

Curso de Administración de GNU/Linux



**Tema: “Herramientas para el testeo y
captura de la información del hardware
de la computadora”**

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Introducción

Este trabajo se enfoca en la utilización de herramientas libres para el testeo y captura de la información del hardware de la computadora.

Se realiza una breve introducción del funcionamiento de cada aplicación, para luego proceder a su instalación y/o utilización. Además, se detalla en cada caso el tipo de licencia, autor/es y web oficial.

NOTA: Las pruebas de las aplicaciones se realizaron sobre una distribución Debian 9.4, por lo cual los pasos para su utilización pueden variar respecto a otras distribuciones de GNU/Linux.

HardInfo

Es una aplicación que permite obtener información de los distintos aspectos del equipo, tales como: procesador, unidades de disco, pantalla, placa madre, Sistema Operativo, entre otros. Se puede monitorizar en tiempo real la utilización de recursos tales como memoria RAM, procesador, valores de sensores, entre otros

Además, tiene un apartado para realizar testeos sobre el procesador (CPU, FPU) basado en distintos algoritmos (View -> Benchmarks).

Toda esta información se puede volcar en archivos .HTML o .txt.

Esta aplicación cuenta con licencia GNU/GPL.

Su autor es Leandro A. F. Pereira.

La web oficial es wiki.hardinfo.org

Para su utilización dirigirse a la terminal de comandos y proceder a instalarlo.

Loguearse como superusuario.

```
# su root
```

Actualizar la cache del repositorio.

```
# apt-get update
```

Instalar.

```
# apt-get install hardinfo
```

Dirigirse al directorio donde se instaló (se puede buscar mediante el comando `find / -iname hardinfo`).

```
# cd /usr/bin
```

