PostgreSQL: Replication Slot Failure – Root Cause Checklist

1. ■ Is the Subscriber Running?

Subscriber side:

ps -ef | grep postgres

→ Check if logical replication apply workers are running. If not, subscriber is down.

2. ■ Is the Network OK?

Subscriber side:

psql -h -U -d

→ If connection fails, issue is firewall, SSL, or DNS.

3. ■ Is Subscription Enabled?

Subscriber side SQL:

SELECT subname, enabled, slot_name, connect, publications FROM pg_subscription;

→ If enabled = f, someone disabled subscription.

To enable: ALTER SUBSCRIPTION sub_name ENABLE;

4. ■■ Any Apply Errors on Subscriber?

Check subscriber logs:

tail -f $PGDATA/log/postgresql*.log

→ Look for missing column, duplicate key, or constraint violation errors.

5. ■ Long Transactions Blocking?

Subscriber side SQL:

SELECT pid, state, query, backend_xmin FROM pg_stat_activity WHERE state <> 'idle';

→ Long-running queries may block replication progress.

6. ■ Subscriber Resource Issues

Check disk: df -h

Check CPU/Memory: top

→ If resources are low, apply worker may fail.

7. ■ Publisher Slot Status

Publisher side SQL:

```
SELECT slot_name, active, restart_lsn, confirmed_flush_lsn, catalog_xmin FROM
pg_replication_slots;
```

→ If active = f, slot not connected. If restart_lsn not moving, subscriber not consuming WAL.

8. ■ Zombie Slot (No Subscriber Using It)

If subscription was dropped but slot still exists:

```
SELECT pg_drop_replication_slot('slot_name');
```

→ Otherwise WAL will never clear.

■ Quick Fix Flow

1. Check if subscriber is running.
2. Check if subscription is enabled.
3. Verify network connection.
4. Look for apply errors in logs.
5. Check for long transactions.
6. Verify resources (disk, CPU, RAM).
7. If subscriber gone, drop slot.

■ In short: Slot fails because subscriber is not reading WAL (due to being down, disabled, errors, long queries, or resource problems).