Online Virtual Phone System

Software Requirements Specification

Version 1.8

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Team Name: Mango Madness

Revision History

Date	Description	Author	Comments
Oct. 10, 2023	Version 1.0	Akira Cooper	Added to functional requirements (3.1)
Oct. 10, 2023	Version 1.1	Tung Nguyen	Added System console requirement
Oct. 11, 2023	Version 1.2	Kris Bessason	Added introduction (1) and functional requirements (3.1)
Oct. 11, 2023	Version 1.3	Xiaohong Zhou	Added nonfunctional requirements (3.2)
Oct. 12, 2023	Version 1.4	Akira Cooper	Edited functional requirements (3.1)
Oct. 12, 2023	Version 1.5	Xiaohong Zhou	Added design constraints (3.3) and legal, copyright (3.4)
Oct. 12, 2023	Version 1.6	Akira Cooper	Revised introduction (1) and added to general description (2)
Oct. 12, 2023	Version 1.7	Kris Bessason	Revised functional requirements (3.1) and document layout
Oct. 13, 2023	Version 1.8	Akira Cooper	Proofreading and final revision

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1. Introduction

This Software Requirements Specification (SRS) document provides an overview of the project, including purpose, scope, definitions, a general description, user characteristics, required features, and design constraints. This document will be used to inform stakeholders of all the high-level features required for the Online Virtual Phone System product and the direction it will take to provide utility to the target user base.

1.1 Purpose

The purpose of this document is to collate all the projected requirements for this project. We will collect and document these ideas here to use and refer to in the future. As such, this document will be subject to change once the software development phase is initiated.

The requirements will be laid out with clarity in the context of its users, providing software engineers and designers with a specific blueprint regarding the product's main objectives as well as its boundaries. The information in this document will be presented in a way that can be understood by all team members and stakeholders.

1.2 Definitions, Acronyms, and Abbreviations

IP address	Internet protocol address: a unique ID assigned to each device that connects to the internet.
Port	A virtual point defined in a computer where network connections begin and end.
Caller	The call originator (the person sending a call).
Callee	The call recipient (the person receiving a call).
Cloud storage	The storage of digital data on the Internet through a cloud computing provider.
CPU	Central Processing Unit: an important hardware component in computers that greatly influences their level of speed.
VoIP	Voice over Internet Protocol: a method of delivering voice communication using Internet Protocol networks such as the Internet.

1.3 References

- Software Requirements Specification Template
- SRS Sample
- IEEE Guide to Software Requirements Specification
- Online Virtual Phone System reference document

2. General Description

This section describes the general factors that will affect the product and its requirements. It is used to provide reasons as to why user characteristics, assumptions, and dependencies will

influence the ways in which the specific requirements are defined later in this document. If any of these factors undergo change, it will influence the requirements such that they are forced to change as well.

2.1 User Characteristics

The target users for the product are those who use phones either occasionally or frequently whether for business or for personal reasons. Users are expected to be familiar with the way that phones work, but do not have to possess a high level of technical expertise to understand how to navigate the product's user interface and make use of the software. We seek to make the interface intuitive and easy to understand to accommodate users of all ages. It is expected that users will be comfortable with using computers in a general sense so they can figure out where to download the product, run it, and close it with little to no assistance.

2.2 Assumptions and Dependencies

2.2.1 Assumptions

- Administrators will receive appropriate training and resources to effectively utilize the application's administrator console.
- Users are assumed to have reliable internet connectivity.
- Users are assumed to know how to operate a smartphone, desktop, or laptop.
- Features pertaining to the System Console (for administrator options) are only available in the desktop version of the application.

2.2.2 Dependencies

- Users have the necessary hardware components to facilitate the use of the app (a viable computer with a network card for wireless internet connection or an ethernet cable for local networks, a microphone for output audio, and a speaker or headset for input audio).
- Users have valid login credentials.
- Sensitive user data is stored using cloud storage.

3. Specific Requirements

3.1 Functional Requirements

FEATURE 1: Basic Call Processing

- The system must enable users (connected to the Internet) to send, receive, hang up, and reject calls.
- The system must enable two or more users to communicate with one another via an audio connection when a successful call has been established.
- The system must enable users to place calls using a dial pad, contact list, search bar, or through a call history.
- The system shall enable users to view a history of all their calls with details about each call (start time, duration, callee, and caller).
- User stories:

  - As a user, I want to be able to send and receive calls using the app, so I don't have to rely on my cellphone connection to talk to others.
  - As a user, I want to be able to place a call using a dial pad, so that I can call someone who isn't in my contacts list.
  - As a user, I want to be able to place a call using my contact list, so that I don't have to manually enter the phone number.
  - As a user, I want to be able to place a call using a search bar in case I can't remember the full phone number.
  - As a user, I want to be able to place a call from a call history, so that I can quickly call back someone I've been in recent contact with.
  - As a user, I want to be able to hang up a call, so that I can end a conversation.
  - As a user, I want to be able to reject a call, so that I don't have to talk to unwanted callers.
  - As a user, I want to be able to view the details of a past call, so that I can see who I've called and how long the call lasted.

FEATURE 2: Phone Number Mapping

- The system must have and maintain a mapping from dialed numbers to an IP address and port. The mapping is responsible for translating a caller's dialed number to the appropriate IP address and port of the callee.
- The system must utilize these mappings to coordinate calls between users.
- User stories:
  - As a user, I want to have my calls reach the right person, given that I've dialed the correct number.

FEATURE 3: Administrator Console

- The system shall authenticate the administrator login name and password to allow administrators to access the admin console.
- The system shall only allow one administrator to be logged in at a time.
- The system must allow an administrator to assign a phone number to an available IP address.
- The system shall allow administrators to view all users and their respective phones, registered on the network.
- The system must allow an administrator to assign privileges to a user account such that they can only originate calls, only receive calls, or do both.
- The system must allow an administrator to cancel a user's phone service by disassociating the IP address from the phone number, and then disassociating both from the user's account.
- The system shall allow the administrator to view, add, and edit billing plans for users.
- The system shall allow the administrator to suspend or cancel a user's phone service.
- The system shall allow administrators to update the profile information for any user.
- The system shall reject administrative input that will create inconsistencies in the database, such as assigning two IP addresses to a single phone number.
- User stories:

  - As a system administrator, I want to be able to assign a phone number to a specific IP address for onboarding, security, and accountability.
  - As a system administrator, I want to be able to assign privileges to users, so that I can control what activities they are allowed to perform.
  - As a system administrator, I want to be able to detach an IP address from a phone number, so that I can free up phone numbers for new employees when offboarding.
  - As a system administrator, I want to be able to change a user's billing plan, phone service, and profile, so that I can accommodate changes in the workplace.

FEATURE 4: Billing Plan

- The system shall allow users to see a record of all their calls with their respective charges.
- The system shall allow users to see the total payable amount that they owe for their defined billing period.
- The system shall generate and display billing statements for users by accumulating the charges for all their calls within a defined billing period.
- The system shall provide users with a record of all their billing statements, starting from the date that they first registered their account.
- The system shall highlight the current billing period when users navigate to the billing section of the app.
- The system shall alert users when they have failed to make a payment for a past-due bill.
- The system shall facilitate multiple payment options for bills.
- The system shall notify users whether an attempted payment was successful or not.
- User stories:
  - As a user, I want to be able to view the cost of my current billing period, records of past billing statements and payments, and account balances, so that I can keep track of my expenses.
  - As a user, I want to receive alerts from the system when I failed to make a payment for a past-due bill, so I can be aware of missed payments.
  - As a user, I want to be able to pay a bill in different ways such as debit, credit, or Google Pay.
  - As a user, I want to know whether my payment was successful or not when paying for a bill.

3.2 Non-Functional Requirements

3.2.1 Performance

- The system shall provide low latency during audio and video calls, with an average of less than 50 millisecond latency per call, ensuring real-time communication.
- The system shall be able to establish connections between users, responding within 3 seconds after the callee initiates the call.
- The system shall be able to handle 50,000 active online users simultaneously accessing information and using services.

- The system shall auto-adjust the quality of audio and video calls when users are facing unexpected network conditions, responding within 5 seconds to ensure uninterrupted communication.

3.2.2 Reliability

- The system shall regularly backup user data, chat history, and contact lists at least once a week to prevent data loss and ensure data security.
- The system shall efficiently distribute online calls to different servers in times of heavy call loads, with no more than 98% usage per server.
- The system shall constantly maintain stable connections during calls, with a dropped call rate of less than 1% for every 1000 calls.

3.2.3 Availability

- The system shall provide a contractual agreement with multiple internet service providers with 99.9% availability.
- The system shall set up maintenance without shutting down all services to keep a 95% uptime rate.
- The system shall be able to successfully process 99.9% of users' requests on their calls.
- The system shall be accessible 24 hours a day for users to manage and pay their bills.

3.2.4 Security

- The system shall encrypt the calls and data using the industry-standard encryption algorithm to prevent data leaking.
- The system shall follow the appropriate data privacy regulations, ensuring that user data is protected and not shared with other parties.
- The system shall log suspicious activities on servers within 5 seconds of detection.
- The system shall inform administrators about suspicious activities within 5 seconds of detection.

3.2.5 Interfaces

- The system shall allow new users to become familiar with all its functions in 10 minutes.
- The system shall allow users to seamlessly transfer phone calls from one platform to another in 6 seconds.
- The system should integrate support functions to assist users with disabilities, allowing them to initiate a call in less than 2 minutes.
- The user interface for the software shall be compatible on any platform such as Mac, Windows, IOS or Android.

3.3 Design Constraints

- **Hardware Constraints:** The performance of the product is closely tied to the capabilities of the hardware components that support it. For instance, faster CPUs can handle audio encoding more efficiently than slower ones, allowing for better call quality.

- **Regulation Constraints:** The system's development shall follow the regulations and standards well recognized in the industry. Depending on the region, regulations and standards can differ in size and scrutiny.
- **Budget Constraints:** The ongoing maintenance and update of the system requires a sufficient stream of funds.
- **Time Constraints:** The system must be designed, developed, thoroughly tested, and ready for deployment before the established deadlines.
- **Legal and Ethical Constraints:** The system involves collecting and analyzing user data which raises concerns regarding data privacy laws and the ethical use of software.
- **Scalability Constraints:** An increase in the number of users and data volume is to be expected. The system must be built in a way that can accommodate this growth.

3.4 Legal, Copyright, and Other Notices

The Online Virtual Phone System should display the disclaimers, copyright, word mark, trademark, and product warranties of the Mango Madness team.

3.5 Other Requirements

4 Other Supporting Documents

A. Appendices

Online virtual phone system	Provided by the client to outline the system requirements and how the product will charge its users.	https://umanitoba-my.sharepoint.com/:w:/r/personal/shaowei_wang_umanitoba_ca/_layouts/15/Doc.aspx?sourcedoc=%7Bd4288f7e-5fee-4658-a262-f83723584887%7D&action=view&wdLOR=c8FACBCF6-0435-46D6-9921-FD4EEFBB17CE&wdAccPdf=0&wdparaid=58A58022