



Electronics and Computer Science  
Faculty of Engineering and Physical Sciences  
University of Southampton Malaysia

**COMP3207**

## **CLOUD APPLICATION DEVELOPMENT**

### **Task 3: Application Development (Using Cloud Development Tools)**

**- CloudTalk**

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## Contents

1. Project Overview .....	3
2. Cloud Application Implementation and Technology Choices .....	4
2.1 Technology Stack implemented in CloudTalk.....	4
2.2 Design patterns and system architecture implemented in CloudTalk .....	8
3. Code Showcase and Quality Description.....	10
3.1 Source code repository.....	10
3.2 Code structure.....	10
4. Functionality Demonstration and Integration Explanation.....	12
5. Cloud Deployment Process and Access Method .....	19
6. Summary .....	20
7. Appendix .....	21
7.1 Register Page .....	21
7.2 Login Page .....	23
7.3 Home Page .....	26
7.3.1 Loading State .....	26
7.3.2 Entire Home Page .....	27
7.3.3 Sidebar .....	29
7.3.4 Group List .....	29
7.3.5 Chat Window.....	33
7.3.6 Group Information .....	51
7.4 Search Page.....	58
7.5 User Profile Page .....	63
7.6 Other Components .....	66
7.6.1 Header.....	66
7.6.2 Responsive Design.....	70
7.6.3 Light mode and dark mode .....	74

# 1. Project Overview

This project aims to develop a cloud-based real-time group messaging platform called CloudTalk. The primary objectives of CloudTalk are to provide a platform that allows users to quickly create and disband group chat rooms, or join public chat rooms for communication, and to send and receive messages in real time. The target audience of this platform is individual users who need secure private chats or want to find groups of common interests, as well as teams or organizations that need to collaborate on short-term projects.

According to the planning of Task 1, Google Cloud Platform (GCP) has been chosen as its cloud infrastructure because of its scalability, security, and real-time service capabilities. This report will discuss on the core content of Task 3: the actual development, code implementation, function integration, and deployment process of the CloudTalk application on the cloud platform.

Github repository:

<https://github.com/JianHengHin0831/Cloutalk>

Website URL:

<https://my-nuxt-app-b8742.web.app/>

## 2. Cloud Application Implementation and Technology Choices

### 2.1 Technology Stack implemented in CloudTalk

In the coursework for task 1, I wrote down the technology stack I planned to use. While developing the application, I did not deploy it according to the technology stack I planned. Instead, I made the final decision based on actual understanding and evaluation. Table 2.1 shows the technology stack I originally planned, the technology stack I deployed, and the justification and explanation.

Component	The original planned technology stack	The actual technology used	Explanation and Justification
Frontend	Nuxt.js	Nuxt.js	Use Nuxt.js to provide SSR support and SEO optimization, build the user interface, and create an interactive experience
Backend	Node.js	Node.js	Node.js provides an API interface and processing logic, and combines with Firebase and other services to process user requests
Authentication	Firebase Authentication	Firebase Authentication + <a href="#">Google Authenticator</a>	Besides the basic login function, Google Authenticator is also integrated to implement two-step verification (2FA) to enhance account security
Database	<a href="#">Firebase</a> <a href="#">Firestore</a>	<a href="#">Firebase Realtime Database</a>	Use Realtime Database instead of Firestore because it is more synchronous and has lower latency when handling real-time communication
Messaging Protocol	<a href="#">WebSockets</a>	<a href="#">Firebase Realtime Database</a>	The original plan was to use WebSocket to achieve real-time communication. I found that WebSocket is the underlying layer of Firebase Realtime Database. Its monitoring function is easier to use, less likely to have bugs, and better integrated with Firebase.

Hosting	Firebase Hosting	Firebase Hosting	Used to deploy static resources and provide HTTPS support
Storage and file sharing	Cloud Storage for Firebase	Cloud Storage for Firebase	Store user uploaded files (such as pictures, videos, files, etc.)
Monitoring	Google Cloud Monitoring and Logging	Google Cloud Monitoring and Logging	Provides real-time performance insights and error tracking.
Deployment	Google Kubernetes Engine <b>(closed)</b>	Google Kubernetes Engine <b>(closed)</b>	Use Kubernetes to deploy applications, and combine Ingress, HPA, BackendConfig, etc., for load balancing and scaling control. GKE has been closed due to the cost consideration.
Push Notifications	(Not planned originally)	Firebase Cloud Messaging (FCM)	Enable background push notifications to users when the browser is inactive, or the app is closed
Cloud Functions	(Not planned originally)	Firebase Cloud Functions	Use Cloud Functions for serverless backend logic, such as sending push notifications, handling scheduled tasks, or reacting to Firebase events like user creation or Firestore writes

## Justification

1. Why choose Realtime Database instead of Firestore and WebSocket?

Comparison	Firestore / WebSocket	Realtime Database	Justification
Real-time performance	WebSocket requires additional connection maintenance	Built-in real-time monitoring	Simple development, while real-time performance is similar

Structural complexity	Firestore is more suitable for complex data structures	Ideal for simple structures (such as chat)	Chat data structure is simple and better adapted
Development cost	WebSocket needs to implement logic by itself	Firebase provides a complete solution, you just need to use the function	More time-saving and fewer bugs
Deployment difficulty	High deployment requirement	Firebase integrated service	Easy to integrate and deploy

## 2. Why use Cloud Functions?

- Handles backend logic without managing servers
- Automatically scales with demand
- Ideal for real-time events like sending notifications or updating database triggers
- Easy integration with Firebase services (e.g., Realtime database, Auth, FCM)
- Keeps frontend clean by offloading heavy or sensitive operations

## 3. Why use Firebase Cloud Messaging?

- Supports background notifications to ensure that users can receive important messages even if they are not open the application in front of the browser
- Seamlessly integrated with services such as Firebase Authentication and Realtime Database
- Provides high reliability and low-latency message transmission

## 4. Why use Google Authenticator?

- Enhanced login security

- Provides Time-based One-Time Password (TOTP), making the account difficult to hack even if the password is leaked
- Simple integration to Nuxt.js
- Suitable for platforms with high security requirements (such as multi-person chat rooms)

## 2.2 Design patterns and system architecture implemented in CloudTalk

In the coursework of Task 2, I wrote down the design patterns and system architecture I planned to implement in CloudTalk. During the development process, I found that the design patterns I wrote at that time were reasonable. Therefore, I followed the design patterns written in Task 2 to complete my cloud application. Table 2.2 shows the table that includes the design patterns I planned and the final implementation method.

Design pattern/ system architecture	Actual Implementation in CloudTalk
MVC model	<p>View: Use Nuxt.js as the front end to display the chat interface, user status, notifications, etc.</p> <p>Controller: Use Node.js and Firebase Cloud Functions on the back end to implement logic control</p> <p>Model: Firebase Realtime Database and Cloud Storage are used as models to store user and message data</p>
Microservices	<p>In implementing CloudTalk, I adopted the idea of microservices for architecture design, modularized different business functions, separated responsibilities, and deployed them through Serverless functions. First, I split the business logic into multiple independent files (such as sendNotification.post.ts, disbandGroup.post.ts, etc.), each responsible for only one specific function, which is convenient for maintenance and expansion.</p> <p>Then, I used the Nuxt Server API (server/api) directory with the Firebase Cloud Functions deployment method to implement Serverless, independent deployment of each API.</p>

Serverless	The server-side rendering part of CloudTalk is implemented using Nuxt.js and hosted through Firebase Cloud Functions. There is no need to build a server yourself. The system can automatically scale according to requests, which fully meets the definition of Serverless architecture. The main significance of deploying to a cloud function is that it can automatically scale, cope with high concurrent requests, and be low-cost.
Event-Driven	Firebase Cloud Messaging is triggered by the user sending messages and group information changes to achieve real-time notifications. For example, when a user joins a group, a welcome message is automatically triggered to be sent. Using the real-time listener function of the real-time database, the system will be triggered to send the change information from the database to the front end when there is a change in the database.
Singleton	Chat Manager is used to ensure that only one instance handles all real-time chat tasks to prevent duplicate messages or omissions. Notification Manager is used to ensure that the push logic is consistent and is not triggered multiple times to improve stability.

## 3. Code Showcase and Quality Description

The best coding practices were followed during the development process to ensure the code's maintainability, readability, and efficiency.

### 3.1 Source code repository

The complete source code of the CloudTalk application has been pushed to the GitHub repository:

<https://github.com/JianHengHin0831/Cloutalk>

### 3.2 Code structure

#### Front-end (Nuxt.js)

pages/: Stores routing pages. Nuxt automatically generates routes based on this directory to facilitate the organization of page logic.

components/: Reusable Vue component library, such as chat boxes, buttons, message bubbles, and other UI elements.

layouts/: The overall page structure template of the application, defining shared layouts such as navigation bars and sidebars.

composables/: Encapsulates commonly used logic and combined functions (such as the use of FCM and notifications, etc.) to improve logic reusability.

store/: Use Pinia for global state management, storing font size and user preferred page styles.

public/: Stores static resources, such as pictures, favicons, default avatars, etc.

utils/: Encapsulates tool functions, such as helper functions for formatting time and formatting text.

## **Backend (Node.js)**

server/api/: Nuxt's Server API function directory, providing backend interfaces (such as sendNotification.post.ts, auth.login.post.ts, etc.) to achieve the combination of SSR and Serverless.

Service: Encapsulate the core business logic, keep the code responsibilities clear, easy to test, and maintain.

### **3.3 Code quality**

Specifications and style: The code follows the general coding standards of JavaScript and Vue.js and uses the Prettier extension for formatting to ensure code consistency.

Comments and documentation: Necessary comments are added to key functions to improve code readability.

Error handling: Error handling is performed on both the front and back ends, such as try-catch blocks

Efficiency: Code execution efficiency is considered, such as using indexes as much as possible when querying the database, avoiding multiple real-time listeners, and unnecessary calculations.

### **3.4 Version control**

Git is used for version control throughout the project development process. After a certain number of results are achieved, they are pushed to GitHub. The commit information also clearly records the changes. At the same time, different branches are used in GitHub to separate the versions. For example, I separate the version confirmed to be error-free from the version still being modified.

## 4. Functionality Demonstration and Integration Explanation

### 4.1 Functional Requirements

Table 4.1.1 is the functional requirement that I expect to complete in task 1, which includes the function, the expected implementation method and the actual implementation method.

Functions	Expected Implementation Method	Actual Implementation Method
User Authentication & Authorization	Registration, login, logout	Firebase authentication: Registration, login, logout. Google Authenticator: two-factor authentication.
Real-Time Messaging	Send and receive messages in real time	Firebase Realtime Database implements real-time communication without WebSocket self-maintenance In addition to real-time messaging, tagging members of the same group in the message is allowed, and sending emojis is supported. .
Chat Rooms & Private Chats	Create/join group chat, one-to-one private chat	Full support is needed to create and join public and private groups. The group information of public groups can be seen and joined by everyone. Private groups require a Group ID to enter and await the moderator's consent. At the same time, the moderator can also invite others to join the group. You can use the method of breaking into private groups to chat privately.
Message Storage & History	View historical messages	Messages are stored in Realtime Database, and historical records can be loaded. There is a historical record loading status display, and the information needs to be decrypted using the user's private key and the group's public key to improve security. And the key will be rotated every time

		there is a member change, ensuring that the removed members cannot decrypt the subsequent information, and the new members cannot decrypt the previous information
Group admin authority	Rename, add, and remove people	<p>Full support for group admin permissions, including transfer of ownership, group disbanding, global muting, renaming the group, changing the group photo and description, adding and removing a group moderator, etc.</p> <p>Full support for group moderator permissions, including add and remove members, pin and remove pinned messages, delete messages, invite and cancel invite members, agree and reject users to join the group, mute and unmute users, etc.</p>
File Sharing	Pictures, videos, and document sharing	<p>It supports uploading and sharing files of any format using Firebase Storage and encrypts files when saving them to ensure end-to-end encryption. Therefore, files will be encrypted twice: once in storage and once in file paths to real-time databases.</p> <p>Supports file preview function, including photos, videos, Microsoft files, PDFs, etc.</p>
Push Notifications	Instant notification of new messages	Complete push information mechanism, including group, member, and message changes, will trigger notifications and support muted user exclusion. There are two triggering methods: if online, it will only trigger the notification to be stored in Firebase; if offline, it will use Firebase Cloud Messaging to notify offline users

