



Academic Year: 2025-26

Semester: V

Class / Branch: TEIT

Subject: DevOps Lab

Name of Instructor: Ms. Sujata Oak

Experiment No. 4

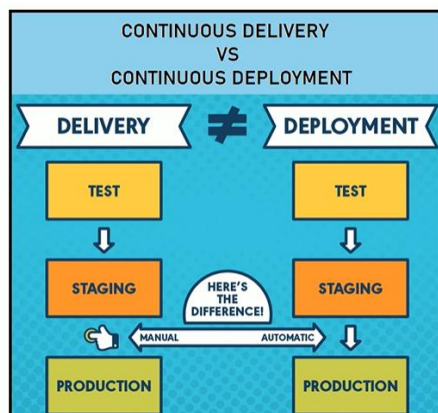
Aim: To install Jenkins and configure parallel jobs for building pipeline.

Theory: Jenkins is an open-source automation server widely used in Continuous Integration (CI) and Continuous Delivery (CD) pipelines. It allows developers to automate building, testing, and deployment of applications. One powerful feature of Jenkins is the ability to execute parallel jobs in a pipeline, which reduces build time and improves efficiency.

Objectives

- Understand the process of installing Jenkins.
- Learn how to configure Jenkins for pipeline execution.
- Implement parallel stages in Jenkins pipelines to run tasks simultaneously.

Continuous Delivery vs Continuous deployment



Continuous Delivery : The entire process is segregated into three phases:



Test, Staging and Production. The test and staging are automatic. But when you try to move your project from staging to production you need manual. So, this is called **continuous delivery**.

Continuous Deployment: All the phases test, staging and production is completely automatic. There is no manual intervention is required. So, this is called **continuous deployment**.

Implementation:

Create 3 jobs: Test , Staging and Production

Test→Freestyle→Ok

Staging→freestyle→Ok



Build Steps

Automate your build process with ordered tasks like

≡

Execute shell

?

Command

See [the list of available environment variables](#)

```
sleep 10  
echo "This is a Staging phase"
```

Advanced ▾

Save

Apply

Production → freestyle → ok

Build Steps

Automate your build process with ordered tasks like

≡

Execute shell

?

Command

See [the list of available environment variables](#)

```
sleep 10  
echo "This is a Production Phase"
```

Advanced ▾

Save

Apply

Part I: Demo on concept of continuous delivery



In continuous delivery you can see the test job and staging is continuous.

Test→Configure→Add post build action→build other project

Post-build Actions

Define what happens after a build completes, li

Build other projects ?

Projects to build

Staging,|

☒ Trigger only if build is stable

☐ Trigger even if the build is unstable

☐ Trigger even if the build fails

Add post-build action ~

Save Apply

In Continuous delivery, test and staging would be automatic. But when you want to move from staging to production it should be manual.

Now goto staging job. In this staging job I have selected this option build other jobs manual step.

Staging→Configure→Post-Build Actions → Build other projects (manual step)→production

So I have created all my jobs and I have interlinked as per the continuous delivery.



