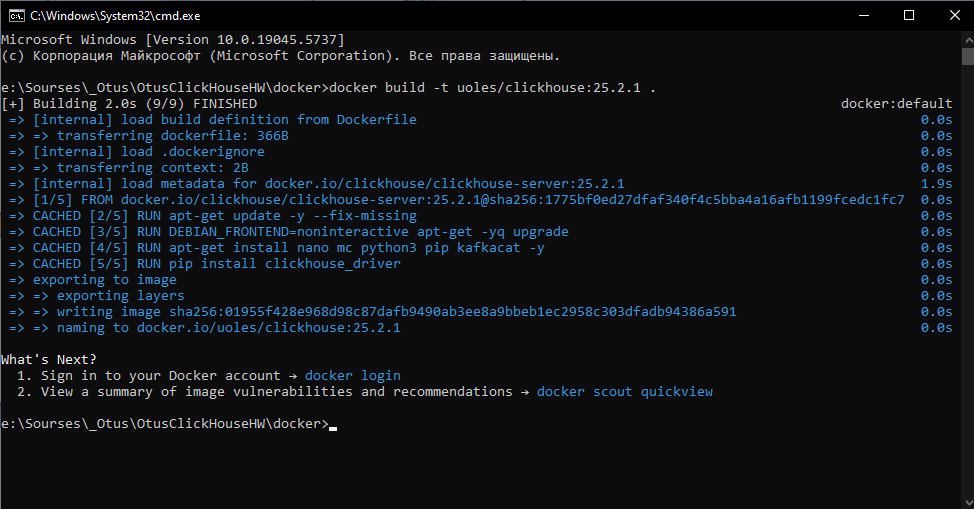
**02 ДЗ - Развертывание и базовая конфигурация, интерфейсы и инструменты.**

**Собираем Dockerfile для clickhouse.**

Dockerfile:  
  
FROM clickhouse/clickhouse-server:25.2.1   
MAINTAINER Maksim Kulikov [max.uoles@rambler.ru](mailto:max.uoles@rambler.ru)  
  
RUN apt-get update -y --fix-missing   
RUN DEBIAN\_FRONTEND=noninteractive apt-get -yq upgrade  
RUN apt-get install nano mc python3 pip kafkacat –y  
RUN pip install clickhouse\_driver  
  
EXPOSE 8123 9000  
ENTRYPOINT ["/entrypoint.sh"]

Собираем образ командой:

docker build -t uoles/clickhouse:25.2.1 .

****

Запускаем контейнер командой:

docker run -d

-p 18123:8123

-p 19000:9000

-e CLICKHOUSE\_DB=my\_database

-e CLICKHOUSE\_USER=username

-e CLICKHOUSE\_DEFAULT\_ACCESS\_MANAGEMENT=1

-e CLICKHOUSE\_PASSWORD=password

--name clickhouse-server-02

--ulimit nofile=262144:262144

uoles/clickhouse:25.2.1

**Создаем таблицу и заливаем данные.**

Набор тестовых данных брал этот:  
<https://clickhouse.com/docs/ru/getting-started/example-datasets/uk-price-paid>

Создаем таблицу:

CREATE TABLE my\_database.uk\_price\_paid (

price UInt32,

date Date,

postcode1 LowCardinality(String),

postcode2 LowCardinality(String),

type Enum8('terraced' = 1, 'semi-detached' = 2, 'detached' = 3, 'flat' = 4, 'other' = 0),

is\_new UInt8,

duration Enum8('freehold' = 1, 'leasehold' = 2, 'unknown' = 0),

addr1 String,

addr2 String,

street LowCardinality(String),

locality LowCardinality(String),

town LowCardinality(String),

district LowCardinality(String),

county LowCardinality(String)

)

ENGINE = MergeTree

ORDER BY (postcode1, postcode2, addr1, addr2);

Вставка данных:

