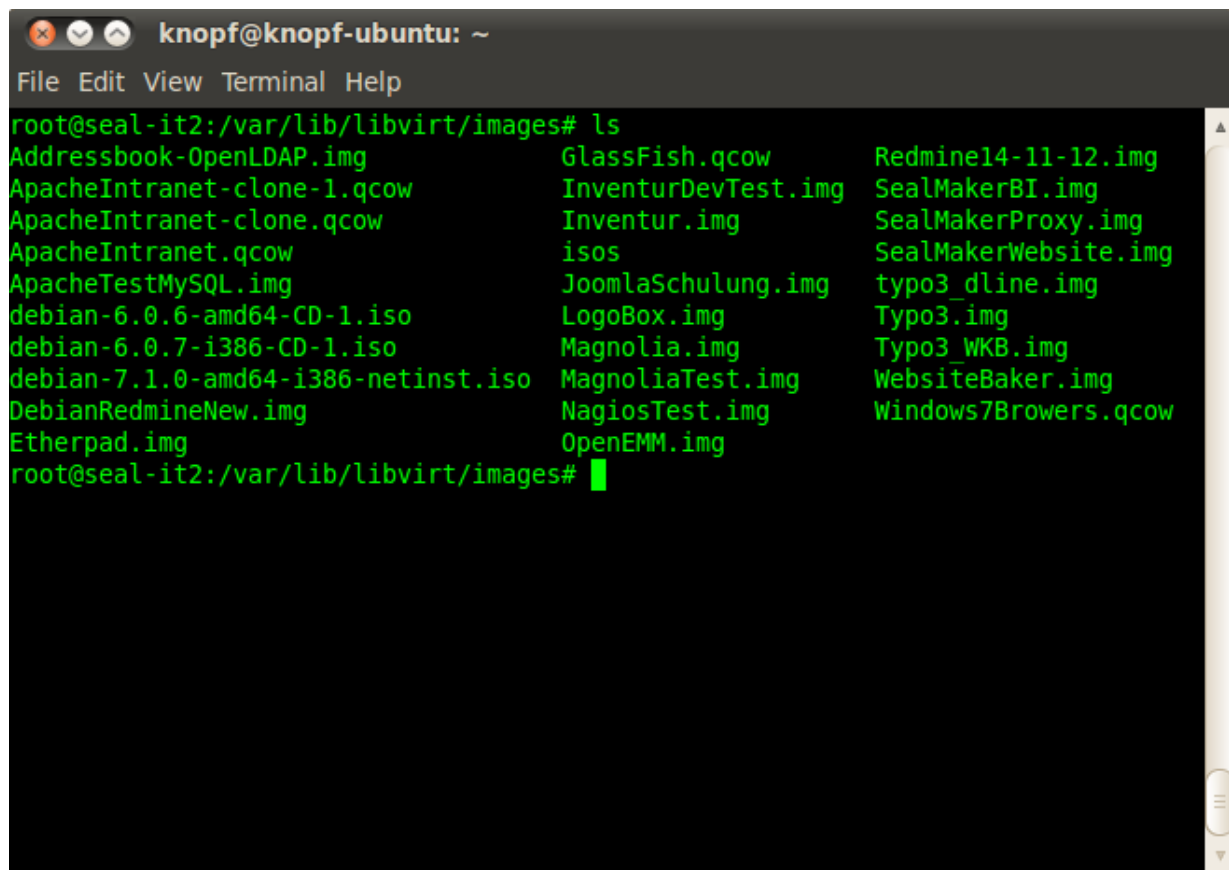


Cloud Computing und SaaS

Exercise – Virtualization

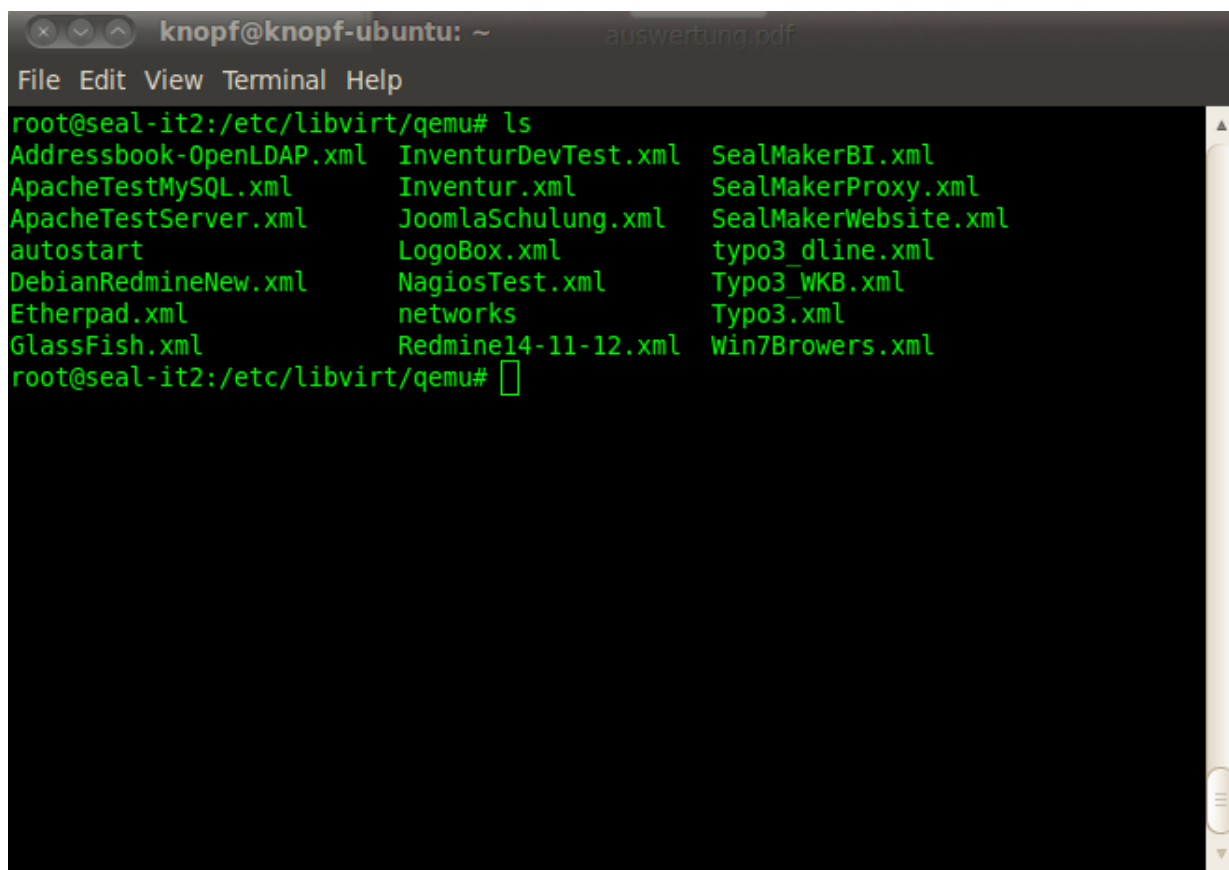
Hannes Knopf

Where are the images stored?



```
knopf@knopf-ubuntu: ~  
File Edit View Terminal Help  
root@seal-it2:/var/lib/libvirt/images# ls  
Addressbook-OpenLDAP.img      GlassFish.qcow      Redmine14-11-12.img  
ApacheIntranet-clone-1.qcow   InventurDevTest.img SealMakerBI.img  
ApacheIntranet-clone.qcow     Inventur.img        SealMakerProxy.img  
ApacheIntranet.qcow          isos                SealMakerWebsite.img  
ApacheTestMySQL.img          JoomlaSchulung.img  typo3_dline.img  
debian-6.0.6-amd64-CD-1.iso   LogoBox.img        Typo3.img  
debian-6.0.7-i386-CD-1.iso    Magnolia.img       Typo3_WKB.img  
debian-7.1.0-amd64-i386-netinst.iso MagnoliaTest.img   WebsiteBaker.img  
DebianRedmineNew.img         NagiosTest.img     Windows7Browsers.qcow  
Etherpad.img                 OpenEMM.img  
root@seal-it2:/var/lib/libvirt/images#
```

Where are the XML descriptions of your images and how are they structured?

