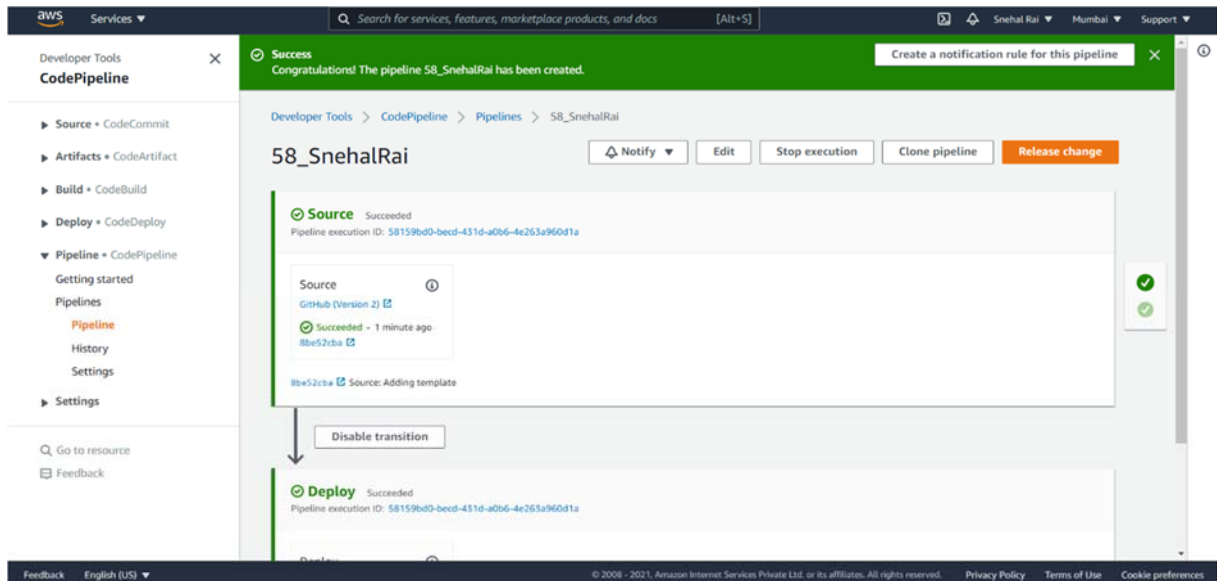
Time	Type	Details
2021-08-04 19:39:08 UTC+05:30	INFO	Environment health has transitioned from Pending to Ok. Initialization completed 11 seconds ago and took 4 minutes.
2021-08-04 19:38:27 UTC+05:30	INFO	Successfully launched environment: Deploymentapp-env
2021-08-04 19:38:27 UTC+05:30	INFO	Application available at Deploymentapp-env.eba-m2rwpzpx.ap-south-1.elasticbeanstalk.com.
2021-08-04 19:38:14 UTC+05:30	INFO	Instance deployment completed successfully.
2021-08-04 19:38:12 UTC+05:30	INFO	Instance deployment: You didn't include a 'composer.json' file in your source bundle. The deployment didn't install Composer dependencies.

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**18. Come back to CodePipeline window and click on release change.**



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**19. Click on History and view the execution history.**

The screenshot shows the AWS CodePipeline console. The left sidebar has a menu with 'Source', 'Artifacts', 'Build', 'Deploy', 'Pipeline', and 'Settings'. The 'Pipeline' section is expanded, and 'History' is selected. The main area displays the 'Execution history' for a pipeline named 'S8\_SnehalRai'. It shows two execution records:

Execution ID	Status	Source revisions	Duration	Completed	Trigger
3df326fb-c6ef-449d-9ea9-e6ea7b070ab9	In progress	Source - 8be52cba Adding template	0 seconds	-	StartPipelineExecution - root
58159bd0-becd-431d-a0b6-4e263a960d1a	Succeeded	Source - 8be52cba Adding template	1 minute 42 seconds	Aug 4, 2021 7:56 PM (UTC+5:30)	CreatePipeline - root

**20. Click on Services and select EC2.**

The screenshot shows the AWS Services console. The left sidebar has a menu with 'Favorites', 'Recently visited', and 'All services'. The 'All services' section is expanded, and 'EC2' is selected. The main area displays a grid of services, including 'Compute', 'Machine Learning', 'AWS Cost Management', 'Front-end Web & Mobile', 'AR & VR', and 'Application Integration'. The 'EC2' service is highlighted in the 'Compute' section.

