JenkinsDSL System

Solution Shortly

JenkinsDSL System will run on ORACLE VirtualBox VM

Jenkins will run as a docker inside the VM

flask and nginx containers will run in jenkins container

In dedicated isolated subnet

Requirements

See requirements in the link in the tests mail

Question: 1/1

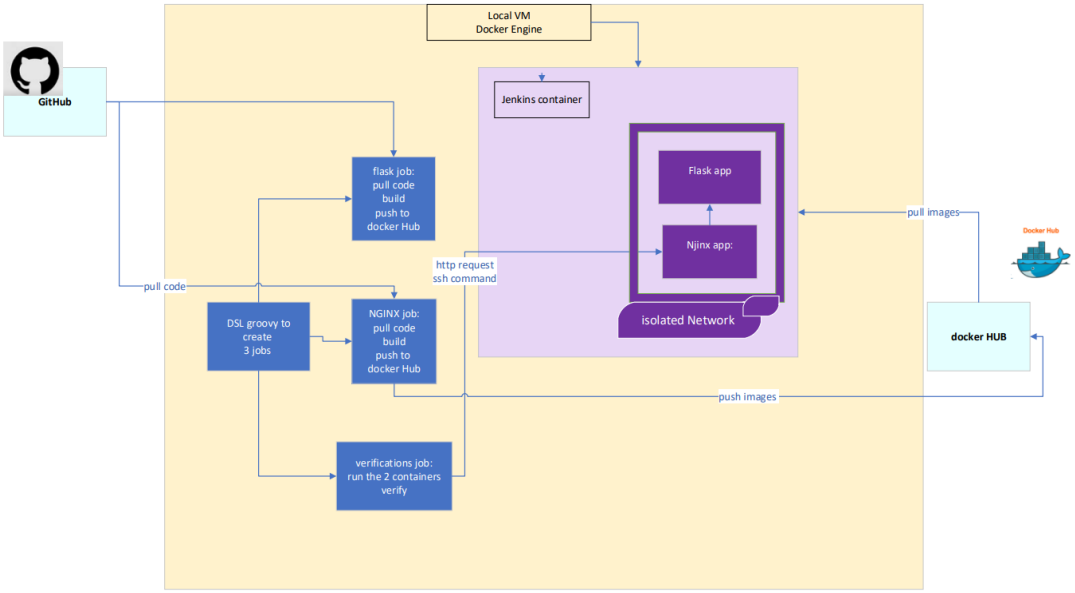
The task will require the following items
a Jenkins groovy file that creates jobs (look for job DSL plugin).
Items :

1. Jenkins groovy file creates a pipeline job that pulls code from your GitHub repo.
2. Build a docker container and push it to the docker hub.
3. The docker it builds is a python (flask simple web application that talks to the local docker engine and gets the list of running containers)
4. Another job that takes a default Nginx docker file and modifies it, and pushes a proxy pass to the first container (and injects in the request headers a source IP), then pushes the container to the docker hub
5. A third job that runs the two containers and exposes the Nginx container ports only on the local Jenkins machine then sends a request to verify the request has gone ok and finishes successfully

In the end, push everything to your Github project.
Write the link on the right side of the screen in the text editor.

ARCHITECTURE DIAGRAM

JenkinsDSL demo System



CODE STRUCTURE

Github repository

https://github.com/BaruchiHalamish20/jenkinsDSL

TestsAndInstallation

Include this document to describe all system technical details

Jenkins

General

The purpose of this folder is to run the main jenkins container and to share its IP Address

Files in this folder

- docker instalation files
- Scripts to be run by jobs and other containers

scripts

Jenkins\nginxVerification.sh - verify nginx connectivity

docker-compose:

Create private network

FLASK

General

The purpose of this folder is to run the flask container

Files in this folder

- docker instalation files
- Application files

NGINX

General

The purpose of this folder is to run the flask container

Files in this folder

- docker instalation files
- Application files

Scripts

Nginx\start.sh set dynamic target SERVER IP

This script will run as part of the docker-compose

Installation Instaructions

General

The system created using ORACLE VirtualBox

All containers are running on 1 VM

VM Details

OS : ubuntu 22.04

ISO file : ubuntu-22.04-desktop-amd64

Docker installation

Install following docker and docker-compose v

- Docker Engine – 20.10.22
- docker-compose – 1.29.2

Verify docker installation

Follow Appendix subject “Docker installation on the VM“

Add baruchih account to docker group

Jenkins Installation

Login to the VM using baruchih account

Commands to run:

git clone https://github.com/BaruchiHalamish20/jenkinsDSL

cd jenkins

./start.sh

Note:

- ***jenkins with docker-compose will run as container***
- ***image used : bhalamish100/bjenkins***
- ***This image was created based on jenkins + docker + docker-compose***

Post installation setup (plugins / secrets / users/ first job) -

Follow “Jenkins setup” in Appendix

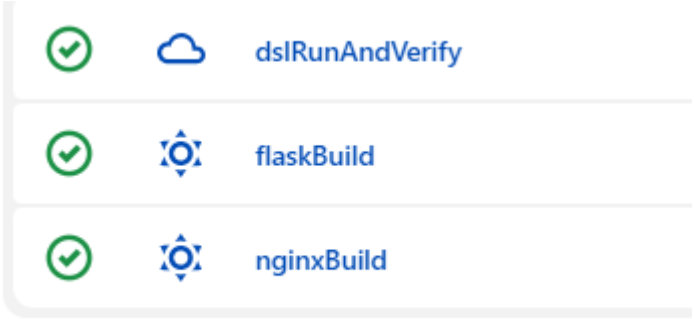
Expected results:

Jenkins installed and run on port 8300

Running JenkinsDSL System

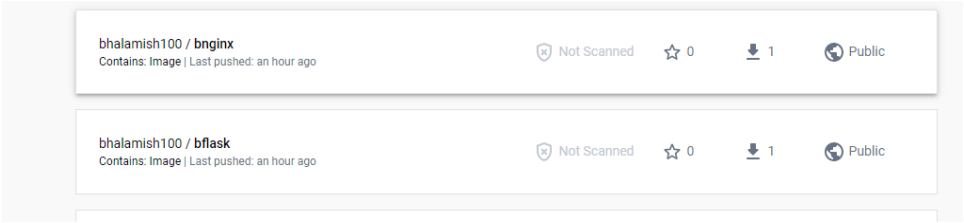
Run job: dslPipelineGroovy

Expected results:
3 new jobs will be created:



In docker Hub

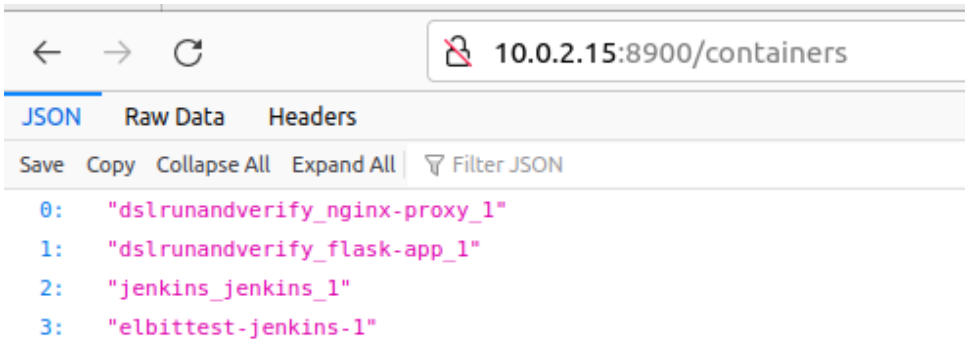
2 images will be created:



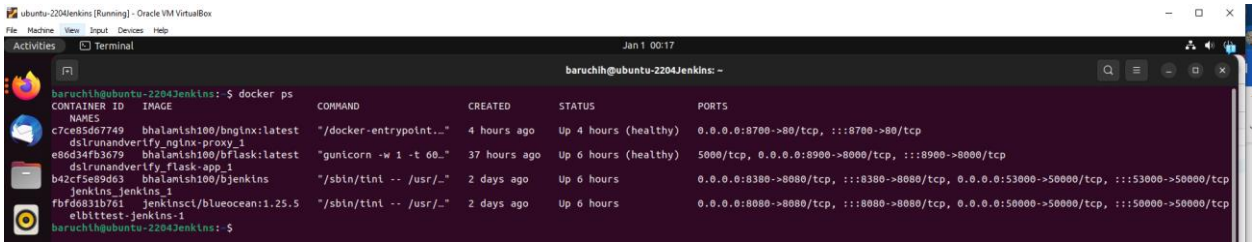
Tests

Flask Connection

Web browser on port 8900

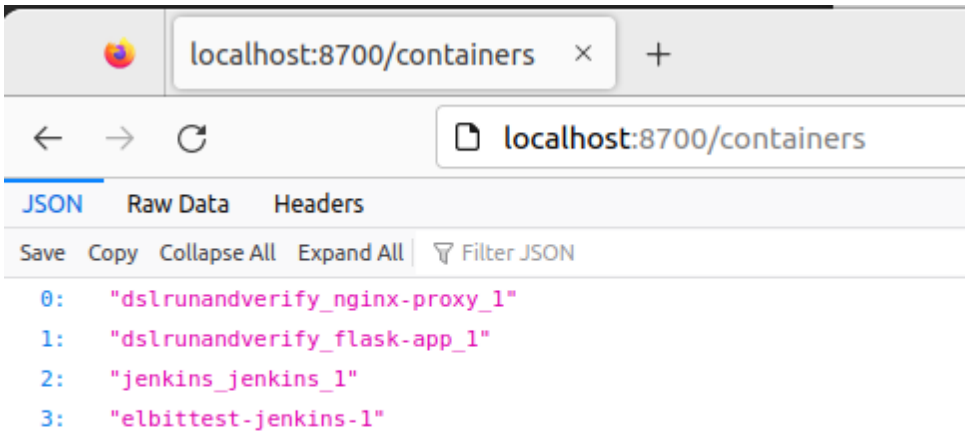


Compare to docker running containers :



NGINX routing

Web browser on port 8700



Security using private network

The 3 containers are running in private sub-net:

```
baruchih@ubuntu-2204Jenkins:~$ docker network inspect jenkins_jenkins_isolated
[
    {
        "Name": "jenkins_jenkins_isolated",
        "Id": "58a8491a091812f02ed76a37765cddd48e9b48980dae4176c5402254847553ba",
        "Created": "2022-12-29T12:51:28.467022531+02:00",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "172.20.0.0/16",
                    "Gateway": "172.20.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": true,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "b42cf5e89d6397d915272ce1f1a65741379c099e3cd27fd57e5c0289edda923b": {
                "Name": "jenkins_jenkins_1",
                "EndpointID": "479858aa8b443ad8189078303e98cb739ba3842e618263c2ba06894912a52e4a",
                "MacAddress": "02:42:ac:14:00:04",
                "IPv4Address": "172.20.0.4/16",
                "IPv6Address": ""
            },
            "c7ce85d677494ccc71132ac3c0c9d34fe87f91f3ab7673d79503aa47ad373acd": {
                "Name": "dslrunandverify_nginx-proxy_1",
                "EndpointID": "df161db39906a11d8bc0d9b1f8c98e900555e3c38bb3b53a9bb8862618d0fa83",
                "MacAddress": "02:42:ac:14:00:02",
                "IPv4Address": "172.20.0.2/16",
                "IPv6Address": ""
            },
            "e86d34fb3679c6358e1805093fefbd77fae3cb28004616ace7a0a5a26f0b6333": {
                "Name": "dslrunandverify_flask-app_1",
                "EndpointID": "c942c367ba2a58fcbffdb8863784a680dfa492ce206e5621da6a0ae432a7653c",
                "MacAddress": "02:42:ac:14:00:03",
                "IPv4Address": "172.20.0.3/16",
                "IPv6Address": ""
            }
        },
        "Options": {},
        "Labels": {
            "com.docker.compose.network": "jenkins_isolated",
            "com.docker.compose.project": "jenkins",
            "com.docker.compose.version": "1.29.2"
        }
    }
]
baruchih@ubuntu-2204Jenkins:~$
```

Appendix

Installing and setting ORACLE VirtualBox 7.0

Follow link: https://www.debugpoint.com/install-ubuntu-virtualbox/

Setting VM

Add New VM

ISO file: ubuntu-22.04-desktop-amd64

Note

This version support docker and docker-compose

Account: baruchih

Ability to Copy / paste:

Follow link:

https://gist.github.com/magnetikonline/1e7e2dbd1b288fecf090f1ef12f0c80b

Adding baruchih to sudo and docker groups:

as root:

sudo usermod -aG sudo baruchih

sudo usermod -aG docker baruchih

Start VM, goto Devices - Insert Guest Additions CD image to mount the ISO image.

