



LINUX CLUSTER MONITOR

Supermicro Solution and Integration Center

Aug. 18th 2020

Chenyang Li | Computer Hardware Engineer, Supermicro Inc.

Project lead by:

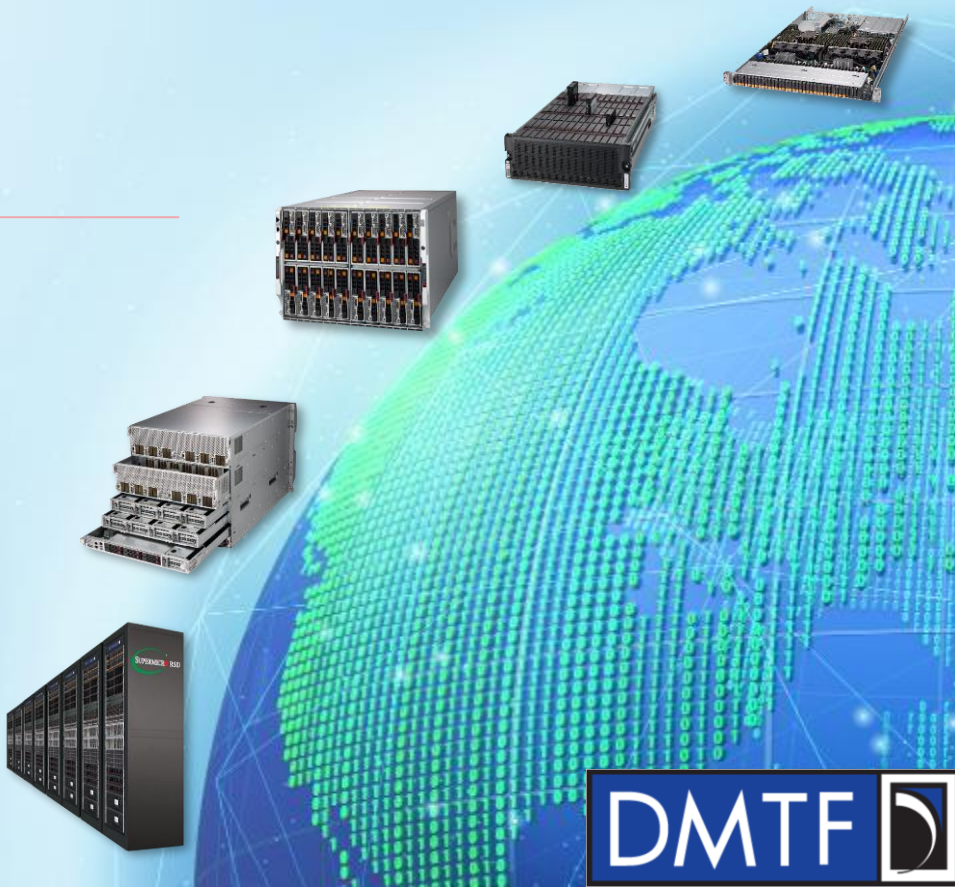
Reeann Zhang | Senior Engineer Manager, Supermicro Inc.

Contributed by:

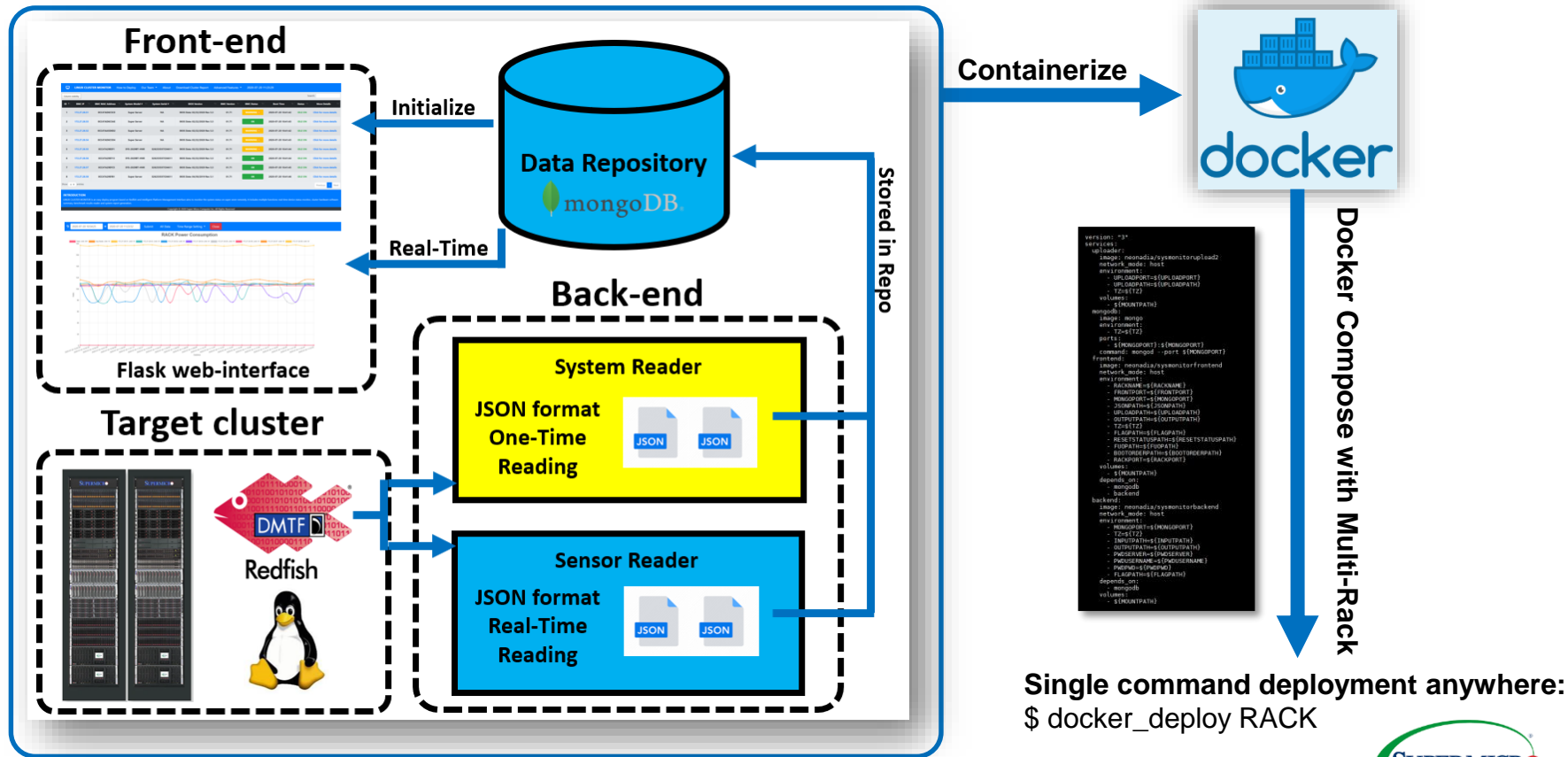
Byron Wang | System Engineer, Supermicro Inc.

Kevin Yu | Software Engineer, Supermicro Inc.

