**DevOps Position Hands-on Test Solution**

# High-Level Design

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# Detailed Solution

## Install Oracle VirtualBox

1. Download installer from: <https://download.virtualbox.org/virtualbox/6.1.30/VirtualBox-6.1.30-148432-Win.exe>
2. Install VirtualBox

## Download CentOs 8

1. Download rpm from: <http://centos.spd.co.il/8.5.2111/isos/x86_64/CentOS-8.5.2111-x86_64-dvd1.iso>

## Create VM and Install CentOs 8

1. Create VM named: CentOs8, Memory Size: 4096 MB, File Size: 100 GB, Operating System Type: Linux, Operating System Version: Red Hat (64 bit)
2. Update Settings to use Storage 🡪 Optical Drive: the downloaded .iso file
3. Start the VM
4. Install OS including setup of root user

## Upgrade system

1. Open Terminal and execute:

[root@localhost ~]# yum -y update && yum install -y \

yum-utils \

gcc \

openssl-devel \

bzip2-devel \

libffi-devel \

zlib-devel \

readline-devel \

tk-devel \

tcl-devel \

sqlite-devel \

wget \

unzip \

zip \

less \

sudo \

net-tools \

bind-utils \

tcsh \

passwd \

which \

openssh \

openssh-clients \

openssh-server \

openssl \

openssl-libs \

java-1.8.0-openjdk \

epel-release \

jq \

nfs-utils \

tar

## Expose ports: 22 and 8080

1. Since I’m using Network Adapter type: NAT, I need to port forwarding.
2. Open Terminal and execute:

[root@localhost ~]# ip addr show

1: lo: <LOOPBACK,UP,LOWER\_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000

link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00

inet 127**.**0**.**0**.**1/8 scope host lo

valid\_lft forever preferred\_lft forever

inet6 ::1/128 scope host

valid\_lft forever preferred\_lft forever

2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER\_UP> mtu 1500 qdisc fq\_codel state UP group default qlen 1000

link/ether 08:00:27:da:53:e9 brd ff:ff:ff:ff:ff:ff

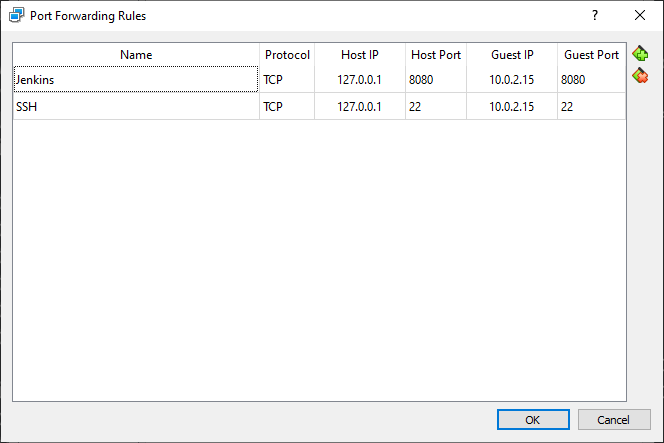
inet 10**.**0**.**2**.**15/24 brd 10**.**0**.**2**.**255 scope global dynamic noprefixroute enp0s3

valid\_lft 84393sec preferred\_lft 84393sec

inet6 fe80::a00:27ff:feda:53e9/64 scope link noprefixroute

valid\_lft forever preferred\_lft forever

1. Getting the IPv4 of the enp0s3 network: 10.0.2.15
2. Open VirtualBox Settings 🡪 Network 🡪 Advanced 🡪 Port Forwarding
3. Setup as below:



1. Reboot system

## Enable SSH Access on the VM

1. Open Terminal and execute:

[root@localhost ~]# systemctl status sshd

1. If inactive, execute:

[root@localhost ~]# systemctl start sshd

1. Check port by execute:

[root@localhost ~]# cat /etc/ssh/sshd\_config | grep Port

1. If the port is different from 22, change it and restart service
2. Finally, enable sshd to start sutomatically after each system reboot by execute:

[root@localhost ~]# systemctl enable sshd

1. Back to laptop, open Command Line and execute:

C:\Users\mronen\Downloads>ssh -p 22 root@localhost**.**localdomain

root@localhost**.**localdomain's password:

Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Jan 14 14:09:32 2022

[root@localhost ~]#

1. SSH Connection Established

## Install package: Python3

1. Open Terminal and execute:

[root@localhost ~]# cd /usr/src

[root@localhost ~]# sudo wget https://www.python.org/ftp/python/3.7.12/Python-3.7.12.tgz

[root@localhost ~]# tar xzf Python-3.7.12.tgz

[root@localhost ~]# cd /usr/src/Python-3.7.12

[root@localhost ~]# ./configure --enable-optimizations

**.**

**.**

**.**

[root@localhost ~]# make altinstall

**.**

**.**

**.**

[root@localhost ~]# rm -rfv /usr/src/Python-3.7.12.tgz

[root@localhost ~]# ln -s /usr/local/bin/python3.7 /usr/bin/python3.7

[root@localhost ~]# ln -s /usr/local/bin/python3.7 /usr/bin/python3

[root@localhost ~]# /usr/bin/python3 --version

Python 3**.**7**.**12

[root@localhost ~]# /usr/bin/python3 -m pip install --upgrade pip==20.2.4

## Install packages: docker, docker-compose

1. Install docker

[root@localhost ~]# yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo

[root@localhost ~]# yum install docker-ce docker-ce-cli containerd.io

[root@localhost ~]# systemctl start docker

1. Verify docker

[root@localhost ~]# docker --version

Docker version 20**.**10**.**12, build e91ed57

1. Execute docker Linux post installation (Reference: [link](https://docs.docker.com/engine/install/linux-postinstall/))
2. Install docker-compose (Reference: [link](https://docs.docker.com/compose/install/))

[root@localhost ~]# curl -L "https://github.com/docker/compose/releases/download/1.29.2/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose

[root@localhost ~]# chmod +x /usr/local/bin/docker-compose

[root@localhost ~]# ln -s /usr/local/bin/docker-compose /usr/bin/docker-compose

1. Verify docker-compose

[root@localhost ~]# docker-compose --version

docker-compose version 1**.**29**.**2, build 5becea4c

## Verify docker by running hello-world image

1. Verify docker by running hello-world image (from non-root user: mronen)

[mronen@localhost ~]# docker run hello-world

Unable to find image 'hello-world:latest' locally

latest: Pulling from library/hello-world

2db29710123e: Pull complete

Digest: sha256:975f4b14f326b05db86e16de00144f9c12257553bba9484fed41f9b6f2257800

Status: Downloaded newer image **for** hello-world:latest

Hello from Docker**!**

This message shows that your installation appears to be working correctly**.**

To generate this message, Docker took the following steps:

1**.** The Docker client contacted the Docker daemon**.**

2**.** The Docker daemon pulled the "hello-world" image from the Docker Hub**.**

(amd64)

3**.** The Docker daemon created a new container from that image which runs the

executable that produces the output you are currently reading**.**

4**.** The Docker daemon streamed that output to the Docker client, which sent it

to your terminal**.**

To try something more ambitious, you can run an Ubuntu container with:

$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:

https://hub.docker.com/

For more examples and ideas, visit:

https://docs.docker.com/get-started/

## Create User for Jenkins

1. Open Terminal and execute:

[jenkins@localhost ~]$ useradd Jenkins

[jenkins@localhost ~]$ passwd jenkins

1. Add user Jenkins to sudoers file /etc/sudoers by executing:

[jenkins@localhost ~]$ sudo visudo

Edit file and add entry:

jenkins ALL=(ALL) ALL

1. Create folder under ~/jenkins named: jenkins\_home to store Jenkins data.

Container Jenkins user uid is 1000. Set the new created folder ~/jenkins/jenkins\_home to uid 1000 (Reference: [link](https://hub.docker.com/_/jenkins))

[jenkins@localhost ~]$ cd /home/jenkins

[jenkins@localhost ~]$ mkdir jenkins\_home

[jenkins@localhost ~]$ cd jenkins\_home

[jenkins@localhost ~]$ sudo chown -R 1000:1000 .