



# Fujitsu Server PRIMERGY RX2540 M7

## Upgrade and Maintenance Manual

## Comments... Suggestions... Corrections...

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## **Before reading this manual**

### **For your safety**

This manual contains important information for safely and correctly using this product.

Carefully read the manual before using this product. Pay particular attention to the accompanying manual "Safety Notes and Regulations" and ensure that these safety notes are understood before using the product. Keep this manual and the "Safety Notes and Regulations" manual in a safe place for easy reference while using this product.

### **Radio interference**

This product is a "Class A" ITE (Information Technology Equipment). In a domestic environment this product may cause radio interference, in which case the user may be required to take appropriate measures.

VCCI-A

### **Aluminum electrolytic capacitors**

The aluminum electrolytic capacitors used in the printed circuit board assemblies of the product and in the mouse and keyboard are limited-life components. Use of these components beyond their operating life may result in electrolyte leakage or depletion, potentially causing emission of foul odor or smoke.

As a guideline, in a normal office environment (25 °C) operating life is not expected to be reached within the maintenance support period (5 years). However, operating life may be reached more quickly if, for example, the product is used in a hot environment. The customer shall bear the cost of replacing replaceable components which have exceeded their operating life. Note that these are only guidelines, and do not constitute a guarantee of trouble-free operation during the maintenance support period.

### **High safety use**

This product has been designed and manufactured to be used in commercial and/or industrial areas as a server.

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The product is not suitable for use at visual display workplaces according to §2 of the Workplace Regulations (applies to all server systems except TX server systems).

When used as visual display workplace, it must not be placed in the direct field of view to avoid incommoding reflections (applies only to TX server systems).

The device has not been designed or manufactured for uses which demand an extremely high level of safety and carry a direct and serious risk of life or body if such safety cannot be assured.

These uses include control of nuclear reactions in nuclear power plants, automatic airplane flight control, air traffic control, traffic control in mass transport systems, medical devices for life support, and missile guidance control in weapons systems (hereafter, "high safety use"). Customers should not use this product for high safety use unless measures are in place for ensuring the level of safety demanded of such use. Please consult the sales staff of Fujitsu if intending to use this product for high safety use.

### **Measures against momentary voltage drop**

This product may be affected by a momentary voltage drop in the power supply caused by lightning. To prevent a momentary voltage drop, the use of an uninterruptible power supply is recommended.

(This notice follows the guidelines of Voltage Dip Immunity of Personal Computer issued by JEITA, the Japan Electronics and Information Technology Industries Association.)

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### **Harmonic Current Standards**

This product conforms to harmonic current standard JIS C 61000-3-2.

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### **Only for Japan: About SATA HDDs**

The SATA version of this server supports HDDs with SATA/BC-SATA storage interfaces. Please note that the usage and operation conditions differ depending on the type of HDD used.

For more information on the usage and operation conditions of each available type of HDD, see the following internet address:

<https://jp.fujitsu.com/platform/server/primergy/harddisk/>

### **Only for Japan:**

Shielded LAN cables should be used in this product.

### **UK Importer information**

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## Version history

Issue number	Issue date	Description
V 1.0	03/2023	Initial release
V 2.0	05/2023	Liquid cooling added
V 3.0	08/2023	Following section was added: <ul style="list-style-type: none"><li>• VROC module</li></ul> Following sections were updated: <ul style="list-style-type: none"><li>• Configuration with up to 12 HDD modules</li><li>• Installing an expansion card</li><li>• Installing a GPU card in a riser module</li><li>• Installing an internal RAID riser module</li><li>• Removing an internal RAID riser module</li><li>• Handling the CPU dummy cover</li><li>• Replacing the system board</li><li>• Indicators on the Common Operation Panel (COP)</li><li>• Cable plan</li><li>• List of Released Adapters</li></ul>
	09/2023	Following section was updated: <ul style="list-style-type: none"><li>• Cable plan</li></ul>

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# 1 Introduction

## 1.1 Concept and target groups of this manual

This upgrade and maintenance manual provides instructions for the following procedures:

- Upgrading the server configuration by adding optional hardware components.
- Upgrading the server configuration by replacing existing hardware components with superior ones.
- Replacing defective hardware components.

This manual focuses on on-site maintenance tasks. It is recommended to prepare each service assignment following remote diagnostics procedures, as described in the "ServerView Suite Local Service Concept (LSC)" manual, see ["Documentation overview" on page 29](#).



### CAUTION

The document at hand comprises procedures of a wide range of complexity.

- ▶ Check the profile of qualification for technicians before assigning tasks.
- ▶ Before you start, carefully read ["Classification of procedures" on page 23](#).

## 1.2 Notational conventions

The following notational conventions are used in this manual:

<b>Text in bold</b>	Indicates references to names of interface elements.
Text in monospace	Indicates commands and text to be entered by the user.

## Introduction

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"Quotation marks"	Indicate names of chapters and terms that are being emphasized.
▶	Describes activities that must be performed in the order shown.
[Abc]	Indicates keys on the keyboard.
 <b>CAUTION</b>	Pay particular attention to texts marked with this symbol. Failure to observe this warning may endanger your life, destroy the system or lead to the loss of data.
	Indicates additional information, notes and tips.
  	Indicates the procedure category in terms of complexity and qualification requirements, see <a href="#">"Classification of procedures" on page 23</a> .
	Indicates the average task duration, see <a href="#">"Average task duration" on page 27</a> .

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## 2 Before you start

### 2.1 Basic information

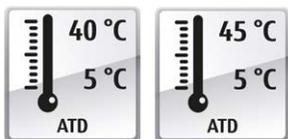
#### 2.1.1 Proceeding

Before you start any upgrade or maintenance task, proceed as follows:

- ▶ Carefully read the safety instructions, see "[Important information](#)" on [page 33](#).
- ▶ Make sure that all necessary manuals are available, see "[Documentation overview](#)" on [page 29](#). Print the PDF files if required.
- ▶ Make yourself familiar with the procedure categories, see "[Classification of procedures](#)" on [page 23](#).
- ▶ Ensure that all required tools are available, see "[Tools you need at hand](#)" on [page 28](#).

#### 2.1.2 Advanced Thermal Design (ATD)

The ATD option allows you to operate the system with a wider temperature range either of 5 °C to 40 °C or 5 °C to 45 °C, depending on your system and configuration.



This option can only be ordered from the manufacturer and is indicated by the respective logo on the identification rating plate.



#### CAUTION

- ▶ In a system that is configured with ATD, only certain components which support the respectively increased higher operating temperature range may be installed and used. For applicable restrictions, see the official configurator tool.

### 2.1.3 Configuration Thermal Design (CTD)

The CTD option allows you to operate the system with a temperature range from 5 °C to 30 °C with corresponding configurations.

 PRIMERGY servers are designed for the usage with operating temperatures of up to 35 °C. There could be configurations that are not able to work within this normal operation class. Please refer to Datasheet and Fujitsu WebArchitect ( [www.fujitsu.com/configurator/public](http://www.fujitsu.com/configurator/public)) to obtain detailed information on the corresponding configurations.



This option can only be ordered from the manufacturer and is indicated by the respective logo on the identification rating plate.



#### CAUTION

▶ In a system that is configured with CTD, only certain components which support the respectively decreased lower operating temperature range may be installed and used. For applicable restrictions, see the official configurator tool.

### 2.1.4 Installing optional components

The operating manual of your server gives an introduction to server features and provides an overview of available hardware options.

Use the Fujitsu ServerView Suite management software and the iRMC S6 web interface to prepare hardware expansions. For more information about ServerView Suite documentation, see "[Documentation overview](#)" on page 29.

Please see the following ServerView Suite topics:

- Operation
- Virtualization
- Maintenance
- Out-Of-Band Management



For the latest information on hardware options, see the hardware configurator of your server, available online at the following address:  
<https://www.fujitsu.com/fts/products/computing/servers/primergy/index.html>

For Japan:

<https://jp.fujitsu.com/platform/server/primergy/system/> (models on sale)  
<https://jp.fujitsu.com/platform/server/primergy/product-navi/> (past models)

Please contact your sales outlet for details on how to order expansion kits or spare parts.

## 2.1.5 Replacing a defective component

The Global Error indicator on the front of the server reports defective hardware components that need to be replaced. For more information on the controls and indicators of your server, see the operating manual of your server and "[Connectors and indicators](#)" on page 542.

If the system has been powered off in order to replace a non-hot plug unit, a system of PRIMERGY diagnostic indicators guides you to the defective component. The "Indicate CSS" button enables the indicator next to the defective component even if the server has been switched off and disconnected from the mains. For more information, see "[Using diagnostic information](#)" on page 47 and "[Indicators on the Common Operation Panel \(COP\)](#)" on page 549.

If the defective component is a customer replaceable unit included in the CSS concept (Customer Self Service), the CSS indicator on the server front will light up.

## 2.2 Classification of procedures

### 2.2.1 Assignment of unit categories

The complexity of maintenance procedures varies significantly. Procedures have been assigned to one of three unit categories, indicating the level of difficulty and required qualification.

## Before you start

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At the beginning of each procedure, the involved unit category is indicated by one of the symbols introduced in this section.



Please ask your local Fujitsu service center for more information.

### 2.2.2 Customer Replaceable Units (CRU)



#### Customer Replaceable Units (CRU)

Customer Replaceable Units are intended for customer self service and may be installed or replaced as hot-plug components during operation.



Components that the customer is entitled to replace may differ according to the service form in his country.

For Japan:

<https://www.fujitsu.com/jp/products/computing/servers/primergy/support/repair.html>



Hot-plug components increase system availability and guarantee a high degree of data integrity and fail-safe performance. Procedures can be carried out without shutting down the server or going offline.



Before replacing non hot-plug components, the server must be shut down and all power cords must be disconnected from the power outlets.

#### Components that are handled as Customer Replaceable Units

- Hot-plug HDD/SSD modules
- Hot-plug PCIe SSD modules
- Hot-plug PSUs
- Fan module (non hot-plug)
- Memory modules (not allowed for Japan)
- Expansion cards (not allowed for Japan)

## Peripherals that are handled as Customer Replaceable Units

- Keyboard
- Mouse

## 2.2.3 Upgrade and Repair Units (URU)



### Upgrade and Repair Units (URU)

Upgrade and Repair Units are non hot-plug components that can be ordered separately to be installed as options (Upgrade Units) or are available to the customer through customer self service (Repair Units).



For Japan, customer allows only upgrade. For upgrade units as customer replaceable, see:

<https://www.fujitsu.com/jp/products/computing/servers/primergy/>



Server management error messages and diagnostic indicators on the front panel and system board will report defective Upgrade and Repair Units as customer replaceable CSS components.

Upgrade and repair procedures involve shutting down and opening the server.



### CAUTION

The device may be seriously damaged or cause damage if it is opened without authorization or if repairs are attempted by unauthorized and untrained personnel.

## Components that are handled as Upgrade Units

- CPU (upgrade kits)
- Expansion cards
- Front VGA
- Flash backup units (FBU)
- GPU card
- Internal RAID riser module

## Before you start

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- iRMC microSD card
- LTO drive
- M.2 SSDs
- M.2 interposer board
- Memory modules
- microSD card
- OCP module
- ODD
- PCIe riser modules
- RDX drive
- Rear HDD cage
- Rear VGA connector
- Rear HDD cage
- SAS expander board / PCIe switch board
- Serial interface
- Slot bracket
- SFP+ transceiver modules
- VROC module

### Components that are handled solely as Repair Units

- CMOS battery

## 2.2.4 Field Replaceable Units (FRU)



### Field Replaceable Units (FRU)

Removing and installing Field Replaceable Units involves complex maintenance procedures on integral server components. Procedures will require shutting down, opening and disassembling the server.

**CAUTION**

Maintenance procedures involving Field Replaceable Units must be performed exclusively by Fujitsu service personnel or technicians trained by Fujitsu. Please note that unauthorized interference with the system will void the warranty and exempt the manufacturer from all liability.

**Components that are handled as Field Replaceable Units**

- Common Operation Panel (COP)
- CPU (replacement)
- HDD backplane (SAS/SATA/PCIe SSD)
- PCIe riser card
- System board
- Trusted Platform Module (TPM)
- Thermal sensor
- Liquid cooling (LC) kit



Please ask your local Fujitsu service center for more information.

## 2.3 Average task duration



**Hardware: 10 minutes**

The average task duration including preliminary and concluding steps is indicated at the beginning of each procedure next to the procedure class.

The following table gives an overview of steps taken into account for calculating the average task duration.

## Before you start

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Step	included	Explanation
Server shutdown	no	Shutdown time depends on hardware and software configuration and may vary significantly.  Software tasks necessary before maintenance, see <a href="#">"Starting the maintenance task" on page 89</a> .
Rack removal, disassembly	<b>yes</b>	Making the server available, removing the server from the rack (if applicable).
Transport	no	Transporting the server to the service table (where required) depends on local customer conditions.
Maintenance procedures	<b>yes</b>	Maintenance procedures including preliminary and concluding software tasks.
Transport	no	Returning the server to its installation site (where required) depends on local customer conditions.
Assembly, rack installation	<b>yes</b>	Reassembling the server, installing the server in the rack (if applicable).
Starting up	no	Booting time depends on hardware and software configuration and may vary significantly.

Table 1: Calculation of the average task duration

## 2.4 Tools you need at hand

When preparing the maintenance task, ensure that all required tools are available. You will find a list of required tools at the beginning of each procedure.

## 2.5 Documentation overview

### 2.5.1 Downloading manuals

Maintenance procedures may include references to additional documentation.

- ▶ Ensure to store all printed manuals enclosed with your server in a save place for future reference.
- ▶ When preparing the maintenance task, ensure that all required manuals are available, see 2.5.2. If applicable, download the manual from the following address:

<https://support.ts.fujitsu.com/>

For Japan:

<https://www.fujitsu.com/jp/products/computing/servers/primergy/manual/>

### 2.5.2 List of documents

Document	Description
"Safety Notes and Regulations" manual "安全上のご注意" for Japan	Important safety information, available online, or as a printed copy
"Fujitsu Server PRIMERGY RX2540 M7 Operating Manual"	Information how to install, set up and operate your server, available online
"Fujitsu Server PRIMERGY RX2540 M7 Upgrade and Maintenance Manual"	Instructions for upgrading the server configuration or replacing defective hardware, available online
"D3983 BIOS Setup Utility for Fujitsu Server PRIMERGY RX2540 M7 Reference Manual"	Information on configurable BIOS options and parameters, available online
"Fujitsu Server PRIMERGY RX2540 M7 Disassembly and Recycling Instructions"	Instructions for disassembling and recycling the server, available online

## Before you start

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Document	Description
System foil	Label inside the top cover outlining connectors, indicators and jumper
iRMC S6 documentation	<ul style="list-style-type: none"><li>– "iRMC S6 - Concepts and Interfaces" user guide</li><li>– "iRMC S6 - Configuration and Maintenance" user guide</li><li>– "iRMC S6 - Web Interface" user guide</li></ul>
Infrastructure Manager documentation	"Fujitsu Software Infrastructure Manager V2.8.0 Infrastructure Manager for PRIMEFLEX V2.8.0 User's Guide"
ServerView documentation	<ul style="list-style-type: none"><li>– "ServerView Suite Local Service Concept (LSC)" user guide</li><li>– "ServerView embedded Lifecycle Management (eLCM)" user guide</li></ul>
Illustrated Spares catalog	Spare parts identification and information system (not valid for Japan), available for online use or download (Windows OS) at <a href="https://manuals.ts.fujitsu.com/isc_illustrated_spares/">https://manuals.ts.fujitsu.com/isc_illustrated_spares/</a> .
Glossary	Contains abbreviations and explanations, available online
"Warranty" manual "保証書" for Japan	Important information on warranty regulations, recycling and service, available online, or as a printed copy
"Returning used devices" manual	Recycling and contact information, available online at <a href="https://ts.fujitsu.com/recycling">https://ts.fujitsu.com/recycling</a> , or as a printed copy
"Service Desk" leaflet "サポート & サービス" for Japan	Not applicable in Japan and other countries that have different regulations for recycling

Document	Description
Additional documentation	RAID documentation, "Intel Virtual RAID on CPU (Intel VROC) User Guide" and "NVMe User Guide", available online at <a href="https://support.ts.fujitsu.com/">https://support.ts.fujitsu.com/</a>  For Japan: <a href="https://www.fujitsu.com/jp/products/computing/servers/primergy/manual/">https://www.fujitsu.com/jp/products/computing/servers/primergy/manual/</a>
Third party documentation	– Operating system documentation, online help – Peripherals documentation

Table 2: List of documents



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## 3 Important information

### 3.1 Introduction

In this chapter you will find essential information regarding safety when working on your server.



Depending on your server or the installed options some information is not valid for your server.



#### **CAUTION**

▶ Before installing and starting up a server, please observe the safety instructions listed in the following section. This will help you to avoid making serious errors that could impair your health, damage the server and endanger the data base.

### 3.2 Safety instructions

#### 3.2.1 Basic safety instructions



The following safety instructions are also provided in the manual "Safety Notes and Regulations" or "安全上のご注意".

This server meets the relevant safety regulations for IT equipment. If you have any questions about whether you can install the server in the intended environment, please contact your sales outlet or our customer service team.

- ▶ The actions described in this manual shall be performed by technical specialists. A technical specialist is a person who is trained to install the server including hardware and software.
- ▶ Repairs to the server that do not relate to CSS failures shall be performed by service personnel. Please note that unauthorized interference with the server will void the warranty and exempt the manufacturer from all liability.
- ▶ Any failure to observe the guidelines in this manual, and any improper repairs could expose the user to risks (electric shock, energy hazards, fire hazards) or damage the equipment.

## Important information

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- ▶ Only valid for non hot-plug components

Before installing/removing internal components to/from the server, turn off the server, all peripheral devices, and any other connected devices. Also unplug all power cords from the power outlet. Failure to do so can cause electric shock or damage.

### 3.2.2 Before starting up

- ▶ During installation and before operating the server, observe the instructions on environmental conditions for your server.

- ▶ If the server is brought in from a cold environment, condensation may form both inside and on the outside of the server.

Wait until the server has acclimatized to room temperature and is absolutely dry before starting it up. Material damage may be caused to the server if this requirement is not observed.

- ▶ Only transport the server in its original packaging or in packaging that protects it from impacts and jolts.

In Japan and APAC, transporting the server in its original packaging does not apply.

### 3.2.3 Installation and operation

- ▶ This server should not be operated in ambient temperatures above 35 °C. For servers with Advanced Thermal Design the ambient temperature can increase to 40 °C or 45 °C.

- ▶ If the server is integrated into an installation that draws power from an industrial power supply network with an IEC309 connector, the power supply's fuse protection must comply with the requirements for non-industrial power supply networks for type A connectors.

- ▶ The server automatically adjusts itself to a mains voltage, see the type label of your server. Ensure that the local mains voltage lies within these limits.

- ▶ This server must only be connected to properly grounded power outlets or connected to the grounded rack internal power distribution server with tested and approved power cords.

- ▶ If a DC power cord is used, the server must be connected to a proper DC source and earth ground stud/end.
- ▶ Ensure that the server is connected to a properly grounded power outlet close to the server.
- ▶ Ensure that the power sockets on the server and the properly grounded power outlets are easily accessible.
- ▶ The On/Off button or the main power switch (if present) does not isolate the server from the mains power supply. In case of repair or servicing disconnect the server completely from the mains power supply, unplug all power plugs from the properly grounded power outlets.
- ▶ Always connect the server and the attached peripheral devices to the same power circuit. Otherwise you run the risk of losing data if, for example, the server is still running but a peripheral device (e.g. memory subsystem) fails during a power outage.
- ▶ The adequately shielded data cables must be used.  
All data and signal cables must have sufficient shielding. The use of cable type S/FTP Cat5 or higher is recommended. Use of unshielded or badly shielded cables may lead to increased emission of interference and/or reduced fault-tolerance of the device.
- ▶ Ethernet cabling has to comply with EN 50173 and EN 50174-1/2 standards or ISO/IEC 11801 standard respectively. The minimum requirement is a Category 5 shielded cable for 10/100 Ethernet, or a Category 5e cable for Gigabit Ethernet.
- ▶ Route the cables in such a way that they do not create a potential hazard (ensure that no-one can trip over them) and that they cannot be damaged. When connecting the server, see the relevant instructions in this manual.
- ▶ Never connect or disconnect data transmission lines during a storm (risk of lightning hazard).
- ▶ Ensure that no objects (e.g. jewelry, paperclips etc.) or liquids can get inside the server (risk of electric shock, short circuit).
- ▶ In emergencies (e.g. damaged casing, controls or cables, penetration of liquids or foreign bodies), contact the server administrator or your customer service team. Only disconnect the server from the mains power supply if there is no risk of harming yourself.

## Important information

---

- ▶ Proper operation of the server (in accordance with IEC 60950-1/62368-1 resp. EN 60950-1/62368-1) is only ensured if the server is completely assembled and the rear covers for the installation slots have been fitted (electric shock, cooling, fire protection, interference suppression).
- ▶ Only install server expansions that satisfy the requirements and rules governing safety and electromagnetic compatibility and those relating to telecommunication terminals. If you install other expansions, they may damage the server or violate the safety regulations. Information on which server expansions are approved for installation can be obtained from our customer service center or your sales outlet.
- ▶ The components marked with a warning notice (e.g. lightning symbol) may only be opened, removed or exchanged by authorized, qualified personnel. Exception: CSS components can be replaced.
- ▶ The warranty is void if the server is damaged during installation or replacement of server expansions.
- ▶ Only set screen resolutions and refresh rates that are specified in the operating manual for the monitor. Otherwise, you may damage your monitor. If you are in any doubt, contact your sales outlet or customer service center.
- ▶ Only valid for non hot-plug components  
Before installing/removing internal components to/from the server, turn off the server, all peripheral devices, and any other connected devices. Also unplug all power cords from the power outlet. Failure to do so can cause electric shock or damage.  
Internal devices remain hot after shutdown. Wait for a while after shutdown before installing or removing internal options.
- ▶ Do not damage or modify internal cables or internal devices. Doing so may cause a server failure, fire, or electric shock and will void the warranty and exempt the manufacturer from all liability.
- ▶ The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. To ensure reliable protection, you must wear an earthing band on your wrist when working with this type of module and connect it to an unpainted, conducting metal part of the server.
- ▶ Do not touch the circuitry on boards or soldered parts. Hold the metallic areas or the edges of the circuit boards.

- ▶ Install the screw removed during installation/detaching internal options in former position. To use a screw of the different kind can cause a breakdown of equipment.
- ▶ The procedure of installation on this notes might change depending on a configuration of option.

### 3.2.4 Batteries

- ▶ Incorrect replacement of batteries may lead to a risk of explosion. The batteries may only be replaced with identical batteries or with a type recommended by the manufacturer.
- ▶ Do not throw batteries into the trash can.  
Batteries must be disposed of in accordance with local regulations concerning special waste.
- ▶ Ensure that you insert the battery the right way round.
- ▶ The battery used in this server may present a fire or chemical burn hazard if mistreated. Do not disassemble, heat about 100 °C (212F), or incinerate the battery.
- ▶ Replace the lithium battery on the system board in accordance with the instructions in the corresponding Upgrade and Maintenance Manual, chapter "System board and components" > "CMOS battery".
- ▶ All batteries containing pollutants are marked with a symbol (a crossed-out garbage can). In addition, the marking is provided with the chemical symbol of the heavy metal decisive for the classification as a pollutant:  
Cd Cadmium  
Hg Mercury  
Pb Lead

### 3.2.5 Working with optical disk drives (ODDs) and media

When working with ODDs, these instructions must be followed.



### CAUTION

- ▶ Only use CDs/DVDs/BDs that are in perfect condition, in order to prevent data loss, equipment damage and injury.
- ▶ Check each CD/DVD/BD for damage, cracks, breakages etc. before inserting it in the drive.

Note that any additional labels applied may change the mechanical properties of a CD/DVD/BD and cause imbalance and vibrations.

Damaged and imbalanced CDs/DVDs/BDs can break at high drive speeds (data loss).

Under certain circumstances, sharp CD/DVD/BD fragments can pierce the cover of the ODD (equipment damage) and can fly out of the drive (danger of injury, particularly to uncovered body parts such as the face or neck).

- ▶ High humidity and airborne dust levels are to be avoided. Electric shocks and/or server failures may be caused by liquids such as water, or metallic items, such as paper clips, entering a drive.
- ▶ Shocks and vibrations are also to be avoided.
- ▶ Do not insert any objects other than the specified CDs/DVDs/BDs.
- ▶ Do not pull on, press hard, or otherwise handle the CD/DVD/BD tray roughly.
- ▶ Do not disassemble the ODD.
- ▶ Before use, clean the ODD tray using a soft, dry cloth.
- ▶ As a precaution, remove disks from the ODD when the drive is not to be used for a long time. Keep the ODD tray closed to prevent foreign matter, such as dust, from entering the ODD.
- ▶ Hold CDs/DVDs/BDs by their edges to avoid contact with the disk surface.
- ▶ Do not contaminate the CD/DVD/BD surface with fingerprints, oil, dust, etc. If dirty, clean with a soft, dry cloth, wiping from the center to the edge. Do not use benzene, thinners, water, record sprays, antistatic agents, or silicone-impregnated cloth.
- ▶ Be careful not to damage the CD/DVD/BD surface.
- ▶ Keep the CDs/DVDs/BDs away from heat sources.

- ▶ Do not bend or place heavy objects on CDs/DVDs/BDs.
- ▶ Do not write with ballpoint pen or pencil on the label (printed) side.
- ▶ Do not attach stickers or similar to the label side. Doing so may cause rotational eccentricity and abnormal vibrations.
- ▶ When a CD/DVD/BD is moved from a cold place to a warm place, moisture condensation on the CD/DVD/BD surface can cause data read errors. In this case, wipe the CD/DVD/BD with a soft, dry cloth then let it air dry. Do not dry the CD/DVD/BD using devices such as a hair dryer.
- ▶ To avoid dust, damage, and deformation, keep the CD/DVD/BD in its case whenever it is not in use.
- ▶ Do not store CDs/DVDs/BDs at high temperatures. Areas exposed to prolonged direct sunlight or near heating appliances are to be avoided.



You can prevent damage from the ODD and the CDs/DVDs/BDs, as well as premature wear of the disks, by observing the following suggestions:

- Only insert disks in the drive when needed and remove them after use.
- Store the disks in suitable sleeves.
- Protect the disks from exposure to heat and direct sunlight.

### 3.2.6 Laser information

The ODD complies with IEC 60825-1 laser class 1.



#### **CAUTION**

The ODD contains a light-emitting diode (LED), which under certain circumstances produces a laser beam stronger than laser class 1. Looking directly at this beam is dangerous.

- ▶ Never remove parts of the ODD casing!

### 3.2.7 Modules with Electrostatic-Sensitive Devices (ESD modules)

ESD modules are identified by the following sticker:

## Important information

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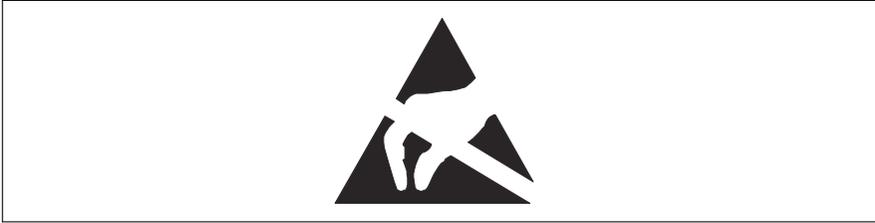


Figure 1: ESD label



The ESD label can be different.

When you handle ESD modules, you must always observe the following points:

- ▶ Switch off the server and remove the power plugs from the power outlets before installing or removing ESD modules.
- ▶ The circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. To ensure reliable protection, you must wear an earthing band on your wrist when working with ESD modules and connect it to an unpainted, conducting metal part of the server.
- ▶ Any devices or tools that are used must be free of electrostatic charge.
- ▶ Wear a suitable grounding cable that connects you to the external chassis of the server.
- ▶ Always hold ESD modules at the edges or at the colored touch points.
- ▶ Do not touch any connectors or conduction paths on an ESD module.
- ▶ Place all the components on a pad which is free of electrostatic charge.



For a detailed description of how to handle ESD modules, see the relevant European or international standards (EN 61340-5-1, ANSI/ESD S20.20).

## 3.2.8 Transporting the server



### CAUTION

- ▶ Only transport the server in its original packaging or in packaging that protects it from impacts and jolts.

In Japan and APAC, transporting the server in its original packaging does not apply.

- ▶ Do not unpack the server until it is at its installation location.
- ▶ If you need to lift or transport the server, ask other people to help you.
- ▶ Never lift or carry the server by the handles or the Quick Release Levers (QRLs) on the front panel.

### 3.2.9 Installing the server in the rack



#### CAUTION

- ▶ For safety reasons, at least 2 people are required to install the server in the rack because of its weight and size.  
(For Japan, see "安全上のご注意".)
- ▶ Never lift the server into the rack using the Quick Release Levers (QRLs) on the front panel.
- ▶ When connecting and disconnecting cables, observe the relevant instructions in the "Important Information" chapter of the technical manual for the corresponding rack. The technical manual is supplied with the corresponding rack.
- ▶ When installing the rack, ensure that the anti-tilt mechanism is correctly fitted.
- ▶ Do not extend more than one server out of the rack simultaneously even if the tilt protection is in place. If several servers are simultaneously extended from the rack, there is a risk that the rack could tip over. See the safety information of the rack and the warning label.
- ▶ If the server/rack is intended for permanent connection to the mains only an authorized specialist (electrician) is allowed to work. Please follow the regulation of each country.
- ▶ If the server is integrated into an installation that draws power from an industrial power supply network with an IEC309 type connector, the power supply's fuse protection must comply with the requirements for non-industrial power supply networks for the type A connector.

### 3.2.10 Other important information

- ▶ During cleaning, observe the instructions in the corresponding operating manual chapter "Operation" > "Cleaning the server".
- ▶ Keep all manuals close to the server. All documentation must be included if the equipment is passed on to a third party.

### 3.3 ENERGY STAR



Products that have been certified compliant with ENERGY STAR and labelled are in full compliance with the specification at shipping. Note that energy consumption can be affected by software that is installed or any changes that are made to the hardware configuration or BIOS or energy options subsequently. In such cases, the properties guaranteed by ENERGY STAR can no longer be assured.

The "Fujitsu Software Infrastructure Manager V2.8.0 User's Guide" contains instructions for reading out measurement values, including those relating to current energy consumption and air temperatures. Either the Performance Monitor or the Task Manager can be used to read out CPU utilization levels.

### 3.4 CE conformity



The system complies with the requirements of European Regulations. Find the CE declaration on certificate portal: <https://sp.ts.fujitsu.com/sites/certificates/default.aspx>



#### CAUTION

This is a Class A product. In a domestic environment this product may cause RF interference.

- ▶ In this case the user may be required to take adequate measures.

To open the CE declaration applicable for your system, proceed as follows:

- ▶ Select the product class, e.g. "Industry Standard Servers".
- ▶ Select the subclass, e.g. "Rack server".
- ▶ Select your server, e.g. "PRIMERGY RX2540 M7".
- ▶ Select the document, e.g. "CE Cert PRIMERGY RX2540 M7".

### 3.5 FCC Class A Compliance Statement

If there is an FCC statement on the device, it applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the accompanying documentation.

#### **NOTE:**

This equipment has been tested and found to comply with the limits for a "Class A" digital device, pursuant to Part 15 of the FCC rules and meets all requirements of the Canadian Interference-Causing Equipment Standard ICES-003 for digital apparatus. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in strict accordance with the instructions, may cause harmful interference to radio communications. However, there is no warranty that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between equipment and the receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help.

Fujitsu is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Fujitsu. The correction of interferences caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC and ICES rules.

## 3.6 Environmental protection

### Environmentally-friendly product design and development

This product has been designed in accordance with the Fujitsu standard for "environmentally friendly product design and development". This means that key factors such as durability, selection and labeling of materials, emissions, packaging, ease of dismantling and recycling have been taken into account. This saves resources and thus reduces the harm done to the environment. More information can be found at:

[https://ts.fujitsu.com/products/standard\\_servers/index.html](https://ts.fujitsu.com/products/standard_servers/index.html)

For Japan:

<https://jp.fujitsu.com/platform/server/primergy/concept/>

### Energy-saving information

Devices that do not need to be constantly switched on should be switched off until they are needed as well as during long breaks and after completion of work.

### Packaging information

This packaging information does not apply in Japan and APAC. Do not throw away the packaging. You may need it later for transporting the server. If possible, the equipment should only be transported in its original packaging.

### Information on handling consumables

Please dispose of printer consumables and batteries in accordance with the applicable national regulations.

In accordance with EU directives, batteries must not be disposed of with unsorted domestic waste. They can be returned free of charge to the manufacturer, dealer or an authorized agent for recycling or disposal.

All batteries containing pollutants are marked with a symbol (a crossed-out garbage can). They are also marked with the chemical symbol for the heavy metal that causes them to be categorized as containing pollutants:

Cd Cadmium

Hg Mercury

Pb Lead

## Important information

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### Labels on plastic casing parts

Please avoid sticking your own labels on plastic parts wherever possible, since this makes it difficult to recycle them.

### Returns, recycling and disposal

Please handle returns, recycling and disposal in accordance with local regulations.



The device must not be disposed of with domestic waste. This device is labeled in compliance with European directive 2012/19/EU on waste electrical and electronic equipment (WEEE).

This directive sets the framework for returning and recycling used equipment and is valid across the EU. When returning your used device, please use the return and collection systems available to you.

More information can be found at:

<https://ts.fujitsu.com/recycling>

Details regarding the return and recycling of devices and consumables within Europe can also be found in the "Returning used devices" manual, via your local Fujitsu branch, or at:

<https://ts.fujitsu.com/recycling>

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## 4 Basic hardware procedures

### 4.1 Using diagnostic information

#### 4.1.1 Proceeding

Use the Fujitsu ServerView Suite management software to plan the upgrade or replacement of hardware components.

It is recommended to prepare local maintenance tasks using remote diagnostics procedures, see the "ServerView Suite Local Service Concept (LSC)" manual.



In Japan remote diagnostics procedures are not used.

Please contact your sales outlet for details on the service concept and on how to order expansion kits or spare parts.

#### 4.1.2 Locating the defective server

Use the ID indicator for easy identification of the server, especially when working in a datacenter environment or a server room:

- ▶ Press the ID button on the front panel, use the iRMC S6 web interface or Infrastructure Manager to switch on the system identification LEDs.



For more information, see the "ServerView Suite Local Service Concept (LSC)" manual, the iRMC user guides or the Infrastructure Manager documentation.

- ▶ Remember to switch off the ID indicator after the maintenance task has been concluded successfully.

#### Using the Infrastructure Manager

- ▶ To toggle the ID indicator from the Infrastructure Manager, select a node from the **Node List** screen and operate the ID indicator from the **Action** button.

### 4.1.3 Determining the error class

The Local Service Concept (LSC) allows you to identify defective server components. Failure events are assigned to one of two error classes:

- Global Error (for non CSS components) events that need to be resolved by maintenance personnel
- Customer Self Service (for CSS components) error events that may be resolved by operating personnel

The Global Error indicator and the CSS indicator can be found on the front side and the rear side of the server.



In some cases the indicator on the rear is designed as a combined indicator (Global Error, ID and CSS indicator).



The indicators also light up in standby mode and after a server restart due to a power failure.

- ▶ Check the Global Error indicator and the CSS indicator.

### 4.1.4 Locating the defective component

After determining the error class by the CSS indicator or the Global Error indicator, indicators on the components and onboard indicators on the system board allow you to identify the defective component, see ["Determining the error class" on page 48](#).

#### Possibilities to get more information about the defective component

- Checking the System Event Log (SEL), see ["Viewing and clearing the System Event Log \(SEL\)" on page 105](#).
- Checking the indicators on the components, see ["Connectors and indicators" on page 542](#).
- Checking the onboard indicators on the system board using the Indicate CSS button, see ["Using the CSS button on the system board" on page 49](#).

## Using the CSS button on the system board

If the system has been powered off, the onboard indicators guides you to the defective component.



### CAUTION

It is mandatory to disconnect all power cords from the system in order to use the Indicate CSS functionality.

- ▶ Shut down and switch off the server.
- ▶ Disconnect all power cords from the system.
- ▶ Press the Indicate CSS button to highlight defective components. The indicator next to the defective component lights up.

## 4.2 Removing the front cover with lock

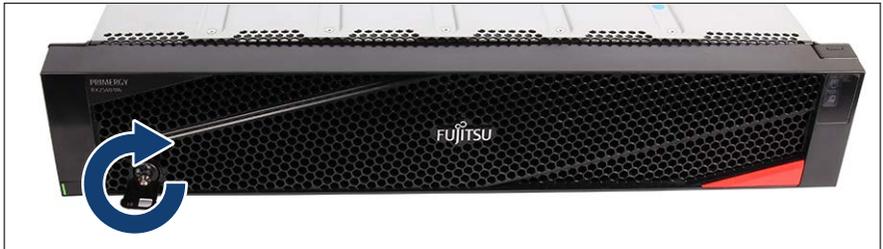


Figure 2: Turning the key

- ▶ Insert the key.
- ▶ Turn the key in open position.



Figure 3: Removing the front cover

- ▶ Push in the lock on the left side (1) and remove the front cover in a slight angle from the front (2).

### 4.3 Shutting down the server



#### CAUTION

- ▶ For more information, see ["Important information" on page 33](#).



This step is only required when upgrading or replacing non-hot-plug components.

- ▶ Inform the system administrator that the server will be shut down and put offline.
- ▶ Terminate all applications.
- ▶ Perform the required procedures described in the preliminary steps of each upgrade or maintenance task.
- ▶ Shut down the server.



If the system is running an ACPI-compliant operating system (OS), pressing the On/Off button will perform a graceful shutdown.

### 4.4 Disconnecting the power cord

#### 4.4.1 Disconnecting the power cord (AC PSU)



You can secure the power cord with a cable clamp or a hook-and-loop tape to ensure that the power cord cannot be disconnected from the server by mistake.

## Using a cable clamp



Figure 4: Unlocking the cable clamp of a PSU

- ▶ Press the cable clamp down until it disengages (1).
- ▶ Open the cable clamp (2).
- ▶ Disconnect the power cord from the PSU and remove it from the cable clamp.

### Using a hook-and-loop tape



Figure 5: Loosening the hook-and-loop tape

- ▶ Unroll the hook-and-loop tape from the power cord.
- ▶ Disconnect the power cord from the PSU.

## 4.4.2 Disconnecting the power cord (DC PSU)

### Example DC PSU -48 V



Figure 6: Disconnecting the server from the dc voltage - example DC PSU -48 V

- ▶ Loosen the two studs (1).
- ▶ Disconnect the power cord from the PSU (2).

### Example HVDC PSU 380 V

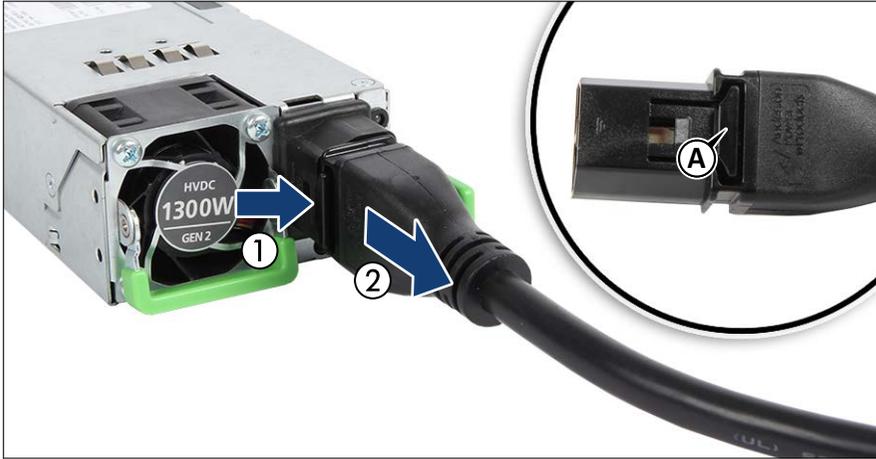


Figure 7: Disconnecting the server from the dc voltage - example HVDC PSU 380 V

- ▶ Press the locking latch (A) of the power cord plug inside, until it disengages (1).
- ▶ Disconnect the power cord from the PSU (2).

## 4.5 Getting access to the component

### 4.5.1 Safety notes



#### CAUTION

- ▶ Only for non-hot plug components:
  - Before removing or attaching covers, turn off the server, all peripheral devices, and any other connected devices.
  - Because there is a risk of electric shock or damage, please disconnect all power cords from the outlet.
- ▶ The top cover must be replaced as soon as possible for purposes of cooling, to comply with EMC regulations (regulations regarding electromagnetic compatibility) and to prevent fires.
- ▶ For more information, see ["Important information" on page 33](#).

### 4.5.2 Extending the server out of the rack



#### CAUTION

- ▶ Use the anti-tilt plate to prevent the rack from tipping when installing the rack. Pulling the server out of the rack without having installed the anti-tilt plate may cause the rack to tip over.
  - ▶ Be careful not to pinch fingers or clothes when sliding out the server or pushing it back. Failure to do so may cause injury.
  - ▶ For more information, see ["Important information" on page 33](#).
- ▶ Remove all remaining external cables from the I/O panel and expansion cards.
- ▶ If you are not using a cable management arm (CMA kit), ensure that the rear cables are long enough not to be strained or damaged when extending the server out of the rack.

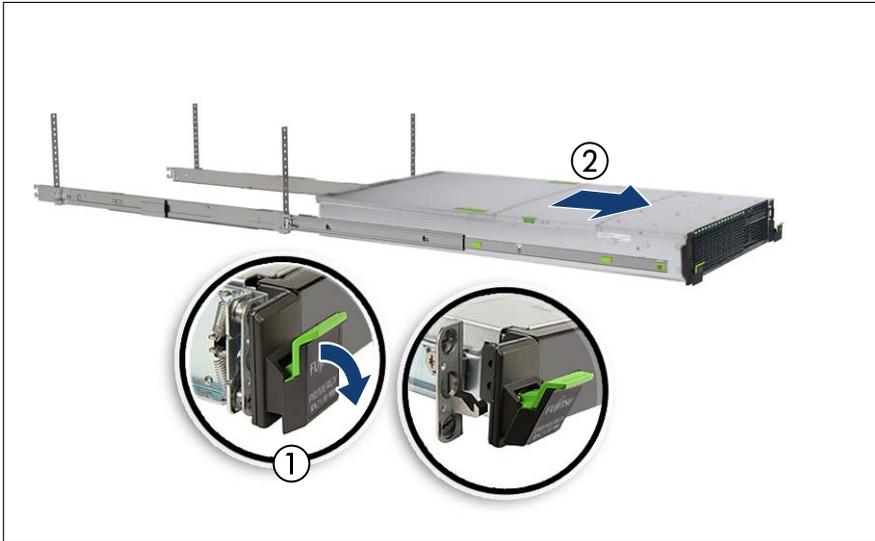


Figure 8: Extending the server out of the rack

- ▶ Fold down the two quick release levers (1).
- ▶ Pull the server out of the rack until it locks in place (2).