We Keep IT Green™



Program Architecture



Current Progress Overview

Front-end:

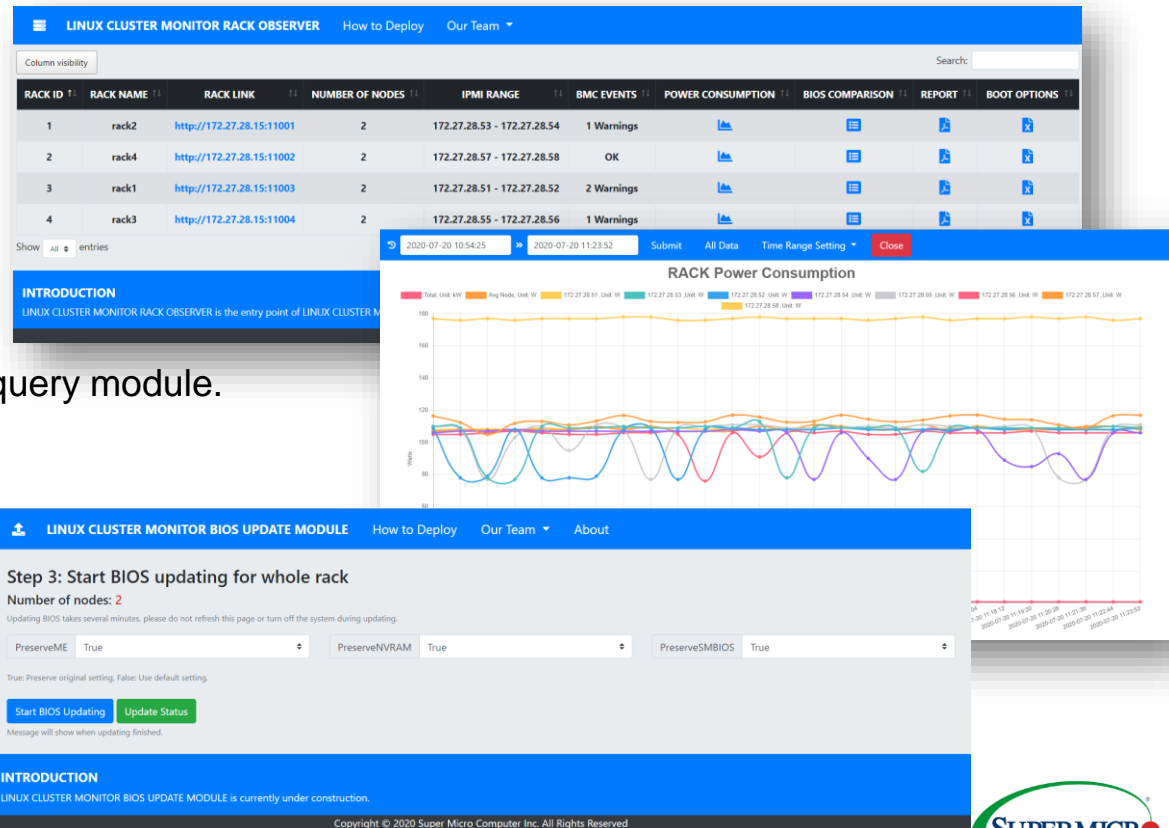
1. Advanced features.
2. Rack view.
3. System status.
4. Remade every single page

Back-end:

1. System password reading and query module.
2. Real-time diagram display.
3. Efficiency improvement.

Docker:

1. Containerize the program.
2. Compose the docker image.
3. Multiple-racks deployment.



Home Page: Node View

Linux Cluster Monitor

Home View Detailed Cluster Summary

Cluster Information									
BMC IP	BMC MAC Address	System Model #	System Serial #	BIOS Version	BMC Version	BMC Status	Timestamp	Last Status	More Details
172.27.28.11	9CC4ADMC1C3	Super Server	α	BIOS Date: 04/30/2019 Rev: 3.1	01.71	OK	2019-11-13 09:53:04	TBD	Click for more details
172.27.28.12	9CC4AAD1D02	Super Server	NA	BIOS Date: 04/30/2019 Rev: 3.1	01.71	OK	2019-11-13 09:53:04	TBD	Click for more details
172.27.28.13	9CC4ADMC1A6	Super Server	NA	BIOS Date: 04/30/2019 Rev: 3.1	01.71	OK	2019-11-13 09:53:05	TBD	Click for more details
172.27.28.14	9CC4ADMC1D4	Super Server	NA	BIOS Date: 04/30/2019 Rev: 3.1	01.71	OK	2019-11-13 09:53:05	TBD	Click for more details
172.27.28.15	9CC4A3MEF13	Super Server	9262313X7C0461	BIOS Date: 04/30/2019 Rev: 3.1	01.71	OK	2019-11-13 09:53:05	TBD	Click for more details
172.27.28.16	9CC4A3MEF13	Super Server	9262313X7C0461	BIOS Date: 04/30/2019 Rev: 3.1	01.71	OK	2019-11-13 09:53:05	TBD	Click for more details
172.27.28.17	9CC4A3MEF13	Super Server	9262313X7C0461	BIOS Date: 04/30/2019 Rev: 3.1	01.71	OK	2019-11-13 09:53:05	TBD	Click for more details
172.27.28.18	9CC4A3MEF18	Super Server	9262313X7C0461	BIOS Date: 04/30/2019 Rev: 3.1	01.71	OK	2019-11-13 09:53:06	TBD	Click for more details

Prototype

By the end of Feb. 2020

New contents:

- BMC status real-time displays.
- Advanced features.
- PDF report.
- Program introduction.
- Foot notes.

.....

LINUX CLUSTER MONITOR Advanced Features Documentations Our Team About 2020-08-18 10:08:17

Column visibility Search

ID	IPVIM	BMC MAC Address	System Model #	System Serial #	BIOS Version	BMC Version	BMC Status	Boot Time	Status	Info & Sensors
1	172.25.4.226	3CECF3BEC46	SYS-9029GP-TNVRT-F1016	S400652X0705820	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING !	2020-08-17 11:13:23	IDLE ON	Info
2	172.25.4.228	3CECF3AFA2E	SYS-9029GP-TNVRT-F1016	S400652X0705832	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING !	2020-08-17 11:13:22	IDLE ON	Info
3	172.25.4.224	3CECF3BEBAD	SYS-9029GP-TNVRT-F1016	S400652X0705839	BIOS Date: 01/22/2020 Rev 3.2	01.00	ERROR ?	2020-08-17 11:13:24	IDLE ON	Info
4	172.25.4.220	3CECF3AFA19	SYS-9029GP-TNVRT-F1016	S400652X0705815	BIOS Date: 01/22/2020 Rev 3.2	01.00	OK	2020-08-17 11:13:26	IDLE ON	Info
5	172.25.4.222	3CECF3BEB9B	SYS-9029GP-TNVRT-F1016	S400652X0705833	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING !	2020-08-17 11:13:25	IDLE ON	Info
6	172.25.4.216	3CECF3BE71F	SYS-9029GP-TNVRT-F1016	S400652X0705811	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING !	2020-08-17 11:13:28	IDLE ON	Info
7	172.25.4.218	3CECF3BE37B	SYS-9029GP-TNVRT-F1016	S400652X0705812	BIOS Date: 01/22/2020 Rev 3.2	01.00	OK	2020-08-17 11:13:27	IDLE ON	Info
8	172.25.4.214	3CECF3BEC47	SYS-9029GP-TNVRT-F1016	S400652X0705818	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING !	2020-08-17 11:13:28	IDLE ON	Info
9	172.25.4.210	3CECF3BEAEB	SYS-9029GP-TNVRT-F1016	S400652X0705836	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING !	2020-08-17 11:13:31	IDLE ON	Info
10	172.25.4.212	3CECF3BEBAF	SYS-9029GP-TNVRT-F1016	S400652X0705837	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING !	2020-08-17 11:13:29	IDLE ON	Info

Show 10 entries

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INTRODUCTION

LINUX CLUSTER MONITOR is an easy deploy program based on Redfish and Intelligent Platform Management Interface aims to monitor the system status on super server remotely. It includes multiple functions: real-time device status monitor, cluster hardware/software summary, benchmark results reader and system report generation.

