

Lesson 4 al lesson 11

The terminal window shows a user named 'verania' at 'webminal.org'. The user runs several commands to demonstrate process management:

```
#####  
- Share files with others, See /common_pool/README.txt  
- See 'Root' menu for Webminal Desktop Root and Webminal Root features  
- For Teachers/Students, partial sudo (plus C programming) platform ava  
ilable - mail us.  
[verania@webminal.org ~]$ps  
PID TTY TIME CMD  
11177 pts/191 00:00:00 sh  
11214 pts/191 00:00:00 ps  
[verania@webminal.org ~]$sleep 60 &  
[1] 11215  
[verania@webminal.org ~]$ps  
PID TTY TIME CMD  
11177 pts/191 00:00:00 sh  
11215 pts/191 00:00:00 sleep  
11254 pts/191 00:00:00 ps  
[verania@webminal.org ~]$kill 11215  
[verania@webminal.org ~]$ps  
PID TTY TIME CMD  
11177 pts/191 00:00:00 sh  
11256 pts/191 00:00:00 ps  
[1]+ Terminated sleep 60  
[verania@webminal.org ~]$kill -9 11215  
-sh: kill: (11215) - No such process  
[verania@webminal.org ~]$sleep 30 &  
[1] 11361  
[verania@webminal.org ~]$sleep 30 &  
[2] 11362  
[verania@webminal.org ~]$killall sleep  
sleep(11266): Operation not permitted  
[1]- Terminated sleep 30  
[2]+ Terminated sleep 30  
[verania@webminal.org ~]$
```

On the right side, a text box explains the `killall` command:

right?thus `killall` terminates processes by process name.

Tips and tricks:

```
killall -u webminal
```

This kills only processes owned by user "webminal"

```
killall -w find
```

Wait for all find process to die. killall checks once per second if any of the killed processes still exist and only returns if none are left. Note that killall may wait forever if the signal was ignored, had no effect. To find a process id (pid) of a process you can use,

```
pidof bash
```

title: pidof

provides the process ID of a running program bash

Tips and tricks:

```
pidof -s bash
```

returns only one process id, instead of all process running as bash

The terminal window shows the same user 'verania' at 'webminal.org'. The user runs several commands to demonstrate process management:

```
- For Teachers/Students, partial sudo (plus C programming) platform ava  
ilable - mail us.  
[verania@webminal.org ~]$ps  
PID TTY TIME CMD  
11177 pts/191 00:00:00 sh  
11214 pts/191 00:00:00 ps  
[verania@webminal.org ~]$sleep 60 &  
[1] 11215  
[verania@webminal.org ~]$ps  
PID TTY TIME CMD  
11177 pts/191 00:00:00 sh  
11215 pts/191 00:00:00 sleep  
11254 pts/191 00:00:00 ps  
[verania@webminal.org ~]$kill 11215  
[verania@webminal.org ~]$ps  
PID TTY TIME CMD  
top - 01:12:57 up 384 days, 6:24, 0 users, load average: 0.09, 0.07, 0.09  
Tasks: 421 total, 1 running, 393 sleeping, 25 stopped, 2 zombie  
%Cpu(s): 0.3 us, 0.2 sy, 0.0 ni, 99.4 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st  
KiB Mem : 14871184 total, 838412 free, 4313384 used, 9719388 buff/cache  
KiB Swap: 0 total, 0 free, 0 used, 5607136 avail Mem  


| PID   | USER     | PR | NI | VIRT    | RES   | SHR   | S | %CPU | %MEM | TIME+   | COMMAND |
|-------|----------|----|----|---------|-------|-------|---|------|------|---------|---------|
| 12972 | verania  | 20 | 0  | 162340  | 2592  | 1576  | R | 0.3  | 0.0  | 0:04.94 | top     |
| 404   | talmagr+ | 20 | 0  | 116344  | 2384  | 1716  | S | 0.0  | 0.0  | 0:00.07 | bash    |
| 470   | PratapA+ | 20 | 0  | 116196  | 1668  | 1328  | S | 0.0  | 0.0  | 0:00.03 | sh      |
| 545   | durgabh+ | 20 | 0  | 1050064 | 71876 | 71380 | S | 0.0  | 0.5  | 0:00.00 | vmlinux |
| 546   | durgabh+ | 20 | 0  | 1050064 | 71876 | 71380 | S | 0.0  | 0.5  | 0:00.06 | vmlinux |
| 547   | durgabh+ | 20 | 0  | 1050064 | 71876 | 71380 | S | 0.0  | 0.5  | 0:00.01 | vmlinux |
| 622   | BOOJA    | 20 | 0  | 115596  | 1912  | 1172  | S | 0.0  | 0.0  | 0:00.00 | nano    |
| 776   | NotroDan | 20 | 0  | 116340  | 2360  | 1696  | S | 0.0  | 0.0  | 0:00.06 | bash    |
| 1007  | LordAsh+ | 20 | 0  | 115596  | 1864  | 1288  | S | 0.0  | 0.0  | 0:00.00 | nano    |
| 1657  | connorh+ | 20 | 0  | 116464  | 2312  | 1680  | S | 0.0  | 0.0  | 0:00.05 | sh      |
| 1711  | claudia+ | 20 | 0  | 115596  | 1848  | 1304  | S | 0.0  | 0.0  | 0:00.24 | nano    |


