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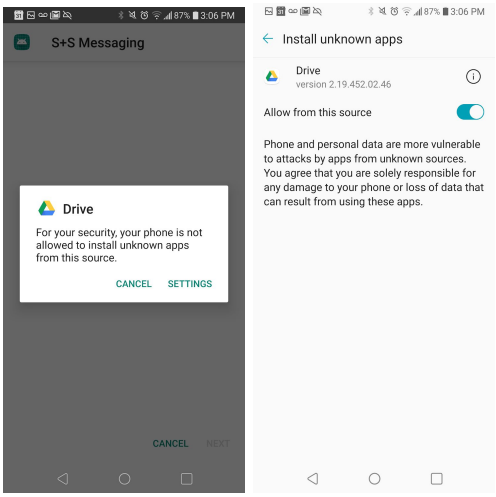
Final Design Release README

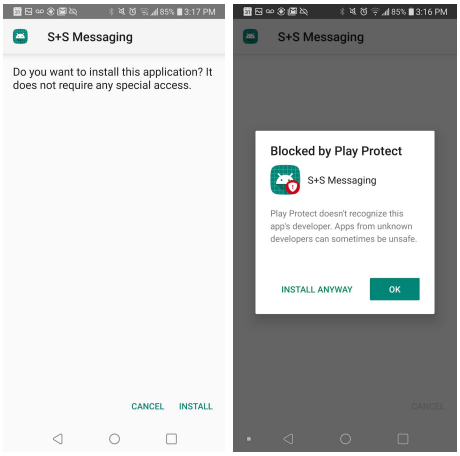
Installation

APK LINK: https://drive.google.com/open?id=1vx2RkeYvD9O-PfJw2vlYz0mqn_7GeeFT
Note: You must be logged into your uchicago email address to access the apk file

Physical Phone (Android Only)

1. On your phone go to the APK LINK given above
2. Download the apk from google drive onto your phone
3. Open the downloaded apk file with Android “Package Installer”
4. Since our app is not available on the Play Store you may need to accept additional permissions in order to install an app downloaded from the internet on your phone.
    a. This is an example of what happens when you attempt to install the app from the Drive app, similarly if you download the app from another source (i.e. Chrome) you will also have to toggle “Allow from this source” in the system app settings
    b. 

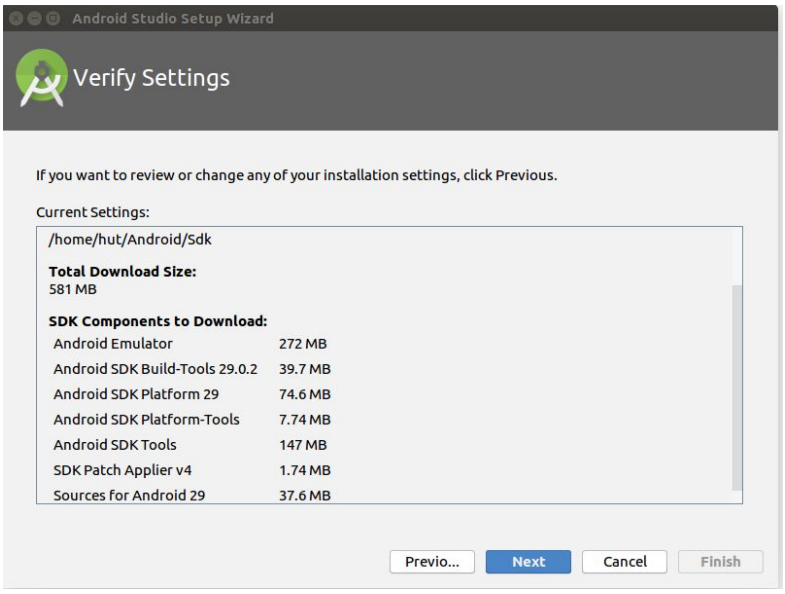
    c. If this option does not automatically appear during the installation process you can change this setting at (Settings -> Apps -> App Info -> [App Name] -> Install unknown apps -> Allow from this source)
    d. You can revert back to your old settings after installation is complete
5. Next you may see a page asking you to confirm that you want to install our application. Click Install each time it asks if you are sure.

a. 

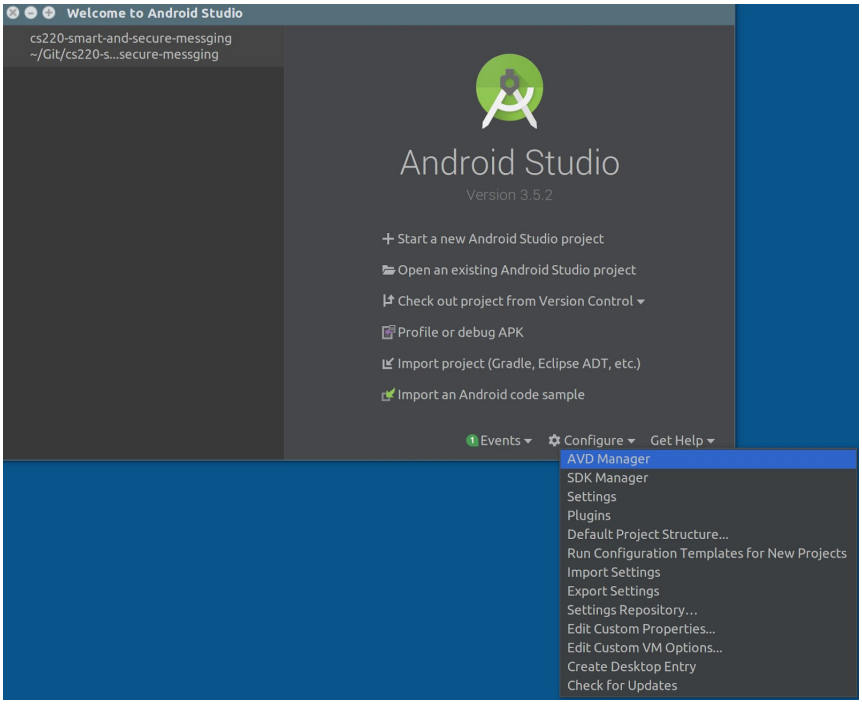
6. The app should be installed! Open S+S Messaging on your phone to send messages to all your friends!

