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Major: Cybersecurity
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CYSE 270: Linux System for Cybersecurity

Lab 13 – System Admin

Task A: **Managing System Processes** (40 points)

Step 1. Open the terminal in your VM.

Step 2. List the processes that are running in the current shell.

```
michael@michael-VirtualBox:~$ ps
  PID TTY          TIME CMD
 1516 pts/0    00:00:00 bash
 2000 pts/0    00:00:00 ps
```

Step 3. List all processes that are running on this system.

```
michael@michael-VirtualBox:~$ ps -e
  PID TTY          TIME CMD
    1 ?        00:00:00 systemd
    2 ?        00:00:00 kthreadd
    3 ?        00:00:00 rcu_gp
    4 ?        00:00:00 rcu_par_gp
    5 ?        00:00:00 netns
    7 ?        00:00:00 kworker/0:0H-events_highpri
    9 ?        00:00:00 kworker/0:1H-events_highpri
   10 ?        00:00:00 mm_percpu_wq
   11 ?        00:00:00 rcu_tasks_rude_
   12 ?        00:00:00 rcu_tasks_trace
```

Step 4. Display all processes that are running by using the **top** command. (Keep this command running for the next few steps

```
top - 19:58:24 up 7 min,  1 user,  load average: 0.00, 0.06, 0.05
Tasks: 170 total,   1 running, 169 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.3 us,  0.3 sy,  0.0 ni, 98.6 id,  0.7 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :    969.5 total,     64.7 free,    511.9 used,    392.9 buff/cache
MiB Swap:   2680.0 total,   2562.7 free,    117.3 used.    308.7 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
    940 michael   20   0 3724216 219808  62460 S   2.0  22.1   0:06.00 gnome-+
   2005 michael   20   0   21740   3896   3300 R   0.3   0.4   0:00.01 top
      1 root      20   0  166652   9564   6360 S   0.0   1.0   0:00.46 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthrea+
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
```

Step 5: While in the top command, display the help screen.

```
Help for Interactive Commands - procps-ng 3.3.17
Window 1:Def: Cumulative mode Off.  System: Delay 3.0 secs; Secure mode Off.

  Z,B,E,e   Global: 'Z' colors; 'B' bold; 'E'/'e' summary/task memory scale
  l,t,m,I   Toggle: 'l' load avg; 't' task/cpu; 'm' memory; 'I' Irix mode
  0,1,2,3,4 Toggle: '0' zeros; '1/2/3' cpu/numa views; '4' cpus two abreast
  f,F,X     Fields: 'f'/'F' add/remove/order/sort; 'X' increase fixed-width

  L,&,<,> . Locate: 'L'/'&' find/again; Move sort column: '<'/'>' left/right
  R,H,J,C . Toggle: 'R' Sort; 'H' Threads; 'J' Num justify; 'C' Coordinates
  c,i,S,j . Toggle: 'c' Cmd name/line; 'i' Idle; 'S' Time; 'j' Str justify
  x,y     . Toggle highlights: 'x' sort field; 'y' running tasks
  z,b     . Toggle: 'z' color/mono; 'b' bold/reverse (only if 'x' or 'y')
  u,U,o,O . Filter by: 'u'/'U' effective/any user; 'o'/'O' other criteria
  n,#,^O  . Set: 'n'/'#' max tasks displayed; Show: Ctrl+'O' other filter(s)
  V,v     . Toggle: 'V' forest view; 'v' hide/show forest view children

  k,r       Manipulate tasks: 'k' kill; 'r' renice
  d or s    Set update interval
  W,Y,!     Write config file 'W'; Inspect other output 'Y'; Combine Cpus '!'
  q         Quit
            ( commands shown with '.' require a visible task display window )
Press 'h' or '?' for help with Windows,
Type 'q' or <Esc> to continue
```

Step 6: Quit the top command.

```
    18 root      20    0          0          0          0 S    0.0    0.0    0:00.00 cpunp/0
    19 root      20    0          0          0          0 S    0.0    0.0    0:00.00 kdevtm+
    20 root       0  -20          0          0          0 I    0.0    0.0    0:00.00 inet_f+
michael@michael-VirtualBox:~$ 
```