```

On the right side, a text box explains the `top` command:

scheduling priorities of their own processes,even if they were the ones that decreased the priorities in the first place.

To adjust priority for all process owned by a user "webminal",

```
renice +1 -u webminal
```

to display running process ,you can also use

```
top
```

title: top

see it provides a dynamic real-time view of a running system. spend sometime ,examining the output.To quit from the top command,press `q`. To display commands in a tree like structure,type

```
pstree
```

title: pstree

display a tree of processes,to display pid , use -p option with pstree.

```
pstree -p
```

below command will let us know how long it took to complete a command.

```
time ls -l
```

```
New File x Webminal x +
webminal.org/terminal/
3989 RAM:54 20 0 115596 2296 1264 S 0.0 0.0 0:00.02 nano
[verania@webminal.org ~]$pstree
? 35*[?]sh
? 19*[?]bash
? 2*[?]4*[sh]]
? 2*[?]sh-cat]
? sh-bash
? 4*[bash]
? 3*[?]2*[sh]]
? sh-grep
? less-vi
? 4*[less]
? 4*[?]2*[bash]]
? 3*[sh]
? sh-zsh
? sh-zsh-sh
? sh
? sh-man-less
? 2*[sh]
? sh-bash
? sh-pstree
? bash-2*[cat]
? sh-nano
? 5*[sh]
? sh-sh-sh
bash-bash
bash-bash-bash
9*[gpg-agent]
ifstat
7*[ls]
17*[nano]
sh-sleep
9*[ssh-agent]
19*[top]
32*[vim]
```

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```
time ls -l
```

```
New File x Webminal x +
webminal.org/terminal/
vmlinux(12405)
vmlinux(28211)
vmlinux(28212)
vmlinux(28213)
[verania@webminal.org ~]$time ls -l
dir1
dir2
dir3
dir4
dir50
file1.txtx
file2.txtx
hello.txt
softlink

real    0m0.004s
user    0m0.002s
sys     0m0.003s
[verania@webminal.org ~]$time ls -l
total 4
drwxrwxr-x. 2 verania verania  6 Oct 30 18:26 dir1
drwxrwxr-x. 2 verania verania 17 Oct 30 18:53 dir2
drwxrwxr-x. 2 verania verania  6 Oct 30 18:27 dir3
drwxrwxr-x. 2 verania verania  6 Oct 30 18:27 dir4
drwxrwxr-x. 2 verania verania 38 Oct 30 18:53 dir50
-rw-rw-r--. 1 verania verania  0 Oct 30 18:34 file1.txtx
-rw-rw-r--. 1 verania verania  0 Oct 30 18:35 file2.txtx
-rw-rw-r--. 1 verania verania 18 Oct 30 18:40 hello.txt
lrwxrwxrwx. 1 verania verania 21 Oct 30 18:58 softlink -> dir2/dir3/dir4/hi.txt

