Project: Capstone I

You have been hired as a Sr. DevOps Engineer in Abode Software. They want to implement DevOps Lifecycle in their company. You have been asked to implement this lifecycle as fast as possible. Abode Software is a product-based company and their product is available on this GitHub link. https://github.com/hshar/website.git

Following are the specifications of the lifecycle:

1. Install the necessary software on the machines using a configuration management tool

2. Git workflow has to be implemented

3. CodeBuild should automatically be triggered once a commit is made to master branch or develop branch.

a. If a commit is made to master branch, test and push to prod

b. If a commit is made to develop branch, just test the product, do not push to prod

4. The code should be containerized with the help of a Dockerfile. The Dockerfile should be built every time there is a push to GitHub. Use the following pre-built container for your application: hshar/webapp The code should reside in '/var/www/html'

5. The above tasks should be defined in a Jenkins Pipeline with the following jobs:

a. Job1: build

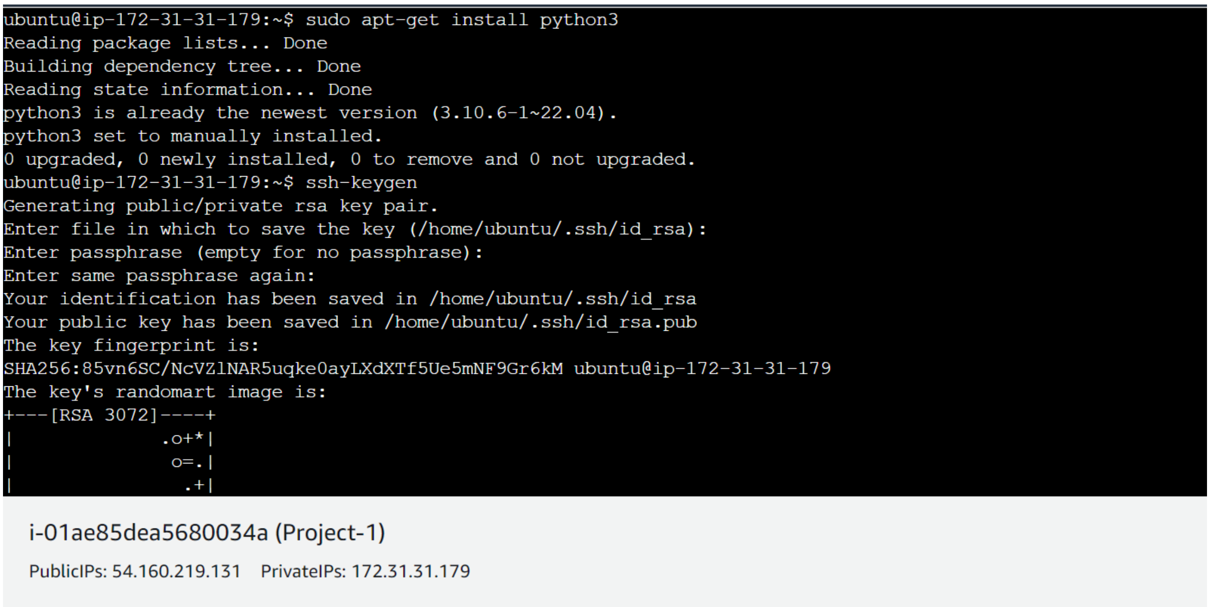
b. Job2: test

c. Job3: Prod

Created 3 instances in aws

Configuration management tool is installed manually in the master node and connected worker nodes by ssh key

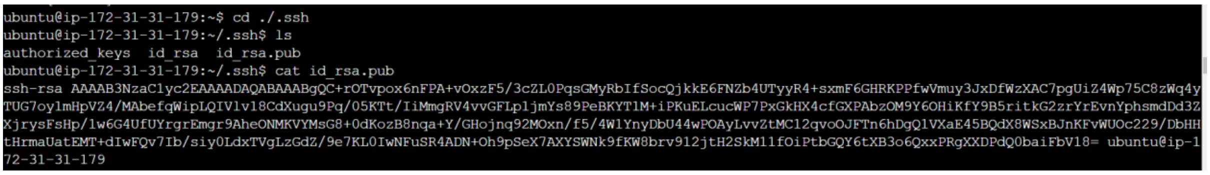
- Ssh key is generated in master node and copied



```
ubuntu@ip-172-31-31-179:~$ sudo apt-get install python3
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3 is already the newest version (3.10.6-1~22.04).
python3 set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
ubuntu@ip-172-31-31-179:~$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ubuntu/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ubuntu/.ssh/id_rsa
Your public key has been saved in /home/ubuntu/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:85vn6SC/NcVZ1NAR5uqke0ayLXdXTf5Ue5mNF9Gr6kM ubuntu@ip-172-31-31-179
The key's randomart image is:
+---[RSA 3072]----+
|              .o+*|
|               o=.|
|                .+|
```

i-01ae85dea5680034a (Project-1)

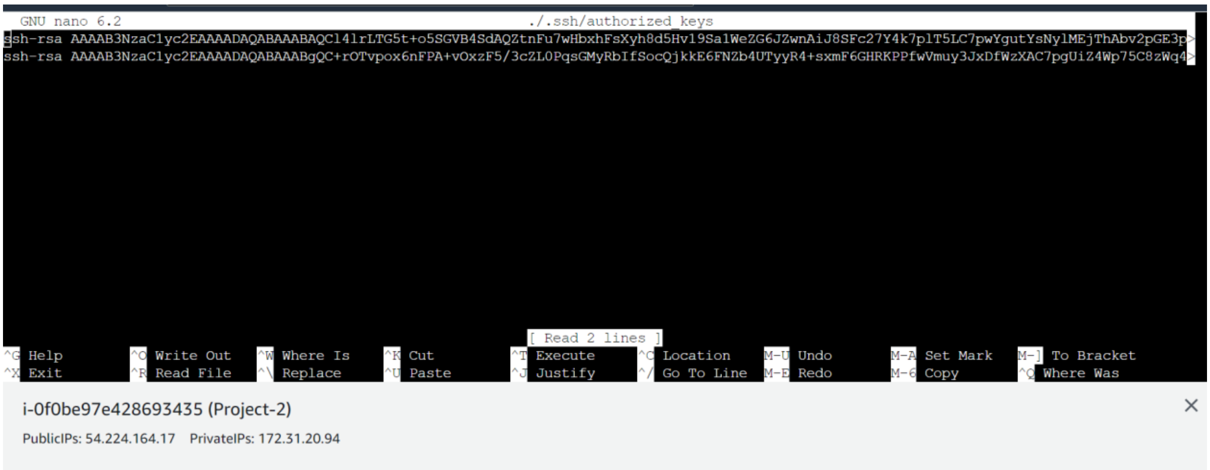
PublicIPs: 54.160.219.131   PrivateIPs: 172.31.31.179



```
ubuntu@ip-172-31-31-179:~$ cd ./.ssh
ubuntu@ip-172-31-31-179:~/.ssh$ ls
authorized_keys  id_rsa  id_rsa.pub
ubuntu@ip-172-31-31-179:~/.ssh$ cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQC+rOTvpox6nFPA+vOxzF5/3cZL0PqsGMyRbIfSocQjkkE6FNZb4UTyyR4+sxmF6GHRKPPfwVmuy3JxDfWzXAC7pgUiZ4Wp75C8zWq4y
TUG7oy1mHpVZ4/MAbefqWipLQIVlv18CdXugu9Pq/05KTt/IiMmgRV4vvGFLpljmYs89PeBKYTlM+iPKuELcucWP7PxGkHX4cfGXPAbzOM9Y6OHiKfY9B5ritkG2zrYrEvnYphsmdDd3Z
XjrysFsHp/lw6G4UfUYrgrEmgr9AheONMKVYMsG8+0dKozB8nqa+Y/GHojnq92MOxn/f5/4W1YnyDbU44wPOAyLvvZtMCl2qvoOJFTn6hDgQ1VXaE45BQdX8WSxBJnKFvWUOc229/DbHH
tHrmaUatEMT+dIwFQv7Ib/siy0LdxTVgLzGdZ/9e7KL0IwNFuSR4ADN+Oh9pSeX7AXYSWNk9fKW8brv912jtH2SkM11fOiPtbGQY6tXB3o6QxxPRgXXDPdQ0baiFbV18= ubuntu@ip-1
72-31-31-179
```

On slave1

Pasted on slave1’s authorised keys



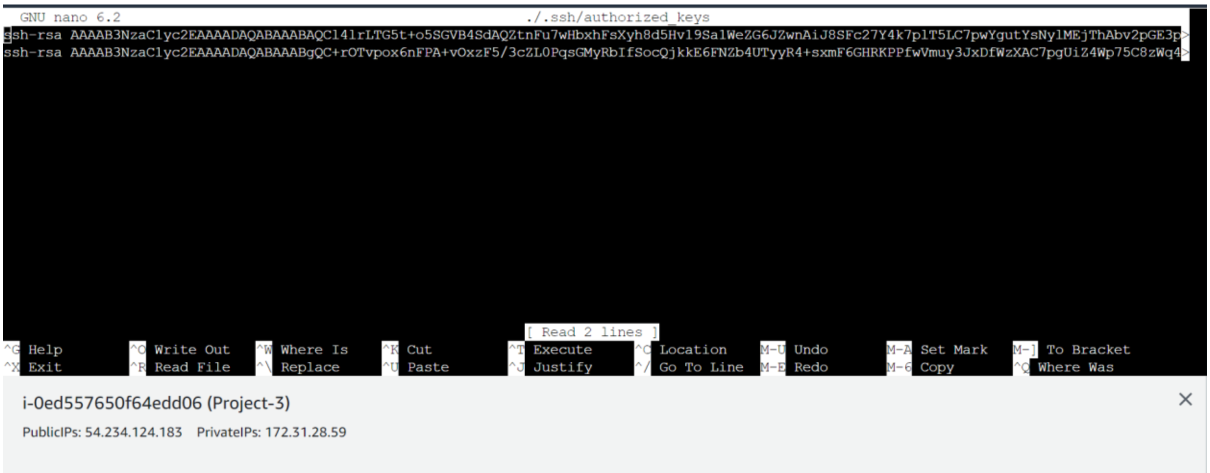
```
  GNU nano 6.2                                              ./.ssh/authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQCl4lrLTG5t+o5SGVB4SdAQZtnFu7wHbxhFsXyh8d5Hv19Sa1WeZG6JZwnAiJ8SFc27Y4k7plT5LC7pwYgutYsNylMEjThAbv2pGE3p>
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQC+rOTvpox6nFPA+vOxzF5/3cZL0PqsGMyRbIfSocQjkkE6FNZb4UTyyR4+sxmF6GHRKPPfwVmuy3JxDfWzXAC7pgUiZ4Wp75C8zWq4>

                                                     [ Read 2 lines ]
^G Help          ^O Write Out     ^W Where Is      ^K Cut           ^T Execute       ^C Location      M-U Undo         M-A Set Mark     M-] To Bracket
^X Exit          ^R Read File     ^\ Replace       ^U Paste         ^J Justify       ^/ Go To Line    M-E Redo         M-6 Copy         ^Q Where Was
```

i-0f0be97e428693435 (Project-2)

PublicIPs: 54.224.164.17   PrivateIPs: 172.31.20.94

On slave2

Pasted ssh key generated on master in slave2's authorized keys



```
  GNU nano 6.2                                    ./.ssh/authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQC141rLTG5t+o5SGVB4SdAQZtnFu7wHbxhFsXyh8d5Hv19SalWeZG6JZwnAiJ8SFc27Y4k7plT5LC7pwYgutYsNylMEjThAbv2pGE3p>
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQC+rOTvpox6nFPA+vOxzF5/3cZL0PqsGMyRbIfSocQjkkE6FNZb4UTyyR4+sxmF6GHRKPPfwVmuy3JxDfWzXAC7pgUiZ4Wp75C8zWq4>

                                        [ Read 2 lines ]
^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo       M-A Set Mark   M-] To Bracket
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo       M-6 Copy       ^Q Where Was
```