INSERT INTO my\_database.uk\_price\_paid

WITH

splitByChar(' ', postcode) AS p

SELECT

toUInt32(price\_string) AS price,

parseDateTimeBestEffortUS(time) AS date,

p[1] AS postcode1,

p[2] AS postcode2,

transform(a, ['T', 'S', 'D', 'F', 'O'], ['terraced', 'semi-detached', 'detached', 'flat', 'other']) AS type,

b = 'Y' AS is\_new,

transform(c, ['F', 'L', 'U'], ['freehold', 'leasehold', 'unknown']) AS duration,

addr1,

addr2,

street,

locality,

town,

district,

county

FROM url(

'http://prod.publicdata.landregistry.gov.uk.s3-website-eu-west-1.amazonaws.com/pp-complete.csv',

'CSV',

'uuid\_string String,

price\_string String,

time String,

postcode String,

a String,

b String,

c String,

addr1 String,

addr2 String,

street String,

locality String,

town String,

district String,

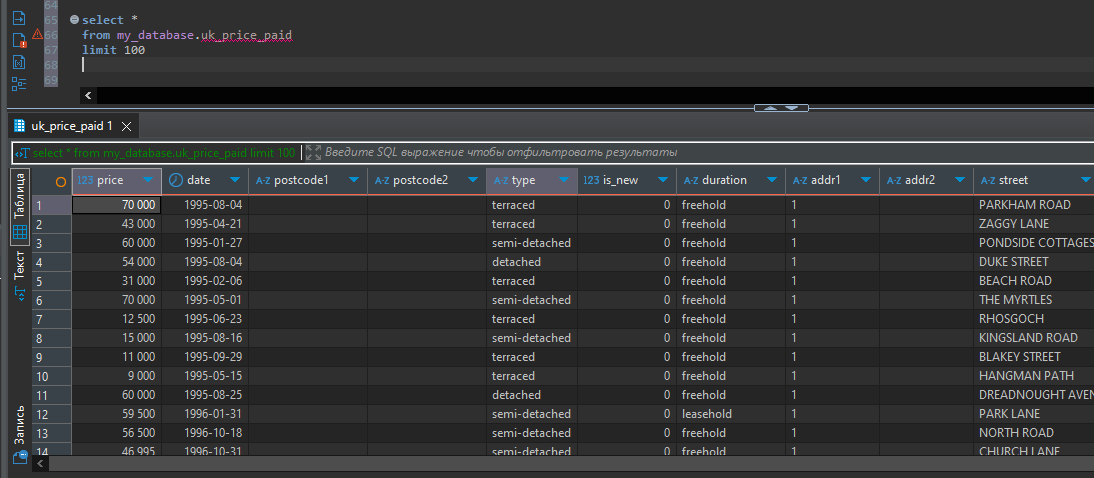
county String,

d String,

e String'

) SETTINGS max\_http\_get\_redirects=10;

Проверяем данные:



**Запускаем бенчмарк и тестируем производительность.**

Заходим в контейнер:  
docker exec -it clickhouse-server-02 bash

Тестируем командой:  
clickhouse-benchmark --user username --password password -i 10 --query "SELECT \* FROM my\_database.uk\_price\_paid LIMIT 6000000 OFFSET 6000000"

Результат без настроек (дефолтные):

Loaded 1 queries.

Queries executed: 2.

localhost:9000, queries: 2, QPS: 1.025, RPS: 12308389.099, MiB/s: 533.694, result RPS: 6149858.387, result MiB/s: 252.186.

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Queries executed: 4.

localhost:9000, queries: 2, QPS: 1.104, RPS: 13272159.292, MiB/s: 575.535, result RPS: 6622368.584, result MiB/s: 271.410.

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Queries executed: 6.

localhost:9000, queries: 2, QPS: 1.016, RPS: 12195265.547, MiB/s: 528.824, result RPS: 6093336.464, result MiB/s: 249.612.

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Queries executed: 8.

localhost:9000, queries: 2, QPS: 1.063, RPS: 12763686.736, MiB/s: 553.471, result RPS: 6377346.807, result MiB/s: 261.314.

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Queries executed: 10.

localhost:9000, queries: 10, QPS: 1.004, RPS: 12057105.729, MiB/s: 522.838, result RPS: 6022661.798, result MiB/s: 246.800.

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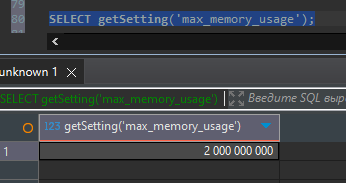
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Выставил ограничение памяти - 2GB



Loaded 1 queries.

Queries executed: 1.

localhost:9000, queries: 1, QPS: 0.975, RPS: 11705636.625, MiB/s: 506.221, result RPS: 5848560.560, result MiB/s: 238.694.

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Queries executed: 3.

localhost:9000, queries: 2, QPS: 1.068, RPS: 12832874.362, MiB/s: 555.397, result RPS: 6407398.478, result MiB/s: 262.341.

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Queries executed: 4.

localhost:9000, queries: 1, QPS: 0.943, RPS: 11321593.368, MiB/s: 490.254, result RPS: 5656678.622, result MiB/s: 231.115.

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Queries executed: 5.

localhost:9000, queries: 1, QPS: 0.980, RPS: 11774290.634, MiB/s: 509.185, result RPS: 5882862.593, result MiB/s: 240.653.

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Queries executed: 7.

localhost:9000, queries: 2, QPS: 1.001, RPS: 12025063.788, MiB/s: 520.823, result RPS: 6008157.955, result MiB/s: 245.952.

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Queries executed: 10.

localhost:9000, queries: 10, QPS: 0.995, RPS: 11952292.630, MiB/s: 517.266, result RPS: 5971354.900, result MiB/s: 244.277.

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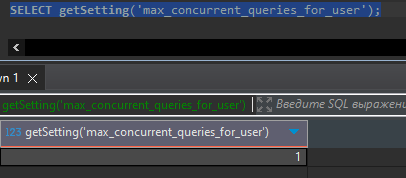
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Ограничение параллельных запросов на пользователя – 1.



Loaded 1 queries.

Queries executed: 3.

localhost:9000, queries: 3, QPS: 2.072, RPS: 24875050.007, MiB/s: 1052.473, result RPS: 12430541.801, result MiB/s: 490.208.

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Queries executed: 6.

localhost:9000, queries: 3, QPS: 2.089, RPS: 25074199.545, MiB/s: 1060.204, result RPS: 12535762.624, result MiB/s: 493.973.

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Queries executed: 10.

localhost:9000, queries: 10, QPS: 2.044, RPS: 24530290.320, MiB/s: 1037.558, result RPS: 12262163.002, result MiB/s: 483.430.

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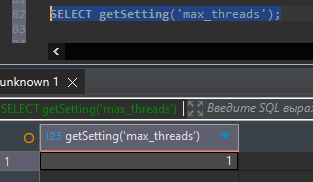
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Ограничение потоков – 1



Loaded 1 queries.

Queries executed: 2.

localhost:9000, queries: 2, QPS: 1.528, RPS: 18372823.725, MiB/s: 766.739, result RPS: 9166660.764, result MiB/s: 357.256.

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Queries executed: 4.

localhost:9000, queries: 2, QPS: 1.549, RPS: 18632808.278, MiB/s: 777.589, result RPS: 9296373.553, result MiB/s: 362.311.

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Queries executed: 6.

localhost:9000, queries: 2, QPS: 1.566, RPS: 18837082.072, MiB/s: 786.114, result RPS: 9398290.852, result MiB/s: 366.283.

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Queries executed: 8.

localhost:9000, queries: 2, QPS: 1.570, RPS: 18876721.507, MiB/s: 787.768, result RPS: 9418067.957, result MiB/s: 367.054.

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Queries executed: 10.

localhost:9000, queries: 10, QPS: 1.531, RPS: 18416615.965, MiB/s: 768.567, result RPS: 9188509.807, result MiB/s: 358.107.

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Изменение памяти в целом не повлияло на результаты, что 2GB, что 20MB. При значении памяти ниже 20 метров уже бенчмарк не запускался. На результаты повлияло только ограничение кол-ва параллельных запросов и потоков, но очень странно - дало лучшие показатели.