Emulator (Assuming Linux OS. Should be similar on Mac and PC.)

1. First download Android Studio: https://developer.android.com/studio to your computer
2. Then extract it someplace and go to android-studio/bin and run ./studio.sh
3. You will now be presented with options.
    a. Choose standard setup keep clicking next until you get to this page

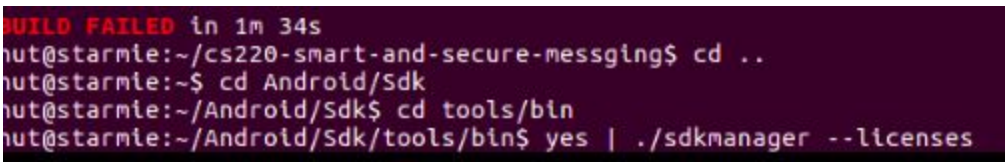


    b. Keep a note of the path given there! It is the path to your Android SDK folder.
    c. Keep clicking next, install, and finish. Wait for the studio to install.
4. In Android Studio, on the bottom right corner of the “Welcome to Android Studio” screen click Configure -> AVD Manager

a. 

b. You may have to exit and run Android Studio again to see the configure option. All you have to do is close the Android Studio window and run ./studio.sh again.

5. On the bottom left corner of the AVD manager click “Create Virtual Device”
    a. Choose a Phone from the list of phones provided and click next. We recommend **Pixel 2 or Pixel 3** as we tested our app on those devices.
    b. Choose an android release to download to your emulator. We recommend **Q (API 29)** the most recent version.
        i. Once the release is downloaded click next
    c. Keep clicking “Next” and “Finish” until the process is complete
    d. **Note:** If you at any point get an error relating to accepting licenses, you may need to accept the license for Android SDK. What you’ll want to do is:
        i. Go to the path shown in the image in step 3a. In my case it is /home/hut/Android/Sdk
        ii. cd into tools/bin
        iii. run the command: yes | ./sdkmanager --licenses



6. Once your device has been created you can open the device by double clicking on its name in the AVD manager
7. Download the app apk from the installation APK LINK given above

8. Drag and drop the apk file from its location on your local file system to the open (and fully booted) emulator
    a. You should see a message indicating that the apk is being installed and a progress bar
9. Once the apk has been installed search for and open the “S+SMessaging” app on the emulator.
    a. You can do this by holding down the circle button at the bottom of the screen, and pulling upwards. You will be brought to a page with the Emulator’s apps
    b. The app Icon looks like so:

Note: The emulator eats up a lot of resources and is much slower than running the app on a real device.

Functionality (Use Cases)

The Smart and Secure Messaging App is built to allow mobile phone users to message each other with privacy in mind. The app supports a number of special sending and deleting features that distinguish it from other messaging apps. A description of use cases is provided below:

- Conversations
    - Starting Conversations
        - Once you start a conversation, you should be almost immediately shown the messaging screen for that conversation (assuming that you’re not offline).
        - You cannot start a conversation with yourself.
        - You cannot start a conversation with someone who blocked you.
        - You cannot start a conversation with someone you blocked.
    - Deleting Conversations
        - Deletes conversations both in the client and database.
        - You should no longer see the conversation in your conversations list.
    - Searching for Conversations
        - Search for conversations using fuzzy search.
        - Relevant conversations will be displayed in the conversations list area.
    - Sending and Receiving both Text and Image Messages
        - Self explanatory; see tutorial.
    - Sending and Receiving Click-to-Reveal Messages

        - Send an image which is hidden until the recipient chooses to reveal it for a short period of time.
    - Sending and Receiving Disappearing Messages
        - Send a message that will disappear a specified number of seconds after being opened.
    - Deleting Messages
        - Self explanatory; see tutorial.
- Users
    - Registering and Logging in
        - Your username must be alphanumeric plus the following chars: +_-@.
        - Your first and last name must be alphabetic
        - Phone number must be 10 digits
    - Searching for users by first, last, and usernames
        - Self explanatory; see tutorial.
    - Blocking and Unblocking Users
        - Blocked users cannot message each other. You cannot block yourself.
        - Blocked users will be displayed in the blocked users tab
    - Changing First and Last Names
        - Same restriction for first and last name applies as with registering.
    - Logging Out
        - Self explanatory; see tutorial.
- Smartness and Security
    - Encryption of both Image and Text Messages Stored on the Server
        - If you would like, we can provide you access to the database.
    - Phone Authentication Login
        - You can use the same phone number for multiple users.
        - However, you cannot use multiple phone numbers for the same user.
    - Toggle a Tone Analysis of the Messages Sent
        - Each text message is analyzed for its sentiment
            - Sentiment will be to the side of each message.
        - The whole conversation is also analyzed for general sentiment
            - The general sentiment will be displayed as a temporary message at the bottom of the screen.

Please read the following three notes before you run the tutorial

1. Note Regarding Network Connectivity:

Use of this app assumes an internet connection, either through WiFi or mobile data (discussed with TAs and allowed to assume). Though a lack of connection will not cause the app to crash,

basic functionality such as logging in, starting conversations, sending messages, and searching for users will not be available. That is, **behavior will differ from the acceptance tests suggested/correct behavior.** Offline behavior is detailed below:

Adding a Conversation

- If the other user's data has been cached:
    - The conversation will appear on the conversation screen, but will not be added to the server or the recipient's device until network connection is restored.
        - *However:*
            - If the user leaves either the user search list or start conversation dialog (text box to input userId) before internet connectivity comes back, the current user will not be redirected into the conversation after clicking "Start Conversation".
            - If the user does not leave the search list or start conversation dialog before internet connectivity comes back, the user will still be redirected to the conversation.
- If the other user's data has not been cached:
    - A "user not found" error will be displayed.

Logging In

- An error message will be displayed and the user will be unable to log in.

Sending a Message

- Message will appear in the sending user's conversation, but will not be delivered to the database or sent to the receiving user until network connection is restored.
- If the app is closed before network connection is restored:
    - Message will be sent when the app is reopened, assuming network connection at the time of reopening.

