



PRÁCTICA

Tarea #998 Instalar Galera 4 Cluster con MariaDB en Linux

ASIGNATURA:

Cómputo de alto desempeño

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PROGRAMA EDUCATIVO: **ING. EN DATOS E INTELIGENCIA ORGANIZACIONAL**

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```

root@nodol:/home/uziel# galera_new_cluster
root@nodol:/home/uziel# netstat -tlnp
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:3306             0.0.0.0:*               LISTEN      3330/mariadb
tcp        0      0 0.0.0.0:3306             0.0.0.0:*               LISTEN      3330/mariadb
tcp        0      0 0.0.0.0:5457             0.0.0.0:*               LISTEN      540/systemd-resolve
tcp6       0      0 :::*                     :::*                     LISTEN      1/init
root@nodol:/home/uziel# mysql -u root -p -e "SHOW STATUS LIKE 'wsrep_cluster_size'"
Enter password:
+-----+-----+
| Variable_name | Value |
+-----+-----+
| wsrep_cluster_size | 1 |
+-----+-----+
root@nodol:/home/uziel# mysql -u root --execute="SHOW GLOBAL STATUS WHERE Variable_name IN ('wsrep_ready', 'wsrep_cluster_size', 'wsrep_cluster_status', 'wsrep_connected');"
+-----+-----+
| Variable_name | Value |
+-----+-----+
| wsrep_cluster_size | 1 |
| wsrep_cluster_status | Primary |
| wsrep_connected | ON |
| wsrep_ready | ON |
+-----+-----+
root@nodol:/home/uziel#

```

Aquí mostramos que se ha creado de manera exitos el cluster

```

root@nodol:/home/uziel# systemctl status mysql
* mariadb.service - MariaDB 10.11.8 database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; preset: enabled)
   Active: active (running) since Tue 2025-02-18 16:04:31 UTC; 12min ago
     Docs: man:mariadb(8)
           https://mariadb.com/kb/en/library/systemd/
   Process: 3218 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysql (code=exited, status=0/SUCCESS)
   Process: 3220 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 3223 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= || VAR='cd /usr/bin/..; /usr/bin/galera_recovery'; [ $? -eq 0 ] &&
   Process: 3340 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 3350 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
  Main PID: 3330 (mariadb)
    Status: "Taking your SQL requests now..."
   Tasks: 14 (limit: 30440)
  Memory: 105.4M (peak: 108.2M)
    CPU: 1.670s
   CGroup: /system.slice/mariadb.service

```

Se puede observar que está corriendo el cluster

```

uziel@nodol: ~
top - 23:55:32 up 43 min, 3 users, load average: 0.00, 0.00, 0.00
Tasks: 101 total, 1 running, 100 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.4 sy, 0.0 ni, 98.9 id, 0.0 wa, 0.0 hi, 0.8 si, 0.0 st
MiB Mem : 3916.4 total, 3447.5 free, 441.5 used, 243.0 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3475.0 avail Mem

  PID USER      PR  NI   VIRT    RES    SHR  S  %CPU  %MEM     TIME+ COMMAND
    72 root        20   0       0       0       0  I   0.7   0.0   0:05.99 kworker/0:3-events
   1272 uziel       20   0   11912    5888   3712  R   0.3   0.1   0:00.10 top
      1 root        20   0   22124   13288   9448  S   0.0   0.3   0:02.58 systemd
      2 root        20   0       0       0       0  S   0.0   0.0   0:00.00 kthreadd
      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        20   0       0       0       0  I   0.0   0.0   0:00.00 kworker/R-rcu_p
      6 root        20   0       0       0       0  I   0.0   0.0   0:00.00 kworker/R-slab_
      7 root        20   0       0       0       0  I   0.0   0.0   0:00.00 kworker/R-netns
      9 root        20   0       0       0       0  I   0.0   0.0   0:07.48 kworker/0:1-cgroup_destroy
     11 root        20   0       0       0       0  I   0.0   0.0   0:00.52 kworker/u2:0-events_power_efficient
     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   0:00.12 ksoftirqd/0
     17 root        20   0       0       0       0  I   0.0   0.0   0:00.11 rcu_preempt
     18 root        rt    0       0       0       0  S   0.0   0.0   0:00.05 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 kdevtmpfs
     22 root         0 -20       0       0       0  I   0.0   0.0   0:00.00 kworker/R-inet_
     24 root        20   0       0       0       0  S   0.0   0.0   0:00.00 kauditd

```

en este “top” podemos observar que no se está consumiendo muchos recursos.


```
uziel@nodo1: ~  
top - 01:03:12 up 1:50, 4 users, load average: 0.00, 0.00, 0.00  
Tasks: 110 total, 1 running, 109 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 0.8 us, 5.2 sy, 0.0 ni, 86.3 id, 2.8 wa, 0.0 hi, 4.8 si, 0.0 st  
MiB Mem : 3916.4 total, 3009.2 free, 518.9 used, 610.5 buff/cache  
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3397.5 avail Mem  


| PID  | USER  | PR | NI  | VIRT    | RES    | SHR   | S | %CPU | %MEM | TIME+   | COMMAND                             |
|------|-------|----|-----|---------|--------|-------|---|------|------|---------|-------------------------------------|
| 2290 | mysql | 20 | 0   | 1273028 | 146712 | 29696 | S | 6.3  | 3.7  | 0:00.71 | mariadb                             |
| 1262 | uziel | 20 | 0   | 15128   | 7088   | 5120  | S | 1.7  | 0.2  | 0:02.75 | sshd                                |
| 43   | root  | 0  | -20 | 0       | 0      | 0     | I | 1.3  | 0.0  | 0:01.08 | kworker/0:1H-kblockd                |
| 230  | root  | 20 | 0   | 0       | 0      | 0     | S | 1.0  | 0.0  | 0:00.27 | jbd2/dm-0-8                         |
| 2182 | root  | 20 | 0   | 0       | 0      | 0     | I | 1.0  | 0.0  | 0:02.75 | kworker/0:1-events                  |
| 2050 | root  | 20 | 0   | 0       | 0      | 0     | I | 0.3  | 0.0  | 0:00.11 | kworker/u2:4-events_power_efficient |
| 1    | root  | 20 | 0   | 22292   | 13416  | 9448  | S | 0.0  | 0.3  | 0:02.75 | systemd                             |
| 2    | root  | 20 | 0   | 0       | 0      | 0     | S | 0.0  | 0.0  | 0:00.00 | kthreadd                            |
| 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                     |

  
root@nodo1: /home/uziel  
ding package lists... Done  
lding dependency tree... Done  
ding state information... Done  
bench is already the newest version (1.0.20+ds-6build2).  
upgraded, 0 newly installed, 0 to remove and 128 not upgraded.  
t@nodo1:/home/uziel# mysql -uroot -p -e "create database sbtest"  
er password:  
t@nodo1:/home/uziel# sysbench --threads=1 --db-driver=mysql --mysql-user=root --events=0 oltp_read_only prepare  
bench 1.0.20 (using system LuaJIT 2.1.0-beta3)  
ating table 'sbtest1'...
```

Aquí aparece el Mariadb como en el video creando los registros

PRUEBA 1 (VIDEO)

