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PRAKTIKUM PENGELOLAAN PROSES DI LINUX DAN WINDOWS

Tujuan Praktikum

1. Memahami konsep pengelolaan proses pada sistem operasi Linux dan Windows.
2. Mampu melihat daftar proses yang berjalan.
3. Mampu mengirim sinyal dan menghentikan proses.
4. Mampu mengubah prioritas proses.
5. Mampu menerapkan konsep message passing melalui pipelining dan redirecting.

Catatan:

Screenshot untuk setiap hasil praktikum/soal yang dikerjakan.

I. Percobaan di Linux

1. Melihat Proses yang Berjalan

1. Jalankan terminal.
2. Gunakan perintah berikut untuk melihat daftar proses:

ps aux

3. Gunakan perintah berikut untuk menampilkan daftar proses secara real-time:

```

root      187 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/u9:2-events_power_efficient]
root      191 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/0:3-events]
root      192 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/u12:2-events_unbound]
root      204 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/R-kdmfl]
root      233 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/R-raids5]
root      245 1.1 0.0   0  0 ?    I  0:14  0:00 [kworker/1:2-events]
root      257 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/3:2H-kblockd]
root      274 0.0 0.0   0  0 ?    S  0:14  0:00 [jbd2/dm-0-8]
root      275 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/R-ext4-]
root      292 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/u11:2]
root      342 0.3 0.4 50436 16580 ?  S<s 0:14  0:00 /usr/lib/systemd/systemd-journald
root      367 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/R-kmpat]
root      368 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/R-kmpat]
root      390 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/u8:1-ext4-rsv-conversion]
root      394 0.1 0.6 289116 27196 ?  Sls1 0:14  0:00 /sbin/multipathd -d -s
root      409 0.2 0.1 28796 7424 ?  Ss  0:14  0:00 /usr/lib/systemd/systemd-udevd
root      417 0.0 0.0   0  0 ?    S  0:14  0:00 [psimmon]
root      505 0.0 0.0   0  0 ?    S  0:14  0:00 [irq/18-vnugfx]
root      506 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/R-ttm]
root      541 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/u12:3-events_unbound]
root      542 0.1 0.0   0  0 ?    I  0:14  0:00 [kworker/3:3-events]
root      546 0.0 0.0   0  0 ?    S  0:14  0:00 [jbd2/sda2-8]
root      548 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/R-ext4-]
systemd+ 581 0.2 0.2 18992 9344 ?  Ss  0:14  0:00 /usr/lib/systemd/systemd-networkd
root      582 1.0 0.0   0  0 ?    I  0:14  0:00 [kworker/2:3-events]
systemd+ 599 0.3 0.3 21576 12544 ?  Ss  0:14  0:00 /usr/lib/systemd/systemd-resolved
systemd+ 613 0.1 0.1 91020 7808 ?  Ssl 0:14  0:00 /usr/lib/systemd/systemd-timesyncd
root      696 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/u9:3]
root      706 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/u9:4]
root      709 0.0 0.0   0  0 ?    I< 0:14  0:00 [kworker/R-cf80]
root      711 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/1:3-mm_percpu_wq]
message+ 712 0.2 0.1 9780 5248 ?  Ss  0:14  0:00 @dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activation --syslog-
root      716 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/0:4]
polkitd  719 0.2 0.2 383700 9428 ?  Ssl 0:14  0:00 /usr/lib/polkit-1/polkitd --no-debug
root      724 0.1 0.2 17988 8576 ?  Ss  0:14  0:00 /usr/lib/systemd/systemd-logind
root      725 0.2 0.3 468980 19440 ?  Ssl 0:14  0:00 /usr/libexec/udisks2/udisksd
syslog   756 0.1 0.1 222590 5688 ?  Ssl 0:14  0:00 /usr/sbin/rsyslog -n -NONE
root      754 0.4 0.5 109672 22784 ?  Ssl 0:14  0:00 /usr/bin/python /usr/share/unattended-upgrades/unattended-upgrade-shutdown --wait-for-signa
root      776 0.2 0.3 392028 12288 ?  Ssl 0:14  0:00 /usr/sbin/ModemManager
root      856 0.0 0.0 6824 2816 ?  Ss  0:14  0:00 /usr/sbin/cron -f -P
root      857 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/3:4]
root      859 0.2 0.1 6976 4480 ttty1  Ss  0:14  0:00 /bin/login -p --
root      863 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/2:4]
root      888 0.0 0.0   0  0 ?    I  0:14  0:00 [kworker/u11:3-events_unbound]
root      986 0.0 0.0   0  0 ?    S  0:14  0:00 [psimmon]
ndru     988 0.6 0.2 20128 11392 ?  Ss  0:14  0:00 /usr/lib/systemd/systemd --user
ndru     989 0.0 0.0 21148 3648 ?  S  0:14  0:00 (sd-pam)
ndru     1002 0.1 0.1 6656 5564 ttty1  S  0:14  0:00 -bash
ndru     1016 0.0 0.1 10884 4480 ttty1  R+ 0:15  0:00 ps aux
ndru@ndru:~$
```

