Cassandra 性能测试

本测试仅为在本地开发笔记本中研究 benchmark 工具，而生成的测试数据，测试数据库中仅 100 条数据。

1. 本地启动临时测试 Cassandra 容器

```
Bash
docker run --name cassandra -d -p 7000:7000 -p 7199:7199 -p
9042:9042 -e CASSANDRA_TRANSPORT_PORT_NUMBER=7000
bitnami/cassandra
```

2. 下载 nosqlbench 工具，并创建如下配置文件

```
Bash
# ./nb5 run driver=cql workload=a.yaml tags=phase:schema
threads=auto cycles=3 username=cassandra password=cassandra
host=10.21.140.217  localdc=datacenter1
# ./nb5 run driver=cql workload=a.yaml tags=phase:rampup
threads=auto cycles=100 username=cassandra password=cassandra
host=10.21.140.217  localdc=datacenter1
# ./nb5 run driver=cql workload=a.yaml tags=phase:rampup
threads=auto cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datacenter1 --report-csv-to summary --
report-summary-to stdout:3,_SESSION_summary.txt
# ./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=4
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datacenter1 --report-csv-to summary --
report-summary-to stdout:3,_SESSION_summary.txt
description: |
  This workload emulates a time-series data model and access
patterns.
blocks:
  - tags:
      phase: schema
    params:
      prepared: false
    statements:
     - create-keyspace: |
        create keyspace if not exists mde_virus_db
        WITH replication = {'class': 'SimpleStrategy',
'replication_factor': '1'}
        AND durable_writes = true;
     - create-table : |
        create table if not exists mde_virus_db.md5_rules (
              size varint,
              md5 text,
              result text,
              PRIMARY KEY (size, md5)
          ) WITH CLUSTERING ORDER BY (md5 ASC);
#     - truncate-table: |
#         truncate table mde_virus_db.md5_rules;
  - tags:
      phase: rampup
    params:
      cl: LOCAL_QUORUM
    bindings:
      size: AddHashRange(100, 2147483646);ModuloToBigInt() ->
java.math.BigInteger
      md5: HashedLineToString('md5.txt')
      result: HashedLineToString('virus.txt')
    statements:
     - insert-rampup: |
        insert into mde_virus_db.md5_rules
        (size, md5, result)
        values ({size}, {md5}, {result})
       idempotent: true
  - tags:
      phase: main
    params:
      cl: LOCAL_QUORUM
      prepared: true
    bindings:
      size: AddHashRange(100, 2147483646);ModuloToBigInt() ->
java.math.BigInteger
      md5: HashedLineToString('md5.txt')
    statements:
     - select-read: |
         select * from baselines.iot
         where machine_id={machine_id} and
sensor_name={sensor_name}
         limit 1;
```

3. 使用 nb5 工具测试 1 线程查询性能

针对本地 docker 临时启动的 Cassandra 节点，使用工具如下参数

```
Bash
./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=1
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datacenter1 --report-csv-to summary --
report-summary-to stdout:3,summary.txt
```

统计性能数据如下：

```
Bash
```

4. 使用 nb5 工具测试 2 线程查询性能

针对本地 docker 临时启动的 Cassandra 节点，使用工具如下参数

```
Bash
./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=2
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datacenter1 --report-csv-to summary --
report-summary-to stdout:3,summary.txt
```

