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## CPU

- Lancer un **sar 1 10** pour avoir une vue globale de la machine :

```
root@server1104092:~# sar 1 10
Linux 2.6.9-67.ELsmp (server1104092) 11/12/08

14:57:54      CPU      %user   %nice   %system   %iowait   %idle
14:57:55      all      11.60    0.00    4.49     25.94    57.98
14:57:56      all      10.88    0.00    3.75     25.00    60.38
14:57:57      all      10.59    0.00    3.86     24.41    61.15
14:57:58      all      10.76    0.00    4.13     24.66    60.45
14:57:59      all      11.36    0.00    4.99     24.22    59.43
14:58:00      all      11.51    0.00    3.25     27.91    57.32
```

- On peut utiliser **top** :

```
top - 15:07:42 up 10 days, 7:32, 20 users, load average: 1.87, 2.72, 2.58
Tasks: 448 total, 1 running, 447 sleeping, 0 stopped, 0 zombie
Cpu(s): 7.6% us, 0.9% sy, 0.0% ni, 87.3% id, 3.1% wa, 0.1% hi, 0.9% si
Mem: 65747848k total, 65217884k used, 529964k free, 168860k buffers
Swap: 65535992k total, 976k used, 65535016k free, 62379852k cached
```

PID	USER	PR	NI	%CPU	TIME+	%MEM	VIRT	RES	SHR	S	COMMAND
32368	root	16	0	54	37:38.27	0.0	20456	5028	3604	S	dsmc
17209	sybase	16	0	5	252:52.99	7.3	7327m	4.6g	4.6g	S	RPO_dataserver
17211	sybase	16	0	4	305:02.35	7.5	7327m	4.7g	4.7g	S	RPO_dataserver
26930	root	16	0	1	20:23.75	0.0	2900	1828	520	S	cmaperfd
14326	sybase	15	0	1	394:40.93	9.3	7327m	5.8g	5.8g	S	IRD_dataserver
18525	sybase	15	0	1	232:11.65	5.4	7331m	3.4g	3.4g	S	RPS_dataserver
30714	root	16	0	1	0:00.07	0.0	6424	1428	848	R	top
14323	sybase	15	0	0	419:17.35	9.3	7327m	5.8g	5.8g	S	IRD_dataserver
15498	sybase	15	0	0	522:40.79	9.1	7578m	5.7g	5.7g	S	IRS_dataserver
16354	sybase	15	0	0	291:18.70	11.0	7337m	6.9g	6.9g	S	RPO_dataserver
17207	sybase	15	0	0	346:40.57	7.5	7327m	4.7g	4.7g	S	RPO_dataserver
18003	sybase	15	0	0	266:00.77	11.0	7341m	6.9g	6.9g	S	RPS_dataserver
22149	root	15	0	0	3:32.06	0.0	0	0	0	S	kjournald
25904	root	15	0	0	22:04.93	0.0	0	0	0	S	kpanfs_thpool
25905	root	15	0	0	22:03.25	0.0	0	0	0	S	kpanfs_thpool

→ **SHIFT + F** pour changer la colonne de tri, etc. **h** pour l'aide.

## Top process

```
ps -eo pcpu,pid,user,args | sort -k 1 -r | head -10
ps -eo pcpu,pid,user,args | sort -r -k1 | less
```

cf. <http://www.cyberciti.biz>

## Mémoire

- Vérifier la mémoire avec un **sar -r 1 10** et **free -m** :

```
root@server1104092:~# sar -r 1 10
Linux 2.6.9-67.ELsmp (server1104092) 11/12/08

15:05:25      kbmemfree kbmemused  %memused  kbbuffers  kbcached  kbswpfree  kbswpused  %swpused  kbswpcad
15:05:26      488156   65259692   99.26     170472   62419380   65535016   976      0.00      0
15:05:27      479004   65268844   99.27     170488   62426708   65535016   976      0.00      0
15:05:28      471644   65276204   99.28     170504   62436008   65535016   976      0.00      0
15:05:29      463452   65284396   99.30     170512   62444228   65535016   976      0.00      0
15:05:30      454292   65293556   99.31     170540   62453448   65535016   976      0.00      0
15:05:31      445596   65302252   99.32     170552   62462344   65535016   976      0.00      0
```

```
root@server1104092:~# free -m
total      used      free      shared    buffers    cached
Mem:      64206   63597      609         0         165      60824
-/+ buffers/cache:      2607   61599
Swap:      63999         0      63999
```

→ ici on a 2607 Mo de ram utilisée et 60824 Mo de cache (utilisable par le kernel en cas de besoin). La valeur 63597 Mo correspond à la mémoire allouée, 61599 correspond à la mémoire disponible.