Searching for a User

- No search results will appear.

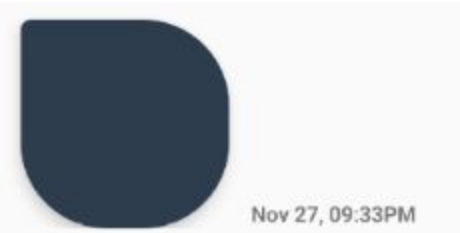
Blocking a User

- Nothing will happen. User will be added to the block screen when connectivity is restored.

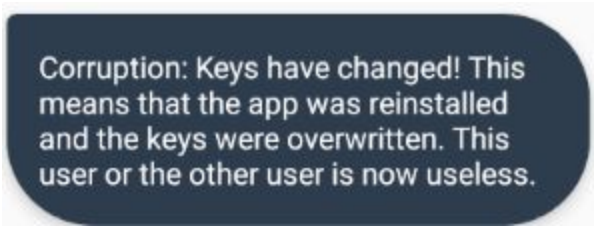
2. Note Regarding Reinstalling Your Application and Using Other Devices:

- ***If you reinstall the app you must create new users. You cannot use your old users. (security feature)***
    - When a user is created, a key pair is generated and stored on the local device. When you do a major reinstall or delete the app and then reinstall, the key pair files are deleted. This means that the next time you log into the device, new key files will be generated for you completely different from the old key files. However, the keys will not be updated in the database.
    - After this key change, whenever you receive a message, the encrypted message assumes that your private key is the OLD private key and NOT the new private key. This is because the message was encrypted with your OLD public key. Thus, the message is not decryptable for you and decryption will throw an exception if not caught (we catch such exceptions).
    - *Thus, if you reinstall the app, you will no longer be able to see previous messages. Nor will you be able to see future messages sent to you.*
- ***Also, you cannot use the same user on more than one device. (security feature)***
    - The explanation for this feature is similar to the previous feature. The private keys stored on the second device are different than your first device's keys. This results in you not being able to decrypt messages from the database.
    - *Thus, if you login on another device, you will no longer be able to see previous messages. Nor will you be able to see future messages sent to you.*
    - *Note that, however, you can still go back to your old device and see the conversation's messages provided that you did not reinstall the app.*
- ***If you reinstall the app and use your previously old users OR use your users on another device, you will see the following whenever you open a conversation with messages:***

    Image Message

    Text Message



3. Note Regarding Tonal Analytics:

The secure functionality uses an IBM tonal analysis service, for which we are subscribed to the free tier. This means we only have 2,500 available calls to the IBM API, after which it will stop sending data. We don't anticipate hitting this cap, but be aware if you choose to run a high volume of tests on the tone analytics. Contact us asap if you run into this problem.

Tutorial

The tutorial should provide you with enough guidance to create your own acceptance tests. However, if you need more guidance, please view our milestone-4b acceptance tests found here:
https://github.com/ze-ne/cs220-smart-and-secure-messging/blob/final-release/Milestone_4b_README.pdf

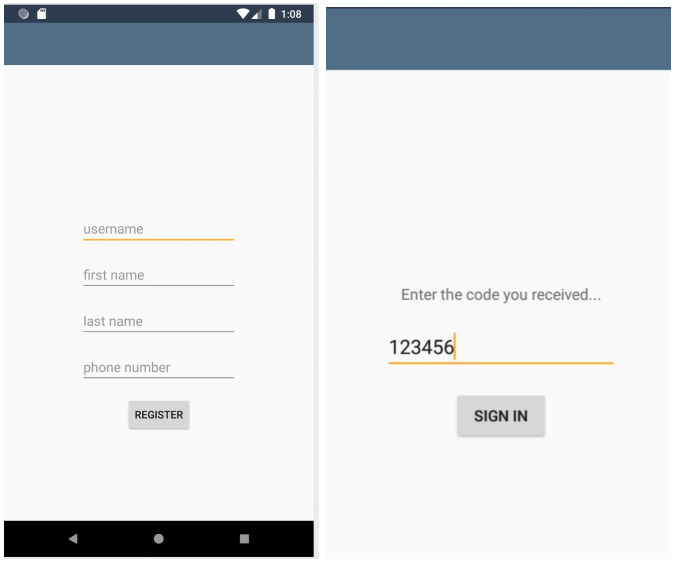
Notes:

- *The username MUST consist exclusively of alphanumeric characters.*
- *Some functions of our app will take time to process as they connect to foreign servers, please be patient if a function does not appear to be running.*
- *You MUST be connected to the internet while you use this app.*
- ***Emulator Users:** You must use one of the following phone numbers and passcode every time you log in or create an account*
  - *Phone number:* 6303920518
  - *Phone number:* 6505551234
  - *Verification code (for both numbers):* 123456
  - *Phone number authentication does not work on the emulator so you have to use these pre-accepted values instead. Physical Phone users should use their personal phone numbers*
- *The secure functionality uses an IBM tonal analysis service, for which we are subscribed to the free tier. This means we only have 2,500 available calls to the IBM API, after which it will stop sending data. We don't anticipate hitting this cap, but be aware if you choose to run a high volume of tests on the tone analytics.*

We have left out the text descriptions of some use cases. For such left out use cases, the annotated images provided for each screen should be enough to guide you.

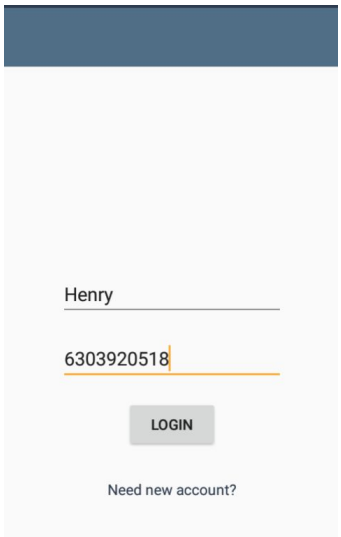
Create a User:

1. Open the app
2. Click “Need a new account?”
3. Fill out all the required form elements.
    a. Phone Users: Use the phone number attached to the sim card of your phone
    b. Emulator Users: Use the number ‘6303920518’ or the number ‘6505551234’
    c. Names must contain alphabetic characters only
    d. Usernames can use all alphanumeric characters as well as ‘_’, ‘+’, ‘@’, ‘-’, and ‘.’
4. Click register
    a. Phone Users: Wait until you are either automatically logged in or a text is sent with a code. If a text is sent copy that code into the code screen
    b. Emulator Users: Enter the code 123456
5. Click Sign in
    a. Emulator Users: If you get a pop up that states connectivity problems, just wait a few seconds before clicking sign in again. It takes a little bit of time for Firebase Auth to “provide a code” or start up if you just started the emulator.



