

Documentation of Booster_CI_CD_Project

Create CI/CD pipeline using jenkinsfile to deploy simple django web app as a microservice running on docker container locally

- 1) Install Jenkins, create Jenkins image and execute it

```
engysamy@Engys-MacBook-Pro Desktop % cd project
engysamy@Engys-MacBook-Pro project % docker run -p 8080:8080 -p 50000:50000 -d jenkins/jenkins:lts
74095f3e51a7933da2e3d0124b7eda21d4830139d9272e4447920e7e6d466a79
engysamy@Engys-MacBook-Pro project % docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED             STATUS              PORTS                               NAMES
74095f3e51a7       jenkins/jenkins:lts "/sbin/tini -- /usr/ 8 seconds ago      Up 8 seconds       0.0.0.0:8080->8080/tcp, 0.0.0.0:50000->50000/tcp   lov
ing_snyder
engysamy@Engys-MacBook-Pro project % docker exec -it 74095f3e51a7 bash
```

- 2) Start to configure slave node

A.) First Build slave Docker file

```
FROM ubuntu
USER root
RUN apt-get update -qq
RUN mkdir -p jenkins_home
RUN chmod 777 jenkins_home
RUN useradd -ms /bin/bash jenkins

RUN apt-get install -qq apt-transport-https ca-certificates curl gnupg2 software-properties-common
RUN curl -fsSL https://download.docker.com/linux/debian/gpg | apt-key add -
RUN add-apt-repository \
    "deb [arch=amd64] https://download.docker.com/linux/ubuntu \
    focal \
    stable"
RUN apt-get update -qq
RUN apt-get install -y docker-ce docker-ce-cli containerd.io
RUN usermod -s /bin/bash jenkins

RUN apt-get update -qq
RUN apt-get -y install python3.6
RUN apt-get -qq install python3-pip
RUN apt-get install openjdk-8-jdk -qq
RUN apt-get install openssh-server -qq

USER jenkins
WORKDIR jenkins_home
CMD ["/bin/bash"]
```

```
engysamy@Engys-MacBook-Pro project % docker build -f slave_Dockerfile . -t slave
Sending build context to Docker daemon  4.608kB
```

B.) Run slave image

```
engysamy@Engys-MacBook-Pro project % docker run --dit -v /var/run/docker.sock:/var/run/docker.sock slave 828fd6faa9abaed7066dfd66713fa9f75a93f73b9a8a961864b88495b631ada2
```

C.) Execute image to show Remote root directory : /jenkins_home

```
engysamy@Engys-MacBook-Pro project % docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS
ES             828fd6faa9ab  slave                  "/bin/bash"    5 seconds ago Up 4 seconds
tifying_thompson 74095f3e51a7  jenkins/jenkins:lts    "/sbin/tini -- /usr/" 5 minutes ago  Up 5 minutes  0.0.0.0:8080->8080/tcp, 0.0.0.0:50000->50000/tcp
ing_snyder
engysamy@Engys-MacBook-Pro project % docker exec -it 828fd6faa9ab bash
jenkins@828fd6faa9ab:/jenkins_home$ cd ~
```

D.) Generate key to Create credential

```
Last login: Sun Sep  6 12:43:16 on ttys001
engysamy@Engys-MacBook-Pro ~ % ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/Users/engysamy/.ssh/id_rsa):
/Users/engysamy/.ssh/id_rsa already exists.
Overwrite (y/n)?
engysamy@Engys-MacBook-Pro ~ % cd ~/.ssh
engysamy@Engys-MacBook-Pro .ssh % ls
id_rsa      id_rsa.pub
engysamy@Engys-MacBook-Pro .ssh % rm *
zsh: sure you want to delete all 2 files in /Users/engysamy/.ssh [yn]? y
engysamy@Engys-MacBook-Pro .ssh % ls
engysamy@Engys-MacBook-Pro .ssh % ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/Users/engysamy/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /Users/engysamy/.ssh/id_rsa.
Your public key has been saved in /Users/engysamy/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:uwNGQW0pgU8TBTv3IYCqU8/ur8PUix+28PaUpYAhhaU engysamy@Engys-MacBook-Pro.local
The key's randomart image is:
+----[RSA 3072]-----+
|  o+==.o o. |
| .oo  o o   |
| Eo.. .    |
| +.+oo     |
| o =.B..S . |
| o  B B. =  |
| . +.=oo=   |
| =+o+..    |
| .o*=.o.   |
+----[SHA256]-----+
engysamy@Engys-MacBook-Pro .ssh % ls
id_rsa      id_rsa.pub
engysamy@Engys-MacBook-Pro .ssh % cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQgQCtj8bLGDxWgS8oqTzUTX2wfr9LeruZwdjaUZUCwsT99EI+cdXjz9/9aZkMFmxcpaDvev3yL0hJ5R75/dGUL9GTElwVhhwS2KJJYTVQV8kLDy5wP2JBbowFM9Q
/qOSvfHpwPImaemKG4i7EfPQL33uk0jQOKP/qSw8bdmcBvaXQ7ZpvbrPNNqzJvdZ/hs2QV0suVdAkpaPieXxdKUmAydvij23WzaPfkt+QnJXS9Jt9R4ehVxziniQmXPH0fiTSrZMpWHLUh0cnjCIU/L1hWDB3
gheiZlhXz/QLapIaYzUkLr0dROUvACT3tKEe3Hn1E3A0rSfqHlbbkbb+0WQ3UNNXLQMsWgltH0QMAD315ziCF4+mLUo0Tz9b1t5prmVEQECTkcCLPMjN9Kq07rV+OQysX98wriEgcDiRWF8Sgl0= engysamy@
engysamy@Engys-MacBook-Pro .ssh % cat id_rsa
```

E.) Echo public key in authorized_keys file in slave image

```
jenkins@828fd6faa9ab:/jenkins_home$ cd ~
jenkins@828fd6faa9ab:~$ mkdir .ssh
jenkins@828fd6faa9ab:~$ cd .ssh/
jenkins@828fd6faa9ab:~/.ssh$ ls
jenkins@828fd6faa9ab:~/.ssh$ echo "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQCTj8bLGDxWgS8oqTzUTX2wfr9LeruZwdjaUZUCwsT99EI+cdXjz9/9aZkMFmxpcaDvev3yL0hJ5
hwS2KJJYTV8kLDy5wP2JBbowFM90CiW8mStQTG8dDzugDvKGhU70SXYsH3jREtEB1A0gYFiN/qOSvfHpwPImsaemKG4i7EfPQL33uk0jQOKP/qSw8bdmcBVaXQ7ZpvbrPNNqzJvdZ/hs2QV0suV
dviJ23WzaPfkt+QnJXS9Jt9R4ehVxziniQmXPH0fiTSrZMpWHLUhOcnjCIU/L1hWDBfUJNedw9zrL51Y/FvzRvaBsdKjFMH20qDPzkr4tc5rF7pghe1ZlhXz/QLapIaYzUkLrOdROUvACT3tKEe3
b+0WQ3UNNXLQmsWgLT0QMAD315ziCF4D+mLUo0Tz9b1t5prMVEQECTkcCLPMjN9KqQ07rV+0QysX98wriEgcDiRWF8Sql0= engysamy@Engys-MacBook-Pro.local" > authorized_keys
jenkins@828fd6faa9ab:~/.ssh$ ls
authorized_keys
jenkins@828fd6faa9ab:~/.ssh$ exit
```

F.) Cat the private key to make credential. In Jenkins, make type of credential ssh with Private key

```
engysamy@Engys-MacBook-Pro .ssh % cat id_rsa
-----BEGIN OPENSSH PRIVATE KEY-----
b3B1bnNzaC1rZXktdjEAAAABG5vbmUAAAABbm9uZQAAAAAAAAABAAABlwAAAAAdzc2gtcn
NhAAAAAwEAAQAAAYEARy/Gyxg8VoEvKKk81E19sH0fS3q7mVnY21GVAsLE/fRCPnHV48/f
/WmZDBZsaY6g73r98izeSelle+f3P1C/PkyC8EYXcEtiJSwE0E5f1Cw8ucD9iQW6MBTPTao1
```

Scope: Global (Jenkins, nodes, items, all child items, etc) ?