real    0m0.058s
user    0m0.054s
sys     0m0.004s
[verania@webminal.org ~]$
```

to display running process ,you can also use

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top
```

title: top

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```

below command will let us know how long it took to complete a command.

```
time ls -l
```

title: time

time gives statistics about the program it ran.

real - the elapsed real time between invocation and termination.

```
sys 0m0.004s
[verania@webminal.org ~]$grep -r 'hello' .
./bash_history:echo "hello"
./bash_history:echo "hello" > hello.txt
./bash_history:echo "linux" > hello.txt
./bash_history:echo "world" > hello.txt
./bash_history:cat hello.txt
./bash_history:head -2 hello.txt
./bash_history:echo "hello"
./bash_history:echo "hello" > hello.txt
./bash_history:echo "linux" >> hello.txt
./bash_history:echo "world" >> hello.txt
./bash_history:cat hello.txt
./bash_history:head -2 hello.txt
./bash_history:head hello.txt
./bash_history:tail hello.txt
./bash_history:stat hello.txt
./bash_history:cp -v hello.txt dir2
./bash_history:cp -v hello.txt dir2/file2.txt
./bash_history:cp -v hello.txt dir2/dir3
./bash_history:md5sum hello.txt
./bash_history:md5sum dir2/hello.txt
./bash_history:mv hello.txt dir2/dir3/dir4/hi.txt
./bash_history:ln dir2/dir3/dir4/hi.txt hello
./bash_history:stat hello
./dir2/dir3:hello
./hello.txt:hello
./dir50/file2.txt:hello
./dir50/hello.txt:hello
[verania@webminal.org ~]$grep -i 'LINUX' hello
grep: hello: No such file or directory
[verania@webminal.org ~]$grep -n 'linux' hello
-sh: grep: command not found
[verania@webminal.org ~]$grep -v 'world' hello
-sh: grep: command not found
```

sort new.txt

title: sort

File contents are sorted.Remember,we have two files new.txt and linux.txt.lets compare them

diff hello linux.txt

title: diff

File contents are sorted.Remember,we have two files new.txt and linux.txt.lets compare them

diff hello linux.txt

Compare files line by line. < denotes first file(hello) and > denotes second file(linux.txt). you can compare three files with

diff3 hello new.txt linux.txt

title: diff3

I'll let you to analyze the output :D we have reached end of lesson5. move on to lesson6.

Just type 'vimtutor', if you want to learn about vim text editor. If you want to change colors, please visit 'play' menu and view first screencast.

```
./dir2/dir3:hello
./hello.txt:hello
./dir50/file2.txt:hello
./dir50/hello.txt:hello
[verania@webminal.org ~]$grep -i 'LINUX' hello
grep: hello: No such file or directory
[verania@webminal.org ~]$grep -n 'linux' hello
-sh: grep: command not found
[verania@webminal.org ~]$grep -v 'world' hello
-sh: grep: command not found
[verania@webminal.org ~]$wc -l hello
wc: hello: No such file or directory
[verania@webminal.org ~]$echo .e "col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3" >> new.txt
[verania@webminal.org ~]$echo -e "Hello\nlinux\nprogrammers paradise" >> linux.txt
[verania@webminal.org ~]$cut -f1 -d ' ' new.txt
cut: invalid byte, character or field list
Try 'cut --help' for more information.
[verania@webminal.org ~]$cut -f1 -d ' ' new.txt
.e
[verania@webminal.org ~]$cut -f3 -d ' ' new.txt
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$paste hello new.txt
paste: hello: No such file or directory
[verania@webminal.org ~]$paste -s hello new.txt
paste: hello: No such file or directory
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$sort new.txt
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$diff hello linux.txt
diff: hello: No such file or directory
[verania@webminal.org ~]$diff3 hello new.txt linux.txt
diff3: hello: No such file or directory
[verania@webminal.org ~]$
```

sort new.txt

title: sort

File contents are sorted.Remember,we have two files new.txt and linux.txt.lets compare them

diff hello linux.txt

title: diff

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```
New File x Webminal x +
webminal.org/terminal/

