

DevOps Capstone Project 1;

Create the Three Instances Named as Master, Slave1 & Slave2

The screenshot shows the AWS Management Console with three EC2 instances listed. The Master instance is a t2.medium instance with ID i-041100a565475b7b2, and the Slave instances are t2.micro instances with IDs i-0768ccb69f336a587 and i-08a4a68e1fbbf990f. All instances are in the 'Running' state and are located in the us-east-1b availability zone.

| Name | Instance ID | Instance state | Instance type | Status check | Alarm status | Availability |
|--------|---------------------|----------------|---------------|--------------|---------------|--------------|
| Master | i-041100a565475b7b2 | Running | t2.medium | Initializing | View alarms + | us-east-1b |
| Slave1 | i-0768ccb69f336a587 | Running | t2.micro | Initializing | View alarms + | us-east-1d |
| Slave2 | i-08a4a68e1fbbf990f | Running | t2.micro | Initializing | View alarms + | us-east-1d |

Creating install.sh file to install Ansible;

```
GNU nano 6.2 install.sh *
sudo apt update
sudo apt install software-properties-common -y
sudo add-apt-repository --yes --update ppa:ansible/ansible
sudo apt install ansible -y
ubuntu@ip-172-31-86-163:~$ ansible --version
ansible [core 2.17.5]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/ubuntu/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /home/ubuntu/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.10.12 (main, Sep 11 2024, 15:47:36) [GCC 11.4.0] (/usr/bin/python3)
  jinja version = 3.0.3
  libyaml = True
ubuntu@ip-172-31-86-163:~$
```

Put the “Slave IPs” into the “Ansible Host File”

```
GNU nano 6.2 /etc/ansible/hosts *
## db01.intranet.mydomain.net
## db02.intranet.mydomain.net
## 10.25.1.56
## 10.25.1.57

# 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

Slave1 ansible_host=172.31.43.51
Slave2 ansible_host=172.31.42.159
```

Pasting the keys of “Master” instance to “Slave1” & “Slave2”(ssh-keygen);

```
aws
Services
Search
[Alt+S]
N. Virginia
SharathBedra
GNU nano 6.2
authorized_keys *
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCAINyGl+YA0nWt51s5DMvmIp4dIcI1BB52/umCOu110/8uqKcG//4KGIF73Pr71E9UyModgz0zn1qiTRW4MPCNDtpDX+9Hf91VWfuKK31i
&mk= ubuntu@ip-172-31-86-163
```

```
aws
Services
Search
[Alt+S]
N. Virginia
SharathBedra
GNU nano 6.2
authorized_keys *
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCAINyGl+YA0nWt51s5DMvmIp4dIcI1BB52/umCOu110/8uqKcG//4KGIF73Pr71E9UyModgz0zn1qiTRW4MPCNDtpDX+9Hf91VWfuKK31i
&gKrQ2Getmk= ubuntu@ip-172-31-86-163
```

Ping the machines;

```
aws
Services
Search
[Alt+S]
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us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?addressFamily=ipv4&connType=standard&instanceId=i-041100a565475b7b2&osUser=ubuntu&region=...
ubuntu@ip-172-31-86-163:~$ ansible -m ping all
[WARNING]: Platform linux on host Slave1 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another
Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-
core/2.17/reference_appendices/interpreter_discovery.html for more information.
Slave1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.10"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Platform linux on host Slave2 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another
Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-
core/2.17/reference_appendices/interpreter_discovery.html for more information.
Slave2 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3.10"
  },
  "changed": false,
  "ping": "pong"
}
ubuntu@ip-172-31-86-163:~$

i-041100a565475b7b2 (Master)
PublicIPs: 54.242.187.61 PrivateIPs: 172.31.86.163
```

Creating an “ans.yaml” file to execute the “master.sh” & “slave.sh” through “Ansible”;

```
aws
Services
Search
[Alt+S]
N. Virginia
SharathBedra
GNU nano 6.2
ans.yaml *
---
- name: Installing tools on master
  hosts: localhost
  become: true
  tasks:
    - name: Executing master.sh script
      script: master.sh
- name: Installing tools on slaves
  hosts: Slave1, Slave2
  become: true
  tasks:
    - name: Executing slave.sh script on slaves
      script: slave.sh

Help Write Out Where Is Cut Execute Location M-U Undo M-A Set Mark M-] To Bracket
Exit Read File Replace Paste Justify Go To Line M-B Redo M-C Copy M-^ Where Was

i-041100a565475b7b2 (Master)
PublicIPs: 54.242.187.61 PrivateIPs: 172.31.86.163
```