```
uziel@nodo1: ~  
top - 01:07:49 up 1:55, 4 users, load average: 0.16, 0.03, 0.01  
Tasks: 110 total, 1 running, 109 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 24.5 us, 12.2 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 63.3 si, 0.0 st  
MiB Mem : 3916.4 total, 3009.2 free, 518.9 used, 610.5 buff/cache  
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3397.6 avail Mem  


| PID  | USER  | PR | NI  | VIRT    | RES    | SHR   | S | %CPU | %MEM | TIME+   | COMMAND                |
|------|-------|----|-----|---------|--------|-------|---|------|------|---------|------------------------|
| 2290 | mysql | 20 | 0   | 1273028 | 146712 | 29696 | S | 77.2 | 3.7  | 0:03.62 | mariadb                |
| 2401 | root  | 20 | 0   | 99492   | 14208  | 11392 | S | 20.9 | 0.4  | 0:00.77 | sysbench               |
| 1262 | uziel | 20 | 0   | 15128   | 7088   | 5120  | S | 0.7  | 0.2  | 0:03.02 | sshd                   |
| 2182 | root  | 20 | 0   | 0       | 0      | 0     | I | 0.7  | 0.0  | 0:04.27 | kworker/0:1-events     |
| 16   | root  | 20 | 0   | 0       | 0      | 0     | S | 0.3  | 0.0  | 0:00.50 | ksoftirqd/0            |
| 1    | root  | 20 | 0   | 22292   | 13416  | 9448  | S | 0.0  | 0.3  | 0:02.75 | systemd                |
| 2    | root  | 20 | 0   | 0       | 0      | 0     | S | 0.0  | 0.0  | 0:00.00 | kthreadd               |
| 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_g        |

  
root@nodo1: /home/uziel  
t@nodo1:/home/uziel# sysbench --threads=1 --time=10 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_only run  
bench 1.0.20 (using system LuaJIT 2.1.0-beta3)  
  
ning the test with following options:  
ber of threads: 1  
tializing random number generator from current time  
  
tializing worker threads...
```

1.- sysbench --threads=1 --time=5 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_only run

```
root@nodo1: /home/uziel |
+
Initializing worker threads...
Threads started!

SQL statistics:
queries performed:
  read:          95466
  write:         0
  other:        13638
  total:       109104
transactions:    6819 (681.56 per sec.)
queries:        109104 (10904.93 per sec.)
ignored errors: 0 (0.00 per sec.)
reconnects:     0 (0.00 per sec.)

General statistics:
total time:      10.0009s
total number of events: 6819

Latency (ms):
min:            0.97
avg:            1.46
max:            8.55
95th percentile: 3.49
sum:           9978.38

Threads fairness:
events (avg/stddev): 6819.0000/0.00
execution time (avg/stddev): 9.9784/0.00

root@nodo1: /home/uziel |
```

AHORA CON DOS CORES

```
uziel@nodo1: ~
+
top - 05:36:45 up 7 min, 3 users, load average: 0.52, 0.18, 0.09
Tasks: 113 total, 1 running, 112 sleeping, 0 stopped, 0 zombie
%Cpu0 : 66.7 us, 33.3 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
%Cpu1 : 60.0 us, 20.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 20.0 si, 0.0 st
MiB Mem : 3916.1 total, 3240.5 free, 523.2 used, 369.5 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3392.9 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM    TIME+  COMMAND
 1347 mysql     20   0 1740684 262476 147584 S 152.8   6.5   0:15.62 mariadb
 1428 root       20   0 165544 14592 11264 S 45.9   0.4   0:04.40 sysbench
   48 root       20   0      0      0      0 I  0.6   0.0   0:01.92 kworker/1:1-events
   24 root       20   0      0      0      0 S  0.3   0.0   0:00.35 ksoftirqd/1
   60 root       20   0      0      0      0 I  0.3   0.0   0:00.32 kworker/u4:4-events_power_efficient
  368 root       rt    0 289116 27264 8576 S  0.3   0.7   0:00.35 multipathd
 1202 uziel      20   0 11912  5888 3712 R  0.3   0.1   0:00.54 top

root@nodo1: /home/uziel |
+
Memory: 121.8M (peak: 124.8M)
CPU: 1.899s
CGroup: /system.slice/mariadb.service
root@nodo1: /home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_only run
```

```
root@nodo1: /home/uziel |
+
General statistics:
total time:      60.0030s
total number of events: 100157

Latency (ms):
min:            0.89
avg:            1.20
max:           27.22
95th percentile: 1.52
sum:          119780.65

Threads fairness:
events (avg/stddev): 50078.5000/119.50
execution time (avg/stddev): 59.8903/0.00

root@nodo1: /home/uziel |
```

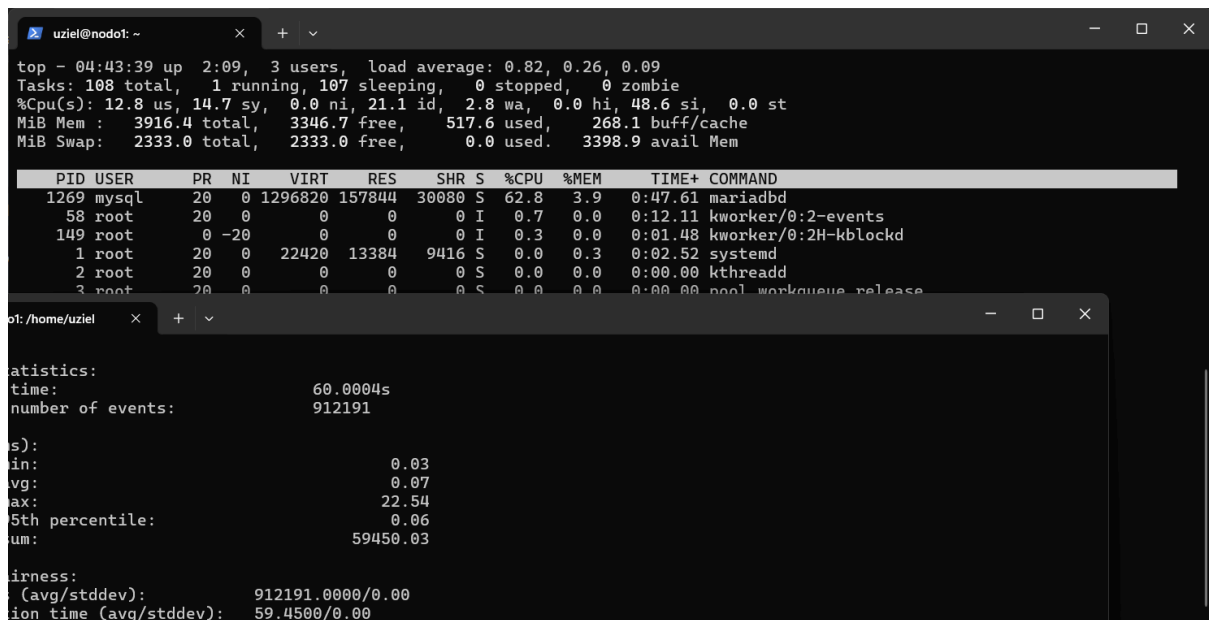
SQL statistics:

queries performed:

read: 95466
write: 0
other: 13638
total: 109104
transactions: 6819 (681.56 per sec.)
queries: 109104 (10904.93 per sec.)

En la imagen podría notarse que solo se ocupó un 77.2% del CPU pero logré ver que ocupaba un 91% después

3.- sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_delete run



The screenshot shows two terminal windows. The top window displays the output of the 'top' command, showing system load and process list. The bottom window shows the output of the 'sysbench' command, displaying statistics for a single-threaded delete test.

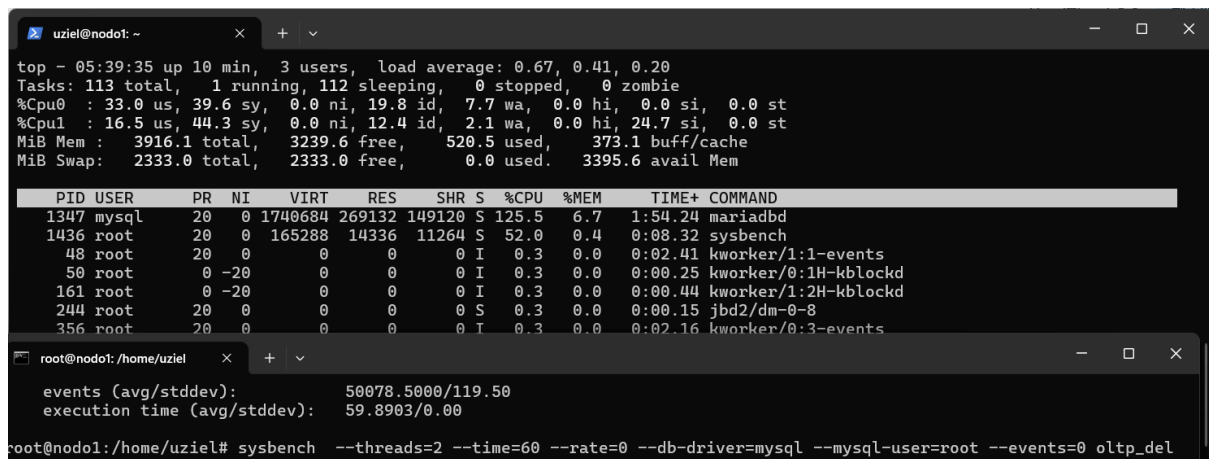
```
top - 04:43:39 up 2:09, 3 users, load average: 0.82, 0.26, 0.09
Tasks: 108 total, 1 running, 107 sleeping, 0 stopped, 0 zombie
%Cpu(s): 12.8 us, 14.7 sy, 0.0 ni, 21.1 id, 2.8 wa, 0.0 hi, 48.6 si, 0.0 st
MiB Mem : 3916.4 total, 3346.7 free, 517.6 used, 268.1 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3398.9 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1269 mysql     20   0 1296820 157844 30080 S 62.8   3.9   0:47.61 mariadb
   58 root       20   0     0     0     0 I 0.7   0.0   0:12.11 kworker/0:2-events
  149 root       0 -20     0     0     0 I 0.3   0.0   0:01.48 kworker/0:2H-kblockd
    1 root      20   0    22420 13384  9416 S 0.0   0.3   0:02.52 systemd
    2 root      20   0     0     0     0 S 0.0   0.0   0:00.00 kthreadd
    3 root      20   0     0     0     0 S 0.0   0.0   0:00.00 pool_workqueue_release

