Software Requirements Specification (SRS)

1. Introduction

1.1. Purpose
This SRS defines the functional and non-functional requirements for a Linux-based system monitor application that provides real-time information about CPU usage, RAM usage, network activity, disk usage, and CPU temperature. The application is developed using C++ and the GTK graphical toolkit.

1.2. Scope
The application will run exclusively on Linux systems, collecting data from /proc and /sys filesystems. It will display the system information in a user-friendly graphical interface.

1.3. Definitions, Acronyms, and Abbreviations

GTK: GIMP Toolkit, a cross-platform toolkit for creating graphical user interfaces.
RAM: Random Access Memory
KB: Kilobyte
RX: Receive (Network)
TX: Transmit (Network)
1.4. References

GTK Documentation: https://docs.gtk.org/
Linux /proc Filesystem: https://man7.org/linux/man-pages/man5/proc.5.html
Linux /sys Filesystem: [invalid URL removed]
1.5. Overview
The SRS is organized into functional and non-functional requirements sections, followed by constraints and assumptions.

2. Overall Description

2.1. Product Perspective
The application will be a standalone system monitor tool, not integrated with other applications.

2.2. Product Functions

Monitor CPU Usage: Display the current CPU usage percentage and a progress bar visualization.
Monitor RAM Usage: Display the current RAM usage percentage and a progress bar visualization.
Monitor Network Activity: Display the received (RX) and transmitted (TX) network traffic in KB.
Monitor Disk Usage: Display the percentage of disk space used across mounted filesystems.
Monitor CPU Temperature: Display the CPU temperature in degrees Celsius.
2.3. User Classes and Characteristics

General Users: Users with basic computer knowledge who want to monitor their system performance.
2.4. Operating Environment

Operating System: Linux distributions (e.g., Ubuntu, Fedora)
Software Dependencies: GTK 3 or 4
3. Specific Requirements

3.1. Functional Requirements

Data Collection:

Read CPU usage information from /proc/stat every second.
Read RAM usage information from /proc/meminfo every second.
Read network activity (RX/TX bytes) from /proc/net/dev every second.
Read disk activity (read/write bytes) from /proc/diskstats every second.

Read CPU temperature from /sys/class/thermal/thermal_zone0/temp every second.
Read disk space usage from /proc/mounts every second.
Data Presentation:

Display CPU and RAM usage as percentages and with progress bars.
Display network activity as KB/s.
Display disk usage as a percentage.
Display CPU temperature in degrees Celsius.
User Interface:

A main window displaying all monitored data.
Clear and intuitive labels and progress bars.
Icons to visually represent the monitored metrics.
3.2. Non-Functional Requirements

Performance:

The application should have minimal impact on system performance.
Data updates should occur smoothly without noticeable lag.
Usability:

The application should be easy to use and understand.
The user interface should be visually appealing.
Error Handling:

The application should gracefully handle errors, such as file reading failures or invalid data.
4. Constraints

The application is designed for Linux operating systems only.
The application relies on the availability and format of specific files in the /proc and /sys filesystems.
5. Assumptions

The user has sufficient permissions to read files in the /proc and /sys filesystems.
The temperature sensor in /sys/class/thermal/thermal_zone0/temp is accurate.