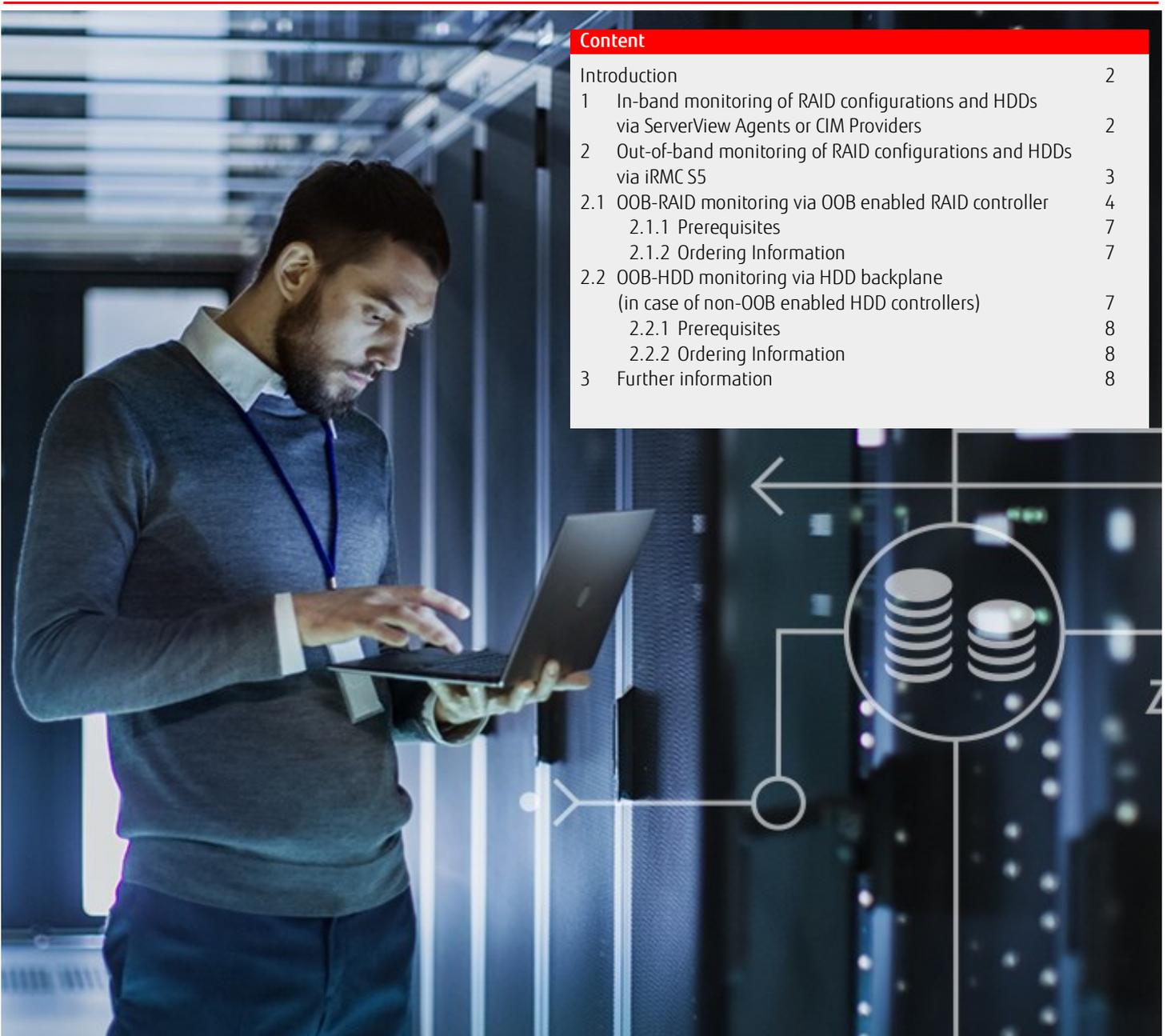


White Paper

FUJITSU Software ServerView® Suite: Out-of-band monitoring of RAID configurations and HDDs via iRMC S5 Management LAN port

This White Paper describes how RAID configurations and HDDs within a Fujitsu PRIMERGY and PRIMEQUEST servers can be monitored in an out-of-band communication via the iRMC S5 Management LAN port.