top

4. Gunakan perintah berikut untuk menampilkan proses berdasarkan nama:

```

top - 02:46:53 up 1:00, 1 user, load average: 0.07, 0.02, 0.00
Tasks: 140 total, 2 running, 138 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni, 100.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 3915.4 total, 3401.5 free, 423.0 used, 308.8 buff/cache
Swap: 0.0 total, 0.0 free, 0.0 used. 3492.4 avail Mem

      PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM TIME+ COMMAND
1408 root      20  0      0    0  0 R  0.0  0.0  0:00.44 kworker/0:1-events
  1 root      20  0 22384 13172 9332 S  0.0  0.3  0:03.09 systemd
  2 root      20  0      0    0  0 S  0.0  0.0  0:00.05 kthread
  3 root      20  0      0    0  0 S  0.0  0.0  0:00.00 pool_workqueue_release
  4 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/R-rcu_g
  5 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/R-rcu_p
  6 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/R-slub_
  7 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/R-netns
  8 root      20  0      0    0  0 I  0.0  0.0  0:00.38 kworker/0:events
 10 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/0:H-events_highpri
 11 root      20 -0      0    0  0 I  0.0  0.0  0:00.00 kworker/u8:0-ext4-rsv-conversion
 12 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/R-mm-pe
 13 root      20  0      0    0  0 I  0.0  0.0  0:00.00 rCU_tasks_kthread
 14 root      20  0      0    0  0 I  0.0  0.0  0:00.00 rCU_tasks_rude_kthread
 15 root      20  0      0    0  0 I  0.0  0.0  0:00.00 rCU_tasks_trace_kthread
 16 root      20  0      0    0  0 S  0.0  0.0  0:00.02 ksoftirqd/0
 17 root      20  0      0    0  0 I  0.0  0.0  0:00.34 rCU_preempt
 18 root      rt  0      0    0  0 S  0.0  0.0  0:00.07 migration/0
 19 root      -51  0      0    0  0 S  0.0  0.0  0:00.00 idle_inject/0
 20 root      20  0      0    0  0 S  0.0  0.0  0:00.00 cpuhp/0
 21 root      20  0      0    0  0 S  0.0  0.0  0:00.00 cpuhp/1
 22 root      -51  0      0    0  0 S  0.0  0.0  0:00.00 idle_inject/1
 23 root      rt  0      0    0  0 S  0.0  0.0  0:00.44 migration/1
 24 root      20  0      0    0  0 S  0.0  0.0  0:00.18 ksoftirqd/1
 25 root      20  0      0    0  0 I  0.0  0.0  0:04.02 kworker/1:0-ata_sff
 27 root      20  0      0    0  0 S  0.0  0.0  0:00.00 cpuhp/2
 28 root      -51  0      0    0  0 S  0.0  0.0  0:00.00 idle_inject/2
 29 root      rt  0      0    0  0 S  0.0  0.0  0:00.46 migration/2
 30 root      20  0      0    0  0 S  0.0  0.0  0:00.04 ksoftirqd/2
 32 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/2:H-events_highpri
 33 root      20  0      0    0  0 S  0.0  0.0  0:00.00 cpuhp/3
 34 root      -51  0      0    0  0 S  0.0  0.0  0:00.00 idle_inject/3
 35 root      rt  0      0    0  0 S  0.0  0.0  0:00.48 migration/3
 36 root      20  0      0    0  0 S  0.0  0.0  0:00.29 ksoftirqd/3
 43 root      20  0      0    0  0 S  0.0  0.0  0:00.01 kdevtmpfs
 44 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/R-inet_
 45 root      20  0      0    0  0 I  0.0  0.0  0:00.36 kworker/u10:1-events_power_efficient
 46 root      20  0      0    0  0 S  0.0  0.0  0:00.01 kauditd
 48 root      20  0      0    0  0 S  0.0  0.0  0:00.00 khungtaskd
 49 root      20  0      0    0  0 S  0.0  0.0  0:00.00 oom_reaper
 51 root      0 -20      0    0  0 I  0.0  0.0  0:00.00 kworker/R-write
 52 root      20  0      0    0  0 S  0.0  0.0  0:00.16 kcompactd0
 53 root      25  5      0    0  0 S  0.0  0.0  0:00.00 ksmd
```

