Setting up simple pipeline using Git, Jenkins, and Docker in local mode on an Ubuntu instance

Aim:

To set up a simple pipeline using Git, Jenkins, and Docker in local mode on an Ubuntu instance.

Procedure:

Step 1: Create an EC2 instance with Ubuntu in Amazon Machine Image.

Step 2: Update package information on the Ubuntu EC2 instance.

```
ubuntu@ip-172-31-47-227:~$ sudo apt-get update
```

```
ubuntu@ip-172-31-47-227:~$ sudo apt update
```

Step 3: Install Docker on the Ubuntu instance by downloading the installation script using 'curl' and then executing the script using the 'sh' shell to perform the installation

```
ubuntu@ip-172-31-47-227:~$ curl -fsSL https://get.docker.com -o get-docker.sh
```

```
ubuntu@ip-172-31-47-227:~$ sh get-docker.sh
```

Step 4: Check the version of docker to verify installation.

```
ubuntu@ip-172-31-47-227:~$ docker –-version
```

Docker version 24.0.4, build 3713ee1

Step 5: Create a docker hub account in DockerHub website and remember the credentials.

Step 6: Login docker

```
ubuntu@ip-172-31-47-227:~$ sudo docker login -u <username> -p <password>
```

Replace <username> and <password> with DockerHub username and password.

Step 7: Install OpenJDK 17 (Java Runtime Environment).

```
ubuntu@ip-172-31-47-227:~$ sudo apt install openjdk-17-jre
```

Step 8: Check the Java version to ensure it is installed correctly.

```
ubuntu@ip-172-31-47-227:~$ java -version
```

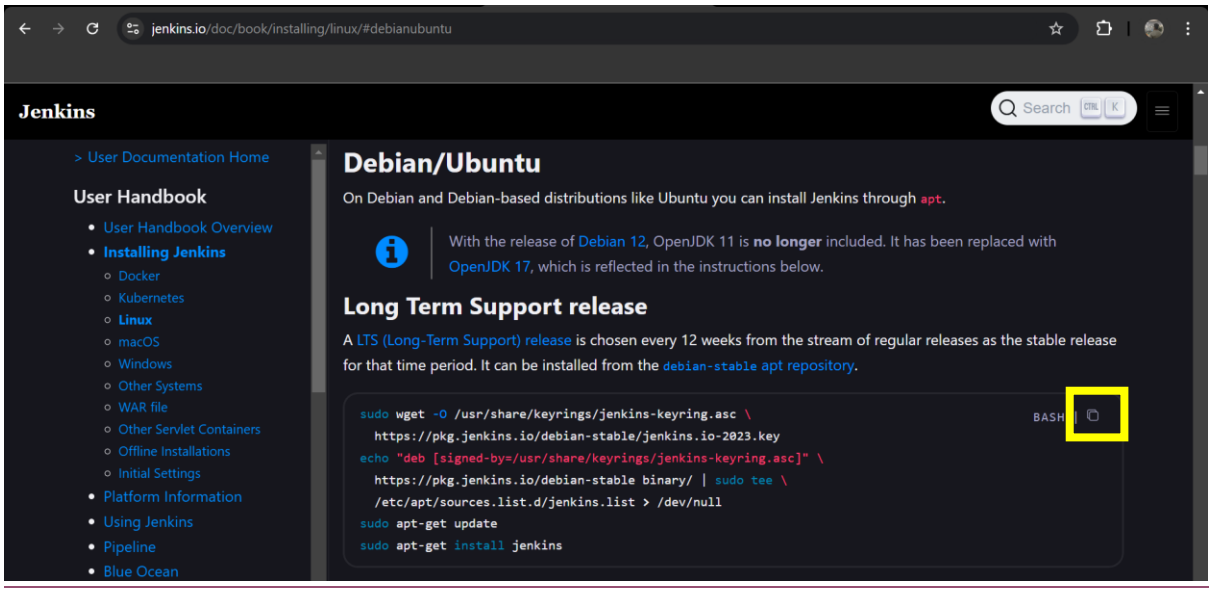
openjdk version "17.0.7" 2023-04-18

OpenJDK Runtime Environment (build 17.0.7+7-Ubuntu-0ubuntu122.04.2)

OpenJDK 64-Bit Server VM (build 17.0.7+7-Ubuntu-0ubuntu122.04.2, mixed mode, sharing)

Step 9: Import Jenkins Repository Key and install jenkins. You can get this from the Jenkins documentation.

