Lab 3: Linux Installation and Runlevel Configuration

The purpose of this lab is to install a Linux distribution according to specifications on a VM and to configure the initial default runlevel. VMware systems are available for you to use in the CTC and the CIS Lab (room 2504).

There are a number of specifications (below) that you must meet; otherwise the choices during the installation are up to you. You may choose to accept the defaults wherever you are unsure. If an installation has already been performed, you may remove the existing VM.

In short you will:

1. Create a VM named *star*.
2. Use (not install) Knoppix to partition the drives of your VM.
3. Install CentOS on the VM.
4. Perform some post-installation boot and runlevel configuration.

A goal of this lab is to see how closely you can build a system given the specifications and for you to discover in what areas you are weak in terms of understanding the installation process.

Procedure

1) Create a VM (virtual machine) named star. Here are the specifications you must meet:
   - Custom
   - Guest OS: Linux, Version: Other Linux 2.6 x kernel
   - VM name: star
   - Access rights: Not private
   - Account: Run this VM as user that powers on the VM
   - One processor
   - 512 MB RAM
   - 2 network interface cards:

    - Ethernet: Bridged networking
    - Ethernet 2: Custom - VNnet4
  - SCSI Adapter: LSI Logic
  - Drive 1 (SCSI)
    - 5 GB
    - Do NOT allocate space now
    - Split disk into 2 GB files
  - Drive 2 (SCSI)
    - 2 GB
    - Do not allocate space now
    - Split disk into 2 GB files
  - USB controller
  - Floppy Drive
  - CD-ROM (IDE)

2) Use Knoppix to pre-partition the drives of your VM. Knoppix is a live Linux distribution that fits on a single CD. I recommend you keep a Knoppix CD in your permanent Linux toolbox for emergencies. Here are the specifications you must meet:

   - Use the **KNOPPIX_V5.1.1CD-2007-01-04-EN.iso** which is either already on the lab systems or can be copied from the NAS server in the CIS Lab. The share on the NAS server is \\172.30.4.12\depot and the credentials are on the whiteboard.
   - Boot off the Knoppix ISO (you may have to adjust BIOS boot order)
   - Close Welcome window,
   - When Knoppix loads, change the screen size to 800 x 600 (right-click on desktop > Configure Desktop… > Display > Screen Size)
   - Bring up a terminal window (icon on bottom tool bar)
   - Use fdisk to partition both drives as specified below:
     - `sudo fdisk /dev/sda`
     - or `sudo passwd root` (and change to Cabri110) and `su -`

Location	Type	Size
MBR		
/dev/sda1	Primary	50 MB
/dev/sda2	Primary	150 MB
/dev/sda3	Primary	4000 MB
/dev/sda4	Extended	
/dev/sda5	logical	600 MB
/dev/sda6	logical	remainder

Location	Type	Size

MBR		
/dev/sdb1	Primary	750 MB
/dev/sdb2	Primary	750 MB
/dev/sdb3	Primary	remainder

- Now shutdown the system.

3) Install the Centos 5.0 distribution. Centos is a rebuild of Red Hat Enterprise Linux but is free of charge. This is allowed under the terms of the GNU General Public License. Here are the specifications you must meet.

- Use the **CentOS-5.0-i386-bin-DVD.iso** which is either already on the lab systems or can be copied from the NAS server in the CIS Lab. The share on the NAS server is \\172.30.4.12\depot and the credentials are on the whiteboard.
- Modify your partitions so the mount points and file systems meet the more detailed specifications:

Location	Type	Boot Code	File System	Usage	Size
MBR					
/dev/sda1	Primary			unused	50 MB
/dev/sda2	Primary	GRUB	ext2	/boot	150 MB
/dev/sda3	Primary		ext3	/	4000 MB
/dev/sda4	Extended				
/dev/sda5	logical			swap	600 MB
/dev/sda6	logical			unused	remainder

Location	Type	Boot Code	File System	Usage	Size
MBR					
/dev/sdb1	Primary		ext3	/var	750 MB
/dev/sdb2	Primary		ext3	/home	750 MB
/dev/sdb3	Primary			unused	remainder

- Do not use LVM (Logical Volume Management)
- Make the boot partition the active partition
- Use GRUB as the boot loader
- Install GRUB into the boot sector of the /boot partition (/dev/sda2)
- Use whatever boot code you want in the MBR
- Network configuration:
  - eth0: Active on boot, DHCP
  - eth1: Active on boot, IP/Netmask: 192.168.0.50 /24 (disable IPv6)

- Hostname: star.localdomain
- Root password: Cabri11o
- Software packages: Only “Desktop – Gnome” checked
- When you reboot at the end of the installation, be sure and “ remove your CD”
- Add one normal user cis191, with a password of Cabri11o

4) Perform some post-installation boot and runlevel configuration. Here are the specifications you must meet.

   - Configure your system default runlevel 3 (edit /etc/inittab)
   - Edit grub.conf to disable hiddenmenu and quiet options
   - Reboot to verify

To turn in

Log in to your new installation as root and compile a log of your accomplishments by running the following commands:

```
fdisk -l > lab3
mount >> lab3
cat /boot/grub/grub.conf >> lab3
dd if=/dev/sda2 bs=512 count=1 | xxd >> lab3
ifconfig >> lab3
cat /etc/fstab /etc/passwd /etc/shadow /etc/inittab >> lab3
rpm -qa | wc -l >> lab3
```

Review your lab3 file for completeness and save a copy for your records. Copy the *lab3* file to the cis191 account on *opus.cabrillo.edu* using the following command:

`scp lab3 cis191@opus.cabrillo.edu:lab3.logname`

Note: you should have access to opus from the CIS lab. If your VM did not get an IP address from the DHCP server, you can request again with the **`dhclient`** command.

Grading Rubric (30 points)

5 points - For setting up the VM as specified
5 points - For setting up drive partitions as specified
5 points - For installing GRUB in the specified partition as specified
5 points - For configuring networking and hostname as specified
5 points - For configuring software packages, users, passwords as specified.
5 points - For configuring post-installation changes as specified

Extra Credit (10 points)

Modify the system you just made to be dual boot, with DOS in partition 1, two boot options in GRUB, conventional code in MBR, GRUB boot code in /dev/sda2

1. **fdisk -l > lab3xc**
2. **mount >> lab3xc**
3. **cat /boot/grub/grub.conf >> lab3xc**
4. **dd if=/dev/sda bs=512 count=1 | xxd >> lab3xc**
5. **dd if=/dev/sda1 bs=512 count=1 | xxd >> lab3xc**
6. **dd if=/dev/sda2 bs=512 count=1 | xxd >> lab3xc**

scp lab3xc cis191@opus.cabrillo.edu:lab3xc.logname