

Linux perusteet [TTC1040]

harjoitus 10



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1. Run command `ps aux | less` and find descriptions for column titles used in output.

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	1	0.0	1.1	102836	11204	?	Ss	Oct14	0:09	/sbin/init maybe-ubiquity
root	2	0.0	0.0	0	0	?	S	Oct14	0:00	[kthreadd]
root	3	0.0	0.0	0	0	?	I<	Oct14	0:00	[rcu_gp]
root	4	0.0	0.0	0	0	?	I<	Oct14	0:00	[rcu_par_gp]
root	6	0.0	0.0	0	0	?	I<	Oct14	0:00	[kworker/0:0H-kblockd]
root	9	0.0	0.0	0	0	?	I<	Oct14	0:00	[mm_percpu_wq]
root	10	0.0	0.0	0	0	?	S	Oct14	0:04	[ksoftirqd/0]
root	11	0.0	0.0	0	0	?	I	Oct14	1:33	[rcu_sched]
root	12	0.0	0.0	0	0	?	S	Oct14	0:03	[migration/0]
root	13	0.0	0.0	0	0	?	S	Oct14	0:00	[idle_inject/0]

User: käyttäjä joka omistaa prosessin

PID: prosessin uniikki id (käytetään esim tappaessa prosessi)

%CPU: montako prosenttia CPUsta prosessi vie

%MEM: montako prosenttia muistista prosessi vie

VSZ: Virtuaalimuistikoko jota prosessi vie KiB muodossa

RSS: fyysinen muistikoko jota prosessi vie KiB muodossa

TTY: terminaalinimi jota prosessi hallitsee

STAT: prosessin statuskoodi

Start: Prosessin aloitus päivämäärä

Time: prosessin viemä prosessoriaika

Command: prosessin komentonimi

2. What is the default delay for top commands screen updates? Change this update time to 0.5 seconds.

```
Help for Interactive Commands - procps-ng UNKNOWN
Window 1:Def: Cumulative mode Off. System: Delay 3.0 secs; Secure mode Off.

Z,B,E,e Global: 'Z' colors; 'B' bold; 'E'/'e' summary/task memory scale
l,t,m Toggle Summary: 'l' load avg; 't' task/cpu stats; 'm' memory info
0,1,2,3,I Toggle: '0' zeros; '1/2/3' cpus or numa node views; 'I' Irix mode
```

komennolla top ja sen sisällä painamalla h tulee näkyviin nykyinen viive, joka on 3.0 sekuntia.

Painamalla d pääsee vaihtamaan

```
top - 12:56:37 up 20 days, 4:24, 1 user, load average: 0.00, 0.00, 0.00
Tasks: 189 total, 1 running, 188 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.3 sy, 0.0 ni, 99.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 981.2 total, 71.5 free, 134.8 used, 774.9 buff/cache
MiB Swap: 1962.0 total, 1950.4 free, 11.6 used. 675.8 avail Mem
Change delay from 3.0 to 0.5

```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1	root	20	0	102836	11172	7156	S	0.0	1.1	0:09.28	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.10	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
9	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq

```
Help for Interactive Commands - procps-ng UNKNOWN
Window 1:Def: Cumulative mode Off. System: Delay 0.5 secs; Secure mode Off.

Z,B,E,e Global: 'Z' colors; 'B' bold; 'E'/'e' summary/task memory scale
l,t,m Toggle Summary: 'l' load avg; 't' task/cpu stats; 'm' memory info
0,1,2,3,I Toggle: '0' zeros; '1/2/3' cpus or numa node views; 'I' Irix mode
f,F,X Fields: 'f'/'F' add/remove/order/sort; 'X' increase fixed width
```

Ja sinne on muuttunut 0.5 sekkaa

3. Open another SSH connection to your Ubuntu (for example using Putty) and shutdown this connection using kill command (Tip: use PID of opened SSH connection).

```
*** System restart required ***

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

mike@P0033-Ubuntu:~$
```

Mike kirjautuu sisään

```
user@P0033-Ubuntu:~$ ps au
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         758  0.0  0.1   2860   1752 ttyl      Ss+  Oct14    0:00 /sbin/agetty -o -p -- \u --noclear ttyl linux
user      763092  0.0  0.4   7080   4880 pts/0      Ss   12:46    0:00 -bash
mike      763545  0.0  0.4   7080   4780 pts/1      Ss+  12:59    0:00 -bash
user      763901  0.0  0.3   7648   3324 pts/0      R+   13:01    0:00 ps au
```

Userilla näkyy näin

```
user@P0033-Ubuntu:~$ sudo kill -9 763545
[sudo] password for user:
user@P0033-Ubuntu:~$ ps au
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         758  0.0  0.1   2860   1752 ttyl      Ss+  Oct14    0:00 /sbin/agetty -o -p -- \u --noclear ttyl linux
user      763092  0.0  0.4   7080   4880 pts/0      Ss   12:46    0:00 -bash
user      763989  0.0  0.3   7648   3324 pts/0      R+   13:04    0:00 ps au
```

