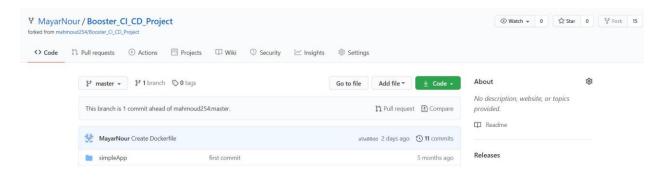
CI CD PROJECT DEVOPS BOOSTER SPRINTS PRESENTED BY: Mayar Wessam Nour Email: Mayarnour98@gmail.com

Objective:

Create CI/CD pipeline using Jenkins file to deploy simple django web app as a micro service running on docker container locally.

Steps:

1- Fork this repo to your account



2- Write dockerfile inside the forked repo to create new image from base image ubuntu and install python3.6 and pip3

```
FROM ubuntu:18.04

RUN apt-get update -qq

RUN apt-get install python3-pip -qq

ADD . /simpleApp

WORKDIR /simpleApp

COPY . .

RUN apt-get update -qq

RUN pip3 install -r requirements.txt

RUN python3.6 manage.py makemigrations

RUN python3.6 manage.py migrate

EXPOSE 8000

CMD ["python3.6", "manage.py", "runserver", "0.0.0.0:8000"]
```

Configuring Jenkins on VM

```
tualBox:~$ sudo docker run -p 8080:8080 -p 50000:50000 -d jenkins/jenkins:lts
| Isolate | Isol
cc4fe40d0e61: Pull complete
9d647f502a07: Pull complete
d108b8c498aa: Pull complete
1bfe918b8aa5: Pull complete
dafa1a7c0751: Pull complete
87e8abcf58a3: Pull complete
 7bac295fef3b: Pull complete
bcc7fef45979: Pull complete
4d6fbe8189de: Pull complete
14eac212d69a: Pull complete
e027eb08ee87: Pull complete
21e7819233f8: Pull complete
067f2478ae19: Pull complete
 645433dc13ee: Pull complete
ad276a4ccb57: Pull complete
72d65febc26c: Pull complete
 a2125ca77846: Pull complete
Digest: sha256:98d3953394a4b9ac65e5e4ab8bc8d8d5bc924716c62b564a113ee57d7736ca0b
Status: Downloaded newer image for jenkins/jenkins:lts
8548873f43a861df8fcbc9b54eb0e818f9bef21b99e633552248a154223beea7
mayar@mayar-VirtualBox:~$ sudo docker ps
CONTAINER ID IMAGE
                                                                                                                                                                                      COMMAND
                                                                                                                                                                                                                                                                                                   CREATED
                                                                                                                                                                                                                                                                                                                                                                                           STATUS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PORTS
                                                                                          NAMES
NAMES
8548873f43a8 jenkins/jenkins:lts "/sbin/tini -- /usr/..." 23 seconds ago Up 14 seconds 0.0.0.0:8080->8080/tcp, 0.0.0.
0:50000->50000/tcp nifty_khorana
mayar@mayar-VirtualBox:-$ docker exec -it 8548873f43a8 bash
Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Get http://%2Fvar%2Frun%2Fdocke
r.sock/v1.40/containers/8548873f43a8/json: dial unix /var/run/docker.sock: connect: permission denied
mayar@mayar-VirtualBox:-$ sudo docker exec -it 8548873f43a8 bash
jenkins@8548873f43a8:/$ cat /var/jenkins_home/secrets/initialAdminPassword
eh7748ra6p6r45Sep048ra89090298ra3
 eb7748c0a6bc455e9b8c3899092b8c31
jenkins@8548873f43a8:/$ exit
```