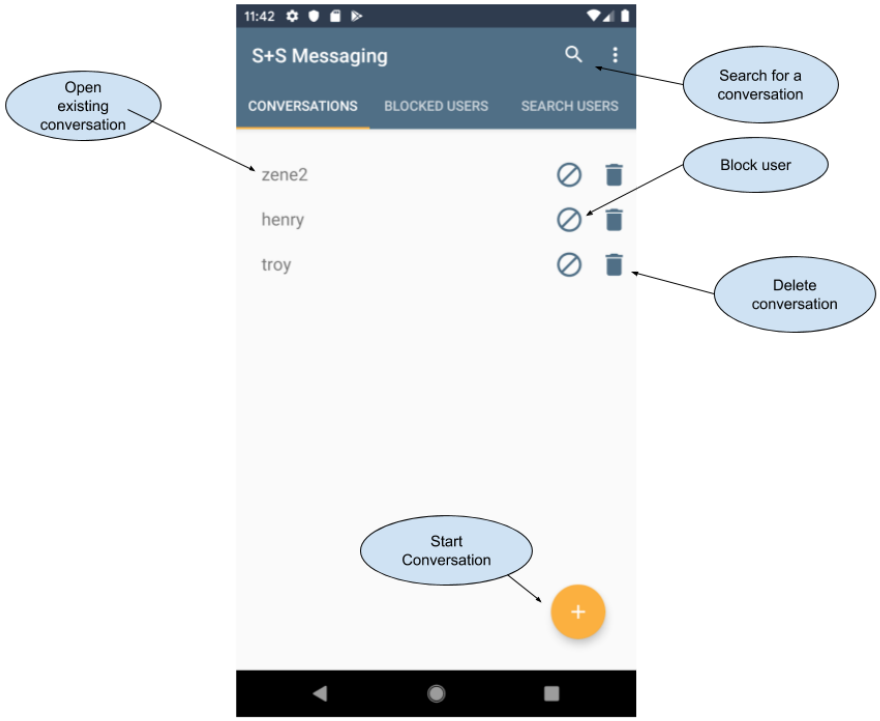
Login:

1. From the login screen
2. Enter a username and the phone number that was used to create that user
3. Click Login
    a. Phone Users: Wait until you are either automatically logged in or a text is sent with a code. If a text is sent copy that code into the code screen
    b. Emulator Users: Enter the code 123456

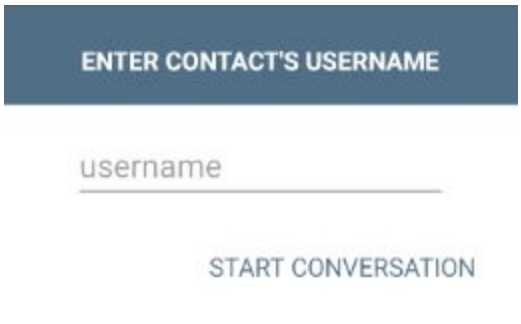


i. Emulator Users: If you get a pop up that states connectivity problems, just wait a few seconds before clicking sign in again. It takes a little bit of time for Firebase Auth to “provide a code” or start up if you just started the emulator.

Conversations Screen



Start Conversation Dialog (pops up if you press the start conversation button)



<u>Start Conversation</u>

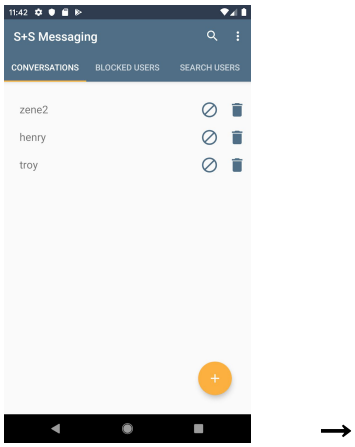
1. From the conversations screen
    a. Press the orange circle with plus sign

b. “Start Conversation Dialog” will pop up

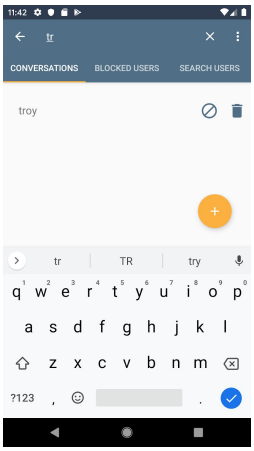
2. From the “Start Conversation Dialog”, enter a userId
3. Press start conversation. If the userId is valid and exists, then the conversation is started and you are immediately brought to the messages screen for that conversation.
    a. *Note:* This behavior is slightly different if you are offline (**which you should not be during acceptance testing**). However, if you are interested about this behavior, see the “Note Regarding Network Activity” section under “Add Conversation” for more information.

<u>Search for Conversation</u>

1. From the conversations screen
    a. Click on the magnifying glass at the top of the conversation select screen.
    b. Enter a string that is a substring of one conversation name but not the others.
    c. The conversations that don’t contain the string entered into the search bar will be filtered out of the visible conversation list.