User Status & Presence	Online, offline, typing status	When viewing the chat window of a group, it will show who is online and who is typing
Search & Filtering	Search messages, groups, and users	Supports searching all public groups and joined groups by using group ID or name, searching for messages, and searching for users
Scheduled Messages	Send messages at scheduled times	<b>Because it is not a frequently used function, it is easy to confuse or complicate users after running it, so it is not implemented</b>
Message Reactions	Emoji response message	Supports using emoji to react to messages, supports 12 types of emoji
User settings	Modify username, notification switch	Supports full user settings In the group setting, the user can leave a group, mute or unmute a group, pin or unpin a group In personal settings, users can change their username and bio, choose light or dark mode, choose the status to display, choose whether to display the exact time, choose whether to mute all groups, and select the font size. In privacy settings, users can choose the invisible state, whether to allow users to see their information, and whether to display email. In security settings, users can choose whether to enable two-factor authentication.
User mention	(Not planned originally)	Users can mention other users, so that notifications can be sent to the user's computer to remind him

User mute	(Not planned originally)	Admin and moderator can mute others. Admin even can mute all members.
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## 4.2 Non-functional Requirements

Requirement	Description	Implementation and description
Scalability	Ensure that the application doesn't become stuck when user demand grows.	<ul style="list-style-type: none"> <li>• Use Google Kubernetes Engine (GKE) to achieve horizontal autoscaling (have closed)</li> <li>• Firebase function has autoscaling feature</li> <li>• Firebase Realtime Database itself supports horizontal scaling.</li> <li>• The front-end and back-end architecture designs are modular, and services can be easily split in the future to increase each service's capacity.</li> </ul>
Security	Provide secure authentication and encryption	<ul style="list-style-type: none"> <li>• Implemented two-step verification with Firebase Authentication and Google Authenticator</li> <li>• Used HTTPS communication protocol</li> <li>• Firebase's data encryption mechanism ensures data security.</li> <li>• Group information is encrypted and decrypted by double ratchet algorithms.</li> <li>• All files are encrypted once when stored in Firebase Storage.</li> <li>• All content that needs to be changed or taken from the database must undergo four verification rounds. To get the content, the user's ID must be confirmed in the front-end. When fetching the API, the user token must be held to go to the back end successfully. The back end needs to verify again that the user is allowed to perform this action, and when going to Firebase, it is confirmed through Firebase Real-Time Database rules that he is allowed to perform this action.</li> </ul>

Performance	Guarantee short message delivery times and low latency	<ul style="list-style-type: none"> <li>• Use Firebase Realtime Database to achieve millisecond-level real-time communication</li> <li>• The data structure is optimized for efficient paths. For example, there are two collections, user_chatrooms and chatroom_users. When you need to know all chatrooms of a user, use user_chatrooms, and when you need to know all members in a chatroom, use user_chatrooms</li> <li>• Real-time listeners are used to reduce unnecessary data pulling, and loading prompts are added to the interface to improve the user experience.</li> <li>• Integrate all data pulling functions, and only perform data pulling actions at the highest level to reduce the number of Realtime listeners and improve performance</li> <li>• When monitoring information, only the last one is monitored, so that users do not need to consume too many resources.</li> <li>• Frequently used resources or information are stored in the cache, saving loading time.</li> </ul>
Reliability	Minimize the probability of application crashes	<ul style="list-style-type: none"> <li>• Add error handling mechanisms to all key operations (such as prompts for failure to create a group)</li> <li>• The frontend uses loading status and error prompts</li> <li>• The backend uses Firebase's reliability guarantee</li> <li>• Automatically retry different methods to try decryption when decryption fails</li> </ul>
Maintainability	Ensure the code is understandable and the documentation is clear for easy updates and debugging in the future.	<ul style="list-style-type: none"> <li>• The project structure is clear, the front end uses modular Nuxt 3 + TypeScript, and the back end uses Node.js.</li> <li>• The architecture is clear, each function has comments and supports continuous expansion.</li> </ul>

		<ul style="list-style-type: none"> <li>• Use Git version control, and the purpose of each Git version is clear.</li> </ul>
Usability	Provides a simple and user-friendly user interface.	<ul style="list-style-type: none"> <li>• The UI design supports dark mode, allowing users to adjust the style of the web page according to their preferences</li> <li>• Responsive design, users can open the web page on any device, whether it is a mobile phone or a computer</li> <li>• The design style of each component, such as button operation prompts, input validation, form modal, and success/failure font design, is consistent to improve the user experience.</li> <li>• Use a loading screen to let users know the current progress</li> <li>• Use optimistic updates to save users from having to wait for a long time to upload files</li> </ul>
Accessibility	Make the application accessible to users with disabilities	<ul style="list-style-type: none"> <li>• Reasonable colour contrast and button size</li> <li>• Users can open the CloudTalk web application on touch devices</li> <li>• Users can adjust the font size according to their needs.</li> </ul>

## 5. Cloud Deployment Process and Access Method

The CloudTalk application has been successfully deployed to Google Cloud Platform to make it accessible to users. The front-end has been deployed using Firebase Hosting, and the backend has been deployed using Cloud Functions

Deployment steps:

1. Configure the environment: Set the environment variables required for the production environment, such as database connection information, API keys, etc. (for example, through .env files or cloud platform configuration management).
2. Run npm run build in the project root directory to generate static files
3. Use npm run deploy-fb to perform deployment directly. I have integrated all the deployment steps, such as creating node\_modules on the static side and initializing npm in the static files, and combined a command that can successfully deploy with npm run deploy-fb

Access method:

After deployment, you can access the CloudTalk application through the following link:

<https://my-nuxt-app-b8742.web.app/>

After opening the above link, click the "Register" button to create a new account or log in with a Google account. After logging in, you will enter the main interface, where you can create a new chat room or join a public chat room through the "Search" page. After entering the chat room, you can start sending and receiving messages in real time.

## 6. Summary

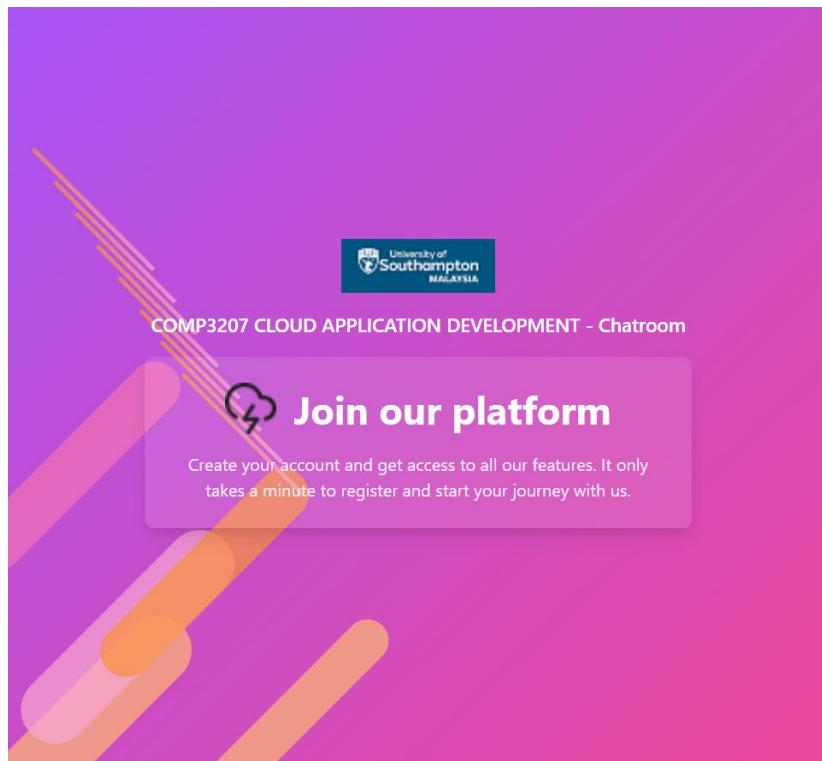
Task 3 completed the core development and deployment of the CloudTalk cloud application. By combining the Nuxt.js front-end framework, the Node.js back-end, and the Firebase service on the Google Cloud Platform (especially the real-time synchronization capability of the Realtime database and the authentication capability of Authentication), a functional real-time messaging application was implemented that met and exceeded the key requirements defined in Task 1, such as user authentication, real-time communication, and chat room management.

The code follows good structure and quality standards and is effectively versioned through Git. The application components (front-end, back-end, database, and authentication service) have been successfully integrated and work together. Finally, the application has been successfully deployed to the GCP cloud platform, and users can access and use all core functions through the browser.

## 7. Appendix

### 7.1 Register Page

The register page includes username, email address, password, confirm password, terms and conditions checkbox and registration button, supports real-time verification, error prompts, loading status, email verification prompts after successful registration and mobile adaptation. The password must be at least 8 characters, contain uppercase and lowercase letters, numbers and special characters, and support visibility switching. The email address must be verified in a valid format, and the interface provides a login link, focusing on user experience and security.



USER REGISTRATION

Jian Heng Hin

example1234@example.com

ExamplePassword

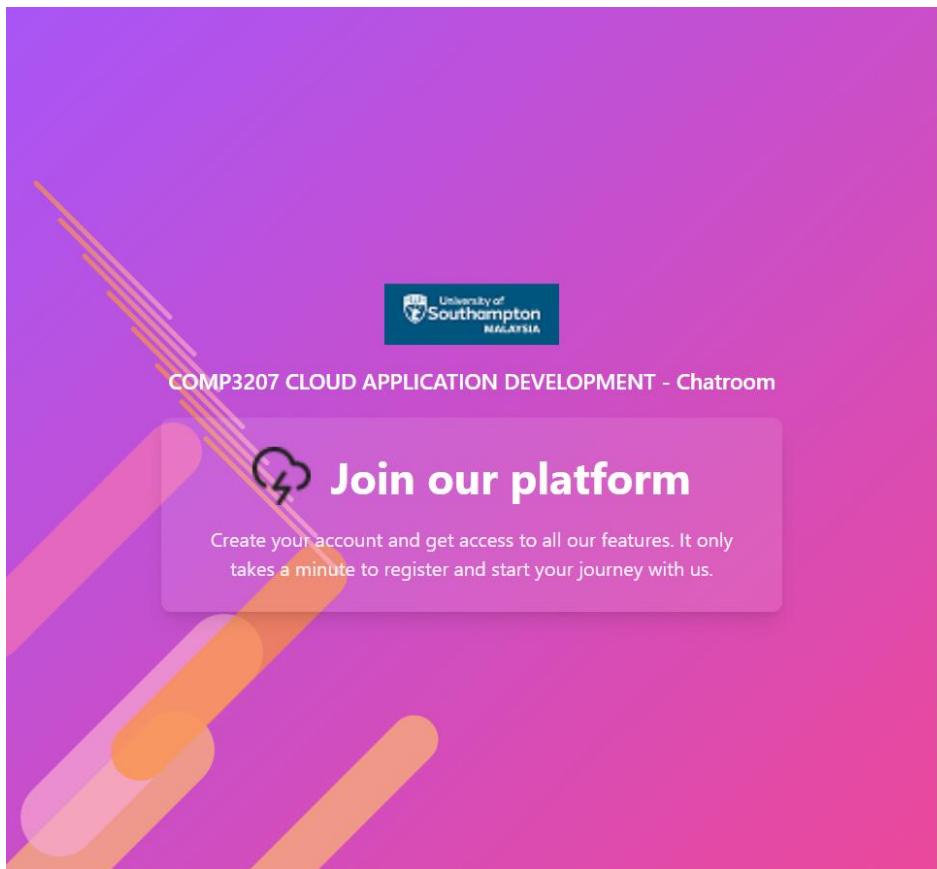
Confirm Password

Password must be at least 8 characters long, contain at least one uppercase letter, one lowercase letter, one number, and one special character.

I agree to the [Terms and Conditions](#)

**REGISTER**

Already have an account? [Login here](#)



## USER REGISTRATION

Jian Heng Hin

example1234@example.com

.....

.....

