

Module 6: Jenkins Assignment - 3

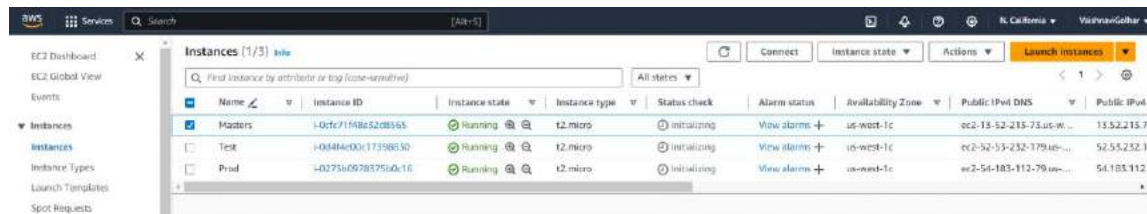
Tasks To Be Performed:

1. Create a pipeline in Jenkins
2. Once push is made to “develop” a branch in Git, trigger job “test”. This will copy Git files to test node
3. If test job is successful, then prod job should be triggered
4. Prod jobs should copy files to prod node

SOLUTION:

1. Create Jenkins Master & Two Jenkins Slave Machine

A. Create Three Amazon EC2 Instances Named As Jenkins Master & Test & Prod



B. Install jenkins and Java on Masters

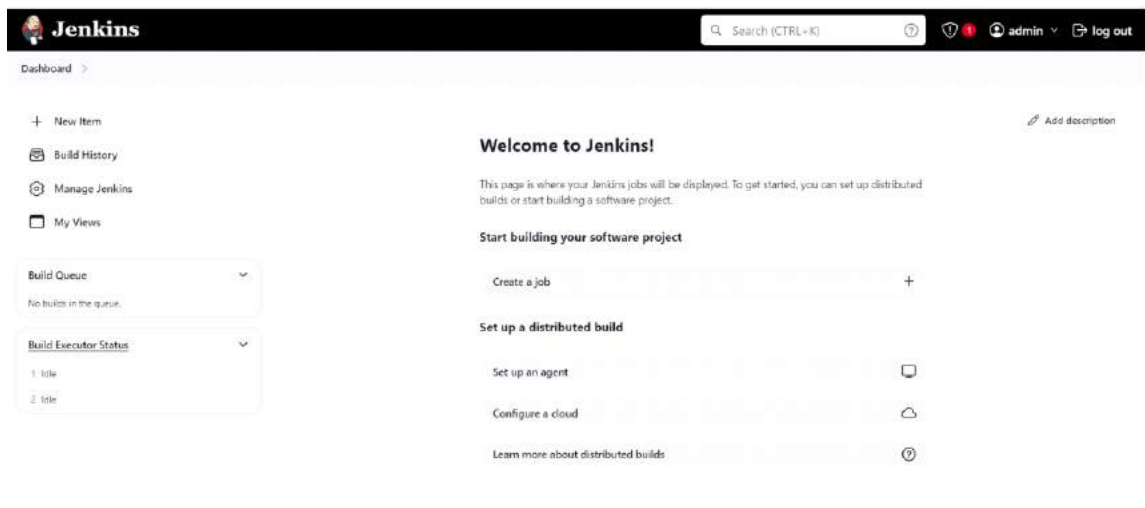
```
aws
Services
[Alt+S]
It California
YourUser@ohar

No user sessions are running outdated binaries.

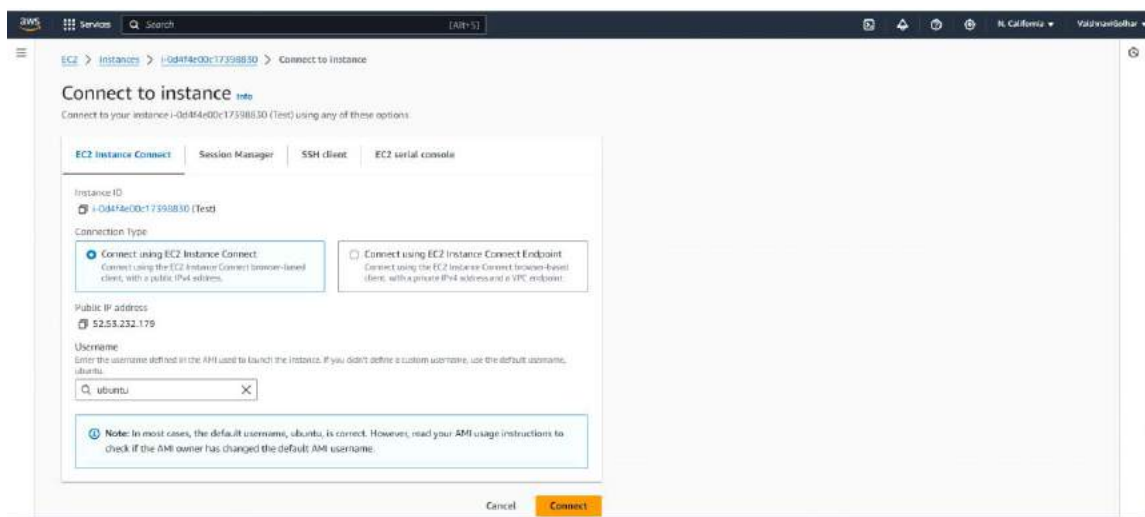
No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-15-36:~$ sudo systemctl enable jenkins
Synchronizing state of jenkins.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable jenkins
ubuntu@ip-172-31-15-36:~$ sudo systemctl start jenkins
ubuntu@ip-172-31-15-36:~$ sudo systemctl status jenkins
* jenkins.service - Jenkins continuous Integration Server
   Loaded: loaded (/usr/lib/systemd/system/jenkins.service; enabled; preset: enabled)
   Active: active (running) since Wed 2024-06-12 07:08:24 UTC; 52s ago
     Main PID: 2873 (java)
       Tasks: 42 (limit: 1130)
    Memory: 296.0M (peak: 303.8M)
       CPU: 46.016s
     CGroup: /system.slice/jenkins.service
             └─073 /usr/bin/java -Djenkins.web.headless=true -jar /usr/share/jenkins/war --webroot=/var/cache/jenkins/war --httpPort=8080

Jan 12 07:07:46 ip-172-31-15-36 jenkins[2873]: 81d96493b4da42349e27122b0f9edcde
Jan 12 07:07:46 ip-172-31-15-36 jenkins[2873]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Jan 12 07:07:46 ip-172-31-15-36 jenkins[2873]: *****
Jan 12 07:07:46 ip-172-31-15-36 jenkins[2873]: *****
Jan 12 07:07:46 ip-172-31-15-36 jenkins[2873]: *****
Jan 12 07:08:24 ip-172-31-15-36 jenkins[2873]: 2024-06-12 07:08:24.622+0000 [id=32] INFO jenkins.initReactorsRunner$ifonAttained: completed initialization
Jan 12 07:08:24 ip-172-31-15-36 jenkins[2873]: 2024-06-12 07:08:24.653+0000 [id=24] INFO hudson.lifecycle.Lifecycle$onReady: Jenkins is fully up and running
Jan 12 07:08:24 ip-172-31-15-36 jenkins[2873]: 2024-06-12 07:08:24.653+0000 [id=24] INFO hudson.lifecycle.Lifecycle$onReady: Jenkins is fully up and running
Jan 12 07:08:24 ip-172-31-15-36 jenkins[2873]: *****
Jan 12 07:08:25 ip-172-31-15-36 jenkins[2873]: 2024-06-12 07:08:25.101+0000 [id=47] INFO h.s.DownloadService$downloadable$load: Obtained the updated data file for hudson
Jan 12 07:08:25 ip-172-31-15-36 jenkins[2873]: 2024-06-12 07:08:25.102+0000 [id=47] INFO hudson.util.Metric$start: Performed the action check updates server successful
ubuntu@ip-172-31-15-36:~$

i-Cfc71f48e32db565 (Masters)
Public IP: 13.52.213.71 Private IP: 172.31.15.36
```