3- Configure ubuntu slave to use it for the pipeline

Building and running the dockerfile for making the slave's image

```
mayar@mayar-VirtualBox:~$ sudo docker build -f slavedockerfile . -t slave
Sending build context to Docker daemon
Successfully tagged slave:latest
mayar@mayar-VirtualBox:~$ sudo docker run -dit -v /var/run/docker.sock:/var/run/docker.sock slave
c60cb16a0db0b481bc6e804468cde4931b703abdb81d33e98a1d969be7fef3e1
mayar@mayar-VirtualBox:~$ docker ps
Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Get http://%2Fvar%2Frun%2Fdocker.sock/v1.40/cont
iners/json: dial unix /var/run/docker.sock: connect: permission denied
mayar@mayar-VirtualBox:~$ sudo docker ps
                                      COMMAND
                                                                               STATUS
                                                                                                  PORTS
CONTAINER ID
                  TMAGE
                                                             CREATED
  NAMES
                                      "/bin/bash"
c60cb16a0db0
                  slave
                                                             12 seconds ago
                                                                               Up 11 seconds
  jolly_perlman
cc757095edcb
                                      "/bin/bash"
                                                             11 minutes ago
                                                                               Up 11 minutes
  gracious tesla
 548873f43a8
                  jenkins/jenkins:lts "/sbin/tini -- /usr/..." About an hour ago Up About an hour 0.0.0.0:8080->8080/tcp, 0.0.0.0:50000->50000/tc
  nifty_khorana
```