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Introduction

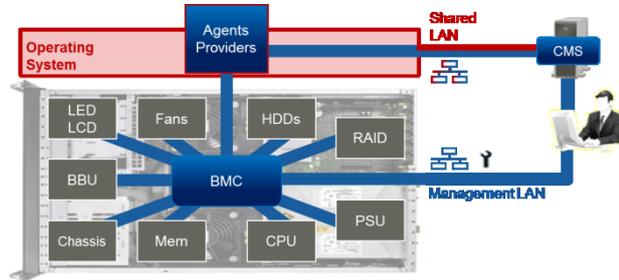
FUJITSU Software ServerView® Suite integrated Remote Management Controller - iRMC S5, powering the latest PRIMERGY M4 and PRIMEQUEST Servers simplifies server management and increases system admin productivity.

Two communication options used in traditional server management concepts to execute management tasks are:

1. In-band communication

In-band communication connects the central management station (CMS) with SNMP agents via the productive (shared) LAN port of the server and requires an installed and active operating system.

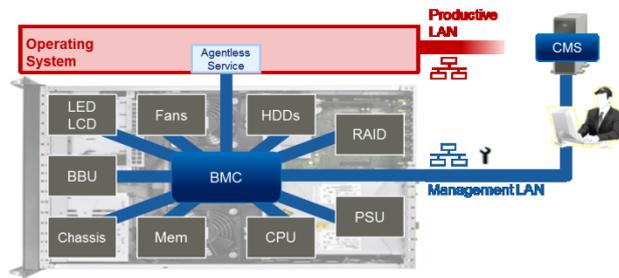
In-band communication can be complemented by a connection directly to the server's baseboard management controller (BMC) via the Management LAN port.



2. Out-of-band (OOB) communication

OOB communication connects the central management station (CMS) solely with the server's baseboard management controller (BMC) via the Management LAN port of the server.

It allows an exchange of management data regardless of whether the system is powered on, or if an operating system and SNMP agents or CIM providers are installed or active.



For many IT administrators server management via a dedicated communication channel to the BMC of a system is an **essential requirement**. Such a connection enhances data security by effectively separating the networks for productive and management data. Furthermore, it allows a so called out-of-band (OOB) management without the need of agents in the operating system and such a connection is available even when the server is in stand-by mode.

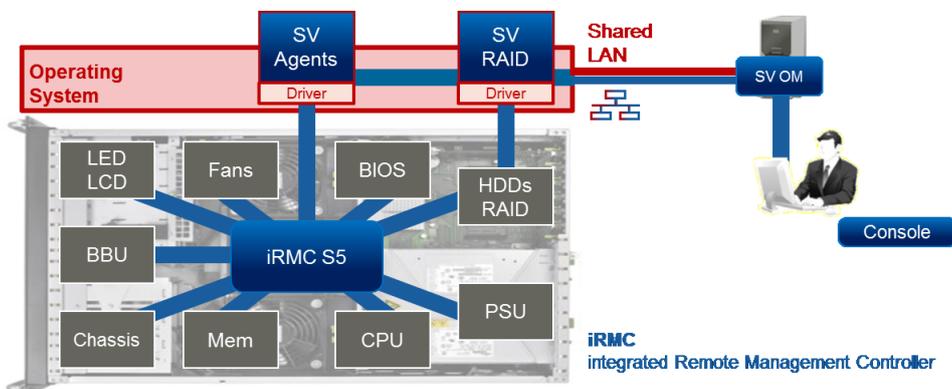
In Fujitsu PRIMERGY servers the ServerView **integrated Remote Management Controller (iRMC)** performs the functions of a BMC and enables extensive monitoring and management of the server.

This White Paper describes how RAID configurations and HDDs within a Fujitsu PRIMERGY M4 and PRIMEQUEST server can be monitored in

1. an **in-band** communication with ServerView agents via the productive (shared) LAN port, and
2. an **out-of-band (OOB)** communication directly via the iRMC S5 Management LAN port.