pgrep nano

catatan: nano adalah text editor linux

```
ndru@ndru:~$ ps aux | grep nano
ndru      1020  0.0  0.0  6544  2304  tty1      S+   03:16   0:00 grep --color=auto nano
```

Soal:

- Apa perbedaan output antara ps aux dan top?

Ps aux	top
Informasi yang ditampilkan mencakup PID (Process ID), CPU usage, memory usage, status, command. Jika ingin informasi terbaru, harus menjalankan kembali perintahnya.	menampilkan total penggunaan CPU, memori, dan beban sistem secara real-time.

- Bagaimana cara menampilkan proses yang dimulai oleh user tertentu saja?

Jawab :

Menggunakan *ps -u [user_name]*.

- Bandingkan hasil ps aux dengan htop. Apa kelebihan htop dibanding ps aux?

Ps aux	htop
Dapat dijalankan disemua sistem linux lebih ringan.	Dapat menggunakan tombol navigasi untuk mencari proses.

2. Mengirimkan Sinyal ke Proses

1. Jalankan proses berikut di background:

sleep 100 &

```
ndru@ndru:~$ sleep 100 &
[1] 1024
```

2. Gunakan perintah berikut untuk melihat PID dari proses sleep:

ps aux | grep sleep

```
ndru@ndru:~$ ps aux | grep sleep
ndru      1024  0.0  0.0  5684  2048  tty1      S    03:18   0:00 sleep 100
ndru      1028  0.0  0.0  6544  2304  tty1      S+   03:19   0:00 grep --color=auto sleep
```

3. Kirim sinyal SIGSTOP untuk menghentikan sementara proses:

kill -STOP <PID>

```
ndru@ndru:~$ kill -STOP 1024
-bash: kill: (1024) - No such process
[1]+ Done sleep 100
```

4. Lanjutkan kembali proses yang dihentikan:

kill -CONT <PID>

```
ndru@ndru:~$ kill -CONT 1024
-bash: kill: (1024) - No such process
```

Soal:

- Jika sleep 100 & dijalankan tanpa &, apakah perbedaannya?

Sleep 100 &	Sleep 100
Digunakan untuk menjalankan proses di background.	Terminal akan tertahan sampai proses selesai.

- Apa perbedaan antara SIGSTOP, SIGTERM, dan SIGKILL?

SIGSTOP	SIGTERM	SIGKILL
Menghentikan proses sementara (pause).	Meminta proses berhenti dengan baik.	Memaksa proses berhenti tanpa memberi kesempatan menyimpan data atau cleanup.

- Bagaimana cara mengirim sinyal SIGINT ke proses tanpa mengetahui PID-nya?

Jawab :

Menggunakan CTRL + C

3. Mematikan Proses

1. Jalankan gedit di terminal:

Gedit

```
ndru@ndru:~$ ps aux | grep nano
ndru      1121  0.0  0.0  6544  2304  ttys1    S+   04:18   0:00 grep --color=auto nano
```

2. Cari PID dari gedit:

pgrep gedit

```
ndru@ndru:~$ ps aux | grep nano
ndru          1121  0.0  0.0  6544  2304  tty1      S+   04:18   0:00 grep --color=auto nano
```

3. Hentikan proses gedit:

kill <PID>

```
ndru@ndru:~$ kill 1121
-bash: kill: (1121) - No such process
```

Soal:

- Apa yang terjadi jika kill digunakan tanpa PID?

Jawab :

Tidak berfungsi, karena tidak tahu proses mana yang harus dihentikan. (Tidak ada alamatnya)

- Bagaimana cara menghentikan semua proses gedit tanpa menggunakan pgrep?

Jawab :

pkill gedit

- Mengapa kill -9 <PID> lebih efektif dibanding kill <PID>?

Jawab :

Adanya -9 membuat proses kill lebih efektif karena memaksa proses tanpa harus negosiasi

4. Meningkatkan Prioritas Proses

1. Jalankan proses gedit dengan prioritas rendah:

nice -n 10 nano

GNU nano 7.2 New Buffer

[Welcome to nano. For basic help, type Ctrl+G.]

