



Academic Year: 2025-26

Semester: V

Class / Branch: TEIT

Subject: DevOps Lab

Name of Instructor: Prof. Sujata Oak

Name: Shravani Sawant
Moodle Id: 24204018
Roll No: 17

Experiment No. 5

Aim: To create and build a CI/CD pipeline in Jenkins to test and deploy an application over the tomcat server.

```
root@shravanisawa: /home/vboxuser
vboxuser@shravanisawa:~$ sudo su root
[sudo] password for vboxuser:
root@shravanisawa:/home/vboxuser# apt-get update
Get:1 file:/cdrom/noble InRelease
Ign:1 file:/cdrom/noble InRelease
Get:2 file:/cdrom/noble Release
Err:2 file:/cdrom/noble Release
  File not found - /cdrom/dists/noble/Release (2: No such file or directory)
Ign:3 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:4 https://pkg.jenkins.io/debian-stable binary/ Release
Err:5 https://pkg.jenkins.io/debian-stable binary/ Release.gpg
  GPG: add_keyblock_resource 33587281  GPG: keydb_search 33554445  GPG: keydb_search 33554445
Hit:6 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:7 http://in.archive.ubuntu.com/ubuntu noble InRelease
Hit:8 http://in.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:9 http://in.archive.ubuntu.com/ubuntu noble-backports InRelease
Reading package lists... Done
E: The repository 'file:/cdrom/noble Release' no longer has a Release file.
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
W: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: https://pkg.jenkins.io/debian-stable binary/ Release: GPG: add_keyblock_resource 33587281  GPG: keydb_search 33554445  GPG: keydb_search 33554445
root@shravanisawa:/home/vboxuser# apt-get install openjdk-11-jdk
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
openjdk-11-jdk is already the newest version (11.0.28+6-1ubuntu1-24.04.1).
0 upgraded, 0 newly installed, 0 to remove and 438 not upgraded.
root@shravanisawa:/home/vboxuser# curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo tee \
/usr/share/keyrings/jenkins-keyring.asc > /dev/null
Command 'curl' not found, but can be installed with:
snap install curl --version 8.16.0 --or
```



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```
root@shravanisawa: /home/vboxuser

Tasks: 38 (limit: 2278)
Memory: 323.1M (peak: 367.3M)
CPU: 2min 6.876s
CGroup: /system.slice/jenkins.service
└─9117 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkin>

Sep 14 07:44:01 shravanisawa jenkins[9117]: f8fd0a76091646e39c55245d8c960ca2
Sep 14 07:44:01 shravanisawa jenkins[9117]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Sep 14 07:44:01 shravanisawa jenkins[9117]: *****
Sep 14 07:44:01 shravanisawa jenkins[9117]: *****
Sep 14 07:44:01 shravanisawa jenkins[9117]: *****
Sep 14 07:44:14 shravanisawa jenkins[9117]: 2025-09-14 07:44:14.053+0000 [id=30] INFO jenkins.InitReactor>
Sep 14 07:44:14 shravanisawa jenkins[9117]: 2025-09-14 07:44:14.075+0000 [id=23] INFO hudson.lifecycle.Li>
Sep 14 07:44:14 shravanisawa systemd[1]: Started jenkins.service - Jenkins Continuous Integration Server.
Sep 14 07:44:16 shravanisawa jenkins[9117]: 2025-09-14 07:44:16.395+0000 [id=47] INFO h.m.DownloadService>
Sep 14 07:44:16 shravanisawa jenkins[9117]: 2025-09-14 07:44:16.396+0000 [id=47] INFO hudson.util.Retrier>
lines 1-20/20 (END)
[1]+ Stopped sudo systemctl status jenkins
root@shravanisawa:/home/vboxuser# sudo ufw allow 8080
Skipping adding existing rule
Skipping adding existing rule (v6)
root@shravanisawa:/home/vboxuser# sudo ufw status
Status: active