ID: slave ?

Description: ?

Username: jenkins

Private Key: ☒ Enter directly

Key:

 Concealed for Confidentiality Replace

Passphrase:

Save

G.) Bring host which is the ipv4 of mystifying_thamson (172.17.0.3)

```
engysamy@Engys-MacBook-Pro .ssh % docker inspect bridge
[
  {
    "Name": "bridge",
    "Id": "2b12264972c927496ea62c8a4d2cae58252e123a31d35af76becefb20adff7f0",
    "Created": "2020-09-06T10:43:21.952531714Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv6": false,
    "IPAM": {
      "Driver": "default",
      "Options": null,
      "Config": [
        {
          "Subnet": "172.17.0.0/16",
          "Gateway": "172.17.0.1"
        }
      ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
      "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {
      "74095f3e51a7933da2e3d0124b7eda21d4838139d9272e4447920e7e6d466a79": {
        "Name": "loving_snyder",
        "EndpointID": "c4280b9343b14e07045d43df2774365c9b73a0526ea9941852c4aca2de7ed9d2",
        "MacAddress": "02:42:ac:11:00:02",
        "IPv4Address": "172.17.0.2/16",
        "IPv6Address": ""
      },
      "828fd6faa9abaed7066dfd66713fa9f75a93f73b9a8a961864b88495b631ada2": {
        "Name": "mystifying_thompson",
        "EndpointID": "1bdbbdfd5c806d2cbaa59ba6f9216489b8a560e609b819f27641dd5450e06711",
        "MacAddress": "02:42:ac:11:00:03",
        "IPv4Address": "172.17.0.3/16",
        "IPv6Address": ""
      }
    }
  }
]
```

H.) Bring path of the environment variable java home and start the service ssh

```
root@828fd6faa9ab:/jenkins_home# cd /usr/lib
root@828fd6faa9ab:/usr/lib# cd jvm
root@828fd6faa9ab:/usr/lib/jvm# ls
java-1.8.0-openjdk-amd64  java-8-openjdk-amd64
root@828fd6faa9ab:/usr/lib/jvm# exit
exit
engysamy@Engys-MacBook-Pro ~ % docker exec -it -u root 828fd6faa9ab bash
root@828fd6faa9ab:/jenkins_home# service ssh start
* Starting OpenBSD Secure Shell server sshd
root@828fd6faa9ab:/jenkins_home# exit
exit
```

I.) Change mod of the image to have permission

```
engysamy@Engys-MacBook-Pro project % docker exec -it -u root 828fd6faa9ab bash
root@828fd6faa9ab:/jenkins_home# chmod 777 /var/run/docker.sock
```

J.) final look of slave node

of executors

1

?

Remote root directory

/jenkins_home

?

Labels

slave

?

Usage

Only build jobs with label expressions matching this node

?

Launch method

Launch agents via SSH

?

Host

172.17.0.3

?

Credentials

jenkins

Add

?

Host Key Verification Strategy

Non verifying Verification Strategy

?

Advanced...

Availability

Keep this agent online as much as possible

?

Node Properties

☐ Disable deferred wipeout on this node

?

☒ Environment variables

List of variables

Name

JAVA_HOME

Value

/usr/lib/jvm/java-8-openjdk-amd64

?

Save

☒ Environment variables

List of variables

Name

JAVA_HOME

Value

/usr/lib/jvm/java-8-openjdk-amd64

?

