CANKAYA UNIVERSITY

Software Requirements Specification

**System Resource Monitoring**

**and Visualization**

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# Preface

This document defines the Software Requirements Specification (SRS) required for controlling a virtual machine over an administrator login website. SRS is prepared according to IEEE STD 830-1998, IEEE Recommended Practice for Software Requirements Specifications [1]. This document includes the product perspective, functions, user characteristics, requirements, system assumptions, and constraints.

# Introduction

The following subsections are an overview of the entire “Software Requirements Specification” (SRS) document.

## Purpose

This document provides information about "Bootstrap Based Theme Modification and Creating Sample Admin Page".

## Scope

This software is based on showing the data of a virtual machine with the help of graphs and charts in a website. Virtual machines data samples can be processor spending, ram spending, how many user are available in the operating system, what are the IP addresses of the users, how many hours has it been open..etc. In this website authentication will be carried out. After logging in to the website, users can see the status of the virtual machine on the website and start it if they wish. Users can edit their own profiles on the website.

The purpose of this software:

It is see the status of a virtual machine or machines and to control them (the virtual machine can be launched through the website).

## Definitions, Abbreviations, Acronyms

|  |  |
| --- | --- |
| TERM | DEFINITIONS |
| User | Right to login to the website. |
| SRS | Software Requirements Specifications |
| IEEE | Institute of Electrical and Electronics Engineers |
| VMI | Virtual Machine Introspection |

## Overview

This document is prepared to give details, technical information, and required specifications for this software aim.

# Overall Description

## Product Perspective

This software is software that aims to view the data of a virtual machine through a website. Virtual machine data will be captured by Virtual Machine Introspection (VMI) technique and displayed on the website via bootstrap-based graphics and charts [2]. The data captured from the virtual machine will be kept in the database and this database will work dynamically with the website. Virtual machine can be started with the help of a button on the website.

## User Interfaces

There are 2 interfaces for the user to use. The user can choose one of these interfaces according to his/her wishes. Light colors are used in one of the interfaces, and dark colors are used in the other. There are graphics displaying virtual machine data in the interface and a button to start the virtual machine.

## Software Interfaces

### For Website Software

|  |  |
| --- | --- |
| FRONT-END | BACK-END |
| HTML5 | PHP(To be determined) |
| CSS3 | Python(To be determined) |
| Javascript | Laravel |
| jQuery | Laravel Telescope |
| Vue.js | Laravel Horizon |
| ApexCharts Addition |  |

### Server-Side

* Linux Ubuntu (>=16.04)
* Nginx (Web Server)
* MySQL (For database)
* Redis (For cache database)
* Supervisor (For background operations)

### For Visual Machine

* Windows Operating System.

## Hardware Interfaces

Users must have at least one tablet, phone or computer to use the software. The systems of the phone, tablet or computer's to be used must be up-to-date. They do not need to be the latest model.

* 1. **Assumptions and Dependencies**
* A new user record can be created.
* If the user has forgotten his/her password, he/she can get the new a password.
* If the user wants, he/she can view her profile.
* If the user wishes, he/she can press the button to start the virtual machine.

# Requirements Spesification

## External Interface Requirements

Mysql will be used for the database. There will be two or more different tables in the database, virtual machine data and user data. Virtual machine must have windows operating system. At certain times, the data of the virtual machine (processor spending, ram spending, how many users are available in the operating system, what are the IP addresses of the users, how many hours has it been open..etc.) Will be pulled into the database's virtual machine table will be recorded. The data of the virtual machine will be pull with the Virtual Machine Introspection (VMI) technique [2]. The table containing the data of the virtual machine in the database has to work dynamically with the website.

## Functional Requirements

### Login Function

* Introduction: Users can login with their email, private question and password.
* Input: User's email and password.
* Output: Error (The user's username or password are incorrect) or login.
* Process: All users will enter the login page and enter their email and password. The system logs in or displays an error message depending on whether the email and password match.

### Register Function

* Introduction: A new user can be created.
* Input: User’s email, password, user’s name and private question.
* Output: Error (Underfilled / passwords are not the same) or create.
* Process: Enter user’s name, email and private question. The system checks whether the user is in the database and adds it to the database if it is not present in the database.

### Forgot Password

* Introduction: A new one can be created instead of the forgotten password.
* Input: User’s email, private question.
* Output: Error (User’s email or admin's private question is wrong) or create password.
* Process: Enter user email and private question. The system checks whether the user's mail and private question are in the database. If there is no match, it gives an error message.

### Reset Password

* Introduction: The password can be changed to a new one.
* Input: User’s old password, User’s new password(x2).
* Output:Error (The new passwords are not the same or the old password is wrong) or change.
* Process: Enter user old password and new password (x2). The system checks if the user's old password is the same as the password in the database and checks the equality of their new password. If an error occurs, it gives an error message.

# Software System Attributes

## Portability

* This website can be run on localhost or on a server.
* Php or python libraries required for the operation of the website must be installed.
* Mysql must be installed to communicate with the database.
* If the server will be operated, the following should be checked:
  + Having Linux ubuntu operating system.
  + SSH feature is active because due to data exchange over SSH connection.
  + Since the servers will be connected remotely, they must be open to the internet and their firewall settings must allow this.
  + Establishing a connection with the root user for full control of the server.

## Usability

* After logging into the website, the current status of the data can be viewed from the charts and graphs on the home page.
* After logging into the website, the profile can be changed from the login screen if desired.
* After logging into the website, a virtual machine can be started with the help of a button.

## Adaptability

* Since the data are received from the moment the website is run, the data will be adaptable.

## Scalability

* There is no scalability requirement as users will see the same data graphics when they log in.

# References

[1] <https://standards.ieee.org/standard/830-1998.html>

[2].Y. Hebbal, S. Laniepce, Jean-Marc Menaud, **Virtual Machine Introspection: Techniques and Applications,** **IEEExplore,** **24-27 Aug. 2015, DOI:** [10.1109/ARES.2015.43](https://doi.org/10.1109/ARES.2015.43) ,

<https://ieeexplore.ieee.org/document/7299979>