Ubuntu Linux Installation

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Last Updated: 26/11/26 06:01:25 AWST

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1 Hardware

1.1 PC

1.1.1 Components

1	ASUS NUC 13 Core i7 Pro Slim Mini PC Barebone - populated mother board.
	https://www.pccasegear.com/products/66185/asus-nuc-13-core-i7-pro-slim-mini-pc-barebone
1	Corsair Vengeance 32GB (2x16GB) 3200MHz CL22 DDR4 SODIMM - DRAM.
	https://www.pccasegear.com/products/58201/corsair-vengeance-32gb-2x16gb-3200mhz-cl22-ddr4-sodimm
1	Crucial T500 M.2 2280 NVMe PCIe 4.0 SSD 4TB - solid state disk.
	https://www.pccasegear.com/products/67496/crucial-t500-m-2-2280-nvme-pcie-4-0-ssd-4tb
1	HDMI Cable
	https://www.jaycar.com.au/economy-hdmi-cable-1-5m/p/WV7913
1	Keyboard & Mouse
	https://www.jaycar.com.au/logitech-mk220-2-4ghz-wireless-combo-keyboard-and-mouse/p/XC8000

This is a minimum mid range spec.

1.1.2 Assembly

1) take the base off the PC - will require a cross head screwdriver.
2) put in the SSD - will require a jeweller's cross head screwdriver.
3) put in the DRAM.

1.2 Laptop

Look at Asus - eg :-

https://www.harveynorman.com.au/computers-tablets/computers/laptops/asus/993?dir=ASC&order=price

Also look at HP :-

https://www.harveynorman.com.au/computers-tablets/computers/laptops/hp/993?dir=ASC&order=price

Make Sure :-
1) it has an Intel processor or a compatible AMD processor.
2) it can run Linux.
3) it has the features that you require.

Eg :-

HP 15.6-inch Intel Core 5-120U/16GB/512GB Laptop

1.3 Raspberry Pi

Raspberry Pi s are a low cost full Linux platform running on an ARM processor. They can be used as a PC or as an embedded system.

1.3.1 Components

1	Raspberry Pi 5
	https://littlebirdelectronics.com.au/products/raspberry-pi-5?collection=raspberry-pi-5
1	Case
	https://littlebirdelectronics.com.au/products/raspberry-pi-5-case?collection=raspberry-pi-5
1	Power Supply
	https://littlebirdelectronics.com.au/products/raspberry-pi-27w-usb-c-psu-au?collection=raspberry-pi-5
1	Micro SD Card
	https://www.harveynorman.com.au/catalogsearch/result/?q=micro+sd+card
1	HDMI Cable
	https://littlebirdelectronics.com.au/products/micro-hdmi-to-hdmi-cable?collection=raspberry-pi-5
1	Keyboard
	https://littlebirdelectronics.com.au/products/raspberry-pi-keyboard?collection=raspberry-pi-5
1	Mouse
	https://littlebirdelectronics.com.au/products/raspberry-pi-mouse?collection=raspberry-pi-5

1.3.2 Assembly

1) put the Ubuntu Raspberry Pi OS on the micro SD card - see below.
2) put the micro SD card into the SD card slot on the Raspberry Pi.
3) put the Raspberry Pi into the case.
4) connect up.
5) power up.
6) follow the instructions - configure the device.

2 Operating System

2.1 Ubuntu PC

1) download the Latest LTS Version - https://ubuntu.com/download/desktop .
   This is the ISO image of the operating system package.

2) create a bootable ISO image on a USB stick - https://ubuntu.com/tutorials/install-ubuntu-desktop#1-overview .
   This is created using an imaging program to install the image on the USB stick. The image is in excess of 2GB - requires a 4GB sized stick minimum.

There is a lot of information on the Internet on Ubuntu and Linux.