1 In-band monitoring of RAID configurations and HDDs via ServerView Agents

Traditional in-band monitoring of RAID configurations and HDDs within a Fujitsu PRIMERGY server requires the presence of ServerView agents or CIM providers in an active operating system. Communication is carried out via the productive (shared) LAN port to the CMS:



- ServerView RAID requests information from RAID controller
- Management applications like ServerView Operations Manager on the CMS receive information from ServerView RAID and ServerView agents or CIM providers
- ServerView RAID call integration in ServerView Operations Manager simplifies management tasks

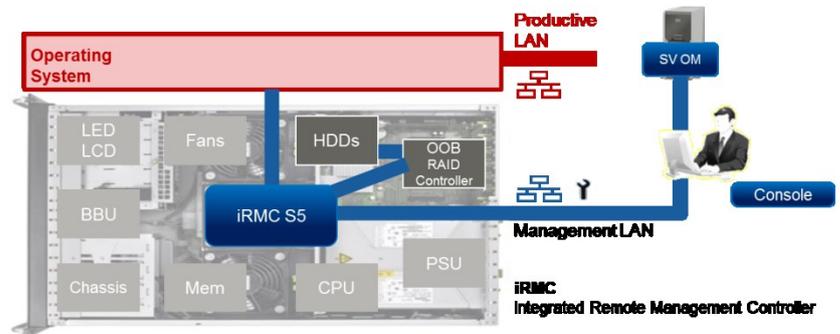
Fig. 1: In-band monitoring of RAID configurations and HDDs via ServerView agents

2 Out-of-band monitoring of RAID configurations and HDDs via iRMC S5

Out-of-band (OOB) monitoring of RAID configurations and HDDs via ServerView integrated Remote Management Controller S5 (iRMC S5) can be divided into **two different scenarios**. The amount of available management information to the iRMC S5 may differ significantly depending on the type of HDD controller configured in the particular Fujitsu PRIMERGY system.

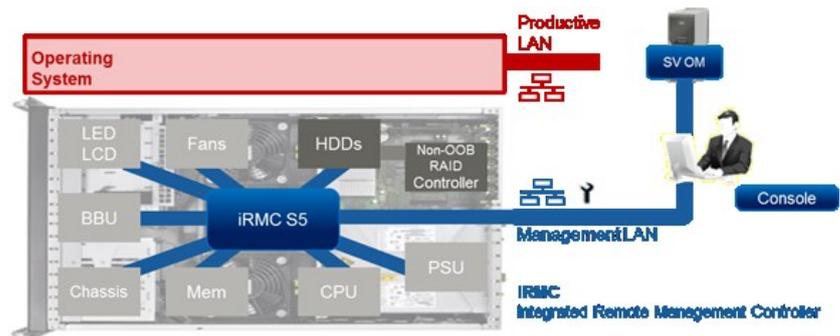
① OOB-RAID: RAID controller ↔ iRMC S5

OOB enabled RAID controller are directly connected to the iRMC S5 via the mainboard of the PRIMERGY server and provide detailed information of the RAID controller itself, the RAID configuration and the status of all connected HDDs. Such information is displayed by various screens on the iRMC S5 web interface.
- Further details are described in chapter 2.1.



② OOB-HDD: HDD backplane ↔ iRMC S5

Non-OOB enabled RAID controller as well as SAS controller or onboard SATA controllers have no connection to the iRMC S5. In this case a cable connects the iRMC S5 to the HDD backplane of the PRIMERGY server. From there the status information of installed HDDs is retrieved and displayed on the iRMC S5 web interface.
- Further details are described in chapter 2.2.



The table on the next page gives an overview of OOB management options in Fujitsu PRIMERGY models with iRMC S5.

The matrix

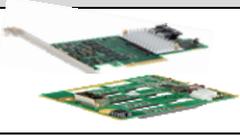
- ① indicates released OOB enabled RAID controllers (OOB-RAID) incl. released PCIe slots in the server, and
- ② provides information on PRIMERGY models with OOB released HDD backplanes (OOB-HDD) in case non-OOB enabled HDD controllers are configured in the server.

