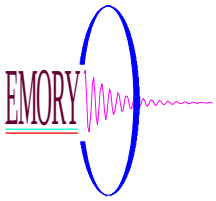
UNIX System Commands For Nuclear Magnetic Resonance(NMR)



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The information in this document is based on my own experiences. It has been carefully checked. However, no responsibility is assumed if any one copied this document as their reference.

UNIX Commands

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Commands for tape operation:

Tape Utility

%mt -f /dev/rst0 retention (rewind)*

Tape Copy

%tcopy /dev/rst0 /dev/rst1 rst0-source rst1 --target

Tape Dump

#/usr/etc/dump 0cdstfu 1000 700 18 /dev/rst0 /dev/sd3c (/dev/sd0a;/dev/sd0g) 150Mb tape
This dump can be recovered by mini root!!!!
#dump 0cdstfu 1000 425 9 /dev/rst0 /dev/rsd0aOn Omega600 (60Mb tape)

Recover some files from the dump tape

#restore -i
restore>ls List files on the tape
restore>add file name
restore>extract you may extract file into a temp.dir first

Tape Backup

#../tar cvf /dev/rst0 dir-to-be-backup
#../tar tvf /dev/rst0 ---list file on the tape
#../tar xvfp /dev/rst0 ./restoredir (current dir)

DATA Compression and Tape Backup

#tar cf directoryname.tar directoryname ------compress all files in the directoryname
#rm -r directoryname
#compress directoryname.tar -------a new file name will be -------.tar.Z
#tar cvf /dev/rst0 -----tar.Z ------save the file on a tape

*******Retrieve the files
#tar xvf /dev/rst0 ------tar.Z
#uncompress ------tar.Z -----a new file will appear -----.tar

#tar xf ----.tar ----all files will appear in the directory

Note 1: Directories cannot be compressed. The above way is much better. In Varian, an FID file is a directory, rather than a single file. You must use above method to compress. In Omega, an data file(2D) can be compressed.
Note 2: Due to the tar command, this procedure temporarily requires almost twice the disk space before the duplicate file is removed, during both compressing and uncompressing.

Networked Use of a Tape
To read a tape catalog of a remote tape located on a remote computer named "icet":
#rsh -n icet dd if=/dev/rst0 bs=20b | tar tvfbB - 20

To read all files from the remote tape:
#rsh -n icet dd if=/dev/rst0 bs=20b | tar xvfbB - 20

To read named files from the remote tape:
#rsh -n icet dd if=/dev/rst0 bs=20b | tar xvfbB - 20 filename1 filename2 ...

To write named files to the remote tape:
#tar cvfb - 20 filename1 filename2 ....| rsh icet dd of=/dev/rst0 obs=20b

Tape Operation on Sun and INDIGO
On SUN (Omega600) tar cvf /dev/rst0 file_names
Retrieve into INDIGO tar xvf /dev/tapens

Silicon Graphics
/root/usr/etc/dump 0uf /dev/tape /dev/usr
/bin/tar cvf /dev/tape /root/usr/people
All can be done in file manager
%mt rewind
%mt retention

Commands for DISK operations

%fdformat %fdformat -L (low density formate)
eject Eject disk. Do not use eject into NMR shell, it will eject the sample.
bar tvf /dev/rfd0 -----list file on the dev/rsd0
bar cvf /dev/rfd0 ./backup-dirname -----copy dir-name to tape
bar xvfp /dev/rfd0 ./restoredir
bar rvf /dev/rfd0 .

warning: your all files on the disk will replaced by new files, if you want keep the old files, you can copy the file back to the system in the same DIR, then backup all the files in the same DIR.

Power off and on for SUN:

logout and loging as root or su
#shutdown -h now

Turn off the power in sequence to:
1. all external drive units (hardisk, tape drive, CD ROM)
2. CPU power.
3. Monitor.

Turn on the power in this sequence:
1. External drive units (Starting with the unit farthest from the system unit on the SCSI bus)
2. monitor
3. CPU Power.