Generating the authorized keys file after getting the public and private keys

```
mayar@mayar-VirtualBox:~$ cd ~/.ssh
mayar@mayar-VirtualBox:~/.ssh$ ls
id_rsa id_rsa.pub
ayar@mayar-VirtualBox:~/.ssh$ rm *
mayar@mayar-VirtualBox:~/.ssh$ ls
mayar@mayar-VirtualBox:~/.ssh$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/mayar/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/mayar/.ssh/id_rsa.
Your public key has been saved in /home/mayar/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:KIbYQia2dNPomFOokJNAq4htQY6q7wGRYQKPH608xTg mayar@mayar-VirtualBox
The key's randomart image is:
 ---[RSA 2048]----+
Bo.
+@0 0
@B*= .
#0X=. .
10E*+0 . S
 .0
 ----[SHA256]-----
mayar@mayar-VirtualBox:~/.ssh$ ls
id rsa id rsa.pub
mayar@mayar-VirtualBox:~/.ssh$ cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDDhoAzLG/DKmMqn6GT483c0PCtbRRCLHDOS0KrVdzzCFB+pSqq1RIYB3YC27dsj9W9ADGA/Wczb0ZvLNWLB3ybMeH1VptpJVoP8MGkSMe9XRf6XjQAHbl
cFpV8Xt8jgSk6jS26/a/+N2IpP+8aqh1awte0FX2X8tiTlGuMG9jSuOh8vCivYGtbCkL2kbebi/kBGfh0L4htEe0i1jlm/GPKrxXP56C1x2uLfXgJxCfEJW3nDTFRPtZBIBqY4LPNzhujoi0eu/9TbKN8jE
VfJouQpHvlrCbBb3zOnvopUx0g7NXtk15Ff5tWS70Z9snAcfWY2G33BZA8xXiKjZmlDxAj mayar@mayar-VirtualBox
mayar@mayar-VirtualBox:~/.ssh$ cat id_rsa
----BEGIN RSA PRIVATE KEY----
MIIEogIBAAKCAQEAw4aAMyxvwypjKp+hk+PN3NDwrW0UQixwzktJK1Xc8whQfqUq
oNUSGAd2Atu3bI/VvQAxgP1nM29GbyzViwd8mzHh9VabaSVaD/DBpEjHvV0X+l40
AB25XBaVfF7fI4OZOo0tuv2v/jdiKT/vGqodWsLXtBV9l/LYk5RrjBvY+bjofLwo
r2BrWwpC9pG3m4v5ARn4dC+IbRHtItY5Zvxjyq8Vz+egtcdri314CcQnxCVt5w0x
UT7WQSAamOCzzc4bo6Ijnrv/U2yjfIxFXyaLkKR75awmwW98zp76KVMdIOzV7ZNe
RX+bVku9GfbJwHH1mNht9wWQPMV4io2ZpQ8QIwIDAQABAoIBADpaXtJm9afyc4wZ
/hfsCdlYBixL/JrPNo9qypiDVKC3n4Zcdr9vN6oyN9ccib59otV4RE3x0qX4FLZD
VCvc/SQ4G+6jfVhBDILrYG90RUZPjUNsb+qE9Hf2SYDHs6KeuNFPpxFCew7MqqAS
86IqmP4oXkXhkA0ULezFg99ZxESqlDRj+QKhHOGVEVTu5KszlJO5PWhRCNr+srk0
yKdlyyjXF4t07VuQKMKQjdiO2rr3MB9gnP0UJ3TJUQDngFtFi+fGqqOKat7B3Mi+
ORA4PC5mGw9KpSAQltaV7DtK/7Boe8Uf2YO5jaND1bEZ3IqmHim3HsmfqOce3wzk
ycxvO6kCgYEA4Ufz8v6xrjYQj0RfFZKWgvE3ahxX8SSmEMXyWfScBD2WEQEPlp+k
+bxeQAerjgMacrioLGJSDxTlAyFSyYEP7bgswy+lO5P/r2n0jNkhwQhogKN7n7LA
l2pfFSWPOf0CaFihL8u+DdGJIWpcSKeaeq582YBxZu+6P2wlP0lPKwUCqYEA3i/Y
aH4D1ZJe4MKYSMT8iCw2C+htGY2qd58B0kb7XHeQTaONwDvw1aOz88n2hvYQ3rFq
PKEcffq0CGzhasfNnyHIJMKh+5TaFEAIa4J7G1vs9abEKVwefaLNm3e0mpveQoaD
pyvTXJUqx+nGby9l2OuE13rucIuLfTwlpPXkxwcCqYBqXKxix7lqBQqqeali6AjD
3dtJ8APdSG5XcP3RVtnqbqFReezAMrOTbUoadQScUf7Et0Y/XlRb5oORjMQnexXo
KJKJvQ8IKAIJ8ayhd0qmdq/QPF97sMuZMZGezFLpC31AgsfnZwxePdW+vxa+/tLC
pWswzaG89eY7V3XmgVgteQKBgGMObarYU5lJ8ma+GuqGeBe1rjrM2qcD07YU+9jl
sHbfD0St4Cq0DqcQns/XgMNWvNqrujNhmLRIfc1jzXOvtGp3wyUwaMsi578TdS2J
NJ1T9GbofJf769QTWxsuyDMBvqtmERfcoBSspDAQd1lmhj+ZcNYohllCvWOOBzJu
NhrNAoGAPrEjsqUVHQnXMAZkpJrHjj4AM+iLzDbBbbrM0uiall6fLEzr4L3HY3u6
sUk9XgcNTzsl/U0/gsjVly8jhpNwQBGex/fz3rR6oicRbTw9FRlrr5MU45kp9MJr
enP/fUGBwVC/S5voF04rsFdArJIqx/j8eAgNuhRCtGv6ZFndJ64=
 ----END RSA PRIVATE KEY----
```

```
mayar@mayar-VirtualBox:~$ sudo docker exec -it c60cb16a0db0 bash
jenkins@c60cb16a0db0:/jenkins_home$ cd ~
jenkins@c60cb16a0db0:~$ mkdir .ssh
jenkins@c60cb16a0db0:~$ cd .ssh/
jenkins@c60cb16a0db0:~$ cd .ssh/
jenkins@c60cb16a0db0:~/.ssh$ ls
jenkins@c60cb16a0db0:~/.ssh$ echo "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDDhoAzLG/DKmMqn6GT483c0PCtbRRCLHDOS0krVdzzCFB+pSqg1RIYB3YC27dsj9W9ADGA/Wczb0ZvLNWL
B3ybMeH1VptpJVoP8MGkSMe9XRf6XjQAHblcFpV8Xt8jg5k6j526/a/+N2IpP+8aqh1awte0FX2X8tiTlGuMG9j5u0h8vCivYGtbCkL2kbebi/kBGfh0L4htEe0i1jlm/GPKrxXP56C1x2uLfXgJxCfEJW3
nDTFRPtZBIBqY4LPNzhujoiOeu/9TbKN8jEVfJouQpHvlrCbBb3zOnvopUx0g7NXtk15Ff5tWS70Z9snAcfWY2G33BZA8xXiKjZmlDxAj mayar@mayar-VirtualBox" > authorized_keys
jenkins@c60cb16a0db0:~/.ssh$ ls
authorized_keys
jenkins@c60cb16a0db0:~/.ssh$ exit
exit
```