^G Help ^O Write Out ^W Where Is ^X Exit
^R Read File ^L Replace ^K Cut ^T Execute ^D Location M-U Undo
^P Paste ^J Justify ^C Go To Line M-F Redn M-A Set Mark M-I To Bracket
M-F Copy ^Q Where Was M-Q Previous
M-H Next

2. Lihat prioritasnya dengan:

```
ps -eo pid,comm,nice | grep nano
```

3. Tingkatkan prioritas proses nano:

GNU nano 7.2 1129 nano 0 New Buffer *

```
1129 nano
1129 (process ID) old priority 0, new priority -5
```

Soal:

- Apa yang terjadi jika nilai nice lebih kecil dari -20?

Jawab :

Tidak bisa, sebab fungsi nice hanya berkisar dari -20(prioritas tertinggi) hingga 19(prioritas terendah).

- Bisakah user biasa mengubah prioritas menjadi -10? Mengapa?

Jawab :

Tidak bisa, sebab hanya root atau user dengan izin CAP_SYS_NICE yang bisa menurunkan nilai nice.

- Bagaimana cara meningkatkan prioritas semua proses yang dimiliki oleh user tertentu?

Jawab :

sudo renice -n -5 -u username

5. Message Passing (Pipelining dan Redirecting)

1. Gunakan pipelining untuk menampilkan hanya 5 proses pertama dari daftar proses:

ps aux | head -n 5

```
ndru@ndru:~$ ps aux |head -n 5
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START  TIME COMMAND
root      1  0.7  0.3  22124 12912 ?        Ss  04:09  0:01 /sbin/init
root      2  0.0  0.0     0     0 ?        S  04:09  0:00 [kthreadd]
root      3  0.0  0.0     0     0 ?        S  04:09  0:00 [pool_workqueue_release]
root      4  0.0  0.0     0     0 ?        I<  04:09  0:00 [kworker/R-rcu_g]
```

2. Redirect output daftar proses ke dalam file:

ps aux > daftar_proses.txt

ls daftar_proses.txt

```
ndru@ndru:~$ ps aux > daftar_proses.txt
ndru@ndru:~$ ls daftar_proses.txt
daftar_proses.txt
ndru@ndru:~$ _
```

Soal:

- Bagaimana cara menyimpan output ps aux ke file sekaligus tetap menampilkannya di layar?

Jawab :

ps aux | tee output.txt

- Jelaskan perbedaan antara > dan >> dalam redirection.

>	>>
Menimpa file	Menambah file

- Buat perintah untuk menampilkan daftar proses, menyaring yang memiliki nama bash, dan menyimpannya ke file.

Jawab :

```
ps aux | grep "[b]ash" > daftar_bash.txt
```

II. Latihan Linux

- Seorang user menjalankan perintah berikut di background:

ping google.com > hasil.txt &

```
ndru@ndru:~$ ping google.com>hasil.txt&
[1] 1115
```

- Apa fungsi **&** dalam perintah tersebut?
- Bagaimana cara menghentikan proses ini tanpa mengetahui PID-nya?

```
ndru@ndru:~$ killall ping
[1]+  Terminated                  ping google.com > hasil.txt
```

- Anda ingin memastikan bahwa hanya satu instance nano yang berjalan. Jika ada lebih dari satu, matikan yang lain. Bagaimana perintahnya?

Jawab :

```
pgrep nano | tail -n +2 | xargs kill
```

- Sebuah server mengalami masalah karena load CPU terlalu tinggi. Bagaimana cara menemukan proses yang menghabiskan CPU terbanyak?

Jawab :

```
top
```

- Anda menjalankan sleep 500 &, lalu menutup terminal. Apakah proses tetap berjalan? Bagaimana cara memastikan bahwa proses tetap berjalan setelah terminal ditutup?

Jawab :

```
nohup sleep 500 &
```

- Anda ingin melihat daftar proses yang telah berjalan lebih dari 1 jam. Bagaimana perintahnya?

