Unix Programming

Popular Unix Commands

Nguyen Thanh Hung
Software Engineering Department
Hanoi University of Science and Technology

tar command

Create a new tar archive.
$ tar cvf archive_name.tar dirname/

Extract from an existing tar archive.
$ tar xvf archive_name.tar

View an existing tar archive.
$ tar tvf archive_name.tar

grep command

Search for a given string in a file (case in-sensitive search).

$ grep -i "the" demo_file

Print the matched line, along with the 3 lines after it.

$ grep -A 3 -i "example" demo_text

Search for a given string in all files recursively

$ grep -r "ramesh" *

find command

Find files using file-name (case in-sensitve find)

 # find -iname "MyCProgram.c"

Execute commands on files found by the find command

$ find -iname "MyCProgram.c" -exec md5sum {} \;

Find all empty files in home directory

 # find ~ -empty

vim command

Go to the 143rd line of file
$ vim +143 filename.txt

Go to the first match of the specified
$ vim +/search-term filename.txt

Open the file in read only mode.
$ vim -R /etc/passwd

diff command

Ignore white space while comparing.
 # diff -w name_list.txt name_list_new.txt

2c2,3
< John Doe --- > John M Doe
> Jason Bourne

sort command

Sort a file in ascending order

$ sort names.txt

Sort a file in descending order

$ sort -r names.txt

export command

To view oracle related environment variables.

$ export | grep ORACLE

declare -x ORACLE_BASE="/u01/app/oracle"

declare -x ORACLE_HOME="/u01/app/oracle/product/10.2.0"

declare -x ORACLE_SID="med"

declare -x ORACLE_TERM="xterm”

To export an environment variable:

$ export ORACLE_HOME=/u01/app/oracle/product/10.2.0

xargs command

Copy all images to external hard-drive

 # ls *.jpg | xargs -n1 -i cp {} /external-hard-drive/directory

Search all jpg images in the system and archive it.

 # find / -name *.jpg -type f -print | xargs tar -cvzf images.tar.gz

Download all the URLs mentioned in the url-list.txt file

 # cat url-list.txt | xargs wget –c

ls command

Display filesize in human readable format (e.g. KB, MB etc.,)

$ ls –lh

-rw-r----- 1 ramesh team-dev 8.9M Jun 12 15:27 arch-linux.txt.gz

Order Files Based on Last Modified Time (In Reverse Order) Using ls -ltr

$ ls –ltr

Visual Classification of Files With Special Characters Using ls -F

$ ls -F

gzip command

To create a *.gz compressed file:

$ gzip test.txt

To uncompress a *.gz file:

$ gzip -d test.txt.gz

Display compression ratio of the compressed file using gzip -l

$ gzip -l *.gz

compressed	uncompressed	ratio	uncompressed_name
23709	97975	75.8%	asp-patch-rpms.txt

unzip command

To extract a *.zip compressed file:

$ unzip test.zip

View the contents of *.zip file (Without unzipping it):

$ unzip -l jasper.zip

```
Archive:  jasper.zip
  Length     Date   Time    Name
 --------    ----   ----    ----
    40995  11-30-98 23:50   META-INF/MANIFEST.MF
    32169  08-25-98 21:07   classes_
    15964  08-25-98 21:07   classes_names
    10542  08-25-98 21:07   classes_ncomp
```

shutdown command

Shutdown the system and turn the power off immediately.

 # shutdown -h now

Shutdown the system after 10 minutes.

 # shutdown -h +10

Reboot the system using shutdown command.

 # shutdown -r now

Force the filesystem check during reboot.

 # shutdown -Fr now

ftp command

Both ftp and secure ftp (sftp) has similar commands. To connect to a remote server and download multiple files, do the following.

$ ftp IP/hostname

ftp> mget *.html

To view the file names located on the remote server before downloading, mls ftp command as shown below.

ftp> mls *.html -

/ftptest/features.html

/ftptest/index.html

/ftptest/othertools.html

/ftptest/samplereport.html

/ftptest/usage.html

crontab command

Field	Description	Allowed Value
MIN	Minute field	0 to 59
HOUR	Hour field	0 to 23
DOM	Day of Month	1-31
MON	Month field	1-12
DOW	Day Of Week	0-6
CMD	Command	Any command to be executed.

