NAME

lmon − ncurses based linux performance viewer

SYNOPSIS

lmon [*OPTION*]

OPTIONS

−b browse the history in the system lard database /var/lib/lard/lard.db (if present)

−f *database*
browse the history in the lard *database*

−g regenerate the configuration file with defaults

−h basic help.

−v show lmon version.

without arguments, lmon operates as a realtime performance viewer.

lmon likes terminals with 256 colors (such as TERM=xterm-256color) and will adapt the screen layout to terminal resizing.

Exit status:

0 if OK,

1 error.

2 more serious error.

DESCRIPTION

lmon shows kernel, CPU, memory, disk, filesystem, network and process activity drawn from the /proc and /sys pseudo filesystems as well as udev.

lmon either operates in realtime mode, taking snapshots from the live system, or in browse mode (-f, -b), displaying snapshots stored in a lard database.

lmon recognizes these key commands in realtime mode:

q quits lmon (as does ˆC).

+ increases sample interval by 1 second.

- decreases sample interval by 1 second.

Note that changing the sample interval clears the CPU trail.

lmon recognizes these key commands in browse mode:

q quits lmon (as does ˆC).

leftarrow or **,**
move back

rightarrow or **.**
move forward

+ zoom in

- zoom out

h one hour back

H one hour forward

d one day back

D one day forward

w one week back

W one week forward

HOME
home key - start of history

END end key - end of history

VIEWS

Some views are only visible, or partly visible, when the terminal screen is large enough.

Sizes expressed in bytes are given in base 1024, ’1.0G’ is a screen-space saving abbreviation for 1.0GiB, one Gibibyte.

CPU

CPU and schedulling details over the last sample interval, title shows number of sockets/cores/logical CPU’s. The character chart shows CPU mode usage per logical CPU. The per-logical CPU chart is not shown when the number of processors exceeds 32.

CPU utilization is given as the ratio CPU time / wallclock time, so full utilization equals 1.

user(*u*) user mode CPU (CPU seconds/clock second).

nice(*n*) nice mode CPU (CPU seconds/clock second).

system(*s*)
system mode CPU (CPU seconds/clock second).

iowait(*w*)
iowait mode CPU (CPU seconds/clock second).

irq(*i*) irq mode CPU (CPU seconds/clock second).

softirq(*o*)
softirq mode (CPU seconds/clock second).

total total of the above CPU modes.

slice total CPU time divided by number of context switches.

ctxsw/s the number of context switches per second.

forks/s the number of forks per second.

loadavg
5 and 10 minute load average (average number of processes on the run or block queue).

runq the number of processes on the run/block queue.

Memory

Memory details, title shows the amount of real memory available to the kernel.

Anonymous memory is memory not associated with file data.

unused real memory not in use.

commitas
total virtual memory allocated.

anon anonymous virtual memory.

file real memory used as page cache.

shmem shared memory.

slab real memory used for the kernel slab.

pagetbls
real memory used for virtual memory paging tables.

dirty memory used by dirty file pages.

pgin/s number of pages/s read into memory from persistent storage.

pgout/s number of pages/s written from memory to persistent storage.

swpin/s number of virtual memory pages/s read into memory from swap.

swpout/s
number of virtual memory pages/s written from memory to swap.

hp total total number of hugepages.

hp rsvd number of reserved hugepages.

hp free number of free hugepages.

thp anon
anonymous memory used by transparent hugepages.

mlock (m)locked memory.

mapped
memory used by memory-mapped files.

swp used
swap used.

swp size
swap size.

minflt/s minor page faults per second.

majflt/s major page faults per second.

alloc/s memory allocations per second.

free/s memory freed per second.

System resources
Miscellaneous system resources.

files open
the number of allocated file handles on the system.

files max
the maximum number of file handles that can be allocated on the system.

inodes open
the number of allocated inode handles.

inodes free
the number of free inode handles.

processes
the number of processes.

users the number of distinct users logged in.

logins the number of user logins.

fs growth/s
total filesystem growth per second.

CPU trail
A time trail of CPU usage, aggregated over all CPUs. CPU modes are coded by character and color. On the ’x-axis, a ’+’ marks 10 ticks.

Disk IO
Disk IO statistics of top ’true’ disks ordered by utilization. Derived block devices such as LVM or MetaDisk are excluded. Not all disks may be shown due to lack of terminal space, but the totals aggregate

all disks nevertheless. The header shows total attached storage size, average IOPS (r+w) and average bandwidth (r+w) over the last sample interval.

device the device name.

util utilization as busy time / wallclock time.

svct average service time - not including queuing time.

r/s read operations per second.

w/s write operations per second.

rb/s bytes read per second.

wb/s bytes written per second.

artm average read time - includes queuing time.

awtm average write time - includes queuing time.

rsz average read size.

wsz average write size.

qsz number of IO's on the device queue at time of last sample.

Filesystem IO

Shows statistics on block devices with mounted filesystems ordered by utilization. Same columns as 'Disk IO'.

Network

Shows network device statistics.

device the device name.

rxb/s bytes received per second.

txb/s bytes transmitted per second.

rxpkt/s packets received per second.

txpkt/s packets transmitted per second.

rxsz received packet average size.

txsz transmitted packet average size.

rxerr/s average receive error rate.

txerr/s average transmit error rate.

TCP server

Shows TCP (v4 and v6) server connection statistics. Connections are counted and grouped by (server address, server port, user running server process) and sorted on number of connections.

address
the address of the server.

port the port of the server.

user the user running the server process.

#conn the number of established tcp connections on this server.

TCP client

Shows TCP (v4 and v6) client connection statistics. Client connections are counted and grouped by (server address, server port, user running client process) and sorted on number of connections.

address
the address of the server.

port the port of the server.

user the user running the server process.

#conn the number of established tcp connections to the server.

Process

Shows top processes ordered by *time*. In order to be 'seen', a process must exist during at least two consecutive samples. Consequently, processes that are created and destroyed within a sample interval are invisible and not aggregated. The reported totals can therefore be lower than the system-wide reality shown in the CPU and Memory views.

The Process view stops sampling when the sample time exceeds 120ms - the sampling time scales linear with the number of processes on the system. On an Intel core i7 this would disable the Process view output above roughly 10000 processes. If the number of processes drops by 10% since disable, a new sample is tried.

pid process id.

pgrp process group id.

S process status. In realtime mode, this is the status of the process at the time of last sample. In browse mode, this is set to 'D' if the pid ever had 'D' in the snapshot range.

user user owning the process.

comm command or 'process image'.

time total of utime, stime and iotime for the process.

utime user mode CPU time over the last interval divided by interval duration.

stime system mode CPU time over the last interval divided by interval duration.

minflt the minor faults per second caused by the process.

majflt the major faults per second caused by the process.

rss the process resident set size - real memory used by the process, some of which may be shared.

vsz the process virtual memory size - virtual memory used by the process, some of which may be shared.

args the process arguments.

wchan for blocked processes (status D), the kernel channel waited on. In browse mode, this is set to the most frequent whcan for pids having state D in the snapshot range at least once.

CONFIG FILE

Configuration file is '.leanux-lmon' located in the first match among
$XDG_CONFIG_HOME, HOME and getpwuid->pw_dir.

BUGS

Report bugs, documentation errors and suggestions at https://github.com/jmspit/leanux/issues.

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SEE ALSO

lard(1), lblk(1), lrep(1), lsys(1)