统计性能数据如下：

```
Bash
a.yaml (remaining,active,completed)=(791969,2,208031) 021%
a.yaml (remaining,active,completed)=(791968,2,208032) 021%
a.yaml (remaining,active,completed)=(575684,2,424316) 042%
a.yaml (remaining,active,completed)=(575682,2,424318) 042%
a.yaml (remaining,active,completed)=(337103,2,662897) 066%
a.yaml (remaining,active,completed)=(337095,2,662905) 066%
a.yaml (remaining,active,completed)=(103049,2,896951) 090%
a.yaml (remaining,active,completed)=(103047,2,896953) 090%
6/8/23, 7:52:01 PM
==============================================================


-- Counters --------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0
```

```
-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 1887.53 calls/second
     1-minute rate = 1977.49 calls/second
     5-minute rate = 1808.67 calls/second
    15-minute rate = 1529.27 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 1887.55 calls/second
     1-minute rate = 1977.43 calls/second
     5-minute rate = 1809.73 calls/second
    15-minute rate = 1532.65 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 1887.30 calls/second
     1-minute rate = 1977.45 calls/second
     5-minute rate = 1808.81 calls/second
    15-minute rate = 1529.72 calls/second
a.yaml.read_input
             count = 1000002
         mean rate = 1887.23 calls/second
     1-minute rate = 1977.43 calls/second
     5-minute rate = 1809.59 calls/second
    15-minute rate = 1532.20 calls/second
a.yaml.result
             count = 1000000
         mean rate = 1887.11 calls/second
     1-minute rate = 1977.42 calls/second
     5-minute rate = 1808.95 calls/second
    15-minute rate = 1530.17 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 1886.95 calls/second
     1-minute rate = 1977.44 calls/second
     5-minute rate = 1809.02 calls/second
    15-minute rate = 1530.40 calls/second
a.yaml.strides.servicetime
```

```
             count = 1000000
         mean rate = 1886.85 calls/second
     1-minute rate = 1977.44 calls/second
     5-minute rate = 1809.59 calls/second
    15-minute rate = 1532.20 calls/second


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=============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 1886.62 calls/second
     1-minute rate = 1906.30 calls/second
     5-minute rate = 1796.75 calls/second
    15-minute rate = 1526.82 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 1886.65 calls/second
     1-minute rate = 1905.51 calls/second
     5-minute rate = 1797.64 calls/second
    15-minute rate = 1530.13 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 1886.50 calls/second
     1-minute rate = 1906.22 calls/second
     5-minute rate = 1796.87 calls/second
    15-minute rate = 1527.26 calls/second
a.yaml.read_input
             count = 1000002
         mean rate = 1886.48 calls/second
     1-minute rate = 1905.69 calls/second
     5-minute rate = 1797.53 calls/second
    15-minute rate = 1529.69 calls/second
a.yaml.result
             count = 1000000
         mean rate = 1886.39 calls/second
     1-minute rate = 1906.10 calls/second
     5-minute rate = 1796.99 calls/second
    15-minute rate = 1527.70 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 1886.31 calls/second
     1-minute rate = 1906.04 calls/second
     5-minute rate = 1797.04 calls/second
    15-minute rate = 1527.93 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 1886.27 calls/second
     1-minute rate = 1905.64 calls/second
     5-minute rate = 1797.52 calls/second
    15-minute rate = 1529.69 calls/second
```

5. 使用 nb5 工具测试 4 线程查询性能

针对本地 docker 临时启动的 Cassandra 节点，使用工具如下参数

```
Bash
./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=4
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datacenter1 --report-csv-to summary --
report-summary-to stdout:3,summary.txt
```

