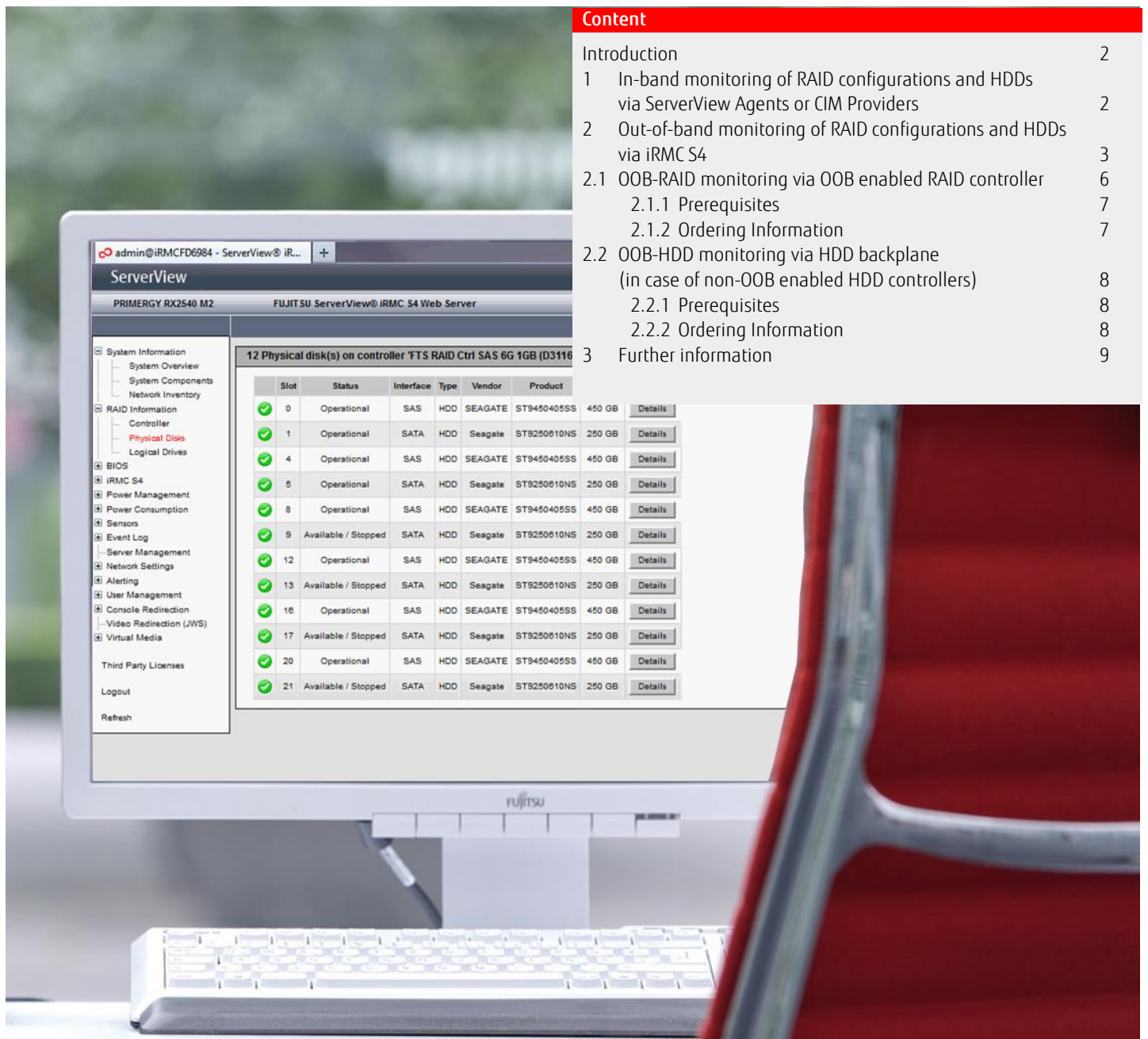


White Paper

FUJITSU Software ServerView® Suite: Out-of-band monitoring of RAID configurations and HDDs via iRMC S4 Management LAN port

This White Paper describes how RAID configurations and HDDs within a Fujitsu PRIMERGY server can be monitored in an out-of-band communication via the iRMC S4 Management LAN port.