C. Install "Java " over Slaves(Test and Prod) machine



```
ubuntu@ip-172-31-4-129:~$ java -version
openjdk version "17.0.13" 2024-04-16
OpenJDK Runtime Environment (build 17.0.11+9-Ubuntu-1)
OpenJDK 64-Bit Server VM (build 17.0.11+9-Ubuntu-1, mixed mode, sharing)
ubuntu@ip-172-31-4-129:~$
```

i-0d4f4e00c17398830 (Test)

PublicPc: 52.53.232.179 PrivatePc: 172.31.4.129

Connect to instance Info

Connect to your instance i-0273b0978375b0c16 (Prod) using any of these options

EC2 Instance Connect | Session Manager | SSH client | EC2 serial console

Instance ID
☒ i-0273b0978375b0c16 (Prod)

Connection Type

☒ Connect using EC2 Instance Connect
Connect using the EC2 Instance Connect browser-based client, with a public IP address.

☐ Connect using EC2 Instance Connect Endpoint
Connect using the EC2 Instance Connect browser-based client, with a private IP address and a VPC endpoint.

Public IP address
☒ 54.183.112.79

Username
Enter the username defined in the AMI used to launch the instance. If you didn't define a custom username, use the default username, ubuntu.

Note: In most cases, the default username, ubuntu, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI username.

```
ubuntu@ip-172-31-4-129:~$ java -version
openjdk version "17.0.13" 2024-04-16
OpenJDK Runtime Environment (build 17.0.11+9-Ubuntu-1)
OpenJDK 64-Bit Server VM (build 17.0.11+9-Ubuntu-1, mixed mode, sharing)
ubuntu@ip-172-31-4-129:~$
```

i-0273b0978375b0c16 (Prod)

PublicPc: 54.183.112.79 PrivatePc: 172.31.4.129

D. Add Nodes (Test & Prod) in Jenkins-Master using .pem

Jenkins admin log out

Dashboard > Manage Jenkins > Nodes > New node

New node

Node name

Type

☒ Permanent Agent

Adds a plain, permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide higher level of integration with these agents, such as dynamic provisioning. Select this type if no other agent types apply — for example such as when you are adding a physical computer, virtual machines managed outside Jenkins, etc.

```
ubuntu@ip-172-31-4-129:~$ mkdir jenkins
ubuntu@ip-172-31-4-129:~$ cd jenkins
ubuntu@ip-172-31-4-129:~/jenkins$ pwd
/home/ubuntu/jenkins
ubuntu@ip-172-31-4-129:~/jenkins$
```

i-Od4f4e00c17398830 (Test)

PublicIPs: 52.53.232.179 PrivateIPs: 172.31.4.129

Jenkins

Search (CTRL+K)

admin

log out

Dashboard

Manage Jenkins

Nodes

Nodes

Clouds

Build Queue

No builds in the queue.

Build Executor Status

Built-In Node

1 idle

Nodes

New Node

Configure Monitors

S	Name	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	Built-In Node	Linux (amd64)	In sync	4.47 GiB	0 B	4.47 GiB	0ms
	Test-Node		N/A	N/A	N/A	N/A	N/A
Data obtained		15 min	15 min	15 min	15 min	15 min	1 ms

Icons:

S

M

L

Legend

Jenkins

Search (CTRL+K)

admin

log out

Dashboard

Manage Jenkins

Nodes

New node

New node

Node name

Prod-Node

Type

Permanent Agent

Adds a plain, permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide higher level of integration with these agents, such as dynamic provisioning. Select this type if no other agent types apply — for example such as when you are adding a physical computer, virtual machines managed outside Jenkins, etc.

Copy Existing Node

Create

New node

Node name

Prod-Node

Type

☐ Permanent Agent

Adds a plain, permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide higher level of integration with these agents, such as dynamic provisioning. Select this type if no other agent types apply — for example such as when you are adding a physical computer, virtual machines managed outside Jenkins, etc.

☒ Copy Existing Node

Q. Test-Node

Create

```
ubuntu@ip-172-31-9-199:~$ mkdir jenkins
ubuntu@ip-172-31-9-199:~$ cd jenkins
ubuntu@ip-172-31-9-199:~/jenkins$ pwd
/home/ubuntu/jenkins
ubuntu@ip-172-31-9-199:~/jenkins$ ^C
ubuntu@ip-172-31-9-199:~/jenkins$
```

i-0273b0978375b0c16 (Prod)

PublicIPs: 54.183.112.79 PrivateIPs: 172.31.9.199

Jenkins

Search (CTRL+K)

admin log out

Dashboard > Manage Jenkins > Nodes > Prod-Node > Configure

Status

Delete Agent

Configure

Build History

Load Statistics

Log

Build Executor Status

Name ?

Prod-Node

Description ?

This is Prod-Node

Plain text Preview

Number of executors ?

1

Remote root directory ?

/home/ubuntu/jenkins

Save

Dashboard > Manage Jenkins > Nodes > Prod-Node > Configure

Labels 

prod

Usage 

Use this node as much as possible

Launch method 

Launch agents via SSH

Host 

54.183.112.79

Credentials 


ubuntu (ssh-key)

+ Add


Host Key Verification Strategy 


Non-verifying Verification Strategy

Dashboard > Manage Jenkins > Nodes > Prod-Node > Configure

Host Key Verification Strategy 


Non-verifying Verification Strategy

Advanced  Edited

Availability 

Keep this agent online as much as possible

Node Properties


☐ Disable deferred wipeout on this node 

☐ Disk Space Monitoring Thresholds

☐ Environment variables

☐ Tool Locations

Save

 Jenkins

Search (CTRL+K)