Creating master.sh and slave.sh;

```
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?addressFamily=ipv4&connType=standard&instanceId=i-041100a565475b7b2&osUser=ubuntu&region=...

aws
Services
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GNU nano 6.2 master.sh *
# Update the package index
sudo apt-get update

# Install necessary packages (Java 17, Docker)
sudo apt-get install -y fontconfig openjdk-17-jre docker.io

# Add Jenkins GPG key
curl -fsSL https://pkg.jenkins.io/debian/jenkins.io-2023.key | sudo tee /usr/share/keyrings/jenkins-keyring.asc > /dev/null

# Add Jenkins repository
echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
https://pkg.jenkins.io/debian binary/ | sudo tee \
/etc/apt/sources.list.d/jenkins.list > /dev/null

# Update package index after adding Jenkins repository
sudo apt-get update

# Install Jenkins
sudo apt-get install -y jenkins

^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^E Execute    ^C Location   ^M Undo       ^- Set Mark    ^_ To Bracket
^X Exit      ^R Read File  ^N Replace    ^U Paste      ^I Justify    ^V Go To Line  ^P Redo      ^- Copy      ^_ Where Was

i-041100a565475b7b2 (Master)
PublicIPs: 54.242.187.61 PrivateIPs: 172.31.86.163
```

```
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?addressFamily=ipv4&connType=standard&instanceId=i-041100a565475b7b2&osUser=ubuntu&region=...

aws
Services
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GNU nano 6.2 slave.sh *
sudo apt-get update
sudo apt-get install openjdk-17-jdk -y
sudo apt-get install -y docker.io
```

Executing the “master.sh” & “slave.sh” through “ans.yaml” file using the command ansible-playbook ans.yaml.

```
aws
Services
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ubuntu@ip-172-31-86-163:~$ ansible-playbook ans.yaml

PLAY [Installing tools on master] *****
TASK [Gathering Facts] *****
ok: [localhost]
TASK [Executing master.sh script] *****
changed: [localhost]
PLAY [Installing tools on slaves] *****
TASK [Gathering Facts] *****
[WARNING]: Platform linux on host Slave1 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another
Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-
core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [Slave1]
[WARNING]: Platform linux on host Slave2 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another
Python interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-
core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [Slave2]
TASK [Executing slave.sh script on slaves] *****
changed: [Slave1]
changed: [Slave2]
PLAY RECAP *****
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
localhost   : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

ubuntu@ip-172-31-86-163:~$
```

