Advance Linux Process Management(Ubuntu,Centos,OpenSuse)

There are some advance process monitoring tools for Linux Operating system.
Some of them are explaining bellow

htop:

Most system administrator familiar with Linux have used the *top* command line utility to see what process is taking the most CPU or memory. There's a similar utility called htop that is much easier to use for normal tasks. It's interactive, real-time and most importantly its very user friendly and you can see the CPU utilization at a glance.

But to use the htop utility we have to install it first. Because By default it is not installed in the operating system

Installing Process of htop in linux(with Different Package management):

Ubuntu:
=> sudo apt install htop

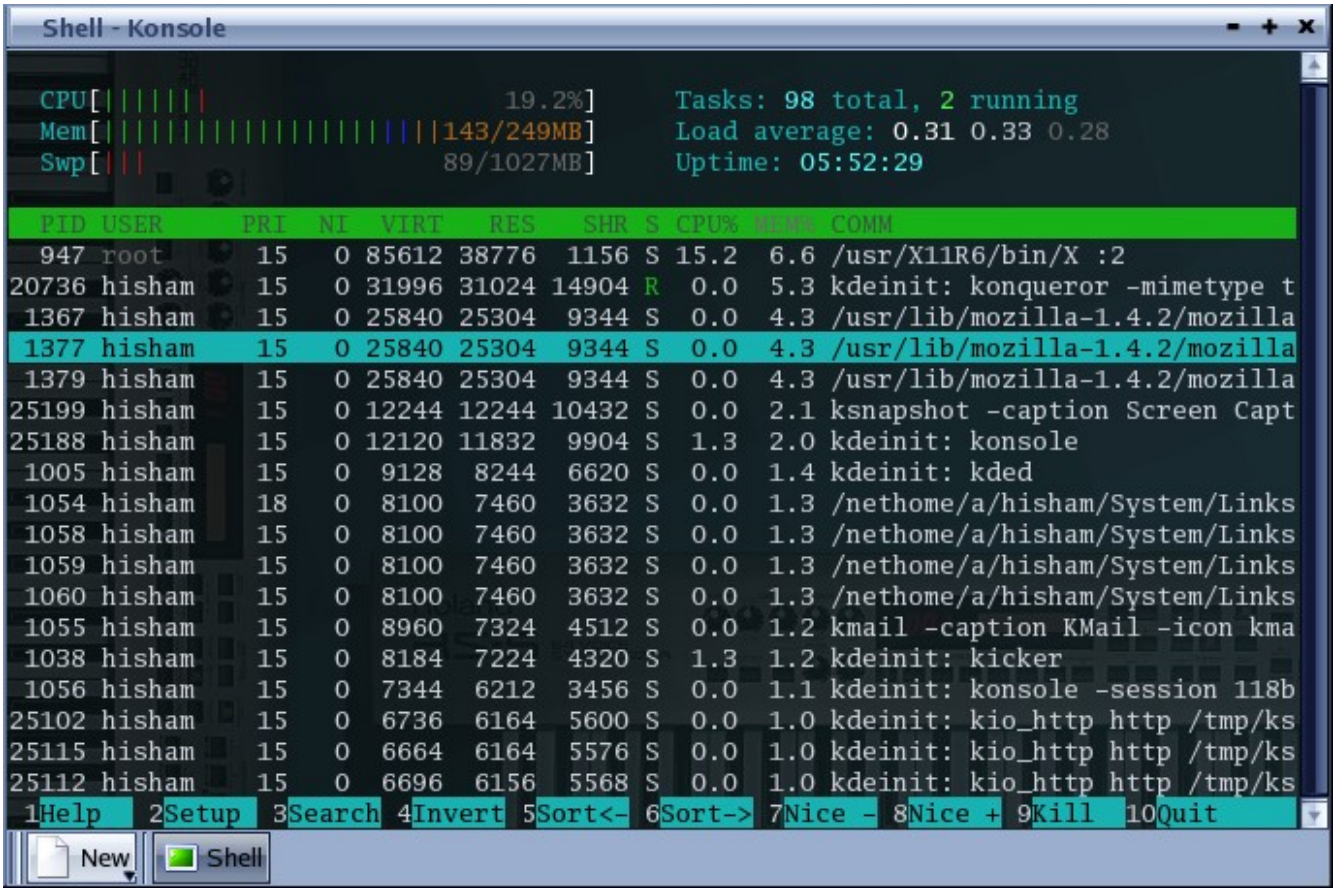
Centos:
for installing in centos we just need to add an EPEL repository so yum can find it.

=>sudo yum -y install epel-release
=>sudo yum -y update
=>sudo yum install htop

After a successful install we have to type

=>sudo htop

we should see the status of your system



Its almost look like top command but more interactive and more user friendly.

Lets talk about each option about the htop utility.

1) First option is the CPU which shows us the CPU utilization percentage and also in a graph mode

2) Second option is the memory option Which shows the actual memory which is used .

