Taut, A Team Collaboration Software

System Requirements Specification

Prepared by Team 5

Richard Alex Showalter-Bucher
Steven Swanton
Joseph Dayton Wilson
Chad Woodrow

Version 1.0

October 4, 2019

Revision History

Name	Date	Reason For Changes	Version
All of Team 5	10-04-19	Initial Version	1.0

1. Introduction

1.1 Purpose

The purpose of this document is the following:

1. Provide the initial scope and objective of Team 5's team collaboration software (Taut)

2. Provide software specification requirements for the team collaboration software

1.2 Scope

This software system, called Taut, will be a team collaboration service where up to a few hundred users can message other users or groups effectively and securely. The system will be accessible to users through a secure private account on a browser-based interface. Additionally, the initial target consumer of this platform will be general North American users. Therefore, the system will support common North American language characters sets and will have features to be compliant with FCC/CALEA requests.

The messages of this platform will support multi-media content such as text, emojis, emoticons, audio, or video. It will also support for encrypted messages and messaging to various granularities such as individual users, groups, or subgroups of users. It will provide support the storage of message histories and a message lifetimes, private messages, forwarding of non-private messaging, and filtering/flagging of messages. The scope of the message history available to the user will be tied to a user account tier.   Lastly, messaging will support meta-tagging and sub-threads of messages to organize the messages for the user.

The software will provide methods for users to be able to find and connect with other users or groups. The users will also be able to invite other users to a group and schedule meetings/events with response requests. Each group will be moderated by a user who can remove users, join that group with another group, or choose whether to require the moderator's approval for users to join the group.

1.3 Definitions, acronyms, and abbreviations

This subsection includes definitions, acronyms, and abbreviations needed to interpret this document.

Term	Definition
User	Individual accounts
Group	Collection of users and/or groups

Moderator	Administrator of a group
Parental control	Ability to flag, filter, or restrict messages to a user and/or group
Hashtags	A metadata tag
Emojis	A small digital image or icon used to express an idea or emotion
Emoticons	A character representation of facial expressions
Sentiment Analysis	process of computationally identifying/ categorizing opinions expressed in a piece of text such as whether their attitude towards a particular topic, product, etc. is positive, negative, or neutral
Sentiment Polarity	Attitude of text, e.g. positive, negative, or neutral
Friend	A mutual association between two user accounts
Reply	Ability to cite message in another message
Follow	To subscribe to receive messages broadcasted by another user (similar to Twitter); i.e. messages that are not directed to any one specific user or group

Acronyms/Abbreviations	Term
SRS	Software requirement specification
CALEA	Commission on Accreditation for Law Enforcement Agencies
FCC	Federal Communications Commission
API	Application programming interface

1.4 References

This subsection contains reference documents for the SRS.

1. SRS Standard: [IEEE 830-1998](#)
2. [Project Product Backlog](#) for NEU CS5500 Fall 2019 Section 2
3. [Course website](#) for NEU CS5500 Fall 2019 Section 2
4. Competitor product: [SLACK](#)
5. Sentiment Analysis [Article](#)
6. Health Tracker APIs: [Fit Bit](#) / [Apple Watch](#)
7. Text Translation API: [Google Translate](#)
8. CALEA [Compliance](#)
9. Multimedia Formats: [MP4](#) / [MP3](#) / [JPG](#) / [GIF](#) / [PNG](#) / [PDF](#)
10. [Twitter](#)

1.5 Overview

This document follows the IEEE830-1998 standard for software requirement specifications. The document contains two other section as well as an appendix and index. The two other sections purposes are the following:

· Section 2 provides an overall description of the product including a product perspective, product and functions, user characterizations, constraints, and assumptions/dependencies.

· Section 3 provides details of specific requirements of the product

2. Overall Description

2.1 Product Perspective

This is a new, self-contained product which serves as a competitor to Slack, a popular messaging service.