Step 7: Execute the **gnome-calculator** program in the background.

```
michael@michael-VirtualBox:~$ gnome-calculator &
[1] 2091
```

Step 8: In the current shell, list all running jobs.

```
michael@michael-VirtualBox:~$ jobs
[1]+  Running                 gnome-calculator &
```

step-9: Use the **killall** command to stop (kill) all instances of the gnome-calculator program.

```
michael@michael-VirtualBox:~$ killall gnome-calculator
[1]+  Terminated              gnome-calculator
```

Step 10. In the current shell, use the **ps** command to list all running processes.

```
michael@michael-VirtualBox:~$ ps
    PID TTY          TIME CMD
   1516 pts/0    00:00:00 bash
   2122 pts/0    00:00:00 ps
michael@michael-VirtualBox:~$ ps -A
    PID TTY          TIME CMD
      1 ?        00:00:00 systemd
      2 ?        00:00:00 kthreadd
      3 ?        00:00:00 rcu_gp
      4 ?        00:00:00 rcu_par_gp
```

Task B

– **Package installation** (60 points)

Step 1. Download the installation package (deb file) for skype in Linux and install it properly. Note: you should not use APT GET to install Skype in this step.

```
michael@michael-VirtualBox:~$ sudo dpkg -i Downloads/skypeforlinux-64.deb
[sudo] password for michael:
Selecting previously unselected package skypeforlinux.
(Reading database ... 196024 files and directories currently installed.)
Preparing to unpack Downloads/skypeforlinux-64.deb ...
Unpacking skypeforlinux (8.91.0.404) ...
Setting up skypeforlinux (8.91.0.404) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
michael@michael-VirtualBox:~$ skype
Command 'skype' not found, but can be installed with:
sudo snap install skype
michael@michael-VirtualBox:~$ skypeforlinux
michael@michael-VirtualBox:~$ 
```
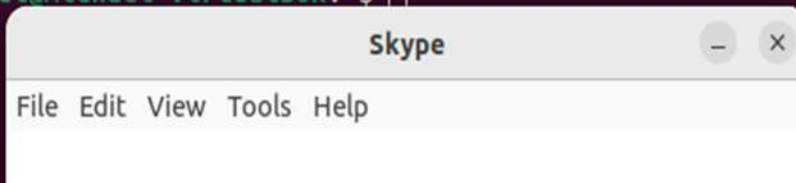
Skype — ✕

File   Edit   View   Tools   Help

Step 2. Create a backup file for the sources.list named source.list.bk in your Linux system. Display the contents in both files, and **make sure they are identical**.

```
michael@michael-VirtualBox:~$ sudo cp /etc/apt/sources.list /etc/apt/
t.bk
michael@michael-VirtualBox:~$ gedit /etc/apt/sources.list
^C
michael@michael-VirtualBox:~$ gedit /etc/apt/sources.list &
[1] 3493
michael@michael-VirtualBox:~$ gedit /etc/apt/sources.list.bk &
[2] 3515
```

| sources.list | × | sources.list.bk | × |

```
1 #deb cdrom:[Ubuntu 22.04.1 LTS _Jammy Jellyfish_ - Release amd64
  (20220809.1)]/ jammy main restricted
2
3 # See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to
4 # newer versions of the distribution.
5 deb http://us.archive.ubuntu.com/ubuntu/ jammy main restricted
6 # deb-src http://us.archive.ubuntu.com/ubuntu/ jammy main restricted
7
8 ## Major bug fix updates produced after the final release of the
9 ## distribution.
.0 deb http://us.archive.ubuntu.com/ubuntu/ jammy-updates main restricted
.1 # deb-src http://us.archive.ubuntu.com/ubuntu/ jammy-updates main restricted
```

| sources.list | × | sources.list.bk | × |

```
1 #deb cdrom:[Ubuntu 22.04.1 LTS _Jammy Jellyfish_ - Release amd64
  (20220809.1)]/ jammy main restricted
2
3 # See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to
4 # newer versions of the distribution.
5 deb http://us.archive.ubuntu.com/ubuntu/ jammy main restricted
6 # deb-src http://us.archive.ubuntu.com/ubuntu/ jammy main restricted
7
8 ## Major bug fix updates produced after the final release of the
9 ## distribution.
10 deb http://us.archive.ubuntu.com/ubuntu/ jammy-updates main restricted
11 # deb-src http://us.archive.ubuntu.com/ubuntu/ jammy-updates main restricted
```

