

# **Taut, A Team Collaboration Software**

## **System Requirements Specification**

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## Revision History

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# 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

<b>Acronyms/Abbreviations</b>	<b>Term</b>
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
- Slack

Potential dependencies:

- If allowing login via external sites (Husky, LinkedIn, Facebook), then there are technical 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

### **3.1.5 Operations Support**

- SRS 3.1.5.1 Notification shall be sent if service has crashed
  - SRS 3.1.5.1.1 \*The operation slack channel shall receive notification
  - SRS 3.1.5.1.2 \*At least one operator shall receive an email notification
- SRS 3.1.5.2 The service shall broadcast a 'heart beat' signal while it is running
- SRS 3.1.5.3 The service shall keep track of how many users are actively connected
- SRS 3.1.5.4 The service shall keep track of how many messages have been sent through the service
- SRS 3.1.5.5 The service shall keep track of the mean, medium, and maximum throughput rates of messages
- SRS 3.1.5.6 The service shall keep track of the resource utilization, i.e, memory usage, CPU usage, and network throughput
- SRS 3.1.5.7 The service shall be able to be externally queried for the tracked metrics mentioned within SRS 3.1.5.3 through SRS 3.1.5.6

## **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