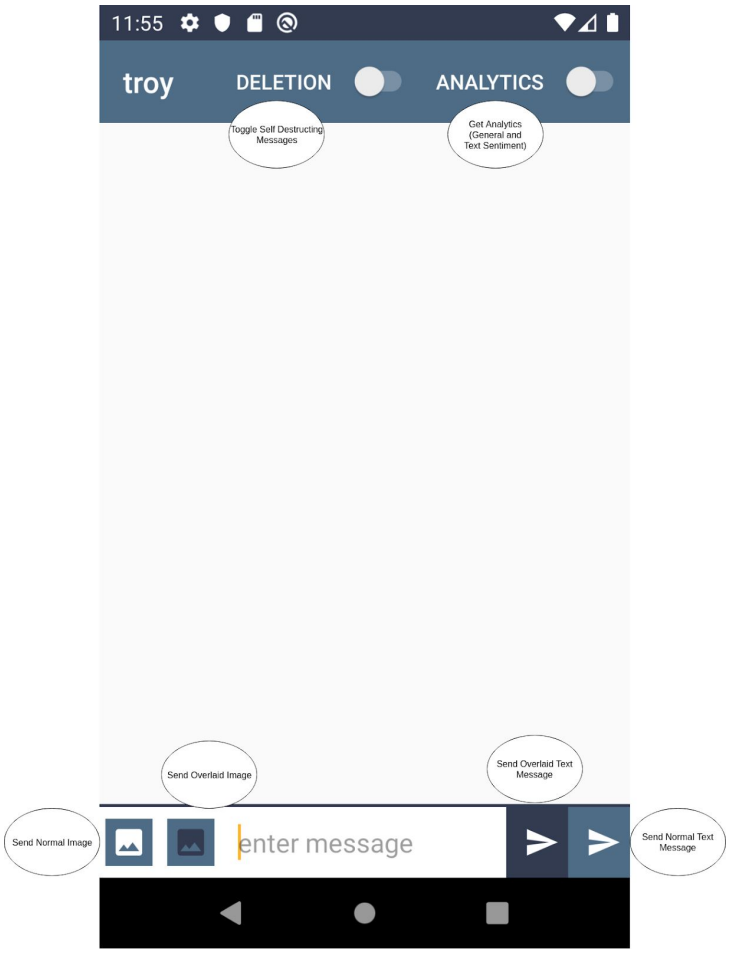


CLICK ON SEARCH ICON



FILTERS LIST BASED ON “TR”

Messages Screen



<u>Send a Text Message:</u>

1. From the message view:
    a. Type in some message in the enter message bar
2. Click on one of the arrow buttons on the bottom right of the screen to send the message.
    a. Dark blue icon for overlaid text
    b. Light blue icon for normal text

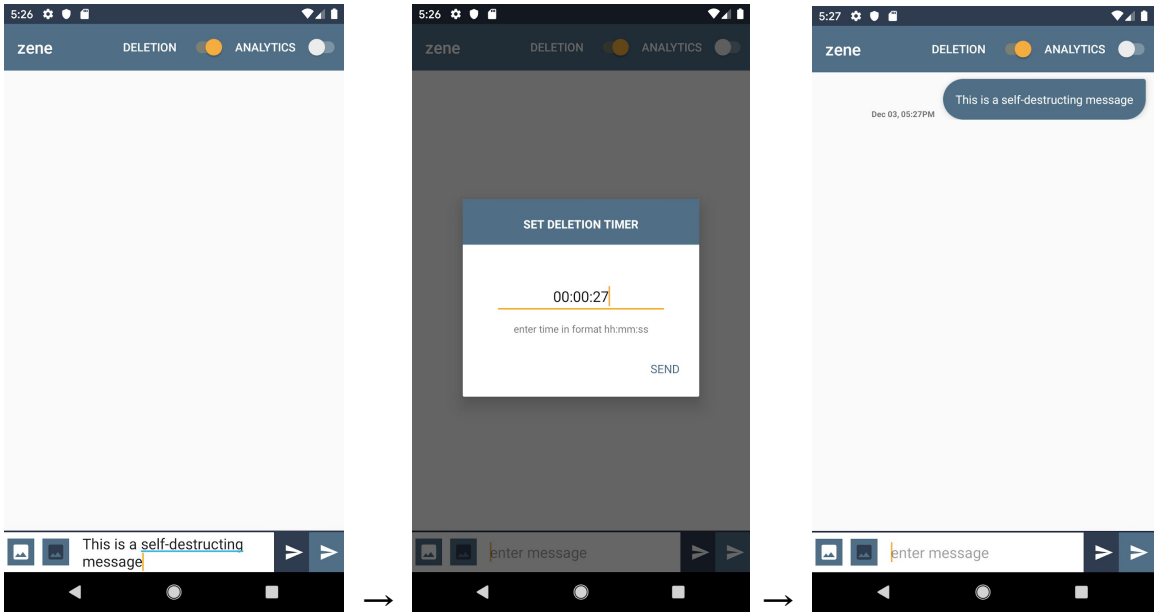
<u>Send an Image Message:</u>

1. From the message view:
    a. Click on one of the image buttons on the bottom left of the screen.
        i. Dark blue icon for overlaid image
        ii. White icon for normal image

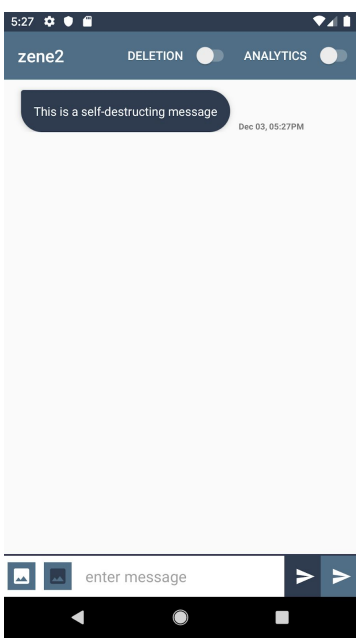
2. Navigate to the desired image from the device's memory.
3. Click on the image you would like to send.

