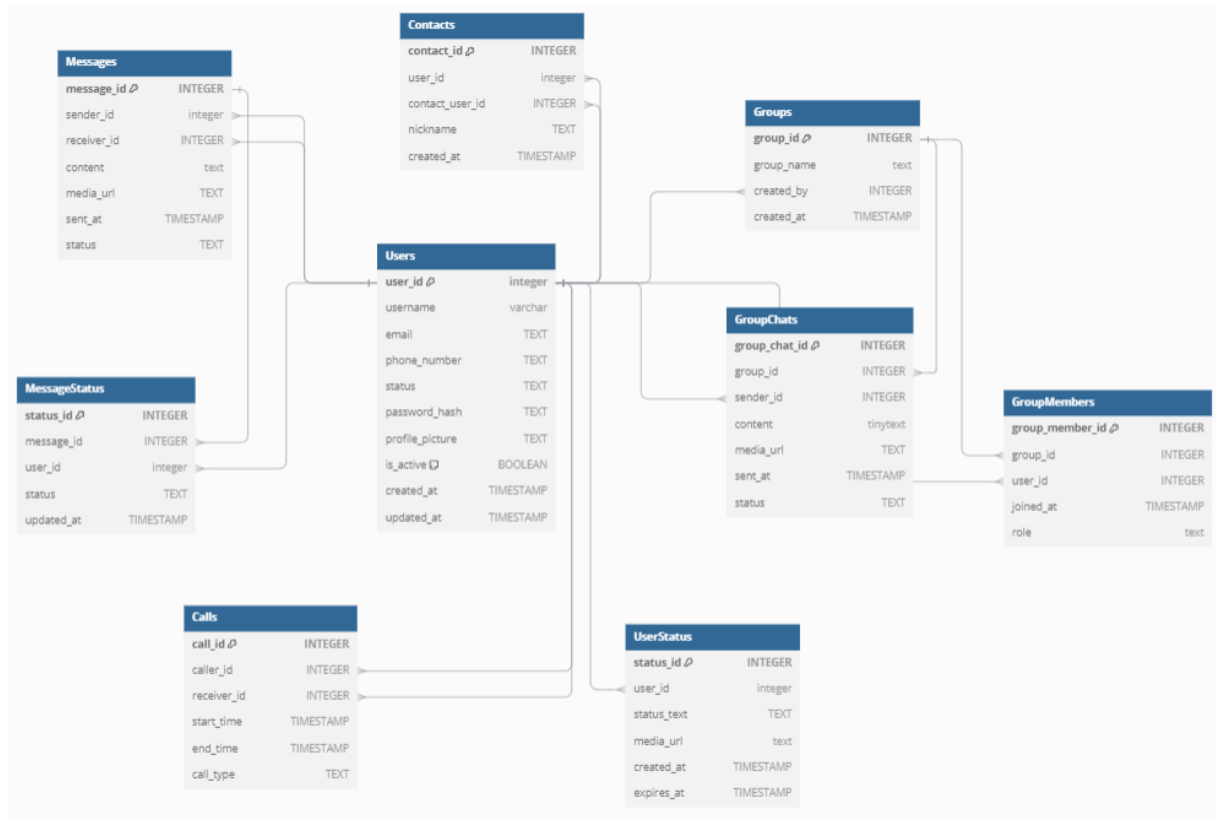


1. Xây dựng mô hình ER



Thực thể: Messages, Users, Contacts, Groups, GroupMembers, MessageStatus, Calls, GroupChats, UserStatus.

Thuộc tính: message_id, sender_id, receiver_id, content, media_url, sent_at, status, user_id, username, email, phone_number, status, password_hash, profile_picture, is_active, created_at, updated_at, contact_id, user_id, contact_user_id, nickname, created_at, group_id, group_name, created_by, created_at, group_member_id, group_id, user_id, joined_at, role, status_id, message_id, user_id, status, updated_at, call_id, caller_id, receiver_id, start_time, end_time, call_type, group_chat_id, group_id, sender_id, content, media_url, sent_at, status, status_id, user_id, status_text, media_url, created_at, expires_at.

