Monitoring the Performance of Virtual Machines

TEAM: 'SHIELD'

HARSHINI NEKKANTI

HIMA BINDU NUTALAPATI

JYOTHI SPANDANA PENMETSA

NAVYA UPPALAPATI

PRIYASUBHA CHUNDRU

RAYWON TEJA KARI

SAIPHANI KRISHNA PRIYANKA KOLLURI

SASANK SAI SUJAN ADAPA

SRAVANI KANCHARLA

TULASI PRIYANKA SANABOYINA VEERAVENKATA NAGA

SOMESWARA MANITEJA DARISIPUDI

Version 1.1

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I. Preface

The proposal aims at providing an outline of the project to be implemented in order to meet the requirements of the customer and CEO. The company comprises of the CEO and development team Shield.

This document is the version 1.1, the revised project proposal. The remainder of the document is organised as follows. Section II defines the technical terms and abbreviations used in the document. Section III gives a brief description of the customer's business environment and an overview of the customer's needs and challenges that will be addressed. Section IV is the proposed solution which includes a proposal to meet the customer's expectations and to overcome the challenges. Section V states the limitations of the project. Finally, section VI includes a detailed time plan that states the work breakdown structure (WBS) and the time allocated for each stage in the project.

Customer: Patrik Arlos

CEO: Dragos Ilie

Revised version v1.1 on 2015-04-20

Revised version history is included in the preface. API, GUI, CN are included in glossary and abbreviations. Block diagram for the background and proposed solution are included. Time plan is modified according to current progress.

Initial version v1.0 on 2015-04-13

-Initial release.

II. Glossary and abbreviations

API: Application Program Interface

A program interface that takes advantage of computer's graphics capabilities to make the program easier to use.

CN: Computer Node

GUI: Graphical User Interface

Hypervisor:

Hypervisor is a hardware or a software that allows multiple operating systems to share a single host.

Monitoring:

Use of systems or processes that constantly oversee computer or network resources for the purpose of alerting personnel in case of outages, alarms, or other predefined events.

VM: Virtual Machine

Virtual machine is an operating system or an application environment that is installed on a software which imitates dedicated hardware.

III. Background

Data centers today employ virtualization in order to support various applications that run simultaneously on server platforms. Virtualization creates virtual desktops which are hosted in the data centers. Virtualization helps in reducing energy consumption.

The customer is a data center provider who controls the pools of processing and network resources. The customer needs help in allocating their resources better by monitoring the compute nodes for:

- CPU load and utilization
- I/O usage
- network usage
- memory usage and
- disk usage

The customer lacks flexibility in identifying status of the compute nodes and requires a system where the status can be tracked through a simple web interface. In order to address this problem we develop a tool that enables the customer to monitor performance of the virtual machines. The product should include a dashboard that shows the status of all the devices