On the ORACLE BOX:
Start VM, goto Devices - Insert Guest Additions CD image to mount the ISO image.

From the terminal, run the following commands:

$ sudo su

$ apt install gcc make

$ mkdir --parents /media/cdrom

$ mount /dev/cdrom /media/cdrom

$ /media/cdrom/VBoxLinuxAdditions.run

$ reboot

After reboot:

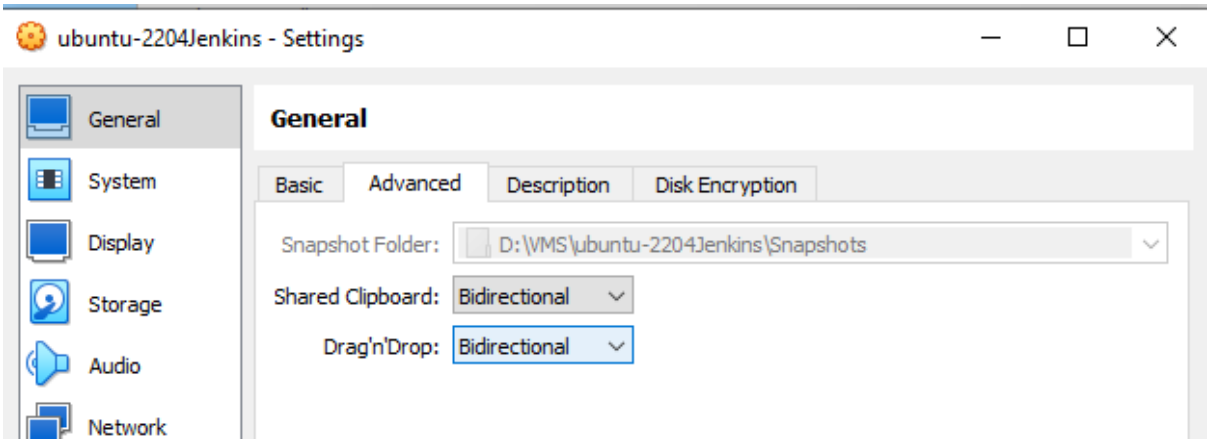
$ modinfo vboxguest

$ sudo usermod --append --groups vboxsf -- "$USER"

$ cat /etc/group | grep "$USER"

Other settings

Copy-Paste



Installing OpenSSh

https://www.cyberciti.biz/faq/ubuntu-linux-install-openssh-server/

Docker installation on the VM

Verify that below versions exist after docker and docker-compose installation:

```
baruchih@ubuntu-2204Jenkins:~$ docker version
Client: Docker Engine - Community
 Version:           20.10.22
 API version:       1.41
 Go version:        go1.18.9
 Git commit:        3a2c30b
 Built:             Thu Dec 15 22:28:04 2022
 OS/Arch:           linux/amd64
 Context:           default
 Experimental:      true

Server: Docker Engine - Community
 Engine:
  Version:          20.10.22
  API version:      1.41 (minimum version 1.12)
  Go version:       go1.18.9
  Git commit:       42c8b31
  Built:            Thu Dec 15 22:25:49 2022
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.6.14
  GitCommit:        9ba4b250366a5ddde94bb7c9d1def331423aa323
 runc:
  Version:          1.1.4
  GitCommit:        v1.1.4-0-g5fd4c4d
 docker-init:
  Version:          0.19.0
  GitCommit:        de40ad0
baruchih@ubuntu-2204Jenkins:~$ docker-compose version
docker-compose version 1.29.2, build unknown
docker-py version: 5.0.3
CPython version: 3.10.6
OpenSSL version: OpenSSL 3.0.2 15 Mar 2022
baruchih@ubuntu-2204Jenkins:~$
```

Jenkins Setup

Once jenkins is up and running config jenkins:

Get key from start log as below or from inside the container:

/var/jenkins_home/secrets/initialAdminPassword

In docker-compose log, watch for this number and register it once login:

jenkins_1 | **

jenkins_1 | Jenkins initial setup is required. An admin user has been created and a password generated.