Ejecutar.

```
# ./hardinfo
```

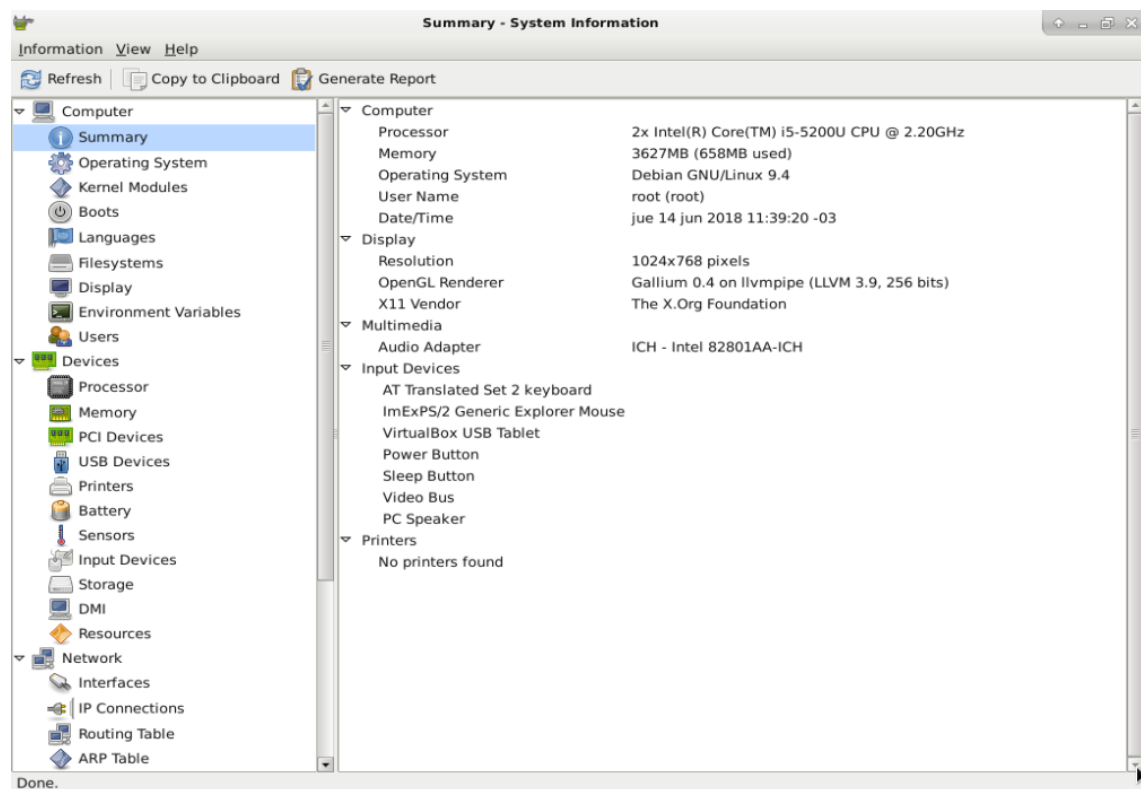


Imagen 1: pantalla Summary.

Memtest86+

Es una aplicación que permite comprobar el estado de la memoria RAM del equipo exhaustivamente.

Para ello, se debe acceder al sistema mediante el gestor de arranque (GRUB por ejemplo), ya que esto permite analizar la memoria completa sin la necesidad de cargar el Sistema Operativo (lo que bloquearía un sector). También, se puede utilizar el programa mediante un CD-ROM, pen drive, entre otros, cargado con el mismo. Algunas distribuciones de GNU/Linux lo traen en sus livesCD's.

Concluyendo, Memtest86+ escribe patrones de prueba en la memoria para luego leerlo y comprobar su integridad.

Esta aplicación cuenta con licencia GNU/GPL y se encuentra escrita en el lenguaje C.

Su autor es Samuel Demeulemeester.

La web oficial es memtest.org

Para su utilización dirigirse a la terminal de comandos y proceder a instalarlo (en el caso de que no esté instalado por defecto).

Loguearse como superusuario.

```
# su root
```

Actualizar la cache del repositorio.

```
# apt-get update
```

Instalar.

```
# apt-get install memtest86+
```

Reiniciamos y seleccionamos la aplicación en nuestro gestor de arranque.

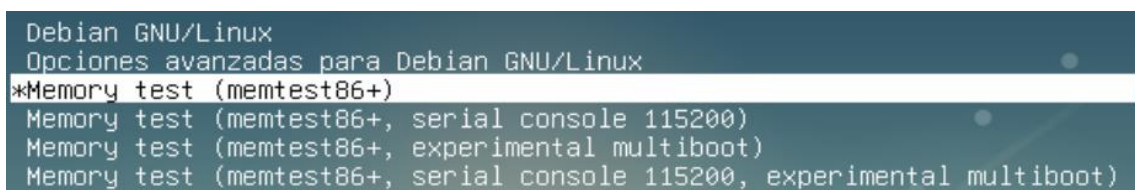


Imagen 2: lista de las diferentes opciones de arranque en GRUB.

```
Memtest86 5.01 | Intel(R) Core(TM) i5-5200U CPU @ 2.20GHz
CLK: 2197 MHz (X64 Mode) | Pass 0%
L1 Cache: 32K 219687 MB/s | Test 36% #####
L2 Cache: 256K 43075 MB/s | Test #3 [Moving inversions, 1s & 0s Parallel]
L3 Cache: 3072K 29291 MB/s | Testing: 1024K - 2048M 2047M of 4096M
Memory : 4096M 11324 MB/s | Pattern: ffffffff | Time: 0:00:09
-----
Core#: 0 (SMP: Disabled) | RAM: 4194MHz (DDR3-8388) - BCLK: 99
State: | Running... | Timings: CAS 0-0-0-0 @ 256-bit Mode
Cores: 1 Active / 1 Total (Run: All) | Pass: 0 Errors: 0
-----
S S
(ESC)exit (c)configuration (SP)scroll_lock (CR)scroll_unlock
```

Imagen 3: Memtest86+ en acción.

CPU Burn

Es una herramienta que permite estresar el procesador al 100% realizando cálculos matemáticos para probar su estabilidad frente a grandes cargas de trabajo.

Esta aplicación cuenta con licencia MIT (Instituto Tecnológico de Massachusetts).

Su autor es Patrick Mylund Nielsen.

La web oficial es patrickmn.com/projects/cpuburn

Para su utilización dirigirse a la terminal de comandos y proceder a instalarlo.