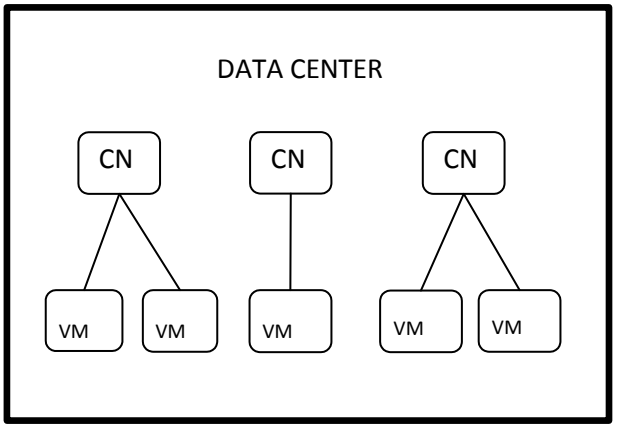


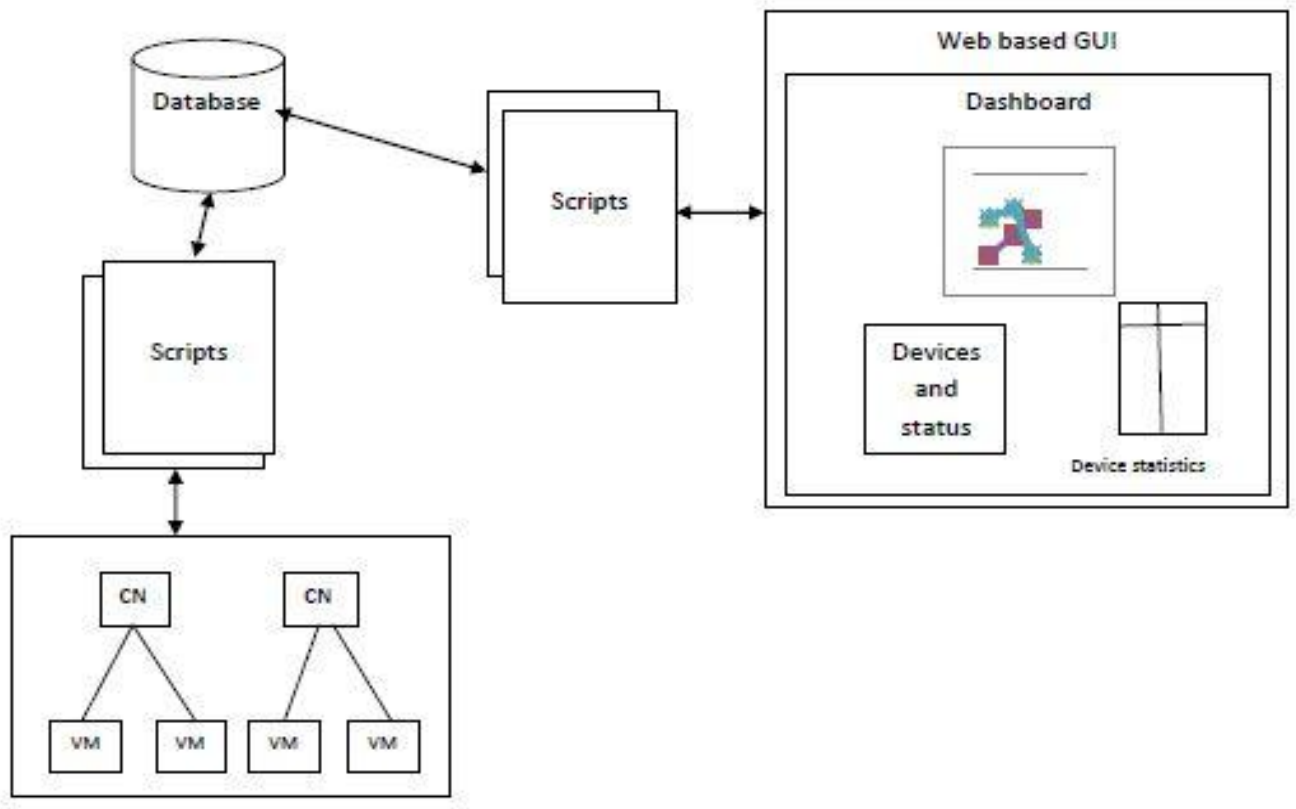
Fig. Block diagram of the customer's data center

IV. Proposed solution

The basic requirement of the customer is to monitor CPU load and utilization, I/O usage, network usage, memory usage and disk usage of the virtual machines in a data center. The proposed solution would be to develop a tool to monitor resources of the virtual machines per host using hypervisors. The user will be able to

- Login to monitor the status of the devices.
- Add a network element to the monitoring list.
- Remove a network element from the monitoring list.
- View the statistics and graphs for a specific VM and a compute node.
- View alerts when any device crosses the threshold level.
- Logout

In order to do so, the devices will be monitored through a web based interface where a simple user authentication is provided. Once authenticated, the customer can view a dashboard with the information of all the VMs and identify their status, whether normal, warning or critical. If the resource usage of any device crosses the threshold, a notification will be sent out to the customer. A time series aggregate of all the metrics will be provided which can be exported as a graph. A historical aggregate up to four weeks with relevant sampling intervals will be displayed. A restful API is used to import or export the data to be appropriate for the third party solution. The solution should be able to handle a large number of nodes simultaneously.