To Action From
--
8080 ALLOW Anywhere
8080 (v6) ALLOW Anywhere (v6)

root@shravanisawa:/home/vboxuser# sudo ufw enable
Firewall is active and enabled on system startup
root@shravanisawa:/home/vboxuser#
```




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```
root@shravanisawa: /home/vboxuser

b_search 33554445 GPG: keydb_search 33554445
root@shravanisawa:/home/vboxuser# sudo apt-get install jenkins
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
jenkins is already the newest version (2.516.2).
0 upgraded, 0 newly installed, 0 to remove and 438 not upgraded.
root@shravanisawa:/home/vboxuser# sudo systemctl start jenkins.service
root@shravanisawa:/home/vboxuser# 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 Sun 2025-09-14 07:44:14 UTC; 57min ago
     Main PID: 9117 (java)
        Tasks: 38 (limit: 2278)
      Memory: 323.1M (peak: 367.3M)
         CPU: 2min 6.876s
       CGroup: /system.slice/jenkins.service
               └─9117 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkin>

Sep 14 07:44:01 shravanisawa jenkins[9117]: f8fd0a76091646e39c55245d8c960ca2
Sep 14 07:44:01 shravanisawa jenkins[9117]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Sep 14 07:44:01 shravanisawa jenkins[9117]: *****
Sep 14 07:44:01 shravanisawa jenkins[9117]: *****
Sep 14 07:44:01 shravanisawa jenkins[9117]: *****
Sep 14 07:44:14 shravanisawa jenkins[9117]: 2025-09-14 07:44:14.053+0000 [id=30] INFO jenkins.InitReactor>
Sep 14 07:44:14 shravanisawa jenkins[9117]: 2025-09-14 07:44:14.075+0000 [id=23] INFO hudson.lifecycle.Li>
Sep 14 07:44:14 shravanisawa systemd[1]: Started jenkins.service - Jenkins Continuous Integration Server.
Sep 14 07:44:16 shravanisawa jenkins[9117]: 2025-09-14 07:44:16.395+0000 [id=47] INFO h.m.DownloadService>
Sep 14 07:44:16 shravanisawa jenkins[9117]: 2025-09-14 07:44:16.396+0000 [id=47] INFO hudson.util.Retrier>
lines 1-20/20 (END)
[1]+  Stopped                  sudo systemctl status jenkins
root@shravanisawa:/home/vboxuser#
```



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```
root@shravanisawa: /home/vboxuser

CPU: 14.864s
CGroup: /system.slice/jenkins.service
└─1060 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java>

Sep 14 11:00:38 shravanisawa jenkins[1060]: Jenkins initial setup is required. >
Sep 14 11:00:38 shravanisawa jenkins[1060]: Please use the following password to >
Sep 14 11:00:38 shravanisawa jenkins[1060]: f8fd0a76091646e39c55245d8c960ca2
Sep 14 11:00:38 shravanisawa jenkins[1060]: This may also be found at: /var/lib>
Sep 14 11:00:38 shravanisawa jenkins[1060]: *****>
Sep 14 11:00:38 shravanisawa jenkins[1060]: *****>
Sep 14 11:00:38 shravanisawa jenkins[1060]: *****>
Sep 14 11:00:49 shravanisawa jenkins[1060]: 2025-09-14 11:00:49.952+0000 [id=30>
Sep 14 11:00:50 shravanisawa jenkins[1060]: 2025-09-14 11:00:49.999+0000 [id=23>
Sep 14 11:00:50 shravanisawa systemd[1]: Started jenkins.service - Jenkins Cont>
lines 1-20/20 (END)
[1]+  Stopped                  sudo systemctl status jenkins
root@shravanisawa:/home/vboxuser# sudo ufw status
Status: active

To Action From
--
8080 ALLOW Anywhere
8080 (v6) ALLOW Anywhere (v6)

root@shravanisawa:/home/vboxuser# sudo ufw allow 8080
Skipping adding existing rule
Skipping adding existing rule (v6)
root@shravanisawa:/home/vboxuser# sudo ufw enable
root@shravanisawa:/home/vboxuser# sudo cat /var/lib/jenkins/secrets/initialAdminPassword^C
root@shravanisawa:/home/vboxuser# sudo cat /var/lib/jenkins/secrets/initialAdminPassword
f8fd0a76091646e39c55245d8c960ca2
root@shravanisawa:/home/vboxuser#
```



← → × localhost:8080/login?from=%2F ☆

Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log ([not sure where to find it?](#)) and this file on the server:

```
/var/lib/jenkins/secrets/initialAdminPassword
```

Please copy the password from either location and paste it below.

Administrator password

Continue



Getting Started

Getting Started

✓ Folders	✓ OWASP Markup Formatter	✓ Build Timeout	✓ Credentials Binding	Gradle ** Pipeline: Milestone Step ** Durable Task ** Pipeline: Nodes and Processes ** Pipeline: Build Step ** Pipeline: SCM Step ** Pipeline: Groovy ** Pipeline: Groovy Libraries ** Joda Time API ** Pipeline: Model API ** Pipeline: Stage Step ** Pipeline: Declarative Extension Points API ** Jakarta Activation API ** Jakarta Mail API ** Instance Identity Mailer ** Branch API ** Pipeline: Multibranch ** Pipeline: Stage Tags Metadata ** Pipeline: Input Step ** - required dependency
✓ Timestampers	✓ Workspace Cleanup	✓ Ant	✓ Gradle	
🔄 Pipeline	🔄 GitHub Branch Source	🔄 Pipeline: GitHub Groovy Libraries	🔄 Pipeline Graph View	
🔄 Git	🔄 SSH Build Agents	🔄 Matrix Authorization Strategy	🔄 LDAP	
🔄 Email Extension	✓ Mailer	🔄 Dark Theme		

Jenkins 2.516.2



Sep 14 11:16

Setup Wizard - Jenkins

localhost:8080

Getting Started

Instance Configuration

Jenkins URL:

The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the BUILD_URL environment variable provided to build steps.

The proposed default value shown is **not saved yet** and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.

Jenkins 2.516.2

Not now [Save and Finish](#)

localhost:8080/#



Sep 14 11:16

Setup Wizard - Jenkins x +

localhost:8080

Getting Started

Create First Admin User

Username

Password