admin log out

Dashboard > Manage Jenkins > Nodes >

Nodes

Clouds

Build Queue

No builds in the queue

Build Executor Status

Built-In Node




1. idle

2. idle

Prod-Node

Nodes

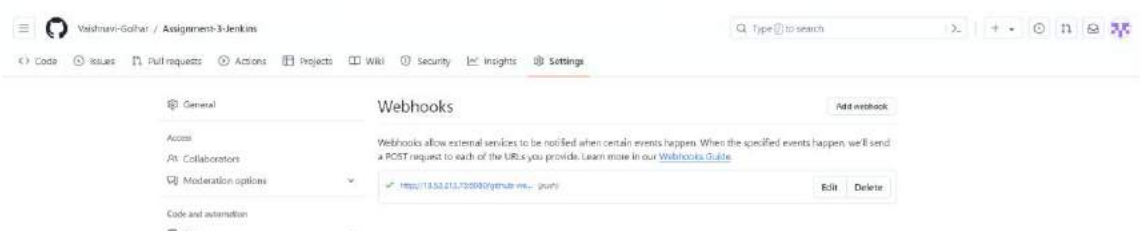
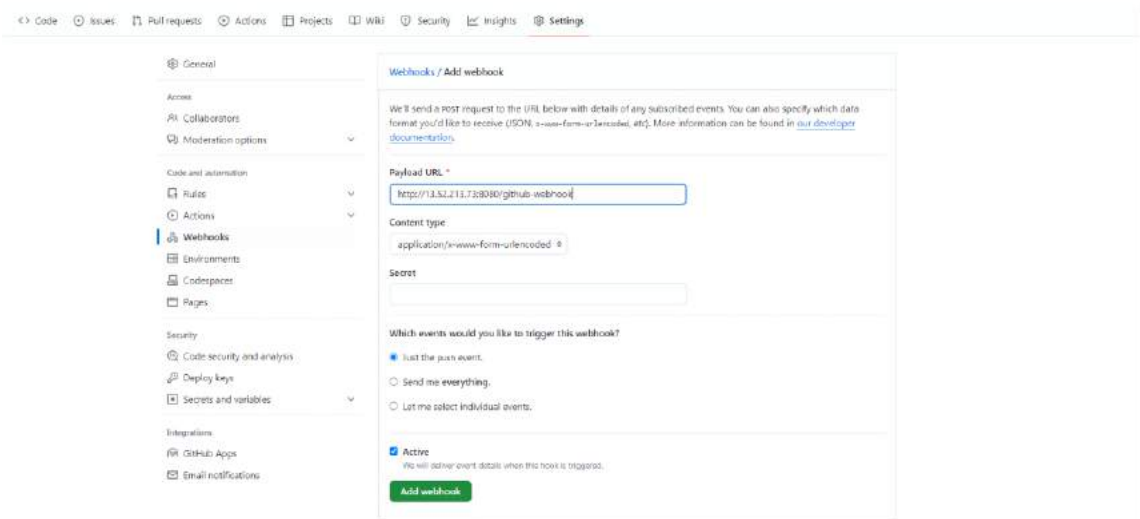
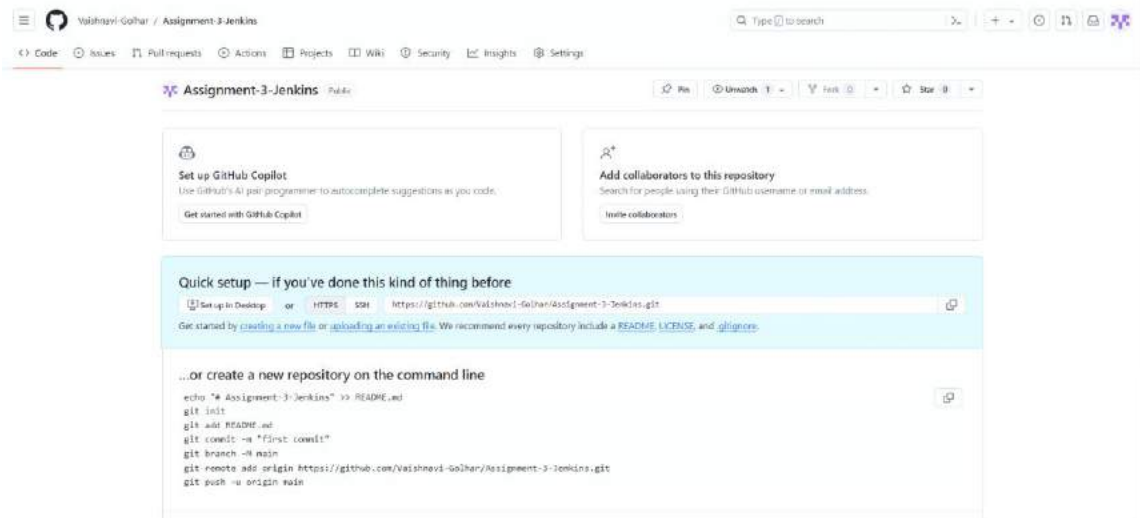
[+ New Node](#) [Configure Monitors](#)

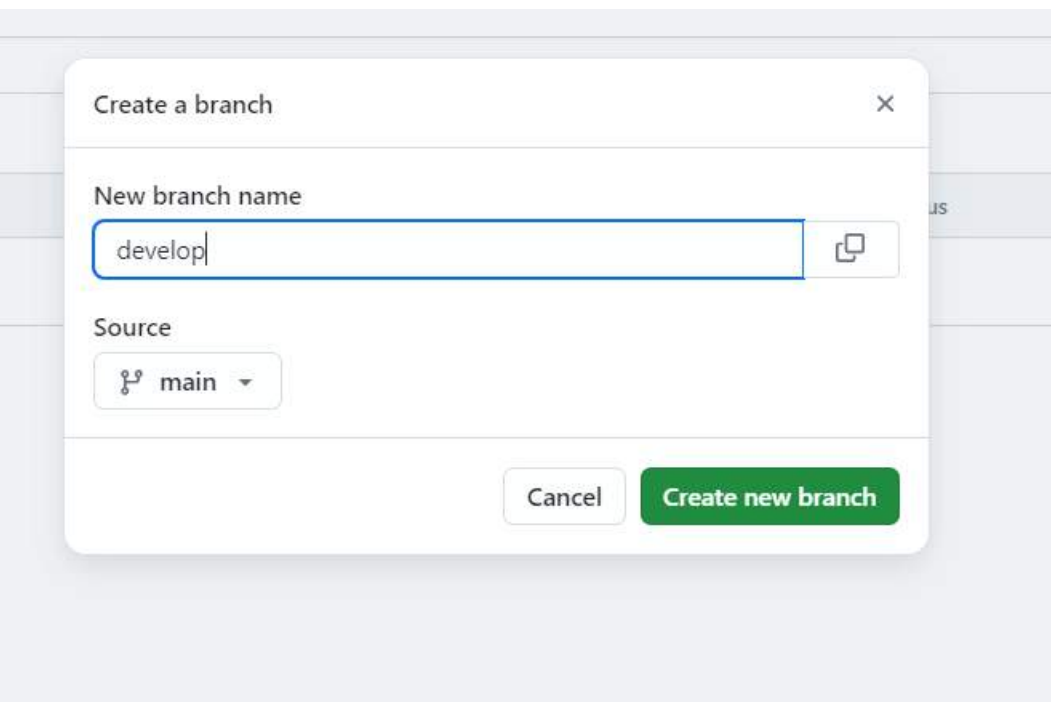
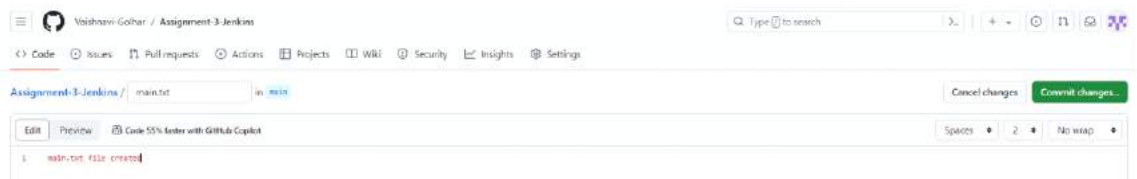
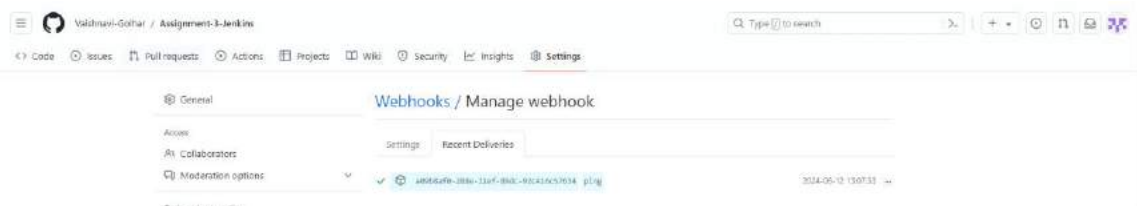
S	Name	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	Built-In Node	Linux (amd64)	In sync	4.21 GiB	0 B	4.21 GiB	0ms
	Prod-Node		N/A	N/A	N/A	N/A	N/A
	Test-Node	Linux (amd64)	In sync	4.73 GiB	0 B	4.73 GiB	36ms
Data obtained		2.8 sec	2.8 sec	3 min 57 sec	2.8 sec	3 min 57 sec	2.8 sec

