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-- database_setup.sql

-- PostgreSQL database schema for Network Traffic Analyzer


-- Create database (run as superuser)

-- CREATE DATABASE network_analyzer;

-- Connect to the network_analyzer database and run the following:

-- Table for storing packet metadata

CREATE TABLE packets (
    id SERIAL PRIMARY KEY,
    timestamp TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    source_ip INET NOT NULL,
    destination_ip INET NOT NULL,
    source_port INTEGER,
    destination_port INTEGER,
    protocol VARCHAR(10) NOT NULL,
    packet_size INTEGER,
    tcp_flags VARCHAR(20),
    node_id VARCHAR(50) NOT NULL,
    raw_data TEXT
);

-- Table for storing security alerts

CREATE TABLE alerts (
    id SERIAL PRIMARY KEY,
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        timestamp TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
        alert_type VARCHAR(50) NOT NULL,  
        source_ip INET NOT NULL,  
        destination_ip INET,  
        severity INTEGER NOT NULL DEFAULT 1,  
        description TEXT NOT NULL,  
        node_id VARCHAR(50) NOT NULL,  
        count INTEGER DEFAULT 1,  
        resolved BOOLEAN DEFAULT FALSE  
    );
```

-- Table for attack signatures (for future pattern matching)

```
CREATE TABLE attack_signatures (  
    id SERIAL PRIMARY KEY,  
    signature_name VARCHAR(100) NOT NULL,  
    pattern TEXT NOT NULL,  
    severity INTEGER DEFAULT 1,  
    enabled BOOLEAN DEFAULT TRUE,  
    created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP  
);
```

-- Indexes for performance optimization

```
CREATE INDEX idx_packets_timestamp ON packets(timestamp);  
CREATE INDEX idx_packets_source_ip ON packets(source_ip);  
CREATE INDEX idx_packets_dest_ip ON packets(destination_ip);  
CREATE INDEX idx_packets_protocol ON packets(protocol);
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CREATE INDEX idx_packets_node_id ON packets(node_id);
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CREATE INDEX idx_alerts_timestamp ON alerts(timestamp);
```

```
CREATE INDEX idx_alerts_type ON alerts(alert_type);
```

```
CREATE INDEX idx_alerts_source_ip ON alerts(source_ip);
```

```
CREATE INDEX idx_alerts_severity ON alerts(severity);
```

```
CREATE INDEX idx_alerts_resolved ON alerts(resolved);
```

```
-- Insert some sample attack signatures
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INSERT INTO attack_signatures (signature_name, pattern, severity) VALUES
```

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('Port Scan Detection', 'Multiple connection attempts to different ports', 3),
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('SYN Flood Attack', 'High volume of TCP SYN packets from single source', 4),
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('Brute Force Attack', 'Repeated connection attempts to same service', 3),
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('ARP Spoofing', 'Inconsistent IP-MAC address mappings', 2);
```