Further details on both OOB management scenarios are described in the following chapters of this White Paper:

- 2.1 OOB-RAID monitoring via OOB enabled RAID controller
- 2.2 OOB-HDD monitoring via HDD backplane (in case of non-OOB enabled HDD controllers)

Out-of-band monitoring of RAID configurations and HDDs via iRMC S5

The table¹⁾ below summarizes for released Fujitsu PRIMERGY and PRIMEQUEST models with iRMC S5 the options for
 ① OOB-RAID monitoring via OOB enabled RAID controller (incl. released PCIe slots in the server),
 ② OOB-HDD monitoring via HDD backplane (in case of non-OOB enabled HDD controllers).

iRMC S5 connected to	Out-of-band enabled RAID Controller *1				HDD Backplane *2	
	⇒ OOB-RAID monitoring incl. HDDs				⇒ OOB-HDD	
	S26361-F3842-E1	S26361-F5243-E*1* / E2	S26361-F3847-E2	S26361-F4042-E*2* / 4 / 8	S26361-F3842-Ex	HDDs and SSDs operated by non-OOB-RAID enabled
	PRAID CP400i	PRAID EP400i	PRAID EP420e	PRAID EP520i / 540i / 580i	PSAS CP40xi	HDD controller like
	based on LSI MegaRAID SAS3008	based on LSI MegaRAID SAS3108	based on LSI MegaRAID SAS3108	based on LSI MegaRAID SAS3508	based on LSI MegaRAID SAS3008	HBA or PCIe switch
PRIMERGY CX Server						
PRIMERGY CX2550 M4	✓	✓	✓	✓	✓	
PRIMERGY CX2560 M4	✓	✓	✓	✓	✓	supported
PRIMERGY CX2570 M4	✓	✓	✓	✓	✓	supported
PRIMERGY RX Server						
PRIMERGY RX1330 M4	✓	✓	✓	✓	✓	supported
PRIMERGY RX2520 M4	✓	✓	✓	✓	✓	supported
PRIMERGY RX2530 M4	✓	✓	✓	✓	✓	supported
PRIMERGY RX2540 M4	✓	✓	✓	✓	✓	supported
PRIMERGY RX4770 M4	✓	✓	✓	✓	✓	supported
PRIMERGY TX Server						
PRIMERGY TX1320 M4	✓	✓	✓	✓	✓	supported
PRIMERGY TX1330 M4	✓	✓	✓	✓	✓	supported
PRIMERGY TX2550 M4	✓	✓	✓	✓	✓	supported

*1 PRAID CP400i, EP4xx, EP5xx (HW-RAID controller) support OOB RAID without any restrictions

*2 Requirements for OOB_HDD (Out Of Band Monitoring via Backplane) for PSAS CP40xi (HBA controller)

1. OOB_HDD works for drives that are part of an RAID Array of the PSAS CP40xi regardless if drives are direct connected or behind an Expander.
2. OOB_HDD works also for drives behind an Expander if drives are configured as a RAID Array by VSAN or Microsoft Storage Spaces, which communicates by SEP within an expander
3. If neither point 1 or 2 is valid than ServerView RAID is required for monitoring.

Listing as of Feb, 2018

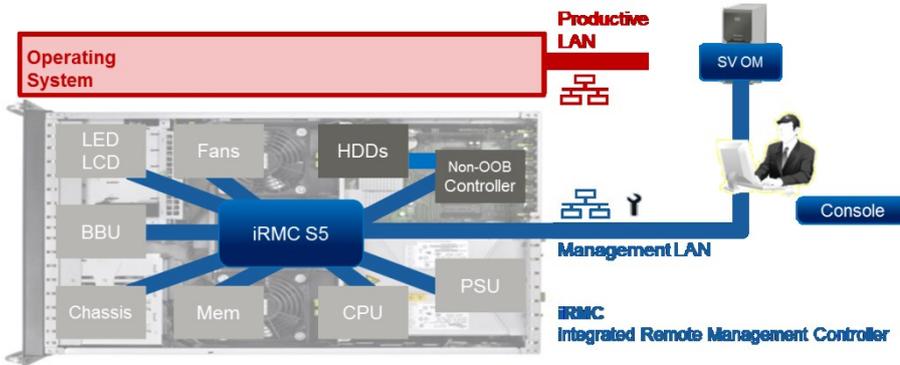
iRMC S5 connected to	Out-of-band enabled RAID Controller *3		
	⇒ OOB-RAID monitoring incl. HDDs		
	MC*0JSRA*	MC*0JSRB*	MC*0JSR7*
	PRAID EP420i	PRAID EP420e	PRAID EP540i
	based on LSI MegaRAID SAS3108	based on LSI MegaRAID SAS3108	based on LSI MegaRAID SAS3508
PRIMEQUEST Server			
PRIMEQUEST 3800B	✓	✓	✓
PRIMEQUEST 3800E	✓	✓	✓
PRIMEQUEST 3400E	✓	✓	✓