Step 3. **Delete everything in the source.list file**. Now try to download the package "joe" by using apt get install command. What error do you see?
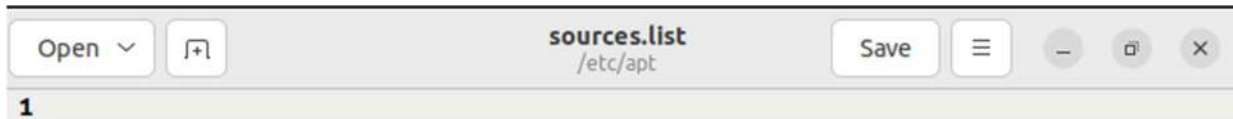
```
Open ∨     [+]                    sources.list                    Save     ≡    —  ⊡  ✕
                                   /etc/apt

1
```

```
michael@michael-VirtualBox:~$ sudo apt-get install joe
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package joe
```
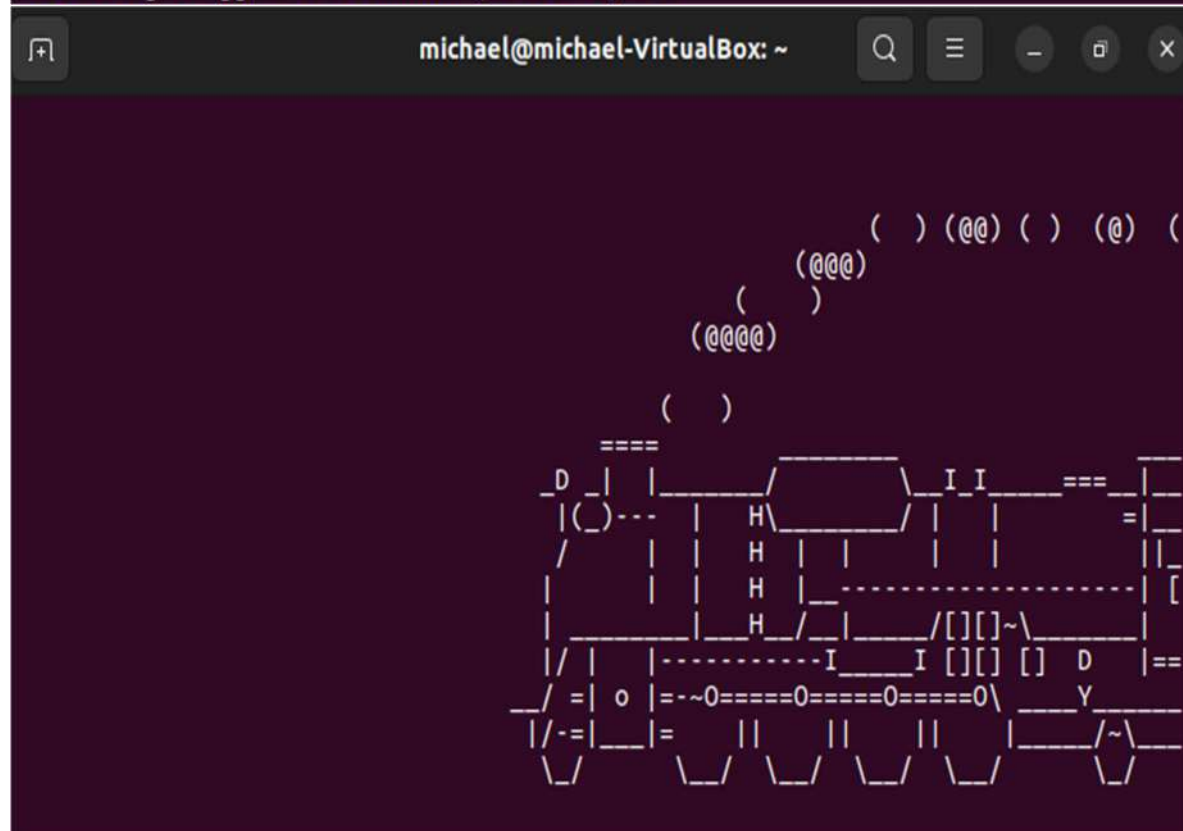
Unable to locate package joe error.