Taut aims to provide additional functionality that Slack lacks, such as conversations within groups, as well as to provide a readily available alternative for those users seeking a more privacy-oriented messaging experience.

Taut tightens where Slack slacks.

2.2 Product Functions

The service shall:
- Provide (nestable) groups.
- Allow for roles (e.g. moderator) with escalating privileges (e.g. kicking members).
- Allow for invitations to join group.
- Require authentication, both for initial login and for access to some groups.
- Allow for users to have personal icons that vary with context.
- Allow users to set own status and visibility.
- Allow users to search and follow other users and groups.
- Allow users to send text messages (to other users or to [subsets of] groups) that optionally may contain other media (e.g. videos).
  Messages shall:
    - Be stored for a predetermined length of time (based on subscription) and/or routed to a subpoena bot if requested to do so (by a governmental agency).
    - Be able to be forwarded.
    - Be able to be scheduled for later delivery in set order.
    - Be partitionable into conversations for easy navigation.
    - Optionally self-delete a short time (how long?) after being read.
    - Be optionally encryptable (for certain subscription tiers).
    - Be composed of extended character sets (language support).
    - Provide time stamps for sending and delivery.
    - Be flaggable for content violations.
  Messages may:

- ○ Be manually recalled by sender if not yet read.
- ○ Provide read receipts (optional for the user).
- ○ Be translated before delivery to user of a different language.Be categorized by keyword(s).

The service may:

- Support "private messaging" to prevent forwarding.
- Offer "parental control" features (e.g. blocking/censoring flagged content).
- Offer scheduling and RSVP support.
- Offer translation support for messages.
- Offer functionality to play games of "translation telephone", where users' messages are run multiple times through Google Translate to produce potentially nonsensical messages.
- Support health tracker heartbeat rate change notification
- Support semantic analysis of text messages and display the attitude of the message

2.3 User Classes and Characteristics

Hardcore security users – Uses only the highest-tier encryption available on the platform; needs each group to have its own password.

Casual/lax security users – Probably more interested in the flair available, such as the different personalities mechanic. Should be able to access the service easily without multiple authentication interruptions.

Global users – Assuming we implement the translation feature, there will likely be groups who use the service primarily for this feature.

Moderators – Admins for the groups; have jurisdiction over approving/removing members and have the power to delete the group.

2.4 Operating Environment

Our backend will run on a cloud server*; the service will run through Chrome browser, and thus will be OS-agnostic.

* TBD since we don't know the advantages or constraints of the different options yet.

2.5 Design and Implementation Constraints

Limited development timespan—funding only until December.

Must satisfy CALEA—implementation must support wiretapping and thus be able to route messages to multiple users (subpoena bot) surreptitiously; must provide storage for message backups for a period of 5 years (double-check this?) along with metadata.

Must run within browser (Chrome v77 or later).

2.6 User Documentation

The application will have a built-in help manual that supports a search function.

The manual will detail operational instructions for the various features of the application, as well as some potential applications for said features that may be of interest to the user. This manual may be in the form of a Wiki so users of the service could add to this to help expand it. If something seems quite difficult for users to perform (as judged by these edits or traffic to the specific pages), then this can be an indicator to assist in updates down the line.

The application may also incorporate a help bot into the primary channel of the group—this bot may be summoned privately with a special help character sequence.

2.7 Assumptions and Dependencies

Known dependencies:

- Tomcat
- Java 8

Potential dependencies:

- If allowing login via external sites (Husky, LinkedIn, Facebook), then there are technically dependencies on those sites.
- If implementing translator, then there is a dependency on Google Translate.
- Meeting scheduling may require integration with calendars on the home system and/or with online calendar services (e.g. Google Calendar).

3. Specific Requirements

The specific requirements are discussed in the following subsections. All non-functional requirements are marked with '*'. All other requirements are functional.