Staging

Upstream Projects

Test

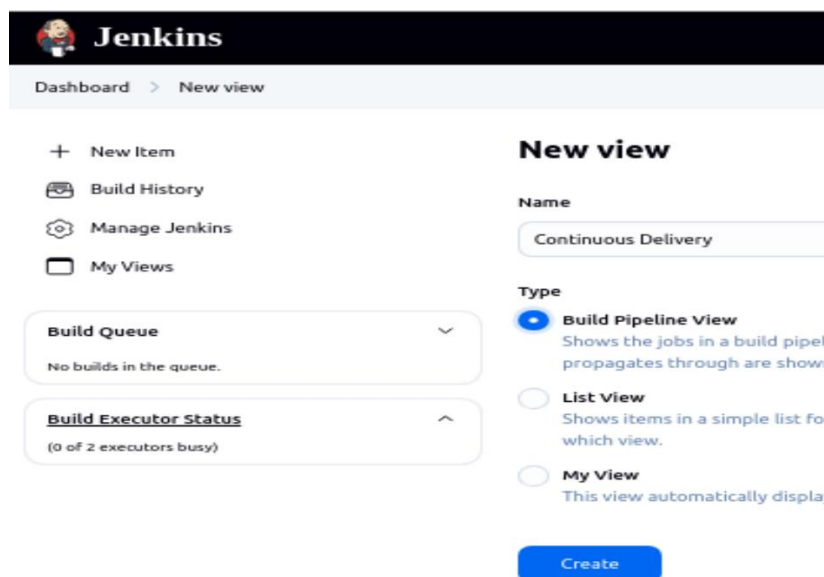
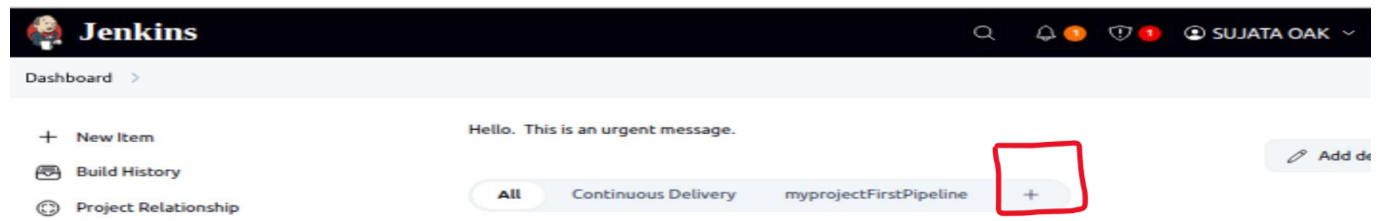
Downstream Projects

production

Permalinks

Goto Dashboard,

Now you need to click on this plus icon. New view: Name: continuous delivery.
And type: build pipeline view and click on create.





and scroll down and look for your initial job.
My initial job is the test job.

Pipeline Flow

Layout

Based on upstream/downstream relationship

This layout mode derives the pipeline structure based on the jobs. This is the only out-of-the-box supported layout mode.

Upstream / downstream config

Select Initial Job ?

Test

Trigger Options

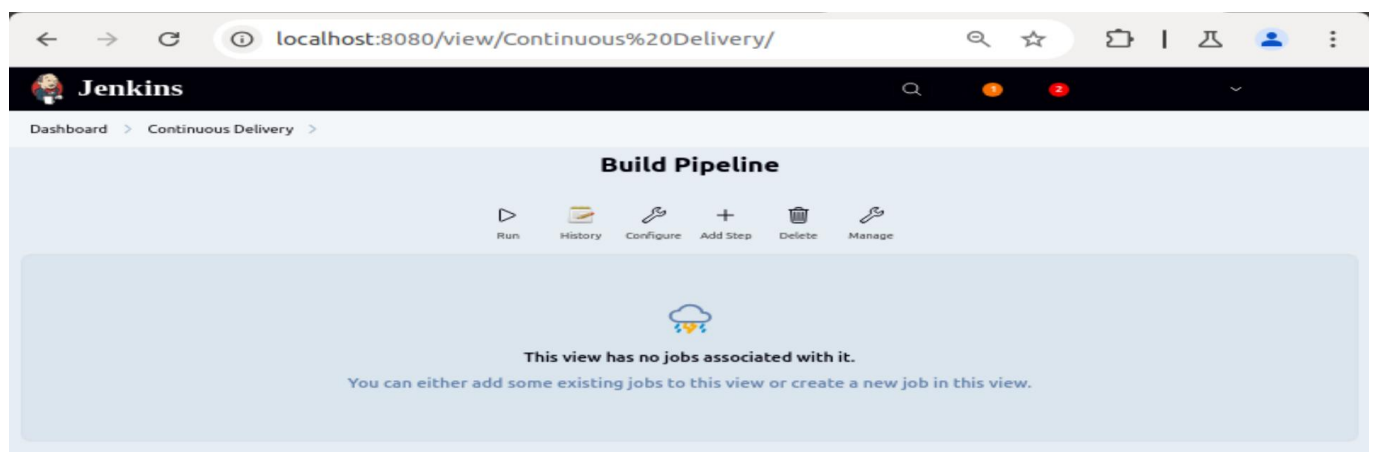
Build Cards

Standard build card

Use the default build cards

Save

Apply





PARSHVANATH CHARITABLE TRUST'S
A. P. SHAH INSTITUTE OF TECHNOLOGY
Department of Information Technology
(NBA Accredited)



