



BLEKINGE TEKNISKA HÖGSKOLA

Monitoring the Performance of Virtual Machines

TEAM: 'SHIELD'

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1. Preface

This is the User document of the developed software product. It consists of all the necessary information required to know about the usage of the software product, and its operations. The document starts with glossary and abbreviations which consists of all the abbreviated terms involved in the product development documents. The overview of the product gives a basic idea on how the product is developed and what it can do. The procedure is listed in detail in section 4.

Revised version v1.3 on 2015-06-15

- Modified the steps to fetch virtual machines.

Revised version v1.2 on 2015-06-05

- Modifications for username and password in the procedure. Refer section 4.3
- Modifications in adding device section under software product information. Refer 4.2

Revised version v1.1 on 2015-05-29

- Modified information related to GUI and services provided.
- Screenshots included in section 4

Initial version v1.0 on 2015-05-20

- Initial version

2. Glossary and Abbreviations

API: Application Program Interface

HTTP: Hyper Text Transfer Protocol

RRD: Round Robin Database

VM: Virtual Machine

3. General Information

The software product is used to monitor resource utilization metrics namely, CPU utilization, network I/O usage, memory usage, and disk usage of all the hosts and virtual machines in them. With the product, the user will be able to monitor the resource utilization in an http page. The user can add/remove hosts and virtual machines, view graphs and utilization statistics of the hosts and virtual machines, receive email notifications and view alerts when any device exceeds threshold.

4. Using the Product

4.1 Prerequisites

- *Installation Document* must be thoroughly read and installations need to be done as mentioned in the installation document.
- A computer with Ubuntu 14.04 LTS operating system installed in it.
- Basic knowledge in Ubuntu and how to use it.

4.2 Software Product Information

➤ LOGIN

- The front end GUI page is the login page in which user can enter the login credentials to start using the product.
- The page includes 'Username' and 'Password' fields.

➤ POST LOGIN

- After successfully logging in, user will be given three options to use:

“Click here to add/delete devices”

ADDING DEVICES:

- User needs to click on this link to add devices to the monitoring list.
- User needs to add the devices he wants to monitor, and after the addition is done, user needs to click on the button present beside the devices table for fetching respective virtual machines present in the devices.
- User needs to refresh the page in the web browser, to view the added devices along with their VMs present in it.
- The added devices are displayed in a table.
- User needs to run the script `time.sh` in the terminal using the command: **“./time.sh”**. This script enables the script to execute every 45 seconds and there after updating the statistical graphs.

REMOVING DEVICES:

- For removing a device, user needs to click on respective “Delete” button, present in the last column of each row.
- For updating the table present in the web page, user needs to refresh the page.

“Click here for usage graphs and statistics”

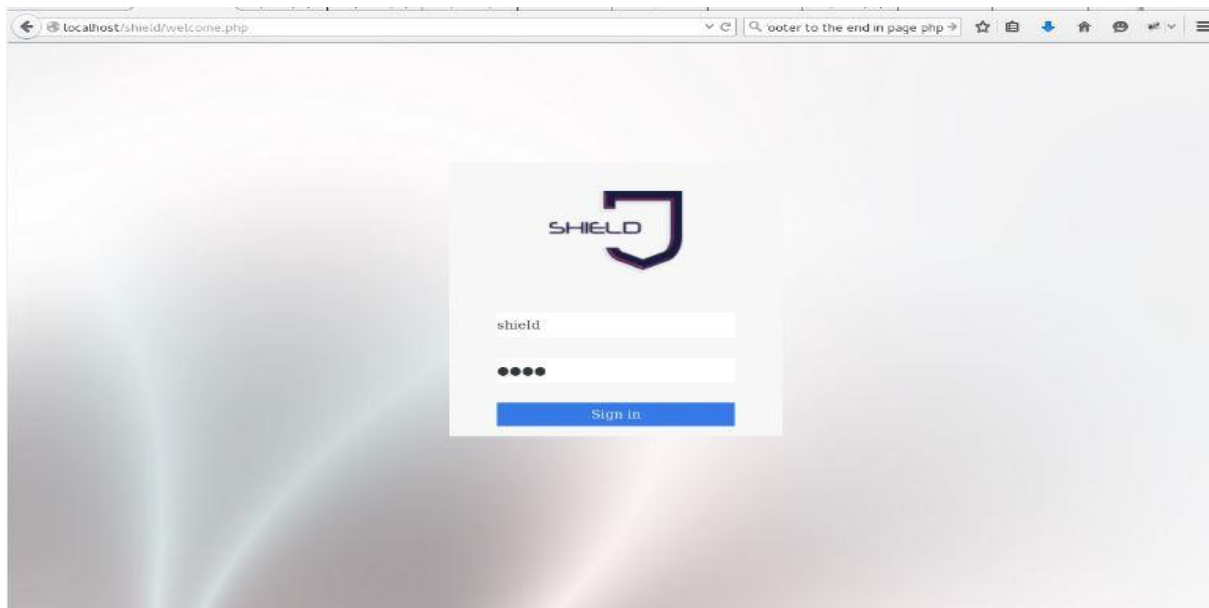
- User needs to click on this link to view graphs and statistics of the devices added in the earlier step.
- After clicking the link, user will be given a table with devices to choose.
- User needs to select the particular metric among 'cpu usage', 'memory', 'network input', 'network input', and 'disk usage' present in each device row.
- After the user selects the metric, user needs to click on "view" present in the next column of that particular device row in the table, to view the particular metric and device's statistical graph
- User can also see a table with the statistics of that particular device.

"Device Status"

- User needs to click on this link to know the status of the device whether it is in normal state, warning state or in critical state.
 - If the device is in normal state, it will be indicated in green colour.
 - If the device is in warning state, it will be indicated in orange colour.
 - If the device is in critical state, it will be indicated in red colour.
 - If the user wish to change the threshold values as per their usage, user needs to enter the respective threshold values and click on update to see the latest status of the devices.
 - User will be getting an email notification when a device is in warning state, to enable this feature, user needs to enter his email id in the column present at the end of the page.
- To logout, user needs to click on the logout button present in the top right corner.
 - To return to the home page from any page in the GUI i.e., the page containing the options to add/remove devices, view graphs, device status, click on the home button present in the top left corner in the page.

4.3 Procedure

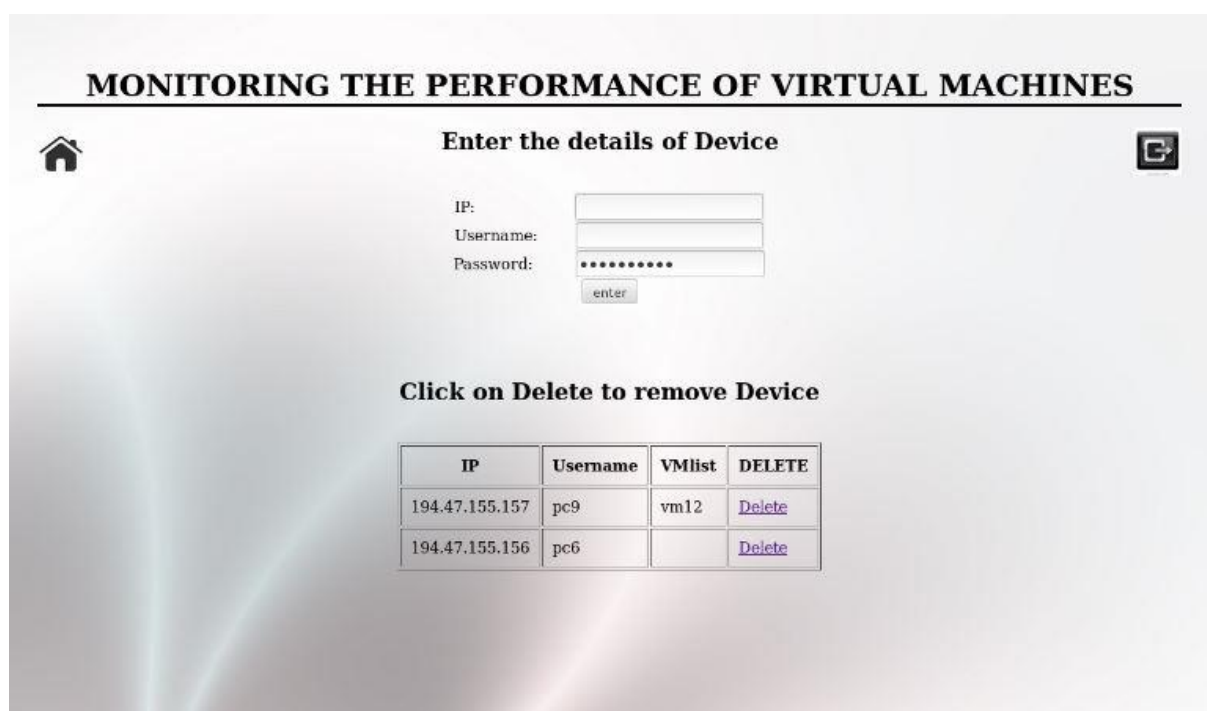
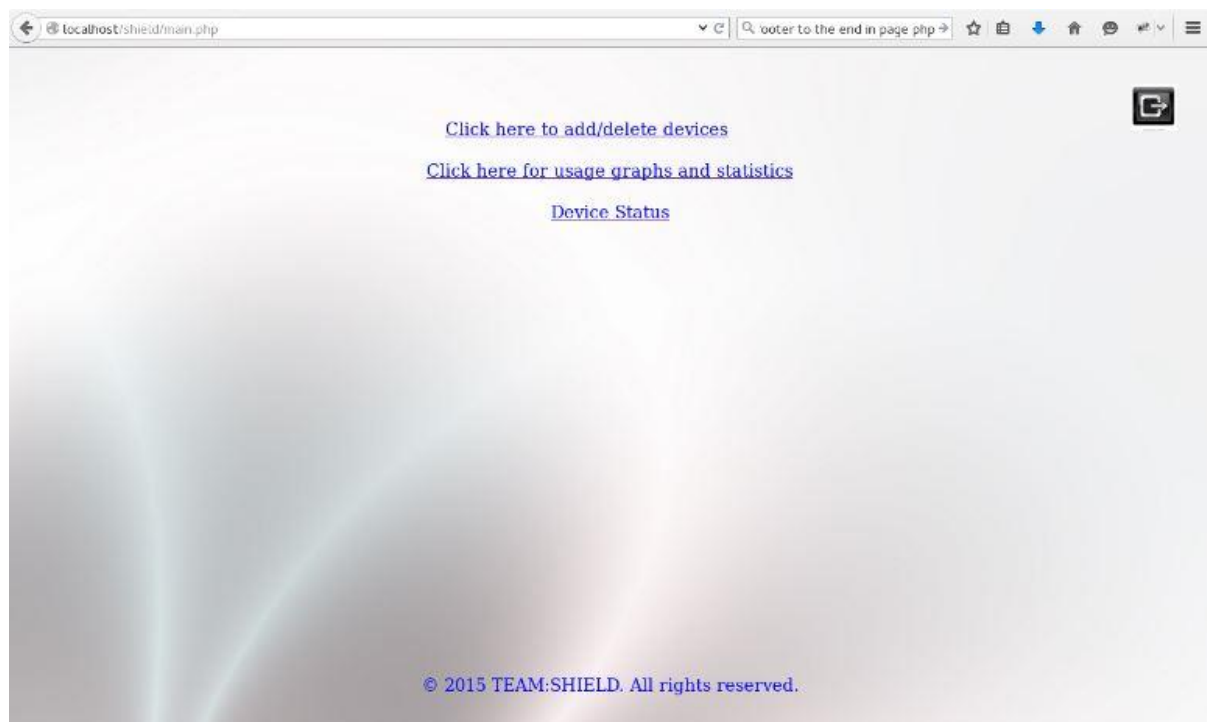
- Open Web server and enter the following URL
 - <https://localhost/SHIELD/welcome.php>
- For logging in, enter the username "shield" and password "1234".
- Open the db.conf found in the folder SHIELD of the final product and edit the password row. The existing password has to be replaced with the password the user gives while installing the packages.



- The user will be redirected to a page with the following links
 - Add/Delete devices
 - Click here to view graphs
 - Device status

To Add Devices


- To add devices, click “Click here to Add/Remove devices.”
- Enter the respective IP address, username, and password in the columns respectively.
- A table in the database project will be created automatically.
- Run the script `time.sh` in the terminal using `sudo ./time.sh`
- After the execution is done, refresh the webpage to see the devices added.




To Remove Devices

- To remove devices, click “Click here to Add/Remove devices.”
- Click delete option present in the table to remove the respective device from the table.
- The registered device is deleted.

MONITORING THE PERFORMANCE OF VIRTUAL MACHINES



Enter the details of Device



IP:

Username:

Password:


Click on Delete to remove Device

| IP | Username | VMlist | DELETE |
|----------------|----------|--------|------------------------|
| 194.47.155.154 | pc5 | | Delete |


To view the resource utilization statistics and graphs

- To see the resource utilization graphs, click “Click here to view Graphs”
- Select the device and resource utilization parameter from the drop down list and click ‘view’ to view the respective statistical graphs and a table with the values.

MONITORING THE PERFORMANCE OF VIRTUAL MACHINES



Click on view to see the statistics/graphs



| IP | Username | VM Name | Select | View: |
|----------------|----------|---------|---|-------------------------------------|
| 194.47.155.154 | pc5 | | <div style="border: 1px solid black; padding: 2px;"><div>CPU Usage ▾</div><div>CPU Usage</div><div>Memory Usage</div><div>Network Input Usage</div><div>Network Output Usage</div><div>Disk Usage</div></div> | <input type="button" value="view"/> |

To view the device status

- Click the “Device Status” button
 - *To change threshold values*
 - Edit the visible table with desired threshold values.

| IP | Username | VMname | cpu | memory | networkinput | networkoutput | disk |
|----------------|----------|--------|-----|----------|--------------|---------------|------|
| 194.47.155.154 | pc6 | | 2.7 | 8.582081 | 52246 | 12582 | 2.85 |

cpu

upper limit:

lower limit:

memory

upper limit:

lower limit:

network input

upper limit:

lower limit:

network output

upper limit:

lower limit:

disk

upper limit:

lower limit:

To logout

- To logout, user needs to click on the logout button present in the top right corner.