统计性能数据如下：

```
Bash
a.yaml (remaining,active,completed)=(631839,4,368161) 037%
a.yaml (remaining,active,completed)=(631839,4,368161) 037%
a.yaml (remaining,active,completed)=(237108,4,762892) 076%
a.yaml (remaining,active,completed)=(237102,4,762899) 076%
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=============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
```

```
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 3160.50 calls/second
     1-minute rate = 3069.01 calls/second
     5-minute rate = 2858.77 calls/second
    15-minute rate = 2552.18 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 3160.50 calls/second
     1-minute rate = 3067.67 calls/second
     5-minute rate = 2865.37 calls/second
    15-minute rate = 2565.82 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 3159.71 calls/second
     1-minute rate = 3068.91 calls/second
     5-minute rate = 2859.25 calls/second
    15-minute rate = 2553.17 calls/second
a.yaml.read_input
             count = 1000004
         mean rate = 3159.52 calls/second
     1-minute rate = 3067.97 calls/second
     5-minute rate = 2864.02 calls/second
    15-minute rate = 2563.01 calls/second
a.yaml.result
             count = 1000000
         mean rate = 3159.21 calls/second
     1-minute rate = 3068.63 calls/second
     5-minute rate = 2860.54 calls/second
    15-minute rate = 2555.84 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 3158.81 calls/second
     1-minute rate = 3068.52 calls/second
     5-minute rate = 2860.94 calls/second
    15-minute rate = 2556.68 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 3158.54 calls/second
     1-minute rate = 3067.87 calls/second
     5-minute rate = 2864.28 calls/second
    15-minute rate = 2563.57 calls/second


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-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 3157.87 calls/second
     1-minute rate = 3069.01 calls/second
     5-minute rate = 2858.77 calls/second
    15-minute rate = 2552.18 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 3157.97 calls/second
     1-minute rate = 3067.67 calls/second
     5-minute rate = 2865.37 calls/second
    15-minute rate = 2565.82 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 3157.47 calls/second
     1-minute rate = 3068.91 calls/second
     5-minute rate = 2859.25 calls/second
    15-minute rate = 2553.17 calls/second
a.yaml.read_input
             count = 1000004
         mean rate = 3157.45 calls/second
     1-minute rate = 3067.97 calls/second
     5-minute rate = 2864.02 calls/second
    15-minute rate = 2563.01 calls/second
a.yaml.result
             count = 1000000
         mean rate = 3157.16 calls/second
     1-minute rate = 3068.63 calls/second
     5-minute rate = 2860.54 calls/second
    15-minute rate = 2555.84 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 3156.94 calls/second
     1-minute rate = 3068.52 calls/second
     5-minute rate = 2860.94 calls/second
    15-minute rate = 2556.68 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 3156.83 calls/second
     1-minute rate = 3067.87 calls/second
     5-minute rate = 2864.28 calls/second
    15-minute rate = 2563.57 calls/second
```

6. 使用 nb5 工具测试 8 线程查询性能

```
Bash
./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=8
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datac
enter1 --report-csv-to summary --report-summary-to
stdout:3,_SESSION_summary.txt
```

统计性能数据如下:

```
Bash
a.yaml (remaining,active,completed)=(677684,8,322316) 032%
a.yaml (remaining,active,completed)=(37404,8,962596) 096%
a.yaml (remaining,active,completed)=(37388,8,962612) 096%
6/8/23, 7:20:20 PM
==============================================================


-- Counters -------------------------------------------------------
--------------
```

```
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 5396.64 calls/second
     1-minute rate = 4937.61 calls/second
     5-minute rate = 4868.89 calls/second
    15-minute rate = 4652.18 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 5397.18 calls/second
     1-minute rate = 4936.31 calls/second
     5-minute rate = 4896.38 calls/second
    15-minute rate = 4694.14 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 5395.15 calls/second
     1-minute rate = 4937.23 calls/second
     5-minute rate = 4867.99 calls/second
    15-minute rate = 4650.87 calls/second
a.yaml.read_input
             count = 1000008
         mean rate = 5395.32 calls/second
     1-minute rate = 4936.52 calls/second
     5-minute rate = 4891.59 calls/second
    15-minute rate = 4686.83 calls/second
a.yaml.result
             count = 1000000
         mean rate = 5394.18 calls/second
     1-minute rate = 4936.97 calls/second
     5-minute rate = 4872.89 calls/second
    15-minute rate = 4658.35 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 5393.23 calls/second
     1-minute rate = 4936.94 calls/second
     5-minute rate = 4874.17 calls/second
    15-minute rate = 4660.31 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 5393.07 calls/second
     1-minute rate = 4936.41 calls/second
     5-minute rate = 4893.39 calls/second
    15-minute rate = 4689.59 calls/second


6/8/23, 7:20:20 PM =============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 5390.82 calls/second
     1-minute rate = 4937.61 calls/second
     5-minute rate = 4868.89 calls/second
    15-minute rate = 4652.18 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 5391.38 calls/second
     1-minute rate = 4936.31 calls/second
     5-minute rate = 4896.38 calls/second
    15-minute rate = 4694.14 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 5388.80 calls/second
     1-minute rate = 4937.23 calls/second
     5-minute rate = 4867.99 calls/second
    15-minute rate = 4650.87 calls/second
a.yaml.read_input
```

```
             count = 1000008
         mean rate = 5388.36 calls/second
     1-minute rate = 4936.52 calls/second
     5-minute rate = 4891.59 calls/second
    15-minute rate = 4686.83 calls/second
a.yaml.result
             count = 1000000
         mean rate = 5386.54 calls/second
     1-minute rate = 4936.97 calls/second
     5-minute rate = 4872.89 calls/second
    15-minute rate = 4658.35 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 5385.72 calls/second
     1-minute rate = 4936.94 calls/second
     5-minute rate = 4874.17 calls/second
    15-minute rate = 4660.31 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 5385.47 calls/second
     1-minute rate = 4936.41 calls/second
     5-minute rate = 4893.39 calls/second
    15-minute rate = 4689.59 calls/second
```