- **vmstat -s** affiche les infos détaillées sur la mémoire :

```
root@server2311829:~# vmstat -s
24665472 total memory
15389220 used memory
14490508 active memory
 136844 inactive memory
 9276252 free memory
 768868 buffer memory
10595768 swap cache
25165816 total swap
 0 used swap
25165816 free swap
12203574 non-nice user cpu ticks
 32747 nice user cpu ticks
141624951 system cpu ticks
4344770172 idle cpu ticks
 579126 IO-wait cpu ticks
 409728 IRQ cpu ticks
 181938 softirq cpu ticks
 9452723 pages paged in
690716466 pages paged out
 0 pages swapped in
 0 pages swapped out
1640151373 interrupts
 765936041 CPU context switches
1223379772 boot time
314718391 forks
```

- un **cat /proc/meminfo** donne aussi des infos pertinentes (noyau 2.6 dans notre cas) :

```
root@parcl1104092:~# cat /proc/meminfo
MemTotal: 65747848 kB
MemFree: 4676348 kB
Buffers: 155412 kB
Cached: 58250332 kB
SwapCached: 0 kB
Active: 42665024 kB
Inactive: 17041772 kB
HighTotal: 0 kB
HighFree: 0 kB
LowTotal: 65747848 kB
LowFree: 4676348 kB
SwapTotal: 65535992 kB
SwapFree: 65535016 kB
Dirty: 3148 kB
Writeback: 0 kB
Mapped: 31220740 kB
Slab: 789220 kB
CommitLimit: 98409916 kB
Committed_AS: 33127992 kB
PageTables: 419756 kB
VmallocTotal: 536870911 kB
VmallocUsed: 51352 kB
VmallocChunk: 536819195 kB
HugePages_Total: 0
HugePages_Free: 0
Hugepagesize: 2048 kB
```

→ *Buffers & Cached* : cette mémoire peut-être utilisée par le kernel en cas de besoin, c'est la mémoire disponible (mais allouée)

→ *Active* : mémoire récemment utilisée qui ne sera pas utilisée par le kernel sauf en cas de besoin fort

→ *Inactive* : mémoire utilisée pouvant être utilisée par le kernel si besoin

→ *Dirty* : datas non flushées sur le disque (ou en cours)

→ D'autres infos [ici](#).

- Un petit **vmstat 1 10** donne aussi des infos utiles :

```
root@server1104092:~# vmstat 1 10
procs -----memory-----swap-----io-----system-----cpu-----
 r b swpd free buff cache si so bi bo in cs us sy id wa
 0 2 976 472404 165332 62007272 0 0 460 550 5 2 12 5 77 6
 2 0 976 467988 165340 62012296 0 0 2208 236 16949 36775 15 12 66 8
 5 0 976 463380 165360 62016900 0 0 2088 1705 9980 36940 16 9 70 5
 3 0 976 457684 165364 62022064 0 0 2264 397 7457 44781 12 9 73 6
```

```

6 0 976 452564 165376 62027832 0 0 2260 275 6159 45565 20 10 66 4
1 3 976 447988 165376 62033068 0 0 2376 9536 7778 35145 15 10 68 7
3 1 976 440628 165384 62038772 0 0 2496 556 8299 71486 21 11 63 5
0 0 976 433684 165400 62045624 0 0 3108 696 5167 52533 10 9 74 6
0 1 976 427284 165400 62051948 0 0 2892 216 4757 45852 12 8 74 7
1 0 976 421468 165404 62056160 0 0 1620 609 6609 69289 11 8 75 6

```

Les champs *so* et *si* permettent de voir l'activité de swap. On peut voir la runqueue *r* et les process *b* qui attendent des I/O (réseau, disque) *b*, cf le man pour les autres infos (*cs* → context swith, *in* → interrupts, etc).