User tappaa ja ei näy enää mikea (terminaali-ikkuna taisi kuolla automaattisesti)

4. Open another SSH connection again to your Ubuntu. Print the tree view of processes when SSH connection has been established. Now shutdown the second SSH connection and print the tree view again. How is SSH connection displayed in tree view on both cases (connection established and connection closed)?

```
user@P0033-Ubuntu:~$ pstree -pn
systemd(1)─systemd-journal(473)
          └─systemd-udevd(503)
            └─multipathd(628)─{multipathd}(629)
                              └─{multipathd}(630)
                                └─{multipathd}(631)
                                  └─{multipathd}(632)
                                    └─{multipathd}(633)
                                      └─{multipathd}(634)
          └─systemd-timesyn(650)─{systemd-timesyn}(664)
            └─VGAuthService(657)
              └─vmttoolsd(658)─{vmttoolsd}(661)
                └─systemd-network(684)
                  └─systemd-resolve(696)
                    └─accounts-daemon(708)─{accounts-daemon}(713)
                                          └─{accounts-daemon}(759)
            └─dbus-daemon(710)
              └─networkd-dispat(718)
                └─cron(725)
                  └─rsyslogd(726)─{rsyslogd}(742)
                                └─{rsyslogd}(743)
                                  └─{rsyslogd}(744)
            └─systemd-logind(728)
              └─udisksd(730)─{udisksd}(735)
                            └─{udisksd}(760)
                              └─{udisksd}(774)
                                └─{udisksd}(782)
            └─atd(737)
              └─sshd(738)─sshd(764968)─sshd(765049)─bash(765050)
                            └─sshd(765076)─sshd(765154)─bash(765155)─pstree(76+
            └─unattended-upgr(762)─{unattended-upgr}(784)
              └─polkitd(767)─{polkitd}(771)
                            └─{polkitd}(773)
            └─upowerd(12226)─{upowerd}(12228)
                          └─{upowerd}(12229)
            └─systemd(762975)─(sd-pam)(762976)
              └─login(764500)─bash(764592)
```

```

user@P0033-Ubuntu:~$ pstree -pn
systemd(1)─systemd-journal(473)
          └─systemd-udev(503)
            └─multipathd(628)─{multipathd}(629)
                              └─{multipathd}(630)
                                └─{multipathd}(631)
                                  └─{multipathd}(632)
                                    └─{multipathd}(633)
                                      └─{multipathd}(634)
          └─systemd-timesyn(650)─{systemd-timesyn}(664)
          └─VGAuthService(657)
          └─vmttoolsd(658)─{vmttoolsd}(661)
          └─systemd-network(684)
          └─systemd-resolve(696)
          └─accounts-daemon(708)─{accounts-daemon}(713)
                                └─{accounts-daemon}(759)
          └─dbus-daemon(710)
          └─networkd-dispat(718)
          └─cron(725)
          └─rsyslogd(726)─{rsyslogd}(742)
                        └─{rsyslogd}(743)
                          └─{rsyslogd}(744)
          └─systemd-logind(728)
          └─udisksd(730)─{udisksd}(735)
                        └─{udisksd}(760)
                          └─{udisksd}(774)
                            └─{udisksd}(782)
          └─atd(737)
          └─sshd(738)─sshd(764968)─sshd(765049)─bash(765050)─pstree(76+
          └─unattended-upgr(762)─{unattended-upgr}(784)
          └─polkitd(767)─{polkitd}(771)
                        └─{polkitd}(773)
          └─upowerd(12226)─{upowerd}(12228)
                          └─{upowerd}(12229)
          └─systemd(762975)─(sd-pam)(762976)
          └─login(764500)─bash(764592)

```

Ero on sshd-prosessin alla. Kun ssh-yhteys muodostetaan, siitä tulee toinen lapsi prosessi sshd:n alle (765076), sieltä oma lapsiprosessi sshd, josta bash-lapsiprosessi josta pstree-lapsiprosessi. Kun ssh-yhteys on suljettu, jäljelle jää alkuperäinen sshd-yhteys (764968), jolla on lapsiprosessi sshd, jolla lapsiprosessi bash jolla lapsiprosessi pstree.