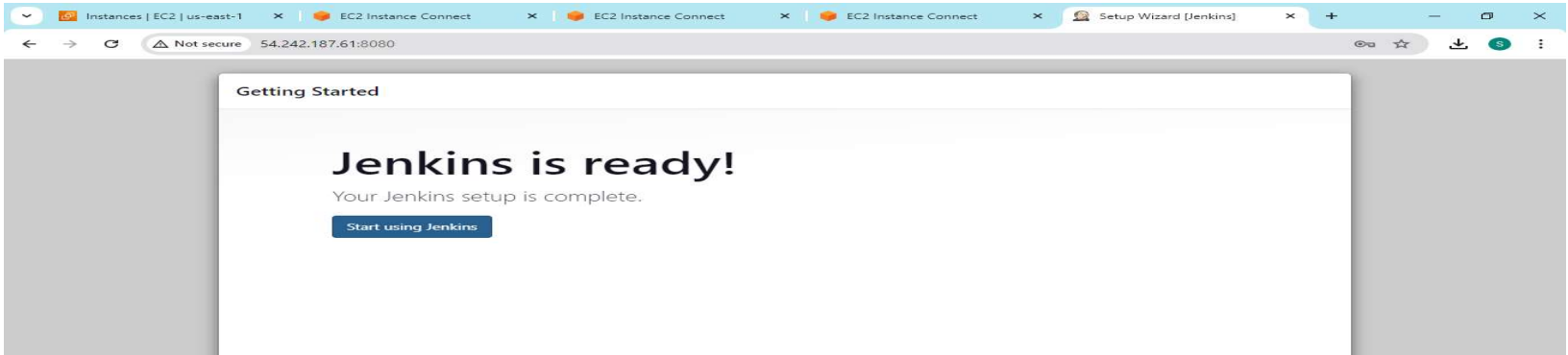
Jenkins is Up and Running;

```
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?addressFamily=ipv4&connType=standard&instanceId=i-041100a565475b7b2&osUser=ubuntu&re...

aws
Services
Search
[Alt+S]
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ubuntu@ip-172-31-86-163:~$ sudo systemctl start jenkins
sudo systemctl enable jenkins
sudo systemctl status jenkins
Synchronizing state of jenkins.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable jenkins
* jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2024-10-14 04:42:18 UTC; 4min 21s ago
     Main PID: 7536 (java)
       Tasks: 45 (limit: 4676)
      Memory: 703.3M
         CPU: 15.167s
    CGroup: /system.slice/jenkins.service
            └─7536 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var/cache/jenkins/war --httpPort=8080

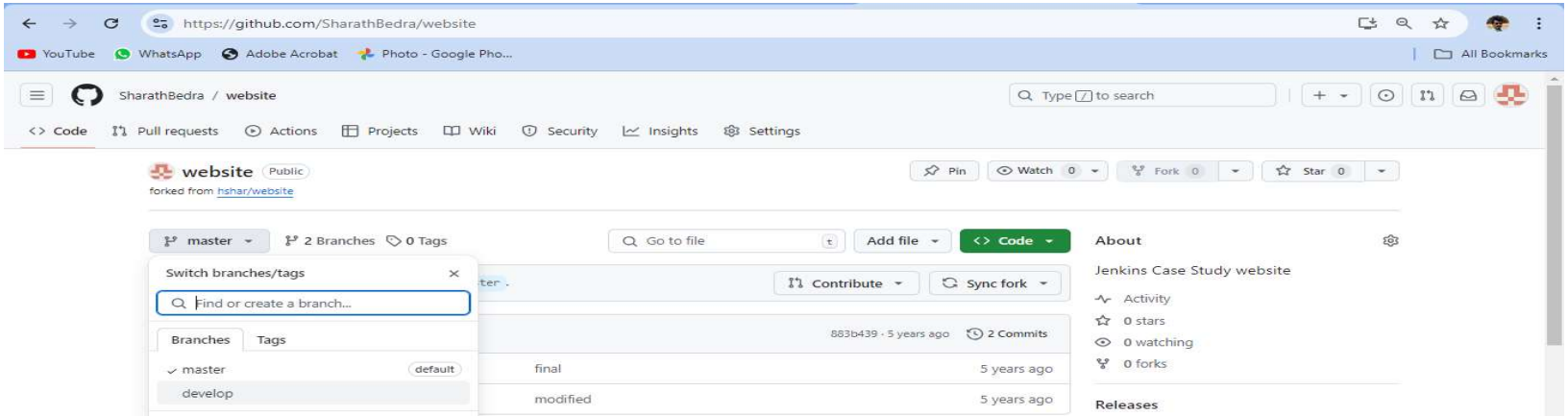
Oct 14 04:42:14 ip-172-31-86-163 jenkins[7536]: ea0fb08a0c654d2699a64c3a16a4b9a7
Oct 14 04:42:14 ip-172-31-86-163 jenkins[7536]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword
Oct 14 04:42:14 ip-172-31-86-163 jenkins[7536]: *****
Oct 14 04:42:14 ip-172-31-86-163 jenkins[7536]: *****
Oct 14 04:42:18 ip-172-31-86-163 jenkins[7536]: *****
Oct 14 04:42:18 ip-172-31-86-163 jenkins[7536]: 2024-10-14 04:42:18.374+0000 [id=32] INFO jenkins.InitReactorRunner$1#onAttained
Oct 14 04:42:18 ip-172-31-86-163 jenkins[7536]: 2024-10-14 04:42:18.400+0000 [id=23] INFO hudson.lifecycle.Lifecycle#onReady: J
Oct 14 04:42:18 ip-172-31-86-163 system[1]: Started Jenkins Continuous Integration Server.
Oct 14 04:42:18 ip-172-31-86-163 jenkins[7536]: 2024-10-14 04:42:18.504+0000 [id=45] INFO h.m.DownloadService$Downloadable#load:
Oct 14 04:42:18 ip-172-31-86-163 jenkins[7536]: 2024-10-14 04:42:18.505+0000 [id=48] INFO hudson.util.Retrier#start: Performed t
lines 1-20/20 (END)
```