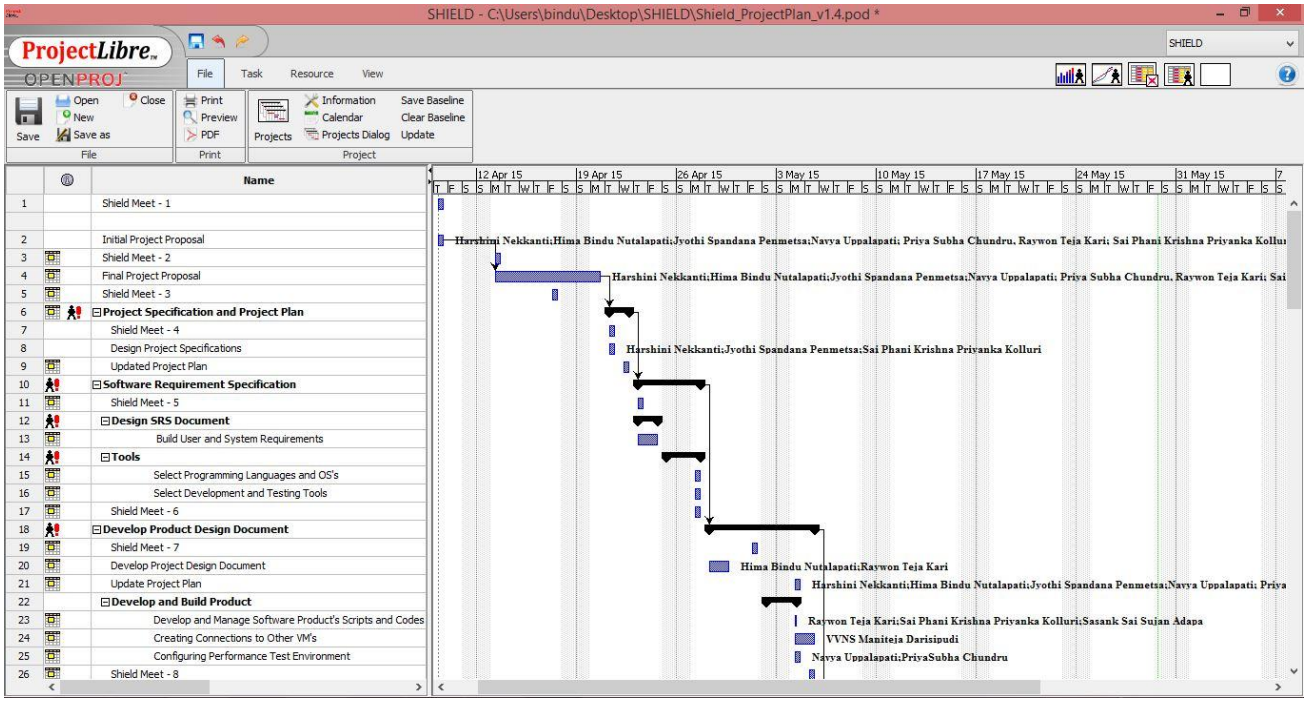
V. Limitations

The tool will only monitor the CPU load and utilization, I/O usage, network usage, memory usage and disk usage. Any other metrics are beyond the scope of the project.

VI. Time Plan

A work break down structure that includes the time allocated for each stage in the project is represented as a Gantt chart using Project Libre. Toll gates and milestones are documented.