2.2 Ubuntu Raspberry Pi

Follow the instructions at :-
https://ubuntu.com/download/raspberry-pi

2.3 Installation

2.3.1 Booting Up

1) power up the PC.
2) as it powers up the BIOS will display a key to press to enter the BIOS - to catch it. This will be something like F2, F10, F11, F12 or del.
3) quickly and repeatedly press this key - or press all the keys above repeatedly.
4) when you have got into the BIOS go into the boot order and select the USB stick as the first device to boot from.
5) after setting it up save and exit - eg F10. The PC will now boot up from the stick.

Please Note :- the BIOS may automatically boot up from the USB stick without being told to specifically do so.

2.3.2 UEFI - in PC BIOS - Very Important

1) before buying the PC make sure that Linux can be installed on it. Check the manufacturer's website or with the distributor. It can usually be checked online.
2) within the BIOS switch off UEFI (secure boot). This is used to force Microsoft capture of the PC hence forces a highly insecure situation.
3) when the installation is complete the UEFI mode can be checked on the terminal by using the following command :- sudo mokutil --sb-state
   it should respond with :- SecureBoot disabled

Windows Secure Boot Kills Linux on June 24th! https://www.youtube.com/watch?v=sm_aqrnlUhE

2.3.3 Installing the OS

The Ubuntu installation process is very straight forward. It can be tried out or you can do a full installation.

1) proceed with a full installation.
2) create your account. This first user account is the superuser account and it gives you full control over the PC. You can create multiple user accounts.
3) remove the USB stick.
4) reboot the PC.
5) log on to the account that you have created.
6) open the system tools area (button at left bottom) and run a terminal  . This will allow you to install the desktop and the applications and to control and manage the PC.

3 Installing Ubuntu Touch on an Android Tablet

On the tablet open the settings menu.

Enable Developer Options go to - Systems --> About --> Tap "Build Number" 10 times

Tap "OEM unlocking" to enable it.

Enable USB debugging.

https://devices.ubuntu-touch.io/installer/
install and follow the instructions.

https://www.youtube.com/watch?v=zuLFTGkuD68

4 Installing a Video and Audio Server

This requires a HTML PHP based server to be installed running via a Apache2 HTTP server on the system. Download the media archive file in the media directory for the files.

Please Note :-

1. whilst this code is operating at a good level the project is Work in Progress and will be updated as time and requirements permit.
2. you will need a basic understanding of coding - HTML + PHP + JavaScript - and Linux to be able to port it onto your system - shouldn't be too difficult.
3. minor variations have been produced. These will ultimately be consolidated.
4. the code does cater to local sensibilities and interpretations - please alter as required.
5. please ensure that you adhere to all local laws. 😁

4.1 PC

Look at using a :-

Intel Twin Lake N150 Dual-system 4-bay NAS Mini PC - NucBox G9

https://www.gmktec.com/products/intel-twin-lake-n150-dual-system-4-bay-nas-mini-pc-nucbox-g9

This has :-

1. A 64GB eMMC flash memory chip built in for the OS.
2. 4 x M.2 2280 NVMe SSD slots - ie for 4 x 4TB SSDs. These need to be purchased separately. They can be relatively low spec.

   https://www.scorptec.com.au/search/go?w=M.2+2280+NVMe+SSD&view=grid&isort=price+rev&cnt=30

   https://www.pccasegear.com/search?query=M.2%202280%20NVMe%20SSD

   https://www.mwave.com.au/searchresult?button=go&w=M.2+2280+NVMe+SSD&af=

5 Using the Terminal - the Command Line

The terminal - the command line - provides a direct character based method of communication with applications.

Limited mouse usage is available. You can highlight text with a mouse and then copy it. You cannot move the cursor with the mouse. Control keys have to be doubled with the shift key.

Ctrl Shift	C	Copy
Ctrl Shift	V	Paste
Ctrl Shift	Q	Close terminal
Ctrl	C	Quit process

The cursor is moved by using the arrow keys. Commands are run by pressing the Enter key.

Almost all administration commands are run as a superuser. To open a superuser shell type :-
sudo bash
then press Enter
 - enter the superuser password
then press Enter

the character at the end of the line will change from a '$' to a '#' to indicate that you are in superuser mode.

sudo can be used at the front of any command to change it from user to superuser mode execution.