5. Why is SSH displayed in tree view even when there is no SSH client connection open from Putty? Important: In VLE environment you will always have SSH client connection open!

```
user@P0033-Ubuntu:~$ pstree -pn
systemd(1)
├── systemd-journal(473)
├── systemd-udevd(503)
├── multipathd(628)
│   ├── {multipathd}(629)
│   ├── {multipathd}(630)
│   ├── {multipathd}(631)
│   ├── {multipathd}(632)
│   ├── {multipathd}(633)
│   └── {multipathd}(634)
├── systemd-timesyn(650) ── {systemd-timesyn}(664)
├── VGAuthService(657)
├── vmttoolsd(658) ── {vmttoolsd}(661)
├── systemd-network(684)
├── systemd-resolve(696)
├── accounts-daemon(708)
│   ├── {accounts-daemon}(713)
│   └── {accounts-daemon}(759)
├── dbus-daemon(710)
├── networkd-dispat(718)
├── cron(725)
├── rsyslogd(726)
│   ├── {rsyslogd}(742)
│   ├── {rsyslogd}(743)
│   └── {rsyslogd}(744)
├── systemd-logind(728)
├── udisksd(730)
│   ├── {udisksd}(735)
│   ├── {udisksd}(760)
│   ├── {udisksd}(774)
│   └── {udisksd}(782)
├── atd(737)
├── sshd(738)
├── unattended-upgr(762) ── {unattended-upgr}(784)
├── polkitd(767)
│   ├── {polkitd}(771)
│   └── {polkitd}(773)
├── upowerd(12226)
│   ├── {upowerd}(12228)
│   └── {upowerd}(12229)
├── systemd(762975) ── (sd-pam)(762976)
├── login(764500) ── bash(764592) ── pstree(764651)
└──
```

Löysin netistä tämmöisen: “sshd is the **OpenSSH server process**. It listens to incoming connections using the SSH protocol and acts as the server for the protocol. It handles user authentication, encryption, terminal connections, file transfers, and tunneling.”

Joten oletan että sen on pakko olla päällä koko ajan, koska sen pitää olla valmis kuuntelemaan yhteyspyyntöjä mitä tulee.

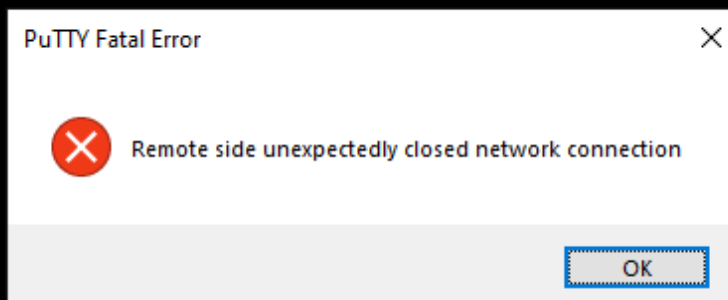
6. How can you shutdown SSH connection through top program?

```
Tasks: 190 total,  1 running, 189 sleeping,  0 stopped,  0 zombie
%Cpu(s):  0.0 us,  0.3 sy,  0.0 ni, 99.7 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   981.2 total,   118.7 free,   138.4 used,   724.1 buff/cache
MiB Swap:  1962.0 total,  1950.4 free,    11.6 used.   672.2 avail Mem
PID to signal/kill [default pid = 11] 765049
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
762975	user	20	0	18380	9132	7648	S	0.0	0.9	0:00.03	systemd
762976	user	20	0	104052	4196	0	S	0.0	0.4	0:00.00	(sd-pam)
764592	user	20	0	7088	5132	3376	S	0.0	0.5	0:00.01	bash
765049	user	20	0	14064	5876	4392	S	0.0	0.6	0:00.01	sshd
765050	user	20	0	7080	5116	3360	S	0.0	0.5	0:00.02	bash
765478	user	20	0	8184	3632	3044	R	0.0	0.4	0:00.02	top

```
Tasks: 190 total,  1 running, 189 sleeping,  0 stopped,  0 zombie
%Cpu(s):  0.0 us,  0.3 sy,  0.0 ni, 99.7 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   981.2 total,   118.7 free,   138.4 used,   724.1 buff/cache
MiB Swap:  1962.0 total,  1950.4 free,    11.6 used.   672.2 avail Mem
Send pid 765049 signal [15/sigterm] 15
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
762975	user	20	0	18380	9132	7648	S	0.0	0.9	0:00.03	systemd
762976	user	20	0	104052	4196	0	S	0.0	0.4	0:00.00	(sd-pam)
764592	user	20	0	7088	5132	3376	S	0.0	0.5	0:00.01	bash
765049	user	20	0	14064	5876	4392	S	0.0	0.6	0:00.01	sshd
765050	user	20	0	7080	5116	3360	S	0.0	0.5	0:00.02	bash
765478	user	20	0	8184	3632	3044	R	0.0	0.4	0:00.02	top



Käsky top

Painaa u, kirjoittaa käyttäjän user

kopioi userin sshd-PID

kirjoita k, se pyytää PID:tä jota tapetaan, annetaan userin sshd-PID

Top pyytää vielä signaalia tapolle, kirjoitin 15. Yhteys tapettu