S.no	Task	Estimated time (in days)
1	Project Allocation	
2	Project Proposal • Researching the topic • Document design based on the customer's requirement	3
3	Theoretical Study and Project Plan • Research on the customer's requirements • Revising the project proposal	6
4	Software Requirement Specification • Defining customer needs • Designing the system architecture according to the customer's needs	7
5	Software Design and Implementation • Selecting appropriate programming language • Designing API • Writing code to implement the system architecture	6
6	Acceptance Test Plan • Testing the code for errors and customer's work environment	7
7	Project Documentation	5
8	Final Product Release	1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Project
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1 Shield Meet - 1
2 Initial Project Proposal
3 Shield Meet - 2
4 Final Project Proposal
5 Shield Meet - 3
6 Project Specification and Project Plan
7 Shield Meet - 4
8 Design Project Specifications
9 Updated Project Plan
10 Software Requirement Specification
11 Shield Meet - 5
12 Design SRS Document
13 Build User and System Requirements
14 Tools
15 Select Programming Languages and OS's
16 Select Development and Testing Tools
17 Shield Meet - 6
18 Develop Product Design Document
19 Shield Meet - 7
20 Develop Project Design Document
21 Update Project Plan
22 Develop and Build Product
23 Develop and Manage Software Product's Scripts and Codes
24 Creating Connections to Other VM's
25 Configuring Performance Test Environment
26 Shield Meet - 8
12 Apr 15
19 Apr 15
26 Apr 15
3 May 15
10 May 15
17 May 15
24 May 15
31 May 15
Harshini Nekkanti;Hima Bindu Nutalapati;Jyothi Spandana Penmetsa;Navya Uppalapati; Priya Subha Chundru, Raywon Teja Kari; Sai Phani Krishna Priyanka Kollu
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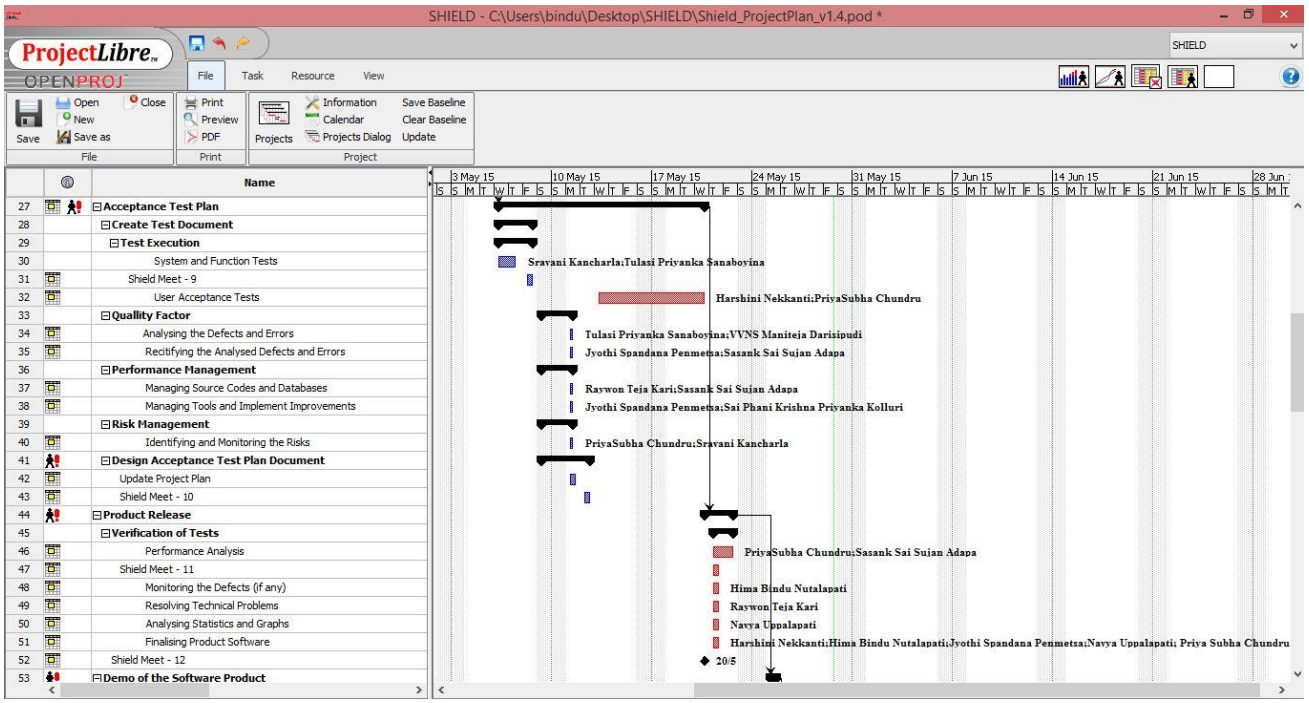