I agree to the [Terms and Conditions](#)

**REGISTER**

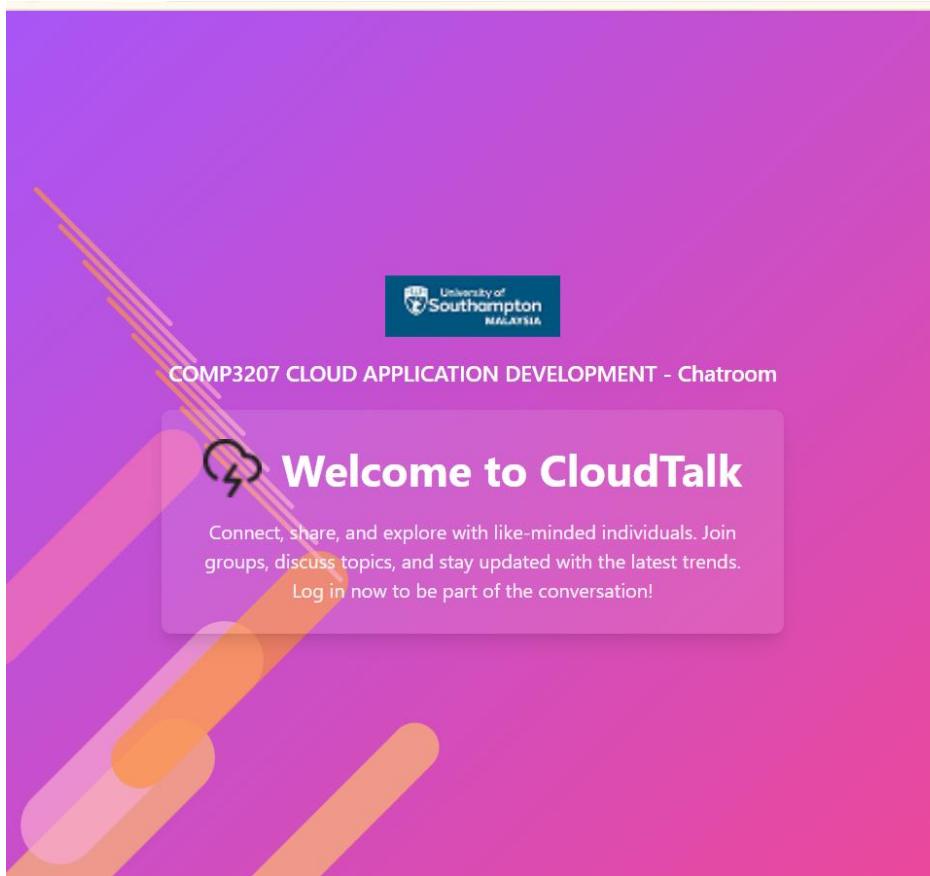
Already have an account? [Login here](#)

A verification email has been sent to  
example1234@example.com. Please check your inbox.

## 7.2 Login Page

The login page supports email password login and Google account login and has a "remember me" function and a forgotten password option. It also supports two-factor authentication (MFA), performs secondary verification through TOTP verification code, and checks the validity of the verification code. The page includes input verification, error prompts, login status persistence, and basic security setting checks to ensure that the user login process is safe and smooth.

The screenshot shows the CloudTalk login interface. On the left, there's a promotional banner for 'COMP3207 CLOUD APPLICATION DEVELOPMENT - Chatroom' featuring the University of Southampton Malaysia logo and a 'Welcome to CloudTalk' message with a lightning bolt icon. The main login form is titled 'USER LOGIN' and contains fields for email ('jh1e22@soton.ac.uk') and password ('\*\*\*\*\*'). It includes a 'Remember me' checkbox, a 'Forgot password?' link, and a large purple 'LOGIN' button. Below the login form are links for 'Sign up' and 'Log in with another methods', followed by a 'Continue with Google' button.



### USER LOGIN

jh1e22@soton.ac.uk

Password

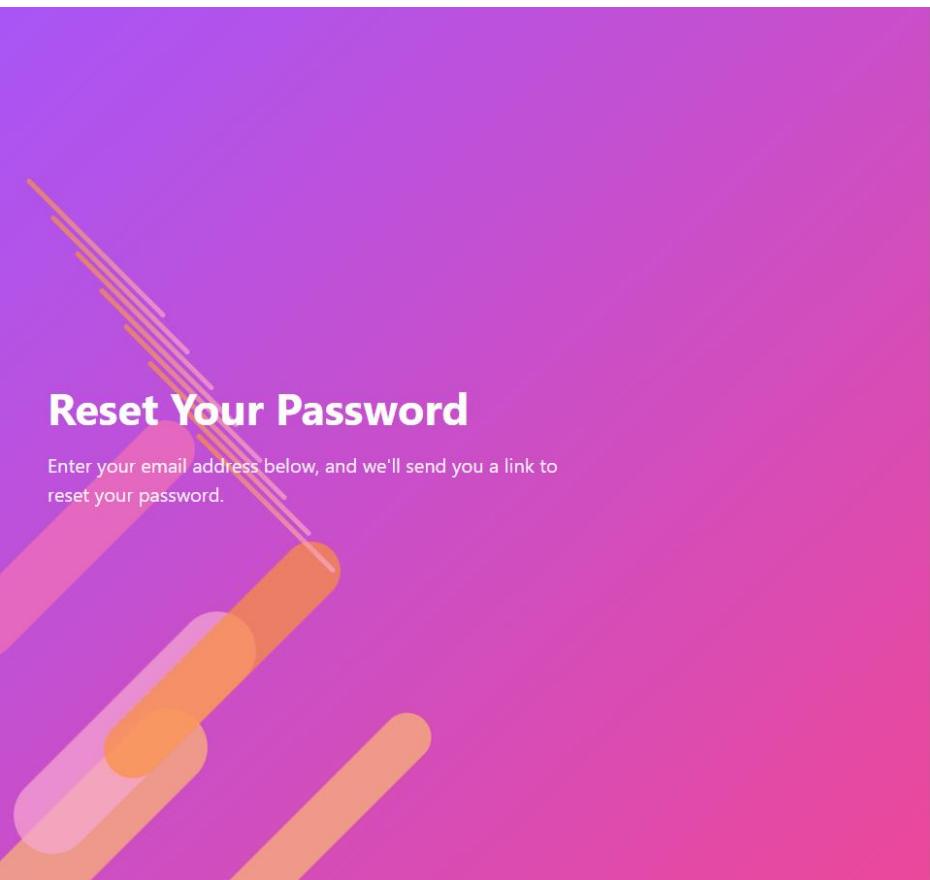
Remember me [Forgot password?](#)

[LOGIN](#)

Don't have an account? [Sign up](#)

Log in with another methods

Continue with Google



## Reset Your Password

Enter your email address below, and we'll send you a link to reset your password.

[FORGOT PASSWORD](#)

 Email

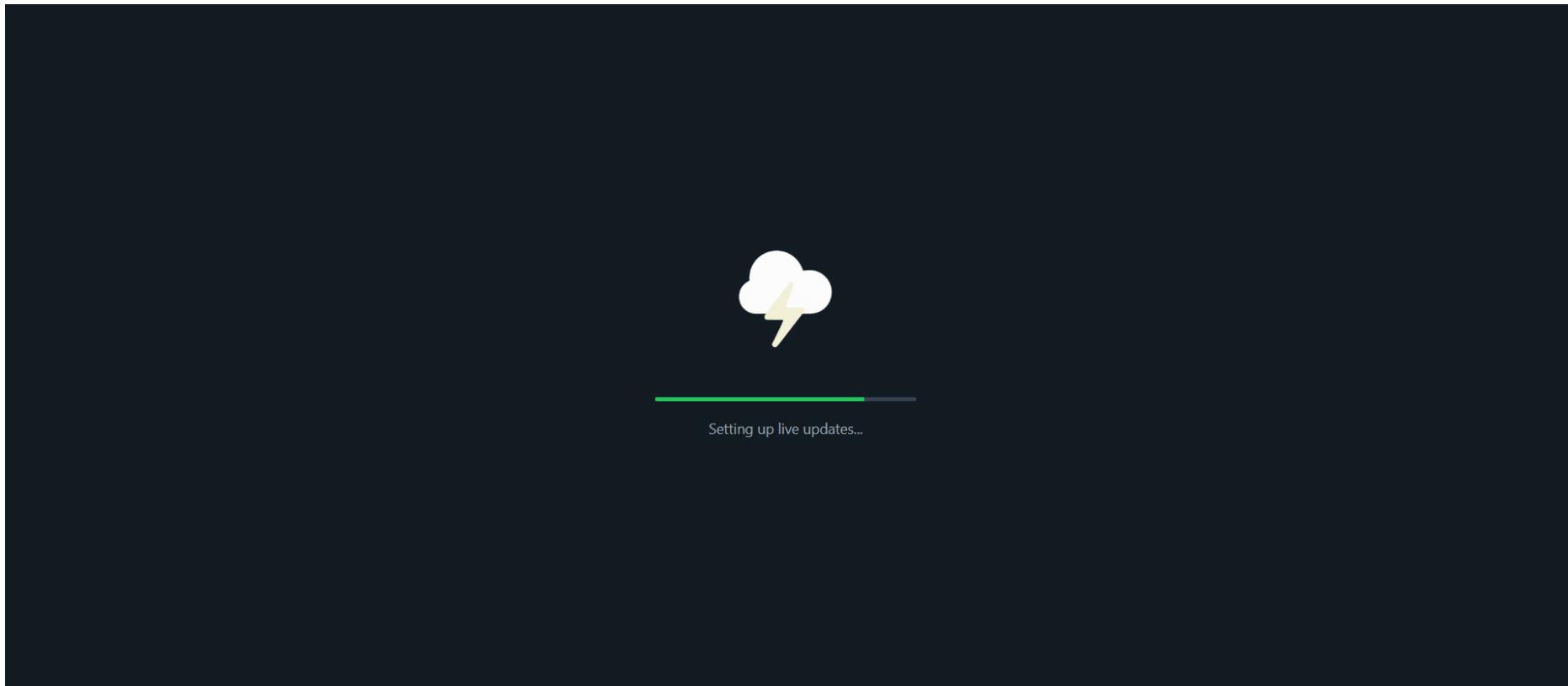
[SEND RESET LINK](#)

Remember your password? [Login here](#)

## 7.3 Home Page

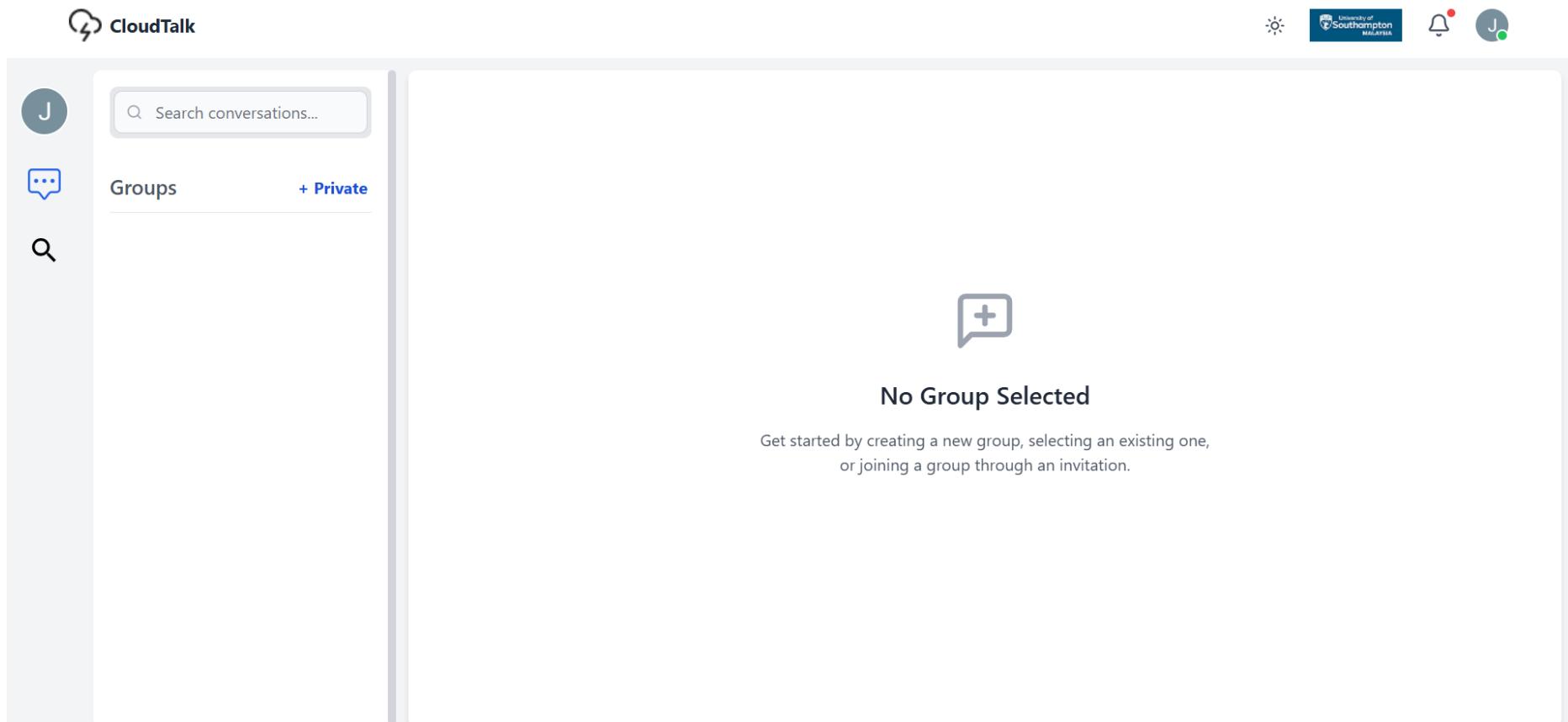
### 7.3.1 Loading State

When entering the home page, there will be a WhatsApp-style loading screen to load the group list and chat window.



### 7.3.2 Entire Home Page

The entire home page is basically composed of sidebar, group list, chat window and group list.



CloudTalk

Search conversations...

Pin Groups

The Studio Room  
a new user is online

4/21/2025

07:25 AM You PDF COMP3207 - Cloud Application Development Updated V2 (1).pdf

07:26 AM You This message has been deleted by a new user

07:26 AM You This message has been deleted by a new user

07:29 AM You This message has been deleted by a new user

Type your message...  

CloudTalk

University of Southampton Malaysia

Group Info

Members (1) View All Members Add Members

a new user admin

Shared Files View All Files

COMP3207 - Cloud Application Development Updated V2 (1).pdf  
2025-04-21 07:25

Mute Notifications

Pin Conversation

Pinned Messages (0)

### 7.3.3 Sidebar

The sidebar contains the two main icons of this website, the home page and the search page, as well as the user avatar

### 7.3.4 Group List

The main purpose of Group List is to view all the groups you have joined. Here they are divided into pinned groups, active groups and inactive groups. All pinned groups are at the top, and disbanded groups are at the bottom. In addition, users can search for the group name or group description to find the group they want. Users can also apply to join a private group by clicking a button and entering the

group ID.

CloudTalk

Search conversations...

Pin Groups

The Studio Room This message has been deleted 7h

Groups + Private

Indie Game Devs United You sent a image 6min

Team Velocity1 Jian heng has left the group 19min

UI/UX Designer Hub Jian heng has left the group 19min

Indie Game Devs United a new user and Jian heng are online

Preprocessing

TabNet

Surrogate Model

Export Formula

Type your message...  

Group Info

Members (2) View All Members Add Members

a new user admin

Jian heng user

Shared Files View All Files

Blank diagram (24) (3).png 2025-04-21 14:35 

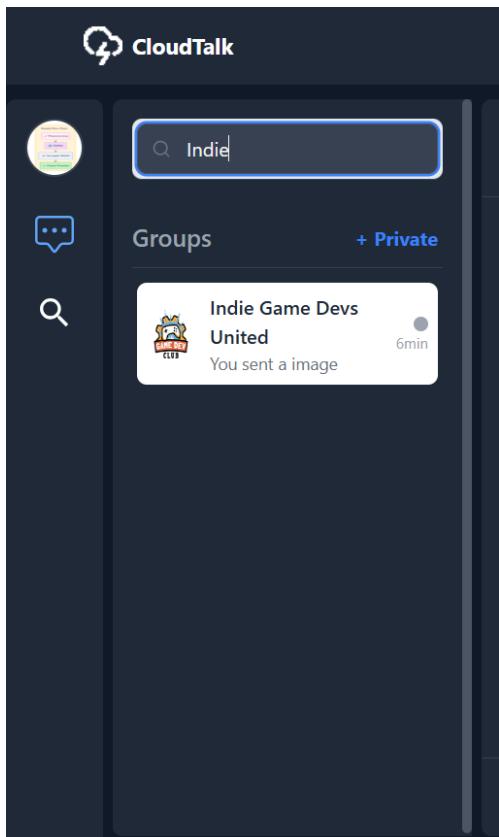
CW3.pdf 2025-04-21 14:35 

Mute Notifications

Pin Conversation

Pinned Messages (0)

# Search and Filtering group function



# Join Private Group Function

The screenshot shows the CloudTalk application interface. At the top, there is a navigation bar with icons for search, notifications, and user profile. The main area displays a conversation with a user named 'example123'. A modal window titled 'Join Private Group' is open, showing the group's ID: '-OOGr9aEozvJ02QrFZkZ'. The group is described as 'Team Velocity1' with a private workspace for internal discussions, task tracking, and weekly sync-ups. It is noted as 'Team only.' Below this, it shows 'Members: 1', 'Created At: 4/20/2025, 2:22:18 PM', and 'Admin: a new user'. At the bottom of the modal are 'Cancel' and 'Request to Join' buttons. The background shows a message from 'example123' stating they created the group 'example123' 17 minutes ago. On the right side, there is a 'Group Info' panel showing one member, 'Jian heng', who is an admin. There are also options to mute notifications and pin the conversation.

CloudTalk

example123  
Jian heng is online

Groups + Private

Indie Game Devs United  
a new user sent a image 7min

example123  
Jian heng created the group "example123" 17min

Join Private Group  
-OOGr9aEozvJ02QrFZkZ

**Team Velocity1**  
Private workspace for internal discussions, task tracking, and weekly sync-ups. Team only.

Members: 1  
Created At: 4/20/2025, 2:22:18 PM  
Admin: a new user

Cancel Request to Join

4/21/2025  
Jian heng created the group "example123"

Type your message...

**Group Info**

Members (1) View All Members Add Members

Jian heng admin

Mute Notifications Pin Conversation

Pinned Messages (0)

### 7.3.5 Chat Window

ChatWindow is the main function of this page, which includes a lot of functions

ChatWindow provides a complete message exchange experience, supports text message sending, file upload preview, emoticon selection and @mention functions to enhance interactivity. Users can react to messages with emoji, delete or pin them. The interface displays online users and typing status and realizes real-time feedback with unread message count. It also has message search and matching highlight functions. The interface is responsive and adapted to mobile terminals, supports dark mode, and realizes scrolling loading of historical messages.

Among them, FilePreview.vue supports previews in multiple formats such as pictures, videos, PDFs, and text files, provides full-screen modal display, file name display, loading instructions and closing control, and includes error handling for loading failure and unsupported format.

GroupMenu.vue provides group management functions, including viewing group details, exiting groups and setting items, with user role-based permission control (such as administrator-exclusive functions), and uses drop-down menus, graphic combinations and floating effects in design, and supports dark themes.

CloudTalk

Search conversations...

Pin Groups

The Studio Room  
This message has been deleted 7h

Groups + Private

Indie Game Devs United You sent a image 9min

Team Velocity1 Jian heng has left the group 22min

UI/UX Designer Hub Jian heng has left the group 19min

Indie Game Devs United a new user and Jian heng are online 4/21/2025

Jian heng has joined the group 02:35 PM You CW3.pdf

Simple Flow Chart Preprocessing

Type your message...  

Group Info

Members (2) [View All Members](#) [Add Members](#)

a new user admin

Jian heng user

Shared Files [View All Files](#)

Blank diagram (24) (3).png 2025-04-21 14:35

CW3.pdf 2025-04-21 14:35

Mute Notifications

Pin Conversation

Pinned Messages (0)

# Message Search

The screenshot displays the CloudTalk messaging application interface. On the left, there's a sidebar with icons for Home, Conversations, Pin Groups, Groups, and Private messages. The main area shows a conversation with 'Team Velocity1'. A search bar at the top of the conversation screen contains the text 'tes'. Below it, a message from 'User' at 07:35 AM is shown: 'This message has been deleted by User'. Another message from 'User' at 4/21/2025, 11:57 AM states: 'Jian Heng Hin changed group name to "Team Velocity1"'. A third message from 'User' at 4/21/2025, 02:46 PM says: 'Jian Heng Hin updated the group image'. At the bottom of the conversation screen, there's a message input field with the placeholder 'Type your message...' and a file attachment icon.

**CloudTalk**

Search conversations...

Pin Groups

The Studio Room  
This message has been deleted 7h

Groups + Private

Team Velocity1 left 1s

Indie Game Devs United 10min  
You sent a image

UI/UX Designer Hub 23min  
Jian heng has left the group

Team Velocity1  
a new user is online

tes

a new user 02:46 PM

testing

User 07:35 AM  
This message has been deleted by User

4/21/2025, 11:57 AM  
Jian Heng Hin changed group name to "Team Velocity1"

4/21/2025, 02:46 PM  
Jian Heng Hin updated the group image

Type your message...

Group Info

Members (1) View All Members Add Members

a new user admin

Mute Notifications

Pin Conversation

Pinned Messages (0)

# Group Menu

The screenshot shows the CloudTalk Group Menu interface. On the left, there's a sidebar with icons for search, pin groups, and groups. The main area displays a group chat for "Team Velocity1". The header shows a profile picture, the group name, and a message: "a new user is online". A timestamp "4/21/2025, 07:23 AM" is also present. Below the header, a message from "User" at 07:35 AM is shown: "This message has been deleted by User". Another timestamp "4/21/2025, 11:57 AM" is followed by a message: "Jian Heng Hin changed group name to "Team Velocity1"" and "Jian Heng Hin updated the group image". At the bottom, there's a message input field with a placeholder "Type your message..." and a send button. A context menu is open on the right side of the screen, listing options: View Group Details, Update Group Details, Disband Group, and Mute All Members. The "Disband Group" option is highlighted. The "Group Info" section on the right shows 1 member, a message about a new user being admin, and toggle switches for Mute Notifications and Pin Conversation.

CloudTalk

Search conversations...

Pin Groups

The Studio Room  
This message has been deleted 7h

Groups + Private

Team Velocity1 left 1s

Indie Game Devs United 10min  
You sent a image

UI/UX Designer Hub Jian heng has left the group 23min

Team Velocity1  
a new user is online

4/21/2025, 07:23 AM

User 07:35 AM  
This message has been deleted by User

4/21/2025, 11:57 AM

Jian Heng Hin changed group name to "Team Velocity1"

Jian Heng Hin updated the group image

Type your message... 😊 🚀

View Group Details

Update Group Details

Disband Group

Mute All Members

Group Info

Members (1) View All Members Add Members

a new user admin

Mute Notifications

Pin Conversation

Pinned Messages (0)

# View Group Details

The screenshot shows the CloudTalk application interface. At the top, there is a navigation bar with the CloudTalk logo, a search bar, and various icons for notifications and account management. The main area displays a list of groups on the left and a detailed view of the selected group on the right.

**Group Details View:**

- Group ID:** -OOGr9aEozvJ02QrFZkZ
- Name:** Team Velocity1
- Description:** Private workspace for internal discussions, task tracking, and weekly sync-ups. Team only.
- Chat Type:** private

A blue "Close" button is located at the bottom of this modal.

**Group Info Panel:**

- Members:** (1) View All Members Add Members
- User:** a new user admin
- Mute Notifications:** (Switched off)
- Pin Conversation:** (Switched off)

**Pinned Messages:** (0)

**Message History:**

- 06:53 AM You 2 (Message from user)
- 07:23 AM You 3 (Message from user)

**Bottom Bar:**

- Type your message...
- Smiley face icon
- Attachment icon (blue arrow)

# Update Group Details

The screenshot shows the CloudTalk application interface. A central modal window titled "Update Group Details" is open, allowing the user to edit group settings. The modal contains fields for "Name" (set to "Team Velocity1"), "Description" (set to "Private workspace for internal discussions, t"), "Group Image" (with a placeholder "Choose File No file chosen"), and "Chat Type" (set to "Private"). At the bottom of the modal are two buttons: "Save Changes" (in blue) and "Cancel".

The background of the app shows a dark-themed interface with several notifications and group lists. On the left, there's a sidebar with "Pin Groups" (containing "The Studio Room" which has been deleted), a search icon, and a "Groups" section listing "Team Velocity1" (private), "Indie Game Devs" (United), and "UI/UX Designer Hub". In the center, a group named "Team Velocity" is active, with a message from "User" at 07:35 AM. On the right, a "Group Info" panel shows one member ("a new user admin") and options for "Mute Notifications" and "Pin Conversation". A message from "You" at 06:53 AM and another at 07:23 AM are also visible.

# Disband Group

The screenshot shows the CloudTalk application interface. On the left, there's a sidebar with a search bar, a 'Pin Groups' section containing 'The Studio Room' (deleted), and a 'Groups' section listing 'Team Velocity1', 'Indie Game Devs', and 'UI/UX Designer Hub'. The main area shows a group chat for 'Team Velocity1'. A modal dialog titled 'Disband Group' is centered, asking 'Are you sure you want to disband this group? This action cannot be undone.' with 'Cancel' and 'Disband' buttons. The group info panel on the right shows one member ('a new user admin'), mute notifications (off), pin conversation (off), and pinned messages (0). The message history includes a recent message from 'User' at 07:35 AM and a note from 'Jian Heng Hin' changing the group name and updating the image.

CloudTalk

Team Velocity1  
a new user is online

Search conversations...

Pin Groups

The Studio Room  
This message has been deleted 7h

Groups + Private

Team Velocity1 left 1s

Indie Game Devs United 10min You sent a image

UI/UX Designer Hub Jian heng has left the group 23min

Disband Group

Are you sure you want to disband this group? This action cannot be undone.