If you want to navigate to a directory by using a file manager such as Caja and then open a terminal in that directory that is possible by using either the File / Open in Terminal button or by right clicking in an empty area of the directory.

6 Creating Users

The first user created is the superuser (Administrator). In normal operation the superuser operates as a standard user. When logged in on a terminal session as a superuser the superuser has superuser privileges. This allows the superuser to carry out operations such as :-

i. install programs.
ii. add users.
iii. set system wide user and group ownership and access (permissions).

Users may be added by going to the :-
System / Control Center / MATE User Manager
or via the Mint equivalent path.

In a multi user setup or a company (or similar) based setup create the superuser (eg admn) separately from the actual user and ensure that the actual user does not have superuser (Administrator) privileges.

6.1 Opening a Superuser Session from Within a Standard User

type:
su admn
 - enter the superuser password
sudo bash
 - enter the superuser password

where admn is the superuser name.

7 Installing Applications

1) type:
sudo bash
enter your password and press the Enter key.
this will log you on as a superuser - open a superuser session.

sudo bash runs a superuser shell on the terminal. That allows commands to be executed with superuser priveleges.

2) type:
apt install
followed by the application name
then press the Enter key.

8 Desktop

Run a superuser shell on a terminal - open a superuser session :-

Install the desktop :-

8.1 Ubuntu MATE

type:
apt install ubuntu-mate-desktop

This will install a good looking desktop that provides a good range of facilities and that is fully configurable. It's what us techies use (as well as other desktops).

and / or

8.2 Ubuntu Mint

type:
apt install cinnamon-desktop-environment

This will install a good looking desktop that provides a good range of facilities and that is fully configurable. It's designed for lay people.

1) close the terminal.
2) log out - button at top right 
3) select your account for log on but don't log on.
4) select the desktop that you want to use - button at bottom right.
5) log on.
6) customise the desktop.

9 Hiding the admn superuser from the Log On Screen

type:
cd /var/lib/AccountsService/users/
nano admn

add or change the line :-
[User]
SystemAccount=false

to :-
[User]
SystemAccount=true

^O (Ctrl O), Enter

^X (Ctrl X)

10 Dealing With rfkill Dialog

Open a superuser session -
type:
cd /etc/polkit-1/rules.d/

Open a nano editor session:
nano username.rules

Change 'username' to your user name.

Copy the following lines - highlight then press ^C (Ctrl C) :-

```
// Allow users in sudo or netdev group to use blueman feature requiring root
without authentication
polkit.addRule(function(action, subject)
  {
    if( ( action.id == "org.blueman.network.setup" ||
          action.id == "org.blueman.dhcp.client" ||
          action.id == "org.blueman.rfkill.setstate" ||
          action.id == "org.blueman.pppd.pppconnect") &&
        subject.local && subject.active &&
        ( subject.isInGroup("sudo") || subject.isInGroup("netdev") ||
subject.isInGroup("username") ) )
    {
        return polkit.Result.YES;
    }
  }
);
```

Then paste into the nano editor session :-

Ctrl Shift V
Change 'username' to your user name. Change 'username' to your user name. Use the arrow keys and the backspace key to delete.

Then save and exit :-

^O
Enter
^X

11 Handling Disk Drive Issues

11.1 Mounting

Go to: System / Control Center / Disks.

11.2 Partitions - Resizing & Formatting

Use: gparted - requires installation.

Use file system type: ext4.

11.3 Checking and Repairing Disks

Use: e2fsck.

eg:

umount /dev/sda1

e2fsck -c /dev/sda1

mount /dev/sda1

https://commandmasters.com/commands/e2fsck-linux/

https://linux.die.net/man/8/e2fsck

Use the System / Control Center / Disks program to determine the device.