Link: https://www.jenkins.io/doc/book/installing/linux/#debianubuntu



Now to do this copy the whole code and paste in the BASH.

Step 10: Start Jenkins service and check its status.

```
ubuntu@ip-172-31-47-227:~$ sudo systemctl start jenkins.service
```

```
ubuntu@ip-172-31-47-227:~$ sudo systemctl status jenkins
```

● *jenkins.service - Jenkins Continuous Integration Server*

Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)

Active: active (running) since Fri 2023-07-21 12:50:18 UTC; 1min 57s ago

Main PID: 6680 (java)

Tasks: 38 (limit: 1111)

Memory: 292.6M

CPU: 1min 17.623s

CGroup: /system.slice/jenkins.service

└─6680 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

Jul 21 12:49:30 ip-172-31-47-227 jenkins[6680]

Step 11: Configure firewall to allow traffic on port 8080 for Jenkins, SSH connections for remote access, port 8000 for container communication.

```
ubuntu@ip-172-31-47-227:~$ sudo ufw allow 8080
```

```
ubuntu@ip-172-31-47-227:~$ sudo ufw allow OpenSSH
```

```
ubuntu@ip-172-31-47-227:~$ sudo ufw allow 8000
```

Step 12: Enable the firewall.

```
ubuntu@ip-172-31-47-227:~$ sudo ufw enable
```

Note: Don’t just hit ‘Enter’ as ufw will not be enabled. Just write ‘y’ and hit ‘Enter’ if it asks y/n.

Step 13: Check the firewall status.

```
ubuntu@ip-172-31-47-227:~$ sudo ufw status
```

Status: active

To	*Action*	*From*
--	*------*	*----*
8080	*ALLOW*	*Anywhere*
OpenSSH	*ALLOW*	*Anywhere*
8000	*ALLOW*	*Anywhere*
8080 (v6)	*ALLOW*	*Anywhere (v6)*
OpenSSH (v6)	*ALLOW*	*Anywhere (v6)*
8000 (v6)	*ALLOW*	*Anywhere (v6)*

Step 14: Retrieve the initialAdminPassword for Jenkins setup.

```
ubuntu@ip-172-31-47-227:~$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword
```

c84c43b9adf14d60873f4185427328ba

Step 15: Add the Jenkins user to the docker group for Docker access.

```
ubuntu@ip-172-31-47-227:~$ sudo usermod -aG docker jenkins
```

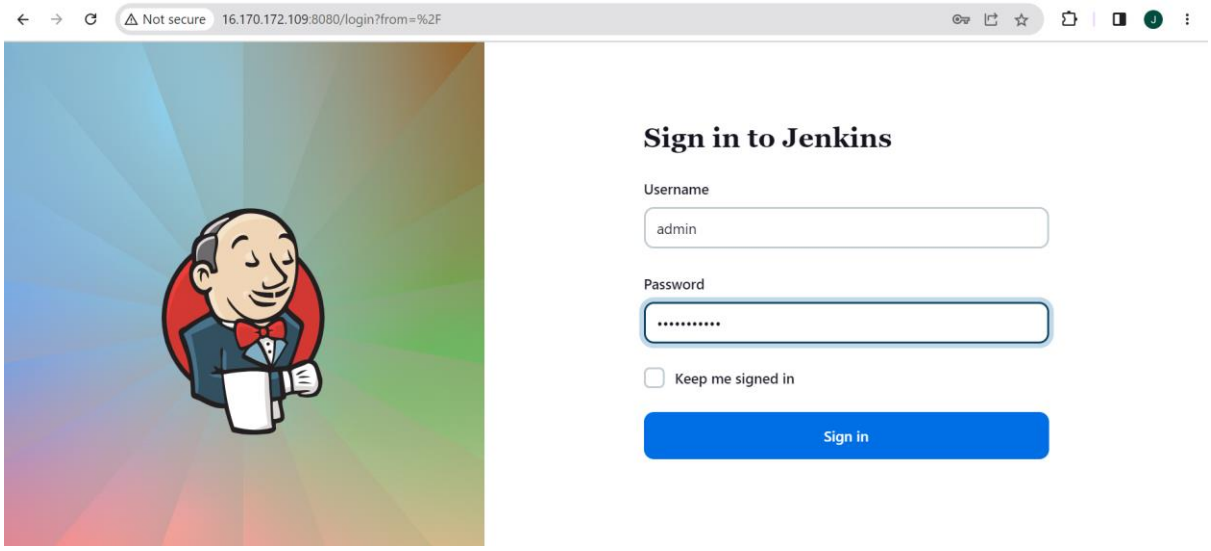
Step 16: Restart Jenkins service to apply the changes.

```
ubuntu@ip-172-31-47-227:~$ sudo systemctl restart jenkins
```