### CAUTION

- ▶ Do not use the extended server as a surface on which to put things or as a work surface, and strictly avoid leaning on or against it.

## 4.5.3 Removing the server from the rack

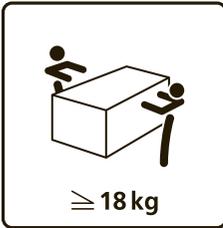


In most cases maintenance tasks can be performed while the server is extended from the rack. However, depending on accessibility or security guidelines, it may make sense to completely remove the server from the rack cabinet for maintenance purposes.



### CAUTION

At least two people are needed to lift the server out of the rack cabinet.  
(For Japan, see " 安全上のご注意".)



**For configurations below 32 kg:**

At least two people are needed to lift the server out of the rack cabinet.



**For configurations below 55 kg:**

At least three people are needed to lift the server out of the rack cabinet.



**For configurations above 55 kg:**

At least four people are needed to lift the server out of the rack cabinet.

Additionally, a lifter is required in the following cases:

- The server weighs more than 50 kg.
- The server weighs more than 21 kg and is to be removed above the height of 25 U.

When using a lifter, this removal procedure needs to be carried out by maintenance personnel.

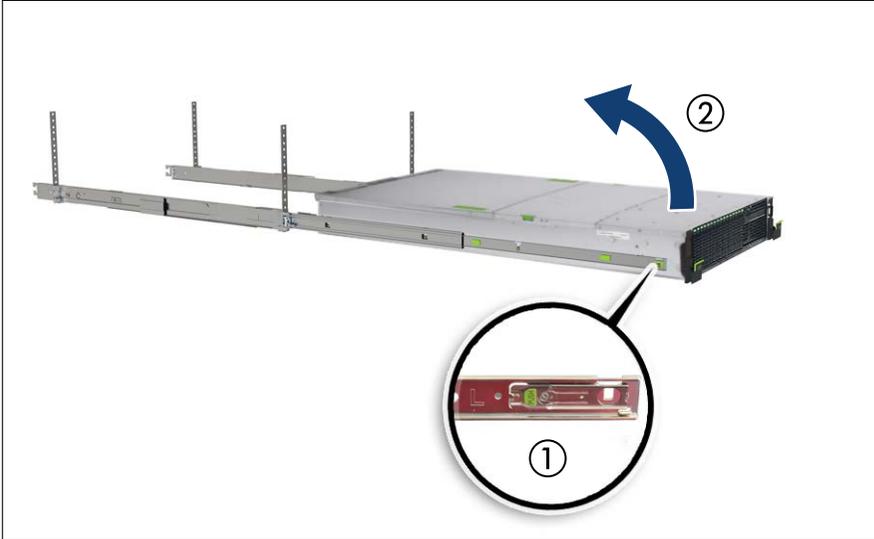


Figure 9: Removing the server from the rack

- ▶ Press on the locking bars on both rack rails (1).
- ▶ Lift the server out of the rack rails (2) and place it on an even surface.

### 4.5.4 Removing the top covers

#### Removing the top cover 1

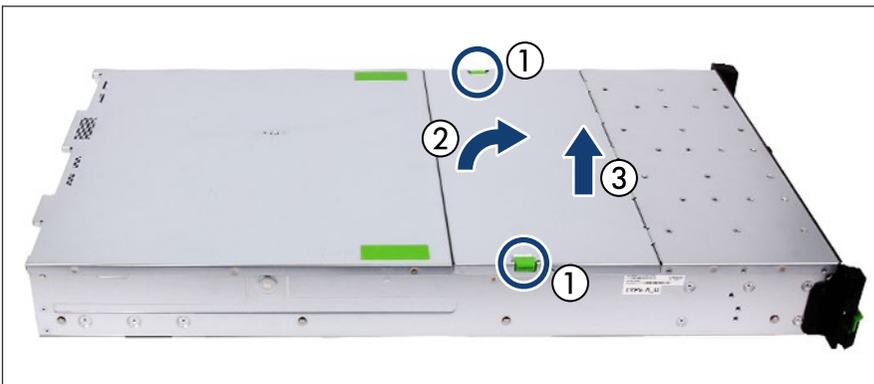


Figure 10: Removing the top cover 1

- ▶ Press the two green buttons inward to release the locking mechanism (1).
- ▶ Fold the top cover 1 up (2).
- ▶ Remove the top cover 1 upward (3).

### Removing the top cover 2

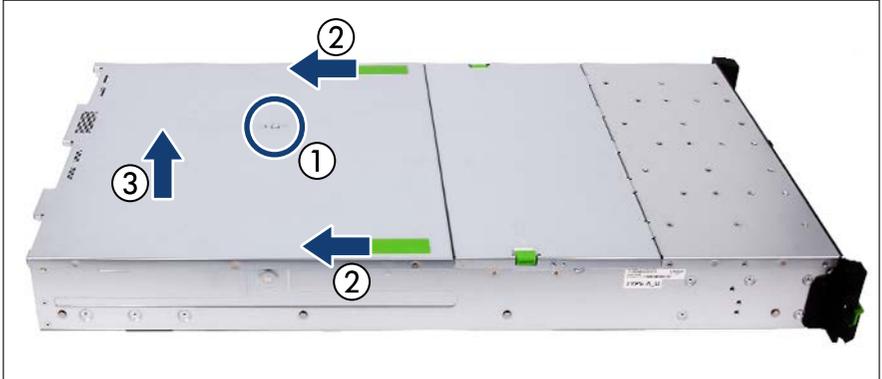


Figure 11: Removing the top cover 2

- ▶ Loosen the screw (1).
- ▶ Push the top cover 2 to the rear side using the green touch points (2).
- ▶ Remove the top cover 2 upward (3).

## 4.6 Reassembling

### 4.6.1 Safety notes



#### CAUTION

- ▶ Before attaching the covers, make sure no unnecessary parts or tools are left inside the server.
- ▶ The top cover must be replaced as soon as possible for purposes of cooling, to comply with EMC regulations (regulations regarding electromagnetic compatibility) and to prevent fires.
- ▶ For more information, see ["Important information" on page 33](#).

## 4.6.2 Installing the top covers

### Installing the top cover 2

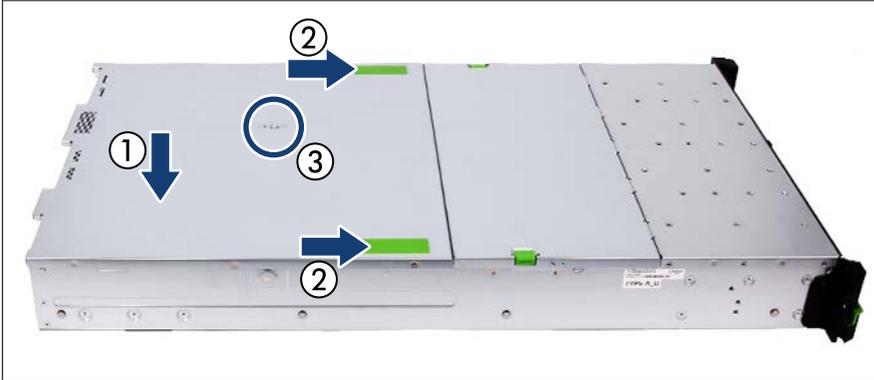


Figure 12: Installing the top cover 2

- ▶ Position the top cover 2 on the server (1). Notice the recesses.



#### CAUTION

- ▶ Take care that all cables are inside the chassis.
- ▶ Push the top cover 2 to the front side using the green touch points (2).
- ▶ Fasten the top cover 2 with the screw (3).

## Installing the top cover 1



Figure 13: Installing the top cover 1

- ▶ Insert the top cover 1 in a slight angle (1).



### CAUTION

- ▶ Take care that all cables are inside the chassis.
- ▶ Fold the top cover 1 down (2).

## 4.6.3 Installing the server in the rack



For information on mounting the server in the rack, see the "Mounting Instructions" provided with the Rack Mounting Kit. For more information, see the manual of your rack system.

For Japan, see also the "Rack system structure guide" and the "Rack Rail Kit Installation Instructions".



Online documentation for rack installation can be found at <https://support.ts.fujitsu.com> under **Product - Rack & Components**.

For Japan:

[https://jp.fujitsu.com/platform/server/primergy/manual/peri\\_rack.html](https://jp.fujitsu.com/platform/server/primergy/manual/peri_rack.html)



### CAUTION

At least two people are needed to position the server on the rack rails.  
(For Japan, see "安全上のご注意".)



**For configurations below 32 kg:**

At least two people are needed to lift the server into the rack cabinet.



**For configurations below 55 kg:**

At least three people are needed to lift the server into the rack cabinet.



**For configurations above 55 kg:**

At least four people are needed to lift the server into the rack cabinet.

Additionally, a lifter is required in the following cases:

- The server weighs more than 50 kg.
- The server weighs more than 21 kg and is to be installed above the height of 25 U.

When using a lifter, this installation procedure needs to be carried out by maintenance personnel.

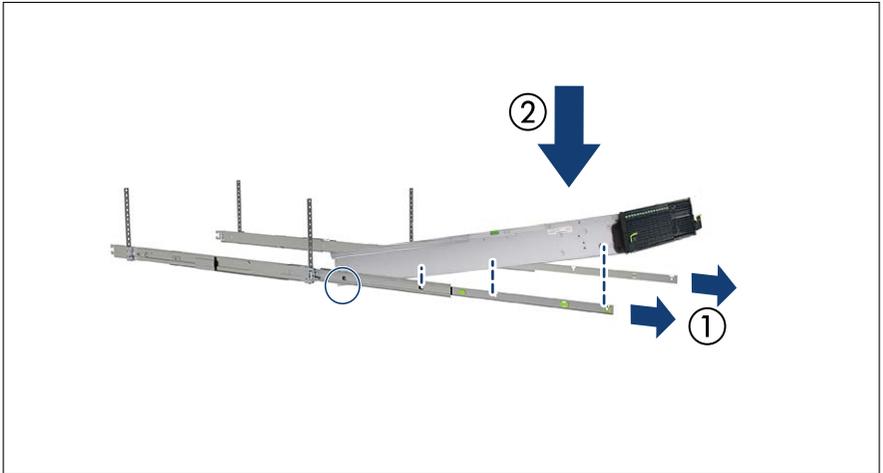


Figure 14: Installing the server in the rack rails

- ▶ Fully extend the rack rails until they lock in place (1).



The rack rails must click into place so that they can no longer be moved.

- ▶ At a slight angle, lower the server onto the rear mounting point on the rack rails (2).
- ▶ Ensure that all four rack mounting bolts are properly seated in the mounting points on the rack rails and that the locking bars engage.

## 4.6.4 Sliding the server into the rack

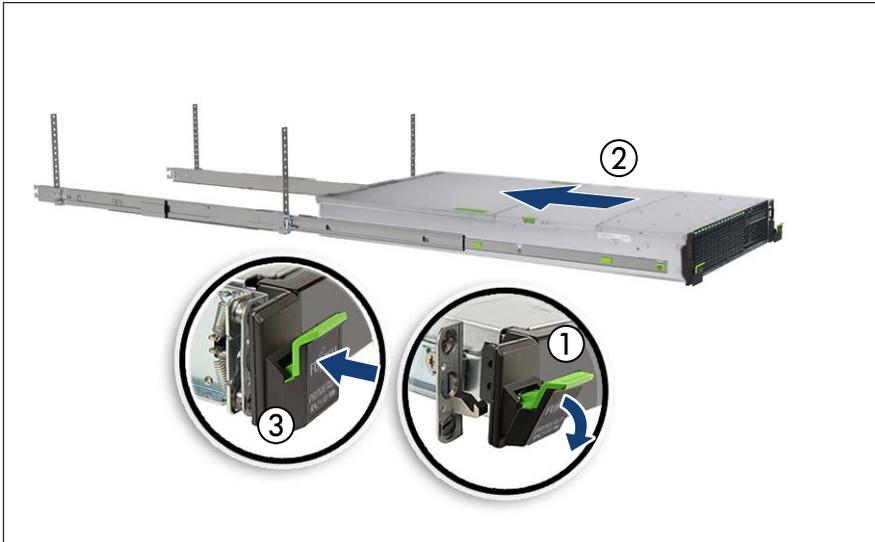


Figure 15: Sliding the server into the rack

- ▶ Release the locking mechanism of both rails (1).
- ▶ Push the server as far as it will go into the rack (2) until the two quick release levers engage (3).



### CAUTION

- ▶ Be careful with your fingers. You can pinch them when the quick release levers change to the release position.
- ▶ Connect all cables except the power cord to the server rear.

## 4.7 Connecting the power cord

### 4.7.1 Connecting the power cord (AC PSU)



#### CAUTION

The AC PSU adjusts automatically to any mains voltage in the range from 100 V - 240 V (AC PSU Platinum) or 200 V - 240 V (AC PSU Titanium).

- ▶ You may only operate the server if its rated voltage range corresponds to the local mains voltage.
- ▶ Connect the power cord to the PSU.
- ▶ If applicable, connect the main plug to an power outlet of the rack socket strip.



To provide true phase redundancy, the second PSU should be connected to a different AC power source from the other PSU. If one AC power source should fail, the server will still continue to run.

- ▶ Ensure that the status indicator on the PSU is lit green, see ["Indicator on hot-plug PSU" on page 564](#).



It will take about 60 seconds until the server can be powered on.



You can secure the power cord with a cable clamp or a hook-and-loop tape to ensure that the power cord cannot be disconnected from the server by mistake.

### Using a cable clamp

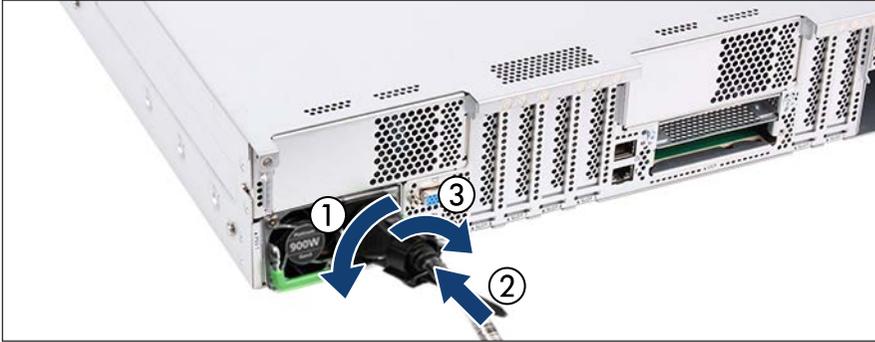


Figure 16: Locking the cable clamp of a PSU

- ▶ Pull the cable clamp up (1).
- ▶ Thread the power cord through the cable clamp (2).
- ▶ Press the cable clamp down until it engages to secure the cable (3).

### Using a hook-and-loop tape



Figure 17: Example PSU with hook-and-loop tape

- 1 Hook-and-loop tape



Figure 18: Securing the power cord with the hook-and-loop tape (A)

- Unroll the hook-and-loop tape.



Figure 19: Securing the power cord with the hook-and-loop tape (B)

- ▶ Secure the mains connector of the power cord with the hook-and-loop tape.

### 4.7.2 Connecting the power cord (DC PSU)

#### Example DC PSU -48 V



#### CAUTION

The DC PSU adjusts automatically to any mains voltage in the range from -40.5 V - -57 V.

- ▶ You may only operate the server if its rated voltage range corresponds to the local mains voltage.

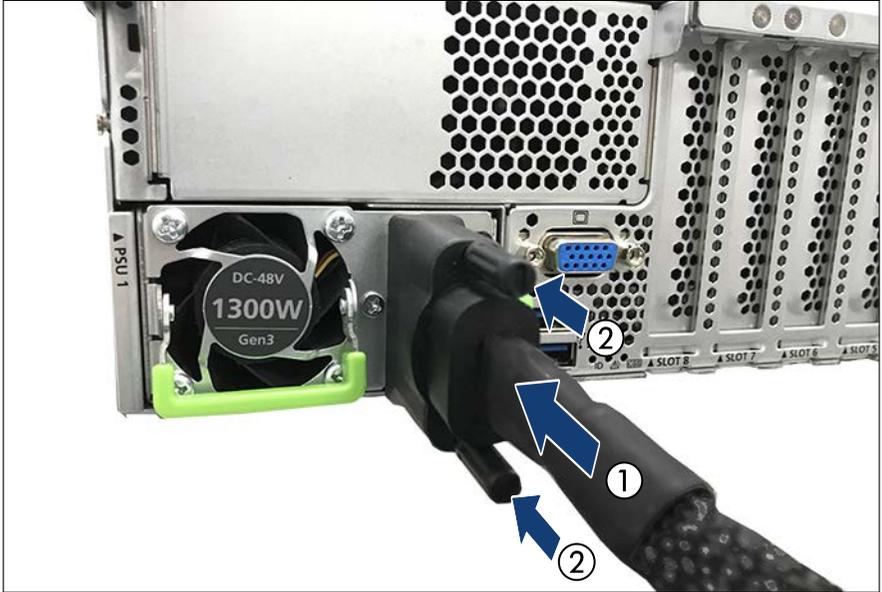


Figure 20: Connecting the server to the DC voltage - example DC PSU -48 V

- ▶ Connect the power cord to the PSU (1).
- ▶ Fasten the two studs (2).
- ▶ Ensure that the status indicator on the PSU is lit green, see ["Indicator on hot-plug PSU" on page 564](#).
- ▶ If necessary, make a permanent connection to the distribution board.



**CAUTION**

If the server/rack is intended for permanent connection to the mains only an authorized specialist (electrician) is allowed to work.

- ▶ Please follow the regulation of each country.



It will take about 60 seconds until the server can be switched on.

### Example HVDC PSU 380 V



#### CAUTION

The HVDC PSU adjusts automatically to any mains voltage in the range from 200 V – 380 V.

- ▶ You may only operate the server if its rated voltage range corresponds to the local mains voltage.

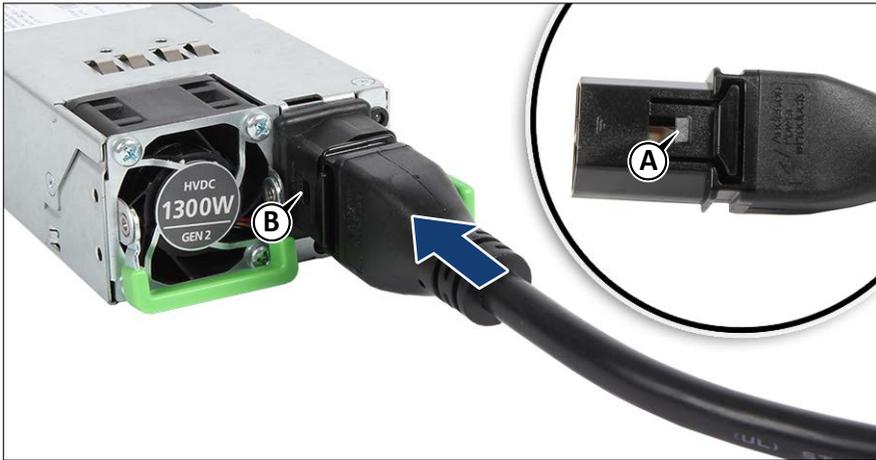


Figure 21: Connecting the server to the DC voltage - example HVDC PSU 380 V

- ▶ Push the power cord plug into the PSU connector until it clicks in. The nose of the power cord plug (A) engages in the recess of the PSU connector (B).
- ▶ Ensure that the status indicator on the PSU is lit green, see "[Indicator on hot-plug PSU](#)" on page 564.
- ▶ If necessary, make a permanent connection to the distribution board.



#### CAUTION

If the server/rack is intended for permanent connection to the mains only an authorized specialist (electrician) is allowed to work.

- ▶ Please follow the regulation of each country.



It will take about 60 seconds until the server can be switched on.

## 4.8 Switching on the server



### CAUTION

- ▶ Before switching on the server, make sure the top cover is closed. In order to comply with applicable EMC regulations (regulations on electromagnetic compatibility) and satisfy cooling requirements, the server must not run while the top cover is removed.
- ▶ For more information, see "[Important information](#)" on page 33.
- ▶ Press the On/Off button to start up the server.
- ▶ Ensure that the power-on indicator is lit green.

## 4.9 Installing the front cover with lock

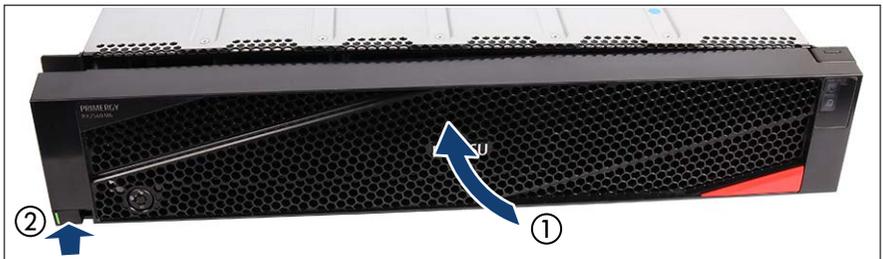


Figure 22: Installing the front cover with lock

- ▶ Attach the front cover in a slight angle to the front (1).
- ▶ Align the front cover to the front. The lock on the left side must be pushed in (2).



Figure 23: Turning the key

- ▶ Insert the key.
- ▶ Turn the key in locked position.

## 4.10 Handling riser modules

### 4.10.1 Removing a riser module

#### Removing the riser module 1



Figure 24: Removing the riser module 1

- ▶ Loosen the knurled screw (see circle).
- ▶ Carefully take out the riser module 1.

### Removing the riser module 2



Figure 25: Removing the riser module 2

- ▶ Loosen the knurled screw (see circle).
- ▶ Carefully take out the riser module 2.

## 4.10.2 Installing a riser module

### Installing the riser module 1

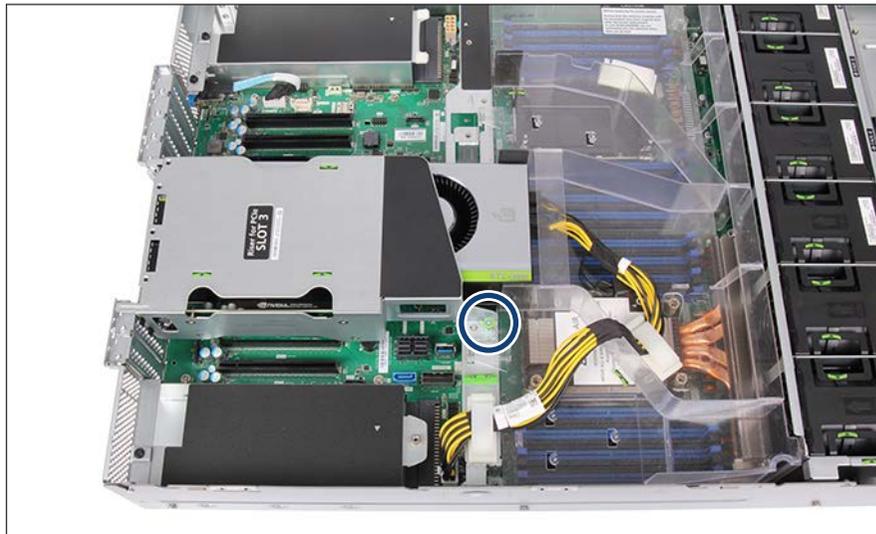


Figure 26: Installing the riser module 1

- ▶ Insert the riser module 1.
- ▶ Fasten the riser module 1 with the knurled screw (see circle).
- ▶ If applicable, connect internal cables to the expansion card or GPU card.



For the cable plan, see ["Appendix B" on page 569](#).

- ▶ If applicable, connect an FBU cable to the RAID controller, see ["Installing an FBU" on page 325](#).

## Installing the riser module 2



Figure 27: Installing the riser module 2

- ▶ Insert the riser module 2.
- ▶ Fasten the riser module 2 with the knurled screw (see circle).
- ▶ If applicable, connect internal cables to the expansion card or GPU card.



For the cable plan, see ["Appendix B" on page 569](#).

- ▶ If applicable, connect an FBU cable to the RAID controller, see ["Installing an FBU" on page 325](#).

## 4.11 Handling the fan cage

### 4.11.1 Removing the fan cage

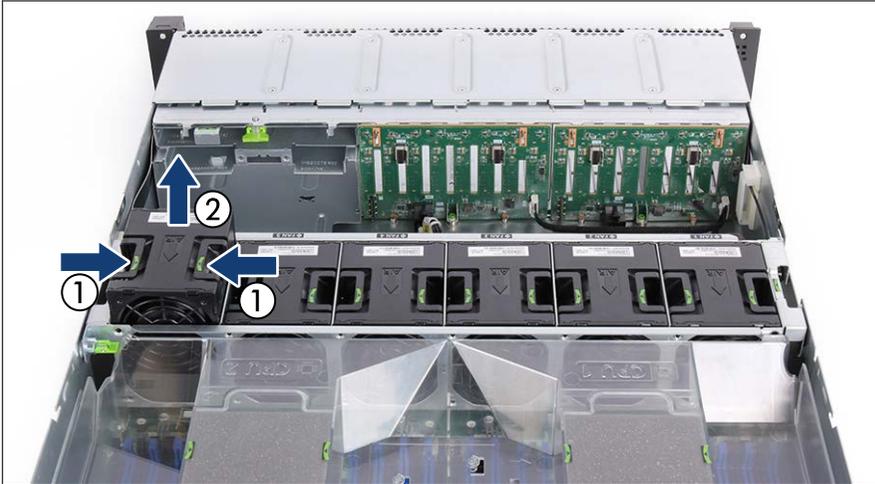


Figure 28: Removing a fan module

- ▶ Take each fan module by the two handles (1).
- ▶ Lift the fan module out of the fan cage (2).

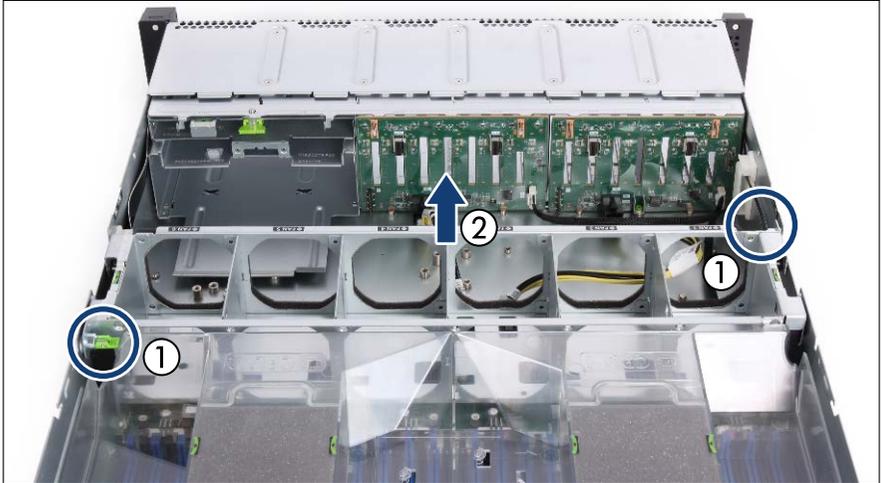


Figure 29: Removing the fan cage

- ▶ Open the green locks (1).
- ▶ Remove the fan cage upward (2).

#### 4.11.2 Installing the fan cage

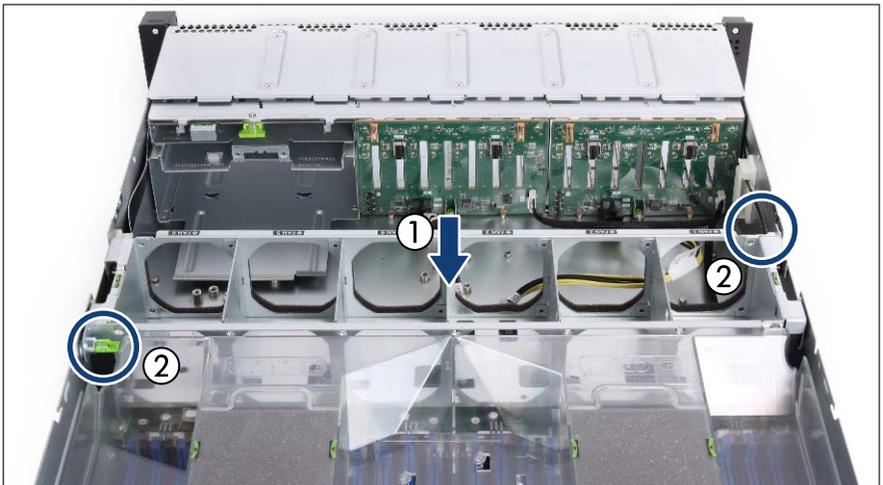


Figure 30: Installing the fan cage

## Basic hardware procedures

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- ▶ Install the fan cage (1).
- ▶ Close the green locks (2).

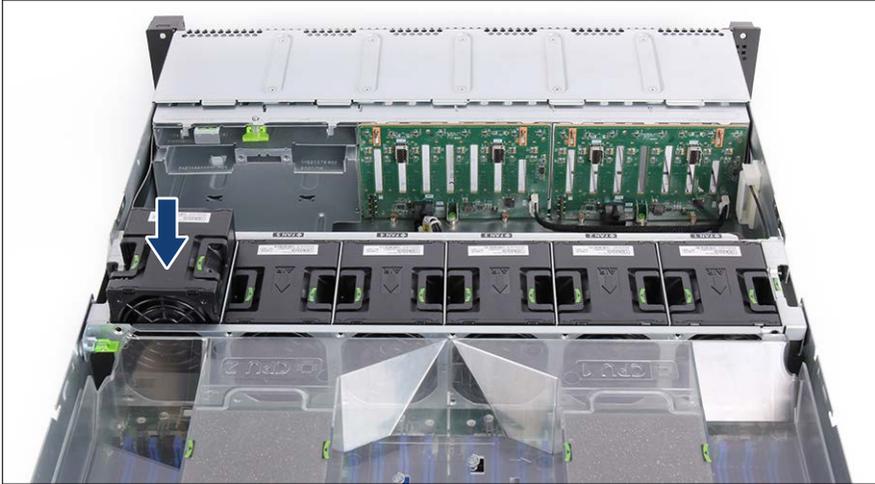


Figure 31: Installing a fan module

- ▶ Insert each fan module in the fan cage.
- ▶ Press down the fan module until it locks.

## 4.12 Handling the air duct

### 4.12.1 Installing the air duct

#### Installing the air duct

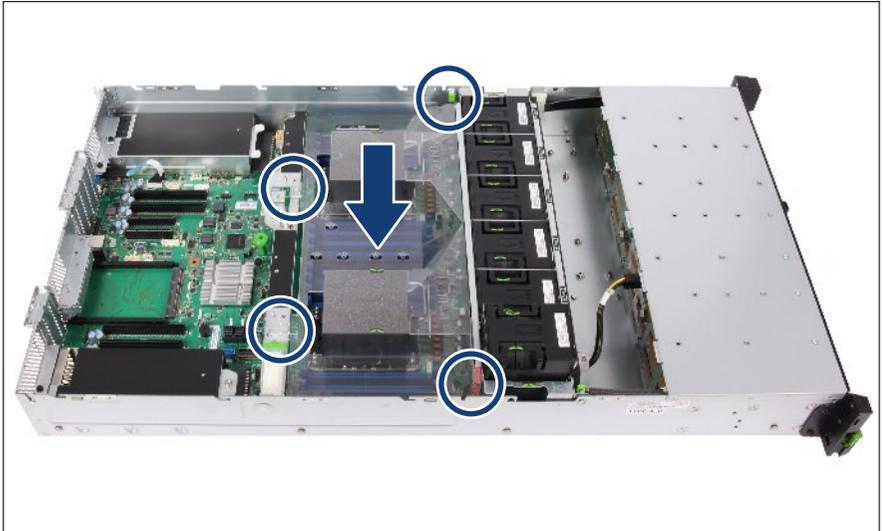


Figure 32: Installing the air duct

- ▶ Install the air duct.



Ensure that the air duct engages in the guiding points (see circles).

- ▶ If applicable, install all riser modules, see ["Handling riser modules" on page 72](#).

### Installing the GPU air duct

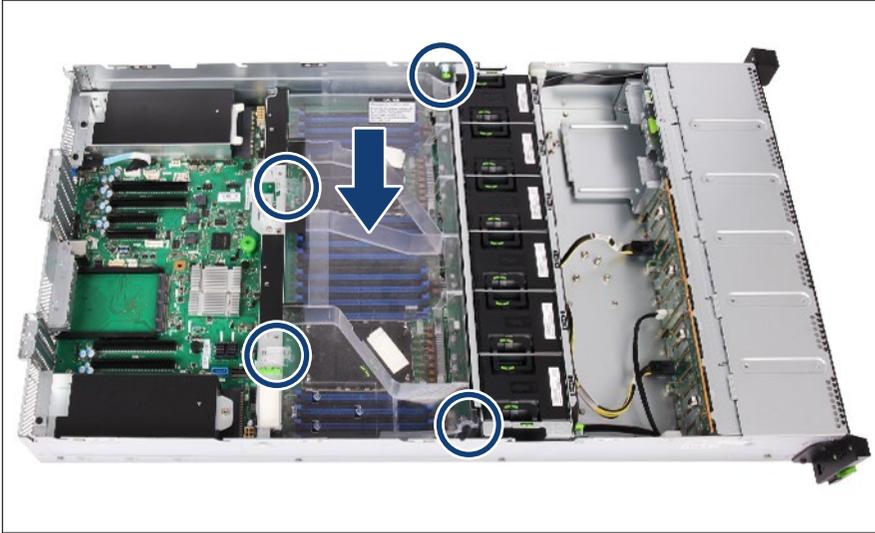


Figure 33: Installing the GPU air duct

- ▶ Install the GPU air duct.



Ensure that the GPU air duct engages in the guiding points (see circles).

- ▶ If applicable, install all riser modules, see ["Handling riser modules" on page 72.](#)



If there is an FBU installed, see ["Installing the FBU with the FBU holder" on page 329.](#)

### 4.12.2 Removing the air duct



#### CAUTION

- ▶ Be careful with the FBU cable.
- ▶ If an FBU is installed, first follow the procedure that is described in ["Removing the FBU with the FBU holder" on page 331.](#)

## Removing the air duct

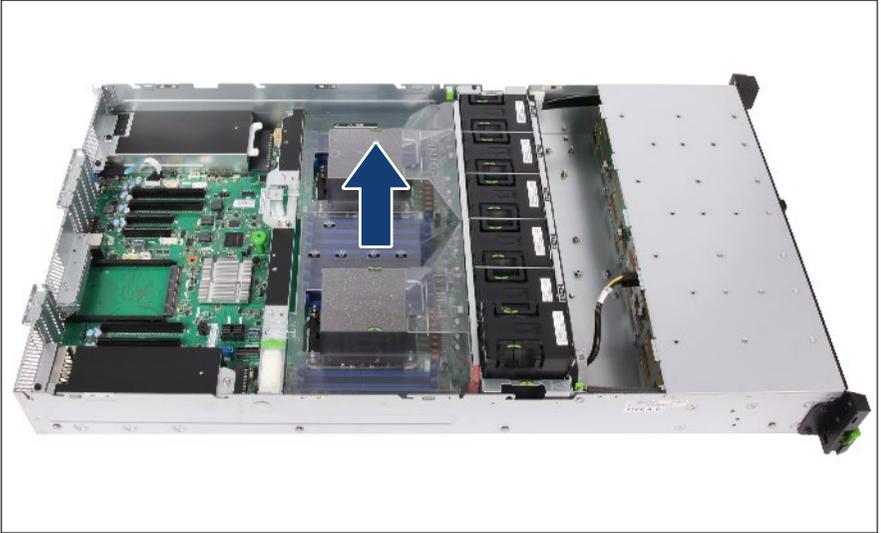


Figure 34: Removing the air duct

- ▶ If applicable, remove all riser modules, see ["Handling riser modules" on page 72](#).
- ▶ Carefully pull out the air duct upward using the four green touch points.

### Removing the GPU air duct

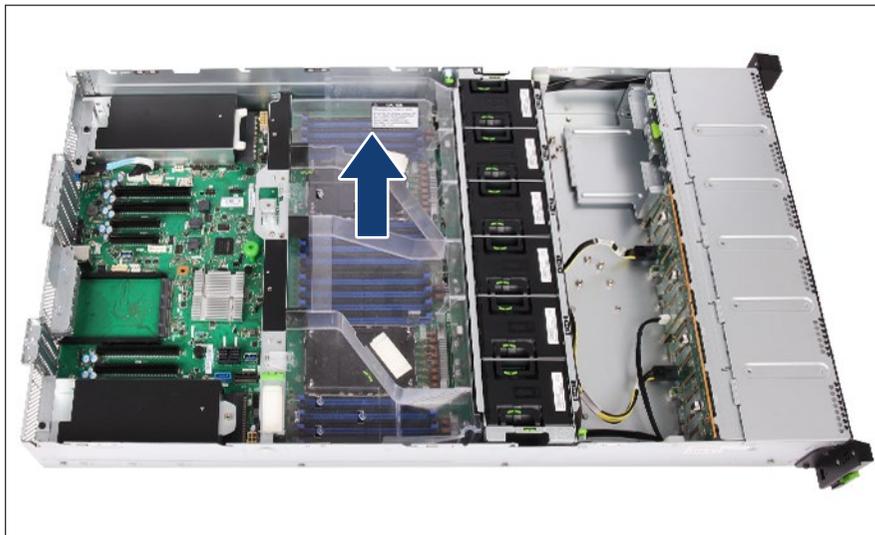


Figure 35: Removing the GPU air duct

- ▶ If applicable, remove all riser modules, see ["Handling riser modules"](#) on [page 72](#).
- ▶ Carefully pull out the GPU air duct upward.

## 4.13 Handling the crossbar

### 4.13.1 Removing the crossbar

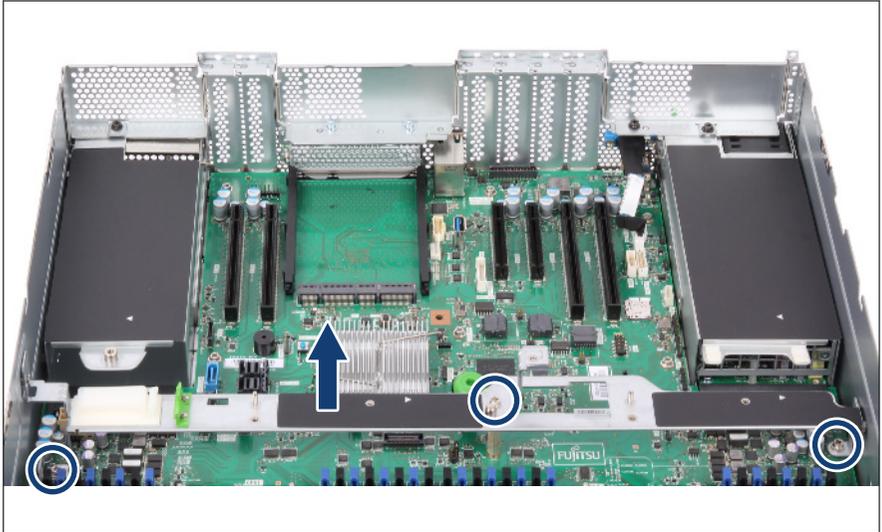


Figure 36: Removing the crossbar

- ▶ Remove the three screws (see circles).
- ▶ Remove the crossbar.

### 4.13.2 Installing the crossbar

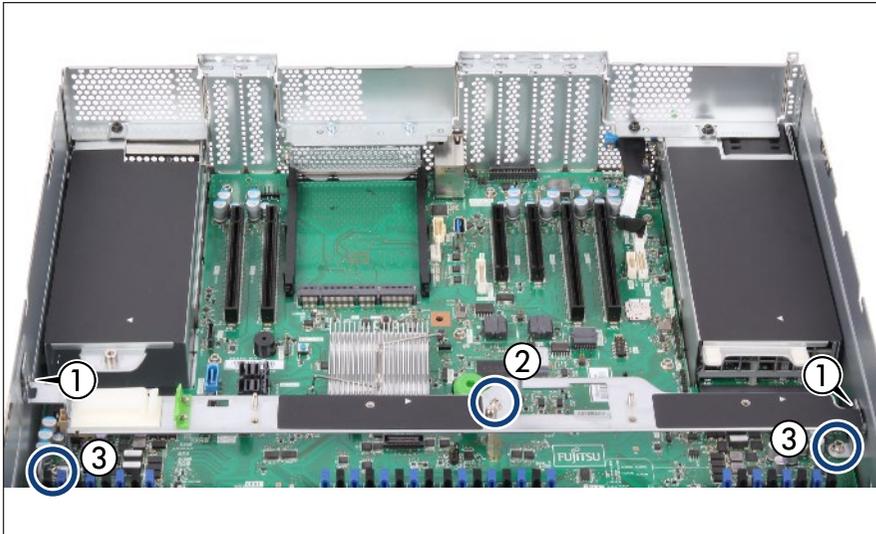


Figure 37: Installing the crossbar

- ▶ Place the crossbar on the two alignment pins (1) and on the standoff (2).
- ▶ Fasten the screw in the middle (2).
- ▶ Fasten the two screws at the sides (3).

