Highly Scalable Server Resource Monitoring System for Cloud

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Abstract: Monitoring is a very important factor for maintaining large-scale systems. There are a large vary of monitoring tools originated, that are designed. These tools specific variety of common elements and styles, that address the needs of cloud monitoring to varied degrees. This paper performs a design of monitoring tools.

Keywords: Cloud computing; Monitoring systems

I. INTRODUCTION

The meaning of cloud computing is "cloud is metaphor for the internet" [1] and "computing means a type of Internet-based computing"[1]. The goal of cloud computing is to provide large scale of computer which are used by IT organizations, military and research facilities that have do huge computation per second.

To make such facility available, cloud computing uses "large groups of servers typically running low-cost consumer PC technology with specialized connections to spread data-processing chores across them"[1]. And generally believe in use of "virtualization techniques to maximize the power of cloud computing" [1].The following figure 1. shows cloud computing services
Since cloud computing have large scale of computer monitoring also become one of the important performance key for the cloud providers. Since cloud also provides various kinds of other service.

"Cloud monitoring is the process of reviewing, monitoring and managing the operational workflow and processes within a cloud-based IT asset or infrastructure" [2]. So that a cloud infrastructure works correctly.

Advantage of good cloud monitoring tool is Any problems that arise can be trace routed, and forced monitoring will help to instantaneously identify the source of malfunctions, so repairs can be completed faster[3].

Figure 2 Show the Cloud Monitoring

In this paper designing a monitoring tool that has good graphical user interface and monitors the system resource such Cpu usage, disk usage, Memory usage. And also provides the an alert when the cpu usage is under or over-utilized.

The outline of this paper starts with the introduction about the topic and then followed by the literature survey which explain about the related work of the topic, then followed by the architecture design of the topic, then followed by the implementation of the topic, then followed by the screen shot of the output and finally end with conclusion and future enhancement of the topic.

II. LITERATURE SURVEY

The literature survey explains about the related research work done by other people about the similar topics.

There can type of monitoring system

- General purpose monitoring system.
- Cloud specific monitoring system.

1. General Purpose Monitoring System

   There are different types of General Purpose Monitoring System are [4]
   A. Nagios
   B. Collectd
   C. Opsview Core
   D. Cacti
   E. Zabbix
   F. Open NMS
   G. Ganglia
   H. Hyper ic HQ
   I. IBM Tivoli
   J. Kiwi Application Monitor
   K. R-OSGi
   L. DAMS

2. Cloud Specific Monitoring System

   There are different types of Cloud Specific Monitoring System are [4]
   A. Amazon cloud Watch
   B. Azure Watch
   C. Nimsoft
   D. Monitis
   E. CloudKick
   F. Boundary Application Monitor
   G. PCMONS
III. SYSTEM DESIGN

“System design is the process of defining the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system. It is meant to satisfy specific needs and requirements of a business or organization through the engineering of a coherent and well-running system”. [5].

System Architecture

This defines the high level design diagram for the topic and the following diagram show the system architecture figure 3.

![System Architecture Diagram]

- XMPP Server
- XMPP Client
- MongoDB
- Node.js
- Graphical User Interface (GUI)

The Module are:

- XMPP Server - XMPP Server is used for collecting the resource usage details of the monitored client such the cpu usage, disk usage and memory usage.
- XMPP Client - XMPP Client is used for collecting the usage details of the system on which it is running and also forwarding the same details into the database.
- Mongo DB - MongoDB is the a database used for storing which is No SQL and No Schema database.
- Node.js - Node.js is server side wrapper used for routing the front end page
- Graphical User Interface (GUI) - The Graphical User Interface consists of login page in which the user name and password has to be entered and also the details of the monitored and also provides a
graphical view to the monitored resources and also graphical view when the system is under or over utilized.

IV. SYSTEM IMPLEMENTATION

System Implementation is place where the system requirements and system design is implemented using a good programing language.

The Programing languages used for implementation are as:
- Java
- HTML
- CSS
- Java Script

Java is used as back-end programming language, HTML and CSS is used as front-end programming language and then Java Script used by Node.js for routing the HTML Page in the front end.

The reason for using Java is as follows:
- Object oriented
- Portable
- Architecture-neutral
- High-performance
- Multithreaded
- Robust & Secure

The reason for using HTML5 as follows:
- Because it provides new tag for multi-media such `<video>`, `<audio>`.
- Because it provides new tag for drawing such `<canvas>`.

The reason for using CSS is for data formatting content of the document.

V. RESULTS

The following figures shows the excepted results

LOGIN PAGE:

This is the entry page for the application in which if the user is an existing customer can enter the username and password if not by click the creating new account where the user can enter the required user fields.

Figure 4: Login page
HOME PAGE:
This is the page after the user has enter the login details, this show the IP address of the system that is monitored and then CPU usage and then disk usage and memory usage details.

CPU MAX PAGE:
This is the page that is displayed after the user click on CPU Usage which display the when the system hits max cpu usage after the client has been running.

CPU USAGE BETWEEN (0-35) SEARCH PAGE:
This is the page that is displayed when user click on CPU(0-35) which is present in the navigation section of the Home page. This page contains an drop in the user can select the host to be use cpu usage along with its time when the cpu usage is between 0 -35. Similarly type of page will be displayed when user clicks on the CPU(35-65) and CPU(65-100) in the Home page.
CPU USAGE BETWEEN (0-35) PAGE:
This is the page that is displayed when user click on CPU(0-35) which is present in the navigation section of the Home page. This page contains details of cpu usage between 0-35. Similarly type of page will be displayed when user clicks on the CPU(35-65) and CPU(65-100) in the Home page.

Graphical View of Latest 5 Values:
This Page display latest 5 values of the CPU Usage in all line, pie, bar and stacked area graph.

CPU TRACKER PAGE:
This page display when Cpu Usage is less than 20 or when cpu usage is greater 80.
USER DETAILS PAGE:
This page display the user details as show below.

![User details page](image1)

Figure 11: User details page

GRAPHICAL VIEW IN SEARCH PAGE:
This similary kind of search page as explained about for graphical view of line, pie, bar graphs.

![Graphical search page](image2)

Figure 12: Graphical search page

GRAPHICAL VIEW IN BAR GRAPH:
This page display the current resource details in form of bar graph.

![Bar Graph page](image3)

Figure 13: Bar Graph page
GRAPHICAL VIEW IN PIE GRAPH:
This page display the current resource details in form of pie graph.

![Pie Graph page](image1.png)

Figure 14: Pie Graph page

GRAPHICAL VIEW IN LINE GRAPH:
This page display the current resource details in form of line graph.

![Line Graph page](image2.png)

Figure 15: Line Graph page

HELP PAGE:
This page display when a user has to contact in case if they require help.

![Help page](image3.png)

Figure 16: Help page
ABOUT US PAGE:
This page displays about the company and department of the company and the development team details.

VI. CONCLUSION
In this page designing and developing a monitoring system that monitors the system resource like the cpu usage, disk usage and memory usage and provide an alert when the cpu usage is under or over utilized. Also have very good graphical user interface which show the resource used in graphical view also.

REFERENCES