3.1 Core Requirements

3.1.1 User Functionality

SRS 3.1.1.1   Users shall be able to send messages
SRS 3.1.1.2   Users shall be able to send messages to other users
SRS 3.1.1.3   Users shall be able to send messages to groups
SRS 3.1.1.4   Users shall be able to access past messages
SRS 3.1.1.5   The service shall allow users to become members of a group(s)
SRS 3.1.1.6   Users shall have multiple personalizable icons
SRS 3.1.1.7   Users shall be able to choose which personalized icon gets displayed to each other user or group (precedence given to individual user over group choice)
SRS 3.1.1.8   Users shall be able to associate other users as 'friends'
SRS 3.1.1.9   Users shall be able to see other users connected to their 'friends'
SRS 3.1.1.10 * Users shall have a Do Not Disturb option
SRS 3.1.1.11 * Users shall have an Away designation
SRS 3.1.1.12 * Users shall have an Idle designation
SRS 3.1.1.13 * Users shall have an Offline designation
SRS 3.1.1.14 * Users shall have an Online designation
SRS 3.1.1.15 Users may be able to set whether they are 'searchable' or not
SRS 3.1.1.16 Users may 'follow' other users
SRS 3.1.1.17 Users may 'follow' groups
SRS 3.1.1.18 Users may 'recall/delete' messages if unread at time of selection

3.1.2 Moderator Functionality

SRS 3.1.2.1   Moderator 'role' shall be tied to specific Group
SRS 3.1.2.2   Moderators shall have power to remove users from any group they are moderating
SRS 3.1.2.3   Moderators shall be able to approve or deny users joining the group they moderate
SRS 3.1.2.4   Moderators shall be able to delete groups they are moderating
SRS 3.1.2.5   Moderators shall be able to approve or deny groups joining the group they moderate

3.1.3 Group Functionality

SRS 3.1.3.1   Groups shall have a moderator
SRS 3.1.3.2   Group users should be able to invite other users to join Group
SRS 3.1.3.3   Group users should be able to invite other Groups to join Group

SRS 3.1.3.4 * Groups joining other Groups shall be approved or denied by the being-joined-Group moderator -- See 3.1.2.5 Moderator Functionality
SRS 3.1.3.5 Groups shall allow users to reply to the entire group
SRS 3.1.3.6 Groups shall allow users to reply to the sender of a message and only the sender of the message
SRS 3.1.3.7 Groups shall allow users to reply to a subset of the group

3.1.4 Group Composition

SRS 3.1.4.1 * Groups shall have no default user limit
SRS 3.1.4.2 Groups may be composed of other groups

3.2 Optional Requirements

3.2.1 App Security

SRS 3.2.1.1 Users shall have a unique login to gain access to their account
SRS 3.2.1.2 Login may be substituted by authorization from a current login on an external service
  SRS 3.2.1.2.1 * External services may include Northeastern University Login, LinkedIn, Facebook
SRS 3.2.1.3 Groups may require an additional password to access group

3.2.2 Message Life Functionality

SRS 3.2.2.1 Users may have access to service tier(s)
  SRS 3.2.2.1.1 * Each tier may determine how long their messages will be available
SRS 3.2.2.2 Service shall store all messages for internal/legal uses
SRS 3.2.2.3 Messages may be end-to-end encrypted
  SRS 3.2.2.3.1 * This feature may be available for an additional fee
SRS 3.2.2.4 Messages may have option for auto-deletion after a set time/event
  SRS 3.2.2.4.1 * This feature may be available for an additional fee
SRS 3.2.2.5 Messages shall queue when recipient-user is offline at time of sending
  SRS 3.2.2.5.1 * Queued messages shall be delivered in chronological order
  SRS 3.2.2.5.2 * Queued messages shall be received by intended recipient upon their subsequent login

3.2.3 Language

SRS 3.2.3.1 The service may support multiple character sets
  SRS 3.2.3.1.1 * The service may prioritize English, Spanish, and French characters

SRS 3.2.3.2 The service may support non-Latin character sets
        SRS 3.2.3.2.1 * The service may prioritize East Asian languages before other region's
languages
SRS 3.2.3.3 The service may provide in-message automatic translation

