13 ДЗ - Storage Policy и резервное копирование.

Собираем Dockerfile и docker-compose.

- clickhouse-minio-25.2.1.Dockerfile – для бэкапа данных средствами clickhouse:

```
FROM clickhouse/clickhouse-server:25.2.1
MAINTAINER Maksim Kulikov <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

COPY clickhouse/backup.xml /etc/clickhouse-server/config.d/backup.xml

EXPOSE 8123 9000 9363

ENTRYPOINT ["/entrypoint.sh"]
```

- clickhouse-backup-25.2.1.Dockerfile – для бэкапа данных через clickhouse-backup:

```
FROM clickhouse/clickhouse-server:25.2.1
MAINTAINER Maksim Kulikov <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

RUN mkdir /tmp/clickhouse-backup \
        && cd /tmp/clickhouse-backup \
        && wget https://github.com/Altinity/clickhouse-backup/releases/download/v2.6.16/clickhouse-backup-
linux-amd64.tar.gz \
        && tar -xf clickhouse-backup-linux-amd64.tar.gz \
        && install -o root -g root -m 0755 build/linux/amd64/clickhouse-backup /usr/local/bin \
   && mkdir /etc/clickhouse-backup

COPY clickhouse/clickhouse-backup/config.yml /etc/clickhouse-backup/config.yml

EXPOSE 8123 9000

ENTRYPOINT ["/entrypoint.sh"]
```

Собираем docker-compose.yml для запуска приложений:

docker-compose-backup.yml

```
version: "3.6"

services:
  clickhouse-server-1:
    container_name: clickhouse-server-1
    image: uoles/clickhouse-minio:25.2.1
    hostname: clickhouse-server-1
    build:
      context: .
      dockerfile: clickhouse-minio-25.2.1.Dockerfile
    environment:
      CLICKHOUSE_DB: my_database
      CLICKHOUSE_USER: username
      CLICKHOUSE_DEFAULT_ACCESS_MANAGEMENT: 1
      CLICKHOUSE_PASSWORD: password
    ports:
      - "18123:8123"
      - "19000:9000"
    ulimits:
      nofile:
        soft: 262144
        hard: 262144
    depends_on:
      minio:
        condition: service_healthy
      createbuckets:
        condition: service_started
    links:
      - minio
    networks:
      - default

  clickhouse-server-2:
    container_name: clickhouse-server-2
    image: uoles/clickhouse:25.2.1
    hostname: clickhouse-server-2
    build:
      context: .
      dockerfile: clickhouse-backup-25.2.1.Dockerfile
    environment:
      CLICKHOUSE_DB: my_database
      CLICKHOUSE_USER: username
      CLICKHOUSE_DEFAULT_ACCESS_MANAGEMENT: 1
      CLICKHOUSE_PASSWORD: password
    ports:
      - "28123:8123"
      - "29000:9000"
    ulimits:
      nofile:
        soft: 262144
        hard: 262144
    depends_on:
      minio:
        condition: service_healthy
      createbuckets:
        condition: service_started
    links:
```

```
      - minio
    networks:
      - default

  minio:
    image: quay.io/minio/minio
    container_name: minio
    hostname: minio
    command: server --address 0.0.0.0:10000 --console-address 0.0.0.0:10001 /data
    ports:
      - "10000:10000"
      - "10001:10001"
    environment:
      - MINIO_ROOT_USER=minio-root-user
      - MINIO_ROOT_PASSWORD=minio-root-password
    networks:
      - default
    healthcheck:
      test: [ "CMD", "curl", "-f", "http://localhost:10001" ]
      interval: 5s
      timeout: 10s
      retries: 5

  createbuckets:
    image: minio/mc
    entrypoint: >
      /bin/sh -c "
      /usr/bin/mc alias set myminio http://minio:10000 minio-root-user minio-root-password;
      /usr/bin/mc admin info myminio;
      /usr/bin/mc mb myminio/clickhouse;
      /usr/bin/mc policy set public myminio/clickhouse;
      exit 0;
      "
    depends_on:
      minio:
        condition: service_healthy
    links:
      - minio
    networks:
      - default

networks:
  default:
    ipam:
      driver: default
      config:
        - subnet: 172.28.0.0/16
```

---

clickhouse-server-1 – для тестирования бэкапа данных средствами clickhouse.
clickhouse-server-2 – для тестирования бэкапа данных через clickhouse-backup.
createbuckets – создает бакет в minio.

