**Lab Exercise 16- Setting Up Streaming Replication in**

**Objective**

* Configure PostgreSQL master and replica (standby) servers
* Enable streaming replication
* Verify replication is working

**Prerequisites**

* Two PostgreSQL installations (on the same or different machines)
* Windows OS
* PostgreSQL version 10 or later
* Superuser access on both nodes
* Identical major PostgreSQL versions on both master and replica

**Step 1: Prepare the Master Server**

**A. Modify postgresql.conf on Master**

Navigate to:

C:\Program Files\PostgreSQL\15\data\postgresql.conf

Enable the following settings:

listen\_addresses = '\*'

wal\_level = replica

max\_wal\_senders = 5

wal\_keep\_size = 64

archive\_mode = on

archive\_command = 'copy "%p" "C:\\pg\_wal\_archive\\%f"'

Make sure the pg\_wal\_archive directory exists.

**B. Modify pg\_hba.conf on Master**

Navigate to:

C:\Program Files\PostgreSQL\15\data\pg\_hba.conf

Add a line to allow the replica to connect:

host replication replicator 192.168.1.101/32 md5

Replace 192.168.1.101 with the IP address of the replica node.

**C. Create a Replication User**

Open **psql** and run:

CREATE ROLE replicator WITH REPLICATION LOGIN ENCRYPTED PASSWORD 'replpass';

**D. Restart the Master Server**

Use Services or command line:

**Step 2: Set Up the Replica Server**

**A. Stop the PostgreSQL Service on Replica**

**B. Clear Existing Data Directory on Replica**

Navigate to:

C:\Program Files\PostgreSQL\15\data

Delete or rename the contents.

**C. Use pg\_basebackup to Copy Data from Master**

Open Command Prompt on the **replica machine**:

pg\_basebackup -h 192.168.1.100 -D "C:\Program Files\PostgreSQL\15\data" -U replicator -Fp -Xs -P

* Replace 192.168.1.100 with the master's IP address
* Enter password replpass when prompted

**D. Create standby.signal File in Replica Data Directory**

In:

C:\Program Files\PostgreSQL\15\data

Create a new file named:

standby.signal

Keep it **empty**.

**E. Edit postgresql.conf on Replica**

Set the connection info in the file:

primary\_conninfo = 'host=192.168.1.100 port=5432 user=replicator password=replpass'

Optionally, set:

hot\_standby = on

**F. Start the Replica Server**

**Step 3: Verify Replication**

On **Master**:

SELECT client\_addr, state FROM pg\_stat\_replication;

You should see the IP address of the replica with a state like streaming.

On **Replica**:

Try to query tables (read-only access):

SELECT \* FROM your\_table\_name;

Try inserting a row (should fail unless promoted to master):

INSERT INTO your\_table\_name VALUES (...);

**Summary**

| **Task** | **Master** | **Replica** |
| --- | --- | --- |
| Configure postgresql.conf | Enable WAL settings | Set primary\_conninfo |
| Create replication user | CREATE ROLE | Use in pg\_basebackup |
| Configure pg\_hba.conf | Add host replication line | Not needed |
| Start replication | Restart PostgreSQL | Use standby.signal |
| Verify | pg\_stat\_replication view | Test read-only queries |