VEMANA INSTITUTE OF TECHNOLOGY

Koramangala, Bengaluru-34.

Department of Computer Science and Engineering

Project Phase-I Review 2

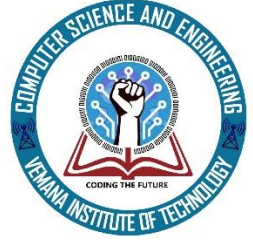## Batch No. 25 - NETWORK MONITOR

By

PAVITHRA K – 1VI17CS071

RAJASHREE – 1VI17CS114

Under the Guidance of

Mr. NOOR BASHA,

Asst. Professor Department of CSE,

Vemana Institute of Technology

BIRD VIEW

- Introduction
- Literature Survey
- Comparative analysis of the survey
- Problem Statement
- Design Methodology
- System Specification
- Module Description
- Expected outcome
- Plan of action for the project
- References

INTRODUCTION

- Network Monitor is a scripted tool that alerts the User about various status changes and updates such as Reachability, Firmware version changes, Issues, Resource usage, Device Information and so on in network nodes such as Servers, Endpoint PCs, Routers, Switches, Virtual Machines, Data stores and so on.

- Alerts can be sent through various modes such as GUI, Email, SMS and so on.

- Various Protocols are used for obtaining these information such as ICMP, ARP, LLDP, SNMP and so on.

- A wide range and variety of devices are supported by the system such as Servers, Routers, Switches, Virtual Machines, IoT Devices, Cloud Instances, Data Stores, Wireless Access Points, Endpoint PCs, Printers, Mobiles and so on.

LITERATURE SURVEY - 1

[1] **Network Monitoring System for Network Equipment Availability and Performance Reporting** –by Baphumelele Masikisiki, Siyabulela Dyakalashre[2020]

It describes availability and performance of a network, reporting with UFH being used as a test platform. This system is meant to help network administrators with troubleshooting network devices because it will tell them exactly where to go in order to fix the network.

Advantage and Disadvantage

- It used to test the availability and performances.

- The limitation of reporting notifications with alarms were not successfully implemented .

[2] Architecture of a Network Performance Monitor for Application Services on Multi-Clouds – by Young-min Kim, Ki-sung Lee, Jae-cheol Uhm, Si-chang Kim, and Chan-gun Lee 2018

Rudimentary reasons for having a network performance monitor for multi-cloud environments have been illustrated with examples in this research. An architecture for such a network monitor is proposed that explains how external agents are used to connect monitor such an environment.

Advantages and Disadvantages:

- The model proposed for monitoring multi clouds is flexible and is integrated using external agents.
- A DBMS approach to store results for offline analysis has been proposed which would be good for non-cloud network monitoring systems as well.

 [3] **Measurement-Aware Monitor Placement and Routing: A Joint Optimization Approach for Network-Wide Measurements** – by Guanyao Huang, Chia-Wei Chang, Chen-Nee Chuah, and Bill Lin 2017

A theoretical framework is proposed in this research that jointly optimizes monitor placement and dynamic routing strategy to achieve maximum measurement utility with limited monitoring resources.

Advantages and Disadvantages:

- There are many implementation issues with the proposed framework that need to be addressed especially determining what routing protocols are being used.

- The major take away from this research is the procedure involved in forming the base framework for a network monitoring system.

[4] **A Web-based monitor and management system architecture for enterprise virtual private network** – by Ruey-Shun Chen *, Change-Jen Hsu, Chan-Chine Chang, S.W. Yeh 2019

Monitoring encrypted connection gateways such as enterprise VPNs is a tedious task. This papers formulates a feasible system that can monitor VPNs and includes essential elements such as system components, operation flow and much more.

Advantages and Disadvantages:

- This research is primarily localized on VPNs and encrypted gateways such as SSLVPN, Client-based VPNs and so on.

- It is still dependent on external management tools in order for the enterprises to be rest assured for using the new technologies.

COMPARATIVE ANALYSIS

Reference	Technique	Advantage	Drawback
Network Monitoring System for Network Equipment Availability and Performance Reporting	SNMP	Used to Test the Performance and Availability	Memory configuration
Architecture of a Network Performance Monitor for Application Services on Multi-Clouds	Multi-Cloud	Flexible and first of its kind	Network intensive and simulated results
Measurement-Aware Monitor Placement and Routing: A Joint Optimization Approach for Network-Wide Measurements	Routing	Method to implement a framework	No Real-time analysis
A Web-based monitor and management system architecture for enterprise virtual private network	VPN	Integration of GUI with back end	Covers only VPNs

PROBLEM STATEMENT

- There are many open source and commercial products which provide network monitoring facilities.