The screenshot displays the ServerView web interface for a Fujitsu PRIMERGY RX2540 M2 server. The interface is divided into a left-hand navigation menu and a main content area. The navigation menu includes sections for System Information, RAID Information, BIOS, iRMC S4, Power Management, Sensors, Event Log, Server Management, Network Settings, Alerting, User Management, Console Redirection, Video Redirection (JWS), Virtual Media, Third Party Licenses, Logout, and Refresh. The main content area shows the RAID configuration for controller 'FTS RAID Ctrl SAS 6G 1GB (D3116)', listing 12 physical disks. A table below the header provides details for each disk, including Slot, Status, Interface, Type, Vendor, Product, and Capacity. Each row includes a 'Details' button. The table shows that slots 0, 1, 4, 5, 8, 12, 16, and 20 are operational, while slots 9, 13, 17, and 21 are available/stopped.

Slot	Status	Interface	Type	Vendor	Product	Capacity	Details
0	Operational	SAS	HDD	SEAGATE	ST9450405SS	450 GB	Details
1	Operational	SATA	HDD	Seagate	ST9250810NS	250 GB	Details
4	Operational	SAS	HDD	SEAGATE	ST9450405SS	450 GB	Details
5	Operational	SATA	HDD	Seagate	ST9250810NS	250 GB	Details
8	Operational	SAS	HDD	SEAGATE	ST9450405SS	450 GB	Details
9	Available / Stopped	SATA	HDD	Seagate	ST9250810NS	250 GB	Details
12	Operational	SAS	HDD	SEAGATE	ST9450405SS	450 GB	Details
13	Available / Stopped	SATA	HDD	Seagate	ST9250810NS	250 GB	Details
16	Operational	SAS	HDD	SEAGATE	ST9450405SS	450 GB	Details
17	Available / Stopped	SATA	HDD	Seagate	ST9250810NS	250 GB	Details
20	Operational	SAS	HDD	SEAGATE	ST9450405SS	450 GB	Details
21	Available / Stopped	SATA	HDD	Seagate	ST9250810NS	250 GB	Details

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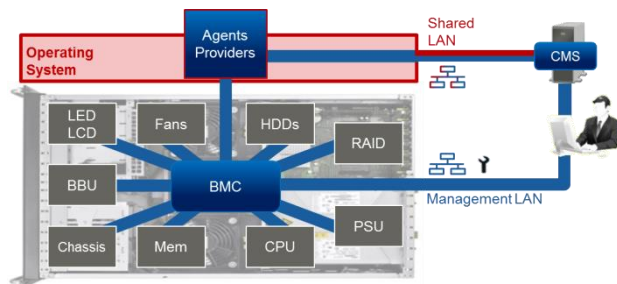
Introduction

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

1. In-band communication

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

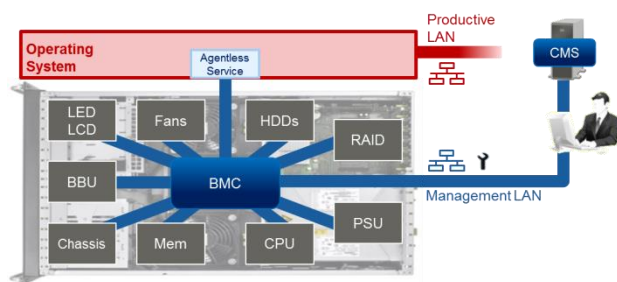
In-band communication can be complemented by a connection directly to the server's baseboard management controller (BMC) via the Management LAN port.



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.

