Initial Report of a Distributed Chat Application

Team Zero members:

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Part 1 - Project Description

1.1 Aims

1. Priority 1 (bare bones)
   - 1.1. Clients register with the server - client details are saved in the database.
   - 1.2. Registered clients can login, and once authenticated can do the following:
     - 1.2.1. Clients can search for other clients in the system, also see the status of other clients (e.g. online, offline and busy).
     - 1.2.2. Clients can fetch their contact list (groups and friends) and chat list.
     - 1.2.3. Clients can initiate a chat with and send messages to other clients, via the server.
     - 1.2.4. Clients can receive messages from other clients, via the server.
       - 1.2.4.1. If a client was to receive a message while they were offline, the message will be sent on login (queued messages).
2. Priority 2
   - 2.1. Group chat functionality - a client can initiate a chat and send messages to a group of more than one client.
     - 2.1.1. The recipients will automatically be placed in the group chat until they choose to leave.
   - 2.2. Message storage and retrieval - chat information is stored in the database, and history can be retrieved on request.
     - 2.2.1. Text messages can be of arbitrary size.
     - 2.2.2. Recent messages (e.g. messages sent after a week ago) cached locally for quick request.
3. Priority 3 (implemented last)
   - 3.1. End to end encryption - to be implemented on the clients, so the server cannot intercept or decrypt messages.
     - 3.1.1. Public key encryption to determine shared keys between 2 clients.

3.1.2. Symmetric encryption with shared keys to encrypt and decrypt messages between 2 clients.

3.1.3. Keys to be kept in clients local storage only.

4. Priority 4 (optional)

4.1. Multimedia messages - besides plain text, message such as pictures, emoji and voice record can be sent.

4.2. Message status - clients can see if their messages are received or read and also see typing status of other clients.

4.3. QR code for adding new friends - rather than search by user name, clients can find another clients quickly after scanning their QR code.

1.2 Progress so far

So far we have determined the architecture for our system and database (may be subject to minor changes in future iterations), and implemented the bare bones of server and client applications.

Figure 1 below shows the structure of the database that will be stored server side.

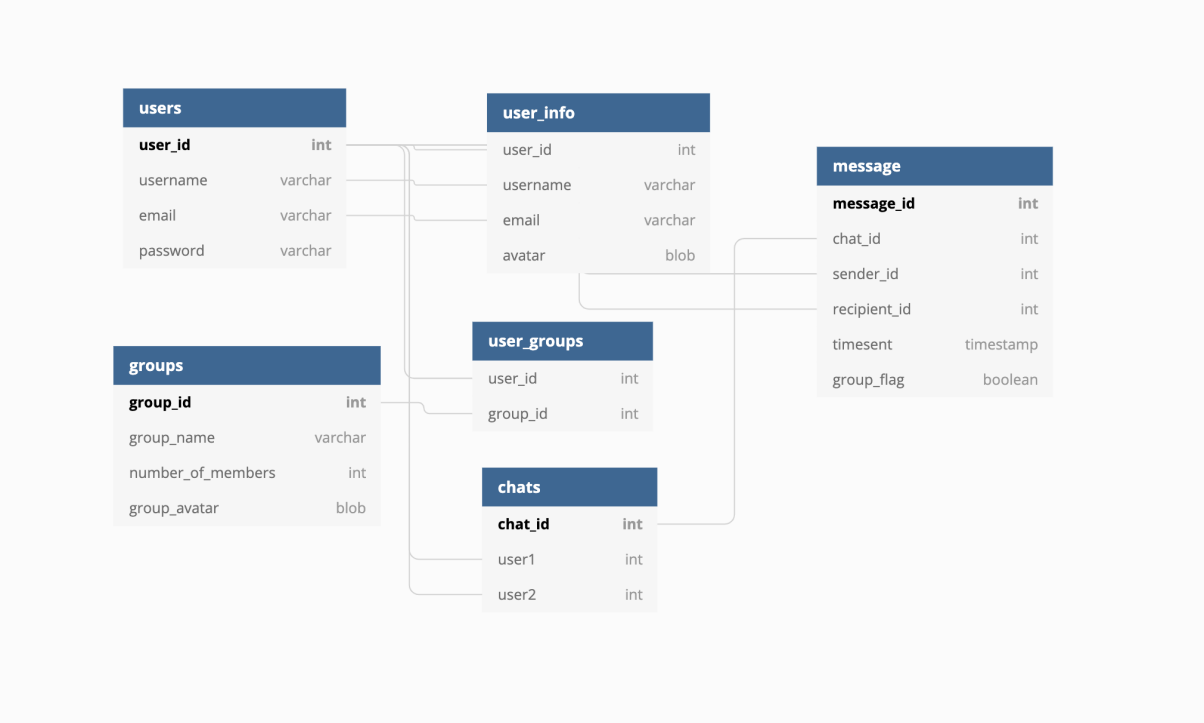

Figure 1: Database structure

Our progress on development can be seen by the following Gantt chart (figure 2), which illustrates our work allocations so far.

1.3 Schedule

(Approximate schedule for the remainder of the project...)

	Task	Assigned To	Start	End	Dur
	Sprint 1 / Aim 1		17/10/19	16/11/19	21
1	Server	Iris Esener & Emad Darwish	17/10/19	16/11/19	21
1.1	Deployment		17/10/19	2/11/19	12
1.2	Database		3/11/19	15/11/19	9
1.3	Connection		28/10/19	16/11/19	14
2	Web App	Zhuoling Li	17/10/19	16/11/19	21
2.1	UI		17/10/19	26/10/19	7
2.2	Mapping and functions		27/10/19	8/11/19	10
2.3	Connection to Server		10/11/19	16/11/19	4
3	Android App	Tiberiu Iustin Zulean	17/10/19	16/11/19	21
3.1	Front end		17/10/19	26/10/19	7
3.2	Back end		27/10/19	9/11/19	10
3.3	Connection		10/11/19	16/11/19	4

Figure 2: Schedule so far

Part 2 - Project Organization

2.4 Team collaboration

Methods of team collaboration:

- Weekly meetings for discussion and planning
- Whatsapp group chat for communication
- Google docs for document draft and brainstorm collaboration
- Trello for task management
- Git and GitHub for software development version control
- Occasional pair programming

2.5 Member roles

Although all members are free to help out in any area of development, we have taken on general roles along the following lines.

- Zhuoling Li: Web client application
- Tiberiu: Android client application
- Iris and Emad: Server application and database development / deployment

2.6 Handling of conflicts

Having agreed to equally share the allocated points for the project, we believe all members are equally invested in the quality of the project. All members of the team have agreed that should there be a conflict, we will resolve it peacefully with each other and take democratic votes when required. In the case that it is absolutely necessary, an outsiders opinion may be sought.