## 4.14 Handling the rear air grids

### 4.14.1 Removing a rear air grid

#### Removing the rear air grid 1

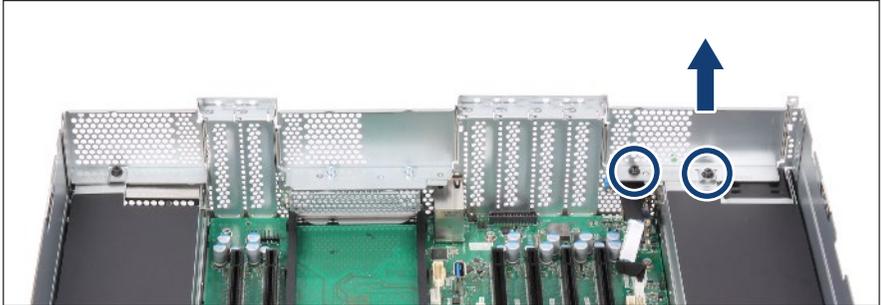


Figure 38: Removing the rear air grid 1

- ▶ Remove the two screws (see circles).
- ▶ Remove the rear air grid 1.



#### **CAUTION**

Keep the rear air grid for future use.

- ▶ Always replace rear air grids into unused installation locations to comply with applicable EMC regulations and satisfy cooling requirements.

### Removing the rear air grid 2

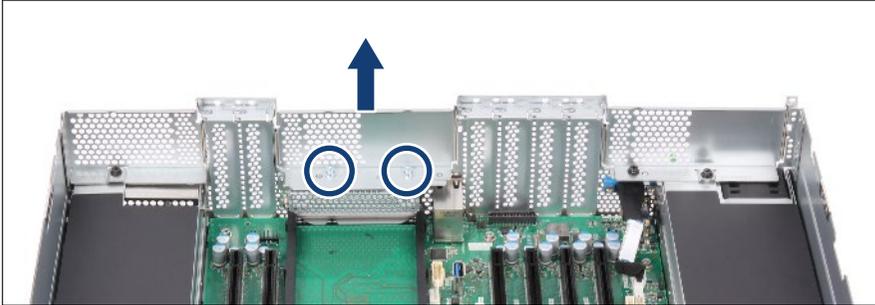


Figure 39: Removing the rear air grid 2

- ▶ Remove the two screws (see circles).
- ▶ Remove the rear air grid 2.



#### **CAUTION**

Keep the rear air grid for future use.

- ▶ Always replace rear air grids into unused installation locations to comply with applicable EMC regulations and satisfy cooling requirements.

### Removing the rear air grid 3

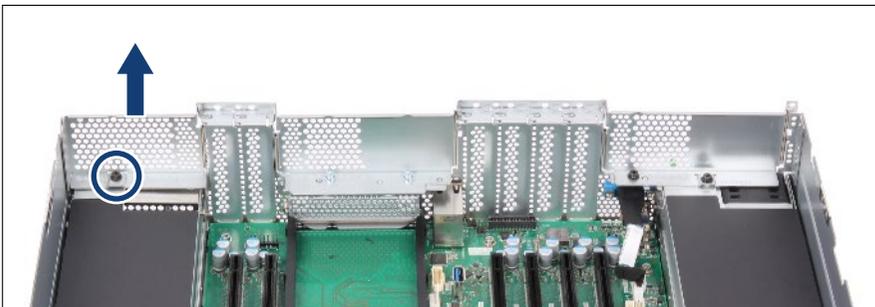


Figure 40: Removing the rear air grid 3

- ▶ Remove the screw (see circle).
- ▶ Remove the rear air grid 3.



**CAUTION**

Keep the rear air grid for future use.

- ▶ Always replace rear air grids into unused installation locations to comply with applicable EMC regulations and satisfy cooling requirements.

## 4.14.2 Installing a rear air grid

### Installing the rear air grid 1

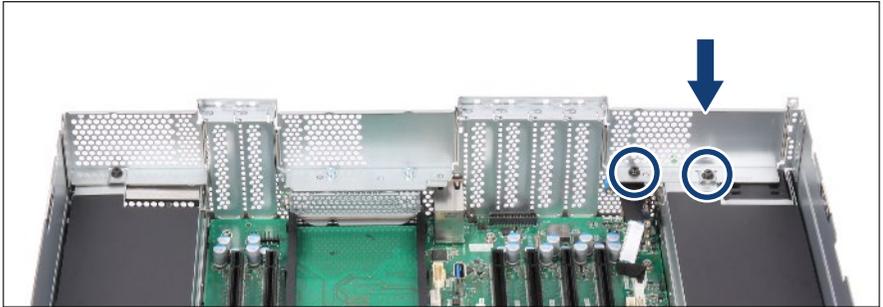


Figure 41: Installing the rear air grid 1

- ▶ Insert the rear air grid 1.
- ▶ Fasten the two screws (see circles).

### Installing the rear air grid 2

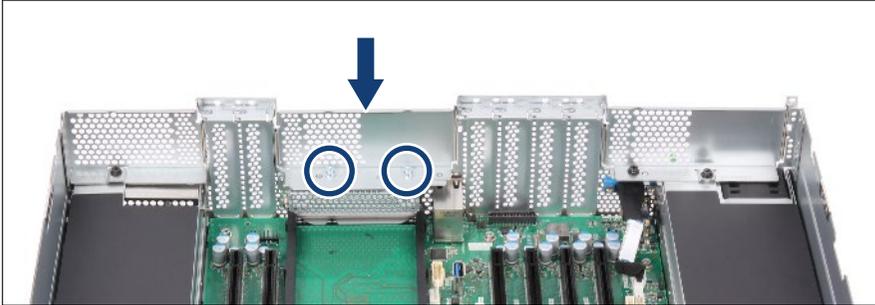


Figure 42: Installing the rear air grid 2

- ▶ Insert the rear air grid 2.
- ▶ Fasten the two screws (see circles).

### Installing the rear air grid 3

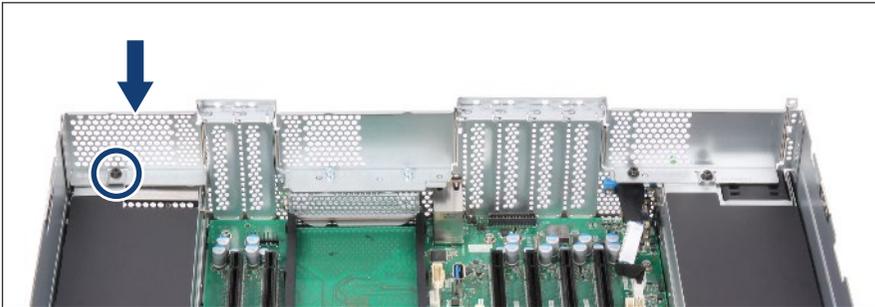


Figure 43: Installing the rear air grid 3

- ▶ Insert the rear air grid 3.
- ▶ Fasten the screw (see circle).

---

# 5 Basic software procedures

## 5.1 Validation



Depending on your server and the installed features some information is not valid for your server.

## 5.2 Starting the maintenance task

### 5.2.1 Suspending BitLocker functionality

BitLocker Drive Encryption provides protection for OS and data drives by encrypting the contents and requiring users to authenticate their credentials to access the information. In the scenario described here, BitLocker uses the compatible Trusted Platform Module (TPM) to detect if the computer's startup process has been modified from its original state.



For more information on how to use BitLocker on a computer without a compatible TPM, see the "BitLocker Drive Encryption" documentation page at:

<https://technet.microsoft.com/library/cc731549.aspx>

Suspending BitLocker Drive Encryption is a temporary method for removing BitLocker protection without decrypting the drive Windows is installed on. Suspend BitLocker before modifying the server's hardware configuration or startup files. Resume BitLocker again after the maintenance procedure is complete.



### CAUTION

- With BitLocker features enabled, modifying the system configuration (hardware or firmware settings) may render the system inaccessible. The system may enter Recovery Mode and require a 48-digits recovery password to return to normal operation. Ensure that you suspend BitLocker drive encryption before maintaining the server.
  - When suspended, BitLocker uses a plain text key instead of the Trusted Platform Module (TPM) to read encrypted files. Keep in mind that information on this drive is not secure until BitLocker has been re-enabled.
- ▶ Ask the system administrator to suspend BitLocker-protection on the system volume, using the **BitLocker Drive Encryption** control panel item.
-  This will temporarily disable BitLocker for maintenance purposes. The volume will not be decrypted and no keys will be discarded.

- ▶ Click **Start - Control Panel - System and Security - BitLocker Drive Encryption** to open the BitLocker Drive Encryption.
- ▶ Select the system volume, and click **Suspend Protection**.
- ▶ Click **Yes** to confirm that your data will not be protected while BitLocker is suspended.



In order to determine which features are accessible through the BitLocker setup wizard, it may be necessary to modify the BitLocker Group Policy settings. For more information on how to suspend BitLocker drive encryption, see the Microsoft TechNet library at: <https://technet.microsoft.com/library/cc731549.aspx>

For more information, see the Fujitsu web pages.

## 5.2.2 Disabling the boot watchdog

The boot watchdog determines whether the OS boots within a preset time frame. If the watchdog timer expires, the system will automatically reboot.

If the system is to be started from removable boot media for firmware upgrade purposes, the boot watchdog needs to be disabled before starting maintenance

task. Otherwise, the boot watchdog might initiate a system reboot before the flash process is complete.



### CAUTION

An incomplete firmware upgrade process may render the server inaccessible or result in damaged/destroyed hardware.

Timer settings can be configured in the BIOS or using the iRMC S6 web interface.

### Disabling the boot watchdog in the BIOS

- ▶ Enter the BIOS.
- ▶ Select the **Management** menu.
- ▶ Set **Boot Watchdog** to **Enabled**.
- ▶ Set **Action** to **Continue**.
- ▶ Save your changes and exit the BIOS.



For more information on BIOS settings, see the corresponding BIOS Setup Utility reference manual.

### Disabling the boot watchdog using the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.
- ▶ Select the **Settings** menu.
- ▶ Open the **Server Management** page.
- ▶ In the **Boot Watchdog** group, check the **Enable Boot Watchdog Support** option. The **Enable Boot Watchdog Support** option must be selected.
- ▶ Select **Continue** from the **Watchdog Action** list.
- ▶ Click **Apply** for the changes to take effect.



For more information on iRMC settings, see the iRMC user guides.

### 5.2.3 Removing backup and optical disk media

- ▶ Ask the system administrator to eject all remaining backup or optical media from the backup drive or ODD before removing it from the server.
- ▶ If the backup media cannot be ejected by conventional means, and it is mandatory that the cartridge be removed prior to returning the drive for repair or disposing it, a manual tape extraction needs to be performed.

Please contact Fujitsu support, if "forcible" tape ejection is necessary.

 Fujitsu does not assume responsibility for any damage to the tape drive, the data cartridge/tape or for the loss of any data resulting from manual tape extraction procedures.

### 5.2.4 Verifying and configuring the backup software solution

 This task only applies to Japan.  
This is a customer procedure.

Depending on the backup software solution, it may be necessary to disable or delete the backup drive from the backup software drive list before starting the maintenance task.

 For more information on suitable backup software solutions and related documentation, see the Fujitsu web pages.

### 5.2.5 Switching on the ID indicator

For easy identification of the server, switch on the ID indicator, especially when working in a datacenter environment or a server room. The ID indicator can also be activated via the iRMC S6 web interface and its status is reported to the iRMC S6.

 For more information, see ["Locating the defective server" on page 47](#) or the "ServerView Suite Local Service Concept (LSC)", the iRMC user guides or the Infrastructure Manager documentation.

### Using the ID button on the front panel

- ▶ Press the ID button on the front panel to switch on the system identification LEDs.



For more information, see ["Indicators on the Common Operation Panel \(COP\)" on page 549](#).

### Using the ID icon in the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.

The icon that represents the ID indicator resides on the right of the menu bar. Its color symbolizes its status:

**blue:** the ID indicator is on.

**grey:** the ID indicator is off.

- ▶ Click the icon to switch the ID indicator on or off.

### Using the Infrastructure Manager

- ▶ To switch on the ID indicator from the Infrastructure Manager, select a node from the **Node List** screen and operate ID indicator from the **Action** button.

## 5.2.6 Checking boot priority

When installing or replacing a bootable device, check the boot priority information before and after the installation or replacement.

- ▶ Enter the BIOS.
- ▶ Select the **Boot** menu.
- ▶ Navigate to the **Boot Maintenance Manager** menu and press the [Enter] key to display the options.
- ▶ Navigate to the **Boot Options** menu and press the [Enter] key to display the options.
- ▶ Select the **Change Boot Order** option and press the [Enter] key.

The current boot order is displayed under **Change Boot Order**. You may also press the [Enter] key again to display the current boot order as a list.

 For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual. To change the boot order before or after device replacement, please refer to "[Setting boot priority](#)" on page 120.

## 5.3 Completing the maintenance task

### 5.3.1 Updating or recovering the BIOS and iRMC S6

 For Japan:  
Follow the instructions provided separately.

The latest BIOS and iRMC versions and their corresponding manuals are available from the Fujitsu support internet pages at:

<https://ts.fujitsu.com/support/>

For Japan:

<https://www.fujitsu.com/jp/products/computing/servers/primergy/downloads/>

 When the system board is replaced, the BIOS and iRMC versions which were being used can be restored by removing the iRMC microSD card from the original system board and installing it on the replaced system board.

 The iRMC microSD card on the system board contains the BIOS/iRMC firmware that is running.

After replacing the system board, the operating version number will be restored based on this information. Do not replace the system board and the iRMC microSD card at the same time.

#### **Note on the boot watchdog**

Before updating or recovering the BIOS and iRMC, ensure that the boot watchdog is disabled, see "[Disabling the boot watchdog](#)" on page 90.

After updating or recovering the BIOS and iRMC, enable the boot watchdog again, see "[Enabling the boot watchdog](#)" on page 101.

 Fujitsu does not assume responsibility for any damage done to the server or for the loss of any data resulting from BIOS updates.

### BIOS flash procedure

- ▶ Perform the BIOS flash procedure as described in the "BIOS Setup Utility" reference manual of your server.

### BIOS recovery procedure

- ▶ Perform the BIOS recovery procedure as described in the "BIOS Setup Utility" reference manual of your server.

### iRMC flash procedure

- ▶ Prepare a USB stick including the bootable iRMC firmware update image.
- ▶ Connect the USB stick containing the iRMC firmware to a USB port.
- ▶ Restart the server. The system will start the POST process.
- ▶ During POST, press [F12] and select the connected USB stick as boot device. The system will detect the USB stick.
- ▶ Choose one of the following options from the update tool menu to start the iRMC update process:

#### **Normal:**

Choose this option to update an existing system board.

#### **Initial:**

Choose this option if the system board has been replaced prior to the iRMC update procedure. This option will perform all relevant flash procedures in a row, including the iRMC firmware and bootloader.



#### **CAUTION**

If the process is interrupted, the iRMC may be permanently corrupted.

- ▶ Do not interrupt the iRMC upgrade process after it has started.



If the iRMC does not work after flashing, disconnect the system from the mains and reconnect it again.

- ▶ After completion of the flash process, remove the USB stick and restart the server.

### iRMC recovery procedure

- ▶ Prepare a USB stick including the bootable iRMC firmware update image.
- ▶ Ensure that the server has been shut down and disconnected from the mains, see "[Disconnecting the power cord](#)" on page 50.
- ▶ Connect the USB stick containing the iRMC firmware to a USB port.
- ▶ Connect the server to the mains while pushing the ID button on the front panel. Ask a second person to help you if necessary.
- ▶ Ensure that the Global Error indicator and the ID indicator are flashing to indicate that the server is entering the iRMC recovery state.
- ▶ Press the Power On/Off button. The system will start the POST process.
- ▶ During POST, press [F12] and select the connected USB stick as boot device. The system will detect the USB stick.
- ▶ Choose the **Emergency Flash of both Images** option from the update tool menu to start the iRMC update process.



#### CAUTION

If the process is interrupted, the iRMC may be permanently corrupted.

- ▶ Do not interrupt the iRMC upgrade process after it has started.



If the iRMC does not work after flashing, disconnect the system from the mains and reconnect it again.

- ▶ Shut down the server by pressing the power On/Off button.
- ▶ Disconnect the server from the mains to exit the iRMC recovery state.

## 5.3.2 Verifying system information backup or restore

To avoid the loss of non-default settings when replacing the system board, a backup copy of important system configuration data is automatically stored from the system board NVRAM to the Chassis ID EPROM. After replacing the system board the backup data is restored from the Chassis ID board to the new system board.

System information also includes license keys for Remote Management Controller upgrades.

In order to verify whether the backup or restore process has been successful, check the System Event Log (SEL), see "[Viewing and clearing the System Event Log \(SEL\)](#)" on page 105.



When using the Infrastructure Manager, please refer to the following manuals about backup and restore function of system information.

See manual "Fujitsu Software Infrastructure Manager V2.8.0 User's Guide", section "2.10 Backup/Restore Hardware Settings", available at: <https://ts.fujitsu.com/support/>

For Japan:

See manual "Fujitsu Software Infrastructure Manager V2.8.0 解説書", section "2.10 ハードウェア設定バックアップ/リストア機能", available at: <https://www.fujitsu.com/jp/products/software/infrastructure-software/infrastructure-software/serverviewism/technical/>

### After replacing the system board

- ▶ Check the SEL log files to verify whether the backup data on the Chassis ID EPROM has been restored to the system board, see "[Viewing and clearing the System Event Log \(SEL\)](#)" on page 105.

```
Chassis IDPROM: Motherboard Exchange detected
```

```
Chassis IDPROM: BMC FW restore successful
```

```
Chassis IDPROM: BIOS restore successful
```

If the restore failed, manually reconfigure the BIOS/iRMC configuration information.

If a Remote Management Controller upgrade license has been installed, it must be reconfigured.



For more information, see the "iRMC S6 - Web Interface" user guide.

### After replacing the front panel or Chassis ID EPROM

- ▶ Check the SEL log files to verify whether a backup copy of the system board settings has been transferred to the Chassis ID EPROM, see "[Viewing and clearing the System Event Log \(SEL\)](#)" on page 105.

```
Chassis IDPROM: BMC FW backup successful
```

### 5.3.3 Updating expansion card firmware

 For Japan:  
Follow the instructions provided separately.

After replacing the expansion card, it is essential to apply the firmware.

- After replacing the RAID card, it is essential to upgrade the firmware to the latest version without connecting any storage devices.
- Some expansion cards may require to update other cards, even if the replaced card has the latest firmware. Check the update instructions for each card.
- Some FC/CNA/LAN/IB cards support adjusting the firmware version after maintenance and replacement to the specified version. Check the update instructions for each card.
- PCIe SSDs can only operate with a combination of supported firmware versions and device driver versions. Check the device driver version number (customer work) before starting work, and apply the firmware corresponding to the device driver version number.

The latest expansion card firmware version is available from the Fujitsu support web pages at:

<https://ts.fujitsu.com/support/>

For Japan:

<https://www.fujitsu.com/jp/products/computing/servers/primergy/downloads/>

 **Note on the boot watchdog**

Before updating expansion card firmware, ensure that the boot watchdog is disabled, see "[Disabling the boot watchdog](#)" on page 90.

After updating expansion card firmware, enable the boot watchdog again, see "[Enabling the boot watchdog](#)" on page 101.

 Fujitsu does not assume responsibility for any damage done to the server or for the loss of any data resulting from firmware updates.

### Using the ServerView Update Manager

For more information on how to update the expansion card firmware using the ServerView Update Manager or Update Manager Express (UME), see the following manuals:

- ServerView Update Manager: "ServerView Update Management" user guide
- ServerView Update Manager Express: "Local System Update for PRIMERGY Servers" user guide

### Using the flash tool

The latest firmware files are available as ASPs (Autonomous Support Packages) for Windows or as Linux tools from the Fujitsu support web pages at:

<https://ts.fujitsu.com/support/>

For Japan:

<https://www.fujitsu.com/jp/products/computing/servers/primergy/downloads/>

## 5.3.4 Reconfiguring the backup software solution



This task only applies to Japan.

This is a customer procedure.

### Disabling backup drives

Depending on the backup software solution, it may be necessary to disable or delete the backup drive from the backup software drive list and reconfigure backup jobs after completing the maintenance task.



More information on suitable backup software solutions and related documentation is available from the Fujitsu web pages.

### Re-enabling backup drives

If a backup drive has been disabled or deleted from the backup software drive list (see "[Verifying and configuring the backup software solution](#)" on page 92), it has to be re-enabled to complete the maintenance task.

- ▶ Re-enable backup drives and revise backup software settings and cronjobs.



More information on suitable backup software solutions and related documentation is available from the Fujitsu web pages.

### 5.3.5 Resetting the boot retry counter

The boot retry counter is decremented from its preset value every time the POST watchdog initiates a system reboot. When the value has reached '0', the system will shut down and power off.

#### Viewing the boot retry counter

The current boot retry counter status is available in the BIOS:

- ▶ Enter the BIOS.
- ▶ Select the **Management** menu.
- ▶ Under **Boot Retry Counter** the current number of remaining boot attempts is displayed. The value is further decremented with every failed boot attempt or system reboot resulting from critical system errors.
- ▶ Exit the BIOS.

#### Resetting the boot retry counter

The boot retry counter should be reset to its original value concluding every service task.



Please note, if the customer does not know about the original boot retry values:

If the system boots up and no further errors occur within 6 hours after that successful boot attempt, the boot retry counter will automatically be reset to its default value. Please take into account, that the specified number of boot attempts can only be determined after this period of time.

If the customer knows about the original boot retry values, proceed as follows to reset or configure the boot retry counter:

### Resetting the boot retry counter in the BIOS

- ▶ Enter the BIOS.
- ▶ Select the **Management** menu.
- ▶ Under **Boot Retry Counter** press the [+] or [-] keys to specify the maximum number of boot attempts (0 to 7).
- ▶ Exit the BIOS.

### Resetting the boot retry counter using iRMC S6 web interface

- ▶ Enter the iRMC S6 web interface.
- ▶ Select the **Server Management** menu.
- ▶ The following boot retry counter settings are available under **ASR&R Options**:
  - ▶ Under **Retry counter max** specify the maximum number of attempts to boot the OS (0 to 7).
  - ▶ Under **Retry counter** the current number of remaining boot attempts is displayed. Overwrite this value with the maximum number of boot attempts specified above in order to reset the boot retry counter.
- ▶ Click **Apply** for the changes to take effect.



For more information on iRMC settings, see the iRMC user guides.

### 5.3.6 Enabling the boot watchdog

If the boot watchdog has been disabled for firmware upgrade purposes (see ["Disabling the boot watchdog" on page 90](#)), it has to be re-enabled to complete the maintenance task.

Timer settings can be configured in the BIOS or using the iRMC S6 web interface.

### Enabling the boot watchdog in the BIOS

- ▶ Enter the BIOS.
- ▶ Select the **Management** menu.
- ▶ Under **Boot Watchdog** set the **Action** setting to **Reset**.
- ▶ Save your changes and exit the BIOS.



For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual.

### Enabling the boot watchdog using the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.
- ▶ Select the **Settings** menu.
- ▶ Open the **Server Management** page.
- ▶ In the **Boot Watchdog** group, check the **Enable Boot Watchdog** option. The **Enable Boot Watchdog** option must be selected.
- ▶ Select **Reset** from the **Watchdog Action** list.
- ▶ Click **Apply** for the changes to take effect.



For more information on iRMC settings, see the iRMC user guides.

## 5.3.7 Enabling replaced components in the BIOS

When an expansion card fails, the defective component will be set to **Disabled** or **Failed** in the BIOS. The server will then reboot with only the intact hardware components remaining in the system configuration.

- Communication between BIOS and iRMC temporarily failed during the POST.
- Booting to execute iRMC Emergency Flash.

In this cases, the defective component needs to be reenabled in the BIOS after replacing it.

- ▶ Enter the BIOS.
- ▶ Select the **Configuration** menu.
- ▶ Select the status menu of the desired component:
  - ▶ Select **PCI Status** for expansion cards.
- ▶ Reset replaced components to **Enabled**.
- ▶ Save your changes and exit the BIOS.



For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual.

### 5.3.8 Verifying the memory mode

If a memory module fails, the server will reboot and the defective module will be disabled. As a result, the current memory mode (e.g. Mirrored Channel mode) may no longer be available due to a lack of identical memory module pairs. In this case, the memory mode will automatically revert to Independent Channel Mode.



For more information on memory modes available for your server, see ["Basic information" on page 336](#).

After replacing the defective module(s) the memory mode is automatically reset to its original state. It is recommended to verify that the memory mode has been correctly.

- ▶ Enter the BIOS.
- ▶ Select the **Configuration** menu.
- ▶ Select **Memory Status** and verify that none of the memory modules are marked as **Failed**.
- ▶ Select **Memory Configuration** to verify **Memory Mode**.
- ▶ Save your changes (if applicable) and exit the BIOS.



For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual.

### 5.3.9 Verifying the system time settings



This task only applies to Linux and VMware environments.

After the system board or CMOS battery has been replaced, the system time is set automatically. By default, the RTC (Real Time Clock) time standard is set as the local time.

If a Linux/VMware OS is used and the hardware clock has been configured as UTC (Universal Time, Coordinated) in the OS, the BMC local time may not be mapped correctly.

- ▶ After replacing the system board or CMOS battery, set the time according to the time set before replacement. If you are unable to verify the original configuration, ask the system administrator whether the RTC or UTC time standard is to be used as system time.



If the system time (RTC) is set to UTC, the SEL (System Event Log) time stamps may differ from the local time (in the case of Japan, it is -9 hours off).

- ▶ Enter the BIOS.
- ▶ Select the **Information** menu.
- ▶ Under **System Time** and **System Date** specify the correct time and date.



By default, the system time set in the BIOS is RTC (Real Time Clock) local time. If your IT infrastructure relies on universally accepted time standards, set the **System Time** to UTC (Universal Time, Coordinated) instead. Greenwich Mean Time (GMT) can be considered equivalent to UTC.

- ▶ Save your changes and exit the BIOS.



For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual.

### 5.3.10 Viewing and clearing the System Event Log (SEL)

 You can view the System Event Log (SEL) using the iRMC S6 web interface.

 You can clear the System Event Log (SEL) using the iRMC S6 web interface.

 You can collect logs using the Infrastructure Manager.

#### Viewing the SEL using the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.
- ▶ Open the **Logs** menu.
- ▶ Click **System Event Log** to open the System Event Log page.  
All events concerning the system are displayed in a table in the Event Log Content group.
- ▶ You can sort the table based on a column using the arrows in the header field.
- ▶ You can also filter the table using the filter lists in the header of some columns.

 **Note on the Driver Monitor of the iRMC S6 web interface**  
The **Driver Monitor** view gives you an overview of the monitored components.

If a component has the status **Warning** or **Error**, you can click **Reset status**. You have to log on to the iRMC S6 web interface beforehand. The status of the component will then be reset to ok. To see the new status you must refresh the iRMC S6 web interface.

 For more information on iRMC settings, see the iRMC user guides.

### Clearing the SEL using the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.
- ▶ Open the **Logs** menu.
- ▶ Click **System Event Log** to open the System Event Log page.  
All events concerning the system are displayed in a table in the Event Log Content group.
- ▶ Click the **Clear Logs** button above the table to clear the SEL.



For more information on iRMC settings, see the iRMC user guides.

### Collecting logs using the Infrastructure Manager

The Infrastructure Manager can collect various logs including System Event Log for system operation and maintainance.



Please refer to the following manuals of Infrastructure Manager for collecting logs from ISM.

See manual "Fujitsu Software Infrastructure Manager V2.8.0 User's Guide", section "2.5 Log Management", available at:

<https://ts.fujitsu.com/support/>

For Japan:

See manual "Fujitsu Software Infrastructure Manager V2.8.0 解説書", section "2.5 ログ管理機能", available at:

<https://www.fujitsu.com/jp/products/software/infrastructure-software/infrastructure-software/serveviewism/technical/>

### 5.3.11 Updating the NIC configuration file in a Linux and VMware environment

In order to prevent errors caused by changing network device names (**eth<x>**), it is recommended to store the MAC address (hardware address) of a network interface card in the related NIC configuration file of the Linux/VMware OS. When replacing a network controller or the system board with onboard LAN controllers in a server running Linux/VMware OS, the MAC address will change but not automatically be updated in the definition file.

In order to prevent communication problems, it is necessary to update the changed MAC address stored in the related **ifcfg-eth<x>** definition file.



Procedures may differ depending on your Linux/VMware OS or the definition file on the client system. Use the following information as reference. Ask the system administrator to change the definition file.

To update the MAC address, proceed as follows:

- ▶ After replacing a network controller or the system board, switch on and boot the server, see ["Switching on the server" on page 71](#).

The hardware configuration tool for Red Hat Linux, will launch at boot and detect the new and/or changed hardware on your system.

- ▶ For the changes to take effect, you need to reboot the network by entering the following command:

```
# service network restart
```



If the system board or network controller offers multiple LAN ports, it is necessary to update the remaining **ifcfg-eth<x>** definition files accordingly.

- ▶ Update the NIC configuration file to reflect the new card sequence and MAC address.

### 5.3.12 Resuming BitLocker functionality

If BitLocker Drive Encryption has been suspended for maintenance purposes (see ["Suspending BitLocker functionality" on page 89](#)), it has to be reenabled to complete the service task.

- ▶ If applicable, ask the system administrator to enter the recovery key in order to boot the OS.



If BitLocker Drive Encryption has been suspended prior to replacing components you won't be asked for a recovery key when rebooting the server after the maintenance task. However, if BitLocker functionality has not been suspended, Windows will enter recovery mode and ask you to input recovery key for further booting.

- ▶ Ask the system administrator to enable the previously suspended BitLocker protection on the system volume, using the **BitLocker Drive Encryption** control panel item:
  - ▶ Click **Start - Control Panel - System and Security - BitLocker Drive Encryption** to open the BitLocker Drive Encryption.
  - ▶ Select the system volume, and click **Resume Protection**.



For more information on how to resume BitLocker drive encryption, see the Microsoft TechNet library at:

<https://technet.microsoft.com/library/cc731549.aspx>

For more information, see the Fujitsu web pages.

### 5.3.13 Performing a RAID array rebuild

After replacing an HDD that has been combined into a RAID array, RAID rebuild will be performed completely unattended as a background process.

- ▶ Ensure that the RAID array rebuild has started normally. Wait until the progress bar has reached at least one percent.
- ▶ Inform the customer about the remaining rebuild time, based on the displayed duration estimate.

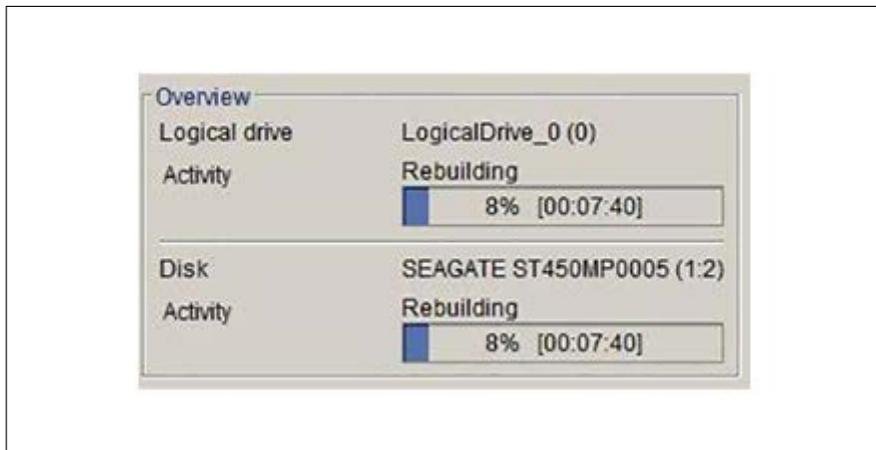


Figure 44: Progress bar (RAID array rebuild)

**CAUTION**

The system is now operational, however, data redundancy will not be available until the RAID array rebuild is complete. Depending on the HDD capacity the overall process can take up to several hours, in some cases even days.



You may notice a slight performance impact during rebuild.

## 5.3.14 Looking for MAC/WWN/GUID and SAS addresses

### 5.3.14.1 Basic information

The customer needs to know the new address of the controller:

- When replacing the system board with an onboard LAN controller
- When adding or replacing a network controller
- When adding or replacing a SAS controller

Different controllers send different addresses:

- LAN controller: MAC (Media Access Control) address
- Fibre channel controller: WWN (World Wide Name) address
- Infiniband/Omni-Path controller: GUID (Globally Unique Identifier) address
- SAS controller: SAS (Serial Attached SCSI) address

### 5.3.14.2 Looking for the MAC address of a LAN controller

There are several possible locations where these addresses can be found.

- ▶ Inform the customer about the new or changed MAC address.

#### Checking the label

- ▶ If available, check the label on the controller. Beside the part number, you may find the MAC address.

#### Using the BIOS

- ▶ Enter the BIOS.
- ▶ Select the **Configuration** menu.

The addresses are displayed at the one or more of the following (it depends on the behavior of the UEFI driver included in each controller).

1. The addresses are displayed at the **UEFI driver** menu included in each controller in the **Configuration** menu.
2. Select the **UEFI driver** menu included in each controller. The addresses are displayed at the help for the **UEFI driver** menu included in each controller.
3. Enter the **Network Device List** menu. The addresses are displayed in the **Network Device List** menu.



Only network controllers supporting the Command Line Protocol (CLP) will be displayed.

### Using the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.
- ▶ Open the **System** menu.
- ▶ Open the **Network** page.
- ▶ In the **Network Adapters** group, you will find detailed information on each network controller in the managed PRIMERGY server, including its MAC address.



This information is only available with the iRMC S6 or above. Only network controllers supporting the Command Line Protocol (CLP) will be displayed.



For add-in cards the vendors provide documentation and tools, offered on the Fujitsu support web pages:

<https://ts.fujitsu.com/support/>

Select the server, select **Downloads - More Details - Driver**. Some vendors bundle the documentation together with the driver package.

#### 5.3.14.3 Looking for the WWN address of a fibre channel controller

There are several possible locations where these addresses can be found.

- ▶ Inform the customer about the new or changed WWN address.

#### Checking the label

- ▶ If available, check the label on the controller. Beside the part number, you may find the WWN address.

#### Using the BIOS

- ▶ Enter the BIOS setup menu.
- ▶ Select the **Configuration** menu.

The addresses are displayed at the one or more of the following (it depends on the behavior of the UEFI driver included in each controller).

1. The addresses are displayed at the **UEFI driver** menu included in each controller in the **Configuration** menu.
2. Select the **UEFI driver** menu included in each controller. The addresses are displayed at the help for the **UEFI driver** menu included in each controller.
3. Enter the **Network Device List** menu. The addresses are displayed in the **Network Device List** menu.



Only network controllers supporting the Command Line Protocol (CLP) will be displayed.

### 5.3.14.4 Looking for the GUID address of an infiniband or Omni-Path controller

- ▶ If available, check the label on the controller. Beside the part number, you may find the GUID address.
- ▶ Inform the customer about the new or changed GUID address.

### 5.3.14.5 Looking for SAS addresses of SAS controllers for external devices

These addresses can be found using the iRMC S6 web interface.

- ▶ Log into the iRMC S6 web interface.
- ▶ Open the **System** menu.
- ▶ Open the **Mass Storage** page.
- ▶ Select the desired SAS controller.
- ▶ Expand the settings of the selected SAS controller. You can find data including the SAS address.



For more information, see the "iRMC S6 - Web Interface" user guide.

- ▶ Inform the customer about the new SAS address. The customer need the new SAS address, especially when the server is connected to a Fujitsu Storage ETERNUS system.

### 5.3.15 Using the Chassis ID Prom Tool

The Common Operation Panel (COP) contains the Chassis ID EPROM that stores the following system information:

- server name and model
- housing type
- serial number
- manufacturing data
- information depending on the configuration:
  - installed HDD/SSD backplanes
  - installed rear HDD/SSD cages
  - installed expansion cards (for example EP6xxi)

In order to integrate your system into the ServerView Management environment and to enable server installation using the ServerView Installation Manager, system information needs to be completed and corrected.

System information has to be updated after one of the following tasks:

- HDD/SSD backplane (2.5-inch, 3.5-inch, PCIe)
  - installing
  - removing
  - changing (the technology, for example from SAS/SATA to PCIe)
- Rear HDD/SSD cages
  - installing
  - removing
- Specified expansion cards (for example EP6xxi)
  - installing
  - changing

Update your system information using the Chassis ID Prom tool. The tool and more information are available to maintenance personnel from the Fujitsu web

pages:

<https://partners.ts.fujitsu.com/com/service/ps/Servers/PRIMERGY/>

- ▶ Select your PRIMERGY system from the main area of the page.
- ▶ From the categories selection, choose **Software & Tools Documentation**.
- ▶ In the **Tools** area click **Tools: Chassis-IDProm Tool** to download the file (*tool-chassis-Idprom-Tool.zip*).



For Japan:  
Follow the instructions provided separately.

### Note on Advanced Thermal Design (ATD)



If the Advanced Thermal Design (ATD) option is available and has been enabled for your server, please set information within the Chassis ID Prom Tool accordingly.

The ATD option can only be ordered from the manufacturer as a factory preset. To find out if your server is ATD-enabled, check for the ATD logo on the identification rating plate.

For ATD logo and more information on Advanced Thermal Design (ATD), see the operating manual of your server.



#### CAUTION

Resetting the ATD flag using the Chassis ID Prom Tool with Linux/Windows version is not possible!



Resetting the ATD flag using the Chassis ID Prom Tool with UEFI version is possible.

### Note on Configuration Thermal Design (CTD)



If the Configuration Thermal Design (CTD) option is available and has been enabled for your server, please set information within the Chassis ID Prom Tool accordingly.

The CTD option can only be ordered from the manufacturer as a factory preset. To find out if your server is CTD-enabled, check for the CTD logo on the identification rating plate.

For CTD logo and more information on Configuration Thermal Design (CTD), see the operating manual of your server.



#### **CAUTION**

Resetting the CTD flag using the Chassis ID Prom Tool with Linux/Windows version is not possible!



Resetting the CTD flag using the Chassis ID Prom Tool with UEFI version is possible.

## 5.3.16 Configuring LAN teaming

### After replacing or upgrading LAN controllers

You need to restore the configuration for the LAN Teaming, using the LAN driver utility or OS teaming software.

- ▶ Ensure that the controllers have been assigned as primary or secondary according to your requirements.



For more information, see the relevant LAN driver manual.

### After replacing a system board



The following procedure must be done for each system board that is replaced.

- ▶ Confirm with the customer whether the onboard LAN controller you have replaced has been used as part of a LAN teaming configuration.
- ▶ If LAN teaming has been active, you will need to restore the configuration using the LAN driver utility or OS teaming software.



For more information, see the relevant LAN driver manual.

### 5.3.17 Switching off the ID indicator

- ▶ Press the ID button on the front panel, or use the iRMC S6 web interface or the Infrastructure Manager to switch off the ID indicator after the maintenance task has been concluded successfully.



For more information, see ["Locating the defective server" on page 47](#) or the "ServerView Suite Local Service Concept (LSC)", the iRMC user guides or the Infrastructure Manager documentation.

#### Using the ID button on the front panel

- ▶ Press the ID button on the front panel to switch off the ID indicators.

#### Using the ID icon in the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.

The icon that represents the ID indicator resides on the right of the menu bar. Its color symbolizes its status:

**blue:** the ID indicator is on.

**grey:** the ID indicator is off.

- ▶ Click the icon to switch the ID indicator on or off.

#### Using the Infrastructure Manager

- ▶ To switch off the ID indicator from the Infrastructure Manager, select a node from the **Node List** screen and operate the ID indicator from the **Action** button.

## 5.3.18 Performing a fan test



### Notes on replacing a defective fan

After replacing a defective system fan or PSU containing a defective fan, the fan error indicators will stay lit until the next fan test. By default, a fan test is automatically started every 24 hours. The first automatic fan test being performed after replacing a fan will turn off the fan error indicator.

If you want to start the fan test manually, you can do so by following the description below:

### Executing the fan test via the iRMC S6 web interface

- ▶ Log into the iRMC S6 web interface.  
The **System** menu is displayed on default.
- ▶ Open the **Cooling** page.
- ▶ Expand the **Cooling Devices** group.
- ▶ Click **Start Fan Test**.



For more information on iRMC settings, see the iRMC user guides.

### In case of maintenance done by Fujitsu engineers in Japan: Executing the fan test via Chassis ID Prom Tool



Please follow the instructions provided separately.

## 5.3.19 Updating the golden image

### 5.3.19.1 Updating the golden image for iRMC S6 firmware



The golden image is part of the PFR (Platform Firmware Resiliency) feature.

The PFR feature provides protection of firmware, detection of tampered firmware and automatic recovery of firmware.

## Basic software procedures

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Prior to the firmware update the image file to be used is checked.

- The image file is verified to prevent an unauthorized image from being used.
- It is checked if the image file has been tampered with.

If the result of the check shows that the image file is not the original one any longer you can configure an automatic recovery of the image file by using a golden image. This golden image is used for recovery and overwrites the tampered firmware image.

During the recovery process of the iRMC S6 firmware image do not power-off/on the server. The Power-on LED blinks white during firmware recovery. The detection of a tampered firmware image and its recovery are logged to the system event log (SEL). The iRMC S6 settings of the firmware remain.

There are two ways to update the golden image:

- Update the active image and update the golden image implicitly with the same version.
- Update the golden image individually to the same version as the active image.

You can update the golden image using the iRMC S6 web interface or the Redfish API of the iRMC S6.

After the update of the golden image the iRMC S6 needs to be rebooted.

### Updating the golden image using the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.
- ▶ Select the **Tools** menu.
- ▶ Open the **Update** page.
- ▶ In the **iRMC Update** group, set the **Update Source** to **Image file**.
- ▶ Set the **Image to Flash** to the desired image.
- ▶ Click **Golden Image Update** to **Perform**.
- ▶ Click **Reboot iRMC**.



For more information on iRMC settings, see the iRMC user guides.

## Updating the golden image using the Redfish API of the iRMC S6

Further information about the Redfish API of the iRMC S6, see the iRMC S6 Redfish documentation on the Fujitsu support internet pages at:

<https://ts.fujitsu.com/support/>

### 5.3.19.2 Updating the golden image for BIOS firmware



The golden image is part of the PFR (Platform Firmware Resiliency) feature.

The PFR feature provides protection of firmware, detection of tampered firmware and automatic recovery of firmware.

Prior to the firmware update the image file to be used is checked.

- The image file is verified to prevent an unauthorized image from being used.
- It is checked if the image file has been tampered with.

If the result of the check shows that the image file is not the original one any longer, system will automatically recover the image by golden image. This golden image is used for recovery and overwrites the tampered firmware image.

During the recovery process of the BIOS firmware image do not power-off/on the server. The detection of a tampered firmware image and its recovery are logged to the system event log (SEL). The BIOS settings will return to what they were when you updated the golden image.

There are two ways to update the golden image:

- Update the golden image at the same time as the Active update (Both mode).
- Update the golden image using the Active image that has already been written (Recovery mode).

The golden image can be updated only when the server is powered off.

You can update the golden image using the iRMC S6 web interface or the Redfish API of the iRMC S6.

### Updating the golden image using the iRMC S6 web interface

- ▶ Log in to the iRMC S6 web interface.
- ▶ Select the **Tools** menu.
- ▶ Open the **Update** page.
- ▶ In the **BIOS Update** group, set the **Update Source** to **Image file**.
- ▶ Set the **Image to Flash** to **Both** or **Recovery**.
- ▶ Click **Start Update** to **Perform**.



For more information on iRMC settings, see the iRMC user guides.

### Updating the golden image using the Redfish API of the iRMC S6

Further information about the Redfish API of the iRMC S6, see the iRMC S6 Redfish documentation on the Fujitsu support internet pages at:

<https://ts.fujitsu.com/support/>

## 5.3.20 Setting boot priority

If the boot priority has been changed after installing or replacing a bootable device, set it to the same priority as before the installation or replacement. To check the boot priority, see "[Checking boot priority](#)" on page 93.

- ▶ Enter the BIOS.
- ▶ Select the **Boot** menu.
- ▶ Navigate to the **Boot Maintenance Manager** menu and press the [Enter] key to display the options.
- ▶ Navigate to the **Boot Options** menu and press the [Enter] key to display the options.

- ▶ If needed, change the boot priority by navigating to the **Change Boot Order** option and pressing the [Enter] key:
  - ▶ Press the [Enter] key to display the current boot order
  - ▶ Press the cursor keys [↑] or [↓] to select the device which you want to move up and down the boot priority list
  - ▶ Press the [+] key to move the device up the boot order list or the [-] key to move the selected device down the boot order list.

 For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual.

### 5.3.21 Recovering the ESXi configuration information encryption functionality

When the ESXi host is configured with a Trusted Platform Module (TPM), the ESXi configuration information is encrypted by an encryption key stored in the TPM, and its security is strongly guaranteed.

The encrypted ESXi configuration information is decrypted at boot time by the encryption key stored in the TPM.

PSOD occurs when ESXi is booted using a TPM that is different from the TPM used to encrypt the ESXi.

After completing the maintenance procedure, recover the ESXi configuration information encryption functionality.

 ESXi configuration information encryption is automatically enabled when you install or upgrade ESXi 7.0 U3 or later with TPM enabled.

 When you recover the ESXi configuration information, you need the recovery key obtained in advance.

- ▶ Ask the system administrator to perform the recovery procedure.
  - ▶ Enter the recovery key and recover the ESXi configuration information encryption functionality, at boot time.



For more information about recovery methods, see the "Recover the Secure ESXi Configuration" page at:

<https://docs.vmware.com/en/VMware-vSphere/7.0/com.vmware.vsphere.security.doc/GUID-23FFB8BB-BD8B-46F1-BB59-D716418E889A.html>

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# 6 Power supply unit (PSU)

## 6.1 Safety notes



### CAUTION

- ▶ Do not disassemble the PSU. Doing so may cause electric shock.
- ▶ Areas around the PSU may remain extremely hot after shutdown. After shutting down the server, wait for hot components to cool down before removing the PSU.
- ▶ When installing a PSU, ensure that the connector of the PSU is not damaged or bent.
- ▶ The PSU is heavy, so handle it carefully. If you drop it by mistake, injuries may result.
- ▶ For more information, see "[Important information](#)" on page 33.

## 6.2 Basic information

The server can be equipped with up to two hot-plug AC PSUs or DC PSUs.



The connectors for the PSUs are integrated on the system board, therefore, the PSUs are connected directly to the system board.

### Server equipped with up to two hot-plug AC PSUs

In its basic configuration, the server has one PSU that adjusts automatically to any mains voltage in the range of 100 V - 240 V (AC PSU Platinum) or 200 V - 240 V (AC PSU Titanium). Besides the PSU, a second PSU can be installed optionally to serve as a redundant power supply. If one PSU fails, the second PSU in the redundant configuration ensures that operation can continue uninterrupted and the defective PSU can be replaced during operation (hot-plug). The second PSU can be installed during operation.

## Power supply unit (PSU)

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### CAUTION

The AC PSU adjusts automatically to any mains voltage in the range from 100 V - 240 V (AC PSU Platinum) or 200 V - 240 V (AC PSU Titanium).

- ▶ You may only operate the server if its rated voltage range corresponds to the local mains voltage.

### Server equipped with up to two hot-plug DC PSUs

In its basic configuration the server has one PSU that adjusts automatically to any mains voltage in the range of -48.0 V - -57 V (DC PSU -48 V) or 200 V - 380 V (HVDC PSU 380 V). Besides the PSU, a second PSU can be installed optionally to serve as a redundant power supply. If one PSU fails, the second PSU in the redundant configuration ensures that operation can continue uninterrupted and the defective PSU can be replaced during operation (hot-plug). The second PSU can be installed during operation.



### CAUTION

The DC PSU adjusts automatically to any mains voltage in the range from -40.5 V - -57 V.

- ▶ You may only operate the server if its rated voltage range corresponds to the local mains voltage.



### CAUTION

The HVDC PSU adjusts automatically to any mains voltage in the range from 200 V – 380 V.

- ▶ You may only operate the server if its rated voltage range corresponds to the local mains voltage.

### PSU types

Power class	Power	PSU
1	500 W	AC PSU Platinum
	500 W	AC PSU Platinum
2	900 W	AC PSU Platinum
	900 W	AC PSU Titanium
3	1300 W	DC PSU -48 V

Power class	Power	PSU
4	1600 W	AC PSU Platinum
	1600 W	AC PSU Titanium
	1600 W	HVDC PSU 380 V
5	2200 W	AC PSU Platinum
6	2400 W	AC PSU Titanium



All different PSUs can be installed, removed or replaced in the same way.

### Assembly rules

- Mixed assembly of PSUs from different power classes (e.g. power class 1 or power class 2) within a system is not supported.
- Mixing of Platinum and Titanium PSUs within same class (e.g. power class 2) within a system is not supported.
- Mixing of Platinum PSUs within same power class and different manufacturer (e.g. power class 1) within a system is supported.
- Always install a dummy cover into an unused PSU bay to comply with applicable EMC regulations and satisfy cooling requirements.
- For a redundant power supply configuration you need always two PSUs with the same power class.

### PSU bays



Figure 45: PSU bays

1 PSU 1

2 PSU 2

## 6.3 Redundant power supply

### 6.3.1 Installing a hot-plug PSU



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH1 / (+) No. 1 screw driver (for DC PSU -48 V)



The procedure of installing an AC PSU or a DC PSU differs only in connecting the power cord.



A second PSU of the same type as the already existing PSU can be installed while the system is in operation.

When the PSU is plugged in, a CSS error is generated, as an information, and will be cleared as soon as the power cord is connected. The system is automatically configured as a system with redundant power supply.

#### Preliminary steps

No steps needed.

## Removing the dummy cover



Figure 46: Removing the dummy cover

- ▶ Press in on both release latches (1) and pull out the dummy cover (2).



### CAUTION

- ▶ Keep the dummy cover for future use.
- ▶ If you remove a PSU and do not immediately replace it with a new one, a dummy cover must be installed in the bay again to comply with applicable EMC regulations and satisfy cooling requirements.

### Installing a hot-plug PSU

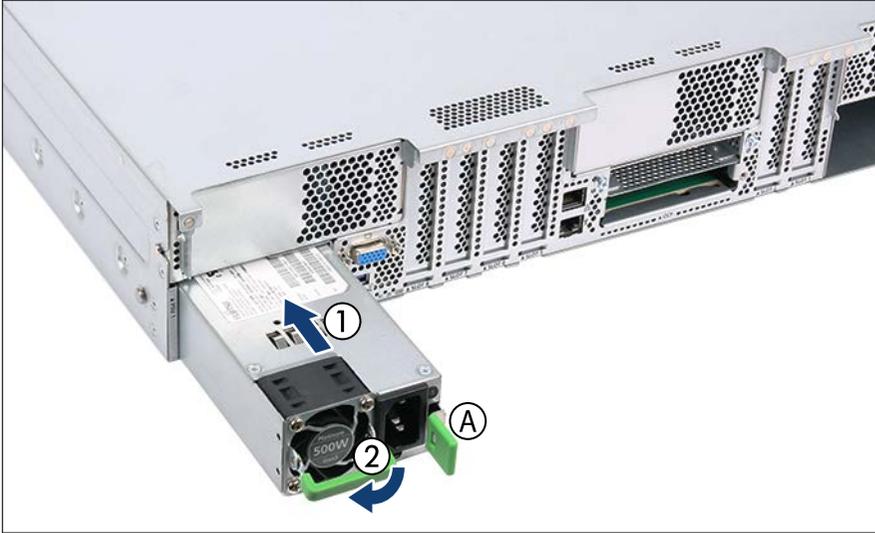


Figure 47: Installing a hot-plug PSU

- ▶ Push the PSU into its bay as far as it will go (1) until the release latch (A) snaps in place.
- ▶ Fold down the handle on the PSU (2).



Ensure that the PSU engages correctly in the bay and is locked in position.



Figure 48: Installing the cable clamp

- ▶ Only for AC PSU with cable clamp: Push the cable clamp into the corresponding hole until it clicks in.  
Once installed, the cable clamp cannot be removed and remains a part of the PSU.
- ▶ Only for AC PSU with an hook-and-loop-tape: Before connecting the power cord, attach the hook-and-loop tape to the handle.

### Concluding steps

- ▶ ["Connecting the power cord" on page 65.](#)

## 6.3.2 Removing a hot-plug PSU



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH1 / (+) No. 1 screw driver (for DC PSU -48 V)

## Power supply unit (PSU)

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The procedure of removing an AC PSU or a DC PSU differs only in disconnecting/connecting the power cord.

### Note for removing a hot-plug PSU from a redundant configuration

If a hot-plug PSU should be removed from a redundant configuration, while the system is in operation, proceed the following:

- ▶ Disconnect the power cord from the dedicated PSU, see ["Disconnecting the power cord" on page 50](#).

A CSS error is detected and the message "redundancy lost" is displayed using the iRMC S6 web interface. Your configuration is now non-redundant. The CSS error is only an information. After removing the PSU out of its bay, the CSS error will be cleared automatically.

### Note for servers using CMA (Cable Management Arm)

Regarding of removing PSUs, additional tasks are needed, due to an interference between CMA and the PSUs.

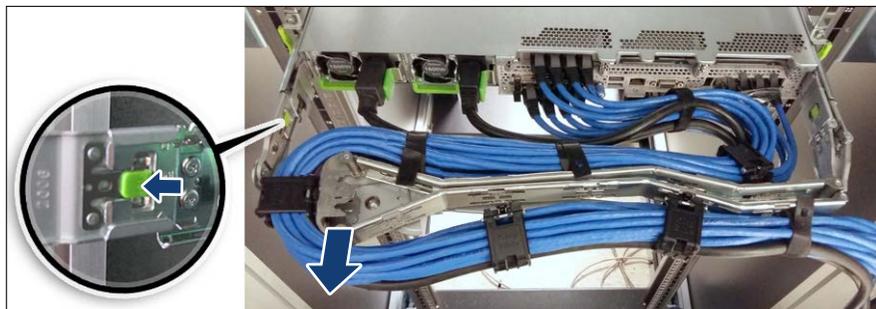


Figure 49: Unlocking the CMA

- ▶ Push the lock spring inward to unlock the CMA bracket.
- ▶ Remove the CMA.
- ▶ Hold the CMA including cables in the one hand.

- ▶ Remove the PSU and install the dummy cover carefully.



Note for PSU 1:

Remove the PSU 1 carefully while lifting PSU 1 and bringing PSU 1 to the right, in order to avoid interference.

- ▶ Mount the complete assembly (CMA bracket and the CMA) again into the rail.

### Preliminary steps

- ▶ Only when replacing a PSU in a non-redundant configuration: ["Shutting down the server" on page 50](#).

### Removing a hot-plug PSU

- ▶ Remove the power cord from the dedicated PSU, see ["Disconnecting the power cord" on page 50](#).

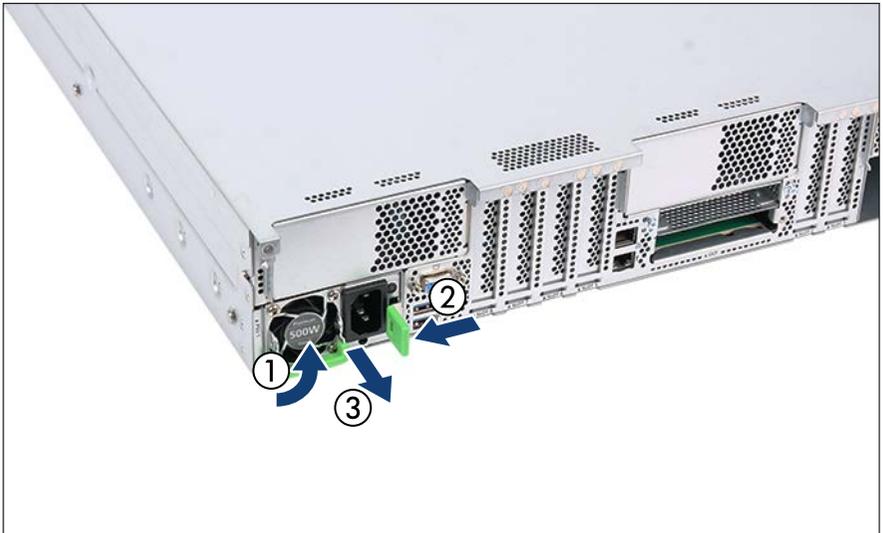


Figure 50: Removing the PSU

- ▶ Push the handle of the PSU halfway upward in the direction of the arrow (1).
- ▶ Press in on the green locking latch (2).

## Power supply unit (PSU)

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- ▶ While keeping the green locking latch pressed, pull the PSU out of its bay (3).



### CAUTION

Excessive temperatures could damage system components.

- ▶ Never leave the bay for the hot-plug PSU empty for more than two minutes during operation.

## Installing the dummy cover



Figure 51: Installing the dummy cover

- ▶ Insert the dummy cover into the empty bay with the impressed triangle symbol pointing upward.
- ▶ Push the dummy cover into its bay until it locks in place.



### CAUTION

- ▶ Always install dummy covers into unused bays to comply with applicable EMC regulations and satisfy cooling requirements.

## Concluding steps

No steps needed.

### 6.3.3 Replacing a hot-plug PSU



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH1 / (+) No. 1 screw driver (for DC PSU -48 V)



The procedure of replacing an AC PSU or a DC PSU differs only in disconnecting/connecting the power cord.



#### **CAUTION**

- ▶ When replacing a PSU in a non-redundant PSU configuration, the server must be switched off first.
- ▶ Replace the PSU after specifying the one that breaks down at work by revitalization.

#### **Note for servers using CMA (Cable Management Arm)**

Regarding of removing PSUs, additional tasks are needed, due to an interference between CMA and the PSUs.

- ▶ Push the lock spring inward to unlock the CMA bracket, see [Figure 49](#).
- ▶ Remove the CMA.
- ▶ Hold the CMA including cables in the one hand.
- ▶ Remove the PSU (see [Figure 50](#)) and install the new PSU carefully.



Note for PSU 1:

Remove the PSU 1 carefully while lifting PSU 1 and bringing PSU 1 to the right, in order to avoid interference.

- ▶ Mount the complete assembly (CMA bracket and the CMA) again into the rail.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ Check which PSU is defective.  
PSU is defective when the PSU status indicator lights orange. For more information, see ["Indicator on hot-plug PSU" on page 564.](#)
- ▶ Only when replacing a PSU in a non-redundant configuration: ["Shutting down the server" on page 50.](#)
- ▶ Remove the power cord from the defective PSU, see ["Disconnecting the power cord" on page 50.](#)

### Removing the defective hot-plug PSU

- ▶ Remove the PSU, see ["Removing a hot-plug PSU" on page 129.](#)

### Installing the new hot-plug PSU

- ▶ Install the PSU, see ["Installing a hot-plug PSU" on page 126.](#)

### Concluding steps

- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ Only when replacing a PSU in a non-redundant configuration: ["Switching on the server" on page 71.](#)
- ▶ ["Performing a fan test" on page 117.](#)



A fan test does not need to be performed if the hot-plug PSU is actively replaced. iRMC runs automatically.

- ▶ Check that the PSU status indicator is lit green.

---

# 7 Hard disk drive (HDD) / solid state disk (SSD)

## 7.1 Safety notes



### CAUTION

- ▶ Before removing several HDD/SSD modules, make sure that all HDD/SSD modules can be reinstalled into their original bay. Otherwise, data may be lost.
- ▶ Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- ▶ Before removing an HDD, wait for about 30 seconds until the disk has stopped spinning completely.
- ▶ When an HDD is starting up, a resonant noise may be audible for a short while. This does not indicate a failure.
- ▶ Depending on the OS, you can configure the write cache settings for the HDDs. If a power failure should occur while the write cache is enabled, cached data may be lost.
- ▶ When disposing of, transferring, or returning an HDD or SSD, wipe out the data on the drive for your own security.
- ▶ Rough handling of HDDs may damage the stored data. To cope with any unexpected problems, always back up important data. When backing up data to another HDD, you should make backups on a file or partition basis.
- ▶ Be careful not to hit the HDD or bring it into contact with metallic objects.
- ▶ Handle the HDD and SSD on a shock and vibration free surface.
- ▶ Do not use the HDD and SSD in extremely hot or cold locations, or locations with extreme temperature changes.
- ▶ Never attempt to disassemble the HDD or SSD.
- ▶ For more information, see ["Important information" on page 33](#).

### 7.2 Basic information

The HDD or SSD and the installation frame together make up the HDD module or SSD module.

The server is shipped with one of the following HDD or SSD subsystems:

- 3.5-inch HDD subsystem
- 2.5-inch HDD/SSD subsystem

#### 3.5-inch HDD subsystem

Up to 10 3.5-inch SAS/SATA HDD modules or up to 12 3.5-inch SAS/SATA HDD/SSD modules can be installed depending on configuration.

The HDD/SSD module is connected to the HDD backplane wirelessly. This allows HDD/SSD modules to be plugged in or pulled out easily.

Hybrid configurations of SAS/SATA HDD/SSD modules are supported in combination with an optional HDD controller.



For information on RAID controllers controlling the HDD modules, see ["Expansion cards and backup units" on page 245](#).

#### 2.5-inch HDD/SSD subsystem

- Up to 16 2.5-inch SAS/SATA HDD/SSD modules can be installed depending on configuration.

The HDD/SSD modules are connected to the HDD backplane wirelessly. This allows HDD/SSD modules to be plugged in or pulled out easily.

If the HDD/SSD modules are controlled by a RAID controller, defective HDD/SSD modules can also be replaced during operation.

- Up to 24 2.5-inch HDD/SSD/PCIe SSD modules can be installed depending on configuration.

The HDD / SSD / PCIe SSD modules are connected to the HDD backplane wirelessly. This allows HDD/SSD/PCIe SSD modules to be plugged in or pulled out easily.

If the HDD/SSD/PCIe SSD modules are controlled by a RAID controller, defective HDD/SSD/PCIe SSD modules can be replaced during operation.



For information on RAID controllers controlling the HDD/SSD/PCIe SSD modules, see ["Expansion cards and backup units" on page 245](#).

### Base units

There are five base units available.

Base unit	Description
Type 1	Base unit with up to 10x 3.5-inch HDDs
Type 2	Base unit with up to 12x 3.5-inch HDDs
Type 3	Base unit for up to 16x 2.5-inch HDDs/SSDs
Type 4	Base unit for up to 24x 2.5-inch HDDs / SSDs / PCIe SSDs
Type 5	Base unit for up to 24x 2.5-inch PCIe SSDs
Type 6	Base unit for up to 16x 2.5-inch HDDs / SSDs / PCIe SSDs

### Replacing failed or aged drives

The tables show the location of the HDD in the device, BIOS Setup or HII Configuration Utility, and the description in the OS log for each AHCI / VROC / PRAID connection. Refer to when replacing failed or aged drives.



ServerView RAID Software is not provided anymore, If you install ServerView Agentless Service, Server View RAID Manager is running internally. So, the source of the logs is listed as ServerView RAID.

### Example for iRMC S6 web interface display

Position	Enclosure	Slot
[0]		0
[1]		1
[2]		2
[3]		3

## Hard disk drive (HDD) / solid state disk (SSD)

---

Position	Enclosure	Slot
[4]		4
[5]		5
[6]		6
[7]		7
[8]		8
[9]		9
[10]		10
[11]		11
[12]		12
[13]		13
[14]		14
[15]		15



Information about HDD/SSD slots can also be displayed using the BIOS, see ["Displaying HDD/SSD slot information" on page 143](#).

## 7.3 Handling HDDs or SSDs without installation frame

### 7.3.1 3.5-inch HDD and 3.5-inch installation frame



Installing or removing the installation frame is only necessary for Japan.



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH1 / (+) No. 1 screwdriver

### Preliminary steps

No steps needed.

### Installing a 3.5-inch HDD in a 3.5-inch installation frame



Figure 52: Installing the 3.5-inch HDD in the 3.5-inch installation frame (A)

► Lay the 3.5-inch HDD into the 3.5-inch installation frame as shown.



Figure 53: Installing the 3.5-inch HDD in the 3.5-inch installation frame (B)

## Hard disk drive (HDD) / solid state disk (SSD)

---

- ▶ Fasten the 3.5-inch HDD with four screws.

### Removing a 3.5-inch HDD from a 3.5-inch installation frame

- ▶ Please proceed in reversed order.

### Concluding steps

No steps needed.

## 7.3.2 2.5-inch HDD/SSD and 2.5-inch installation frame



Installing or removing the installation frame is only necessary for Japan.



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH1 / (+) No. 1 screwdriver

### Preliminary steps

No steps needed.

### Installing a 2.5-inch HDD/SSD in a 2.5-inch installation frame



Figure 54: Installing the 2.5-inch HDD/SSD in the 2.5-inch installation frame (A)

- ▶ Lay the 2.5-inch HDD/SSD into the 2.5-inch installation frame as shown.



Figure 55: Installing the 2.5-inch HDD/SSD in the 2.5-inch installation frame (B)

- ▶ Fasten the 2.5-inch HDD/SSD with four screws.

### Removing a 2.5-inch HDD/SSD from a 2.5-inch installation frame

- ▶ Please proceed in reversed order.

### Concluding steps

No steps needed.

## 7.3.3 2.5-inch HDD/SSD and 3.5-inch installation frame



Installing or removing the installation frame is only necessary for Japan.



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

## Hard disk drive (HDD) / solid state disk (SSD)

---

**Tools:** Phillips PH1 / (+) No. 1 screwdriver



In order to use 2.5-inch HDD/SSD, you can install a 2.5-inch HDD/SSD in the 3.5-inch installation frame.

### Preliminary steps

No steps needed.

### Installing a 2.5-inch HDD/SSD in a 3.5-inch installation frame



Figure 56: Installing the 2.5-inch HDD/SSD in the 3.5-inch installation frame (A)

- Lay the 2.5-inch HDD/SSD into the 3.5-inch installation frame as shown.



Figure 57: Installing the 2.5-inch HDD/SSD in the 3.5-inch installation frame (B)

- Fasten the 2.5-inch HDD/SSD with four screws.

### Removing a 2.5-inch HDD/SSD from a 3.5-inch installation frame

- Please proceed in reversed order.

### Concluding steps

No steps needed.

## 7.4 Displaying HDD/SSD slot information

Information about HDD/SSD slots can be displayed using the BIOS or the iRMC S6 web interface.



The display depends on the installed expansion cards, the HDD backplanes and the cabling.

## Hard disk drive (HDD) / solid state disk (SSD)

---

### Using the BIOS

- ▶ Enter the BIOS setup menu.
- ▶ Select the **Configuration** menu.
- ▶ Select the **SATA Configuration** menu.

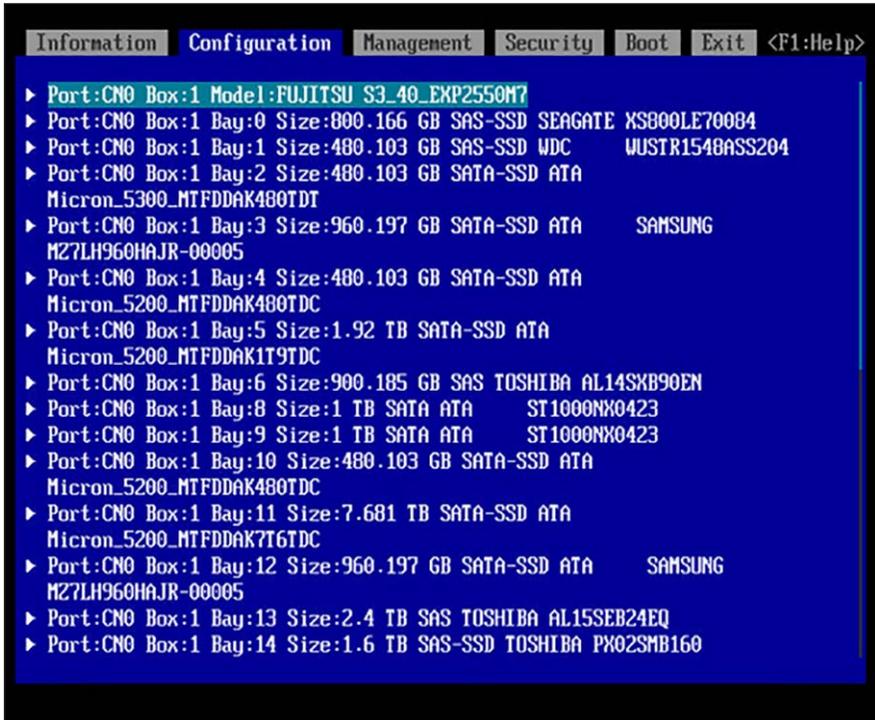


Figure 58: Example - HDD/SSD slot information in BIOS

### Using the iRMC S6 web interface

- ▶ Log into the iRMC S6 web interface.
- ▶ Open the **System** menu.
- ▶ Open the **Mass Storage** page.

- ▶ Select the desired HDD/SSD.



For more information, see the "iRMC S6 - Web Interface" user guide.

**Mass Storage**

OK PRAID EP0254-B./e (0) 03.01

Ports	1
Protocol	PCIe
Device Protocols	
Vendor	Adaptec
Serial Number	2214F300031
PCI Vendor and Device ID	9005 / 020F
Sub Vendor and Device ID	9005 / 14A4
Controller firmware version	03.01.14.062
Temperature [°C]	31
Rebuild Priority	High
Surface Analysis Priority	15h
Parallel Surface Scan Current Count	1
Internal Connector Count	1
External Connector Count	0
Family	SmartRAID
Drive Write Cache	Configured
Connectors	Unconfigured
Alarm present	No
SMART Support	Disabled
Memory Size	4096 MB
Correctable Errors	0
Uncorrectable Errors	0
Operations	

Physical Disks

Status	Enclosure	Port	Slot
Operational		0	0
Available		0	1
Operational		0	2
Operational		0	3
Operational		0	4
Available		0	5
Available		0	6
Available		0	7

Logical Drives

Status	Drive
Operational	0 Logical Drive

Model Name: PRIMERGY RX2540 M7  
Host Name: PE-RX2540M7-411

Figure 59: Example - HDD/SSD slot information in iRMC S6 web interface

## 7.5 3.5-inch HDD configurations

### 7.5.1 Overview of configurations

#### 7.5.1.1 Configuration with up to 10 HDD modules

**i** The HDD bays can be equipped with 3.5-inch HDD modules or 2.5-inch HDD/SSD modules, see ["2.5-inch HDD/SSD and 3.5-inch installation frame"](#) on page 141.



Figure 60: Configuration with up to 10 3.5-inch HDD modules

### Configuration with up to 10 3.5-inch HDD modules

			Position	Enclosure	Slot
HBA/ RAID (0)	Front HDD	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3
			[4]		4
			[5]		5
			[6]		6
			[7]		7
			[8]		8
			[9]		9

Table 3: iRMC S6 web interface display



Information about HDD/SSD slots can also be displayed using the BIOS, see ["Displaying HDD/SSD slot information" on page 143](#).

#### 7.5.1.2 Configuration with up to 12 HDD modules



The HDD bays can be equipped with 3.5-inch HDD modules or 2.5-inch HDD/SSD modules, see ["2.5-inch HDD/SSD and 3.5-inch installation frame" on page 141](#).

## Hard disk drive (HDD) / solid state disk (SSD)

---



Figure 61: Configuration with up to 12 3.5-inch HDD modules

**Configuration with up to 12 3.5-inch HDD modules and 6x 2.5-inch rear HDD modules**

			Position	Enclosure	Slot
HBA/ RAID (0)	Front HDD	with Expander	[0]	1	0
			[1]	1	1
			[2]	1	2
			[3]	1	3
			[4]	1	4
			[5]	1	5
			[6]	1	6
			[7]	1	7
			[8]	1	8
			[9]	1	9
			[10]	1	10
			[11]	1	11
	Rear HDD		[0]	1	24
			[1]	1	25
			[2]	1	26
			[3]	1	27
			[4]	1	28
			[5]	1	29

Table 4: iRMC S6 web interface display

**Configuration with up to 12 3.5-inch HDD modules and 4x 2.5-inch rear PCIe SSD modules**

			Position	Enclosure	Slot
HBA/ RAID (0)	Front HDD	with Expander	[0]	1	0
			[1]	1	1
			[2]	1	2
			[3]	1	3
			[4]	1	4
			[5]	1	5
			[6]	1	6
			[7]	1	7
			[8]	1	8
			[9]	1	9
			[10]	1	10
			[11]	1	11
HBA/ RAID for NVMe (1)	Rear NVMe	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3

Table 5: iRMC S6 web interface display

 Information about HDD/SSD slots can also be displayed using the BIOS, see ["Displaying HDD/SSD slot information" on page 143](#).

## 7.5.2 Installing 3.5-inch HDD modules



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ Locate the correct drive bay, see ["Overview of configurations" on page 146.](#)

### Removing a 3.5-inch HDD dummy module

**i** Unusable HDD bays contain a HDD dummy with dummy lock to prevent customer from erroneously adding a HDD.

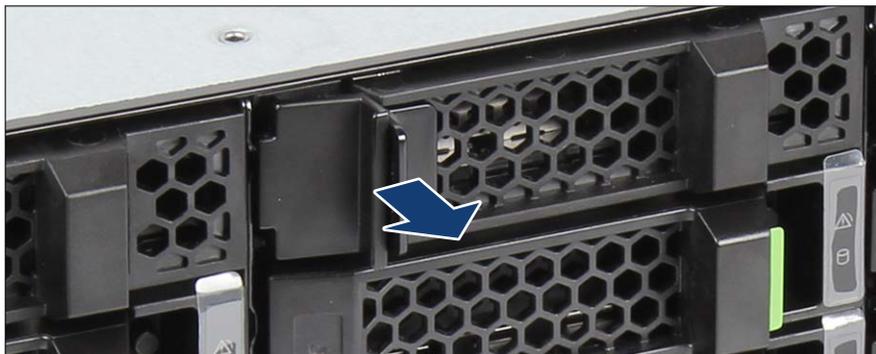


Figure 62: Removing the dummy lock

- ▶ Pull the dummy lock out of the dummy cover. Please be aware that the dummy lock can be damaged.

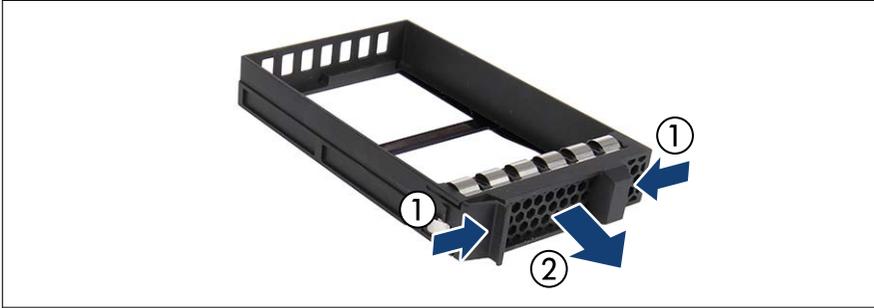


Figure 63: Removing the 3.5-inch dummy module

- ▶ Press both tabs together (1) and pull the dummy module out of its bay (2).



### CAUTION

- ▶ Keep the dummy module for future use.
- ▶ Always replace dummy modules into unused HDD/SSD bays to comply with applicable EMC regulations and satisfy cooling requirements.

## Installing a 3.5-inch HDD module



Figure 64: Opening the locking lever

- ▶ Pinch the green locking clip (1) and open the locking lever (2).

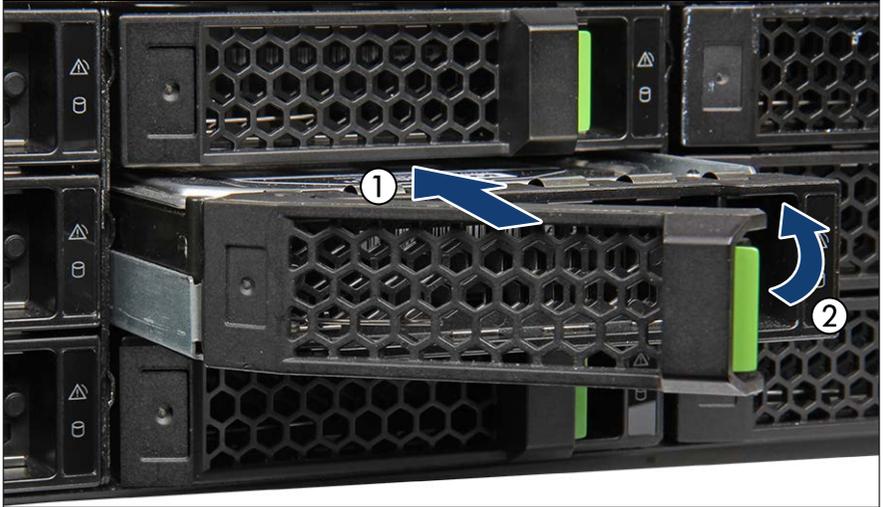


Figure 65: Installing the 3.5-inch HDD module

- ▶ Insert the HDD module into a drive bay and carefully push back as far as it will go (1).
- ▶ Close the locking lever to lock the HDD module in place (2).
- ▶ When using a RAID array, add the additional HDD to the RAID array.



Configuring the RAID array, refer to the documentation of the RAID controller, used in your configuration, see ["Documentation overview" on page 29](#).

### Concluding steps

- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 7.5.3 Removing 3.5-inch HDD modules



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less

## Hard disk drive (HDD) / solid state disk (SSD)

---

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ If the HDD module to be removed is combined into a RAID array, please proceed as follows:

RAID level	Procedure
RAID 0	 <b>CAUTION</b> RAID 0 provides no data redundancy. In case of an HDD module is defect, all data are lost!
RAID 1 RAID 5	Removing an HDD module from a RAID 1 or RAID 5 array will not result in data loss. However, the removed drive needs to be replaced immediately by an HDD module of the same or larger capacity.   After replacing the HDD module, RAID rebuild will be performed as a background process, see <a href="#">"Performing a RAID array rebuild" on page 108.</a>

In order to permanently remove an operational HDD module that is part of a RAID array from the server, you first need to delete the array using iRMC S6 web interface.



### CAUTION

All data on all HDDs in the array will be lost when deleting the RAID array!

- ▶ Be sure to back up your data before deleting a RAID array.
- ▶ For more information, see the "iRMC S6 - Web Interface" user guide.

### Removing a 3.5-inch HDD module

- ▶ Pinch the green locking clips and open the locking lever, see [Figure 64.](#)
- ▶ Pull the HDD module out a few centimeters.

- ▶ Wait about 30 seconds to allow the HDD to spin down.



This period is necessary for the RAID controller to recognize that an HDD module has been removed and for the HDD to come to a stop.

- ▶ Pull the HDD module completely out of its bay.

### Installing a 3.5-inch dummy module



#### CAUTION

- ▶ If the removed HDD module is not replaced immediately, always replace a dummy module into the unused HDD bay to comply with applicable EMC regulations and satisfy cooling requirements.

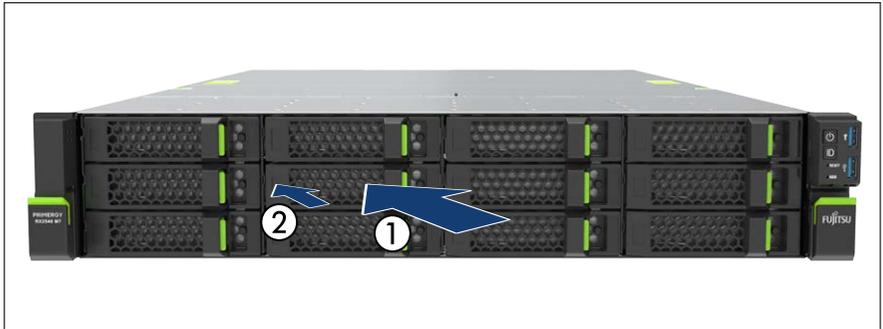


Figure 66: Installing a 3.5-inch HDD dummy module

- ▶ Push the dummy module into the empty bay until it engages (1).
- ▶ If applicable, insert the dummy lock (2).

### Concluding steps

- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

## 7.5.4 Replacing a 3.5-inch HDD module



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

- Tools:**
- Installation frame included: tool-less
  - Installation frame excluded: Phillips PH1 / (+) No. 1 screw driver



### CAUTION

- ▶ Only remove an HDD module during operation if the drive is not currently being accessed. Observe the indicators on the corresponding HDD module, see ["Indicators on hot-plug HDD / SSD / PCIe SSD modules" on page 557](#).
- ▶ An HDD module can be replaced while the system is in operation.  
**RAID configuration with a RAID controller:**
  - Modular Host Bus Adapter with "Integrated RAID" (IR). RAID levels 0 and 1 are supported for internal HDD configurations.
  - Modular RAID 0/1 controller with "MegaRAID functionality" (integrated MegaRAID). RAID levels 0, 1, 10, 5 and 50 are supported for internal HDD configurations.
  - Modular RAID 5/6 controller with "MegaRAID functionality" (MegaRAID). RAID levels 0, 1, 10, 5, 50, 6 and 60 are supported for internal HDD configurations. As an option, a flash backup unit (FBU) can save the memory content even if the power fails. Cache memory size of up to 8 GB is available.
- ▶ An HDD module can be replaced while the system is in operation.  
**RAID configuration without a RAID controller:**

Please follow the instruction of each software e.g. VSAN, Storage Spaces, and Storage Spaces Direct, provided separately to use the software RAID function of OS or Hypervisor.
- ▶ All HDD modules (drives) must be uniquely identified so that they can be reinstalled in their original bays later. If this is not done, existing data can be lost.



Some SSDs / PCIe SSDs have a write life (limited life component). Ask the customer to check the write status before replacing the spare part. If the product has reached the end of its life, ask the customer to purchase it again.

For Japan, refer to the following:

<https://jp.fujitsu.com/platform/server/primergy/support/parts/#parts2>

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Locating the defective component" on page 48.](#)

### Removing the defective 3.5-inch HDD module

- ▶ Remove the HDD module, see ["Removing a 3.5-inch HDD module" on page 154.](#)
- ▶ If the new HDD module does not have an installation frame, replace the installation frame, ["Handling HDDs or SSDs without installation frame" on page 138.](#)

### Installing the new 3.5-inch HDD module

- ▶ Install the HDD module, see ["Installing a 3.5-inch HDD module" on page 152.](#)

### Concluding steps

- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If the HDD is configured using a RAID controller with a RAID level higher than "0", the rebuild will start automatically, see ["Performing a RAID array rebuild" on page 108.](#)
- ▶ For a spare disk, verify that it is set to **Hotspare** in iRMC S6 web interface.

## 7.5.5 Replacing the 10x 3.5-inch HDD backplane



**Field Replaceable Unit (FRU)**



**Hardware: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)
- ▶ Release all HDD modules and pull them out a few centimeters, see ["Removing 3.5-inch HDD modules" on page 153.](#)



### **CAUTION**

The HDD modules need not to be removed.

- ▶ If you want to remove them nevertheless, check if all HDD modules are uniquely identified so that you can reinsert them into their original bays.
- ▶ Release all dummy modules and pull them out a few centimeters, see ["Removing a 3.5-inch HDD dummy module" on page 151.](#)

### Removing the defective 10x 3.5-inch HDD backplane

- ▶ If applicable, remove the internal RAID riser module, see ["Removing an internal RAID riser module" on page 307.](#)
- ▶ Disconnect all cables from the HDD backplane.

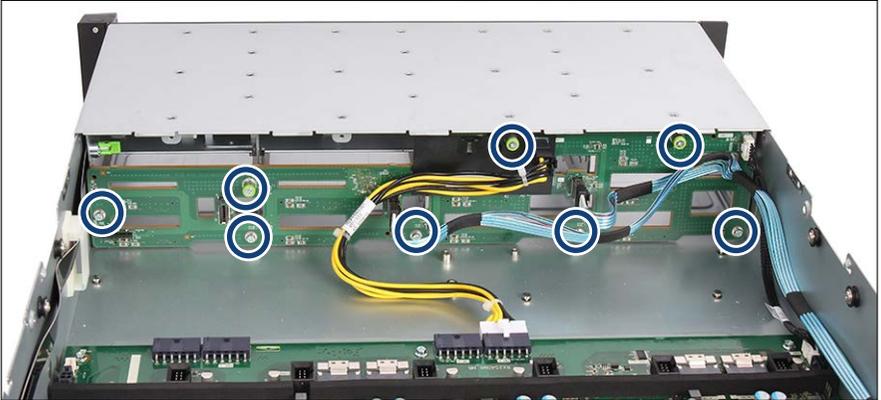


Figure 67: Removing the 10x 3.5-inch HDD backplane

- ▶ Release the eight screws (see circles).
- ▶ Take out the HDD backplane at a slight angle.