<u>Send a Self-Destructing Text Message:</u>

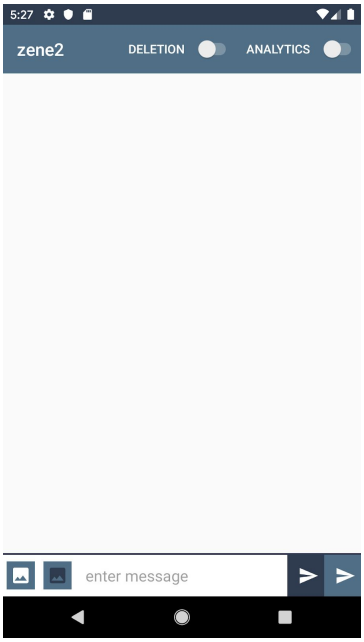
1. From the messages view:
    a. Turn on the toggle to the right of DELETION (top bar of conversations screen).
    b. Send a message
    c. When the popup appears, enter the amount of time you want the message to exist for and click "SEND"
        i. *NOTE:* Time must be in the format hh:mm:ss
        ii. If no time is entered, the timer will default to 5 seconds
    d. The message will delete itself X seconds after the user you sent the message to opens your conversation where X is the number of seconds you set in the popup



TOGGLE ON DELETION → SET TIME FOR DELETION → SELF-DELETING SENT



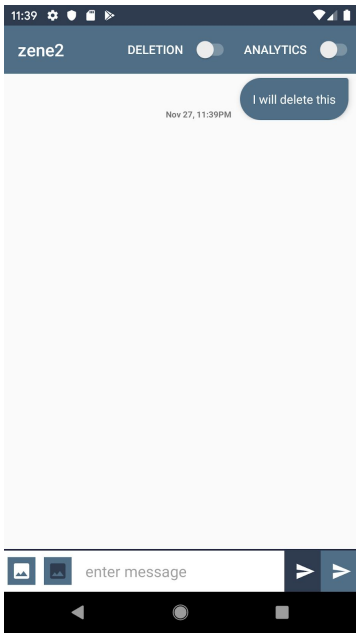
→ 27 seconds later



RECEIVE SELF-DESTRUCTING MESSAGE DELETES ITSELF

<u>Delete a Sent Message:</u>

1. From the messages view:
    a. Click to the left of the sent message bubble, above the timestamp
    b. Click confirm.
        i. *Note:* confirmation now appears above the message you are deleting



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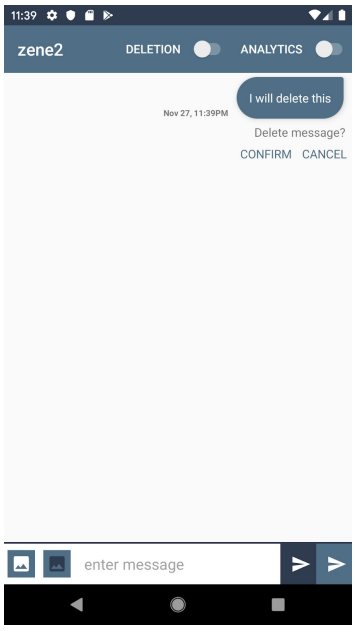

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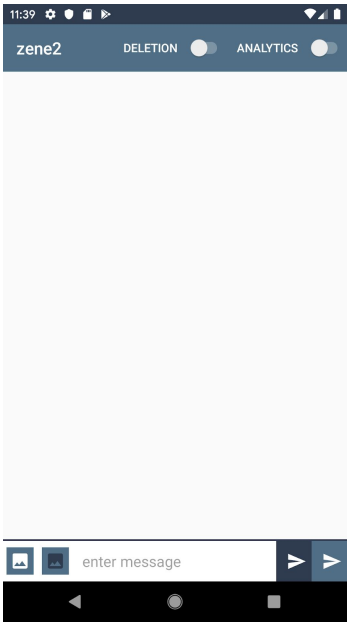


SEND MESSAGE CLICK CONFIRM TO DELETE MESSAGE IS DELETED

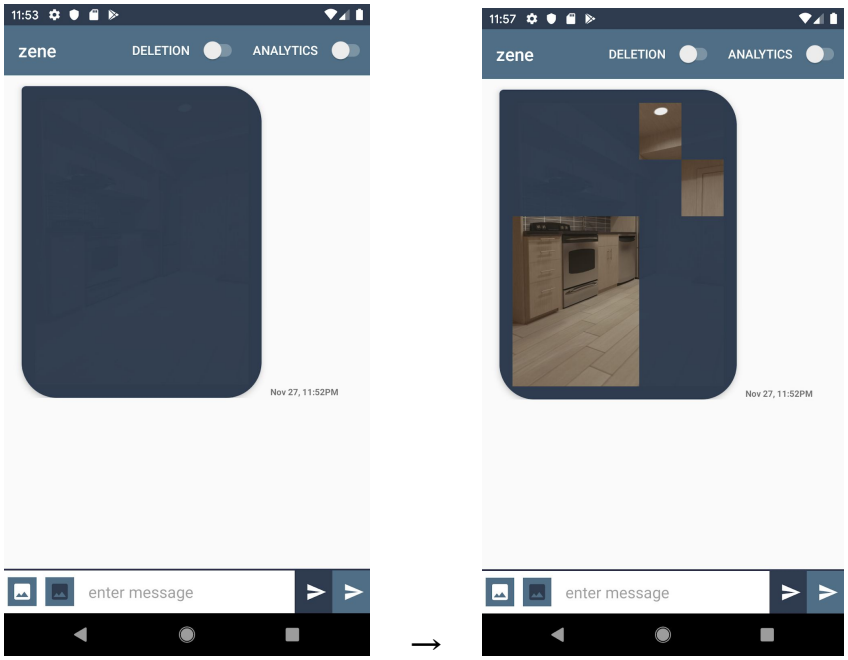
Send an Overlay Image Message:

This is similar to sending an image message.

1. Follow the directions for sending an image message. The only difference is that you press the dark blue image icon in the message bar.