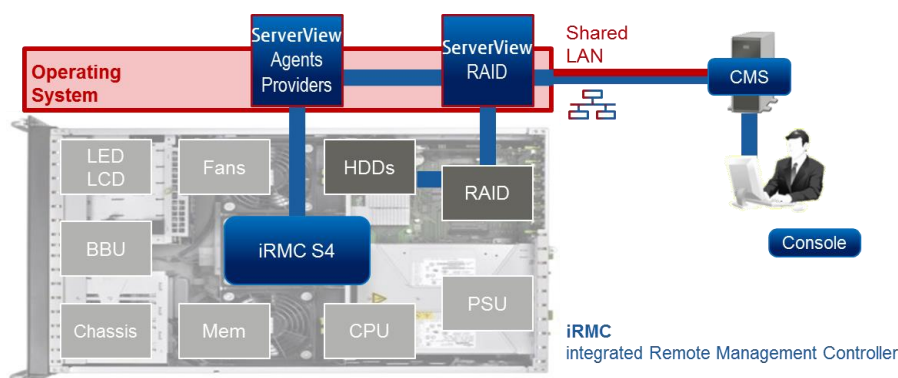
In Fujitsu PRIMERGY servers the ServerView **integrated Remote Management Controller (iRMC)** performs the functions of a BMC and enables extensive monitoring and management of the server.

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

1. an **in-band** communication with ServerView agents or CIM providers via the productive (shared) LAN port, and
2. an **out-of-band (OOB)** communication directly via the iRMC S4 Management LAN port.

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

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

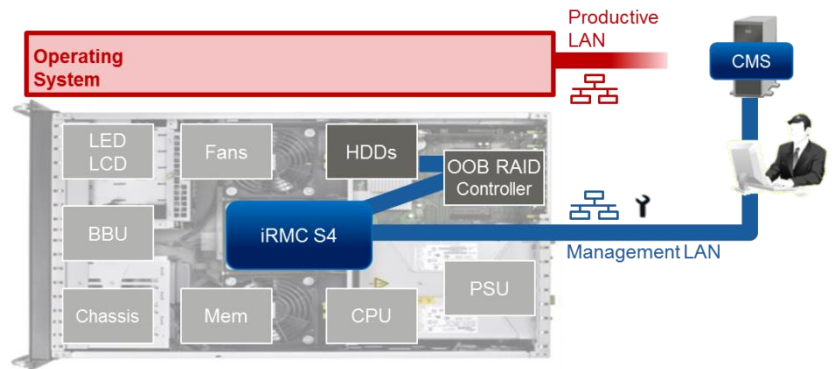
Fig. 1: In-band monitoring of RAID configurations and HDDs via ServerView agents or CIM providers

2 Out-of-band monitoring of RAID configurations and HDDs via iRMC S4

Out-of-band (OOB) monitoring of RAID configurations and HDDs via ServerView integrated Remote Management Controller S4 (iRMC S4) can be divided into **two different scenarios**. The amount of available management information to the iRMC S4 may differ significantly depending on the type of HDD controller configured in the particular Fujitsu PRIMERGY system.

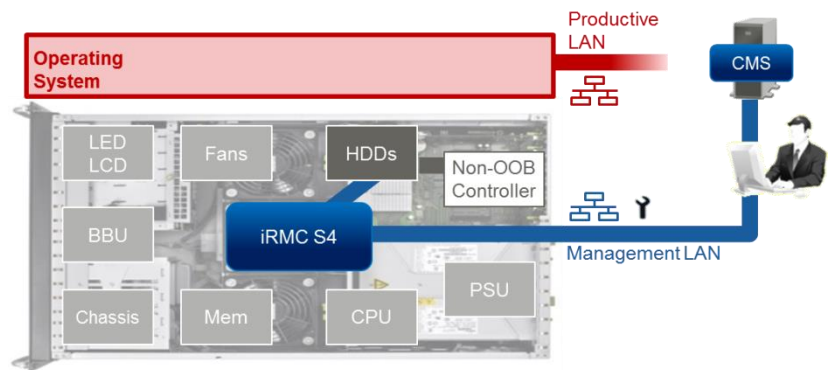
① OOB-RAID: RAID controller ↔ iRMC S4

OOB enabled RAID controller are directly connected to the iRMC S4 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 S4 web interface.
- Further details are described in chapter 2.1.



