Stegord: A better way to send messages software requirements specification

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https://github.com/Avi-Lance/Painted-Penguins-Stegord

1. SRS Revision History

This lists every modification to the document. Entries are ordered chronologically.

Date	Author	Description
5/12/2023	Isaac P.	Created template and first draft of the SRS
5/18/2023	Isaac P.	Removed file messaging and group messaging
6/5/2023	Jaxon S.	Made edits to sections 2.1 - 2.3
6/6/2023	Jaxon S.	Revised entire draft of the SRS

2. The Concept of Operations (ConOps)

The concept of operations (ConOps) “describes system characteristics for a proposed system from the users’ viewpoint.” (IEEE Std 1362-1998) The ConOps document communicates overall system characteristics to all stakeholders.

2.1. Current System or Situation

Written messages have been a method of communication since the invention of written language. From letters written in stone to email we have relied on textual based transmission of information. Now, in the digital age the use of computers enables the transmission of all forms of data. Simply sending messages over the network is dangerous which is why secure message transmission is important to protect the sender's data. As of right now there are a large number of professional applications that facilitate secure message transmission, but they all have something in common. They only use encryption. For example, if an organization like a government has a robust way to both intercept and decrypt the packets sent through these applications, there is no privacy for the user. The user’s packets need an extra layer of misdirection to protect the information they wish to send, that is where our system comes in. On top of that, many of today’s chat applications feature complex systems which have many features. Too many features can be overwhelming which is why there is a need for a system less complicated, but just as functional.

2.2. Justification for a New System

With the ever growing use of digital communication the need for a secure and dependable messaging system is evident. People are trying to find ways to chat digitally with the reassurance

of secure message transmission. The need for a secure messaging platform finds a solution in the ability to send messages and files securely and privately without fear of interception. As of now there are quite a few applications which facilitate secure message transmission such as Microsoft Teams, Discord, and Skype. While these services are useful they do not provide any layer of security above end to end encryption and tend to be complex. Our system adds an extra layer of security through steganography. All messages are first encrypted using steganography and sent as an image of a barcode which is then further encrypted in traditional means like the applications you know. Not only does this feature make messages sent and received more secure, if your packets are intercepted, the interceptors will see that it is an image file and not chat information. This is the reason for our messaging system that enables users to send secure messages while also remaining simple and intuitive.

2.3. Operational Features of the Proposed System

The new system, Stegord, will be a desktop application that c

1. The user has a computer.
2. The user has an internet connection.
3. The user has an email address.

Steps to Complete the Task:

1. The user follows the prompt on the initial screen and enters their email as well as creates a password and username.
2. The user continues to the next page and enters an optional bio as well as sets an optional profile picture.

Postconditions: The user has successfully created a profile with Stegord and they are now able to use the application for messaging.

2.5.2. Add a Friend

Brief Description: This use case describes how a user would add or accept a friend request.

Actors: A user.

Preconditions:

1. The user has a Stegord account.
2. The user has an internet connection.
3. The user is logged in.

Steps to Complete the Task:

1. The user will navigate to the friends section.
2. The user will search for their friend’s Stegord username.
3. The user will click on and view their friends' accounts.
4. The user will then click “Add Friend” and wait for a response.

Postconditions: The user will have sent a pending friend request to another user of the application.

2.5.3. Accept a Friend Request

Brief Description: This use case will discuss how a user accepts or rejects another user's friend request.

Actors: A user.

Preconditions:

1. The user has a Stegord account.
2. The user has an internet connection.

3. The user is logged in.
4. The user has a pending friend request.

Steps to Complete the Task:

1. The user will navigate to the friends section.
2. The user will view the pending requests menu.
3. The user will either click “accept” or “reject” friend request.

Postconditions: The user has a new Stegord friend.

2.5.4. Send a Private Message

Brief Description: This use case discusses how a user sends a message to another user.

Actors: A user.

Preconditions:

1. The user has a Stegord account.
2. The user has an internet connection.
3. The user is logged in.
4. The user has friends.

Steps to Complete the Task:

1. The user will navigate to the chat section.
2. If the user is starting a new conversation they will search the name of the friend to message, otherwise they will click on an existing conversation.
3. The user will type a message and/or attach files to the text box.
4. The user will then click send and watch the message appear in the conversation.

Postconditions: The user will have sent a message to another user.

3. Specific Requirements

3.1. External Interfaces (Inputs and Outputs)

3.1.1. Creating an Account

Purpose: Create an account with Stegord to allow future user relationships and messaging.

Source of input/source of output: The input will be the user's email, password, username, bio, and profile image. The output will be a Stegord account.

Valid ranges of input/output: All authentication information must be unique. The email and username cannot match another user's email or username. Only one account will be output.

Units of measure: N/A

Data formats: ?

3.1.2. Add a Friend

Purpose: To add new users to your friends list for easy contact.

Source of input/source of output: The input is the user selecting another user. There will be a button on the potential friend's profile which says "Add Friend".

Valid ranges of input/output: Other user must not already be a friend.

Units of measure: Friend request sent or add friends status.

Data formats: ?

3.1.3. Accept or Reject a Friend

Purpose: To add a new user to your friends list.

Source of input/source of output: The input is friend request. The output is a friend.

Valid ranges of input/output: Only friend requests can be accepted.

Units of measure: N/A

Data formats: ?

3.1.4. Send a Message

Purpose: To send a text message to one or more people.

Source of input/source of output: Input is a text field. Output is a displayed message in the conversation log.

Valid ranges of input/output: Text field must not exceed 2000 characters.

Units of measure: N/A

Data formats: ?

3.2. Functions

Validity checks on input: The program must verify no user is using the same email and username that is already registered with Stegord. This will prevent multiple of the same users occuring.

Authentication and Protected Pages: The program must verify a user's password is correct before it allows that user to access Stegord.

Hide Messages: All messages must be hidden over the network using steganography.

Profile Image Cropping: Each user has the option to upload a profile image. The image must be resized to a standard size to 320 x 320 pixels.

3.3. Usability Requirements

The Stegord messaging application will be able to allow new users to create an account as well as set up their profile with a bio and a profile picture. Users are able to send and accept friend requests with other users so they can conveniently message each other. Users also have the ability to reject friend requests which will remove that user from the requestors pending friends list.

3.4. Performance Requirements

Numerous users can create accounts, send friend requests, and send messages at the same time. The number of friends a user can have is unlimited as of right now and the number of requests is also unlimited.

3.5. Software System Attributes

The messaging application must protect the privacy of each user by keeping their email and password hidden from all other users. Only the username, bio, and profile image will be shown to other users of the application. Users can have private conversations which are only able to be viewed by the users within the conversation.

The main feature of Stegord is its use of steganography to hide messages over the network, so we must ensure the steganography system is consistent and reliable.

4. References

N/A

5. Acknowledgements

The SRS template was provided by Juan Flores, who changed the original document created by Anthony Hornof.