Jawab :

```
ps -eo pid,etimes,cmd --sort=-etimes | awk '$2 > 3600'
```

III. Percobaan di Windows

1. Melihat Proses yang Berjalan

1. Buka Command Prompt atau PowerShell.
2. Gunakan perintah berikut untuk menampilkan daftar proses:

powershell

tasklist

Image Name	PID	Session Name	Session#	Mem Usage
System Idle Process	0	Services	0	8 K
System	4	Services	0	144 K
Secure System	140	Services	0	39.508 K
Registry	184	Services	0	40.736 K
smss.exe	572	Services	0	76 K
csrss.exe	960	Services	0	2.648 K
wininit.exe	600	Services	0	1.104 K
csrss.exe	664	Console	1	3.300 K
winlogon.exe	1064	Console	1	4.404 K
services.exe	1104	Services	0	6.736 K
LsaIso.exe	1124	Services	0	28 K
lsass.exe	1136	Services	0	16.564 K
svchost.exe	1284	Services	0	27.684 K
fontdrvhost.exe	1324	Services	0	820 K
fontdrvhost.exe	1316	Console	1	3.904 K
WUDFHost.exe	1332	Services	0	1.700 K
svchost.exe	1452	Services	0	13.928 K
svchost.exe	1508	Services	0	3.836 K
dwm.exe	1592	Console	1	135.904 K
svchost.exe	1656	Services	0	1.148 K
svchost.exe	1684	Services	0	12.948 K
svchost.exe	1768	Services	0	8.988 K
svchost.exe	1812	Services	0	3.056 K
svchost.exe	1828	Services	0	7.328 K
svchost.exe	1852	Services	0	9.572 K
svchost.exe	1960	Services	0	2.460 K
svchost.exe	2016	Services	0	2.544 K
svchost.exe	668	Services	0	5.900 K
svchost.exe	1208	Services	0	3.420 K
svchost.exe	1164	Services	0	9.052 K
svchost.exe	2112	Services	0	4.600 K
MsMpEng.exe	2120	Services	0	221.960 K
IntelCpHDCPSvc.exe	2132	Services	0	1.604 K
svchost.exe	2152	Services	0	1.576 K
svchost.exe	2176	Services	0	4.752 K
svchost.exe	2248	Services	0	1.132 K
svchost.exe	2316	Services	0	12.812 K
svchost.exe	2516	Services	0	6.952 K
svchost.exe	2624	Services	0	4.296 K
svchost.exe	2648	Services	0	1.480 K
svchost.exe	2656	Services	0	5.204 K
svchost.exe	2664	Services	0	3.432 K

3. Gunakan perintah berikut untuk melihat detail proses tertentu:

powershell

tasklist | findstr notepad

```
PS C:\Users\Ndru> tasklist | findstr Notepad  
Notepad.exe . 28808 Console 1 137.208 K
```

2. Mengirimkan Sinyal ke Proses

1. Jalankan Notepad.
2. Cari PID dari Notepad dengan:

powershell

```
tasklist | findstr notepad
```

```
PS C:\Users\Ndru> tasklist | findstr Notepad  
Notepad.exe . 28808 Console 1 137.208 K
```

3. Hentikan proses Notepad:

powershell

```
taskkill /PID <PID>
```

```
PS C:\Users\Ndru> taskkill /PID 28808  
SUCCESS: Sent termination signal to the process with PID 28808.
```

3. Meningkatkan Prioritas Proses

1. Jalankan Notepad.
2. Ubah prioritasnya menjadi tinggi:

powershell

```
wmic process where name="notepad.exe" call setpriority 128
```

```
PS C:\Users\Ndru> Get-WmiObject Win32_Process -Filter "Name='Notepad.exe'" |  
ForEach-Object { $_.SetPriority(128) }  
  
--GENUS : 2  
--CLASS : __PARAMETERS  
--SUPERCLASS :  
--DYNASTY : __PARAMETERS  
--RELPATH :  
--PROPERTY_COUNT : 1  
--DERIVATION : {}  
--SERVER :  
--NAMESPACE :  
--PATH :  
ReturnValue : 0  
PSConmputerName :
```

4. Message Passing (Pipelining dan Redirecting)

1. Gunakan pipelining untuk menampilkan hanya 5 proses pertama dari daftar proses:

powershell

tasklist | Select-Object -First 5

Image Name	PID	Session Name	Session#	Mem Usage
System Idle Process	0	Services	0	8 K
System	4	Services	0	144 K

2. Redirect output daftar proses ke dalam file:

powershell

tasklist > daftar_proses.txt

```
PS C:\Users\Ndru> tasklist > daftar_proses.txt
```

IV. Latihan di Windows

1. Tampilkan hanya proses yang dijalankan oleh user tertentu.

Jawab :

```
Get-WmiObject Win32_Process | Where-Object { $_.GetOwner().User -eq "username" }
```