Настройки storage policy:
/etc/clickhouse-server/config.d/backup.xml

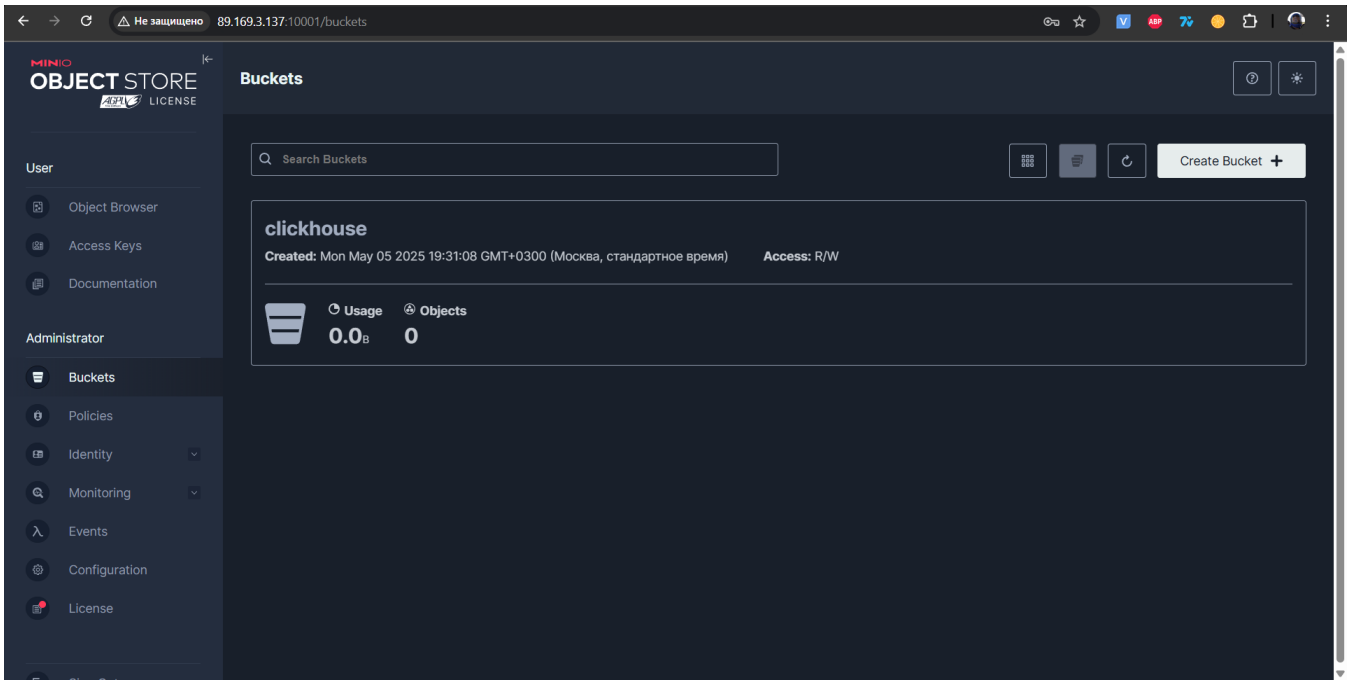
```
<clickhouse>
    <storage_configuration>
        <disks>
            <s3_plain>
                <type>s3_plain</type>
                <endpoint>http://minio:10000/clickhouse/</endpoint>
                <access_key_id>minio-root-user</access_key_id>
                <secret_access_key>minio-root-password</secret_access_key>
            </s3_plain>
        </disks>
        <policies>
            <s3>
                <volumes>
                    <main>
                        <disk>s3_plain</disk>
                    </main>
                </volumes>
            </s3>
        </policies>
    </storage_configuration>

    <backups>
        <allowed_disk>s3_plain</allowed_disk>
    </backups>
</clickhouse>
```