Cancel Disband

06:53 AM You 2

07:23 AM You 3

4/21/2025, 11:57 AM

Jian Heng Hin changed group name to "Team Velocity1"

Jian Heng Hin updated the group image

Type your message... 😊 🔍

Group Info

Members (1) View All Members Add Members

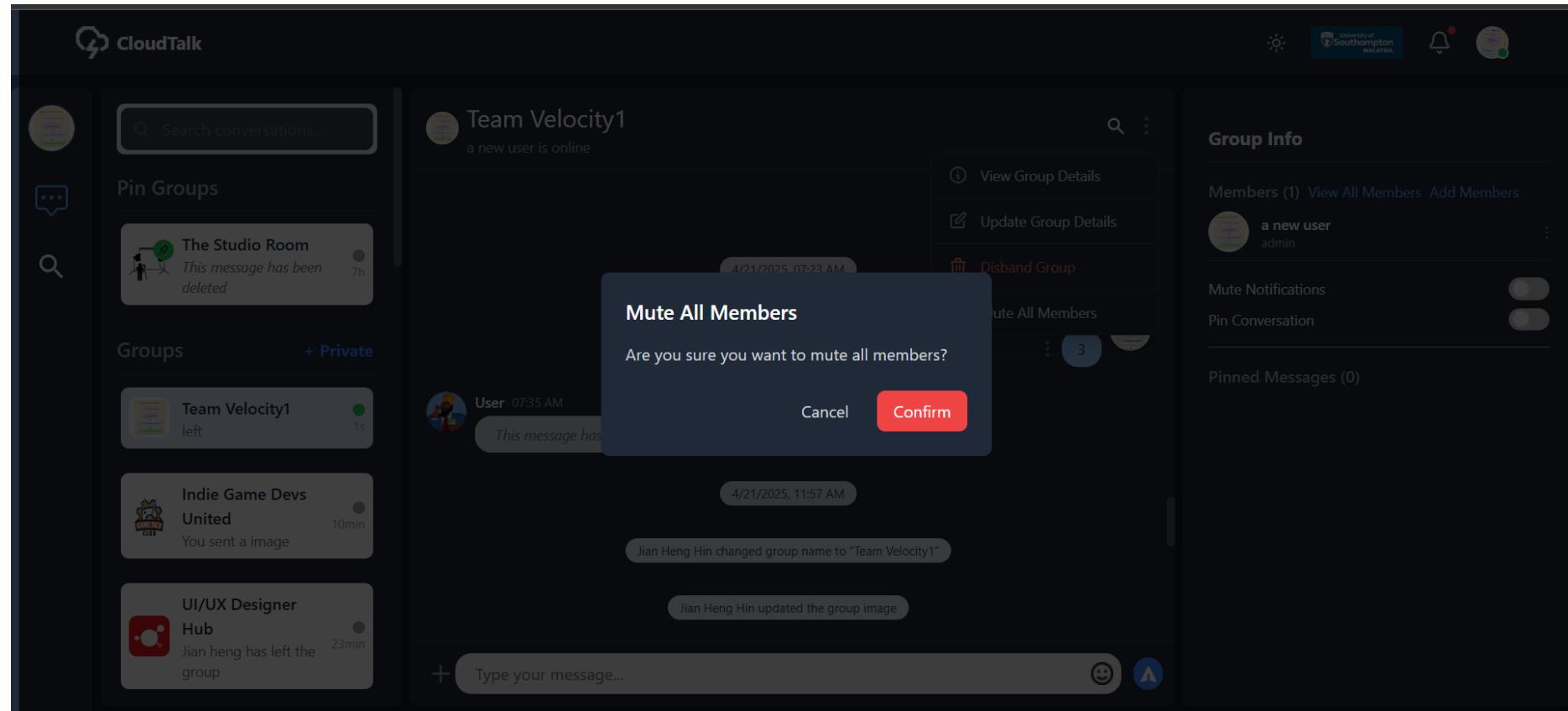
a new user admin

Mute Notifications

Pin Conversation

Pinned Messages (0)

# Mute all members function



# Message Handling Menu

The screenshot displays the CloudTalk messaging application interface. On the left, a sidebar shows pinned groups and other group conversations. The main area shows a group named "Team Velocity1" with a message from "User" that has been deleted. A context menu is open over this message, listing "Add Reaction", "Pin Message", and "Delete Message". The right side shows the "Group Info" panel with member details, notification settings, and pinned messages.

**CloudTalk**

Search conversations...

Pin Groups

The Studio Room  
This message has been deleted 7h

Groups + Private

Team Velocity1 left 1s

Indie Game Devs United 10min You sent a image

UI/UX Designer Hub 23min Jian heng has left the group

Team Velocity1  
a new user is online

06:53 AM You 2

4/21/2025, 07:23 AM

User 07:35 AM This message has been deleted by User

4/21/2025, 11:57 AM

Jian Heng Hin changed group name to "Team Velocity1"

Jian Heng Hin updated the group image

Type your message... 😊 ⚡

Group Info

Members (1) View All Members Add Members

a new user admin

Mute Notifications

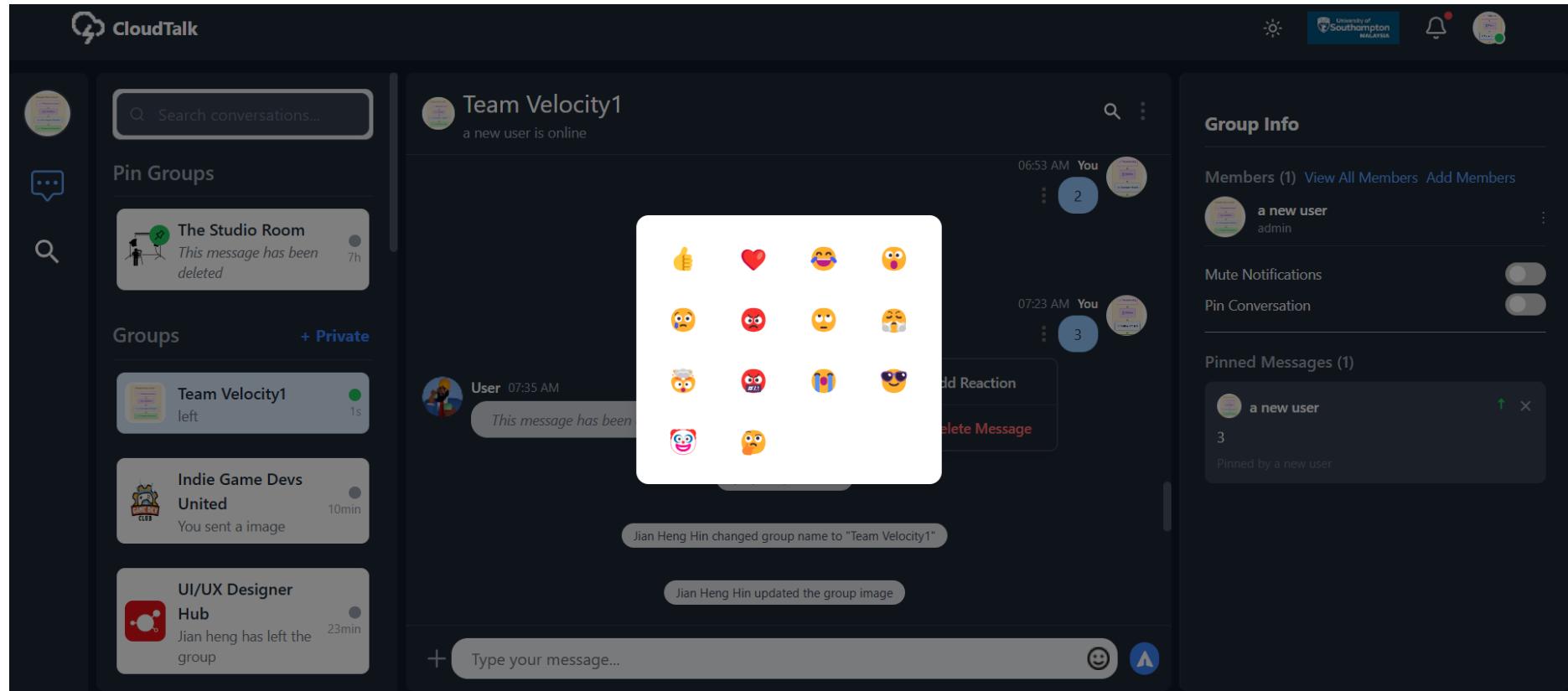
Pin Conversation

Pinned Messages (0)

# Pin Message Function

The screenshot displays the CloudTalk messaging application interface. At the top, there is a navigation bar with the CloudTalk logo, a search bar, and various icons for notifications and account settings. The main area shows a conversation with a group named "Team Velocity1". A message from "User" at 07:35 AM stating "This message has been deleted by User" is highlighted with a blue background and white text. Below this, a message from "Jian Heng Hin" at 11:57 AM indicates a group name change: "Jian Heng Hin changed group name to 'Team Velocity1'". Another message from "Jian Heng Hin" at 11:57 AM indicates an update: "Jian Heng Hin updated the group image". On the left sidebar, under "Groups", there are three pinned groups: "The Studio Room" (deleted), "Team Velocity1" (left), and "Indie Game Devs United" (You sent a image). The "Group Info" panel on the right shows basic details like members, mute notifications, pin conversation, and pinned messages, which currently lists the deleted message from "User".

# Emoji Reaction Function



The screenshot displays the CloudTalk application interface. On the left, there's a sidebar with a search bar, a 'Pin Groups' section containing 'The Studio Room' (deleted 7h ago), and a 'Groups' section listing 'Team Velocity1' (left 1s ago), 'Indie Game Devs United' (10min ago - You sent a image), and 'UI/UX Designer Hub' (23min ago - Jian heng has left the group). The main area shows a group chat for 'Team Velocity1'. A message from 'User' at 07:35 AM says 'This message has been deleted'. A reaction overlay titled 'Reactions' shows a single emoji. Another message from 'User' at 07:23 AM says 'a new user'. A message from 'You' at 07:23 AM says '3'. A message from 'Jian Heng Hin' at 11:57 AM says 'Jian Heng Hin changed group name to "Team Velocity1"'. A message from 'Jian Heng Hin' at 11:57 AM says 'Jian Heng Hin updated the group image'. At the bottom, there's a message input field with a placeholder 'Type your message...' and a send button. The top right corner shows the University of Southampton logo, a notification bell, and a user profile icon.

CloudTalk

Search conversations...

Pin Groups

The Studio Room  
This message has been deleted 7h

Groups + Private

Team Velocity1 left 1s

Indie Game Devs United 10min You sent a image

UI/UX Designer Hub 23min Jian heng has left the group

Team Velocity1  
a new user is online

4/21/2025, 07:23 AM

Reactions

a new user

07:23 AM You 3

4/21/2025, 11:57 AM

Jian Heng Hin changed group name to "Team Velocity1"

Jian Heng Hin updated the group image

Type your message... ☺️ 🔍

Group Info

Members (1) View All Members Add Members

a new user admin

Mute Notifications

Pin Conversation

Pinned Messages (1)

a new user 3 Pinned by a new user

# File Upload Function

The screenshot shows the CloudTalk application interface. On the left, there's a sidebar with a search bar, a pinned groups section containing "The Studio Room" (deleted), and a groups section listing "Team Velocity1" (private), "Indie Game Devs United" (with a message about sending an image), and "UI/UX Designer Hub" (with a message about Jian heng leaving).

The main area displays a group chat titled "Team Velocity1". A notification at the top indicates "a new user is online". The conversation shows messages from "User" (07:35 AM) and "You" (07:23 AM). A message from "User" was deleted. A pinned message from "a new user" (07:23 AM) is shown, stating "Pinned by a new user".

A central feature is a file upload interface with a placeholder "Drag and drop files here" and a "Browse Files" button. Below this is a message input field with a placeholder "Type your message..." and icons for attachments and emojis.

On the right, the "Group Info" panel shows one member ("a new user" - admin), mute and pin notification toggles, and a pinned messages section with the same pinned message from "a new user".

# Mention User Function

CloudTalk

Indie Game Devs United  
a new user and Jian heng are online

Preprocessing → TabNet → Surrogate Model → Export Formula

Jian heng

Search conversations...  
Pin Groups  
The Studio Room  
This message has been deleted  
7h

Groups + Private  
Team Velocity1 left 3min  
Indie Game Devs United You sent a image 13min  
UI/UX Designer Hub Jian heng has left the group 23min

Group Info  
Members (2) View All Members Add Members  
a new user admin  
Jian heng user

Shared Files View All Files  
Blank diagram (24) (3).png 2025-04-21 14:35  
CW3.pdf 2025-04-21 14:35

Mute Notifications  
Pin Conversation

Pinned Messages (0)

The screenshot shows the CloudTalk application interface. On the left, there's a sidebar with pinned groups like 'The Studio Room' (deleted), 'Team Velocity1' (left), and 'Indie Game Devs United' (where a new user and Jian heng are online). Below that is a list of other groups. The main area shows a group chat for 'Indie Game Devs United'. A large flowchart diagram is displayed in the center of the screen, consisting of four boxes connected by arrows: 'Preprocessing' (pink), 'TabNet' (purple), 'Surrogate Model' (blue), and 'Export Formula' (green). At the bottom of the group chat window, there's an input field with a placeholder '@' and a mention icon. To the right of the group chat is a 'Group Info' sidebar showing member details ('a new user' and 'Jian heng'), shared files ('Blank diagram (24) (3).png' and 'CW3.pdf'), and settings for notifications and pinning.



Search conversations...

Pin Groups

The Studio Room  
This message has been deleted 7h

Groups + Private

Team Velocity1 left 3min

Indie Game Devs United You sent a image 13min

UI/UX Designer Hub Jian heng has left the group 23min

## Indie Game Devs United

a new user and Jian heng are online

02:50 PM You @Jian heng hi

Type your message...

### Group Info

Members (2) [View All Members](#) [Add Members](#)

a new user admin

Jian heng user

Shared Files [View All Files](#)

Blank diagram (24) (3).png 2025-04-21 14:35

CW3.pdf 2025-04-21 14:35

Mute Notifications

Pin Conversation

Pinned Messages (0)

# Emoji Message Function

The screenshot displays the CloudTalk messaging interface. At the top left is the CloudTalk logo. On the right side, there are icons for a sun, a bell, and a user profile.

The main area shows a conversation in the "Indie Game Devs United" group. A message from "Jian heng" has been deleted. The message input field at the bottom says "Type your message..." and includes a smiley face icon and a blue arrow icon.

On the left sidebar, under "Groups", the "Indie Game Devs United" group is selected, showing a message from Jian heng. Other groups listed are "The Studio Room" (deleted), "Team Velocity1" (left), and "UI/UX Designer Hub" (Jian heng has left).

The central part of the screen features a large emoji grid. The first row is labeled "Frequently Used" and contains a variety of emojis including a thumbs up, heart eyes, and a heart. Below this is a section labeled "Smileys & Emotion" containing many more detailed emoji faces.

To the right of the emoji grid is the "Group Info" panel, which lists members "a new user" and "Jian heng", shared files ("Blank diagram (24) (3).png" and "CW3.pdf"), and settings for "Mute Notifications" and "Pin Conversation".

Search conversations...

Pin Groups

The Studio Room  
*This message has been deleted* 7h

Groups + Private

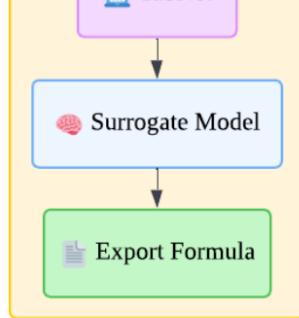
Indie Game Devs United 2s

Team Velocity1 4min

UI/UX Designer Hub  
Jian heng has left the group 27min

## Indie Game Devs United

a new user and Jian heng are online



02:50 PM You @Jian heng hi

02:51 PM You 🎉🎉🎉

Type your message...  

### Group Info

Members (2) [View All Members](#) [Add Members](#)

 a new user admin

 Jian heng user

Shared Files [View All Files](#)

 Blank diagram (24) (3).png 2025-04-21 14:35 

 CW3.pdf 2025-04-21 14:35 

Mute Notifications 

Pin Conversation 

Pinned Messages (0)

# File Preview Function

The screenshot shows the CloudTalk application interface with a file preview modal open. The modal displays a PDF titled "COMP3207 - Cloud Application Development Upated V2 (1).pdf". The PDF content includes the University of Southampton logo, the title "COMP3207 CLOUD APPLICATION DEVELOPMENT 2024/25", a blue header bar with "CONTINUOUS ASSESSMENT", and a table with the following data:

<b>Module Code:</b>	COMP3207
<b>Module Title:</b>	Cloud Application Development
<b>Module Leader:</b>	Dr. Madni / Dr. Najeeb
<b>Assessment Type:</b>	Individual
<b>Weightage:</b>	100%
<b>Submission Due Date:</b>	Week-12 [30/04/2025, 05:00 PM Malaysia Standard Time (MST)]
<b>Method of Submission:</b>	Blackboard
<b>GenAI</b>	Tier 1: No GenAI use [applies All - Entire work]
<b>Tier Specification:</b>	

Below the table, it says "This assessment relates to the following Module Learning Outcomes:". At the bottom of the modal are "Download" and "Close" buttons.

The background shows the CloudTalk sidebar with "Pin Groups" and "Groups" sections, and a central feed area with various notifications and file previews.

### 7.3.6 Group Information

GroupInfo and its subcomponents together build a fully functional group management system, covering multiple core modules from basic information display to permission control. Users can view and edit the basic information of the group, manage the member list (including searching for members, viewing details, adjusting permissions, removing members, etc.), and manage group owners, add administrators, and mute people through permission control. At the same time, it also supports unified management of shared files within the group, including file preview, download, and scroll loading functions. In addition, users can also invite new members to join the group, approve joining requests, and view the invitation status. The interface provides a simple and clear operation menu, modal pop-up window interaction, responsive design, and dark mode to ensure a good user experience. In terms of function implementation, the component also integrates error prompts, loading status display, notification push, and activity log recording to ensure the stability and traceability of the system.

CloudTalk

Search conversations...

Pin Groups

The Studio Room This message has been deleted 7h

Groups + Private

Indie Game Devs United 2s

Team Velocity1 4min

UI/UX Designer Hub Jian heng has left the group 27min

Indie Game Devs United  
a new user and Jian heng are online

Surrogate Model

Export Formula

02:50 PM You @Jian heng hi

02:51 PM You

Type your message...

Group Info

Members (2) [View All Members](#) [Add Members](#)

a new user admin

Jian heng user

Shared Files [View All Files](#)

Blank diagram (24) (3).png 2025-04-21 14:35

CW3.pdf 2025-04-21 14:35

Mute Notifications

Pin Conversation

Pinned Messages (0)

# All Member Function

The screenshot shows the CloudTalk application interface. At the top, there is a navigation bar with icons for search, pin, and notifications, along with the University of Southampton logo. The main area displays a group named "Indie Game Devs United" with a message indicating "a new user and Jian heng are online". A modal window titled "All Members" is open, showing a search bar and a list of two members: "a new user" (admin) and "Jian heng" (user). The "Group Info" sidebar on the right lists "Members (2)" with links to "View All Members" and "Add Members". It also shows shared files like "Blank diagram (24) (3).png" and "CW3.pdf", and settings for "Mute Notifications" and "Pin Conversation". The bottom of the screen features a message input field with placeholder text "Type your message..." and various message composition buttons.

CloudTalk

Indie Game Devs United  
a new user and Jian heng are online

Search conversations...

Pin Groups

The Studio Room  
This message has been deleted 7h

Groups + Private

Indie Game Devs United 2s

Team Velocity1 left 4min

UI/UX Designer Hub Jian heng has left the group 27min

All Members

Search by username or ID

a new user admin

Jian heng user

Close

Group Info

Members (2) View All Members Add Members

a new user admin

Jian heng user

Shared Files View All Files

Blank diagram (24) (3).png 2025-04-21 14:35

CW3.pdf 2025-04-21 14:35

Mute Notifications

Pin Conversation

Pinned Messages (0)

Type your message... ☺️ 📈

# Member Menu

The screenshot shows the CloudTalk application interface. At the top, there is a navigation bar with the CloudTalk logo, a search bar, and various icons for notifications and user profiles. The main content area displays a group named "Indie Game Devs United" with a message indicating "a new user and Jian heng are online". A "Member Menu" is currently open, listing five options: "View Member Details", "Transfer Group Ownership", "Add Moderator", "Remove Member", and "Mute Member". Below the menu, there is a "Close" button. On the right side of the screen, there is a "Group Info" panel showing member details (a new user, admin; Jian heng, user), shared files (Blank diagram (24) (3).png, CW3.pdf), and settings for mute notifications and pinning conversations. At the bottom, there is a message input field with placeholder text "Type your message..." and a smiley face emoji.

CloudTalk

Indie Game Devs United  
a new user and Jian heng are online

Member Menu

- View Member Details
- Transfer Group Ownership
- Add Moderator
- Remove Member
- Mute Member

Close

Group Info

Members (2) View All Members Add Members

- a new user admin
- Jian heng user

Shared Files View All Files

- Blank diagram (24) (3).png 2025-04-21 14:35
- CW3.pdf 2025-04-21 14:35

Mute Notifications Pin Conversation

Pinned Messages (0)

Search conversations...

Pin Groups

The Studio Room This message has been deleted 7h

Groups + Private

- Indie Game Devs United 2s
- Team Velocity1 4min
- UI/UX Designer Hub 27min

Type your message... 😊 ⬆️

# View Member Details

Member Details

 a new user

online

Bio

a new user

Status

Available

Email

jianhenghin0831@gmail.com

Common Groups

 UI/UX Designer Hub

 Mind Hackers Club

 Pet Lovers Lounge

and 13 other groups

▶ Technical Details

[Close](#)

# Add Member

The screenshot shows the CloudTalk application interface. At the top, there's a header with the CloudTalk logo, a search bar, and user profile icons. Below the header, the main feed displays several group conversations:

- The Studio Room**: A message was deleted 7 hours ago.
- Indie Game Devs United**: You sent a image 3 minutes ago.
- Team Velocity1**: Jian heng has left the group 15 minutes ago.
- UI/UX Designer Hub**:
  - a new user and Jian heng are online
  - User 01:57 PM: tell me why
  - User 01:57 PM: baby why
  - Jian Heng 01:57 PM: 不要一直发信息
  - Jian Heng 01:57 PM: +
- E-commerce Website Redesign – Shopee**: Jian Heng Hin created it 1 day ago.

In the center, a modal window titled "Add Member" is open, containing a search bar and two member entries:

- Sizhi Xu** (S icon) vincentxu20031216@gmail.com
- Lee Wei qua** (L icon) leeweiquan12@gmail.com

At the bottom of the modal is a "Close" button. The background shows some recent messages from the UI/UX Designer Hub conversation.

**Group Info** section on the right shows:

- Members (3): a new user (admin), Jian heng (user), Jian Heng (moderator)
- Mute Notifications (switch off)
- Pin Conversation (switch off)
- Pinned Messages (0)

The bottom of the screen features a message input field with a placeholder "Type your message..." and a smiley face icon.

# All Share Files

The screenshot shows the CloudTalk application interface. On the left, there's a sidebar with a search bar, a 'Pin Groups' section containing 'The Studio Room' (deleted 7h ago), and a 'Groups' section listing 'Indie Game Devs United', 'Team Velocity1', and 'UI/UX Designer Hub'. A message at the bottom of the sidebar indicates 'Jian heng has left the group 27min'. The main area is titled 'Indie Game Devs United' with the note 'a new user and Jian heng are online'. A central modal window is open, titled 'All Shared Files', displaying two items: 'Blank diagram (24) (3).png' (2025-04-21 14:35) and 'CW3.pdf' (2025-04-21 14:35). Below the files is a 'Close' button. In the background, there's a blurred view of a game development interface with various UI elements like 'Model', 'Controller', and 'Input'. The right side of the screen shows 'Group Info' with members 'a new user' (admin) and 'Jian heng' (user), a 'Shared Files' section with preview cards for the same two documents, and settings for 'Mute Notifications' and 'Pin Conversation'.

CloudTalk

Search conversations...

Indie Game Devs United  
a new user and Jian heng are online

Group Info

Members (2) View All Members Add Members

a new user admin

Jian heng user

Shared Files View All Files

Blank diagram (24) (3).png 2025-04-21 14:35

CW3.pdf 2025-04-21 14:35

Mute Notifications

Pin Conversation

Pinned Messages (0)

Indie Game Devs United

The Studio Room This message has been deleted 7h

Groups + Private

Indie Game Devs United 2s

Team Velocity1 4min

UI/UX Designer Hub Jian heng has left the group 27min

Type your message...

All Shared Files

Blank diagram (24) (3).png 2025-04-21 14:35

CW3.pdf 2025-04-21 14:35

Close

02:50 PM You @Jian heng hi

02:51 PM You

## 7.4 Search Page

On the search page, users can view all public groups and join them, search for groups, and create groups.

The screenshot shows the CloudTalk search page interface. At the top, there is a navigation bar with the CloudTalk logo, a search bar containing 'Search public groups...', a 'Create Group' button, and user profile icons for 'J' and 'University of Southampton MALAYSIA'. On the left, there is a sidebar with icons for messaging ('...'), search ('Q'), and a profile ('J'). The main content area displays six public groups in a grid:

- UI/UX Designer Hub**: Red and white abstract icon. Description: Welcome all UI/UX designers! Share inspirations, get feedback, and discuss the latest trends in user experience and interface design. Status: Already Joined (grey button). Member count: 3.
- Indie Game Devs United**: Abstract icon featuring a game controller. Description: A chill space for indie game developers, artists, writers, and music creators. Share your projects, ask for feedback, and support each other's journeys. Status: Join Group (blue button). Member count: 1.
- Mind Hackers Club**: Black and white abstract icon. Description: For those obsessed with productivity, mental models, and life hacks. Let's optimize our brains and lives together. Status: Join Group (blue button). Member count: 1.
- Pet Lovers Lounge**: Abstract icon featuring stylized dogs. Status: Join Group (blue button). Member count: 1.
- Remote Workers Cafe**: Abstract icon featuring a stylized eye and house-like shapes. Status: Join Group (blue button). Member count: 1.
- Writers' Corner**: Abstract icon featuring green and orange bars. Status: Join Group (blue button). Member count: 1.

 Search public groups...[+ Create Group](#)**UI/UX Designer Hub**

3

Welcome all UI/UX designers! Share inspirations, get feedback, and discuss the latest trends in user experience and interface design.

[+ Already Joined](#)**Indie Game Devs United**

2

A chill space for indie game developers, artists, writers, and music creators. Share your projects, ask for feedback, and support each other's journeys.

[+ Already Joined](#)**Mind Hackers Club**

1

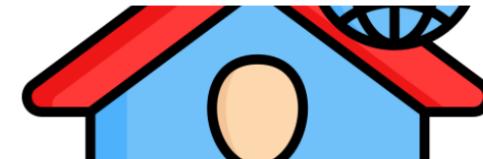
For those obsessed with productivity, mental models, and life hacks. Let's optimize our brains and lives together.

[+ Join Group](#)**Pet Lovers Lounge**

1

**Remote Workers Cafe**

1

**Writers' Corner**

1

# Search Public Group Function

CloudTalk

University of Southampton  
MALAYSIA

J

user experience

+ Create Group

UI/UX Designer Hub

Welcome all UI/UX designers! Share inspirations, get feedback, and discuss the latest trends in user experience and interface design.

+ Already Joined

# Create Group Function

The screenshot shows the CloudTalk application interface. At the top, there is a navigation bar with icons for search, notifications, and user profile. Below the navigation bar, a search bar says "Search public groups...". On the left, there is a sidebar with a user icon (J) and three buttons: a message icon, a search icon, and a plus sign icon. The main content area displays several group cards:

- UI/UX Designer Hub**: Red and white abstract logo. Welcome message: "Welcome all UI/UX designers! Share inspirations, get feedback, and discuss the latest trends in user experience and interface design." Status: "+ Already Joined".
- Pet Lovers Lounge**: Illustration of two dogs. Status: "1 member".
- Remote Workers Cafe**: Abstract blue and black logo.
- Mind Hackers Club**: Black and white abstract logo. Welcome message: "For those obsessed with productivity, mental models, and life hacks. Let's optimize our brains and lives together." Status: "+ Join Group".
- Writers' Corner**: Abstract green and yellow logo. Status: "1 member".

A central modal window titled "Create Group" is open. It contains the following fields:

- Group Name**: An input field with placeholder text "Enter group name".
- Group Description (Optional)**: A text area with placeholder text "Enter group description".
- Chat Type**: A dropdown menu set to "Public".
- Group Photo (Optional)**: A section with a "Choose File" button and a message "No file chosen".
- Create Group**: A large blue button at the bottom of the modal.

CloudTalk

Search public groups...

+ Create Group

UI/UX Designer Hub

Welcome all UI/UX designers! Share inspirations, get feedback, and discuss the latest trends in user experience and interface design.

+ Already Joined

Mind Hackers Club

For those obsessed with productivity, mental models, and life hacks. Let's optimize our brains and lives together.

+ Join Group

Pet Lovers Lounge

Remote Workers Cafe

Writers' Corner

Created

Group created with ID: -OOM0fuVGdrhHuKoA9CI

**Create Group**

X

Group Name

example123

Group Description (Optional)

Enter group description

Chat Type

Private

Group Photo (Optional)

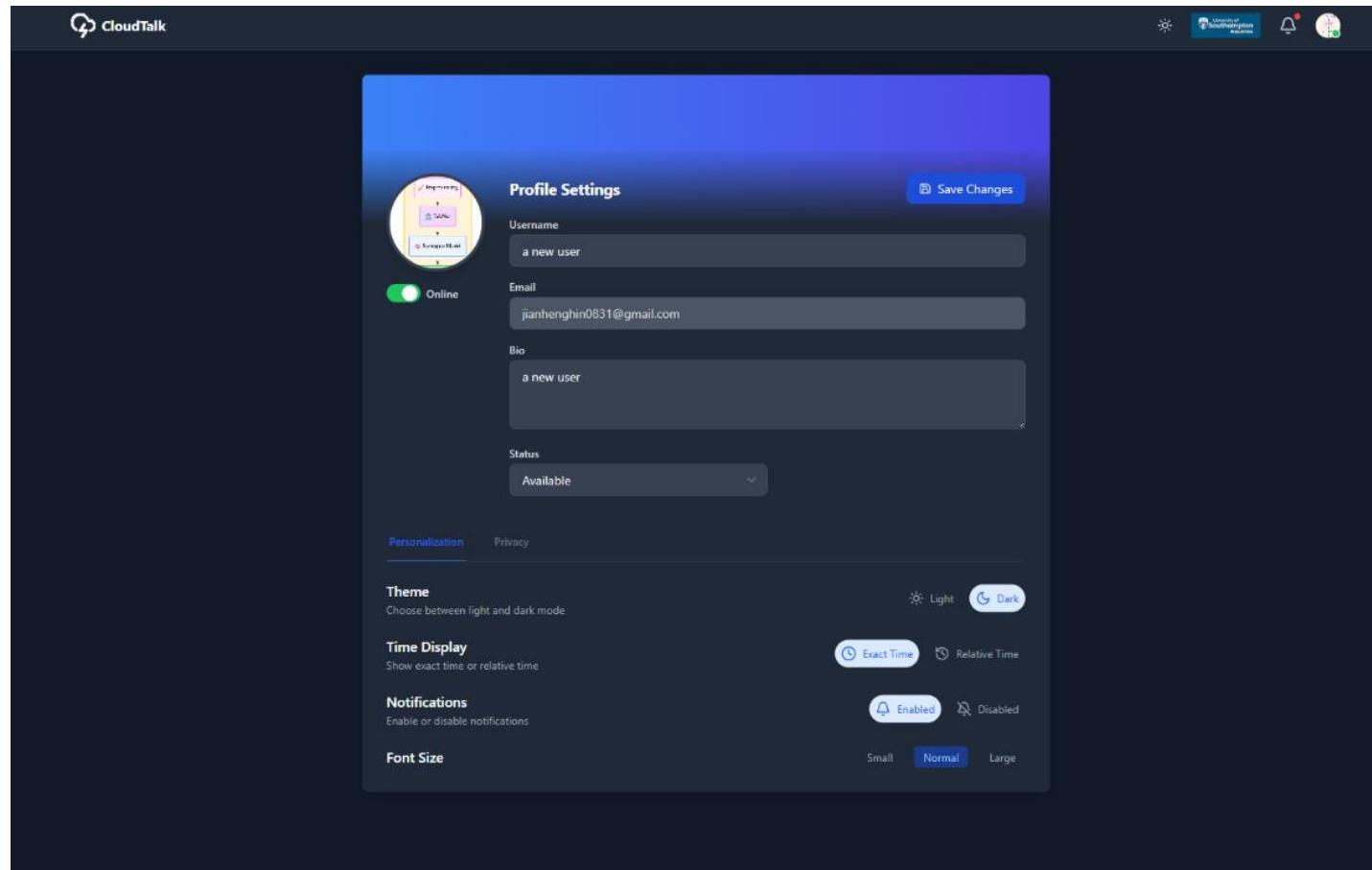
Choose File No file chosen

Group created with ID: -OOM0fuVGdrhHuKoA9CI

Created

## 7.5 User Profile Page

On the user profile page, users can customize their website design, such as changing font size, username, bio, etc. They can also increase their privacy, such as hiding their online status, hiding their email, two-factor authentication, resetting passwords, etc.



# Privacy Part

The screenshot shows a dark-themed user interface for managing account privacy. At the top, there is a bio field containing the text "a new user". Below it is a status dropdown set to "Available". The interface includes tabs for "Personalization" and "Privacy", with "Privacy" being the active tab.

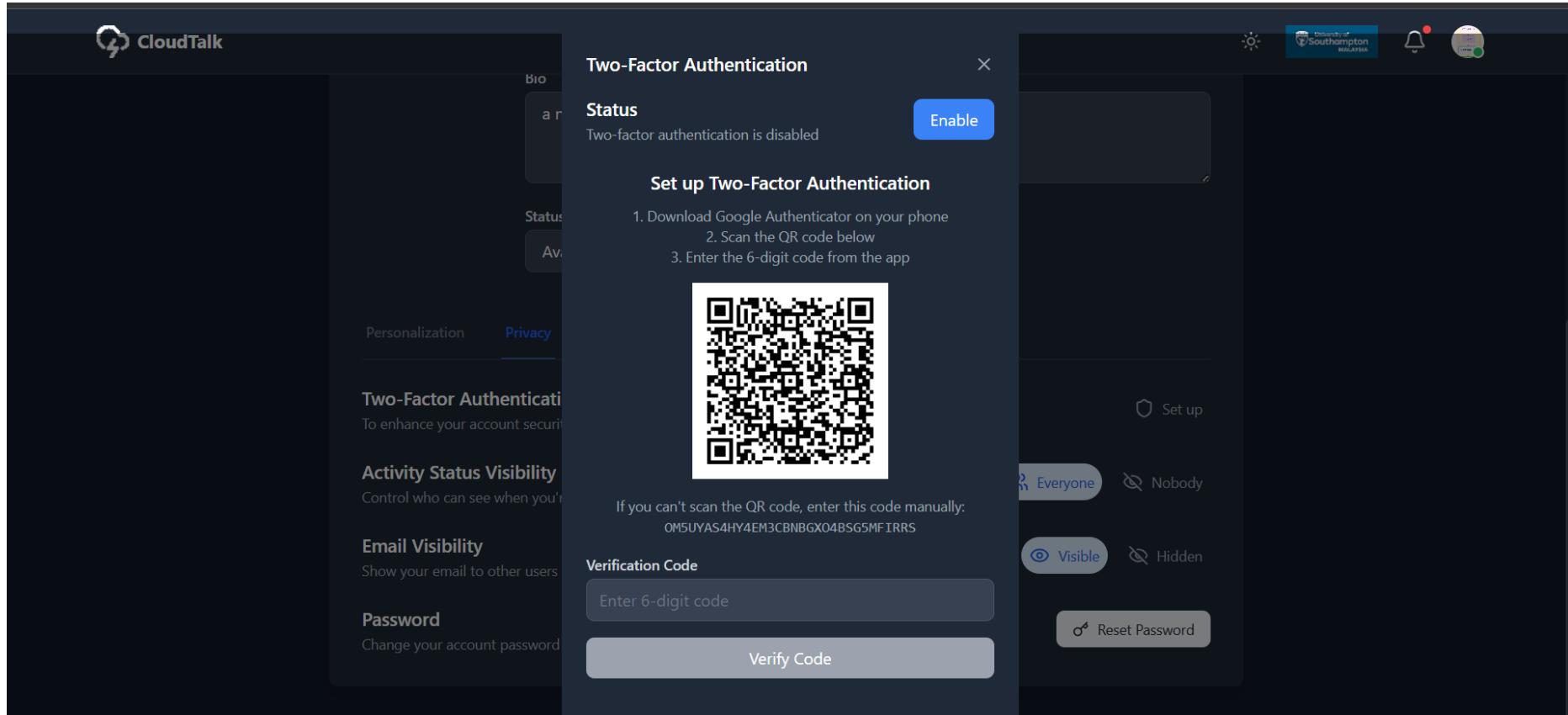
**Two-Factor Authentication**  
To enhance your account security, please enable two-factor authentication. A "Set up" button with a shield icon is available.

**Activity Status Visibility**  
Control who can see when you're active. Options include "Everyone" (selected), "Nobody", and "Hidden".

**Email Visibility**  
Show your email to other users. Options include "Visible" (selected) and "Hidden".

**Password**  
Change your account password. A "Reset Password" button is present.

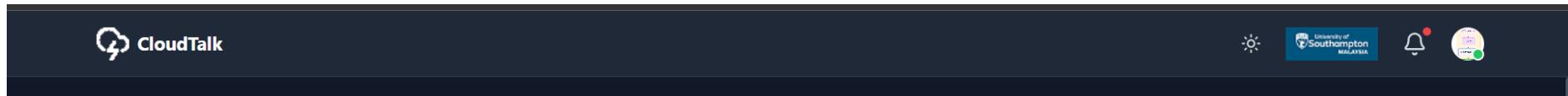
# Two factor Authentication



## 7.6 Other Components

### 7.6.1 Header

In the header, users can see all notifications, all group invites, toggle light mode and dark mode, go to the user profile page, and log out.



# Notification

The screenshot shows the CloudTalk application interface. On the left, there is a sidebar with a circular icon containing a flowchart labeled "Preprocessing", "TabNet", and "Surrogate Model". Below this is a green "Online" status indicator. The main area is titled "Profile Settings" and contains fields for "Username" (set to "a new user"), "Email" (set to "jianhenghin0831@gmail.com"), "Bio" (set to "a new user"), and "Status" (set to "Available"). On the right, there is a "Notifications" sidebar with a list of recent events:

- Leave Group** 36m ago  
Team Velocity1: Jian heng has left the group Team Velocity1
- Leave Group** 36m ago  
UI/UX Designer Hub: Jian heng has left the group UI/UX Designer Hub
- Someone wants to join group!** 12:14 PM  
The Studio Room: Jian Heng requested to join group
- Group Updated** 12:04 PM  
Team Velocity1: Group information has been updated

At the top of the notifications sidebar, there are buttons for "Mark all as read" and a user profile picture.

# User Menu

The screenshot shows the CloudTalk user interface. At the top left is the CloudTalk logo. The top right features a dark-themed header with icons for brightness, University of Southampton, notifications, and user profile. A sidebar on the left contains a circular icon with a flowchart diagram labeled "Preprocessing", "TabNet", and "Surrogate Model". Below this is a green "Online" status indicator. The main content area is titled "Profile Settings" and includes fields for "Username" (a new user), "Email" (jianhenghin0831@gmail.com), "Bio" (a new user), and "Status" (Available). A blue "Save Changes" button is located at the top right of the form. To the right of the main content is a white sidebar with the user's name, email, and three links: "User Profile Setting", "Pending Invitation", and "Log out".

**Profile Settings**

Username: a new user

Email: jianhenghin0831@gmail.com

Bio: a new user

Status: Available

**Jian Heng Hin**  
jianhenghin0831@gmail.com

User Profile Setting

Pending Invitation

Log out

# Pending Invitation

CloudTalk

Search conversations...

Groups + Private

Indie Game Devs United

a new user: 🎉🎉

example123 Jian heng is online

Jian heng jianheng601@gmail.com

User Profile Setting

Pending Invitation

Log out

Mute Notifications

Pin Conversation

Pinned Messages (0)

4/21/2025

Jian heng created the group "example123"

Type your message...

**Pending Invitations**

**The Studio Room**

Closed creative group for our in-house designers, editors, and idea people. Brainstorms welcome.

GroupType: private

Invited at: 2025-04-21 15:01

Approve Reject

Close

## 7.6.2 Responsive Design

This design also uses responsive design, with three designs in total. Including mobile, tablet and computer views

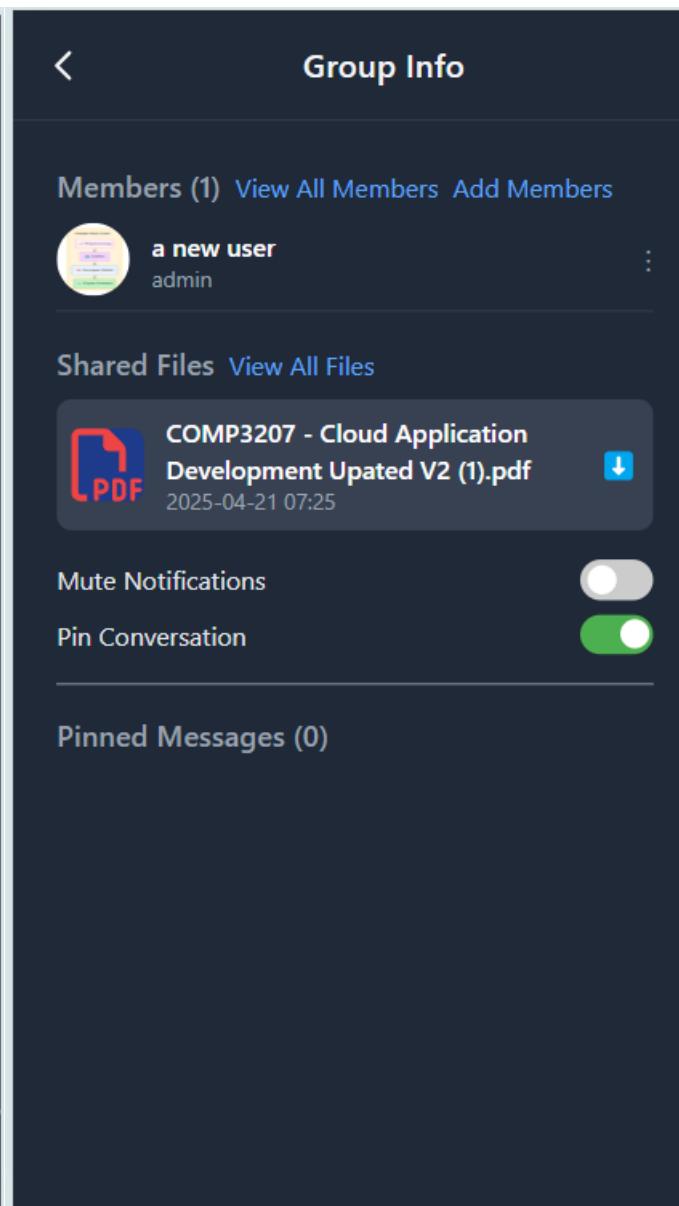
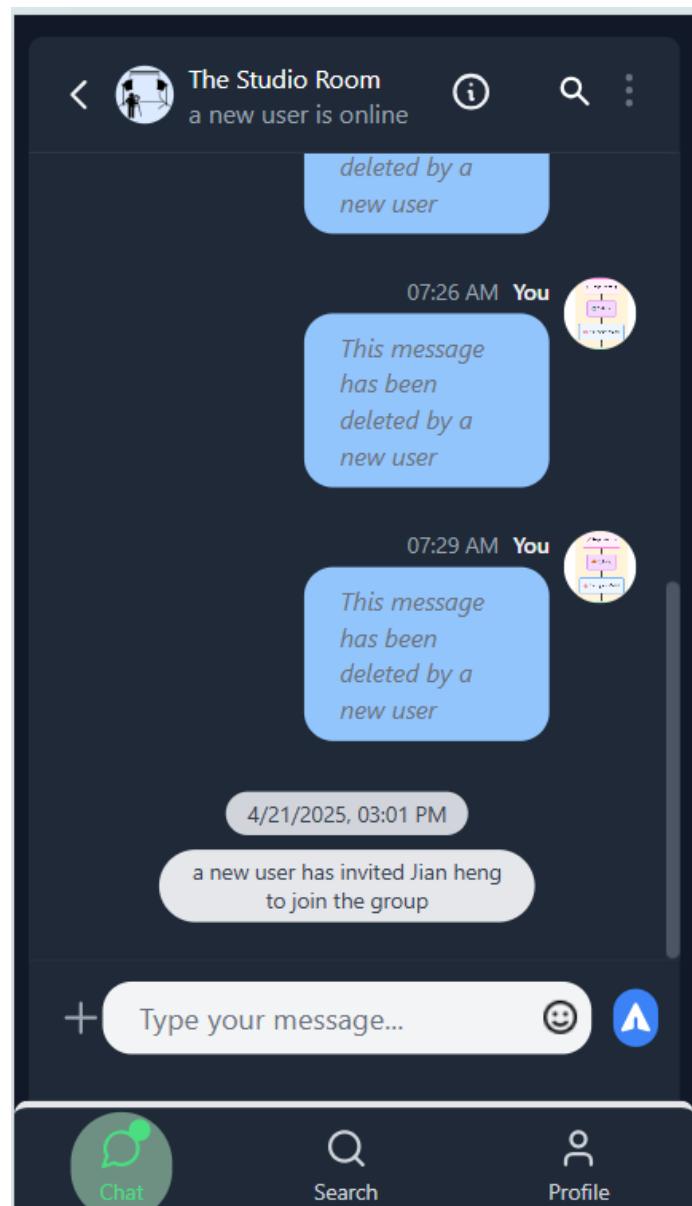
# Mobile Web

The screenshot shows a mobile web application interface. At the top, there is a header bar with the logo "CloudTalk" and several icons: a gear, a lightbulb, a bell with a red dot, and a document. Below the header is a navigation bar with the text "Groups" and search and add icons.

The main content area displays a list of groups:

- The Studio Room**  
a new user has invited Jian heng to join the group
- Indie Game Devs United**  
2 members
- Team Velocity1**  
left
- UI/UX Designer Hub**  
Jian heng has left the group
- E-commerce Website Redesign – Shopee**  
Jian Heng Hin created the group "E-commerce Website Redesign – Shopee"

At the bottom of the screen are three navigation icons: "Chat" (highlighted in green), "Search", and "Profile".



# Tablet View

The screenshot shows the CloudTalk application interface on a tablet. At the top, there's a header bar with the CloudTalk logo, a search icon, and a notification bell. Below the header is a sidebar titled "Pin Groups" which lists "The Studio Room" as pinned. The main content area is titled "The Studio Room" and displays a message from "Jian heng" inviting "Jian heng" to join the group. A timestamp indicates it was 2min ago. Below this, there's a section for "Groups" with a "+ Private" button. A list of groups is shown, each with a thumbnail, name, member count, and last activity time. Some groups have creation or modification messages from "Jian Heng Hin". On the right side of the main content area, there's a message list. The first message is from "You" at 07:25 AM, containing a PDF file named "COMP3207 - Cloud Application Development Updated V2 (1).pdf". Subsequent messages from "You" at 07:26 AM show that the message was deleted by a new user. The message list ends with a timestamp of 4/21/2025, 07:29 AM. At the bottom of the screen is a text input field with the placeholder "Type your message..." and a send button.

 CloudTalk

Search conversations...

Pin Groups

The Studio Room  
a new user has invited Jian heng to join the... 2min

Groups + Private

- Indie Game Devs United 10min
- Team Velocity1 14min left
- UI/UX Designer Hub Jian heng has left the group 37min
- E-commerce Website Redesign – Shopee 1d Jian Heng Hin created the group "E-commerce..."
- Ops Central – Internal Only 1d Jian Heng Hin created the group "Ops Central..."
- Press F to Join 1d Jian Heng Hin created the group "Press F to Join"
- AFK but Online 1d Jian Heng Hin changed the group type to private
- Noobs Assemble 1d Jian Heng Hin created the group "Noobs Assemble"
- Visual Storytellers 1d Jian Heng Hin created the group "Visual Storytellers"

...

**Group Info**

Members (1) [View All Members](#) [Add Members](#)

a new user  
admin

Shared Files [View All Files](#)

COMP3207 - Cloud Application Development Updated V2 (1).pdf 2025 04 21 07:25

Mute Notifications

Pin Conversation

Pinned Messages (0)

### 7.6.3 Light mode and dark mode

## Light mode

The screenshot shows the CloudTalk application interface in Light mode. The top navigation bar includes the CloudTalk logo, a search bar, and various icons for notifications and user profile. The main left sidebar features a search bar and sections for 'Groups' and 'Private'. Under 'Groups', there is a 'Indie Game Devs United' group with 2 members and a recent activity message. Below it is a newly created group named 'example123' by Jian heng. The main conversation area shows a message from Jian heng about creating the group. The right sidebar displays 'Group Info' with one member (Jian heng), admin status, and settings for 'Mute Notifications' and 'Pin Conversation'. A pinned message section is also present.

CloudTalk

Search conversations...

Groups + Private

Indie Game Devs United  
a new user: 🎉🎉 1s

example123  
Jian heng is online

4/21/2025  
Jian heng created the group "example123"

Type your message...

Group Info

Members (1) View All Members Add Members

Jian heng admin

Mute Notifications  Pin Conversation

Pinned Messages (0)

# Dark mode

The screenshot shows the CloudTalk application interface in dark mode. The header features the CloudTalk logo, a search bar, and various notification icons for the University of Southampton Malaysia, a bell, and a user profile.

The left sidebar includes a user icon (J), a search icon, a groups icon, and a message icon. The main content area displays a group named "example123" where "Jian heng is online". A message from Jian heng is visible: "Jian heng created the group \"example123\"". The bottom of the screen has a message input field with placeholder text "Type your message..." and a toolbar with a plus sign, a smiley face emoji, and a file attachment icon.

The right sidebar is titled "Group Info" and shows one member, Jian heng, who is an admin. It also includes settings for "Mute Notifications" and "Pin Conversation", both of which are turned off. A section for "Pinned Messages (0)" is also present.