

# Logical Replication in PostgreSQL 10

Peter Eisentraut

2ndQuadrant<sup>®</sup>   
P o s t g r e S Q L

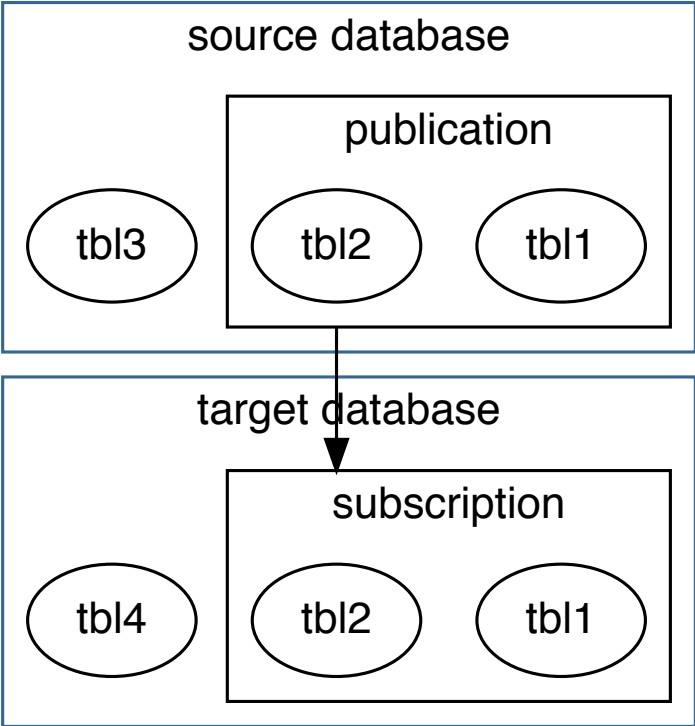
[peter.eisentraut@2ndquadrant.com](mailto:peter.eisentraut@2ndquadrant.com)  
[@petereisentraut](https://twitter.com/petereisentraut)

# Uses

- partial replication
- upgrades
- anything where physical replication is insufficient

# What about

- BDR
- pglogical



# Tables, columns, types

- mapped by name
- different column orders possible
- data currently in text format
- table changes are allowed

# Publications

```
CREATE PUBLICATION mypub1
  FOR TABLE tbl1, tbl2;
CREATE PUBLICATION mypub2
  FOR ALL TABLES;
CREATE PUBLICATION mypub3
  FOR TABLE tbl3
  WITH (publish = 'insert,update');
```

# Publications

```
ALTER PUBLICATION mypub1  
    ADD TABLE tbl4, tbl5;  
ALTER PUBLICATION mypub1  
    SET TABLE tbl4, tbl5;  
ALTER PUBLICATION mypub1  
    DROP TABLE tbl4, tbl5;
```

# Publications

```
DROP PUBLICATION mypub1;
```

```
DROP PUBLICATION mypub2, mypub3;
```



# Subscriptions

```
CREATE SUBSCRIPTION mysub1
  CONNECTION 'host=elsewhere '
             'dbname=mydb '
             'user=repuser'
  PUBLICATION mypub1, mypub2;
```

# Subscriptions

```
CREATE SUBSCRIPTION mysub1
  CONNECTION '...'
  PUBLICATION ...
  WITH (enabled = false,
        create_slot = false,
        slot_name = 'myslot',
        copy_data = false, ...);
```

# Subscriptions

```
ALTER SUBSCRIPTION mysub1 ENABLE;  
ALTER SUBSCRIPTION mysub1 DISABLE;
```

```
ALTER SUBSCRIPTION mysub1  
    CONNECTION 'host=newhost ...';
```

# Subscriptions

```
ALTER SUBSCRIPTION mysub1  
    SET (slot_name = 'news1ot', ...);
```

```
ALTER SUBSCRIPTION mysub1  
    SET (slot_name = NONE);
```

# Subscriptions

```
ALTER SUBSCRIPTION mysub1  
    SET PUBLICATION mypub3 REFRESH;
```

```
ALTER SUBSCRIPTION mysub1  
    REFRESH PUBLICATION;
```

# Subscriptions

```
DROP SUBSCRIPTION mysub1;
```

# Configuration settings

Publisher:

- `wal_level = logical`
- `(max_wal_senders)`
- `(max_replication_slots)`
- for remote: `listen_addresses +`  
`pg_hba.conf`

# Configuration settings

Subscriber:

- `(max_replication_slots)`
- `(max_worker_processes)`
- `(max_logical_replication_workers)`
- `(max_sync_workers_per_subscription)`



# Security

- publication: GRANT CREATE ON DATABASE + table owner
- subscription: local superuser + remote replication user
- hba:  
host dbname repuser 0.0.0.0/0  
scram-sha-256

# Monitoring

- `pg_stat_replication`
- `pg_replication_slots`
- `pg_stat_subscription`
- `pg_stat_activity`

# Other features

- synchronous replication
- cascading
- triggers
- constraints
- writing to subscribed tables

# Missing features

- does not replicate schema/DDL
- does not replicate sequences
- does not replicate TRUNCATE
- only supports replicating base table to base table

# Usability issues

- more moving parts than physical replication
- replica identity handling
- issues with long-running transactions
- pg\_dump behavior
- no failback

# Future

- fix missing features
- multimaster
- better integration with physical replication
- more granular security
- transforming, filtering, ...

# Credits

- Petr Jelinek
- Andres Freund
- Erik Rijkers
- Craig Ringer
- Masahiko Sawada