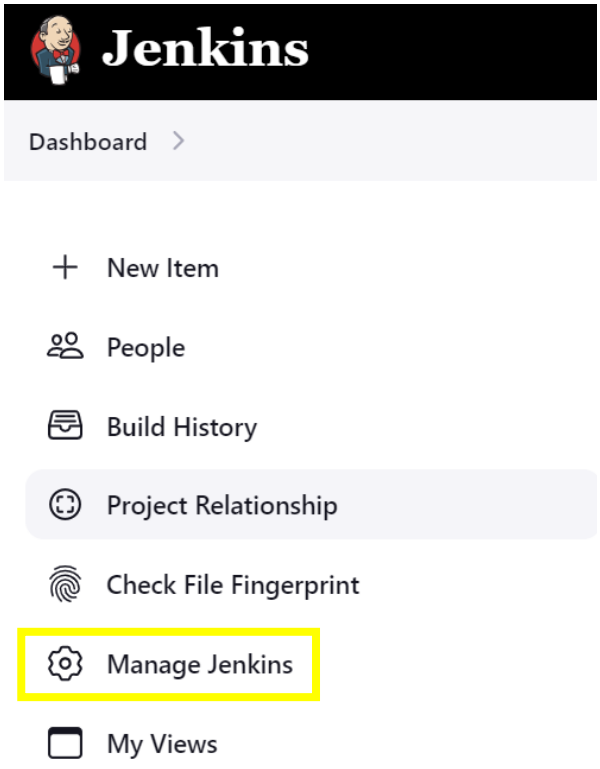
Step 17: Allow Custom TCP port 8080, 8000 in Inbound rules.

Step 18: Now open <Public_IP_Address_of_EC2_Instance>:8080 in Browser to open Jenkins.

Step 22: Login with initialAdminPassword that we retrieved in Step 14 – Install suggested plugins – Setup new username and password. After that you will get this page or you will be logged in



Step 23: Setup Credentials in Jenkins.



