DistributedMobilityDB Cluster Setup Summary

# 1. Creating the citus-net Docker Network

Purpose:  
To allow containers (coordinator, worker1, worker2) to resolve each other by hostname and communicate internally.  
  
Command used:  
docker network create citus-net  
  
Each container was then launched with:  
--network citus-net

# 2. Creating Worker Containers

Commands used:  
docker run -d --name worker1 --shm-size=512m -e POSTGRES\_PASSWORD=postgres --network citus-net pg16\_with\_mobility\_citus\_distmob  
docker run -d --name worker2 --shm-size=512m -e POSTGRES\_PASSWORD=postgres --network citus-net pg16\_with\_mobility\_citus\_distmob  
  
Coordinator:  
docker run -d --name coordinator --shm-size=512m -e POSTGRES\_PASSWORD=postgres -p 5432:5432 --network citus-net pg16\_with\_mobility\_citus\_distmob

# 3. Enabling Citus in the Container

Purpose:  
To allow containers to enable the citus extension.  
  
Steps taken:  
- Set shared\_preload\_libraries = 'citus' in /var/lib/postgresql/data/postgresql.conf

# 4. Disabling SSL for Inter-Node Communication

Why:  
Citus tried to enforce SSL when connecting to workers, but the workers had ssl = off.  
  
Fix steps:  
- Edited /var/lib/postgresql/data/postgresql.conf on the coordinator:  
 citus.node\_conninfo = 'sslmode=disable'  
- Restarted the coordinator container:  
 docker restart coordinator

# 5. Enabling Communication Between Coordinator and Workers

Problems solved:  
- SSL error  
- Authentication errors (no password supplied)  
  
Fixes:  
- Edited /var/lib/postgresql/data/postgresql.conf on each worker:  
 add at the end of the file: ssl = off  
- Edited /var/lib/postgresql/data/pg\_hba.conf on each worker:  
 add at the end of the file: host all all all trust  
- Reset any conflicting auto settings in all containers (run inside coordinator via psql):  
 ALTER SYSTEM RESET ssl;  
 ALTER SYSTEM RESET ssl\_ciphers;  
- Restarted all containers:  
 docker restart coordinator  
 docker restart worker1  
 docker restart worker2

# 6. Registering Workers with Coordinator

Command (run inside coordinator via psql):  
SELECT \* FROM citus\_add\_node('worker1', 5432);  
SELECT \* FROM citus\_add\_node('worker2', 5432);

# 7. Enabling Required Extensions on All Nodes

Inside each node (coordinator and workers):  
CREATE EXTENSION IF NOT EXISTS postgis;  
CREATE EXTENSION IF NOT EXISTS citus;  
CREATE EXTENSION IF NOT EXISTS mobilitydb;  
CREATE EXTENSION IF NOT EXISTS distributed\_mobilitydb;

# 9. Verifying SSL and Extension Setup

Checks performed:  
- SHOW ssl; → Verified it was off  
- SHOW config\_file; → Verified correct config path  
- SELECT \* FROM citus\_get\_active\_worker\_nodes(); → Verified worker registration  
- Inspected .auto.conf to remove any conflicting ssl = 'on' settings

# 10. Summary: The Final Working Setup

- 1 custom image with:  
 - PostgreSQL 16  
 - Citus (compiled manually)  
 - PostGIS  
 - MobilityDB  
 - DistributedMobilityDB (patched to compile)  
- 3 containers:  
 - coordinator  
 - worker1  
 - worker2  
- Shared network: citus-net  
- SSL: disabled across all nodes  
- Authentication: trust via pg\_hba.conf  
- Inter-node registration via citus\_add\_node