2. Chuyển đổi từ mô hình ER sang mô hình quan hệ

Messages(**message_id**, sender_id, receiver_id, content, media_url, sent_at, status)

Users(**user_id**, username, email, phone_number, status, password_hash, profile_picture, is_active, created_at, updated_at)

Contacts(**contact_id**, user_id, contact_user_id, nickname, created_at)

Groups(**group_id**, group_name, created_by, created_at)

GroupMembers(**group_member_id**, group_id, user_id, joined_at)

MessageStatus(**status_id**, message_id, user_id, status, updated_at)

Calls(**call_id**, caller_id, receiver_id, start_time, end_time, call_type)

GroupChats(**group_chat_id**, group_id, sender_id, content, media_url, sent_at, status)

UserStatus(**status_id**, user_id, status_text, media_url, created_at, expires_at)

3. Xây dựng cơ sở dữ liệu

DB.sql - ADMIN\S...ADMIN\Admin (61) ✕

```
CREATE DATABASE CHATAPP
USE CHATAPP

CREATE TABLE Users (
    user_id INT PRIMARY KEY,
    username VARCHAR(255),
    email VARCHAR(255) UNIQUE,
    phone_number VARCHAR(255),
    status VARCHAR(255) UNIQUE,
    password_hash VARCHAR(255),
    profile_picture VARCHAR(255),
    is_active BIT DEFAULT 1,
    created_at DATETIME,
    updated_at DATETIME
);

CREATE TABLE Messages (
    message_id INT PRIMARY KEY,
    sender_id INT,
    receiver_id INT,
    content VARCHAR(255),
    media_url VARCHAR(255),
    sent_at DATETIME,
    status VARCHAR(255),
    FOREIGN KEY (sender_id) REFERENCES Users(user_id),
    FOREIGN KEY (receiver_id) REFERENCES Users(user_id)
);
```

DB.sql - ADMIN\S...ADMIN\Admin (61) ✕

```
CREATE TABLE GroupChats (
    group_chat_id INT PRIMARY KEY,
    group_id INT,
    sender_id INT,
    content VARCHAR(255),
    media_url VARCHAR(255),
    sent_at DATETIME,
    status VARCHAR(255),
    FOREIGN KEY (group_id) REFERENCES Groups(group_id),
    FOREIGN KEY (sender_id) REFERENCES Users(user_id)
);

CREATE TABLE UserStatus (
    status_id INT PRIMARY KEY,
    user_id INT,
    text VARCHAR(255),
    media_url VARCHAR(255),
    created_at DATETIME,
    expires_at DATETIME,
    FOREIGN KEY (user_id) REFERENCES Users(user_id)
);
```

```
CREATE TABLE Contacts (  
    contact_id INT PRIMARY KEY,  
    user_id INT,  
    contact_user_id INT,  
    nickname VARCHAR(255),  
    created_at DATETIME,  
    FOREIGN KEY (user_id) REFERENCES Users(user_id),  
    FOREIGN KEY (contact_user_id) REFERENCES Users(user_id)  
);  
  
CREATE TABLE Groups (  
    group_id INT PRIMARY KEY,  
    group_name VARCHAR(255),  
    created_by INT,  
    created_at DATETIME,  
    FOREIGN KEY (created_by) REFERENCES Users(user_id)  
);  
  
CREATE TABLE GroupMembers (  
    group_member_id INT PRIMARY KEY,  
    group_id INT,  
    user_id INT,  
    joined_at DATETIME,  
    role VARCHAR(255),  
    FOREIGN KEY (group_id) REFERENCES Groups(group_id),  
    FOREIGN KEY (user_id) REFERENCES Users(user_id)  
);
```

```
CREATE TABLE MessageStatus (  
    status_id INT PRIMARY KEY,  
    message_id INT,  
    user_id INT,  
    status VARCHAR(255),  
    updated_at DATETIME,  
    FOREIGN KEY (message_id) REFERENCES Messages(message_id),  
    FOREIGN KEY (user_id) REFERENCES Users(user_id)  
);  
  
CREATE TABLE Calls (  
    call_id INT PRIMARY KEY,  
    caller_id INT,  
    receiver_id INT,  
    start_time DATETIME,  
    end_time DATETIME,  
    call_type VARCHAR(255),  
    FOREIGN KEY (caller_id) REFERENCES Users(user_id),  
    FOREIGN KEY (receiver_id) REFERENCES Users(user_id)  
);
```