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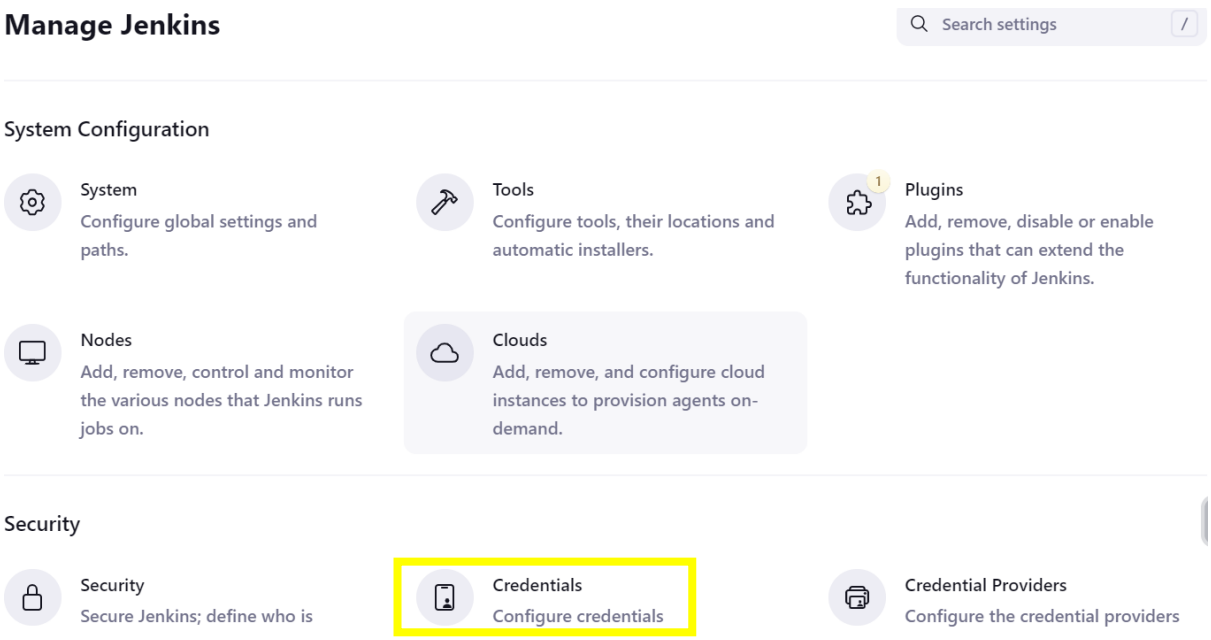

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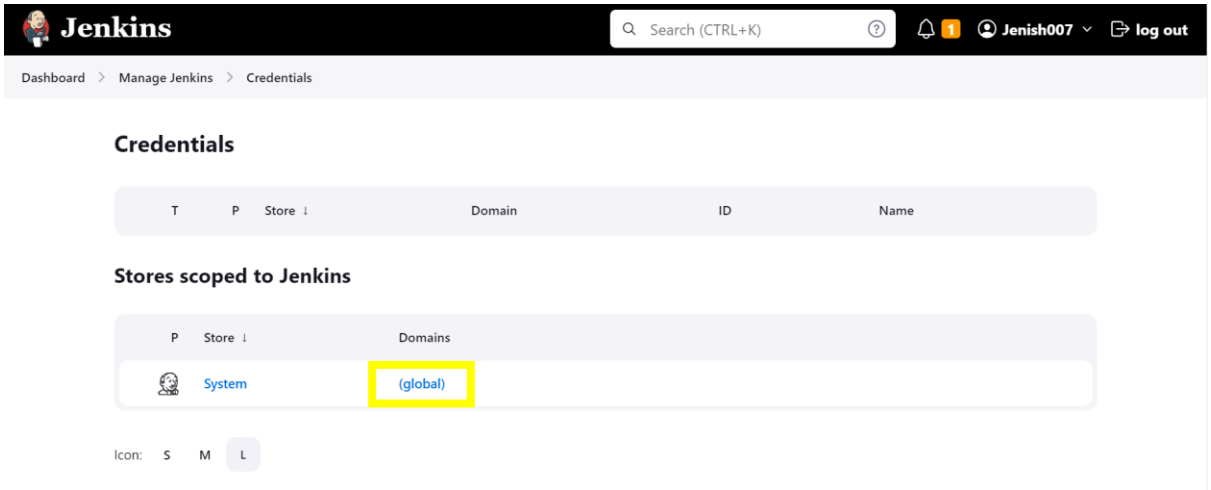
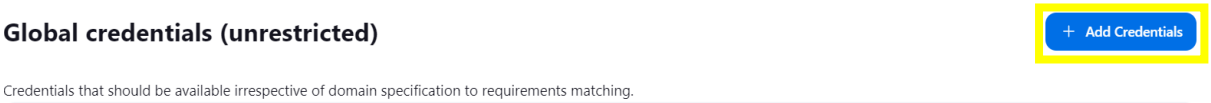


<next>



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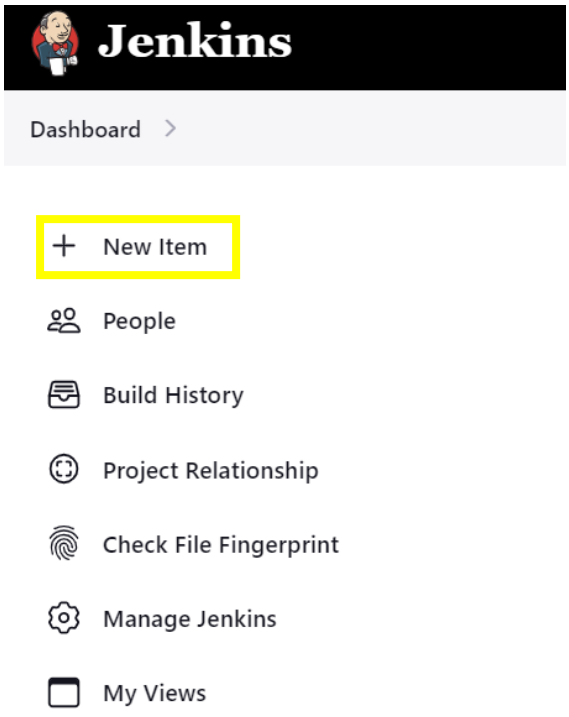
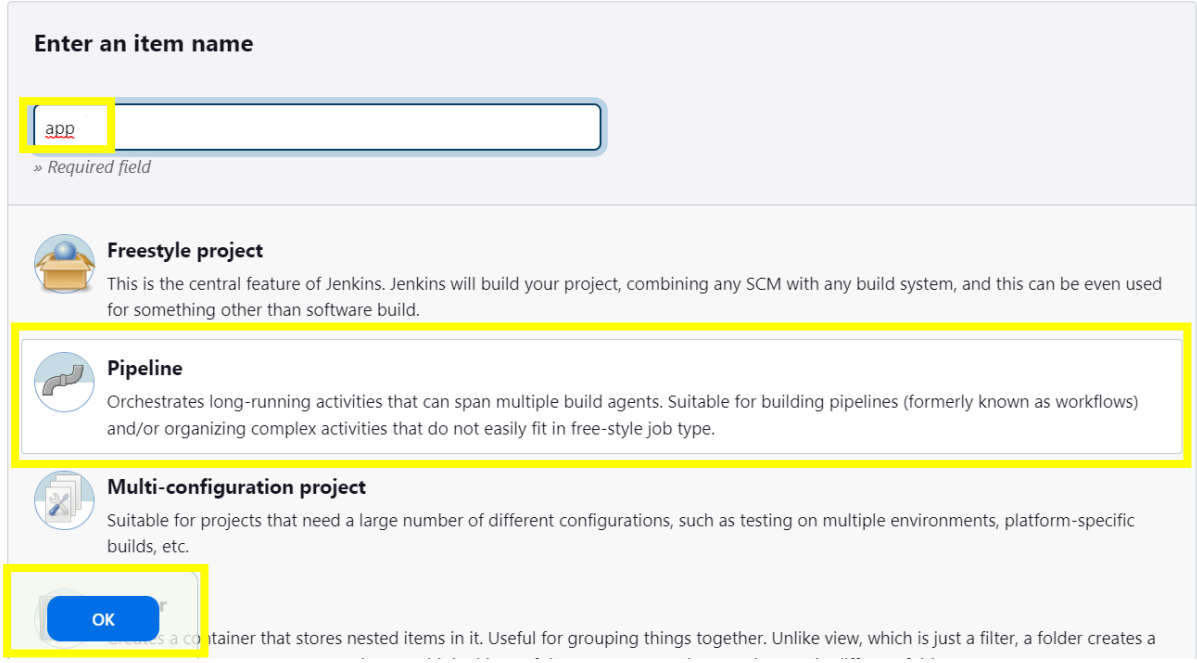
Now add your **Docker hub User name** and **password** and save it with Id (I have used **test1**). Also make necessary changes in the Jenkinsfile like setting **credentials id** and **username of docker**

Step 24: Create Pipeline in Jenkins.



<next>

Enter an item name of your wish.



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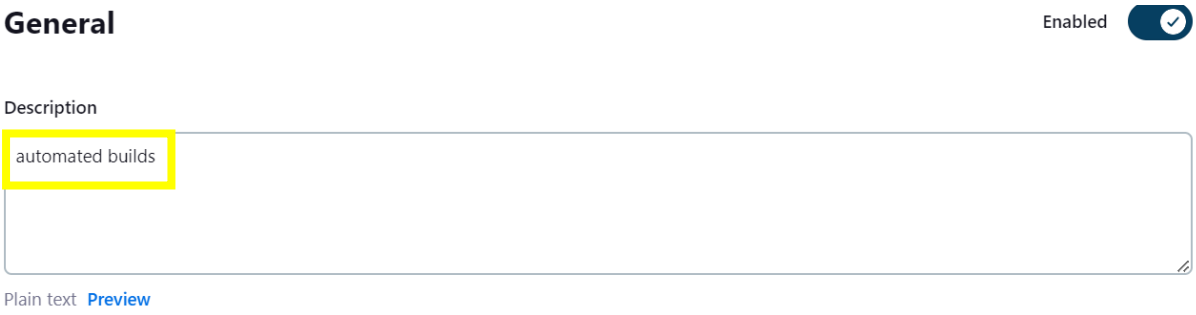
Add some description:



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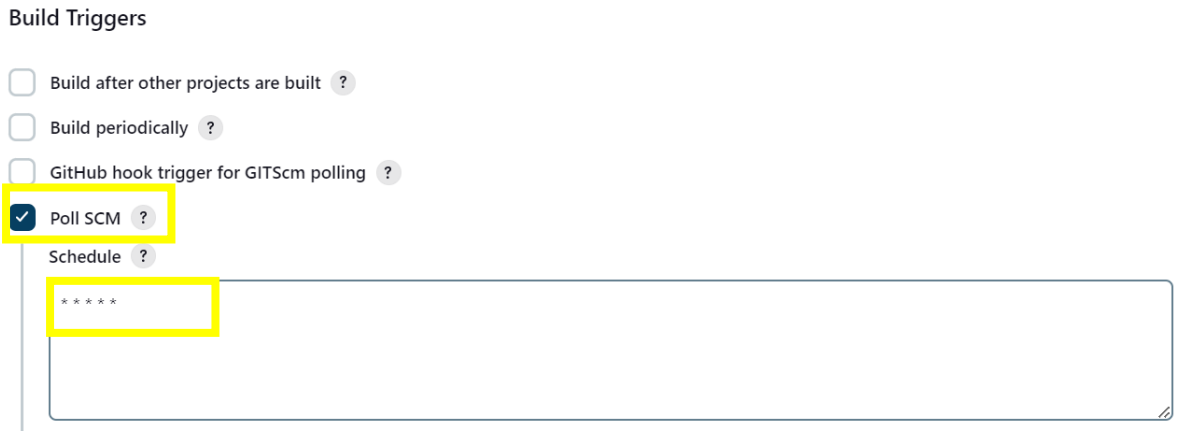
Build Triggers with Poll SCM.

This poll SCM with Schedule '* * * * *' will check the git repository every minute and if a commit is encounter it automatically build up…



