

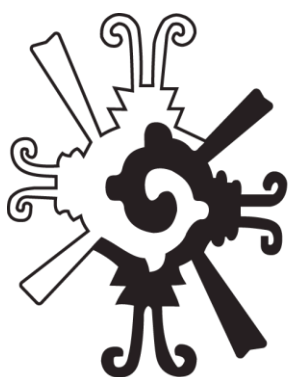


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# PRUEBAS DE DESEMPEÑO

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Tarea #998



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del Caribe

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## Reporte

Este reporte muestra las pruebas que se hicieron en MySQL usando la herramienta Sysbench. El objetivo era ver qué tan bien funciona la base de datos con diferentes tareas, usando 1 y 2 hilos. Las pruebas que se realizaron fueron: bulk\_insert

- oltp\_delete
- oltp\_insert
- oltp\_point\_select
- oltp\_read\_only
- oltp\_read\_write
- oltp\_update\_index
- oltp\_update\_non\_index
- oltp\_write\_only
- select\_random\_points
- select\_random\_ranges

Los resultados obtenidos para cada prueba son los siguientes:

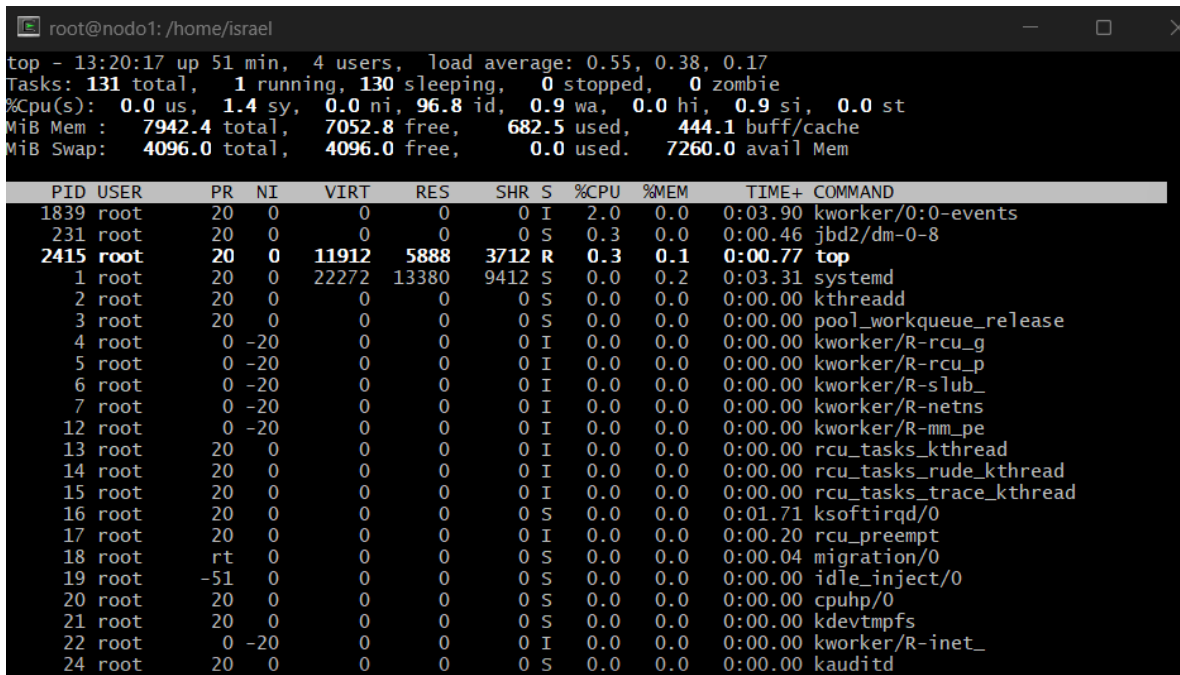
Prueba	1 hilo	2 hilos
bulk_insert	Rendimiento estable con menor uso de CPU.	Incremento en el rendimiento con mayor consumo.
oltp_delete	Eliminación eficiente con latencia moderada.	Reducción de latencia y mayor eficiencia.
oltp_insert	Inserciones consistentes pero lentas.	Mayor velocidad de inserción.
oltp_point_select	Selecciones rápidas y estables.	Selección más eficiente.
oltp_read_only	Lectura eficiente.	Mayor velocidad de lectura.
oltp_read_write	Buen balance entre lectura y escritura.	Aumento del rendimiento sin errores.
oltp_update_index	Actualización eficiente.	Mayor eficiencia con ligero aumento de latencia.
oltp_update_non_index	Actualización estable.	Incremento del rendimiento sin degradación.
oltp_write_only	Escritura moderada.	Aumento significativo en la velocidad de escritura.
select_random_points	Selección aleatoria rápida.	Selección más eficiente.
select_random_ranges	Rango de selección rápido.	Mayor eficiencia con tiempos de respuesta mejorados.

Comparando las pruebas con 1 y 2 hilos, se nota que usar 2 hilos hace que todo funcione más rápido. Las tareas como insertar, seleccionar y escribir datos mejoraron bastante. Trabajar con varios hilos al mismo tiempo hizo que el sistema fuera más eficiente sin causar problemas.

Por eso, es buena idea configurar la base de datos para usar varios hilos, ya que así se obtiene un mejor rendimiento sin afectar el funcionamiento de la base de datos.

## EVIDENCIAS

### Rendimiento antes de las pruebas



```
root@nodo1: /home/israel
top - 13:20:17 up 51 min, 4 users, load average: 0.55, 0.38, 0.17
Tasks: 131 total, 1 running, 130 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 1.4 sy, 0.0 ni, 96.8 id, 0.9 wa, 0.0 hi, 0.9 si, 0.0 st
MiB Mem : 7942.4 total, 7052.8 free, 682.5 used, 444.1 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7260.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1839	root	20	0	0	0	0	I	2.0	0.0	0:03.90	kworker/0:0-events
231	root	20	0	0	0	0	S	0.3	0.0	0:00.46	jbd2/dm-0-8
<b>2415</b>	<b>root</b>	<b>20</b>	<b>0</b>	<b>11912</b>	<b>5888</b>	<b>3712</b>	<b>R</b>	<b>0.3</b>	<b>0.1</b>	<b>0:00.77</b>	<b>top</b>
1	root	20	0	22272	13380	9412	S	0.0	0.2	0:03.31	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-slub_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
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	0:01.71	ksoftirqd/0
17	root	20	0	0	0	0	I	0.0	0.0	0:00.20	rcu_preempt
18	root	rt	0	0	0	0	S	0.0	0.0	0:00.04	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

bulk\_insert

```
root@nodo1: /home/israel
top - 13:21:26 up 53 min,  4 users,  load average: 0.83, 0.47, 0.21
Tasks: 132 total,  2 running, 130 sleeping,  0 stopped,  0 zombie
%Cpu(s): 15.3 us,  5.5 sy,  0.0 ni,  0.0 id,  0.6 wa,  0.0 hi, 78.5 si,  0.0 st
MiB Mem : 7942.4 total, 6988.8 free,  728.1 used,  462.7 buff/cache
MiB Swap: 4096.0 total, 4096.0 free,  0.0 used. 7214.4 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM    TIME+  COMMAND
 2536 mysql     20   0 1274716 210524 46720 S   87.1   2.6   1:08.40 mariadb
 2628 root       20   0 100072   14848 11264 S    5.6   0.2   0:01.20 sysbench
   54 root       20   0         0         0      0 I    2.6   0.0   0:00.88 kworker/u2:5-events_unbound
 1839 root       20   0         0         0      0 I    2.0   0.0   0:05.30 kworker/0:0-kdmflush/252:0
 231  root       20   0         0         0      0 S    1.0   0.0   0:00.78 jbd2/dm-0-8
 2076 root        0 -20         0         0      0 I    0.7   0.0   0:02.10 kworker/0:0H-kblockd
   16 root       20   0         0         0      0 R    0.3   0.0   0:01.95 ksoftirqd/0
 1453 root       20   0 314136   9088   7552 S    0.3   0.1   0:00.51 upowerd
 2415 root       20   0 11912   5888   3712 R    0.3   0.1   0:00.97 top
    1 root       20   0 22272   13380  9412 S    0.0   0.2   0:03.32 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-slab_
    7 root        0 -20         0         0      0 I    0.0   0.0   0:00.00 kworker/R-netns
   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
   17 root       20   0         0         0      0 I    0.0   0.0   0:00.21 rcu_preempt
   18 root       rt    0         0         0      0 S    0.0   0.0   0:00.04 migration/0
```

```
Threads started!

SQL statistics:
  queries performed:
    read:          0
    write:         47
    other:         0
    total:        47
  transactions:    1468412 (24377.27 per sec.)
  queries:         47 (0.78 per sec.)
  ignored errors:  0 (0.00 per sec.)
  reconnects:      0 (0.00 per sec.)

General statistics:
  total time:      60.2166s
  total number of events: 1468412

Latency (ms):
  min:             0.00
  avg:             0.04
  max:            4947.02
  95th percentile: 0.00
  sum:            57813.05

Threads fairness:
  events (avg/stddev): 1468412.0000/0.00
  execution time (avg/stddev): 57.8131/0.00

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

## 2 hilos

```
top - 14:48:17 up 6 min, 2 users, load average: 0.39, 0.32, 0.19
Tasks: 131 total, 1 running, 130 sleeping, 0 stopped, 0 zombie
%Cpu(s): 34.1 us, 20.9 sy, 0.0 ni, 6.8 id, 3.6 wa, 0.0 hi, 34.5 si, 0.0 st
MiB Mem : 7942.1 total, 7143.5 free, 596.2 used, 434.9 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7345.9 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1748048	328328	157056	S	164.6	4.0	0:14.27	mariadb
1396	root	20	0	166896	15744	11264	S	9.1	0.2	0:00.70	sysbench
86	root	20	0	0	0	0	I	2.3	0.0	0:03.02	kworker/0:4-events
254	root	20	0	0	0	0	D	1.3	0.0	0:00.50	jbd2/dm-0-8
1129	root	0	-20	0	0	0	I	1.3	0.0	0:00.50	kworker/0:2H-kblockd
24	root	20	0	0	0	0	S	1.0	0.0	0:04.16	ksoftirqd/1
31	root	20	0	0	0	0	I	0.6	0.0	0:01.11	kworker/u5:1-writeback
39	root	20	0	0	0	0	I	0.6	0.0	0:02.04	kworker/1:1-mm_percpu_wq
376	root	rt	0	289116	27136	8576	S	0.6	0.3	0:00.68	multipathd
17	root	20	0	0	0	0	I	0.3	0.0	0:00.39	rcu_preempt
63	root	20	0	0	0	0	I	0.3	0.0	0:00.27	kworker/u5:3-events_power_effi+
387	root	20	0	0	0	0	I	0.3	0.0	0:00.03	kworker/u4:1-ext4-rsv-conversi+
607	systemd+	20	0	91020	7680	6784	S	0.3	0.1	0:00.11	systemd-timesyn
1356	israel	20	0	15124	6832	4992	S	0.3	0.1	0:01.24	sshd
1386	root	20	0	11904	5888	3712	R	0.3	0.1	0:00.89	top
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.64	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_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

```
Threads started!

SQL statistics:
  queries performed:
    read: 0
    write: 93
    other: 0
    total: 93
  transactions: 2897309 (47600.80 per sec.)
  queries: 93 (1.53 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects: 0 (0.00 per sec.)

General statistics:
  total time: 60.8572s
  total number of events: 2897309

Latency (ms):
  min: 0.00
  avg: 0.04
  max: 4227.30
  95th percentile: 0.00
  sum: 118158.49

Threads fairness:
  events (avg/stddev): 1448654.5000/14562.50
  execution time (avg/stddev): 59.0792/0.42

root@nodol1:/home/israel#
```

## oltp\_delete

```
root@nodo1: /home/israel
top - 13:24:00 up 55 min, 4 users, load average: 0.85, 0.62, 0.31
Tasks: 138 total, 1 running, 137 sleeping, 0 stopped, 0 zombie
%Cpu(s): 2.6 us, 30.8 sy, 0.0 ni, 0.0 id, 14.4 wa, 0.0 hi, 52.3 si, 0.0 st
MiB Mem : 7942.4 total, 6917.6 free, 763.2 used, 499.3 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7179.2 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM    TIME+  COMMAND
 2536 mysql     20   0 1276608 282332 82944 S   54.1   3.5   1:52.14 mariadb
 2646 root       20   0  99364  13952 11136 S    6.3   0.2   0:00.71 sysbench
 2631 root        0 -20    0      0    0  I   4.6   0.0   0:01.19 kworker/0:2H-kblockd
 2637 root       20   0    0      0    0  I   1.7   0.0   0:03.83 kworker/0:8-events
  16 root       20   0    0      0    0  S    0.3   0.0   0:02.31 ksoftirqd/0
 352 root       rt    0 289116  27392  8704 S    0.3   0.3   0:00.53 multipathd
 2075 root       20   0    0      0    0  I   0.3   0.0   0:00.40 kworker/u2:0-events_power_effi+
 2296 israel     20   0  15128   7092  5120 S    0.3   0.1   0:01.96 sshd
    1 root       20   0  22272  13380  9412 S    0.0   0.2   0:03.32 systemd
    2 root       20   0    0      0    0  S    0.0   0.0   0:00.01 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-slab_
    7 root        0 -20    0      0    0  I   0.0   0.0   0:00.00 kworker/R-netns
   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
   17 root       20   0    0      0    0  I   0.0   0.0   0:00.21 rcu_preempt
   18 root       rt    0    0      0    0  S    0.0   0.0   0:00.04 migration/0
   19 root      -51   0    0      0    0  S    0.0   0.0   0:00.00 idle_inject/0
```

```
SQL statistics:
  queries performed:
    read:          0
    write:         4422
    other:        193923
    total:        198345
  transactions:   198345 (3305.40 per sec.)
  queries:        198345 (3305.40 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects:     0 (0.00 per sec.)
```

```
General statistics:
  total time:      60.0012s
  total number of events: 198345
```

```
Latency (ms):
  min:             0.02
  avg:             0.30
  max:             45.37
  95th percentile: 0.32
  sum:            59628.59
```

```
Threads fairness:
  events (avg/stddev): 198345.0000/0.00
  execution time (avg/stddev): 59.6286/0.00
```

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

## 2 hilos

```
top - 14:51:14 up 9 min,  2 users,  load average: 0.52, 0.64, 0.36
Tasks: 138 total,  1 running, 137 sleeping,  0 stopped,  0 zombie
%Cpu(s): 14.5 us, 26.0 sy,  0.0 ni, 17.8 id, 15.4 wa,  0.0 hi, 26.2 si,  0.0 st
MiB Mem : 7942.1 total, 7052.9 free, 683.1 used, 439.8 buff/cache
MiB Swap: 4096.0 total, 4096.0 free,  0.0 used, 7259.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1739852	420616	157056	S	86.2	5.2	1:46.22	mariadb
1434	root	20	0	165288	14720	11264	S	11.8	0.2	0:00.59	sysbench
24	root	20	0	0	0	0	S	5.9	0.0	0:06.67	ksoftirqd/1
1409	root	0	-20	0	0	0	I	3.0	0.0	0:00.52	kworker/0:1H-kblockd
1253	israel	20	0	15120	7084	5120	S	2.6	0.1	0:02.79	sshd
53	root	0	-20	0	0	0	I	1.6	0.0	0:01.37	kworker/1:1H-kblockd
1393	root	20	0	0	0	0	I	1.6	0.0	0:03.04	kworker/1:0-events
1411	root	20	0	0	0	0	I	0.7	0.0	0:00.06	kworker/0:5-events
1356	israel	20	0	15124	6832	4992	S	0.3	0.1	0:01.38	sshd
1386	root	20	0	11904	5888	3712	R	0.3	0.1	0:02.20	top
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.67	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_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-slab_
7	root	0	-20	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	0:00.31	kworker/0:1-dio/dm-0
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u4:0-ext4-rsv-conversi+
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

Threads started!

SQL statistics:

```
  queries performed:
    read:                0
    write:               4354
    other:              166274
    total:              170628
  transactions:        170628 (2842.70 per sec.)
  queries:             170628 (2842.70 per sec.)
  ignored errors:       0      (0.00 per sec.)
  reconnects:          0      (0.00 per sec.)
```

General statistics:

```
  total time:          60.0029s
  total number of events: 170628
```

Latency (ms):

```
  min:                 0.02
  avg:                 0.70
  max:                 48.48
  95th percentile:    3.02
  sum:                119416.95
```

Threads fairness:

```
  events (avg/stddev):  85314.0000/773.00
  execution time (avg/stddev): 59.7085/0.01
```

root@nodol:/home/israel# |

## oltp\_insert

```
root@nodo1: /home/israel
top - 13:26:28 up 58 min,  4 users,  load average: 0.48, 0.56, 0.33
Tasks: 138 total,  1 running, 137 sleeping,  0 stopped,  0 zombie
%Cpu(s):  0.5 us, 31.9 sy,  0.0 ni,  0.0 id, 22.4 wa,  0.0 hi, 45.2 si,  0.0 st
MiB Mem : 7942.4 total, 6908.0 free, 766.1 used, 506.1 buff/cache
MiB Swap: 4096.0 total, 4096.0 free,  0.0 used. 7176.3 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM    TIME+  COMMAND
 2536 mysql     20   0 1276608 291932 89216 S  49.2   3.6   2:28.34 mariadb
 2631 root       0  -20      0      0      0 I   4.7   0.0   0:02.94 kworker/0:2H-kblockd
 2637 root      20   0      0      0      0 I   1.3   0.0   0:06.09 kworker/0:8-events
 2655 root      20   0   99620  14208 11136 S   1.3   0.2   0:00.23 sysbench
 2296 israel    20   0   15128   7092  5120 S   0.3   0.1   0:02.27 sshd
 2415 root      20   0  11912   5888  3712 R   0.3   0.1   0:01.86 top
    1 root      20   0   22272  13380  9412 S   0.0   0.2   0:03.32 systemd
    2 root      20   0      0      0      0 S   0.0   0.0   0:00.01 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-slub_
    7 root       0  -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-netns
   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   0:02.63 ksoftirqd/0
   17 root      20   0      0      0      0 I   0.0   0.0   0:00.21 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
```

```
SQL statistics:
  queries performed:
    read:                0
    write:               10214
    other:                0
    total:               10214
  transactions:         10214 (170.21 per sec.)
  queries:              10214 (170.21 per sec.)
  ignored errors:        0 (0.00 per sec.)
  reconnects:            0 (0.00 per sec.)

General statistics:
  total time:            60.0013s
  total number of events: 10214

Latency (ms):
  min:                   1.36
  avg:                   5.87
  max:                   100.00
  95th percentile:      8.13
  sum:                   59906.20

Threads fairness:
  events (avg/stddev):   10214.0000/0.00
  execution time (avg/stddev): 59.9062/0.00

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



## 2 hilos

```
top - 14:53:15 up 11 min,  2 users,  load average: 1.62, 0.99, 0.52
Tasks: 138 total,  1 running, 137 sleeping,  0 stopped,  0 zombie
%Cpu(s): 10.4 us, 22.3 sy,  0.0 ni, 26.7 id, 16.1 wa,  0.0 hi, 24.5 si,  0.0 st
MiB Mem : 7942.1 total, 7052.7 free, 683.1 used, 440.1 buff/cache
MiB Swap: 4096.0 total, 4096.0 free,  0.0 used. 7259.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1748048	423560	157056	S	77.6	5.2	3:03.69	mariadb
1443	root	20	0	165800	14720	11136	S	5.9	0.2	0:01.48	sysbench
53	root	0	-20	0	0	0	I	3.0	0.0	0:03.19	kworker/1:1H-kblockd
1409	root	0	-20	0	0	0	I	2.6	0.0	0:02.01	kworker/0:1H-kblockd
24	root	20	0	0	0	0	S	2.3	0.0	0:08.52	ksoftirqd/1
1411	root	20	0	0	0	0	I	2.3	0.0	0:01.60	kworker/0:5-events
1386	root	20	0	11904	5888	3712	R	1.6	0.1	0:03.10	top
1393	root	20	0	0	0	0	I	0.3	0.0	0:04.35	kworker/1:0-events
1442	root	20	0	0	0	0	I	0.3	0.0	0:00.03	kworker/u5:0-events_power_effi+
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.67	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_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
9	root	20	0	0	0	0	I	0.0	0.0	0:00.31	kworker/0:1-dio/dm-0
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u4:0-ext4-rsv-conversi+
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

```
SQL statistics:
  queries performed:
    read:          0
    write:         7672
    other:         0
    total:         7672
  transactions:   7672 (127.81 per sec.)
  queries:        7672 (127.81 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects:     0 (0.00 per sec.)
```

```
General statistics:
  total time:      60.0176s
  total number of events: 7672
```

```
Latency (ms):
  min:            2.16
  avg:            15.62
  max:            63.34
  95th percentile: 24.38
  sum:            119820.09
```

```
Threads fairness:
  events (avg/stddev): 3836.0000/17.00
  execution time (avg/stddev): 59.9100/0.01
```

```
root@nodol1:/home/israel#
```

## oltp\_point\_select

```
root@nodo1: /home/israel
top - 13:30:47 up 1:02, 4 users, load average: 0.33, 0.39, 0.32
Tasks: 130 total, 2 running, 128 sleeping, 0 stopped, 0 zombie
%Cpu(s): 12.6 us, 7.9 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 79.5 si, 0.0 st
MiB Mem : 7942.4 total, 6900.1 free, 768.1 used, 512.0 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7174.3 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM    TIME+  COMMAND
 2536 mysql    20   0 1276608 299356  94592 S   72.6   3.7   2:59.10 mariadb
 2664 root      20   0  99364   14080 11264 S   25.1   0.2   0:02.63 sysbench
 2637 root      20   0      0      0      0 I    1.7   0.0   0:09.89 kworker/0:8-events
  16 root      20   0      0      0      0 R    0.3   0.0   0:02.96 ksoftirqd/0
 2415 root      20   0  11912   5888   3712 R    0.3   0.1   0:02.51 top
    1 root      20   0  22272   13380  9412 S    0.0   0.2   0:03.34 systemd
    2 root      20   0      0      0      0 S    0.0   0.0   0:00.01 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-slub_
    7 root      0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-netns
   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
   17 root      20   0      0      0      0 I    0.0   0.0   0:00.22 rcu_preempt
   18 root      rt    0      0      0      0 S    0.0   0.0   0:00.06 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_
```

```
Threads started!

SQL statistics:
  queries performed:
    read:                267480
    write:                0
    other:                0
    total:               267480
  transactions:         267480 (4457.03 per sec.)
  queries:              267480 (4457.03 per sec.)
  ignored errors:        0 (0.00 per sec.)
  reconnects:            0 (0.00 per sec.)

General statistics:
  total time:            60.0010s
  total number of events: 267480

Latency (ms):
  min:                   0.02
  avg:                   0.22
  max:                   34.93
  95th percentile:      0.25
  sum:                   59490.49

Threads fairness:
  events (avg/stddev):   267480.0000/0.00
  execution time (avg/stddev): 59.4905/0.00

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

## 2 hilos

```
top - 14:55:04 up 12 min, 2 users, load average: 0.70, 0.90, 0.54
Tasks: 133 total, 5 running, 128 sleeping, 0 stopped, 0 zombie
%Cpu(s): 24.6 us, 21.8 sy, 0.0 ni, 29.1 id, 0.0 wa, 0.0 hi, 24.6 si, 0.0 st
MiB Mem : 7942.1 total, 7050.6 free, 684.5 used, 440.8 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7257.6 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1748048	426760	157056	S	93.7	5.2	3:36.59	mariadb
1458	root	20	0	165288	14208	11136	S	33.0	0.2	0:01.05	sysbench
1253	israel	20	0	15120	7084	5120	S	12.9	0.1	0:04.12	sshd
24	root	20	0	0	0	0	R	5.7	0.0	0:10.27	ksoftirqd/1
1449	root	20	0	0	0	0	R	3.5	0.0	0:00.95	kworker/1:2+events
1386	root	20	0	11904	5888	3712	R	0.9	0.1	0:03.76	top
17	root	20	0	0	0	0	I	0.3	0.0	0:00.49	rcu_preempt
39	root	20	0	0	0	0	R	0.3	0.0	0:03.94	kworker/1:1+events
1442	root	20	0	0	0	0	I	0.3	0.0	0:00.17	kworker/u5:0-flush-252:0
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.67	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	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-slub_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u4:0-ext4-rsv-conversi+
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

Threads started!

SQL statistics:

queries performed:

read:	610580
write:	0
other:	0
total:	610580
transactions:	610580 (10170.65 per sec.)
queries:	610580 (10170.65 per sec.)
ignored errors:	0 (0.00 per sec.)
reconnects:	0 (0.00 per sec.)

General statistics:

total time:	60.0252s
total number of events:	610580

Latency (ms):

min:	0.02
avg:	0.19
max:	58.14
95th percentile:	0.32
sum:	118950.91

Threads fairness:

events (avg/stddev):	305290.0000/907.00
execution time (avg/stddev):	59.4755/0.03

root@nodol:/home/israel#

## oltp\_read\_only

```
root@nodo1: /home/israel
top - 13:18:52 up 50 min, 4 users, load average: 0.49, 0.27, 0.11
Tasks: 133 total, 1 running, 132 sleeping, 0 stopped, 0 zombie
%Cpu(s): 15.0 us, 7.2 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 77.8 si, 0.0 st
MiB Mem : 7942.4 total, 7052.8 free, 682.5 used, 444.0 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7259.9 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 2536 mysql    20   0 1272556 146908 29824 S  80.9   1.8   0:16.09 mariadb
 2618 root      20   0 99492 14720 11392 S  15.8   0.2   0:02.79 sysbench
 1839 root      20   0      0      0      0 I   2.0   0.0   0:02.14 kworker/0:0-events
   54 root      20   0      0      0      0 I   0.3   0.0   0:00.67 kworker/u2:5-events_power_effi+
 2296 israel    20   0 15128 7092 5120 S   0.3   0.1   0:01.29 sshd
 2415 root      20   0 11912 5888 3712 R   0.3   0.1   0:00.53 top
    1 root      20   0 22272 13380 9412 S   0.0   0.2   0:03.31 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-slub_
    7 root      0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/R-netns
   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   0:01.56 ksoftirqd/0
   17 root      20   0      0      0      0 I   0.0   0.0   0:00.20 rcu_preempt
   18 root      rt   0      0      0      0 S   0.0   0.0   0:00.04 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
```

```
Threads started!

SQL statistics:
  queries performed:
    read: 137102
    write: 0
    other: 19586
    total: 156688
  transactions: 9793 (163.17 per sec.)
  queries: 156688 (2610.66 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects: 0 (0.00 per sec.)

General statistics:
  total time: 60.0048s
  total number of events: 9793

Latency (ms):
  min: 0.58
  avg: 6.11
  max: 57.91
  95th percentile: 14.46
  sum: 59842.23

Threads fairness:
  events (avg/stddev): 9793.0000/0.00
  execution time (avg/stddev): 59.8422/0.00

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

## 2 hilos