2. Cari PID dari proses chrome.exe.

```
PS C:\Users\Ndru> tasklist | findstr chrome
chrome.exe          25680 Console           1   128.592 K
chrome.exe          21456 Console           1    8.308 K
chrome.exe          24652 Console           1   88.392 K
chrome.exe          26812 Console           1   38.912 K
chrome.exe          23756 Console           1   19.868 K
chrome.exe          27412 Console           1   65.008 K
chrome.exe          28848 Console           1   29.644 K
```

3. Hentikan semua proses chrome.exe.

```
PS C:\Users\Ndru> taskkill /IM chrome.exe /T
SUCCESS: Sent termination signal to process with PID 19120, child of PID 10832.
SUCCESS: Sent termination signal to process with PID 16236, child of PID 10832.
SUCCESS: Sent termination signal to process with PID 15648, child of PID 10832.
ERROR: The process with PID 13984 (child process of PID 10832) could not be terminated.
Reason: This process can only be terminated forcefully (with /F option).
ERROR: The process with PID 3324 (child process of PID 10832) could not be terminated.
Reason: This process can only be terminated forcefully (with /F option).
ERROR: The process with PID 2336 (child process of PID 10832) could not be terminated.
Reason: This process can only be terminated forcefully (with /F option).
ERROR: The process with PID 13916 (child process of PID 10832) could not be terminated.
Reason: This process can only be terminated forcefully (with /F option).
ERROR: The process with PID 10832 (child process of PID 6520) could not be terminated.
Reason: One or more child processes of this process were still running.
PS C:\Users\Ndru> wmic process where name="cmd.exe" CALL setpriority 64
```

4. Hentikan proses firefox.exe secara paksa. (Saya menggunakan msedge karena tidak memiliki firefox)

```
PS C:\Users\Ndru> taskkill /F /IM msedge.exe
SUCCESS: The process "msedge.exe" with PID 10192 has been terminated.
SUCCESS: The process "msedge.exe" with PID 3260 has been terminated.
SUCCESS: The process "msedge.exe" with PID 9888 has been terminated.
SUCCESS: The process "msedge.exe" with PID 9900 has been terminated.
SUCCESS: The process "msedge.exe" with PID 10996 has been terminated.
SUCCESS: The process "msedge.exe" with PID 17120 has been terminated.
SUCCESS: The process "msedge.exe" with PID 3244 has been terminated.
SUCCESS: The process "msedge.exe" with PID 8372 has been terminated.
SUCCESS: The process "msedge.exe" with PID 25688 has been terminated.
SUCCESS: The process "msedge.exe" with PID 14016 has been terminated.
SUCCESS: The process "msedge.exe" with PID 6736 has been terminated.
SUCCESS: The process "msedge.exe" with PID 29656 has been terminated.
SUCCESS: The process "msedge.exe" with PID 7712 has been terminated.
SUCCESS: The process "msedge.exe" with PID 20756 has been terminated.
SUCCESS: The process "msedge.exe" with PID 25512 has been terminated.
SUCCESS: The process "msedge.exe" with PID 26428 has been terminated.
SUCCESS: The process "msedge.exe" with PID 5180 has been terminated.
SUCCESS: The process "msedge.exe" with PID 26980 has been terminated.
SUCCESS: The process "msedge.exe" with PID 28480 has been terminated.
SUCCESS: The process "msedge.exe" with PID 16984 has been terminated.
SUCCESS: The process "msedge.exe" with PID 20132 has been terminated.
SUCCESS: The process "msedge.exe" with PID 23452 has been terminated.
SUCCESS: The process "msedge.exe" with PID 5516 has been terminated.
SUCCESS: The process "msedge.exe" with PID 14148 has been terminated.
SUCCESS: The process "msedge.exe" with PID 22928 has been terminated.
SUCCESS: The process "msedge.exe" with PID 28076 has been terminated.
SUCCESS: The process "msedge.exe" with PID 1836 has been terminated.
SUCCESS: The process "msedge.exe" with PID 22692 has been terminated.
SUCCESS: The process "msedge.exe" with PID 1924 has been terminated.
SUCCESS: The process "msedge.exe" with PID 25668 has been terminated.
SUCCESS: The process "msedge.exe" with PID 23748 has been terminated.
```

