

**Sri Lanka Institute of Information Technology**

**Fire Alarm Monitoring System**

**Distributed System Assignment 2**

**2020**

Submitted by:

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**1.Introduction**

A fire alarm system has a number of devices working together to detect and warn people through visual and audio appliances when smoke, fire, carbon monoxide or other emergencies are present. This report contains the high-level system architectures of a fire alarm monitoring system which we have developed for the 3rd year Distributed Systems module. And it lists out the service interfaces exposed by each service and briefly explains each of the workflows used in the system.

·         The system has a web client application where users can view the status of all fire alarm sensors. For each sensor, the web application displays whether the fire alarm sensor is active, the location, smoke level and the CO2 level. The data is sent from a dummy application which we have assumed as a building every 10 seconds. The data in the web client application is refreshed every 15 seconds. Anyone can check carbon dioxide or smoke level by checking the web application. If the smoke level or CO2 level is above 5, then they mark in red for convenience.

·         The system contains a desktop client application where users can view the same information from a desktop client. The information is refreshed every 15 seconds. It has an administrator login, where an administrator can add/register new fire alarm sensors. To register, the floor number and the room no should be given. The administrator can edit sensor details as well as it has an administrator login, where an administrator can add/register new fire alarm sensors. To register, the floor number and the room no should be given. The administrator can edit sensor details as well.

The system identifies a situation as a special fire situation if the carbon dioxide level is above 5. The main purpose of the monitoring system is to send alerts when a fire emergency has occurred. The system sends SMS and emails to the relevant parties when it identifies a fire situation.

A screenshot of a cell phone

Description automatically generated**2.System Architecture Diagram**

**A close up of a map

Description automatically generated3.Sequence Diagram**

**4.RESTful Web API**

The RESTful web API as well as the MySQL database are hosted in a private host service: Baiscope Hosting Service. We have created the API by implementing the GET method, POST method and email sending methods separately. The code will supply below. According to the client’s request, data is extracted in json format by GET method from searching the database. This data which is sent by the fire alarm is saved in a relevant table by POST method. URLs of GET (***appendix A***) and POST (***appendix B***) method can be found below.

* GET method - <https://www.firealermmonitoring.baishost.com/status.php>
* POST method - <https://www.firealermmonitoring.baishost.com/sentStatues.php>

**5.Fire Alarms**

We have created a dummy application to act as a fire alarm using Node-Red. (***appendic C***) We can add one or more fire alarms from that. Data of newly added alarms can be sent to the API. The carbon dioxide level and smoke level are checked from that data. If the carbon dioxide level and smoke level is 5 or more than 5, SMS alert and email alert is sent to the relevant parties by the system.(***appendix D***) If the smoke level or CO2 level is above 5 in a particular fire alarm data set, that data set is marked in red in both client applications for convenience. We can run one or more fire alarms at once. The data is sent from every fire alarm to the API in every 10 seconds. (***appendix E***) That data is sent to the database and saved there.

**6.Web Client**

The system has a web client application where users can view the status of all fire alarm sensors.(***appendix F***) For each sensor, the web application displays whether the fire alarm sensor is active, the location, smoke level and the CO2 level. The data in the web client application is refreshed every 15 seconds. (***appendix G***) Anyone can check carbon dioxide and smoke levels by checking the relevant page in the web application. If the smoke level or CO2 level is 5 or above 5, then they mark in red for convenience. Anyone can search details of a particular alarm by searching it.

**6.Web Client**

 The system has a desktop client application where users can view the same information from a desktop client. (***appendix H***) The information is refreshed every 15 seconds. If the smoke level or CO2 level is 5 or above 5, then they mark in red for convenience. The client application has an administrator login, where an administrator can add/register new fire alarm sensors. (***appendix I***) To register, the floor number and the room no should be given. The administrator can edit sensor details as well as it has an administrator login, where an administrator can add/register new fire alarm sensors.(***appendix J***) To register, the floor number and the room no should be given. The administrator can edit sensor details as well.