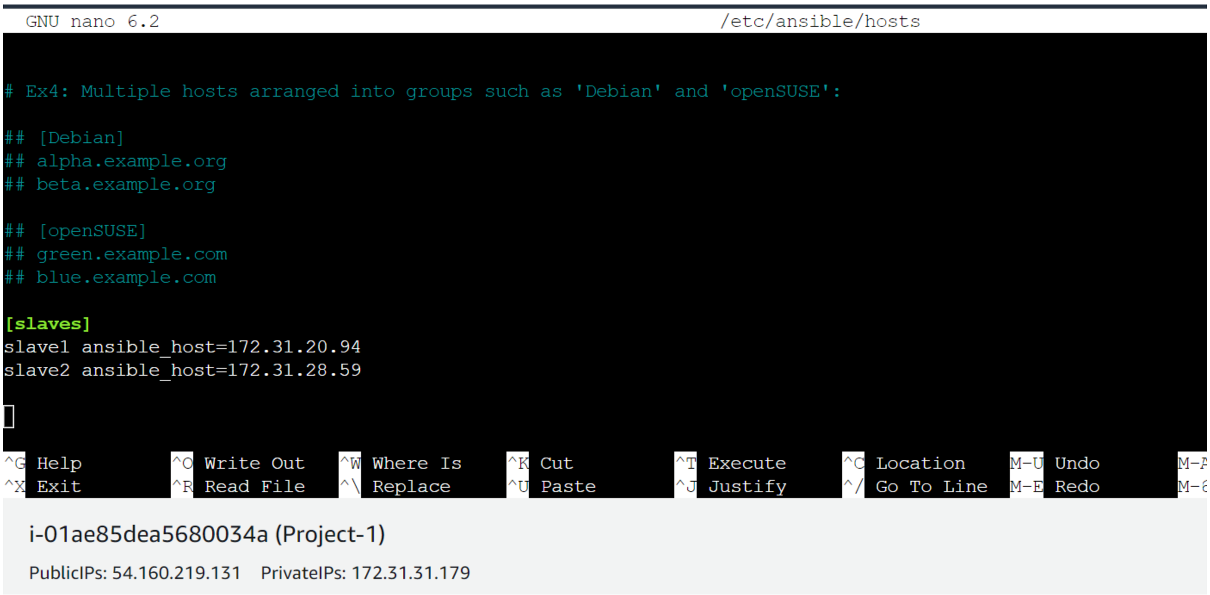
i-0ed557650f64edd06 (Project-3)

PublicIPs: 54.234.124.183 PrivateIPs: 172.31.28.59

On master server, installed Ansible with following commands

- Sudo apt update
- sudo apt install software-properties-common
- sudo apt-add-repository ppa: ansible/ansible
- sudo apt install ansible

then added slave's IPs to the hosts in the master server

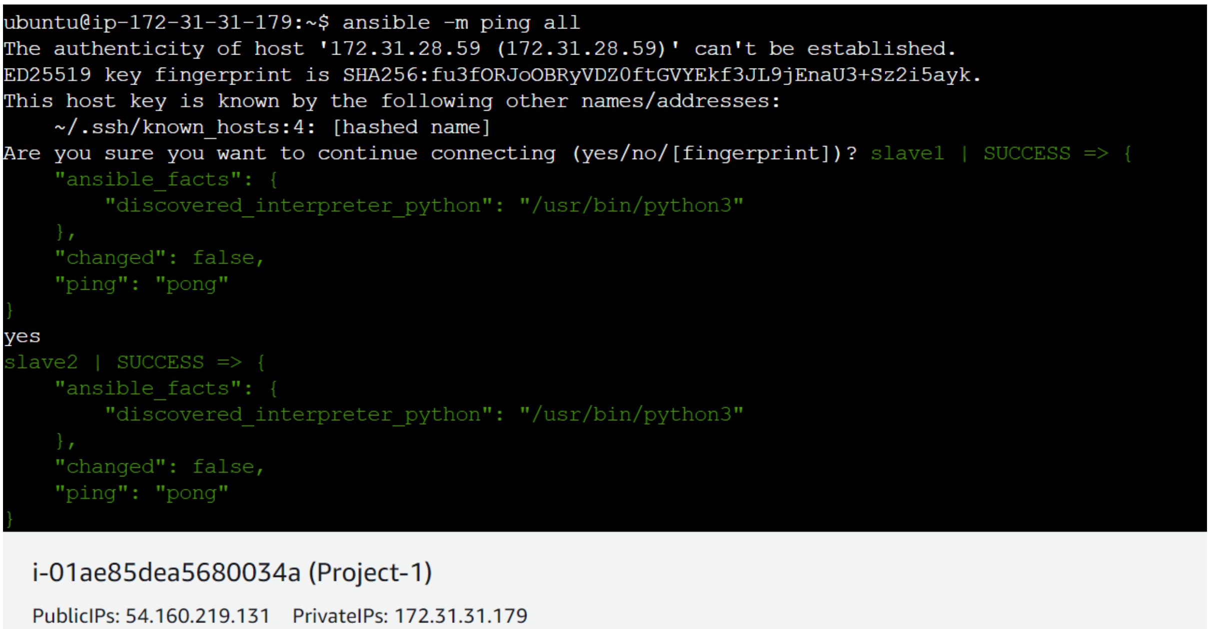


```
  GNU nano 6.2                                    /etc/ansible/hosts

# Ex4: Multiple hosts arranged into groups such as 'Debian' and 'openSUSE':

## [Debian]
## alpha.example.org
## beta.example.org

## [openSUSE]
## green.example.com
## blue.example.com

[slaves]
slave1 ansible_host=172.31.20.94
slave2 ansible_host=172.31.28.59


^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo       M-A
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo       M-6
```

i-01ae85dea5680034a (Project-1)

PublicIPs: 54.160.219.131 PrivateIPs: 172.31.31.179

- Ansible slave connection is setup successfully
- To ensure perfomed ping from master



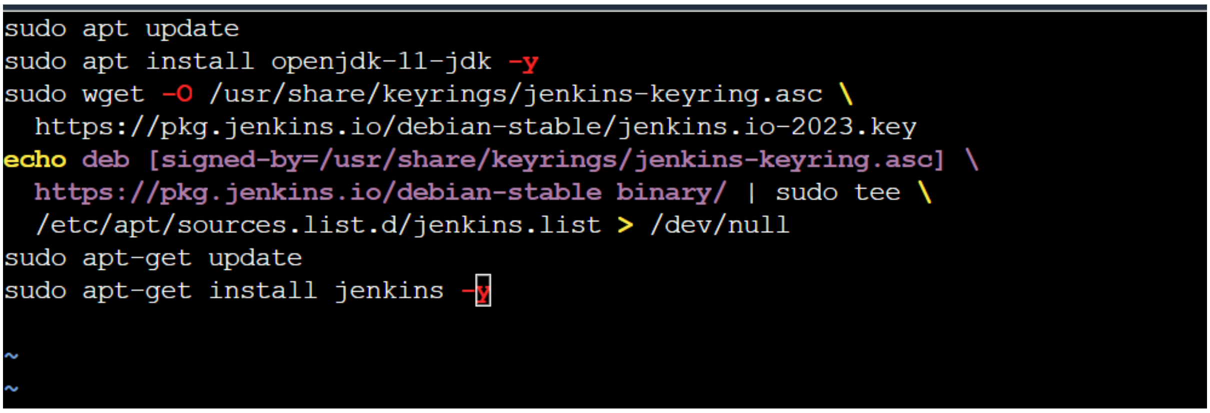
```
ubuntu@ip-172-31-31-179:~$ ansible -m ping all
The authenticity of host '172.31.28.59 (172.31.28.59)' can't be established.
ED25519 key fingerprint is SHA256:fu3fORJoOBRyVDZ0ftGVYEkf3JL9jEnaU3+Sz2i5ayk.
This host key is known by the following other names/addresses:
    ~/.ssh/known_hosts:4: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? slave1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
yes
slave2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
```

i-01ae85dea5680034a (Project-1)

PublicIPs: 54.160.219.131 PrivateIPs: 172.31.31.179

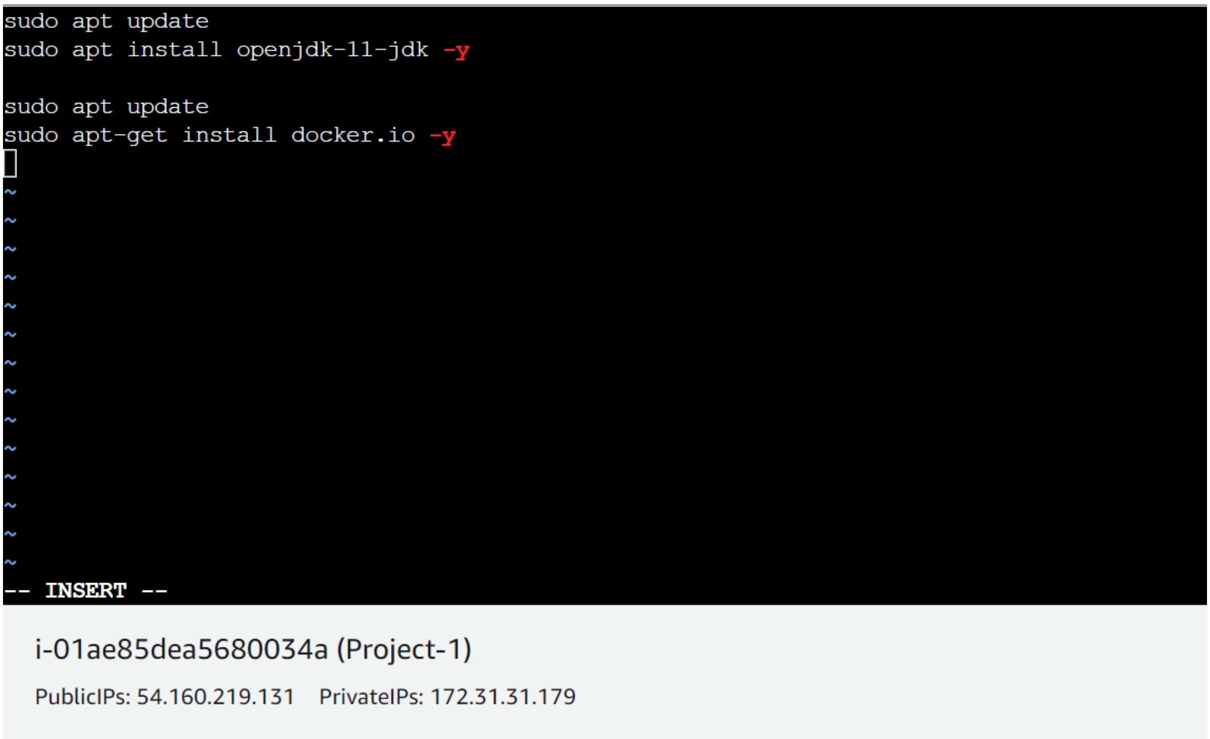
Afterthat written shell scripts to configure java and jenkins on master , java and docker on slaves

- Shellscript for master



```
sudo apt update
sudo apt install openjdk-11-jdk -y
sudo wget -O /usr/share/keyrings/jenkins-keyring.asc \
  https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
  https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
sudo apt-get update
sudo apt-get install jenkins -y

~
~
```

- Shellscript for slaves

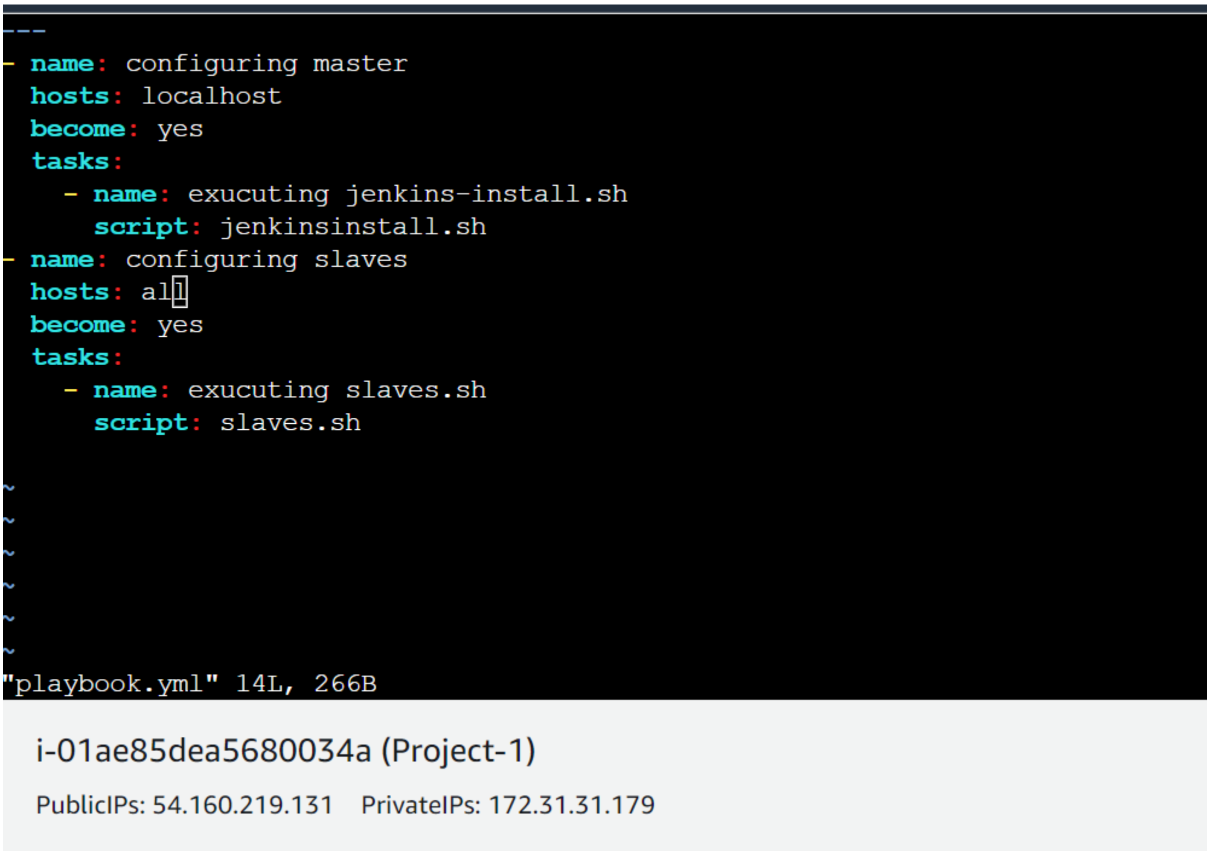


```
sudo apt update
sudo apt install openjdk-11-jdk -y

sudo apt update
sudo apt-get install docker.io -y

~
~
~
~
~
~
~
~
~
~
~
~
~
~
-- INSERT --
```

i-01ae85dea5680034a (Project-1)