11.4 Defraging Disks

Use: e4defrag.

eg:

e4defrag /mnt/data

https://askubuntu.com/questions/221079/how-to-defrag-an-ext4-filesystem

12 Applications

There are a whole range of applications that can be installed on Linux. Many of them are free. These are installed either by using the command line (apt install) or by downloading an installation package (debian, snap, flatpak) and installing via the archive manager. There is extensive information available on the Internet.

Caja	File manager.
dconf	Configuration editor.
Firefox	Browser.
Thunderbird	Email.
Chromium \ Chrome	Browser.
LibreOffice	Office suite.
Obsidian	Note taking.
Joplin	Secure note taking.
Inkscape	Drawing.
VLC	Video display and conversion.
MPV	Minimal media player.
Handbrake	Video conversion.
Audacity	Audio file editing.
Ardour	Digital audio workstation.
GIMP	Image processing.
gThumb	Thumbnail display. Basic image operations - resizing, rotating.
Davinci Resolve	Movie and image editing and processing.
LMMS	Music production studio.
Shotcut	Movie editing.
Kdenlive	Movie editing.
OBS Studio	Streaming.
Code::Blocks	Program file editing - eg C & C++. Will also handle other file types.
Bluefish	HTML & PHP file editing.
Beyond Compare	Diff package.
Filezilla	FTP transfer.
LocalSend	Simple file transfer. Works across platforms and operating systems.
Xournal	PDF file overlay - form filling.

GoogleEarth	Earth satellite and map views. Also Moon & Mars.
Stellarium	Night sky.
SDRConnect	SDR UI.
SDR++	SDR UI.
SDRAngel	SDR UI.

These can be installed by :-
i. the command line (terminal) - as a superuser.
ii. using an archive manager - eg a downloaded .deb package file.
iii. using the app manager, snap, flatpak.

13 Transferring Files

13.1 FTP - File Transfer Protocol - Client - Server Based

13.1.1 Server

Run a superuser shell on a terminal :-

type:
apt install vsftpd

This will install the FTP server.

Edit the configuration file :-

nano /etc/vsftpd.conf

Enable writing :-

write_enable=YES

Note :- the '#' character at the start of the line changes the line to a comment. Remove that character to make the line active.

Press : ^O (Ctrl O), Enter to save the file.
Press : ^X (Ctrl X) to exit to the shell.

Start \ Restart the server :-
systemctl restart vsftpd

13.1.1.1 Enabling SSL - SFTP - Secure FTP

Edit the configuration file :-

nano /etc/vsftpd.conf

Enable SSL :-

ssl_enable=YES

13.1.2 Client

Install the filezilla client :-

https://filezilla-project.org/

13.2 Samba - Peer to Peer Based File Access

Run a superuser shell on a terminal :-

type:
apt install samba

Edit the configuration file :-

nano /etc/samba/smb.conf

Put in these lines at the end of the file :-

```
[global]
   unix extensions = no
   mangle case = no
   mangled names = no

[share]
   comment = Samba on Ubuntu
   valid users=guest
   public = no
   path = /home/guest/media
   browsable = yes
   printable = no
   read only = no
   writable = yes
   follow symlinks = yes
   wide links = yes
   allow insecure wide links=yes
```

Where :-

[share]	Indicates the share name 'share'. This is what is shown on the network.
valid users=guest	Indicates the log on user name 'guest'.
path = /home/guest/media	Indicates the path to the shared location '/home/guest/media'.

^O

^X

Start \ Restart the server :-

systemctl restart smbd.service nmbd.service

Update the firewall rules to allow Samba traffic :-

ufw allow samba

Set up a Samba password for the user account :-

smbpasswd -a username

This is the password to use to log on via the network. It can, and should, be separate from the actual user of the computer.

This installs a Windows compatible and accessible network system.

To access use the file manager to access the network drive area eg :-

smb://xyz-nuc13ank-b.local/share/

14 Installing a Web Server, PHP and Database

14.1 HTTP Server

Run a superuser shell on a terminal :-

type:
apt install apache2

This will install the HTTP server.

The web pages are accessed from :-
/var/www/html

html can be replaced with a symbolic link.