Receive an Overlay-Image Message:

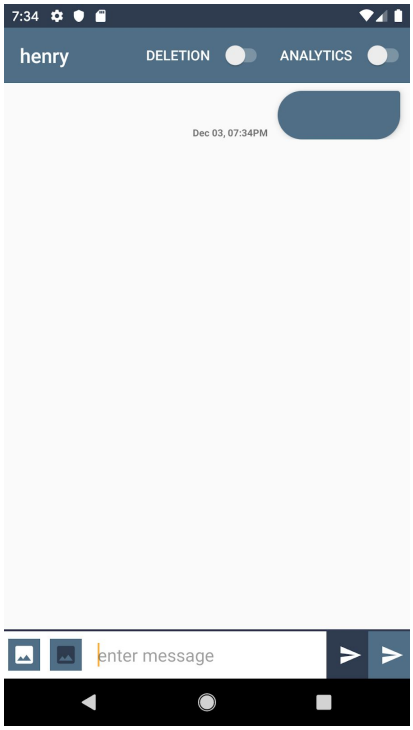
1. Open a conversation where you have sent or received an overlay image
2. Click on various portions of the overlay, the clicked portions of the overlay should disappear for a short time, revealing the image beneath



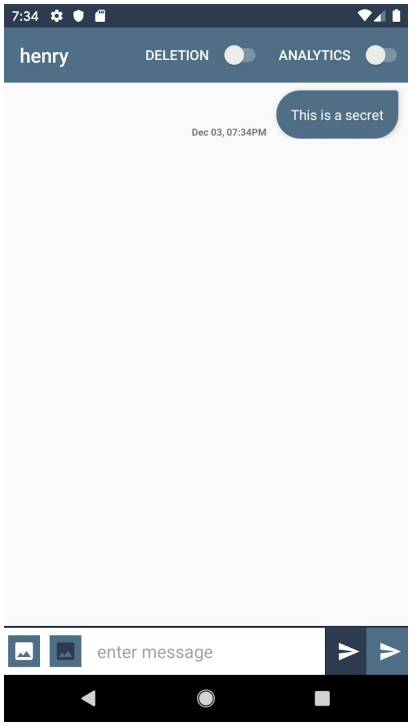
RECEIVE MESSAGE WITH OVERLAY CLICK TO REVEAL

Send an Overlay Text Message:

1. Send message with dark blue send button (the arrow)
2. Click on message to reveal text
    a. *Note:* Only one hidden text message can be revealed at a time
    b. *Note:* Emojis are not hidden as they do not constitute as text.
3. Message should hide again after 7 seconds



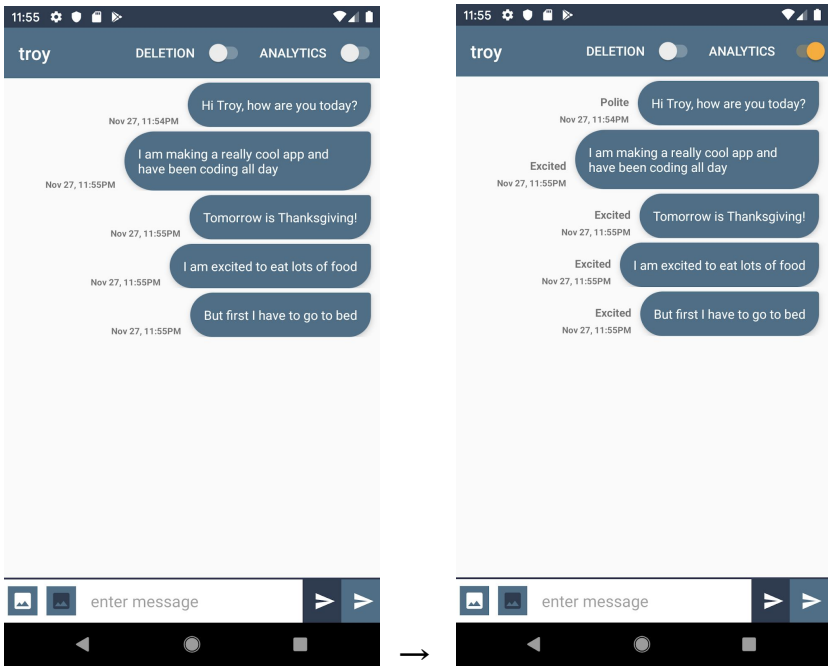
→



HIDDEN MESSAGE SENT CLICK TO REVEAL

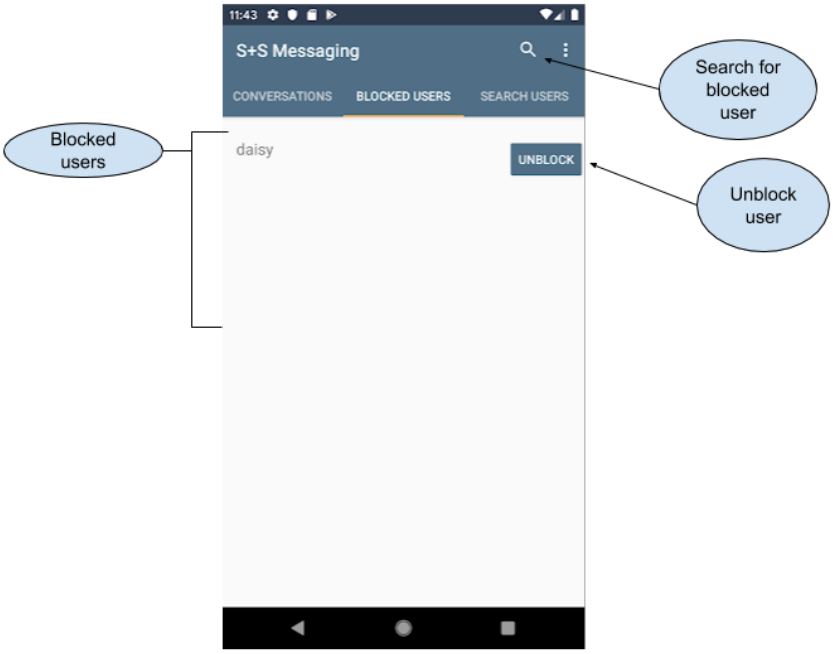
<u>Display and Toggle Tone (aka Get Analytics):</u>

1. Navigate to a specific conversation with text messages.
2. Click on the switch in the upper right corner of the screen labeled ANALYTICS
    a. While the switch is on, the words displayed next to text messages should reflect the tone of the user who sent them. While the switch is off, there should only be timestamps next to messages.
    b. *Note:* The Watson Analytics service cannot determine tone in all cases. When this happens “No sentiment” is displayed next to the message rather than an actual sentiment. Because the analysis is handled by Watson, we have no control over the presence of the results or their accuracy.