PublicIPs: 54.160.219.131 PrivateIPs: 172.31.31.179

- Then a manifest file playbook.yml is created to run shell scripts in respective servers

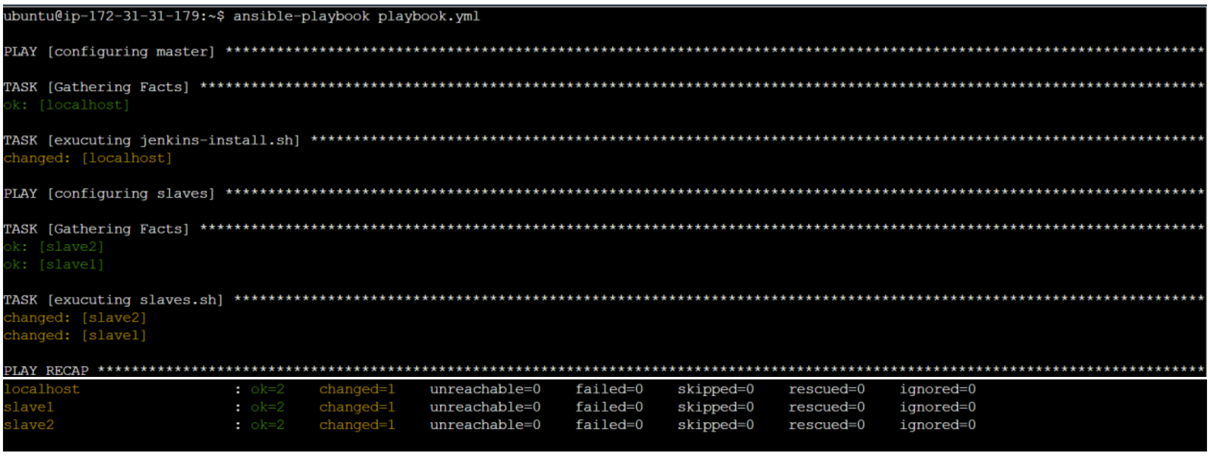


```
---
- name: configuring master
  hosts: localhost
  become: yes
  tasks:
    - name: exucuting jenkins-install.sh
      script: jenkinsinstall.sh
- name: configuring slaves
  hosts: all
  become: yes
  tasks:
    - name: exucuting slaves.sh
      script: slaves.sh

~
~
~
~
~
~
"playbook.yml" 14L, 266B
```

i-01ae85dea5680034a (Project-1)

PublicIPs: 54.160.219.131 PrivateIPs: 172.31.31.179

- Then the playbook is executed

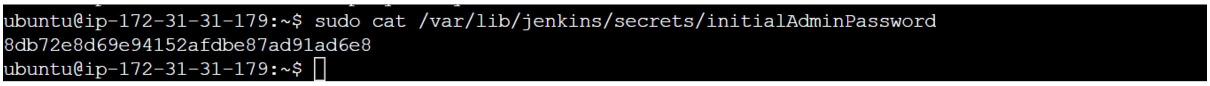


```
ubuntu@ip-172-31-31-179:~$ ansible-playbook playbook.yml

PLAY [configuring master] ******************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [localhost]

TASK [exucuting jenkins-install.sh] ********************************************************************************
changed: [localhost]

PLAY [configuring slaves] ******************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [slave2]
ok: [slave1]

TASK [exucuting slaves.sh] *****************************************************************************************
changed: [slave2]
changed: [slave1]

PLAY RECAP *********************************************************************************************************
localhost                  : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
slave1                     : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
slave2                     : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Now java and jenkins installed on master server

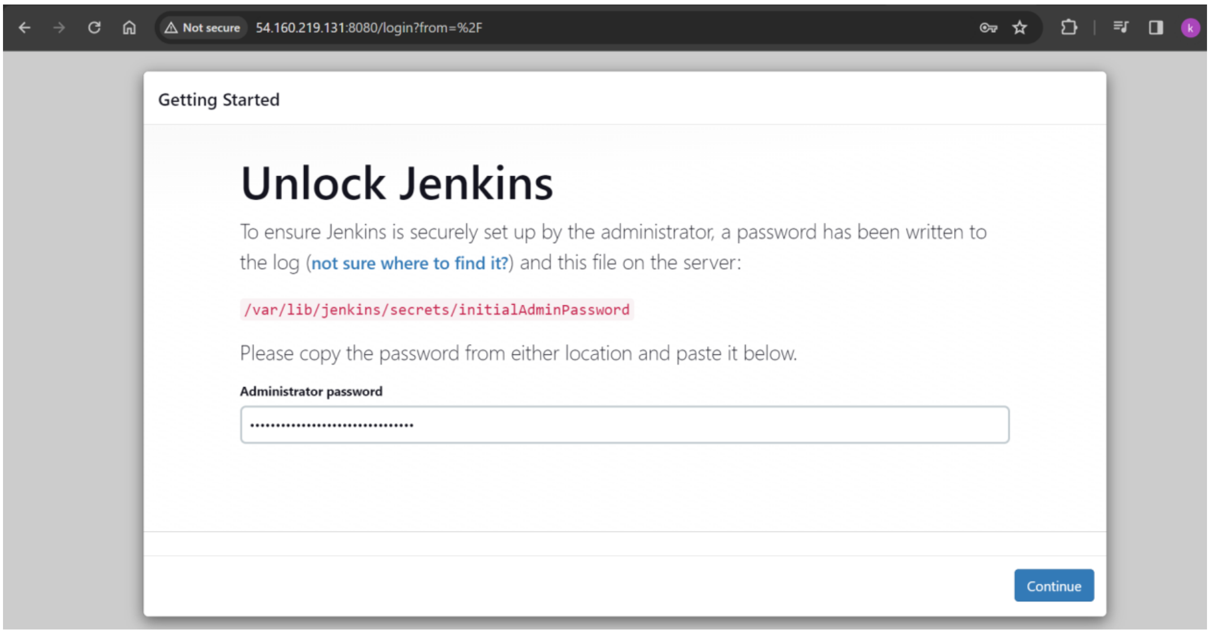
And java and docker installed on slaves

- Navigated to initialAdminPassword in master server and copied the password