Настройки для clickhouse-backup:
/etc/clickhouse-backup/config.yml

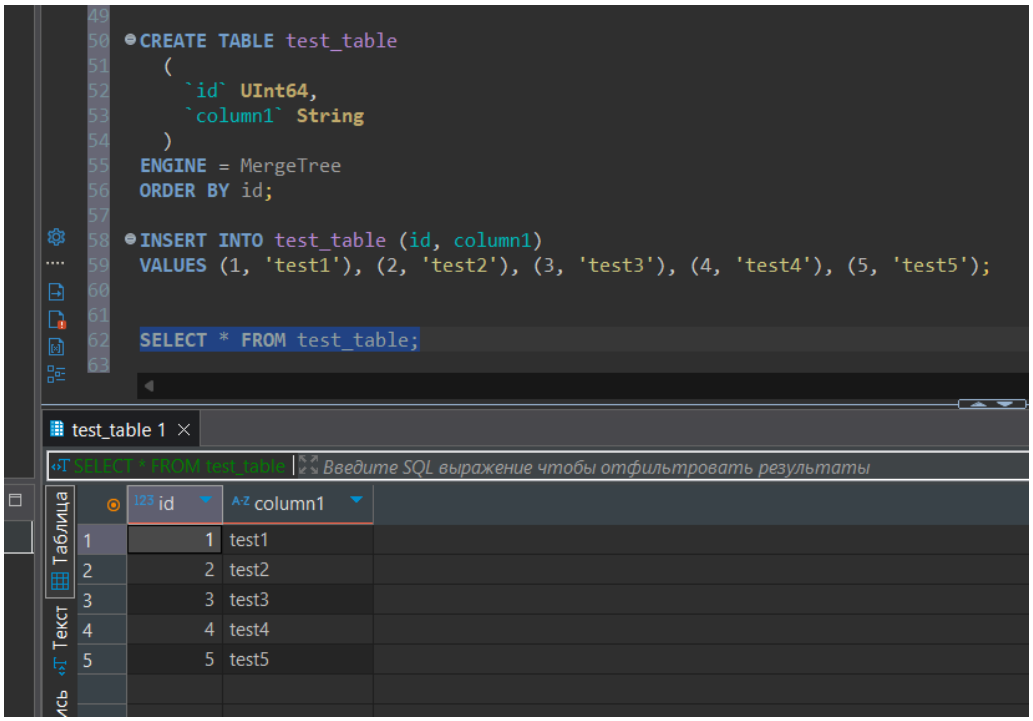
```
general:
  remote_storage: s3
  disable_progress_bar: false
  backups_to_keep_local: 0
  backups_to_keep_remote: 0
  log_level: info
  allow_empty_backups: false
clickhouse:
  username: username
  password: password
  skip_tables:
  - system.*
  - INFORMATION_SCHEMA.*
s3:
  access_key: minio-root-user
  secret_key: minio-root-password
  bucket: ""
  endpoint: http://minio:10000/clickhouse/
  region: us-west-000
  acl: ""
  force_path_style: false
  path: clickhouse-backup
  disable_ssl: false
  part_size: 536870912
  compression_level: 1
  compression_format: tar
  sse: ""
  disable_cert_verification: false
  storage_class: STANDARD
```

Создание бэкапа средствами clickhouse.

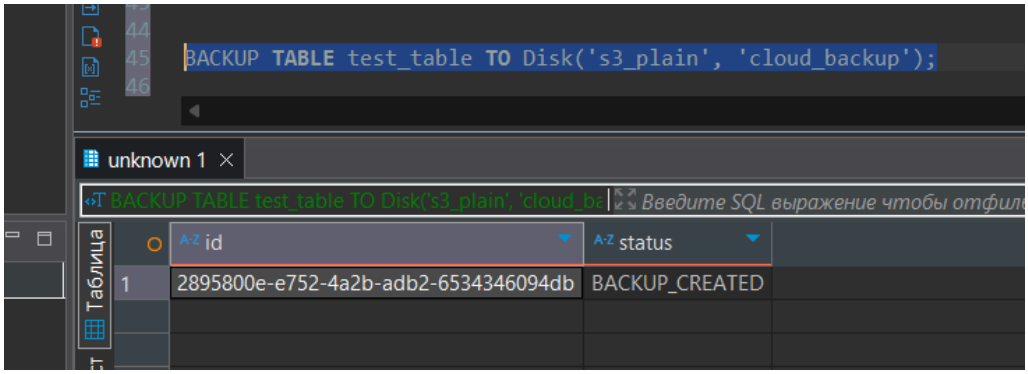
Проверяем наличие созданного бакета в minio:



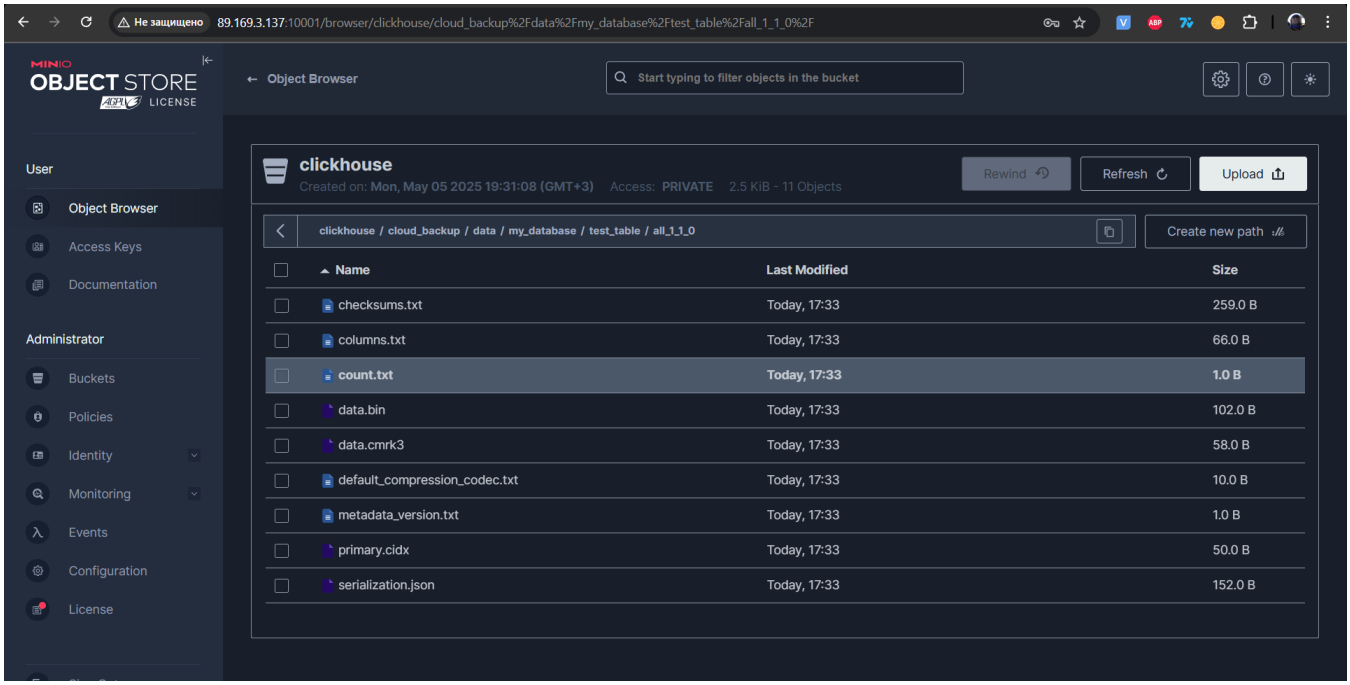
Подключаемся к clickhouse-server-1 и создаем таблицу с данными:



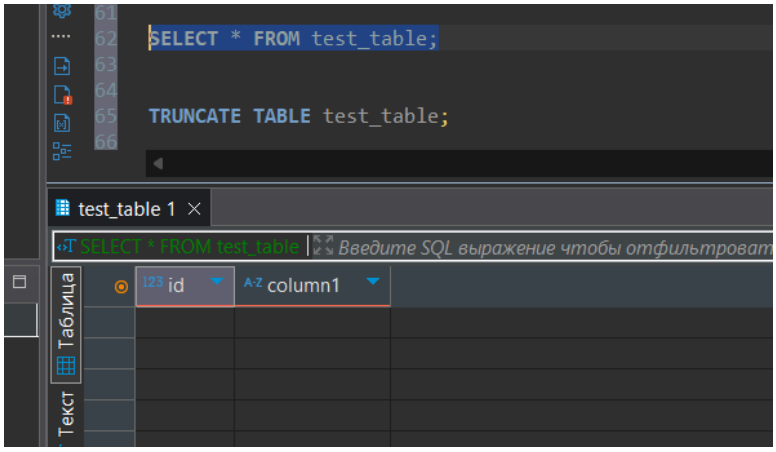
Делаем бэкап данных:



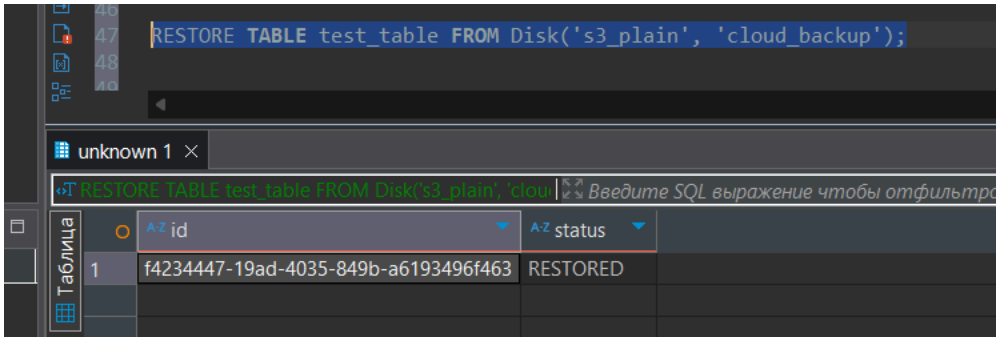
Проверяем данные в minio:

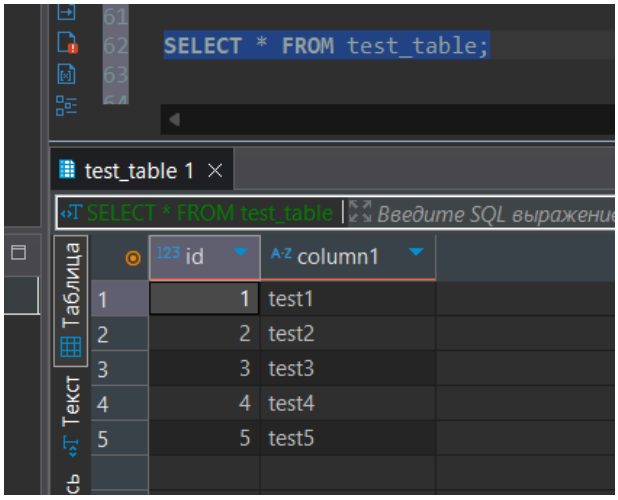


Очищаем таблицу и проверяем:



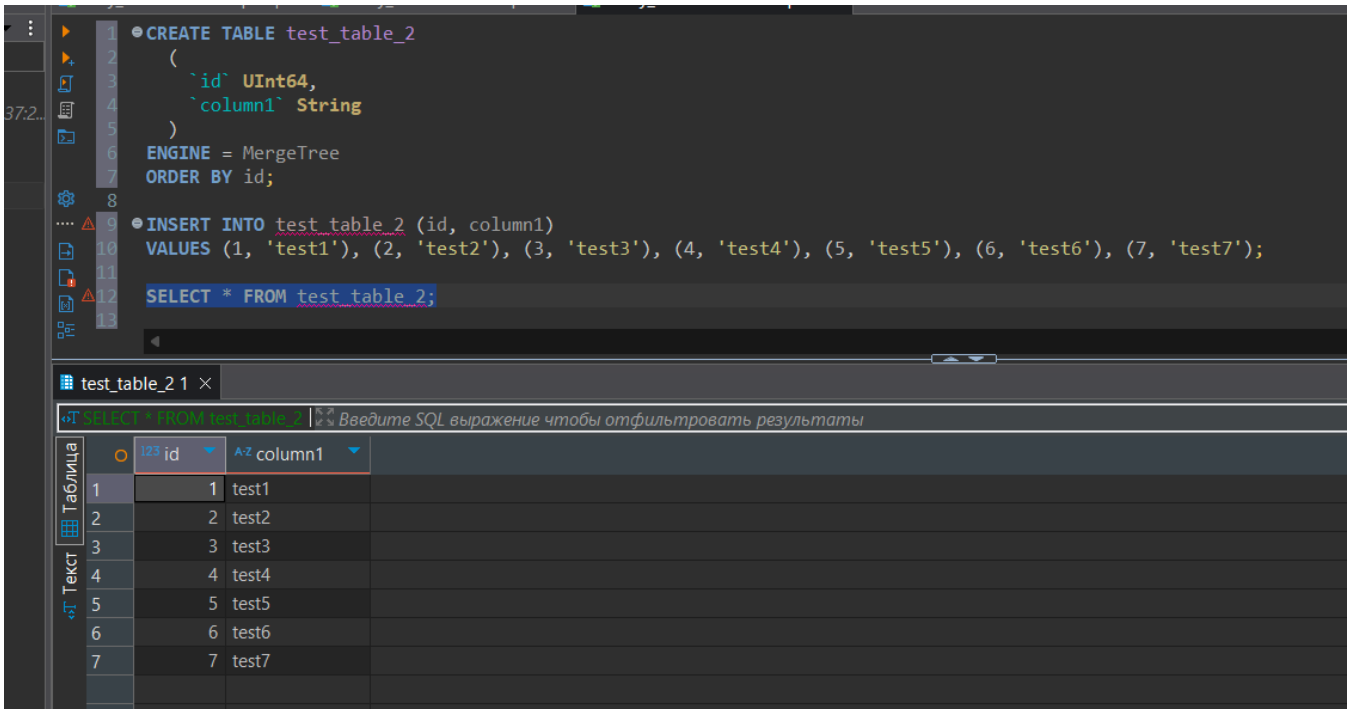
Восстанавливаем данные и проверяем:





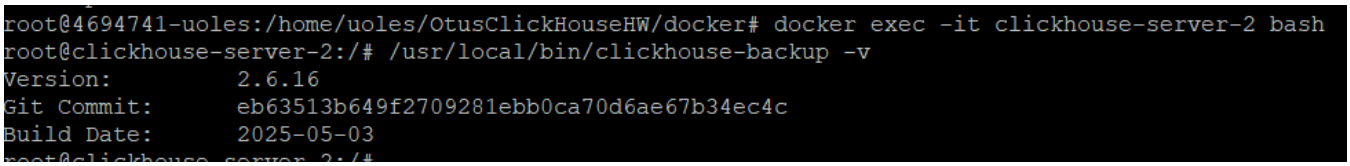
Делаем бэкап данных через cklickhouse-backup.

Подключаемся к clickhouse-server-2 и создаем таблицу с данными:



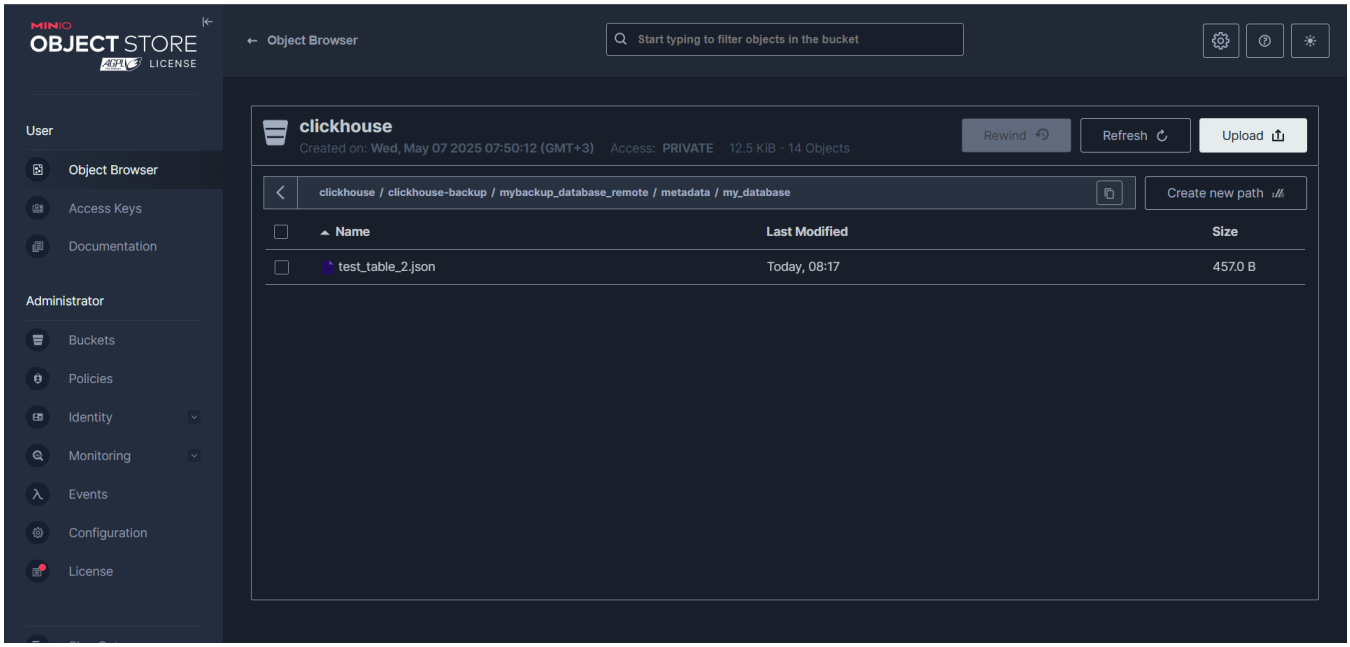
Заходим в контейнер clickhouse-server-2 командой:
>> docker exec -it clickhouse-server-2 bash