View crontab entry for a specific user
 # crontab -u john –l

Schedule a cron job every 10 minutes.
***/10 * * * * /home/ramesh/check-disk-space**

Schedule a cron job everday at 11am and 16pm
00 11,16 * * * /home/ramesh/bin/incremental-backup
00 – 0th Minute (Top of the hour)
11,16 – 11 AM and 4 PM
**** – Every day***
**** – Every month***
- ***– Every day of the week***

Schedule a cron job everyday (including weekends) during the working hours 9 a.m – 6 p.m
00 09-18 * * * /home/ramesh/bin/check-db-status
00 – 0th Minute (Top of the hour)
09-18 – 9 am, 10 am,11 am, 12 am, 1 pm, 2 pm, 3 pm, 4 pm, 5 pm, 6 pm
**** – Every day***
**** – Every month***
**** – Every day of the week***

ps command

ps command is used to display information about the processes that are running in the system.

While there are lot of arguments that could be passed to a ps command, following are some of the common ones.

To view current running processes.

$ ps -ef | more

To view current running processes in a tree structure. H option stands for process hierarchy.

$ ps -efH | more

free command

This command is used to display the free, used, swap memory available in the system.
Typical free command output. The output is displayed in bytes.

```
$ free
             total       used       free     shared    buffers     cached
Mem:       3566408    1580220    1986188          0     203988     902960
-/+ buffers/cache:     473272    3093136
Swap:      4000176          0    4000176
```

If you want to quickly check how many GB of RAM your system has use the -g option. -b option displays in bytes, -k in kilo bytes, -m in mega bytes.

```
$ free -g
             total       used       free     shared    buffers     cached
Mem:             3          1          1          0          0          0
-/+ buffers/cache:          0          2
Swap:            3          0          3
```

If you want to see a total memory (including the swap), use the -t switch, which will display a total line as shown below.

```
ramesh@ramesh-laptop:~$ free -t
             total       used       free     shared    buffers     cached
Mem:       3566408    1592148    1974260          0     204260     912556
-/+ buffers/cache:     475332    3091076
Swap:      4000176          0    4000176
Total:     7566584    1592148    5974436
```

top command

top command displays the top processes in the system (by default sorted by cpu usage). To sort top output by any column, Press O (upper-case O) , which will display all the possible columns that you can sort by as shown below.

Current Sort Field: P for window 1:Def

Select sort field via field letter, type any other key to return

a: PID	= Process Id	v: nDRT	= Dirty Pages count
d: UID	= User Id	y: WCHAN	= Sleeping in Function
e: USER	= User Name	z: Flags	= Task Flags

.....

To displays only the processes that belong to a particular user use -u option. The following will show only the top processes that belongs to oracle user.

$ top -u oracle

df command

Displays the file system disk space usage. By default df -k displays output in bytes.

```
$ df -k
Filesystem           1K-blocks      Used Available Use% Mounted on
/dev/sda1             29530400   3233104  24797232  12% /
/dev/sda2            120367992  50171596  64082060  44% /home
```

df -h displays output in human readable form. i.e size will be displayed in GB's.

```
ramesh@ramesh-laptop:~$ df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/sda1              29G  3.1G   24G  12% /
/dev/sda2             115G   48G   62G  44% /home
```

Use -T option to display what type of file system.

```
ramesh@ramesh-laptop:~$ df -T
Filesystem    Type   1K-blocks      Used Available Use% Mounted on
/dev/sda1     ext4    29530400   3233120  24797216  12% /
/dev/sda2     ext4   120367992  50171596  64082060  44% /home
```

kill command

Use kill command to terminate a process. First get the process id using ps -ef command, then use kill -9 to kill the running Linux process as shown below. You can also use killall, pkill, xkill to terminate a unix process.

```
$ ps -ef | grep vim
ramesh    7243  7222  9 22:43 pts/2    00:00:00 vim

$ kill -9 7243
```

rm command

Get confirmation before removing the file.

$ rm -i filename.txt

It is very useful while giving shell metacharacters in the file name argument.

Print the filename and get confirmation before removing the file.

$ rm -i file*

Following example recursively removes all files and directories under the example directory. This also removes the example directory itself.

$ rm -r example

cp command

Copy file1 to file2 preserving the mode, ownership and timestamp.

$ cp -p file1 file2

Copy file1 to file2. if file2 exists prompt for confirmation before overwritting it.

$ cp -i file1 file2

mv command

Rename file1 to file2. if file2 exists prompt for confirmation before overwritting it.

$ mv -i file1 file2

Note: mv -f is just the opposite, which will overwrite file2 without prompting.

mv -v will print what is happening during file rename, which is useful while specifying shell metacharacters in the file name argument.

$ mv -v file1 file2

cat command

You can view multiple files at the same time. Following example prints the content of file1 followed by file2 to stdout.

```
$ cat file1 file2
```

While displaying the file, following cat -n command will prepend the line number to each line of the output.

```
$ cat -n /etc/logrotate.conf
    1      /var/log/btmp {
    2          missingok
    3          monthly
    4          create 0660 root utmp
    5          rotate 1
    6      }
```

mount command

To mount a file system, you should first create a directory and mount it as shown below.

```
# mkdir /u01
```

```
# mount /dev/sdb1 /u01
```

You can also add this to the fstab for automatic mounting. i.e Anytime system is restarted, the filesystem will be mounted.

```
/dev/sdb1 /u01 ext2 defaults 0 2
```

chmod command

chmod command is used to change the permissions for a file or directory.