VVNS Maniteja Darisipudi
Navya Uppalapati;PriyaSubha Chundru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Save as
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Preview
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Information
Calendar
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Save Baseline
Clear Baseline
Update
File
Print
Project
Name
27 Acceptance Test Plan
28 Create Test Document
29 Test Execution
30 System and Function Tests
31 Shield Meet - 9
32 User Acceptance Tests
33 Quallity Factor
34 Analysing the Defects and Errors
35 Rectifying the Analysed Defects and Errors
36 Performance Management
37 Managing Source Codes and Databases
38 Managing Tools and Implement Improvements
39 Risk Management
40 Identifying and Monitoring the Risks
41 Design Acceptance Test Plan Document
42 Update Project Plan
43 Shield Meet - 10
44 Product Release
45 Verification of Tests
46 Performance Analysis
47 Shield Meet - 11
48 Monitoring the Defects (if any)
49 Resolving Technical Problems
50 Analysing Statistics and Graphs
51 Finalising Product Software
52 Shield Meet - 12
53 Demo of the Software Product
3 May 15
10 May 15
17 May 15
24 May 15
31 May 15
7 Jun 15
14 Jun 15
21 Jun 15
28 Jun
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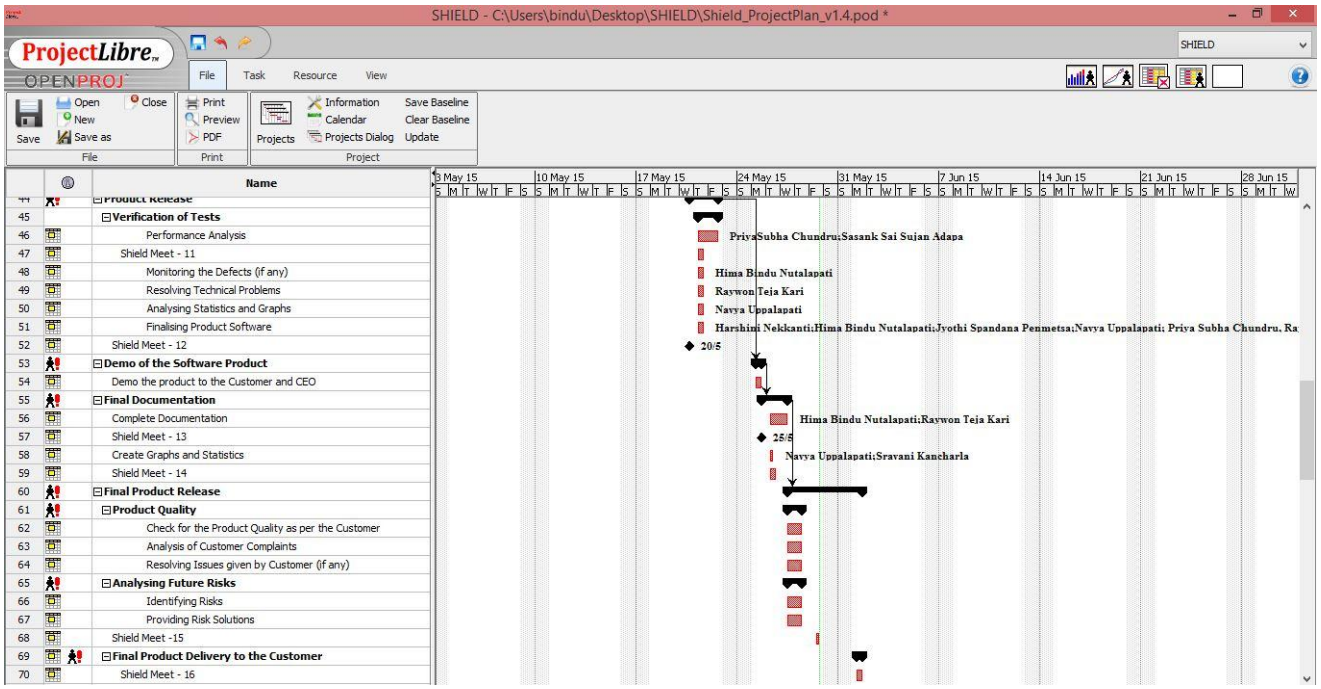

Fig.Snapzshot of Project Libre Plan

CHECK POINT	TASK	PARTIES INVOLVED	ESTIMATED COMPLETION TIME
Tollgate 1	Project Proposal	Customer and CEO	2015-04-13
Milestone 1	Project Plan	Customer and CEO	2015-04-20
Tollgate 2	Software Requirement Specification	Customer and CEO	2015-04-27
Milestone 2	Design documentation	CEO and Team Shield	2015-05-04
Tollgate 3	Acceptance Test Plan	Customer, CEO and Team Shield	2015-05-11
Milestone 3	Project Documentation	CEO and Team Shield	2015-05-18
Tollgate 4	Final Product Release	Customer and CEO	2015-05-28

Table: Toll gates and milestones