```
ubuntu@ip-172-31-31-179:~$ sudo cat /var/lib/jenkins/secrets/initialAdminPassword
8db72e8d69e94152afdbe87ad91ad6e8
ubuntu@ip-172-31-31-179:~$ 
```

- Then port 8080 is opened on master server's Public Ip and signin with the password created



54.160.219.131:8080/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:

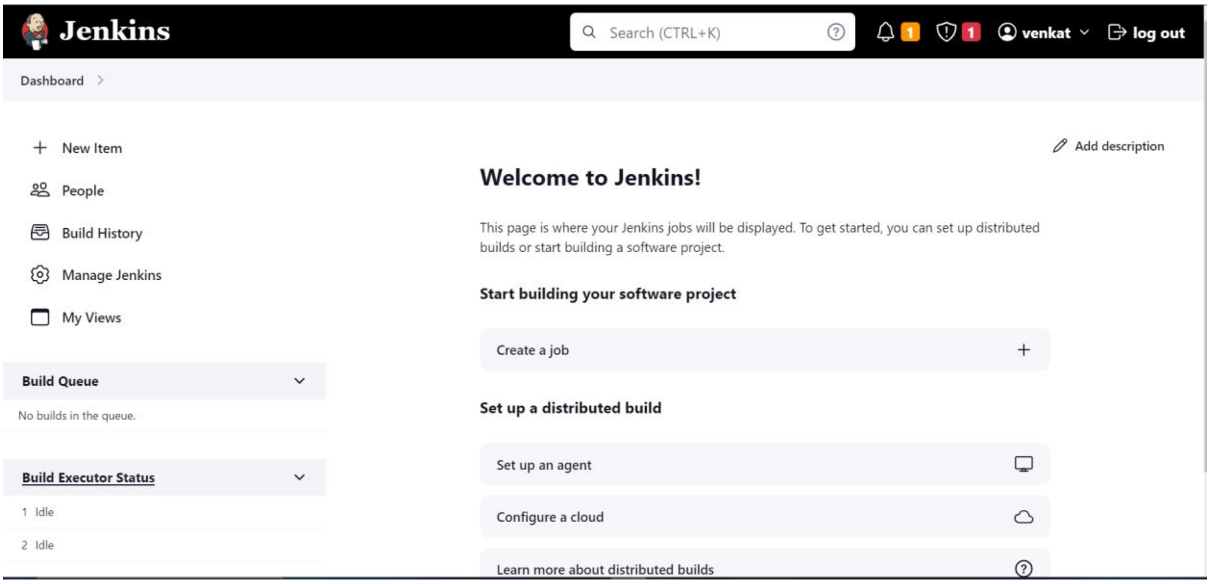
/var/lib/jenkins/secrets/initialAdminPassword

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

Administrator password

••••••••••••••••••••••••••••••••

- Redirected to the Jenkins Dashboard



No builds in the queue.

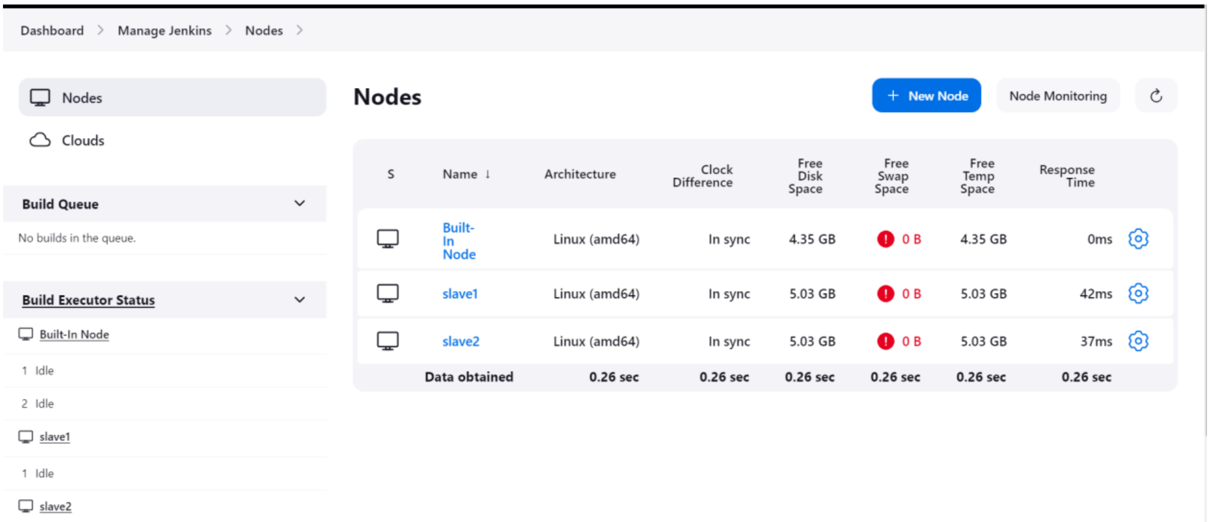
Welcome to Jenkins!

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

Set up a distributed build

- Navigated to manage Jenkins>>Nodes and added slaves as nodes with private IP of slave machines

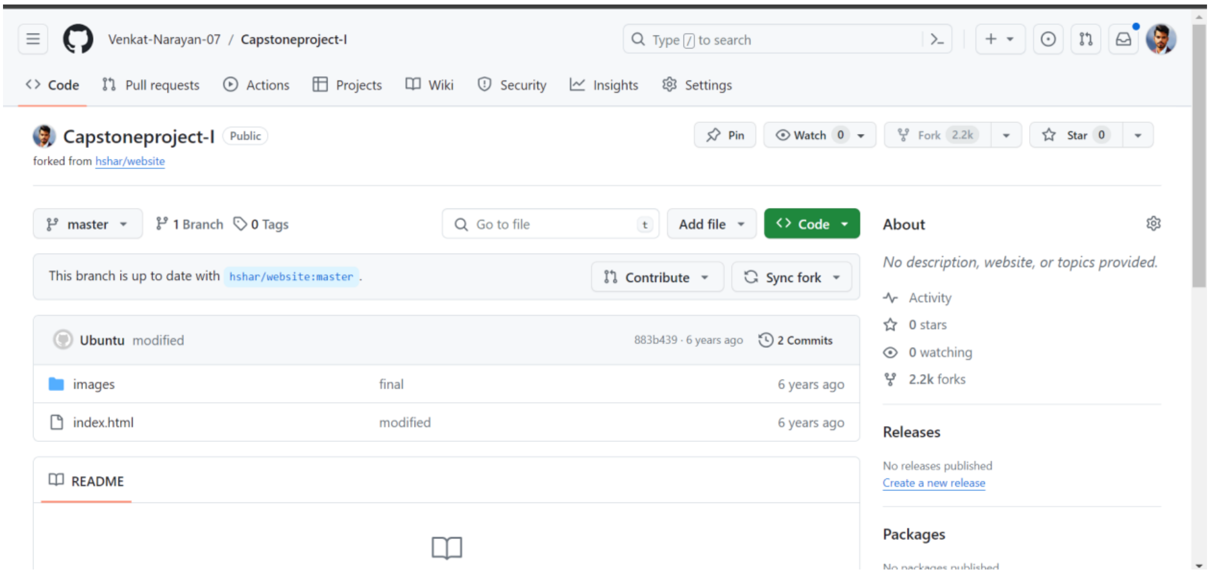


No builds in the queue.

Nodes

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	Built-In Node	Linux (amd64)	In sync	4.35 GB	! 0 B	4.35 GB	0ms
	slave1	Linux (amd64)	In sync	5.03 GB	! 0 B	5.03 GB	42ms
	slave2	Linux (amd64)	In sync	5.03 GB	! 0 B	5.03 GB	37ms
	Data obtained	0.26 sec	0.26 sec	0.26 sec	0.26 sec	0.26 sec	0.26 sec

- Navigated to hshar/website and forked repo to the personal github account



Capstoneproject-I Public

forked from hshar/website

This branch is up to date with hshar/website:master .

Ubuntu modified 883b439 · 6 years ago 2 Commits

images	final	6 years ago
index.html	modified	6 years ago

No description, website, or topics provided.

Activity

0 stars

0 watching

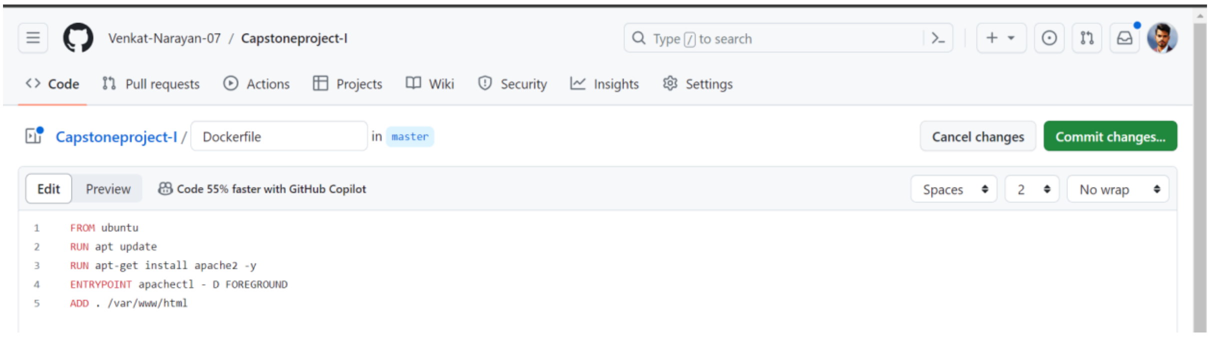
2.2k forks

No releases published

Create a new release

No packages published

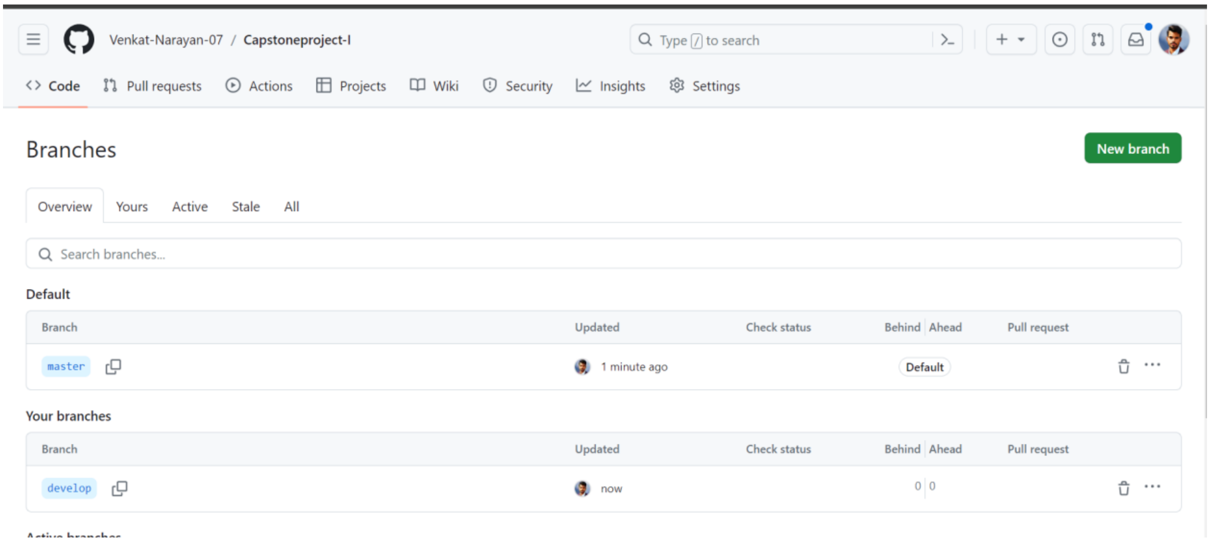
- Then created a new Dockerfile in the repo to copy the repo and create a custom image



Capstoneproject-I / Dockerfile in master