```
top - 14:57:37 up 15 min, 2 users, load average: 1.02, 0.96, 0.62
Tasks: 134 total, 1 running, 133 sleeping, 0 stopped, 0 zombie
%Cpu(s): 34.1 us, 26.4 sy, 0.0 ni, 1.1 id, 0.0 wa, 0.0 hi, 38.5 si, 0.0 st
MiB Mem : 7942.1 total, 7048.0 free, 686.6 used, 441.5 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7255.5 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1739852	426760	157056	S	162.3	5.2	5:36.16	mariadb
1469	root	20	0	165544	14976	11264	S	37.1	0.2	0:08.64	sysbench
1412	root	20	0	0	0	0	I	2.0	0.0	0:04.13	kworker/0:6-events
<b>1386</b>	<b>root</b>	<b>20</b>	<b>0</b>	<b>11904</b>	<b>5888</b>	<b>3712</b>	<b>R</b>	<b>1.7</b>	<b>0.1</b>	<b>0:04.84</b>	<b>top</b>
376	root	rt	0	289116	27136	8576	S	0.7	0.3	0:02.11	multipathd
39	root	20	0	0	0	0	I	0.3	0.0	0:04.56	kworker/1:1-events
1356	israel	20	0	15124	6832	4992	S	0.3	0.1	0:02.17	sshd
1449	root	20	0	0	0	0	I	0.3	0.0	0:02.64	kworker/1:2-ata_sff
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.72	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	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-slub_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u4:0-ext4-rsv-conversi
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	0:00.25	ksoftirqd/0

```
SQL statistics:
  queries performed:
    read: 312032
    write: 0
    other: 44576
    total: 356608
  transactions: 22288 (371.04 per sec.)
  queries: 356608 (5936.57 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects: 0 (0.00 per sec.)

General statistics:
  total time: 60.0597s
  total number of events: 22288

Latency (ms):
  min: 0.60
  avg: 5.38
  max: 250.62
  95th percentile: 8.90
  sum: 119824.46

Threads fairness:
  events (avg/stddev): 11144.0000/59.00
  execution time (avg/stddev): 59.9122/0.00

root@node1: /home/israel#
```

## oltp\_read\_write

```
root@nodo1: /home/israel
top - 13:35:10 up 1:06, 4 users, load average: 0.32, 0.33, 0.32
Tasks: 131 total, 1 running, 130 sleeping, 0 stopped, 0 zombie
%Cpu(s): 4.6 us, 23.4 sy, 0.0 ni, 1.1 id, 7.4 wa, 0.0 hi, 63.4 si, 0.0 st
MiB Mem : 7942.4 total, 6888.5 free, 778.4 used, 513.3 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7164.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
2536	mysql	20	0	1276608	300764	95872	S	66.3	3.7	3:42.68	mariadb
2679	root	20	0	99492	14080	11136	S	7.3	0.2	0:00.88	sysbench
43	root	0	-20	0	0	0	I	5.6	0.0	0:00.68	kworker/0:1H-kblockd
2637	root	20	0	0	0	0	I	1.7	0.0	0:14.08	kworker/0:8-events
16	root	20	0	0	0	0	S	0.3	0.0	0:03.44	ksoftirqd/0
2296	israel	20	0	15128	7092	5120	S	0.3	0.1	0:03.22	sshd
2415	root	20	0	11912	5888	3712	R	0.3	0.1	0:03.19	top
2658	root	20	0	0	0	0	I	0.3	0.0	0:00.28	kworker/u2:2-events_power_effi+
1	root	20	0	22272	13380	9412	S	0.0	0.2	0:03.35	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.01	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-slub_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
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
17	root	20	0	0	0	0	I	0.0	0.0	0:00.22	rcu_preempt
18	root	rt	0	0	0	0	S	0.0	0.0	0:00.06	migration/0
19	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0

Threads started!

SQL statistics:

queries performed:

read: 62538

write: 17868

other: 8934

total: 89340

transactions: 4467 (74.43 per sec.)

queries: 89340 (1488.63 per sec.)

ignored errors: 0 (0.00 per sec.)

reconnects: 0 (0.00 per sec.)

General statistics:

total time: 60.0093s

total number of events: 4467

Latency (ms):

min: 1.89

avg: 13.42

max: 65.59

95th percentile: 21.11

sum: 59964.18

Threads fairness:

events (avg/stddev): 4467.0000/0.00

execution time (avg/stddev): 59.9642/0.00

root@nodo1:/home/israel#

## 2 hilos

```
top - 14:59:20 up 17 min, 2 users, load average: 0.86, 0.97, 0.67
Tasks: 133 total, 3 running, 130 sleeping, 0 stopped, 0 zombie
%Cpu(s): 24.7 us, 33.1 sy, 0.0 ni, 12.1 id, 8.8 wa, 0.0 hi, 21.2 si, 0.0 st
MiB Mem : 7942.1 total, 7046.5 free, 687.5 used, 442.1 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7254.5 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1748048	429704	157056	S	113.2	5.3	6:39.64	mariadb
1484	root	20	0	165544	14464	11136	S	19.7	0.2	0:01.47	sysbench
24	root	20	0	0	0	0	S	4.3	0.0	0:13.26	ksoftirqd/1
1450	root	0	-20	0	0	0	R	2.0	0.0	0:00.35	kworker/1:2H+kblockd
1253	israel	20	0	15120	7084	5120	R	1.6	0.1	0:05.54	sshd
1412	root	20	0	0	0	0	I	1.6	0.0	0:05.98	kworker/0:6-events
1386	root	20	0	11904	5888	3712	R	1.0	0.1	0:05.65	top
1409	root	0	-20	0	0	0	I	1.0	0.0	0:03.53	kworker/0:1H-kblockd
36	root	20	0	0	0	0	I	0.3	0.0	0:01.67	kworker/u5:2-events_power_effi+
1356	israel	20	0	15124	6832	4992	S	0.3	0.1	0:02.44	sshd
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.75	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	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-slab_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u4:0-ext4-rsv-conversi+
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

Threads started!

SQL statistics:

queries performed:

read: 58422

write: 16692

other: 8346

total: 83460

transactions: 4173 (69.51 per sec.)

queries: 83460 (1390.19 per sec.)

ignored errors: 0 (0.00 per sec.)

reconnects: 0 (0.00 per sec.)

General statistics:

total time: 60.0257s

total number of events: 4173

Latency (ms):

min: 3.23

avg: 28.74

max: 165.08

95th percentile: 55.82

sum: 119937.80

Threads fairness:

events (avg/stddev): 2086.5000/11.50

execution time (avg/stddev): 59.9689/0.00

root@nodo1:/home/israel#

## oltp\_update\_index

```
root@nodo1: /home/israel
top - 13:38:05 up 1:09, 4 users, load average: 0.54, 0.42, 0.36
Tasks: 130 total, 1 running, 129 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.5 us, 31.4 sy, 0.0 ni, 0.0 id, 22.2 wa, 0.0 hi, 45.9 si, 0.0 st
MiB Mem : 7942.4 total, 6887.3 free, 768.6 used, 524.5 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7173.8 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 2536 mysql    20   0 1276608 311900 106752 S   48.2   3.8   4:31.14 mariadb
   43 root       0 -20      0      0      0 I    4.7   0.0   0:04.82 kworker/0:1H-kblockd
 2637 root     20   0      0      0      0 I    1.3   0.0   0:16.71 kworker/0:8-events
 2688 root     20   0  99364  14208  11264 S    1.3   0.2   0:00.42 sysbench
 2415 root     20   0 11912  5888  3712 R    0.3   0.1   0:03.64 top
    1 root     20   0  22272  13380  9412 S    0.0   0.2   0:03.36 systemd
    2 root     20   0      0      0      0 S    0.0   0.0   0:00.01 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-slub_
    7 root      0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-netns
   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   0:03.72 ksoftirqd/0
   17 root     20   0      0      0      0 I    0.0   0.0   0:00.22 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 kdevtmpfs
```

```
SQL statistics:
  queries performed:
    read: 0
    write: 10553
    other: 0
    total: 10553
  transactions: 10553 (175.86 per sec.)
  queries: 10553 (175.86 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects: 0 (0.00 per sec.)
```

```
General statistics:
  total time: 60.0025s
  total number of events: 10553
```

```
Latency (ms):
  min: 1.18
  avg: 5.68
  max: 33.80
  95th percentile: 8.13
  sum: 59951.79
```

```
Threads fairness:
  events (avg/stddev): 10553.0000/0.00
  execution time (avg/stddev): 59.9518/0.00
```

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



## 2 hilos

```
top - 15:01:19 up 19 min, 2 users, load average: 1.42, 1.20, 0.79
Tasks: 133 total, 1 running, 132 sleeping, 0 stopped, 0 zombie
%Cpu(s): 11.7 us, 22.7 sy, 0.0 ni, 25.7 id, 15.8 wa, 0.0 hi, 24.2 si, 0.0 st
MiB Mem : 7942.1 total, 7041.8 free, 691.9 used, 442.5 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7250.2 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1748048	430088	157056	S	83.8	5.3	7:51.30	mariadb
1495	root	20	0	165288	14208	11136	S	5.9	0.2	0:00.82	sysbench
1450	root	0	-20	0	0	0	I	3.6	0.0	0:01.96	kworker/1:2H-kblockd
1409	root	0	-20	0	0	0	I	2.3	0.0	0:04.65	kworker/0:1H-kblockd
1412	root	20	0	0	0	0	I	2.0	0.0	0:08.17	kworker/0:6-events
24	root	20	0	0	0	0	S	1.7	0.0	0:15.19	ksoftirqd/1
39	root	20	0	0	0	0	I	1.0	0.0	0:06.14	kworker/1:1-events
1356	israel	20	0	15124	6832	4992	S	0.7	0.1	0:02.59	sshd
1386	root	20	0	11904	5888	3712	R	0.7	0.1	0:06.37	top
28	root	20	0	0	0	0	I	0.3	0.0	0:00.75	kworker/u6:0-events_power_effi+
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.80	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	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-slab_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u4:0-ext4-rsv-conversi+
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

Threads started!

### SQL statistics:

```
queries performed:
  read:                0
  write:               7713
  other:               0
  total:              7713
transactions:         7713 (128.49 per sec.)
queries:              7713 (128.49 per sec.)
ignored errors:       0 (0.00 per sec.)
reconnects:           0 (0.00 per sec.)
```

### General statistics:

```
total time:           60.0112s
total number of events: 7713
```

### Latency (ms):

```
min:                  1.98
avg:                  15.54
max:                  43.91
95th percentile:     24.38
sum:                  119887.32
```

### Threads fairness:

```
events (avg/stddev):  3856.5000/2.50
execution time (avg/stddev): 59.9437/0.01
```

root@node1:/home/israel#

## oltp\_update\_non\_index

```
root@nodo1: /home/israel
top - 13:40:57 up 1:12, 4 users, load average: 0.82, 0.55, 0.41
Tasks: 131 total, 1 running, 130 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.9 us, 31.3 sy, 0.0 ni, 0.0 id, 21.2 wa, 0.0 hi, 46.5 si, 0.0 st
MiB Mem : 7942.4 total, 6876.7 free, 770.5 used, 533.3 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7171.9 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM    TIME+  COMMAND
 2536 mysql    20   0 1276608 322396 115328 S   48.5   4.0   5:06.28 mariadb
 2669 root      0  -20      0      0      0 I    5.0   0.0   0:01.08 kworker/0:2H-kblockd
 2637 root     20   0      0      0      0 I    1.3   0.0   0:19.11 kworker/0:8-events
 2700 root     20   0  99492  14336  11264 S    1.0   0.2   0:00.59 sysbench
 2296 israel   20   0  15128   7092   5120 S    0.3   0.1   0:03.90 sshd
    1 root     20   0  22272  13380  9412 S    0.0   0.2   0:03.37 systemd
    2 root     20   0      0      0      0 S    0.0   0.0   0:00.01 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-slub_
    7 root     0  -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-netns
   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   0:03.93 ksoftirqd/0
   17 root     20   0      0      0      0 I    0.0   0.0   0:00.23 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 kdevtmpfs

SQL statistics:
  queries performed:
    read: 0
    write: 10641
    other: 0
    total: 10641
  transactions: 10641 (177.33 per sec.)
  queries: 10641 (177.33 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects: 0 (0.00 per sec.)

General statistics:
  total time: 60.0025s
  total number of events: 10641

Latency (ms):
  min: 1.23
  avg: 5.63
  max: 182.27
  95th percentile: 7.84
  sum: 59934.43

Threads fairness:
  events (avg/stddev): 10641.0000/0.00
  execution time (avg/stddev): 59.9344/0.00
root@nodo1: /home/israel#
```

## 2 hilos

```
top - 15:03:08 up 21 min,  2 users,  load average: 1.21, 1.21, 0.85
Tasks: 133 total,  1 running, 132 sleeping,  0 stopped,  0 zombie
%Cpu(s): 10.5 us, 24.6 sy,  0.0 ni, 25.9 id, 14.9 wa,  0.0 hi, 24.1 si,  0.0 st
MiB Mem : 7942.1 total, 7044.3 free,  688.8 used,  443.2 buff/cache
MiB Swap: 4096.0 total, 4096.0 free,  0.0 used, 7253.3 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1748048	432520	157056	S	81.8	5.3	8:38.40	mariadb
1505	root	20	0	165544	14336	11136	S	6.6	0.2	0:00.83	sysbench
1409	root	0	-20	0	0	0	I	3.3	0.0	0:06.34	kworker/0:1H-kblockd
1450	root	0	-20	0	0	0	I	3.0	0.0	0:03.74	kworker/1:2H-kblockd
1412	root	20	0	0	0	0	I	2.3	0.0	0:10.15	kworker/0:6-events
24	root	20	0	0	0	0	S	1.3	0.0	0:17.60	ksoftirqd/1
39	root	20	0	0	0	0	I	1.0	0.0	0:07.20	kworker/1:1-events
1386	root	20	0	11904	5888	3712	R	1.0	0.1	0:07.10	top
16	root	20	0	0	0	0	S	0.3	0.0	0:00.34	ksoftirqd/0
376	root	rt	0	289116	27136	8576	S	0.3	0.3	0:02.87	multipathd
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.81	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	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-slub_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
11	root	20	0	0	0	0	I	0.0	0.0	0:00.00	kworker/u4:0-ext4-rsv-conversi+
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

Threads started!

```
SQL statistics:
  queries performed:
    read:          0
    write:         7299
    other:         0
    total:         7299
  transactions:   7299 (121.59 per sec.)
  queries:        7299 (121.59 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects:     0 (0.00 per sec.)
```

```
General statistics:
  total time:      60.0186s
  total number of events: 7299
```

```
Latency (ms):
  min:            2.46
  avg:            16.42
  max:            58.68
  95th percentile: 26.20
  sum:            119872.36
```

```
Threads fairness:
  events (avg/stddev): 3649.5000/69.50
  execution time (avg/stddev): 59.9362/0.01
```

root@nodol1:/home/israel#

## oltp\_write\_only

```
root@nodo1: /home/israel
top - 13:42:30 up 1:14, 4 users, load average: 0.84, 0.59, 0.44
Tasks: 131 total, 1 running, 130 sleeping, 0 stopped, 0 zombie
%Cpu(s): 2.0 us, 32.2 sy, 0.0 ni, 0.0 id, 17.1 wa, 0.0 hi, 48.8 si, 0.0 st
MiB Mem : 7942.4 total, 6863.2 free, 771.0 used, 546.5 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7171.5 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM    TIME+  COMMAND
 2536 mysql     20   0 1276608 335452 128384 S   53.3   4.1   5:34.22 mariadb
 2669 root       0  -20     0     0     0  I    5.0   0.0   0:03.68 kworker/0:2H-kblockd
 2707 root     20   0  99492  14464 11264  S    3.6   0.2   0:01.54 sysbench
 2637 root     20   0     0     0     0  I    1.7   0.0   0:20.53 kworker/0:8-mm_percpu_wq
  231 root     20   0     0     0     0  S    0.3   0.0   0:01.55 jbd2/dm-0-8
 2296 israel    20   0  15128  7092  5120  S    0.3   0.1   0:04.09 sshd
 2415 root     20   0  11912  5888  3712  R    0.3   0.1   0:04.31 top
    1 root     20   0  22272  13380 9412  S    0.0   0.2   0:03.38 systemd
    2 root     20   0     0     0     0  S    0.0   0.0   0:00.01 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-slub_
    7 root     0  -20     0     0     0  I    0.0   0.0   0:00.00 kworker/R-netns
   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   0:04.15 ksoftirqd/0
   17 root     20   0     0     0     0  I    0.0   0.0   0:00.23 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
```

```
SQL statistics:
  queries performed:
    read:          0
    write:         36000
    other:         18000
    total:         54000
  transactions:    9000 (149.97 per sec.)
  queries:         54000 (899.82 per sec.)
  ignored errors:  0 (0.00 per sec.)
  reconnects:      0 (0.00 per sec.)
```

```
General statistics:
  total time:      60.0068s
  total number of events: 9000
```

```
Latency (ms):
  min:            1.74
  avg:            6.66
  max:            35.05
  95th percentile: 9.56
  sum:            59931.63
```

```
Threads fairness:
  events (avg/stddev): 9000.0000/0.00
  execution time (avg/stddev): 59.9316/0.00
```

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

## 2 hilos

```
top - 15:05:00 up 22 min,  2 users,  load average: 0.87, 1.12, 0.86
Tasks: 132 total,  1 running, 131 sleeping,  0 stopped,  0 zombie
%Cpu(s): 16.5 us, 26.2 sy,  0.0 ni, 19.3 id, 14.9 wa,  0.0 hi, 23.1 si,  0.0 st
MiB Mem : 7942.1 total, 7043.3 free,  689.7 used,  443.3 buff/cache
MiB Swap: 4096.0 total, 4096.0 free,  0.0 used. 7252.4 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1748048	432904	157056	S	90.5	5.3	9:30.13	mariadb
1508	root	20	0	165544	14336	11264	S	16.1	0.2	0:02.22	sysbench
1450	root	0	-20	0	0	0	I	3.9	0.0	0:05.65	kworker/1:2H-kblockd
1409	root	0	-20	0	0	0	I	2.3	0.0	0:08.00	kworker/0:1H-kblockd
24	root	20	0	0	0	0	S	2.0	0.0	0:19.04	ksoftirqd/1
1412	root	20	0	0	0	0	I	2.0	0.0	0:11.99	kworker/0:6-events
1386	root	20	0	11904	5888	3712	R	1.3	0.1	0:07.83	top
28	root	20	0	0	0	0	I	0.3	0.0	0:00.82	kworker/u6:0-flush-252:0
376	root	rt	0	289116	27136	8576	S	0.3	0.3	0:03.08	multipathd
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.81	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	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-slab_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
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	0:00.37	ksoftirqd/0

```
Threads started!

SQL statistics:
  queries performed:
    read:          0
    write:         25240
    other:         12620
    total:         37860
  transactions:   6310   (105.12 per sec.)
  queries:        37860  (630.69 per sec.)
  ignored errors: 0      (0.00 per sec.)
  reconnects:     0      (0.00 per sec.)

General statistics:
  total time:      60.0161s
  total number of events: 6310

Latency (ms):
  min:             3.25
  avg:             18.99
  max:             66.83
  95th percentile: 32.53
  sum:             119823.15

Threads fairness:
  events (avg/stddev): 3155.0000/31.00
  execution time (avg/stddev): 59.9116/0.01

root@nodol:/home/israel#
```

## select\_random\_points

```
root@nodo1: /home/israel
top - 13:43:36 up 1:15, 4 users, load average: 0.50, 0.55, 0.44
Tasks: 130 total, 1 running, 129 sleeping, 0 stopped, 0 zombie
%Cpu(s): 17.6 us, 3.3 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 79.1 si, 0.0 st
MiB Mem : 7942.4 total, 6857.8 free, 771.1 used, 551.9 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7171.3 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR  S  %CPU  %MEM    TIME+  COMMAND
 2536 mysql    20   0 1276608 340700 133632 S   90.7   4.2   5:48.46 mariadb
 2710 root      20   0  99884  14584  11264 S    6.6   0.2   0:00.40 sysbench
 2637 root      20   0      0      0      0 I    1.7   0.0   0:21.48 kworker/0:8-events
   16 root      20   0      0      0      0 S    0.3   0.0   0:04.32 ksoftirqd/0
 2415 root      20   0  11912   5888   3712 R    0.3   0.1   0:04.48 top
     1 root      20   0  22272  13380   9412 S    0.0   0.2   0:03.38 systemd
     2 root      20   0      0      0      0 S    0.0   0.0   0:00.01 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-slub_
     7 root      0 -20      0      0      0 I    0.0   0.0   0:00.00 kworker/R-netns
    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
    17 root      20   0      0      0      0 I    0.0   0.0   0:00.23 rcu_preempt
    18 root      rt   0      0      0      0 S    0.0   0.0   0:00.08 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_
```

```
Threads started!

SQL statistics:
  queries performed:
    read:          3965
    write:         0
    other:         0
    total:        3965
  transactions:    3965 (66.06 per sec.)
  queries:        3965 (66.06 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects:     0 (0.00 per sec.)

General statistics:
  total time:      60.0069s
  total number of events: 3965

Latency (ms):
  min:            1.19
  avg:            15.12
  max:            41.19
  95th percentile: 22.69
  sum:            59936.68

Threads fairness:
  events (avg/stddev): 3965.0000/0.00
  execution time (avg/stddev): 59.9367/0.00

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

## 2 hilos

```
top - 15:07:13 up 25 min,  2 users,  load average: 0.92, 1.05, 0.87
Tasks: 131 total,  2 running, 129 sleeping,  0 stopped,  0 zombie
%Cpu(s): 40.3 us, 20.8 sy,  0.0 ni,  1.4 id,  0.0 wa,  0.0 hi, 37.5 si,  0.0 st
MiB Mem : 7942.1 total, 7041.6 free,  691.3 used,  443.5 buff/cache
MiB Swap: 4096.0 total, 4096.0 free,  0.0 used. 7250.8 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1739852	433032	157056	S	155.0	5.3	10:25.30	mariadb
1522	root	20	0	165800	14976	11264	S	33.9	0.2	0:02.83	sysbench
39	root	20	0	0	0	0	R	3.2	0.0	0:10.27	kworker/1:1+events
376	root	rt	0	289116	27136	8576	S	1.3	0.3	0:03.39	multipathd
1386	root	20	0	11904	5888	3712	R	1.3	0.1	0:08.63	top
24	root	20	0	0	0	0	S	1.0	0.0	0:20.45	ksoftirqd/1
1516	root	20	0	0	0	0	I	0.6	0.0	0:00.15	kworker/1:2-events
1442	root	20	0	0	0	0	I	0.3	0.0	0:01.12	kworker/u5:0-flush-252:0
1521	root	20	0	0	0	0	I	0.3	0.0	0:00.01	kworker/u6:1-events_power_effi+
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.81	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	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-slab_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
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	0:00.39	ksoftirqd/0

Threads started!

```
SQL statistics:
  queries performed:
    read:                256718
    write:                0
    other:                0
    total:                256718
  transactions:          256718 (4267.97 per sec.)
  queries:                256718 (4267.97 per sec.)
  ignored errors:         0      (0.00 per sec.)
  reconnects:             0      (0.00 per sec.)
```

```
General statistics:
  total time:             60.1030s
  total number of events: 256718
```

```
Latency (ms):
  min:                    0.04
  avg:                     0.46
  max:                    106.06
  95th percentile:       0.73
  sum:                    118775.99
```

```
Threads fairness:
  events (avg/stddev):    128359.0000/7447.00
  execution time (avg/stddev): 59.3880/0.03
```

root@nodol1:/home/israel#

## select\_random\_ranges

```
root@nodo1: /home/israel
top - 13:45:43 up 1:17, 4 users, load average: 0.37, 0.54, 0.45
Tasks: 130 total, 1 running, 129 sleeping, 0 stopped, 0 zombie
%Cpu(s): 18.1 us, 6.6 sy, 0.0 ni, 0.0 id, 0.0 wa, 0.0 hi, 75.3 si, 0.0 st
MiB Mem : 7942.4 total, 6843.0 free, 785.4 used, 552.3 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7157.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
2536	mysql	20	0	1276608	340700	133632	S	89.1	4.2	6:42.03	mariadb
2385	israel	20	0	15128	7092	5120	S	4.0	0.1	0:15.56	sshd
16	root	20	0	0	0	0	S	2.6	0.0	0:04.74	ksoftirqd/0
2637	root	20	0	0	0	0	I	2.0	0.0	0:23.53	kworker/0:8-events
2724	root	20	0	99364	14080	11264	S	1.3	0.2	0:00.11	sysbench
1453	root	20	0	314136	9216	7552	S	0.3	0.1	0:01.59	upowerd
2296	israel	20	0	15128	7092	5120	S	0.3	0.1	0:04.40	sshd
2415	root	20	0	11912	5888	3712	R	0.3	0.1	0:04.83	top
1	root	20	0	22272	13380	9412	S	0.0	0.2	0:03.38	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.01	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-slub_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
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
17	root	20	0	0	0	0	I	0.0	0.0	0:00.24	rcu_preempt
18	root	rt	0	0	0	0	S	0.0	0.0	0:00.08	migration/0
19	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0

```
Threads started!

SQL statistics:
  queries performed:
    read: 4989
    write: 0
    other: 0
    total: 4989
  transactions: 4989 (83.11 per sec.)
  queries: 4989 (83.11 per sec.)
  ignored errors: 0 (0.00 per sec.)
  reconnects: 0 (0.00 per sec.)

General statistics:
  total time: 60.0165s
  total number of events: 4989

Latency (ms):
  min: 0.52
  avg: 12.02
  max: 46.89
  95th percentile: 19.65
  sum: 59973.20

Threads fairness:
  events (avg/stddev): 4989.0000/0.00
  execution time (avg/stddev): 59.9732/0.00

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



## 2 hilos

```
top - 15:09:06 up 26 min, 2 users, load average: 0.54, 0.94, 0.86
Tasks: 133 total, 1 running, 132 sleeping, 0 stopped, 0 zombie
%Cpu(s): 36.4 us, 22.7 sy, 0.0 ni, 0.6 id, 0.0 wa, 0.0 hi, 40.3 si, 0.0 st
MiB Mem : 7942.1 total, 7038.4 free, 694.0 used, 444.0 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used, 7248.1 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1030	mysql	20	0	1748048	436104	157056	S	158.2	5.4	11:56.60	mariadb
1536	root	20	0	165672	14848	11264	S	32.9	0.2	0:02.26	sysbench
1412	root	20	0	0	0	0	I	3.9	0.0	0:15.33	kworker/0:6-events
1386	root	20	0	11904	5888	3712	R	2.4	0.1	0:09.62	top
1516	root	20	0	0	0	0	I	1.2	0.0	0:01.56	kworker/1:2-mm_percpu_wq
1356	israel	20	0	15124	6832	4992	S	0.9	0.1	0:03.31	sshd
24	root	20	0	0	0	0	S	0.6	0.0	0:22.04	ksoftirqd/1
376	root	rt	0	289116	27136	8576	S	0.6	0.3	0:03.82	multipathd
1494	root	20	0	0	0	0	I	0.6	0.0	0:00.64	kworker/u5:3-events_power_effi+
37	root	20	0	0	0	0	S	0.3	0.0	0:00.38	kcompactd0
1366	root	20	0	16904	7296	6144	S	0.3	0.1	0:00.39	sudo
1409	root	0	-20	0	0	0	I	0.3	0.0	0:09.13	kworker/0:1H-kblockd
1521	root	20	0	0	0	0	I	0.3	0.0	0:00.17	kworker/u6:1-events_power_effi+
1	root	20	0	22116	13220	9380	S	0.0	0.2	0:03.81	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.03	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-slub_
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kblockd
12	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-mm_pe

Threads started!

SQL statistics:

queries performed:

read:	280353
write:	0
other:	0
total:	280353
transactions:	280353 (4668.17 per sec.)
queries:	280353 (4668.17 per sec.)
ignored errors:	0 (0.00 per sec.)
reconnects:	0 (0.00 per sec.)

General statistics:

total time:	60.0483s
total number of events:	280353

Latency (ms):

min:	0.04
avg:	0.42
max:	118.56
95th percentile:	0.67
sum:	118881.26

Threads fairness:

events (avg/stddev):	140176.5000/1319.50
execution time (avg/stddev):	59.4406/0.02

root@nodo1:/home/israel#