sysbench statistics:
time: 60.0004s
number of events: 912191
s):
in: 0.03
vg: 0.07
ax: 22.54
5th percentile: 0.06
um: 59450.03

irness:
 (avg/stddev): 912191.0000/0.00
ion time (avg/stddev): 59.4500/0.00
```

AHORA CON DOS HILOS



The screenshot shows two terminal windows. The top window displays the output of the 'top' command, showing system load and process list. The bottom window shows the output of the 'sysbench' command, displaying statistics for a two-threaded delete test.

```
top - 05:39:35 up 10 min, 3 users, load average: 0.67, 0.41, 0.20
Tasks: 113 total, 1 running, 112 sleeping, 0 stopped, 0 zombie
%Cpu0 : 33.0 us, 39.6 sy, 0.0 ni, 19.8 id, 7.7 wa, 0.0 hi, 0.0 si, 0.0 st
%Cpu1 : 16.5 us, 44.3 sy, 0.0 ni, 12.4 id, 2.1 wa, 0.0 hi, 24.7 si, 0.0 st
MiB Mem : 3916.1 total, 3239.6 free, 520.5 used, 373.1 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3395.6 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1347 mysql     20   0 1740684 269132 149120 S 125.5   6.7   1:54.24 mariadb
 1436 root       20   0 165288 14336 11264 S 52.0   0.4   0:08.32 sysbench
   48 root      20   0     0     0     0 I 0.3   0.0   0:02.41 kworker/1:1-events
   50 root      0 -20     0     0     0 I 0.3   0.0   0:00.25 kworker/0:1H-kblockd
  161 root      0 -20     0     0     0 I 0.3   0.0   0:00.44 kworker/1:2H-kblockd
  244 root      20   0     0     0     0 S 0.3   0.0   0:00.15 jbd2/dm-0-8
  356 root      20   0     0     0     0 I 0.3   0.0   0:02.16 kworker/0:3-events

root@nodo1:/home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_delete run
events (avg/stddev): 50078.5000/119.50
execution time (avg/stddev): 59.8903/0.00
```

```
root@nodo1: /home/uziel  X + v

SQL statistics:
queries performed:
  read:          0
  write:         3583
  other:        1782847
  total:        1786430
transactions:    1786430 (29771.92 per sec.)
queries:         1786430 (29771.92 per sec.)
ignored errors:  0 (0.00 per sec.)
reconnects:      0 (0.00 per sec.)

General statistics:
total time:      60.0026s
total number of events: 1786430

Latency (ms):
```

4.-sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0
oltp_insert run

```
uziel@nodo1: ~  X + v

top - 04:45:53 up 2:12, 3 users, load average: 0.85, 0.38, 0.15
Tasks: 107 total, 2 running, 105 sleeping, 0 stopped, 0 zombie
%Cpu(s): 1.2 us, 64.4 sy, 0.0 ni, 0.0 id, 30.1 wa, 0.0 hi, 4.3 si, 0.0 st
MiB Mem : 3916.4 total, 3299.7 free, 525.2 used, 308.2 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3391.3 avail Mem

  PID USER  PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1269 mysql  20   0 1296820 180884 47744 S 44.0   4.5   1:10.00 mariadb
 149  root   0 -20    0     0     0 I  6.0   0.0   0:04.56 kworker/0:2H-kblockd
1588  root   20   0 99620 14080 11136 S  3.0   0.4   0:01.37 sysbench
 229  root   20   0     0     0     0 D  2.7   0.0   0:01.74 jbd2/dm-0-8
  58  root   20   0     0     0     0 R  1.3   0.0   0:13.14 kworker/0:2-kdmflush/252:0
1408  uziel   20   0 11912  6016  3840 R  0.3   0.2   0:07.05 top
    1  root   20   0 22420 13384 9416 S  0.0   0.3   0:02.53 systemd
    2  root   20   0     0     0     0 S  0.0   0.0   0:00.00 kthreadd

ot@nodo1: /home/uziel  X + v

vents (avg/stddev):      912191.0000/0.00
xecution time (avg/stddev): 59.4500/0.00

nodo1:/home/uziel# sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_ins
un
nch 1.0.20 (using system LuaJIT 2.1.0-beta3)

ng the test with following options:
r of threads: 1
alizing random number generator from current time

alizing worker threads...
```

```
root@nodo1: /home/uziel  X + v

General statistics:
total time:      60.0026s
total number of events: 29664

Latency (ms):
  min:          1.11
  avg:          2.02
  max:         18.61
  95th percentile: 4.18
  sum:         59862.88

Threads fairness:
events (avg/stddev):    29664.0000/0.00
execution time (avg/stddev): 59.8629/0.00

root@nodo1:/home/uziel# |
```


AHORA CON 2 HILOS:

```

uziel@nodo1: ~
top - 05:41:08 up 12 min, 3 users, load average: 0.83, 0.54, 0.27
Tasks: 113 total, 1 running, 112 sleeping, 0 stopped, 0 zombie
%Cpu0 : 12.8 us, 15.1 sy, 0.0 ni, 38.1 id, 34.0 wa, 0.0 hi, 0.0 si, 0.0 st
%Cpu1 : 2.3 us, 12.0 sy, 0.0 ni, 26.6 id, 12.0 wa, 0.0 hi, 47.1 si, 0.0 st
MiB Mem : 3916.1 total, 3234.7 free, 516.3 used, 382.5 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3399.8 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM    TIME+  COMMAND
 1347 mysql    20   0 1740684 273740 153216 S  44.7   6.8   2:49.80 mariadb
 1446 root      20   0 165800   14464 11136 S   4.3   0.4   0:00.61 sysbench
 161  root      0 -20    0      0      0 I   2.3   0.0   0:00.85 kworker/1:2H-kblockd
 50  root      0 -20    0      0      0 I   2.0   0.0   0:00.50 kworker/0:1H-kblockd
 244  root      20   0      0      0      0 S   2.0   0.0   0:00.41 jbd2/dm-0-8
 24  root      20   0      0      0      0 S   1.3   0.0   0:00.71 ksoftirqd/1
 1445 root      20   0      0      0      0 T   0.7   0.0   0:00.14 kworker/1:2-kdmflush/252:0

root@nodo1: /home/uziel
events (avg/stddev):      893215.0000/1810.00
execution time (avg/stddev): 59.5702/0.00

root@nodo1: /home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_ins
run

```

```

root@nodo1: /home/uziel
Threads started!

SQL statistics:
  queries performed:
    read:              0
    write:             27155
    other:              0
    total:             27155
  transactions:       27155 (452.56 per sec.)
  queries:            27155 (452.56 per sec.)
  ignored errors:     0 (0.00 per sec.)
  reconnects:         0 (0.00 per sec.)

General statistics:
  total time:          60.0026s
  total number of events: 27155

```

5.- sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_point_select run

```

uziel@nodo1: ~
top - 04:52:42 up 2:18, 3 users, load average: 1.06, 0.55, 0.28
Tasks: 107 total, 1 running, 106 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.4 sy, 0.0 ni, 98.5 id, 0.4 wa, 0.0 hi, 0.8 si, 0.0 st
MiB Mem : 3916.4 total, 3299.7 free, 519.5 used, 313.9 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3397.0 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM    TIME+  COMMAND
 58  root      20   0      0      0      0 I   0.3   0.0   0:15.29 kworker/0:2-events
1569 root      20   0      0      0      0 I   0.3   0.0   0:00.20 kworker/u2:3-events_power_efficient
 1  root      20   0 22420 13384 9416 S   0.0   0.3   0:02.53 systemd
 2  root      20   0      0      0      0 S   0.0   0.0   0:00.00 kthreadd
 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-rcu_w

root@nodo1: /home/uziel
General statistics:
  total time:          60.0003s
  total number of events: 1060882

Latency (ms):
  min:                 0.04
  avg:                 0.06
  max:                 8.25
  95th percentile:    0.06
  sum:                59467.39

Threads fairness:
  events (avg/stddev): 1060882.0000/0.00

```

AHORA CON DOS CORE:

```
uziel@node1: ~
top - 05:44:54 up 15 min, 3 users, load average: 0.12, 0.40, 0.28
Tasks: 114 total, 1 running, 113 sleeping, 0 stopped, 0 zombie
%Cpu0 : 41.7 us, 50.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 8.3 si, 0.0 st
%Cpu1 : 16.7 us, 50.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 33.3 si, 0.0 st
MiB Mem : 3916.1 total, 3210.4 free, 520.5 used, 402.9 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3395.6 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1347 mysql    20   0 1740684 282828 157056 S 137.3   7.1   3:21.99 mariadb
 1453 root      20   0 165288 14208 11264 S  60.2   0.4   0:04.41 sysbench
 1445 root      20   0      0      0      0 I   0.6   0.0   0:00.92 kworker/1:2-events
   24 root      20   0      0      0      0 S   0.3   0.0   0:01.24 ksoftirqd/1
 1192 uziel    20   0  15128  7092  5120 S   0.3   0.2   0:00.39 sshd
     1 root      20   0  22300  13240  9400 S   0.0   0.3   0:02.77 systemd
     2 root      20   0      0      0      0 S   0.0   0.0   0:00.02 kthreadd

root@node1: /home/uziel
events (avg/stddev):      13577.5000/1.50
execution time (avg/stddev): 59.9236/0.00

root@node1: /home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_poi
nt select run
```

```
root@node1: /home/uziel
Initializing worker threads...

Threads started!

SQL statistics:
queries performed:
  read:      2523619
  write:      0
  other:      0
  total:     2523619
transactions: 2523619 (42055.74 per sec.)
queries:      2523619 (42055.74 per sec.)
ignored errors: 0 (0.00 per sec.)
reconnects:   0 (0.00 per sec.)

General statistics:
```

6.- sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_only run

```
uziel@node1: ~
top - 05:00:04 up 2:26, 3 users, load average: 0.40, 0.22, 0.19
Tasks: 108 total, 1 running, 107 sleeping, 0 stopped, 0 zombie
%Cpu(s): 21.9 us, 13.5 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 64.6 si, 0.0 st
MiB Mem : 3916.4 total, 3282.8 free, 526.5 used, 329.0 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3390.0 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1269 mysql    20   0 1296820 184596 50176 S  69.5   4.6   2:43.71 mariadb
 1618 root      20   0  99492 14080 11264 S  27.8   0.4   0:02.75 sysbench
   58 root      20   0      0      0      0 I   0.7   0.0   0:17.49 kworker/0:2-events
   16 root      20   0      0      0      0 S   0.3   0.0   0:00.42 ksoftirqd/0
 1398 uziel    20   0  15132  7096  5120 S   0.3   0.2   0:04.12 sshd
     1 root      20   0  22420  13384  9416 S   0.0   0.3   0:02.55 systemd
     2 root      20   0      0      0      0 S   0.0   0.0   0:00.00 kthreadd
     3 root      20   0      0      0      0 S   0.0   0.0   0:00.00 pool_workqueue_release

root@node1: /home/uziel
events (avg/stddev):      1060882.0000/0.00
execution time (avg/stddev): 59.4674/0.00

root@node1: /home/uziel# sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_only run
sysbench 1.0.20 (using system LuaJIT 2.1.0-beta3)

Running the test with following options:
Number of threads: 1
Initializing random number generator from current time

Initializing worker threads...
```

```
root@nodo1: /home/uziel

General statistics:
total time:          60.0027s
total number of events: 62934

Latency (ms):
min:                 0.61
avg:                 0.95
max:                 15.04
95th percentile:    2.86
sum:                 59876.42

Threads fairness:
events (avg/stddev): 62934.0000/0.00
execution time (avg/stddev): 59.8764/0.00

root@nodo1: /home/uziel#
```

AHORA CON DOS CORE:

```
uziel@nodo1: ~
top - 05:47:03 up 18 min, 3 users, load average: 0.56, 0.55, 0.36
Tasks: 113 total, 1 running, 112 sleeping, 0 stopped, 0 zombie
%Cpu0  : 33.3 us, 66.7 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu1  : 33.3 us, 33.3 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.0 hi, 33.3 si,  0.0 st
MiB Mem : 3916.1 total, 3208.6 free, 522.2 used, 402.9 buff/cache
MiB Swap: 2333.0 total, 2333.0 free,  0.0 used, 3393.9 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1347 mysql    20   0 1740684 283212 157056 S 140.0   7.1   4:50.69 mariadb
 1461 root      20   0 165544 14464 11264 S  59.4   0.4   0:06.89 sysbench
   33 root      20   0      0     0     0 I   0.3   0.0   0:00.58 kworker/u4:2-events_power_efficient
  356 root      20   0      0     0     0 I   0.3   0.0   0:03.46 kworker/0:3-events
 1192 uziel     20   0 15128  7092  5120 S   0.3   0.2   0:00.46 sshd
 1445 root      20   0      0     0     0 I   0.3   0.0   0:01.65 kworker/1:2-events
    1 root      20   0  22300  13240  9400 S   0.0   0.3   0:02.77 systemd

root@nodo1: /home/uziel
events (avg/stddev): 1261809.5000/2113.50
execution time (avg/stddev): 59.4204/0.00

root@nodo1: /home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_write run
```

```
root@nodo1: /home/uziel

Initializing worker threads...

Threads started!

SQL statistics:
queries performed:
  read:          2117038
  write:         0
  other:        302434
  total:       2419472
transactions:    151217 (2520.18 per sec.)
queries:        2419472 (40322.89 per sec.)
ignored errors: 0 (0.00 per sec.)
reconnects:     0 (0.00 per sec.)

General statistics:
total time:          60.0012s
```

7.- sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_write run

```
uziel@nodo1: ~  
top - 05:02:08 up 2:28, 3 users, load average: 0.56, 0.37, 0.26  
Tasks: 108 total, 1 running, 107 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 2.5 us, 55.2 sy, 0.0 ni, 0.0 id, 20.9 wa, 0.0 hi, 21.5 si, 0.0 st  
MiB Mem : 3916.4 total, 3267.3 free, 531.1 used, 340.0 buff/cache  
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3385.3 avail Mem  


| PID  | USER  | PR | NI  | VIRT    | RES    | SHR   | S | %CPU | %MEM | TIME+   | COMMAND                    |
|------|-------|----|-----|---------|--------|-------|---|------|------|---------|----------------------------|
| 1269 | mysql | 20 | 0   | 1296820 | 192788 | 56832 | S | 53.6 | 4.8  | 3:28.83 | mariadb                    |
| 1623 | root  | 20 | 0   | 99492   | 14208  | 11264 | S | 8.3  | 0.4  | 0:01.52 | sysbench                   |
| 149  | root  | 0  | -20 | 0       | 0      | 0     | I | 5.0  | 0.0  | 0:06.03 | kworker/0:2H-kblockd       |
| 229  | root  | 20 | 0   | 0       | 0      | 0     | S | 2.6  | 0.0  | 0:02.50 | jbd2/dm-0-8                |
| 58   | root  | 20 | 0   | 0       | 0      | 0     | I | 1.3  | 0.0  | 0:18.27 | kworker/0:2-kdmflush/252:0 |
| 1    | root  | 20 | 0   | 22420   | 13384  | 9416  | S | 0.0  | 0.3  | 0:02.55 | systemd                    |
| 2    | root  | 20 | 0   | 0       | 0      | 0     | S | 0.0  | 0.0  | 0:00.00 | kthreadd                   |
| 3    | root  | 20 | 0   | 0       | 0      | 0     | S | 0.0  | 0.0  | 0:00.00 | pool_workqueue_release     |

  
root@nodo1:/home/uziel  
events (avg/stddev): 62934.0000/0.00  
execution time (avg/stddev): 59.8764/0.00  
  
root@nodo1:/home/uziel# sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_write run  
sysbench 1.0.20 (using system LuaJIT 2.1.0-beta3)  
  
Running the test with following options:  
Number of threads: 1  
Initializing random number generator from current time  
  
Initializing worker threads...
```

```
root@nodo1:/home/uziel  
General statistics:  
total time: 60.0031s  
total number of events: 13798  
  
Latency (ms):  
min: 2.76  
avg: 4.34  
max: 30.70  
95th percentile: 6.79  
sum: 59938.20  
  
Threads fairness:  
events (avg/stddev): 13798.0000/0.00  
execution time (avg/stddev): 59.9382/0.00  
  
root@nodo1:/home/uziel#
```

AHORA CON DOS CORES:

```
uziel@nodo1: ~  
top - 05:48:35 up 19 min, 3 users, load average: 0.88, 0.71, 0.44  
Tasks: 113 total, 1 running, 112 sleeping, 0 stopped, 0 zombie  
%Cpu0 : 24.2 us, 26.6 sy, 0.0 ni, 25.8 id, 23.0 wa, 0.0 hi, 0.4 si, 0.0 st  
%Cpu1 : 10.9 us, 33.6 sy, 0.0 ni, 12.6 id, 6.9 wa, 0.0 hi, 36.0 si, 0.0 st  
MiB Mem : 3916.1 total, 3206.7 free, 524.1 used, 403.0 buff/cache  
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3392.0 avail Mem  


| PID  | USER  | PR | NI  | VIRT    | RES    | SHR    | S | %CPU | %MEM | TIME+   | COMMAND              |
|------|-------|----|-----|---------|--------|--------|---|------|------|---------|----------------------|
| 1347 | mysql | 20 | 0   | 1740684 | 285644 | 157056 | S | 90.4 | 7.1  | 6:07.60 | mariadb              |
| 1464 | root  | 20 | 0   | 165544  | 14848  | 11008  | S | 24.3 | 0.4  | 0:02.83 | sysbench             |
| 161  | root  | 0  | -20 | 0       | 0      | 0      | I | 1.3  | 0.0  | 0:02.14 | kworker/1:2H-kblockd |
| 50   | root  | 0  | -20 | 0       | 0      | 0      | I | 1.0  | 0.0  | 0:01.58 | kworker/0:1H-kblockd |
| 24   | root  | 20 | 0   | 0       | 0      | 0      | S | 0.7  | 0.0  | 0:01.41 | ksoftirqd/1          |
| 1445 | root  | 20 | 0   | 0       | 0      | 0      | I | 0.7  | 0.0  | 0:01.96 | kworker/1:2-events   |
| 1192 | uziel | 20 | 0   | 15128   | 7092   | 5120   | S | 0.3  | 0.2  | 0:00.50 | sshd                 |

  
root@nodo1:/home/uziel  
events (avg/stddev): 75608.5000/86.50  
execution time (avg/stddev): 59.8824/0.00  
  
root@nodo1:/home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_read_write run
```

```
root@nodo1: /home/uziel x + v
Initializing worker threads...

Threads started!

SQL statistics:
queries performed:
  read:                259322
  write:               66656
  other:               44474
  total:               370452
transactions:         18520 (308.64 per sec.)
queries:               370452 (6173.60 per sec.)
ignored errors:        3 (0.05 per sec.)
reconnects:            0 (0.00 per sec.)

General statistics:
total time:            60.0051s
```

8.-sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0
oltp_update_index run

```
uziel@nodo1: ~ x + v
top - 05:06:05 up 2:32, 3 users, load average: 0.40, 0.35, 0.28
Tasks: 107 total, 1 running, 106 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.6 us, 59.1 sy, 0.0 ni, 0.0 id, 34.1 wa, 0.0 hi, 6.1 si, 0.0 st
MiB Mem : 3916.4 total, 3227.9 free, 536.6 used, 374.2 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3379.8 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 1269 mysql    20   0 1296820 215700 78720 S   45.5    5.4   4:00.04 mariadb
 149  root      0 -20     0     0     0 I    5.0    0.0   0:09.27 kworker/0:2H-kblockd
1633  root     20   0  99364  14080 11392 S    2.0    0.4   0:00.42 sysbench
 229  root     20   0     0     0     0 S    1.7    0.0   0:04.14 jbd2/dm-0-8
  58  root     20   0     0     0     0 I    1.0    0.0   0:19.79 kworker/0:2-kdmflush/252:0
1398  uziel     20   0  15132   7096  5120 S    0.3    0.2   0:04.36 sshd
   1  root     20   0  22420  13384  9416 S    0.0    0.3   0:02.55 systemd
   2  root     20   0     0     0     0 S    0.0    0.0   0:00.00 kthreadd

root@nodo1: /home/uziel x + v
events (avg/stddev):      13798.0000/0.00
execution time (avg/stddev): 59.9382/0.00

root@nodo1: /home/uziel# sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_upd
re_index run
sysbench 1.0.20 (using system LuaJIT 2.1.0-beta3)

Running the test with following options:
number of threads: 1
initializing random number generator from current time

initializing worker threads...
```

```
root@nodo1: /home/uziel x + v

General statistics:
total time:            60.0014s
total number of events: 33562