*3 PRAID EP4xx, EP5xx (HW-RAID controller) support OOB RAID without any restrictions

2.1 OOB-RAID monitoring via OOB enabled RAID controller



With the introduction of the ServerView integrated Remote Management Controller S5 (iRMC S5) and the use of out-of-band (OOB) enabled RAID controllers a comprehensive monitoring of RAID configurations and their attached HDDs is now possible via the Management LAN port of the Fujitsu PRIMERGY server:



- iRMC S5 requests detailed RAID and HDD information from the OOB enabled RAID controller
- Please note: iRMC requests are only sent to released Fujitsu PRIMERGY systems and RAID controllers as mentioned in chapter 2

Fig. 2: OOB-RAID monitoring via OOB enabled RAID controller

IT administrators can check details of configured RAID systems in a Fujitsu PRIMERGY system on various iRMC S5 web server pages ⇒ left navigation "RAID Information" as well as "Sensors" ⇒ "Temperature":

- status of installed RAID controllers and associated batteries
- status of each RAID physical disk on the managed server
- status of each RAID logical drive on the managed server

Please refer to the [iRMC S5 user manual](#), chapters 7.5 RAID Information and 7.10 Sensors.

The screenshots below show examples of these different iRMC S5 web server pages:

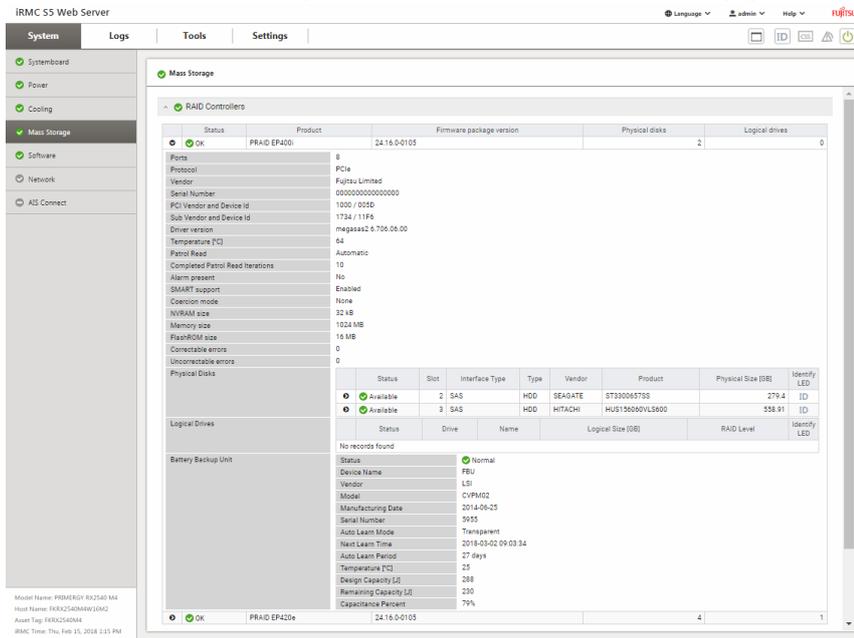


Fig. 3: Status of installed RAID controllers and associated batteries