Icons: S M L

Legend

2. Create a Separate Git Hub Repository for this Assignment as “Assignment-3-Jenkins”





Create a branch

New branch name

dev1

Source

main

Cancel

Create new branch

Branches

[New branch](#)

Overview Yours Active Stale All

Search branches...

Default

Branch	Updated	Check status	Behind Ahead	Pull request
main	1 minute ago		Default	

Your branches

Branch	Updated	Check status	Behind Ahead	Pull request
dev1	now		0 0	
develop	now		0 0	

Volkaneri-Golhar / Assignment-3-Jenkins

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

Assignment-3-jenkins / dev1.txt

Cancel changes Commit changes...

Edit Preview Code 55% faster with GitHub Copilot

1 This is dev1.txt file

Commit changes

Commit message

Create dev1.txt

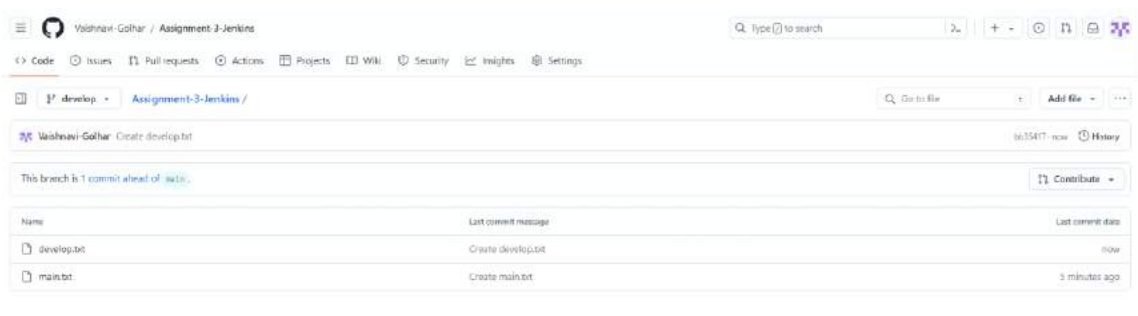
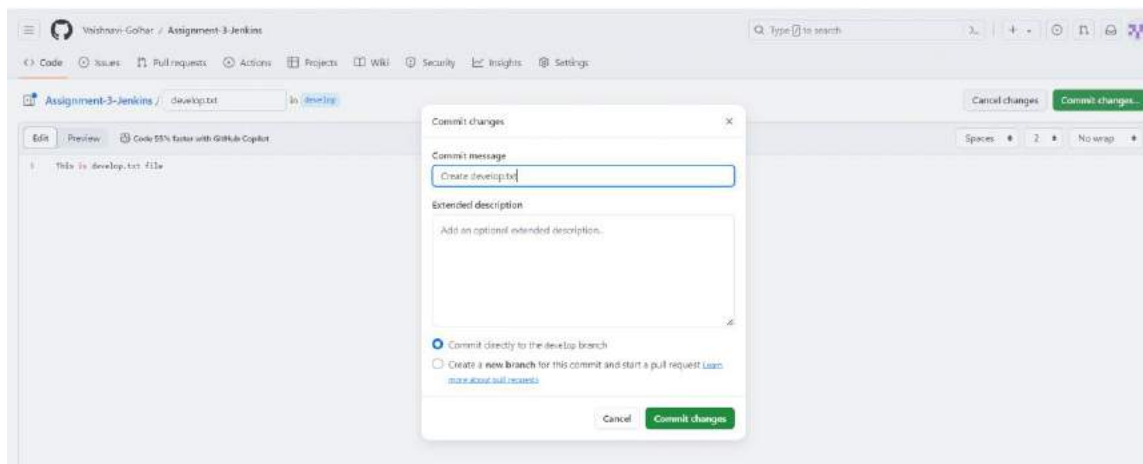
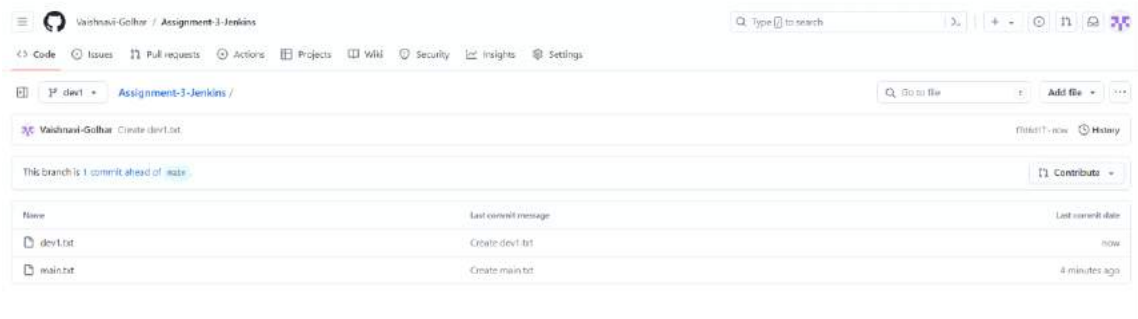
Extended description

Add an optional extended description.

☒ Commit directly to the dev1 branch


☐ Create a new branch for this commit and start a pull request

Cancel Commit changes





Problem (2) Solution: Once a push is made to “develop” a branch in Git, trigger job “test”. This will copy Git files to test node

A. Create a Test Job & Put “develop” Branch Path Here


 Jenkins


Search (CTRL+K)

  admin  log out


Dashboard


+ New Item

 Build History

 Project Relationship

 Check File Fingerprint

 Manage Jenkins

 My Views

Build Queue


Add description

Welcome to Jenkins!




This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.

Start building your software project

Create a job

 Jenkins

Search (CTRL+K)


  admin  log out


Dashboard > All


Enter an item name


Test-job

= Required field


 **Freestyle project**
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

 **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.




 **Multi-configuration project**
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

 **Folder**
Container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a namespace, so you can have multiple things of the same name as long as they are in different folders.

OK

 Jenkins

Search (CTRL+K)

  admin  log out

Dashboard > Test-job > Configuration

Configure

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

General

Enabled

Description

If we commit in the develop branch of "github" then this job should be triggered

Plain text: Preview

☐ Discard old builds

☒ GitHub project

Project url

https://github.com/Vaishnavi-Golhar/Assignment-3-Jenkins.git

Advanced

Dashboard > Test job > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

☒ Restrict where this project can be run ?