Getting the host's IP of the slave image we built

```
mayar@mayar-VirtualBox:~/.ssh$ sudo docker inspect bridge
[sudo] password for mayar:
          "Name": "bridge",
          "Id": "f02958c0b64cec285d5add87039a61ddaf97723ed8064b0b2ab9106d040988b6",
          "Created": "2020-09-06T17:48:26.312064379+02:00",
         "Scope": "local",
"Driver": "bridge",
          "EnableIPv6": false,
          "IPAM": {
               "Driver": "default",
              "Options": null,
              "Config": [
                         "Subnet": "172.17.0.0/16"
          },
"Internal": false,
          "Attachable": false,
          "Ingress": false,
          "Ingress .
"ConfigFrom": {
---"·""
               "Network":
         },
"ConfigOnly": false,
". .
          "Containers": {
               "8548873f43a861df8fcbc9b54eb0e818f9bef21b99e633552248a154223beea7": {
                    "IPv6Address": ""

"Bame": "nifty_khorana",
"EndpointID": "2aef194179f243511ad81c3e15c608c865d191ac6bd43e30887822de133faca2",
"MacAddress": "02:42:ac:11:00:02",
"IPv4Address": "172.17.0.2/16",
"IPv6Address": "
              },
"c60cb16a0db0b481bc6e804468cde4931b703abdb81d33e98a1d969be7fef3e1": {
                    "Name": "jolly_perlman".
"EndpointID": "bf678175999f8cb74e2bbb2f49de6cc5d4fb81d88a71e481ffb9e589583f4a31",
                    "EndpointID": "bf678175999f8cb74e2
"MacAddress": "02:42:ac:11:00:04",
                    "IPv4Address": "172.17.0.4/16",
                    "IPv6Address": '
```

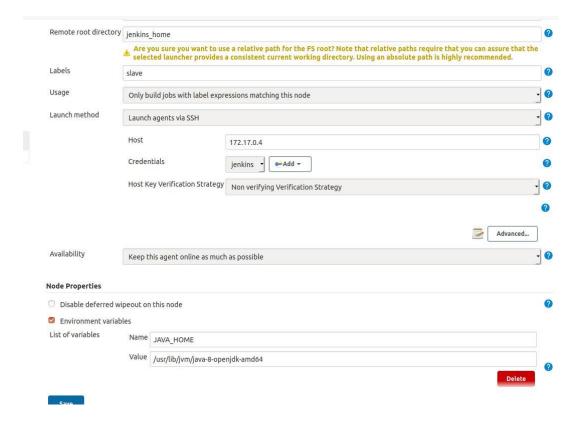
Getting the Environmental Variables (Path and Value)

```
mayar@mayar-VirtualBox:~$ sudo docker exec -it c60cb16a0db0 bash
jenkins@c60cb16a0db0:/jenkins home$ cd /usr/lib
jenkins@c60cb16a0db0:/usr/lib$ ls
                  kernel
X11
                                                         os-release
аррагмог
                  klibc
                                                         packagekit
                  klibc-xcgdUApi-P9SoPhW_fi5gXfvWpw.so
apt
                                                         policykit-1
binfmt.d
                  libau.so
                                                         python2.7
                                                         python3
dbus-1.0
                  libau.so.2
debug
                  libau.so.2.10
                                                         python3.8
dpkg
                  linux
                                                         sasl2
environment.d
                  linux-boot-probes
                                                         sftp-server
ile
                  locale
                                                         software-properties
girepository-1.0 lsb
                                                         ssl
git-core
                 mime
                                                         sysctl.d
                 modprobe.d
                                                         systemd
gnupg
                 modules
                                                         sysusers.d
gnupg2
                 modules-load.d
grub
                                                         terminfo
grub-legacy
                 networkd-dispatcher
                                                         tmpfiles.d
init
                 openssh
                                                         udev
initramfs-tools
                                                         valgrind
                 os-prober
                  os-probes
                                                         x86_64-linux-gnu
ivm
jenkins@c60cb16a0db0:/usr/lib$ cd jvm/
jenkins@c60cb16a0db0:/usr/lib/jvm$ ls
java-1.8.0-openjdk-amd64 java-8-openjdk-amd64
jenkins@c60cb16a0db0:/usr/lib/jvm$ pwd
/usr/lib/jvm
jenkins@c60cb16a0db0:/usr/lib/jvm$ exit
```