Step 4. **Recover the sources**.list from the backup file, then try to download the "joe" file again. You should be able to install joe this time.

```
michael@michael-VirtualBox:~$ sudo apt-get install joe
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  joe
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 509 kB of archives.
After this operation, 2,150 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu jammy/universe amd64 joe amd64 4.6-1b
uild2 [509 kB]
Fetched 509 kB in 1s (537 kB/s)
Selecting previously unselected package joe.
(Reading database ... 196174 files and directories currently installed.)
Preparing to unpack .../joe_4.6-1build2_amd64.deb ...
Unpacking joe (4.6-1build2) ...
Setting up joe (4.6-1build2) ...
update-alternatives: using /usr/bin/joe to provide /usr/bin/editor (editor) in
auto mode
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
```

Step 5. Install and play the "sl" command.

```
michael@michael-VirtualBox:~$ sudo apt-get install sl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  sl
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 12.7 kB of archives.
After this operation, 60.4 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu jammy/universe amd64 sl amd64 5.02-1
[12.7 kB]
Fetched 12.7 kB in 0s (68.2 kB/s)
Selecting previously unselected package sl.
(Reading database ... 196313 files and directories currently installed.)
Preparing to unpack .../archives/sl_5.02-1_amd64.deb ...
Unpacking sl (5.02-1) ...
Setting up sl (5.02-1) ...
Processing triggers for man-db (2.10.2-1) ...
```

michael@michael-VirtualBox: ~

```
                                               (  ) (@@) ( )  (@)  (
                                         (@@@)
                                       (    )
                                    (@@@@)

                              (    )
                     ====
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                |(_)---  |   H_____/ |   |        =|_
                /     |  |   H  |  |     |   |         ||_
               |      |  |   H  |__--------------------| [
               |_____|___H__/__|_____/[][]~_____|
               |/ |   |-----------I_____I [][] []  D   |==
             __/ =| o |=-~~\  /~~\  /~~\  /~~\ ____Y_____|
              |/-=|___|=    ||    ||    ||    |_____/~\___/
               \_/      \__/  \__/  \__/  \__/      \_/
```

Step 6. Install and play the "cowsay" command.

```
michael@michael-VirtualBox:~$ sudo apt-get install cowsay
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2
Use 'sudo apt autoremove' to remove them.
Suggested packages:
  filters cowsay-off
The following NEW packages will be installed:
  cowsay
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 18.6 kB of archives.
After this operation, 93.2 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu jammy/universe amd64 cowsay all 3.03+
dfsg2-8 [18.6 kB]
Fetched 18.6 kB in 0s (57.0 kB/s)
Selecting previously unselected package cowsay.
(Reading database ... 196336 files and directories currently installed.)
Preparing to unpack .../cowsay_3.03+dfsg2-8_all.deb ...
Unpacking cowsay (3.03+dfsg2-8) ...
Setting up cowsay (3.03+dfsg2-8) ...
Processing triggers for man-db (2.10.2-1) ...
```

```
michael@michael-VirtualBox:~$ cowsay hello Michael
 _____
< hello Michael >
 ---------------
        \   ^__^
         \  (oo)_____
            (__)\       )\/\
                ||----w |
                ||     ||
```

Step 7. Install and play the "cmatrix" command.

```
michael@michael-VirtualBox:~$ sudo apt-get install cmatrix
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2
Use 'sudo apt autoremove' to remove them.
Suggested packages:
  cmatrix-xfont
The following NEW packages will be installed:
  cmatrix
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 17.1 kB of archives.
After this operation, 57.3 kB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu jammy/universe amd64 cmatrix amd64 2.
0-3 [17.1 kB]
Fetched 17.1 kB in 0s (91.1 kB/s)
Selecting previously unselected package cmatrix.
(Reading database ... 196396 files and directories currently installed.)
Preparing to unpack .../cmatrix_2.0-3_amd64.deb ...
Unpacking cmatrix (2.0-3) ...
Setting up cmatrix (2.0-3) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for man-db (2.10.2-1) ...
```