INT - 301: OPEN SOURCE TECHNOGOLIES

A Project Report

Submitted in partial fulfilment for the requirements of the award of the degree of

Bachelor of Technology Computer Science Engineering (Hons.)

Lovely Professional University Phagwara, Punjab.



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CA-3

Q42. Using desired Open Source Software display an overview of all the hardware and operating system detail; also do live monitoring to show the temperature and current usage of various hardware components.

To display an overview of hardware and operating system details in Linux, you can use the following open-source software:

1. Ishw

- It is a command-line utility that provides detailed information about the hardware in our system.

To install Ishw on Ubuntu or Debian-based systems, we can use the following command:

sudo apt-get install Ishw

Once installed, we can use the following command to display the hardware details:

We can use this command:

sudo Ishw

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2. Neofetch

- It is a command-line system information tool that displays the operating system, CPU, GPU, RAM, and other system details in an aesthetically pleasing way.

To install Neofetch on Ubuntu or Debian-based systems, use the following command:

sudo apt-get install neofetch

Once installed, we can use the following command to display the system details:

sudo neofetch

To monitor the temperature and current usage of various hardware components in Linux, you can use the following open-source software:

```
rasool@rasool-VirtualBox:~$ sudo neofetch
             ...-::::-...
.-ММММММММММММММ-.
                                                        root@rasool-VirtualBox
        .-MMMM`..-::::::-..`MMMM-.
                                                        OS: Linux Mint 20.1 x86 64
   Host: VirtualBox 1.2
                                                        Kernel: 5.4.0-58-generic
                                                       Uptime: 3 hours, 27 mins
Packages: 2013 (dpkg)
 : MMM: MMM*
                                       : MMM: MMM:
               :MM. -MM. .MM- `MMMM.MMM.
. MMM . MMMM`
                                                       Shell: bash 5.0.17
               :MM. -MM- .MM: `MMMM-MMM:
: MMM : MMMM `
                                                       Resolution: 1920x1004
                                     `MMMM:MMM:
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               :MM. -MM- .MM:
:MM. -MM- .MM:
:MM:--:MM:--:MM:
                                                       DE: Cinnamon
                                                       WM: Mutter (Muffin)
WM Theme: Mint-Y-Dark (Mint-Y)
Theme: Mint-Y [GTK2/3]
Icons: Mint-Y [GTK2/3]
 : MMM : MMM -
                `-MMMMMMMMMM-`
                                       - MMM - MMM :
  :MMM:MMM:`
                                      : MMM : MMM :
    . MMM . MMMM : ------: MMMM . MMM .
                                                        Terminal: gnome-terminal
      '-MMMM.-MMMMMMMMMMMMMM-.MMMM-'
'.-MMMM``--::::--``MMMM-.'
                                                       CPU: Intel i5-10300H (4) @ 2.495GHz
GPU: 00:02.0 VMware SVGA II Adapter
               '-MMMMMMMMMMMM-'
                                                        Memory: 955MiB / 5015MiB
                     `-::::-`
rasool@rasool-VirtualBox:~$
```

3. Im-sensors

- It is a command-line utility that provides information about the temperature, voltage, and fan speed sensors in your system.

To install Im-sensors on Ubuntu or Debian-based systems, use the following command:

sudo apt-get install Im-sensors

Once installed, we can use the following command to detect the sensors in our system:

sudo sensors-detect

```
rasool@rasool-VirtualBox:~$ sudo sensors-detect
# sensors-detect version 3.6.0
# System: innotek GmbH VirtualBox [1.2]
# Board: Oracle Corporation VirtualBox
# Kernel: 5.4.0-58-generic x86 64
# Processor: Intel(R) Core(TM) i5-10300H CPU @ 2.50GHz (6/165/2)
This program will help you determine which kernel modules you need
to load to use lm sensors most effectively. It is generally safe
and recommended to accept the default answers to all questions,
unless you know what you're doing.
Some south bridges, CPUs or memory controllers contain embedded sensors.
Do you want to scan for them? This is totally safe. (YES/no): y
Silicon Integrated Systems SIS5595...
VIA VT82C686 Integrated Sensors...
                                                                             No
VIA VT8231 Integrated Sensors...
                                                                             No
AMD K8 thermal sensors...
AMD Family 10h thermal sensors...
AMD Family 11h thermal sensors...
                                                                             Nο
                                                                             No
                                                                             No
AMD Family 12h and 14h thermal sensors...
                                                                             No
AMD Family 15h thermal sensors...
AMD Family 15H thermal sensors...

AMD Family 16h thermal sensors...

AMD Family 15h power sensors...

AMD Family 16h power sensors...

Hygon Family 18h thermal sensors...
                                                                             No
                                                                             No
                                                                             No
                                                                             No
                                                                             No
Intel digital thermal sensor...
                                                                             No
Intel AMB FB-DIMM thermal sensor...
                                                                             No
Intel 5500/5520/X58 thermal sensor...
                                                                             No
VIA C7 thermal sensor...
                                                                             No
VIA Nano thermal sensor...
                                                                             No
Some Super I/O chips contain embedded sensors. We have to write to
standard I/O ports to probe them. This is usually safe.
Do you want to scan for Super I/O sensors? (YES/no): y
Probing for Super-I/O at 0x2e/0x2f
Trying family `National Semiconductor/ITE'...
Trying family `SMSC'...
Trying family `VIA/Winbond/Nuvoton/Fintek'...
Trying family `ITE'...
Probing for Super-I/O at 0x4e/0x4f
                                                                             No
                                                                             No
                                                                             No
Trying family `National Semiconductor/ITE'...
Trying family `SMSC'...
                                                                             No
                                                                             No
Trying family `VIA/Winbond/Nuvoton/Fintek'...
Trying family `ITE'...
                                                                             No
                                                                             No
Some systems (mainly servers) implement IPMI, a set of common interfaces
through which system health data may be retrieved, amongst other things.
We first try to get the information from SMBIOS. If we don't find it
there, we have to read from arbitrary I/O ports to probe for such
interfaces. This is normally safe. Do you want to scan for IPMI interfaces? (YES/no): y
```

```
Some systems (mainly servers) implement IPMI, a set of common interfaces
through which system health data may be retrieved, amongst other things.
We first try to get the information from SMBIOS. If we don't find it
there, we have to read from arbitrary I/O ports to probe for such
interfaces. This is normally safe. Do you want to scan for IPMI
interfaces? (YES/no): y
Probing for `IPMI BMC KCS' at 0xca0...
Probing for `IPMI BMC SMIC' at 0xca8...
                                                                             No
Some hardware monitoring chips are accessible through the ISA I/O ports.
We have to write to arbitrary I/O ports to probe them. This is usually
safe though. Yes, you do have ISA I/O ports even if you do not have any
ISA slots! Do you want to scan the ISA I/O ports? (YES/no): y
Probing for `National Semiconductor LM78' at 0x290... No
Probing for `National Semiconductor LM79' at 0x290... No
Probing for `Winbond W83781D' at 0x290...
                                                                            No
                                                                             No
Probing for `Winbond W83782D' at 0x290...
Lastly, we can probe the I2C/SMBus adapters for connected hardware
monitoring devices. This is the most risky part, and while it works
reasonably well on most systems, it has been reported to cause trouble
on some systems.
Do you want to probe the I2C/SMBus adapters now? (YES/no): y
Using driver `i2c-piix4' for device 0000:00:07.0: Intel 82371AB PIIX4 ACPI
Next adapter: SMBus PIIX4 adapter at 4100 (i2c-0)
Do you want to scan it? (YES/no/selectively): y
Sorry, no sensors were detected.
Either your system has no sensors, or they are not supported, or
they are connected to an I2C or SMBus adapter that is not
supported. If you find out what chips are on your board, check
https://hwmon.wiki.kernel.org/device support status for driver status.
```

After detecting the sensors, you can use the following command to display the sensor readings:

sudo sensors

```
rasool@rasool-VirtualBox:~$ sensors
BATO-acpi-0
Adapter: ACPI interface
in0: 10.00 V

rasool@rasool-VirtualBox:~$
```

4. htop

- It is a command-line utility that provides real-time monitoring of CPU usage, memory usage, and other system details.

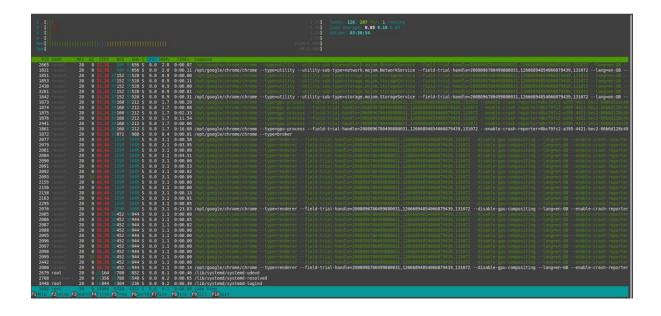
To install htop on Ubuntu or Debian-based systems, use the following command:

sudo apt-get install htop

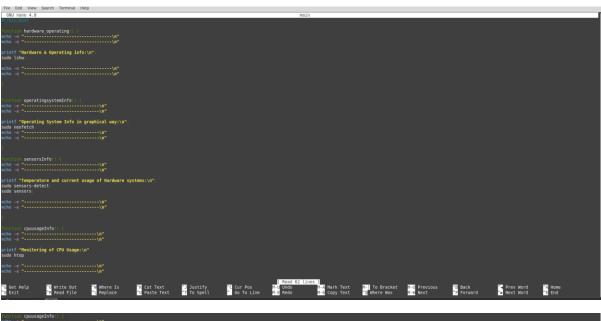
Once installed, we can use the following command to display the system details:

htop

We can use these open-source software tools to display an overview of hardware and operating system details and monitor the temperature and current usage of various hardware components in Linux.



Created a File called "main" and using functions I had executed all 4 commands for getting info of Hardware overview & operating system details, and live monitoring of temperature and current working of various hardware components



GITHUB:

```
function operatingsystemInfo() {
echo -e "-----\n"
echo -e "-----\n"
printf "Operating System Info in graphical way:\n";
sudo neofetch
echo -e "-----\n"
echo -e "-----\n"
}
function sensorsInfo() {
echo -e "-----\n"
echo -e "-----\n"
printf "Temperature and current usage of Hardware systems:\n";
sudo sensors-detect;
sudo sensors;
echo -e "-----\n"
echo -e "-----\n"
}
function cpuusageInfo() {
echo -e "-----\n"
echo -e "-----\n"
printf "Monitoring of CPU Usage:\n"
sudo htop
echo -e "-----\n"
echo -e "-----\n"
}
```

```
54
55 echo "Report of all Hardware & operating system details, sensors(temparature), cpu usage...!"
56 {
57 hardware_operating
58 operatingsystemInfo
59 sensorsInfo
60 cpuusageInfo
61 }
```

GIT CODE:

#!/bin/bash function hardware operating() { echo -e "-----\n" echo -e "-----\n" printf "Hardware & Operating info:\n"; sudo Ishw; echo -e "-----\n" echo -e "-----\n" } function operatingsystemInfo() { echo -e "-----\n" echo -e "-----\n" printf "Operating System Info in graphical way:\n"; sudo neofetch echo -e "-----\n" echo -e "-----\n" }

```
function sensorsInfo() {
echo -e "-----\n"
echo -e "-----\n"
printf "Temperature and current usage of Hardware systems:\n";
sudo sensors-detect;
sudo sensors;
echo -e "-----\n"
echo -e "-----\n"
}
function cpuusageInfo() {
echo -e "-----\n"
echo -e "-----\n"
printf "Monitoring of CPU Usage:\n"
sudo htop
echo -e "-----\n"
echo -e "-----\n"
}
```

```
echo "Report of all Hardware & operating system details, sensors(temparature), cpu usage...!"
{
hardware_operating
operatingsystemInfo
sensorsInfo
cpuusageInfo
}
```