```
FROM ubuntu
RUN apt update
RUN apt-get install apache2 -y
ENTRYPOINT apachectl - D FOREGROUND
ADD . /var/www/html
```

- Then created a new branch named develop



Branches

Default

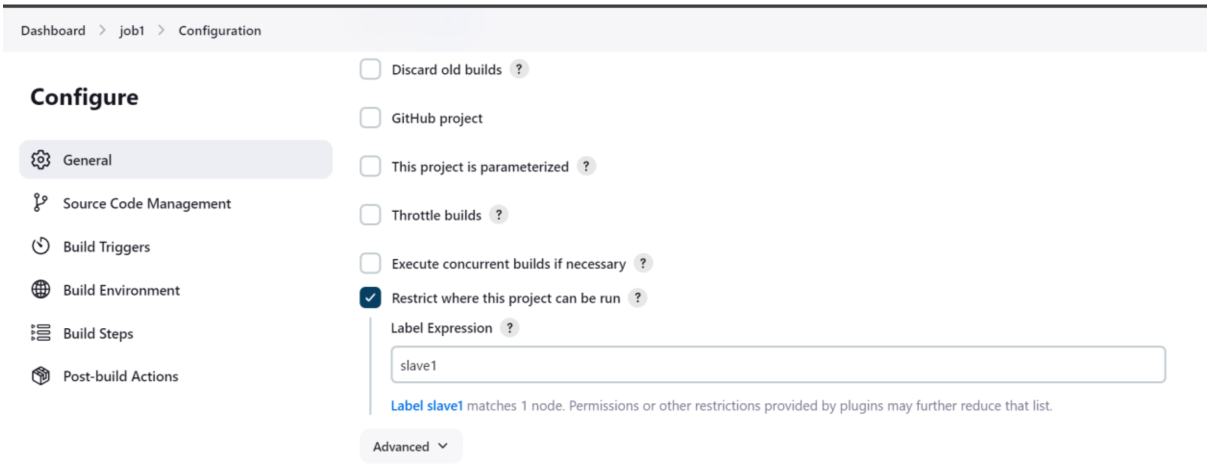
Branch	Updated	Check status	Behind | Ahead	Pull request
master	1 minute ago		Default	

Your branches

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

Navigated to jenkins dashboard and created a job1

In the configuration, restricted the job to slave1



□ Discard old builds ?

□ GitHub project

□ This project is parameterized ?

□ Throttle builds ?

□ Execute concurrent builds if necessary ?

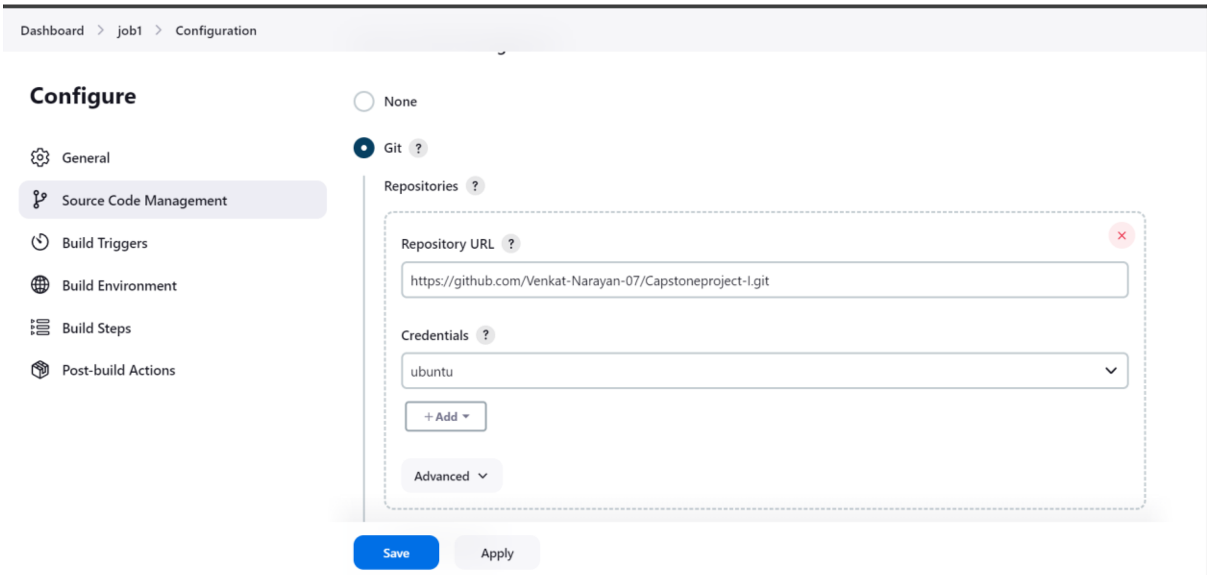
☑ Restrict where this project can be run ?

Label Expression ?

slave1

Label slave1 matches 1 node. Permissions or other restrictions provided by plugins may further reduce that list.

- Added git repo in source code management and specified develop branch to build



○ None

● Git ?

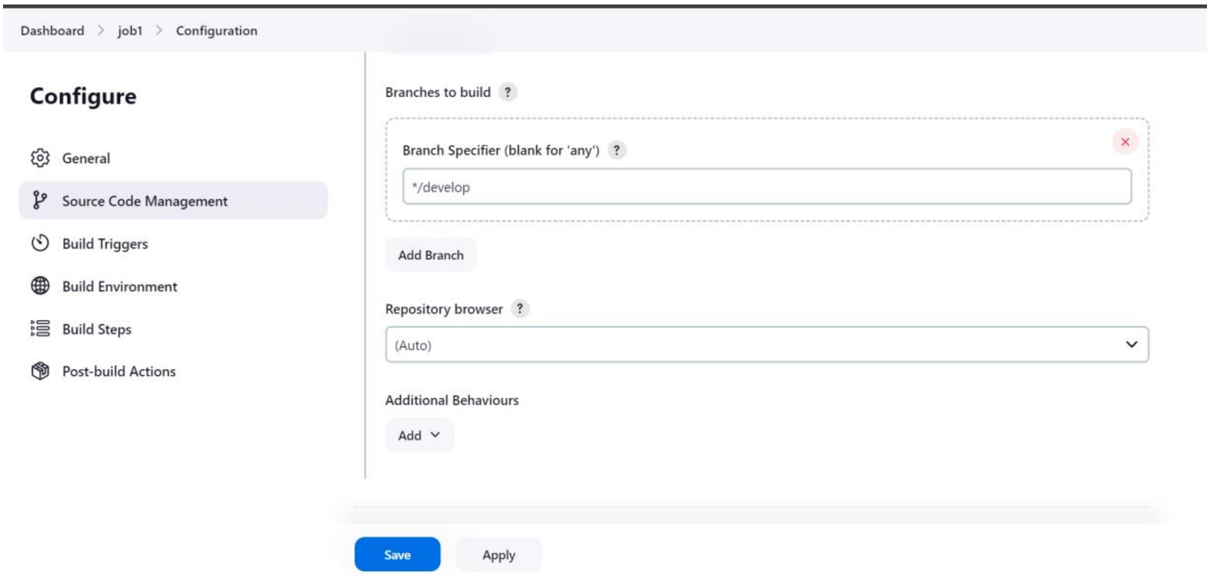
Repositories ?

Repository URL ?

https://github.com/Venkat-Narayan-07/Capstoneproject-I.git

Credentials ?

ubuntu



Branches to build ?

Branch Specifier (blank for 'any') ?

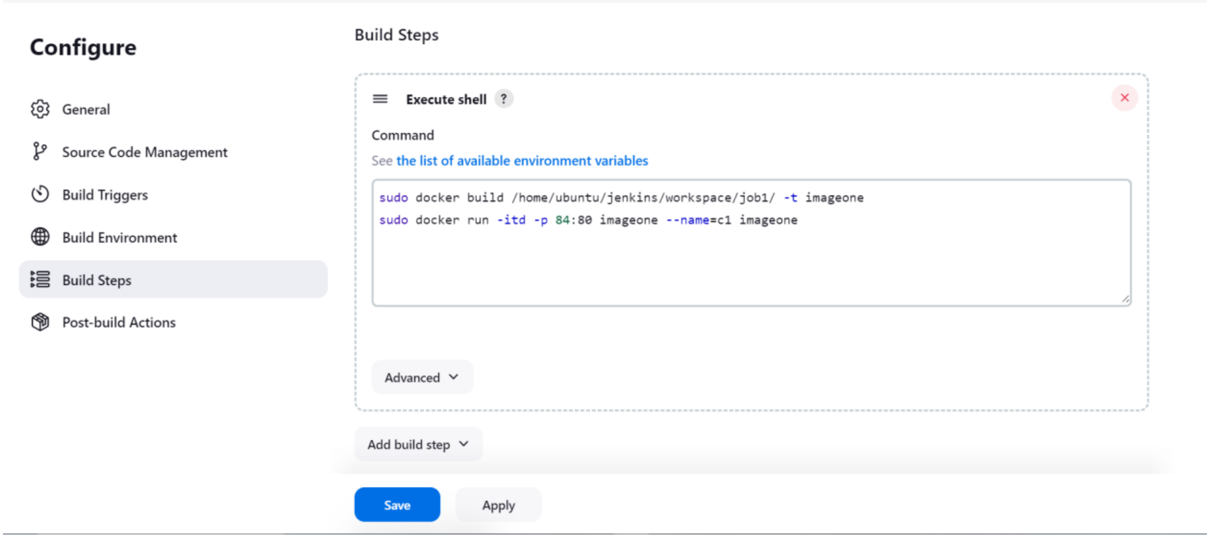
*/develop

Repository browser ?

(Auto)

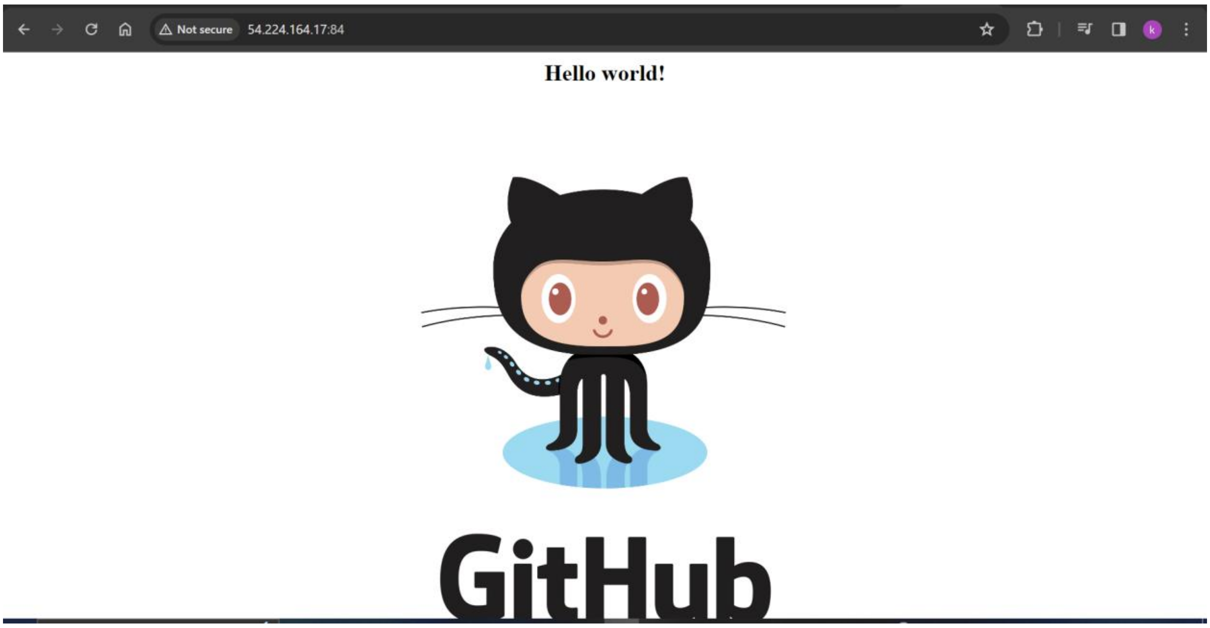
Additional Behaviours

- In the post build gave commands to create a custom image out of the docker file copied to the server
- And run a container named c1 on port 84 in detached mode
- Then saved the configuration and ran build manually



```
sudo docker build /home/ubuntu/jenkins/workspace/job1/ -t imageone
sudo docker run -itd -p 84:80 imageone --name=c1 imageone
```

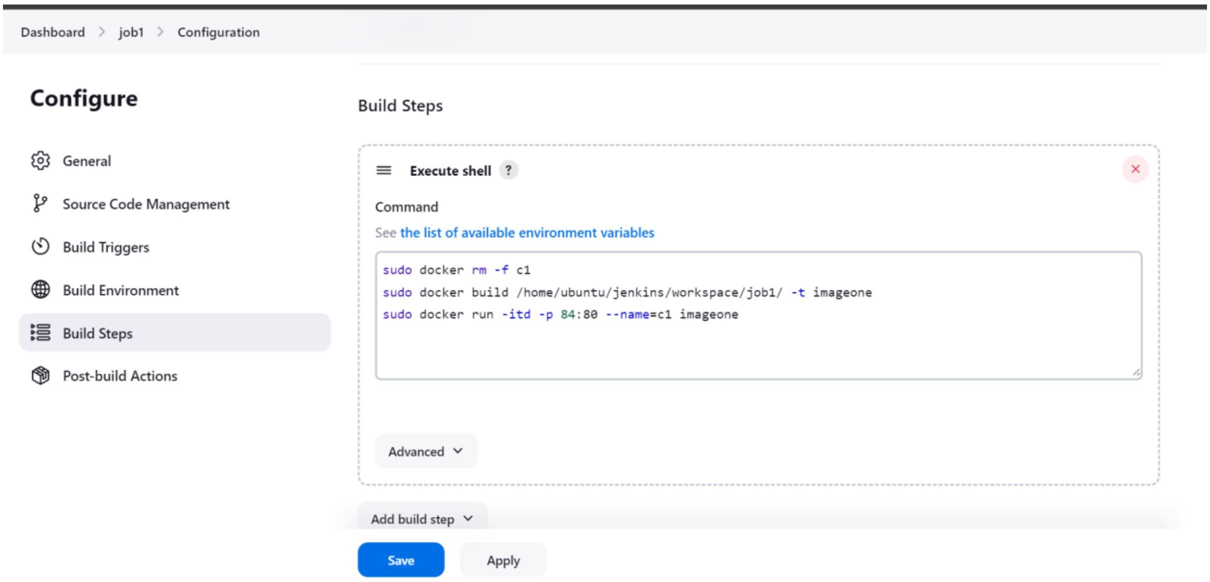
- Build is successful resulting the index.html of repo on port84



Hello world!

Then navigated to build steps of job1 and added a new command to delete the container named c1 before building a image and creating a container which lets slave to containrize the code rverytime there is push made to the repo

And enabled build trigger gitwebhook to trigger from github



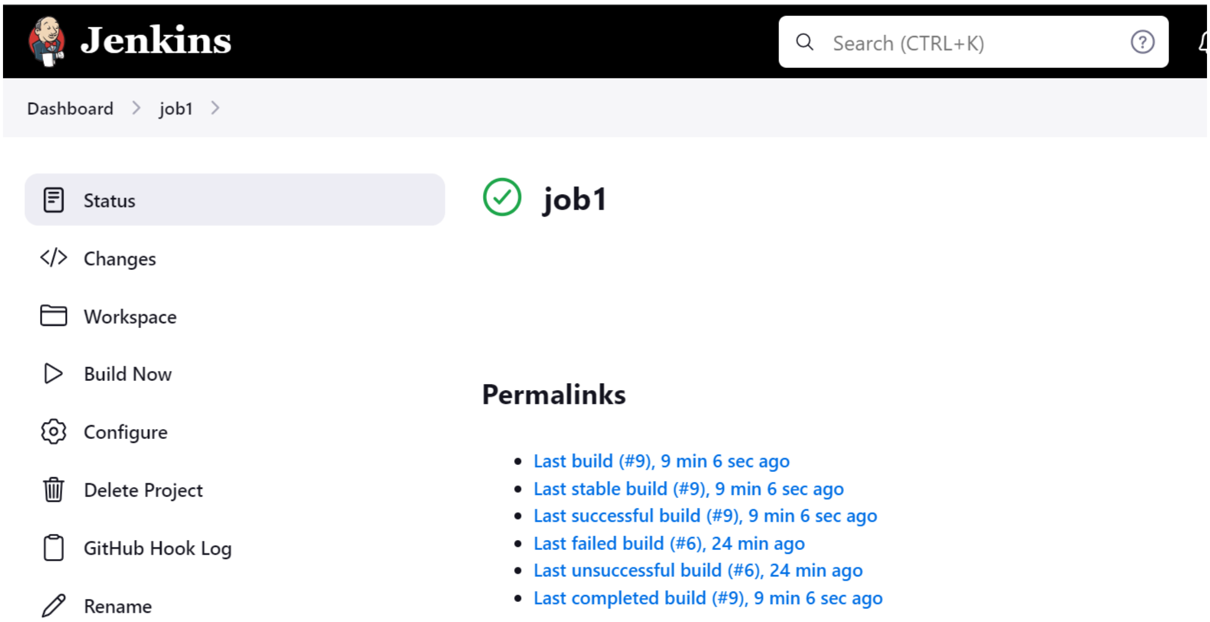
Build Steps

Execute shell ?

Command

See the list of available environment variables