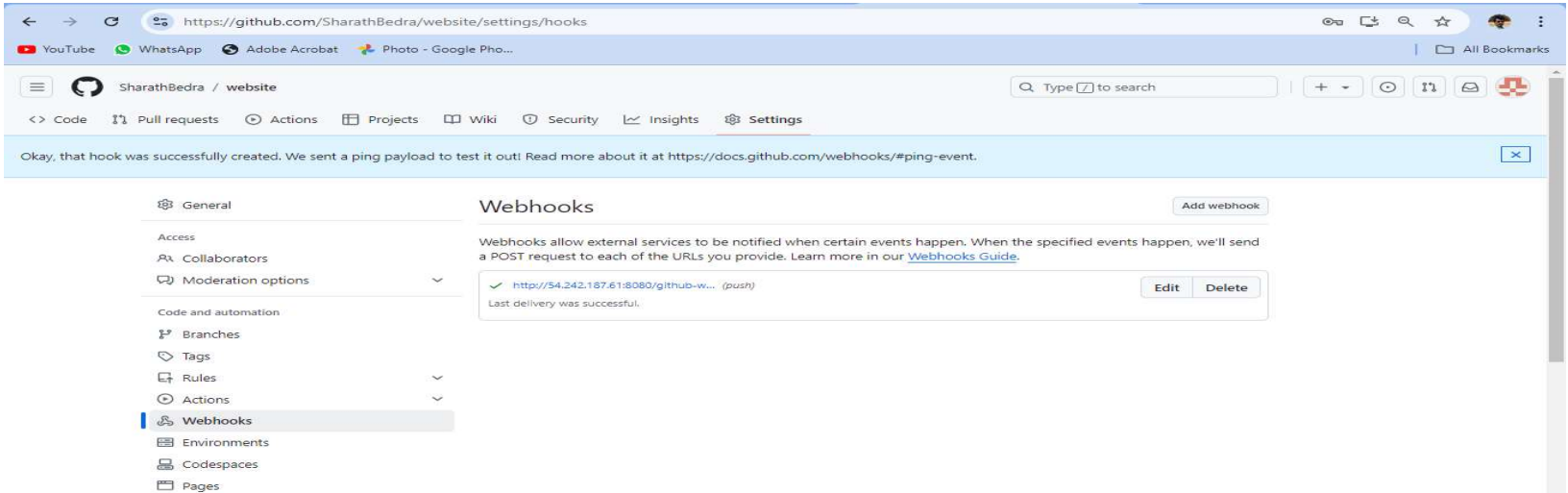
Created 2 nodes as Slave1 and Slave2;

We shall fork the given Git-Hub link;

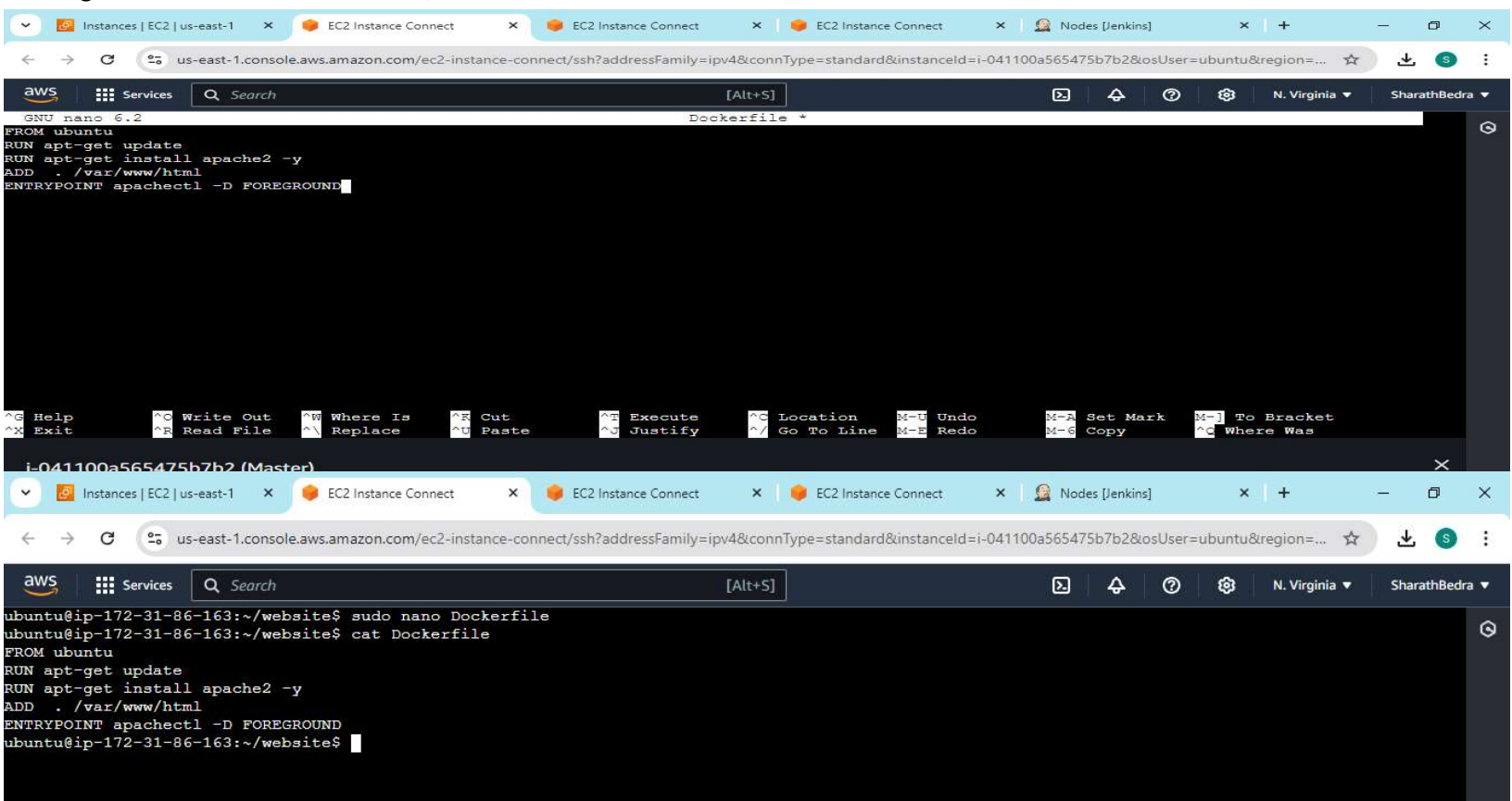
Verifying in the master node also we shall create a develop branch;