[verania@webminal.org ~]$grep -i 'LINUX' hello
grep: hello: No such file or directory
[verania@webminal.org ~]$grep -n 'linux' hello
-sh: grep: command not found
[verania@webminal.org ~]$grep -v 'world' hello
-sh: grep: command not found
[verania@webminal.org ~]$wc -l hello
wc: hello: No such file or directory
[verania@webminal.org ~]$echo .e "col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3" >> new.txt
[verania@webminal.org ~]$echo -e "Hello\nlinux\nprogrammers paradise" >> linux.txt
[verania@webminal.org ~]$cut -f1 -d ' ' new.txt
cut: invalid byte, character or field list
Try 'cut --help' for more information.
[verania@webminal.org ~]$cut -f1 -d ' ' new.txt
.e
[verania@webminal.org ~]$cut -f3 -d ' ' new.txt
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$paste hello new.txt
paste: hello: No such file or directory
[verania@webminal.org ~]$paste -s hello new.txt
paste: hello: No such file or directory
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$sort new.txt
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$diff hello linux.txt
diff: hello: No such file or directory
[verania@webminal.org ~]$diff3 hello new.txt linux.txt
diff3: hello: No such file or directory
[verania@webminal.org ~]$dirname dir2/dir3/dir4\hi.txt
.
[verania@webminal.org ~]$dirname dir2/dir3/dir4\hi.txt
dir2/dir3/dir4
[verania@webminal.org ~]$cd dir2/dir3/dir4
-sh: dir2/dir3/dir4: Not a directory
[verania@webminal.org ~]$
```

```
chown root:staff -R ~/dir2

Use option "--from" to change files that belongs to specific user group.

chown --from=webminal:webminal root:staff -R ~/dir2

will change the files the belong to webminal user and webminal group
to root and other user files left as it is. Lets change the group alone-

chgrp root file1.txt

title: chgrp

chgrp: changing group of `file1.txt': Operation not permitted

hehe...again thats expected error message :) you can use chgrp only as
root user, but anyway thats the syntax/usage of chgrp command.

Tips and tricks:

To change the group of dir2 and subfiles to "root".

chgrp -hR root dir2

Thats it we have completed lesson6.

Just type 'vimtutor', if you want to learn about vim text editor. If you
want to change colors, please visit 'play' menu and view first
screencast.
```

```
New File x Webminal x +
webminal.org/terminal/

.e
[verania@webminal.org ~]$cut -f3 -d ' ' new.txt
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$paste hello new.txt
paste: hello: No such file or directory
[verania@webminal.org ~]$paste -s hello new.txt
paste: hello: No such file or directory
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$sort new.txt
.e col1 col2 r1\ncol5 col6 r2\ncol13 col14 r3
[verania@webminal.org ~]$diff hello linux.txt
diff: hello: No such file or directory
[verania@webminal.org ~]$diff3 hello new.txt linux.txt
diff3: hello: No such file or directory
[verania@webminal.org ~]$dirname dir2/dir3/dir4\hi.txt
.
[verania@webminal.org ~]$dirname dir2/dir3/dir4\hi.txt
dir2/dir3/dir4
[verania@webminal.org ~]$cd dir2/dir3/dir4
-sh: dir2/dir3/dir4: Not a directory
[verania@webminal.org ~]$basename dir2/dir3/dir4
dir4
[verania@webminal.org ~]$hi.txt
-sh: hi.txt: command not found
[verania@webminal.org ~]$chmod -v 666 file1.txt
chmod: cannot access `file1.txt': No such file or directory
failed to change mode of `file1.txt' from 0000 (-----) to 0666 (-----)
[verania@webminal.org ~]$chmod a+rwx file1.txt
chmod: cannot access `file1.txt': No such file or directory
[verania@webminal.org ~]$chmod a-rw file1.txt
chmod: cannot access `file1.txt': No such file or directory
[verania@webminal.org ~]$chmod -R 644 ~/dir2
chmod: cannot access `/home/verania/dir2/dir3': Permission denied
[verania@webminal.org ~]$
```

