Query Profiling without EXPLAIN

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We'll Discuss

- Why profile queries
- Summary statistics
- Using "EXPLAIN"
- Example Debug Log

Why Profile Queries? 3 Levels of Analysis

Basic

- Latency!

Medium

- Rows / bytes scanned
- Memory used

Advanced

- Indices read
- Marks read
- Parts read
- Execution order (pipeline)

What can you see without EXPLAIN

Summary statistics:

- clickhouse-client prints them
- HTTP: use *send_progress_in_http_headers* or look at *x-clickhouse-summary*

We can answer basic and medium level questions here

```
1 rows in set. Elapsed: 0.007 sec. Processed 34.63 thousand rows, 484.78 KB (4.79 million rows/s., 67.00 MB/s.)
```

Let's Use EXPLAIN!

Syntax error: failed at position 1:

Expected one of: CREATE TABLE or ATTACH TABLE query, SELECT query, possibly with UNION, SHOW [TEMPORARY] TABLES|DATABASES [[NOT] LIKE 'str'], SELECT query, subquery, possibly with UNION, Query, CREATE, EXISTS, ATTACH, DETACH, DROP, SHOW, DESCRIBE, DESC, USE, SET, SELECT, WITH, list of elements, ALTER query, ALTER TABLE, Query with output, SHOW PROCESSLIST query, SHOW PROCESSLIST, AST, RENAME query, RENAME TABLE, SET query, SYSTEM query, EXISTS or SHOW CREATE query, USE query, SELECT subquery, CHECK TABLE, DESCRIBE query, DROP query, TRUNCATE, INSERT query, INSERT INTO, KILL QUERY query, KILL QUERY, OPTIMIZE query, OPTIMIZE TABLE, SELECT query

No EXPLAIN: Use debug logging

```
<logger>

    <level>debug</level>

    <log>/var/log/clickhouse-server/clickhouse-server.log</log>

    <errorlog>/var/log/clickhouse-server/clickhouse-server.err.log</errorlog>

    <size>1000M</size>

    <count>10</count>

</logger>
```

Server settings: https://clickhouse.tech/docs/en/operations/server_settings/settings/

Or, from clickhouse-client

:) SET send_logs_level='trace';

SET send_logs_level = 'trace'

Ok.

Example Debug Log: Finding the Query

{7f5fcef4-0a7f-47c7-8870-6248fbd0edcf} <Debug> executeQuery: (from [2400:cb00:36:1038::a29e:4616]:63494) SELECT 'trace-me-plz', countMerge(queryCount) FROM r0.dnslogs_1m_from_r0 WHERE date = today() AND timeslot >= toStartOfHour(now()) AND zoneId = 4240

Example Debug Log

```
{7f5fcef4-0a7f-47c7-8870-6248fbd0edcf} <Debug> r0..inner.dnslogs_1m_from_r0 (SelectExecutor): Key condition: (colum
n 0 in [18297, 18297]), (column 4 in [1580929200, +inf)), and, (column 2 in [4240, 4240]), and
{7f5fcef4-0a7f-47c7-8870-6248fbd0edcf} <Debug> r0..inner.dnslogs_1m_from_r0 (SelectExecutor): MinMax index conditio
n: (column 0 in [18297, 18297]), unknown, and, unknown, and
{7f5fcef4-0a7f-47c7-8870-6248fbd0edcf} <Debug> r0..inner.dnslogs_1m_from_r0 (SelectExecutor): Selected 9 parts by d
ate, 9 parts by key, 16 marks to read from 16 ranges
{7f5fcef4-0a7f-47c7-8870-6248fbd0edcf} <Information> executeQuery: Read 95223 rows, 3.01 MiB in 0.008 sec., 1140048
5 rows/sec., 360.32 MiB/sec.
{7f5fcef4-0a7f-47c7-8870-6248fbd0edcf} <Debug> MemoryTracker: Peak memory usage (for query): 33.79 MiB.
```

Example Debug Log: Query Pipeline

```
{b77ef8e1-55cf-4a67-8e29-e8b762b4dadb} <Debug> executeQuery: Query pipeline:
    Expression
      Expression
   Filter
  Expression
Expression
          Expression
      Aggregating
     Concat
        Filter
```

HAPPY PROFILING!

- Use the knowledge to write more efficient queries and to design better schemas.

Links

- [EXPLAIN в Clickhouse](#) (Explain In ClickHouse: Machine Translation from Russian)
- https://clickhouse.tech/docs/en/operations/settings/settings/#settings-send_progress_in_http_headers
- https://clickhouse.tech/docs/en/operations/server_settings/settings/
- https://clickhouse.tech/docs/en/operations/table_engines/mergetree/ (See "Primary Keys and Indexes in Queries" Section