## Disque

### ● vmstat -d 1 1

```

root@server2311829:~# vmstat -d 1 1
disk-----reads-----writes-----IO-----
total merged sectors ms total merged sectors ms cur sec
ram0 0 0 0 0 0 0 0 0 0 0
ram1 0 0 0 0 0 0 0 0 0 0
ram2 0 0 0 0 0 0 0 0 0 0
ram3 0 0 0 0 0 0 0 0 0 0
ram4 0 0 0 0 0 0 0 0 0 0
ram5 0 0 0 0 0 0 0 0 0 0
ram6 0 0 0 0 0 0 0 0 0 0
ram7 0 0 0 0 0 0 0 0 0 0
ram8 0 0 0 0 0 0 0 0 0 0
ram9 0 0 0 0 0 0 0 0 0 0
ram10 0 0 0 0 0 0 0 0 0 0
ram11 0 0 0 0 0 0 0 0 0 0
ram12 0 0 0 0 0 0 0 0 0 0
ram13 0 0 0 0 0 0 0 0 0 0
ram14 0 0 0 0 0 0 0 0 0 0
ram15 0 0 0 0 0 0 0 0 0 0
hda 0 0 0 0 0 0 0 0 0 0
sda 194356 5945 4172146 137864 96031752 77260674 1380561782 51965656 0 6458
dm-0 11404 0 509890 13774 28497459 0 227979672 39823426 0 701
dm-1 13623 0 533730 13236 7019350 0 56154800 11378930 0 637
dm-2 2998 0 24154 844 109615714 0 876925712 7213939 0 3883
dm-3 2972 0 23770 1397 280989 0 2247912 3567093 0 42
dm-4 3373 0 78090 1367 2954396 0 23635168 5853703 0 166
dm-5 69064 0 2116530 67730 2682039 0 21456312 8221587 0 204
dm-6 5320 0 114218 7105 2974177 0 23793416 267554994 0 381
dm-7 2909 0 23272 621 0 0 0 0 0 0
dm-8 3222 0 25770 8636 7034863 0 56278904 2119759062 0 217
md0 0 0 0 0 0 0 0 0 0 0
loop0 0 0 0 0 0 0 0 0 0 0
loop1 0 0 0 0 0 0 0 0 0 0
loop2 0 0 0 0 0 0 0 0 0 0
loop3 0 0 0 0 0 0 0 0 0 0
loop4 0 0 0 0 0 0 0 0 0 0
loop5 0 0 0 0 0 0 0 0 0 0
loop6 0 0 0 0 0 0 0 0 0 0
loop7 0 0 0 0 0 0 0 0 0 0
dm-9 2235 0 17874 2412 474271 0 3794168 150902341 0 27
dm-10 3787 0 22986 1879 318459 0 654606 163241 0 9
dm-11 5240 0 34388 4321 197786 0 424060 493783 0 5
dm-12 5274 0 34456 4168 323270 0 675028 963431 0 5
dm-15 1721 0 13762 1684 5671213 0 45369704 8472081 0 458
dm-16 1708 0 13658 8814 469486 0 3755888 64149095 0 21
dm-17 1764 0 14106 3557 4370518 0 34964144 204951066 0 231
dm-14 3378 0 19768 1341 62748 0 138480 209068 0 2
dm-18 3784 0 22980 1701 45660 0 109008 60575 0 3
dm-19 807 0 6450 525 249030 0 1992240 6801428 0 4
dm-20 2868 0 19382 1516 25806 0 69300 1170260 0 1

```

→ Ici on voit l'activité de chaque device. Pour déterminer à quel LV correspond quel device dm-x voir [ici](#).

### ● iostat -k -x 1 10

```

root@server2311828:~# iostat -k -x 1 1
Linux 2.6.9-67.ELsmp (parsl2311828) 12/11/2008

avg-cpu:  %user   %nice   %sys %iowait  %idle
           1.09    0.00  18.40   0.11  80.40

```

Device:	rrqm/s	wrqm/s	r/s	w/s	rsec/s	wsec/s	rkB/s	wkB/s	avgrq-sz	avgqu-sz	await	svctm	%util
sda	0.00	62.30	0.05	106.47	0.92	585.84	0.46	292.92	5.51	0.01	0.13	0.05	0.58
dm-0	0.00	0.00	0.00	20.08	0.12	160.66	0.06	80.33	8.00	0.02	0.82	0.02	0.05
dm-1	0.00	0.00	0.00	1.95	0.10	15.56	0.05	7.78	8.04	0.00	0.67	0.05	0.01
dm-2	0.00	0.00	0.00	139.36	0.00	351.81	0.00	175.91	2.52	0.01	0.06	0.04	0.51
dm-3	0.00	0.00	0.00	0.03	0.00	0.24	0.00	0.12	8.00	0.00	0.26	0.05	0.00
dm-4	0.00	0.00	0.00	1.65	0.00	13.20	0.00	6.60	8.00	0.00	2.19	0.04	0.01
dm-5	0.00	0.00	0.01	0.65	0.41	5.22	0.21	2.61	8.44	0.00	1.87	0.06	0.00
dm-6	0.00	0.00	0.00	0.64	0.03	5.12	0.01	2.56	8.03	0.03	51.40	0.08	0.00
dm-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	0.00	0.34	0.21	0.00
dm-8	0.00	0.00	0.00	0.84	0.00	6.70	0.00	3.35	8.00	0.15	184.80	0.03	0.00
dm-9	0.00	0.00	0.00	0.20	0.01	1.60	0.00	0.80	8.01	0.04	205.42	0.04	0.00
dm-10	0.00	0.00	0.00	0.03	0.00	0.07	0.00	0.04	2.18	0.00	0.35	0.03	0.00
dm-11	0.00	0.00	0.00	0.05	0.01	0.10	0.00	0.05	2.20	0.00	0.41	0.03	0.00
dm-12	0.00	0.00	0.00	0.08	0.01	0.16	0.00	0.08	2.12	0.00	0.38	0.03	0.00
dm-15	0.00	0.00	0.00	1.67	0.06	13.35	0.03	6.67	8.02	0.00	0.29	0.08	0.01
dm-16	0.00	0.00	0.00	0.17	0.00	1.33	0.00	0.67	8.00	0.00	0.55	0.04	0.00
dm-17	0.00	0.00	0.00	1.18	0.03	9.44	0.02	4.72	8.00	0.13	108.44	0.07	0.01
dm-14	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.01	2.39	0.00	1.09	0.06	0.00
dm-18	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.01	2.73	0.00	0.40	0.10	0.00
dm-19	0.00	0.00	0.00	0.13	0.00	1.01	0.00	0.51	8.00	0.00	0.63	0.05	0.00
dm-20	0.00	0.00	0.00	0.02	0.01	0.05	0.00	0.03	2.34	0.00	0.57	0.04	0.00