5. Atur prioritas cmd.exe menjadi rendah.

```
PS C:\Users\Ndru> Get-WmiObject Win32_Process -Filter "Name='cmd.exe'" | For Each-Object { $_.SetPriority(64) }

--GENUS      : 2
--CLASS      : __PARAMETERS
--SUPERCLASS :
--DYNASTY    : __PARAMETERS
--RELPATH    :
--PROPERTY_COUNT : 1
--DERIVATION  : {}
--SERVER     :
--NAMESPACE   :
--PATH        :
ReturnValue   : 0
PSCoputerName :
```

6. Tampilkan prioritas dari semua proses yang berjalan.

Name	ProcessId	Priority
System Idle Process	0	0
System	4	8
Secure System	140	8
Registry	184	8
smss.exe	572	11
csrss.exe	960	13
wininit.exe	600	13
csrss.exe	664	13
winlogon.exe	1064	13
services.exe	1104	9
LsaIso.exe	1124	8
lsass.exe	1136	9
svchost.exe	1284	8
fontdrvhost.exe	1324	8
fontdrvhost.exe	1316	8
WUDFHost.exe	1332	8
svchost.exe	1452	8
svchost.exe	1508	8
dwm.exe	1592	13
svchost.exe	1656	8
svchost.exe	1684	8
svchost.exe	1768	10
svchost.exe	1812	8
svchost.exe	1828	8
svchost.exe	1852	8
svchost.exe	1960	8
svchost.exe	2016	8
svchost.exe	668	8
svchost.exe	1208	8
svchost.exe	1164	8
svchost.exe	2112	8
MsMpEng.exe	2120	8
IntelCpHDCPSvc.exe	2132	8
svchost.exe	2152	8
svchost.exe	2176	8
svchost.exe	2248	8
svchost.exe	2316	8
svchost.exe	2516	8
svchost.exe	2624	8

7. Jalankan dir C:\Windows lalu alihkan outputnya ke file output.txt.

Mode	LastWriteTime	Length	Name
d----	3/11/2025 10:42 PM		appcompat
d----	3/13/2025 9:39 AM		apppatch
d----	3/20/2025 8:27 AM		AppReadiness
d----	3/12/2025 10:26 PM		assembly
d----	3/12/2025 11:07 PM		bcastdvr
d----	4/1/2024 2:34 PM		Boot
d----	4/1/2024 2:26 PM		Branding
d----	3/12/2025 4:43 AM		BrowserCore
d----	3/20/2025 7:48 AM		CbsTemp
d----	4/1/2024 2:26 PM		Cursors
d----	3/12/2025 3:36 AM		debug
d----	4/1/2024 2:34 PM		diagnostics
d----	4/1/2024 2:34 PM		DiagTrack
d----	4/1/2024 3:06 PM		DigitalLocker
d--s-	4/1/2024 2:26 PM		Downloaded Program Files
d-----	3/12/2025 4:43 AM		en-US
d-----	3/12/2025 4:23 AM		Firmware
d-r-s-	3/12/2025 9:32 AM		Fonts
d-----	4/1/2024 2:26 PM		GameBarPresenceWriter
d-----	4/1/2024 3:08 PM		Globalization
d-----	4/1/2024 3:06 PM		Help
d-----	4/1/2024 2:34 PM		IdentityCRL
d-----	3/12/2025 4:43 AM		IME
d-r---	3/12/2025 4:43 AM		ImmersiveControlPanel
d-----	3/12/2025 4:43 AM		InboxApps
d-----	3/19/2025 9:26 AM		INF
d-----	4/1/2024 2:34 PM		InputMethod
d-----	4/1/2024 2:26 PM		L2Schemas
d-----	4/1/2024 2:26 PM		LiveKernelReports
d-----	3/17/2025 8:49 AM		Logs
d-r-s-	4/1/2024 2:34 PM		Media
d-----	3/19/2025 10:34 AM		Microsoft.NET
d-----	4/1/2024 2:26 PM		Migration
d-----	4/1/2024 2:26 PM		ModemLogs
d-----	3/12/2025 9:16 AM		OCR
d-r---	4/1/2024 2:26 PM		Offline Web Pages
d-----	3/11/2025 7:44 AM		Panther
d-----	4/1/2024 2:26 PM		Performance