```
sudo docker rm -f c1
sudo docker build /home/ubuntu/jenkins/workspace/job1/ -t imageone
sudo docker run -itd -p 84:80 --name=c1 imageone
```

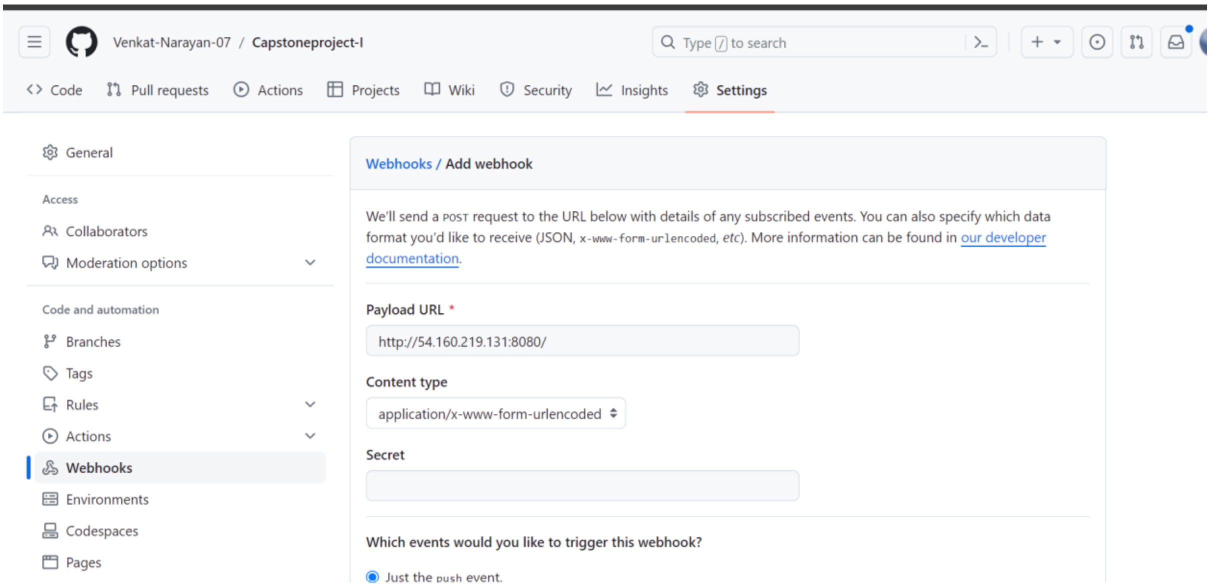


job1

Permalinks

- Last build (#9), 9 min 6 sec ago
- Last stable build (#9), 9 min 6 sec ago
- Last successful build (#9), 9 min 6 sec ago
- Last failed build (#6), 24 min ago
- Last unsuccessful build (#6), 24 min ago
- Last completed build (#9), 9 min 6 sec ago

- Then navigated to the github repo and created a webhook with payload url as the jenkins dashboard url



Webhooks / Add webhook

We'll send a POST request to the URL below with details of any subscribed events. You can also specify which data format you'd like to receive (JSON, x-www-form-urlencoded, *etc*). More information can be found in our developer documentation.

Payload URL *

http://54.160.219.131:8080/

Content type

application/x-www-form-urlencoded

Secret

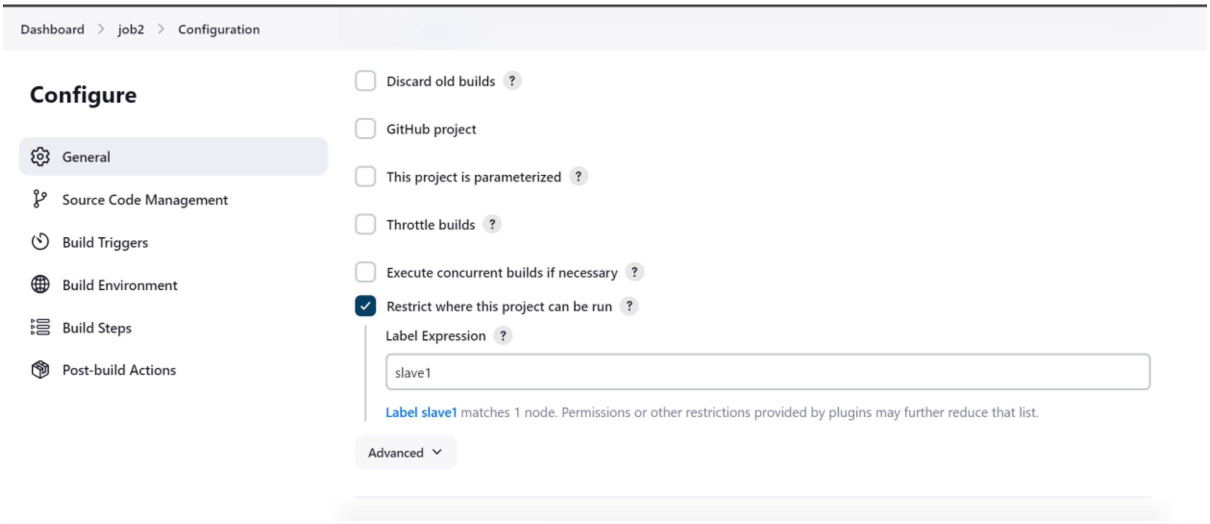
Which events would you like to trigger this webhook?

● Just the push event.

With that job1 is successfully configured

Then moved ahead to create a job2

Job2 is restricted to run only on slave 1 with master branch as the build branch



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□ GitHub project

□ This project is parameterized ?

□ Throttle builds ?

□ Execute concurrent builds if necessary ?

☑ Restrict where this project can be run ?

Label Expression ?

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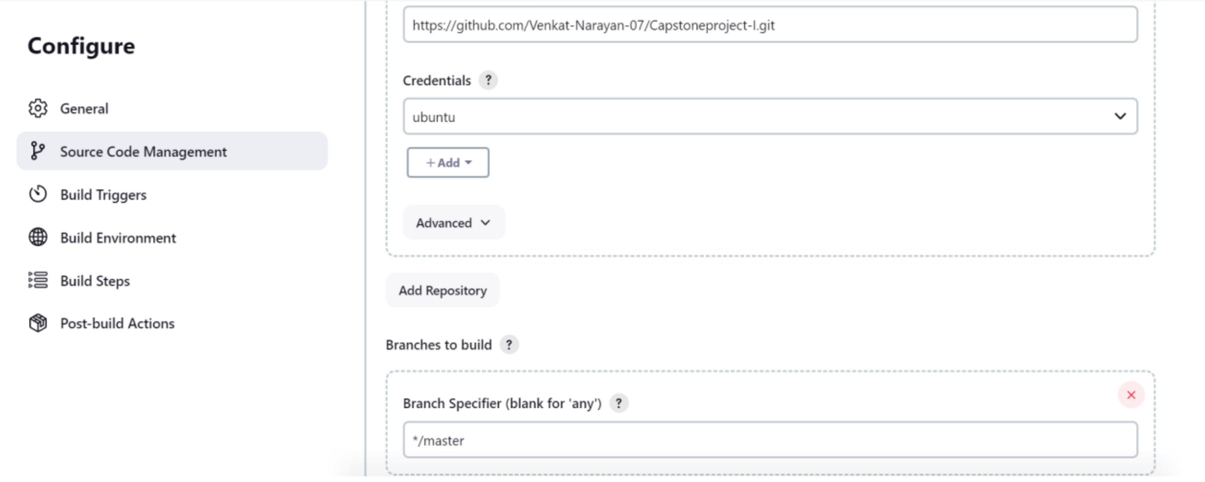


https://github.com/Venkat-Narayan-07/Capstoneproject-I.git

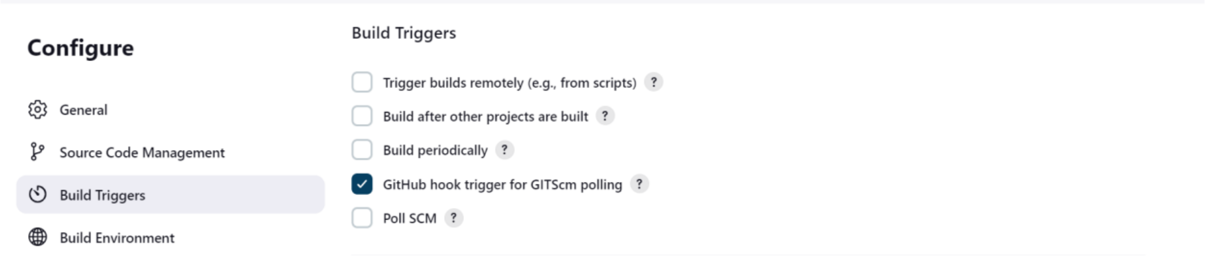
Credentials ?

ubuntu

Branches to build ?

Branch Specifier (blank for 'any') ?

*/master



Build Triggers

□ Trigger builds remotely (e.g., from scripts) ?

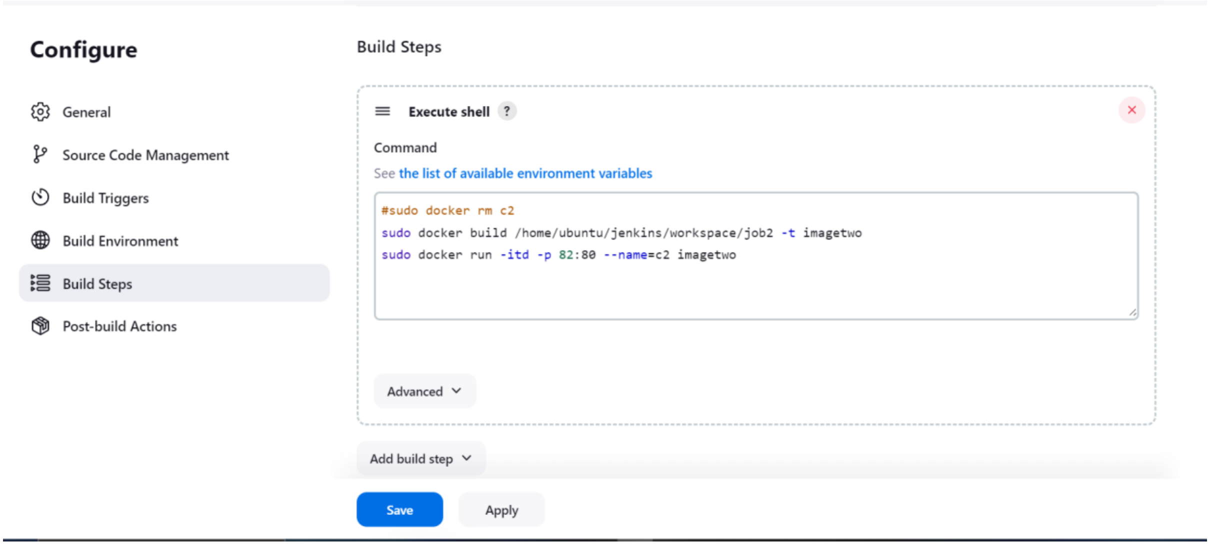
□ Build after other projects are built ?

□ Build periodically ?

☑ GitHub hook trigger for GITScm polling ?

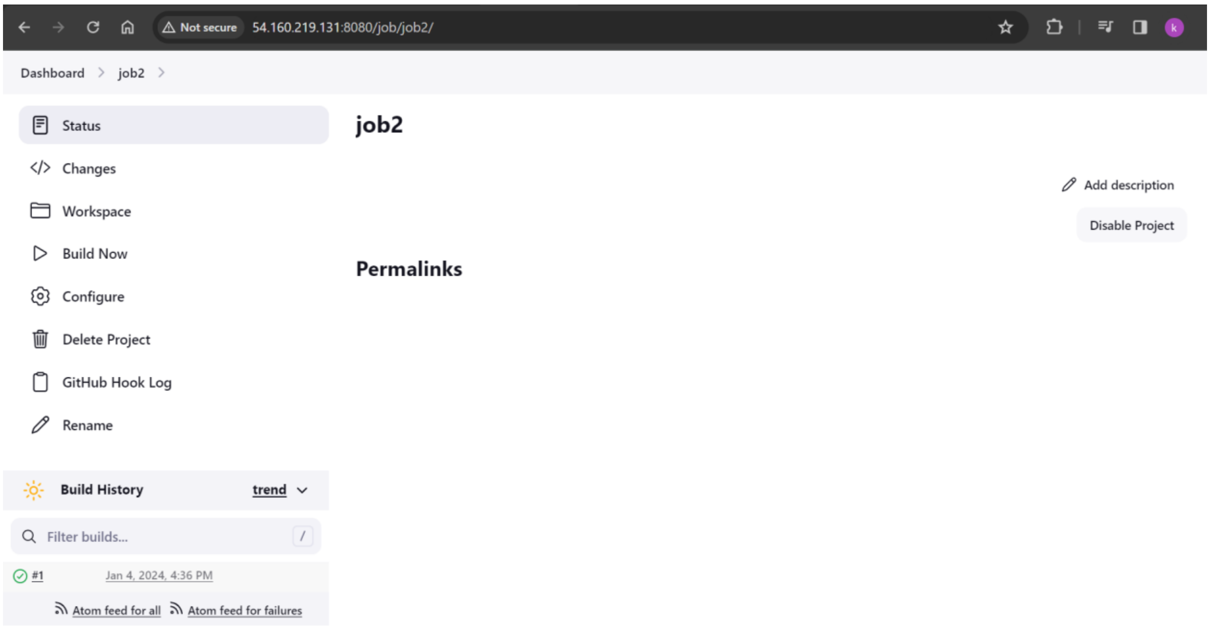
□ Poll SCM ?

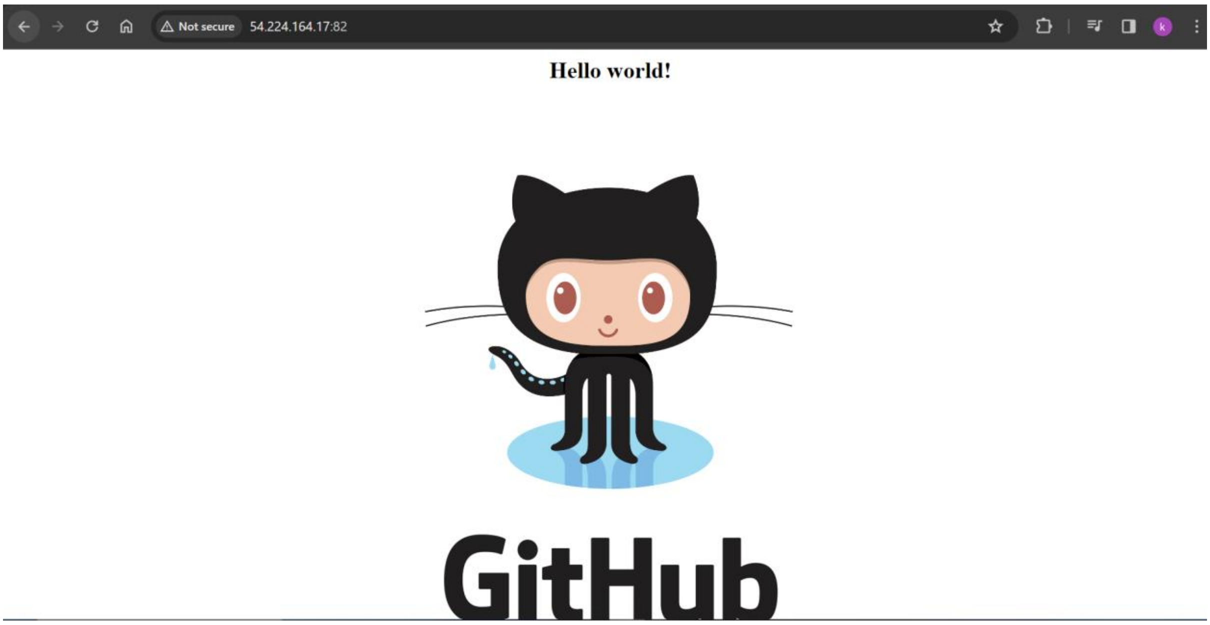
Build steps are configure in such way that there will be docker build at every push made to the master branch