Confirm password

Full name

Jenkins 2.516.2

[Skip and continue as admin](#) [Save and Continue](#)

localhost:8080/#



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Sep 14 11:18

Dashboard - Jenkins x +

localhost:8080

Jenkins

+ New Item

Build History

Build Queue ▾

No builds in the queue.

Build Executor Status 0/2 ▾

Welcome to Jenkins!

This page is where your Jenkins jobs will be displayed. To get started, you can create a new job or start building a software project.

Start building your software project

Create a job

Set up a distributed build

Set up an agent

Configure a cloud

Learn more about distributed builds ?

SHRAVANISAWANT

Theme Light

My Views

Account

Appearance

Preferences

Security

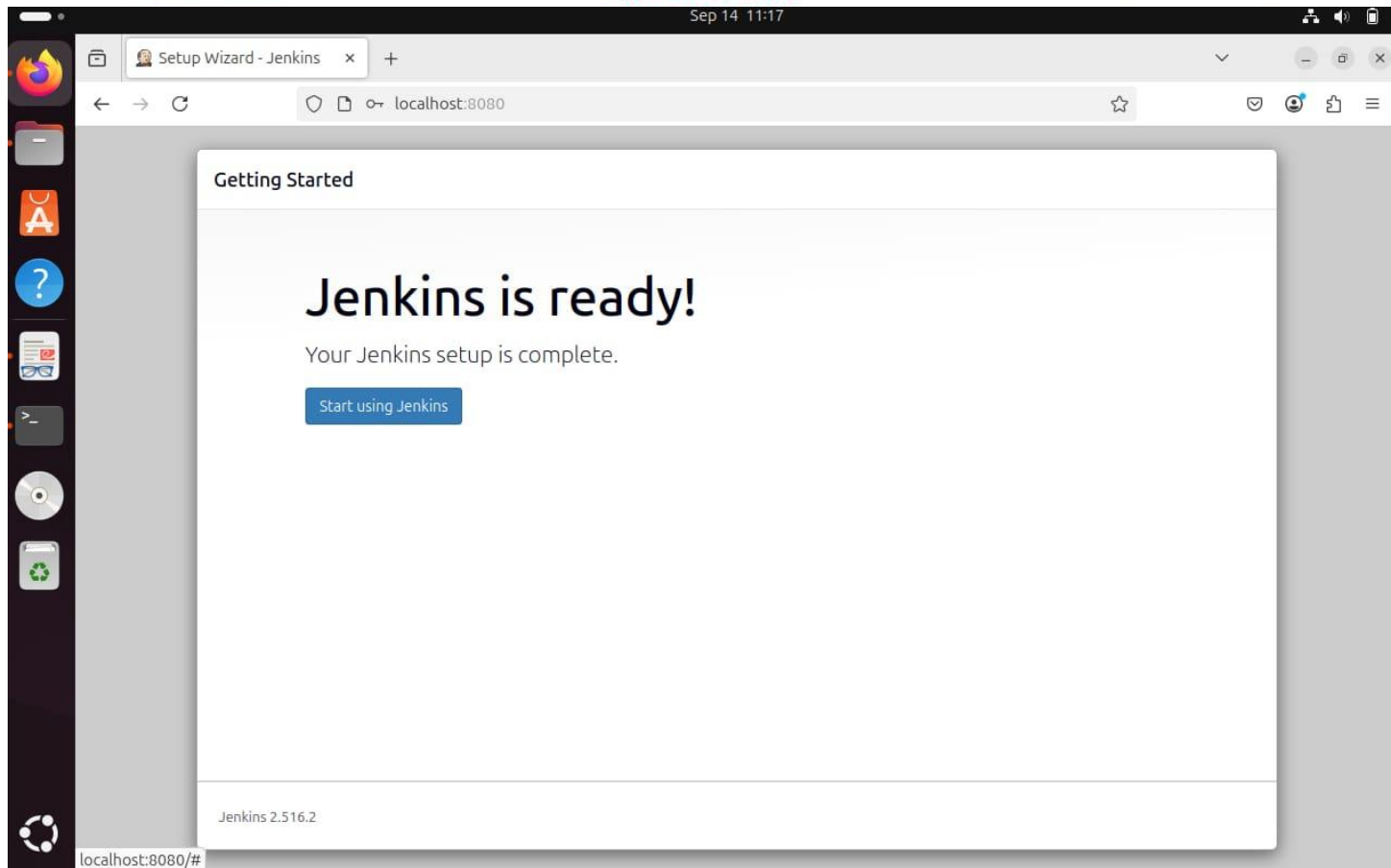
Experiments

Credentials

Sign out

localhost:8080/user/shravanisawant

REST API Jenkins 2.516.2





Sep 14 13:52

New Item - Jenkins x Fibonacci script in Jenkins x

localhost:8080/view/all/newJob





Jenkins / All / New Item

New Item

Enter an item name

shravanifibonacci

Select an item type

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

OK



Sep 14 13:54

shravanifibonacci Config x Fibonacci script in Jenkins x +

localhost:8080/job/shravanifibonacci/configure

Jenkins / shravanifibonacci / Configuration

Configure

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

Build Steps

Automate your build process with ordered tasks like code compilation, testing, and deployment.

Execute shell ?

Command

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