Label Expression ?

Test-Node

Label **Test-Node** matches 1 node. Permissions or other restrictions provided by plugins may further reduce that list.

Advanced ▾

Source Code Management

☐ None

☒ Git ?

Repositories ?

Repository URL ?

https://github.com/Vishnavi-Gohar/Assignment-3-dmkins.git

Credentials ?

ncne ▾

+ Add +

Dashboard > Test job > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

Branch Specifier (blank for 'any') ?

*/develop

Add Branch

Repository browser ?

(Auto) ▾

Additional Behaviours

Add ▾

Build Triggers

☐ Trigger builds remotely (e.g. from scripts) ?

☐ Build after other projects are built ?

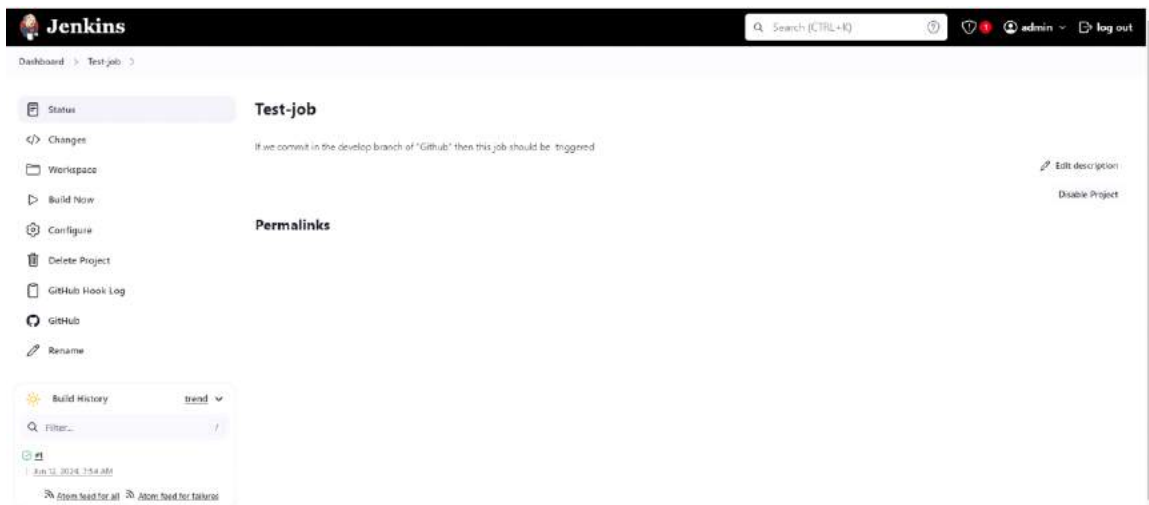
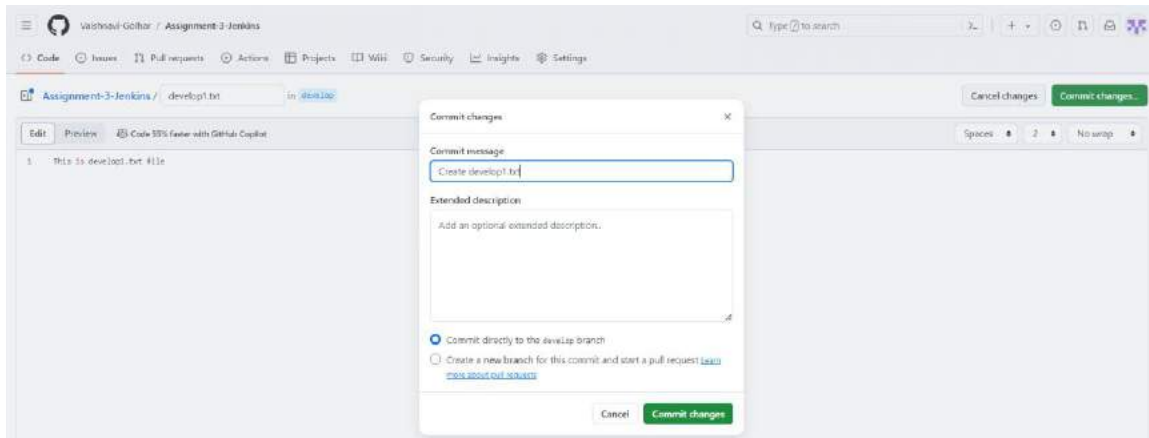
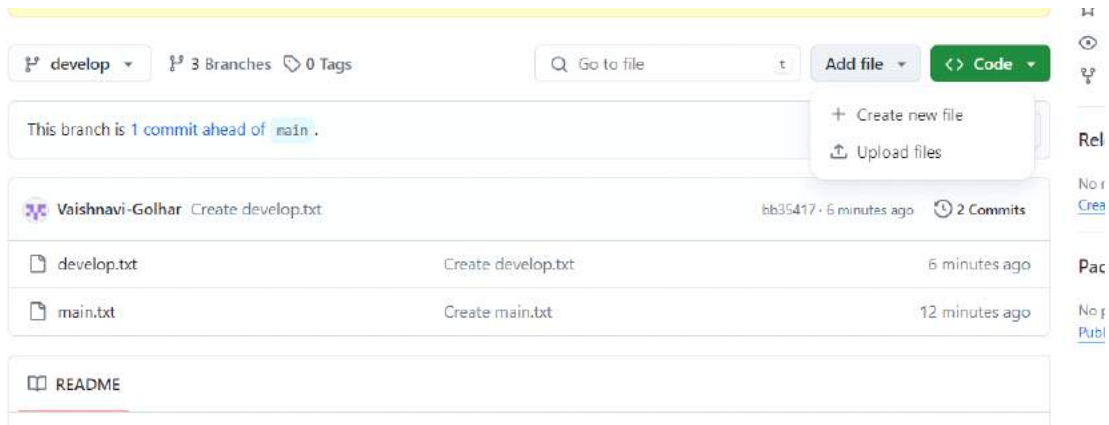
☐ Build periodically ?

☒ GitHub hook trigger for GITScm polling ?

☐ Poll SCM ?

Save Apply

B. Commit in the “Develop” Branch & “Test” Job Should Be Automatically Triggered



Jenkins Search (CTRL+K) admin log out

Dashboard > Test-job > #1

Status #1 (Jun 12, 2024, 7:54:02 AM) Keep this build forever

Changes Console Output Edit Build Information Delete build #1 Polling Log Timings Git Build Data

No changes.

Started by GitHub push by Vaishnavi-Golhar

This run spent:

- 0.5 sec waiting
- 0 sec build duration
- 17 sec total from scheduled to completion.