3) Third Option is the Swap space that is used by the system

4) Next option on the right portion is Task. It show the total ,Threads and the Running task

5) Next option shows the Load average of the system

6) Third option shows on the right shows the Uptime of the server shows the amount of time server is running

The lower Part provides details of the process just like top command lets see it again

Name Of The Header	Description
PID	Every Process has a unique process id (the so called PID).the process id is very important. For example you want to kill a process then you need to provide the process id for that
USER	The name of the users the process is using .many process are run as root so you can see it quite often
PRI	It shows the priority of the process. This number is an indication that when the process will get the CPU cycles again. Lower the value higher the priority. Process with a higher priority will have the CPU cycle sooner. And lower priority process get the CPU cycle later
NI	The NICE value of the process .With the Help of the NICE value we can change the process Priority
VIRT	Total amount of Memory claimed by the process
RES	The memory size that the process is using at that moment
SHR	The amount of Shared memory that the process is sharing with other processed

S	Shows the status of the processed 'R' means it is running 'S' means it is in sleeping mode 'Z' means its a zombie process 'T' means stopped, either by a job control signal 'D' means uninterruptible sleep
%CPU	The amount of CPU that is used by the last pooling cycle (which is typically 5 seconds)
%MEM	The amount of MEMORY that is used by the last pooling cycle (which is typically 5 seconds)
TIME	It indicates the total amount of CPU time that the process has used since it was started
COMMAND	This is the command that started the processed

---

the most useful option is the option on the bottom .There are 10 option on the bottom of the screen

Name	Description
F1	Its the help option. it contains the descriptions of every other option and short codes
F2	Setup option with this option you can customize the appearance of the htop utility .you can also set the color of the output and your desired option with this option. you can set which column should be there and which column should not

F3	With this option you can search a particular process just type F3 and the name of the process to find it.
F4	You can filter the process with this command. if you write a process name and it will show all the process s name with the same command name
F6	F6 is the sort option .you can sort the process by different options. you can sort the process by PID,USER,Priority,Time etc
F7	F7 is used to decrease the Nice value of any process the low the Nice value the greater the priority
F8	F8 is used to increase the Nice value of any process the higher the Nice value the lower the priority
F9	Its the kill command you select a process and press F9 it will show you a list of signal the you want to send to that process. That's how you can kill any process
F10	Exit command for htop

You can also find the process filtered bu user from the commands just like we use like top command.

=>htop -u <username>

Fuser:

The *fuser* command is basically used to identify processes using files, directories, or sockets. The tool basically displays the PIDs of processes that are using the file whose name is passed as argument to the command. Suppose you are given a task to identify the processes that are using a particular file,'fuser' command lets you identify processes based on the files (or directories, or sockets) they are accessing. For block special devices, the command lists the processes that use any file on that device.Not only that, the tool also allows you to kill these processes, so you don't have to use the *kill* or *killall* commands separately.

Fuser command output displays a list of PID of process followed by a letter indicating how the process use the file. cause the fuser command not only displays the process but also the type of access the as well.

Each type of access denoted by a letter

item	Description
c	Uses the file as a current directory.
e	Uses the file as as a programs executable object.
r	Uses the file as the root directory
m	Uses the file as a shared library (or other loadable object)

[Remember Linux consider everything as a file]

Suppose you want to see which process is currently using the root directory

=>fuser /

```
[root@localhost vagrant]# fuser /
/:                    1rc     2rc     3rc     5rc     6rc     7rc     8rc     9rc    10rc    11rc    14rc
    15rc    16rc    17rc    18rc    19rc    20rc    21rc    22rc    23rc    24rc    26rc    33rc    34rc
35rc    36rc    44rc    45rc    46rc    47rc    48rc    62rc    92rc   602rc   622rc   627rc   631rc   635rc
   971rc   976rc   978rc   981rc   984rc   988rc   989rc   992rc   993rc   994rc   995rc   996rc  1048rc  10
87rc  1184rc  1228rc  1231rc  1544rc  1596rc  1620rc  1655rc  1669rc  1765rc  1970rc  1979rc  2482rc  2483rc
  2484rc  2572r  2575r  2576r  3994rc  4022rc  4609rc  4612rc  4613r  4643rc  4658rc  4700rc  4732rc  4736r
[root@localhost vagrant]#
```

