NAME

htop – interactive process viewer

SYNOPSIS

htop [−*dChustv*]

DESCRIPTION

Htop is a free (GPL) ncurses-based process viewer for Linux.

It is similar to top, but allows you to scroll vertically and horizontally, so you can see all the processes running on the system, along with their full command lines, as well as viewing them as a process tree, selecting multiple processes and acting on them all at once.

Tasks related to processes (killing, renicing) can be done without entering their PIDs.

COMMAND-LINE OPTIONS

Mandatory arguments to long options are mandatory for short options too.

−d −−delay=DELAY
Delay between updates, in tenths of seconds

−C −−no-color −−no-colour
Start htop in monochrome mode

−h −−help
Display a help message and exit

−p −−pid=PID,PID...
Show only the given PIDs

−s −−sort−key COLUMN
Sort by this column (use −−sort−key help for a column list)

−u −−user=USERNAME
Show only the processes of a given user

−v −−version
Output version information and exit

−t −−tree
Show processes in tree view

INTERACTIVE COMMANDS

The following commands are supported while in htop:

Up, Alt-k
Select (highlight) the previous process in the process list. Scroll the list if necessary.

Down, Alt-j
Select (highlight) the next process in the process list. Scroll the list if necessary.

Left, Alt-h
Scroll the process list left.

Right, Alt-l
Scroll the process list right.

PgUp, PgDn
Scroll the process list up or down one window.

Home
Scroll to the top of the process list and select the first process.

End Scroll to the bottom of the process list and select the last process.

Ctrl-A, ^
Scroll left to the beginning of the process entry (i.e. beginning of line).

Ctrl-E, $
Scroll right to the end of the process entry (i.e. end of line).

Space
Tag or untag a process. Commands that can operate on multiple processes, like "kill", will then apply over the list of tagged processes, instead of the currently highlighted one.

U Untag all processes (remove all tags added with the Space key).

s Trace process system calls: if strace(1) is installed, pressing this key will attach it to the currently selected process, presenting a live update of system calls issued by the process.

l Display open files for a process: if lsof(1) is installed, pressing this key will display the list of file descriptors opened by the process.

F1, h, ?
Go to the help screen

F2, S
Go to the setup screen, where you can configure the meters displayed at the top of the screen, set various display options, choose among color schemes, and select which columns are displayed, in which order.

F3, / Incrementally search the command lines of all the displayed processes. The currently selected (highlighted) command will update as you type. While in search mode, pressing F3 will cycle through matching occurrences.

**F4, ** Incremental process filtering: type in part of a process command line and only processes whose names match will be shown. To cancel filtering, enter the Filter option again and press Esc.

F5, t Tree view: organize processes by parenthood, and layout the relations between them as a tree. Toggling the key will switch between tree and your previously selected sort view. Selecting a sort view will exit tree view.

F6 On sorted view, select a field for sorting, also accessible through < and >. The current sort field is indicated by a highlight in the header. On tree view, expand or collapse the current subtree. A "+" indicator in the tree node indicates that it is collapsed.

F7,] Increase the selected process’s priority (subtract from ’nice’ value). This can only be done by the superuser.

F8, [Decrease the selected process’s priority (add to ’nice’ value)

F9, k
"Kill" process: sends a signal which is selected in a menu, to one or a group of processes. If processes were tagged, sends the signal to all tagged processes. If none is tagged, sends to the currently selected process.

F10, q
Quit

I Invert the sort order: if sort order is increasing, switch to decreasing, and vice-versa.

+, – When in tree view mode, expand or collapse subtree. When a subtree is collapsed a "+" sign shows to the left of the process name.

a (on multiprocessor machines)
Set CPU affinity: mark which CPUs a process is allowed to use.

u Show only processes owned by a specified user.

M Sort by memory usage (top compatibility key).

P Sort by processor usage (top compatibility key).

T Sort by time (top compatibility key).

F "Follow" process: if the sort order causes the currently selected process to move in the list, make the selection bar follow it. This is useful for monitoring a process: this way, you can keep a process always visible on screen. When a movement key is used, "follow" loses effect.

K Hide kernel threads: prevent the threads belonging the kernel to be displayed in the process list. (This is a toggle key.)

H Hide user threads: on systems that represent them differently than ordinary processes (such as recent NPTL-based systems), this can hide threads from userspace processes in the process list. (This is a toggle key.)

p Show full paths to running programs, where applicable. (This is a toggle key.)

Ctrl-L
Refresh: redraw screen and recalculate values.

Numbers
PID search: type in process ID and the selection highlight will be moved to it.

COLUMNS

The following columns can display data about each process. A value of '−' in all the rows indicates that a column is unsupported on your system, or currently unimplemented in htop. The names below are the ones used in the "Available Columns" section of the setup screen. If a different name is shown in htop's main screen, it is shown below in parenthesis.

Command
The full command line of the process (i.e. program name and arguments).

PID The process ID.

STATE (S)
The state of the process:
S for sleeping (idle)
R for running
D for disk sleep (uninterruptible)
Z for zombie (waiting for parent to read its exit status)
T for traced or suspended (e.g by SIGTSTP)
W for paging

PPID
The parent process ID.

PGRP
The process's group ID.

SESSION (SID)
The process's session ID.

TTY_NR (TTY)
The controlling terminal of the process.

TPGID
The process ID of the foreground process group of the controlling terminal.

MINFLT
The number of page faults happening in the main memory.

CMINFLT
The number of minor faults for the process's waited-for children (see MINFLT above).

MAJFLT
The number of page faults happening out of the main memory.

CMAJFLT
The number of major faults for the process's waited-for children (see MAJFLT above).

UTIME (UTIME+)
The user CPU time, which is the amount of time the process has spent executing on the CPU in user mode (i.e. everything but system calls), measured in clock ticks.

STIME (STIME+)
The system CPU time, which is the amount of time the kernel has spent executing system calls on behalf of the process, measured in clock ticks.

CUTIME (CUTIME+)
The children's user CPU time, which is the amount of time the process's waited-for children have spent executing in user mode (see UTIME above).

CSTIME (CSTIME+)
The children's system CPU time, which is the amount of time the kernel has spent executing system calls on behalf of all the process's waited-for children (see STIME above).

PRIORITY (PRI)
The kernel's internal priority for the process, usually just its nice value plus twenty. Different for real-time processes.

NICE (NI)
The nice value of a process, from 19 (low priority) to -20 (high priority). A high value means the process is being nice, letting others have a higher relative priority. The usual OS permission restrictions for adjusting priority apply.

STARTTIME (START)
The time the process was started.

PROCESSOR (CPU)
The ID of the CPU the process last executed on.

M_SIZE (VIRT)
The size of the virtual memory of the process.

M_RESIDENT (RES)
The resident set size (text + data + stack) of the process (i.e. the size of the process's used physical memory).

M_SHARE (SHR)
The size of the process's shared pages.

M_TRS (CODE)
The text resident set size of the process (i.e. the size of the process's executable instructions).

M_DRS (DATA)
The data resident set size (data + stack) of the process (i.e. the size of anything except the process's executable instructions).

M_LRS (LIB)
The library size of the process.

M_DT (DIRTY)
The size of the dirty pages of the process.

ST_UID (UID)
The user ID of the process owner.

PERCENT_CPU (CPU%)
The percentage of the CPU time that the process is currently using.

PERCENT_MEM (MEM%)
The percentage of memory the process is currently using (based on the process's resident memory size, see M_RESIDENT above).

USER
The username of the process owner, or the user ID if the name can't be determined.

TIME (TIME+)
The time, measured in clock ticks that the process has spent in user and system time (see UTIME, STIME above).

NLWP
The number of threads in the process.

TGID
The thread group ID.

CTID
OpenVZ container ID, a.k.a virtual environment ID.

VPID
OpenVZ process ID.

VXID
VServer process ID.

RCHAR (RD_CHAR)
The number of bytes the process has read.

WCHAR (WR_CHAR)
The number of bytes the process has written.

SYSCR (RD_SYSC)
The number of read(2) syscalls for the process.

SYSCW (WR_SYSC)
The number of write(2) syscalls for the process.

RBYTES (IO_RBYTES)
Bytes of read(2) I/O for the process.

WBYTES (IO_WBYTES)
Bytes of write(2) I/O for the process.

CNCLWB (IO_CANCEL)
Bytes of cancelled write(2) I/O.

IO_READ_RATE (DISK READ)
The I/O rate of read(2) in bytes per second, for the process.

IO_WRITE_RATE (DISK WRITE)
The I/O rate of write(2) in bytes per second, for the process.

IO_RATE (DISK R/W)
The I/O rate, IO_READ_RATE + IO_WRITE_RATE (see above).

CGROUP
Which cgroup the process is in.

OOM
OOM killer score.

IO_PRIORITY (IO)
The I/O scheduling class followed by the priority if the class supports it:
R for Realtime
B for Best-effort

id for Idle

PERCENT_CPU_DELAY (CPUD%)

The percentage of time spent waiting for a CPU (while runnable). Requires CAP_NET_ADMIN.

PERCENT_IO_DELAY (IOD%)

The percentage of time spent waiting for the completion of synchronous block I/O. Requires CAP_NET_ADMIN.

PERCENT_SWAP_DELAY (SWAPD%)

The percentage of time spent swapping in pages. Requires CAP_NET_ADMIN.

All other flags

Currently unsupported (always displays '-').

CONFIG FILE

By default htop reads its configuration from the XDG-compliant path ~/.config/htop/htoprc -- the configuration file is overwritten by htop's in-program Setup configuration, so it should not be hand-edited. If no user configuration exists htop tries to read the system-wide configuration from /etc/htoprc and as a last resort, falls back to its hard coded defaults.

You may override the location of the configuration file using the $HTOPRC environment variable (so you can have multiple configurations for different machines that share the same home directory, for example).

MEMORY SIZES

Memory sizes in htop are displayed as they are in tools from the GNU Coreutils (when ran with the --human-readable option). This means that sizes are printed in powers of 1024. (e.g., 1023M = 1072693248 Bytes)

The decision to use this convention was made in order to conserve screen space and make memory size representations consistent throughout htop.

SEE ALSO

proc(5), top(1), free(1), ps(1), uptime(1), limits.conf(5)

AUTHORS

htop is developed by Hisham Muhammad <hisham@gobolinux.org>.

This man page was written by Bartosz Fenski <fenio@o2.pl> for the Debian GNU/Linux distribution (but it may be used by others). It was updated by Hisham Muhammad, and later by Vincent Launchbury, who wrote the 'Columns' section.