### Installing the new 10x 3.5-inch HDD backplane

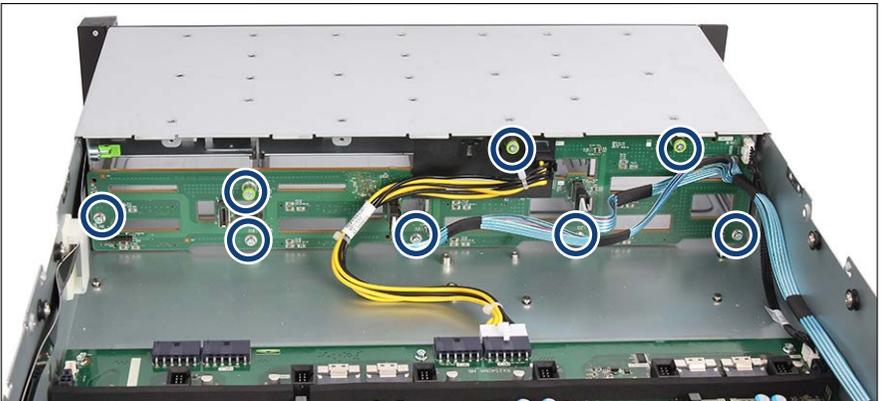


Figure 68: Installing the 10x 3.5-inch HDD backplane

- ▶ Insert the HDD backplane into the chassis.
- ▶ Fasten the eight screws (see circles).
- ▶ If applicable, install the internal RAID riser module, see ["Installing an internal RAID riser module" on page 297](#).

## Hard disk drive (HDD) / solid state disk (SSD)

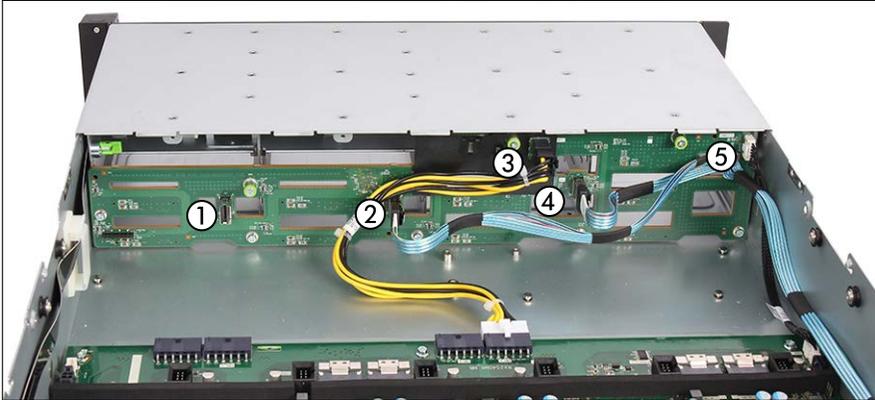


Figure 69: Connecting cables to the 10x 3.5-inch HDD backplane

► Connect the following cables to the HDD backplane:

- 1 SAS/SATA cable
- 2 SAS/SATA cable
- 3 Power cable
- 4 SAS/SATA cable
- 5 OOB cable



The cables are equipped with labels showing the right connector.

For the cable plan, see ["Appendix B" on page 569](#).



### CAUTION

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- Check the correct cabling using the labels on the cables and the cable plans.

## Concluding steps

- ▶ Insert all HDD/SSD modules, see ["Installing a 3.5-inch HDD module" on page 152](#).



Ensure that you install the HDD module in the bay it was located before the HDD backplane replacement.

- ▶ Insert all dummy modules, see ["Installing a 3.5-inch dummy module" on page 155](#).
- ▶ ["Installing the fan cage" on page 77](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ Verify that the iRMC S6 recognizes the installed HDDs/SSDs.
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

### 7.5.6 Replacing the 12x 3.5-inch HDD backplane



**Field Replaceable Unit (FRU)**



**Hardware: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

#### Preliminary steps

- ▶ ["Locating the defective server" on page 47](#).
- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ ["Getting access to the component" on page 55](#).
- ▶ ["Removing the fan cage" on page 76](#).

## Hard disk drive (HDD) / solid state disk (SSD)

---

- ▶ Release all HDD modules and pull them out a few centimeters, see ["Removing 3.5-inch HDD modules" on page 153](#).



### CAUTION

The HDD modules need not to be removed.

- ▶ If you want to remove them nevertheless, check if all HDD modules are uniquely identified so that you can reinsert them into their original bays.
- ▶ Release all dummy modules and pull them out a few centimeters, see ["Removing a 3.5-inch HDD dummy module" on page 151](#).

### Removing the defective 12x 3.5-inch HDD backplane

- ▶ If applicable, remove the SAS expander board holder, see ["Removing the SAS expander board holder" on page 208](#).
- ▶ Remove the internal RAID riser module, see ["Removing an internal RAID riser module" on page 307](#).
- ▶ Disconnect all cables from the HDD backplane.

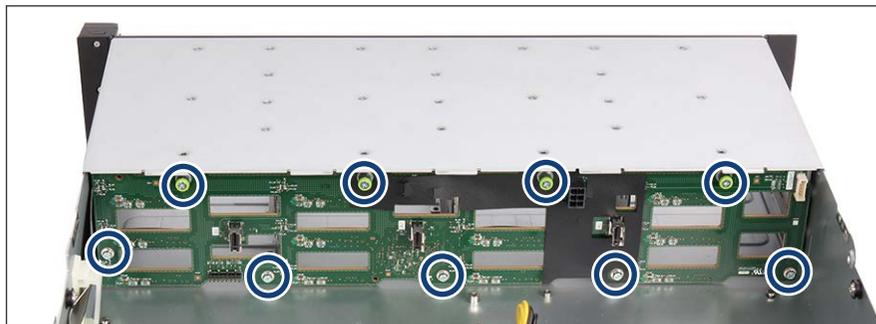


Figure 70: Removing the 12x 3.5-inch HDD backplane

- ▶ Release the nine screws (see circles).
- ▶ Take out the HDD backplane at a slight angle.

### Installing the new 12x 3.5-inch HDD backplane

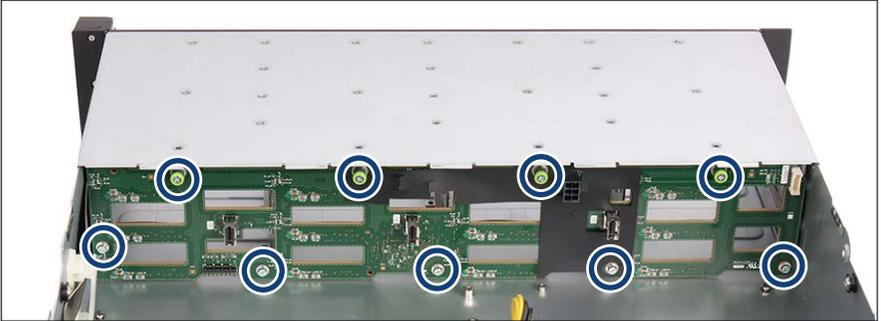


Figure 71: Installing the 12x 3.5-inch HDD backplane

- ▶ Insert the HDD backplane into the chassis.
- ▶ Fasten the nine screws (see circles).
- ▶ Install the internal RAID riser module, see ["Installing the internal RAID riser module" on page 305](#).
- ▶ If applicable, install the SAS expander board holder, see ["Installing the SAS expander board holder" on page 205](#).

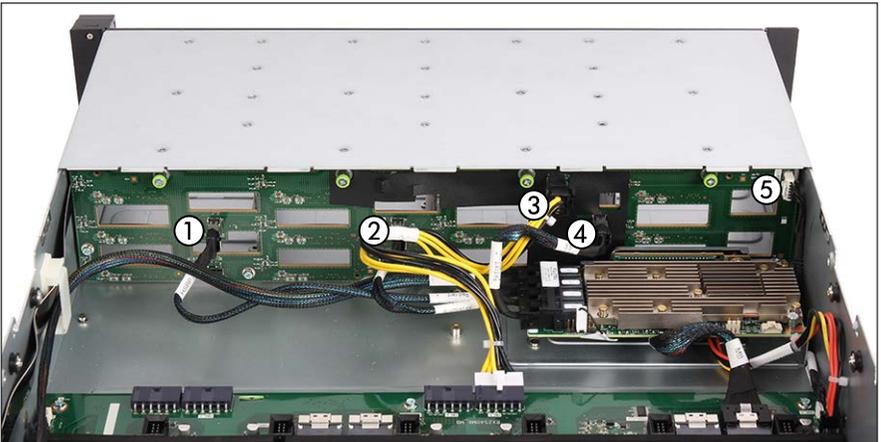


Figure 72: Connecting cables to the 12x 3.5-inch HDD backplane

- ▶ Connect the following cables to the HDD backplane:

## Hard disk drive (HDD) / solid state disk (SSD)

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- 1 SAS/SATA cable
- 2 SAS/SATA cable
- 3 Power cable
- 4 SAS/SATA cable
- 5 OOB cable



The cables are equipped with labels showing the right connector.

For the cable plan, see ["Appendix B" on page 569](#).



### CAUTION

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- ▶ Check the correct cabling using the labels on the cables and the cable plans.

### Concluding steps

- ▶ Insert all HDD/SSD modules, see ["Installing a 3.5-inch HDD module" on page 152](#).



Ensure that you install the HDD module in the bay it was located before the HDD backplane replacement.

- ▶ Insert all dummy modules, see ["Installing a 3.5-inch dummy module" on page 155](#).
- ▶ ["Installing the fan cage" on page 77](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ Verify that the iRMC S6 recognizes the installed HDDs/SSDs.
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 7.6 2.5-inch HDD/SSD configurations

### 7.6.1 Overview of configurations

#### 7.6.1.1 Configuration with up to 16 HDD / SSD / PCIe SSD modules

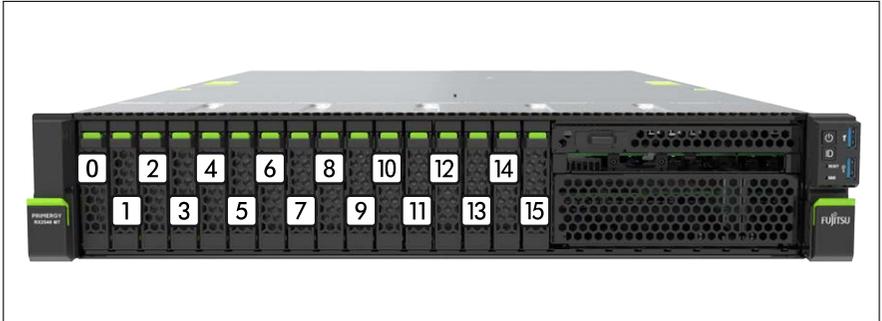


Figure 73: Configuration with up to 16 2.5-inch HDDs/SSDs

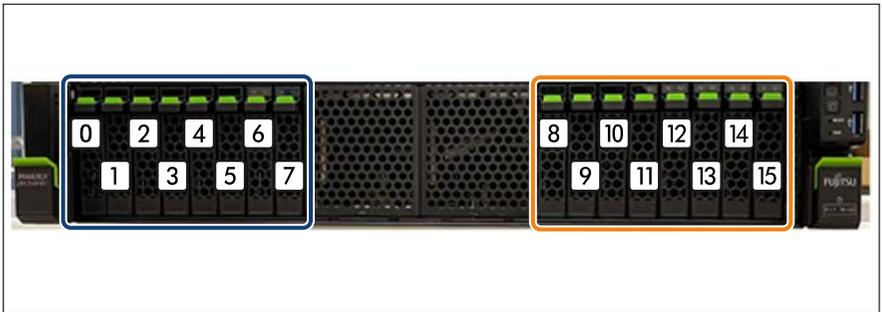


Figure 74: Configuration with up to eight 2.5-inch HDDs/SSDs and up to eight 2.5-inch PCIe SSDs

Configuration with up to 16 2.5-inch HDDs/SSDs

			Position	Enclosure	Slot
HBA/RAID (0)	Front HDD	with Expander	[0]	1	0
			[1]	1	1
			[2]	1	2
			[3]	1	3
			[4]	1	4
			[5]	1	5
			[6]	1	6
			[7]	1	7
			[8]	1	0
			[9]	1	1
			[10]	1	2
			[11]	1	3
			[12]	1	4
			[13]	1	5
			[14]	1	6
			[15]	1	7

Table 6: iRMC S6 web interface display

**Configuration with up to 16 2.5-inch HDDs/SSDs and four 2.5-inch rear PCIe SSDs, three RAID controllers**

			Position	Enclosure	Slot
8ch HBA/ RAID (0)	Front HDD	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3
			[4]		4
			[5]		5
			[6]		6
			[7]		7
8ch HBA/ RAID (1)	Front HDD	without Expander	[8]		0
			[9]		1
			[10]		2
			[11]		3
			[12]		4
			[13]		5
			[14]		6
			[15]		7
HBA/ RAID for NVMe (2)	Rear NVMe	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3

Table 7: iRMC S6 web interface display

**Hard disk drive (HDD) / solid state disk (SSD)**

---

**Configuration with up to 16 2.5-inch HDDs/SSDs and four 2.5-inch rear PCIe SSDs, two RAID controllers**

			<b>Position</b>	<b>Enclosure</b>	<b>Slot</b>
16ch HBA/ RAID (0)	Front HDD	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3
			[4]		4
			[5]		5
			[6]		6
			[7]		7
			[8]		8
			[9]		9
			[10]		10
			[11]		11
			[12]		12
			[13]		13
			[14]		14
[15]		15			
HBA/RAID for NVMe (1)	Rear NVMe	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3

Table 8: iRMC S6 web interface display

**Configuration with up to eight 2.5-inch HDDs/SSDs and up to eight PCIe SSDs**

			Position	Enclosure	Slot
HBA/ RAID/ onBoard SATA for SAS/ SATA (0)	Front HDD	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3
			[4]		4
			[5]		5
			[6]		6
			[7]		7
HBA/ RAID for NVMe (1)	Front NVMe	without Expander	[8]		0
			[9]		1
			[10]		2
			[11]		3
HBA/ RAID for NVMe (2)	Front NVMe	without Expander	[12]		4
			[13]		5
			[14]		6
			[15]		7

Table 9: iRMC S6 web interface display



Information about HDD/SSD slots can also be displayed using the BIOS, see ["Displaying HDD/SSD slot information" on page 143](#).

## Hard disk drive (HDD) / solid state disk (SSD)

### 7.6.1.2 Configuration with up to 24 HDD / SSD / PCIe SSD modules

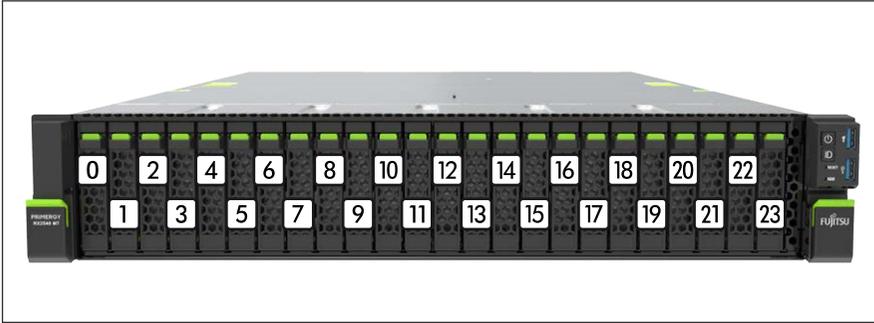


Figure 75: Configuration with up to 24 2.5-inch HDDs/SSDs

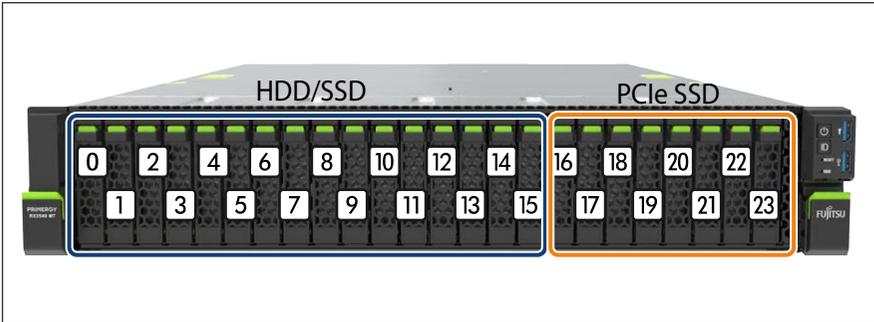


Figure 76: Configuration with up to 16 2.5-inch HDDs/SSDs and up to eight 2.5-inch PCIe SSDs

Configuration with up to 24 2.5-inch HDDs/SSDs

			Position	Enclosure	Slot
8ch HBA/ RAID (0)	Front HDD	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3
			[4]		4
			[5]		5
			[6]		6
			[7]		7
8ch HBA/ RAID (1)	Front HDD	without Expander	[8]		0
			[9]		1
			[10]		2
			[11]		3
			[12]		4
			[13]		5
			[14]		6
			[15]		7
8ch HBA/ RAID (2)	Front HDD	without Expander	[16]		0
			[17]		1
			[18]		2
			[19]		3
			[20]		4
			[21]		5
			[22]		6
			[23]		7

Table 10: iRMC S6 web interface display

## Hard disk drive (HDD) / solid state disk (SSD)

---

### Configuration with up to 24 2.5-inch HDDs/SSDs and six rear 2.5-inch HDDs/SSDs

			Position	Enclosure	Slot
16ch HBA/ RAID (0)	Front HDD	without Expander	[0]		0
			[1]		1
			[2]		2
			[3]		3
			[4]		4
			[5]		5
			[6]		6
			[7]		7
			[8]		8
			[9]		9
			[10]		10
			[11]		11
			[12]		12
			[13]		13
			[14]		14
			[15]		15

## Hard disk drive (HDD) / solid state disk (SSD)

			Position	Enclosure	Slot
16ch HBA/ RAID (1)	Front HDD	without Expander	[16]		0
			[17]		1
			[18]		2
			[19]		3
			[20]		4
			[21]		5
			[22]		6
	Rear HDD	without Expander	[23]		7
			[0]		8
			[1]		9
			[2]		10
			[3]		11
			[4]		12
			[5]		13

Table 11: iRMC S6 web interface display



Information about HDD/SSD slots can also be displayed using the BIOS, see ["Displaying HDD/SSD slot information" on page 143](#).

### 7.6.1.3 Configuration with up to 24 PCIe SSD modules

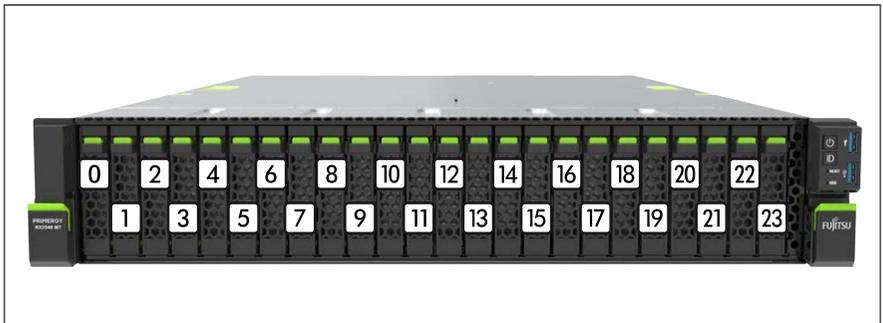


Figure 77: Configuration with up to 24x 2.5-inch PCIe SSDs

**Hard disk drive (HDD) / solid state disk (SSD)**

---

**Configuration with up to 24 2.5-inch PCIe SSDs and up to 6 2.5-inch rear HDDs/SSDs, with SAS expander board - part 1**

			<b>Position</b>	<b>Enclosure</b>	<b>Slot</b>
8ch HBA/ RAID (0)	Front HDD	with Expander	[0]	378	0
			[1]	378	1
			[2]	378	2
			[3]	378	3
			[4]	378	4
			[5]	378	5
			[6]	378	6
			[7]	378	7
			[8]	378	8
			[9]	378	9
			[10]	378	10
			[11]	378	11
			[12]	378	12
			[13]	378	13
			[14]	378	14
			[15]	378	15
			[16]	378	16
			[17]	378	17
			[18]	378	18
			[19]	378	19
			[20]	378	20
			[21]	378	21
			[22]	378	22
			[23]	378	23

Table 12: iRMC S6 web interface display

**Configuration with up to 24 2.5-inch PCIe SSDs and up to 6 2.5-inch rear HDDs/SSDs, with SAS expander board - part 2**

			<b>Position</b>	<b>Enclosure</b>	<b>Slot</b>
8ch HBA/ RAID (0)	Rear HDD	with Expander	[0]	378	24
			[1]	378	25
			[2]	378	26
			[3]	378	27
			[4]	378	28
			[5]	378	29

Table 13: iRMC S6 web interface display

## Hard disk drive (HDD) / solid state disk (SSD)

### Configuration with up to 24 2.5-inch PCIe SSDs and up to 6 2.5-inch rear HDDs/SSDs without SAS expander board - part 1

			Position	Enclosure	Slot
16ch HBA/ RAID (0)	Front HDD	with Expander	[0]	2	0
			[1]	2	1
			[2]	2	2
			[3]	2	3
			[4]	2	4
			[5]	2	5
			[6]	2	6
			[7]	2	7
			[8]	2	8
			[9]	2	9
			[10]	2	10
			[11]	2	11
			[12]	2	12
			[13]	2	13
			[14]	2	14
			[15]	2	15
			[16]	2	16
			[17]	2	17
			[18]	2	18
			[19]	2	19
			[20]	2	20
			[21]	2	21
			[22]	2	22
			[23]	2	23

Table 14: iRMC S6 web interface display

**Configuration with up to 24 2.5-inch PCIe SSDs and up to 6 2.5-inch rear HDDs/SSDs without SAS expander board - part 2**

			Position	Enclosure	Slot
16ch HBA/ RAID (0)	Rear HDD	without Expander	[0]	1	0
			[1]	1	1
			[2]	1	2
			[3]	1	3
			[4]	1	4
			[5]	1	5

Table 15: iRMC S6 web interface display

 Information about HDD/SSD slots can also be displayed using the BIOS, see ["Displaying HDD/SSD slot information" on page 143](#).

## 7.6.2 Installing 2.5-inch HDD/SSD modules



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ Locate the correct drive bay, see ["Overview of configurations" on page 165](#).

### Removing a 2.5-inch HDD/SSD dummy module

 Unusable HDD bays contain a HDD/SSD dummy with dummy lock to prevent customer from erroneously adding a HDD.



Figure 78: Removing the dummy lock

- ▶ Pull the dummy lock out of the dummy cover. Please be aware that the dummy lock can be damaged.

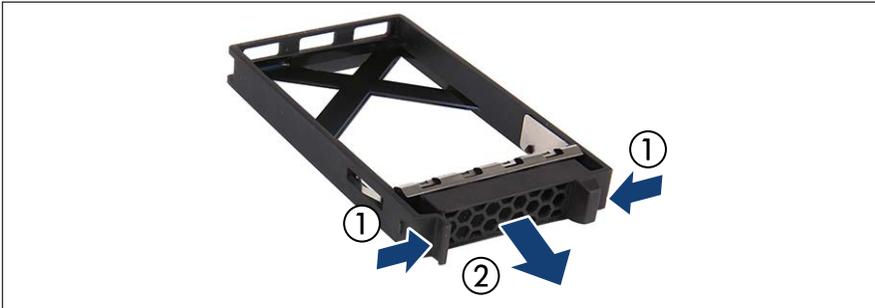


Figure 79: Removing a 2.5-inch HDD/SSD dummy module

- ▶ Press both tabs together (1) and pull the dummy module out of its bay (2).



### CAUTION

- ▶ Keep the dummy module for future use.
- ▶ Always replace dummy modules into unused HDD/SSD bays to comply with applicable EMC regulations and satisfy cooling requirements.

## Installing a 2.5-inch HDD/SSD module



Figure 80: Opening the locking lever

- ▶ Pinch the green locking clips (1) and open the locking lever (2).

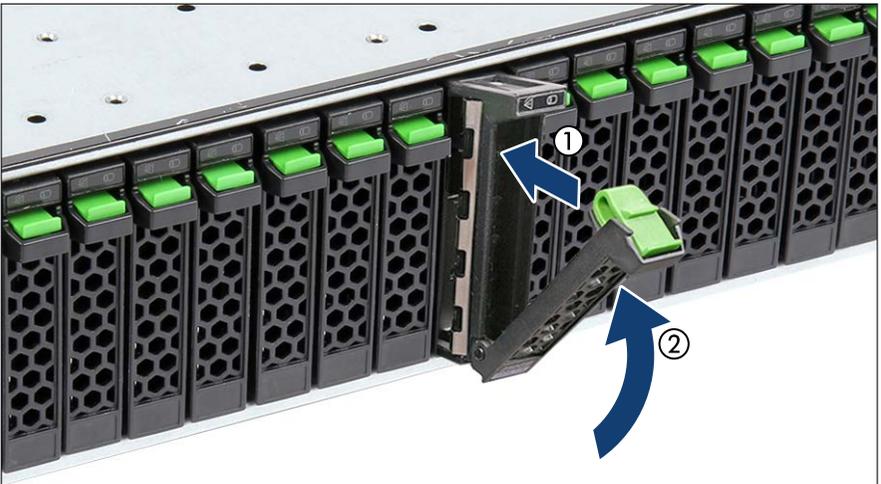


Figure 81: Installing the 2.5-inch HDD/SSD module

- ▶ Insert the HDD/SSD module into a drive bay and carefully push back as far as it will go (1).
- ▶ Close the locking lever to lock the HDD/SSD module in place (2).
- ▶ When using a RAID array, add the additional HDD/SSD to the RAID array.

## Hard disk drive (HDD) / solid state disk (SSD)

---



Configuring the RAID array, see the documentation of the RAID controller, used in your configuration, see "[Documentation overview](#)" on [page 29](#).

### Concluding steps

- ▶ If applicable, "[Installing the front cover with lock](#)" on [page 71](#).

## 7.6.3 Removing 2.5-inch HDD/SSD modules



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less

### Preliminary steps

- ▶ If applicable, "[Removing the front cover with lock](#)" on [page 49](#).
- ▶ If the HDD/SSD module to be removed is combined into a RAID array, please proceed as follows:

RAID level	Procedure
RAID 0	 <p><b>CAUTION</b> RAID 0 provides no data redundancy. In case of an HDD module is defect, all data are lost!</p>
RAID 1 RAID 5	<p>Removing an HDD/SSD module from a RAID 1 or RAID 5 array will not result in data loss. However, the removed drive needs to be replaced immediately by an HDD/SSD module of the same or larger capacity.</p> <p> After replacing the HDD/SSD module, RAID rebuild will be performed as a background process, see <a href="#">"Performing a RAID array rebuild" on page 108</a>.</p>

In order to permanently remove an operational HDD/SSD module that is part of a RAID array from the server, you first need to delete the array using iRMC S6 web interface.

-  **CAUTION** All data on all HDDs in the array will be lost when deleting the RAID array!
- ▶ Be sure to back up your data before deleting a RAID array.
  - ▶ For more information, see the "iRMC S6 - Web Interface" user guide.

### Removing a 2.5-inch HDD/SSD module

- ▶ Pinch the green locking clips and open the locking lever, see [Figure 80](#).
- ▶ Pull the HDD/SSD module out a few centimeters.
- ▶ Wait about 30 seconds.

 This period is necessary for the RAID controller to recognize that an HDD module has been removed and for the HDD to come to a stop.

 This period is necessary for the RAID controller to recognize that an SSD module has been removed.

## Hard disk drive (HDD) / solid state disk (SSD)

---

- ▶ Pull the HDD/SSD module completely out of its bay.

### Installing a 2.5-inch HDD/SSD dummy module



#### CAUTION

- ▶ If the removed HDD/SSD module is not replaced immediately, always replace a dummy module into the unused HDD/SSD bay to comply with applicable EMC regulations and satisfy cooling requirements.



Figure 82: Installing the 2.5-inch HDD/SSD dummy module

- ▶ Push the dummy module into the empty bay until it engages.
- ▶ If applicable, insert the dummy lock.

### Concluding steps

- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

## 7.6.4 Replacing a 2.5-inch HDD/SSD module



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

- Tools:**
- Installation frame included: tool-less
  - Installation frame excluded: Phillips PH1 / (+) No. 1 screw driver



### CAUTION

- ▶ Only remove an HDD/SSD module during operation if the drive is not currently being accessed. Observe the indicators on the corresponding HDD/SSD module, see ["Indicators on hot-plug HDD / SSD / PCIe SSD modules"](#) on page 557.
- ▶ An HDD/SSD module can be replaced while the system is in operation. **RAID configuration with a RAID controller:**
  - Modular Host Bus Adapter with "Integrated RAID" (IR). RAID levels 0 and 1 are supported for internal HDD configurations.
  - Modular RAID 0/1 controller with "MegaRAID functionality" (integrated MegaRAID). RAID levels 0, 1, 10, 5 and 50 are supported for internal HDD configurations.
  - Modular RAID 5/6 controller with "MegaRAID functionality" (MegaRAID). RAID levels 0, 1, 10, 5, 50, 6 and 60 are supported for internal HDD configurations. As an option, a flash backup unit (FBU) can save the memory content even if the power fails. Cache memory size of up to 8 GB is available.
- ▶ An HDD/SSD module can be replaced while the system is in operation. **RAID configuration without a RAID controller:**

Please follow the instruction of each software e.g. VSAN, Storage Spaces, and Storage Spaces Direct, provided separately to use the software RAID function of OS or Hypervisor.
- ▶ All HDD/SSD modules (drives) must be uniquely identified so that they can be reinstalled in their original bays later. If this is not done, existing data can be lost.



Some SSDs / PCIe SSDs have a write life (limited life component). Ask the customer to check the write status before replacing the spare part. If the product has reached the end of its life, ask the customer to purchase it again.

For Japan, refer to the following:

<https://jp.fujitsu.com/platform/server/primergy/support/parts/#parts2>

### Preliminary steps

- ▶ If applicable, "[Removing the front cover with lock](#)" on page 49.
- ▶ "[Locating the defective server](#)" on page 47.
- ▶ "[Locating the defective component](#)" on page 48.

### Removing the defective 2.5-inch HDD/SSD module

- ▶ Remove the HDD/SSD module, see "[Removing a 2.5-inch HDD/SSD module](#)" on page 181.
- ▶ If the new HDD/SSD module does not have an installation frame, replace the installation frame, "[Handling HDDs or SSDs without installation frame](#)" on page 138.

### Installing the new 2.5-inch HDD module

- ▶ Install the HDD/SSD module, see "[Installing a 2.5-inch HDD/SSD module](#)" on page 179.

### Concluding steps

- ▶ If applicable, "[Installing the front cover with lock](#)" on page 71.
- ▶ If the HDD/SSD is configured using a RAID controller with a RAID level higher than "0", the rebuild will start automatically, see "[Performing a RAID array rebuild](#)" on page 108.
- ▶ For a spare disk, verify that it is set to **Hotspare** in iRMC S6 web interface.

## 7.6.5 Installing 2.5-inch PCIe SSD modules



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less



If the PCIe SSD module is controlled by a RAID controller of the PRAID EP5x0i family, the PCIe SSD module can be installed during operation (hot-plug), see ["Installing a 2.5-inch HDD/SSD module" on page 179](#).

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ Locate the correct drive bay, see ["Overview of configurations" on page 165](#).
- ▶ Depending on your operating system: ["Shutting down the server" on page 50](#).

### Removing a 2.5-inch HDD/SSD dummy lock



In configuration with only one 8x 2.5-inch HDD backplane dummy locks are installed to make it impossible to equip the bays with no HDD backplane behind.



Figure 83: Removing the dummy lock

- ▶ Only valid after upgrading the server with the second HDD backplane: pull the dummy lock out of the dummy cover. Please be aware that the dummy lock can be damaged.

### Removing a 2.5-inch HDD/SSD dummy module

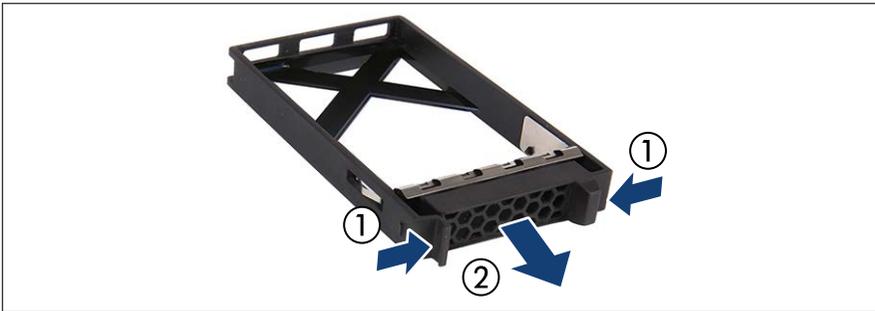


Figure 84: Removing a 2.5-inch HDD/SSD dummy module

- ▶ Press both tabs together (1) and pull the dummy module out of its bay (2).



#### CAUTION

- ▶ Keep the dummy module for future use.
- ▶ Always replace dummy modules into unused HDD/SSD bays to comply with applicable EMC regulations and satisfy cooling requirements.

### Installing a 2.5-inch PCIe SSD module



Figure 85: Opening the locking lever

- ▶ Pinch the green locking clips (1) and open the locking lever (2).

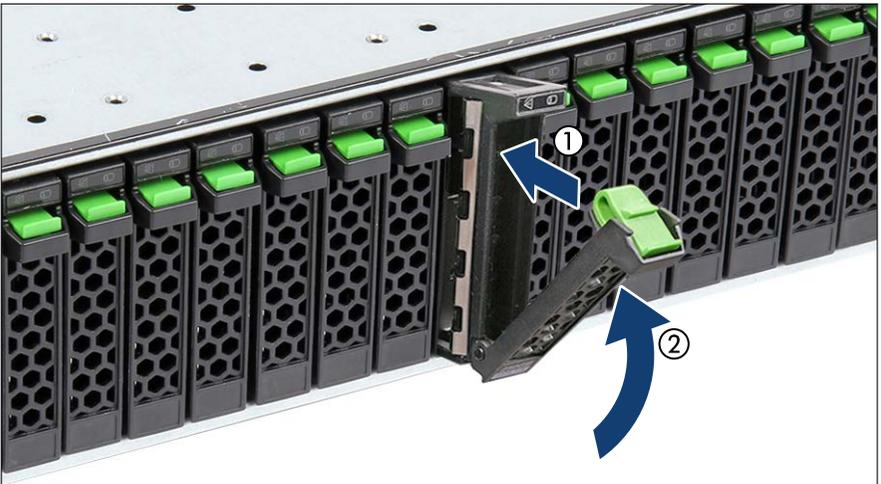


Figure 86: Installing the 2.5-inch PCIe SSD module

- ▶ Insert the PCIe SSD module into a drive bay and carefully push back as far as it will go (1).
- ▶ Close the locking lever to lock the PCIe SSD module in place (2).

### Concluding steps

- ▶ If applicable, ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).
- ▶ If applicable, rescan available devices from your operating system.

## 7.6.6 Removing 2.5-inch PCIe SSD modules



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

**Tools:** tool-less



If the PCIe SSD module is controlled by a RAID controller of the PRAID EP5x0i family, the PCIe SSD module can be installed during operation (hot-plug), see ["Removing 2.5-inch HDD/SSD modules" on page 180](#).

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ Identify the physical location of the PCIe SSD module, see ["Overview of configurations" on page 165](#).
- ▶ Prepare the removing of the PCIe SSD module.
- ▶ Depending on your OS: ["Shutting down the server" on page 50](#).

### Removing a 2.5-inch PCIe SSD module



Figure 87: Opening the locking lever

- ▶ Pinch the green locking clips (1) and open the locking lever (2).
- ▶ Pull the PCIe SSD module completely out of its bay.

### Installing a 2.5-inch HDD/SSD dummy module



#### CAUTION

- ▶ If the removed HDD/SSD module is not replaced immediately, always replace a dummy module into the unused HDD/SSD bay to comply with applicable EMC regulations and satisfy cooling requirements.



Figure 88: Installing the 2.5-inch HDD/SSD dummy module

- ▶ Push the dummy module into the empty bay until it engages.
- ▶ If applicable, insert the dummy lock.

### Concluding steps

- ▶ If applicable, ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 7.6.7 Replacing a 2.5-inch PCIe SSD module



**Customer Replaceable Unit (CRU)**



**Hardware: 5 minutes**

- Tools:**
- Installation frame included: tool-less
  - Installation frame excluded: Phillips PH1 / (+) No. 1 screw driver



If the PCIe SSD module is controlled by a RAID controller of the PRAID EP5xxi/CP5xxi/EP6xxi family, the PCIe SSD module can be installed during operation (hot-plug), see "[Removing a 2.5-inch HDD/SSD module](#)" on page 181.



### **CAUTION**

All HDD/SSD modules (drives) must be uniquely identified so that they can be reinstalled in their original bays later. If this is not done, existing data can be lost.



Some SSDs / PCIe SSDs have a write life (limited life component). Ask the customer to check the write status before replacing the spare part. If the product has reached the end of its life, ask the customer to purchase it again.

For Japan, refer to the following:

<https://jp.fujitsu.com/platform/server/primergy/support/parts/#parts2>

### **Preliminary steps**

- ▶ If applicable, "[Removing the front cover with lock](#)" on page 49.
- ▶ "[Locating the defective server](#)" on page 47.
- ▶ Identify the physical location of the PCIe SSD module, see "[2.5-inch HDD/SSD configurations](#)" on page 165.
- ▶ Prepare the removing of the PCIe SSD module.
- ▶ Depending on your configuration and OS: "[Shutting down the server](#)" on page 50.

### **Removing the defective 2.5-inch PCIe SSD module**

- ▶ Remove the PCIe SSD module, see "[Removing 2.5-inch PCIe SSD modules](#)" on page 188.
- ▶ If the new PCIe SSD module does not have an installation frame, replace the installation frame, "[Handling HDDs or SSDs without installation frame](#)" on page 138.

### Installing the new 2.5-inch PCIe SSD module

- ▶ Install the PCIe SSD module, see ["Installing 2.5-inch PCIe SSD modules" on page 185](#).

### Concluding steps

- ▶ If applicable, ["Switching on the server" on page 71](#).
- ▶ Verify that the operating system recognizes the newly installed drive.
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 7.6.8 Replacing a 8x 2.5-inch HDD backplane



**Field Replaceable Unit (FRU)**



**Hardware: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver



In configuration with 24x 2.5-inch HDD/SSD/PCIe modules the third backplane is a combo HDD backplane that also allows to install PCies. The replacing procedure is the same as a HDD backplane.

There are three types of 8x 2.5-inch HDD backplane (P/N: CA05973-8303) with or without a foam.

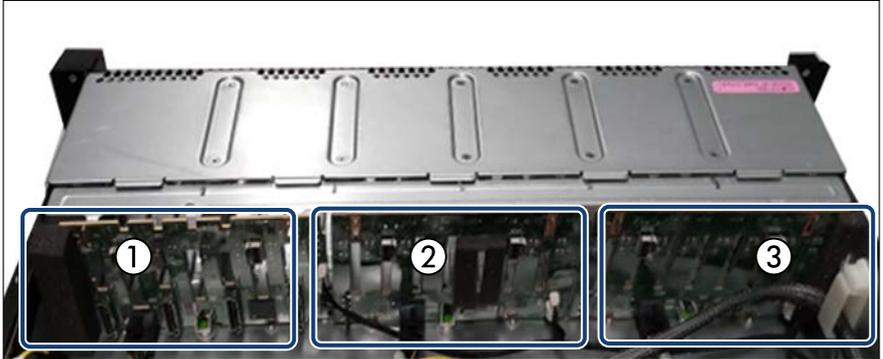


Figure 89: Foams at the 8x 2.5-inch HDD backplanes

- |   |   |   |   |
|---|---|---|---|
| 1 | HDD backplane without foam                | 3 | HDD backplane with one foam at the right side |
| 2 | HDD backplane with one foam in the center |   |   |

The HDD backplane (3) may be without foam depending on the server configuration.



Figure 90: Foams for the 8x 2.5-inch HDD backplane

8x 2.5-inch HDD backplane (P/N: CA05973-8303) spare parts come with two foams separated. When replacing the HDD backplane, attach the foam according to the original mounting position.

## Hard disk drive (HDD) / solid state disk (SSD)

---



Only for Japan/APAC:

Two foams are attached to the spare part of the HDD backplane to allow the replacement in any mounting position.

When replacing the HDD backplane, detach the foam according to the original mounting position.



Figure 91: 8x 2.5-inch HDD backplane with two foams

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ Release all HDD/SSD modules and pull them out a few centimeters, see ["Removing 2.5-inch HDD/SSD modules" on page 180.](#)



The HDD/SSD modules need not to be removed. But if you want to remove them nevertheless, check if all HDD/SSD modules are uniquely identified so that you can reinsert them into their original bays.

- ▶ Release all dummy modules and pull them out a few centimeters, see ["Removing a 2.5-inch HDD/SSD dummy module" on page 177.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the defective 8x 2.5-inch HDD backplane

- ▶ If applicable, remove the SAS expander board holder, see ["Removing the SAS expander board holder" on page 208](#).
- ▶ If applicable, remove the internal RAID riser module, see ["Removing an internal RAID riser module" on page 307](#).
- ▶ Disconnect all cables from the HDD backplane.

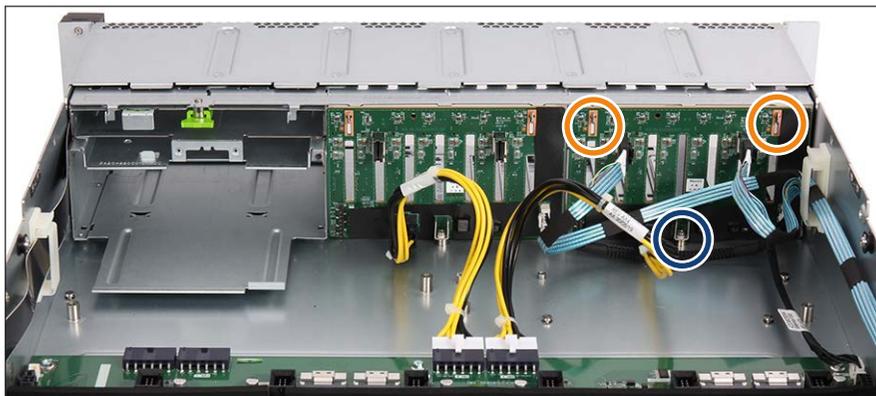


Figure 92: Removing the 8x 2.5-inch HDD/SSD backplane

- ▶ Release the screw (see circle).
- ▶ Pull the HDD backplane upward until the two hooks disengage (see orange circles).
- ▶ Take out the HDD backplane.