8. Gabungkan dua perintah: tasklist dan findstr chrome.

PS C:\Users\Ndru> tasklist Select-String "chrome"					
chrome.exe	10832	Console	1	30.088	K
chrome.exe	19120	Console	1	2.024	K
chrome.exe	16236	Console	1	8.968	K
chrome.exe	15648	Console	1	16.952	K
chrome.exe	13984	Console	1	3.684	K
chrome.exe	3324	Console	1	7.444	K
chrome.exe	2336	Console	1	7.864	K
chrome.exe	13916	Console	1	3.908	K

9. Anda menjalankan Notepad dan ingin memastikan bahwa tidak ada proses Notepad yang berjalan lebih dari 5 menit. Bagaimana cara mengeceknya?

```
PS C:\Users\Ndru> $process = Get-Process notepad -ErrorAction SilentlyContinue
PS C:\Users\Ndru> if ($process) {
>>     $elapsedTime = (Get-Date) - $process.StartTime
>>     if ($elapsedTime.TotalMinutes -gt 5) {
>>         Write-Host "Notepad telah berjalan lebih dari 5 menit."
>>     } else {
>>         Write-Host "Notepad berjalan kurang dari 5 menit."
>>     }
>> } else {
>>     Write-Host "Tidak ada proses Notepad yang berjalan."
>> }
Notepad telah berjalan lebih dari 5 menit.
```

10. Sebuah proses bernama svchost.exe menggunakan terlalu banyak memori. Bagaimana cara menghentikan hanya proses svchost.exe tertentu yang menghabiskan lebih dari 500MB RAM?

```
PS C:\Users\Ndru> Get-Process svchost | Where-Object { $_.WorkingSet64 -gt 500MB } | Select-Object Name, Id, WorkingSet64
PS C:\Users\Ndru> Get-Process svchost | Where-Object { $_.WorkingSet64 -gt 500MB } | Stop-Process -Force
```

11. Anda ingin menampilkan semua proses yang memiliki nama mengandung "chrome" dan menyimpan hasilnya ke file. Bagaimana caranya?

```

PS C:\Users\Ndru> Get-Process | Where-Object { $_.ProcessName -match "chrome"
" }

Handles NPM(K) PM(K) WS(K) CPU(s) Id SI ProcessName
----- ----- ----- ----- -- -- -----
    402     23   27712   2936    0.84  2336 1 chrome
    306     23   21440   3560    0.72  3324 1 chrome
   1347     57   42864  26732   184.25 10832 1 chrome
    232     19   16092   2264    0.30  13916 1 chrome
    191     14    7768   1956    0.42  13984 1 chrome
    363     25   10884  15172    4.55  15648 1 chrome
    650     29   59204   8112    1.34  16236 1 chrome
    166     10    2220     500    0.05  19120 1 chrome

PS C:\Users\Ndru> Get-Process | Where-Object { $_.ProcessName -match "chrome"
" } | Out-File output.txt

```

12. Anda menemukan bahwa Windows berjalan lambat karena banyak proses latar belakang. Buat perintah untuk menampilkan hanya proses dengan prioritas "Tinggi".

```

PS C:\Users\Ndru> Get-WmiObject Win32_Process | Where-Object { $_.Priority -eq 13 } | Select-Object Name, ProcessId, Priority

Name          ProcessId Priority
----          ----- -----
csrss.exe      960       13
wininit.exe    600       13
csrss.exe      664       13
winlogon.exe   1064      13
dwm.exe        1592      13
ipf_uf.exe     4640      13
NgcIso.exe     6740      13
ctfmon.exe     9528      13
WUDFHost.exe   10900     13
TextInputHost.exe 8032      13
Notepad.exe    21656     13

PS C:\Users\Ndru>

```

13. Sebuah aplikasi tidak merespons. Anda mencoba menghentikannya dengan taskkill, tetapi tidak berhasil. Apa kemungkinan penyebabnya dan bagaimana solusi lainnya?

Jawab :

A. Penyebab taskkill Gagal:

1. Proses dilindungi sistem (winlogon.exe, csrss.exe).
2. Proses berjalan sebagai Admin, tapi taskkill tanpa hak admin.
3. Proses stuck di kernel mode atau zombie process.
4. Ada proses anak (child process) yang masih berjalan.
5. Proses mengunci file/resource penting.

B. Solusi Menghentikan Proses yang Tidak Merespons:

1. Gunakan taskkill dengan paksa:

```
taskkill /IM nama_proses.exe /F
```

2. Hentikan semua proses terkait:

```
taskkill /IM nama_proses.exe /T /F
```

3. Gunakan PowerShell (Stop-Process):

```
Stop-Process -Name "nama_proses" -Force
```