```
chown root:staff -R ~/dir2

Use option "--from" to change files that belongs to specific user group.

chown --from=webminal:webminal root:staff -R ~/dir2

will change the files the belong to webminal user and webminal group
to root and other user files left as it is. Lets change the group alone-

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chgrp: changing group of `file1.txt': Operation not permitted

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To change the group of dir2 and subfiles to "root".

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```

```
[verania@webminal.org ~]$file linux.txt
linux.txt: ASCII text
[verania@webminal.org ~]$file /dev/null
/dev/null: character special
[verania@webminal.org ~]$file -s /dev/sda2
/dev/sda2: cannot open (No such file or directory)
[verania@webminal.org ~]$whereis ls
ls: /usr/bin/ls /usr/share/man/man1/ls.1.gz
[verania@webminal.org ~]$whereis stdio.h
stdio: /usr/include/stdio.h
[verania@webminal.org ~]$php
-sh: php: command not found
[verania@webminal.org ~]$which php
/usr/bin/which: no php in (/usr/local/bin:/bin:/usr/bin:/usr/local/sbin:/usr/sbin)
[verania@webminal.org ~]$find ~ -name "linux.txt"
find: '/home/verania/dir2/dir3': Permission denied
/home/verania/linux.txt
[verania@webminal.org ~]$find . -type f -exec file '{}' \;
./bash_profile: ASCII text
./emacs: ASCII text
./bash_history: ASCII text
./bashrc: ASCII text
./bash_logout: ASCII text
./zshrc: ASCII text
./magic_string.txt: ASCII text
find: './dir2/dir3': Permission denied
./file1.txtx: empty
./file2.txtx: empty
./hello.txt: ASCII text
./dir50/file2.txt: ASCII text
./dir50/hello.txt: ASCII text
./new.txt: ASCII text
./linux.txt: ASCII text
[verania@webminal.org ~]$find . -type f -exec ls -l '{}' \;
```

title: find

Searches for files in a directory hierarchy.

Tips and tricks:

To find regular files and invoke the file command on the results, run

```
find . -type f -exec file '{}' \;
```

To find regular files and display their attributes using the ls command, run

```
find . -type f -exec ls -l '{}' \;
```

To find files over 20 bytes in size and list them out, run

```
find ~ -type f -size +20c -exec ls -hl {} \;
```

What this last command does is left as an exercise for you.

```
find ~ -type f -size +20c -exec cp dir1 {} \;
```

After you have practised above commands, move to our final lesson see you later.