### Installing the new 8x 2.5-inch HDD backplane

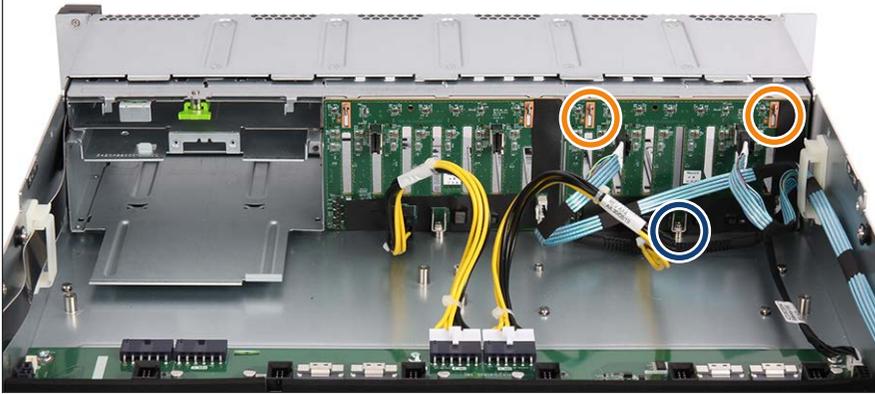


Figure 93: Installing the 8x 2.5-inch SAS HDD/SSD backplane

- ▶ Position the HDD backplane on the two hooks (see orange circles).
- ▶ Push the HDD backplane downward. Make sure that the HDD backplane fits into the guide pins.
- ▶ Fasten the screw (see circle).
- ▶ If applicable, install the internal RAID riser module, see ["Installing an internal RAID riser module" on page 297](#).
- ▶ If applicable, install the SAS expander board holder, see ["Installing the SAS expander board holder" on page 205](#).

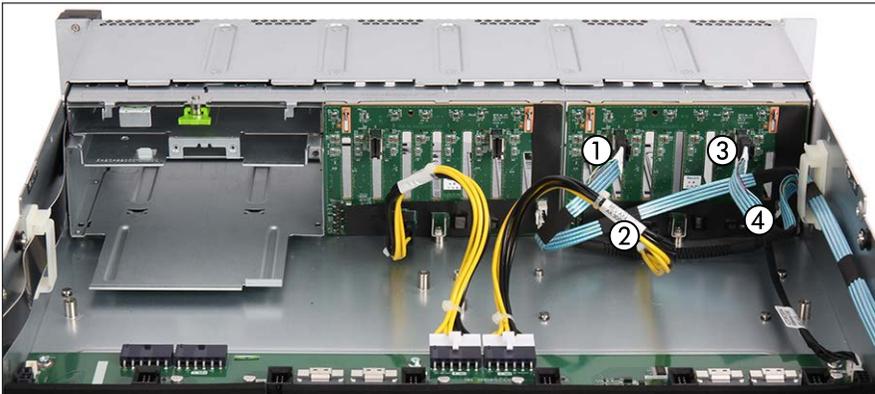


Figure 94: Connecting cables to the 8x 2.5-inch HDD backplane (example onboard SATA)

► Connect the following cables to the HDD backplane:

- 1 SAS/SATA cable
- 2 Power cable
- 3 SAS/SATA cable
- 4 OOB cable



For the cable plan, see ["Appendix B" on page 569](#).

**Example combo HDD backplane:**

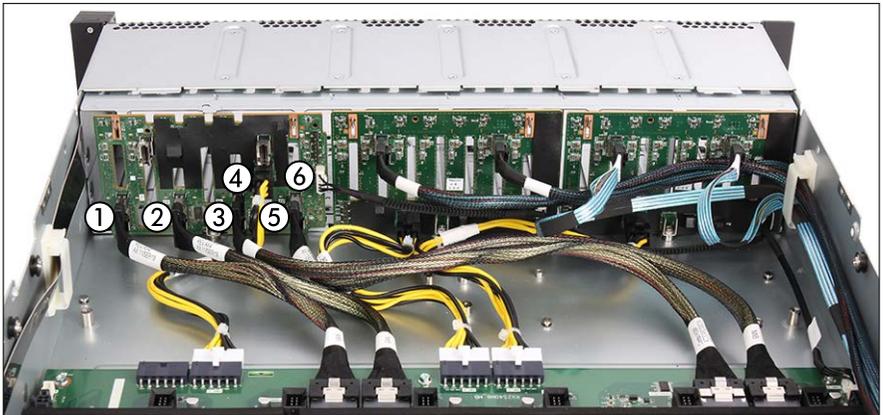


Figure 95: Connecting cables to the 8x 2.5-inch combo HDD backplane (example onboard PCIe)

► Connect the following cables to the combo HDD backplane:

- 1 Slimline cable
- 2 Slimline cable
- 3 Slimline cable
- 4 Power cable
- 5 Slimline cable
- 6 OOB cable



The cables are equipped with labels showing the right connector.

For the cable plan, see ["Appendix B" on page 569](#).



### CAUTION

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- ▶ Check the correct cabling using the labels on the cables and the cable plans.

### Concluding steps

- ▶ ["Installing the fan cage" on page 77](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ Insert all HDD/SSD modules, see ["Installing a 2.5-inch HDD/SSD module" on page 179](#).



Ensure that you install the HDD/SSD module in the bay it was located before the HDD backplane replacement.

- ▶ Insert all dummy modules, see ["Installing a 2.5-inch HDD/SSD dummy module" on page 182](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ Verify that the iRMC S6 recognizes the installed HDDs/SSDs.
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 7.6.9 Replacing a 24x 2.5-inch HDD backplane and a switch board



The 24x 2.5-inch HDD backplane and the switch board are combined into one spare part.



**Field Replaceable Unit  
(FRU)**



**Hardware: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ Release all PCIe SSD modules and pull them out a few centimeters, see ["Removing 2.5-inch HDD/SSD modules" on page 180.](#)



The PCIe SSD modules need not to be removed. But if you want to remove them nevertheless, check if all PCIe SSD modules are uniquely identified so that you can reinsert them into their original bays.

- ▶ Release all dummy modules and pull them out a few centimeters, see ["Removing a 2.5-inch HDD/SSD dummy module" on page 177.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the defective 24x 2.5-inch HDD backplane and the switch board

- ▶ Disconnect all cables from the switch board.

## Hard disk drive (HDD) / solid state disk (SSD)

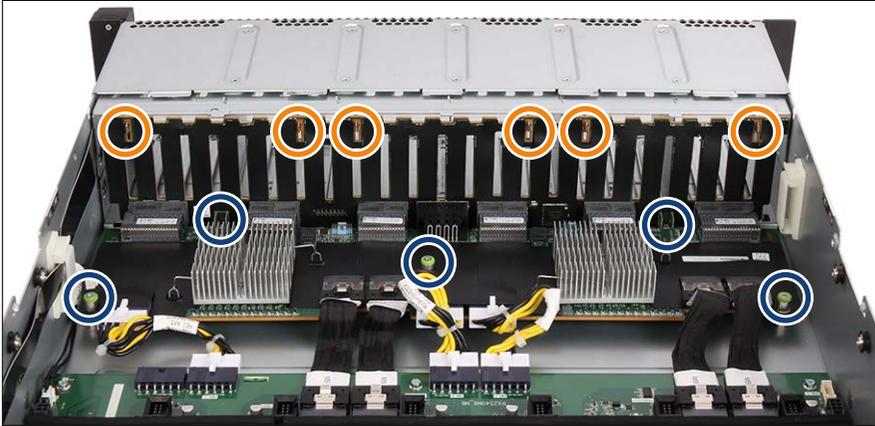


Figure 96: Removing the 24x 2.5-inch HDD backplane and the switch board

- ▶ Release the screws (see blue circles).
- ▶ Pull the HDD backplane upward until the six hooks disengage (see orange circles).
- ▶ Take out the HDD backplane with the switch board.

## Installing the new 24x 2.5-inch HDD backplane and the switch board

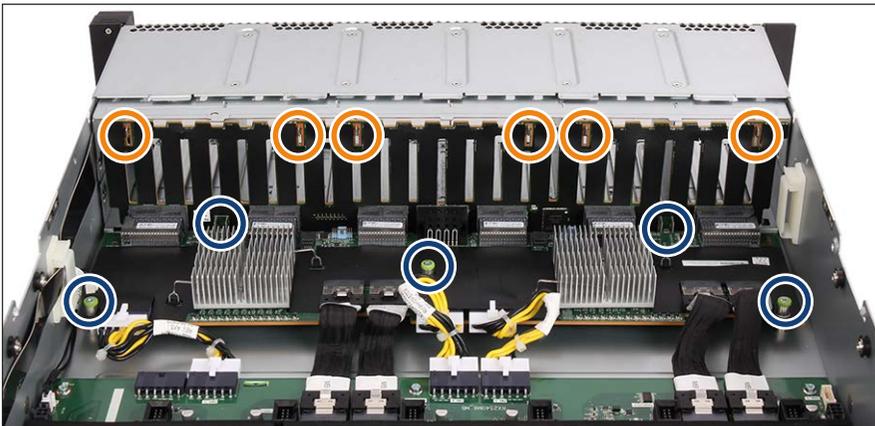


Figure 97: Installing the 24x 2.5-inch SAS HDD backplane and the switch board

- ▶ Position the HDD backplane on the six hooks (see orange circles).
- ▶ Push the HDD backplane downward. Make sure that the HDD backplane and the switch board fits into the guide pins.
- ▶ Fasten the screws (see blue circles).

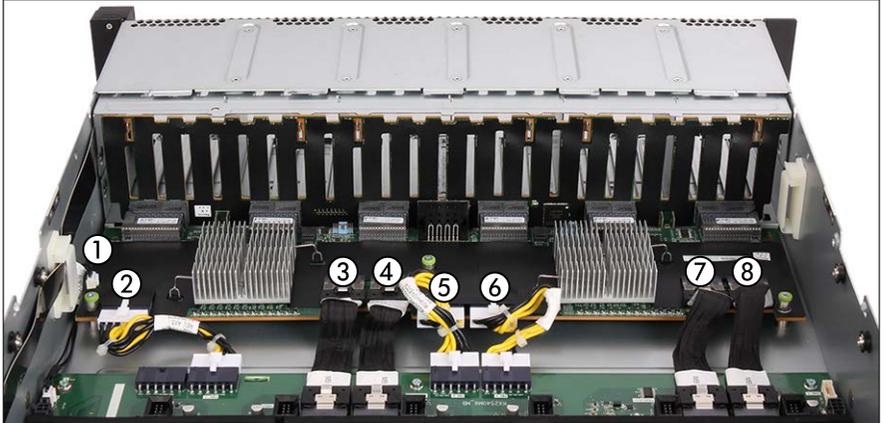


Figure 98: Connecting cables to the switch board

- ▶ Connect the following cables to the switch board:
  - 1 Signal cable
  - 2 Power cable
  - 3 Slimline cable
  - 4 Slimline cable
  - 5 Power cable
  - 6 Power cable
  - 7 Slimline cable
  - 8 Slimline cable



The cables are equipped with labels showing the right connector.  
For the cable plan, see ["Appendix B" on page 569](#).



### CAUTION

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- ▶ Check the correct cabling using the labels on the cables and the cable plans.

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ Insert all PCIe SSD modules, see ["Installing a 2.5-inch HDD/SSD module" on page 179.](#)



Ensure that you install the PCIe SSD module in the bay it was located before the HDD backplane replacement.

- ▶ Insert all dummy modules, see ["Installing a 2.5-inch HDD/SSD dummy module" on page 182.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ Verify that the iRMC S6 recognizes the installed HDDs/SSDs.
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

## 7.7 SAS expander board

### 7.7.1 Installing the SAS expander board



The SAS expander board is an option for the 12x 3.5-inch HDD configuration, the 16x 2.5-inch HDD/SSD configuration and the 24x 2.5-inch HDD/SSD configuration.



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ "Locating the defective server" on page 47.
- ▶ If applicable, "Removing the front cover with lock" on page 49.
- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.
- ▶ "Getting access to the component" on page 55.
- ▶ "Removing the fan cage" on page 76.

### Installing the SAS expander board

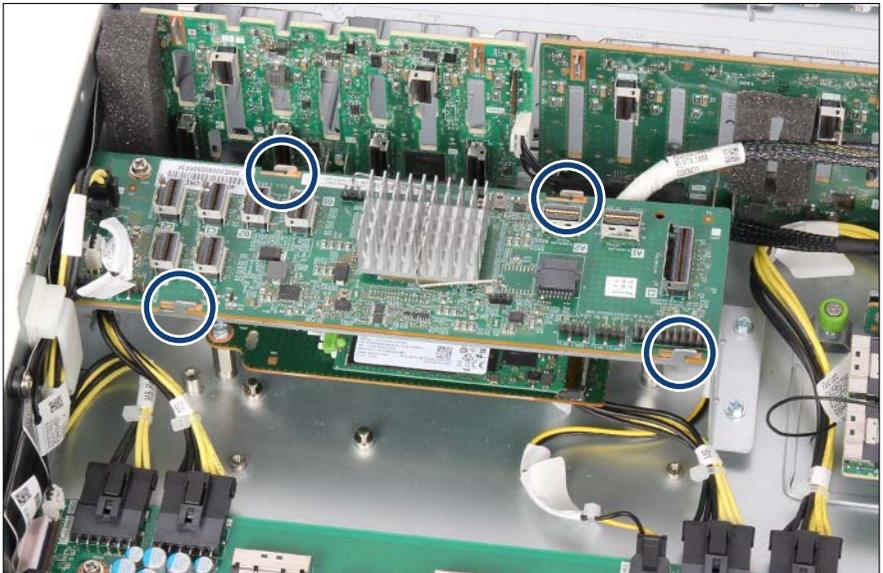


Figure 99: Positioning the SAS expander board

## Hard disk drive (HDD) / solid state disk (SSD)

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- ▶ Position the SAS expander board to the four hooks of the SAS expander board holder (see circles).

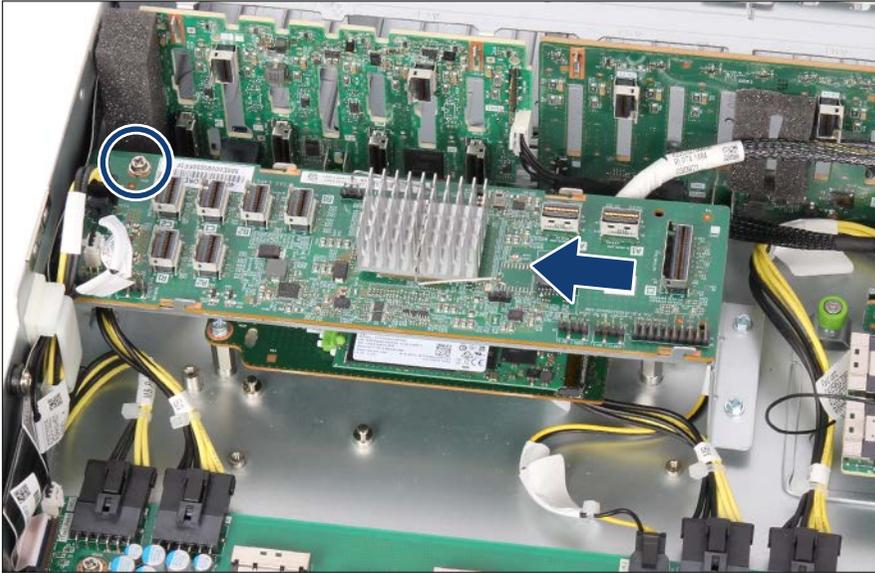


Figure 100: Installing the SAS expander board

- ▶ Push the SAS expander board in the direction of the arrow.
- ▶ Fasten the SAS expander board with the screw (see circle).

### Installing the SAS expander board holder

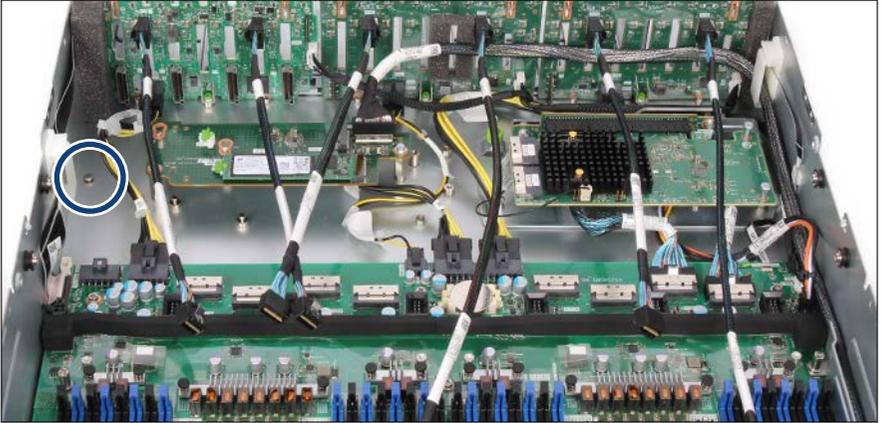


Figure 101: Positioning the SAS expander board holder

- Position the SAS expander board holder on the guide pin (see circle).

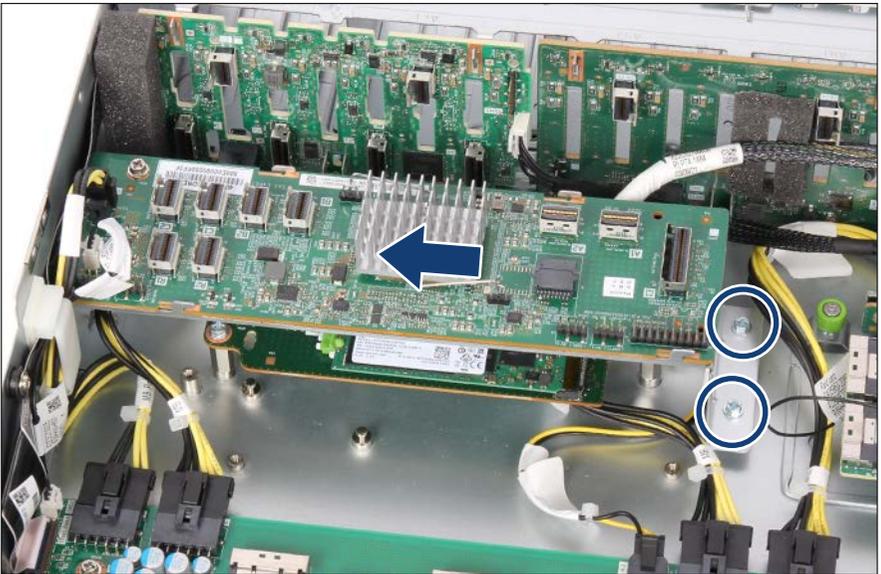


Figure 102: Installing the SAS expander board holder

## Hard disk drive (HDD) / solid state disk (SSD)

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- ▶ Push the SAS expander board holder in direction of the arrow until the guide pin engages.
- ▶ Fasten the two screws (see circles).

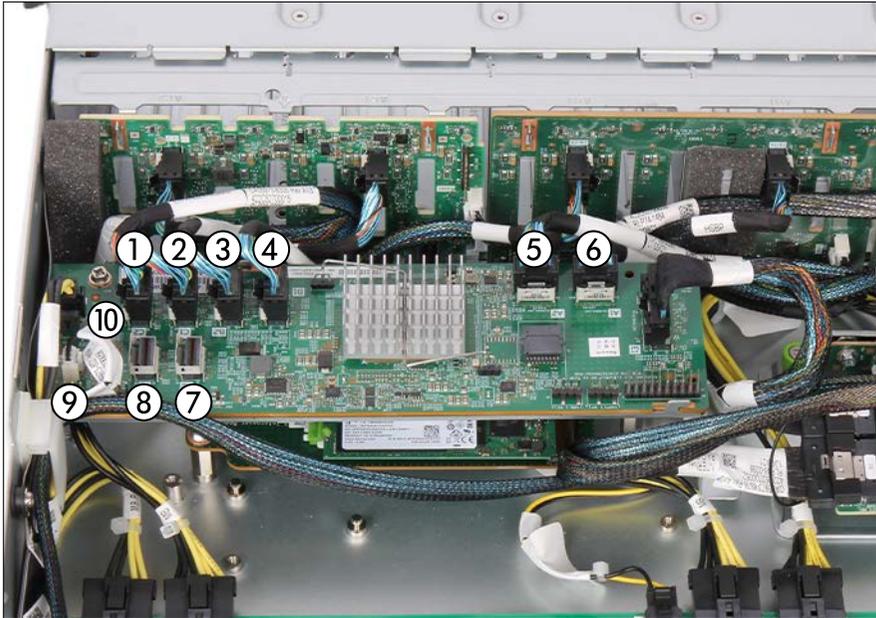


Figure 103: Connecting cables to the SAS expander board

- ▶ Connect the following cables to the SAS expander board:
  - 1 SAS/SATA cable (third HDD backplane)
  - 2 SAS/SATA cable (third HDD backplane)
  - 3 SAS/SATA cable (second HDD backplane)
  - 4 SAS/SATA cable (second HDD backplane)
  - 5 SAS/SATA cable (first HDD backplane)
  - 6 SAS/SATA cable (first HDD backplane)
  - 7 SAS/SATA cable (rear HDD backplane)
  - 8 SAS/SATA cable (rear HDD backplane)
  - 9 Signal cable

### 10 Power cable

- ▶ Connect the power cable to the connector "PWR 4" on the system board.
- ▶ Connect the signal cable to the connector "SMB2" on the system board.



The cables are equipped with labels showing the right connector.  
For the cable plan, see ["Appendix B" on page 569](#).



#### **CAUTION**

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- ▶ Check the correct cabling using the labels on the cables and the cable plans.

### **Concluding steps**

- ▶ ["Installing the fan cage" on page 77](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## **7.7.2 Removing the SAS expander board**



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### **Preliminary steps**

- ▶ ["Locating the defective server" on page 47](#).
- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).

## Hard disk drive (HDD) / solid state disk (SSD)

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- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.
- ▶ "Getting access to the component" on page 55.
- ▶ "Removing the fan cage" on page 76.

### Removing the SAS expander board holder

- ▶ Disconnect all cables from the SAS expander board.



Figure 104: Removing the SAS expander board holder

- ▶ Remove the two screws (see circles).
- ▶ Push the SAS expander board holder in direction of the arrow until the guide pin disengages.
- ▶ Remove the SAS expander board holder.

## Removing the SAS expander board

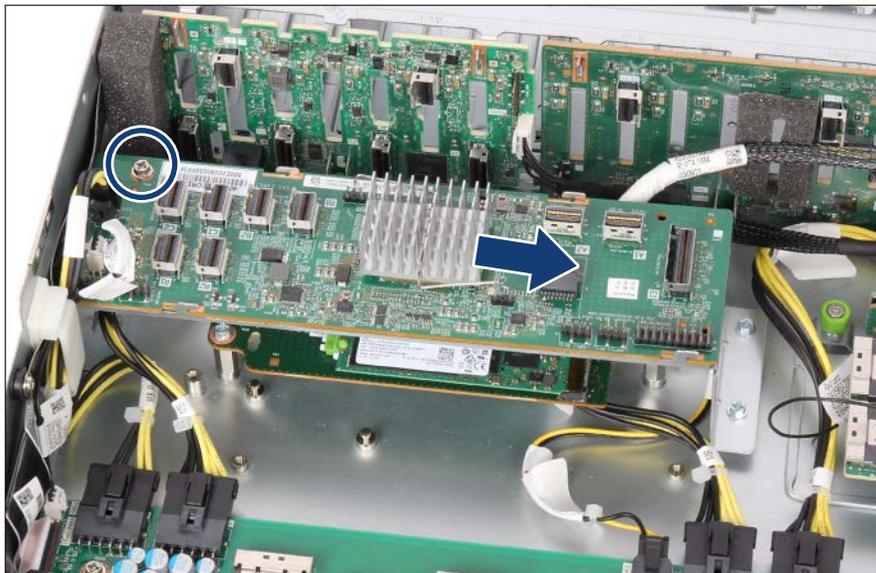


Figure 105: Removing the SAS expander board

- ▶ Loosen the screw (see circle).
- ▶ Push the SAS expander board in the direction of the arrow.
- ▶ Remove the SAS expander board from the SAS expander board holder.

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

## 7.7.3 Replacing the SAS expander board



### Upgrade and Repair Unit (URU)



Hardware: 10 minutes

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the defective SAS expander board

- ▶ Disconnect all cables from the SAS expander board.
- ▶ Remove the SAS expander board, see ["Removing the SAS expander board" on page 207.](#)

### Installing the new SAS expander board

- ▶ Install the SAS expander board, see ["Installing the SAS expander board" on page 202.](#)
- ▶ Connect the cables to the SAS expander board, see [Figure 103.](#)

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ Verify that the iRMC S6 recognizes the installed HDDs/SSDs.



M.2 SSD slot		BIOS menu	iRMC SEL
1	M.2 SSD1	Port 4	Port 4
2	M.2 SSD2	Port 6	Port 6

### 7.8.2 Installing an M.2 SSD



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**  
**Software: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (for cover 2)

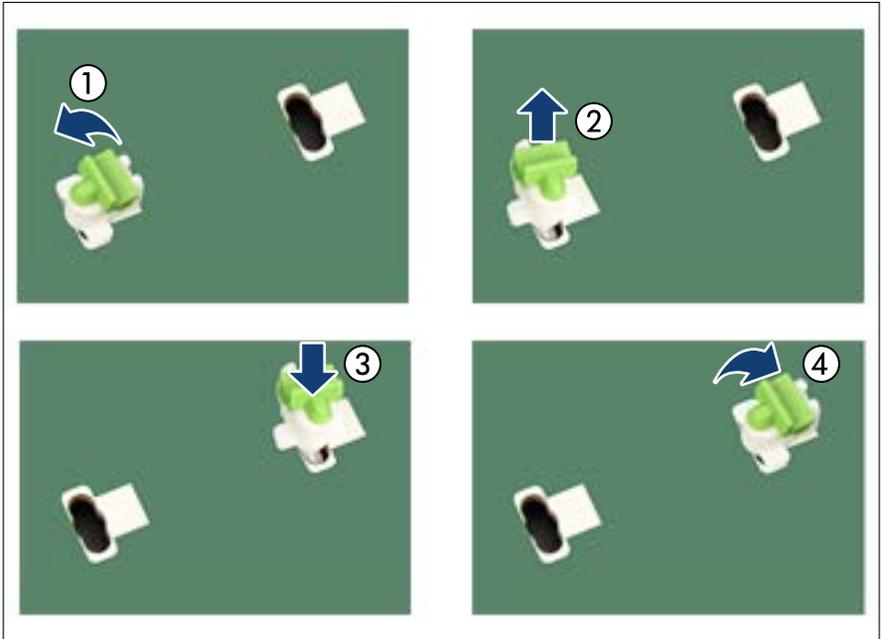
#### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Checking boot priority" on page 93.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)

#### Installing the M.2 SSD



To support different length of M.2 SSD, the M.2 SSD latch can be moved to another position.



- ▶ If applicable, move the M.2 SSD latch to a fitting position:
  - ▶ Turn the M.2 SSD latch for 90 degrees (1).
  - ▶ Remove the M.2 SSD latch (2).
  - ▶ Install the M.2 SSD latch in the right position depending on the length of the M.2 SSD (3).
  - ▶ Turn the M.2 SSD latch for 90 degrees (4).

## Hard disk drive (HDD) / solid state disk (SSD)



Figure 107: Installing the M.2 SSD (A)

- ▶ With the label facing up, insert the M.2 SSD into the M.2 slot at a slight angle.
- ▶ Align the key pin with the M.2 slot.



Figure 108: Installing the M.2 SSD (B)

- ▶ Push down the M.2 SSD until the M.2 SDD latch locks in (see circle).

### Concluding steps

- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ ["Setting boot priority" on page 120.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

### Software configuration

In order to install the ESXi to the M.2 SSD, the VMware ESXi installer CD is required. To obtain the ESXi installer CD by purchasing the OEM Media Kit, or downloading the ESXi Custom Image ISO file from the VMware website and burn the image to the CD.

<https://www.vmware.com/go/download-vsphere>

Install the ESXi to the M.2 SSD by following the steps below:

- ▶ Disconnect all storage devices from the server beside the M.2 SSD.
- ▶ Power on the server. Once the server has been started, then enter the BIOS setup menu and select the DVD drive as primary boot device.
- ▶ Insert the CD into the DVD drive and reboot the server. The server will boot from the installer CD.
- ▶ Follow the on-screen instructions to install the ESXi. When the installation is complete, you will be asked to reboot the server.
- ▶ While the server is rebooting, enter the BIOS setup menu again and select the M.2 SSD as primary boot device.

The installation of the ESXi to the M.2 SSD is complete.



For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual.



The M.2 SSD can be used only for boot device. Do not use VMFS on the M.2 SSD because of not meeting required endurance. For more information, see the VMware Knowledge Base 2145210.

<https://kb.vmware.com/s/article/2145210>



### For Japan

In order to setup the ESXi, see the corresponding version of the "VMware vSphere Software Description" from the following URL and reinstall ESXi to the M.2 SSD.

<https://jp.fujitsu.com/platform/server/primergy/software/vmware/manual/>

## 7.8.3 Removing an M.2 SSD



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver (for cover 2)

### Preliminary steps

- ▶ If applicable, "Removing the front cover with lock" on page 49.
- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.
- ▶ "Getting access to the component" on page 55.

## Removing the M.2 SSD



Figure 109: Removing the M.2 SSD (A)

- ▶ Push the green latch in direction of the arrow.



Figure 110: Removing the M.2 SSD (B)

- ▶ Take the M.2 SSD out of its slot at a slight angle.
- ▶ If applicable, remove the second M.2 SSD in the same way.

### Concluding steps

- ▶ "Reassembling" on page 59.
- ▶ "Connecting the power cord" on page 65.
- ▶ "Switching on the server" on page 71.
- ▶ If applicable, "Installing the front cover with lock" on page 71.

## 7.8.4 Replacing an M.2 SSD



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes  
Software: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver (for cover 2)



Some M.2 SSDs have a write life (limited life component). Ask the customer to check the write status before replacing the spare part. If the product has reached the end of its life, ask the customer to purchase it again.

For Japan, refer to the following:

<https://jp.fujitsu.com/platform/server/primergy/support/parts/#parts2>

### Preliminary steps

- ▶ "Locating the defective server" on page 47.
- ▶ If applicable, "Removing the front cover with lock" on page 49.
- ▶ "Checking boot priority" on page 93.
- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.
- ▶ "Getting access to the component" on page 55.

### Replacing the M.2 SSD

- ▶ Remove the defective M.2 SSD, see ["Removing the M.2 SSD" on page 217](#).
- ▶ Install the new M.2 SSD, see ["Installing the M.2 SSD" on page 212](#).

### Concluding steps

- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ ["Setting boot priority" on page 120](#).
- ▶ Verify the iRMC recognizes the installed M.2 SSD.
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).
- ▶ For non-array RAID configurations, ask the customer to reinstall the OS or restore the data after the M.2 SSD have been replaced.

For array configurations, see the "PRIMERGY Intel Virtual RAID on CPU (Intel VROC) User Guide".

### Software configuration



To install the ESXi to the M.2 SSD, see ["Software configuration" on page 215](#).

## 7.8.5 Installing the M.2 interposer board



The M.2 interposer board is an option.



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ "Locating the defective server" on page 47.
- ▶ If applicable, "Removing the front cover with lock" on page 49.
- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.
- ▶ "Getting access to the component" on page 55.
- ▶ "Removing the air duct" on page 80
- ▶ "Removing the fan cage" on page 76.
- ▶ If applicable, remove the riser module 2, see "Removing a riser module" on page 72.
- ▶ If applicable, "Removing the SAS expander board holder" on page 208.



If the SAS expander board is installed, ensure that none of the cables are strained or damaged during the installation of the M.2 interposer board.

### Installing the M.2 interposer board

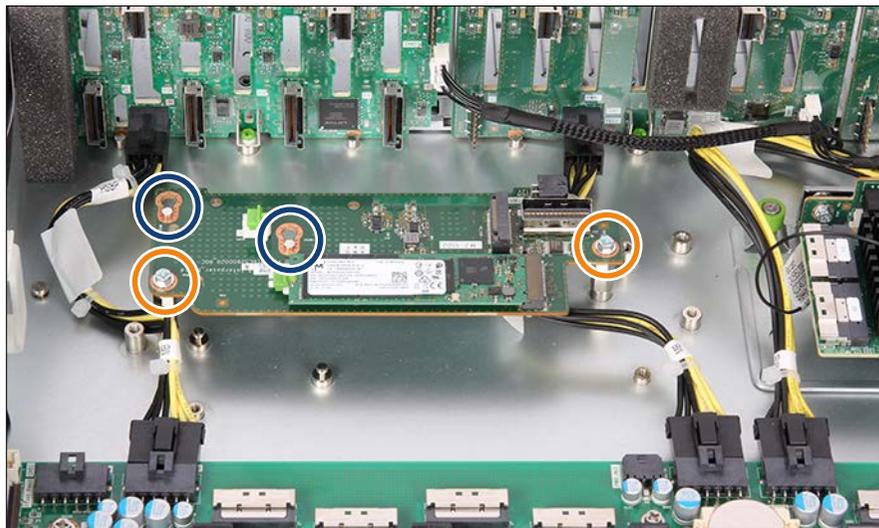


Figure 111: Installing the M.2 interposer board

- ▶ Position the M.2 interposer board on the four standoffs of the chassis (see circles).
- ▶ Fasten the two screws (see orange circles).

### Connecting the M.2 interposer board

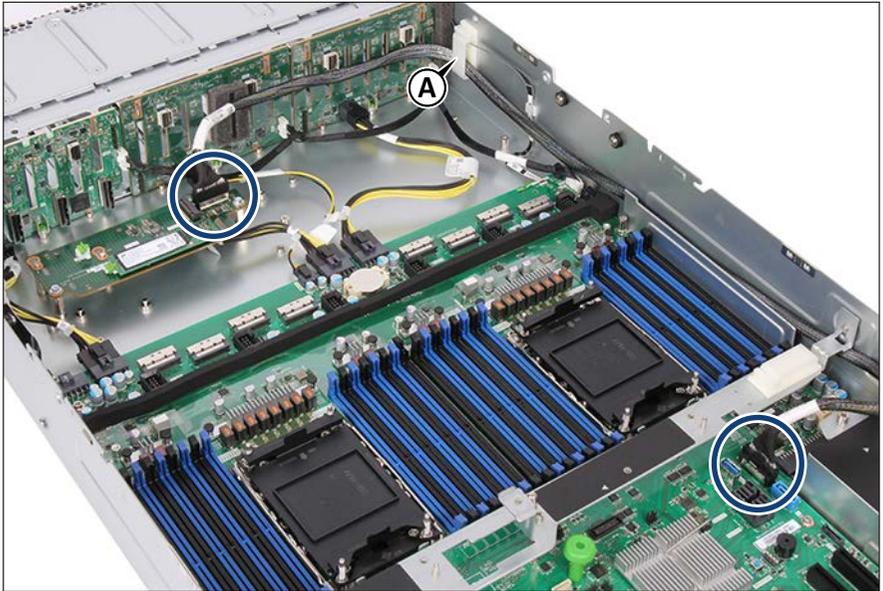


Figure 112: Connecting the M.2 interposer board

- ▶ Connect the M.2 interposer board cable to M.2 interposer board.
- ▶ Insert the M.2 interposer board cable in the cable clamp (A).
- ▶ Run the M.2 interposer board cable in the guide rail.
- ▶ Connect the M.2 interposer board cable to the connector "INTERPOSER 1" on the system board (see circles).
- ▶ Connect the power cable to M.2 interposer board.
- ▶ Run the power cable over the M.2 interposer board cable.
- ▶ Connect the power cable to connector "PWR M2" on the system board.

### Concluding steps

- ▶ If applicable, ["Installing the SAS expander board holder"](#) on page 205.
- ▶ If applicable, install the riser module 2, see ["Installing a riser module"](#) on page 74.
- ▶ ["Installing the fan cage"](#) on page 77.
- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.
- ▶ ["Switching on the server"](#) on page 71.
- ▶ If applicable, ["Installing the front cover with lock"](#) on page 71.

## 7.8.6 Removing the M.2 interposer board



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

<b>Tools:</b> Phillips PH2 / (+) No. 2 screw driver
---

### Preliminary steps

- ▶ ["Locating the defective server"](#) on page 47.
- ▶ If applicable, ["Removing the front cover with lock"](#) on page 49.
- ▶ ["Shutting down the server"](#) on page 50.
- ▶ ["Disconnecting the power cord"](#) on page 50.
- ▶ ["Getting access to the component"](#) on page 55.
- ▶ ["Removing the air duct"](#) on page 80.
- ▶ ["Removing the fan cage"](#) on page 76.
- ▶ If applicable, remove the riser module 2, see ["Removing a riser module"](#) on page 72.
- ▶ If applicable, ["Removing the SAS expander board holder"](#) on page 208.

### Disconnecting the M.2 interposer board

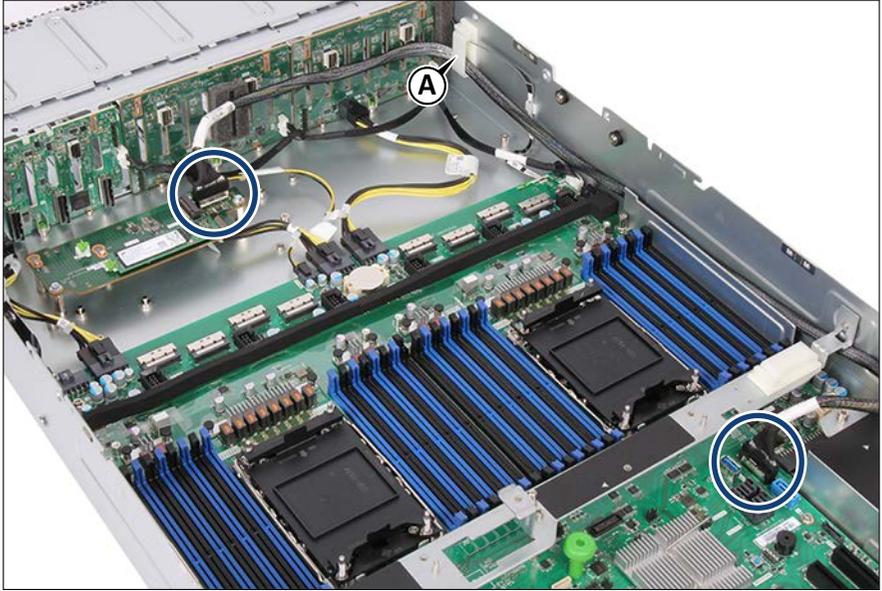


Figure 113: Disconnecting the M.2 interposer board cable

- ▶ Remove the M.2 interposer board cable from the cable clamp (A).
- ▶ Disconnect the M.2 interposer board cable (see circles).
- ▶ Remove the M.2 interposer board cable.

### Removing the M.2 interposer board

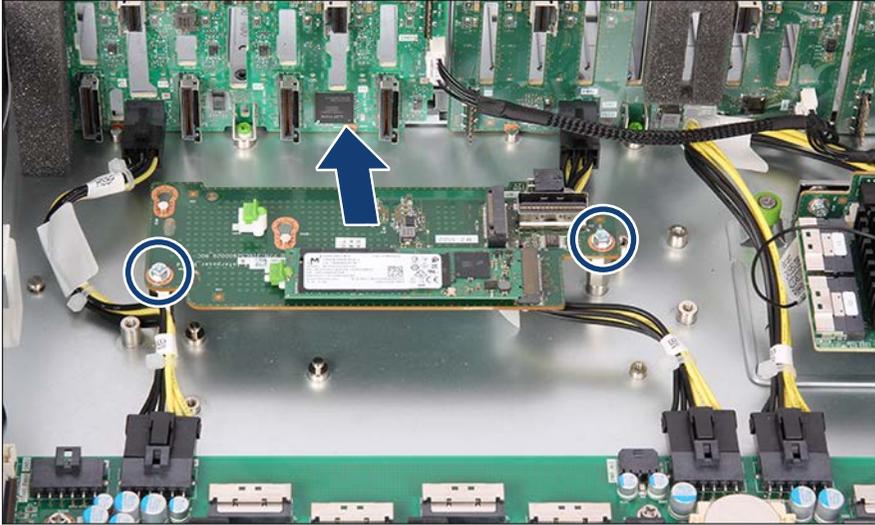


Figure 114: Removing the M.2 interposer board

- ▶ Loosen the two screws (see circles).
- ▶ Remove the M.2 interposer board.

### Concluding steps

- ▶ If applicable, ["Installing the SAS expander board holder"](#) on page 205.
- ▶ If applicable, install the riser module 2, see ["Installing a riser module"](#) on page 74.
- ▶ ["Installing the fan cage"](#) on page 77.
- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.
- ▶ ["Switching on the server"](#) on page 71.
- ▶ If applicable, ["Installing the front cover with lock"](#) on page 71.

## 7.8.7 Replacing the M.2 interposer board



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the air duct" on page 80](#)
- ▶ ["Removing the fan cage" on page 76.](#)
- ▶ If applicable, remove the riser module 2, see ["Removing a riser module" on page 72.](#)
- ▶ If applicable, ["Removing the SAS expander board holder" on page 208.](#)

### Removing the defective M.2 interposer board

- ▶ Remove the defective M.2 interposer board, see ["Removing the M.2 interposer board" on page 222.](#)

### Installing the new M.2 interposer board

- ▶ Install the new M.2 interposer board, see ["Installing the M.2 interposer board" on page 219.](#)

### Concluding steps

- ▶ If applicable, ["Installing the SAS expander board holder"](#) on page 205.
- ▶ If applicable, install the riser module 2, see ["Installing a riser module"](#) on page 74.
- ▶ ["Installing the fan cage"](#) on page 77.
- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.
- ▶ ["Switching on the server"](#) on page 71.
  - ▶ Verify whether the iRMC recognizes the installed M.2 SSD.
- ▶ If applicable, ["Installing the front cover with lock"](#) on page 71.

