City-Scale Digital Twin: Deployment Diagram

Vercel
- Deployed from Git
- React Frontend App

Docker Host (Monitoring)
- Self-hosted via Docker Compose
- Grafana
- Prometheus

Render
- Hosted as a Worker Service
  - Data Simulation Service
- Hosted as a Web Service
  - FastAPI Backend

HiveMQ Cloud
- Managed Service
- MQTT Broker

IoT Sensor / Simulator
- Data Generator

Neon PostgreSQL
- Serverless Database
- PostgreSQL Database

Pulls Metrics (HTTP)

Pulls Dashboard Data (HTTP)

HTTPS (REST API)

Scrapes Metrics (HTTP)

MQTT Data Stream (TLS/SSL)

MQTT Data Stream (TLS/SSL)

MQTT (Subscribe) (TLS/SSL)

asyncpg (TCP/IP)