② OOB-HDD: HDD backplane ↔ iRMC S4

Non-OOB enabled RAID controller as well as SAS controller or onboard SATA controller have no connection to the iRMC S4. In this case a cable connects the iRMC S4 to the HDD backplane of the PRIMERGY server. From there the status information of installed HDDs is retrieved and displayed on the iRMC S4 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 S4.

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 S4

The table¹⁾ below summarizes for released Fujitsu PRIMERGY models with iRMC S4 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 S4 connected to	① Out-of-band enabled RAID Controller ⇒ OOB-RAID monitoring incl. HDDs							② HDD Backplane ⇒ OOB-HDD	
	SZ6361-F3669-E4 RAID Ctrl SAS 6G 1GB (D3116C) based on LSI MegaRAID SAS2208	SZ6361-F3713-E3 / -E203 RAID Ctrl SAS 6G 8Port ex 1GB LSI V3 LSI MegaRAID SAS 9286CV-8e	SZ6361-F3842-E1 PRAID CP400i based on LSI MegaRAID SAS3008	SZ6361-F5243-E1 PRAID EP400i based on LSI MegaRAID SAS3108	SZ6361-F5243-E2 PRAID EP420i based on LSI MegaRAID SAS3108	SZ6361-F3847-E2 / -E202 PRAID EP420e based on LSI MegaRAID SAS3108	SZ6361-F4531-E300 / -E513 SAS RAID HDD Module based on LSI MegaRAID SAS2208	SZ6361-F3823-E400 / -E410 PRAID CM400i / PRAID EM400i based on LSI MegaRAID SAS3108	HDDs and SSDs operated by non-OOB enabled HDD controller like HBA or PCIe switch 
PRIMERGY CX Server									
CX2550 M1			✓	✓	✓			supported ²⁾	
CX2550 M2			✓	✓	✓			supported ²⁾	
CX2570 M1			✓	✓	✓			supported ²⁾	
CX2570 M2			✓	✓	✓			supported ²⁾	
PRIMERGY Rack Server									
RX100 S8	✓							supported	
RX1330 M1			✓	✓	✓			supported	
RX1330 M2			✓	✓	✓			supported ³⁾	
RX200 S8	✓	✓						supported	
RX2510 M2			✓	✓	✓			supported	
RX2520 M1	✓	✓						supported ⁴⁾	
RX2530 M1			✓	✓	✓	✓		supported	
RX2530 M2			✓	✓	✓	✓		supported	
RX2540 M1			✓	✓	✓	✓		supported	
RX2540 M2			✓	✓	✓	✓		supported	
RX2560 M1			✓	✓	✓	✓		supported	
RX2560 M2			✓	✓	✓	✓		supported	
RX300 S8	✓	✓		✓	✓			supported ⁵⁾	
RX350 S8	✓	✓		✓	✓			supported ⁵⁾	
RX4770 M1	✓	✓	✓	✓	✓			RAID controller is mandatory	
RX4770 M2			✓	✓	✓			RAID controller is mandatory	

Table is continued on next page

- ¹⁾ Listing as of May 11th, 2016
- ²⁾ HDD backplane is wired to iRMC S4 via the mainboard (PCBA); no cable required
- ³⁾ OOB-HDD on 10x 2.5" backplane is not supported
- ⁴⁾ OOB-HDD only released for 3.5" HDD configuration
- ⁵⁾ OOB-HDD released with SAS 3.0 2.5" HDD Backplane

The table¹⁾ below summarizes for released Fujitsu PRIMERGY models with iRMC S4 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).