Give full access to user and group (i.e read, write and execute) on a specific file.

$ chmod ug+rwx file.txt

Revoke all access for the group (i.e read, write and execute) on a specific file.

$ chmod g-rwx file.txt

Apply the file permissions recursively to all the files in the sub-directories.

$ chmod -R ug+rwx file.txt

passwd command

Change your password from command line using passwd. This will prompt for the old password followed by the new password.

$ passwd

Super user can use passwd command to reset others password. This will not prompt for current password of the user.

passwd USERNAME

Remove password for a specific user. Root user can disable password for a specific user. Once the password is disabled, the user can login without entering the password.

passwd -d USERNAME

mkdir command

Following example creates a directory called temp under your home directory.

$ mkdir ~/temp

Create nested directories using one mkdir command. If any of these directories exist already, it will not display any error. If any of these directories doesn't exist, it will create them.

$ mkdir -p dir1/dir2/dir3/dir4/

ifconfig command

Use ifconfig command to view or configure a network interface on the Linux system.

View all the interfaces along with status.

$ ifconfig –a

Start or stop a specific interface using up and down command as shown below.

$ ifconfig eth0 up

$ ifconfig eth0 down

uname command

Uname command displays important information about the system such as — Kernel name, Host name, Kernel release number, Processor type, etc.,

Sample uname output from a Ubuntu laptop is shown below.

$ uname -a

Linux john-laptop 2.6.32-24-generic #41-Ubuntu SMP Thu Aug 19 01:12:52 UTC 2010 i686 GNU/Linux

whatis command

Whatis command displays a single line description about a command.

```
$ whatis ls
ls                (1)  - list directory contents

$ whatis ifconfig
ifconfig (8)          - configure a network interface
```

locate command

Using locate command you can quickly search for the location of a specific file (or group of files). Locate command uses the database created by updatedb.

The example below shows all files in the system that contains the word crontab in it.

```
$ locate crontab
/etc/anacrontab
/etc/crontab
/usr/bin/crontab
/usr/share/doc/cron/examples/crontab2english.pl.gz
/usr/share/man/man1/crontab.1.gz
/usr/share/man/man5/anacrontab.5.gz
/usr/share/man/man5/crontab.5.gz
/usr/share/vim/vim72/syntax/crontab.vim
```

man command

Display the man page of a specific command.

$ man crontab

When a man page for a command is located under more than one section, you can view the man page for that command from a specific section as shown below.

$ man SECTION-NUMBER commandname

$ whatis crontab

crontab (1) - maintain crontab files for individual users (V3)

crontab (5) - tables for driving cron

$ man 5 crontab

tail command

Print the last 10 lines of a file by default.

$ tail filename.txt

Print N number of lines from the file named filename.txt

$ tail -n N filename.txt

View the content of the file in real time using tail -f. This is useful to view the log files, that keeps growing. The command can be terminated using CTRL-C.

$ tail -f log-file

less command

less is very efficient while viewing huge log files, as it doesn't need to load the full file while opening.

$ less huge-log-file.log

One you open a file using less command, following two keys are very helpful.

CTRL+F – forward one window

CTRL+B – backward one window

su command

Switch to a different user account using su command. Super user can switch to any other user without entering their password.

$ su – USERNAME

Execute a single command from a different account name. In the following example, john can execute the ls command as raj username. Once the command is executed, it will come back to john’s account.

[john@dev-server]$ su - raj -c 'ls'

[john@dev-server]$

Login to a specified user account, and execute the specified shell instead of the default shell.

$ su -s 'SHELLNAME' USERNAME

mysql command

mysql is probably the most widely used open source database on Linux. Even if you don't run a mysql database on your server, you might end-up using the mysql command (client) to connect to a mysql database running on the remote server.

To connect to a remote mysql database. This will prompt for a password.

$ mysql -u root -p -h 192.168.1.2

To connect to a local mysql database.

$ mysql -u root -p

If you want to specify the mysql root password in the command line itself, enter it immediately after -p (without any space).

ping command

Ping a remote host by sending only 5 packets.

$ ping -c 5 gmail.com

wget command

The quick and effective method to download software, music, video from internet is using wget command.

$ wget http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-3.2.1.tar.gz

Download and store it with a different name.

$ wget -O taglist.zip http://www.vim.org/scripts/download_script.php?src_id=7701