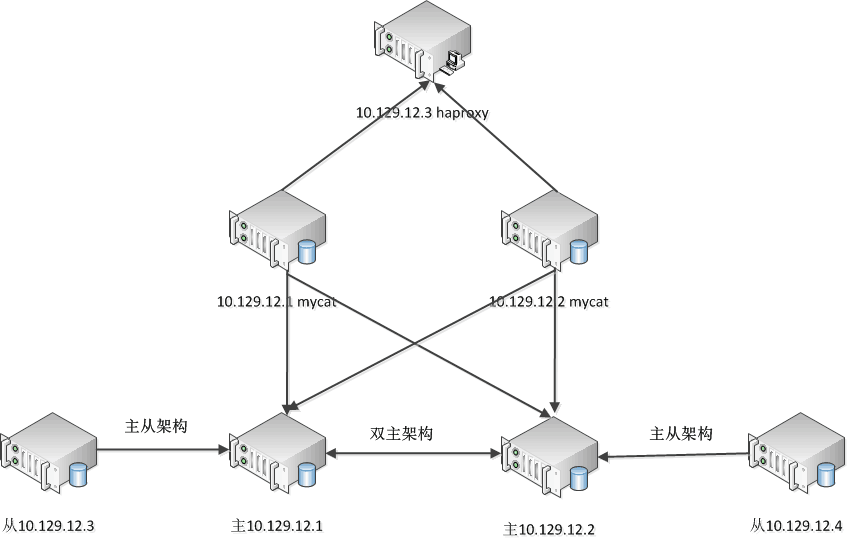


**统一开发环境mysql 5.7.11测试文档**

**基于sysbench测试工具**



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**1 文档概述**

**1.1 范围说明**

本文通过sysbench对mysql环境进行基准测试。该测试基于扬州机房现运行生产环境和移动机房统一开发环境。测试从5个方面进行比对，分别是CPU计算，FILEIO文件读取能力，OLTP联机事务处理能力，MEMORY内存能力、THREADS多线程能力进行比对，比对分别产出运行结果，并根据运行结过项，产出对比报表。

**1.2 sysbench工具简介**

sysbench专门针对mysql等关系型数据库进行测试的工具，多个mysql专家推荐的mysql基准测试工具。需编译安装，安装好后通过运行相应的参数，得到关于CPU计算，FILEIO文件输入输出能力，OLTP联机事务处理能力等真实环境的性能测试结果。

**1.3 测试环境说明**

**(1) 172.168.234.31 （内网IP）**

扬州机房现运行生产环境

mysql版本 5.6.24

CPU型号: Intel Xeon E312xx (8CPU)

内存大小: 32 GB

**(2) 10.129.12.1 （内网IP）**

移动机房新统一开发环境

mysql版本 5.7.11

CPU型号: Intel(R) Xeon(R) CPU E5-2609 v2 @ 2.50GHz (8CPU)

内存大小: 16 GB

**2 测试用例与测试结果**

**2.1 CPU测试**

**2.1.1 CPU测试用例与参数说明**

$ sysbench

--test=cpu \

--cpu-max-prime=20000 \

run

求20000以内最大素数

**2.1.2 CPU测试报告**

**2.1.2.1 CPU测试结果**

(1) 172.168.234.31现生产环境

[root@mysql-server03 sysbench]# sysbench --test=cpu --cpu-max-prime=20000 run

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 1

Random number generator seed is 0 and will be ignored

Primer numbers limit: 20000

Threads started!

General statistics:

total time: 31.9484s

total number of events: 10000

total time taken by event execution: 31.9375s

response time:

min: 3.05ms

avg: 3.19ms

max: 3.96ms

approx. 95 percentile: 3.27ms

Threads fairness:

events (avg/stddev): 10000.0000/0.00

execution time (avg/stddev): 31.9375/0.00

(2) 10.129.12.1 新开发环境

[root@mysql01 sysbench]# sysbench --test=cpu --cpu-max-prime=20000 run

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 1

Random number generator seed is 0 and will be ignored

Primer numbers limit: 20000

Threads started!