Revision: 8c134322b79d468ac328c753cf20d8b3d2994080
Repository: <https://github.com/Vaishnavi-Golhar/Assignment-3-Jenkins.git>
• refs/remotes/origin/develop

Jenkins Search (CTRL+K) admin log out

Dashboard > Test-job > #1 > Console Output

Console Output

```

Started by GitHub push by Vaishnavi-Golhar
Running as SYSTEM
Building remotely on Test-Node (test) in workspace /home/ubuntu/jenkins/workspace/Test-job
The recommended git tool is: NONE
No credentials specified
Cloning the remote Git repository
Cloning repository https://github.com/Vaishnavi-Golhar/Assignment-3-Jenkins.git
> git init /home/ubuntu/jenkins/workspace/Test-job # timeout=10
Fetching upstream changes from https://github.com/Vaishnavi-Golhar/Assignment-3-Jenkins.git
> git --version # timeout=10
> git --version # 'git version 2.45.0'
> git fetch --tags --force --progress -- https://github.com/Vaishnavi-Golhar/Assignment-3-Jenkins.git :refs/remotes/origin/* # timeout=10
> git config remote.origin.url https://github.com/Vaishnavi-Golhar/Assignment-3-Jenkins.git # timeout=10
> git config --add remote.origin.fetch +refs/remotes/origin/*:refs/remotes/origin/* # timeout=10
Avoid second fetch
> git rev-parse refs/remotes/origin/develop^{commit} # timeout=10
Checking out Revision 8c134322b79d468ac328c753cf20d8b3d2994080 (refs/remotes/origin/develop)
> git config core.sparsecheckout # timeout=10
> git checkout -f 8c134322b79d468ac328c753cf20d8b3d2994080 # timeout=10
Commit message: 'Create develop.txt'
First time build. Skipping changelog.
Finished: SUCCESS
  
```

```

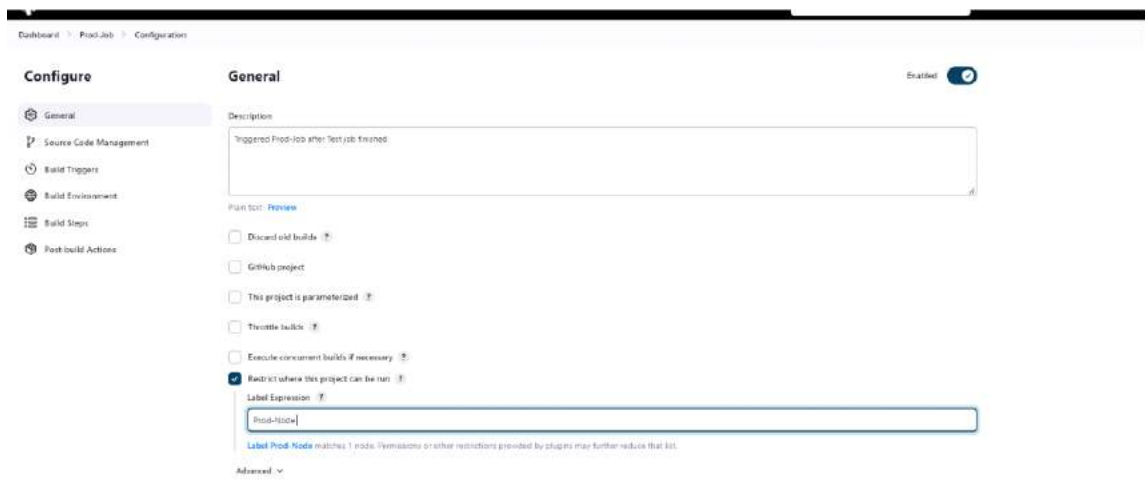
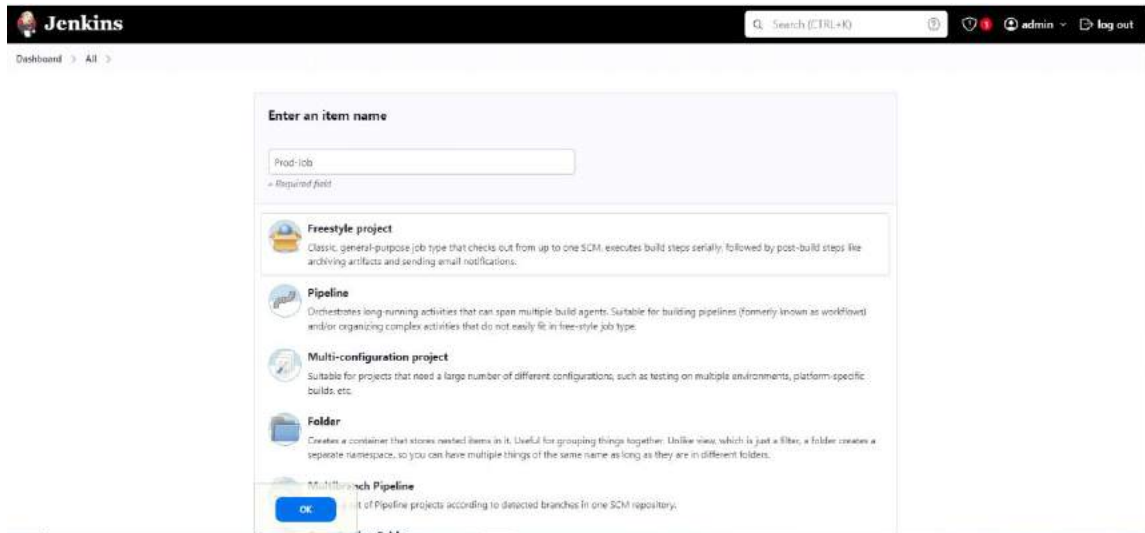
ubuntu@ip-172-31-4-129:~/jenkins$ pwd
/home/ubuntu/jenkins
ubuntu@ip-172-31-4-129:~/jenkins$ ls
remoting  remoting.jar  workspace
ubuntu@ip-172-31-4-129:~/jenkins$ cd workspace
ubuntu@ip-172-31-4-129:~/jenkins/workspace$ ls
Test-job
ubuntu@ip-172-31-4-129:~/jenkins/workspace$ ls
Test-job
ubuntu@ip-172-31-4-129:~/jenkins/workspace$ ls Test-job
develop.txt  develop1.txt  main.txt
ubuntu@ip-172-31-4-129:~/jenkins/workspace$
  
```

i-0d4f4e00c17398830 (Test)

PublicIPs: 52.53.232.179 PrivateIPs: 172.31.4.129

Problem (3) Solution: If the test job is successful, then the prod job should be triggered

A. Create a “Prod” Job & Put the “dev1” Branch Here



Dashboard > Prod Job > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

☐ None

☒ Git

Repositories

Repository URL:

Credentials:

Advanced

Add Repository

Branches to build

Branch Specifier (blank for 'any')

Add Branch

Jenkins

Search (CTRL+K)

admin log out

Dashboard

+ New Item

Build History

Project Relationship

Check File Fingerprint

Manage Jenkins

My Views

Build Queue

No builds in the queue

S	W	Name	Last Success	Last Failure	Last Duration
		Prod Job	N/A	N/A	N/A
		Test Job	9 min 25 sec #1	N/A	8 sec

100% S M L

B. Now, Add the “Prod” Job to “Test” for Automatically Triggering

Dashboard > Test Job > Configuration

Configure

- General
- Source Code Management
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