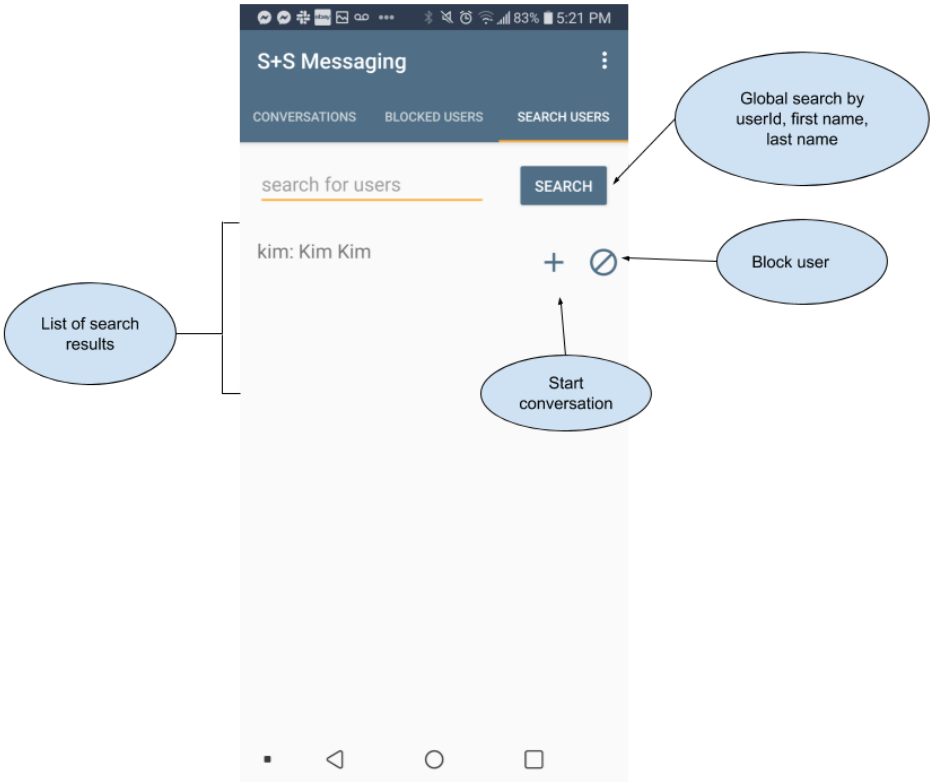


SEND MESSAGES → TOGGLE ANALYTICS ON TO DISPLAY SENTIMENTS

Block Screen



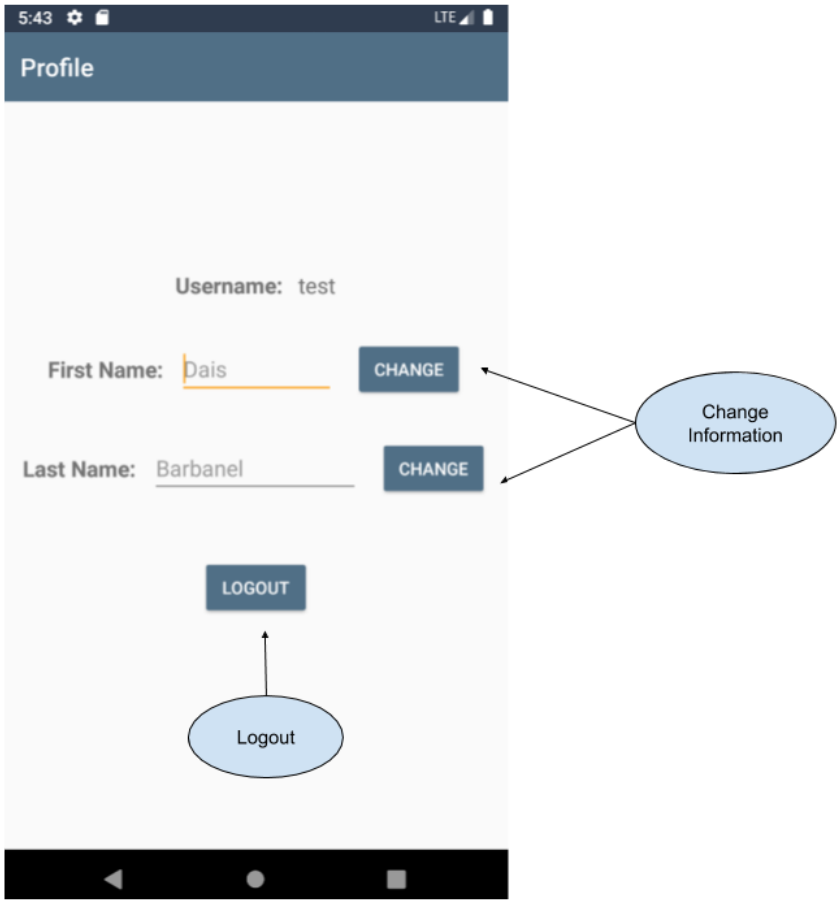
Search Screen



Start Conversation From Search Screen

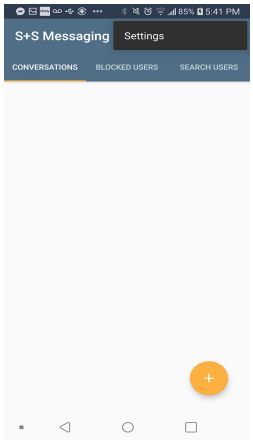
1. Search for a user(s) by userId, first name, or lastname. If such a user exists, you will see their info listed.
    a. *Note:* Unlike the search on the "conversations" and "blocked users" screens, this global search does not find users based on partial strings (i.e. searching for "ki" would not bring up "kim," you have to type the whole userId, first name, or last name)
2. Press the plus icon next to the user you want to start a conversation with. The conversation is started and you are immediately brought to the messages screen for that conversation.
    a. *Note:* This behavior is slightly different if you are offline (**which you should not be during acceptance testing**). However, if you are interested about this behavior, see the "Note Regarding Network Activity" section under "Add Conversation" for more information.

Profile



Open Profile

1. From Conversations, Block Users, or Search Users Screen
2. Click the three dots in the top right corner
3. Click Settings



Log Out

1. From Conversations, Block Users, or Search Users Screen
2. Click the three dots in the top right corner
3. Click Settings
4. Click logout