Just type 'vimtutor', if you want to learn about vim text editor. If you want to change colors, please visit 'play' menu and view first screencast.

```
-rw-r--r-- 1 verania verania 193 Dec 7 2016 ./bash_profile
-rw-r--r-- 1 verania verania 334 Sep 20 2017 ./emacs
-rw-r--r-- 1 verania verania 945 Oct 30 19:05 ./bash_history
-rw-r--r-- 1 verania verania 231 Dec 7 2016 ./bashrc
-rw-r--r-- 1 verania verania 18 Dec 7 2016 ./bash_logout
-rw-r--r-- 1 verania verania 658 Aug 2 2017 ./zshrc
-rw-r--r-- 1 root root 9 Oct 30 18:15 ./magic_string.txt
find: './dir2/dir3': Permission denied
-rw-rw-r-- 1 verania verania 0 Oct 30 18:34 ./file1.txtx
-rw-rw-r-- 1 verania verania 0 Oct 30 18:35 ./file2.txtx
-rw-rw-r-- 1 verania verania 18 Oct 30 18:40 ./hello.txt
-rw-rw-r-- 1 verania verania 18 Oct 30 18:47 ./dir50/file2.txt
-rw-rw-r-- 1 verania verania 18 Oct 30 18:47 ./dir50/hello.txt
-rw-rw-r-- 1 verania verania 46 Nov 8 01:20 ./new.txt
-rw-rw-r-- 1 verania verania 33 Nov 8 01:21 ./linux.txt
[verania@webminal.org ~]$find ~ -type f -size +20c -exec ls -hl {} \;
-rw-r--r-- 1 verania verania 193 Dec 7 2016 /home/verania/.bash_profile
-rw-r--r-- 1 verania verania 334 Sep 20 2017 /home/verania/.emacs
-rw-r--r-- 1 verania verania 945 Oct 30 19:05 /home/verania/.bash_history
-rw-r--r-- 1 verania verania 231 Dec 7 2016 /home/verania/.bashrc
-rw-r--r-- 1 verania verania 658 Aug 2 2017 /home/verania/.zshrc
find: '/home/verania/dir2/dir3': Permission denied
-rw-rw-r-- 1 verania verania 46 Nov 8 01:20 /home/verania/new.txt
-rw-rw-r-- 1 verania verania 33 Nov 8 01:21 /home/verania/linux.txt
[verania@webminal.org ~]$find ~ -type f -size +20c -exec cp dir1 {} \;
cp: omitting directory 'dir1'
cp: omitting directory 'dir1'
cp: omitting directory 'dir1'
cp: omitting directory 'dir1'
cp: omitting directory 'dir1'
find: '/home/verania/dir2/dir3': Permission denied
cp: omitting directory 'dir1'
cp: omitting directory 'dir1'
[verania@webminal.org ~]$
```

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```
New File x Webminal x +
webminal.org/terminal/

[verania@webminal.org ~]$uptime
01:47:36 up 384 days, 6:58, 0 users, load average: 0.18, 0.12, 0.13
[verania@webminal.org ~]$date
Sun Nov 8 01:47:40 CET 2020
[verania@webminal.org ~]$who
[verania@webminal.org ~]$w
01:48:02 up 384 days, 6:59, 0 users, load average: 0.19, 0.13, 0.14
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU   WHAT
[verania@webminal.org ~]$mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime,seclabel)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
devtmpfs on /dev type devtmpfs (rw,nosuid,seclabel,size=7425888k,nr_inodes=1856472,mode=755)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev,noexec,relatime,seclabel)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,seclabel,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,nodev,seclabel,mode=755)
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,seclabel,mode=755)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release_agent=/usr/lib/systemd/systemd-cgroups-agent,name=systemd)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net_cls,net_prio)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpuacct,cpu)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset)
[verania@webminal.org ~]$mount -t ext4
[verania@webminal.org ~]$df -h
title: df
-h switch makes the output more headable for humans. so we found df finds disk usage, but to find memory usage, we need to use
free -m
title: free
displays the total amount of free and used physical and swap memory in the system, as well as the buffers used by the kernel.
Wow!Cool,
You have completed the lesson.
Just type 'vimtutor', if you want to learn about vim text editor. If you want to change colors, please visit 'play' menu and view first screencast.
```