I am not sure it is working or not!!!
System Crash and Load Dumped file system

power on (if power is already on, don't turn off)
L1 A
ok>probe-scsi (see three device alive)
ok>boot tape (boot on tape, insert tape with mini root)
answer several questions
(format)?
(partition)?
#/etc/unmount /a
#newfs /dev/rsd0a (the first device you want to restore) not necessary if the disk has been formatted before. It is for new disk only.
#mount /dev/sd0a /a
#cd /a
#restore rvf /dev/rst0 /a (it takes hours!!!!, you do retention several times, if the tape not used for several months)
#rm restoresystable
#umount /a
#newfs /dev/rsd0g (the second device you want to restore)
#mount /dev/sd0g /a
.....
#umount /a
#rm restoresymtable
L1 A boot (reboot the system and done)
(installboot /a/boot bootsd /dev/a)
boot st()
boot tape
boot vmunix.old (there are several kernel in root with *)
ok>probe-scsi

/usr/etc/extract

Network for Sun Workstation

After reinstall the file system, the following file should be checked.

/etc/hosts

```
127.0.0.1          localhost
170.140.39.1       gn600    loghost   ----------IP address for gn600
170.140.39.4       euch2e   INDIGO ----------IP for other computer
                            telnet euch2e or IP both work, if not in here, you
                            have to type IP for ftp and telnet.
```

/etc/rc.boot

```
hostname=Omega #after reboot the hostname will changed to Omega,
                    whenever
                    #you can set the hostname by #hostname gn600 command.
```

/etc/netmasks

```
170.140.39.0       255.255.255.62  ------chemistry department. Emory
```

/etc/networks

```
loopback 127
```

#ifconfig le0 170.140.39.1 up
If all hardware work, it should work by using ping command
#ping 170.140.39.1

170.140.39.1 is alive #other IP# should have the same response.

The last command for accounting and managing the cpu usage.

#last | lp;
#Last > file_name
#sort file_name > sorted_file

Update the Last file (Start a new accounting):
cp /dev/null /var/adm/wtmp (empty of "last" command)
ac -d sxwu
%who > temp_who send "who" file to temp_who

Add a New User (Omega600, INOVA, UNITY, Sun and INDIGO)

Sun
#cd /usr/etc/install/add_user sxwu 2300 34 "shaoxiong wu" /home/sxwu /bin/csh
#passwd sxwu
put a new passwd twice(the first character must be a letter)

Add a New User In Omega600
#AddUser

Add a New User In UNITY400

#/vnmr/bin/makeusr
cp /home/vnmr1/.defaults /home/New_ID
cp /home/vnmr1/.Xdefault /home/New_ID
Change the printer setup for the new account: Use LaserJet 4 for both printer and plotter.

Convert Omega file to INDIGO(Felix file)

%export Omega_data header.h data.d two new files will generated
%omegaout
header file: header.h
data file: data.d
out file: felix.dat A new file will generated.

Use ftp and set it to binary to transfer the data from Sun to INDIGO.
Put **omegaout** into /bin, everyone can execute this command.

FTP Operation
ftp IP#
login and passwd login as "anonymouse" you may needn't passwd in some computer
mget *
binary ----set to binary
bye for quit ftp
cd;ls; .... all works
cdl ----change local dir

UNIX Commands

%nsloopup name server look up. check IP number for an address
mv f1 f2
cp f1 f2; cp -r dir1 dir2
rm file_name rm -r directory
date; cal 1977;cal 2 1956
write
talk user_name who is current log on
env ----------check UNIX working environment
cal 1993
head 5 file_name
tail 5 file_name
chmod a+rwx filename 744 755 700
ls -al;-lg;-F;-r;-l;-C;-ld;-i
finger userid
stty -a
du;df
cat > file_name (keyboad input a file)
cat f1 f2 f3 > f123

cat date >> temp

%arch -k check arch on omega600 sun4e
/usr/etc/catman -w for shorcut man page
man -k passwd
#mount /dev/sd2g /big
%fsck file system checking
ping -s IP# check file transfer speed
ifconfig -a

look at images:
setup xv
xv *
in icet:
xhost +
telnet 128.113.5.82
setup xv
setenv DISPLAY 128.113.21.11:0 (for display on the icet)
xv *
man tar | lpr send tar man page to the printer

#hostname display hostname
#hostname omega600 set hoatname to omega600
ps -aux
find / -name "file_to_be_found" -print

vi editor:

vi -r filename (is for retrieve a file which is interrupted)
:set showmode
:set nu set #; :num goto line num
:set flash
:w file_name; w: /dir/filename
ctr -H erease a char
ctr -u kill the line
ctr -w erease a word
ctr -R redraw the screen
G goto end of file; 5G goto fifth line
^D move down; ^U move up ^B move back
:/test CR string searching
o open a new line below; O open a new line above
2dd delete 2 lines u undo the last command
Y save line in buffer; p put saved line after cursor
^L refrash screen
ZZ save and quit

****

HPLj does not print:
login as root
#lpc
lpc>status -check printer status
lpc>help
lpc>restart lw
#lprm - get rid of que-files
#lpc up all

GE500 Omega600 NMR Commands

filter -p on/off
vol 800 or 2000 for adjusting filter on the modular
a alias_name "cd /home/sxwu"
****

Some Important Notes:
in the /etc/hosts file
shouldn't comment out the first line 127.0.0.1
if did, when boot it up, and login, error message
"Unable to resolve host localhost"

SG For Chemagnetic Solid State NMR(The problem may resolved already)
The system can not login, (halted on the login screen)
reset the system
<ESC> for Diagnostic
menu; install; sh
#ls sys*
#cat sys*
(if not there edit it by)
#ed sys*
0
a
1,700000
w
q
#
rboot by press reset button
****
If there is a file in /usr/adm. called .profile and there is adm account in the passwd file, the login prompt will be:
funny like no uid .....
delete these things, it will be batter.

New SCSI Hard DISK Installation and Partition

Note: Read the document come with the Hard drive. ID setting, Power, Connecting and termination. Turn off all power supply. After installed, turn on the computer. It should boot up.

ok>probe-scsi the new disk should show up.
after reboot
login as root
#format
see the including document.
#mount /dev/sd2g /big
"big" is a sub directory under /
#format
Select the disk sd0 for root, rd1 for data disk
format>partition
partition>print list the current partition
#newfs /dev/rsd1a

PLEASE READ THE ENTIRE DOCUMENT BEFORE PROCEEDING

Before You Begin Partitioning

Caution - *Changing an existing a partition wipes out any information you have stored on that partition. Unless this system is brand new, you should make certain you have backups of any important files on the system. Back up the entire disk. See System and Network Administration for instructions on making backups.*

1. Log in as superuser (root)
2. Start /etc/format
3. from the format prompt, select "partition."
4. from the partition> prompt, select "print" to display current partitions
5. If necessary, "zero out" all but the "c" partition (this is generally recommended when multiple partitions are being redefined.)
   5a. select the letter for the first partition to configure
   5b. at "Enter new starting cyl" type 0 (or whatever is appropriate)
   5c. at "Enter new # block" type 0 (or whatever is appropriate)
   Perform steps 5a, 5b and 5c for each remaining partition (except "c")
6. from the partition> prompt, select the first partition to be changed
   (i.e., partition "e")
7. Determine how many megabytes you wish to dedicate to the selected partition. Multiply the number of megabytes by 2048 to determine the number of blocks required to generate your partition. For example, a 500MB partition consists of 1024000 blocks.
   partition> e
   Enter new starting cyl: 0
   Enter new # blocks: type the number of blocks from step 7
   partition> print
   partition e - starting cyl 0, # blocks 1024000 (718/8/90)
8. Make sure the cylinders start and end on even boundaries; the track and block numbers should be 0. For example, the partition above does not end evenly at cylinder

718 (718 / 8 / 90 = cyls/tracks/blocks). If a partition does not start or end on an even cylinder boundary, chose the partition again from the menu but this time "round up" (or down) the value you enter at the "new # blocks" prompt as follows:

```
partition> e
Enter new starting cyl: 0
Enter new # blocks [1024000, 718/8/90]: 719/
partition> print  -  verify partition looks like: (719/0/0)
  partition e - starting cyl  0, # blocks  1024575   (719/0/0)
```

9. Select the next partition to define (i.e., "f")
10. If "f" is NOT to be the remainder of the disk, calculate the size of i.e., 300MB x 2048 = 614400 blocks).

```
partition> f
Enter new starting cyl: 719 (same as new # blocks of partition "e")
Enter new # blocks: 614400
partition> print
  partition f - starting cyl  719, # blocks  614400   (431/2/35)
```

11. Adjust the cylinder boundaries for "f" as in step 8 above.

```
  partition f - starting cyl  719, # blocks  615600   (432/0/0)
```

12. Select the next partition to define (i.e., "g")
13. If "g" IS to be the remainder of the disk, calculate the starting cylinder by adding the cylinder values for partitions "e" and "f" (i.e., 719 + 432 = 1151). Calculate the "new # of blocks" by subtracting the starting cylinder # from the total cylinders for partition "c" (i.e., 1890 - 1151 = 739).

```
partition> g
Enter new starting cyl: 1151
Enter new # blocks: 739/
partition> print
  partition a - starting cyl    0, # blocks        0   (0/0/0)
  partition b - starting cyl    0, # blocks        0   (0/0/0)
  partition c - starting cyl    0, # blocks  2693250   (1890/0/0)
  partition d - starting cyl    0, # blocks        0   (0/0/0)
  partition e - starting cyl    0, # blocks  1024575   (719/0/0)
  partition f - starting cyl  719, # blocks   615600   (432/0/0)
  partition g - starting cyl 1151, # blocks  1053075   (739/0/0)
  partition h - starting cyl    0, # blocks        0   (0/0/0)
```

14. Make sure the sum of blocks for all new partitions equals the total blocks for partition "c" (the entire disk).

    1024575 + 615600 + 1053075 = 2693250 blocks for partition "c"

15. Make sure the sum of cylinders for all new partitions equals the total cylinders for partition "c" (the entire disk).

    719 + 432 + 739 = 1890 cylinders for partition "c"

16. If you wish, you may save your work to a named partition table in the /etc/format.dat file. Do this by selecting 'name' and then entering a name for the new table such as "M1908 3 partitions" (don't forget the quotes). In the future you may access this table with the 'select' from the same menu.

17. Quit the partition shell, label the disk and quit the format shell.
    partition> quit
    format> label
    Ready to label disk, continue? y
    format> quit
18. Run newfs on each of your new partitions, create mount points, mount them, and make /etc/fstab entries as appropriate.

NOTES:
If you wish to start over at any point during repartitioning, type "quit" until you get back to a system prompt. DO NOT RELABEL the disk before quitting the format shell. This will discard all changes you may have made to the partition table. After repartitioning the disk you must relabel the disk in order for the label to reflect the changes. SunOS limits partitions to a maximum size of 2 gigabytes each. This means any disk with formatted capacity greater than 2GB must have a minimum of 2 partitions in order to exploit all its space. For example, you may wish to create a 2GB partition for a database and allocate the remainder to another partition. Allocate 3906250 blocks to generate a maximum sized (2GB) partition.
Alternatively, you may wish to create 2 or 3 equal-sized partitions on a disk. It is sometimes easier to do this by dividing the "cylinders" value for partition "c" (the whole disk) by 2 or 3. This will tell you how many cylinders to dedicate to each partition. Tack any remainder on to the partition of your choice.
Each partition must have a WHOLE NUMBER value for # of cylinders and the sum of cylinder values for all partitions must be equal to the value of "c" with no remainder. Follow the procedures above for determining the starting cylinder for each partition; enter the values you calculated when you the partition "c" cylinders by 2 or 3 at the "enter new # of blocks" prompt using the form "###/" (no quotes, where ### is the value).
If you wish, you can use the SunInstall program from cdrom instead of format(8S) to change the size of any partitions other than root or swap. (SunInstall may also be use to enlarge the swap partition, but it may be easier to add swap space using the swapon command.)
end