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Current version

By the end of July 2020

Remake:

1. New navigation bar with dropdown menu.
2. New system overall information table.
3. Dynamical interface.



Home Page: Node View

LINUX CLUSTER MONITOR Advanced Features Documentations Our Team About 2020-08-18 10:08:17

Column visibility Search

ID	IPV4	BMC MAC Address	System Model #	System Serial #	BIOS Version	BMC Version	BMC Status	Boot Time	Status	Info & Sensors
1	172.25.4.226	3CECF38EC46	SYS-9029GP-TNVRT-F1016	S400652X0705820	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:23	IDLE ON	
2	172.25.4.228	3CECF3AFA2E	SYS-9029GP-TNVRT-F1016	S400652X0705832	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:22	IDLE ON	
3	172.25.4.224	3CECF38E8AD	SYS-9029GP-TNVRT-F1016	S400652X0705839	BIOS Date: 01/22/2020 Rev 3.2	01.00	ERROR 2	2020-08-17 11:13:22	IDLE ON	
4	172.25.4.220	3CECF3AFA19	SYS-9029GP-TNVRT-F1016	S400652X0705815	BIOS Date: 01/22/2020 Rev 3.2	01.00	OK	2020-08-17 11:13:26	IDLE ON	
5	172.25.4.222	3CECF38E998	SYS-9029GP-TNVRT-F1016	S400652X0705833	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:25	IDLE ON	
6	172.25.4.216	3CECF38E71F	SYS-9029GP-TNVRT-F1016	S400652X0705811	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:28	IDLE ON	
7	172.25.4.218	3CECF38E57B	SYS-9029GP-TNVRT-F1016	S400652X0705812	BIOS Date: 01/22/2020 Rev 3.2	01.00	OK	2020-08-17 11:13:27	IDLE ON	
8	172.25.4.214	3CECF38EC47	SYS-9029GP-TNVRT-F1016	S400652X0705818	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:28	IDLE ON	
9	172.25.4.210	3CECF38E4EB	SYS-9029GP-TNVRT-F1016	S400652X0705836	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:31	IDLE ON	
10	172.25.4.212	3CECF38E8AF	SYS-9029GP-TNVRT-F1016	S400652X0705837	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:29	IDLE ON	

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INTRODUCTION
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Home

Power

Voltages

Temperatures

Fans

Generate Report

About

SYSTEM SUMMARY

BMC IP

172.27.28.51

Datetime

2020-04-27 21:42:27

UUID

00000000-0000-0000-0000-0CC4AD6C5CB3

Systems

1

Description

Description of server

SerialNumber

1

Model

Super Server

ProcessorSummary

Count

2

Model

Intel(R) Xeon(R) processor

MemorySummary

TotalSystemMemoryGB96

SimpleStorage

1

Devices

Name

Model

Slot 0 (NVMe Device)

Micron, 9300_MTFHAL38TCT

Slot 1 (NVMe Device)

Micron, 9300_MTFHAL38TCT

Details page

Monitor boot up timestamp

Documentations

- Deployment Manual
- Development Notes
- Cluster Report

Readme

Our Team

- Team BLOG
- Team Site

Team Sites

ERROR 9	2020-04-27 21:42:28	TBD
9 04/08/2020 05:59:43 Session Audit #0xff Asserted		
8 04/08/2020 05:59:42 Session Audit #0xff Asserted		
7 04/08/2020 05:57:59 Session Audit #0xff Asserted		
6 04/08/2020 05:57:58 Session Audit #0xff Asserted		
5 04/08/2020 05:57:57 Session Audit #0xff Asserted		
More Events		
WARNING 4	2020-04-27 21:42:30	TBD

Home About

BMC Events LOG

1 | 10/08/2020 | 01:20:42 | Unknown Error | Asserted
2 | 02/14/2020 | 21:33:03 | Memory | Unrecoverable ECC (0000000000000000) | Asserted
3 | 04/08/2020 | 05:59:43 | Session Audit #0xff | Asserted
4 | 04/08/2020 | 05:57:59 | Session Audit #0xff | Asserted
5 | 04/08/2020 | 05:57:58 | Session Audit #0xff | Asserted
6 | 04/08/2020 | 05:57:57 | Session Audit #0xff | Asserted
7 | 04/08/2020 | 05:57:56 | Session Audit #0xff | Asserted
8 | 04/08/2020 | 05:57:55 | Session Audit #0xff | Asserted
9 | 04/08/2020 | 05:57:54 | Session Audit #0xff | Asserted
10 | 04/08/2020 | 05:57:53 | Session Audit #0xff | Asserted

INTRODUCTION
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Events log



Home Page: Node View

LINUX CLUSTER MONITOR **Advanced Features** Documentations Our Team About 2020-08-18 10:08:17

Column visibility Search:

ID	IKVM	BMC MAC Address	System Model #	System Serial #	BIOS Version	BMC Version	BMC Status	Boot Time	Status	Info & Sensors
1	172.25.4.226	3CECF3BEC46	SYS-9029GP-TNVRT-F1016	S400652X0705820	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:23	IDLE ON	Info
2	172.25.4.228	3CECF3AFA2E	SYS-9029GP-TNVRT-F1016	S400652X0705832	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:22	IDLE ON	Info
3	172.25.4.224	3CECF3BEBAD	SYS-9029GP-TNVRT-F1016	S400652X0705839	BIOS Date: 01/22/2020 Rev 3.2	01.00	ERROR 7	2020-08-17 11:13:24	IDLE ON	Info
4	172.25.4.220	3CECF3AFA19	SYS-9029GP-TNVRT-F1016	S400652X0705815	BIOS Date: 01/22/2020 Rev 3.2	01.00	OK	2020-08-17 11:13:26	IDLE ON	Info
5	172.25.4.222	3CECF3BE89B	SYS-9029GP-TNVRT-F1016	S400652X0705855	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:25	IDLE ON	Info
6	172.25.4.216	3CECF3BE71F	SYS-9029GP-TNVRT-F1016	S400652X0705811	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:28	IDLE ON	Info
7	172.25.4.218	3CECF3BE57B	SYS-9029GP-TNVRT-F1016	S400652X0705812	BIOS Date: 01/22/2020 Rev 3.2	01.00	OK	2020-08-17 11:13:27	IDLE ON	Info
8	172.25.4.214	3CECF3BEC47	SYS-9029GP-TNVRT-F1016	S400652X0705818	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:28	IDLE ON	Info
9	172.25.4.210	3CECF3BEAE8	SYS-9029GP-TNVRT-F1016	S400652X0705836	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:31	IDLE ON	Info
10	172.25.4.212	3CECF3BE8AF	SYS-9029GP-TNVRT-F1016	S400652X0705837	BIOS Date: 01/22/2020 Rev 3.2	01.00	WARNING 1	2020-08-17 11:13:29	IDLE ON	Info

Show 10 entries

Previous 1 2 Next

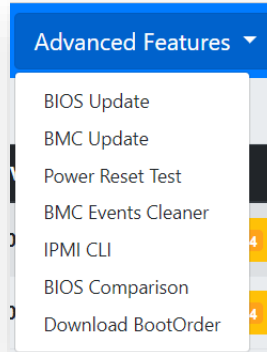
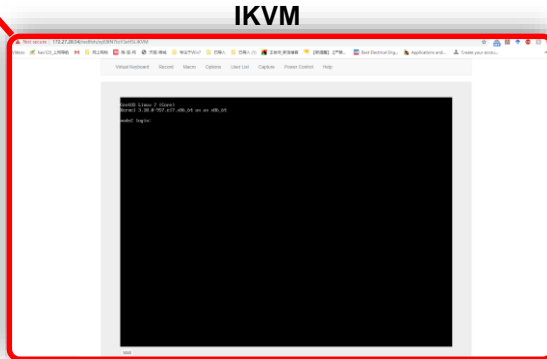
INTRODUCTION
LINUX CLUSTER MONITOR is an easy-to-use program based on Redfish and Intelligent Platform Management Interface aims to monitor the system status on super server remotely. It includes multiple functions: real-time device status monitor, cluster hardware software summary, benchmark results reader and system report generator.
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Keyword Search: row customization


Monitor & System Status

Pages

Column Customization



Advanced Features: Bios Update

 **LINUX CLUSTER MONITOR BIOS UPDATE MODULE** [How to Deploy](#) [Our Team](#) [About](#)

Step 1: Upload BIOS binary file:

Choose your binary file

Check MB model with "dmidecode -l 2" and visit [SuperMicroBIOS](#) to download binary file

File will be uploaded into local sever.

