

Experiment – 6: a. To build pipeline of jobs in Jenkins, create a pipeline script to test and deploy an application.

b. To automatically build a job in Jenkins using webhooks (Topic Beyond Syllabus)

1. **Aim:** To build pipeline of jobs in Jenkins, create a pipeline script to test and deploy an application
2. **Objectives:** Aim of this experiment is that, the students will be able
 - To build pipeline of jobs in Jenkins, create a pipeline script to test and deploy an application
3. **Outcomes:** After study of this experiment, the students will be able
 - To understand the importance of Jenkins to Build and deploy Software Applications on server environment.
4. **Prerequisite:** Knowledge of software engineering concept of integration and deployment
5. **Requirements:** Jenkins, JDK, python, Personal Computer, Windows operating system, browser, Internet Connection, Microsoft Word.
6. **Pre-Experiment Exercise:**
Brief Theory: Refer shared material
7. **Laboratory Exercise**

A. Procedure:

a. Answer the following:

- What is Jenkins pipeline?

Jenkins Pipeline is a powerful automation feature within the Jenkins continuous integration and continuous delivery (CI/CD) platform. It allows you to define and manage your build, test, and deployment processes as code, enabling you to create, version, and execute complex, orchestrated workflows for software development and delivery. Jenkins Pipeline is typically defined using a domain-specific language called Groovy DSL, making it a flexible and extensible way to automate and manage your software delivery pipelines.

- What are the different ways to write a Jenkins pipeline?

There are two primary ways to write a Jenkins Pipeline:

1. Declarative Pipeline: This is a simplified and structured way to define pipelines using a more human-readable syntax. It's ideal for straightforward, linear workflows.
2. Scripted Pipeline: This approach allows you to write pipelines using a full-fledged Groovy script, providing more flexibility and control for complex and conditional workflows.

You can choose the one that best suits your project's requirements and complexity.

7b. Execute following (Refer the shared material) and attach screenshots:

1. Create and build pipeline project with pipeline script
 - Project with Hello World pipeline script

Enter an item name

devops6_1

» Required field



Freestyle project

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.



Maven project

Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.



Pipeline

Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

General

Build Triggers

Advanced Project Options

Pipeline

Description

Name :- Lian Dabre
Roll No :- 18

[Plain text] [Preview](#)

- ☐ Discard old builds ?
- ☐ Do not allow concurrent builds
- ☐ Do not allow the pipeline to resume if the controller restarts
- ☐ GitHub project
- ☐ Pipeline speed/durability override ?
- ☐ Preserve stashes from completed builds ?

Save

Apply

General

Build Triggers

Advanced Project Options

Pipeline

Pipeline

Definition

Pipeline script

Script ?

```
1 pipeline {  
2   agent any  
3  
4   stages {  
5     stage('Hello') {  
6       steps {  
7         echo 'Hello World'  
8       }  
9     }  
10  }  
11 }  
12
```

Hello World

Save

Apply

Dashboard > LianDabre_18 > devops6_1 > #1

Stage Logs (Hello)

Print Message -- Hello World (self time 15ms)

Hello World

Build Now Disable Project

Configure

Delete Pipeline

Full Stage View

Rename

Pipeline Syntax

Stage View

Recent Changes

Average stage times:
(Average full run time: ~2s)

	Hello
Average stage times:	131ms
#1 Sep 08 10:46 No Changes	131ms

Build History

trend

Filter builds...

#1 Sep 8, 2023 10:46 AM

Atom feed for all Atom feed for failures

Permalinks

Last build (#1) 12 sec ago

Dashboard > LianDabre_18 > devops6_1 > #1

Back to Project

Status

Changes

Console Output

View as plain text

Edit Build Information

Delete build '#1'

Restart from Stage

Replay

Pipeline Steps

Workspaces

Console Output

```
Started by user admin
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in C:\ProgramData\Jenkins\.jenkins\workspace\devops6_1
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Hello)
[Pipeline] echo
Hello World
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

REST API Jenkins 2.342

- Project with your own pipeline script

Q Type to search

ActionsProjectsSecurityInsights

Create a new fork

A fork is a copy of a repository. Forking a repository allows you to freely experiment with changes without affecting the original project. [View existing forks.](#)

Required fields are marked with an asterisk (*).

Owner *

Sally-2304

Repository name *

jenkins-pipeline-tutorial

jenkins-pipeline-tutorial is available.

By default, forks are named the same as their upstream repository. You can customize the name to distinguish it further.

Description (optional)

Jenkins Pipeline Tutorial

☒ Copy the master branch only
Contribute back to chrismld/jenkins-pipeline-tutorial by adding your own branch. [Learn more.](#)

① You are creating a fork in your personal account.

Create fork

kins

Q Search

32admin

Sally_25 > exp6.c >

GeneralBuild TriggersAdvanced Project OptionsPipeline

Description

Sally25

5.c >

GeneralBuild TriggersAdvanced Project OptionsPipeline

Pipeline

Definition

Pipeline script from SCM

SCM ?

Git

Repositories ?

Repository URL ?

https://github.com/Sally-2304/jenkins-pipeline-tutorial.git

Credentials ?

- none -

+ Add

Script Path ?

hello-world/Jenkinsfile

☒ Lightweight checkout ?

2. Create and build pipeline project with Git

Jenkins Search ? 3 2 admin log out

Dashboard > Sally_25 > exp6.c >

↑ Back to Dashboard

Q Status

Changes

▶ Build Now

⚙ Configure

🗑 Delete Pipeline

Q Full Stage View

✎ Rename

? Pipeline Syntax

Pipeline exp6.c

Sally25

[Edit description](#)

[Disable Project](#)

Recent Changes

Stage View

Average stage times:
(Average full run time: ~3s)

	Declarative: Checkout SCM	Static Analysis	Compile	Security Check	Run Unit Tests	Run Integration Tests	Publish Artifacts
1s	34ms	49ms	47ms	31ms	32ms	47ms	
1s	34ms	49ms	47ms	31ms	32ms	47ms	

Build History trend

Q Filter builds...

✓ #1 Sep 8, 2023 11:06 AM

Atom feed for all Atom feed for failures

Permalinks

```
Save the assemblies generated from the compilation
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

- Fork repository on GitHub

Actions Projects Security Insights

Q Type to search

Create a new fork

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Required fields are marked with an asterisk (*).