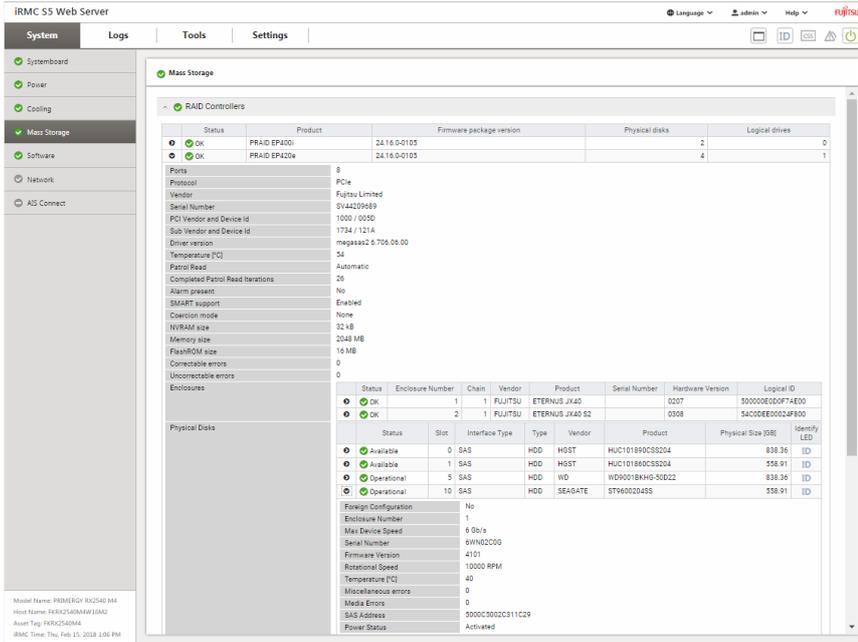


Fig. 4: Status of each RAID physical disk on the managed server

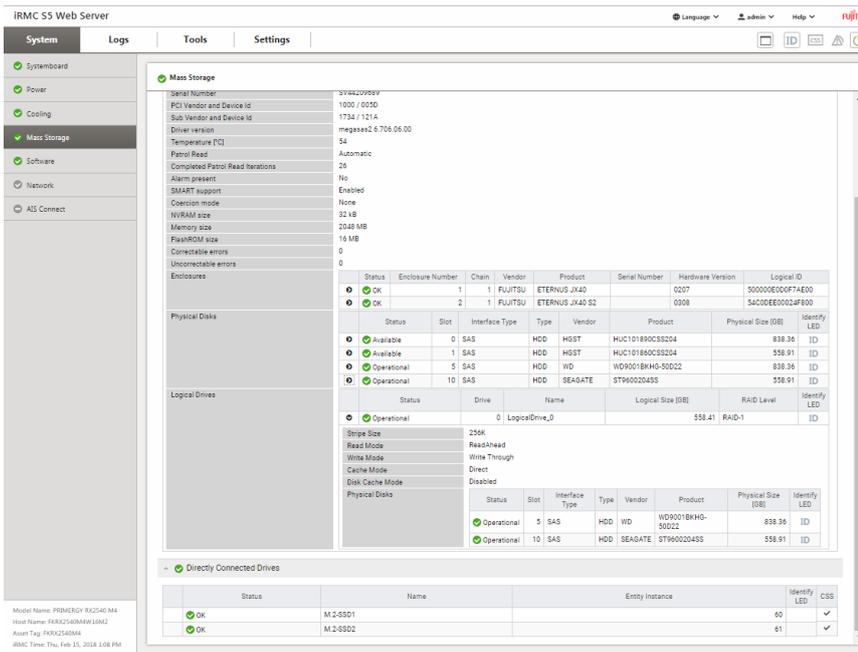


Fig. 5: Status of each RAID logical drive on the managed server

Status	Designation	Temperature [°C]	Warning Level [°C]	Critical Level [°C]	Fail Reaction	CSS
OK	Ambient	27	87	42	Continue	---
N/A	Systemboard 1				Continue	---
OK	Systemboard 2	37	75	80	Continue	---
OK	CPU1	27	92	93	Continue	---
OK	CPU2	27	92	93	Continue	---
OK	MEM A	27	78	82	Continue	---
N/A	MEM B				Continue	---
N/A	MEM C				Continue	---
N/A	MEM D				Continue	---
N/A	MEM E				Continue	---
N/A	MEM F				Continue	---
OK	MEM G	27	78	82	Continue	---
N/A	MEM H				Continue	---
N/A	MEM J				Continue	---
N/A	MEM K				Continue	---
N/A	MEM L				Continue	---
N/A	MEM M				Continue	---
OK	PCH	48	80	85	Continue	---
N/A	OC				Continue	---
N/A	Pump CPU				Continue	---
OK	PSU1 Inlet	27	57	61	Continue	---
OK	PSU2 Inlet	28	57	61	Continue	---
OK	PSU1	37	103	107	Continue	---
OK	PSU2	38	103	107	Continue	---
OK	FBU	25	50	55	Continue	---
OK	RAID Controller	64	110	114	Continue	---
N/A	PCIeSSD_OFF				Continue	---
N/A	PCIeSSD_LAIC				Continue	---
OK	HDD	44	60		Continue	---
N/A	GPU1				Continue	---
N/A	GPU2				Continue	---

Fig. 6: Temperature sensor information

2.1.1 Prerequisites



OoB-RAID monitoring requires a Fujitsu PRIMERGY system with
 - iRMC S5 and