- These applications provide network engineers and administrators with many features and tools to identify and examine network infrastructure.

- Many of the monitoring tools available in the industry provide specific monitoring tasks which are limited for one feature.

- The user web interface for the users to view and monitor network and server and also the terminal for viewing configurations of network devices.

DESIGN METHODOLOGY
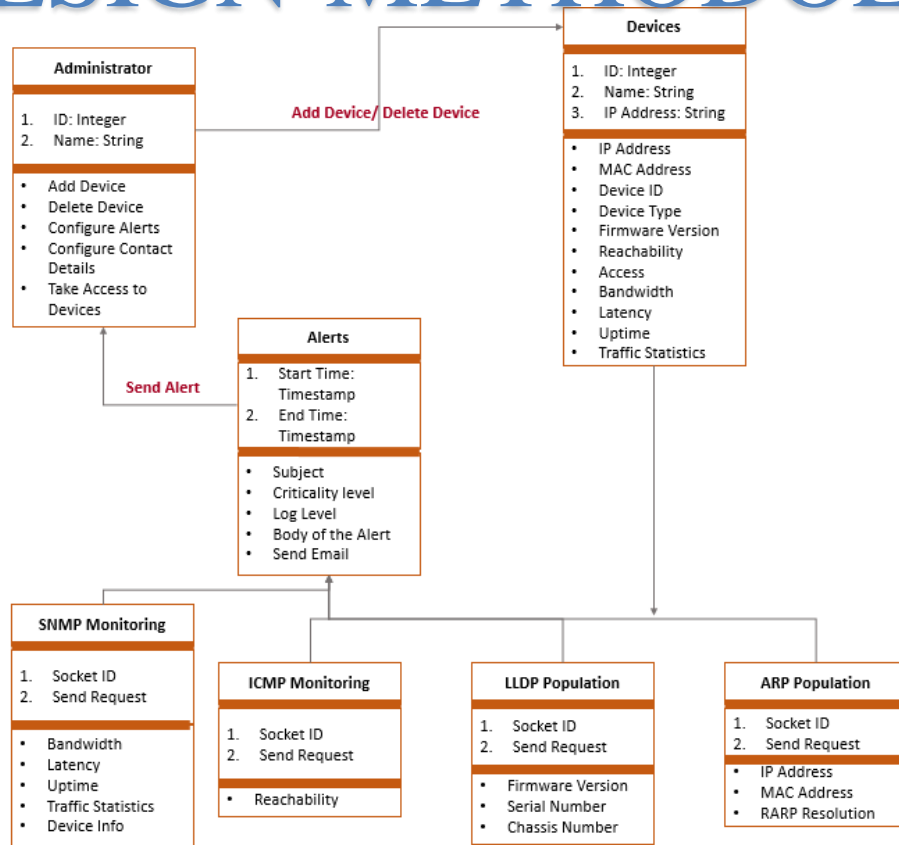
SYSTEM SPECIFICATION

Hardware Specifications:

- Processor: Intel® Core i5 ™ CPU and above

- RAM: 8 GB or higher

- Hard Disk: 100 GB or higher

Software Specifications:

- Operating System: Windows 10/Ubuntu 20.04 LTS

- Architecture: 64-bit OS

- Python 3.8 or higher

- PIP Packages: RegEx, Django, Pymysql

- Database: MySQL5.7 or higher

- JavaScript 1.8.5 or higher

- Front End: HTML5, CSS3, Bootstrap4

MODULE DESCRIPTION

Graphical User Interface:

- This facilitates the user to login into the system, initiate the utility, whereby detail of the entire network is present in a table.

- The Traffic Status will show up eventually which are obtained from the device using ICMP protocol

- The user can also see all the performance attributes such as reachability, latency and so on present on any network node by switching between tabs.

- Coding Languages used for this Component: HTML, CSS, Bootstrap Templates, JavaScript

Back-end Processing:

- This module handles all functionality from finding the network nodes, attributes, querying with the network nodes and updating the database with information obtained through back end processing.