```
New File x Webminal x +
webminal.org/terminal/

cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer)
configfs on /sys/kernel/config type configfs (rw,relatime)
/dev/sda1 on / type ext4 (rw,relatime,seclabel,discard,errors=remount-ro,data=ordered)
selinuxfs on /sys/fs/selinux type selinuxfs (rw,relatime)
mqueue on /dev/mqueue type mqueue (rw,relatime,seclabel)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime,seclabel)
debugfs on /sys/kernel/debug type debugfs (rw,relatime)
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw,relatime)
/dev/sdc1 on /home type xfs (rw,nosuid,nodev,noexec,relatime,seclabel,attr2,inode64,usrquota)
/dev/sdb on /common_pool type xfs (rw,nosuid,nodev,noexec,relatime,seclabel,attr2,inode64,noquota)
[verania@webminal.org ~]$mount -t ext4
/dev/sda1 on / type ext4 (rw,relatime,seclabel,discard,errors=remount-ro,data=ordered)
[verania@webminal.org ~]$df -h
title: df
-h switch makes the output more headable for humans. so we found df finds disk usage, but to find memory usage, we need to use
free -m
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Wow!Cool,
You have completed the lesson.
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[verania@webminal.org ~]$free -m
total      used        free      shared  buff/cache   available
Mem:    14522      4235         849       4233       9438       5517
Swap:      0           0           0
```


New File

Webminal

+

webminal.org/terminal/

```

[verania@webminal.org ~]$ps
  PID TTY          TIME CMD
27449 pts/215    00:00:00 sh
27511 pts/215    00:00:00 ps
[verania@webminal.org ~]$sleep 5
[verania@webminal.org ~]$sleep 2
[verania@webminal.org ~]$sleep 5 &
[1] 27530
[verania@webminal.org ~]$sleep 2
[1]+  Done                  sleep 5
[verania@webminal.org ~]$sleep 5 &
[1] 27743
~sh: ssleep: command not found
[verania@webminal.org ~]$ps
  PID TTY          TIME CMD
27449 pts/215    00:00:00 sh
27778 pts/215    00:00:00 ps
[1]+  Done(127)             ssleep 5
[verania@webminal.org ~]$jobs
[verania@webminal.org ~]$$fg 5
~sh: fg: 5: no such job
[verania@webminal.org ~]$$sleep 145 &
[1] 27874
[verania@webminal.org ~]$$sleep 145 &
[2] 27875
[verania@webminal.org ~]$$sleep 145 &
[3] 27876
[verania@webminal.org ~]$$sleep 145 &
[4] 27877
[verania@webminal.org ~]$$sleep 3000 &
[5] 27879
[verania@webminal.org ~]$$-sh: sleep: command not found
fg 5
~sh: fg: job has terminated
[5]+  Done(127)             sleep 3000

```

Lets admit it, by mistake without thinking, you (yes, its you :p)brought this background process to foreground, now you desperately want to put in on background again!!

Dont worry, Linux is so flexible we can do that too. Just press 'ctrl+z'.You get output which says job is stopped.

```

^Z
[5]+  Stopped                  sleep 3000

```

verify the status by checking output of jobs command.

```

$jobs
[5]+  Stopped                  sleep 3000

```

Its stopped, we can restart the process again in background with 'bg '

```

$bg 5
[5]+ sleep 3000 &

```

```

$jobs
[5]+  Running                  sleep 3000 &

```

Great, Today we learned about background and foreground process and how to move between them. We will discuss in upcoming lessons.

Just type 'vimtutor', if you want to learn about vim text editor. If you want to change colors, please visit 'play' menu and view first screencast.

New File

Webminal

+

webminal.org/terminal/