but this is only showing the PID and its hard to understand .so we add verbose flag (- v) lets the result now

```
[root@localhost vagrant]# fuser -v /
                     USER         PID ACCESS COMMAND
/:                   root     kernel mount /
                     root          1 .rc.. systemd
                     root          2 .rc.. kthreadd
                     root          3 .rc.. ksoftirqd/0
                     root          5 .rc.. kworker/0:0H
                     root          6 .rc.. kworker/u2:0
                     root          7 .rc.. migration/0
                     root          8 .rc.. rcu_bh
                     root          9 .rc.. rcu_sched
                     root         10 .rc.. lru-add-drain
                     root         11 .rc.. watchdog/0
                     root         14 .rc.. netns
                     root         15 .rc.. khungtaskd
                     root         16 .rc.. writeback
                     root         17 .rc.. kintegrityd
                     root         18 .rc.. bioset
                     root         19 .rc.. bioset
                     root         20 .rc.. bioset
                     root         21 .rc.. kblockd
                     root         22 .rc.. md
                     root         23 .rc.. edac-poller
                     root         24 .rc.. watchdogd
                     root         26 .rc.. kworker/u2:1
                     root         33 .rc.. kswapd0
                     root         34 .rc.. ksmd
                     root         35 .rc.. khugepaged
                     root         36 .rc.. crypto
                     root         44 .rc.. kthrotld
                     root         45 .rc.. kmpath_rdacd
                     root         46 .rc.. kaluad
```

[killing process]

suppose you want to know which process is using a specific file.for example create a file ping.txt and store the output of the ping www.google.com

=>pi ng www.google.com > ping.txt &

So now process created y the ping command is currently using this file lets check with the fuser command

=> fuser -v ping.txt

```
[vagrant@localhost ~]$ ping 8.8.8.8 >ping.txt &
[1] 4882
[vagrant@localhost ~]$ sudo fuser -v ping.txt
                     USER        PID ACCESS COMMAND
/home/vagrant/ping.txt:
                     vagrant    4882 F.... ping
[vagrant@localhost ~]$
```

to list the process number and user login names of process .The -u flag is username

=> fuser -u ping.txt

```
[vagrant@localhost ~]$ ping 8.8.8.8 >ping.txt &
[1] 4976
[vagrant@localhost ~]$ sudo fuser -u  ping.txt
/home/vagrant/ping.txt:  4976(vagrant)
[vagrant@localhost ~]$
```

like top or htop command we can also send the kill signal to the process that are currently using the process. Then you have to use the -k switch with the command.

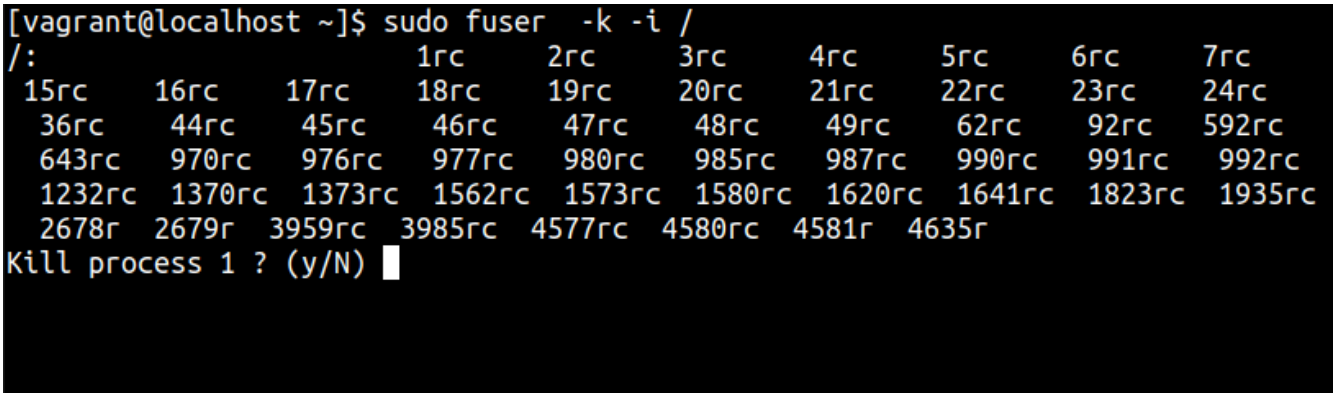
=>sudo fuser -k <filesystem>

To terminate all of the processes using a given file system, enter:

=>sudo fuser -kxuc /dev/hd1

if you want to kill the process interactively then you have to add -i switches

=>fuser -v -k -i <filesystem>



[The fuser command is used to determine the processes that are using a file system. If the file system is a network file system (NFS) and the NFS server is not responding, the fuser command might hang. To avoid such a situation, you can set the `FUSER_VERSION` environment variable to 1.]

nohup:

Basically when you logout of the system all the process under this user will terminate but There is a command called nohup which executes another command and force the system to continue running it even the session the disconnected. nohup prevents the system from being aborted automatically when a user logout

=>nohup <command> <command argument>

There are some important properties of nohup command

1)The nohup command redirects the **standard input** to ***/dev/null*** therefore terminal input is not possible when running command using nohup

2)**Standard output** will be redirected to a file called **nohup.out** .So all the result of that command will be logged to this file

3)And **standard error** will be redirect to the terminal.

You can also the output to any file you want by redirecting the output to a file

=>nohup command > file