 - an OoB enabled RAID controller¹⁾:

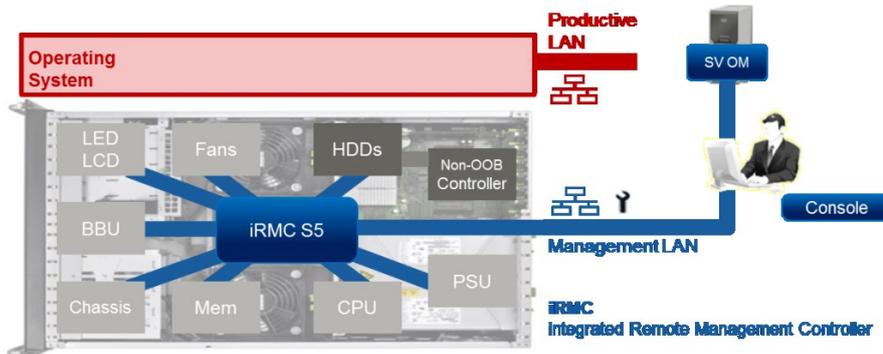
2.1.2 Ordering Information

OoB enabled RAID controllers are available in System Architect as standard component for Fujitsu PRIMERGY servers. Their product description in System Architect informs about out-of-band capabilities. For configuration hints please refer to the individual system configurators. The table in chapter 2 of this White Paper maps these OoB enabled RAID controllers to Fujitsu PRIMERGY models.

2.2 OoB-HDD monitoring via HDD backplane (in case of non-OoB enabled HDD controllers)



In case a non-OoB enabled RAID controller, SAS controller or onboard SATA controller is used in a Fujitsu PRIMERGY system the iRMC S5 retrieves status information of installed HDDs via a cable connection from the HDD backplane:



- iRMC S5 is connected to the HDD backplane of the Fujitsu PRIMERGY server
- iRMC S5 retrieves status information of installed HDDs
- Please note:
Available for selected Fujitsu PRIMERGY servers only
(see table in chapter 2 for details)

Fig. 8: OoB-HDD monitoring via HDD backplane (in case of non-OoB enabled HDD controllers)

IT administrators can check the status of each HDD installed on the backplane in a Fujitsu PRIMERGY system on an iRMC S5 web server page
 ⇒ left navigation "Sensors" ⇒ "Component Status":
 Please refer to the [iRMC S5 user manual](#), chapters 2.1 System menu.

