Assignment 2 - CS416
Virtual Machine and Code Skeleton Instructions
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Your officially supported virtual machine will be supported on stratus.rutgers.edu. We recommend that you access the VMs from the iLabs machines.

To access the VM host from a Linux workstation:

Connect to stratus.rutgers.edu:

- $ ssh -Y netid@stratus.rutgers.edu

* **$ represents the prompt, and is not part of the command that you type. In this document, I will use $ to indicate a command that you must type into a Linux shell.**

Your access credentials are your netid and associated password.

Once you connect to stratus, you will have a shell prompt similar to the following:

```
[netid@stratus netid]$
```

All commands prefixed with $ in this document should be entered at this prompt.

To initially set up your VM:

- $ cd /s12-cs416/netid
- $ cp /s12-cs416/common/gentoo-x86-vm-cs416.tar .
- $ tar -xvf gentoo-x86-vm-cs416

You will now have a personal copy of the VM in /s12-cs416/netid

To start the VM:

- $ cd /s12-cs416/netid/gentoo-x86-vm-cs416
- $ vmplayer gentoo-x86-vm.vmx

To log into the VM, the username/password is vadmin/vadmin

To obtain the skeleton:

- Launch the Chromium web browser inside the VM.
- Log in to sakai and download the vmemraid-skeleton.tar.gz file.
- Open Terminal.
- $ tar -zxvf ~/Downloads/vmemraid-skeleton.tar.gz
- Your should now have a directory under your home directory called vmemraid.

To compile, load, and unload the vmemraid module:

- Open Terminal.
- $ cd vmemraid
- $ make
    - If the compile is successful, you will have a file named vmemraid.ko. This is the compiled kernel module.
- $ sudo insmod vmemraid.ko
    - This command load the module into the kernel.
- $ sudo lsmod
    - This command lists all currently loaded modules.
    - Your should see a listing for vmemraid.
- $ sudo rmmod vmemraid
    - This command unloads the module.

To partition and format a block device:

Once your module works to the point that it successfully registers a block device with the system, you will see a file called /dev/vmemraid. This is the device file that represents your “disk”.

To create a file system on your “disk”, you must first use the fdisk utility to partition the disk:

- $ sudo fdisk /dev/vmemraid
- Type n, and press enter (new partition).
- Type p, and press enter (primary partition).
- Type 1, and press enter (partition 1).
- Press enter for all following prompts to select defaults.
- When you come back to the fdisk prompt, type p to display the partition table.

    - If you see a single Linux partition, you have correctly partitioned your write.
    - Type w, and press enter (write partition table and exit).

After you partition your disk, you will see an additional device file has been created: /dev/vmemraid1

This new file represents the partition that you have created on the disk. You can now create a file system on your new partition:

    - $ sudo mkfs.ext3 /dev/vmemraid1
        - This will create a Linux ext3 file system on your partition.

After you have created the file system, you must “mount” it to make use of it:

    - $ mkdir /home/vadmin/vmemraid_mnt (this creates an empty directory to serve as a “mount point”, only necessary the first time).
    - sudo mount /dev/vmemraid1 /home/vadmin/vmemraid_mnt

You should now have your “disk” mounted at /home/vadmin/vmemraid_mnt.

You may verify that the disk is mounted by typing:

    $ df

KEEP IN MIND THAT UNLESS YOUR DRIVER IS 100% WORKING, YOU WILL BE UNLIKELY TO COMPLETE ALL OF THESE STEPS.

<u>To drop/add memdisks using the supplied RAID Utility:</u>

- First, load the vmemraid module as instructed above.
- $ cd ~/vmemraid
- $ sudo ./raidutil/raidutil /dev/vmemraid list
    - This will list the currently attached memdisks.
- $ sudo ./raidutil/raidutil /dev/vmemraid drop n
    - This will drop the disk at location n.
- $ sudo ./raidutil/raidutil /dev/vmemraid new n
    - This will create a new disk at location n.