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Department of Information Technology A.Y. 2024-25

Advance DevOps Lab
Experiment 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.

Roll No.	42
Name	Naikwadi Yash Shivdas
Class	D15B
Subject	Advance DevOps Lab
LO Mapped	LO1: To understand the fundamentals of Cloud Computing and be fully proficient with Cloud based DevOps solution deployment options to meet your business requirements.
Grade:	

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 :

Continuous deployment is a key practice in modern DevOps, enabling organizations to streamline their software release process by automating the deployment of application updates. It allows for the seamless delivery of code revisions to production environments without requiring explicit approval from a developer, thereby reducing time-to-market and enhancing the overall efficiency of the development lifecycle.

AWS CodePipeline is a continuous integration and continuous delivery (CI/CD) service that facilitates the building, testing, and deployment of code whenever there is a change in the source code repository. By automating these steps, CodePipeline ensures that new features, bug fixes, and updates are reliably and consistently delivered to users.

One of the critical components of a continuous deployment pipeline is the deployment environment, which is typically made up of virtual servers or containers that host the application.

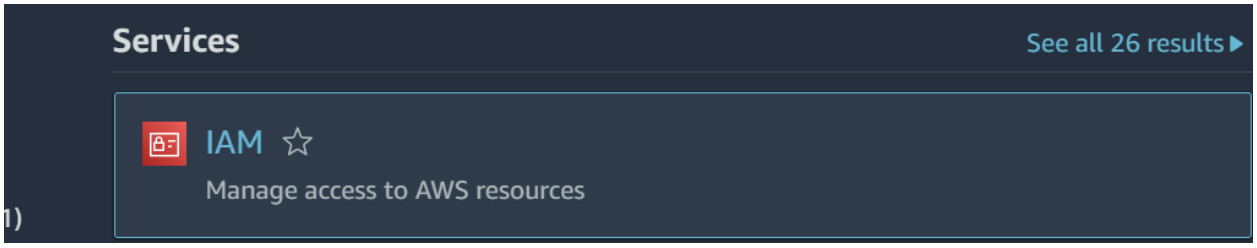
Amazon Elastic Beanstalk (EBS) is a Platform as a Service (PaaS) offering that simplifies the deployment and management of applications in the cloud. It abstracts the underlying infrastructure, such as EC2 instances, load balancers, and scaling configurations, allowing developers to focus on writing code without worrying about provisioning and maintaining the infrastructure.

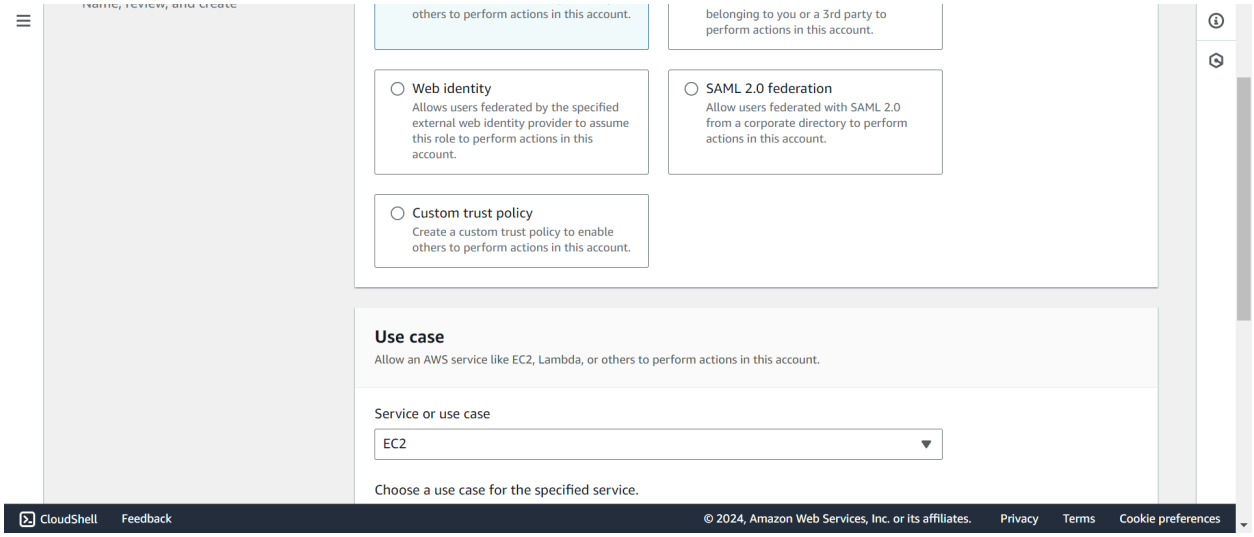
In a typical AWS CodePipeline workflow, the source code for an application is stored in a version control system like GitHub, an S3 bucket, or AWS CodeCommit. The pipeline monitors this source repository for changes and triggers a series of automated actions whenever a change is detected. These actions might include building the application, running automated tests, and finally deploying the code to a live environment.