A terminal window titled 'knopf@knopf-ubuntu: ~' with a subtitle 'auswertung.pdf'. The window has a menu bar with 'File', 'Edit', 'View', 'Terminal', and 'Help'. The terminal shows the command 'ls' being executed in the directory '/etc/libvirt/qemu'. The output lists 18 XML files and one directory, arranged in three columns. The files are: Addressbook-OpenLDAP.xml, ApacheTestMySQL.xml, ApacheTestServer.xml, autostart, DebianRedmineNew.xml, Etherpad.xml, GlassFish.xml, InventurDevTest.xml, Inventur.xml, JoomlaSchulung.xml, LogoBox.xml, NagiosTest.xml, networks, Redmine14-11-12.xml, SealMakerBI.xml, SealMakerProxy.xml, SealMakerWebsite.xml, typo3_dline.xml, Typo3_WKB.xml, Typo3.xml, and Win7Browsers.xml. The prompt 'root@seal-it2:/etc/libvirt/qemu#' is visible at the bottom.

```
knopf@knopf-ubuntu: ~  
File Edit View Terminal Help  
root@seal-it2:/etc/libvirt/qemu# ls  
Addressbook-OpenLDAP.xml  InventurDevTest.xml  SealMakerBI.xml  
ApacheTestMySQL.xml      Inventur.xml          SealMakerProxy.xml  
ApacheTestServer.xml     JoomlaSchulung.xml   SealMakerWebsite.xml  
autostart                 LogoBox.xml           typo3_dline.xml  
DebianRedmineNew.xml     NagiosTest.xml        Typo3_WKB.xml  
Etherpad.xml              networks              Typo3.xml  
GlassFish.xml            Redmine14-11-12.xml  Win7Browsers.xml  
root@seal-it2:/etc/libvirt/qemu#
```

```
knopf@knopf-ubuntu: ~
File Edit View Terminal Help
GNU nano 2.2.4 Datei: JoomlaSchulung.xml

<domain type='kvm'>
  <name>JoomlaSchulung</name>
  <uuid>793354ec-6a63-1e43-e756-b46d44eb0e9e</uuid>
  <memory>1048576</memory>
  <currentMemory>1048576</currentMemory>
  <vcpu>1</vcpu>
  <os>
    <type arch='x86_64' machine='pc-0.12'>hvm</type>
    <boot dev='hd'>/>
  </os>
  <features>
    <acpi/>
    <apic/>
    <pae/>
  </features>
  <clock offset='utc'>/>
  <on_poweroff>destroy</on_poweroff>
  <on_reboot>restart</on_reboot>
  <on_crash>restart</on_crash>
  <devices>
    <emulator>/usr/bin/kvm</emulator>
    <disk type='file' device='disk'>
      <driver name='qemu' type='raw'>/>
      <source file='/var/lib/libvirt/images/JoomlaSchulung.img'>/>
      <target dev='vda' bus='virtio'>/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x04' function='0x0'>/>
    </disk>
    <disk type='file' device='cdrom'>
      <driver name='qemu' type='raw'>/>
      <source file='/var/lib/libvirt/images/debian-6.0.6-amd64-CD-1.iso'>/>
      <target dev='hdc' bus='ide'>/>
      <readonly/>
      <address type='drive' controller='0' bus='1' unit='0'>/>
    </disk>
    <controller type='ide' index='0'>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x01' function='0x1'>/>
    </controller>
    <interface type='network'>
      <mac address='52:54:00:62:e0:ef'>/>
      <source network='default'>/>
      <model type='virtio'>/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x03' function='0x0'>/>
    </interface>
    <serial type='pty'>
      <target port='0'>/>
    </serial>
    <console type='pty'>
      <target type='serial' port='0'>/>
    </console>
    <input type='tablet' bus='usb'>/>
    <input type='mouse' bus='ps2'>/>
    <graphics type='vnc' port='-1' autoport='yes'>/>
    <video>
      <model type='cirrus' vram='9216' heads='1'>/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x02' function='0x0'>/>
    </video>
    <memballoon model='virtio'>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x05' function='0x0'>/>
    </memballoon>
  </devices>
</domain>

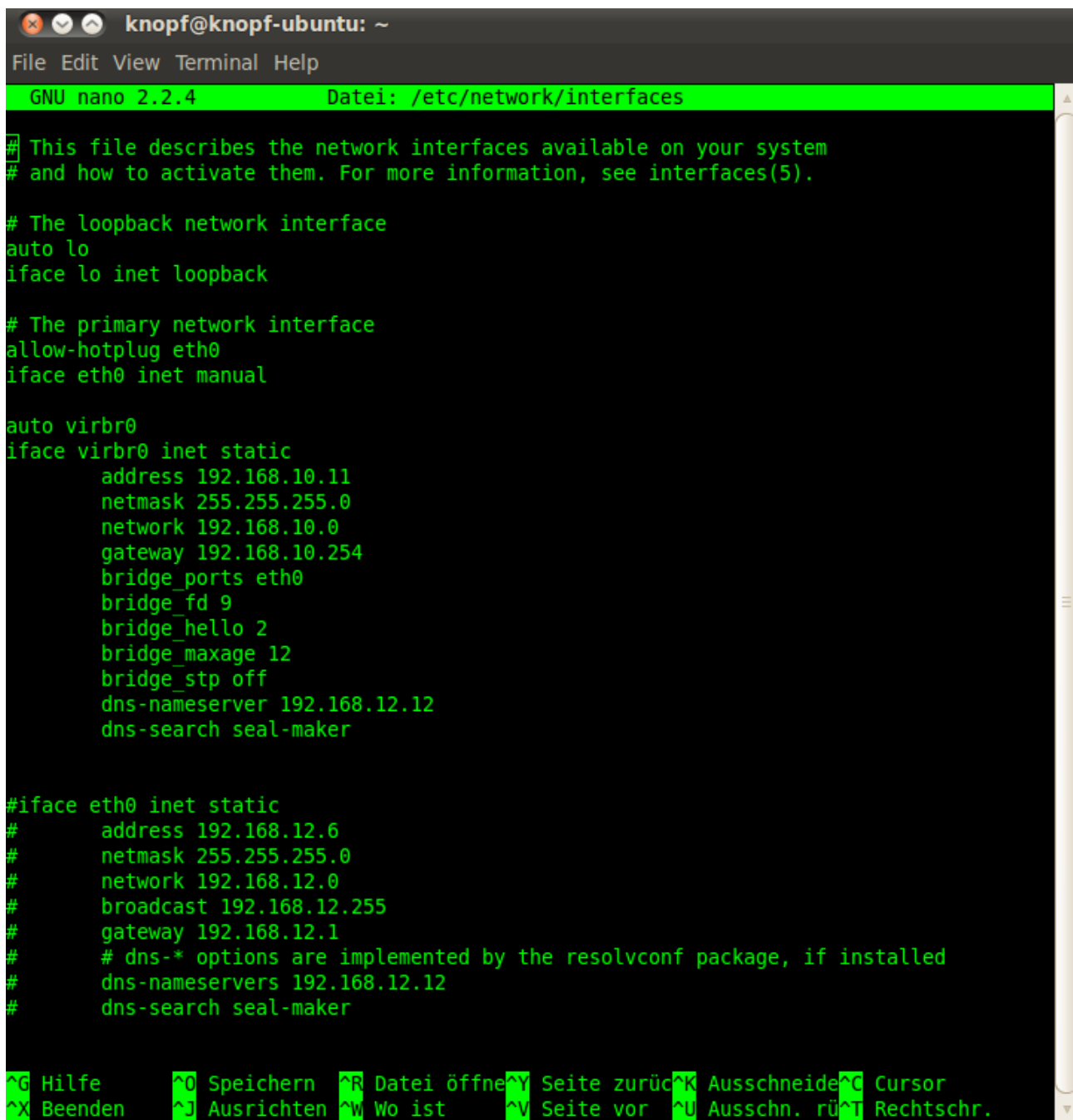
^G Hilfe      ^O Speichern  ^R Datei öffne ^Y Seite zurück ^K Ausschneide ^C Cursor
^X Beenden    ^J Ausrichten ^W Wo ist      ^V Seite vor   ^U Ausschn. rück ^T Rechtschr.
```

