NASA 2016 HW7 SA2

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References:

http://www.cyberciti.biz/faq/how-to-install-kvm-on-ubuntu-linux-14-04/

http://manpages.ubuntu.com/manpages/trusty/man1/virt-install.1.html

http://blog.johngoulah.com/tag/virt-install/

http://linux.die.net/man/1/virt-install

http://linux.die.net/man/1/virsh

http://www.howtogeek.com/117635/how-to-install-kvm-and-create-virtual-machines-on-ubuntu/

http://stackoverflow.com/questions/28151414/using-ks-cfg-with-virt-install

http://superuser.com/questions/333851/find-ip-of-vm-running-kvm

http://serverfault.com/questions/627238/kvm-libvirt-how-to-configure-static-guest-ip-addresses-on-the-virtualisation-ho

install.sh:

```
#!/bin/bash

getIP() {
   grep $(virsh dumpxml ubuntu | grep 'mac adddress' | grep -o
'..:..:..:..') <(arp -a) |
       grep -o '(.*)' |
          sed -e 's/(//' -e 's/)//'
}

sudo virt-install \
--connect=qemu:///system \
--name ubuntu \
--vcpus=2 \
--ram=2048 \
--memballoon virtio \
--os-type=linux \
--network bridge=virbr0 \
--nographics \
--accelerate \
--noautoconsole --wait=-1 \
--location http://archive.ubuntu.com/ubuntu/dists/trusty-
updates/main/installer-amd64/ \
--disk path=/var/lib/libvirt/images/ubuntu.img,size=5 \
--initrd-inject=/tmp/ks.cfg \
--extra-args="ks=file:/ks.cfg console=tty1 console=ttyS0,115200n8
serial"

sleep 30s

ssh-keygen -t rsa -f ~/.ssh/id_rsa -q -P "" && ssh-copy-id
kevin@$(getIP) && ssh-add
```

ks.cfg:

```
lang en_US
keyboard us
timezone --utc Asia/Taipei
rootpw --disabled
user kevin --fullname "kevin" --password kevin
reboot
text
install
bootloader --location=mbr
zerombr yes
clearpart --all --initlabel
autopart
preseed partman-partitioning/confirm_write_new_label boolean true
preseed partman/choose_partition select finish
preseed partman/confirm boolean true
preseed partman/confirm_nooverwrite boolean true
preseed base-installer/install-recommends boolean false
network --bootproto=dhcp
firewall --disabled --ssh
preseed pkgsel/update-policy select unattended-upgrades
skipx

%packages
openssh-server
apache2
vim
htop

%post
sed -i '/GRUB_HIDDEN_TIMEOUT=0/ s/^/#/' /etc/default/grub
upgrade grub
echo "export TERM='xterm-256color'" >> /etc/profile
echo "stty rows 30 cols 90" >> /etc/profile
. /etc/profile
```

1.

(a)

```
sed -i '/GRUB_HIDDEN_TIMEOUT=0/ s/^/#/' /etc/default/grub
```

in ks.cfg modifies the grub config file to set the timeout.

(b)

After starting the VM, the grub menu is shown. Press E on the option wanted, and replace

```
ro quiet splash $vt_handoff
```

with

```
ro console=ttyS0 serial single,
```

and then press Ctrl-X to boot in single user mode.

(c)

```
--extra-args="ks=file:/ks.cfg console=tty1 console=ttyS0,115200n8
serial"
```

in install.sh does the work.

(d)

```
echo "export TERM='xterm-256color'" >> /etc/profile
```

in ks.cfg does the work.

(e)

```
echo "stty rows 30 cols 90" >> /etc/profile
```

in ks.cfg does the work.

2.

```
--network bridge=virbr0
```

in install.sh does the work.

3.

```
--memballoon virtio
```

in install.sh does the work.

4.

After starting the VM, the steps done in getIP() gets the MAC address from the XML file, and then get the IP by arp. Then

```
ssh-keygen -t rsa -f ~/.ssh/id_rsa -q -P "" && ssh-copy-id
kevin@$(getIP) && ssh-add
```

in install.sh finishes the work.

5.

Install apache2 in the %packages section of ks.cfg, which does the work.

```
virsh dumpxml ubuntu > dumpxml.out
```