Step 2: Choose a server to update:

Choose a server

DO NOT CHOOSE LOCAL SERVER FOR BIOS UPDATING.


INTRODUCTION

LINUX CLUSTER MONITOR BIOS UPDATE MODULE is currently under construction.

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Upload binary file from local

Choose one or multiple servers

 **LINUX CLUSTER MONITOR BIOS UPDATE MODULE** [How to Deploy](#) [Our Team](#) [About](#)

Step 3: Start BIOS updating for whole rack

Number of nodes: 2

Updating BIOS takes several minutes, please do not refresh this page or turn off the system during updating.

True

True

True

True: Preserve original setting. False: Use default setting.

Message will show when updating finished.

INTRODUCTION

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Update settings

Update status display



Advanced Features: BMC Update

 **LINUX CLUSTER MONITOR BMC UPDATE MODULE** [How to Deploy](#) [Our Team](#) [About](#)

Step 1: Upload BMC binary file:

Choose your binary file

Choose File No file chosen

Check MB model with "dmidecode -t 2" and visit [SuperMicroBMC](#) to download binary file

Upload file

File will be uploaded into local sever.

Step 2: Choose a server to update:

Choose a server

Server List

DO NOT CHOOSE LOCAL SERVER FOR BMC UPDATING.

INTRODUCTION

LINUX CLUSTER MONITOR BMC UPDATE MODULE is currently under construction.

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Upload binary file from local

Choose one or multiple servers

 **LINUX CLUSTER MONITOR BMC UPDATE MODULE** [How to Deploy](#) [Our Team](#) [About](#)

Step 3: Start BMC updating for multiple nodes:

Number of nodes: 2

Updating BMC takes several minutes, please do not refresh this page or turn off the system during updating.

PreserveCFG True

PreserveSDR True

PreserveSSL True

True: Preserve original setting, False: Use default setting.

Start BMC Updating Update Status

Message will show when updating finished.

INTRODUCTION

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Update settings

Update status display



Advanced Features: IPMI CLI

🏠 IPMITOOL COMMAND LINE

Current Selected IPs

Documentations

Our Team

About

Step 1: Config Input IPs

Option 1: Upload a text file of the BMC IPs

Choose your text file

Choose File

No file chosen

Please upload a text file of VLAN BMC IPs, one IP per line

UPLOAD FILE

File will be uploaded into local server.

Option 2: Input IPs

Input IP range

IP starts from (Included)

IP ends (Not included)

CREATE FILE

Input file will be created.

Step 2: Enter IPMITOOL commands

ipmitool -H IPMIIP -U ADMIN -P PWD

addr list full

Please input valid ipmitool command

Example: get_sensors

SUBMIT

INTRODUCTION

LINUX CLUSTER MONITOR TESTING MODULE is currently under construction.

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Choose one or multiple node:

Option 1: upload file.

Option 2: Input an IP range.

IPMI syntax with auto fill:

**Authentications & Hostname,
pipe is supported.**

```
Home | Documentations | Our Team | About

IPMI CLI STDOUT

17/12/25-4:20:01 start herat
17/12/25-4:20:01 end herat
17/12/25-4:20:02 start herat
17/12/25-4:20:02 [1/2/3/5] Unknown K80FF [1] Assorted
17/12/25-4:20:02 end herat
17/12/25-4:20:02 start herat
17/12/25-4:20:02 [1/1/4/25] Unknown K80FF [1] Assorted
17/12/25-4:20:03 [2/05/00] Temperature K80FF [Upper Critical going high] Assorted
17/12/25-4:20:03 [00/07/00] Temperature K80FF [Upper Critical going high] Deasserted
47/12/25-4:20:03 [2059/27] Temperature K80FF [Upper Critical going high] Assorted
47/12/25-4:20:03 [01/33/35] Temperature K80FF [Upper Critical going high] Deasserted
17/12/25-4:20:03 [01/13/02] Temperature K80FF [Upper Critical going high] Assorted
17/12/25-4:20:03 [01/12/30] Temperature K80FF [Upper Critical going high] Deasserted
17/12/25-4:20:04 start herat
17/12/25-4:20:04 end herat
17/12/25-4:20:04 start herat
17/12/25-4:20:04 end herat
17/12/25-4:20:04 start herat
17/12/25-4:20:04 end herat
17/12/25-4:20:04 start herat
17/12/25-4:20:04 end herat

INTRODUCTION
Advanced features are currently under construction

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```

IPMI command line standard output

IPMI command line standard error output



Advanced Features: BIOS Comparison

[Home](#) [How to Deploy](#) [Our Team](#) [About](#)

BIOS Settings Comparison Results

No.1:

***** Golden Sample *****

ip	172.27.28.57
PPRType	Hard PPR
HttpBootOneTime	None
Intel® VMDforVolumeManagementDeviceforPStack0	None
Intel® VMDforVolumeManagementDeviceforPStack252	None
Sdelete	None

***** Different Node *****

ip	172.27.28.58
PPRType	Auto
HttpBootOneTime	Disable
Intel® VMDforVolumeManagementDeviceforPStack0	Disable
Intel® VMDforVolumeManagementDeviceforPStack252	Disable
Sdelete	<ul style="list-style-type: none">• ARISupport• EnhancedPPR• HTTPBootOneTime• Intel® VMDforVolumeManagementDeviceforPStack0(NVMeDrive4-5)• Intel® VMDforVolumeManagementDeviceforPStack2(NVMeDrive0-3)• OperationMode• PanicandHighWatermark• ResetKeyType• SecureBoot• SecureBootMode• SecurityFunction• tRFCOptimizationfor16GbBasedDIMM

***** Golden Sample All Settings *****

2xRefresh	Auto
ACSCControl	Enable
AES- NI	Enable
ARISupport	Enabled
ATS	Enable
Above4GDecoding	Enabled
AdjacentCachePrefetch	Enable
AggressiveLinkPowerManagement	Disable
AggressiveLinkPowerManagement\$2	Disable
AutonomousCoreC- State	Disable
Bitspersecond	115200
Bitspersecond\$2	115200

BIOS comparison results:

1. Settings are obtained real-time.
2. Golden sample is the settings of the node which is consistent with most nodes.
3. Comparison result only shows the different settings.

All the settings of golden sample.

\$replace: additional items.
\$delete: non-exist items.
Golden Sample: Sample node sharing the highest number of identicle settings with other nodes.
Different Node: Node with different BIOS setting compared to golden sample node.
No Settings Obtained: no attribute found in the bios setting, might be due to all defaults or error 403.

Legends of comparison results



Other Advanced Features

LCM also have:

1. Power Recycle Tests
2. BMC events cleaner
3. Boot option spread sheet generator

LINUX CLUSTER MONITOR REBOOT TEST

Current Selected IPs

Back Power

How to Deploy

Our Team

About

Step 1: Config Input IPs

Option 1: Upload a text file of the BMC IPs

Choose your text file

Choose File

No file chosen

Please upload a text file of **IPMI** BMC IPs, one IP per line

UPLOAD FILE

File will be uploaded into local server.

Option 2: Input IPs

Input IP range

IP starts from (Included)

IP ends (Not included)

CREATE FILE

Input file will be created.

Step 2: Enter test parameters

Time between off and on (Units: min)

Time between on and off (Units: min)

Number of reboot runs

Please input valid numbers greater than 0 as test parameters

Example: Time between off and on 1; Time between on and off 2; Number of reboot runs 2

The script will shut down and power off the system for 1 minute and turn on, then wait 2 minutes and turn off. Test will be executed 2 times.

RUN TEST

TEST STATUS

INTRODUCTION

LINUX CLUSTER MONITOR TESTING MODULE is currently under construction.

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A	B	C	D
IPMI_IP	BootOption1	BootOption2	BootOption3
172.27.28.51	USB CD/DVD	UEFI: Built-in EFI Shell	ISATA P1: Micron_5100_MTFDDAV4(SATA,Port:1)
172.27.28.52	Hard Disk: Micron_5100_MTFDDAV4	UEFI: Built-in EFI Shell	ISATA P1: Micron_5100_MTFDDAV4(SATA,Port:1)
172.27.28.53	Hard Disk: Micron_5100_MTFDDAV4	UEFI: Built-in EFI Shell	ISATA P1: Micron_5100_MTFDDAV4(SATA,Port:1)
172.27.28.54	Hard Disk: Micron_5100_MTFDDAV4	UEFI: Built-in EFI Shell	ISATA P1: Micron_5100_MTFDDAV4(SATA,Port:1)
172.27.28.55	N/A	N/A	N/A
172.27.28.56	Hard Disk: Micron_5100_MTFDDAV4	UEFI: Built-in EFI Shell	ISATA P0: Micron_5100_MTFDDAV4(SATA,Port:0)