## 7.9 Rear HDD/SSD extension box

### 7.9.1 Basic information (rear HDD/SSD)

#### Position of the rear HDD cages

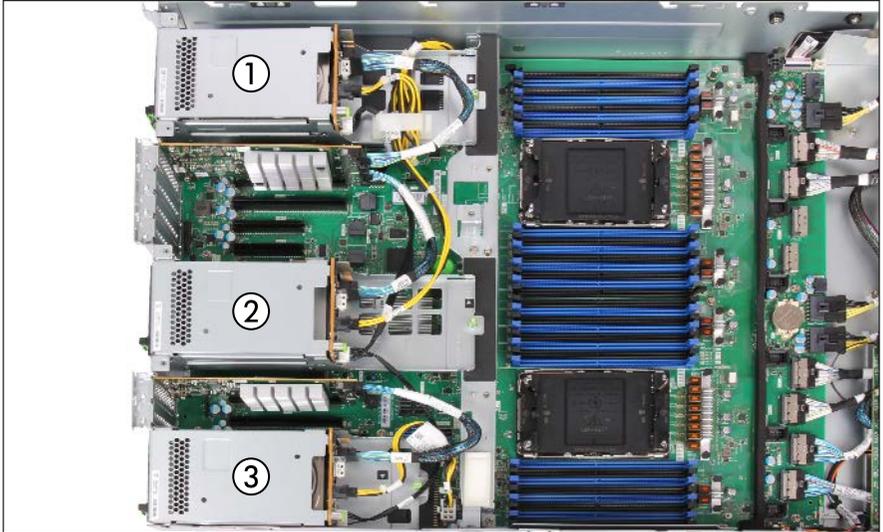


Figure 115: Position of the rear HDD cages

- 1 HDD cage 1
- 2 HDD cage 2

- 3 HDD cage 3

#### Replacing failed or aged drives

The tables show the location of the HDD in the device, BIOS Setup or HII Configuration Utility, and the description in the OS log for each AHCI/PRAID connection. Refer to when replacing failed or aged drives.

**i** ServerView RAID Software is not provided anymore, If you install ServerView Agentless Service, Server View RAID Manager is running internally. So, the source of the logs is listed as ServerView RAID.

### Example for iRMC S6 web interface display

Position	Enclosure	Slot
[0]		0
[1]		1
[2]		2
[3]		3
[4]		4
[5]		5

 Information about HDD/SSD slots can also be displayed using the BIOS, see ["Displaying HDD/SSD slot information" on page 143](#).

## 7.9.2 Upgrading with rear HDD cage 1 and rear HDD cage 2



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**  
**Software: 10 minutes**

**Tools:** – Phillips PH2 / (+) No. 2 screw driver



### CAUTION

All data on all HDDs in the array will be lost when deleting the RAID array!

- ▶ Be sure to back up your data before deleting a RAID array.
- ▶ For more information, see the "iRMC S6 - Web Interface" user guide.



After installing or removing an additional backplane, never forget to change the system information using the Chassis ID Prom Tool.

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock"](#) on page 49.
- ▶ ["Shutting down the server"](#) on page 50.
- ▶ ["Disconnecting the power cord"](#) on page 50.
- ▶ ["Getting access to the component"](#) on page 55.
- ▶ ["Removing the rear air grid 1"](#) on page 85.
- ▶ ["Removing the rear air grid 2"](#) on page 86.

### Installing the rear HDD cage 1 and the rear HDD cage 2

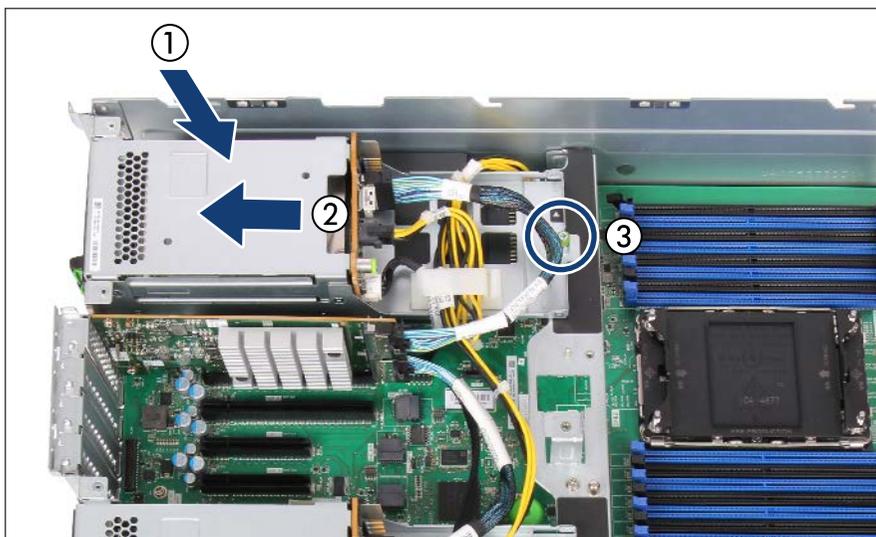


Figure 116: Installing the rear HDD cage 1

- ▶ Position the rear HDD cage 1 into the chassis (1).
- ▶ Push the rear HDD cage 1 in the direction of the arrow (2).
- ▶ Fasten the knurled screw (3).
- ▶ If applicable, install a RAID controller or a retimer card, see ["Installing an expansion card"](#) on page 269.

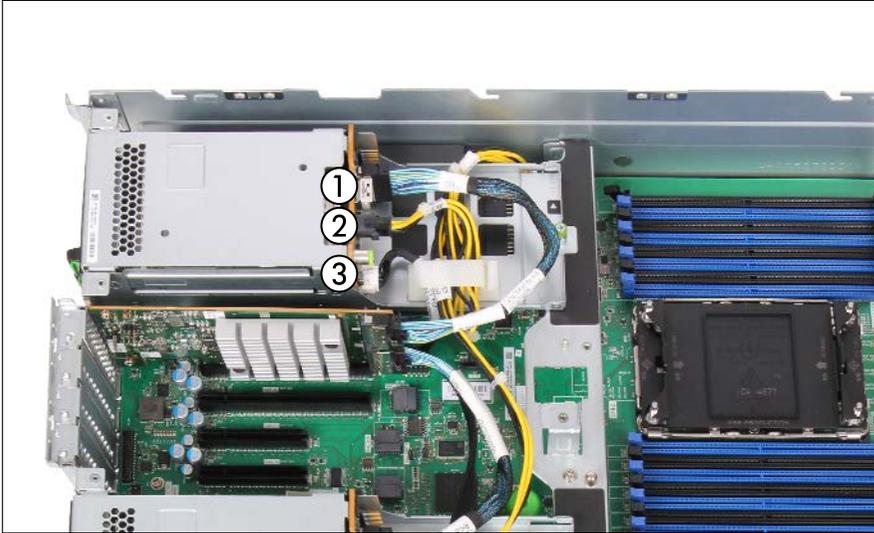


Figure 117: Connecting the cables to the rear HDD backplane (example with SATA cable)

► Connect the following cables to the rear HDD backplane:

- 1 SAS/SATA cable depending on configuration
- 2 Power cable to HDD backplane and connector "PWR7" on system board
- 3 OOB cable to HDD backplane and connector "SMB3" on system board

► Run the power cable and the OOB cable through the cable clamp.



The cables are equipped with labels showing the right connector.

For the cable plan, see ["Appendix B" on page 569](#).



### CAUTION

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- Check the correct cabling using the labels on the cables and the cable plans.

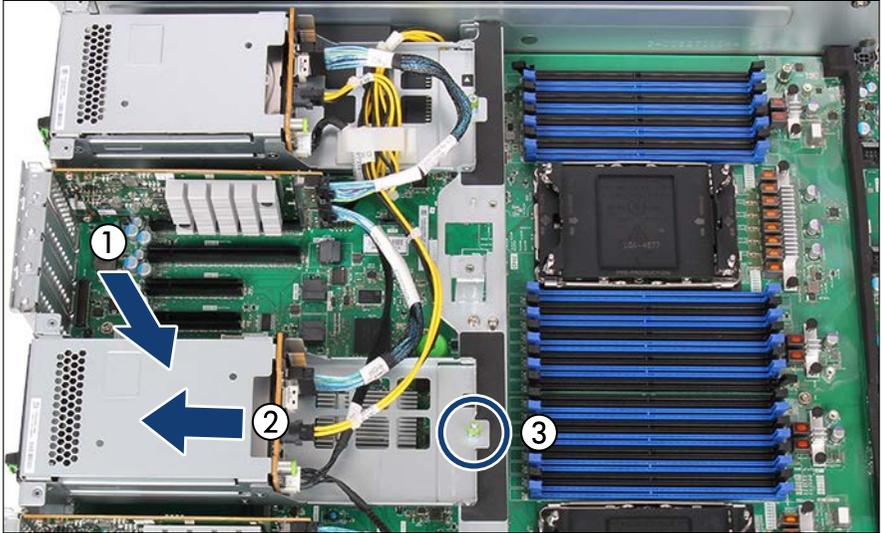


Figure 118: Installing the rear HDD cage 2

- ▶ Position the rear HDD cage 2 into the chassis (1).
- ▶ Push the rear HDD cage 2 in the direction of the arrow (2).
- ▶ Fasten the knurled screw (3).
- ▶ If applicable, install a RAID controller or a retimer card, see ["Installing an expansion card" on page 269](#).

## Hard disk drive (HDD) / solid state disk (SSD)

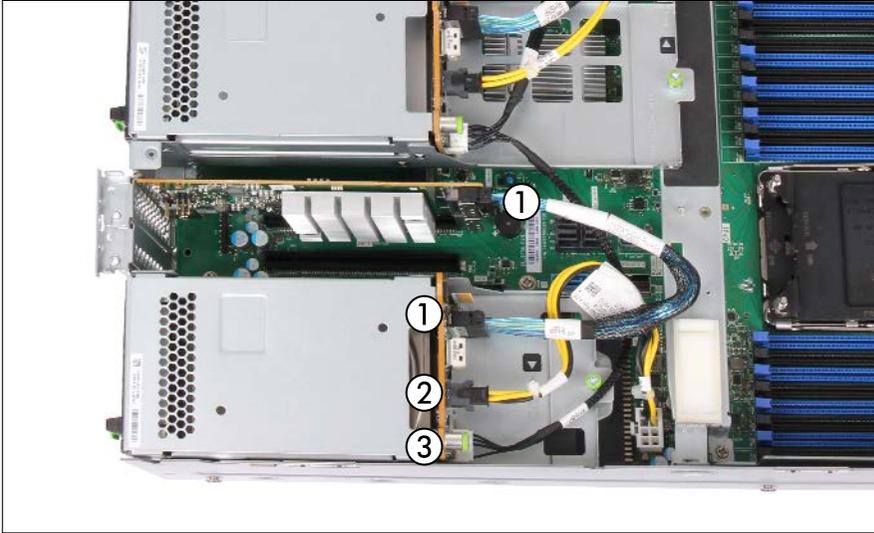


Figure 119: Connecting the cables to the rear HDD backplane (example with slimline cable)

► Connect the following cables to the rear HDD backplane:

- 1 SAS/SATA cable depending on configuration
- 2 Power cable to HDD backplane and connector "PWR7" on system board
- 3 OOB cable to HDD backplane and connector "SMB3" on system board



For the cable plan, see chapter ["Appendix B" on page 569](#).

### Installing additional HDD/SSD/PCIe SSD modules

- Insert additional HDD/SSD modules, see ["Installing 2.5-inch HDD/SSD modules" on page 177](#) or PCIe SSD modules, see ["Installing 2.5-inch PCIe SSD modules" on page 185](#).

### Concluding steps

- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ Update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#) Select the corresponding system name.
- ▶ ["Performing a RAID array rebuild" on page 108.](#)

### 7.9.3 Upgrading with rear HDD cage 3



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**  
**Software: 10 minutes**

**Tools:** – Phillips PH2 / (+) No. 2 screw driver



#### **CAUTION**

All data on all HDDs in the array will be lost when deleting the RAID array!

- ▶ Be sure to back up your data before deleting a RAID array.
- ▶ For more information, see the "iRMC S6 - Web Interface" user guide.



After installing or removing an additional backplane, never forget to change the system information using the Chassis ID Prom Tool.

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)

- ▶ ["Removing the rear air grid 2" on page 86.](#)

### Installing the rear HDD cage 3

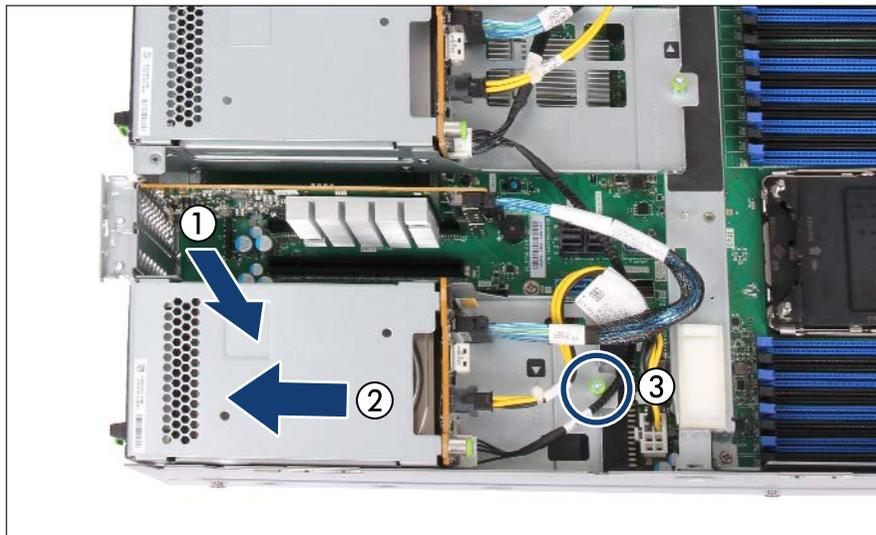


Figure 120: Installing the rear HDD cage 3

- ▶ Position the rear HDD cage 3 into the chassis (1).
- ▶ Push the rear HDD cage 3 in the direction of the arrow (2).
- ▶ Fasten the knurled screw (3).
- ▶ If applicable, install a RAID controller or a retimer card, see ["Installing an expansion card" on page 269.](#)

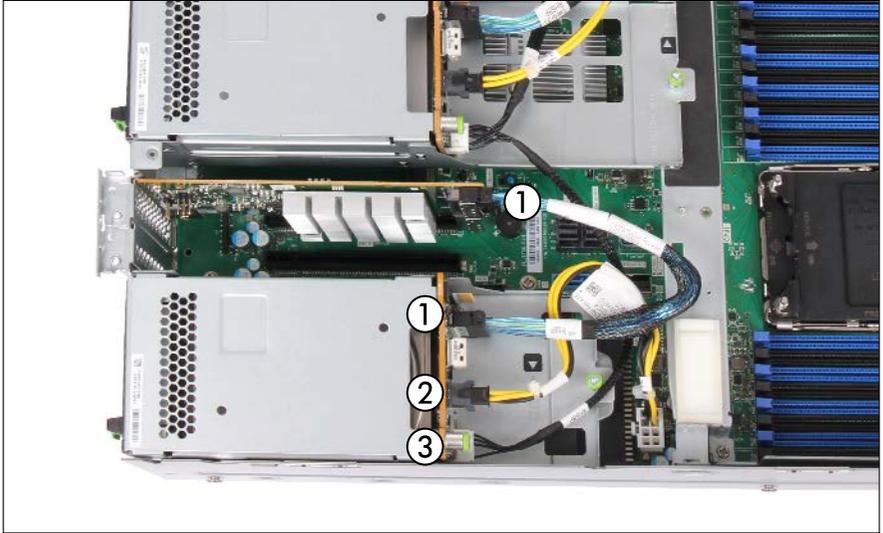


Figure 121: Connecting the cables to the rear HDD backplane (example with SATA cable)

► Connect the following cables to the rear HDD backplane:

- 1 SAS/SATA cable depending on configuration
- 2 Power cable to HDD backplane and connector "PWR8" on system board
- 3 OOB cable to HDD backplane and connector "SMB3" on system board



The cables are equipped with labels showing the right connector.

For the cable plan, see ["Appendix B" on page 569](#).



### CAUTION

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- Check the correct cabling using the labels on the cables and the cable plans.

### Installing additional HDD/SSD/PCIe SSD modules

- ▶ Insert additional HDD/SSD modules, see ["Installing 2.5-inch HDD/SSD modules" on page 177](#) or PCIe SSD modules, see ["Installing 2.5-inch PCIe SSD modules" on page 185](#).

### Concluding steps

- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).
- ▶ Update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113](#). Select the corresponding system name.
- ▶ ["Performing a RAID array rebuild" on page 108](#).

## 7.9.4 Replacing a rear 2x 2.5-inch HDD backplane



**Field Replaceable Unit (FRU)**



**Hardware: 10 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ ["Locating the defective server" on page 47](#).
- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ ["Getting access to the component" on page 55](#).

- ▶ Release all HDD/SSD modules and pull them out a few centimeters, see ["Removing a 2.5-inch HDD/SSD module" on page 181](#).



The HDD/SSD modules need not to be removed. But if you want to remove them nevertheless, check if all HDD/SSD modules are uniquely identified so that you can reinsert them into their original bays.

- ▶ Release all dummy modules and pull them out a few centimeters, see ["Removing a 2.5-inch HDD/SSD dummy module" on page 178](#).

### Removing the rear 2x 2.5-inch HDD backplane

- ▶ Disconnect all cables from the rear HDD backplane.

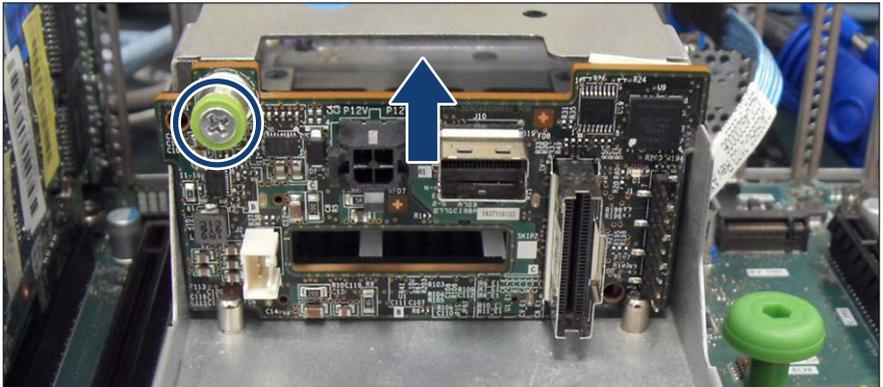


Figure 122: Removing the rear 2x 2.5-inch HDD backplane

- ▶ Loosen the screw (see circle).
- ▶ Take out the rear HDD backplane.

### Installing the rear 2x 2.5-inch HDD backplane

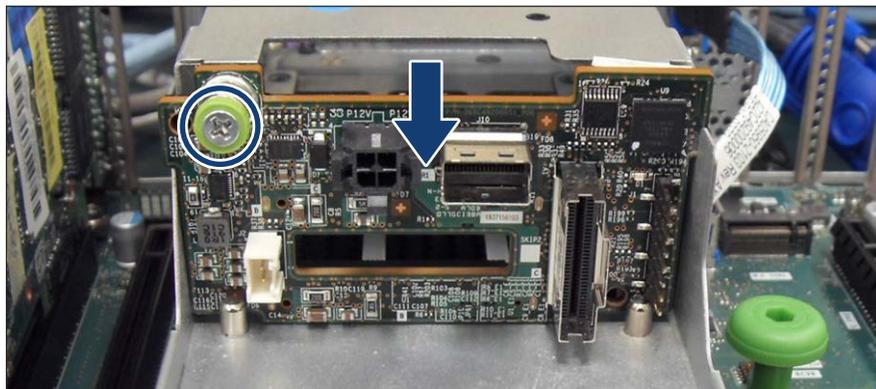


Figure 123: Installing the rear 2x 2.5-inch HDD backplane

- ▶ Position the rear HDD backplane.
- ▶ Fasten the screw (see circle).
- ▶ Connect the cables to the rear HDD backplane.

**i** The cables are equipped with labels showing the right connector.  
For the cable plan, see ["Appendix B" on page 569](#).

**!** **CAUTION**  
Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- ▶ Check the correct cabling using the labels on the cables and the cable plans.

### Concluding steps

- ▶ Insert all HDD/SSD modules, see ["Installing 2.5-inch HDD/SSD modules" on page 177](#).

**i** Ensure that you install the HDD/SSD module in the bay it was located before the HDD backplane replacement.

- ▶ Insert all dummy modules, see ["Installing a 2.5-inch HDD/SSD dummy module" on page 182](#).

- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ Verify that the iRMC S6 recognizes the installed HDDs/SSDs.
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)



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# 8 Fans

## 8.1 Safety notes



### CAUTION

- ▶ Do not damage or modify internal cables or devices. Doing so may cause a device failure, fire, or electric shock.
- ▶ Devices and components inside the server remain hot after shutdown. After shutting down the server, wait for hot components to cool down before installing or removing internal options.
- ▶ Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).
- ▶ Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- ▶ If devices are installed or disassembled using methods other than those outlined in this chapter, the warranty will be invalidated.
- ▶ The procedure of installation on this notes might change depending on a configuration of options.
- ▶ For more information, see "[Important information](#)" on page 33.

## 8.2 Basic information

Base units are supplied with three hot-plug fan modules (1 CPU configuration) or six hot-plug fan modules (2 CPU configuration).

Base units with three fan modules operate in a 1 of 3 redundancy, base units with six fan modules operate in a 1 of 6 redundancy. In other words, if one of the three or six fan modules fails, the system will operate without any problem. The failed fan module can be exchanged without shutting down the server (hot-plug).

There are dual rotor fan types installed.

## Fans



Fan type (FJ P/N: CA05950-2152) is a dual rotor fan. In the system information (Chassis ID EPROM) the term "Dual Fan" is used in system names.



### CAUTION

Depending on the configuration, different fan types are necessary!

- ▶ Please check, if you ordered the correct fans.

## Numbering of the fan modules

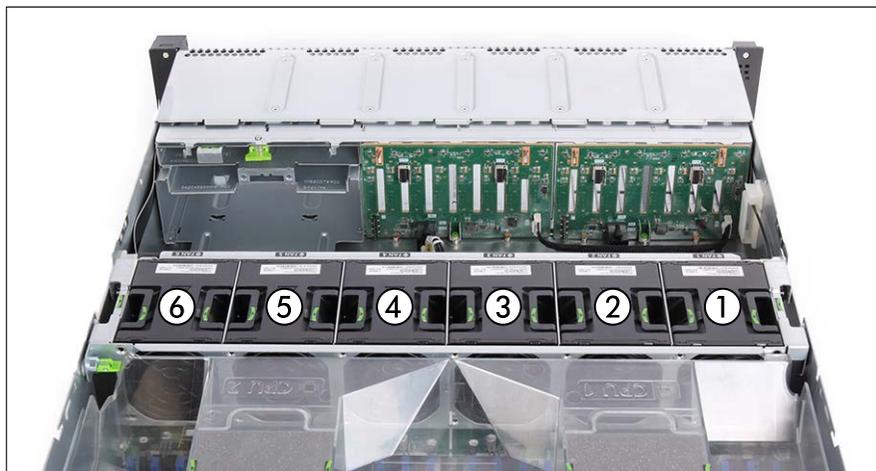


Figure 124: Numbering of the fan modules

Pos.	CPU	Dual rotor fans
1	CPU 1	fan 1 (A/B)
2	CPU 1	fan 2 (A/B)
3	CPU 1	fan 3 (A/B)
4	CPU 2	fan 4 (A/B)
5	CPU 2	fan 5 (A/B)
6	CPU 2	fan 6 (A/B)

## 8.3 Replacing a fan module



Customer Replaceable  
Unit (CRU)



Hardware: 5 minutes

**Tools:** tool-less

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Locating the defective component" on page 48.](#)

### Removing the fan module

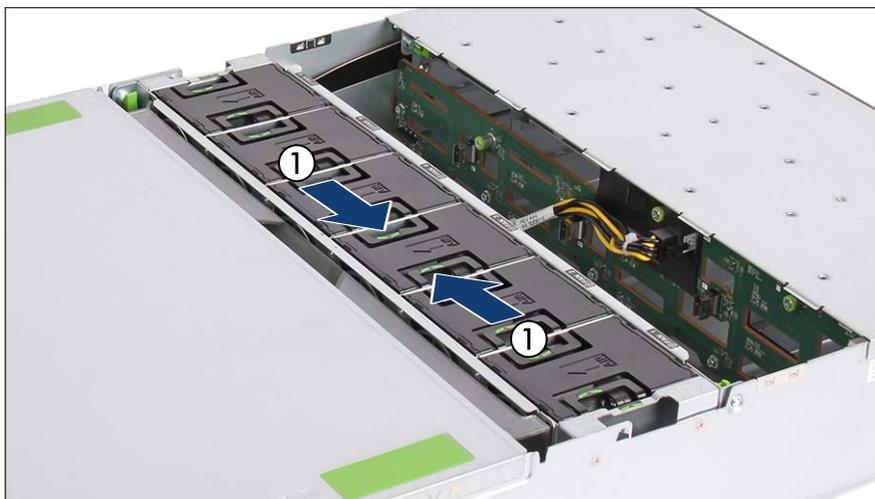


Figure 125: Removing the fan module

- ▶ Take the fan module by the two handles (1).
- ▶ Lift the fan module out of the fan cage.

### Installing the fan module

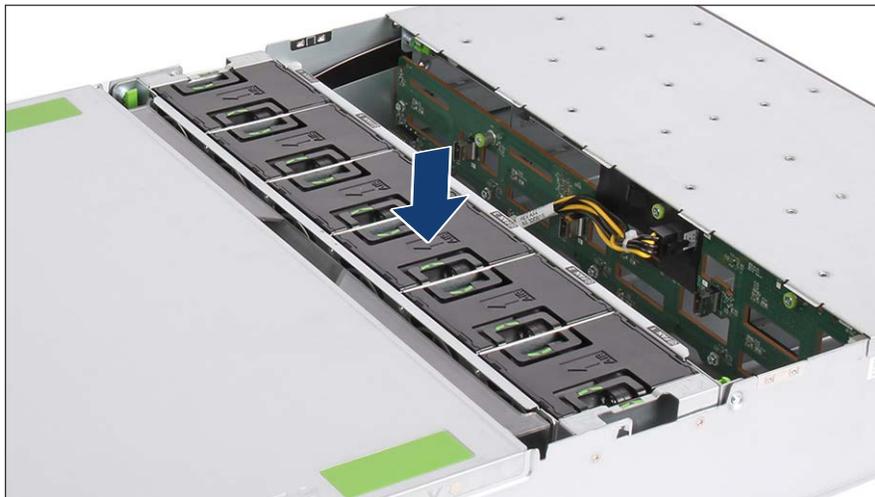


Figure 126: Installing the fan module

- ▶ Insert the fan module in the fan cage.
- ▶ Press down the fan module until it locks.

### Concluding steps

- ▶ ["Reassembling" on page 59.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ Check the CSS indicator and Global Error indicator and ensure that they are off.
- ▶ ["Performing a fan test" on page 117.](#)



A fan test does not need to be performed if the fan module is actively replaced. iRMC runs automatically.

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# 9 Expansion cards and backup units

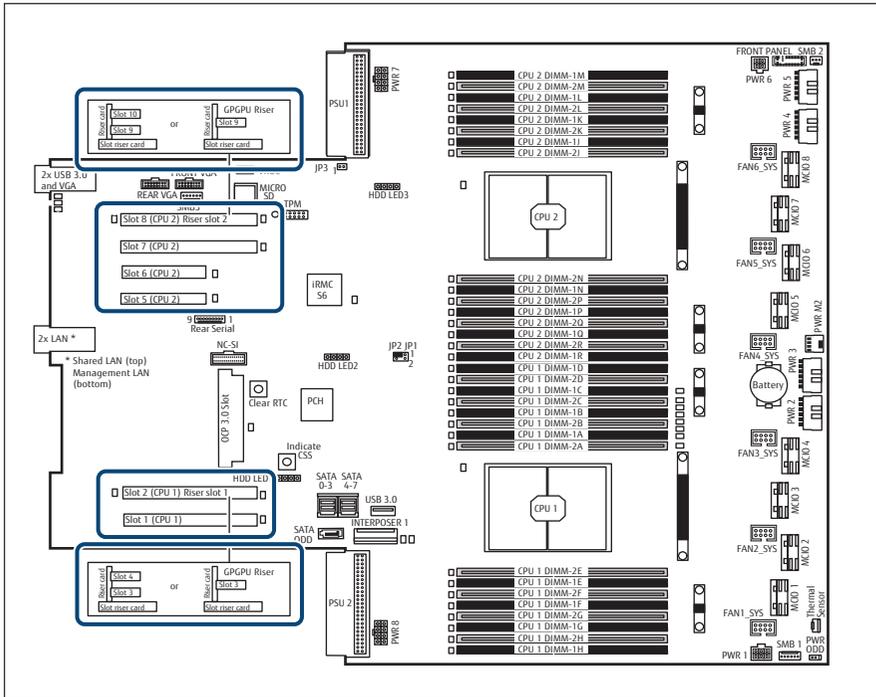
## 9.1 Safety notes



### CAUTION

- ▶ Do not damage or modify internal cables or devices. Doing so may cause a device failure, fire, or electric shock.
- ▶ Devices and components inside the server remain hot after shutdown. After shutting down the server, wait for hot components to cool down before installing or removing internal options.
- ▶ Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).
- ▶ Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- ▶ If devices are installed or disassembled using methods other than those outlined in this chapter, the warranty will be invalidated.
- ▶ For more information, see "[Important information](#)" on page 33.

## 9.2 Basic information



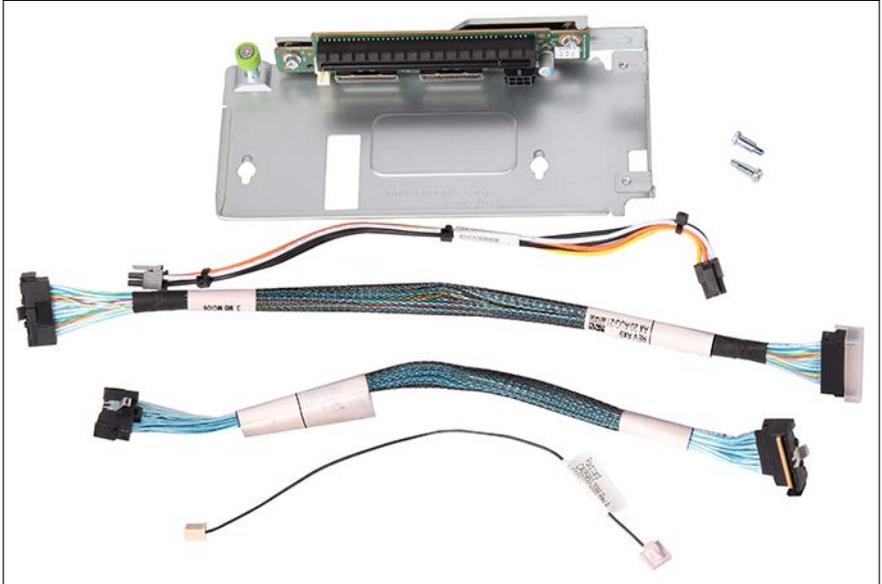


Figure 128: Internal RAID riser module kit

**i** For system relevant information, see the hardware configurator of your server available online at the following address:  
[https://ts.fujitsu.com/products/standard\\_servers/index.html](https://ts.fujitsu.com/products/standard_servers/index.html)

For Japan:

<https://jp.fujitsu.com/platform/server/primergy/system/> (models on sale)

<https://jp.fujitsu.com/platform/server/primergy/product-navi/> (past models)

Slot offered	Type	Description
Slot 1 (CPU1)	PCIe Gen5 x16	low profile slot
Slot 2 (CPU1)	PCIe Gen5 x16	low profile slot
Slot 3/4 (CPU1) GPGPU riser module	PCIe Gen5 x16	full height slot; riser module 1
Slot 3 (CPU1)	PCIe Gen5 x8	full height slot; riser module 1
Slot 4 (CPU1)	PCIe Gen5 x8	full height slot; riser module 1

## Expansion cards and backup units

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Slot offered	Type	Description
Slot 5 (CPU2)	PCIe Gen5 x8	low profile slot
Slot 6 (CPU2)	PCIe Gen5 x8	low profile slot
Slot 7 (CPU2)	PCIe Gen5 x16	low profile slot
Slot 8 (CPU2)	PCIe Gen5 x16	low profile slot
Slot 9/10 (CPU2) GPGPU riser module	PCIe Gen5 x16	full height slot; riser module 2
Slot 9 (CPU2)	PCIe Gen5 x8	full height slot; riser module 2
Slot 10 (CPU)	PCIe Gen5 x8	low profile slot
Internal RAID riser module (CPU1)	PCIe Gen4 x16	low profile slot

- i** Slot 2, 5, 6, 7, 8 and 10 are normal PCIe slots or usable for slot expansion for riser modules. Slot 3/4, slot 9/10, slot 3 and slot 9 are only available with a riser module.
- i** As an option, up to two rear HDD cages can be installed. In this case the riser modules are not available.
- i** As an option, an internal RAID riser module can be installed behind HDD backplane.

## Position of riser modules



Figure 129: Positions of riser modules

- |  |   |
|--|---|
| <p>1 Riser module 1, offers PCIe slot 3/4 or PCIe slot 3 (GPGPU riser module).</p> | <p>2 Riser module 2, offers PCIe slot 9/10 or PCIe slot 9 (GPGPU riser module).</p> |
|--|---|

## 9.3 Handling slot brackets

### 9.3.1 Installing slot brackets



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver



Use the low profile bracket perforated for relevant controllers. No bracket needed for installing the internal RAID controller in the internal RAID riser module.



Figure 130: Perforated and non-perforated slot brackets

- |   |                                    |   |                                |
|---|------------------------------------|---|--------------------------------|
| 1 | Full height bracket non-perforated | 3 | Low profile bracket perforated |
| 2 | Full height bracket perforated     |   |                                |

### Installing a slot bracket

- ▶ Place the controller on the mounting tabs on the slot bracket.
- ▶ Fasten the slot bracket to the controller with two screws.

### Example: EP540i

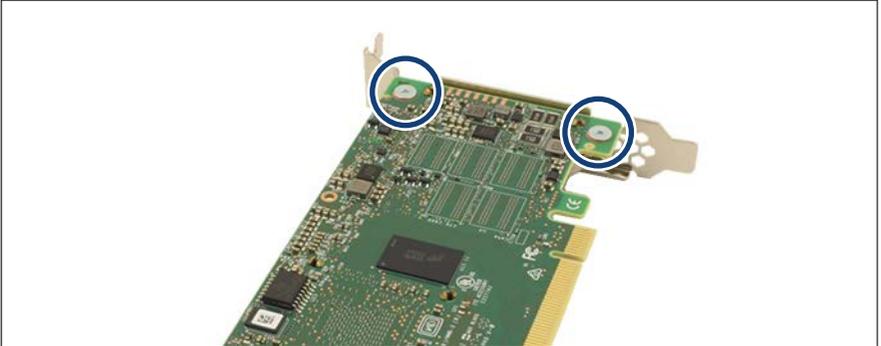


Figure 131: Placing the slot bracket

- ▶ Turn the controller to his bottom side.
- ▶ Place the controller on the slot bracket.
- ▶ Secure the slot bracket to the expansion card with two screws (see circles).

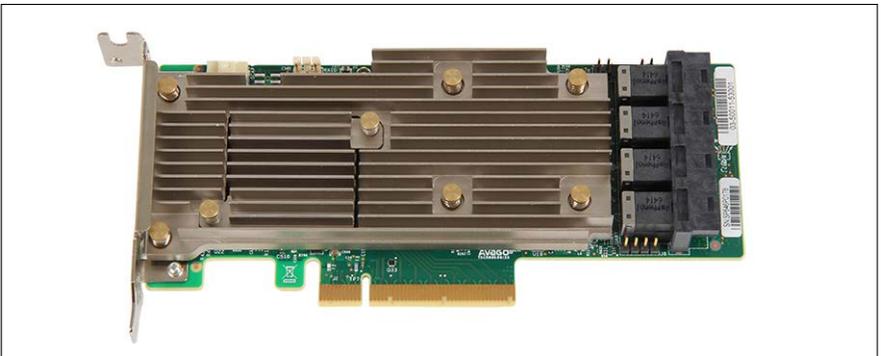


Figure 132: EP540i with installed slot bracket

- ▶ Turn the controller to his top side.

### 9.3.2 Removing slot brackets



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver

#### Removing a slot bracket

- ▶ Remove the two screws.
- ▶ Remove the controller from the mounting tabs on the slot bracket.

## 9.4 Handling SFP+ transceiver modules

### 9.4.1 Installing SFP+ transceiver modules



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** tool-less

The SFP+ transceiver modules are hot-pluggable.

The activation replacement depends on the system configuration. Check it with the customer who is managing the system or the system engineer.

In addition, if the SFP+ transceiver module is independently registered as a spare part, the SFP+ transceiver module can be replaced independently. If the spare part unit consists of an SFP+ transceiver module and an expansion card, replace them in the set.

## Installing SFP+ transceiver modules



Figure 133: Removing the protective cap

- ▶ Remove the SFP+ transceiver module from its protective packaging.
- ▶ Remove the protective cap from the new/additional SFP+ transceiver module.



### CAUTION

- ▶ Always keep the protective caps attached to the SFP+ transceiver modules and fiber-optic cable connectors until you are ready to make a connection.
- ▶ Keep the protective cap for future use.



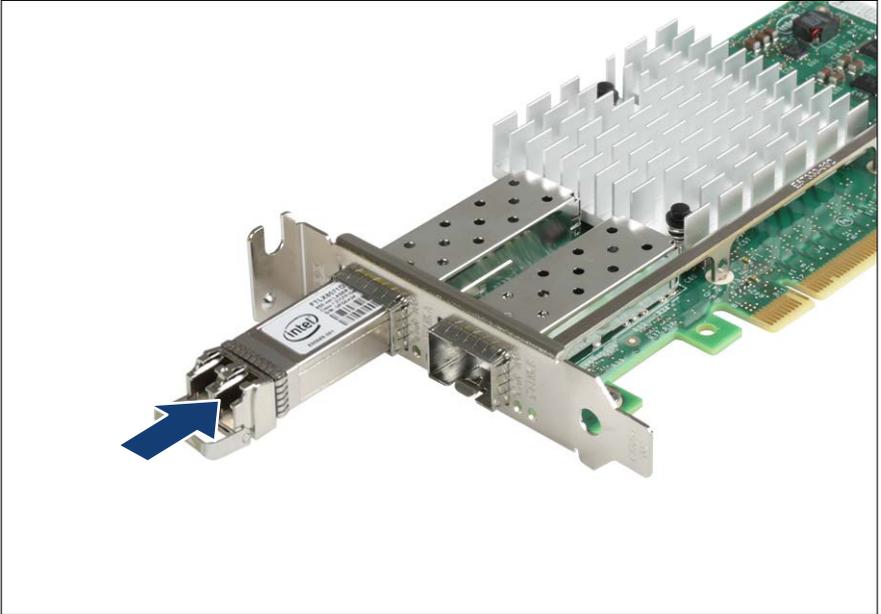


Figure 135: Inserting the SFP+ transceiver module

- ▶ Insert and slide the SFP+ transceiver module into the socket connector as far as it will go.

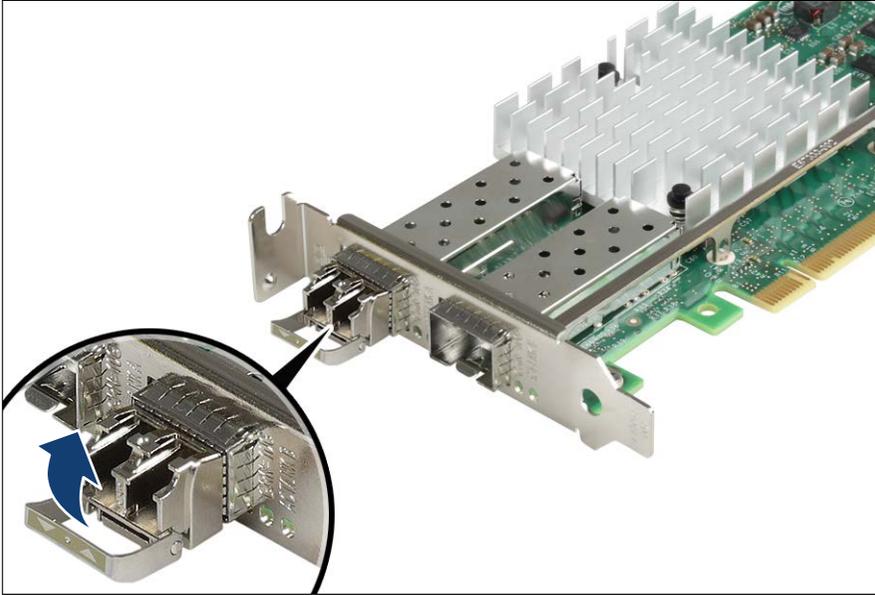


Figure 136: Latching the locking bail

- ▶ Carefully fold up and latch the locking bail.



Figure 137: Installing the protective cap

- ▶ If the SFP+ transceiver module is not immediately connected, attach the protective cap to the SFP+ transceiver module.



Figure 138: Installing the secondary SFP+ transceiver module

- ▶ If applicable, install the secondary SFP+ transceiver module accordingly.

### 9.4.2 Removing SFP+ transceiver modules



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes**

**Tools:** tool-less

The SFP+ transceiver modules are hot-pluggable.

The activation replacement depends on the system configuration. Check it with the customer who is managing the system or the system engineer.

In addition, if the SFP+ transceiver module is independently registered as a spare part, the SFP+ transceiver module can be replaced independently. If the spare part unit consists of an SFP+ transceiver module and an expansion card, replace them in the set.