→ Pour afficher les infos sur l'utilisation des disques

## Réseau

- **mii-tool** et **ethtool** pour vérifier le statut des cartes :

```
root@server1104092:~# mii-tool
eth0: 100 Mbit, full duplex, link ok
eth1: no link
eth2: 100 Mbit, full duplex, link ok
eth3: negotiated, link ok
eth4: 100 Mbit, full duplex, link ok
eth5: negotiated, link ok
eth6: 100 Mbit, full duplex, link ok
eth7: negotiated, link ok
```

```
root@server1104092:~# ethtool eth7
Settings for eth7:
    Supported ports: [ TP ]
    Supported link modes:   10baseT/Half 10baseT/Full
                           100baseT/Half 100baseT/Full
                           1000baseT/Full
    Supports auto-negotiation: Yes
    Advertised link modes:  1000baseT/Full
    Advertised auto-negotiation: Yes
    Speed: 1000Mb/s
    Duplex: Full
    Port: Twisted Pair
    PHYAD: 0
    Transceiver: internal
    Auto-negotiation: on
    Supports Wake-on: umbg
    Wake-on: g
    Current message level: 0x00000007 (7)
    Link detected: yes
```

- **netstat -taunp|grep -c ESTA** pour vérifier le nombre de connexions établies

## Sémaphores

Pour voir la conf des sémaphores :

```
root@server9010504:~# cat /proc/sys/kernel/sem
1024 32000 100 606

SEMMSL - semaphores per ID
SEMMNS - (SEMMNI*SEMMSL) max semaphores in system
SEMOPM - max operations per semop call
```

SEMMNI - max semaphore identifiers

Ca se modifie à chaud avec la commande :

```
echo "1024 32000 100 606" > /proc/sys/kernel/sem
```

Il ne faut pas oublier de modifier la ligne kernel.sem du fichier `/etc/sysctl.conf` pour la prise en compte aux prochains reboots :

```
root@server9010504:/# grep kernel.sem /etc/sysctl.conf
kernel.sem = 1024 32000 100 606
```

On retrouve les infos aussi avec la commande `ipcs` :

```
root@server9010504:/# ipcs -s -l
----- Semaphore Limits -----
max number of arrays = 606
max semaphores per array = 1024
max semaphores system wide = 32000
max ops per semop call = 100
semaphore max value = 32767
```

### Description

Semaphore	Description	Minimum
SEMMSL	maximum number of semaphores per array	128
SEMMNS	maximum semaphores system-wide	
SEMOPM	maximum operations per semop call	
SEMMNI	maximum arrays	

### Calcul des valeurs

- Calculate the minimum total semaphore requirements using the following formula:

$\text{sum}(\text{process parameters of all database instances on the system}) + \text{system and other application requirements}$

Set `semms` (total semaphores systemwide) to this total.

Set `semmsl` (semaphores per set) to 256.

Set `semgni` (total semaphores sets) to `semms / semmsl` rounded up to the nearest multiple of 1024.

The following formula can be used as a guide, although in practice, `SEMMNS` and `SEMMNU` can be much less than `SEMMNI * SEMMSL` because not every program in the system needs semaphores.

$\text{SEMMNS} = \text{SEMMNU} = (\text{SEMMNI} * \text{SEMMSL})$

From:  
<https://unix.ndlp.info/> - **Where there is a shell, there is a way**

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