localhost:8080/view/Continuous%20Delivery/

Jenkins

Dashboard > Continuous Delivery >

Build Pipeline

Run History Configure Add Step Delete Manage

Pipeline #1

#1 Test
Jul 1, 2025 6:33:27 PM
3.2 sec and counting
sujata

Staging
N/A
N/A

production
N/A
N/A

Jenkins

Dashboard > Continuous Delivery >

Build Pipeline

Run History Configure Add Step Delete Manage

Pipeline #1

#1 Test
Jul 1, 2025 6:33:27 PM
10 sec
sujata

#1 Staging
Jul 1, 2025 6:33:42 PM
10 sec

production
N/A
N/A

Refresh it , still the production stage will not start Since it is a manual process in continuous delivery. We need to trigger it manually.

Dashboard > Continuous Delivery >

Build Pipeline

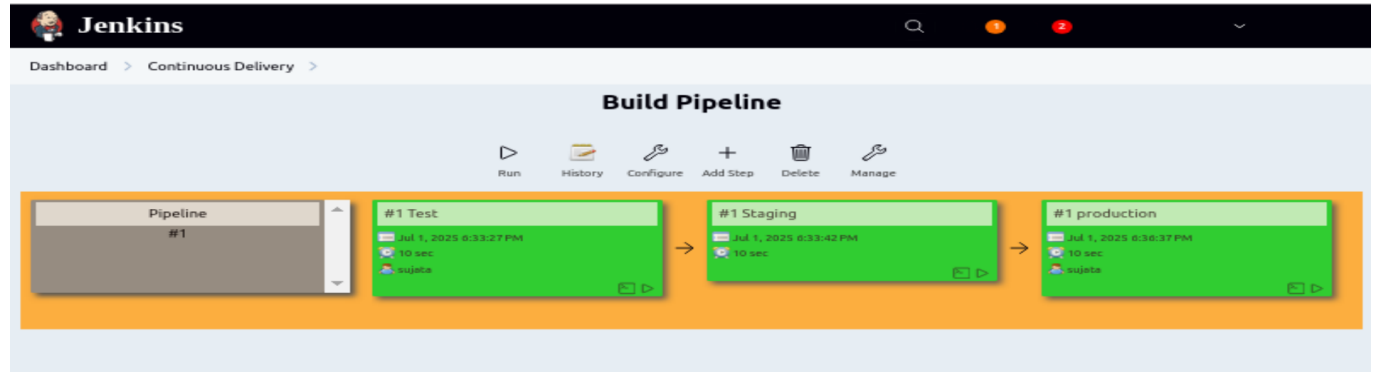
Run History Configure Add Step Delete Manage

Pipeline #1

#1 Test
Jul 1, 2025 6:33:27 PM
10 sec
sujata

#1 Staging
Jul 1, 2025 6:33:42 PM
10 sec

production
N/A
N/A



Part II: Demo on concept of continuous deployment

All 3 stages has to be automated

Goto Dashboard→Staging→Configure

Post-build Actions

Define what happens after a build completes,

Build other projects ?