Within this area create a directory (folder) for your website - eg websitename.

To navigate to this put :-
http://localhost/websitename/
in your browser.

The webserver will be looking first for a
index.html
file.
If it can't find that it will look for a
index.php
file.

The configuration files are in :-
/etc/apache2

These can be edited in superuser mode by using nano.

14.2 PHP

type:
apt install php libapache2-mod-php

This will install the PHP server side scripting language handler.

The contents of a PHP file are bracketted by :-

<?php

...contents...

?>

HTML scripts - text data - is sent to the screen by using the echo statement :-+

echo "Hello World?";

All PHP statements end in a semicolon ';'.

Within strings if a double quote character " is being used it is escaped by a backslash \" :-

echo "Hello to \"Kim's\" World?";

There is extensive information on HTML, CSS and PHP on the Internet :-

HTML	https://www.w3schools.com/
CSS	https://www.w3schools.com/css/
PHP	https://www.w3schools.com/php/

14.3 Database

14.3.1 Install the Database Package

type:
apt install mysql-server

This will install the database.

type:
apt install php-mysql

This will link PHP to the database.

type:
apt install php-xml

This is required for phpMyAdmin.

14.3.2 Configure the Database Package

14.3.2.1 Create the Database Package Password

type:
mysql -u root -p

enter:
databasepassword

Create the User and Password

type:
CREATE USER databaseusername IDENTIFIED BY 'databasepassword';

14.3.2.2 Create the Database

type:
CREATE DATABASE databasename;
GRANT ALL PRIVILEGES ON databasename.* TO 'databaseusername' WITH GRANT OPTION;
FLUSH PRIVILEGES;
exit

To drop a database type:
DROP DATABASE databasename;

14.3.3 Install the Database Web Based Manager

Install phpMyAdmin :-
https://www.phpmyadmin.net/downloads/
in your website area.

Log on - you might need to try twice.

14.4 Creating a Website - Hosted Service

There are many website hosting service providers. Look for one with :-

1) Linux servers.
2) a good management system.
3) support and provision for HTTP \ HTML (standard), PHP, MySQL database (or equivalent) - if needed, FTP (file transfer).

You will need to :-

1) choose and register your domain name.
2) design and test your website on your PC.
3) upload your files to your host.

The default file name is :- index.html. If PHP is being used the default file name is :- index.php.

You can construct your website using a page builder design :-

index.php

```
<?php
$pagelevel="../";
$leftindex="";
include "${pagelevel}page.php";
?>
```

item.php
Contains the individual page details

page.php
Is in the root directory. Build the pages - adds the furniture - indexes, tool and task bars etc.
Includes the various component files including item.php.

There is a lot of information on the Internet on HTML, PHP, JavaScript and MySQL.

15 Commands

15.1 Create User and Group

useradd username

This will create the user and group.

15.1.1.1 To Create the Home Area

useradd -m username

15.1.2 Hiding the user from the Log On Screen

type:
cd /var/lib/AccountsService/users/
nano username

add or change the line :-
[User]
SystemAccount=false

to :-
[User]
SystemAccount=true

15.2 Create User Without Creating a Home area - alternative command

adduser --system --no-create-home username

15.3 Display Users

cat /etc/passwd

15.4 Display Group Members

cat /etc/group

15.5 Set User Password

passwd username

15.6 Create Group

groupadd groupname

15.7 Add User to Group

usermod -aG groupname username

15.8 Set Ownership

chown username:groupname fileordirectoryname

15.8.1 Set Ownership Recursively

chown -R username:groupname fileordirectoryname

15.8.2 Change User Id Number

usermod -u nnnn username

15.8.3 Change Group Id Number

usermod -g nnnn groupname

15.8.4 Tell chown to Follow Symbolic Links

use option -L

15.8.5 Display the User id

id -u username

15.8.6 Display the Group id

id -g groupname

15.8.7 Display the User Name

getent passwd uid

15.8.8 Display the Group Name

getent group gid

15.8.9 Set User Name to Logon Status

chsh -s /bin/bash uername

15.8.10 Remove User

userdel username

15.8.11 Remove Group

groupdel groupname

15.9 Set Permissions

chmod permissions fileordirectoryname

15.9.1 Set Permissions Recursively

chmod -R permissions fileordirectoryname

15.9.2 Permissions

15.9.2.1 Textual

user	u	nxx
group	g	xnx
all	a	xxn

add	+	put on
subtract	-	take off

read	r	4
write	w	2
execute	x	1
execute directories (recursive)	X	must be set

example

chmod g+rw filename

15.9.2.2 Numerical - Binary Positions

4	read
2	write
1	execute

example

chmod 664 filename

user - group - all

15.9.3 Set Default Permissions

chmod g+rwxs dirname

the 's' indicates to set as a default.

15.10 Installing the dconf editor

apt install dconf-editor

15.11 Installing the Vino VNC Remote Desktop Server

apt install vino

15.12 Executing Script Files as a Superuser

visudo
ALL ALL = (root) NOPASSWD: /pathto/scriptfile.sh

15.13 Determining Disk Usage, Capacity and Free Amount

df

https://www.geeksforgeeks.org/linux-unix/checking-disk-space-in-linux/

du

https://linuxconfig.org/how-to-check-disk-usage-by-folder-on-linux

15.14 Listing Directories and Files

ls	compact list
ls -l	long list - display details
ls -al	also display hidden files

Hidden Files
Directories and files are usually prefixed with a . to hide them. ~ is sometimes used.

15.15 Changing to Directories

cd directory_name	change to directory
cd ..	go up a level
cd ~	change to home directory
./	indicates directory at current level
../	indicates directory up a level

15.16 Renaming and Moving Files

mv from_file_name to_file_name

mv from_file_path_and_name to_file_path_and_name

15.17 Renaming Multiple Files

install

apt install mmv

command

mmv from to

from

place name within single quotes

use character patterns and wild cards

example

mmv 'DSC_*' '261025#1'

From	To
DSC_1317.JPG	2610251317.JPG
DSC_1318.JPG	2610251318.JPG
DSC_1319.JPG	2610251319.JPG
DSC_1320.JPG	2610251320.JPG

#1 indicates to copy over the first wildcard matched argument.

15.18 Creating Directories

mkdir directory_name

15.19 Deleting Directories

rmdir directory_name

15.20 Deleting Files

rm file_name

15.21 Deleting Directories and their Contents

rm -r directory_name

15.22 Listing Directory Names in a File

As a Single Line

```
ls -d */ | cut -f1 -d'/' | tr '\n' ' ' > dirlist.txt
```

As Individual Lines

```
ls -d */ | cut -f1 -d'/' > dirlist.txt
```

15.23 Creating Directories from a List in a File

use dirlist.txt with directories listed as individual lines

```
while read dir; do mkdir "$dir"; done < dirlist.txt
```

15.24 Wild Cards

?	single characters
*	multiple characters

15.25 Piping and Streaming

|	passes the output from a command process into another command process
>	streams the output from a command process to an output device or storage location such as a file
<	inputs from an input device or storage location such as a file

15.26 Constructing and Running Shell Script Files

Put the commands into a text file - eg script.sh .

Set the execution bit

```
chmod u+x script.sh
```

Run the script file

```
./script.sh
```

15.27 Monitoring Touchpad Events

type:
libinput debug-events --verbose

15.28 Displaying Input List

type:
xinput list

https://computingforgeeks.com/fix-touchpad-issues-linux/

16 CDs & DVDs & Audio Tracks & Movies

16.1 Playing CDs & DVDs & Audio & Movie Files

Use VLC
apt install vlc

The default player - Videos - will indicate whether DVDs are encrypted.

16.2 Ripping CDs

Copy over using the file manager.

16.3 Ripping DVDs

Use Handbrake
apt install handbrake

Known Bug
If you are ripping multiple videos Handbrake may give the first video the name of the last video and then write over it with the last video.

Recommendation
Under File / Preferences set
Auto-Name Template: {date}-{time}-{source}-{title}

16.4 Handling Encrypted DVDs

apt install libdvdcss2
dpkg-reconfigure libdvd-pkg

16.5 Scaling Movies

Use ffmpeg

https://ffmpeg.org/

https://ffmpeg.org/download.html#build-linux

Debian format.

ffmpeg -i input.mov -s 358x202 -c:a copy output.mov

where input.mov is the source file name and output.mov is the destination file name.

.mov is the file extension - the encoding format. Can be .mov, .mp4 etc.

16.6 Trimming Files

ffmpeg -i input.mp4 -ss start_time -t duration_time -c:v copy -c:a copy output.mp4

ffmpeg -i input.mp4 -ss start_time -to end_time -c:v copy -c:a copy output.mp4

17 Editing Photos

17.1 GIMP

apt install gimp

17.2 Basic Operations - Display Thumbnails & Resizing

apt install gthumb

18 Filling Out PDF Forms

apt install xournal

19 Security Issues

19.1 Keystroke Loggers

19.1.1 Looking for Indications of Presence

3. keystroke response delay.
4. losing focus - needing to refocus with the mouse.

Please Note :- If you suspect that a keystroke logger is installed first check whether the problem is just associated with a specific application. If so the problem is probably just with that application's code - not a keystroke logger.

19.1.2 Dealing With

1. identify the presence of the process.
2. remove the process.

19.1.2.1 Process Identification

https://latesthackingnews.com/2026/06/20/how-to-detect-a-keylogger/

lsof /dev/input/event*

lsmod

https://askubuntu.com/questions/169887/how-can-i-detect-a-keylogger-on-my-system

ps -aux

htop

20 Listing and Killing Processes

20.1 Common Uses

1. to detect and remove malware.
2. to detect and remove badly behaving software.

20.2 List Processes

top
Ctrl C to exit
list the top (time usage) processes.

pidof processname
lists the specific process.

pgrep -l processname
lists the specific process.

ps aux
lists all running processes.

lsof
shows open files and the processes that opened them

20.3 Kill Process

Just stops the process operating. Doesn't stop the process automatically starting on startup.

kill pid

or

kill -9 pid

21 Internet \ Local Area Network \ Wide Area Network

IPv4 uses 32 bit dot decimal addresses. IPv6 uses 128 bit addresses. LANs usually use IPv4 addressing.

21.1 Addresses

https://www.meridianoutpost.com/resources/articles/IP-classes.php
https://ipinfo.io/ips
https://iptoolskit.com/learn/ip-ranges-network-analysis

21.1.1 Private Addresses

192.168.X.X	Default LAN addressing range.
10.X.X.X	Extended LAN addressing range - commercial networks.
127.X.X.X	Internal PC addresses - virtual addresses.

192.168.0.1	Router website & Gateway address.
192.168.255.255	Broadcast address - to all devices on the subnet.

21.2 DHCP - Dynamic Host Configuration Protocol

If a device has a dynamic IP address - assigned temporarily - when it boots up it contacts the DHCP server and obtains its IP address.

21.3 DNS - Domain Name Server

DNS servers resolve domain names to statically assigned IP addresses.

8.8.8.8	Primary DNS server address.
8.8.4.4	Secondary DNS server address.

21.4 DDNS - Dynamic Domain Name Server

DDNS servers resolve domain names to dynamically assigned IP addresses.

Device IP addresses can be statically assigned within the LAN's router.

21.5 MDNS - Micro Domain Name Server

Used on LANs.

21.6 SSH

SSH operates on terminals and provides a means of opening a terminal session on another device that is on a LAN or WAN. The terminal must be in superuser mode.

1. ssh user@ipaddress .
2. enter user password.

21.7 Determining a Device's IP Address

use :-
ip addr

or :-
ipconfig

21.8 Ping

Ping allows a device presence on the network to be tested.

1. ping ipaddress .
2. Ctrl C to exit.