测试过程

Sysbench 使用：

数据初始化	sysbench --test=/usr/share/sysbench/oltp_read_only.lua --mysql-host=bogon187 --mysql-port=4000 --mysql-db=test --mysql-user="root" --tables=16 --table_size=1000000 --threads=32 --time=300 --report-interval=10 --db-driver=mysql --db-ps-mode=disable --skip-trx=on --mysql-ignore-errors=6002,6004,4012,2013,4016 prepare sysbench /usr/share/sysbench/oltp_read_only.lua --pgsql-host=10.64.200.186 --pgsql-port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000 --tables=16 --threads=32 --time=300 --report-interval=10 --db-driver=pgsql prepare
纯读场景	sysbench /usr/share/sysbench/oltp_read_only.lua --mysql-host=bogon187 --mysql-port=4000 --mysql-db=test --mysql-user=root --table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=mysql run sysbench /usr/share/sysbench/oltp_read_only.lua --pgsql-host=10.64.200.186 --pgsql-port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=pgsql run
读写混合场景	sysbench /usr/share/sysbench/oltp_read_write.lua --mysql-host=10.64.200.187 --mysql-port=4000 --mysql-db=test --mysql-user=root --table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=mysql run sysbench /usr/share/sysbench/oltp_read_write.lua --pgsql-host=10.64.200.186 --pgsql-port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=pgsql run
纯写场景	sysbench /usr/share/sysbench/oltp_write_only.lua --mysql-host=10.64.200.187 --mysql-port=4000 --mysql-db=test --mysql-user=root --table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=mysql run sysbench /usr/share/sysbench/oltp_write_only.lua --pgsql-host=10.64.200.186 --pgsql-port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=pgsql run

crdb 分布式数据库 oltp 场景

运行 OLTP 只读测试脚本（100 万记录、16 个表、线程 4、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_read_only.lua --pgsql-host=10.64.200.186 --pgsql-
port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000
--tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=pgsql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)
Running the test with following options:
Number of threads: 4
Report intermediate results every 10 second(s)
Initializing random number generator from current time
Initializing worker threads...
Threads started!
[ 10s ] thds: 4 tps: 121.94 qps: 1952.59 (r/w/o: 1708.31/0.00/244.27) lat (ms,95%): 47.47
err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 4 tps: 116.00 qps: 1855.80 (r/w/o: 1623.80/0.00/232.00) lat (ms,95%): 49.21
err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 119.01 qps: 1905.23 (r/w/o: 1667.21/0.00/238.02) lat (ms,95%): 47.47
err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 123.69 qps: 1981.14 (r/w/o: 1733.76/0.00/247.38) lat (ms,95%): 45.79
err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 4 tps: 115.91 qps: 1852.74 (r/w/o: 1620.92/0.00/231.82) lat (ms,95%): 51.02
err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 127.89 qps: 2047.35 (r/w/o: 1791.57/0.00/255.78) lat (ms,95%): 45.79
err/s: 0.00 reconn/s: 0.00
SQL statistics:
queries performed:
read: 101486
write: 0
other: 14498
total: 115984
transactions: 7249 (120.77 per sec.)
queries: 115984 (1932.27 per sec.)
ignored errors: 0 (0.00 per sec.)
reconnects: 0 (0.00 per sec.)

General statistics:
total time: 60.0212s
total number of events: 7249
```

```
Latency (ms):
min: 7.17
avg: 33.11
max: 87.90
95th percentile: 48.34
sum: 239990.12

Threads fairness:
events (avg/stddev): 1812.2500/239.36
execution time (avg/stddev): 59.9975/0.00
```

运行 OLTP 只读测试脚本（100 万记录、16 个表、线程 32、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_read_only.lua --pgsql-host=10.64.200.186 --pgsql-
port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000
--tables=16 --threads=32 --time=60 --report-interval=10 --db-driver=pgsql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 32
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 32 tps: 616.14 qps: 9883.36 (r/w/o: 8647.99/0.00/1235.37) lat (ms,95%):
78.60 err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 32 tps: 610.57 qps: 9764.79 (r/w/o: 8543.66/0.00/1221.14) lat (ms,95%):
78.60 err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 32 tps: 633.67 qps: 10140.77 (r/w/o: 8873.33/0.00/1267.43) lat (ms,95%):
70.55 err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 32 tps: 628.89 qps: 10062.95 (r/w/o: 8805.27/0.00/1257.68) lat (ms,95%):
71.83 err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 32 tps: 621.15 qps: 9938.44 (r/w/o: 8696.05/0.00/1242.39) lat (ms,95%):
74.46 err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 32 tps: 628.22 qps: 10054.08 (r/w/o: 8797.75/0.00/1256.34) lat (ms,95%):
70.55 err/s: 0.00 reconn/s: 0.00
SQL statistics:
```

```
queries performed:
read: 523880
write: 0
other: 74840
total: 598720
transactions: 37420 (623.21 per sec.)
queries: 598720 (9971.41 per sec.)
ignored errors: 0 (0.00 per sec.)
reconnects: 0 (0.00 per sec.)

General statistics:
total time: 60.0423s
total number of events: 37420

Latency (ms):
min: 13.04
avg: 51.31
max: 516.69
95th percentile: 73.13
sum: 1920196.44

Threads fairness:
events (avg/stddev): 1169.3750/126.85
execution time (avg/stddev): 60.0061/0.01
```

运行 OLTP 写测试场景：（100 万记录、16 个表、线程 4、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_write_only.lua --pgsql-host=10.64.200.186 --pgsql-
port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000
--tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=pgsql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 4
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...
```

```
Threads started!

[ 10s ] thds: 4 tps: 170.01 qps: 1021.13 (r/w/o: 0.00/172.30/848.83) lat (ms,95%): 44.17
err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 4 tps: 125.71 qps: 755.18 (r/w/o: 0.00/130.41/624.77) lat (ms,95%): 57.87
err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 126.90 qps: 761.10 (r/w/o: 0.00/131.50/629.60) lat (ms,95%): 58.92
err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 127.39 qps: 764.36 (r/w/o: 0.00/135.39/628.97) lat (ms,95%): 64.47
err/s: 0.10 reconn/s: 0.00
[ 50s ] thds: 4 tps: 142.91 qps: 858.04 (r/w/o: 0.00/156.41/701.63) lat (ms,95%): 55.82
err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 123.90 qps: 743.50 (r/w/o: 0.00/137.80/605.70) lat (ms,95%): 63.32
err/s: 0.00 reconn/s: 0.00
SQL statistics:
queries performed:
read: 0
write: 8639
other: 40403
total: 49042
transactions: 8173 (136.10 per sec.)
queries: 49042 (816.66 per sec.)
ignored errors: 1 (0.02 per sec.)
reconnects: 0 (0.00 per sec.)

General statistics:
total time: 60.0480s
total number of events: 8173

Latency (ms):
min: 8.14
avg: 29.37
max: 229.51
95th percentile: 57.87
sum: 240071.36

Threads fairness:
events (avg/stddev): 2043.2500/195.04
execution time (avg/stddev): 60.0178/0.01
```

运行 OLTP 写测试场景：（100 万记录、16 个表、线程 32、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_write_only.lua --pgsql-host=10.64.200.186 --pgsql-
port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000
--tables=16 --threads=32 --time=60 --report-interval=10 --db-driver=pgsql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 32
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 32 tps: 550.57 qps: 3319.91 (r/w/o: 0.00/794.82/2525.08) lat (ms,95%): 97.55
err/s: 0.30 reconn/s: 0.00
[ 20s ] thds: 32 tps: 568.38 qps: 3410.09 (r/w/o: 0.00/851.47/2558.62) lat (ms,95%): 97.55
err/s: 0.10 reconn/s: 0.00
[ 30s ] thds: 32 tps: 552.61 qps: 3315.34 (r/w/o: 0.00/857.17/2458.18) lat (ms,95%):
101.13 err/s: 0.10 reconn/s: 0.00
[ 40s ] thds: 32 tps: 577.19 qps: 3463.56 (r/w/o: 0.00/929.49/2534.07) lat (ms,95%): 99.33
err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 32 tps: 501.39 qps: 3006.54 (r/w/o: 0.00/834.68/2171.86) lat (ms,95%):
108.68 err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 32 tps: 537.79 qps: 3226.32 (r/w/o: 0.00/927.68/2298.64) lat (ms,95%):
104.84 err/s: 0.00 reconn/s: 0.00
SQL statistics:
queries performed:
read: 0
write: 51976
other: 145530
total: 197506
transactions: 32914 (548.03 per sec.)
queries: 197506 (3288.53 per sec.)
ignored errors: 5 (0.08 per sec.)
reconnects: 0 (0.00 per sec.)

General statistics:
```

```
total time: 60.0553s
total number of events: 32914

Latency (ms):
min: 16.05
avg: 58.35
max: 274.35
95th percentile: 102.97
sum: 1920499.92

Threads fairness:
events (avg/stddev): 1028.5625/51.67
execution time (avg/stddev): 60.0156/0.02
```

运行 OLTP 混合读写场景：（100 万记录、16 个表、线程 4、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_read_write.lua --pgsql-host=10.64.200.186 --pgsql-
port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000
--tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=pgsql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 4
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 4 tps: 60.29 qps: 1208.54 (r/w/o: 846.41/69.78/292.34) lat (ms,95%): 110.66
err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 4 tps: 63.88 qps: 1279.59 (r/w/o: 896.19/73.58/309.83) lat (ms,95%): 90.78
err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 54.30 qps: 1086.44 (r/w/o: 760.46/61.90/264.09) lat (ms,95%): 125.52
err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 48.10 qps: 959.95 (r/w/o: 671.23/55.50/233.21) lat (ms,95%): 127.81
err/s: 0.00 reconn/s: 0.00
```

```
[ 50s ] thds: 4 tps: 58.50 qps: 1172.81 (r/w/o: 821.41/66.60/284.80) lat (ms,95%): 102.97
err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 66.80 qps: 1333.14 (r/w/o: 933.16/76.40/323.58) lat (ms,95%): 86.00
err/s: 0.00 reconn/s: 0.00
SQL statistics:
queries performed:
read: 49322
write: 4043
other: 17095
total: 70460
transactions: 3523 (58.66 per sec.)
queries: 70460 (1173.26 per sec.)
ignored errors: 0 (0.00 per sec.)
reconnects: 0 (0.00 per sec.)

General statistics:
total time: 60.0512s
total number of events: 3523

Latency (ms):
min: 21.96
avg: 68.15
max: 175.32
95th percentile: 110.66
sum: 240104.75

Threads fairness:
events (avg/stddev): 880.7500/131.65
execution time (avg/stddev): 60.0262/0.01
```

运行 OLTP 混合读写场景：（100 万记录、16 个表、线程 32、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_read_write.lua --pgsql-host=10.64.200.186 --pgsql-
port=26257 --pgsql-db=sysbench --pgsql-user=backup --pgsql-password= --table_size=1000000
--tables=16 --threads=32 --time=60 --report-interval=10 --db-driver=pgsql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 32
Report intermediate results every 10 second(s)
```

```
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 32 tps: 340.17 qps: 6855.99 (r/w/o: 4802.97/404.33/1648.69) lat (ms,95%):
139.85 err/s: 0.10 reconn/s: 0.00
[ 20s ] thds: 32 tps: 305.12 qps: 6098.37 (r/w/o: 4269.46/374.92/1453.99) lat (ms,95%):
158.63 err/s: 0.30 reconn/s: 0.00
[ 30s ] thds: 32 tps: 322.98 qps: 6466.65 (r/w/o: 4526.78/411.47/1528.39) lat (ms,95%):
150.29 err/s: 0.60 reconn/s: 0.00
[ 40s ] thds: 32 tps: 321.86 qps: 6442.84 (r/w/o: 4510.50/420.44/1511.90) lat (ms,95%):
150.29 err/s: 0.30 reconn/s: 0.00
[ 50s ] thds: 32 tps: 313.15 qps: 6274.06 (r/w/o: 4392.64/423.47/1457.95) lat (ms,95%):
144.97 err/s: 0.40 reconn/s: 0.00
[ 60s ] thds: 32 tps: 267.79 qps: 5362.81 (r/w/o: 3754.67/374.59/1233.56) lat (ms,95%):
176.73 err/s: 0.30 reconn/s: 0.00
SQL statistics:
queries performed:
read: 262696
write: 24118
other: 88424
total: 375238
transactions: 18745 (311.72 per sec.)
queries: 375238 (6240.05 per sec.)
ignored errors: 20 (0.33 per sec.)
reconnects: 0 (0.00 per sec.)

General statistics:
total time: 60.1301s
total number of events: 18745

Latency (ms):
min: 36.76
avg: 102.54
max: 573.45
95th percentile: 155.80
sum: 1922037.90
```

```
Threads fairness:
events (avg/stddev): 585.7812/57.78
execution time (avg/stddev): 60.0637/0.03
```

tidb 分布式数据库 oltp 场景

纯读场景（100 万记录、16 个表、线程 4、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_read_only.lua --mysql-host=bogon186 --mysql-port=40000 --mysql-db=test --mysql-user=root  --table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-driver=mysql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

[ 10s ] thds: 4 tps: 116.43 qps: 1866.65 (r/w/o: 1633.38/0.00/233.27) lat (ms,95%): 42.61 err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 4 tps: 118.50 qps: 1897.24 (r/w/o: 1660.24/0.00/237.01) lat (ms,95%): 44.98 err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 102.61 qps: 1639.63 (r/w/o: 1434.42/0.00/205.22) lat (ms,95%): 51.94 err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 104.90 qps: 1679.01 (r/w/o: 1469.21/0.00/209.80) lat (ms,95%): 49.21 err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 4 tps: 113.30 qps: 1813.08 (r/w/o: 1586.48/0.00/226.60) lat (ms,95%): 47.47 err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 112.40 qps: 1799.02 (r/w/o: 1574.21/0.00/224.80) lat (ms,95%): 46.63 err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
        read:                            93604
        write:                           0
        other:                           13372
        total:                           106976
    transactions:                        6686   (111.39 per sec.)
    queries:                             106976 (1782.17 per sec.)
    ignored errors:                      0      (0.00 per sec.)
    reconnects:                          0      (0.00 per sec.)

General statistics:
    total time:                          60.0221s
    total number of events:              6686
```

```
Latency (ms):
         min:                                    16.27
         avg:                                    35.89
         max:                                  241.49
         95th percentile:                        47.47
         sum:                                239977.93

Threads fairness:
    events (avg/stddev):       1671.5000/136.01
    execution time (avg/stddev):   59.9945/0.00
```

纯读场景（100 万记录、16 个表、线程 32、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_read_only.lua --mysql-host=bogon186 --mysql-port=40000 --mysql-db=test --mysql-user=root  --table_size=1000000 --tables=16 --threads=32 --time=60 --report-interval=10 --db-driver=mysql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

[ 10s ] thds: 32 tps: 671.41 qps: 10768.42 (r/w/o: 9422.59/0.00/1345.83) lat (ms,95%): 62.19 err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 32 tps: 657.06 qps: 10512.58 (r/w/o: 9198.36/0.00/1314.22) lat (ms,95%): 61.08 err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 32 tps: 688.03 qps: 11010.49 (r/w/o: 9634.43/0.00/1376.06) lat (ms,95%): 56.84 err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 32 tps: 655.07 qps: 10484.18 (r/w/o: 9173.94/0.00/1310.23) lat (ms,95%): 59.99 err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 32 tps: 688.23 qps: 11009.06 (r/w/o: 9632.70/0.00/1376.36) lat (ms,95%): 55.82 err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 32 tps: 625.11 qps: 9995.92 (r/w/o: 8745.71/0.00/1250.22) lat (ms,95%): 66.84 err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
        read:                            558390
        write:                           0
        other:                           79770
        total:                           638160
    transactions:                        39885  (664.13 per sec.)
    queries:                             638160 (10626.05 per sec.)
```

```
    ignored errors:                  0      (0.00 per sec.)
    reconnects:                      0      (0.00 per sec.)

General statistics:
    total time:                      60.0525s
    total number of events:          39885

Latency (ms):
         min:                                    24.57
         avg:                                    48.15
         max:                                  261.12
         95th percentile:                        59.99
         sum:                                1920495.75

Threads fairness:
    events (avg/stddev):       1246.4062/35.33
    execution time (avg/stddev):   60.0155/0.01
```

读写混合（100 万记录、16 个表、线程 4、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_read_write.lua --mysql-host=10.64.200.186 --mysql-
port=40000 --mysql-db=test --mysql-user=root --table_size=1000000 --tables=16 --threads=4
--time=60 --report-interval=10 --db-driver=mysql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

[ 10s ] thds: 4 tps: 39.29 qps: 789.92 (r/w/o: 553.78/155.87/80.28) lat (ms,95%): 176.73
err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 4 tps: 37.60 qps: 752.63 (r/w/o: 526.52/149.41/76.70) lat (ms,95%): 207.82
err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 37.90 qps: 760.70 (r/w/o: 532.40/150.60/77.70) lat (ms,95%): 193.38
err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 51.30 qps: 1022.90 (r/w/o: 716.50/202.10/104.30) lat (ms,95%): 161.51
err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 4 tps: 33.80 qps: 677.87 (r/w/o: 474.88/134.09/68.90) lat (ms,95%): 179.94
err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 34.00 qps: 678.13 (r/w/o: 473.52/135.51/69.10) lat (ms,95%): 196.89
err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
```

```
        read:                            32802
        write:                           9284
        other:                           4774
        total:                           46860
    transactions:                        2343   (39.00 per sec.)
    queries:                             46860  (780.05 per sec.)
    ignored errors:                      0      (0.00 per sec.)
    reconnects:                          0      (0.00 per sec.)

General statistics:
    total time:                          60.0690s
    total number of events:              2343

Latency (ms):
         min:                                    32.88
         avg:                                  102.48
         max:                                  263.28
         95th percentile:                      186.54
         sum:                                  240111.55

Threads fairness:
    events (avg/stddev):           585.7500/66.27
    execution time (avg/stddev):   60.0279/0.03
```

读写混合（100 万记录、16 个表、线程 32、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_read_write.lua --mysql-host=10.64.200.186 --mysql-
port=40000 --mysql-db=test --mysql-user=root --table_size=1000000 --tables=16 --threads=32
--time=60 --report-interval=10 --db-driver=mysql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

[ 10s ] thds: 32 tps: 187.90 qps: 3809.43 (r/w/o: 2671.35/751.19/386.89) lat (ms,95%):
244.38 err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 32 tps: 209.22 qps: 4179.06 (r/w/o: 2927.55/825.07/426.44) lat (ms,95%):
215.44 err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 32 tps: 187.25 qps: 3725.15 (r/w/o: 2603.03/740.01/382.11) lat (ms,95%):
248.83 err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 32 tps: 233.44 qps: 4678.64 (r/w/o: 3277.82/924.65/476.17) lat (ms,95%):
200.47 err/s: 0.00 reconn/s: 0.00
```

```
[ 50s ] thds: 32 tps: 187.95 qps: 3768.31 (r/w/o: 2638.01/745.30/385.00) lat (ms,95%):
235.74 err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 32 tps: 214.81 qps: 4292.74 (r/w/o: 3005.37/848.85/438.52) lat (ms,95%):
227.40 err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
        read:                            171346
        write:                           48447
        other:                           24987
        total:                           244780
    transactions:                        12239  (203.28 per sec.)
    queries:                             244780 (4065.69 per sec.)
    ignored errors:                      0      (0.00 per sec.)
    reconnects:                          0      (0.00 per sec.)

General statistics:
    total time:                          60.2049s
    total number of events:              12239

Latency (ms):
         min:                                    59.83
         avg:                                  157.22
         max:                                  627.54
         95th percentile:                      231.53
         sum:                                  1924227.05

Threads fairness:
    events (avg/stddev):           382.4688/24.12
    execution time (avg/stddev):   60.1321/0.06
```

纯写（100 万记录、16 个表、线程 4、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_write_only.lua --mysql-host=10.64.200.186 --mysql-
port=40000 --mysql-db=test --mysql-user=root --table_size=1000000 --tables=16 --threads=4
--time=60 --report-interval=10 --db-driver=mysql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

[ 10s ] thds: 4 tps: 55.57 qps: 334.53 (r/w/o: 0.00/221.49/113.04) lat (ms,95%): 142.39
err/s: 0.00 reconn/s: 0.00
```

```
[ 20s ] thds: 4 tps: 47.90 qps: 287.41 (r/w/o: 0.00/189.61/97.80) lat (ms,95%): 147.61
err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 57.90 qps: 347.60 (r/w/o: 0.00/229.00/118.60) lat (ms,95%): 142.39
err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 69.30 qps: 415.71 (r/w/o: 0.00/275.11/140.60) lat (ms,95%): 130.13
err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 4 tps: 50.40 qps: 303.20 (r/w/o: 0.00/199.60/103.60) lat (ms,95%): 147.61
err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 62.10 qps: 371.97 (r/w/o: 0.00/246.18/125.79) lat (ms,95%): 139.85
err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
        read:                            0
        write:                           13617
        other:                           6999
        total:                           20616
    transactions:                        3436   (57.21 per sec.)
    queries:                             20616  (343.28 per sec.)
    ignored errors:                      0      (0.00 per sec.)
    reconnects:                          0      (0.00 per sec.)

General statistics:
    total time:                          60.0515s
    total number of events:              3436

Latency (ms):
         min:                                    17.04
         avg:                                    69.86
         max:                                   261.56
         95th percentile:                       142.39
         sum:                                   240046.30

Threads fairness:
    events (avg/stddev):           859.0000/29.67
    execution time (avg/stddev):   60.0116/0.02
```

纯写（100 万记录、16 个表、线程 32、时间 60s 报告间隔 10）

```
sysbench /usr/share/sysbench/oltp_write_only.lua --mysql-host=10.64.200.186 --mysql-
port=40000 --mysql-db=test --mysql-user=root --table_size=1000000 --tables=16 --threads=32
--time=60 --report-interval=10 --db-driver=mysql run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

[ 10s ] thds: 32 tps: 309.44 qps: 1867.65 (r/w/o: 0.00/1233.17/634.48) lat (ms,95%):
155.80 err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 32 tps: 299.62 qps: 1797.30 (r/w/o: 0.00/1186.67/610.63) lat (ms,95%):
167.44 err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 32 tps: 268.50 qps: 1610.09 (r/w/o: 0.00/1063.69/546.40) lat (ms,95%):
170.48 err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 32 tps: 255.30 qps: 1533.21 (r/w/o: 0.00/1013.61/519.60) lat (ms,95%):
200.47 err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 32 tps: 354.29 qps: 2125.45 (r/w/o: 0.00/1403.27/722.18) lat (ms,95%):
153.02 err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 32 tps: 297.11 qps: 1782.55 (r/w/o: 0.00/1177.23/605.32) lat (ms,95%):
179.94 err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
        read:                            0
        write:                           70835
        other:                           36421
        total:                           107256
    transactions:                        17876  (297.50 per sec.)
    queries:                             107256 (1785.01 per sec.)
    ignored errors:                      0      (0.00 per sec.)
    reconnects:                          0      (0.00 per sec.)

General statistics:
    total time:                          60.0833s
    total number of events:              17876

Latency (ms):
         min:                                    31.37
         avg:                                  107.47
         max:                                  369.84
         95th percentile:                      176.73
         sum:                                  1921065.40

Threads fairness:
    events (avg/stddev):           558.6250/15.88
```

```
    execution time (avg/stddev):   60.0333/0.03
```

Greenplum 分布式数据库 oltp 场景

sysbench 32 线程纯读场景

```
sysbench /usr/share/sysbench/oltp_read_only.lua --pgsql-host=10.64.200.190 --pgsql-
port=5432 --pgsql-db=sysbench --pgsql-user=gpadmin --pgsql-password=gpadmin --
table_size=1000000 --tables=16 --threads=32 --time=600 --report-interval=10 --db-
driver=pgsql  run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 32
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 32 tps: 189.20 qps: 3054.27 (r/w/o: 2672.86/0.00/381.41) lat (ms,95%):
308.84 err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 32 tps: 195.51 qps: 3129.91 (r/w/o: 2738.70/0.00/391.21) lat (ms,95%):
363.18 err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 32 tps: 244.22 qps: 3909.74 (r/w/o: 3421.31/0.00/488.43) lat (ms,95%):
183.21 err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 32 tps: 285.68 qps: 4565.77 (r/w/o: 3994.41/0.00/571.36) lat (ms,95%):
147.61 err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 32 tps: 247.60 qps: 3966.66 (r/w/o: 3471.47/0.00/495.20) lat (ms,95%):
183.21 err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 32 tps: 250.32 qps: 4003.56 (r/w/o: 3502.93/0.00/500.63) lat (ms,95%):
204.11 err/s: 0.00 reconn/s: 0.00
[ 70s ] thds: 32 tps: 287.61 qps: 4598.62 (r/w/o: 4023.50/0.00/575.13) lat (ms,95%):
147.61 err/s: 0.00 reconn/s: 0.00
[ 80s ] thds: 32 tps: 277.68 qps: 4447.93 (r/w/o: 3892.47/0.00/555.45) lat (ms,95%):
155.80 err/s: 0.00 reconn/s: 0.00
```

```
[ 90s ] thds: 32 tps: 260.82 qps: 4165.44 (r/w/o: 3643.80/0.00/521.64) lat (ms,95%):
176.73 err/s: 0.00 reconn/s: 0.00
[ 100s ] thds: 32 tps: 256.80 qps: 4111.55 (r/w/o: 3597.96/0.00/513.59) lat (ms,95%):
183.21 err/s: 0.00 reconn/s: 0.00
[ 110s ] thds: 32 tps: 234.79 qps: 3759.08 (r/w/o: 3289.51/0.00/469.57) lat (ms,95%):
196.89 err/s: 0.00 reconn/s: 0.00
[ 120s ] thds: 32 tps: 245.89 qps: 3934.84 (r/w/o: 3443.26/0.00/491.58) lat (ms,95%):
183.21 err/s: 0.00 reconn/s: 0.00
[ 130s ] thds: 32 tps: 222.70 qps: 3557.34 (r/w/o: 3111.85/0.00/445.49) lat (ms,95%):
244.38 err/s: 0.00 reconn/s: 0.00
[ 140s ] thds: 32 tps: 285.60 qps: 4578.06 (r/w/o: 4006.85/0.00/571.21) lat (ms,95%):
161.51 err/s: 0.00 reconn/s: 0.00
```

sysbench 32 线程纯写场景

```
sysbench /usr/share/sysbench/oltp_write_only.lua --pgsql-host=10.64.200.190 --pgsql-
port=5432 --pgsql-db=sysbench --pgsql-user=gpadmin --pgsql-password=gpadmin --
table_size=1000000 --tables=16 --threads=32 --time=600 --report-interval=10 --db-
driver=pgsql  run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 32
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 32 tps: 754.82 qps: 4541.00 (r/w/o: 0.00/3028.37/1512.63) lat (ms,95%):
80.03 err/s: 0.10 reconn/s: 0.00
[ 20s ] thds: 32 tps: 882.45 qps: 5295.00 (r/w/o: 0.00/3529.10/1765.90) lat (ms,95%):
64.47 err/s: 0.20 reconn/s: 0.00
[ 30s ] thds: 32 tps: 1096.68 qps: 6582.69 (r/w/o: 0.00/4388.43/2194.26) lat (ms,95%):
56.84 err/s: 0.30 reconn/s: 0.00
[ 40s ] thds: 32 tps: 500.32 qps: 3005.32 (r/w/o: 0.00/2004.68/1000.64) lat (ms,95%):
363.18 err/s: 0.00 reconn/s: 0.00
```

```
[ 50s ] thds: 32 tps: 832.64 qps: 4991.56 (r/w/o: 0.00/3326.07/1665.49) lat (ms,95%):
51.02 err/s: 0.10 reconn/s: 0.00
[ 60s ] thds: 32 tps: 1121.71 qps: 6734.44 (r/w/o: 0.00/4490.12/2244.31) lat (ms,95%):
45.79 err/s: 0.40 reconn/s: 0.00
[ 70s ] thds: 32 tps: 650.65 qps: 3905.97 (r/w/o: 0.00/2604.58/1301.39) lat (ms,95%):
68.05 err/s: 0.00 reconn/s: 0.00
```

sysbench 32 线程混合读写场景

```
sysbench /usr/share/sysbench/oltp_read_write.lua --pgsql-host=10.64.200.190 --pgsql-
port=5432 --pgsql-db=sysbench --pgsql-user=gpadmin --pgsql-password=gpadmin --
table_size=1000000 --tables=16 --threads=32 --time=600 --report-interval=10 --db-
driver=pgsql  run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 32
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 32 tps: 139.83 qps: 2842.83 (r/w/o: 1993.37/566.71/282.75) lat (ms,95%):
458.96 err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 32 tps: 199.01 qps: 3970.87 (r/w/o: 2779.79/792.95/398.13) lat (ms,95%):
207.82 err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 32 tps: 192.30 qps: 3840.46 (r/w/o: 2689.47/766.39/384.60) lat (ms,95%):
223.34 err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 32 tps: 109.00 qps: 2207.76 (r/w/o: 1543.24/446.51/218.01) lat (ms,95%):
634.66 err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 32 tps: 175.00 qps: 3468.32 (r/w/o: 2429.24/688.98/350.09) lat (ms,95%):
314.45 err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 32 tps: 176.49 qps: 3532.25 (r/w/o: 2474.39/704.87/352.98) lat (ms,95%):
292.60 err/s: 0.00 reconn/s: 0.00
[ 70s ] thds: 32 tps: 103.50 qps: 2068.86 (r/w/o: 1445.64/416.21/207.01) lat (ms,95%):
943.16 err/s: 0.00 reconn/s: 0.00
```

```
[ 80s ] thds: 32 tps: 188.48 qps: 3778.15 (r/w/o: 2645.99/755.21/376.96) lat (ms,95%):
231.53 err/s: 0.00 reconn/s: 0.00
```

sysbench 4 线程纯读场景

```
sysbench /usr/share/sysbench/oltp_read_only.lua --pgsql-host=10.64.200.190 --pgsql-
port=5432 --pgsql-db=sysbench --pgsql-user=gpadmin --pgsql-password=gpadmin --
table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-
driver=pgsql  run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 4
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 4 tps: 61.97 qps: 996.06 (r/w/o: 871.72/0.00/124.33) lat (ms,95%): 114.72
err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 4 tps: 54.20 qps: 866.78 (r/w/o: 758.37/0.00/108.41) lat (ms,95%): 123.28
err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 51.60 qps: 823.40 (r/w/o: 720.20/0.00/103.20) lat (ms,95%): 125.52
err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 62.50 qps: 1002.35 (r/w/o: 877.35/0.00/124.99) lat (ms,95%): 106.75
err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 4 tps: 66.60 qps: 1065.77 (r/w/o: 932.56/0.00/133.21) lat (ms,95%): 104.84
err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 57.40 qps: 919.27 (r/w/o: 804.48/0.00/114.80) lat (ms,95%): 118.92
err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
        read:                            49658
        write:                           0
        other:                           7094
        total:                           56752
```

```
    transactions:                        3547   (59.05 per sec.)
    queries:                             56752  (944.84 per sec.)
    ignored errors:                      0      (0.00 per sec.)
    reconnects:                          0      (0.00 per sec.)

General statistics:
    total time:                          60.0612s
    total number of events:              3547

Latency (ms):
         min:                                    35.15
         avg:                                    67.68
         max:                                   243.56
         95th percentile:                       116.80
         sum:                                   240050.09

Threads fairness:
    events (avg/stddev):           886.7500/13.44
    execution time (avg/stddev):   60.0125/0.02
```

sysbench 4 线程纯写场景

```
sysbench /usr/share/sysbench/oltp_write_only.lua --pgsql-host=10.64.200.190 --pgsql-
port=5432 --pgsql-db=sysbench --pgsql-user=gpadmin --pgsql-password=gpadmin --
table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-
driver=pgsql  run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 4
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!
```

```
[ 10s ] thds: 4 tps: 159.62 qps: 959.12 (r/w/o: 0.00/639.48/319.64) lat (ms,95%): 50.11
err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 4 tps: 197.01 qps: 1182.27 (r/w/o: 0.00/788.24/394.02) lat (ms,95%): 36.24
err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 192.10 qps: 1152.70 (r/w/o: 0.00/768.50/384.20) lat (ms,95%): 38.25
err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 187.69 qps: 1126.02 (r/w/o: 0.00/750.65/375.37) lat (ms,95%): 39.65
err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 4 tps: 221.91 qps: 1331.39 (r/w/o: 0.00/887.56/443.83) lat (ms,95%): 34.95
err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 198.70 qps: 1192.30 (r/w/o: 0.00/794.90/397.40) lat (ms,95%): 38.94
err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
        read:                            0
        write:                           46300
        other:                           23150
        total:                           69450
    transactions:                        11575  (192.79 per sec.)
    queries:                             69450  (1156.74 per sec.)
    ignored errors:                      0      (0.00 per sec.)
    reconnects:                          0      (0.00 per sec.)

General statistics:
    total time:                          60.0359s
    total number of events:              11575

Latency (ms):
         min:                                    5.29
         avg:                                   20.73
         max:                                  251.29
         95th percentile:                       39.65
         sum:                                240002.02

Threads fairness:
    events (avg/stddev):           2893.7500/7.85
    execution time (avg/stddev):   60.0005/0.01
```

sysbench 4 线程混合读写场景

```
sysbench /usr/share/sysbench/oltp_read_write.lua --pgsql-host=10.64.200.190 --pgsql-
port=5432 --pgsql-db=sysbench --pgsql-user=gpadmin --pgsql-password=gpadmin --
table_size=1000000 --tables=16 --threads=4 --time=60 --report-interval=10 --db-
driver=pgsql  run
sysbench 1.0.17 (using system LuaJIT 2.0.4)

Running the test with following options:
Number of threads: 4
Report intermediate results every 10 second(s)
Initializing random number generator from current time


Initializing worker threads...

Threads started!

[ 10s ] thds: 4 tps: 36.98 qps: 743.92 (r/w/o: 521.24/148.33/74.36) lat (ms,95%): 144.97
err/s: 0.00 reconn/s: 0.00
[ 20s ] thds: 4 tps: 36.00 qps: 722.43 (r/w/o: 506.02/144.41/72.00) lat (ms,95%): 161.51
err/s: 0.00 reconn/s: 0.00
[ 30s ] thds: 4 tps: 38.30 qps: 763.11 (r/w/o: 534.11/152.40/76.60) lat (ms,95%): 139.85
err/s: 0.00 reconn/s: 0.00
[ 40s ] thds: 4 tps: 50.58 qps: 1009.96 (r/w/o: 706.46/202.33/101.17) lat (ms,95%): 116.80
err/s: 0.00 reconn/s: 0.00
[ 50s ] thds: 4 tps: 38.31 qps: 768.86 (r/w/o: 538.18/154.05/76.63) lat (ms,95%): 155.80
err/s: 0.00 reconn/s: 0.00
[ 60s ] thds: 4 tps: 40.50 qps: 810.68 (r/w/o: 568.09/161.60/81.00) lat (ms,95%): 150.29
err/s: 0.00 reconn/s: 0.00
SQL statistics:
    queries performed:
        read:                            33754
        write:                           9644
        other:                           4822
        total:                           48220
    transactions:                        2411   (40.14 per sec.)
    queries:                             48220  (802.88 per sec.)
    ignored errors:                      0      (0.00 per sec.)
    reconnects:                          0      (0.00 per sec.)

General statistics:
    total time:                          60.0545s
```

```
    total number of events:          2411

Latency (ms):
         min:                                    46.15
         avg:                                    99.59
         max:                                  587.46
         95th percentile:                      144.97
         sum:                                  240123.35

Threads fairness:
    events (avg/stddev):       602.7500/3.03
    execution time (avg/stddev):   60.0308/0.02
```

Pgbench 开启死锁检测参数，没有关闭 orca 单线程和 32 线程无明显差别

使用 pgbench 测试场景

16 个客户端连接，一线程并发 测试时间 20s ，每个命令的报告 指定自定义脚本

单独查询场景：

```
\set scale 1000
\set naccounts 100000 * :scale
\set aid random(1, :naccounts)
SELECT abalance FROM pgbench_accounts WHERE aid = :aid;

[root@mdw 12.2]# pgbench -hlocalhost -Ugpadmin -c16 -j1 -T 20 -r pgbench -f
/opt/single.sql
starting vacuum...end.
transaction type: /opt/single.sql
scaling factor: 1
query mode: simple
```

```
number of clients: 16
number of threads: 1
duration: 20 s
number of transactions actually processed: 45746
latency average = 7.000 ms
tps = 2285.869876 (including connections establishing)
tps = 2286.386920 (excluding connections establishing)
statement latencies in milliseconds:
0.002 \set scale 1000
0.001 \set naccounts 100000 * :scale
0.002 \set aid random(1, :naccounts)
6.950 SELECT abalance FROM pgbench_accounts WHERE aid = :aid;
```

更新写入场景：

```
\set scale 1000
\set nbranches 1 * :scale
\set ntellers 10 * :scale
\set naccounts 100000 * :scale
\set aid random(1, :naccounts)
\set bid random(1, :nbranches)
\set tid random(1, :ntellers)
\set delta random(-5000, 5000)

BEGIN;
UPDATE pgbench_accounts SET abalance = abalance + :delta WHERE aid = :aid;
SELECT abalance FROM pgbench_accounts WHERE aid = :aid;
UPDATE pgbench_tellers SET tbalance = tbalance + :delta WHERE tid = :tid;
UPDATE pgbench_branches SET bbalance = bbalance + :delta WHERE bid = :bid;
INSERT INTO pgbench_history (tid, bid, aid, delta, mtime) VALUES
(:tid, :bid, :aid, :delta, CURRENT_TIMESTAMP);
END;

[root@mdw 12.2]# pgbench -hlocalhost -Ugpadmin -c16 -j1 -T 20 -r pgbench -f
/opt/update.sql
starting vacuum...end.
transaction type: /opt/update.sql
scaling factor: 1
query mode: simple
```

```
number of clients: 16
number of threads: 1
duration: 20 s
number of transactions actually processed: 4671
latency average = 68.797 ms
tps = 232.568474 (including connections establishing)
tps = 232.654774 (excluding connections establishing)
statement latencies in milliseconds:
0.003 \set scale 1000
0.003 \set nbranches 1 * :scale
0.001 \set ntellers 10 * :scale
0.001 \set naccounts 100000 * :scale
0.003 \set aid random(1, :naccounts)
0.002 \set bid random(1, :nbranches)
0.001 \set tid random(1, :ntellers)
0.002 \set delta random(-5000, 5000)
0.379 BEGIN;
11.739 UPDATE pgbench_accounts SET abalance = abalance + :delta WHERE aid = :aid;
8.683 SELECT abalance FROM pgbench_accounts WHERE aid = :aid;
10.525 UPDATE pgbench_tellers SET tbalance = tbalance + :delta WHERE tid = :tid;
10.229 UPDATE pgbench_branches SET bbalance = bbalance + :delta WHERE bid = :bid;
10.125 INSERT INTO pgbench_history (tid, bid, aid, delta, mtime) VALUES
(:tid, :bid, :aid, :delta, CURRENT_TIMESTAMP);
16.496 END;
```

单独更新场景：

```
\set scale 1000
\set naccounts 100000 * :scale
\set aid random(1, :naccounts)
\set delta random( -5000, 5000)

UPDATE pgbench_accounts SET abalance = abalance + :delta WHERE aid = :aid;
```

```
[root@mdw 12.2]# pgbench -hlocalhost -Ugpadmin -c16 -j1 -T 20 -r pgbench -f
/opt/single_update.sql
starting vacuum...end.
transaction type: /opt/single_update.sql
scaling factor: 1
```

```
query mode: simple
number of clients: 16
number of threads: 1
duration: 20 s
number of transactions actually processed: 29630
latency average = 10.809 ms
tps = 1480.219151 (including connections establishing)
tps = 1481.356649 (excluding connections establishing)
statement latencies in milliseconds:
0.002 \set scale 1000
0.001 \set naccounts 100000 * :scale
0.002 \set aid random(1, :naccounts)
0.001 \set delta random( -5000, 5000)
10.649 UPDATE pgbench_accounts SET abalance = abalance + :delta WHERE aid = :aid;
```

单独写入场景：

```
\set scale 1000
\set nbranches 1 * :scale
\set ntellers 10 * :scale
\set naccounts 100000 * :scale
\set aid random(1, :naccounts)
\set bid random(1, :nbranches)
\set tid random(1, :ntellers)
\set delta random(-5000, 5000)

INSERT INTO pgbench_history (tid, bid, aid, delta, mtime) VALUES
(:tid, :bid, :aid, :delta, CURRENT_TIMESTAMP);
```

```
[root@mdw 12.2]# pgbench -hlocalhost -Ugpadmin -c16 -j1 -T 20 -r pgbench -f
/opt/single_insert.sql
starting vacuum...end.
transaction type: /opt/single_insert.sql
scaling factor: 1
query mode: simple
number of clients: 16
number of threads: 1
duration: 20 s
number of transactions actually processed: 20372
latency average = 15.732 ms
tps = 1017.034475 (including connections establishing)
```

```
tps = 1017.841020 (excluding connections establishing)
statement latencies in milliseconds:
0.003 \set scale 1000
0.002 \set nbranches 1 * :scale
0.001 \set ntellers 10 * :scale
0.001 \set naccounts 100000 * :scale
0.002 \set aid random(1, :naccounts)
0.001 \set bid random(1, :nbranches)
0.001 \set tid random(1, :ntellers)
0.001 \set delta random(-5000, 5000)
15.476 INSERT INTO pgbench_history (tid, bid, aid, delta, mtime) VALUES
(:tid, :bid, :aid, :delta, CURRENT_TIMESTAMP);
```

16 个客户端连接，32 线程并发 测试时间 20s ，每个命令的报告 指定自定义脚本

单独查询场景：

```
[postgres@mdw ~]$ pgbench -hlocalhost -Ugpadmin -c16 -j32 -T 20 -r pgbench -f
/opt/single.sql
starting vacuum...end.
transaction type: /opt/single.sql
scaling factor: 1
query mode: simple
number of clients: 16
number of threads: 16
duration: 20 s
number of transactions actually processed: 40572
latency average = 7.893 ms
tps = 2027.231461 (including connections establishing)
tps = 2029.835059 (excluding connections establishing)
statement latencies in milliseconds:
0.002 \set scale 1000
0.001 \set naccounts 100000 * :scale
0.002 \set aid random(1, :naccounts)
7.879 SELECT abalance FROM pgbench_accounts WHERE aid = :aid;
```

更新写入场景：

```
[postgres@mdw ~]$ pgbench -hlocalhost -Ugpadmin -c16 -j32 -T 20 -r pgbench -f
/opt/update.sql
starting vacuum...end.
transaction type: /opt/update.sql
scaling factor: 1
query mode: simple
number of clients: 16
number of threads: 16
duration: 20 s
number of transactions actually processed: 4567
latency average = 70.332 ms
tps = 227.491103 (including connections establishing)
tps = 227.730726 (excluding connections establishing)
statement latencies in milliseconds:
0.004 \set scale 1000
0.003 \set nbranches 1 * :scale
0.001 \set ntellers 10 * :scale
0.001 \set naccounts 100000 * :scale
0.004 \set aid random(1, :naccounts)
0.001 \set bid random(1, :nbranches)
0.002 \set tid random(1, :ntellers)
0.002 \set delta random(-5000, 5000)
0.385 BEGIN;
11.844 UPDATE pgbench_accounts SET abalance = abalance + :delta WHERE aid = :aid;
8.818 SELECT abalance FROM pgbench_accounts WHERE aid = :aid;
10.576 UPDATE pgbench_tellers SET tbalance = tbalance + :delta WHERE tid = :tid;
10.451 UPDATE pgbench_branches SET bbalance = bbalance + :delta WHERE bid = :bid;
10.373 INSERT INTO pgbench_history (tid, bid, aid, delta, mtime) VALUES
(:tid, :bid, :aid, :delta, CURRENT_TIMESTAMP);
17.705 END;
```

单独写入场景：

```
[postgres@mdw ~]$ pgbench -hlocalhost -Ugpadmin -c16 -j32 -T 20 -r pgbench -f
/opt/single_insert.sql
```

```
starting vacuum...end.
transaction type: /opt/single_insert.sql
scaling factor: 1
query mode: simple
number of clients: 16
number of threads: 16
duration: 20 s
number of transactions actually processed: 18077
latency average = 17.714 ms
tps = 903.248151 (including connections establishing)
tps = 904.348639 (excluding connections establishing)
statement latencies in milliseconds:
0.004 \set scale 1000
0.003 \set nbranches 1 * :scale
0.001 \set ntellers 10 * :scale
0.001 \set naccounts 100000 * :scale
0.003 \set aid random(1, :naccounts)
0.001 \set bid random(1, :nbranches)
0.001 \set tid random(1, :ntellers)
0.002 \set delta random(-5000, 5000)
17.682 INSERT INTO pgbench_history (tid, bid, aid, delta, mtime) VALUES
(:tid, :bid, :aid, :delta, CURRENT_TIMESTAMP);
```

pgbench 优化后 32 线程读、写、读写混合

```
pgbench -h10.64.200.190 -Ugpadmin -c32 -j32 -T 20 -r pgbench -f /opt/single.sql
Password:
starting vacuum...end.
transaction type: Custom query
scaling factor: 1
query mode: simple
number of clients: 32
number of threads: 32
duration: 20 s
number of transactions actually processed: 215672
tps = 10777.690592 (including connections establishing)
tps = 10797.557023 (excluding connections establishing)
statement latencies in milliseconds:
        0.006641         \set scale 1000
```

```
        0.001822         \set naccounts 100000 * :scale
        0.001566         \setrandom aid 1 :naccounts
        2.947055        SELECT abalance FROM pgbench_accounts WHERE aid = :aid;

-bash-4.2$ pgbench -h10.64.200.190 -Ugpadmin -c32 -j32 -T 20 -r pgbench -f
/opt/single_insert.sql
Password:
starting vacuum...end.
transaction type: Custom query
scaling factor: 1
query mode: simple
number of clients: 32
number of threads: 32
duration: 20 s
number of transactions actually processed: 93161
tps = 4634.385668 (including connections establishing)
tps = 4644.544709 (excluding connections establishing)
statement latencies in milliseconds:
        0.004898         \set scale 1000
        0.001213         \set nbranches 1 * :scale
        0.000923         \set ntellers 10 * :scale
        0.000962         \set naccounts 100000 * :scale
        0.001178         \setrandom aid 1 :naccounts
        0.000861         \setrandom bid 1 :nbranches
        0.000893         \setrandom tid 1 :ntellers
        0.000935         \setrandom delta -5000 5000
        6.860416        INSERT INTO pgbench_history (tid, bid, aid, delta, mtime) VALUES
(:tid, :bid, :aid, :delta, CURRENT_TIMESTAMP);
-bash-4.2$ pgbench -h10.64.200.190 -Ugpadmin -c32 -j32 -T 20 -r pgbench -f /opt/update.sql
Password:
starting vacuum...end.
transaction type: Custom query
scaling factor: 1
query mode: simple
number of clients: 32
number of threads: 32
duration: 20 s
number of transactions actually processed: 19412
tps = 967.984892 (including connections establishing)
tps = 969.740280 (excluding connections establishing)
statement latencies in milliseconds:
```

```
        0.007900         \set scale 1000
        0.002276         \set nbranches 1 * :scale
        0.001800         \set ntellers 10 * :scale
        0.001787         \set naccounts 100000 * :scale
        0.002059         \setrandom aid 1 :naccounts
        0.001507         \setrandom bid 1 :nbranches
        0.001516         \setrandom tid 1 :ntellers
        0.001504         \setrandom delta -5000 5000
        0.877593        BEGIN;
        3.375003        UPDATE pgbench_accounts SET abalance = abalance + :delta WHERE aid
= :aid;
        3.742017        SELECT abalance FROM pgbench_accounts WHERE aid = :aid;
        3.330311        UPDATE pgbench_tellers SET tbalance = tbalance + :delta WHERE tid
= :tid;
        3.171567        UPDATE pgbench_branches SET bbalance = bbalance + :delta WHERE bid
= :bid;
        3.419975        INSERT INTO pgbench_history (tid, bid, aid, delta, mtime) VALUES
(:tid, :bid, :aid, :delta, CURRENT_TIMESTAMP);
        14.980200       END;
```