Descargar el paquete de la web oficial (patrickmn.com/projects/cpuburn).

Loguearse como superusuario.

su root

Dirigirse al directorio de descarga para descomprimir y desempaquetar el archivo.

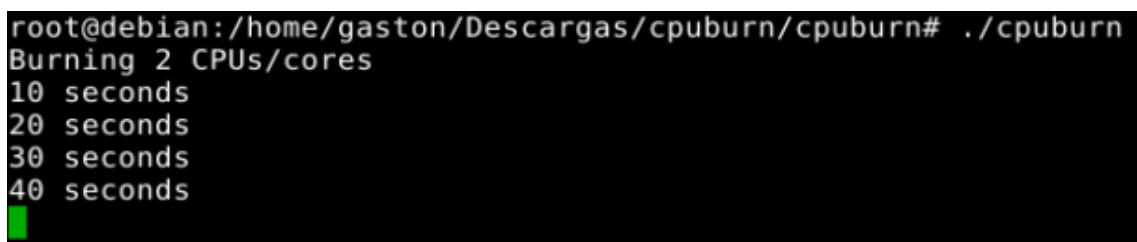
```
# cd /home/usuario/Descargas
# tar zxvf cpuburn.tar.gz
```

Dirigirse al directorio que nos creó con los archivos.

```
# cd /cpuburn
```

Ejecutar.

```
# ./cpuburn
```

A terminal window with a black background and white text. The prompt is 'root@debian:/home/gaston/Descargas/cpuburn/cpuburn#'. The command executed is './cpuburn'. The output shows 'Burning 2 CPUs/cores' followed by a list of time intervals: '10 seconds', '20 seconds', '30 seconds', and '40 seconds'. A green cursor is visible at the end of the '40 seconds' line.

```
root@debian:/home/gaston/Descargas/cpuburn/cpuburn# ./cpuburn
Burning 2 CPUs/cores
10 seconds
20 seconds
30 seconds
40 seconds
```

Imagen 4: CPU Burn en ejecución.

Smartmontools

Esta herramienta sencilla permite supervisar el estado de las unidades de almacenamiento realizando pruebas para verificar su buen funcionamiento. Requiere que la unidad y la placa madre tengan la tecnología **S.M.A.R.T.** (**S**elf-**M**onitoring, **A**nalysis and **R**eporting **T**echnology) y que la misma se encuentre habilitada en la configuración de la placa madre.

Esta aplicación cuenta con licencia GNU/GPL.

Sus autores son Bruce Allen, Christian Franke, Guido Guenther.

La web oficial es www.smartmontools.org

Para su utilización dirigirse a la terminal de comandos y proceder a instalarlo.

Loguearse como superusuario.

```
# su root
```


Actualizar la cache del repositorio.

```
# apt-get update
```

Instalar.

```
# apt-get install smartmontools
```

Luego utilizar el comando fdisk para identificar la unidad a analizar.

```
# fdisk -l
```

Ejecutar pasando como argumento el nombre del dispositivo (Ej.: sda1).

Primero se verifica que pruebas acepta el disco mediante el parámetro “-c”.

```
# smartctl -c /dev/sda1
```

Posteriormente, se eligen los posibles tests a ejecutar.

Corto:

```
# smartctl -t short /dev/sda1
```

Largo:

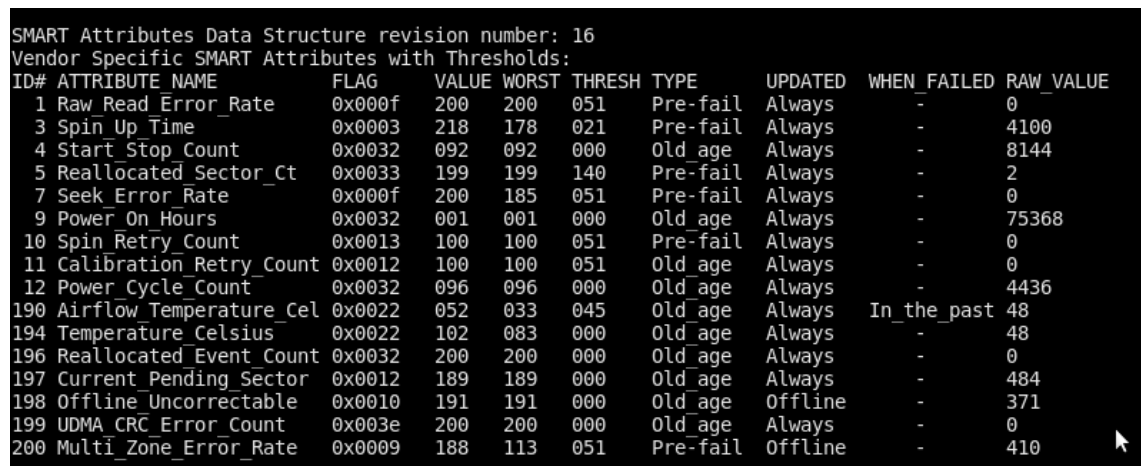
```
# smartctl -t long /dev/sda1
```

Transporte:

```
# smartctl -t conveyance /dev/sda1
```

Por último, se obtienen los resultados.

```
# smartctl -H /dev/sda1
```



```
SMART Attributes Data Structure revision number: 16
Vendor Specific SMART Attributes with Thresholds:
ID# ATTRIBUTE NAME          FLAG         VALUE  WORST  THRESH TYPE      UPDATED  WHEN FAILED RAW_VALUE
  1 Raw Read Error Rate       0x000f       200    200    051   Pre-fail Always    -         0
  3 Spin Up Time              0x0003       218    178    021   Pre-fail Always    -        4100
  4 Start/Stop Count          0x0032       092    092    000   Old_age Always    -       8144
  5 Reallocated Sector Count  0x0033       199    199    140   Pre-fail Always    -         2
  7 Seek Error Rate           0x000f       200    185    051   Pre-fail Always    -         0
  9 Power On Hours            0x0032        01     01     000   Old_age Always    -      75368
 10 Spin Retry Count          0x0013       100    100    051   Pre-fail Always    -         0
 11 Calibration Retry Count  0x0012       100    100    051   Old_age Always    -         0
 12 Power Cycle Count         0x0032       096    096    000   Old_age Always    -       4436
190 Airflow Temperature_Cel  0x0022       052    033    045   Old_age Always    In_the_past 48
194 Temperature Celsius      0x0022       102    083    000   Old_age Always    -         48
196 Reallocated Event Count  0x0032       200    200    000   Old_age Always    -         0
197 Current Pending Sector    0x0012       189    189    000   Old_age Always    -        484
198 Offline Uncorrectable     0x0010       191    191    000   Old_age Offline    -        371
199 UDMA CRC Error Count      0x003e       200    200    000   Old_age Always    -         0
200 Multi-Zone Error Rate     0x0009       188    113    051   Pre-fail Offline    -        410
```

Imagen 5: atributos SMART de una unidad de disco.

```
SMART Self-test log structure revision number 1
Num Test Description Status Remaining LifeTime(hours) LBA_of_first_error
# 1 Extended captive Interrupted (host reset) 90% 9831 -
# 2 Extended captive Interrupted (host reset) 90% 9829 -
# 3 Short captive Completed: read failure 90% 9827 228246187
# 4 Short captive Completed without error 00% 22379 -
# 5 Short captive Completed without error 00% 22006 -
```

Imagen 6: test fallado.

Conclusión

Teniendo en cuenta la distribución de GNU/Linux utilizada, se pueden encontrar numerosas herramientas para comprobar el estado del hardware del equipo de computación, como también conocer las características del mismo.

Es de gran importancia conocer las especificaciones del hardware al momento de realizar la instalación y configuración del Sistema Operativo, adquirir nuevo hardware para mejorar la performance o para el reemplazo de un componente defectuoso, entre otros.

A su vez, también es importante contar con herramientas de testeo para conocer el estado de los componentes físicos del sistema, lo que permite diagnosticar fallas o predecirlas, evitando problemas o ayudando a resolverlos.

Bibliografía

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