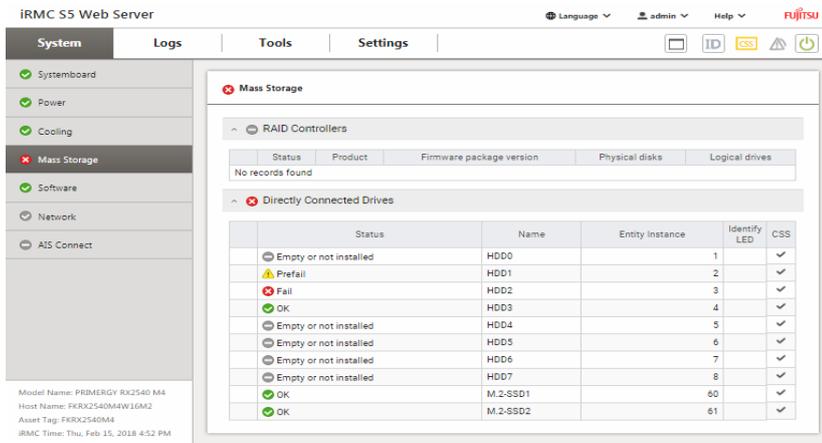


Fig. 9: iRMC S5 web server page - Status of installed HDDs

2.2.1 Prerequisites



- OOB-HDD monitoring requires a Fujitsu PRIMERGY system with- iRMC S5 and
- An OOB enabled HDD backplane incl. connection to the iRMC S5 (cable or directly wired)

Please note: OOB-HDD monitoring via HDD backplane is disabled as soon as an OOB enabled RAID controller is installed in the Fujitsu PRIMERGY server.

2.2.2 Ordering Information

- System Architect selects automatically the OOB-HDD monitoring option when
- a Fujitsu PRIMERGY systems with iRMC S5 is selected, and
 - a non-OOB enabled RAID controller, SAS controller or onboard SATA controller is configured, and
 - the HDD backplane of the selected PRIMERGY model supports OOB-HDD monitoring.

For configuration hints please refer to the individual system configurators. The table in chapter 2 of this White Paper maps OOB enabled HDD backplanes to Fujitsu PRIMERGY models.

3 Further information

Fujitsu Internet Websites

- ServerView Suite in the www.fujitsu.com/fts/serveview ⇒ documents on [iRMC](#)
- ServerView Manuals ([sitemap](#))
- System Configurators for Fujitsu PRIMERGY systems in the [Internet](#) (check in "Documents" on the webpage of every PRIMERGY model)
- System Architect in the [Internet](#)

DEPLOY Fast, easy, reliable	CONTROL Centralized, easy, efficient	DYNAMIZE Simple, sophisticated, efficient	MAINTAIN In any state, at any place	INTEGRATE Seamless, manage uniformly
Server Setup and Deployment <ul style="list-style-type: none"> ■ Installation Manager ■ Scripting Toolkit 	Server Monitoring and Control <ul style="list-style-type: none"> ■ Operations Manager ■ Agents / CIM Providers <ul style="list-style-type: none"> ■ System Monitor ■ Agentless Service ■ Event Manager ■ RAID Manager Capacity Management <ul style="list-style-type: none"> ■ Threshold Manager Power Management <ul style="list-style-type: none"> ■ Power Monitor ■ Power Consumption Management (in iRMC) Storage Support <ul style="list-style-type: none"> ■ Storage Management <ul style="list-style-type: none"> - Monitoring - Events 	I/O Management <ul style="list-style-type: none"> □ Virtual-IO Manager 	Remote Management <ul style="list-style-type: none"> ■ integr. Remote Management Controller (iRMC) <ul style="list-style-type: none"> □ iRMC Advanced Pack ■ Management Blade □ Support Gateway / AutoCall embedded LifeCycle Management □ eLCM Activation License Update Management <ul style="list-style-type: none"> ■ Update Manager (SVUM) <ul style="list-style-type: none"> Download Manager Repository Manager ■ Repository Server ■ Update DVD / SVUM Express Content Collector Performance Measurement <ul style="list-style-type: none"> ■ Performance Manager Investigation <ul style="list-style-type: none"> ■ Asset Management <ul style="list-style-type: none"> ■ Archive / Inventory Manager ■ PrimeCollect Inspection <ul style="list-style-type: none"> ■ Online Diagnostics ■ Customer Self Service <ul style="list-style-type: none"> □ Local Service Display 	Uniformed Management <ul style="list-style-type: none"> □ Fujitsu ManageNow® solutions Integration Packs <ul style="list-style-type: none"> ■ Microsoft SCOM ■ Microsoft SCCM ■ Microsoft SC VMM ■ Microsoft SC PRO Packs ■ VMware vCenter ■ VMware vRealize Operations ■ VMware vRealize Orchestrator ■ Nagios ■ Icinga ■ HP Systems Insight Manager

■ Standard □ Optional

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2018-02-11 CE-EN

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