Coding Languages used for this Component: Python, Django Framework, JavaScript, pymysql framework.

Database:

- This module handles acts a buffer between the backend functionality and the graphical user interface. It provides synchronization between the activities of the user and the backend
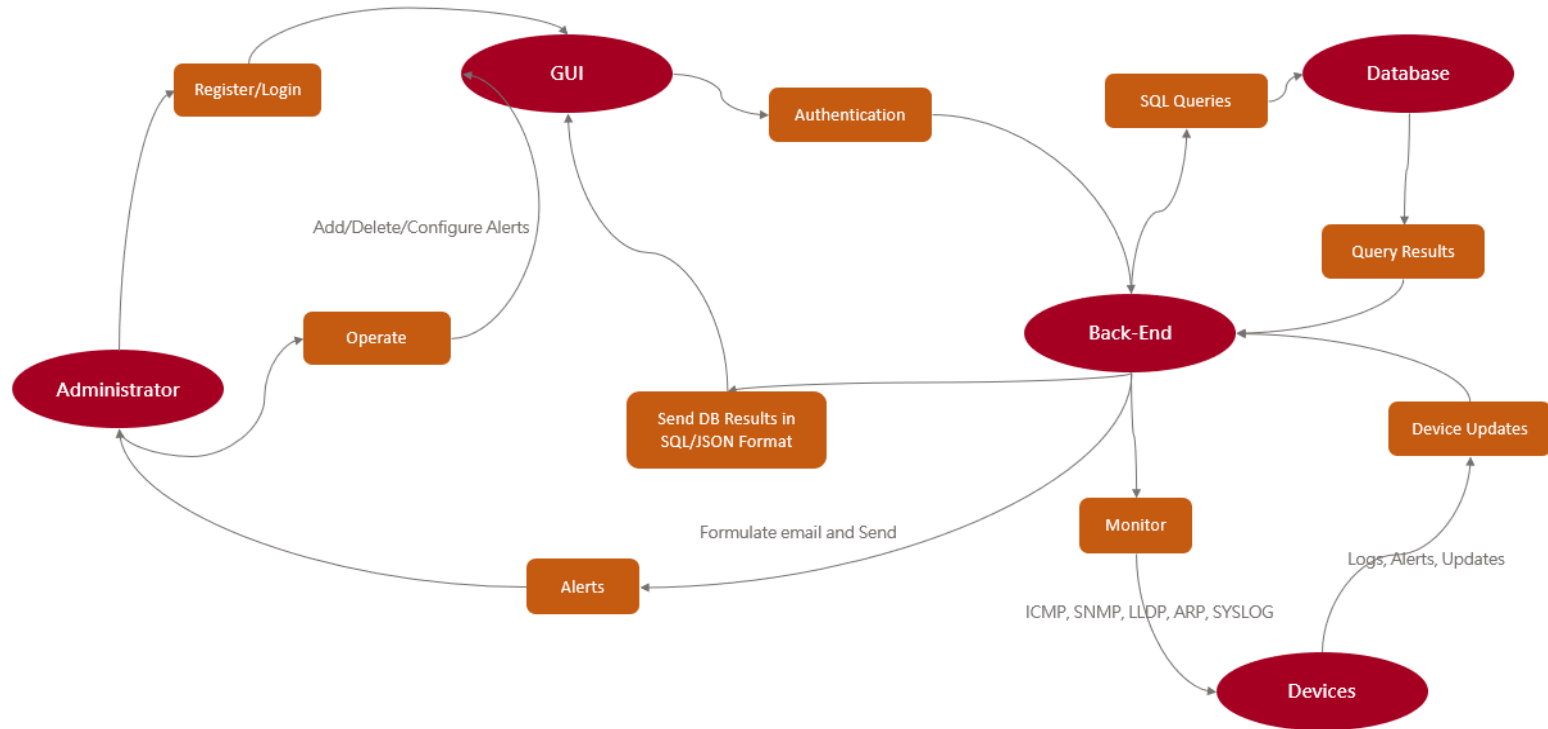
MySQL Tables used:

 UserAuthentication: Deals with user login, logout, and session keys

 Devices: Deals with devices and their attributes at real time

Languages used for this Component: MySQL Database, MySQL query Language, MySQL Workbench

