# Traffic Visualization System

This repository contains a system for visualizing real-time traffic data on a 3D globe. The system is composed of three main components:

1. **Sender**: Reads traffic data from a CSV file and sends it to the server.
2. **Server**: Processes incoming traffic data and serves it to the frontend.
3. **Frontend**: Displays the traffic data on a 3D globe using Three.js.

## Components

- **Sender**:

    - Reads `ip_addresses.csv` and sends traffic data to the server at regular intervals.
    - Code: sender/sender.py
    - Dependencies: sender/requirements.txt

- **Server**:

    - A Flask-based server that receives traffic data from the sender and provides it to the frontend.
    - Code: server/app.py
    - Dependencies: server/requirements.txt

- **Frontend**:

    - A web-based visualization using Three.js to display traffic data on a 3D globe.
    - Code: frontend/index.html

## Prerequisites

- Docker
- Docker Compose

## Setup and Usage

1. **Clone the repository**:

```
git clone <repository-url>
cd <repository-folder>
```

2. Build and run the system:

```
docker-compose up --build
```

3. Sender:

- The sender reads data from ip_addresses.csv and sends it to the server.
- The delay between sending data is based on the timestamps in the CSV file.

4. Server:

- The server runs on http://localhost:5000.
- Endpoint /data provides traffic data to the frontend.

5. Frontend:

- Displays the traffic data on a 3D globe.
- Recent IP addresses are shown in a sidebar.
- Access the frontend: Open your browser and navigate to http://localhost.