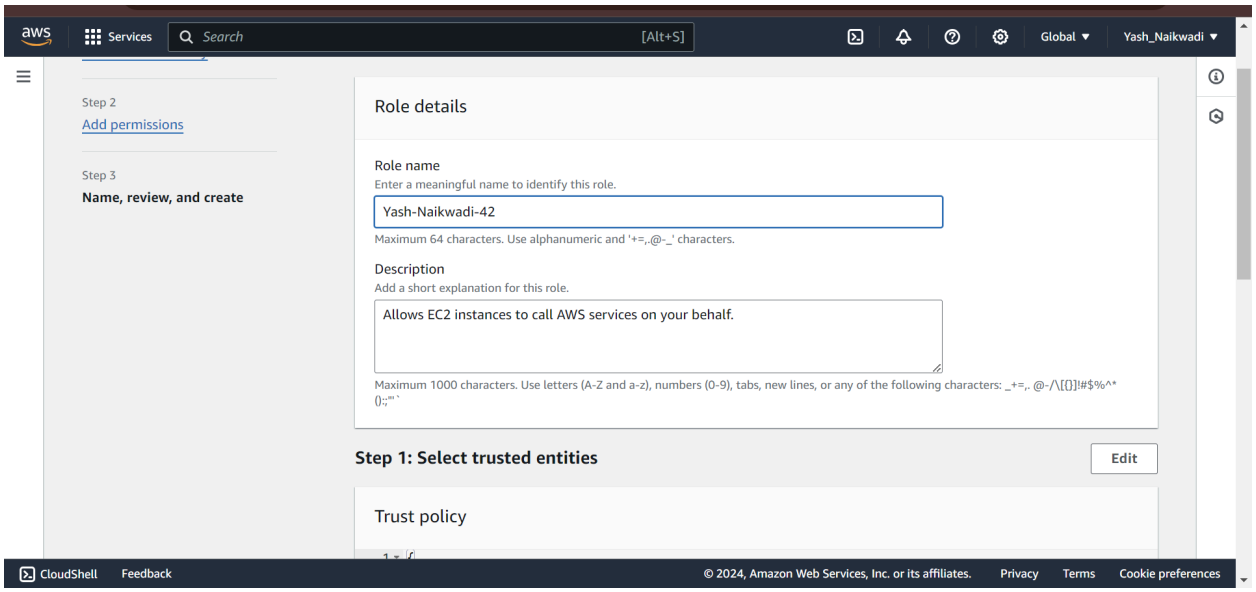
The deployment target in this setup could be an Amazon EC2 instance managed by Elastic Beanstalk, which takes care of the deployment details like setting up the necessary resources, deploying the code, and ensuring that the application is running smoothly. This integration with Elastic Beanstalk offers an out-of-the-box deployment solution that is both scalable and resilient.

AWS CodePipeline's integration with Elastic Beanstalk ensures that every code change goes through a consistent deployment process, thereby minimizing human errors and ensuring that the application remains stable and reliable. This automated process not only accelerates the development cycle but also improves the quality of the software by providing immediate feedback on the code’s performance in a production-like environment.

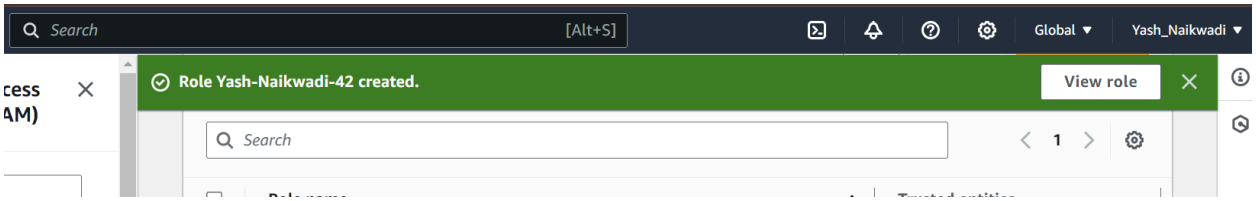
Create an IAM Role

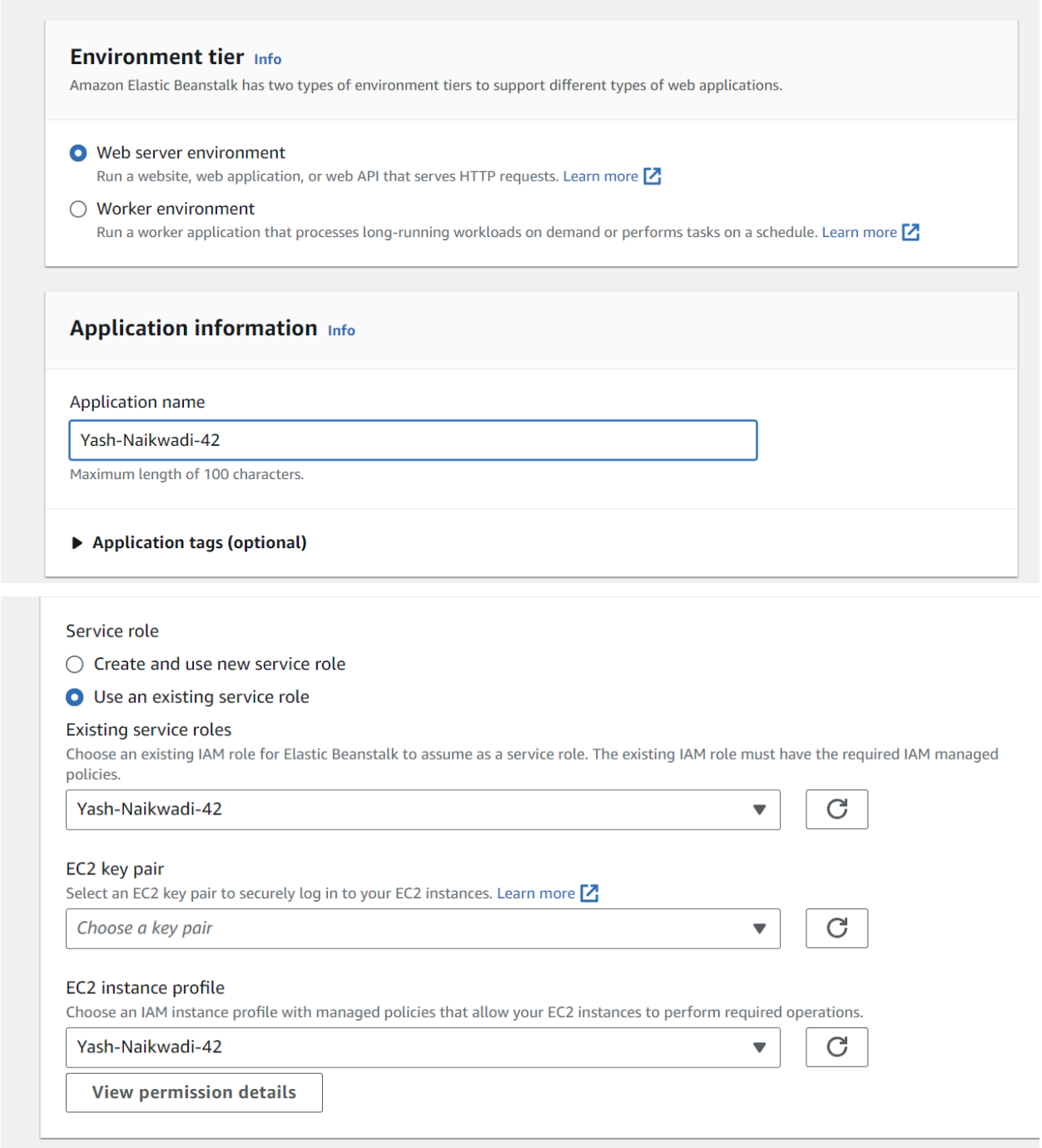






Creating an environment using elastic beanstalk.




Environment tier Info
Amazon Elastic Beanstalk has two types of environment tiers to support different types of web applications.
Web server environment
Run a website, web application, or web API that serves HTTP requests. Learn more
Worker environment
Run a worker application that processes long-running workloads on demand or performs tasks on a schedule. Learn more
Application information Info
Application name
Yash-Naikwadi-42
Maximum length of 100 characters.
Application tags (optional)
Service role
Create and use new service role
Use an existing service role
Existing service roles
Choose an existing IAM role for Elastic Beanstalk to assume as a service role. The existing IAM role must have the required IAM managed policies.
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EC2 key pair
Select an EC2 key pair to securely log in to your EC2 instances. Learn more
Choose a key pair
EC2 instance profile
Choose an IAM instance profile with managed policies that allow your EC2 instances to perform required operations.
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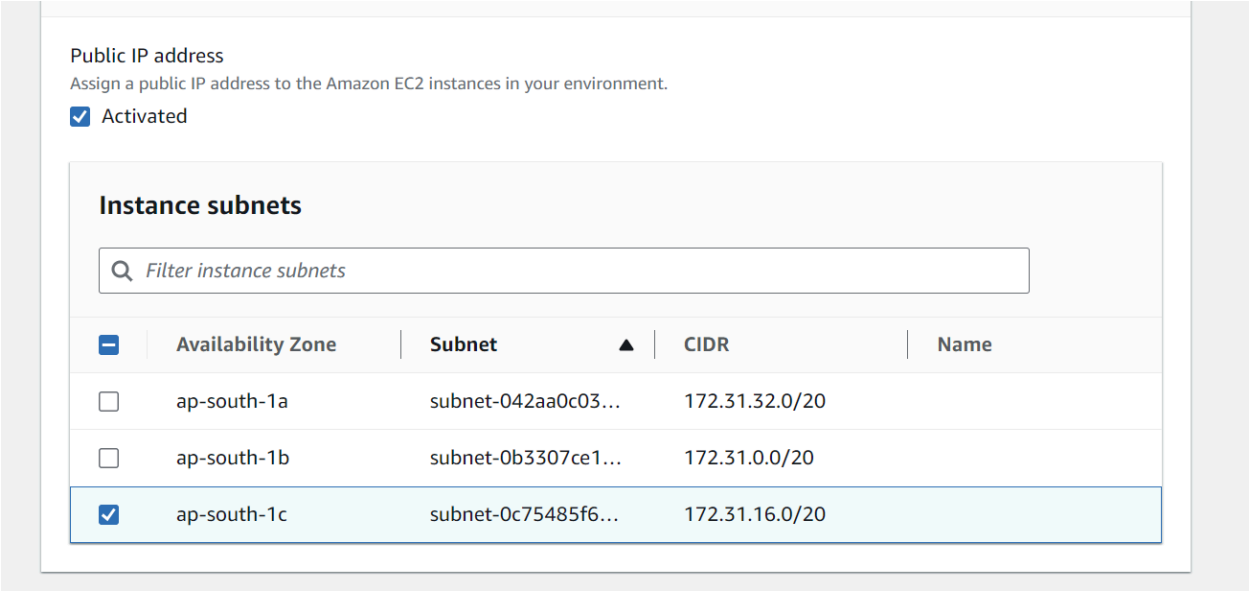
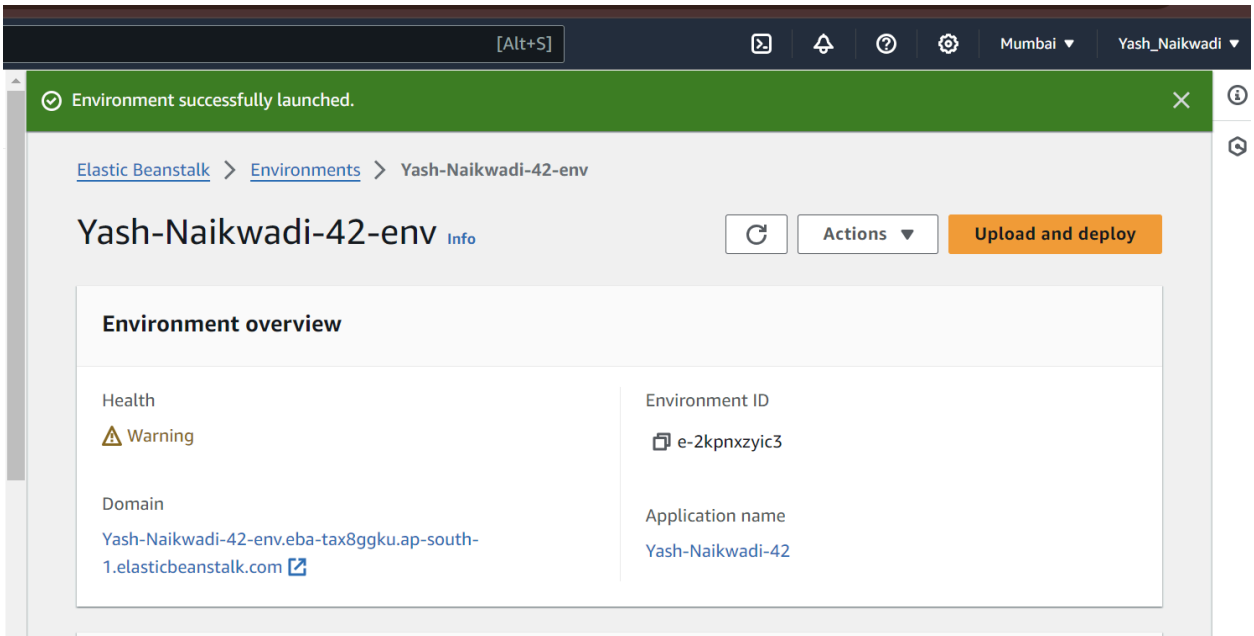
View permission details



Successful creation of Environment.



Creating pipeline using CodePipeline service from AWS.

Choose pipeline settings Info

Step 1 of 5

Pipeline settings

Pipeline name

Enter the pipeline name. You cannot edit the pipeline name after it is created.

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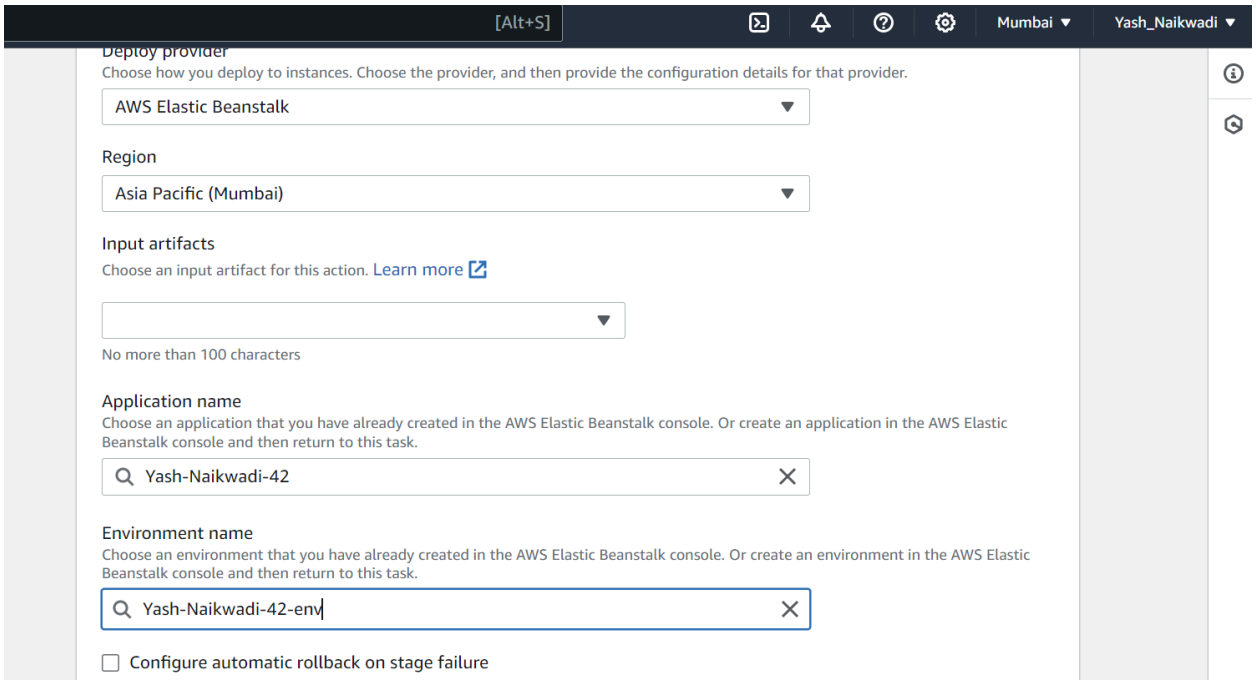
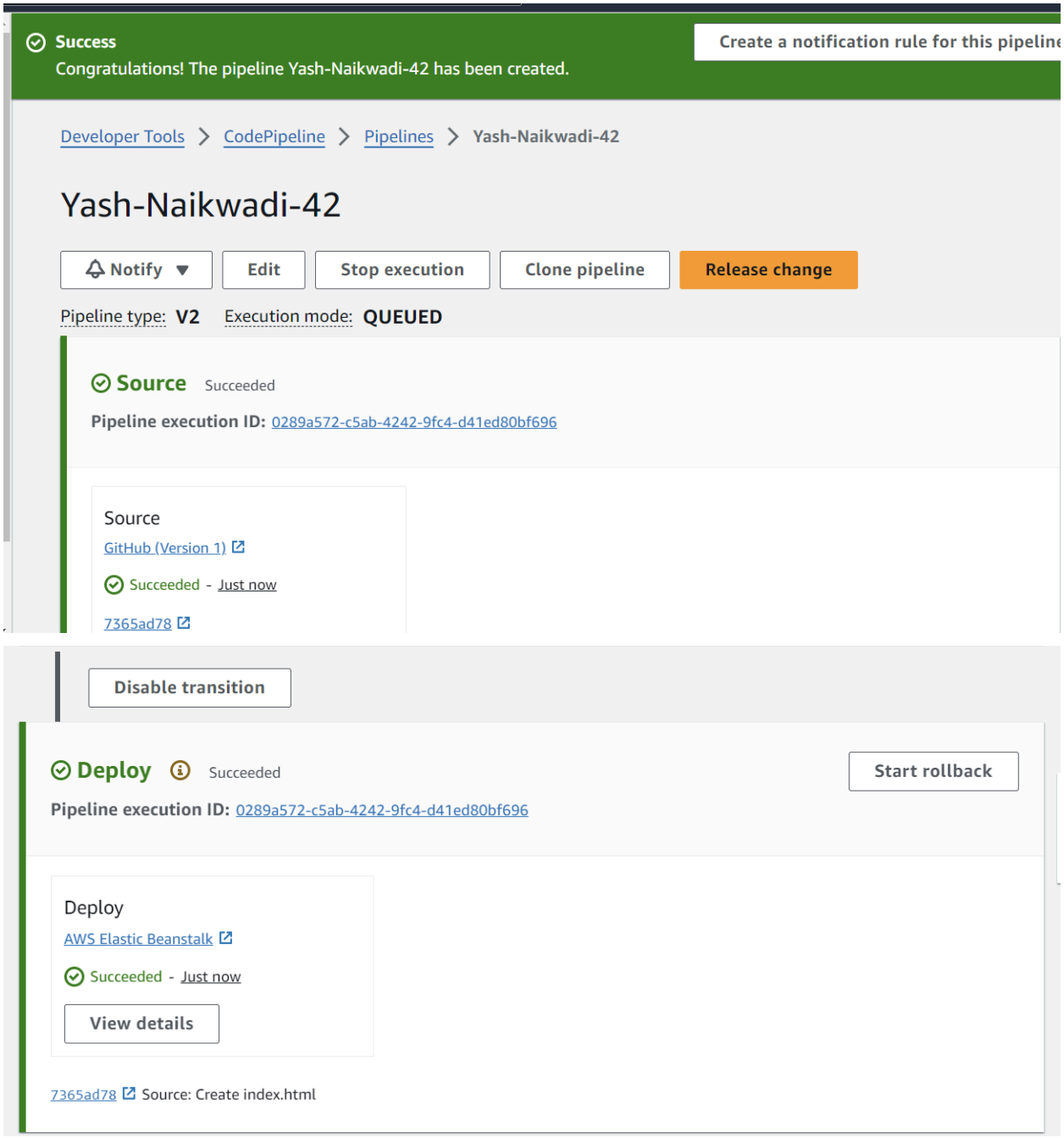
No more than 100 characters