Owner * Repository name *

Sally-2304 / jenkins-pipeline-tutorial

✓ jenkins-pipeline-tutorial is available.

By default, forks are named the same as their upstream repository. You can customize the name to distinguish it further.

Description (optional)

Jenkins Pipeline Tutorial

☒ Copy the master branch only

Contribute back to chrismld/jenkins-pipeline-tutorial by adding your own branch. [Learn more.](#)

① You are creating a fork in your personal account.

Create fork

- Create pipeline project with pipeline script from SCM

- Add webhooks to the forked repository

Script Path ?

hello-world/Jenkinsfile

☒ Lightweight checkout ?


[Pipeline Syntax](#)


- Build pipeline project
- Add file to forked repository and observe the automated build


Enter an item name

exp6b

» Required field

 **Freestyle project**
This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

 **Maven project**
Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.

 **Pipeline**
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

Install ngrok

The fastest way to put anything on the internet.

Mac OS Windows Linux Docker Other

Install ngrok via Chocolatey

```
$ choco install ngrok
```

or

Download ZIP file

Select Download

```
ngrok (Ctrl+C to quit)

Introducing Always-On Global Server Load Balancer: https://ngrok.com/r/gslb

Session Status      online
Session Expires     1 hour, 59 minutes
Update              update available (version 3.3.5, Ctrl-U to update)
Terms of Service     https://ngrok.com/tos
Version             3.3.4
Region              India (in)
Latency              2ms
Web Interface        http://127.0.0.1:4040
Forwarding            https://c8c3-139-5-239-162.ngrok.io -> http://localhost:8080

Connections          ttl    opn    rt1    rt5    p50    p90
                     0      0      0.00   0.00   0.00   0.00
```

General

Access

Collaborators

Moderation options

Code and automation

Branches

Tags

Rules

Actions

Webhooks

Webhooks

Add webhook

Webhooks allow external services to be notified when certain events happen. When the specified events happen, we'll send a POST request to each of the URLs you provide. Learn more in our [Webhooks Guide](#).

✓ https://c8c3-139-5-239-162.ngrok.i... (push)

EditDelete

Code and automation

Branches

Tags

Rules

Actions

Webhooks

Environments

Codespaces

Pages

Security

Code security and analysis

Deploy keys

Secrets and variables

Integrations

GitHub Apps

Email notifications

Payload URL *

https://c8c3-139-5-239-162.ngrok.io/github-webhook/

Content type

application/json

Secret

SSL verification

By default, we verify SSL certificates when delivering payloads.

Enable SSL verification

Disable (not recommended)

Which events would you like to trigger this webhook?

Just the push event.

Send me everything.

Let me select individual events.

Active

We will deliver event details when this hook is triggered.

Add webhook

Configure

General

Advanced Project Options

Pipeline

- ☐ GitHub project
- ☐ Pipeline speed/durability override ?
- ☐ Preserve stashes from completed builds ?
- ☐ This project is parameterized ?
- ☐ Throttle builds ?

Build Triggers

- ☐ Build after other projects are built ?
- ☐ Build periodically ?
- ☒ GitHub hook trigger for GITScm polling ?

Rename

Pipeline Syntax

GitHub Hook Log

Build History

trend

Filter builds...

#2 Oct 6, 2023, 11:15 AM

#1 Oct 6, 2023, 10:45 AM

Atom feed for all Atom feed for failures

	Declarative: Checkout SCM	Static Analysis	Compile	Security Check	Run Unit Tests	Run Integration Tests	Publish Artifacts
Average stage times: (Average full run time: ~6s)	1s	83ms	55ms	52ms	55ms	51ms	55ms
#2 Oct 06 11:15 1 commit	1s	64ms	54ms	49ms	54ms	49ms	51ms
#1 Oct 06 10:45 No Changes	1s	102ms	57ms	55ms	57ms	53ms	60ms

Permalinks

- Last build (#1), 27 min ago

<> Code Pull requests Actions Projects Wiki Security Insights Settings

jenkins-pipeline-tutorial / sally25.txt in master

Edit Preview Code 55% faster with GitHub Copilot

```
1 Hello All!
2 subscribe to my channel
```

8. Post-Experiments Exercise

A. Extended Theory:

Nil

B. Questions:

- Explain the types of agents in a Jenkinsfile?
- What are webhooks?

C. Conclusion:

- Write what was performed in the experiment.
- Write the significance of the topic studied in the experiment.

D. References:

<https://jenkins.io/doc/>
<https://www.jenkins.io/doc/book/pipeline/syntax/>
<https://www.edureka.co/blog/jenkins-pipeline-tutorial-continuous-delivery>
<https://www.slideshare.net/abediaz/introduction-to-jenkins>
<https://www.slideshare.net/jph98/jenkins-ci-presentation>