```
n=10  
a=0  
b=1
```

Advanced ▾

Add build step ▾

Save Apply



Sep 14 14:00

shravanisawantfibonacci x Fix shell script error x +

localhost:8080/job/shravanisawantfibonacci/1/console

Jenkins / shravanisawantfibonacci / #1 / Console Output

Status

Changes

Console Output

Edit Build Information

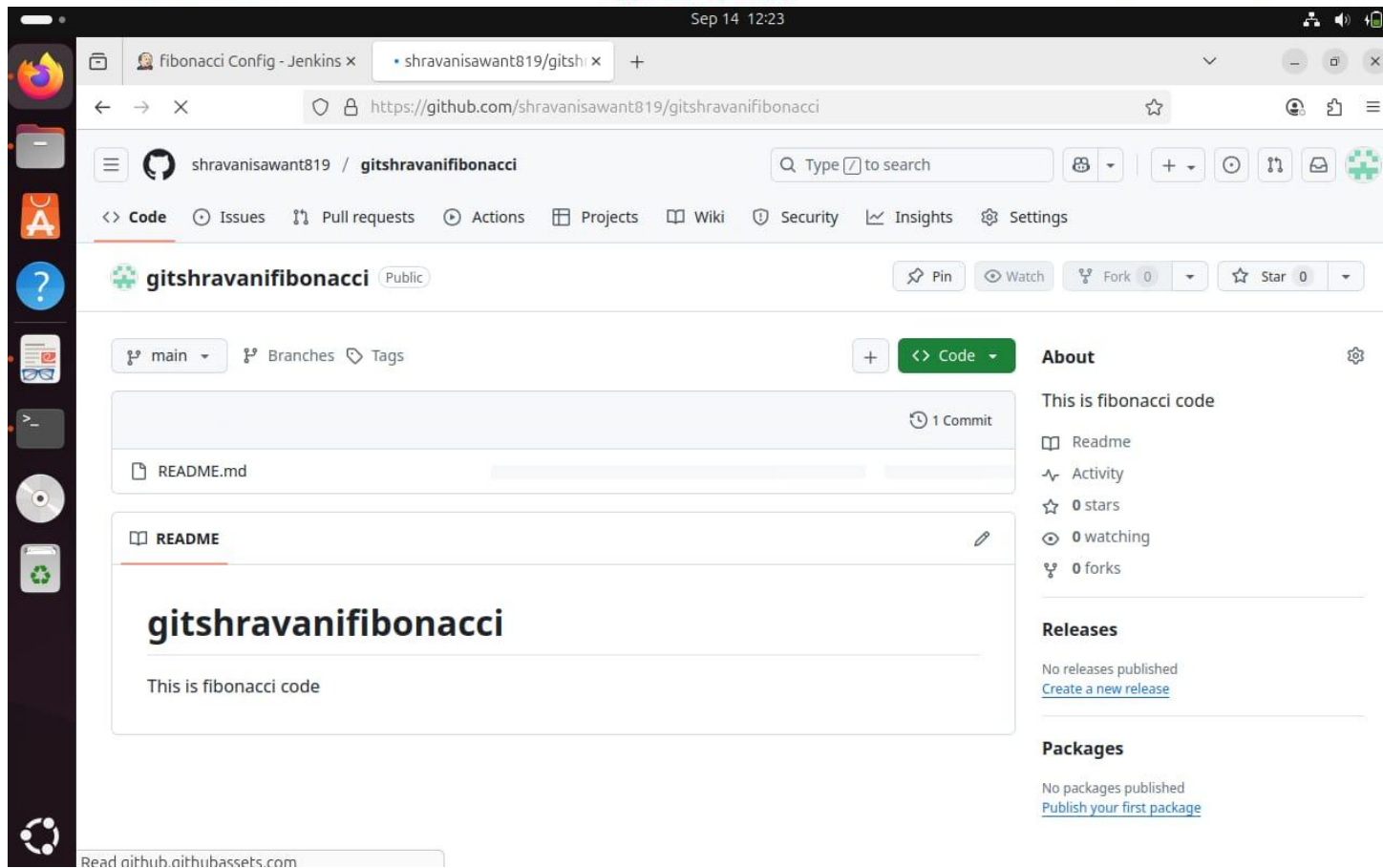
Delete build '#1'

Timings

Console Output Download Copy View as plain text

```
Started by user SHRAVANISAWANT
Running as SYSTEM
Building in workspace /var/lib/jenkins/jobs/shravanisawantfibonacci/workspace
[workspace] $ /bin/sh /tmp/jenkins688036960181738176.sh
Fibonacci sequence up to 10 terms:
0
1
1
2
3
5
8
13
21
34
Finished: SUCCESS
```

REST API Jenkins 2.516.2



Conclusion:

Creating and building a CI/CD pipeline in Jenkins to test and deploy an application on a Tomcat server streamlines the software delivery process by automating repetitive tasks. This approach ensures consistent and reliable builds, reduces manual errors, and accelerates deployment cycles. Automated testing within the pipeline helps catch issues early, improving overall code quality. Integrating Jenkins with Tomcat allows for seamless deployment, making updates faster and more efficient. Ultimately, this setup enhances collaboration among development teams and supports continuous delivery of high-quality applications.