System Architecture

Department of CSE, Vemana IT
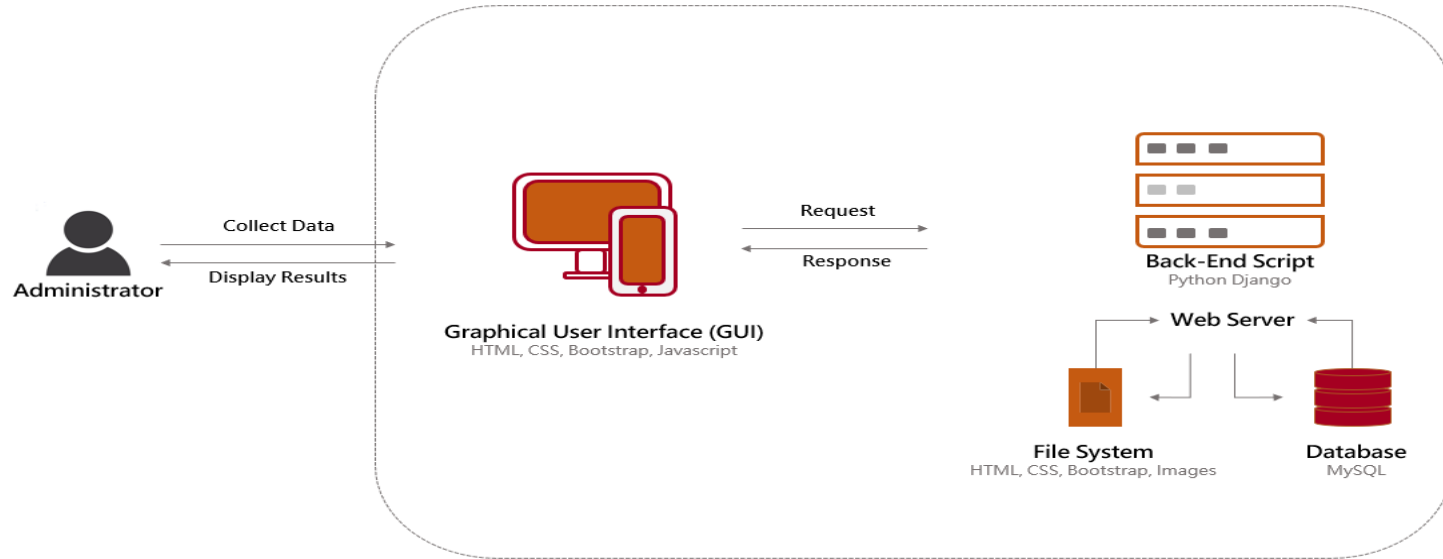
Data Flow Diagram for Network Monitor

EXPECTED OUTCOME

- A fully functional network monitoring system that can overlay various monitoring protocols such as ICMP, SNMP, SYSLOG, ARP, LLDP and so on to obtain all information about various network nodes.

- Development of easy installation script setup documentation.

- A lucid, user-friendly User Interface for the application that can display information with right intensity

- Consistent triggering for alerts in any inconsistent conditions that found in a network

- Alerts should be sent to the users configured as per their customizations.

Network Monitor

PLAN OF ACTION FOR THE PROJECT

TASK	SEP	OCT	NOV	DEC	JAN
RESEARCH					
USING IPCONFIG COMMEND	▭				
REVIEW 1 PRESENTATION		▭			
IDENTIFICATION AND DESIGN OF PROJECT			▭		
REVIEW 2 PRESENTATION				▭	
PHASE1 REPORT PREPARATION				▭	
PHASE 1 FINAL REPORT					▭

REFERENCES

[1] **Network Monitoring System for Network Equipment Availability and Performance Reporting** –by Baphumelele Masikisiki, Siyabulela Dyakalashre[2020]

[2] Architecture of a Network Performance Monitor for Application Services on Multi-Clouds – by Young-min Kim, Ki-sung Lee, Jae-cheol Uhm, Si-chang Kim, and Chan-gun Lee 2018

[3] **Measurement-Aware Monitor Placement and Routing: A Joint Optimization Approach for Network-Wide Measurements** – by Guanyao Huang, Chia-Wei Chang, Chen-Nee Chuah, and Bill Lin 2017

[4] **A Web-based monitor and management system architecture for enterprise virtual private network** – by Ruey-Shun Chen , Change-Jen Hsu 2019

THANK YOU