General statistics:

total time: 36.9325s

total number of events: 10000

total time taken by event execution: 36.9301s

response time:

min: 3.64ms

avg: 3.69ms

max: 7.65ms

approx. 95 percentile: 3.65ms

Threads fairness:

events (avg/stddev): 10000.0000/0.00

execution time (avg/stddev): 36.9301/0.00

**2.1.2.2 CPU测试报表**

表2-1-2-2 CPU测试报表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结果项 | 结过项含义 | 172.168.234.31  现生产环境 | 10.129.12.1  新开发环境 | 优势说明 |
| total time | 脚本总运行时间 | 31.9484s | 36.9325s | 越小执行越快 |
| total number of events | 总的执行事件数（个） | 10000 | 10000 | 越大负载越强 |
| total time taken by event execution | 事件总的执行时间 | 31.9375s | 36.9301s | 越小执行越快 |
| min response time | 最小的响应时间 | 3.05ms | 3.64ms | 越小响应越快 |
| avg response time | 平均的响应时间 | 3.19ms | 3.69ms | 越小响应越快 |
| max response time | 最大的响应时间 | 3.96ms | 7.65ms | 越小响应越快 |
| approx. 95 percentile response time | 大约95%的响应时间 | 3.27ms | 3.65ms | 越小响应越快 |
| threads events avg | 每线程平均执行事件数 | 10000.0000 | 10000.0000 | 越大负载越强 |
| threads events stddev | 每线程事件数标准方差 | 0.00 | 0.00 | 据线程能力判断 |
| Threads execution time avg | 每线程平均执行时间 | 31.9375 | 36.9301 | 越小执行越快 |
| Threads execution time stddev | 每线程执行标准方差 | 0.00 | 0.00 | 越小越稳定 |

**2.1.2.3 CPU测试结论**

关于针对mysql计算的CPU性能，扬州机房现生产环境机器 略优于 移动机房新统一开发环境机器。

**2.2 FILEIO测试**

**2.2.1 FILEIO测试用例与脚本**

**2.2.1.1 prepare预准备测试文件（文件写时间测试）**

## 在/data/sysbench文件夹下生成测试文件，统一管理

$ mkdir -p /data/sysbench

$ cd /data/sysbench

$ nohup \

sysbench --test=fileio --file-total-size=128GB --num-threads=16 \

prepare > /data/sysbench/fileio.log &

其中，

test=fileio表示进行文件输入输出测试。

file-total-size表示生成的文件的总大小。

num-threads表示分16线程进行生成与测试。

**2.2.1.2 run运行测试（文件读写时间测试）**

$ sysbench \

--test=fileio \

--file-total-size=128GB \

--num-threads=16 \

--file-test-mode=rndrw \

run

其中，

file-test-mode=rndrw表示进行对生成文件进行random read write随机读写测试。

**2.2.1.3 cleanup清空测试文件**

$ sysbench \

--test=fileio \

--file-total-size=128GB \

--num-threads=16 \

cleanup

**2.2.2** **FILEIO测试报告**

**2.2.2.1 FILEIO测试结果**

(1) 172.168.234.31现生产环境

1) 创建128G文件时间

sysbench 0.5: multi-threaded system evaluation benchmark

128 files, 1048576Kb each, 131072Mb total

Creating files for the test...

Extra file open flags: 0

Creating file test\_file.0

Creating file test\_file.1

...

Creating file test\_file.127

137438953472 bytes written in 2766.32 seconds (47.38 MB/sec).

2) 随机读写128G文件时间

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 16

Random number generator seed is 0 and will be ignored

Extra file open flags: 0

128 files, 1Gb each

128Gb total file size

Block size 16Kb

Number of IO requests: 10000

Read/Write ratio for combined random IO test: 1.50

Periodic FSYNC enabled, calling fsync() each 100 requests.

Calling fsync() at the end of test, Enabled.

Using synchronous I/O mode

Doing random r/w test

Threads started!

Operations performed: 6006 reads, 3994 writes, 12800 Other = 22800 Total

Read 93.844Mb Written 62.406Mb Total transferred 156.25Mb (423.11Kb/sec)

26.44 Requests/sec executed

General statistics:

total time: 378.1508s

total number of events: 10000

total time taken by event execution: 5321.2143s

response time:

min: 0.01ms

avg: 532.12ms

max: 3157.79ms

approx. 95 percentile: 2006.80ms

Threads fairness:

events (avg/stddev): 625.0000/20.74

execution time (avg/stddev): 332.5759/6.31

(2) 10.129.12.1 新开发环境

1) 创建128G文件时间

sysbench 0.5: multi-threaded system evaluation benchmark

128 files, 1048576Kb each, 131072Mb total

Creating files for the test...

Extra file open flags: 0

Creating file test\_file.0

Creating file test\_file.1

......

Creating file test\_file.127

137438953472 bytes written in 449.59 seconds (291.54 MB/sec).

2) 随机读写128G文件时间

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 16

Random number generator seed is 0 and will be ignored

Extra file open flags: 0

128 files, 1Gb each

128Gb total file size

Block size 16Kb

Number of IO requests: 10000

Read/Write ratio for combined random IO test: 1.50

Periodic FSYNC enabled, calling fsync() each 100 requests.

Calling fsync() at the end of test, Enabled.

Using synchronous I/O mode

Doing random r/w test

Threads started!

Operations performed: 6006 reads, 3994 writes, 12800 Other = 22800 Total

Read 93.844Mb Written 62.406Mb Total transferred 156.25Mb (20.217Mb/sec)

1293.92 Requests/sec executed

General statistics:

total time: 7.7285s

total number of events: 10000

total time taken by event execution: 121.2307s

response time:

min: 0.01ms

avg: 12.12ms

max: 250.46ms

approx. 95 percentile: 50.83ms

Threads fairness:

events (avg/stddev): 625.0000/27.35

execution time (avg/stddev): 7.5769/0.02

**2.2.2.2 FILEIO测试报表**

表2-2-2-2 FILEIO测试报表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结果项 | 结过项含义 | 172.168.234.31  现生产环境 | 10.129.12.1  新开发环境 | 优势说明 |
| 137438953472 bytes written in | 创建128G文件秒数 | 2766.32s | 449.59s | 越小执行越快 |
| MB/sec | 每秒写入MB数 | 47.38 MB/sec | 291.54 MB/sec | 越大写入越快 |
| total time | 脚本总运行时间 | 378.1508s | 7.7285s | 越小执行越快 |
| total number of events | 总的执行事件数（个） | 10000 | 10000 | 越大负载越强 |
| total time taken by event execution | 事件总的执行时间 | 5321.2143s | 121.2307s | 越小执行越快 |
| min response time | 最小的响应时间 | 0.01ms | 0.01ms | 越小响应越快 |
| avg response time | 平均的响应时间 | 532.12ms | 12.12ms | 越小响应越快 |
| max response time | 最大的响应时间 | 3157.79ms | 250.46ms | 越小响应越快 |
| approx. 95 percentile response time | 大约95%的响应时间 | 2006.80ms | 50.83ms | 越小响应越快 |
| threads events avg | 每线程平均执行事件数 | 625.0000 | 625.0000 | 越大负载越强 |
| threads events stddev | 每线程事件数标准方差 | 20.74 | 27.35 | 据线程能力判断 |
| Threads execution time avg | 每线程平均执行时间 | 332.5759 | 7.5769 | 越小执行越快 |
| Threads execution time stddev | 每线程执行标准方差 | 6.31 | 0.02 | 越小越稳定 |

**2.2.2.3 FILEIO测试结论**

关于针对mysql文件读写FILEIO性能，扬州机房现生产环境机器 远差于 移动机房新统一开发环境机器。每线程执行标准方差来看，新环境文件读写更加稳定，从总时间和平均时间上来看，新环境文件读写的时间更少。

**2.3 OLTP测试**

OLTP联机事务能力测试，根据参数，生成10个测试表格，根据表格中数据的随机读写，来生成测试结果。

**2.3.1 OLTP测试用例与脚本**

**2.3.1.1 prepare预准备测试表格**

create database sysbenchtest default character set utf8;

nohup \

sysbench \ --test=/root/wenlong.zhou/sysbench-0.4.12-1.1/sysbench/tests/db/oltp.lua \

--mysql-host=localhost \

--mysql-socket=/tmp/mysql.sock \

--mysql-db=sysbenchtest \

--mysql-user=root \

--mysql-password=xxxxxx \

--oltp-tables-count=10 \

--oltp-table-size=10000000 \

--max-time=60 \

--max-requests=100000 \

--num-threads=16 \

prepare > /data/sysbench/oltp\_prepare.log

其中的部分参数解释：

test=…/ oltp.lua引用OLTP测试配置文件。

mysql-host=localhost测试主机名

mysql-socket=/tmp/mysql.sock mysql接口文件，在31上不用写这个参数

mysql-db=sysbenchtest测试数据库名

mysql-user=root测试用户名

mysql-password=测试密码

oltp-tables-count=10 测试生成的表格数量，这里为10张

oltp-table-size=10000000 每张表生成一千万条数据

max-time=60 最大的读取次数

max-requests=100000 最大的并发访问量

num-threads=16 总共16个线程

**2.3.1.2 run运行测试**

**2.3.1.2.1 多线程测试**

sysbench \ --test=/root/wenlong.zhou/sysbench-0.4.12-1.1/sysbench/tests/db/oltp.lua \

