

DevOps Project -1

Deployment of Python Flask API framework

- ❖ Write a Code
- ❖ Test the code
- ❖ Build the image
- ❖ Deployment

Pre-requisites

- ✓ Gitbash on local pc – Write Code and Commit to GitHub.
- ✓ GitHub account – Source Code Management
- ✓ Docker hub account – To push/pull images
- ✓ Oracle VM/Linux System
 - (Jenkins + Docker + bridge Network in VM.) -CI/CD automation
- ✓ Putty on local pc – Connect to Jenkins VM.

Overview

1. From GitBash write a Code
2. Push the code to GitHub
3. Pull the code from GitHub to Jenkins Server /Console
4. Code test and Build the docker image from Jenkins Console
5. Create Container from the same Image and run it.
6. Access the URL.

Key Points

- Jenkins - Port 8080
- Python Flask API – Port 5000
- We use Jenkins for entire CI/CD pipeline automation.
- We can use Pytest for testing and other tools else implement manually.

Gitbash contents

```
balaj@Balaji MINGW64 ~/OneDrive/Documents/devops projects/app123 (main)
$ ll
total 5
-rw-r--r-- 1 balaj 197609 132 Aug 29 20:42 Dockerfile
-rw-r--r-- 1 balaj 197609 19 Aug 12 11:17 README.md
-rw-r--r-- 1 balaj 197609 219 Aug 29 21:10 app.py
-rw-r--r-- 1 balaj 197609 209 Aug 29 21:00 app.py_old
-rw-r--r-- 1 balaj 197609 83 Aug 18 12:22 test_app.py
```

```
balaj@Balaji MINGW64 ~/OneDrive/Documents/devops projects/app123 (main)
$ pwd
/c/Users/balaj/OneDrive/Documents/devops projects/app123
```

Note: ignore app.py_old file.

Code written by Developer from local pc

expected result is - /info and /phone should return the output from URL at the end.

```
balaj@Balaji MINGW64 ~/OneDrive/Documents/devops projects/app123 (main)
```

```
$ cat app.py
from flask import Flask
```

```
app = Flask(__name__)
```

```
@app.route("/info")
def lwinfo():
    return "iam balaji-gv from scb chennai"
```

```
@app.route("/phone")
def lwphone():
    return "9949095520"
```

```
app.run(host="0.0.0.0")
```

```
balaj@Balaji MINGW64 ~/OneDrive/Documents/devops projects/app123 (main)
```

```
$ cat test_app.py
from app import lwphone
```

```
def test_lwphone():
    assert lwphone() == "9949095520"
```

Docker file to build the custom image contains (python3+flask+developercode)

```
balaj@Balaji MINGW64 ~/OneDrive/Documents/devops projects/app123 (main)
```

```
$ cat Dockerfile
FROM redhat/ubi8
```

```
RUN yum install python3 -y
```

```
RUN pip3 install flask
```

```
COPY app.py /app.py
```

```
CMD [ "python3" , "/app.py" ]
```

```
balaj@Balaji MINGW64 ~/OneDrive/Documents/devops projects/app123 (main)
```

```
$ date
Sat Aug 30 08:07:38 IST 2025
.....
```

Docker hub info

User - 1601071

Repository - 1601071/balaji_hub:it

Note: repository is a pre-requisite before pushing the image to docker hub

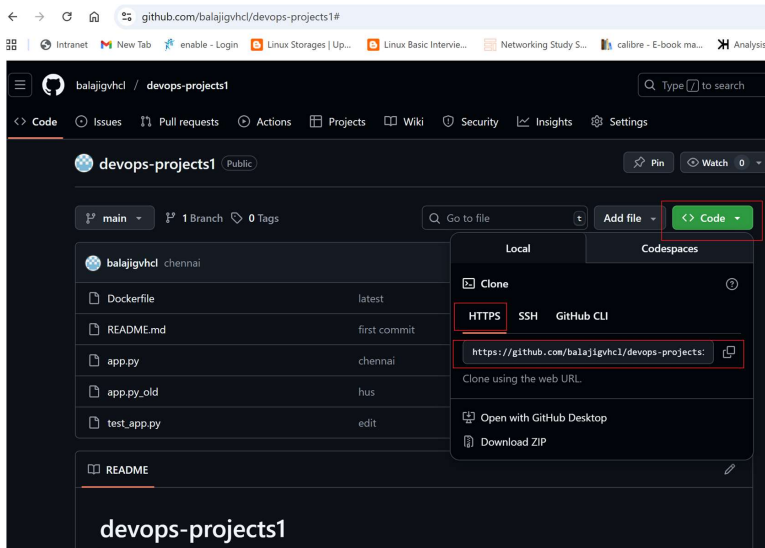
It – is the tag name for the image.

Repository should be made public

GitHub info

This acts as SCM – Source Code Management, Jenkins will keep checking the SCM for latest code for any deployment activity.

Post code commit from gitbash, you can see the list of files shown in the pic, similar to the local pc content.



Jenkins info


Username – devops created while installation itself, along with port no.

Create a job name and update the details


We can see the workspace for each job and its contents.


Configure button – to configure and save

Build button – to deploy

 **Jenkins** / myappjob1 ▾ / Configuration

Configure **General**

 General

 Source Code Management

Description

this is my first devops project 1

Source Code Management

Connect and manage your code repository to automatically pull the latest code for your builds.

☐ None

☒ Git ?

Repositories ?

Repository URL ?

https://github.com/balajigvhcl/devops-projects1.git

Branches to build ?


Branch Specifier (blank for 'any

*/main

← → ↺ 🏠

⚠ Not secure 192.168.0.105:8080/job/myappjob1/ws/

📁 Intranet 🌐 New Tab ⚙ enable - Login 📁 Linux Storages | Up... 📁 Linux Basic Intervie... 📁 Networking Study S... 📁 calibr

 **Jenkins**

myappjob1 ▾ / Workspace of myappjob1 ...

Status

<> Changes

Workspace

🗑 Wipe Out Current Workspace

▶ Build Now

⚙ Configure

🗑 Delete Project

✎ Rename

Workspace of myappjob1 on Built-In Node

myappjob1 / →

__pycache__

.git

pytest_cache

app.py

app.py_old

Dockerfile

README.md

test_app.py

Aug 29, 2025, 9:11:13 PM

Aug 29, 2025, 9:02:20 PM

Aug 29, 2025, 8:44:03 PM

Aug 23, 2025, 5:47:12 PM

Aug 23, 2025, 5:47:12 PM

206 B

197 B

122 B

19 B

79 B

🔗

🔗

🔗

🔗

🔗

[📁 \(all files in zip\)](#)

Build script content

```
sudo docker login -u 1601071 -p xxx registry-1.docker.io
sudo docker build -t 1601071/balaji_hub:lt .
sudo docker push 1601071/balaji_hub:lt
sudo docker run -dit --name contrn-1 1601071/balaji_hub:lt
```

1. login to docker registry with your credentials
2. building the image under the docker hub repo
3. pushing the custom image to respective docker hub repo.
4. Running the container from the custom image from dockerhub.

Save

Click the build button and open the console output to see the log.

Dashboard - Jen...

balajigv@devops: ~

1601071/balaji_h...

Error writing t...

docker login: we...


containers/comm...

10.88.0.2

⚠ Not secure 192.168.0.105:8080

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 **Jenkins**

+ New Item

📁 Build History

Build Queue

Build Executor Status

All +

S	W	Name	Last Success	Last Failure	Last Duration
🟢	☁	myapp-1	11 days #14	11 days #13	0.92 sec
🟢	☁	myappjob1	11 hr #67	11 hr #65	26 sec

BALAJI GV

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Once build is success, you can see the console ouput similar to this.

```
Started by user devops-projects
Running as SYSTEM
Building in workspace /var/lib/jenkins/workspace/myappjob1
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/myappjob1/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/balajigvhcl/devops-projects1.git # timeout=10
Fetching upstream changes from https://github.com/balajigvhcl/devops-projects1.git
> git --version # timeout=10
> git --version # 'git version 2.47.3'
> git fetch --tags --force --progress -- https://github.com/balajigvhcl/devops-projects1.git +refs/heads/*:refs/remotes/origin/* #
timeout=10
> git rev-parse refs/remotes/origin/main^[commit] # timeout=10
Checking out Revision 009317afefa102af9845e8ddb716e3e4607d594e (refs/remotes/origin/main)
> git config core.sparsecheckout # timeout=10
> git checkout -f 009317afefa102af9845e8ddb716e3e4607d594e # timeout=10
Commit message: "latest"
> git rev-list --no-walk 009317afefa102af9845e8ddb716e3e4607d594e # timeout=10
[myappjob1] $ /bin/sh -xe /tmp/jenkins1470993903376214481.sh
+ sudo docker login -u 1601071 -p xx registry-1.docker.io
Login Succeeded!
+ sudo docker build -t 1601071/balaji_hub:lt .
STEP 1/5: FROM redhat/ubi8
STEP 2/5: RUN yum install python3 -y
--> Using cache b9dcb92df76448148406750a817c98e5b700f3410708da7bb8d8a902667db4a5
--> b9dcb92df764
STEP 3/5: RUN pip3 install flask
--> Using cache 9b55689709ba67579145a68d1d5502282ca8ba75c3eeea58a0da57b1341e5ae1
--> 9b55689709ba
STEP 4/5: COPY app.py /app.py
--> Using cache e01c4acf4707f2b299aca85fc88e3a751223d7d709ec1217728b05865e10cb5
--> e01c4acf470
STEP 5/5: CMD [ "python3", "/app.py" ]
--> Using cache ef67ed7d63dda6b764de5a917f164dcf5d5022f8e015d82034c38cb5a64cabf9
COMMIT 1601071/balaji_hub:lt
--> ef67ed7d63dd
Successfully tagged localhost/1601071/balaji_hub:lt
Successfully tagged localhost/1601071/balaji_hub:new_release
Successfully tagged localhost/1601071/balaji_hub:v1
ef67ed7d63dda6b764de5a917f164dcf5d5022f8e015d82034c38cb5a64cabf9
+ sudo docker push 1601071/balaji_hub:lt
Getting image source signatures
Copying blob sha256:d64abcee6e4db7e32a65746ebb9a1ba4cf9fa93685b9a68a1413a383015fbca1
Copying blob sha256:a251e76744259d826503539dbbd24000dcbdef5e64ce2183af2b3023ce1d3850
Copying blob sha256:b50462d6e59e625208d1be74bd561a22e7f6f78c007929242097c30ad43ed394
Copying blob sha256:eb498ee8e3450a9f736c3454a06b2279d8d5a52fbcaaf4e6ba17542d05ed5f9e
Copying config sha256:ef67ed7d63dda6b764de5a917f164dcf5d5022f8e015d82034c38cb5a64cabf9
Writing manifest to image destination
+ sudo docker run -dit --name contrn-1 1601071/balaji_hub:lt
time="2025-08-29T20:55:37+05:30" level=warning msg="The input device is not a TTY. The --tty and --interactive flags might not work properly"
c7e97c35200d3119baaa7097245de9cde18973da3c236fbd0a278f4d3074fb76
[myappjob1] $ /bin/sh -xe /tmp/jenkins1815714825077173398.sh
Finished: SUCCESS
```