Latency (ms):
min:                    0.04
avg:                    1.78
max:                    16.28
95th percentile:       3.89
sum:                    59898.88

Threads fairness:
events (avg/stddev):    33562.0000/0.00
execution time (avg/stddev): 59.8989/0.00

root@nodo1: /home/uziel# |
```

AHORA CON DOS CORES:

```
uziel@nodo1: ~  
top - 05:50:38 up 21 min, 3 users, load average: 0.72, 0.76, 0.49  
Tasks: 114 total, 1 running, 113 sleeping, 0 stopped, 0 zombie  
%Cpu0 : 14.3 us, 17.7 sy, 0.0 ni, 24.5 id, 43.4 wa, 0.0 hi, 0.0 si, 0.0 st  
%Cpu1 : 1.1 us, 8.4 sy, 0.0 ni, 32.4 id, 6.5 wa, 0.0 hi, 51.5 si, 0.0 st  
MiB Mem : 3916.1 total, 3203.7 free, 526.9 used, 403.2 buff/cache  
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3389.2 avail Mem  


| PID  | USER  | PR | NI  | VIRT    | RES    | SHR    | S | %CPU | %MEM | TIME+   | COMMAND              |
|------|-------|----|-----|---------|--------|--------|---|------|------|---------|----------------------|
| 1347 | mysql | 20 | 0   | 1740684 | 287308 | 157056 | S | 48.8 | 7.2  | 6:58.73 | mariadb              |
| 1473 | root  | 20 | 0   | 165288  | 14080  | 11136  | S | 3.7  | 0.4  | 0:00.43 | sysbench             |
| 50   | root  | 0  | -20 | 0       | 0      | 0      | I | 3.0  | 0.0  | 0:02.36 | kworker/0:1H-kblockd |
| 24   | root  | 20 | 0   | 0       | 0      | 0      | S | 1.0  | 0.0  | 0:01.82 | ksoftirqd/1          |
| 161  | root  | 0  | -20 | 0       | 0      | 0      | I | 0.7  | 0.0  | 0:02.83 | kworker/1:2H-kblockd |
| 1    | root  | 20 | 0   | 22300   | 13240  | 9400   | S | 0.3  | 0.3  | 0:02.78 | systemd              |
| 17   | root  | 20 | 0   | 0       | 0      | 0      | T | 0.3  | 0.0  | 0:00.30 | rcu_preempt          |

  
root@nodo1: /home/uziel  
events (avg/stddev): 9260.0000/2.00  
execution time (avg/stddev): 59.9597/0.00  
root@nodo1: /home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_upd  
to_index run
```

```
root@nodo1: /home/uziel  
Threads started!  
SQL statistics:  
queries performed:  
  read: 0  
  write: 31141  
  other: 2081  
  total: 33222  
transactions: 33222 (553.65 per sec.)  
queries: 33222 (553.65 per sec.)  
ignored errors: 0 (0.00 per sec.)  
reconnects: 0 (0.00 per sec.)  
General statistics:  
total time: 60.0024s  
total number of events: 33222
```

9.- sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0
oltp_update_non_index run

```
uziel@nodo1: ~  
top - 05:07:47 up 2:34, 3 users, load average: 0.65, 0.47, 0.33  
Tasks: 107 total, 1 running, 106 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 1.2 us, 60.5 sy, 0.0 ni, 0.0 id, 33.3 wa, 0.0 hi, 4.9 si, 0.0 st  
MiB Mem : 3916.4 total, 3204.5 free, 536.5 used, 398.2 buff/cache  
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3380.0 avail Mem  


| PID  | USER  | PR | NI  | VIRT    | RES    | SHR   | S | %CPU | %MEM | TIME+   | COMMAND                    |
|------|-------|----|-----|---------|--------|-------|---|------|------|---------|----------------------------|
| 1269 | mysql | 20 | 0   | 1296820 | 235412 | 98304 | S | 42.9 | 5.9  | 4:26.60 | mariadb                    |
| 149  | root  | 0  | -20 | 0       | 0      | 0     | I | 6.0  | 0.0  | 0:12.39 | kworker/0:2H-kblockd       |
| 229  | root  | 20 | 0   | 0       | 0      | 0     | S | 2.7  | 0.0  | 0:05.20 | jbd2/dm-0-8                |
| 1638 | root  | 20 | 0   | 99492   | 13952  | 11264 | S | 2.3  | 0.3  | 0:00.37 | sysbench                   |
| 58   | root  | 20 | 0   | 0       | 0      | 0     | I | 1.3  | 0.0  | 0:20.62 | kworker/0:2-kdmflush/252:0 |
| 1408 | uziel | 20 | 0   | 11912   | 6016   | 3840  | R | 0.3  | 0.2  | 0:08.27 | top                        |
| 1    | root  | 20 | 0   | 22420   | 13384  | 9416  | S | 0.0  | 0.3  | 0:02.55 | systemd                    |
| 2    | root  | 20 | 0   | 0       | 0      | 0     | S | 0.0  | 0.0  | 0:00.00 | kthreadd                   |

  
root@nodo1: /home/uziel  
events (avg/stddev): 33562.0000/0.00  
execution time (avg/stddev): 59.8989/0.00  
root@nodo1: /home/uziel# sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_upd  
e_non_index run  
sysbench 1.0.20 (using system LuaJIT 2.1.0-beta3)  
Running the test with following options:  
Number of threads: 1  
Initializing random number generator from current time  
Initializing worker threads...
```

```
root@nodo1: /home/uziel  x + v

Threads started!

SQL statistics:
  queries performed:
    read:          0
    write:         29441
    other:         2712
    total:         32153
  transactions:    32153 (535.84 per sec.)
  queries:         32153 (535.84 per sec.)
  ignored errors:  0      (0.00 per sec.)
  reconnects:      0      (0.00 per sec.)

General statistics:
  total time:      60.0024s
  total number of events: 32153
```

AHORA CON DOS CORES:

```
uziel@nodo1: ~  x + v

top - 05:52:05 up 23 min,  3 users,  load average: 0.82, 0.80, 0.54
Tasks: 114 total,  2 running, 112 sleeping,  0 stopped,  0 zombie
%Cpu0  : 13.4 us, 15.7 sy,  0.0 ni, 29.1 id, 41.8 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu1  :  1.9 us,  8.7 sy,  0.0 ni, 30.7 id,  6.4 wa,  0.0 hi, 52.3 si,  0.0 st
MiB Mem : 3916.1 total, 3202.7 free,  527.8 used,  403.3 buff/cache
MiB Swap: 2333.0 total, 2333.0 free,  0.0 used. 3388.3 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 1347 mysql    20   0 1740684 287436 157056 S  49.8   7.2   7:27.50 mariadb
 1479 root      20   0 165544 14080 11136 S   4.0   0.4   0:00.28 sysbench
   50 root      0 -20     0     0     0  I   2.7   0.0   0:03.88 kworker/0:1H-kblockd
   24 root     20   0     0     0     0  R   1.0   0.0   0:02.43 ksoftirqd/1
  161 root      0 -20     0     0     0  I   1.0   0.0   0:03.24 kworker/1:2H-kblockd
  356 root     20   0     0     0     0  I   0.3   0.0   0:04.16 kworker/0:3-events
  368 root      rt   0 289116 27264  8576 S   0.3   0.7   0:00.72 multipathd

root@nodo1: /home/uziel  x + v

events (avg/stddev):      16611.0000/10.00
execution time (avg/stddev): 59.9460/0.00

root@nodo1: /home/uziel# sysbench  --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_upd
to non index run
```

```
root@nodo1: /home/uziel  x + v

Threads started!

SQL statistics:
  queries performed:
    read:          0
    write:         30889
    other:         2040
    total:         32929
  transactions:    32929 (548.77 per sec.)
  queries:         32929 (548.77 per sec.)
  ignored errors:  0      (0.00 per sec.)
  reconnects:      0      (0.00 per sec.)

General statistics:
  total time:      60.0028s
  total number of events: 32929
```

10.- sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root
--events=0 oltp_write_only run

```
uziel@nodot: ~  
top - 05:16:54 up 2:43, 3 users, load average: 0.51, 0.22, 0.25  
Tasks: 107 total, 1 running, 106 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 1.0 us, 60.6 sy, 0.0 ni, 0.0 id, 25.4 wa, 0.0 hi, 13.0 si, 0.0 st  
MiB Mem : 3916.4 total, 3165.4 free, 543.5 used, 430.6 buff/cache  
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3372.9 avail Mem  


| PID  | USER  | PR | NI  | VIRT    | RES    | SHR    | S | %CPU | %MEM | TIME+   | COMMAND                    |
|------|-------|----|-----|---------|--------|--------|---|------|------|---------|----------------------------|
| 1269 | mysql | 20 | 0   | 1296820 | 261780 | 123008 | S | 44.9 | 6.5  | 4:53.71 | mariadb                    |
| 149  | root  | 0  | -20 | 0       | 0      | 0      | I | 7.0  | 0.0  | 0:16.16 | kworker/0:2H-kblockd       |
| 1650 | root  | 20 | 0   | 99492   | 13824  | 11136  | S | 4.7  | 0.3  | 0:00.80 | sysbench                   |
| 229  | root  | 20 | 0   | 0       | 0      | 0      | S | 4.0  | 0.0  | 0:06.99 | jbd2/dm-0-8                |
| 58   | root  | 20 | 0   | 0       | 0      | 0      | I | 1.7  | 0.0  | 0:23.82 | kworker/0:2-kdmflush/252:0 |
| 1398 | uziel | 20 | 0   | 15132   | 7096   | 5120   | S | 0.3  | 0.2  | 0:04.72 | sshd                       |
| 1    | root  | 20 | 0   | 22420   | 13384  | 9416   | S | 0.0  | 0.3  | 0:02.56 | systemd                    |
| 2    | root  | 20 | 0   | 0       | 0      | 0      | S | 0.0  | 0.0  | 0:00.00 | kthreadd                   |

  
root@nodot: /home/uziel  
events (avg/stddev): 32153.0000/0.00  
execution time (avg/stddev): 59.9015/0.00  
  
root@nodot: /home/uziel# sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_wri  
e_only run  
sysbench 1.0.20 (using system LuaJIT 2.1.0-beta3)  
  
Running the test with following options:  
Number of threads: 1  
Initializing random number generator from current time  
  
Initializing worker threads...
```

```
root@nodot: /home/uziel  
read: 0  
write: 78560  
other: 43720  
total: 122280  
transactions: 20380 (339.63 per sec.)  
queries: 122280 (2037.78 per sec.)  
ignored errors: 0 (0.00 per sec.)  
reconnects: 0 (0.00 per sec.)  
  
General statistics:  
total time: 60.0044s  
total number of events: 20380  
  
Latency (ms):  
min: 1.46  
avg: 2.94  
max: 305.32
```

DOS CORES:

```
uziel@nodot: ~  
top - 05:53:48 up 24 min, 3 users, load average: 0.73, 0.83, 0.58  
Tasks: 115 total, 1 running, 114 sleeping, 0 stopped, 0 zombie  
%Cpu0 : 17.1 us, 34.6 sy, 0.0 ni, 22.8 id, 25.5 wa, 0.0 hi, 0.0 si, 0.0 st  
%Cpu1 : 5.7 us, 21.3 sy, 0.0 ni, 27.8 id, 5.2 wa, 0.0 hi, 40.0 si, 0.0 st  
MiB Mem : 3916.1 total, 3201.8 free, 528.6 used, 403.4 buff/cache  
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used, 3387.5 avail Mem  


| PID  | USER  | PR | NI  | VIRT    | RES    | SHR    | S | %CPU | %MEM | TIME+   | COMMAND              |
|------|-------|----|-----|---------|--------|--------|---|------|------|---------|----------------------|
| 1347 | mysql | 20 | 0   | 1740684 | 289612 | 157056 | S | 65.4 | 7.2  | 8:01.56 | mariadb              |
| 1483 | root  | 20 | 0   | 165544  | 14208  | 11136  | S | 20.9 | 0.4  | 0:02.10 | sysbench             |
| 161  | root  | 0  | -20 | 0       | 0      | 0      | I | 2.0  | 0.0  | 0:03.88 | kworker/1:2H-kblockd |
| 24   | root  | 20 | 0   | 0       | 0      | 0      | S | 1.7  | 0.0  | 0:03.14 | ksoftirqd/1          |
| 50   | root  | 0  | -20 | 0       | 0      | 0      | I | 1.7  | 0.0  | 0:05.41 | kworker/0:1H-kblockd |
| 1445 | root  | 20 | 0   | 0       | 0      | 0      | I | 0.7  | 0.0  | 0:03.11 | kworker/1:2-ata_sff  |
| 1    | root  | 20 | 0   | 22300   | 13240  | 9400   | S | 0.0  | 0.3  | 0:02.79 | systemd              |

  
root@nodot: /home/uziel  
events (avg/stddev): 16464.5000/26.50  
execution time (avg/stddev): 59.8898/0.01  
  
root@nodot: /home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 oltp_wr  
ite_only run
```



```
root@nodo1: /home/uziel  x + v
Initializing worker threads...

Threads started!

SQL statistics:
queries performed:
  read:                0
  write:               86125
  other:               46841
  total:              132966
transactions:         22160 (369.30 per sec.)
queries:              132966 (2215.90 per sec.)
ignored errors:       2 (0.03 per sec.)
reconnects:           0 (0.00 per sec.)

General statistics:
total time:           60.0048s
```

11.-sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root
--events=0 select_random_points run

```
uziel@nodo1: ~  x + v
top - 05:19:01 up 2:45, 3 users, load average: 0.41, 0.33, 0.29
Tasks: 109 total, 1 running, 108 sleeping, 0 stopped, 0 zombie
%Cpu(s): 28.9 us, 5.6 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 65.6 si, 0.0 st
MiB Mem : 3916.4 total, 3139.3 free, 540.5 used, 460.1 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used. 3375.9 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 1269 mysql     20   0 1296820 289044 148992 S   91.4   7.2   5:22.18 mariadb
 1664 root       20   0 100660 15168  11136 S    7.3   0.4   0:00.73 sysbench
   58 root       20   0      0      0      0 I    0.3   0.0   0:24.99 kworker/0:2-events
 1398 uziel     20   0  15132   7096   5120 S    0.3   0.2   0:04.81 sshd
 1408 uziel     20   0  11912   6016   3840 R    0.3   0.2   0:08.89 top
    1 root       20   0  22420  13384   9416 S    0.0   0.3   0:02.56 systemd
    2 root       20   0      0      0      0 S    0.0   0.0   0:00.00 kthreadd
    3 root       20   0      0      0      0 S    0.0   0.0   0:00.00 pool_workqueue_release

root@nodo1: /home/uziel  x + v
events (avg/stddev):       20380.0000/0.00
execution time (avg/stddev): 59.9128/0.00

root@nodo1: /home/uziel# sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 select_r
ndom_points run
sysbench 1.0.20 (using system LuaJIT 2.1.0-beta3)

Running the test with following options:
Number of threads: 1
Initializing random number generator from current time

Initializing worker threads...
```

```
root@nodo1: /home/uziel  x + v
Initializing worker threads...

Threads started!

SQL statistics:
queries performed:
  read:                9053
  write:                0
  other:                0
  total:              9053
transactions:          9053 (150.88 per sec.)
queries:               9053 (150.88 per sec.)
ignored errors:        0 (0.00 per sec.)
reconnects:            0 (0.00 per sec.)