3.2.4 Supported Datatypes

SRS 3.2.4.1 The service shall support emoji via messages
SRS 3.2.4.2 The service shall support emoticons via messages
SRS 3.2.4.3 The service shall support sending audio files (mp3 format) via messages
SRS 3.2.4.4 The service shall support sending video files (mp4 format) via messages
SRS 3.2.4.5 The service shall support sending image files (.JPG, .PNG, .GIF) via messages
SRS 3.2.4.6 The service may support sending PDF files via messages

3.2.5 Government Requirements

SRS 3.2.5.1 * The service should satisfy CALEA requirements
SRS 3.2.5.2 The service shall preserve all messages in a way that supports recreation of the
original message
SRS 3.2.5.3 The service should provide access to real-time communication of subpoenaed
users
SRS 3.2.5.4 The service should record when subpoenaed users log in or log out of service
SRS 3.2.5.5 * The service should not notify users who are under court-ordered surveillance
SRS 3.2.5.6 * Decryption of encrypted messages shall only be possible at the client-side of the
service

3.2.6 Parental Controls

SRS 3.2.6.1 Content filter may flag inappropriate content
SRS 3.2.6.2 Users may filter flagged content
SRS 3.2.6.3 * Content filter may filter for vulgarities, phrases that suggest violence, sexual
imposition, and bigotries
SRS 3.2.6.4 * The service may filter content server-side
SRS 3.2.6.5 * User may determine style of content filtering
        SRS 3.2.6.4.1 * Filter may block messages
        SRS 3.2.6.4.2 * Filter may 'mark out' violating content
        SRS 3.2.6.4.3 * Filter may add a 'flag' to violating content

3.2.7 Private Message Functionality

SRS 3.2.7.1 The service may allow users to create private messages

SRS 3.2.7.2 * Private messages may not be forwarded to other users
SRS 3.2.7.3 * Private messages may not be copied
SRS 3.2.7.4 * Private messages may be encrypted during transport
SRS 3.2.7.5 * Private messages may be encrypted in storage

3.2.8 Keywords

SRS 3.2.8.1 Users may be able to add hashtags to messages for categorization purposes
SRS 3.2.8.2 Users may be able to search for messages containing particular hashtags
SRS 3.2.8.3 Users may see active hashtags

3.2.9 Meeting scheduling

SRS 3.2.9.1 Users may be able to schedule meetings
SRS 3.2.9.2 Users may be able to schedule events
SRS 3.2.9.3 Scheduled meetings/events may request RSVPs from invited users

3.2.10 Health Tracker Integration

SRS 3.2.10.1 Users should be able to register a health tracker (TBD) to their user account
SRS 3.2.10.2 Users may be able to register a health tracker (TBD) to a group
SRS 3.2.10.3 Registered health tracker should be able to transmit temporal heartbeat rate to the Taut service
SRS 3.2.10.4 A registered health tracker may be able to transmit a GPS signal to Taut service
SRS 3.2.10.5 A user should be notified if there is a sudden change in heart rate data
SRS 3.2.10.6 A user may be notified of the health tracker location when receiving notifications about the heart rate data
> *Note: There are security issues related to the topic of which users are authorized to receive another party's health data (especially someone who is not able to moderate their own group). However, we feel that this issue is beyond the scope of this project's consideration.

3.2.11 Contextual Sentiment Analysis

SRS 3.2.11.1 Messages that contain text may be able to be analyzed for sentiment polarity
SRS 3.2.11.2 Sentiment polarity of a message containing text may be displayed to a user or group
SRS 3.2.11.3 Users may have the option to enable and disable sentiment analysis of messages containing text that they receive

3.2.12 Miscellaneous

SRS 3.2.12.1 Users may be able to forward messages received from another user to a third user

SRS 3.2.12.2 Users who author a forwarded message may be able to 'track' where/to whom said message is forwarded to