

# Software Requirements Specification

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TauNet

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# 1. Introduction

## 1.1 Purpose

The purpose of this document is to give an overview of the TauNet communication system. It will provide outlines of both the purpose of the TauNet system as well as the expected interactions from users of the system. This document is primarily intended to be reviewed by the customer for approval and to be used as a guide for the developer of the system.

## 1.2 Scope

The TauNet software will allow its users to privately and securely send messages to other users within their network using a Raspberry Pi. A direct connection will be made between two Raspberry Pis using the internet and the process outlined in the TauNet Protocol v0.2 document.

The overall purpose of the system is to allow its users a way to communicate in a way that eliminates the possibility of eavesdropping from external parties to the network.

## 1.3 Glossary

Term	Definition
Raspberry Pi 2	A small computer developed by the Raspberry Pi Foundation
User	A person with access to a TauNet node connected to the network
Node	A Raspberry Pi in the TauNet network.
Network	A collection of Raspberry Pi 2s capable of communication via the internet using the TauNet Protocol

## 1.4 References

- 1) IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998
- 2) 2015 PSU CS 300 Section 1 Fall 2015 Participants, "TauNet Protocol Version 0.1", October 2015

## 1.5 Overview

The remainder of this document will cover a basic outline of the uses of the TauNet system.

Chapter 2 will cover the uses of the software including both the dependencies and constraints placed on it.

Chapter 3 will cover both formal and non-formal requirements of the software. It also details use case scenarios and provides an overview of the interfaces of the system.

## **2. General Description**

This section gives a general overview of the functionality of the TauNet system. It also details constraints and dependencies placed on the system.

### **2.1 Product Perspective**

The system environment being built will be comprised solely of TauNet nodes. The TauNet system environment is essentially a closed off network and requires no external systems besides other nodes in the TauNet network. All nodes in this network will function as both a sender and a receiver of messages. Any stored messages will be located within the nodes that are involved in the transmission of a message.

### **2.2 Product Functions**

The functionality of the TauNet software is comprised of two components:

- 1) To allow a user to send direct messages to other users of their choosing within their network.
- 2) To receive and read direct messages from other users within their network.

### **2.3 User Characteristics**

Section 2.2 effectively implies there is one type of user that plays two roles. That is, the user is both a sender of messages and a receiver of messages. All functionality of the system is provided to each user.

The user is expected to understand the basic use of the Linux command line in order to both start and operate the software.

### **2.4 General Constraints & Dependencies**

The first constraint placed on the system is that it must have connectivity to the internet. All communications within this network require the use of the internet as described in the TauNet Protocol v0.2 document. A consequence of this constraint is that in order to send a message to another user the receiving user must be connected to the internet at the time of transmission.

Another constraint of the software is that it be able to work on any Raspberry Pi 2 that it is running the Raspbian operating system. This effectively eliminates any features that would be beyond the capabilities of the Raspberry Pi 2 and/or Raspbian.

### 3. Specific Requirements

All requirements of the system are gone over in detail in this section. This is achieved primarily through the use of use case scenarios and descriptions of the interfaces of the software. This section is primarily intended to be a guide for the development of the software.

#### 3.1 External Interface Requirements

##### 3.1.1 User Interfaces

All input from the user will be the result of the following interactions:

- Prompts for message input
- General prompts for navigation of the system

The user is expected to interact with the software via a Linux terminal.

The main interaction with the software will happen by using a mouse/keyboard/monitor for input and navigation.

##### 3.1.2 Communications Interfaces

The software will be able to communicate via the internet by using TCP/IP as outlined in the TauNet Protocol V0.2 document.

#### 3.2 Functional Requirements & Use Cases

##### 3.2.1 Compose/Send a Message

**Description:** The user will be able to choose to send a message to another user provided they are part of the network. The user will make this choice by entering that user's name and the message they would like to send to them.

**Use Case:**

- The user selects they would like to send a message to another user.
- The user is shown the options of who they can send messages to and make a choice from this selection.
- The user is prompted to enter a message for the receiving user.
- The user sends the message.

##### 3.2.2 Receive Message & Read It

**Description:** If the user has received a message from another user they will be notified that a message has been received and then be able to read the message.

**Use Case:**

- The user is visually notified that a message from another user has been received.
- The message will be automatically displayed to the screen.
- The user is shown the name of the sending user and the message that was received is displayed to the screen.

##### 3.2.3 Review Members of Network

**Description:** The user can choose to view all member of their network.

**Use Case:**

- The user enters the appropriate command to view all members of their network
- All members of the network are displayed on the screen.
- User is able to then enter another command to proceed to next function

**3.5 Non-Functional Requirements**

An identical file containing IP(or domain name)/Username will be distributed in a secure fashion to all users of a TauNet network. This can be done in any way of the users choosing.

Adding new nodes to the network should only involve updating the file that contains the IP(or domain name)/Username. This requirement was specified on October 12, 2015 during the CS300 class. It was agreed that anybody who owns a TauNet node should be able to create their own TauNet network and all that would be involved to do that is an update of the file containing IP/Username.

All nodes on the network should have access to the security key as described in the TauNet Protocol v0.2. This will be distributed in a secure way that is chosen amongst all members of the TauNet network.

The network should still work if any one of the nodes in the network is disabled.

If a node is currently connected to the internet and the TauNet software is active it is always possible to send messages to this node. Messages from other users should always be allowed.

Within the network there is no need to hide who is sending the message.

Security measures regarding this project are covered in the TauNet Protocol v0.2 document

All connections made with this system are 1-to-1 meaning that the system does not allow for a group of users to communicate with each other simultaneously in a group chat setting.

If a message from a different version of TauNet is received or a message is received from an unknown user then a notification is displayed.