Projects to build

production,

☒ Trigger only if build is stable

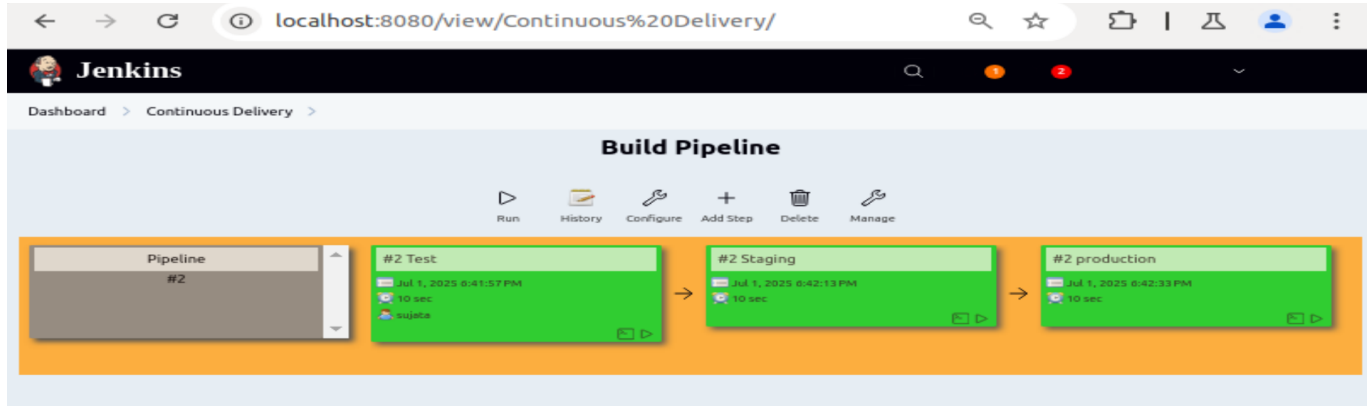
☐ Trigger even if the build is unstable

☐ Trigger even if the build fails

Add post-build action

Save

Apply

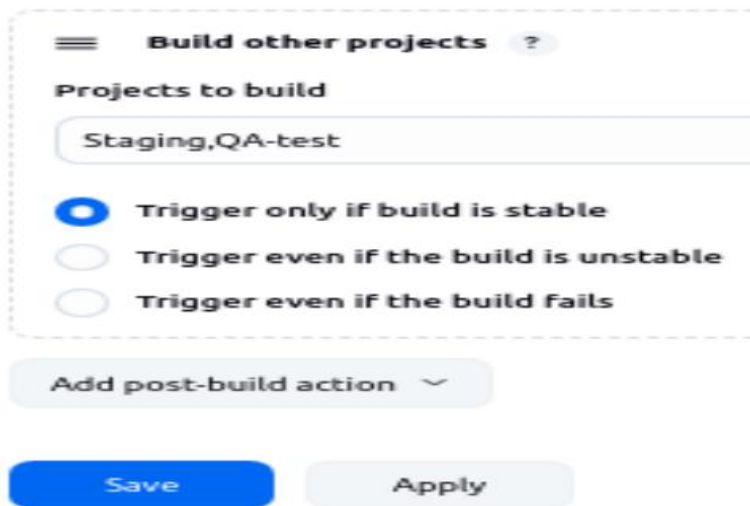


Part III: Parallel Jobs in Jenkins Build Pipeline

In Test job → Configure

Post-build Actions

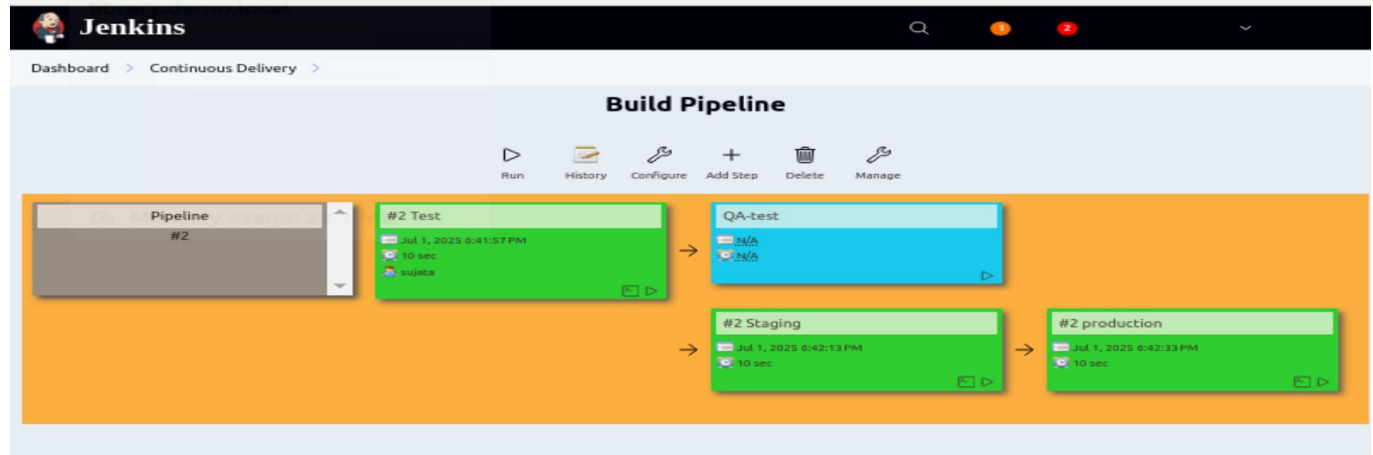
Define what happens after a build completes.