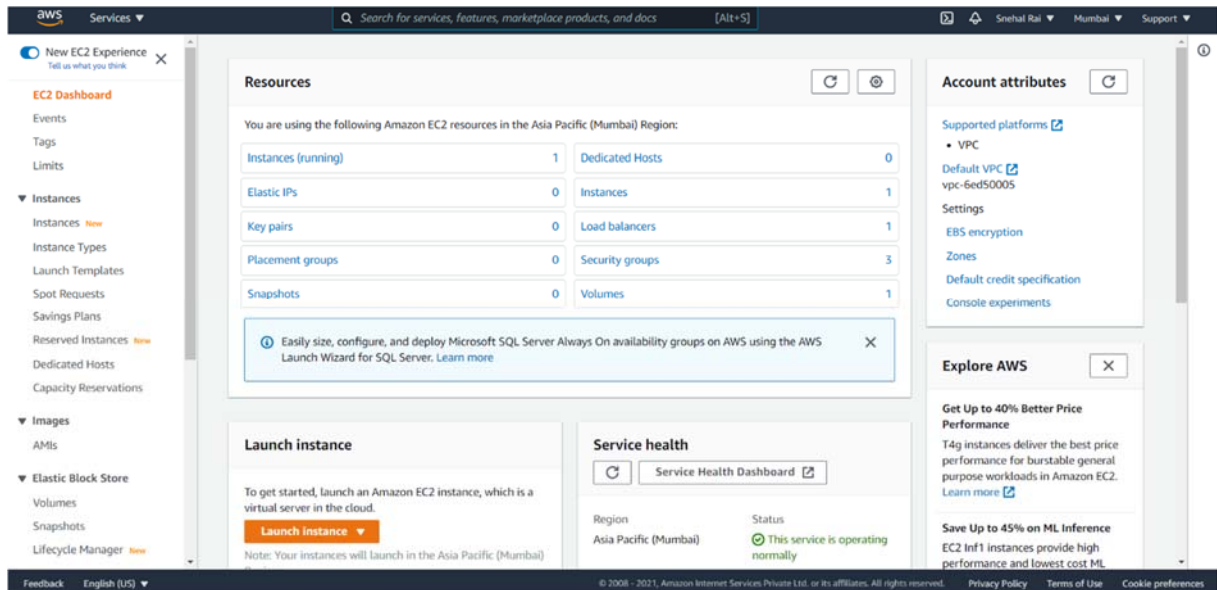


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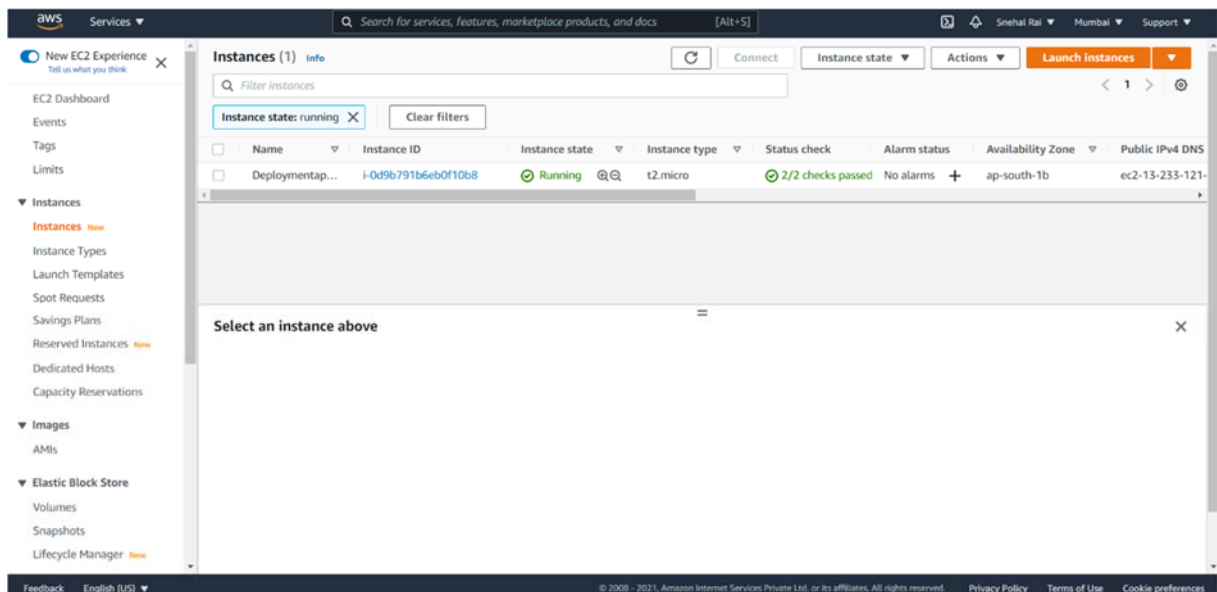
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**21. From the Resources, click on instances(running).**



**22. Select the running instance.**

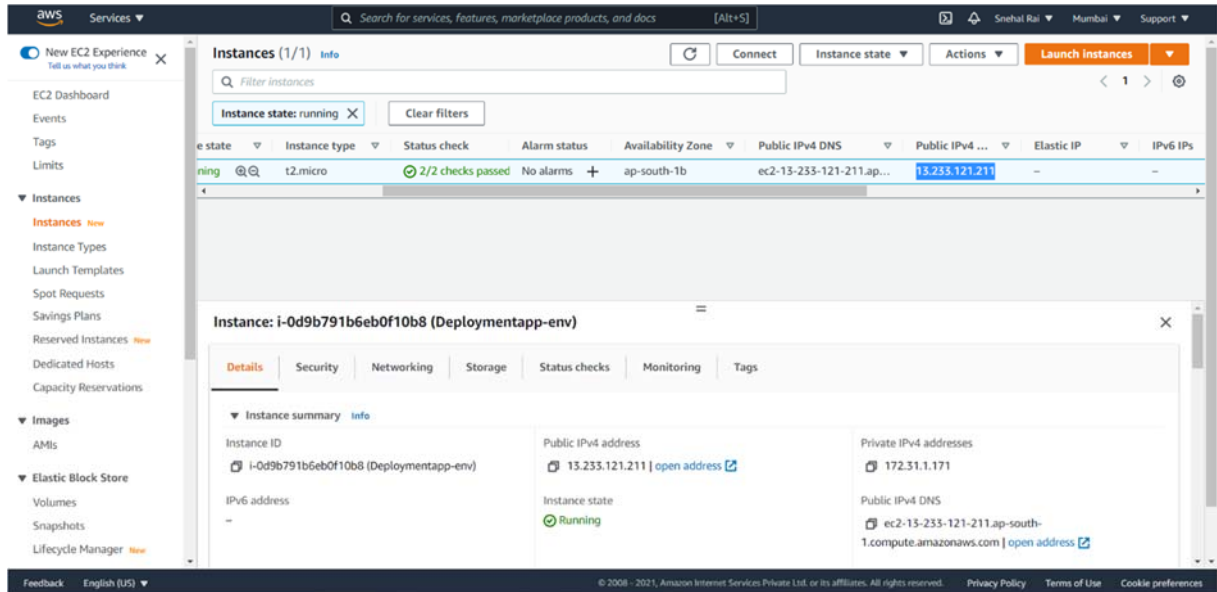


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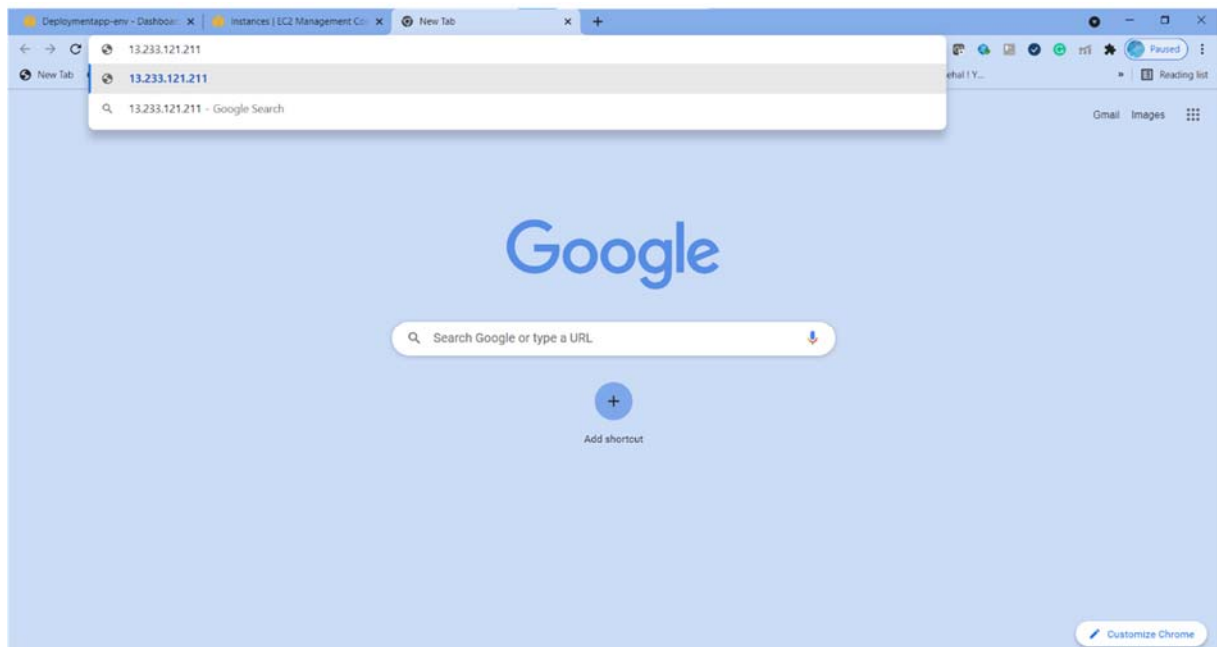
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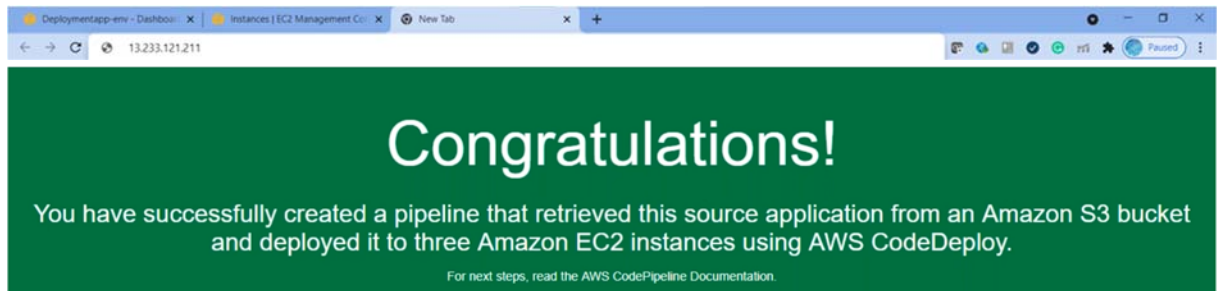
**23. Copy the Public IPv4 address:**



**24. Paste the copied IPv4 address in new window.**



## 25. Successful creation of an automated software release pipeline using AWS CodePipeline



**Conclusion:** There was successful creation of an automated software release pipeline using AWS CodePipeline. Using CodePipeline, I created a pipeline that uses GitHub, Amazon S3, or AWS CodeCommit as the source location for application code and then deploys the code to an Amazon EC2 instance managed by AWS Elastic Beanstalk. The pipeline will automatically deploy my code every time there is a code change. Continuous deployment allows me to deploy revisions to a production environment automatically without explicit approval from a developer, making the entire software release process automated.