Commented [BG1]: Password striked you can also run this command in your jenkins pc before running the build from console like below
 sudo docker login -u 1601071 -p xx registry-1.docker.io

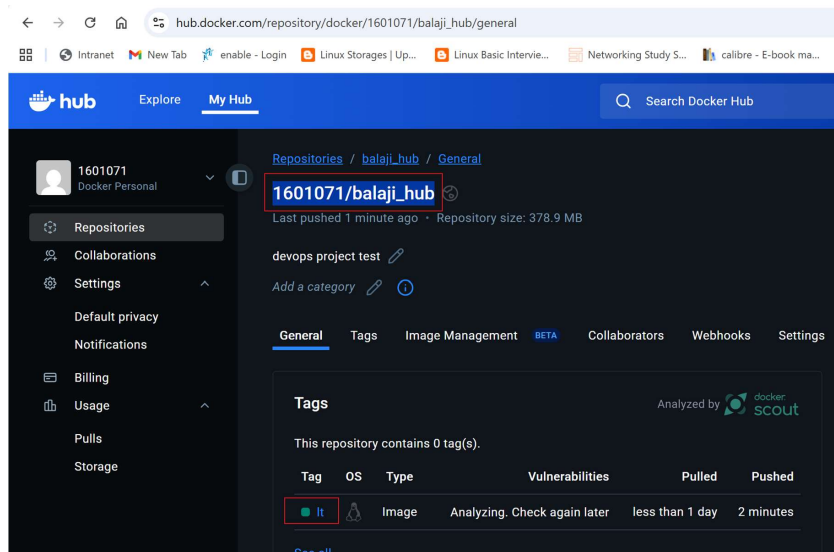
You can edit the code and commit it again and run the build, before that remove the existing container of same name. FYI.

```
sudo docker rm -f contrn-1
```

image is successfully created locally.

```
[root@balajipc ~]# docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
localhost/1601071/balaji_hub  lt                 94281ef15ce1       12 hours ago       593 MB
<none>              <none>             e5361614a0fc       12 hours ago       593 MB
localhost/1601071/balaji_hub  new_release        ef67ed7d63dd       14 hours ago       593 MB
localhost/1601071/balaji_hub  v1                 ef67ed7d63dd       14 hours ago       593 MB
docker.io/redhat/ubi8         latest             0ce92d409ef0       3 days ago         205 MB
[root@balajipc ~]#
```

Same image is pushed to docker hub



We can see the container is running now (contr-1)

```
[root@balajipc ~]# docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS        PORTS        NAMES
55b16580fc98  localhost/1601071/balaji_hub:lt    python3 /app.py         12 hours ago  Up 12 hours  -            contrn-1
[root@balajipc ~]#
```

IP address of the container

```
[root@balajipc ~]# docker inspect contrn-1 |grep -i IPAddress
"IPAddress": "10.88.0.4",
```

Now finally test the API working successfully

```
[root@balajipc ~]# curl http://10.88.0.4:5000/info
iam balaji-gv from scb chennai [root@balajipc ~]#
[root@balajipc ~]#
[root@balajipc ~]# curl http://10.88.0.4:5000/phone
9949095520 [root@balajipc ~]#
[root@balajipc ~]# date
Sat Aug 30 09:02:12 AM IST 2025
[root@balajipc ~]#
```

End