Lab 10 - sprawozdanie

Wojciech Przybytek, Dariusz Piwowarski

Przebieg ćwiczenia

Utworzono serwery `publisher_db` i `subscriber_db`

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ ls /tmp
publisher_db  subscriber_db
```

Ustawiono port `publisher_db` na 5433 oraz `wal_level` na `logical`

```
 54 #------------------------------------------------------------------------------
 55 # CONNECTIONS AND AUTHENTICATION
 56 #------------------------------------------------------------------------------
 57
 58 # - Connection Settings -
 59
 60 listen_addresses = '*'
 61                     # comma-separated list of addresses;
 62                     # defaults to 'localhost'; use '*' for all
 63                     # (change requires restart)
 64 port = 5433             # (change requires restart)
```

```
199 #------------------------------------------------------------------------------
200 # WRITE-AHEAD LOG
201 #------------------------------------------------------------------------------
202
203 # - Settings -
204
205 wal_level = logical        # minimal, replica, or logical
```

Ustawiono port `subscriber_db` na 5434

```
54 #------------------------------------------------------------------------------
55 # CONNECTIONS AND AUTHENTICATION
56 #------------------------------------------------------------------------------
57
58 # - Connection Settings -
59
60 listen_addresses = '*'
61                     # comma-separated list of addresses;
62                     # defaults to 'localhost'; use '*' for all
63                     # (change requires restart)
64 port = 5434             # (change requires restart)
```

Uruchomiono obie instancje

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ pg_ctl -D /tmp/publisher_db -l /tmp/publisher_db_logfile start
waiting for server to start.... done
server started
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ pg_ctl -D /tmp/subscriber_db -l /tmp/subscriber_db_logfile start
waiting for server to start.... done
server started
```

Połączono się z serwerem `publisher_db` , utworzono w nim baze `pub_db` , a w niej tabelę `pub_tbl`

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ psql -d postgres -p 5433
psql (14.1 (Debian 14.1-1.pgdg110+1))
Type "help" for help.

postgres=# create database pub_db;
CREATE DATABASE
postgres=# \c pub_db
You are now connected to database "pub_db" as user "postgres".
pub_db=# create table pub_tbl(id int, name varchar);
CREATE TABLE
```

Wygenerowano 10 wierszy w tabeli

```
pub_db=# insert into pub_tbl select x.*, 'data' || cast(x.* as varchar) from generate_series(1,10) x;
INSERT 0 10
```

```
pub_db=# select * from pub_tbl;
 id |  name
----+--------
  1 | data1
  2 | data2
  3 | data3
  4 | data4
  5 | data5
  6 | data6
  7 | data7
  8 | data8
  9 | data9
 10 | data10
(10 rows)
```

Utworzono na serwerze `subscriber_db` bazę `sub_db`

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ psql -d postgres -p 5434
psql (14.1 (Debian 14.1-1.pgdg110+1))
Type "help" for help.

postgres=# create database sub_db;
CREATE DATABASE
postgres=# \c sub_db
You are now connected to database "sub_db" as user "postgres".
```

Przekopiowano schemat tabeli `pub_tbl` do bazy `sub_db`

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ pg_dump -p 5433 -d pub_db -t pub_tbl -s | psql -p 5434 -d sub_db
SET
SET
SET
SET
SET
 set_config
------------

(1 row)

SET
SET
SET
SET
SET
SET
CREATE TABLE
ALTER TABLE
```

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ psql -p 5434 -d sub_db
psql (14.1 (Debian 14.1-1.pgdg110+1))
Type "help" for help.

sub_db=# \d pub_tbl
                  Table "public.pub_tbl"
 Column |       Type        | Collation | Nullable | Default
--------+-------------------+-----------+----------+---------
 id     | integer           |           |          |
 name   | character varying |           |          |

sub_db=# select * from pub_tbl;
 id | name
----+------
(0 rows)
```

W bazie `pub_db` utworzono publikację `test_publication` na tabeli `pub_tbl`

```
pub_db=# create publication test_publication for table pub_tbl;
CREATE PUBLICATION
```

W bazie `sub_db` utworzono subskrypcję `test_subscription` na wcześniej stworzoną publikację

```
sub_db=# create subscription test_subscription connection 'port=5433 dbname=pub_db' publication test_publication;
NOTICE:  created replication slot "test_subscription" on publisher
CREATE SUBSCRIPTION
```

W bazie `sub_db` dane w tabeli `pub_tbl` zostały przekopiowane

```
sub_db=# select * from pub_tbl;
 id |  name
----+--------
  1 | data1
  2 | data2
  3 | data3
  4 | data4
  5 | data5
  6 | data6
  7 | data7
  8 | data8
  9 | data9
 10 | data10
(10 rows)
```

W logach publishera widać utworzenie publikacji

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ tail -n 16 /tmp/publisher_db_logfile
2024-05-13 17:23:19.250 UTC [389] STATEMENT:  CREATE_REPLICATION_SLOT "test_subscription" LOGICAL pgoutput NOEXPORT_SNAP
SHOT
2024-05-13 17:23:19.262 UTC [391] LOG:  starting logical decoding for slot "test_subscription"
2024-05-13 17:23:19.262 UTC [391] DETAIL:  Streaming transactions committing after 0/171F218, reading WAL from 0/171F1E0
.
2024-05-13 17:23:19.262 UTC [391] STATEMENT:  START_REPLICATION SLOT "test_subscription" LOGICAL 0/0 (proto_version '2',
 publication_names '"test_publication"')
2024-05-13 17:23:19.262 UTC [391] LOG:  logical decoding found consistent point at 0/171F1E0
2024-05-13 17:23:19.262 UTC [391] DETAIL:  There are no running transactions.
2024-05-13 17:23:19.262 UTC [391] STATEMENT:  START_REPLICATION SLOT "test_subscription" LOGICAL 0/0 (proto_version '2',
 publication_names '"test_publication"')
2024-05-13 17:23:19.277 UTC [393] LOG:  logical decoding found consistent point at 0/171F218
2024-05-13 17:23:19.277 UTC [393] DETAIL:  There are no running transactions.
2024-05-13 17:23:19.277 UTC [393] STATEMENT:  CREATE_REPLICATION_SLOT "pg_16395_sync_16390_7368525060899668040" LOGICAL
pgoutput USE_SNAPSHOT
2024-05-13 17:23:19.283 UTC [393] LOG:  starting logical decoding for slot "pg_16395_sync_16390_7368525060899668040"
2024-05-13 17:23:19.283 UTC [393] DETAIL:  Streaming transactions committing after 0/171F250, reading WAL from 0/171F218
.
2024-05-13 17:23:19.283 UTC [393] STATEMENT:  START_REPLICATION SLOT "pg_16395_sync_16390_7368525060899668040" LOGICAL 0
/171F250 (proto_version '2', publication_names '"test_publication"')
2024-05-13 17:23:19.283 UTC [393] LOG:  logical decoding found consistent point at 0/171F218
2024-05-13 17:23:19.283 UTC [393] DETAIL:  There are no running transactions.
2024-05-13 17:23:19.283 UTC [393] STATEMENT:  START_REPLICATION SLOT "pg_16395_sync_16390_7368525060899668040" LOGICAL 0
/171F250 (proto_version '2', publication_names '"test_publication"')
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$
```

W logach subscribera widać utworzenie subskrypcji

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ tail -n 5 /tmp/subscriber_db_logfile
2024-05-13 17:23:19.257 UTC [390] LOG:  logical replication apply worker for subscription "test_subscription" has starte
d
2024-05-13 17:23:19.265 UTC [392] LOG:  logical replication table synchronization worker for subscription "test_subscrip
tion", table "pub_tbl" has started
2024-05-13 17:23:19.285 UTC [392] LOG:  logical replication table synchronization worker for subscription "test_subscrip
tion", table "pub_tbl" has finished
2024-05-13 17:24:50.392 UTC [381] ERROR:  relation "postgres.users" does not exist at character 15
2024-05-13 17:24:50.392 UTC [381] STATEMENT:  select * from postgres.users;
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$
```

Utworzenie nowych 10 rekordów w bazie `pub_db` w tabeli `pub_tbl`

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ psql -p 5433 pub_db
psql (14.1 (Debian 14.1-1.pgdg110+1))
Type "help" for help.

pub_db=# insert into pub_tbl select x.*, 'data' || cast(x.* as varchar) from generate_series(11,20) x;
INSERT 0 10
pub_db=# select * from pub_tbl;
 id |  name
----+--------
  1 | data1
  2 | data2
  3 | data3
  4 | data4
  5 | data5
  6 | data6
  7 | data7
  8 | data8
  9 | data9
 10 | data10
 11 | data11
 12 | data12
 13 | data13
 14 | data14
 15 | data15
 16 | data16
 17 | data17
 18 | data18
 19 | data19
 20 | data20
(20 rows)

pub_db=#
```

Rekordy zostały przekopiowane do bazy `sub_db`

```
postgres@b266e31efaed:/usr/lib/postgresql/14/bin$ psql -p 5434 sub_db
psql (14.1 (Debian 14.1-1.pgdg110+1))
Type "help" for help.

sub_db=# select * from pub_tbl;
 id |  name
----+--------
  1 | data1
  2 | data2
  3 | data3
  4 | data4
  5 | data5
  6 | data6
  7 | data7
  8 | data8
  9 | data9
 10 | data10
 11 | data11
 12 | data12
 13 | data13
 14 | data14
 15 | data15
 16 | data16
 17 | data17
 18 | data18
 19 | data19
 20 | data20
(20 rows)

sub_db=#
```

Nie udało się wykonać komendy update, otrzymaliśmy następujący komunikat o błędzie

```
pub_db=# update pub_tbl set name='roman' where id < 3;
ERROR:  cannot update table "pub_tbl" because it does not have a replica identity and publishes updates
HINT:  To enable updating the table, set REPLICA IDENTITY using ALTER TABLE.
pub_db=#
```

Według informacji które znaleźliśmy, jest to spowodowane brakiem primary key w tabeli, ale można to też obejść wykonując proponowane przez postgresa polecenie

```
pub_db=# ALTER TABLE pub_tbl REPLICA IDENTITY FULL;
ALTER TABLE
pub_db=# update pub_tbl set name='roman' where id < 3;
UPDATE 2
pub_db=# select * from pub_tbl;
 id |  name
----+--------
  3 | data3
  4 | data4
  5 | data5
  6 | data6
  7 | data7
  8 | data8
  9 | data9
 10 | data10
 11 | data11
 12 | data12
 13 | data13
 14 | data14
 15 | data15
 16 | data16
 17 | data17
 18 | data18
 19 | data19
 20 | data20
  1 | roman
  2 | roman
(20 rows)

pub_db=#
```

```
sub_db=# select * from pub_tbl;
 id |  name
----+--------
  3 | data3
  4 | data4
  5 | data5
  6 | data6
  7 | data7
  8 | data8
  9 | data9
 10 | data10
 11 | data11
 12 | data12
 13 | data13
 14 | data14
 15 | data15
 16 | data16
 17 | data17
 18 | data18
 19 | data19
 20 | data20
  1 | roman
  2 | roman
(20 rows)

sub_db=#
```

Dane zostały poprawnie uaktualnione w replice