```
#sudo docker rm c2
sudo docker build /home/ubuntu/jenkins/workspace/job2 -t imagetwo
sudo docker run -itd -p 82:80 --name=c2 imagetwo
```

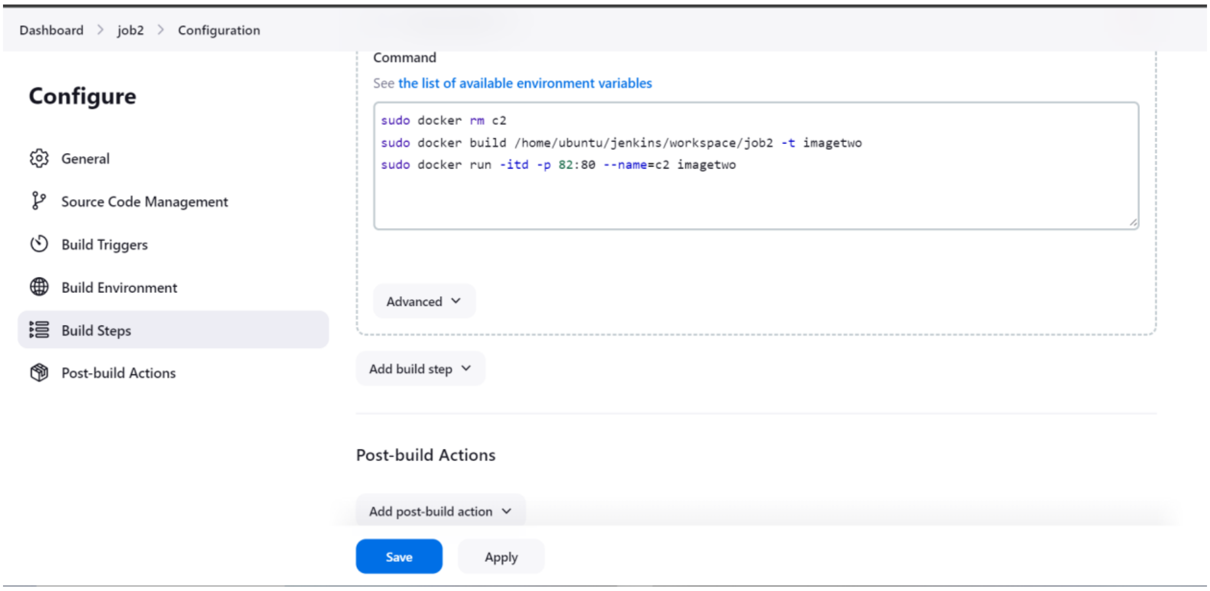
Job2 is successfully created and built manually to create a container on port 82





Hello world!

- Then navigated to job2 configuration and added a command to delete previous build and container and create and run new container with the push made everytime



Command

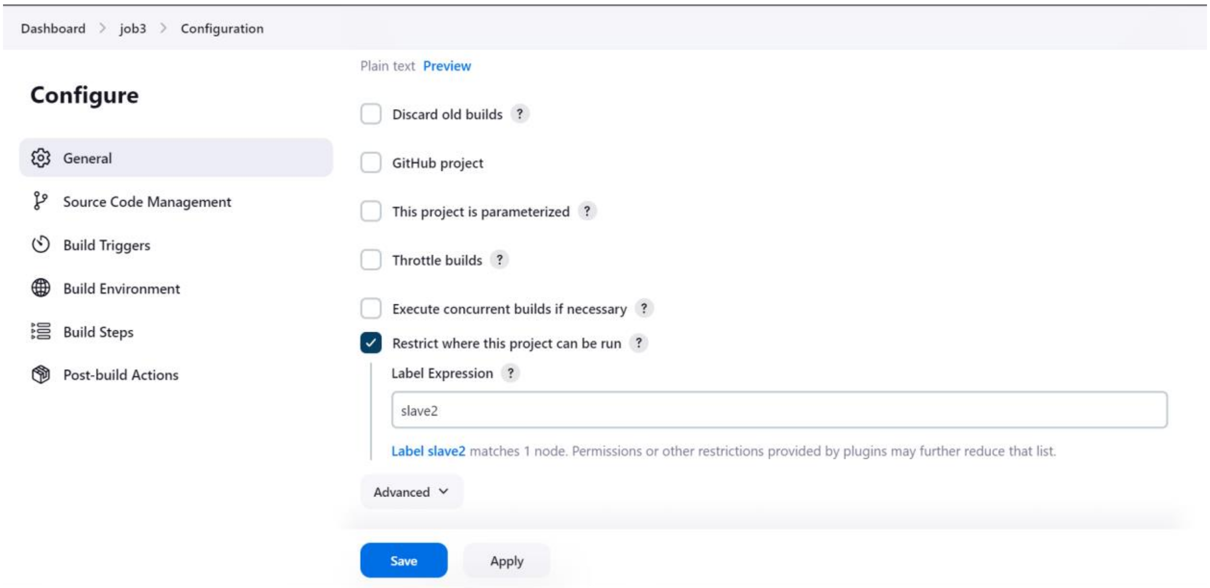
See the list of available environment variables

```
sudo docker rm c2
sudo docker build /home/ubuntu/jenkins/workspace/job2 -t imagetwo
sudo docker run -itd -p 82:80 --name=c2 imagetwo
```

With this job2 also successfully completed.

Moving ahead to create a job3 to copy code to the test server

Job3 is configured to slave2 and master branch, gitwebhook is enabled to auto trigger and copy code to the test server



□ Discard old builds ?

□ GitHub project

□ This project is parameterized ?

□ Throttle builds ?

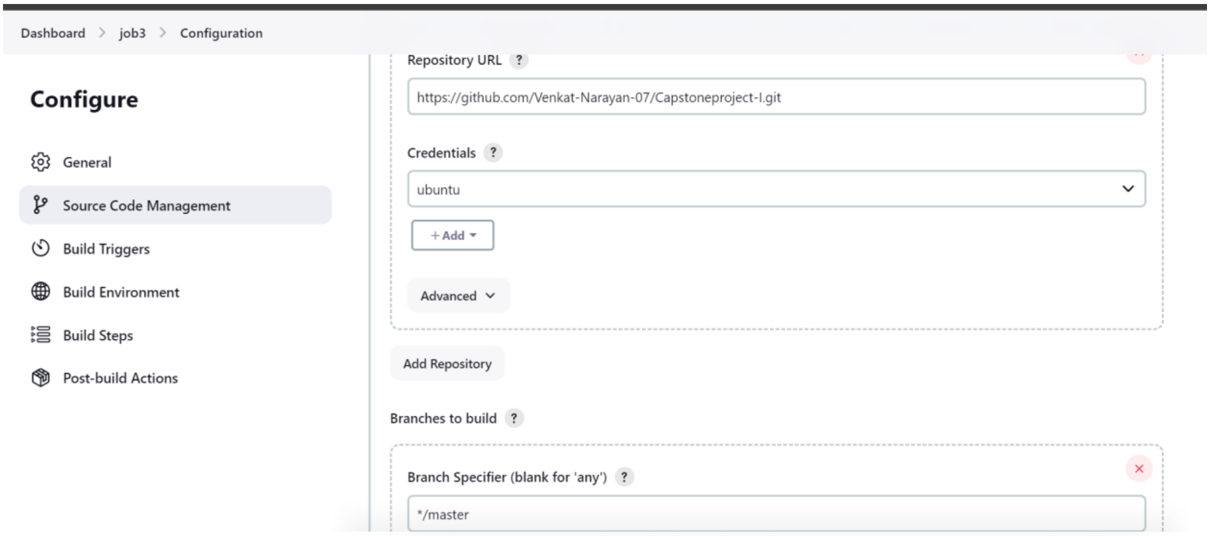
□ Execute concurrent builds if necessary ?

☑ Restrict where this project can be run ?

Label Expression ?

slave2

Label slave2 matches 1 node. Permissions or other restrictions provided by plugins may further reduce that list.



Repository URL ?

https://github.com/Venkat-Narayan-07/Capstoneproject-I.git

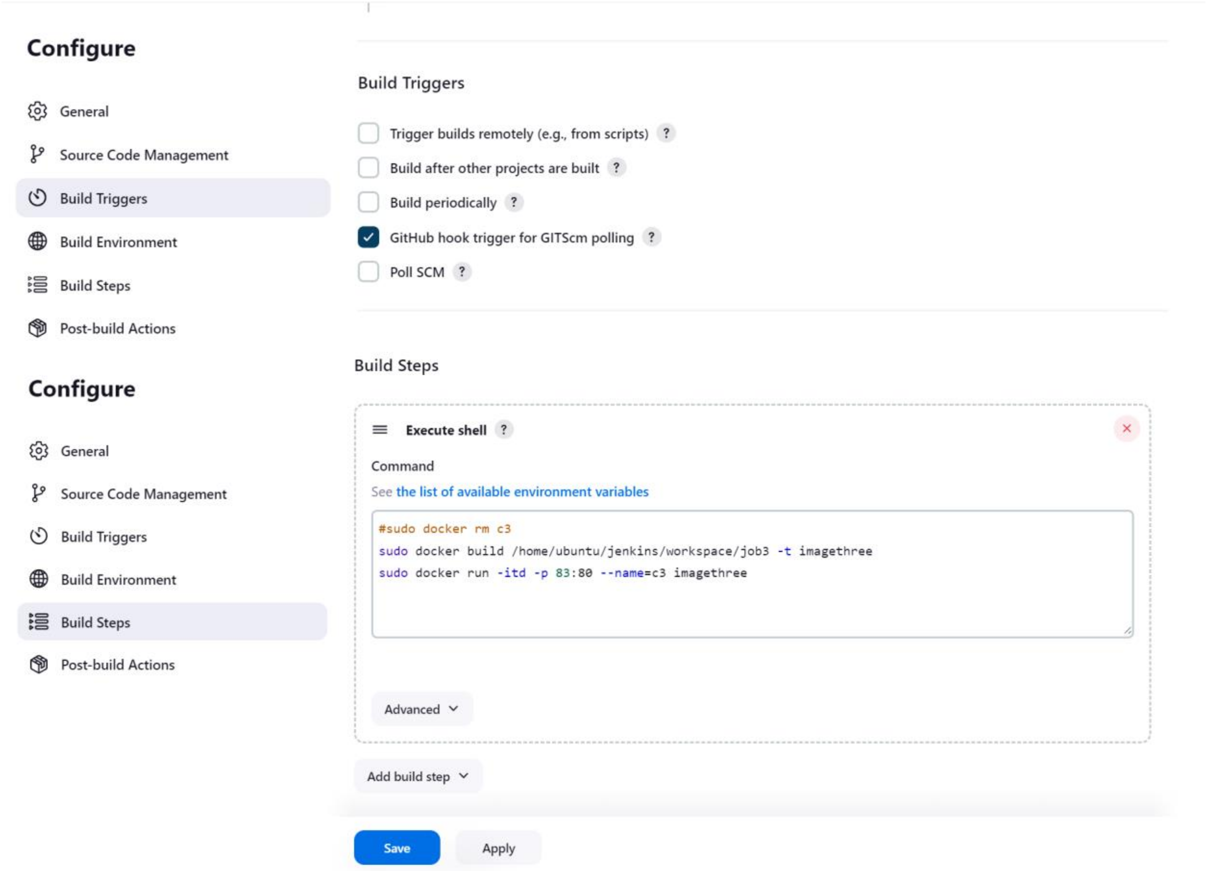
Credentials ?

ubuntu

Branches to build ?

Branch Specifier (blank for 'any') ?

*/master



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 ?

Build Steps

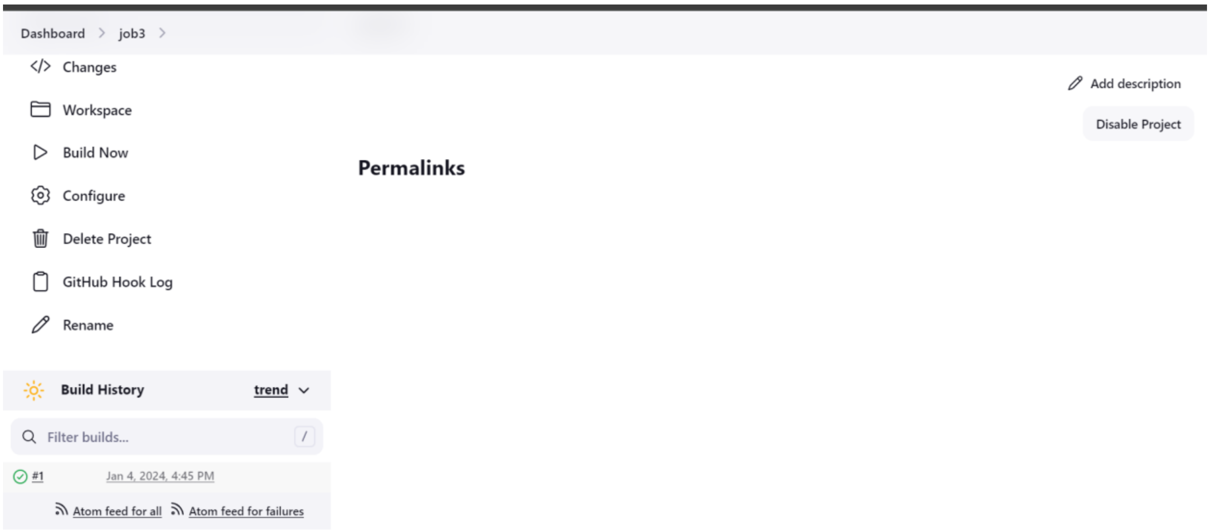
Execute shell ?

Command

See the list of available environment variables