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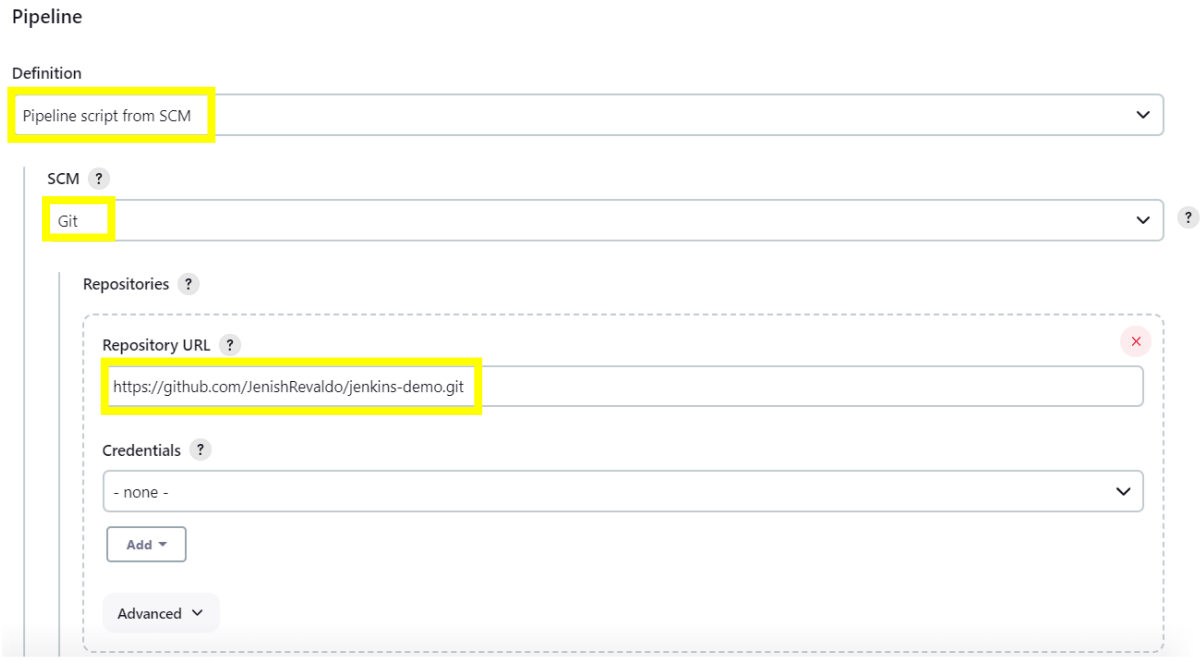
Display name – The same name given in item name

<next>

Setting up pipeline definition from my GitHub Repository.



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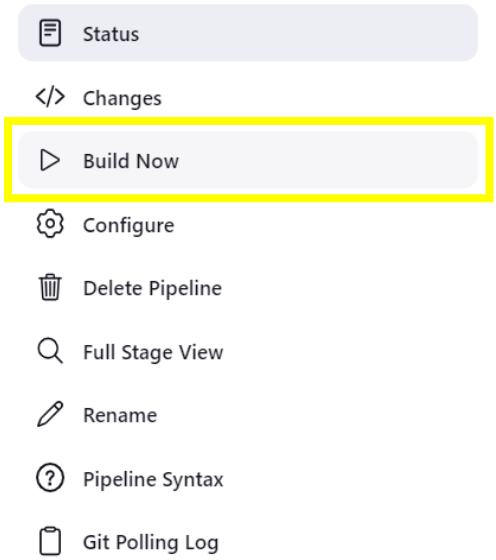
Change the branch specifier according to your repository and save the pipeline.

<next>

Now build the pipeline.



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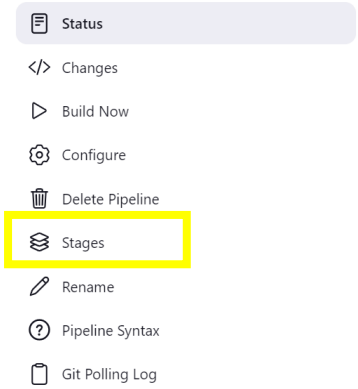
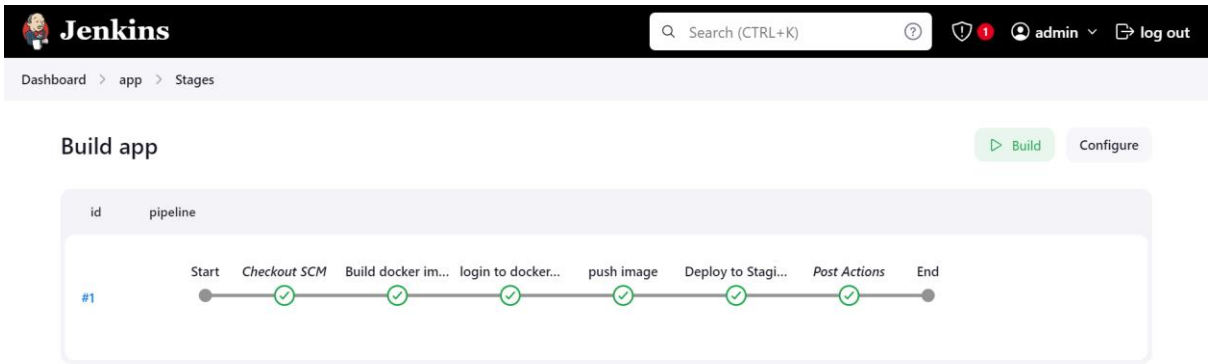
Stages of pipeline will get executed. Click on the ‘Stages’ Menu to see the stages.