Table continued from previous page

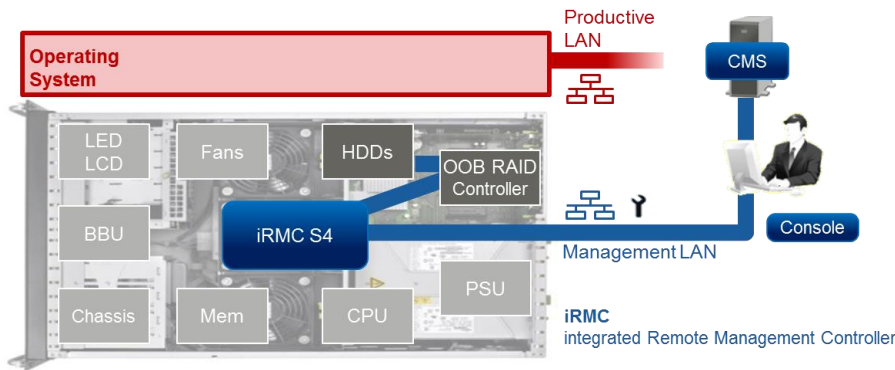
iRMC S4 connected to	① Out-of-band enabled RAID Controller ⇒ OOB-RAID monitoring incl. HDDs						② HDD Backplane ⇒ OOB-HDD		
	S26361-F3669-E4 RAID Ctrl SAS 6G 1GB (D3116C) based on LSI MegaRAID SAS2208	S26361-F3713-E3 / -E203 RAID Ctrl SAS 6G 8Port ex 1GB LSI V3 LSI MegaRAID SAS 9286CV-8e	S26361-F3842-E1 PRAID CP400i based on LSI MegaRAID SAS3008	S26361-F5243-E1 PRAID EP400i based on LSI MegaRAID SAS3108	S26361-F5243-E2 PRAID EP420i based on LSI MegaRAID SAS3108	S26361-F3847-E2 / -E202 PRAID EP420e based on LSI MegaRAID SAS3108	S26361-F3823-E400 / -E410 PRAID CM400i / PRAID EM400i based on LSI MegaRAID SAS3108	S26361-F4531-E300 / -E513 SAS RAID HDD Module based on LSI MegaRAID SAS2208	HDDs and SSDs operated by non-OOB enabled HDD controller like HBA or PCIe switch 
PRIMERGY Tower Server									
TX1320 M1	✓								not supported
TX1320 M2			✓	✓	✓				supported
TX1330 M1	✓								not supported
TX1330 M2			✓	✓	✓				supported
TX2540 M1	✓		✓						not supported
TX2560 M1			✓	✓	✓	✓			supported
TX2560 M2			✓	✓	✓	✓			supported
TX300 S8	✓	✓		✓	✓				supported ⁵⁾
PRIMERGY Server Blades									
BX2560 M1							✓		supported
BX2560 M2							✓		supported
BX920 S4								✓	supported
BX2580 M1 with SX960	✓			✓	✓				not supported
BX2580 M2 with SX960	✓			✓	✓				not supported
BX924 S4 with SX960	✓			✓	✓				not supported

1) Listing as of May 11th, 2016
 2) HDD backplane is wired to iRMC S4 via the mainboard (PCBA); no cable required
 3) OOB-HDD on 10x 2.5" backplane is not supported
 4) OOB-HDD only released for 3.5" HDD configuration
 5) OOB-HDD released with SAS 3.0 2.5" HDD Backplane

2.1 OOB-RAID monitoring via OOB enabled RAID controller



With the introduction of the ServerView integrated Remote Management Controller S4 (iRMC S4) 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 S4 requests detailed RAID and HDD information from the OOB enabled RAID controller
- Please note:
For released Fujitsu PRIMERGY systems and RAID controllers only (see table in chapter 2 for details)

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 S4 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 S4 user manual](#), chapters 7.5 RAID Information and 7.10 Sensors.