и проверяем наличие clickhouse-backup:

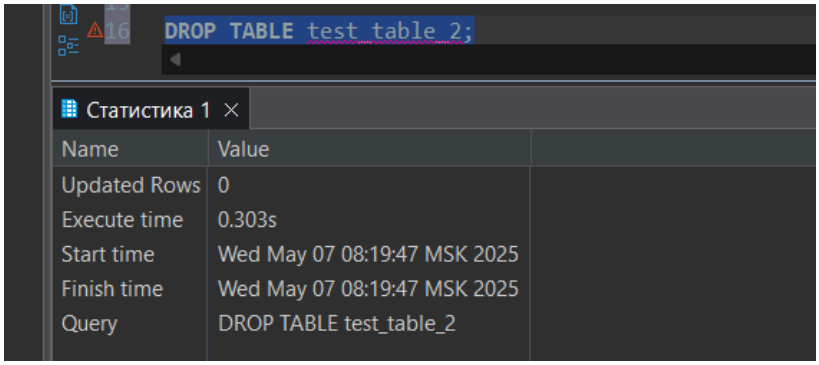


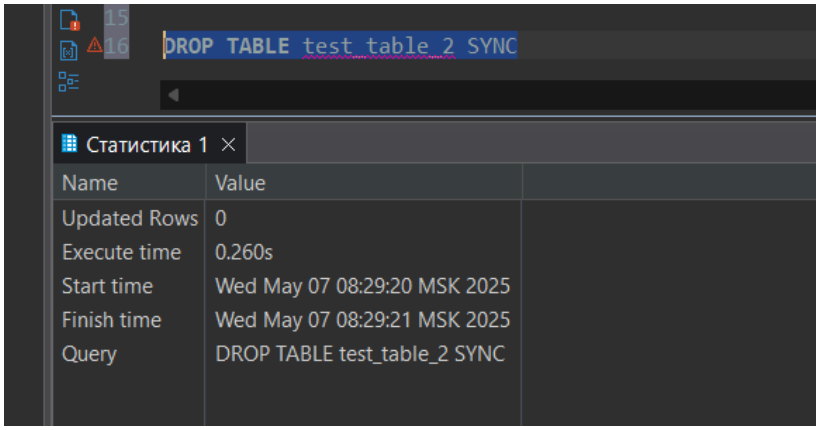
Делаем бэкап базы данных «my_database» командой:
>> clickhouse-backup create_remote mybackup_database_remote -t 'my_database.*'

Проверяем наличие бэкапа в minio:



Удаляем таблицу в clickhouse:





Восстанавливаем схему из бекапа командой:
>> clickhouse-backup restore_remote mybackup_database_remote -t 'my_database.*'

и проверяем таблицу: