**Create VM**

Network

Mgmt IF + build network IF

Disks

OS Disk – 20G

PXE Disk – 50G

Memory 8G

CPU 2 vCPUs

**CentOS 7 minimal install**

Network

Enable mgmt interface with static IPADDR/GATEWAY/SUBNETMASK – eth0

Enable PXE network interface with static IPADDR/GATEWAY/SUBNETMASK-eth1

Enter hostname

Disks

/home – 5GiB ext4 from /dev/hda

/boot – 1024MiB ext4 from /dev/hda

/swap – 8GiB swap from /dev/had

/netboot – 50GiB ext4 from /dev/hdb

/ - <remaining capacity…just leave it blank> ext4 /dev/hda

Login on reboot as root

curl https://packages.microsoft.com/config/rhel/7/prod.repo | tee /etc/yum.repos.d/microsoft.repo

yum update -y

yum install -y epel-release net-tools dos2unix unzip wget sshpass powershell

PXE services installation

*$* yum makecache

Graphical user interface, text

Description automatically generated with medium confidence

Now, install the dnsmasq with the following command:

*$* yum install -y dnsmasq



dnsmasq should be installed.

Graphical user interface, application

Description automatically generated

Now, rename the original **/etc/dnsmasq.conf**file to **/etc/dnsmasq.conf.backup** as follows:

*$* mv -v /etc/dnsmasq.conf /etc/dnsmasq.conf.backup

Text

Description automatically generated

Now, create an empty **dnsmasq.conf** file with the following command:

*$* vi /etc/dnsmasq.conf



Now, type in (or cut/paste) the following lines to the file. Be sure to update the bolded IP details as needed:

interface=eth1

bind-interfaces

domain=GRIC-PXE.local

dhcp-range=eth1,**192.169.71.10,192.169.71.250,255.255.255.0**,2h

dhcp-option=option:router,**192.169.71.1**

dhcp-option=option:dns-server,**8.8.8.8**

enable-tftp

tftp-root=/netboot/tftp

dhcp-boot=pxelinux.0,linuxhint-s80,**192.169.71.2**

pxe-prompt="Press F8 for PXE Network boot.",5

pxe-service=x86PC,"Install OS via PXE",pxelinux

except-interface=eth0

dhcp-leasefile=/var/lib/dnsmasq/dnsmasq.leases

dhcp-script=/etc/dnsmasq.d/log\_ips.sh

Now, create a new directory **/netboot/tftp** for TFTP as follows:

*$* mkdir -p /netboot/tftp



Now, restart the **dnsmasq** service with the following command:

*$* systemctl restart dnsmasq



Configure SELINUX to allow dnsmasq script execution:

vi /etc/selinux/config

Change SELINUX=enabled to SELINUX=disabled

*$* systemctl status dnsmasq



As you can see, dnsmasq service is running.

Text

Description automatically generated

Now, add the dnsmasq service to the system startup as follows:

*$* systemctl enable dnsmasq

Text

Description automatically generated

**Installing and Configuring PXE Bootloader:**

Now, you have to install the PXE bootloader files and copy them over to the TFTP root directory.

To install the PXE bootloader files, run the following command:

*$* yum install -y syslinux



Once syslinux is installed, copy the **pxelinux.0** and **menu.c32** files to the **/netboot/tftp** directory as follows:

*$* cp -v /usr/share/syslinux/{pxelinux.0,menu.c32} /netboot/tftp/

Text

Description automatically generated

Now, create PXE bootloader configuration directory **/netboot/tftp/pxelinux.cfg/** as follows:

*$* mkdir /netboot/tftp/pxelinux.cfg



Now, create PXE bootloader’s default configuration file **/netboot/tftp/pxelinux.cfg/default** as follows:

*$* touch /netboot/tftp/pxelinux.cfg/default



TFTP server is now able to serve all the required bootloader files over the network.

**Installing Apache Web Server:**

To install Apache 2 web server, run the following command:

*$* yum install -y httpd



Apache 2 should be installed.

Text

Description automatically generated

Now, make a directory in the /netboot mount to hold the HTTP delivered install:

*$* mkdir /netboot/www

Edit Apache config file to denote the new HTTP root from the /netboot mount

*$* vi  /etc/httpd/conf/httpd.conf

Replace all /var/www and /var/www/http references in the file with /netboot/www

Now, start the **httpd** service as follows:

*$* systemctl start httpd



Now, check whether the **httpd** service is running as follows:

*$* systemctl status httpd

As you can see, the **httpd** service is running correctly.

Text

Description automatically generated

Now, add the **httpd** service to the system startup with the following command:

*$* systemctl enable httpd

Graphical user interface, text

Description automatically generated

**Preparing Linux Distribution for PXE Boot:**

Now, download the CentOS ISO image with the following command:

$ wget https://vault.centos.org/7.7.1908/isos/x86\_64/CentOS-7-x86\_64-Minimal-1908.iso

It will take a while for the download to complete.