Goto dashboard → Click on Continuous Delivery



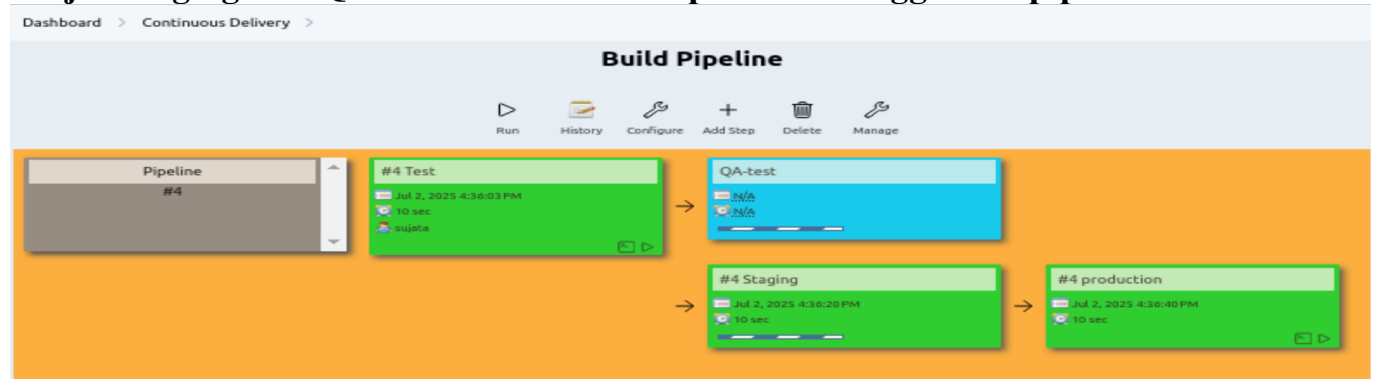
PARSHVANATH CHARITABLE TRUST'S
A. P. SHAH INSTITUTE OF TECHNOLOGY
Department of Information Technology
(NBA Accredited)



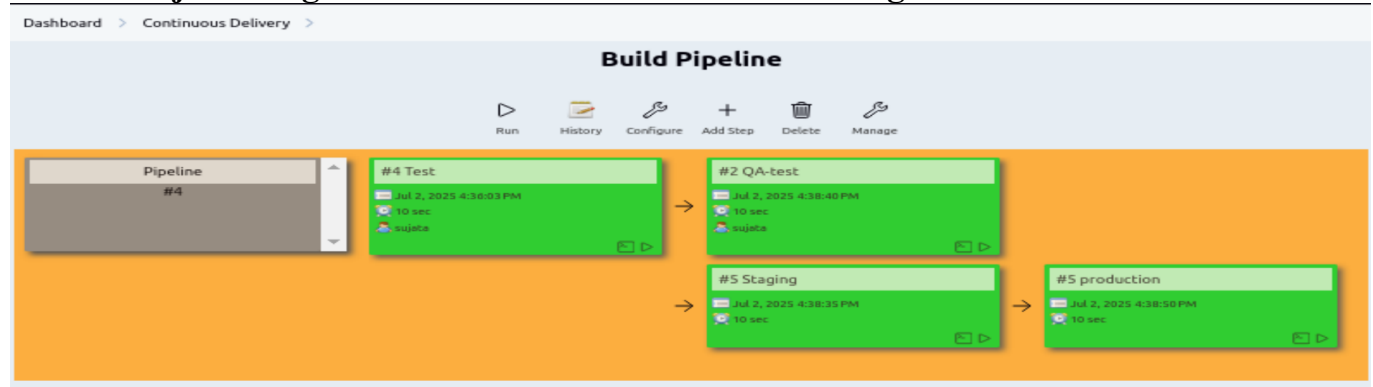
Refresh and Run

1st job executed shown in green color

2nd job staging and QA-test will execute in parallel. Trigger the pipeline



At last all job will get executed and the color should be green.





PARSHVANATH CHARITABLE TRUST'S
A. P. SHAH INSTITUTE OF TECHNOLOGY
Department of Information Technology
(NBA Accredited)



Conclusion:

In this experiment we successfully learned installing jenkins and setting up parallel jobs in a pipeline which significantly improves CI/CD efficiency. This approach helps in faster feedback cycles, quicker releases, and better utilization of resources. With proper pipeline configuration, teams can ensure high productivity while maintaining quality.