☐ Full SCM

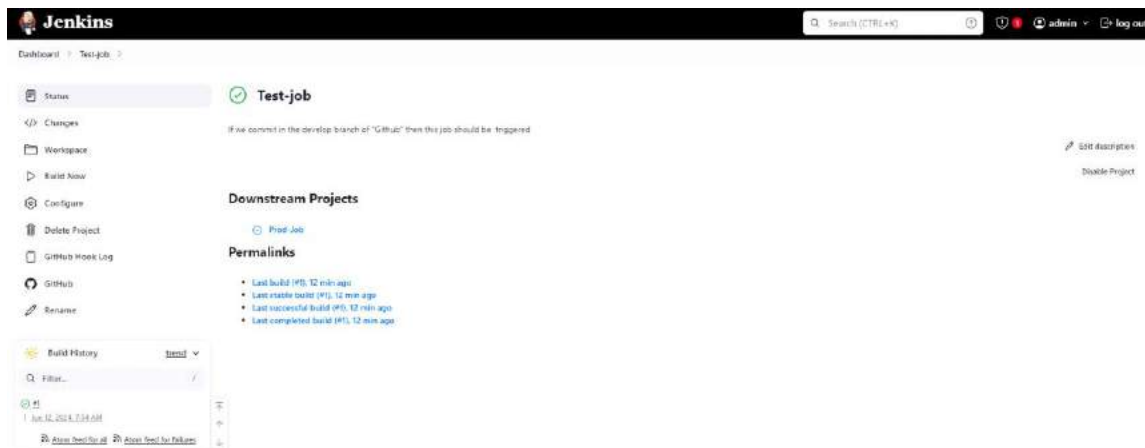
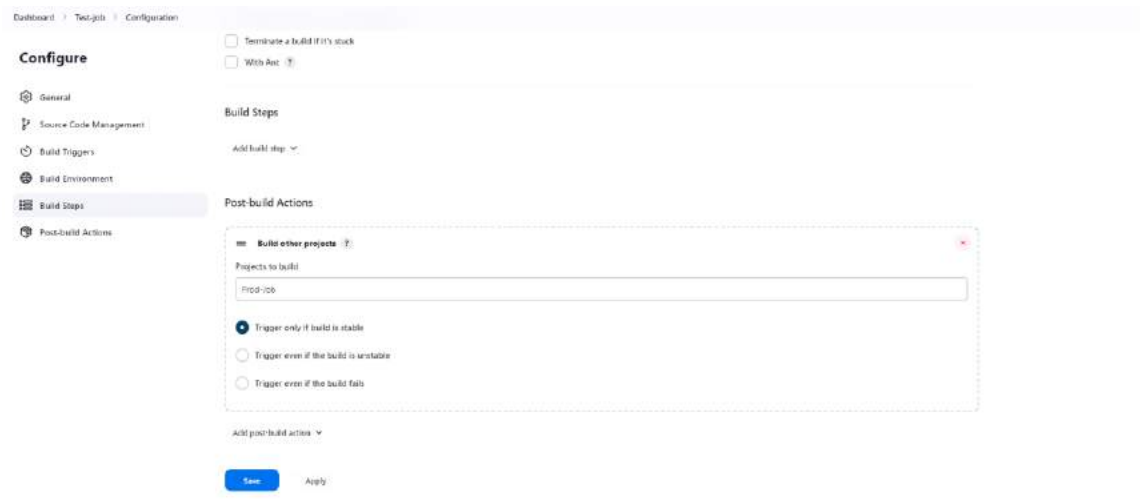
Build Environment

☐ Delete workspace before build starts

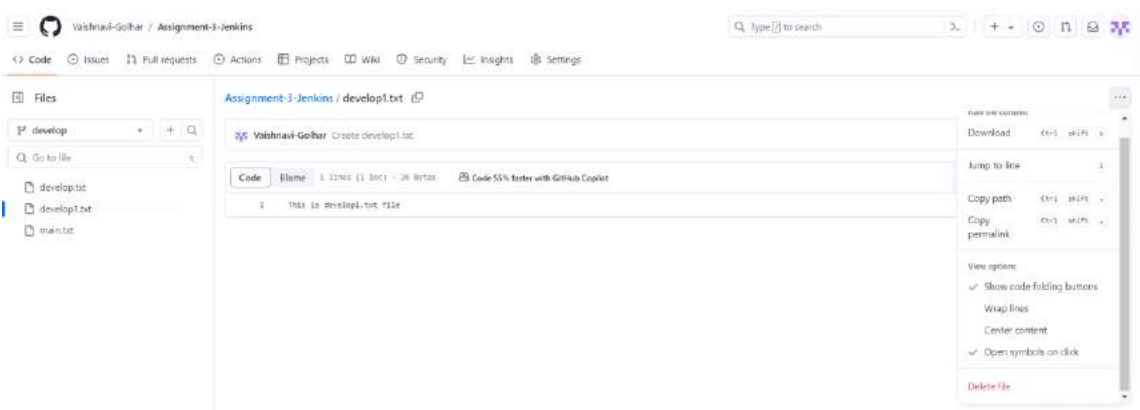
☐ Use secret text(s) or file(s)

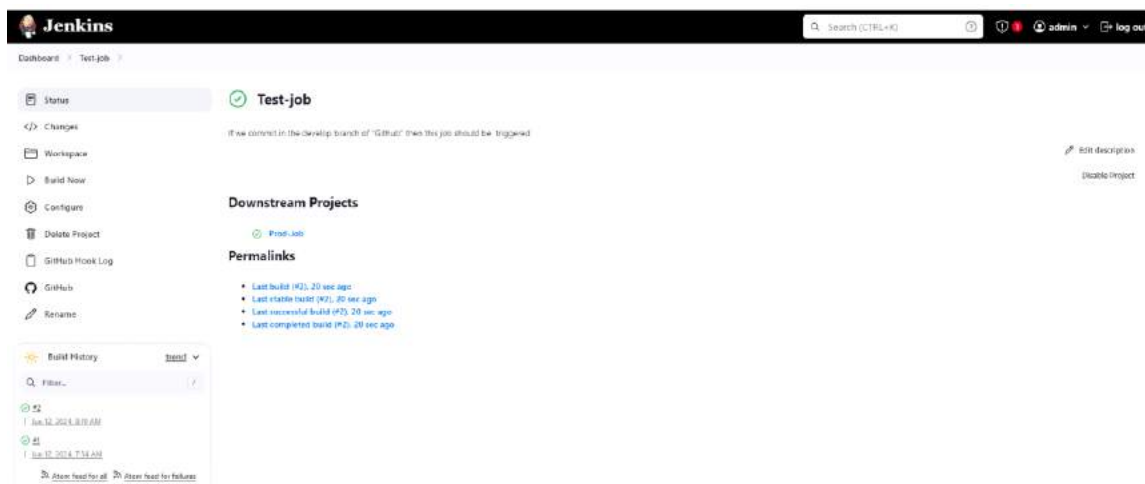
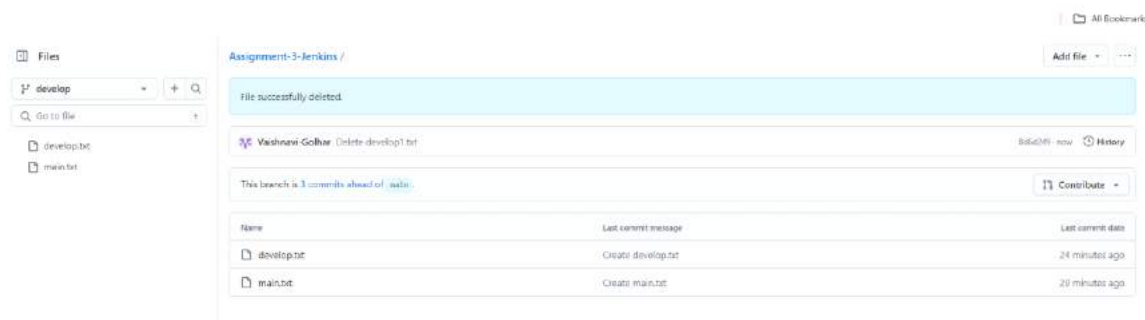
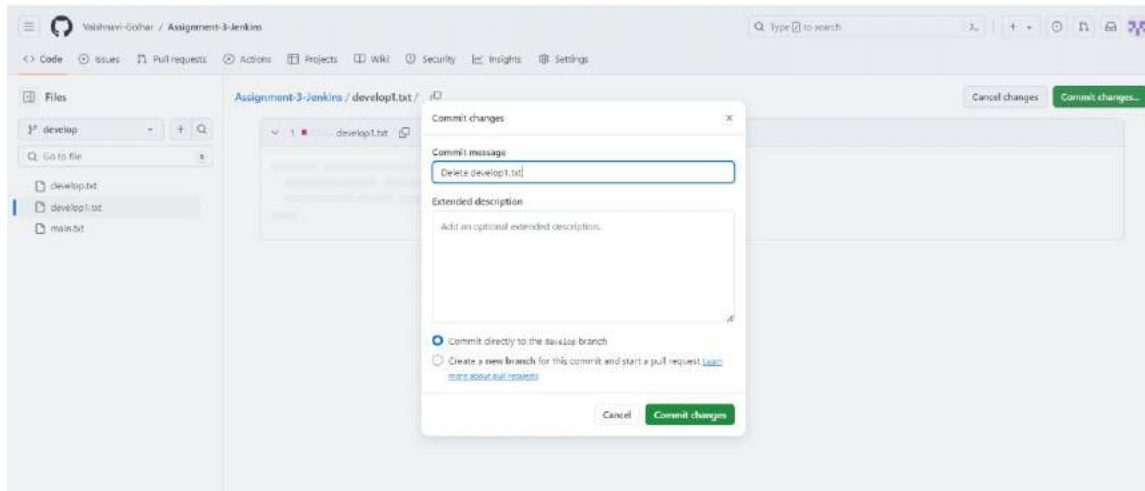
Plugins

