

Dell Red Hat Virtual-Lab-in-a-Box Setup

This document will provide the steps necessary to deploy a virtual environment and then virtual machines for a single “server1” and up to 50 “stations”. For a single person environment, 2 stations should be sufficient to complete and test the exercises.

This document will focus on using VMware Workstation v11 on your work laptop. We will not assist you in setting this up on your personal machine. We will assist with Workstation v11/12, vSphere/ESXi v5.5, and vSphere/ESXi v6.0. Other options such as VirtualBox or KVM should work but will not be supported. Behavior in other virtualization/hypervisors is undefined, and may result in lost time, hair, sanity, and/or geek cred.

Installing the “server1” virtual machine is completed using a RHEL 7.2/CentOS 7.2 ISO and then a PostInstall script to automate installation and configuration.

Installing the “station” virtual machines is done via DHCP and PXE. If at any time your station virtual machine stops working, you can simply reboot and PXE boot again to redeploy the station.

Required Software Downloads

Red Hat Enterprise Linux 7.2 Server x86_64 DVD ISO / CentOS 7.2 DVD

<https://dell.app.box.com/s/ykx2wydk0vvopa2ecn1w>

You can also download RHEL from <http://access.redhat.com>

Username: dellsupport

Password: dell_linux

In addition to these downloads, the following files are required to complete the steps below

These files were included in the box.com location with these instructions

RHIAB7_20160229_3.iso

RHIAB_VM_Templates.zip

CentOS-7.x86_64-DVD-1511

rhel-server-7.2-x86_64-dvd

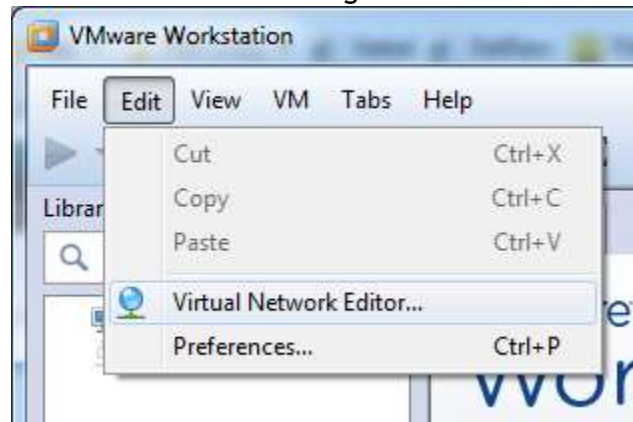
Note:

Any of the steps below which are commands to be run from command line will start with a #

Do not include the # in your typed command

Configuring VMware Workstation

- Install VMware Workstation with Typical Settings
- Edit Virtual Network Settings



- Create a new network by clicking Add Network
 - Select the default network name (for example VMnet2)
- Remember network name for use later on
- Select Host-only
 - Unselect Use local DHCP service to distribute IP address to VMs
 - If no Subnet address is present, add one (use example in screenshot)
- This field is required but will not be used for the purpose of our VMs

Name	Type	External Connection	Host Connection	DHCP	Subnet Address
VMnet0	Bridged	Auto-bridging	-	-	-
VMnet1	Host-only	-	Connected	Enabled	192.168.206.0
VMnet2	Host-only	-	Connected	-	192.168.233.0
VMnet8	NAT	NAT	Connected	Enabled	192.168.89.0

Create “server1” Virtual Machine

Import the OVA file titled “RHIAB_Server”, you will need to customize the Network and CDROM settings.

The first NIC on the server should be connected to NAT, the second NIC on your server should be connected to the Custom Network you configured above.

Create “station1” Virtual Machine

Import the OVA file titled “RHIAB_Workstation”, you will need to customize the Network settings. The NIC should be connected to the Custom Network you configured above.

Informational Passwords

root is the superuser on a Linux system, similar to administrator in Windows. You will need the “root” password to login to your new Server1. That password, and a few others that are used on Station1 are included here:

Station1 credentials

Username: root

Password: P@ssw0rd

Username: student

Password: password

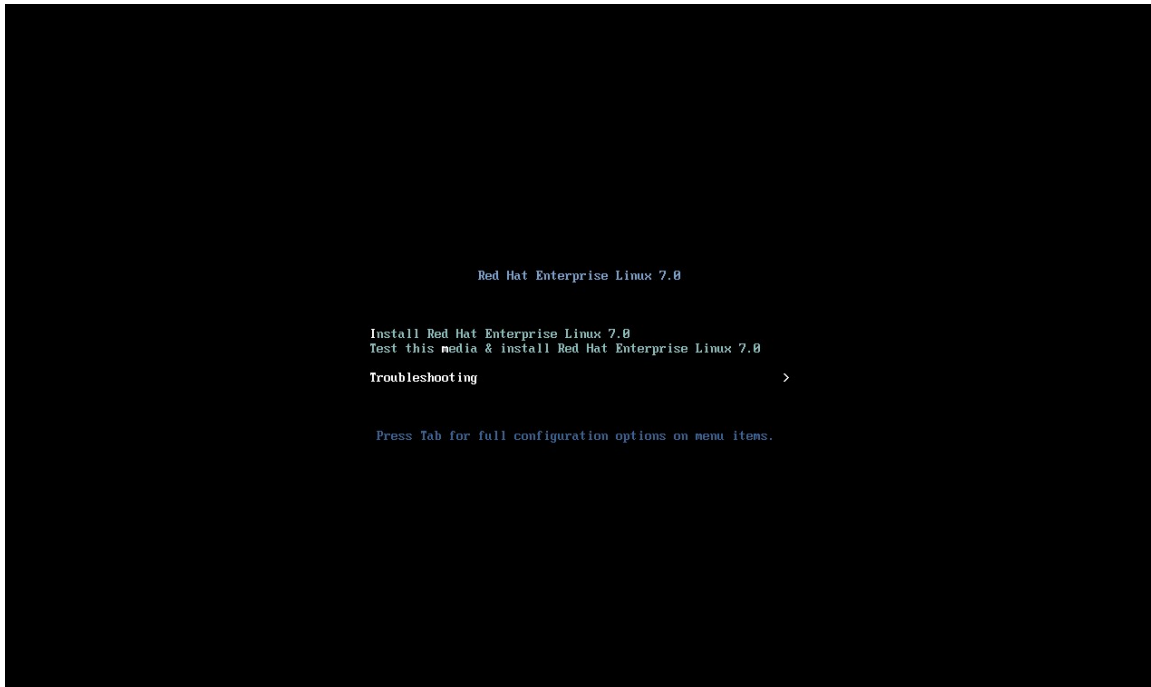
Server1 Credentials

Username: root

Password: you set this during the install

Installing “server1”

1. Select “server1” virtual machine
2. Double Click on CD/DVD (SATA)
3. Select Use ISO image file:
 - A. Browse for the RHEL 7.2-x86_64 ISO
4. Power on your Server1 VM.
 - A. Your VM should automatically boot from the attached RHEL7 ISO.
5. Press “Enter” to start the install.



6. Manually install RHEL v7.2 minimal, taking defaults
7. Boot the VM and copy the RHEL v7.2 installation ISO to it using this command:

```
# cp /dev/sr0 /root/rhel.iso
```

The path/name of the ISO really does not matter, so long as it has the case-insensitive extension ".iso".

8. Attach the ISO titled RHIAB7_20160229_3.iso to your VM.
9. Mount the ISO to the OS

```
# mount /dev/sr0 /mnt
```

10. Run the post install script from /root/

```
# /mnt/postinstall.sh
```

11. Reboot the server1 VM once the post install script has informed you that installation has completed.

At this time, if you like, you can start interacting with server1 using SSH, via PuTTY or any other SSH client

The first network device (likely called "eno16777728") should have a 192.168.89.X address (default IP scheme for a NAT network adapter in VMware Workstation). To show all of the IP addresses that the server holds, run "ip add show" from the server VM.

Installing "stationX"

The "server1" virtual machine should now be ready to provide PXE boot OS installation to your "stationX" virtual machines

1. Power on your “stationX” virtual machine
2. PXE installation should begin automatically within a few seconds.

Installation is now, mostly, automated

If prompted, discard any data for the new virtual hard disks

Reboot if prompted

When Installation is complete, you have a functioning lab environment

Use “stationX” virtual machines to complete learning assignments unless otherwise instructed by a lab

If a “stationX” virtual machine stops functioning, redeploy it by PXE booting again

“server1” Services

Hostname: server1.example.com

NIC1: DHCP

NIC2: 172.26.0.1

Routes through 172.26.0.X to 172.26.X.0/24

This permits the server to reach a second NIC on stationX which are configured for 172.26.x.0/24

LDAP directory services available

Users named guest01-50 and ldapuser exist local and in directory services with a password of redhat.

The cacert for kerberized LDAP is named cert.pem

Sample repo file exists in /var/ftp/pub/materials/server1.repo

Also accessible by

<ftp://server1.example.com/var/ftp/pub/rhel-7.2/dvd>

<http://server1.example.com/pub/rhel-7.2/dvd>

nfs server1:/var/ftp/pub/rhel-7.0/dvd

DHCP configured to assign IP addresses 172.26.0.101-150

DNS

PTR records for 172.26.0.201-250 resolve stationX.example.com

PTR records for 172.26.0.101-150 resolve dhcpX.example.com

dhcpX.example.com resolves to 172.26.0.101-150

stationX.example.com resolves to 172.26.0.201-250

stationX.com resolves to 172.26.0.201-250

TFTP

To provide for PXE boot of student stations

NTP server

NTP is setup to think its own clock is a stratum 3

Check the local time table with "ntpq -pn"

LDAP

LDAP structure exists with non-daemon users

LDAP uses Kerberos Authentication

NFS exports

/var/ftp/pub *(ro, sync)

/home/server1 *(rw, sync)

iSCSI Targets for each station

25M each