What virsh commands do you need to configure and manage an image?

virsh

- list --all
- start *name*
- shutdown *name*
- destroy *name*
- suspend *name*
- resume *name*

Explain the type of network configuration you have chosen.



The screenshot shows a terminal window titled 'knopf@knopf-ubuntu: ~' with a menu bar (File, Edit, View, Terminal, Help). The terminal is running GNU nano 2.2.4, editing the file /etc/network/interfaces. The file content is as follows:

```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
allow-hotplug eth0
iface eth0 inet manual

auto virbr0
iface virbr0 inet static
    address 192.168.10.11
    netmask 255.255.255.0
    network 192.168.10.0
    gateway 192.168.10.254
    bridge_ports eth0
    bridge_fd 9
    bridge_hello 2
    bridge_maxage 12
    bridge_stp off
    dns-nameserver 192.168.12.12
    dns-search seal-maker

#iface eth0 inet static
#    address 192.168.12.6
#    netmask 255.255.255.0
#    network 192.168.12.0
#    broadcast 192.168.12.255
#    gateway 192.168.12.1
#    # dns-* options are implemented by the resolvconf package, if installed
#    dns-nameservers 192.168.12.12
#    dns-search seal-maker
```

The bottom of the terminal shows nano editor shortcuts: ^G Hilfe, ^O Speichern, ^R Datei öffnen, ^Y Seite zurück, ^K Ausschneiden, ^C Cursor, ^X Beenden, ^J Ausrichten, ^W Wo ist, ^V Seite vor, ^U Ausschn. rück, ^T Rechtschr.

Durch 'bridge' sind auch die virtuellen Maschinen im Netzwerk erreichbar.

Describe the virtual machine migration capabilities of KVM.

Requirements

- The VM image is accessible on both source and destination hosts (located on a shared storage, e.g. using nfs).
 - It is recommended an images-directory would be found on the same path on both hosts
 - The src and dst hosts must be on the same subnet
 - Do not use -snapshot qemu command line option.
 - For tcp: migration protocol
 - the guest on the destination must be started the same way it was started on the source.
-
- Almost unnoticeable guest down time
 - Guest is not involved
 - Capability to tunnel VM state through an external program
 - ssh/gzip/bzip2/gpg/your own
 - Upon success guest continues to run on destination host, upon failure guest continues to run on source host (with one exception)
 - Short and Simple
 - Easy to enhance
 - Hardware independence (almost).
 - Support for migration of stopped (paused) VMs.
 - Open