7. 使用 nb5 工具测试 16 线程查询性能

```
Bash
./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=16
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datac
enter1 --report-csv-to summary --report-summary-to
stdout:3,_SESSION_summary.txt
```

统计性能数据如下:

```
Bash
6/8/23, 7:24:10 PM
=============================================================

-- Counters ------------------------------------------------------
--------------
```

```
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 9418.67 calls/second
     1-minute rate = 9162.79 calls/second
     5-minute rate = 7774.28 calls/second
    15-minute rate = 7304.06 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 9419.77 calls/second
     1-minute rate = 9166.74 calls/second
     5-minute rate = 7806.26 calls/second
    15-minute rate = 7344.78 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 9413.34 calls/second
     1-minute rate = 9163.02 calls/second
     5-minute rate = 7776.65 calls/second
    15-minute rate = 7307.09 calls/second
a.yaml.read_input
             count = 1000016
         mean rate = 9411.92 calls/second
     1-minute rate = 9166.72 calls/second
     5-minute rate = 7802.69 calls/second
    15-minute rate = 7340.18 calls/second
a.yaml.result
             count = 1000000
         mean rate = 9408.43 calls/second
     1-minute rate = 9163.82 calls/second
     5-minute rate = 7782.52 calls/second
    15-minute rate = 7314.55 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 9404.78 calls/second
     1-minute rate = 9163.96 calls/second
     5-minute rate = 7784.05 calls/second
    15-minute rate = 7316.51 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 9402.40 calls/second
     1-minute rate = 9166.43 calls/second
     5-minute rate = 7802.78 calls/second
    15-minute rate = 7340.34 calls/second


6/8/23, 7:24:11 PM
=============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 9396.05 calls/second
     1-minute rate = 9162.79 calls/second
     5-minute rate = 7774.28 calls/second
    15-minute rate = 7304.06 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 9397.34 calls/second
     1-minute rate = 9166.74 calls/second
     5-minute rate = 7806.26 calls/second
    15-minute rate = 7344.78 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 9392.49 calls/second
     1-minute rate = 9163.02 calls/second
     5-minute rate = 7776.65 calls/second
    15-minute rate = 7307.09 calls/second
a.yaml.read_input
```

```
             count = 1000016
         mean rate = 9392.62 calls/second
     1-minute rate = 9166.72 calls/second
     5-minute rate = 7802.69 calls/second
    15-minute rate = 7340.18 calls/second
a.yaml.result
             count = 1000000
         mean rate = 9389.75 calls/second
     1-minute rate = 9163.82 calls/second
     5-minute rate = 7782.52 calls/second
    15-minute rate = 7314.55 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 9387.96 calls/second
     1-minute rate = 9163.96 calls/second
     5-minute rate = 7784.05 calls/second
    15-minute rate = 7316.51 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 9387.47 calls/second
     1-minute rate = 9166.43 calls/second
     5-minute rate = 7802.78 calls/second
    15-minute rate = 7340.34 calls/second
```