172.27.28.57	Hard Disk: Micron_5100_MTFDDAV4	UEFI: Built-in EFI Shell	ISATA P1: Micron_5100_MTFDDAV4(SATA,Port:1)
172.27.28.58	Hard Disk: Micron_5100_MTFDDAV4	UEFI: Built-in EFI Shell	ISATA P1: Micron_5100_MTFDDAV4(SATA,Port:1)

LINUX CLUSTER MONITOR BMC EVENT CLEANER

Home

Current Selected IPs

How to Deploy

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About

Step 1: Config Input IPs

Option 1: Upload a text file of the BMC IPs

Choose your text file

Choose File

No file chosen

Please upload a text file of **IPMI** BMC IPs, one IP per line

UPLOAD FILE

File will be uploaded into local server.

Option 2: Input IPs

Input IP range

IP starts from (Included)

IP ends (Not included)

CREATE FILE

Input file will be created.

Step 2: Run the cleaner

Selecting "RUN CLEANER" will clean the BMC events for all the BMC IPs listed in the text file.

RUN CLEANER

INTRODUCTION

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Home Page: Rack View

[LINUX CLUSTER MONITOR RACK OBSERVER](#)
[How to Deploy](#)
[Our Team](#)

Column visibility

Search:

RACK NAME	RACK LINK	NUMBER OF NODES	IPMI RANGE	BMC EVENTS	POWER CONSUMPTION	BIOS COMPARISON	REPORT	BOOT OPTIONS
rack1	http://172.27.28.15:11001	2	172.27.28.51 - 172.27.28.52	2 Warnings				
rack2	http://172.27.28.15:11003	2	172.27.28.53 - 172.27.28.54	1 Warnings				
rack3	http://172.27.28.15:11004	2	172.27.28.55 - 172.27.28.56	1 Warnings				
rack4	http://172.27.28.15:11002	2	172.27.28.57 - 172.27.28.58	OK				

Show entries

Previous

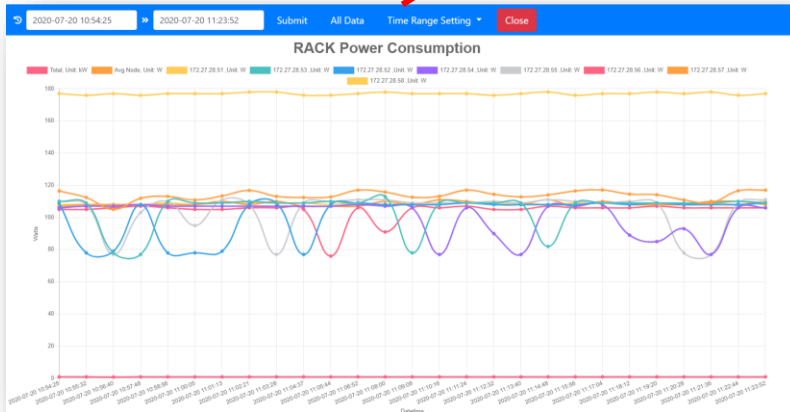
Next

INTRODUCTION

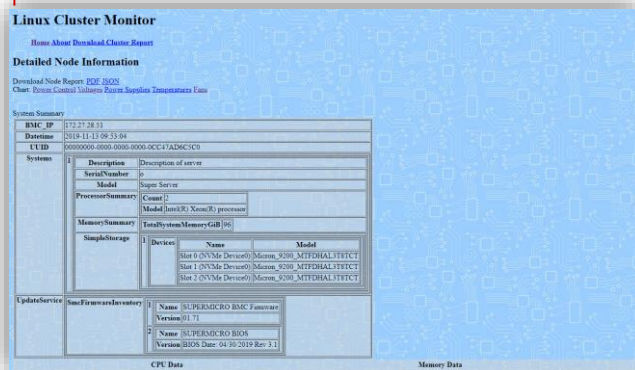
LINUX CLUSTER MONITOR RACK OBSERVER is the entry point of LINUX CLUSTER MONIOTR .

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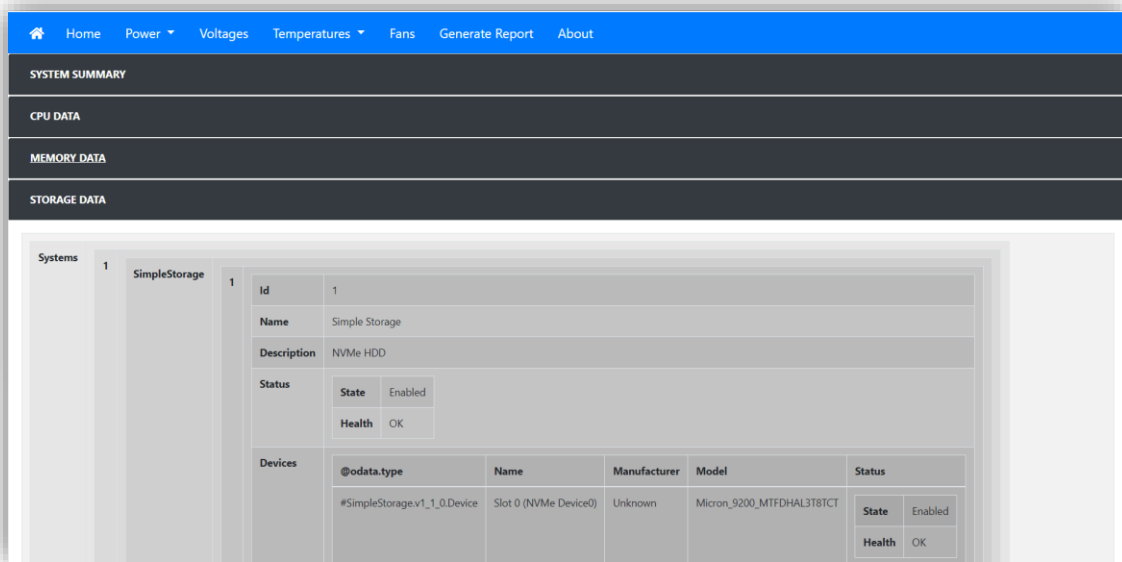
IPMI AP	B		C		D	
	BootOption1	BootOption2	BootOption3	BootOption4	BootOption5	BootOption6
172.27.28.51	USB CD/DVD		UEFI: Built-in EFI Shell		ISATA P1: Micron_5100_MTFDDAV4(SATA.P1)	
172.27.28.52	Hard Disk: Micron_5100_MTFDDAV4		UEFI: Built-in EFI Shell		ISATA P1: Micron_5100_MTFDDAV4(SATA.P1)	
172.27.28.53	Hard Disk: Micron_5100_MTFDDAV4		UEFI: Built-in EFI Shell		ISATA P1: Micron_5100_MTFDDAV4(SATA.P1)	
172.27.28.54	Hard Disk: Micron_5100_MTFDDAV4		UEFI: Built-in EFI Shell		ISATA P1: Micron_5100_MTFDDAV4(SATA.P1)	
172.27.28.55	N/A		N/A		N/A	
172.27.28.56	Hard Disk: Micron_5100_MTFDDAV4		UEFI: Built-in EFI Shell		ISATA P0: Micron_5100_MTFDDAV4(SATA.P0)	
172.27.28.57	Hard Disk: Micron_5100_MTFDDAV4		UEFI: Built-in EFI Shell		ISATA P1: Micron_5100_MTFDDAV4(SATA.P1)	
172.27.28.58	Hard Disk: Micron_5100_MTFDDAV4		UEFI: Built-in EFI Shell		ISATA P1: Micron_5100_MTFDDAV4(SATA.P1)	

[illegible][illegible]

Details Page



Prototype
By the end of Feb. 2020



Current version

By the end of July 2020

Remake:

1. New navigation bar with dropdown menu.
2. New hardware information table.

New functions:

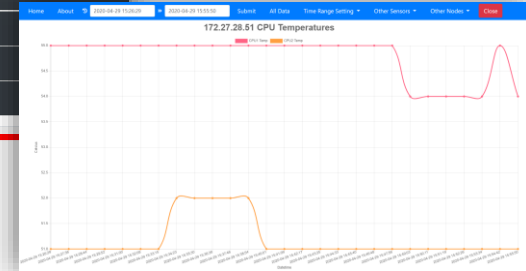
- Report generator.
- Collapsible table.
- More diagrams.
- Foot notes.

Details Page

The screenshot shows the 'Temperatures' dropdown menu with the following options:

- Processors
- Voltage Regulator Module
- Dual In-Line Memory Module
- Others

Red lines indicate the navigation path from the 'Temperatures' menu to the 'Processors' option and then to the 'Detailed Node Information' section.



Sensor diagram

SYSTEM SUMMARY

BMC IP: 172.27.28.51
Datetime: 2020-07-21 14:40:47
UUID: 00000000-0000-0000-0000-0CC47AD6C5D0

System: 1

Description	Description of server
SerialNumber	1
Model	Super Server
ProcessorSummary	Count: 2 Model: Intel(R) Xeon(R) processor
MemorySummary	TotalSystemMemoryGiB: 96
SimpleStorage	1

Devices	Name	Manufacturer	Model
#SimpleStorage.v1_1_0.Device	Slot 0 (NVMe Device)	Unknown	Micron_9200_MTFDHAL
#SimpleStorage.v1_1_0.Device	Slot 1 (NVMe Device)	Unknown	Micron_9200_MTFDHAL
#SimpleStorage.v1_1_0.Device	Slot 2 (NVMe Device)	Unknown	Micron_9200_MTFDHAL

Collapsible table

Detailed Node Information

System Summary

BMC IP	172.27.28.51
Datetime	2020-07-21 14:40:47
UUID	00000000-0000-0000-0000-0CC47AD6C5D0
Description	Description of server
SerialNumber	PW
Model	Super Server
ProcessorSummary	Count: 2 Model: Intel(R) Xeon(R) processor
MemorySummary	TotalSystemMemoryGiB: 96
SimpleStorage	1
UpdateService	SmcFirmwareInventory
Name	SUPERMICRO BMC Firmware
Version	01.71
Name	SUPERMICRO BIOS
Version	BIOS Date: 02/22/2020 Rev 3.3

CPU Summary

Model	Count	Cores per CPU	Max Speed MHz
Intel(R) Xeon(R) Gold 6242 CPU @ 2.80GHz	2	16	4500

Memory Summary

Count	Capacity MB	Device Type	Operating Speed MHz	Manufacturer	Part Number
12	8192	DDR4	2666	Micron Technology	9ASF1GT2P2-3G6D1

Memory Serial Numbers

1EEB2568
1EEB24EC
1EEB2AC1
1EEB2552
1EEB2518
1EEB2A79
1EEB2B0D
1EEB2B5F
1EEB2A02
1EEB2B04
1EEB2167
1EEB2143

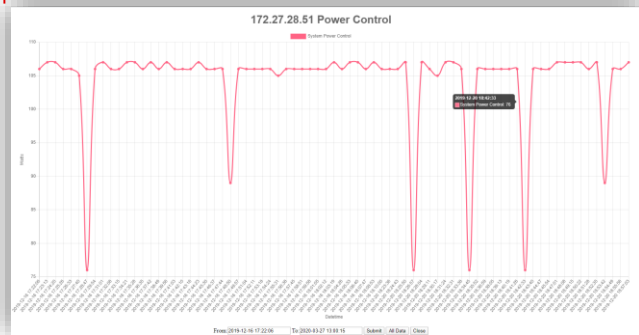
Storage Summary

Description	Drive Count	Model
NVMe HDD	3	Micron_9200_MTFDHAL3T8CT

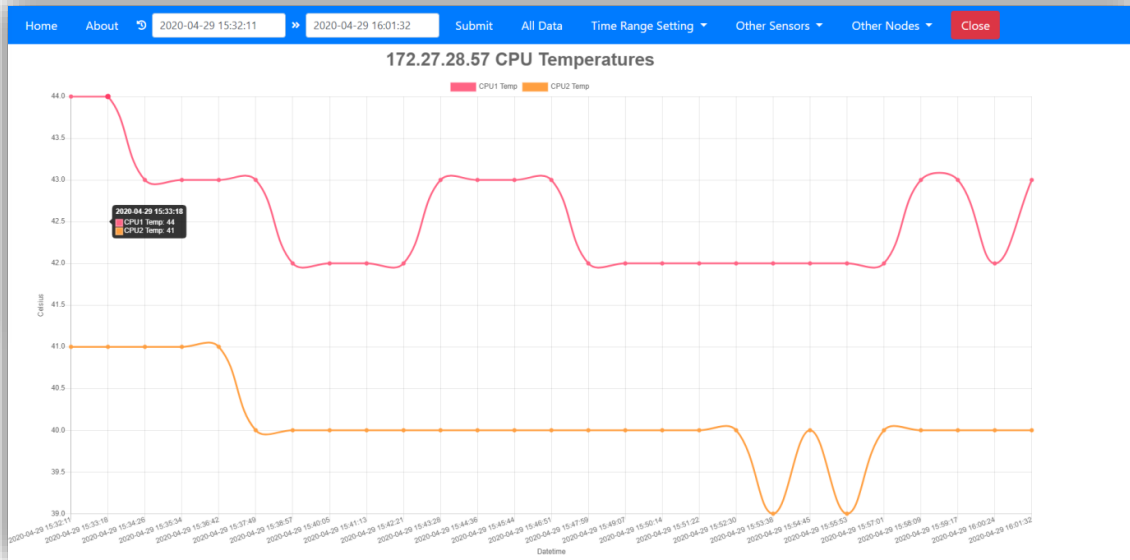
PCIe Summary



Sensor Diagram Page



