



# Going cross-platform how **htop** was made portable

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PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
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## About me

original author of htop, a project started in 2004

<http://hisham.hm/htop/>

lead developer of LuaRocks, the package manager for the Lua

<http://luarocks.org/>

co-founder of the GoboLinux distribution

<http://gobolinux.org/>

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## What is htop

an interactive process manager

intended to be “a better top”

by this I originally meant: scrolling!

(versions of top improved a lot since!)

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# Hello, htop!

```

./htop
 0 [|||||] 8.4%] Tasks: 94, 42 thr; 1 running
 1 [|||] 3.8%] Load average: 0.47 0.26 0.22
 2 [|] 0.6%] Uptime: 04:28:22
 3 [|] 1.3%] Battery: n/a
Mem[|||||||||||||||||||||||||||||||||||||] 1114/3819MB]
Swp[|] 0/0MB]

IO Priority:
None (based on nice)
Realtme 0 (High)
Realtme 1
Realtme 2
Realtme 3
Realtme 4
Realtme 5
Realtme 6
Realtme 7 (Low)
Best-effort 0 (High)
Best-effort 1
Best-effort 2
Best-effort 3
Best-effort 4
Best-effort 5
Best-effort 6
Best-effort 7 (Low)
Idle
EnterSet EscCancel

PID USER PRI NI VIRT RES SHR S CPU% MEM% Command
1 root 40 0 1672 572 508 S 0.0 0.0 init [2]
15814 hisham 40 0 16140 6284 3856 S 0.0 0.2 | urxvt -cr green -fn *-lode-* -fb *
15815 hisham 40 0 8804 6004 1692 S 0.0 0.2 | | zsh
15836 hisham 40 0 45512 30796 13920 S 0.0 0.8 | | | gimp
16474 hisham 40 0 26020 12624 8792 S 0.6 0.3 | | | | /System/Index/lib/gimp/2.
16047 hisham 40 0 20552 5344 3236 S 0.0 0.1 | | | | /System/Index/lib/gimp/2.
15345 hisham 40 0 62852 54784 3920 S 0.0 1.4 | urxvt -cr green -fn *-lode-* -fb *
15346 hisham 40 0 9132 6460 1868 S 0.0 0.2 | | zsh
15357 hisham 40 0 1716 564 468 T 0.0 0.0 | | | cw: wrapping [find] {pid=153
| | | | find
15291 hisham 40 0 16332 6492 3920 S 0.0 0.2 | urxvt -cr green -fn *-lode-* -fb *
15292 hisham 40 0 9000 6316 1856 S 0.0 0.2 | | zsh
15340 hisham 40 0 3116 1852 1148 R 4.4 0.0 | | | ./htop
14628 hisham 40 0 16140 6304 3864 S 0.0 0.2 | urxvt -cr green -fn *-lode-* -fb *
14629 hisham 40 0 9240 6496 1868 S 0.0 0.2 | | zsh
14646 hisham 40 0 1712 548 468 S 0.0 0.0 | | | cw: wrapping [env] {pid=1464
| | | | /bin/bash /System/Links/E
| | | | python /System/Links/E
13475 hisham 40 0 16140 6380 3864 S 0.0 0.2 | urxvt -cr green -fn *-lode-* -fb *
13476 hisham 40 0 8988 6320 1868 S 0.0 0.2 | | zsh
13808 hisham 40 0 3976 1912 1532 S 0.0 0.0 | | | ssh -t loderunner,htop@shell
13384 hisham 40 0 16140 6288 3864 S 0.0 0.2 | urxvt -cr green -fn *-lode-* -fb *
13385 hisham 40 0 9000 6296 1844 S 0.0 0.2 | | zsh
10544 hisham 40 0 26212 16596 3920 S 0.0 0.4 | urxvt -cr green -fn *-lode-* -fb *

```

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## Linux-only

entire logic for gathering process data is based on the `/proc` filesystem

that's how top did it too, seemed right

UI was dependent only on the portable library `ncurses`

so far so good, for many years

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## htop off-Linux

users got htop running on **FreeBSD**

using **linprocfs** (a Linux procfs emulation layer)

users sent patches and asked for minor tweaks  
for that scenario

happy to merge!

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## Backstory

« A wild Mac OS X fork appears! »

an ad-hoc port of htop 0.8.2

deleted all Linux-specific code

by the time I took note of it, the codebase had diverged

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## Fast-forward a few years

bug reports popping up in htop's bugtracker

old bugs, fixed in htop mainline for **years!**

it started to get annoying and look bad



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## A fundraiser

summer job: port it to Mac OS X “the right way”

reached 1/3 of its goal

so I decided not to port it to the Mac, but to at least make htop **portable**

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## Making it portable

by this I mean making it **amenable to be ported**

so initially I didn't really port it

but I paved the way so that whoever did it,  
could do it cleanly

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## Breaking Linux dependency the easy way

try to compile it on another OS

set up a VM

first try: FreeBSD

gave up quickly

second try: **PC-BSD**

path of least resistance for a Linux user!

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## Approaches for multi-platform apps

separate **codebases**

sometimes it really makes sense: iOS vs. Android

a spaghetti of **#ifdefs**

sometimes it's the right thing to do

Clean interfaces (**APIs**) between portable and platform-specific parts

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# Isolated the Linux-specific code

Created two sub-directories

linux/

unsupported/

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## Isolated the Linux-specific code

Created two sub-directories

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unsupported/

And, for fun

freebsd/

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## An “00P” approach

Process.c

Process.h

ProcessList.c

ProcessList.h

...

linux/

LinuxProcess.c

LinuxProcessList.c

...

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## Upload to GitHub and...

unsupported/

linux/

freebsd/



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## Upload to GitHub and...

unsupported/

linux/

freebsd/ - merged PRs!

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## Upload to GitHub and...

unsupported/

linux/

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openbsd/

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## Upload to GitHub and...

unsupported/

linux/

freebsd/

openbsd/

darwin/

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## Positive social impact

more, new contributors

always a good thing!

more diverse contributors

OpenBSD people and their security concerns!

anyone wants to port it to NetBSD?

...Cygwin!?

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# htop 2.0

The code is ready!

<http://github.com/hishamhm/htop/>

Packages reaching your repositories soon!

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# Thanks !

All fundraiser contributors!

David Hunt - Darwin support

Martin Misuth (etosan)

Christian Hesse (eworm-de)

Michael McConville (mmcco)

Michael Klein (mklein-de)

Kang-Che Sung (Explorer09)

and many others who sent in patches and bug reports!!