--mysql-host=localhost \

--mysql-socket=/tmp/mysql.sock \

--mysql-db=sysbenchtest \

--mysql-user=root \

--mysql-password=xxxxxx \

--oltp-tables-count=10 \

--oltp-table-size=10000000 \

--max-time=60 \

--max-requests=100000 \

--num-threads=16 \

prepare > /data/sysbench/oltp\_run.log

其中，

num-threads=16为多线程测试。

**2.3.1.2.2 单线程测试**

sysbench \ --test=/root/wenlong.zhou/sysbench-0.4.12-1.1/sysbench/tests/db/oltp.lua \

--mysql-host=localhost \

--mysql-db=sysbenchtest \

--mysql-user=root \

--mysql-password=xxxxxx \

--oltp-tables-count=10 \

--oltp-table-size=10000000 \

--max-time=60 \

--max-requests=100000 \

prepare > /data/sysbench/oltp\_run\_single\_threads.log

其中，

将num-threads=16这个参数去掉

**2.3.1.3 cleanup清空测试表格**

sysbench \ --test=/root/wenlong.zhou/sysbench-0.4.12-1.1/sysbench/tests/db/oltp.lua \

--mysql-host=localhost \

--mysql-db=sysbenchtest \

--mysql-user=root \

--mysql-password=xxxxxx \

--oltp-tables-count=10 \

--oltp-table-size=10000000 \

--max-time=60 \

--max-requests=100000 \

cleanup

**2.3.2 OLTP测试报告**

**2.3.2.1 第一次16线程OLTP测试结果**

(1) 172.168.234.31现生产环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 16

Random number generator seed is 0 and will be ignored

Threads started!

OLTP test statistics:

queries performed:

read: 1176

write: 336

other: 168

total: 1680

transactions: 84 (1.26 per sec.)

deadlocks: 0 (0.00 per sec.)

read/write requests: 1512 (22.73 per sec.)

other operations: 168 (2.53 per sec.)

General statistics:

total time: 66.5230s

total number of events: 84

total time taken by event execution: 1032.1404s

response time:

min: 6356.93ms

avg: 12287.39ms

max: 22921.33ms

approx. 95 percentile: 20900.33ms

Threads fairness:

events (avg/stddev): 5.2500/0.43

execution time (avg/stddev): 64.5088/1.54

(2) 10.129.12.1 新开发环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 16

Random number generator seed is 0 and will be ignored

Threads started!

OLTP test statistics:

queries performed:

read: 89544

write: 25584

other: 12792

total: 127920

transactions: 6396 (105.73 per sec.)

deadlocks: 0 (0.00 per sec.)

read/write requests: 115128 (1903.09 per sec.)

other operations: 12792 (211.45 per sec.)

General statistics:

total time: 60.4952s

total number of events: 6396

total time taken by event execution: 961.7860s

response time:

min: 2.81ms

avg: 150.37ms

max: 2568.62ms

approx. 95 percentile: 643.62ms

Threads fairness:

events (avg/stddev): 399.7500/19.46

execution time (avg/stddev): 60.1116/0.19

**2.3.2.2 第一次16线程OLTP测试报表**

表2-3-2-2 第一次多线程OLTP测试报表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结果项 | 结过项含义 | 172.168.234.31  现生产环境 | 10.129.12.1  新开发环境 | 优势说明 |
| read queries performed | 执行的读请求(个) | 1176 | 89544 | 越大负载越强 |
| write queries performed | 执行的写请求(个) | 336 | 25584 | 越大负载越强 |
| other queries performed | 执行的其它请求(个) | 168 | 12792 | 越大负载越强 |
| total queries performed | 执行的总请求(个) | 1680 | 127920 | 越大负载越强 |
| transactions | 执行事务总数和每秒数 | 84 (1.26/s) | 6396(105.73/s) | 越大负载越强 |
| deadlocks | 期间死锁总数和每秒数 | 0 (0.00/s) | 0 (0.00/s) | 越小越好 |
| read/write requests | 读写请求总数和每秒数 | 1512(22.73/s) | 115128 (1903.09/s) | 越大负载越强 |
| other operations | 其它操作总数和每秒数 | 168 (2.53/s) | 12792(211.45/s) | 越大负载越强 |
| total time | 脚本总运行时间 | 66.5230s | 60.4952s | 越小执行越快 |
| total number of events | 总的执行事件数 | 84 | 6396 | 越大负载越强 |
| total time taken by event execution | 事件总的执行时间 | 1032.1404s | 961.7860s | 越小执行越快 |
| min response time | 最小的响应时间 | 6356.93ms | 2.81ms | 越小响应越快 |
| avg response time | 平均的响应时间 | 12287.39ms | 150.37ms | 越小响应越快 |
| max response time | 最大的响应时间 | 22921.33ms | 2568.62ms | 越小响应越快 |
| approx. 95 percentile response time | 大约95%的响应时间 | 20900.33ms | 643.62ms | 越小响应越快 |
| threads events avg | 每线程平均执行事件数 | 5.2500 | 399.7500 | 越大负载越强 |
| threads events stddev | 每线程事件数标准方差 | 0.43 | 19.46 | 据线程能力判断 |
| Threads execution time avg | 每线程平均执行时间 | 64.5088 | 60.1116 | 越小执行越快 |
| Threads execution time stddev | 每线程执行标准方差 | 1.54 | 0.19 | 越小越稳定 |

**2.3.2.3 第二次16线程OLTP测试结果**

(1) 172.168.234.31现生产环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 16

Random number generator seed is 0 and will be ignored

Threads started!

OLTP test statistics:

queries performed:

read: 1778

write: 508

other: 254

total: 2540

transactions: 127 (1.99 per sec.)

deadlocks: 0 (0.00 per sec.)

read/write requests: 2286 (35.79 per sec.)

other operations: 254 (3.98 per sec.)

General statistics:

total time: 63.8699s

total number of events: 127

total time taken by event execution: 999.3582s

response time:

min: 2969.68ms

avg: 7868.96ms

max: 18056.23ms

approx. 95 percentile: 11894.90ms

Threads fairness:

events (avg/stddev): 7.9375/0.83

execution time (avg/stddev): 62.4599/1.00

(2) 10.129.12.1 新开发环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 16

Random number generator seed is 0 and will be ignored

Threads started!

OLTP test statistics:

queries performed:

read: 166110

write: 47460

other: 23730

total: 237300

transactions: 11865 (197.30 per sec.)

deadlocks: 0 (0.00 per sec.)

read/write requests: 213570 (3551.34 per sec.)

other operations: 23730 (394.59 per sec.)

General statistics:

total time: 60.1379s

total number of events: 11865

total time taken by event execution: 960.7736s

response time:

min: 2.75ms

avg: 80.98ms

max: 1020.67ms

approx. 95 percentile: 291.33ms

Threads fairness:

events (avg/stddev): 741.5625/30.20

execution time (avg/stddev): 60.0483/0.03

**2.3.2.4 第二次16线程OLTP测试报表**

表2-3-2-4 第二次多线程OLTP测试报表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结果项 | 结过项含义 | 172.168.234.31  现生产环境 | 10.129.12.1  新开发环境 | 优势说明 |
| read queries performed | 执行的读请求(个) | 1778 | 166110 | 越大负载越强 |
| write queries performed | 执行的写请求(个) | 508 | 47460 | 越大负载越强 |
| other queries performed | 执行的其它请求(个) | 254 | 23730 | 越大负载越强 |
| total queries performed | 执行的总请求(个) | 2540 | 237300 | 越大负载越强 |
| transactions | 执行事务总数和每秒数 | 127 (1.99/s) | 11865 (197.30/s) | 越大负载越强 |
| deadlocks | 期间死锁总数和每秒数 | 0 (0.00/s) | 0 (0.00/s) | 越小越好 |
| read/write requests | 读写请求总数和每秒数 | 2286(35.79/s) | 213570(3551.34/s) | 越大负载越强 |
| other operations | 其它操作总数和每秒数 | 254(3.98/s) | 23730 (394.59/s) | 越大负载越强 |
| total time | 脚本总运行时间 | 63.8699s | 60.1379s | 越小执行越快 |
| total number of events | 总的执行事件数 | 127 | 11865 | 越大负载越强 |
| total time taken by event execution | 事件总的执行时间 | 999.3582s | 960.7736s | 越小执行越快 |
| min response time | 最小的响应时间 | 2969.68ms | 2.75ms | 越小响应越快 |
| avg response time | 平均的响应时间 | 7868.96ms | 80.98ms | 越小响应越快 |
| max response time | 最大的响应时间 | 18056.23ms | 1020.67ms | 越小响应越快 |
| approx. 95 percentile response time | 大约95%的响应时间 | 11894.90ms | 291.33ms | 越小响应越快 |
| threads events avg | 每线程平均执行事件数 | 7.9375 | 741.5625 | 越大负载越强 |
| threads events stddev | 每线程事件数标准方差 | 0.83 | 30.20 | 据线程能力判断 |
| Threads execution time avg | 每线程平均执行时间 | 62.4599 | 60.0483 | 越小执行越快 |
| Threads execution time stddev | 每线程执行标准方差 | 1.00 | 0.03 | 越小越稳定 |