The screenshots below show examples of these different iRMC S4 web server pages:

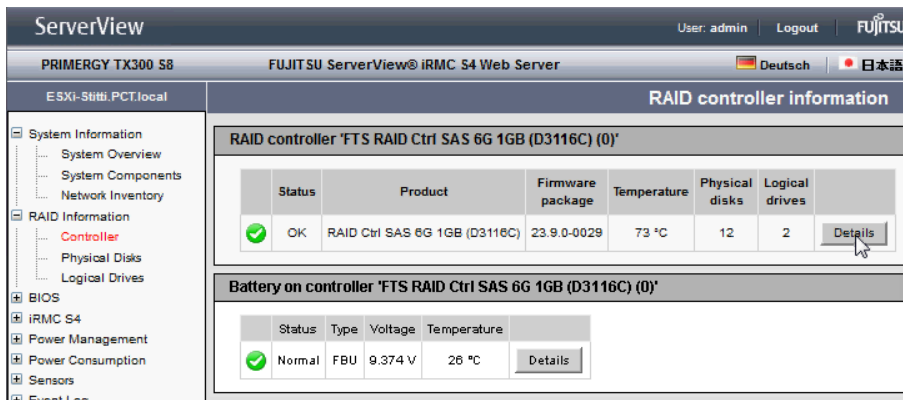


Fig. 3: Status of installed RAID controllers and associated batteries

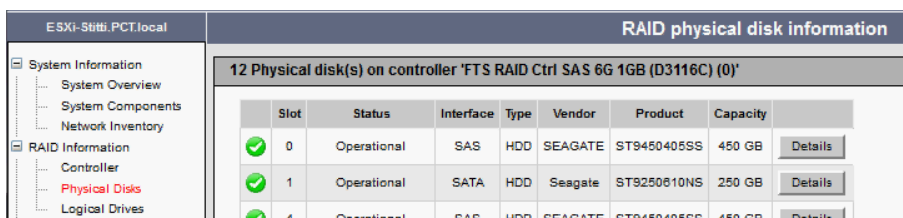


Fig. 4: Status of each RAID physical disk on the managed server

Drive	Status	Name	Size	RAID	
0	Operational	LogicalDrive_0	232.00 GB	RAID-1	Details
1	Operational	LogicalDrive_1	2093.00 GB	RAID-5	Details

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

Select	No.	Designation	Temperature (*Celsius)	Warning Level	Critical Level	Fail Reaction	Status
<input checked="" type="checkbox"/>	16	BBU	27	50	55	Continue	OK
<input checked="" type="checkbox"/>	17	RAID Controller	103	110	115	Continue	OK

Fig. 6: Temperature sensor information

2.1.1 Prerequisites



OOB-RAID monitoring requires a Fujitsu PRIMERGY system with
 - iRMC S4 and
 - an OOB enabled RAID controller¹⁾:

2.1.2 Ordering Information

Released OOB enabled RAID controllers for Fujitsu PRIMERGY servers ¹⁾

Description	Order codes	
	factory installation	subsequent delivery
RAID Ctrl SAS 6G 1GB (D3116C) based on LSI MegaRAID SAS2208	S26361-F3669-E4	S26361-F3669-L4
RAID Ctrl SAS 6G 8Port ex 1GB FH SI V3 LSI MegaRAID SAS 9286CV-8e	S26361-F3713-E203 S26361-F3713-E3 ³⁾	S26361-F3713-L503
PRAID CP400i based on LSI MegaRAID SAS3008	S26361-F3842-E1	S26361-F3842-L501
PRAID EP400i based on LSI MegaRAID SAS3108	S26361-F5243-E1	S26361-F5243-L1
PRAID EP420i based on LSI MegaRAID SAS3108	S26361-F5243-E2	S26361-F5243-L2
PRAID EP420e based on LSI MegaRAID SAS3108	S26361-F3847-E2 S26361-F3847-E202	S26361-F3847-L502
PRAID CM400i / PRAID EM400i based on LSI MegaRAID SAS3108	S26361-F3823-E400 S26361-F3823-E410	
SAS RAID HDD Module for BX920 S4 based on LSI MegaRAID SAS2208	S26361-F4531-E300 ³⁾ S26361-F4531-E513 ³⁾	S26361-F4531-L300 ⁴⁾ S26361-F4531-L513 ²⁾