dmpxml.out:

```
<domain type='qemu' id='1'>
  <name>ubuntu</name>
  <uuid>5b57737b-1eb5-44c2-9bf8-5af83934d0ad</uuid>
  <memory unit='KiB'>2097152</memory>
  <currentMemory unit='KiB'>2097152</currentMemory>
  <vcpu placement='static'>2</vcpu>
  <resource>
    <partition>/machine</partition>
  </resource>
  <os>
    <type arch='x86_64' machine='pc-i440fx-wily'>hvm</type>
    <boot dev='hd'/>
  </os>
  <features>
    <acpi/>
    <apic/>
  </features>
  <clock offset='utc'>
    <timer name='rtc' tickpolicy='catchup'/>
    <timer name='pit' tickpolicy='delay'/>
    <timer name='hpet' present='no'/>
  </clock>
  <on_poweroff>destroy</on_poweroff>
  <on_reboot>restart</on_reboot>
  <on_crash>restart</on_crash>
  <pm>
    <suspend-to-mem enabled='no'/>
    <suspend-to-disk enabled='no'/>
  </pm>
  <devices>
    <emulator>/usr/bin/qemu-system-x86_64</emulator>
    <disk type='file' device='disk'>
```

```
      <driver name='qemu' type='qcow2'/>
      <source file='/var/lib/libvirt/images/ubuntu.img'/>
      <backingStore/>
      <target dev='hda' bus='ide'/>
      <alias name='ide0-0-0'/>
      <address type='drive' controller='0' bus='0' target='0'
unit='0'/>
    </disk>
    <controller type='usb' index='0' model='ich9-ehci1'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x04'
function='0x7'/>
    </controller>
    <controller type='usb' index='0' model='ich9-uhci1'>
      <alias name='usb'/>
      <master startport='0'/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x04'
function='0x0' multifunction='on'/>
    </controller>
    <controller type='usb' index='0' model='ich9-uhci2'>
      <alias name='usb'/>
      <master startport='2'/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x04'
function='0x1'/>
    </controller>
    <controller type='usb' index='0' model='ich9-uhci3'>
      <alias name='usb'/>
      <master startport='4'/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x04'
function='0x2'/>
    </controller>
    <controller type='pci' index='0' model='pci-root'>
      <alias name='pci.0'/>
    </controller>
    <controller type='ide' index='0'>
      <alias name='ide'/>
```

```
     <address type='pci' domain='0x0000' bus='0x00' slot='0x01'
function='0x1'/>
   </controller>
   <interface type='bridge'>
     <mac address='52:54:00:d0:fd:9a'/>
     <source bridge='virbr0'/>
     <target dev='vnet0'/>
     <model type='rtl8139'/>
     <alias name='net0'/>
     <address type='pci' domain='0x0000' bus='0x00' slot='0x02'
function='0x0'/>
   </interface>
   <serial type='pty'>
     <source path='/dev/pts/2'/>
     <target port='0'/>
     <alias name='serial0'/>
   </serial>
   <console type='pty' tty='/dev/pts/2'>
     <source path='/dev/pts/2'/>
     <target type='serial' port='0'/>
     <alias name='serial0'/>
   </console>
   <memballoon model='virtio'>
     <alias name='balloon0'/>
     <address type='pci' domain='0x0000' bus='0x00' slot='0x03'
function='0x0'/>
   </memballoon>
 </devices>
 <seclabel type='dynamic' model='apparmor' relabel='yes'>
   <label>libvirt-5b57737b-1eb5-44c2-9bf8-5af83934d0ad</label>
   <imagelabel>libvirt-5b57737b-1eb5-44c2-9bf8-
5af83934d0ad</imagelabel>
 </seclabel>
</domain>
```

```
virsh domxml-to-native qemu-argv dumpxml.out > native.out
```

native.out:

```
LC_ALL=C
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
QEMU_AUDIO_DRV=none /usr/bin/qemu-system-x86_64 -name ubuntu -
machine pc-i440fx-wily,accel=tcg,usb=off -m 2048 -realtime
mlock=off -smp 2,sockets=2,cores=1,threads=1 -uuid 5b57737b-1eb5-
44c2-9bf8-5af83934d0ad -nographic -no-user-config -nodefaults -
chardev socket,id=charmonitor,path=/var/lib/libvirt/qemu/domain-
ubuntu/monitor.sock,server,nowait -mon
chardev=charmonitor,id=monitor,mode=control -rtc
base=utc,driftfix=slew -global kvm-pit.lost_tick_policy=discard -
no-hpet -no-shutdown -global PIIX4_PM.disable_s3=1 -global
PIIX4_PM.disable_s4=1 -boot strict=on -device ich9-usb-
ehci1,id=usb,bus=pci.0,addr=0x4.0x7 -device ich9-usb-
uhci1,masterbus=usb.0,firstport=0,bus=pci.0,multifunction=on,addr=
0x4 -device ich9-usb-
uhci2,masterbus=usb.0,firstport=2,bus=pci.0,addr=0x4.0x1 -device
ich9-usb-uhci3,masterbus=usb.0,firstport=4,bus=pci.0,addr=0x4.0x2
-drive
file=/var/lib/libvirt/images/ubuntu.img,format=qcow2,if=none,id=dr
ive-ide0-0-0 -device ide-hd,bus=ide.0,unit=0,drive=drive-ide0-0-
0,id=ide0-0-0,bootindex=1 -netdev tap,id=hostnet0 -device
rtl8139,netdev=hostnet0,id=net0,mac=52:54:00:d0:fd:9a,bus=pci.0,ad
dr=0x2 -chardev pty,id=charserial0 -device isa-
serial,chardev=charserial0,id=serial0 -device virtio-balloon-
pci,id=balloon0,bus=pci.0,addr=0x3 -msg timestamp=on
```