8. 使用 nb5 工具测试 32 线程查询性能

```
Bash
./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=32
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datac
enter1 --report-csv-to summary --report-summary-to
stdout:3,_SESSION_summary.txt
```

统计性能数据如下:

```
Bash
a.yaml (remaining,active,completed)=(149755,32,850245) 085%
6/8/23, 7:29:15 PM
=============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
```

```
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 14663.97 calls/second
     1-minute rate = 13662.81 calls/second
     5-minute rate = 11495.02 calls/second
    15-minute rate = 10922.73 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 14661.15 calls/second
     1-minute rate = 13683.47 calls/second
     5-minute rate = 11539.88 calls/second
    15-minute rate = 10973.87 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 14642.92 calls/second
     1-minute rate = 13664.50 calls/second
     5-minute rate = 11498.61 calls/second
    15-minute rate = 10926.84 calls/second
a.yaml.read_input
             count = 1000032
         mean rate = 14635.28 calls/second
     1-minute rate = 13683.54 calls/second
     5-minute rate = 11540.19 calls/second
    15-minute rate = 10974.24 calls/second
a.yaml.result
             count = 1000000
         mean rate = 14624.77 calls/second
     1-minute rate = 13665.01 calls/second
     5-minute rate = 11500.09 calls/second
    15-minute rate = 10928.53 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 14610.40 calls/second
     1-minute rate = 13666.06 calls/second
     5-minute rate = 11501.78 calls/second
    15-minute rate = 10930.42 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 14601.84 calls/second
     1-minute rate = 13681.46 calls/second
     5-minute rate = 11535.47 calls/second
    15-minute rate = 10968.82 calls/second


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=============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 14585.35 calls/second
     1-minute rate = 13662.81 calls/second
     5-minute rate = 11495.02 calls/second
    15-minute rate = 10922.73 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 14585.70 calls/second
     1-minute rate = 13683.47 calls/second
     5-minute rate = 11539.88 calls/second
    15-minute rate = 10973.87 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 14576.08 calls/second
     1-minute rate = 13664.50 calls/second
     5-minute rate = 11498.61 calls/second
    15-minute rate = 10926.84 calls/second
a.yaml.read_input
             count = 1000032
         mean rate = 14575.32 calls/second
     1-minute rate = 13683.54 calls/second
     5-minute rate = 11540.19 calls/second
    15-minute rate = 10974.24 calls/second
a.yaml.result
             count = 1000000
         mean rate = 14567.73 calls/second
     1-minute rate = 13665.01 calls/second
     5-minute rate = 11500.09 calls/second
    15-minute rate = 10928.53 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 14562.24 calls/second
     1-minute rate = 13666.06 calls/second
     5-minute rate = 11501.78 calls/second
    15-minute rate = 10930.42 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 14560.09 calls/second
     1-minute rate = 13681.46 calls/second
     5-minute rate = 11535.47 calls/second
    15-minute rate = 10968.82 calls/second
```

9. 使用 nb5 工具测试 64 线程查询性能

```
Bash
./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=64
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datac
enter1 --report-csv-to summary --report-summary-to
stdout:3,_SESSION_summary.txt
```