Create a Webhook for Trigger the Jobs;



Creating Dockerfile in the master node;




```
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?addressFamily=ipv4&connType=standard&instanceId=i-041100a565475b7b2&osUser=ubuntu&region=...

aws
Services Search [Alt+S]
N. Virginia SharathBedra

ubuntu@ip-172-31-86-163:~/website$ git add .
ubuntu@ip-172-31-86-163:~/website$ git commit -m "Dockerfile"
[master d8a1f21] Dockerfile
Committer: Ubuntu <ubuntu@ip-172-31-86-163.ec2.internal>
Your name and email address were configured automatically based
on your username and hostname. Please check that they are accurate.
You can suppress this message by setting them explicitly. Run the
following command and follow the instructions in your editor to edit
your configuration file:

    git config --global --edit

After doing this, you may fix the identity used for this commit with:

    git commit --amend --reset-author

1 file changed, 5 insertions(+)
create mode 100644 Dockerfile
ubuntu@ip-172-31-86-163:~/website$

i-041100a565475b7b2 (Master)
PublicIPs: 54.242.187.61 PrivateIPs: 172.31.86.163
```

```
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?addressFamily=ipv4&connType=standard&instanceId=i-041100a565475b7b2&osUser=ubuntu&region=...

aws
Services Search [Alt+S]
N. Virginia SharathBedra

ubuntu@ip-172-31-86-163:~/website$ git push --all
Username for 'https://github.com': SharathBedra
Password for 'https://SharathBedra@github.com':
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 2 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 423 bytes | 423.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0

To https://github.com:SharathBedra/website.git
   883b439..d8a1f21 master -> master
ubuntu@ip-172-31-86-163:~/website$
ubuntu@ip-172-31-86-163:~/website$

i-041100a565475b7b2 (Master)
PublicIPs: 54.242.187.61 PrivateIPs: 172.31.86.163
```

https://github.com/SharathBedra/website

SharathBedra / website

Code Pull requests Actions Projects Wiki Security Insights Settings

website Public
forked from hshar/website

master 2 Branches 0 Tags

This branch is 1 commit ahead of hshar/website:master.

Contribute Sync fork

| | | |
|-------------------|------------------------|--------------|
| Ubuntu Dockerfile | d8a1f21 · 1 minute ago | 3 Commits |
| images | final | 5 years ago |
| Dockerfile | Dockerfile | 1 minute ago |
| index.html | modified | 5 years ago |
| README | | |

About
Jenkins Case Study website
Activity
0 stars
0 watching
0 forks
Releases
No releases published
Create a new release

```
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?addressFamily=ipv4&connType=standard&instanceId=i-041100a565475b7b2&osUser=ubuntu&region=...

aws
Services Search [Alt+S]
N. Virginia SharathBedra

ubuntu@ip-172-31-86-163:~/website$ ls
Dockerfile images index.html
ubuntu@ip-172-31-86-163:~/website$
```

Search (CTRL+K)

Sharath Bedra

log out

Dashboard > Test > Configuration

Configure

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

General

Enabled

Description

For develop branch, don't publish it

Plain text: [Preview](#)

☐ Discard old builds [?](#)

☒ GitHub project

Project url [?](#)

https://github.com/SharathBedra/website.git

Advanced

☐ 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.

Advanced

Save

Apply

Configure

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

Source Code Management

☐ None
☒ Git [?](#)

Repositories [?](#)

Repository URL [?](#)

https://github.com/SharathBedra/website.git

Credentials [?](#)

- none -

+ Add

Advanced

Add Repository

Branches to build [?](#)

Branch Specifier (blank for 'any') [?](#)

*/develop

Add Branch

Repository browser [?](#)

(Auto)

Additional Behaviours

Save

Apply

Configure

General

Source Code Management

Build Triggers

Build Environment

Build Steps

Post-build Actions

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 Environment

☐ Delete workspace before build starts
☐ Use secret text(s) or file(s) [?](#)
☐ Add timestamps to the Console Output
☐ Inspect build log for published build scans
☐ Terminate a build if it's stuck
☐ With Ant [?](#)

Build Steps

Add build step

Post-build Actions

Add post-build action

Save

Apply

Configure

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

General

Enabled 

Description

For master branch, publish it

Plain text: [Preview](#)

☐ Discard old builds [?](#)

☒ GitHub project

Project url [?](#)

<https://github.com/SharathBedra/website.git/>

Advanced 

☐ 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.

Advanced 

Source Code Management

Save

Apply

Configure

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

Source Code Management

☐ None

☒ Git [?](#)

Repositories [?](#)

Repository URL [?](#)

<https://github.com/SharathBedra/website.git>

Credentials [?](#)

- none -

+ Add

Advanced 

Add Repository

Branches to build [?](#)

Branch Specifier (blank for 'any') [?](#)

*/master

Add Branch

Repository browser [?](#)

(Auto)

Additional Behaviours

Save

Apply

Configure

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

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 Environment

☐ Delete workspace before build starts

☐ Use secret text(s) or file(s) [?](#)

☐ Add timestamps to the Console Output

☐ Inspect build log for published build scans

☐ Terminate a build if it's stuck

☐ With Ant [?](#)

Build Steps

Add build step 

Post-build Actions

Add post-build action 

Save

Apply

The Jenkins Dashboard shows a list of jobs. The 'Prod' job is highlighted. The build queue is empty. The build executor status shows 0/2 built-in nodes, 0/1 slave1, and 0/1 slave2.

| S | W | Name ↓ | Last Success | Last Failure | Last Duration |
|-----|---|--------|--------------|--------------|---------------|
| ... | ☀ | Prod | N/A | N/A | N/A |
| ... | ☀ | Test | N/A | N/A | N/A |

Build Queue: No builds in the queue.

Build Executor Status:

- Built-In Node: 0/2
- Slave1: 0/1
- Slave2: 0/1

Now we shall configure the Prod (Execute Shell);

The Jenkins 'Prod' configuration page is shown. The 'Build Steps' section is active. A dropdown menu is open, showing options like 'Execute shell', 'Invoke Ant', etc. The 'Execute shell' option is selected. The command field contains the following text:

```
sudo docker build . -t finalrelease
sudo docker run -itd -p 80:80 finalrelease
```

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

Now we shall commit some changes to index.html file in master branch;

We added Hi to the title;

The GitHub repository page for 'SharathBedra / website' is shown. The 'index.html' file is selected. A 'Commit changes' dialog box is open, showing the commit message 'Update index.html' and the option to 'Commit directly to the master branch'.

Commit message: Update index.html

Extended description: Add an optional extended description...

☒ Commit directly to the master branch

☐ Create a new branch for this commit and start a pull request [Learn more about pull requests](#)

Buttons: Cancel, Commit changes

Build #1 has been successfully created.

Jenkins

Dashboard > Prod > #1 > Console Output

Status

Changes

Console Output

Edit Build Information

Delete build '#1'

Polling Log

Timings

Git Build Data

Console Output

Started by GitHub push by SharathBedra
Running as SYSTEM
Building remotely on Slave2 in workspace /home/ubuntu/jenkins/workspace/Prod
The recommended git tool is: NONE
No credentials specified
Cloning the remote Git repository
Cloning repository https://github.com/SharathBedra/website.git
> git init /home/ubuntu/jenkins/workspace/Prod # timeout=10
Fetching upstream changes from https://github.com/SharathBedra/website.git
> git --version # timeout=10
> git --version # 'git version 2.34.1'
> git fetch --tags --force --progress -- https://github.com/SharathBedra/website.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git config remote.origin.url https://github.com/SharathBedra/website.git # timeout=10
> git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
Avoid second fetch
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision 179ee8f948f01fbc3f1fce194fb3e49d89fae62e (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10

Jenkins

Dashboard > Prod > #1 > Console Output

invoke-rc.d: policy-rc.d denied execution of start.
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
Processing triggers for ca-certificates (20240203) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
Removing intermediate container 0c8ab7b5ee0a
---> 43b40adeb1bb
Step 4/5 : ADD . /var/www/html
---> 5c82d542b73f
Step 5/5 : ENTRYPOINT apachectl -D FOREGROUND
---> Running in b8373d373abd
Removing intermediate container b8373d373abd
---> 589e273e68c8
Successfully built 589e273e68c8
Successfully tagged finalrelease:latest
+ sudo docker run -itd -p 80:80 finalrelease
09766e2d1565d92ac0ce1b8e80393c31f3cfe6d6c1e9fc7e9436f07975a54820
Finished: SUCCESS

http://54.164.237.82

YouTube WhatsApp Adobe Acrobat Photo - Google Pho...

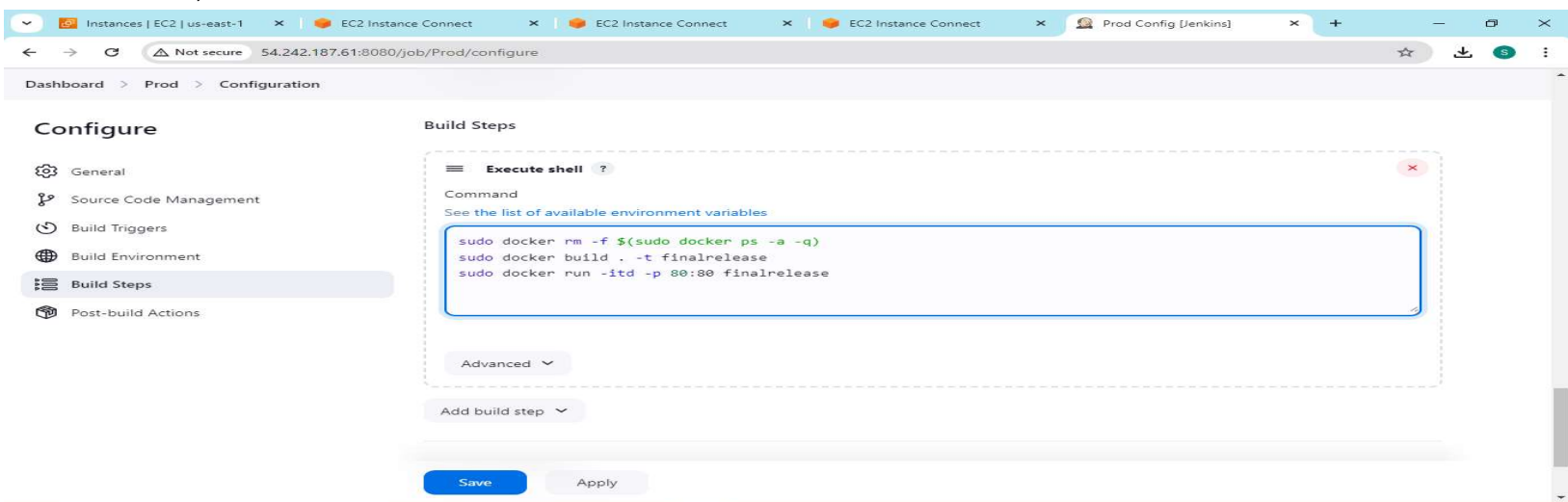
All Bookmarks

Hello world!