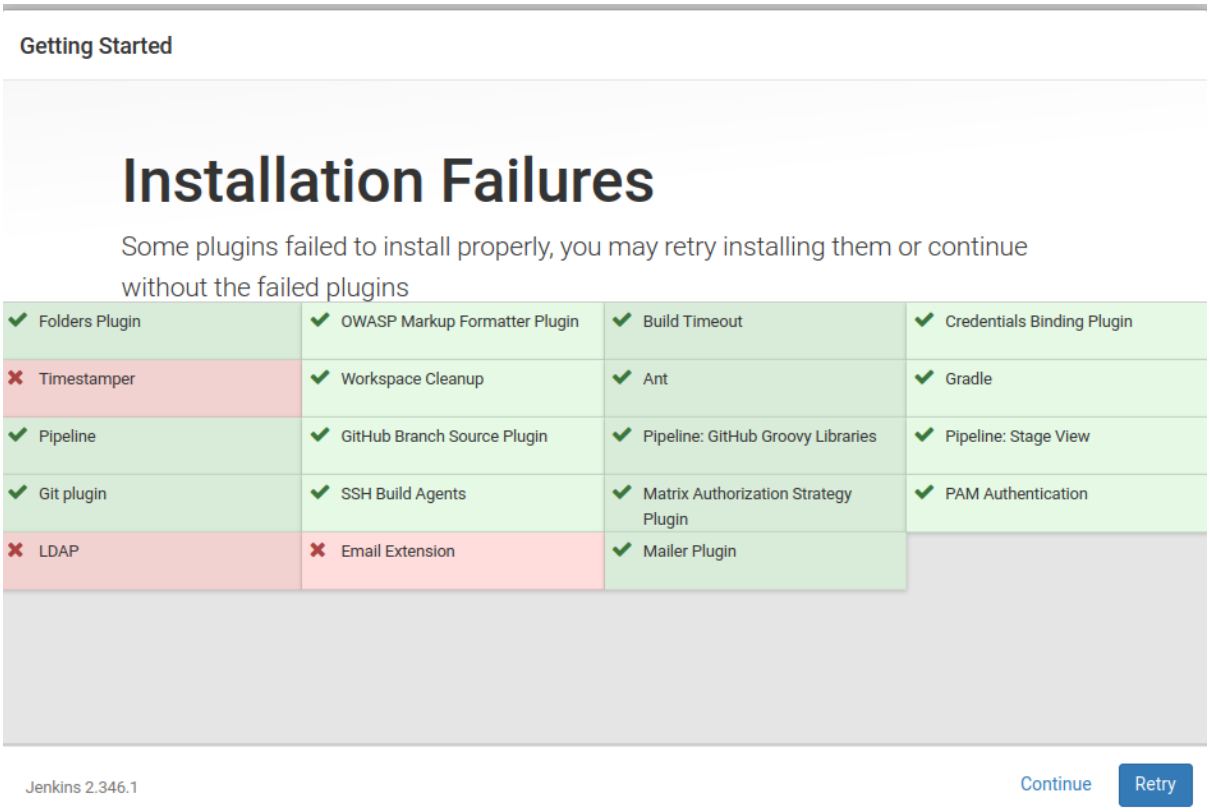
jenkins_1 | Please use the following password to proceed to installation:

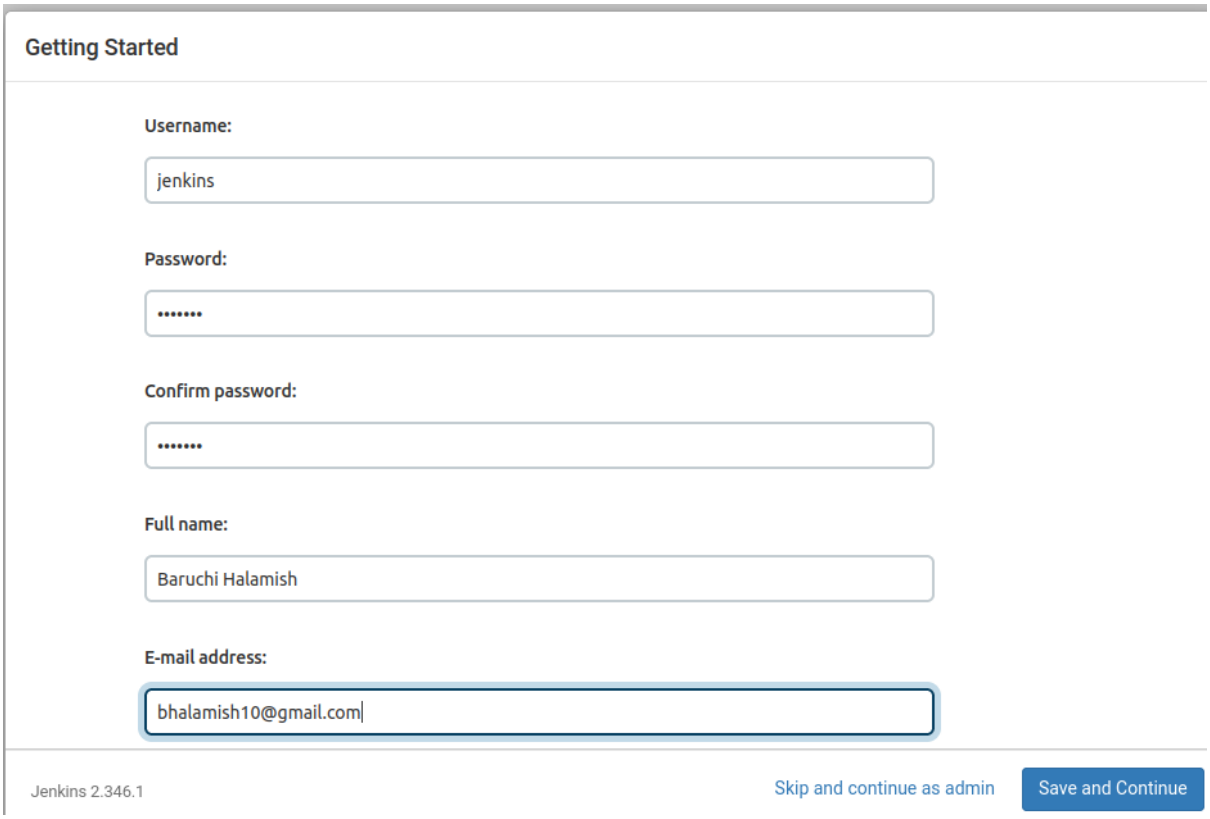
jenkins_1 | c96215e954014e57a622ddf42142c522

jenkins_1 | This may also be found at: /var/jenkins_home/secrets/initialAdminPassword

jenkins_1 | **

Customize jenkins -> installed suggested plugins


Getting Started
Installation Failures
Some plugins failed to install properly, you may retry installing them or continue without the failed plugins
Folders Plugin
OWASP Markup Formatter Plugin
Build Timeout
Credentials Binding Plugin
Timestamper
Workspace Cleanup
Ant
Gradle
Pipeline
GitHub Branch Source Plugin
Pipeline: GitHub Groovy Libraries
Pipeline: Stage View
Git plugin
SSH Build Agents
Matrix Authorization Strategy Plugin
PAM Authentication
LDAP
Email Extension
Mailer Plugin
Jenkins 2.346.1
Continue
Retry


Getting Started
Username:
jenkins
Password:
Confirm password:
Full name:
Baruchi Halamish
E-mail address:
bhalamish10@gmail.com
Jenkins 2.346.1
Skip and continue as admin
Save and Continue

Instance configuration

Jenkins URL : http://localhost:8380/

Restart and wait

Checking jenkins log :

From VM desktop ,

Find jenkins process and run command:

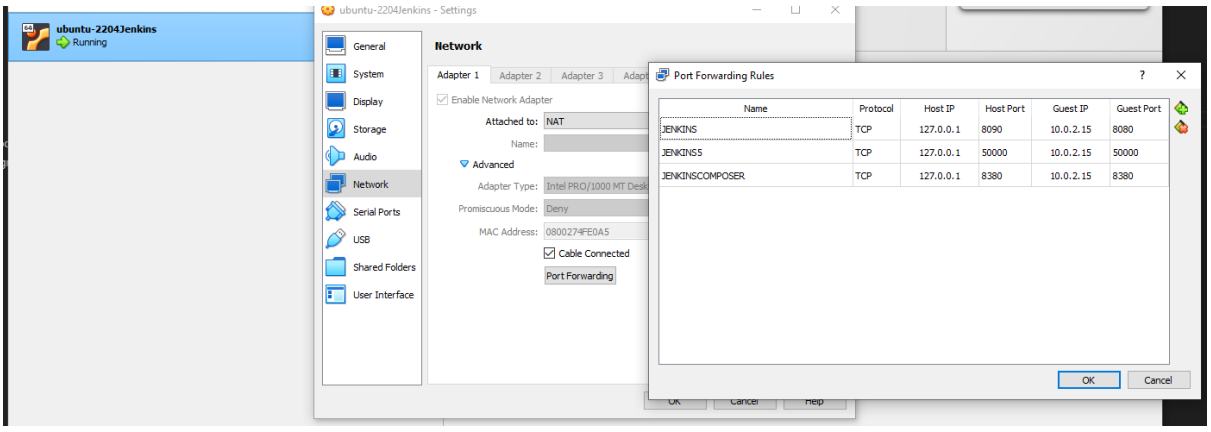
docker logs jenkins_jenkins_1 -f --since 2m