Save

3) Make multi-branch pipeline called project

Branch Sources

Git

Project Repository

https://github.com/engysamy29/Booster_CI_CD_Project.git

Credentials

- none -

Add

Behaviors

Discover branches

Add

Property strategy

All branches get the same properties

Add property

Add source

4) Run Master Branch

Console Output

```
Started by user engy
> git rev-parse --is-inside-work-tree # timeout=10
Setting origin to https://github.com/engysamy29/Booster_CI_CD_Project.git
> git config remote.origin.url https://github.com/engysamy29/Booster_CI_CD_Project.git # timeout=10
Fetching origin...
Fetching upstream changes from origin
> git --version # timeout=10
> git --version # 'git version 2.11.0'
> git config --get remote.origin.url # timeout=10
> git fetch --tags --progress -- origin +refs/heads/*:refs/remotes/origin/* # timeout=10
Seen branch in repository origin/dev
Seen branch in repository origin/master
Seen 2 remote branches
Obtained Jenkinsfile from acfb2077a7bc913660cd369bcb61fece75d6a0d1
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on slave in /jenkins_home/workspace/project_master
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Checkout SCM)
[Pipeline] checkout
The recommended git tool is: git
No credentials specified
Fetching changes from the remote Git repository
Fetching without tags
> git rev-parse --is-inside-work-tree # timeout=10
> git config remote.origin.url https://github.com/engysamy29/Booster_CI_CD_Project.git # timeout=10
```



```

24a7c2c9bc62: Waiting
4b562a21ac3e: Pushed
f77249ed9761: Pushed
b58a9f7974a2: Pushed
24a7c2c9bc62: Layer already exists
e126d63f0afe: Pushed
46a6fbcfe6ac: Layer already exists
001e4a80973b: Layer already exists
2ba5b91ca2b0: Layer already exists
2f37d1102187: Layer already exists
79bde4d54386: Layer already exists
9dce532948fc: Pushed
2ebc4148c469: Pushed
v1.0: digest: sha256:f5ee5430ea299a7af83961db075d3382fc95473c383c951fbbb73f4cb807495d size: 2833
[Pipeline] }
[Pipeline] // withCredentials
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] sh
+ docker run -d -p 5000:5000 engysamy/dajngoo:v1.0
2ea364c5f93e2fc2c3f96f76c439062f6d237fel42ffa5a8d31ef2ac367d424a
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS

```

5) Run Dev branch

Console Output

```

Started by user engy
> git rev-parse --is-inside-work-tree # timeout=10
Setting origin to https://github.com/engysamy29/Booster\_CI\_CD\_Project.git
> git config remote.origin.url https://github.com/engysamy29/Booster\_CI\_CD\_Project.git # timeout=10
Fetching origin...
Fetching upstream changes from origin
> git --version # timeout=10
> git --version # 'git version 2.11.0'
> git config --get remote.origin.url # timeout=10
> git fetch --tags --progress -- origin +refs/heads/*:refs/remotes/origin/* # timeout=10
Seen branch in repository origin/dev
Seen branch in repository origin/master
Seen 2 remote branches
Obtained Jenkinsfile from cd21f89170c39dcf14a9661ef96bbde05cf396d5
Running in Durability level: MAX_SURVIVABILITY
[Pipeline] Start of Pipeline
[Pipeline] node
Running on slave in /jenkins_home/workspace/project_dev
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Checkout SCM)
[Pipeline] checkout
The recommended git tool is: git
No credentials specified
Fetching changes from the remote Git repository
Fetching without tags
> git rev-parse --is-inside-work-tree # timeout=10
> git config remote.origin.url https://github.com/engysamy29/Booster\_CI\_CD\_Project.git # timeout=10
Fetching upstream changes from https://github.com/engysamy29/Booster\_CI\_CD\_Project.git

```

```
79bde4d54386: Waiting
80ae5eleccd8: Waiting
6d32133e8ce1: Pushed
24d470c6cc7c: Pushed
cdec99512f73: Pushed
5flac4f2cede: Pushed
24a7c2c9bc62: Layer already exists
46a6fbcfe6ac: Layer already exists
001e4a80973b: Layer already exists
2ba5b91ca2b0: Layer already exists
2f37d1102187: Layer already exists
79bde4d54386: Layer already exists
80ae5eleccd8: Pushed
940ee442a0c1: Pushed
v1.0: digest: sha256:4eacd95d1fad55b96dbfde5f011671384f899fac5043fa4279a9263ec4a7ea7 size: 2835
[Pipeline] }
[Pipeline] // withCredentials
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Deploy)
[Pipeline] sh
+ docker run -d -p 6000:3000 engysamy/dajngoo_dev:v1.0
7b48c364a1a62372f352943f87e1e2f023e8af6ff89b0b9a2d080a2223674fa4
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```