General statistics:
total time:           60.0014s
```

DOS CORES:

```
uziel@node1: ~
top - 05:55:33 up 26 min, 3 users, load average: 0.51, 0.80, 0.60
Tasks: 115 total, 1 running, 114 sleeping, 0 stopped, 0 zombie
%Cpu0 : 69.0 us, 27.6 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 3.4 si, 0.0 st
%Cpu1 : 28.6 us, 25.0 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 46.4 si, 0.0 st
MiB Mem : 3916.1 total, 3200.2 free, 530.1 used, 403.6 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used. 3386.1 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1347 mysql    20   0 1740684 290252 157056 S 155.3   7.2   8:45.03 mariadb
 1494 root      20   0 165800 14592 11264 S  41.6   0.4   0:02.07 sysbench
 1136 uziel     20   0 15124  6960  5120 S   1.6   0.2   0:04.83 sshd
  356 root      20   0      0      0      0 I   0.6   0.0   0:04.79 kworker/0:3-events
   24 root      20   0      0      0      0 S   0.3   0.0   0:03.91 ksoftirqd/1
 1445 root      20   0      0      0      0 I   0.3   0.0   0:03.46 kworker/1:2-events
    1 root      20   0  22300  13240  9400 S   0.0   0.3   0:02.79 systemd

root@node1: /home/uziel
events (avg/stddev):      11080.0000/7.00
execution time (avg/stddev): 59.9440/0.00

root@node1: /home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 select_r
andom_ranges run
```

```
root@node1: /home/uziel
Initializing worker threads...

Threads started!

SQL statistics:
  queries performed:
    read:      1239065
    write:     0
    other:     0
    total:     1239065
  transactions: 1239065 (20650.02 per sec.)
  queries:      1239065 (20650.02 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects:   0 (0.00 per sec.)

General statistics:
  total time:      60.0017s
```

12.-sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root
--events=0 select_random_ranges run

```
uziel@node1: ~
top - 05:21:16 up 2:47, 3 users, load average: 0.28, 0.36, 0.31
Tasks: 108 total, 1 running, 107 sleeping, 0 stopped, 0 zombie
%Cpu(s): 31.5 us, 2.2 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 66.3 si, 0.0 st
MiB Mem : 3916.4 total, 3138.9 free, 541.0 used, 460.1 buff/cache
MiB Swap: 2333.0 total, 2333.0 free, 0.0 used. 3375.5 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1269 mysql    20   0 1296820 289044 148992 S  97.7   7.2   6:12.91 mariadb
 1669 root      20   0  99492 13952 11264 S   1.3   0.3   0:00.07 sysbench
   58 root      20   0      0      0      0 I   0.3   0.0   0:25.70 kworker/0:2-events
    1 root      20   0  22420 13384  9416 S   0.0   0.3   0:02.57 systemd
    2 root      20   0      0      0      0 S   0.0   0.0   0:00.00 kthreadd
    3 root      20   0      0      0      0 S   0.0   0.0   0:00.00 pool_workqueue_release
    4 root      20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/R-rcu_g
    5 root      20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/R-rcu_g

root@node1: /home/uziel
events (avg/stddev):      9053.0000/0.00
execution time (avg/stddev): 59.9346/0.00

root@node1: /home/uziel# sysbench --threads=1 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 select_r
andom_ranges run
sysbench 1.0.20 (using system LuaJIT 2.1.0-beta3)

Running the test with following options:
  number of threads: 1
  initializing random number generator from current time

initializing worker threads...
```

```
root@nodo1: /home/uziel  X + v
Initializing worker threads...

Threads started!

SQL statistics:
queries performed:
  read:                  12885
  write:                  0
  other:                  0
  total:                 12885
transactions:          12885 (214.73 per sec.)
queries:               12885 (214.73 per sec.)
ignored errors:        0 (0.00 per sec.)
reconnects:            0 (0.00 per sec.)

General statistics:
total time:            60.0057s
```

AHORA DOS CORES:

```
uziel@nodo1: ~  X + v
top - 05:57:43 up 28 min,  3 users,  load average: 0.58, 0.83, 0.64
Tasks: 114 total,  1 running, 113 sleeping,  0 stopped,  0 zombie
%Cpu0  : 77.1 us, 22.9 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
%Cpu1  : 66.7 us, 27.3 sy,  0.0 ni,  0.0 id,  0.0 wa,  0.0 hi,  6.1 si,  0.0 st
MiB Mem : 3916.1 total, 3200.2 free,  530.0 used,  403.6 buff/cache
MiB Swap: 2333.0 total, 2333.0 free,  0.0 used. 3386.1 avail Mem

  PID USER      PR  NI   VIRT   RES    SHR S  %CPU  %MEM    TIME+  COMMAND
 1347 mysql     20   0 1740684 290380 157056 S 158.1   7.2 10:20.26 mariadb
 1497 root       20   0 165800   1452 11264 S  41.2   0.4  0:02.31 sysbench
 1445 root       20   0      0      0      0 I   0.7   0.0  0:03.79 kworker/1:2-events
    1 root       20   0  22300  13240  9400 S   0.0   0.3  0:02.79 systemd
    2 root       20   0      0      0      0 S   0.0   0.0  0:00.02 kthreadd
    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 a

root@nodo1: /home/uziel  X + v
events (avg/stddev):        619532.5000/6460.50
execution time (avg/stddev): 59.5009/0.01

root@nodo1: /home/uziel# sysbench --threads=2 --time=60 --rate=0 --db-driver=mysql --mysql-user=root --events=0 select_r
andom_pages_run
```

```
root@nodo1: /home/uziel  X + v

Threads started!

SQL statistics:
queries performed:
  read:                  1244041
  write:                  0
  other:                  0
  total:                 1244041
transactions:          1244041 (20732.25 per sec.)
queries:               1244041 (20732.25 per sec.)
ignored errors:        0 (0.00 per sec.)
reconnects:            0 (0.00 per sec.)

General statistics:
total time:            60.0015s
total number of events: 1244041
```

CONCLUSIÓN

Un **servidor** es una computadora especializada que responde a solicitudes de otros dispositivos en una red, brindando servicios como bases de datos, almacenamiento o procesamiento de aplicaciones. Su rendimiento depende de varios factores, como la capacidad de la CPU, la memoria RAM, la velocidad del disco y la optimización del sistema operativo.

Uno de los aspectos clave en el desempeño de un servidor es la **cantidad de núcleos (cores) del procesador**.

Diferencia entre usar 1 núcleo vs. 2 núcleos

1. Con un solo núcleo (1 core)

- Todas las tareas deben ejecutarse secuencialmente, lo que puede generar **cuellos de botella** en procesos intensivos.
- Si hay múltiples aplicaciones ejecutándose (como una base de datos y un servidor web), deben compartir el mismo núcleo, lo que puede causar **latencia y ralentización**.
- Es menos eficiente para manejar múltiples conexiones simultáneas.

2. Con dos núcleos (2 cores)

- Se pueden ejecutar procesos en paralelo, permitiendo una mejor distribución de carga.
- Mejora significativamente el rendimiento en tareas multi-hilo, como el manejo de bases de datos o servidores web con múltiples usuarios.
- Reduce el **tiempo de respuesta**, ya que el sistema puede asignar diferentes tareas a distintos núcleos, evitando bloqueos.

En conclusión, **tener más núcleos mejora el rendimiento y la capacidad de respuesta del servidor**, especialmente en entornos donde hay múltiples tareas en ejecución. Para cargas ligeras, un solo núcleo puede ser suficiente, pero para bases de datos, virtualización o servidores web con muchas conexiones, **más núcleos significan mayor eficiencia y estabilidad**.