```
#sudo docker rm c3
sudo docker build /home/ubuntu/jenkins/workspace/job3 -t imagethree
sudo docker run -itd -p 83:80 --name=c3 imagethree
```

Job3 is built successfully



Dashboard > job3 >

- Changes
- Workspace
- Build Now
- Configure
- Delete Project
- GitHub Hook Log
- Rename

Add description

Disable Project

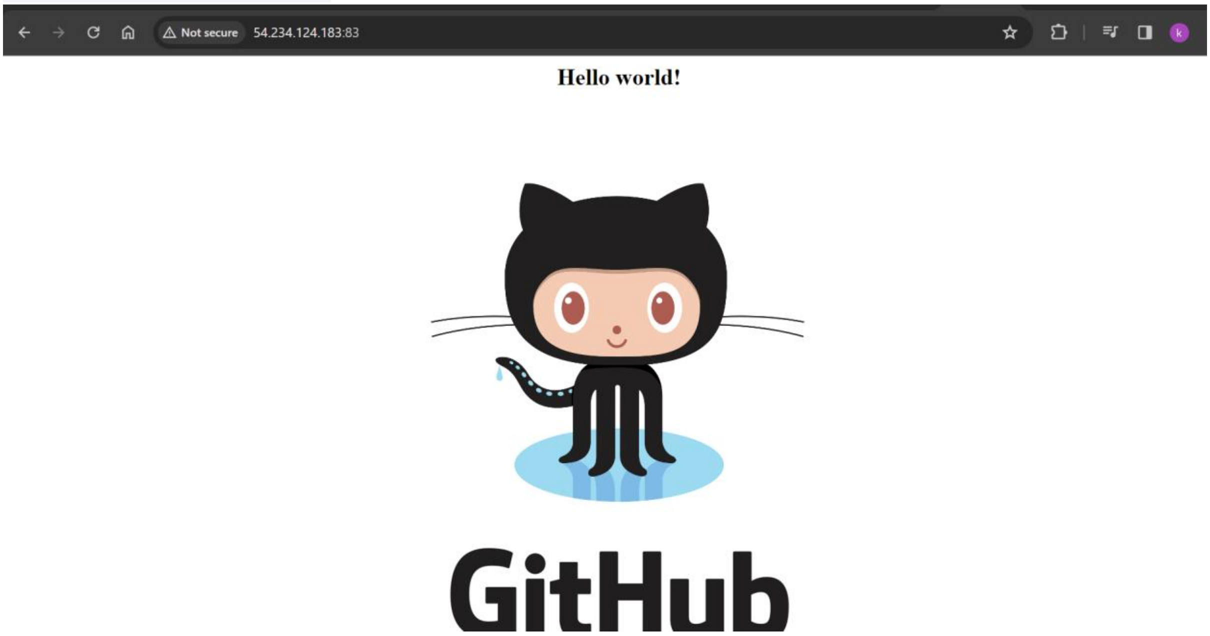
Permalinks

Build History trend

Filter builds... /

✓ #1 Jan 4, 2024, 4:45 PM

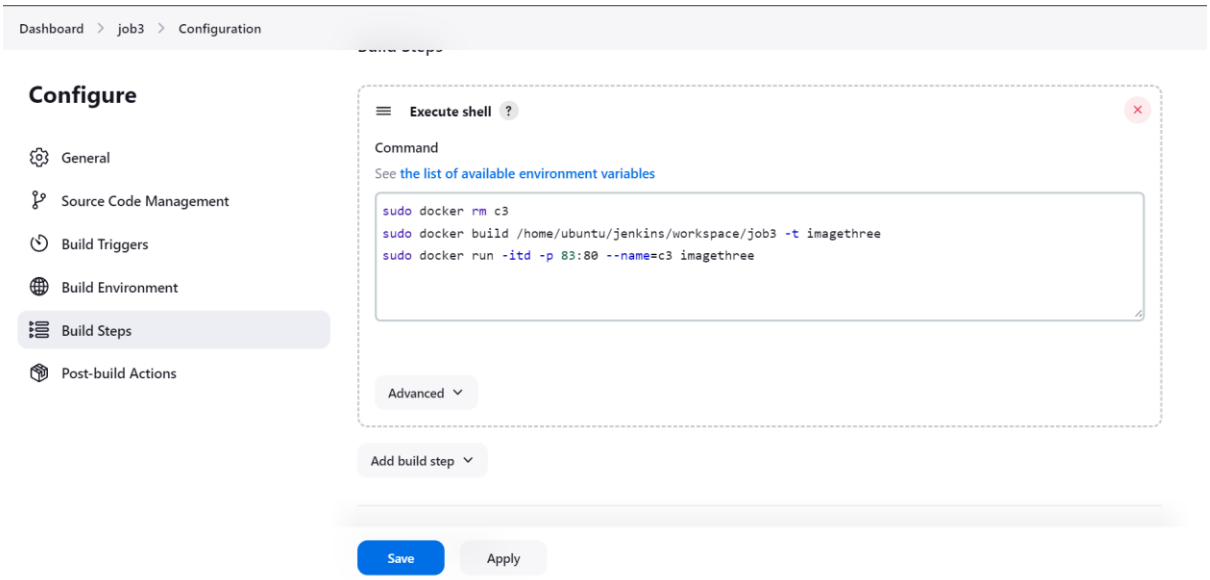
Atom feed for all Atom feed for failures



Not secure 54.234.124.183:83

Hello world!

Navigated into job3 configuration and added a command to remove previous deployments and create new with push made everytime



Dashboard > job3 > Configuration

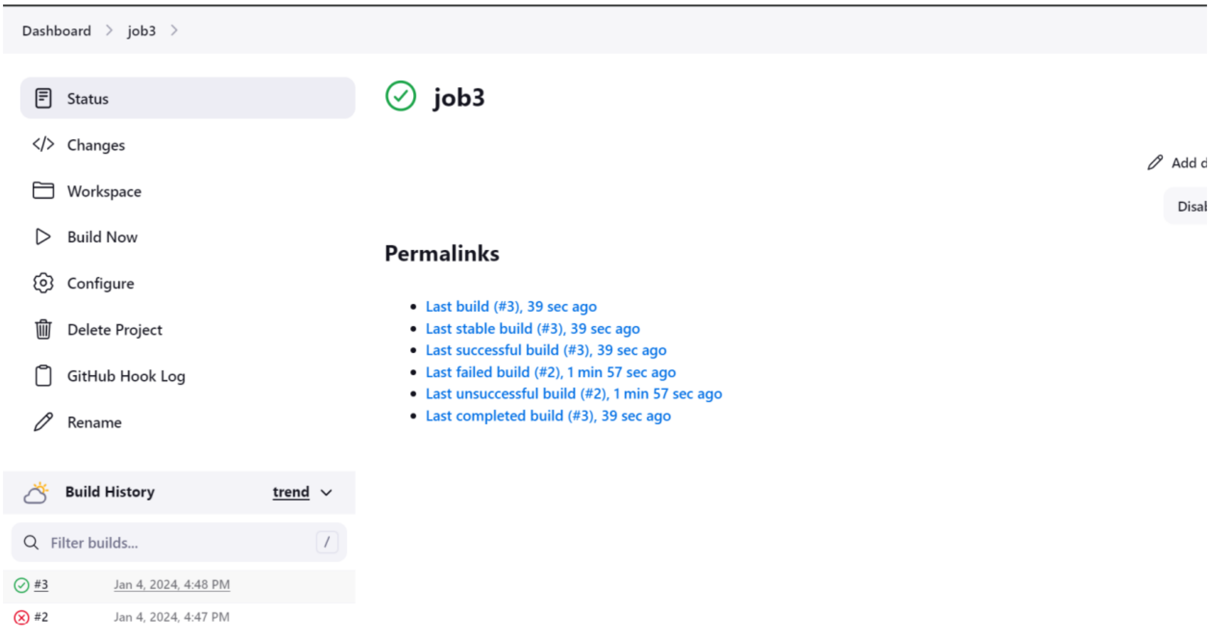
Execute shell ?

Command

See the list of available environment variables

```
sudo docker rm c3
sudo docker build /home/ubuntu/jenkins/workspace/job3 -t imagethree
sudo docker run -itd -p 83:80 --name=c3 imagethree
```

And built job3 successfully



Dashboard > job3 >

job3

Permalinks

- Last build (#3), 39 sec ago
- Last stable build (#3), 39 sec ago
- Last successful build (#3), 39 sec ago
- Last failed build (#2), 1 min 57 sec ago
- Last unsuccessful build (#2), 1 min 57 sec ago
- Last completed build (#3), 39 sec ago

Build History trend

✓ #3 Jan 4, 2024, 4:48 PM
✗ #2 Jan 4, 2024, 4:47 PM