Verify this line in jenkins log:

2022-12-29 11:09:19.151+0000 [id=22] INFO hudson.lifecycle.Lifecycle#onReady: Jenkins is fully up and running

Expose jenkins ports from the VM to local pc:

On ORACLE VirtualBox:



Install other plugins:

Pipeline: Supporting APIs	workflow-support plugin is already installed. Jenkins needs to be restarted for the update to take effect.
Durable Task	durable-task plugin is already installed. Jenkins needs to be restarted for the update to take effect.
Pipeline: Nodes and Processes	workflow-durable-task-step plugin is already installed. Jenkins needs to be restarted for the update to take effect.
Pipeline: Model API	pipeline-model-api plugin is already installed. Jenkins needs to be restarted for the update to take effect.
Pipeline: Declarative Extension Points API	pipeline-model-extensions plugin is already installed. Jenkins needs to be restarted for the update to take effect.
Pipeline: Stage Tags Metadata	pipeline-stage-tags-metadata plugin is already installed. Jenkins needs to be restarted for the update to take effect.
Pipeline: Declarative	pipeline-model-definition plugin is already installed. Jenkins needs to be restarted for the update to take effect.
Pipeline: Basic Steps	workflow-basic-steps plugin is already installed. Jenkins needs to be restarted for the update to take effect.

	Docker Version 1.2.10

Restart docker container !!!

On console , find container name and restart.

Here is an example:

docker restart jenkins_jenkins_1

Manage Credentials -> global

Add below credentials:

Github user:

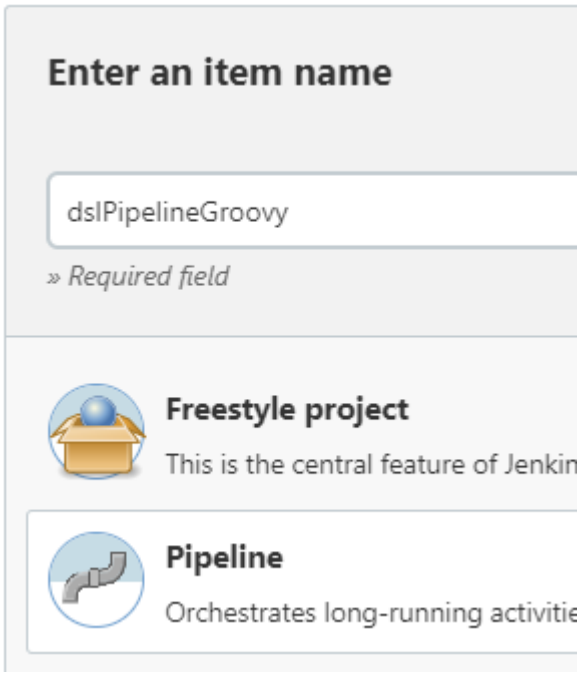
- Id: 70da42b3-4632-4314-bcf5-522c5866760d
- Github user with access to https://github.com/BaruchiHalamish20/jenkinsDSL

DockerHub user:

- Id: dockerhubc
- Dockerhub user

Add dslPipelineGroovy JOB

dslPipelineGroovy Type: Pipeline



Script form SCM: GIT

GITHUB: https://github.com/BaruchiHalamish20/jenkinsDSL

Credential: git

Branch: */main

Script Path: dslPipeline.groovy

Note:

Make sure to uncheck Use Groovy Sandbox

Build this job

If you has an error of Approval by Admin – Approve it

You will get 3 jobs: