

# Linux 性能優化實戰

## CH 26 | 案例篇：如何找出狂打日誌的“內鬼”？

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# Outline

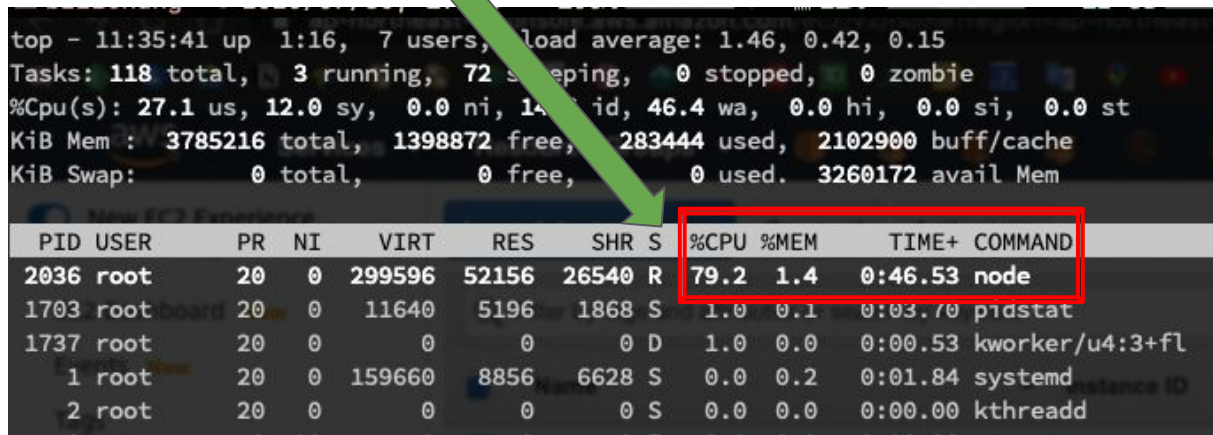
- 排除問題步驟
- 動態調整 log level
- 思考題

# 排除問題步驟

1. 找出是否有 process 佔用較多計算資源
2. 找 I/O 相關數值
3. 定位 process ID, 使用找出目標檔案與大致寫入內容

# 排除問題步驟 - 找出是否有 process 佔用較多計算資源

- top
- htop
- ...



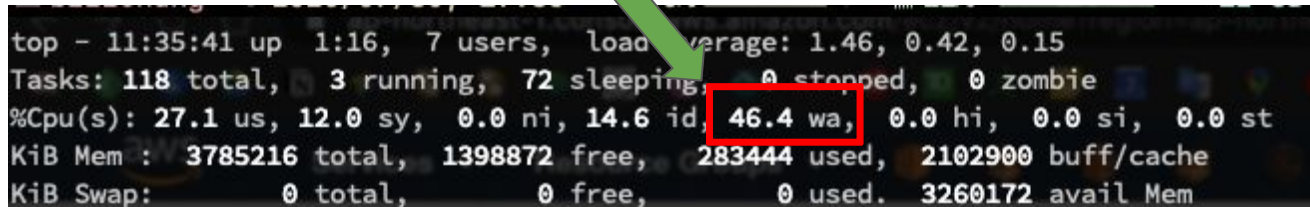
```
top - 11:35:41 up 1:16, 7 users, load average: 1.46, 0.42, 0.15
Tasks: 118 total, 3 running, 72 sleeping, 0 stopped, 0 zombie
%Cpu(s): 27.1 us, 12.0 sy, 0.0 ni, 14.0 id, 46.4 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 3785216 total, 1398872 free, 283444 used, 2102900 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 3260172 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
 2036 root        20   0 299596 52156 26540 R    79.2   1.4   0:46.53 node
 1703 root        20   0  11640  5196  1868 S     1.0   0.1   0:03.70 pidstat
 1737 root        20   0     0     0     0 D     1.0   0.0   0:00.53 kworker/u4:3+fl
    1 root        20   0 159660  8856  6628 S     0.0   0.2   0:01.84 systemd
    2 root        20   0     0     0     0 S     0.0   0.0   0:00.00 kthreadd
```

[wa, IO-wait : time waiting for I/O completion](#)

# 排除問題步驟 - 找 I/O 相關數值

- top: wa metric



```
top - 11:35:41 up 1:16, 7 users, load average: 1.46, 0.42, 0.15
Tasks: 118 total, 3 running, 72 sleeping, 0 stopped, 0 zombie
%Cpu(s): 27.1 us, 12.0 sy, 0.0 ni, 14.6 id, 46.4 wa, 0.0 hi, 0.0 si, 0.0 st
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[wa, IO-wait : time waiting for I/O completion](#)

- [pidstat](#)
  - -d: Report I/O statistics (kernels 2.6.20 and later only)
- [iostat](#)
  - -d: Display the device utilization report
  - -x: Display extended statistics.
  - %util 在不同硬體環境下的意義

# 排除問題步驟 - 定位 process ID, 使用找出目標檔案 與大致寫入內容

- strace
  - -p (pid): Attach to the process with the process ID pid and begin tracing.
  - strace -p <pid> 後, 觀察 write/stat 等 syscall
- lsuf (List opened files)
  - -p:
    - This option excludes or selects the listing of files for the processes...
    - ...PID numbers that begin with '^' (negation) represent exclusions.
  - FD 欄位
    - **w** for write access
    - **u** for read and write access
  - TYPE 欄位
    - ...or "REG" for a regular file;
  - SIZE, SIZE/OFF, or OFFSET 欄位, 顯示 SIZE 或者 OFFSET

# 動態調整 log level

- SIGUSR1 & SIGUSR2:
  - The **SIGUSR1** and **SIGUSR2** signals are set aside for you to use any way you want. They're useful for simple interprocess communication, if you write a signal handler for them in the program that receives the signal.
  - [https://www.gnu.org/software/libc/manual/html\\_node/Miscellaneous-Signals.html](https://www.gnu.org/software/libc/manual/html_node/Miscellaneous-Signals.html)

# 動態調整 log level - Lab

- SIGUSR1: 提升 log level (log 量減少)
- SIGUSR2: 降低 log level (log 量增加, I/O 增加)
- 兩個 Signal 都用來調 level 太浪費, 也可以只用一個循環



# 思考題

- “那么，今天的问题就是，这些内存到底是被 Buffer 还是 Cache 占用了呢？有没有什么方法来确认你的分析结果呢？”
- → **watch -d -n 1 cat /proc/meminfo**