**2.3.2.5 单线程OLTP测试结果**

(1) 172.168.234.31现生产环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 1

Random number generator seed is 0 and will be ignored

Threads started!

OLTP test statistics:

queries performed:

read: 1414

write: 404

other: 202

total: 2020

transactions: 101 (1.67 per sec.)

deadlocks: 0 (0.00 per sec.)

read/write requests: 1818 (30.05 per sec.)

other operations: 202 (3.34 per sec.)

General statistics:

total time: 60.4965s

total number of events: 101

total time taken by event execution: 60.4922s

response time:

min: 47.71ms

avg: 598.93ms

max: 3379.83ms

approx. 95 percentile: 1577.55ms

Threads fairness:

events (avg/stddev): 101.0000/0.00

execution time (avg/stddev): 60.4922/0.00

(2) 10.129.12.1 新开发环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 1

Random number generator seed is 0 and will be ignored

Threads started!

OLTP test statistics:

queries performed:

read: 38570

write: 11020

other: 5510

total: 55100

transactions: 2755 (45.90 per sec.)

deadlocks: 0 (0.00 per sec.)

read/write requests: 49590 (826.19 per sec.)

other operations: 5510 (91.80 per sec.)

General statistics:

total time: 60.0223s

total number of events: 2755

total time taken by event execution: 60.0076s

response time:

min: 5.42ms

avg: 21.78ms

max: 604.03ms

approx. 95 percentile: 51.38ms

Threads fairness:

events (avg/stddev): 2755.0000/0.00

execution time (avg/stddev): 60.0076/0.00

**2.3.2.6** **单线程OLTP测试报表**

表2-3-2-6单线程OLTP测试报表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结果项 | 结过项含义 | 172.168.234.31  现生产环境 | 10.129.12.1  新开发环境 | 测试结果 |
| read queries performed | 执行的读请求(个) | 1414 | 38570 | 越大负载越强 |
| write queries performed | 执行的写请求(个) | 404 | 11020 | 越大负载越强 |
| other queries performed | 执行的其它请求(个) | 202 | 5510 | 越大负载越强 |
| total queries performed | 执行的总请求(个) | 2020 | 55100 | 越大负载越强 |
| transactions | 执行事务总数和每秒数 | 101(1.67/s) | 2755(1.26/s) | 越大负载越强 |
| deadlocks | 期间死锁总数和每秒数 | 0(0.00/s) | 0 (/s) | 越小越好 |
| read/write requests | 读写请求总数和每秒数 | 1818(30.05/s) | 49590(826.19/s) | 越大负载越强 |
| other operations | 其它操作总数和每秒数 | 202(3.34/s) | 5510(91.80/s) | 越大负载越强 |
| total time | 脚本总运行时间 | 60.4965s | 60.0223s | 越小执行越快 |
| total number of events | 总的执行事件数 | 101 | 2755 | 越大负载越强 |
| total time taken by event execution | 事件总的执行时间 | 60.4922s | 60.0076s | 越小执行越快 |
| min response time | 最小的响应时间 | 47.71ms | 5.42ms | 越小响应越快 |
| avg response time | 平均的响应时间 | 598.93ms | 21.78ms | 越小响应越快 |
| max response time | 最大的响应时间 | 3379.83ms | 604.03ms | 越小响应越快 |
| approx.95 percentile response time | 大约95%的响应时间 | 1577.55ms | 51.38ms | 越小响应越快 |
| threads events avg | 每线程平均执行事件数 | 101.0000 | 2755.0000 | 越大负载越强 |
| threads events stddev | 每线程事件数标准方差 | 0.00 | 0.00 | 据线程能力判断 |
| Threads execution time avg | 每线程平均执行时间 | 60.4922 | 60.0076 | 越小执行越快 |
| Threads execution time stddev | 每线程执行标准方差 | 0.00 | 0.00 | 越小越稳定 |