统计性能数据如下:

```
Bash
a.yaml (remaining,active,completed)=(7563,64,992437) 099%
6/8/23, 7:32:32 PM
=============================================================


-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0
```

```
-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 17156.70 calls/second
     1-minute rate = 14984.54 calls/second
     5-minute rate = 11347.43 calls/second
    15-minute rate = 10489.60 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 17158.58 calls/second
     1-minute rate = 15011.41 calls/second
     5-minute rate = 11390.74 calls/second
    15-minute rate = 10536.74 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 17136.75 calls/second
     1-minute rate = 14986.56 calls/second
     5-minute rate = 11348.55 calls/second
    15-minute rate = 10490.51 calls/second
a.yaml.read_input
             count = 1000064
         mean rate = 17131.58 calls/second
     1-minute rate = 15014.66 calls/second
     5-minute rate = 11397.87 calls/second
    15-minute rate = 10544.82 calls/second
a.yaml.result
             count = 1000000
         mean rate = 17117.66 calls/second
     1-minute rate = 14990.29 calls/second
     5-minute rate = 11355.82 calls/second
    15-minute rate = 10498.65 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 17103.75 calls/second
     1-minute rate = 14990.95 calls/second
     5-minute rate = 11356.72 calls/second
    15-minute rate = 10499.61 calls/second
```

```
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 17096.09 calls/second
     1-minute rate = 15011.00 calls/second
     5-minute rate = 11390.45 calls/second
    15-minute rate = 10536.51 calls/second


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=============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
         mean rate = 17073.39 calls/second
     1-minute rate = 14984.54 calls/second
     5-minute rate = 11347.43 calls/second
    15-minute rate = 10489.60 calls/second
a.yaml.cycles.servicetime
             count = 1000000
         mean rate = 17076.87 calls/second
     1-minute rate = 15011.41 calls/second
     5-minute rate = 11390.74 calls/second
    15-minute rate = 10536.74 calls/second
a.yaml.execute
             count = 1000000
         mean rate = 17061.76 calls/second
     1-minute rate = 14986.56 calls/second
     5-minute rate = 11348.55 calls/second
    15-minute rate = 10490.51 calls/second
a.yaml.read_input
             count = 1000064
         mean rate = 17062.20 calls/second
     1-minute rate = 15014.66 calls/second
     5-minute rate = 11397.87 calls/second
    15-minute rate = 10544.82 calls/second
a.yaml.result
             count = 1000000
         mean rate = 17049.72 calls/second
     1-minute rate = 14990.29 calls/second
     5-minute rate = 11355.82 calls/second
    15-minute rate = 10498.65 calls/second
a.yaml.result-success
             count = 1000000
         mean rate = 17042.21 calls/second
     1-minute rate = 14990.95 calls/second
     5-minute rate = 11356.72 calls/second
    15-minute rate = 10499.61 calls/second
a.yaml.strides.servicetime
             count = 1000000
         mean rate = 17041.31 calls/second
     1-minute rate = 15011.00 calls/second
     5-minute rate = 11390.45 calls/second
    15-minute rate = 10536.51 calls/second
```

10. 使用 nb5 工具测试 128 线程查询性能

```
Bash
./nb5 run driver=cql workload=a.yaml tags=phase:rampup threads=128
cycles=1000000 username=cassandra password=cassandra
host=10.21.140.217  localdc=datac
enter1 --report-csv-to summary --report-summary-to
stdout:3,_SESSION_summary.txt
```

统计性能数据如下:

```
Bash
6/8/23, 7:40:10 PM
=============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0
```

```
-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
a.yaml.cycles.servicetime
             count = 1000000
a.yaml.execute
             count = 1000000
a.yaml.read_input
             count = 1000128
a.yaml.result
             count = 1000000
a.yaml.result-success
             count = 1000000
a.yaml.strides.servicetime
             count = 1000000


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=============================================================

-- Counters ------------------------------------------------------
--------------
a.yaml.optracker_blocked
             count = 0

-- Histograms ----------------------------------------------------
--------------
a.yaml.tries
             count = 1000000

-- Timers --------------------------------------------------------
--------------
a.yaml.bind
             count = 1000000
a.yaml.cycles.servicetime
             count = 1000000
a.yaml.execute
             count = 1000000
```

```
a.yaml.read_input
             count = 1000128
a.yaml.result
             count = 1000000
a.yaml.result-success
             count = 1000000
a.yaml.strides.servicetime
             count = 1000000
```

简要汇总结果

线程数	1	2	4	8	16	32	64	128
calls/second	1050.98	1886.62	3156.83	5393.07	9387.47	14560.09	17041.31	20204.57
mean nanoseconds	946,339	1,055,508	1,258,919	1,498,700	1,692,150	2,191,128	4,026,522	6,379,623