- Aggregate downstream test results
- Archive the artifacts
- Build other projects
- Publish JUnit test result report
- Record fingerprints of files to track usage
- Git Publisher
- E-mail Notification
- Editable Email Notification
- Set GitHub commit status (universal)
- Set build status on GitHub commit (deprecated)
- Delete workspace when build is done
- Add post-build action



C. Now, Delete the “develop1.txt” file from GitHub to Trigger the Prod-Job via “Test-Job”.





Jenkins

Dashboard
> Test job
> #2
> Console Output

Status

Changes

Console Output

View as plain text

Edit Build Information

Delete build "2"

Polking Log

Timings

Git Build Data

Previous Build

✓

Console Output

Started by Github push by Vaidhram-Golpar

Running as VSCINE

Building remotely on Test-Node (Test) in workspace /home/ubuntu/jenkins/workspace/Test-Job

The recommended git tool is: none

No credentials specified

```

> git --version --resolved-git-dir /home/ubuntu/jenkins/workspace/Test-Job/.git * timeout=10
git fetch --tags --force --progress -- https://github.com:Vaidhram-Golpar/Assignment-3-jenkins.git refs/heads/*:refs/remotes/origin/* * timeout=10
git merge --no-ff --no-commit --no-edit https://github.com:Vaidhram-Golpar/Assignment-3-jenkins.git * timeout=10
Fetching upstream changes from https://github.com:Vaidhram-Golpar/Assignment-3-jenkins.git
> git --version * timeout=10
> git --version * git version 2.43.0
> git fetch --tags --force --progress -- https://github.com:Vaidhram-Golpar/Assignment-3-jenkins.git refs/heads/*:refs/remotes/origin/* * timeout=10
git merge --no-ff --no-commit --no-edit https://github.com:Vaidhram-Golpar/Assignment-3-jenkins.git refs/heads/*:refs/remotes/origin/* * timeout=10
Checking out 8d61e4483d64b3c356dfe3895320e347dd7d1 (refs/remotes/origin/develop)
> git ls-tree --no-commit-check * timeout=10
> git checkout -f 8d61e4483d64b3c356dfe3895320e347dd7d1 * timeout=10
Commit message: "Update Assignment-3"
> git rev-list --no-walk 8d61e4483d64b3c356dfe3895320e347dd7d1 * timeout=10
Triggering a new build of #24344
Finished: SUCCESS

```

Problem (1) Solution: Create a Pipeline in Jenkins

Dashboard > Manage Jenkins > Plugins

Plugins

Updates

Available plugins

Installed plugins

Advanced settings

Search installed plugins

Branch API Plugin v1.10.0 (40 downloads)

This plugin provides an API for multiple branch based projects.
Report an issue with this plugin

Build Pipeline Plugin 1.0.2

This plugin renders upstream and downstream connected jobs that typically form a build pipeline. In addition, it offers the ability to define manual triggers for jobs that require intervention prior to execution, e.g. an approval process outside of Jenkins.
Report an issue with this plugin

Warning: The currently installed plugin version may not be safe to use. Please review the following security notice:

- Stored XSS vulnerability

This plugin is up for adoption! We are looking for new maintainers. Visit our [Adopt a Plugin](#) initiative for more information.

On

Off

Jenkins

Search (CTRL-F)

admin log out

Dashboard > Assignment-3-Pipeline-Testing > Configure

New Item

Build History

Build View

Delete View

Project Relationship

Check file fingerprint

Manage Jenkins

My Views

Build Queue

No builds in the queue

Build Executor Status

Builds in Node

1 idle

2 idle

Name

Assignment-3-Pipeline-Testing

Description

Assignment-3-Pipeline-Testing

Plain text [Preview](#)

☐ Filter build queue

☐ Filter build execution

Build Pipeline View Title

Pipeline Flow

Layout

Based on upstream/downstream relationship

All Bookmarks

Dashboard > Assignment-3-Pipeline-Testing > Configure

No

Always allow manual trigger on pipeline steps

☐ Yes

☒ No

Display Options

No Of Displayed Builds

1

Row Headers

Just the pipeline number

Show just the build pipeline number

Column Headers

No header

Do not show any column headers

Refresh frequency (in seconds)

5

Dashboard > Assignment-3-Pipeline-Testing > Configure

No of Deployed Builds

Row Headers
Show just the build pipeline number

Column Headers
Do not show any column headers

Refresh frequency (in seconds)

URL for custom CSS files

Console Output Link Style

Jenkins Search (CTRL+F)

Dashboard > Assignment-3-Pipeline-Testing >

Build Pipeline

Assignment-3-Pipeline-Testing

Pipeline #1

#1 Test job
Run 12, 2024 9:59:41 AM
12 min

#1 Prod job
Run 12, 2024 9:59:41 AM
12 min

Jenkins Search (CTRL+F)

Dashboard > Assignment-3-Pipeline-Testing >

Build Pipeline

Assignment-3-Pipeline-Testing

Pipeline #1

#1 Test job
Run 12, 2024 9:59:41 AM
12 min

Prod job
Run 12, 2024 9:59:41 AM
12 min

Jenkins Search (CTRL+F)

Dashboard > Assignment-3-Pipeline-Testing >

Build Pipeline

Assignment-3-Pipeline-Testing

Pipeline #1

#1 Test job
Run 12, 2024 9:59:41 AM
12 min

#2 Prod job
Run 12, 2024 9:59:41 AM
12 min