Now, mount the ISO image on the **/mnt** directory as follows:

*$* mount -o loop CentOS-7-x86\_64-Minimal-1908.iso /mnt

Now, create dedicated directories for the Linux OS **/netboot/www/centos7\_1908/**and **/netboot/tftp/centos7\_1908/**as follows:

*$* mkdir -v /netboot/{tftp,www}/centos7\_1908

Text

Description automatically generated with medium confidence

Now, copy the contents of the ISO file to the **/netboot/www/centos7\_1908/** directory as follows:

*$* cp -Rfv /mnt/\* /netboot/www/centos7\_1908/



The contents of the CentOS7 ISO file should be copied.

Text

Description automatically generated

Now, copy the **initrd.img** and **vmlinuz** files of CentOS7 to the **/netboot/tftp/centos7\_1908/** directory as follows:

$  cp -v /netboot/www/centos7\_1908/images/pxeboot/{initrd.img,vmlinuz} /netboot/tftp/centos7\_1908/

Graphical user interface, text

Description automatically generated

Now, you can unmount the CentOS 7 ISO image and delete it if you want.

$  umount /mnt  
$ rm -f CentOS-7-x86\_64-Minimal-1908.iso

**Install custom vDCM config detail and software to PXE directories**

Pull the main /netboot/ from box.com and SCP it to the hosts /tmp directory. (Box it terrible about enabling direct curl or wget access to files…so we do it the old fashioned way…)

<https://trace3.box.com/s/lkrdealp544xgnrur6bac6nnmlnw8b7o>

The Trace3\_vDCM\_Scripts\_03302021.zip and Charter.zip files …

$ cd /tmp

$ unzip Charter.zip

$ mv -r ./Charter /netboot/www/

$ unzip Trace3\_vDCM\_Scripts\_03302021.zip

$ cp -f ./Trace3\_vDCM\_Scripts\_03302021/Charter/\* /netboot/www/Charter/

$ cp -f ./Trace3\_vDCM\_Scripts\_03302021/Config\_Files/default /netboot/tftp/pxelinux.cfg/

$ cp -f ./Trace3\_vDCM\_Scripts\_03302021/Config\_Files/log\_ips.sh /etc/dnsmasq.d/

$ mv -f ./ Trace3\_vDCM\_Scripts\_03302021/vDCM\_Scripts/ /netboot/

$ chmod +x /netboot/www/Charter/\*.sh

$ chmod +x /netboot/vDCM\_Scripts/\*.sh

$ mkdir /netboot/Host\_Logs

**Edit IPs in Configs**

Edit IPs in vDCM.cfg and Init\_vDCM\_Server.sh from /netboot/www/Charter. Replace existing IPs with eth1 interface IP.

$ vi /netboot/www/Charter/vDCM.cfg

$ vi /netboot/www/Charter/Init\_vDCM\_Server.sh

Edit IPs in multiserver\_config from /netboot/vDCM\_Scripts. Replace existing IPs with eth1 interface IP.

$ vi /netboot/vDCM\_Scripts/multiserver\_config

Edit IPs in ‘default’ from /netboot/tftp/pxelinux.cfg. Replace existing IPs with eth1 interface IP.

$ vi /netboot/tftp/pxelinux.cfg/default

Edit IPs in ‘Cleanup.sh’ from /netboot/www/Charter/Cleanup.sh. Replace existing IP in SCP line near end with eth1 interface IP and login password to allow SCP log return

$ vi /netboot/www/Charter/Cleanup.sh

**Adding Firewall Rules:**

Now, you have to open ports from your firewall for the PXE boot server to work.

Allow the DHCP service as follows:

*$* firewall-cmd --zone=public --add-service=dhcp --permanent

Text

Description automatically generated with medium confidence

Allow the HTTP service as follows:

*$* firewall-cmd --zone=public --add-service=http --permanent

Text

Description automatically generated

Allow the TFTP service as follows:

*$* firewall-cmd --zone=public --add-service=tftp --permanent

Text

Description automatically generated

Allow the UDP port 4011 and 69 as follows:

*$* firewall-cmd --zone=public --add-port=4011/udp --permanent

Text

Description automatically generated

*$* firewall-cmd --zone=public --add-port=69/udp --permanent

Text

Description automatically generated with medium confidence

Now, reload the firewall as follows:

*$* firewall-cmd --reload

Text

Description automatically generated

**Install powershell modules:**

pwsh

Install-Module -Name Cisco.IMC

exit

**Change Apache default www root to /netboot/www:**

Vi /etc/httpd/conf/http.conf

Change entries with /var/www/html or /var/www to /netboot/www (3 locations)