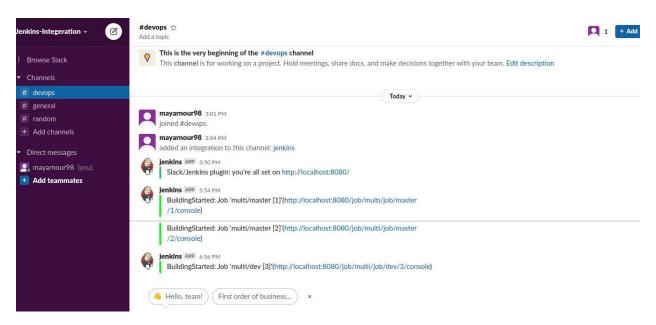
Starting the server

```
mayar@mayar-VirtualBox:~$ sudo docker exec -it -u root c60cb16a0db0 bash
root@c60cb16a0db0:/jenkins_home# service ssh start
  * Starting OpenBSD Secure Shell server sshd [ OK ]
root@c60cb16a0db0:/jenkins_home# exit
exit
mayar@mayar-VirtualBox:~$ sudo docker exec -it -u root c60cb16a0db0 bash
root@c60cb16a0db0:/jenkins_home# service ssh start
  * Starting OpenBSD Secure Shell server sshd [ OK ]
root@c60cb16a0db0:/jenkins_home# chmod 777 /var/run/docker.sock
root@c60cb16a0db0:/jenkins_home# exit
exit
mayar@mayar-VirtualBox:~$
```

Jenkins Configuration for the slave node



4- Create slack workspace and integrate it with Jenkins



6- Write Jenkins file

For the dev branch pipeline:

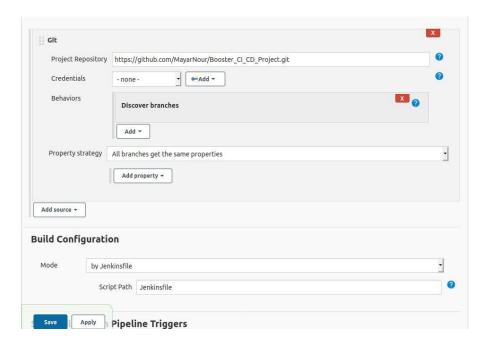
```
pipel
ine {
             agent {label 'slave'}
             stages {
                 stage('Build') {
                         steps {
                             sh 'docker build -f Dockerfile . -t mayarnour/dajangoappdev:v1.0'
                               }
                            post{
                             success{
                                  slackSend(color: '#00FF00',message: "BuildingStarted: Job
         '${env.JOB_NAME} [${env.BUILD_NUMBER}]'(${env.BUILD_URL}console)")
                           }
                     }
                 stage('Push') {
                     steps {
        withCredentials([usernamePassword(credentialsId:"dockerhub",usernameVariable:"USERNAM
        E",passwordVariable:"PASSWORD")]){
                         sh 'docker login --username $USERNAME --password $PASSWORD'
                         sh 'docker push mayarnour/dajangoappdev:v1.0'
                     }
                  stage('Deploy') {
                     steps {
                         sh 'docker run -d -p 4000:3000 mayarnour/dajangoappdev:v1.0'
                     }
             }
           }
        }
```

For the master branch pipeline:

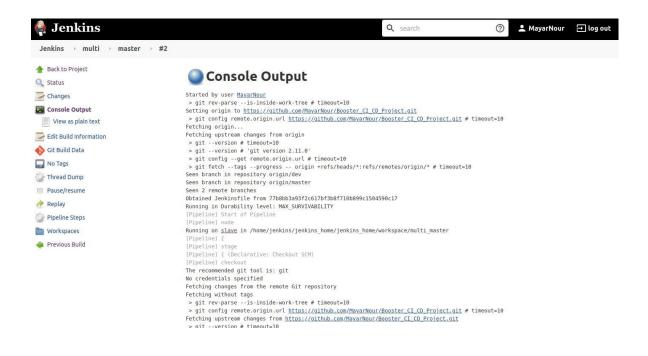
```
pipel
ine {
             agent {label 'slave'}
             stages {
                 stage('Build') {
                             sh 'docker build -f Dockerfile . -t mayarnour/dajangoapp:v1.0'
                               }
                            post{
                             success{
                                  slackSend(color: '#00FF00',message: "BuildingStarted: Job
         '${env.JOB_NAME} [${env.BUILD_NUMBER}]'(${env.BUILD_URL}console)")
                           }
                     }
                 stage('Push') {
                     steps {
        withCredentials([usernamePassword(credentialsId:"dockerhub",usernameVariable:"USERNAM
        E",passwordVariable:"PASSWORD")]){
                         sh 'docker login --username $USERNAME --password $PASSWORD'
                         sh 'docker push mayarnour/dajangoapp:v1.0'
                         }
                     }
                 }
                  stage('Deploy') {
                     steps {
                         sh 'docker run -d -p 3000:3000 mayarnour/dajangoapp:v1.0'
                     }
             }
        }
```

7- Configure job in Jenkins using multi-branch pipeline type with the forked Git repo URL

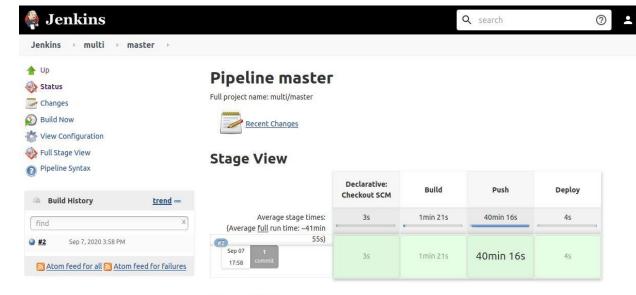
Making a new Multi-branch pipeline



Master Branch:



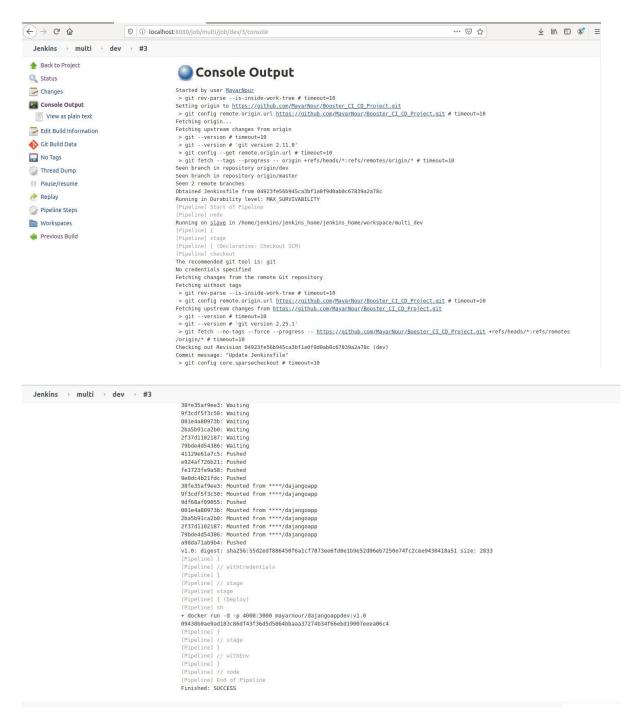
```
38te35a19ee3: Waiting
09rdef575c80: Waiting
00rde480973b: Waiting
27s7d102327a: Waiting
27s7d102327a: Waiting
27s7d102327a: Waiting
42ebc35c76d: Pushed
42r0ea506d0: Pushed
cdc10ec435f: Pushed
cdc10ec435f: Pushed
00rde480973b: Mounted from library/ubuntu
49ad5sc746d: Pushed
2babBolca20b: Mounted from library/ubuntu
27s7d102327a: Mounted from library/ubuntu
79bded54386: Mounted from library/ubuntu
49ad5sc746d: Pushed
38te35a19ea3: Pushed
9fad5f5c30: Pushed
38te35a19ea3: Pushed
4.0: digest: sha256:15h26055209ffec70c1b34390beb73ff2010076892cd0290cd9288c168b738bd size: 2833
[Pipeline] /
1 pipeline] / withCredentials
[Pipeline] / stage
[Pipeline] / fstage
[Pipeline] (Deploy)
[Pipeline] (Deploy)
[Pipeline] (Deploy)
[Pipeline] / stage
[Pipeline] / stage
[Pipeline] / stage
[Pipeline] / pipeline] /
1 pipeline] / node
```



Permalinks

- Last build (#2), 1 hr 14 min ago
- Last stable build (#2), 1 hr 14 min ago
- Last successful build (#2), 1 hr 14 min ago
- Last completed build (#2), 1 hr 14 min ago

Dev Branch:







Permalinks

#3 Sep 07

18:55

- <u>Last build (#3), 16 min ago</u>
 <u>Last stable build (#3), 16 min ago</u>
- Last successful build (#3), 16 min ago

Average stage times:

(Average <u>full</u> run time: ~5min

Declarative:

Checkout SCM

Build

1min 5s

1min 5s

Push

3min 54s

3min 54s

Deploy

5s

5s

• Last completed build (#3), 16 min ago