Prototype
By the end of Feb. 2020



Current version

By the end of July 2020

Remake:

1. Performance optimization for the diagram, resolve lagging issue.
2. Adjust layout for all the buttons.
3. Remake the style to fit other pages.

New functions:

- Navigation bar.
- Auto time-range settings.
- Hyper-link to other nodes.
- Hyper-link to other sensors.
- Auto update.

Sensor Diagram Page



Other Nodes

172.27.28.51
172.27.28.52
172.27.28.53
172.27.28.54
172.27.28.55
172.27.28.56
172.27.28.57
172.27.28.58



Other Sensors

Power Consumption
Power Supply Voltage
Power Supply Power
Voltage
Processors Temp
VRM Temp
DIMM Temp
Others Temp
Fan Speed



Time Range Setting

Last half-hour
Last hour
Last day

Manual Time Range

Details Reading

Auto Time Range

Other Pages

Linux Cluster Monitor

[Home](#) [About](#) [Download Cluster Report](#)

Program created by:

Kevin Yu

Byron Wang

For more information, please visit:

[Supermicro Solution and Integration Center](#)

Linux Cluster Monitor

[Home](#) [About](#) [Download Cluster Report](#)

BMC Event

[Event: '1 | 10/11/2019 | 20:57:03 | Unknown #0x0f | Asserted', '2 | 10/25/2019 | 21:24:03 | Session Audit #0x0f | Asserted', '3 | 10/28/2019 | 01:30:05 | Unknown #0x0f | Asserted']

Prototype

By the end of Feb. 2020

Home

How to Deploy

Our Team

About

About

Learn about the development and maintaining Linux Cluster Monitor, how and why the project started.

Developers information

This project is lead by **Resuan Zheng**, the manager of Back team. It is created and currently maintained by:

- Kevin Yu**, HPC/Cloud benchmarking and automation software cluster testing
- Byron Wang**, System engineer working to enable HPC/Cloud solutions on Supermicro's server platforms
- Changyong Li's**, Computer hardware engineer focus on machine learning, software design and cluster testing

Architecture

This program consists of two parts: the front-end and back-end. The front-end is based on Back a micro web framework written in Python. The back-end is supported by mongoDB, RedisDB module and Intelligent Platform Management Interface (IPMI) module. The real-time system data is query from Baseboard Management Controller (BMC) by redisDB module and IPMI module, stored in the mongoDB database. And the data is visualized by the webpage front-end.

The latest program has included the docker and docker-compose support for this program. By using docker-compose command, it can be tested by one the command.

Program Architecture

The diagram illustrates the program architecture. The Front-end (web browser) connects to the Back-end (Python application). The Back-end connects to the Target cluster (server) via a Docker container. The Target cluster connects to the BMC (Baseboard Management Controller) via a Docker container. The BMC connects to the IPMI (Intelligent Platform Management Interface) module. The IPMI module connects to the RedisDB module. The RedisDB module connects to the mongoDB database. The mongoDB database connects to the RedisDB module. The RedisDB module connects to the IPMI module. The IPMI module connects to the BMC. The BMC connects to the Target cluster. The Target cluster connects to the Back-end. The Back-end connects to the Front-end.

History

The first version of this program is created by Kevin Yu and Byron Wang in 2019, including almost all the basic features we have now.

Later Kevin Yu is continuing working on improving the functionality of software. Byron Wang is focused on the auto-generation tool of system report in different format, starting from early 2020. Changyong Li's responsible for the UI design, performance optimization and debug.

Contact Information

For any bug report and technical support, please contact: 0800-888-0888.

For more information please visit [Supermicro Solution and Integration Center](#).

INTRODUCTION

LINUX CLUSTER MONITOR is an easy deploy program based on Redfish and Intelligent Platform Management Interface aims to monitor the system status on super server remotely. It includes multiple functions: real-time device status monitor, cluster hardware software summary, benchmark results reader and system report generation.

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Current version

By the end of July 2020

Home

About

BMC Events LOG

- 1 | 10/28/2019 | 01:29:42 | Unknown #0x0f | Asserted
- 2 | 02/14/2020 | 21:33:33 | Memory | Uncorrectable ECC (@DIMM#1(CPU1)) | Asserted
- 3 | 04/06/2020 | 22:50:53 | Session Audit #0x0f | Asserted
- 4 | 04/08/2020 | 05:57:54 | Session Audit #0x0f | Asserted
- 5 | 04/08/2020 | 05:57:57 | Session Audit #0x0f | Asserted
- 6 | 04/08/2020 | 05:57:58 | Session Audit #0x0f | Asserted
- 7 | 04/08/2020 | 05:57:59 | Session Audit #0x0f | Asserted
- 8 | 04/08/2020 | 05:59:42 | Session Audit #0x0f | Asserted
- 9 | 04/08/2020 | 05:59:43 | Session Audit #0x0f | Asserted

INTRODUCTION