**2.3.2.7 OLTP测试结论**

关于针对mysql的联机事务处理性能，扬州机房现生产环境机器 远差于 移动机房新统一开发环境机器。结合机器配置，从某个方面说明mysql5.7.11的OLTP性能高于mysql5.6.24的OLTP性能。

**2.4 THREADS测试**

**2.4.1 THREADS测试用例与脚本**

sysbench \

--test=threads \

--num-threads=64 \

--thread-yields=100 \

--thread-locks=2 \

run

其中，

test=threads 表示多线程测试。

num-threads=64 表示有64个线程。

thread-yields=100 每线程负载

thread-locks=2 2个线程锁

**2.4.2 THREADS测试报告**

**2.4.2.1 THREADS测试结果**

(1) 172.168.234.31现生产环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 64

Random number generator seed is 0 and will be ignored

Threads started!

General statistics:

total time: 0.9510s

total number of events: 10000

total time taken by event execution: 60.6549s

response time:

min: 0.03ms

avg: 6.07ms

max: 38.90ms

approx. 95 percentile: 19.60ms

Threads fairness:

events (avg/stddev): 156.2500/17.23

execution time (avg/stddev): 0.9477/0.00

(2) 10.129.12.1 新开发环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 64

Random number generator seed is 0 and will be ignored

Threads started!

General statistics:

total time: 1.8114s

total number of events: 10000

total time taken by event execution: 115.6659s

response time:

min: 0.06ms

avg: 11.57ms

max: 48.01ms

approx. 95 percentile: 29.68ms

Threads fairness:

events (avg/stddev): 156.2500/8.29

execution time (avg/stddev): 1.8073/0.00

**2.4.2.2 THREADS测试报表**

表2-4-2-2 THREADS测试报表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结果项 | 结过项含义 | 172.168.234.31  现生产环境 | 10.129.12.1  新开发环境 | 优势说明 |
| total time | 脚本总运行时间 | 0.9510s | 1.8114s | 越小执行越快 |
| total number of events | 总的执行事件数（个） | 10000 | 10000 | 越大负载越强 |
| total time taken by event execution | 事件总的执行时间 | 60.6549s | 115.6659s | 越小执行越快 |
| min response time | 最小的响应时间 | 0.03ms | 0.06ms | 越小响应越快 |
| avg response time | 平均的响应时间 | 6.07ms | 11.57ms | 越小响应越快 |
| max response time | 最大的响应时间 | 38.90ms | 48.01ms | 越小响应越快 |
| approx. 95 percentile response time | 大约95%的响应时间 | 19.60ms | 29.68ms | 越小响应越快 |
| threads events avg | 每线程平均执行事件数 | 156.2500 | 156.2500s | 越大负载越强 |
| threads events stddev | 每线程事件数标准方差 | 17.23 | 8.29 | 据线程能力判断 |
| Threads execution time avg | 每线程平均执行时间 | 0.9477 | 1.8073s | 越小执行越快 |
| Threads execution time stddev | 每线程执行标准方差 | 0.00 | 0.00 | 越小越稳定 |

**2.4.2.3 THREADS测试结论**

关于针对mysql并行计算和协调的多线程性能，扬州机房现生产环境机器 优于 移动机房新统一开发环境机器。

**2.5 MEMORY测试**

**2.5.1 MEMORY测试用例与脚本**

sysbench \

--test=memory \

--memory-block-size=8k \

--memory-total-size=4G \

run

其中，

test=memory 表示内存基准测试

memory-block-size=8k 每个内存块的大小为8KB

memory-total-size=4G 测试总的内存大小 4GB

**2.5.2 MEMORY测试报告**

**2.5.2.1 MEMORY测试结果**

(1) 172.168.234.31现生产环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 1

Random number generator seed is 0 and will be ignored

Threads started!

Operations performed: 524288 (823376.63 ops/sec)

4096.00 MB transferred (6432.63 MB/sec)

General statistics:

total time: 0.6368s

total number of events: 524288

total time taken by event execution: 0.4778s

response time:

min: 0.00ms

avg: 0.00ms

max: 0.05ms

approx. 95 percentile: 0.00ms

Threads fairness:

events (avg/stddev): 524288.0000/0.00

execution time (avg/stddev): 0.4778/0.00

(2) 10.129.12.1 新开发环境

sysbench 0.5: multi-threaded system evaluation benchmark

Running the test with following options:

Number of threads: 1

Random number generator seed is 0 and will be ignored

Threads started!

Operations performed: 524288 (555625.57 ops/sec)

4096.00 MB transferred (4340.82 MB/sec)

General statistics:

total time: 0.9436s

total number of events: 524288

total time taken by event execution: 0.7745s

response time:

min: 0.00ms

avg: 0.00ms

max: 0.12ms

approx. 95 percentile: 0.00ms

Threads fairness:

events (avg/stddev): 524288.0000/0.00

execution time (avg/stddev): 0.7745/0.00

**2.5.2.2 MEMORY测试报表**

表2-5-2-2 MEMORY测试报表

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结果项 | 结过项含义 | 172.168.234.31  现生产环境 | 10.129.12.1  新开发环境 | 优势说明 |
| total time | 脚本总运行时间 | 0.6368s | 0.9436s | 越小执行越快 |
| total number of events | 总的执行事件数（个） | 524288 | 524288 | 越大负载越强 |
| total time taken by event execution | 事件总的执行时间 | 0.4778s | 0.7745s | 越小执行越快 |
| min response time | 最小的响应时间 | 0.00ms | 0.00ms | 越小响应越快 |
| avg response time | 平均的响应时间 | 0.00ms | 0.00ms | 越小响应越快 |
| max response time | 最大的响应时间 | 0.00ms | 0.12ms | 越小响应越快 |
| approx. 95 percentile response time | 大约95%的响应时间 | 0.00ms | 0.00ms | 越小响应越快 |
| threads events avg | 每线程平均执行事件数 | 524288.0000 | 524288.0000 | 越大负载越强 |
| threads events stddev | 每线程事件数标准方差 | 0.00 | 0.00 | 据线程能力判断 |
| Threads execution time avg | 每线程平均执行时间 | 0.4778s | 0.7745s | 越小执行越快 |
| Threads execution time stddev | 每线程执行标准方差 | 0.00 | 0.00 | 越小越稳定 |

**2.5.2.3 MEMORY测试结论**

关于针对mysql计算的内存MEMORY性能，扬州机房现生产环境机器 优于 移动机房新统一开发环境机器。

**2.6 总体结论**

表2-6 总体比较

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 测试项 | 扬州机房 | 性能优劣 | 移动机房 | 说明 |
| CPU测试 | 172.168.234.31  现生产环境 | >=(优于) | 10.129.12.1  新统一开发环境 | 同位Xeon 8 CPU，但型号不同，性能不同 |
| FILEIO吞吐量测试 | 172.168.234.31  现生产环境 | <(远劣于) | 10.129.12.1  新统一开发环境 | 扬州机房FILEIO是瓶颈 |
| OLTP测试（多线程第一次） | 172.168.234.31  现生产环境 | <(远劣于) | 10.129.12.1  新统一开发环境 | OLTP为综合各方面能力评定，由于扬州机房生产环境FILEIO是瓶颈，而移动机房统一开发环境物理机各方面较为平衡，导致结果偏向于移动机房统一开发环境的物理机， |
| OLTP测试（多线程第二次） | 172.168.234.31  现生产环境 | <(远劣于) | 10.129.12.1  新统一开发环境 | 同上 |
| OLTP测试（单线程） | 172.168.234.31  现生产环境 | <(远劣于) | 10.129.12.1  新统一开发环境 | 同上 |
| MEMORY内存测试 | 172.168.234.31  现生产环境 | >(优于) | 10.129.12.1  新统一开发环境 | 可能原因：生产环境的内存32G大于移动机房统一开发环境 |
| THREADS多线程 | 172.168.234.31  现生产环境 | >(优于) | 10.129.12.1  新统一开发环境 | 可能和CPU关于多线程统一协调能力有关 |

总体结论：

扬州机房mysql生产环境，CPU性能，多线程的协调能力，以及内存性能，虽然优于移动机房统一开发平台，但是由于针对数据库的FILEIO（文件输入输出）能力较弱，产生性能瓶颈。导致数据库OLTP整体性能较弱。

移动机房mysql统一开发环境，各方面性能较为平均，并且磁盘IO能力较强，解决了瓶颈问题。导致各项测试指标高于扬州机房mysql生产环境。

另外sysbench的各项服务器指标测试，其实都是基于mysql进行的，从数据库OLTP的测试结果看，5.7.x的测试结果，好于5.6.x的结果。测试结果属正常范围。