```

4130
4151^Z
[2]+  Stopped(SIGTSTP)         seq 1 500000
[verania@webminal.org ~]$ps
  PID TTY          TIME CMD
27449 pts/215    00:00:00 sh
28292 pts/215    00:00:00 sleep
28412 pts/215    00:00:00 seq
28467 pts/215    00:00:00 ps
[verania@webminal.org ~]$$bash
[verania@webminal.org ~]$ps
  PID TTY          TIME CMD
27449 pts/215    00:00:00 sh
28292 pts/215    00:00:00 sleep
28412 pts/215    00:00:00 seq
28468 pts/215    00:00:00 bash
28488 pts/215    00:00:00 ps
[verania@webminal.org ~]$( ( kill -STOP 2498 ) )
bash: kill: (2498) - No such process
[verania@webminal.org ~]$ps S
  PID TTY          STAT      TIME COMMAND
27449 pts/215    Ss         0:00 -sh
28292 pts/215    T          0:00 sleep 100
28412 pts/215    T          0:00 seq 1 500000
28468 pts/215    S          0:00 bash
28538 pts/215    R+         0:00 ps S
[verania@webminal.org ~]$$jobs
[verania@webminal.org ~]$$fg
bash: fg: current: no such job
[verania@webminal.org ~]$ps S
  PID TTY          STAT      TIME COMMAND
27449 pts/215    Ss         0:00 -sh
28292 pts/215    T          0:00 sleep 100
28412 pts/215    T          0:00 seq 1 500000
28468 pts/215    S          0:00 bash

```

```

3371 pts/1      00:00:00 ps

```

From grandchild skill our sub-shell 3329 where as his child is still running.

```

( sleep 100 & ( kill -9 3329 ))
Killed

```

Now verify that subshell with 3329 is indeed dead.

```

ps S
PID TTY          STAT      TIME COMMAND
2249 pts/1       Ss         0:01 bash
3376 pts/1       S          0:00 sleep 100
3381 pts/1       R+         0:00 ps S

```

Go ahead verify the parent of our orphaned child.

```

ps -o ppid 3376
PPID
1

```

Its our `init` process. It adopted it!

This marks end of this session. We used `kill` command without exploring further in our next session will discuss them. See you!

Just type 'vimtutor', if you want to learn about vim text editor. If you want to change colors, please visit 'play' menu and view first screencast.

File

Webmin

webminal.org/terminal/

```
[verania@webminal.org ~]$jobs
[verania@webminal.org ~]$fg
bash: fg: current: no such job
[verania@webminal.org ~]$ps S
  PID TTY          STAT       TIME COMMAND
27449 pts/215    Ss        0:00      -sh
28292 pts/215    T         0:00      sleep 100
28412 pts/215    T         0:00      seq 1 500000
28468 pts/215    S         0:00      bash
28613 pts/215    R+        0:00      ps S
[verania@webminal.org ~]$bash
[verania@webminal.org ~]$ps
  PID TTY          TIME CMD
27449 pts/215    00:00:00 sh
28292 pts/215    00:00:00 sleep
28412 pts/215    00:00:00 seq
28468 pts/215    00:00:00 bash
28622 pts/215    00:00:00 bash
28642 pts/215    00:00:00 ps
[verania@webminal.org ~]$( sleep 100 & ( kill -9 3329 ))
bash: kill: (3329) - No such process
[verania@webminal.org ~]$ps S
  PID TTY          STAT       TIME COMMAND
27449 pts/215    Ss        0:00      -sh
28292 pts/215    T         0:00      sleep 100
28412 pts/215    T         0:00      seq 1 500000
28468 pts/215    S         0:00      bash
28622 pts/215    S         0:00      bash
28658 pts/215    S         0:00      sleep 100
28690 pts/215    R+        0:00      ps S
[verania@webminal.org ~]$ps -o ppid 3376
PPID
1
[verania@webminal.org ~]$
```

33/1 pts/1 00:00:00 ps

From grandchild skill our sub-shell 3329 where as his child is still running.

(sleep 100 & (kill -9 3329))

Killed

Now verify that subshell with 3329 is indeed dead.

ps S

PID	TTY	STAT	TIME	COMMAND
2249	pts/1	Ss	0:01	bash
3376	pts/1	S	0:00	sleep 100
3381	pts/1	R+	0:00	ps S

Go ahead verify the parent of our orphaned child.

ps -o ppid 3376

PPID

1

Its our `init` process. It adopted it!

This marks end of this session. We used `kill` command without exploring further in our next session will discuss them. See you!

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10:20 p.m.
07/11/2020