¹⁾ listing as of May 11th, 2016

²⁾ component in phase out

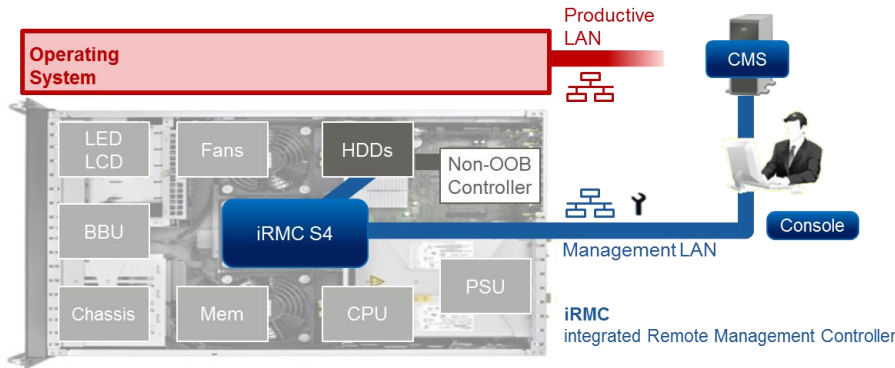
³⁾ component no longer available for ordering

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 S4 retrieves status information of installed HDDs via a cable connection from the HDD backplane:



- iRMC S4 is connected to the HDD backplane of the Fujitsu PRIMERGY server
- iRMC S4 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 a iRMC S4 web server page
 ⇒ left navigation "Sensors" ⇒ "Component Status":

Please refer to the [iRMC S4 user manual](#), chapters 7.10 Sensors.

Component Status Sensor Information						
No.	Designation	Entity Id	Entity Instance	Signal Status	CSS Component	
56	HDD0	Disk / Disk Bay	1	OK	Yes	
57	HDD1	Disk / Disk Bay	2	OK	Yes	
59	HDD2	Disk / Disk Bay	3	Prefail	Yes	
59	HDD3	Disk / Disk Bay	4	Failed	Yes	
60	HDD4	Disk / Disk Bay	5	OK	Yes	
61	HDD5	Disk / Disk Bay	6	Empty Slot	Yes	

Fig. 9: iRMC S4 web server page - Status of installed HDDs

2.2.1 Prerequisites



- OOB-HDD monitoring requires a Fujitsu PRIMERGY system with
- iRMC S4 and
 - an OOB enabled HDD backplane incl. connection to the iRMC S4 (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 S4 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 [Internet](#) ⇒ 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](#)

FUJITSU Software ServerView® Suite - Overview



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 Configures Fujitsu PRIMERGY server hardware and installs operating systems and server management software either unattended or menu-driven, locally or remotely. ■ Scripting Toolkit Collection of utilities and sample scripts for individual script-based Fujitsu PRIMERGY server configuration and installation. 	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 	Private Cloud Infrastructure <ul style="list-style-type: none"> □ Resource Orchestrator Cloud Edition Consolidated Server Infrastructures <ul style="list-style-type: none"> □ Resource Orchestrator Virtual Edition I/O Management <ul style="list-style-type: none"> □ Virtual-I/O Manager 	Remote Management <ul style="list-style-type: none"> ■ Integrated Remote Management Controller (iRMC) <ul style="list-style-type: none"> □ iRMC Advanced Pack ■ Management Blade □ Support Gateway / AutoCall embedded LifeCycle Management <ul style="list-style-type: none"> □ 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 SCVMM ■ Microsoft SC PRO Packs ■ VMware vCenter ■ VMware vRealize ■ Nagios ■ Icinga ■ HP Systems Insight Manager

■ = Standard □ = Option

Contact

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