UNIX

System Administration Manual

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SYSTEM ADMINISTRATION MANUAL

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The purpose of this manual is to show people some useful commands and concepts that are used heavily by UNIX system administrators to manage users, filesystems, and software. Some of the assignments we had to do similar to what system administrators must do on a daily basis. If you want to practice the system administration tasks, you should try it on a virtual machine. You will be granted administrator privileges and if you mess something up, you don't have to worry.

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Filesystems

Creating a Filesystem

This tutorial will create a filesystem with the following characteristics:

- Volume Group: vg_csc352
- Logical Volume: lv_csc352
- Filesystem: /home
- Partition type: primary
- Partition number: 1
- Volume size: Use all available for the volume group

To create a filesystem in UNIX, we must use the **fdisk** command, which is a utility that provides disk partitioning functions.

```
[root@fedora-test ~]# fdisk /dev/sdb
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel
Building a new DOS disklabel with disk identifier 0xe1410716.
Changes will remain in memory only, until you decide to write them.
After that, of course, the previous content won't be recoverable.

Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)

Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1):
Using default value 1
First sector (2048-41943039, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-41943039, default 41943039):
Using default value 41943039
```

Screenshot above taken from http://bencane.com/2011/12/19/creating-a-new-filesystem-with-fdisk-lvm-and-mkfs/

We will use 'n' to create a new partition, 'p' to make it a primary partition, and the default values for the first and last sector. Enter 'w' to complete the action and alter the partition table.

Now that the partition has been created, we must initialize it using **pvcreate**, create the volume group, and then add the partition to the volume group.

```
[root@fedora-test ~]# pvcreate /dev/sdb1
```

Now using **vgcreate**, we will create the volume group vg_csc352, then add the physical volume to the volume group.

```
[root@csc352-vm15 ~]# vgcreate vg_csc352 /dev/sdb1
Volume group "vg_csc352" successfully created
[root@csc352-vm15 ~]# vgextend vg_csc352 /dev/sdb1
```

To display the attributes of the volume group, we can use the **vgdisplay** command. Now we will create the logical volume using the **lvcreate** command. You can display the attributes using **lvdisplay**.

```
[root@csc352-vm15 ~]# lvcreate -L 4.9GB -n lv_csc352 vg_csc352
Rounding up size to full physical extent 4.90 GiB
Logical volume "lv_csc352" created.
[root@csc352-vm15 ~]# lvdisplay vg_csc352 lv_csc352
--- Logical volume ---
LV Path                /dev/vg_csc352/lv_csc352
LV Name                lv_csc352
VG Name                vg_csc352
LV UUID                GRxC0G-f3cO-4rRj-1cH5-vdKE-RTaN-AqBL4C
LV Write Access        read/write
LV Creation host, time csc352-vm15, 2017-04-12 13:29:25 -0400
LV Status              available
# open                 1
LV Size                4.99 GiB
Current LE             1278
Segments               1
Allocation             inherit
Read ahead sectors     auto
- currently set to     256
```

Now we will use the **mkfs** command to make the filesystem.

```
mkfs -t ext3 /dev/vg_csc352/lv_csc352
```

Now we must create the directory that the mount point will overlay and add the appropriate lines to the /etc/fstab file. Lastly, we must mount the filesystem using the **mount** command.

```
[root@csc352-vm15 ~] mkdir /var/repo
[root@csc352-vm15 ~] vi /etc/fstab
    ## Append to bottom
    /dev/mapper/vg_csc352-lv_csc352 /var/repo ext3 defaults 0 0


[root@csc352-vm15 ~] mount
/dev/mapper/vg_csc352vm1-lv_root on / type ext4 (rw)
proc on /proc type proc (rw)
```

Command Summary

fdisk - used to delete and create partitions on the hard drive

pvcreate – initialize a disk partition

vgcreate – create a volume group

vgextend – add physical volumes to a volume group

lvcreate – create a logical volume in an existing volume group

mkfs – build a linux file system

mount – mount a filesystem

User Management

The following will explain how to create and modify a user with the following characteristics:

- Name: James West (include in GECOS field)
- Username: west
- Password: pick a random password
- User ID: 100
- Home directory: /home/west
- Shell: dash
- Primary group: users

In the screenshot below, we used commands to add a user account, modify user accounts by giving it a group, userID, password etc.

To add a user account onto the system, use the **useradd** command. You can use this with arguments like this **useradd** -d /home/west -g users -m -s /bin/dash -u 100 west -c "James West"

This will give the account a path name, a group named users, the shell named dash and a userID of 100 with the full name of James West.

```
34 passwd: all authentication tokens updated successfully.
35 ESC]0;root@csc352-vm6:~BEL[root@csc352-vm6 ~]# usermod -s /bin/bash west
36 ESC]0;root@csc352-vm6:~BEL[root@csc352-vm6 ~]# groupadd -g 150 csc352
37 ESC]0;root@csc352-vm6:~BEL[root@csc352-vm6 ~]# usermod -G csc352 west
38 ESC]0;root@csc352-vm6:~BEL[root@csc352-vm6 ~]# gropsBSESC[KBSESC[Kups west
39 west : users csc352
```

You also have commands such as **usermod**, which allows you to modify the attributes of the user such as the shell or userid. Just like above, I have a command that says usermod -s /bin/bash west that changes the default shell to bash.

After you are satisfied with adding the characteristics onto the account, you can use the cat /etc/passwd command to check to see if it's in the GECOS field and if the information is correct. If something doesn't look right, you can always use **usermod** to make changes as needed.

If you want to delete a user account, you can use the **userdel** command. If you wanted to make an account and you messed something up, you can easily remove it.

Command Summary

useradd – create a new user

userdel – delete a user

usermod – modify the attributes of a user

Software

Yum is a command used to install software, check for updates, and update software. It's a highly used tool and it's very easy to understand.

```
ESC]0;root@csc352-vm6:~BELESC[?1034h[root@csc352-vm6 ~]# yum check-update
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirror.lug.udel.edu
 * extras: mirror.trouble-free.net
 * updates: mirror.steadfast.net

acl.x86_64                                2.2.49-7.el6                      base
audit.x86_64                              2.4.5-6.el6                       base
audit-libs.x86_64                         2.4.5-6.el6                       base
bash.x86_64                               4.1.2-48.el6                      base
```

In the screenshot, the yum check-update does exactly what it looks like. It checks for available updates and you can proceed onto update them as you wish.

Listed are the various variations for using the command yum.

yum install <packageName>	Install package and dependency packages
yum update [<packageName>]	Without package name, updates all installed packages
yum check-update	Lists available updates for installed packages
yum clean all	Removes all header files used for resolving dependencies and cached packages
yum list available	Lists all available packages
yum search <word>	Searches for word in package description, summary, packager, and name

For example, if you want to install a package named gcc, enter the following command and installation will start:

```
yum install gcc
```

Same thing goes for finding information on a package. Just type in yum info and the package name. So for finding info on gcc, you will have to say yum info gcc.

There is also a command similar to yum called **apt-get** which works with Advanced Packaging Tool software packages.

You will almost always have to be updating software on a daily basis as a System Administrator which is why it's essential to learn these commands.

Command Summary

yum – an interactive, automated update program which can be used for maintaining systems using rpm

apt-get **–** command line tool for working with Advanced Packaging Tool software packages.