You can see the stages are successful now:

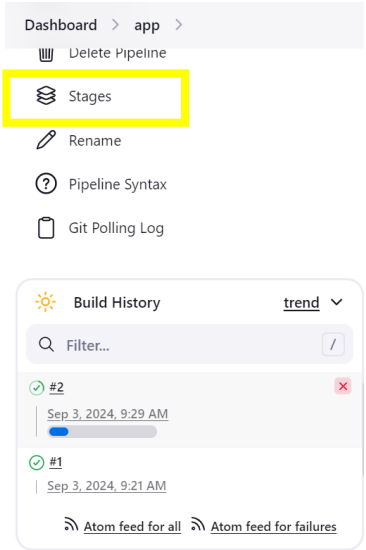


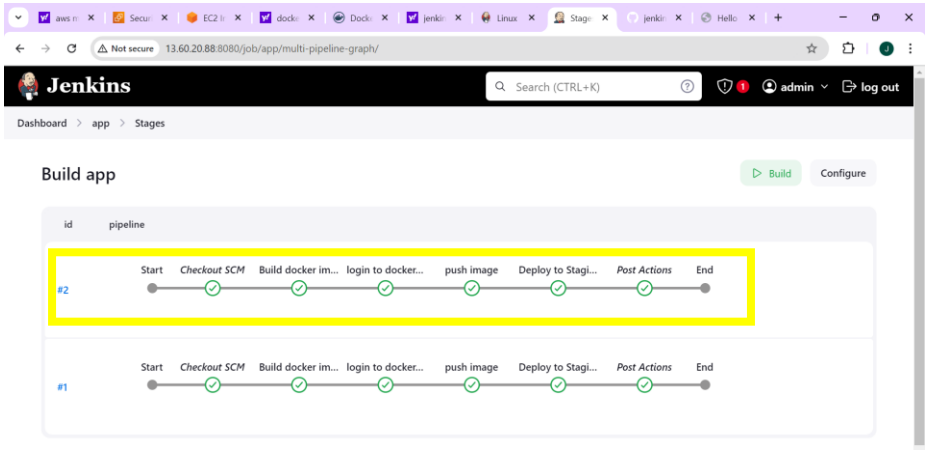
Step 25: Now open <Public_IP_Address_of_EC2_Instance>:8000 in Browser

Output:

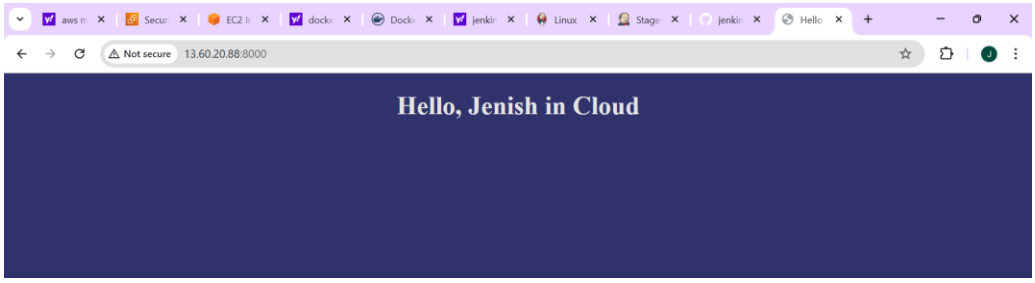
Now you can make changes in the **hello.html** file located in the templates folder in the repository and commit it, within one minute it gets reflect in the end page.

After committing changes in hello.html file you can see the triggers automatic execution in the ‘Stages’ menu.





Now you can see the changes in the end page:



The local pipeline setup for Git, Jenkins, and Docker has been successfully established on the Ubuntu instance, enabling efficient software development, testing, and deployment processes.