Pipeline type

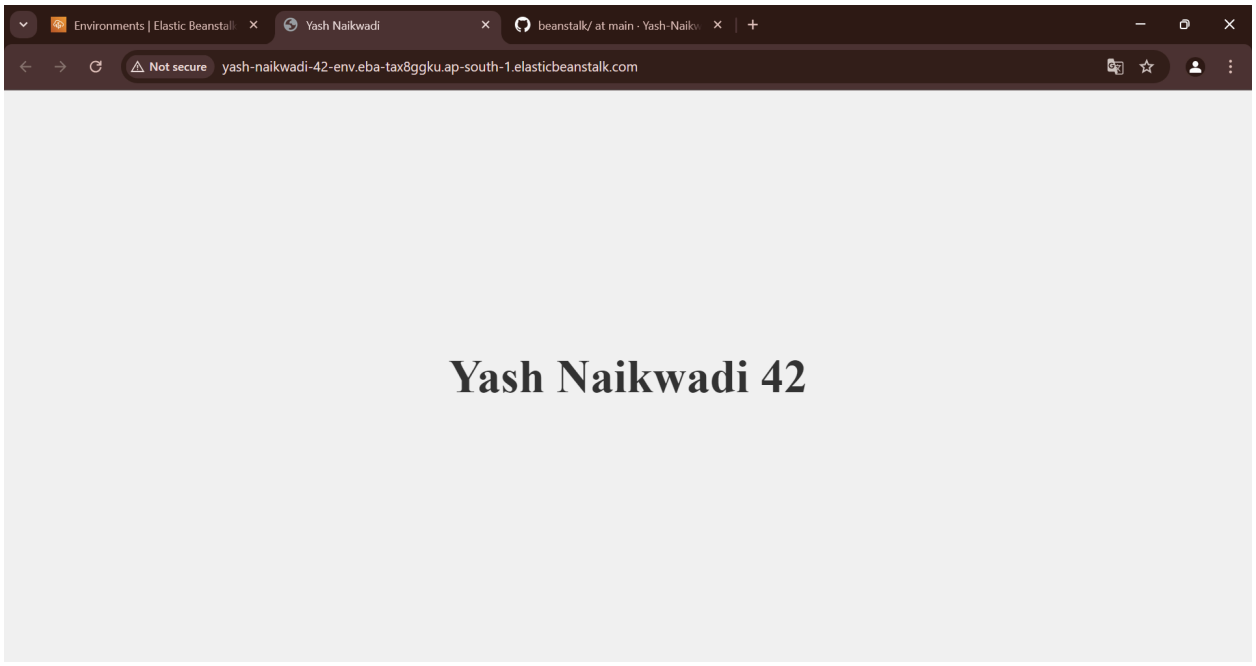
You can no longer create V1 pipelines through the console. We recommend you use the V2 pipeline type with improved release safety, pipeline triggers, parameterized pipelines, and a new billing model.



Successful creation of CodePipeline.



Selection domain from the specified environment and observing the webpage created, that is linked with GitHub.



CONCLUSION :

Continuous deployment using AWS CodePipeline and Elastic Beanstalk represents a powerful approach to modern software development, where automation plays a crucial role in delivering high-quality software quickly and efficiently. This method supports the agile methodology by enabling rapid iterations and continuous improvements, leading to more responsive and innovative applications.