LINUX CLUSTER MONITOR is an easy deploy program based on Redfish and Intelligent Platform Management Interface aims to monitor the system status on super server remotely. It includes multiple functions: real-time device status monitor, cluster hardware software summary, benchmark results reader and system report generation.

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Current version

By the end of July 2020

Auto Deployment

1. Containerize the program into three parts:

- I. Front-end: web-interface and advanced features.
- II. Back-end: system access and database.
- III. Deployment tool: read from input and generate necessary files for deployment

2. Using docker-compose to containerize different parts and set up boot up sequence:

- I. Boot up database, mapping port, mapping local volume;
- II. Boot up backend as localhost, mapping local volume for input file;
- III. Boot up frontend as localhost.

3. Using bash shell script to deploy LCM with multiple racks

- I. Each csv file should contain the login information of a single rack: IPMI password is optional.
- II. Script can automatically deploy all the racks into different containers with certain rule.

Deployment Steps

1. Install Docker, Docker-compose and ncat:

I. Docker: <https://docs.docker.com/engine/install/centos/>

II. Docker-compose: <https://docs.docker.com/compose/install/>

III. Ncat: `$ yum install nmap-ncat.x86_64`

IV. Pull or build necessary images: front-end, back-end, sensor, rack observer and so on.

2. Bash shell script for deployment:

https://www.dropbox.com/s/91xzx4pskjed8td/docker_deploy.sh?dl=0

3. Create input files and start deployment:

I. Create a folder for input files.

II. Copy “.csv” files into folders.

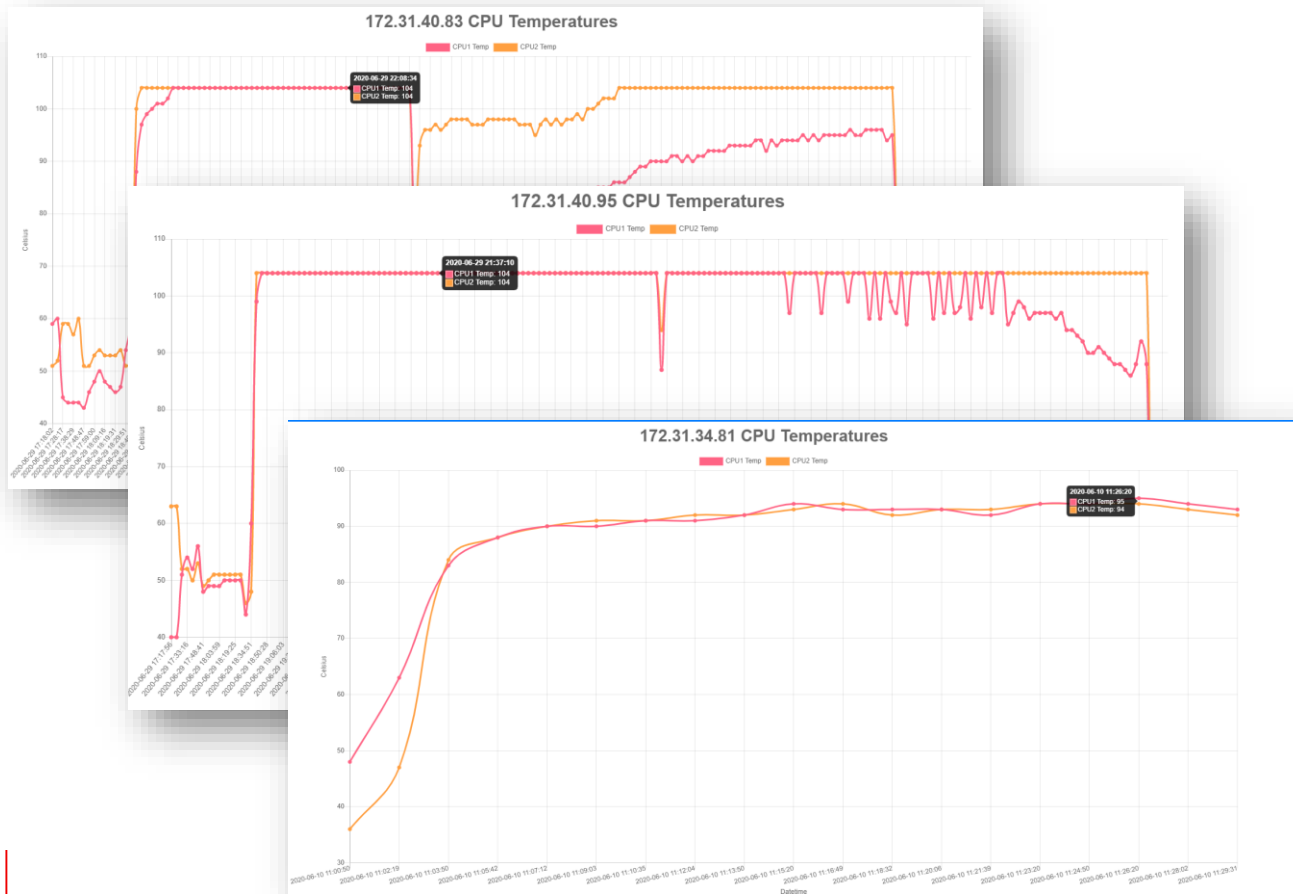
III. Create an “auto.env” file, example can be found below :

https://www.dropbox.com/sh/jsgaerdl49xx6qi/AADRq3ZNG9sfdeXGP_OgLIKia?dl=0

IV. Run: `$./docker_deploy.sh FOLDERNAME`



Projects Application: PNNL



1b | 05/11/2020 | 22:11:25 | Processor #0x01 | Throttled 0 | Asserted
1c | 05/11/2020 | 22:11:27 | Processor #0x01 | Throttled 0 | Deasserted
1d | 05/11/2020 | 22:11:28 | Processor #0x01 | Throttled 0 | Asserted
1e | 05/11/2020 | 22:11:33 | Processor #0x01 | Throttled 0 | Deasserted
1f | 05/12/2020 | 01:57:46 | Unknown #0xff || Asserted
20 | 05/12/2020 | 02:29:52 | OS Boot | Installation started 0 | Asserted
21 | 05/12/2020 | 08:16:42 | Session Audit #0xff || Asserted
22 | 05/12/2020 | 08:25:11 | Session Audit #0xff || Asserted
23 | 05/12/2020 | 17:56:53 | Unknown #0xff || Asserted
24 | 05/12/2020 | 20:55:59 | Session Audit #0xff || Asserted
25 | 05/12/2020 | 20:55:59 | Session Audit #0xff || Asserted
26 | 05/12/2020 | 22:48:02 | Unknown #0xff || Asserted
27 | 05/13/2020 | 01:36:38 | Unknown #0xff || Asserted
28 | 05/13/2020 | 02:24:30 | OS Boot | Installation started 0 | Asserted
29 | 05/13/2020 | 02:37:44 | OS Boot | Installation completed 0 | Asserted

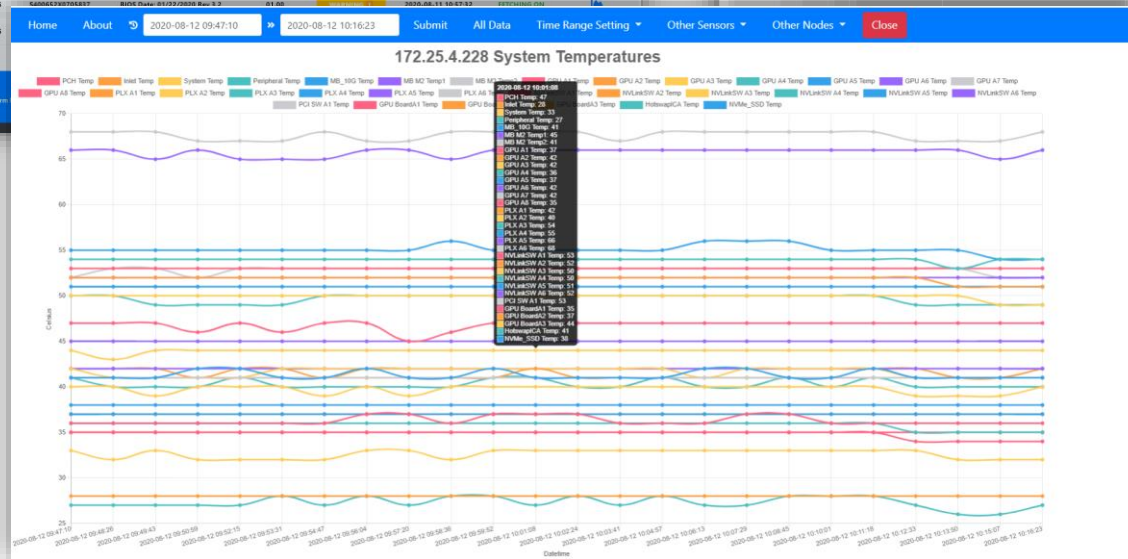
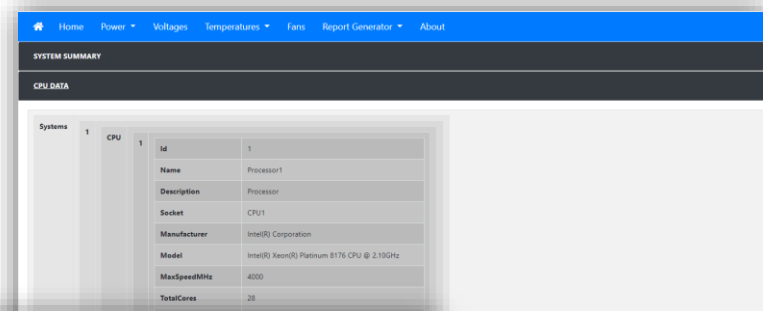
CPU throttling has been recorded by LCM



The screenshot displays the Linux Cluster Monitor interface. At the top, there are navigation links: 'Linux Cluster Monitor', 'How to Deploy', 'Our Team', 'About', 'Download Cluster Report', 'Advanced Features', and a timestamp '2020-08-12 10:16:43'. Below the navigation bar is a search input field labeled 'Column visibility' and a search button.

The main content area features a table with 10 columns: ID, IPV4, BMC MAC Address, System Model #, System Serial #, BIOS Version, BMC Version, BMC Status, Boot Time, Status, and Info & Sensors. The table lists 10 nodes, each with a unique ID and IPV4 address. The BMC Status column shows various states: 'WARNING' (yellow), 'OK' (green), and 'FETCHING ON' (blue). The Status column shows 'FETCHING ON' for all nodes.

Below the table, there is a section titled '772.25.4.228 System Temperature'. It includes a legend for various temperature sensors: PCH Temp, GPU A5 Temp, PLX A1 Temp, PLX A2 Temp, System Temp, Peripheral Temp, MB_SIG Temp, ME_MO Temp, GPU A5 Temp, PLX A1 Temp, PLX A2 Temp, PCH Temp, GPU A5 Temp, PLX A1 Temp, PLX A2 Temp, GPU A5 Temp, PLX A1 Temp, PLX A2 Temp, GPU A5 Temp, PLX A1 Temp, PLX A2 Temp. The chart shows a line graph of temperature over time, with a peak around 70°C.



Future Plans

1. ~~More advanced features:~~

~~BMC firmware updating tool, redfish request tool.~~ **Done Already !!**

2. Combined with benchmark tools:

Integrate generic benchmark tools into Linux Cluster Monitor:

I. Monitor benchmark status along with system sensors.

II. Submit/Cancel benchmark jobs.

3. More compatibility tests:

The program has been successfully deployed on multiple kinds of systems: JBOD, GPU nodes, big-twin and blade with multiple projects: PNNL & GM. However, more compatibility tests are necessary.

4. Other functions:

I. Max/Min sensor reading during a certain period.

II. Display settings panel for sensor diagram.