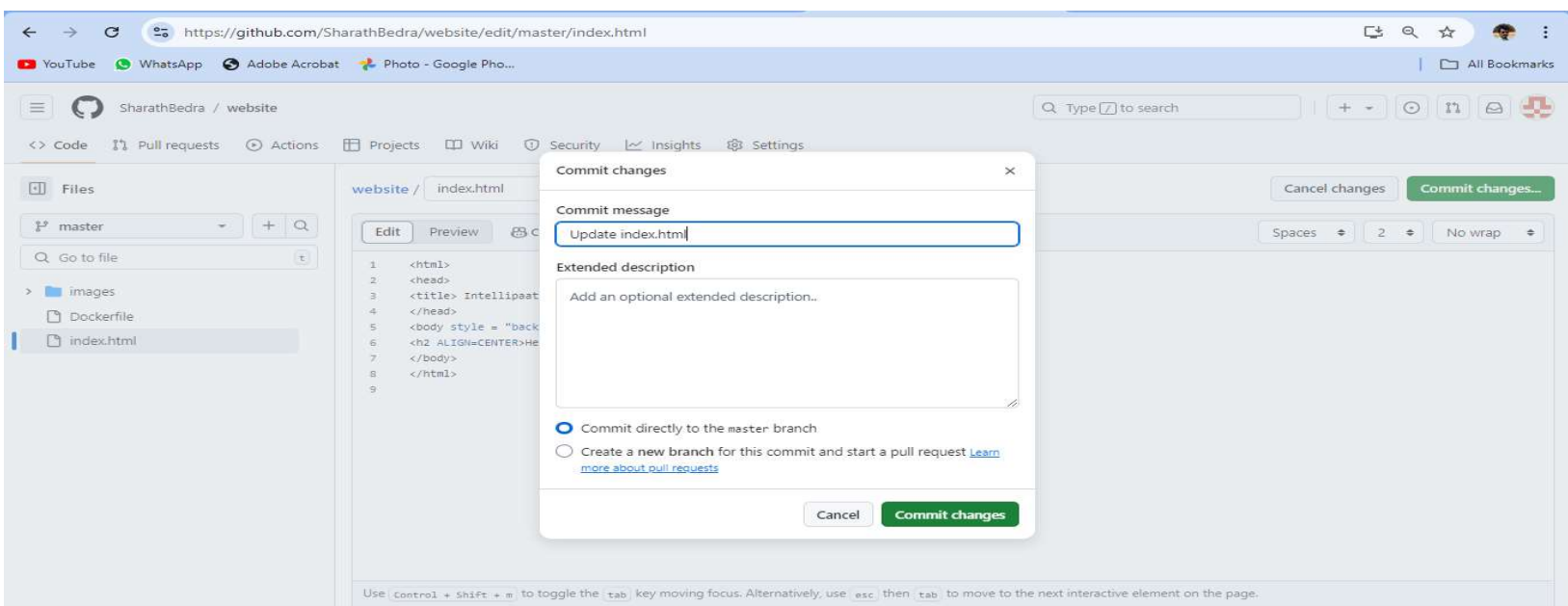


GitHub

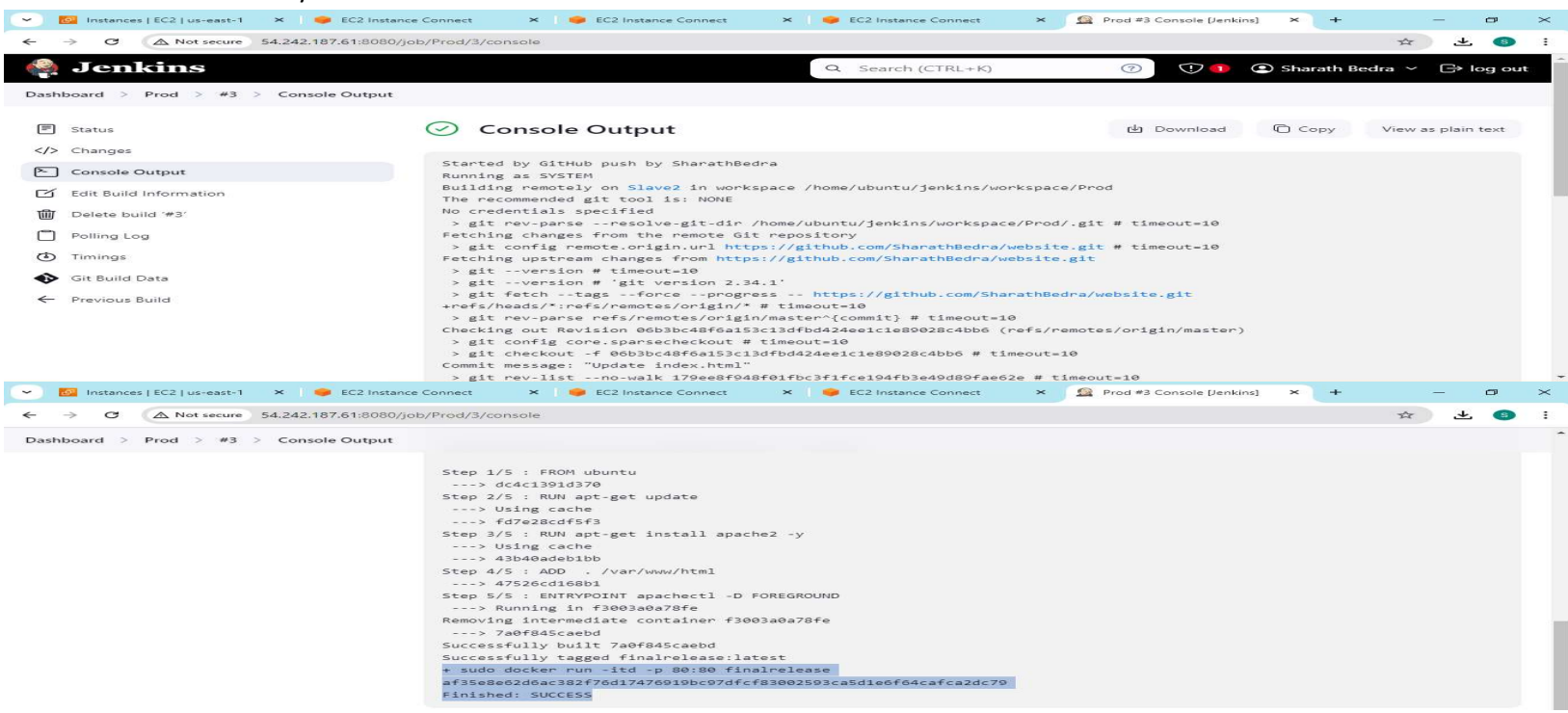
If we do the changes a second time, we shall paste the command “sudo docker rm -f \$(sudo docker ps -a -q)” in “execute shell” before these commands;



Here now we shall remove Hi from index.html file and commit it.



Build has been successfully executed.





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

Creating a develop.txt file in develop branch;