## Removing an SFP+ transceiver module

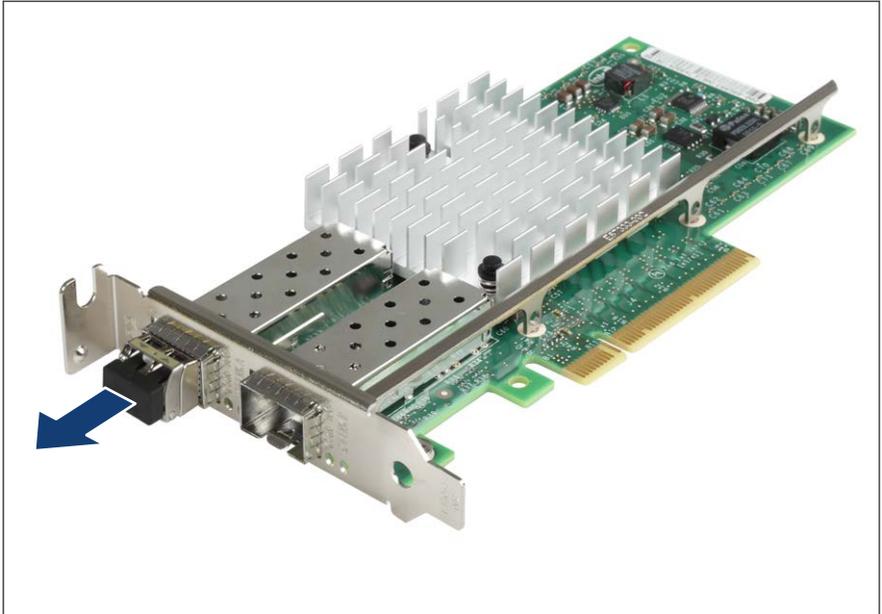


Figure 139: Removing the protective cap

- ▶ If present, remove the protective cap from the SFP+ transceiver module.



### **CAUTION**

- ▶ Keep the protective cap for future use.

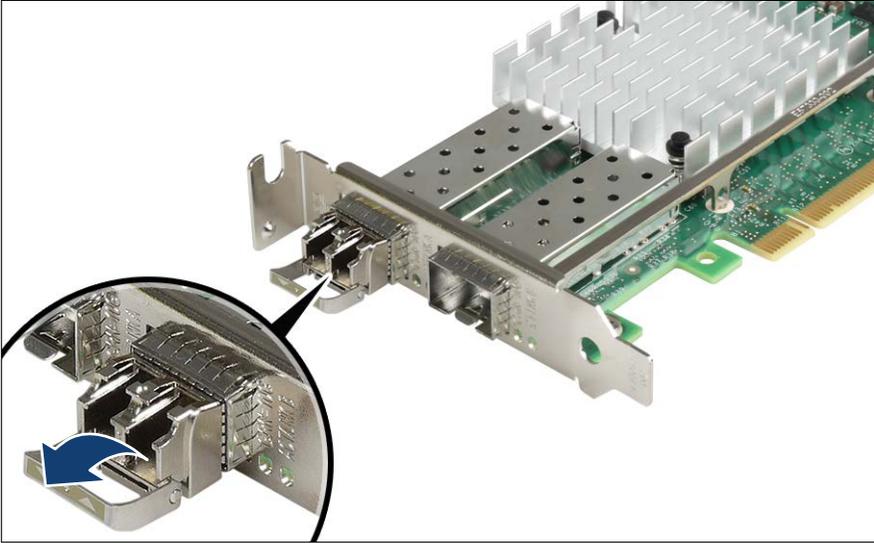


Figure 140: Unlatching the locking bail

- Carefully unlatch and fold down the locking bail on the SFP+ transceiver module to eject the transceiver from the socket connector.

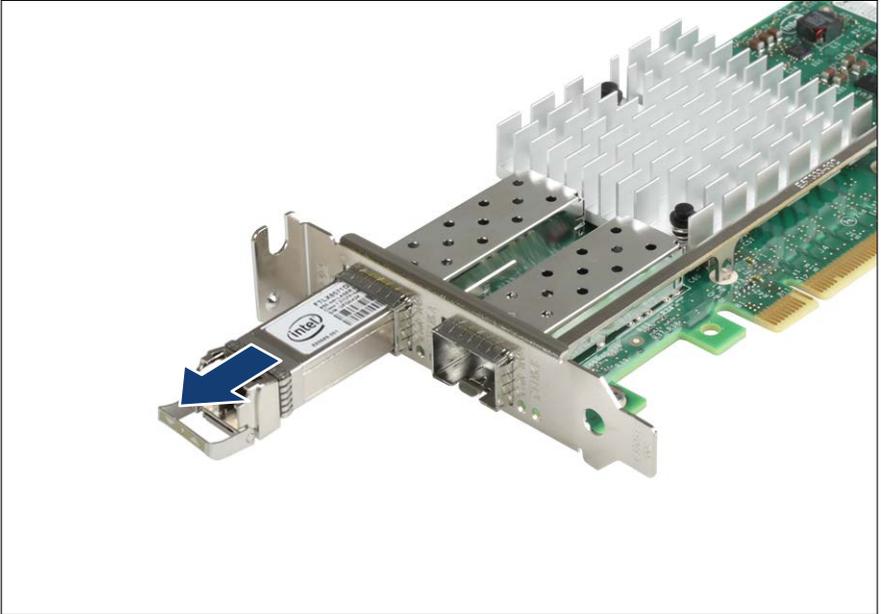


Figure 141: Removing the SFP+ transceiver module

- ▶ Pull the SFP+ transceiver module out of its socket connector.
- ▶ Attach the protective cap to the SFP+ transceiver module.

**i** Place the removed SFP+ transceiver module in an antistatic bag or other protective environment.

## 9.5 OCP (Open Compute Project) modules

### 9.5.1 Position of the OCP module

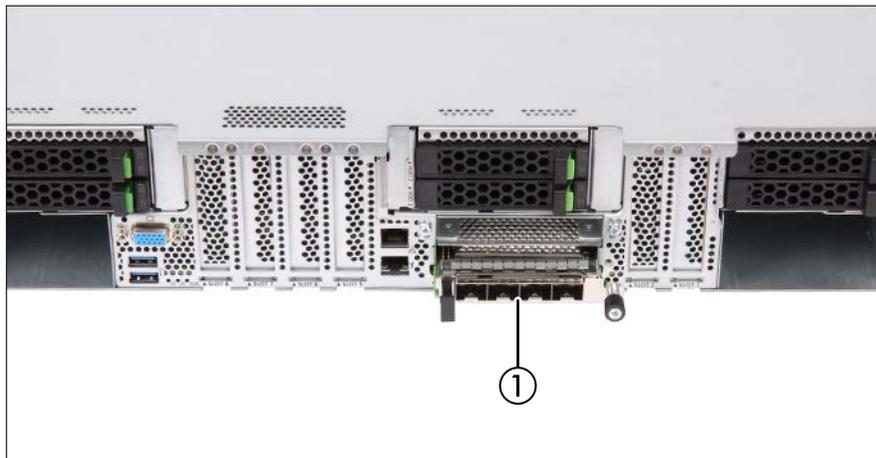


Figure 142: Position of OCP module at the rear side

1 OCP module

**i** There are different OCP modules available. OCP modules can be equipped with SFP+ transceiver modules, see ["Handling SFP+ transceiver modules" on page 252](#).

### 9.5.2 Installing an OCP module



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** tool-less

### Preliminary steps

- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.

### Removing the OCP dummy cover



Figure 143: Removing the OCP dummy cover

- ▶ Loosen the knurled screw (1).
- ▶ Pull the OCP dummy cover open to release the hook on the left side (2).
- ▶ Remove the OCP dummy cover (3).



#### CAUTION

- ▶ Keep the dummy cover for future use.
- ▶ If you remove an OCP module and do not immediately replace it with a new one, a dummy cover must be reinstalled in the bay to comply with applicable EMC regulations and satisfy cooling requirements.

### Installing the OCP module

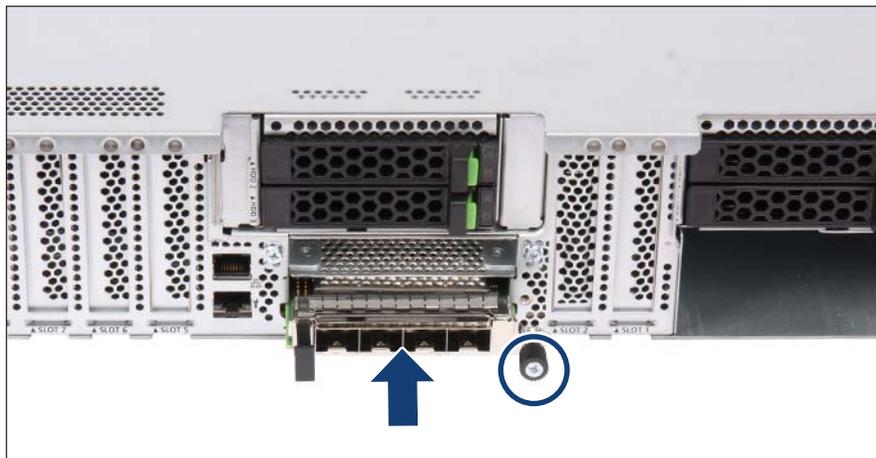


Figure 144: Installing the OCP module

- ▶ Push the OCP module into the slot. Ensure that the left cant fits into the recess.
- ▶ Fasten the OCP module with the knurled screw (see circle).

### Concluding steps

- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ Configure the new MAC address in the OS, if you have no VIOM (ServerView Virtual-IO Manager) installed. If you have VIOM installed, it is not necessary to configure the MAC address. This is virtualized by VIOM.
- ▶ Inform the customer about new MAC addresses. For more information, see ["Looking for MAC/WWN/GUID and SAS addresses" on page 109.](#)
- ▶ ["Updating the NIC configuration file in a Linux and VMware environment" on page 106.](#)
- ▶ ["Configuring LAN teaming" on page 115.](#)

### 9.5.3 Removing an OCP module



Upgrade and Repair Unit  
(URU)



Hardware: 5 minutes

**Tools:** tool-less

#### Preliminary steps

- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.

#### Removing the OCP module

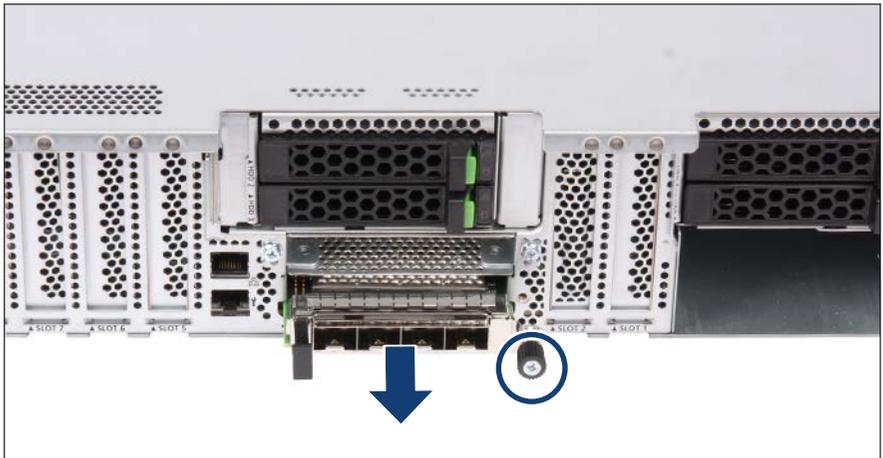


Figure 145: Removing the OCP module

- ▶ Loosen the knurled screw (see circle).
- ▶ Remove the OCP module.

### Installing the OCP dummy cover

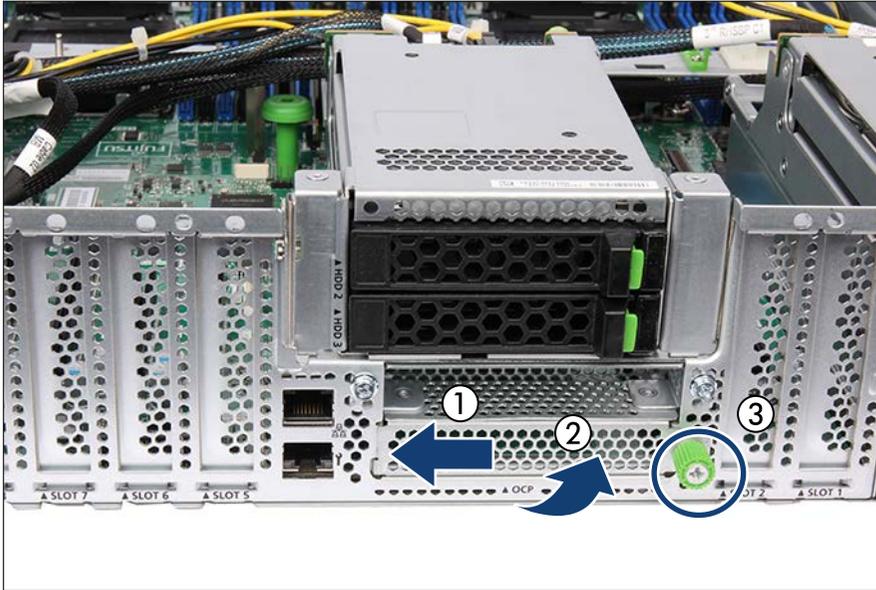


Figure 146: Installing the OCP dummy cover

- ▶ Insert the OCP dummy cover at a slight angle (1). Notice the position of the hook and the recess in the chassis (A).
- ▶ Push the OCP dummy cover in place (2).
- ▶ Fasten the OCP dummy cover with the knurled screw (3).

### Concluding steps

- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)

## 9.5.4 Replacing the OCP module



Upgrade and Repair Unit  
(URU)



Hardware: 10 minutes

**Tools:** tool-less



MAC/WWN/GUID and SAS addresses will be changed by replacing an expansion card or by replacing the system board. Inform the customer about that before starting these tasks. After doing these tasks, inform the customer about the changed MAC/WWN/GUID and SAS addresses.

### Notes on network settings recovery



When replacing network controllers or the system board, network configuration settings in the OS will be lost and replaced by default values. This applies to all static IP address and LAN teaming configurations.

Ensure to note down your current network settings before replacing a network controller or the system board.



If the SAS controller or FC card has an ETERNUS connection and the SAS host (SAS address) or WWN is registered on the ETERNUS side, contact the customer to reconfigure the host affinity on the ETERNUS side (reassociate the server with ETERNUS) after replacing the SAS controller or FC card.

### Note on expansion card replacement



Some FC/CNA/LAN/IB cards support adjusting the firmware version after maintenance and replacement to the specified version. There are cards that support matching the number of editions specified by the customer to manage the card.

Also, check the settings before replacing some cards and reconfigure after replacing some cards.

Follow the procedure specified separately.

For Japan:

Follow the instructions provided separately.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)

### Removing the defective OCP module

- ▶ Remove the OCP module, see ["Removing an OCP module" on page 265.](#)

### Installing the new OCP module

- ▶ Install the OCP module, see ["Installing an OCP module" on page 262.](#)

### Concluding steps

- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ Inform the customer about changed WWN, MAC, GUID and SAS addresses, see ["Looking for MAC/WWN/GUID and SAS addresses" on page 109.](#)
- ▶ ["Updating expansion card firmware" on page 98.](#)
- ▶ ["Updating the NIC configuration file in a Linux and VMware environment" on page 106.](#)
- ▶ ["Configuring LAN teaming" on page 115.](#)
- ▶ If applicable, reconfigure your network settings in the operation system according to the original configuration of the replaced expansion card.  
The configuration of the network settings should be performed by the customer. For more information, see ["Notes on network settings recovery" on page 267.](#)

## 9.6 Expansion cards in standard PCIe slots

### 9.6.1 Installing an expansion card



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**  
**Software: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

#### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)

### Removing the slot cover

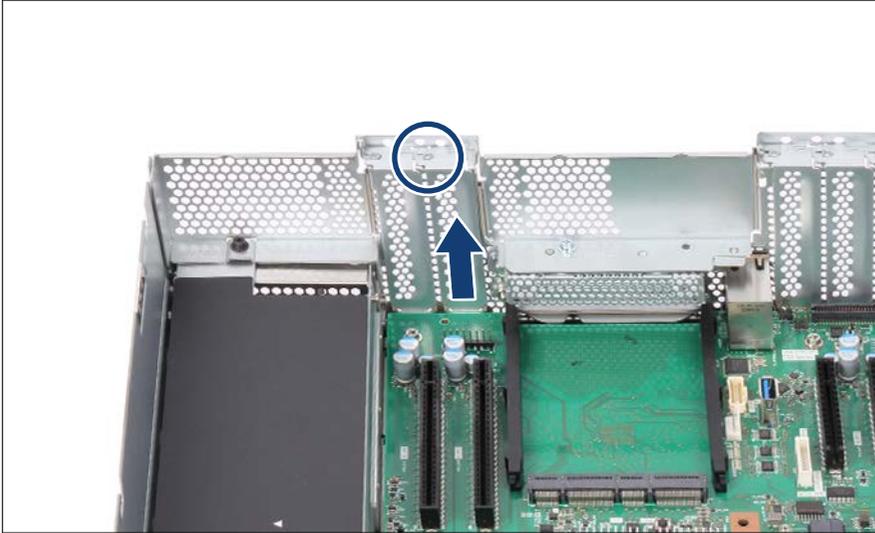


Figure 147: Removing the slot cover

- ▶ Loosen the screw (see circle).
- ▶ Remove the slot cover.



#### **CAUTION**

Keep the slot cover for future use.

- ▶ Always replace slot covers into unused PCI slot openings to comply with applicable EMC regulations and satisfy cooling requirements.

### Installing the expansion card

- ▶ Please read the documentation supplied with the expansion card.
- ▶ If applicable, install a slot bracket to the expansion card, see "[Installing slot brackets](#)" on page 249.

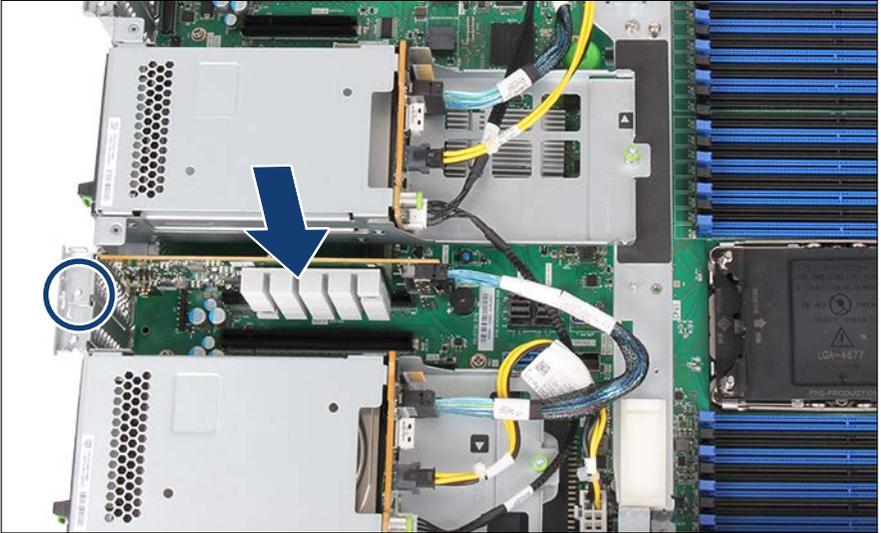


Figure 148: Installing the expansion card

- ▶ Carefully insert the expansion card into the desired PCIe slot and press down firmly until it is fully seated in the slot.
- ▶ If applicable, install SFP+ transceiver modules into the new expansion card, see ["Installing SFP+ transceiver modules" on page 252](#).
- ▶ If applicable, connect the FBU cable to the FBU, see ["Installing an FBU" on page 325](#).
- ▶ Fasten the screw (see circle).

### Example PRAID EP5xxi

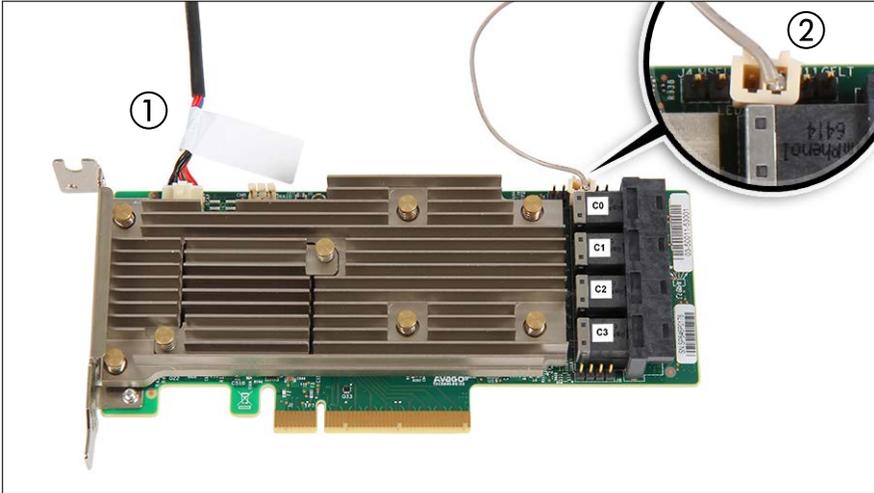
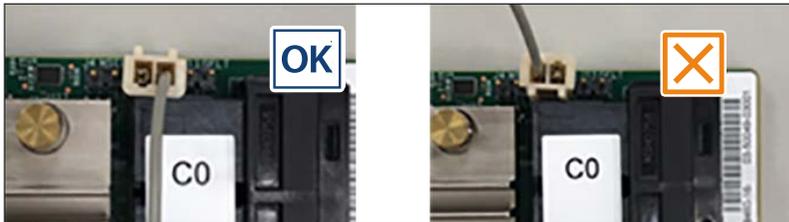


Figure 149: Connecting the cables to the PRAID EP5xxi

► Connect the following cables:

- 1 If applicable, FBU cable
- 2 If applicable, HDD LED cable



## Example PRAID EP 3258-16i

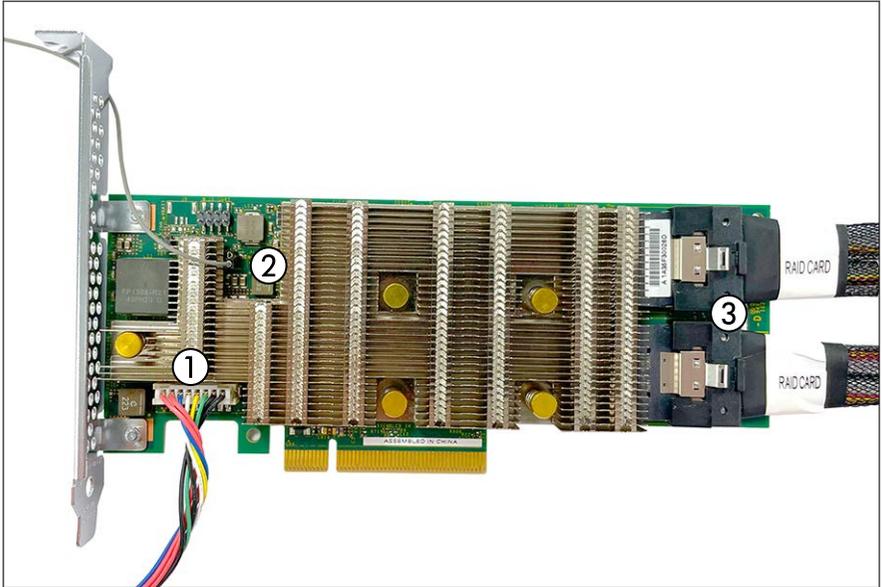
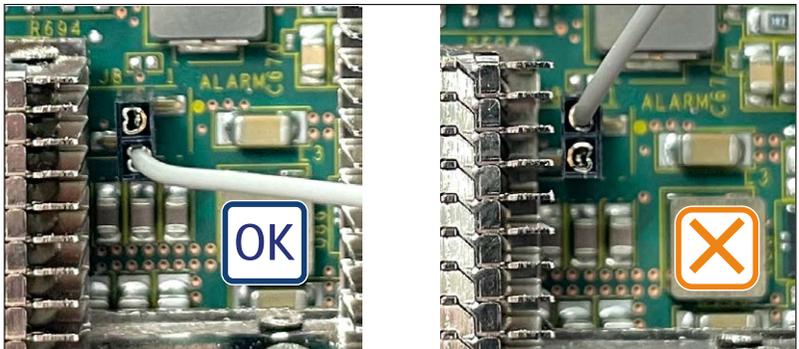


Figure 150: Connecting cables - PRAID EP 3258-16i

## ► Connect the following cables:

- 1 If applicable, FBU cable
- 2 HDD LED cable



- 3 SAS cables

## Expansion cards and backup units

### Example EP6xxi RAID controller

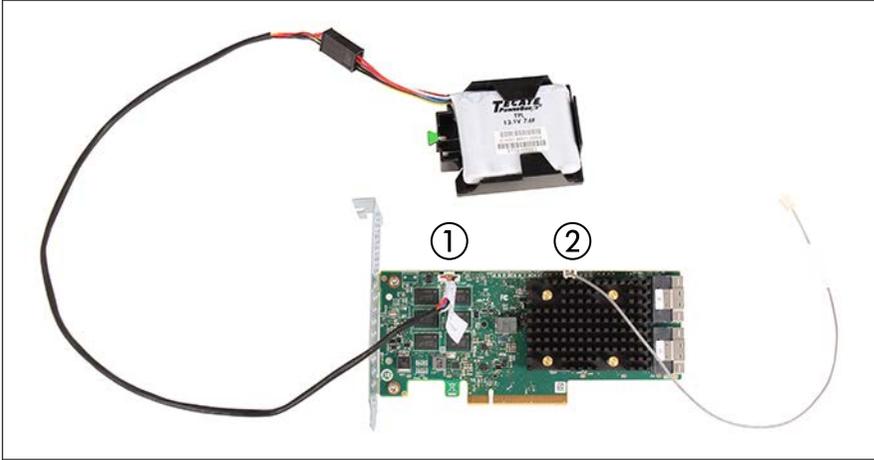
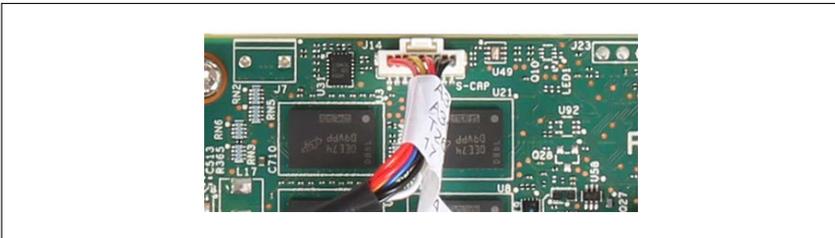
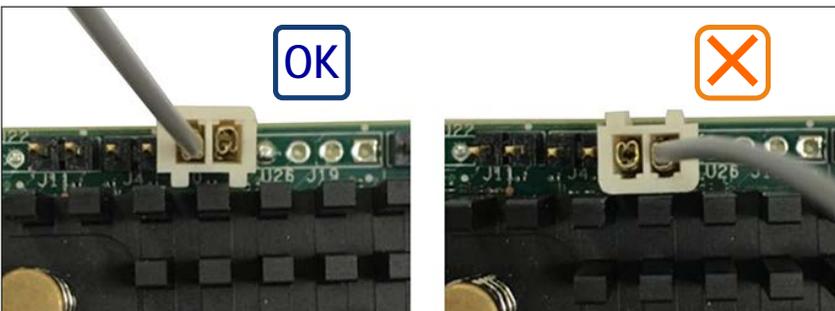


Figure 151: Connecting cables to the RAID controller

- Connect the FBU adapter cable to the RAID controller (1).



- Connect the HDD LED cable to the RAID controller (2).



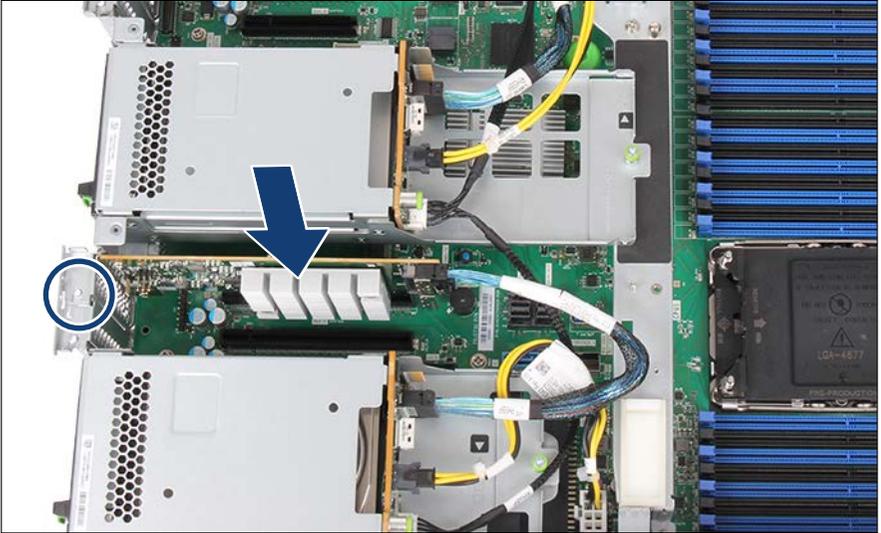
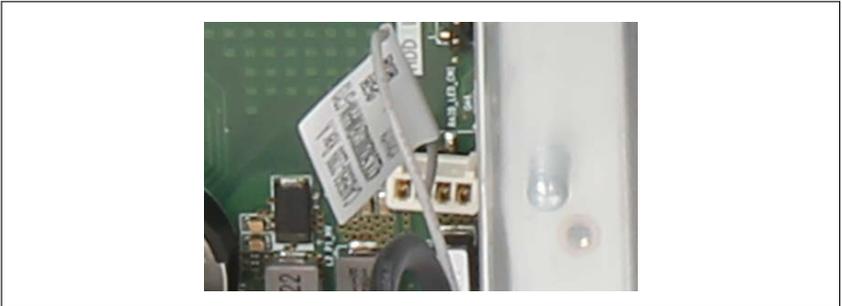


Figure 152: Installing the RAID controller

- ▶ Install the RAID controller.
- ▶ Fasten the screw (see circle).
- ▶ Connect the HDD LED cable to connector "HDD LED1" on the system board (see circle).



### Example SAS CP5xxi

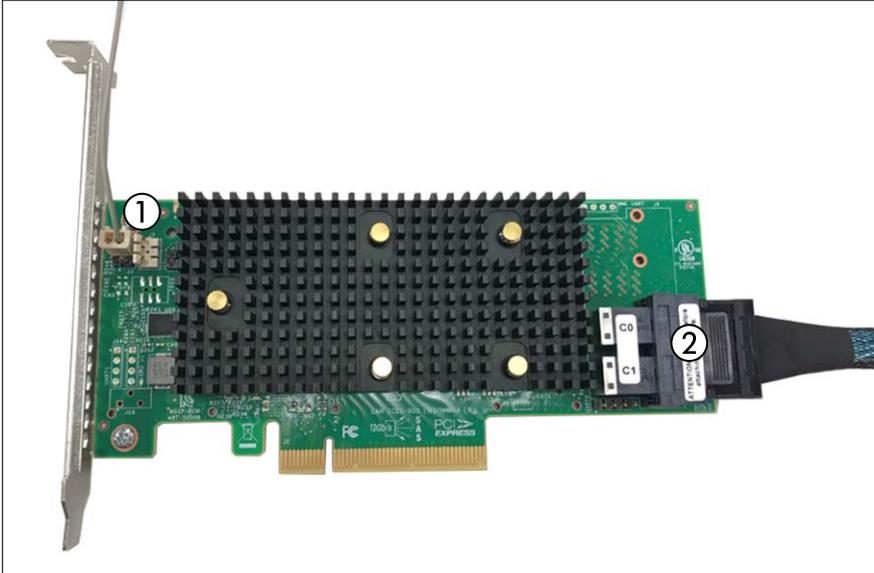
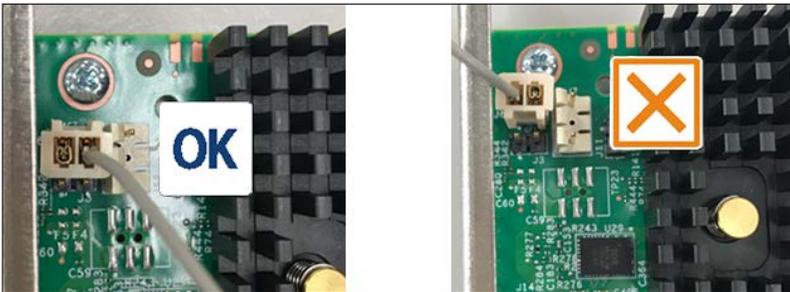


Figure 153: Connecting cables - SAS CP5xxi

► Connect the following cables:

- 1 If applicable, HDD LED cable



- 2 SAS cable



The cables are equipped with labels showing the right connector.

For the cable plan, see ["Appendix B" on page 569](#).

**CAUTION**

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- ▶ Check the correct cabling using the labels on the cables and the cable plans.

**Example PDUAL CP100 (2x M.2 SSDs SATA RAID PCIe card)**

Figure 154: PDUAL CP100

1 PDUAL CP100

2 Screws

## Expansion cards and backup units



Figure 155: Installing M.2 SSDs (A)

- ▶ Insert the two M.2 SDDs in a slight angle.



Figure 156: Installing M.2 SSDs (B)

- ▶ Fasten each M.2 SSD with one screw (see circles).

### Concluding steps

- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#)
- ▶ ["Updating expansion card firmware" on page 98.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 9.6.2 Removing an expansion card



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

<b>Tools:</b> Phillips PH2 / (+) No. 2 screw driver
---

### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)

### Removing the expansion card

- ▶ If applicable, disconnect internal cables from the expansion card.
- ▶ If applicable, ["Removing SFP+ transceiver modules" on page 258.](#)

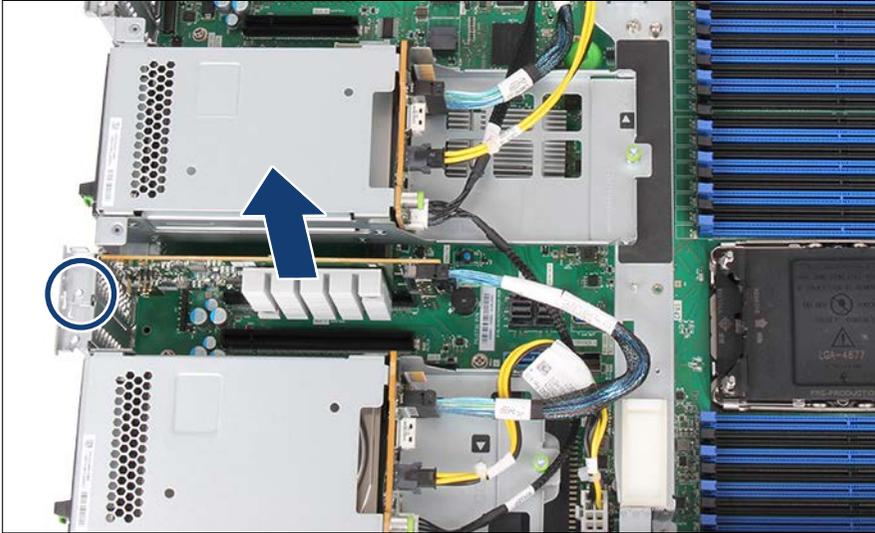


Figure 157: Removing the expansion card

- ▶ Remove the screw (see circle).
- ▶ Carefully remove the expansion card from its slot.

### Installing the slot cover



#### **CAUTION**

- ▶ Always replace slot covers into unused PCIe slot openings to comply with applicable EMC regulations and satisfy cooling requirements.

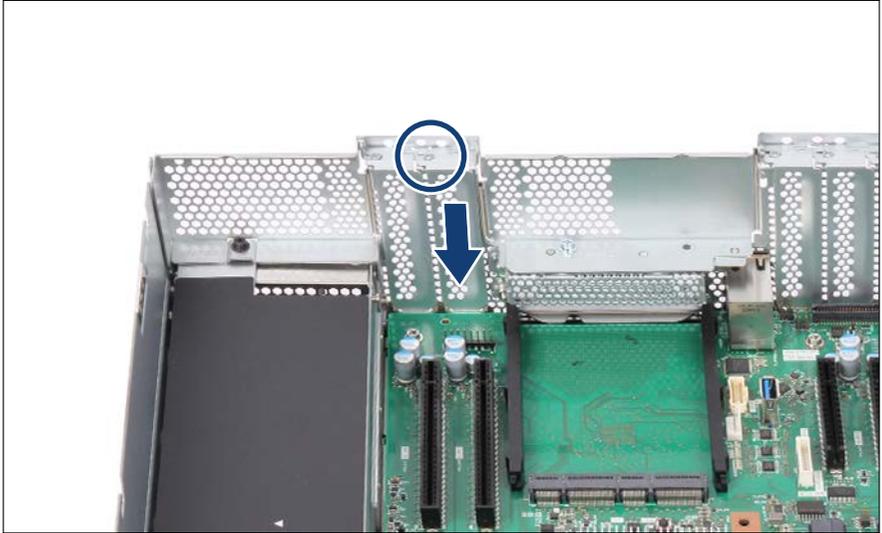


Figure 158: Installing the slot cover

- ▶ Insert a slot cover into the unused PCIe slot opening.
- ▶ Fasten the screw (see circle).

### Concluding steps

- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 9.6.3 Replacing an expansion card



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Software: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver



Some PCIe SSDs have a write life (limited life component). Ask the customer to check the write status before replacing the spare part. If the product has reached the end of its life, ask the customer to purchase it again.

For Japan, refer to the following:

<https://jp.fujitsu.com/platform/server/primergy/support/parts/#parts2>



MAC/WWN/GUID and SAS addresses will be changed by replacing an expansion card or by replacing the system board. Inform the customer about that before starting these tasks. After doing these tasks, inform the customer about the changed MAC/WWN/GUID and SAS addresses.

#### Notes on network settings recovery



When replacing network controllers or the system board, network configuration settings in the OS will be lost and replaced by default values. This applies to all static IP address and LAN teaming configurations.

Ensure to note down your current network settings before replacing a network controller or the system board.



If the SAS controller or FC card has an ETERNUS connection and the SAS host (SAS address) or WWN is registered on the ETERNUS side, contact the customer to reconfigure the host affinity on the ETERNUS side (reassociate the server with ETERNUS) after replacing the SAS controller or FC card.

### Note on expansion card replacement



Some FC/CNA/LAN/IB cards support adjusting the firmware version after maintenance and replacement to the specified version. There are cards that support matching the number of editions specified by the customer to manage the card.

Also, check the settings before replacing some cards and reconfigure after replacing some cards.

Follow the procedure specified separately.

For Japan:

Follow the instructions provided separately.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Configuring LAN teaming" on page 115.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ ["Checking boot priority" on page 93.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Locating the defective component" on page 48.](#)

### Removing the defective expansion card

- ▶ Remove the expansion card, see ["Removing an expansion card" on page 279.](#)
- ▶ If the slot bracket on the defective expansion card is to be reused, remove it from the expansion card, see ["Removing slot brackets" on page 252.](#)

### Installing the new expansion card

- ▶ If applicable, install the slot bracket, see ["Installing slot brackets" on page 249](#).
- ▶ Install the expansion card, see ["Installing an expansion card" on page 269](#).

### Concluding steps

- ▶ ["Reassembling" on page 59](#).
- ▶ If applicable, connect external cables to the expansion card.
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).
- ▶ ["Enabling replaced components in the BIOS" on page 102](#).
- ▶ Inform the customer about changed WWN, MAC, GUID and SAS addresses, see ["Looking for MAC/WWN/GUID and SAS addresses" on page 109](#).
- ▶ ["Updating the NIC configuration file in a Linux and VMware environment" on page 106](#).
- ▶ ["Updating expansion card firmware" on page 98](#).
- ▶ ["Setting boot priority" on page 120](#).
- ▶ ["Resuming BitLocker functionality" on page 107](#).
- ▶ If applicable, reconfigure your network settings in the operation system according to the original configuration of the replaced controller (expansion card).
  -  Configuration of network settings should be performed by the customer. For more information, see ["Notes on network settings recovery" on page 282](#).
- ▶ If applicable, restore LAN teaming configurations, see ["After replacing or upgrading LAN controllers" on page 115](#).

## 9.7 GPU cards in riser modules

### 9.7.1 Installing a GPU card in a riser module



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Software: 5 minutes**

- Tools:**
- Phillips PH2 / (+) No. 2 screwdriver
  - Phillips PH1 / (+) No. 1 screwdriver
  - Hexagon screwdriver 4.5 mm

#### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ Remove all riser modules, see ["Removing a riser module" on page 72.](#)
- ▶ If no riser module is installed: Remove the corresponding rear air grid, see ["Removing a rear air grid" on page 85.](#)
- ▶ ["Removing the air duct" on page 80.](#)
- ▶ ["Removing the crossbar" on page 83.](#)

#### Installing the GPU card in a riser module (example GPU NVIDIA A16)



The GPU cards A30/A40/A100/H100/RTX A4500/RTX A6000/A30X/A100X have the same installation procedure.

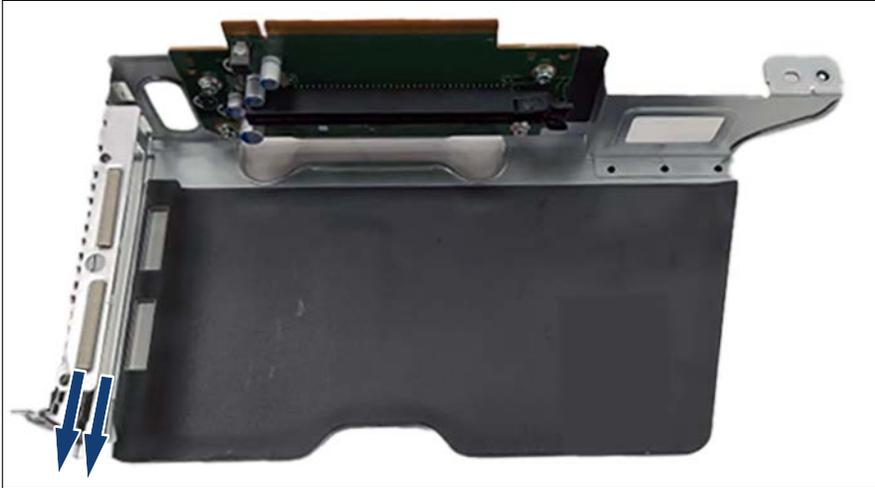


Figure 159: Removing the two slot covers

- ▶ Remove the two slot covers.



### CAUTION

- ▶ Keep the slot cover for future use.
- ▶ If the expansion card is removed and not replaced with a new one, the slot cover must be reinstalled due to cooling, to comply with applicable EMC regulations and to protect against fire.



Figure 160: Connecting the GPU power cable

- ▶ Connect the GPU power cable to the GPU card (see circle).
- ▶ Connect the GPU signal cable to the GPU card.

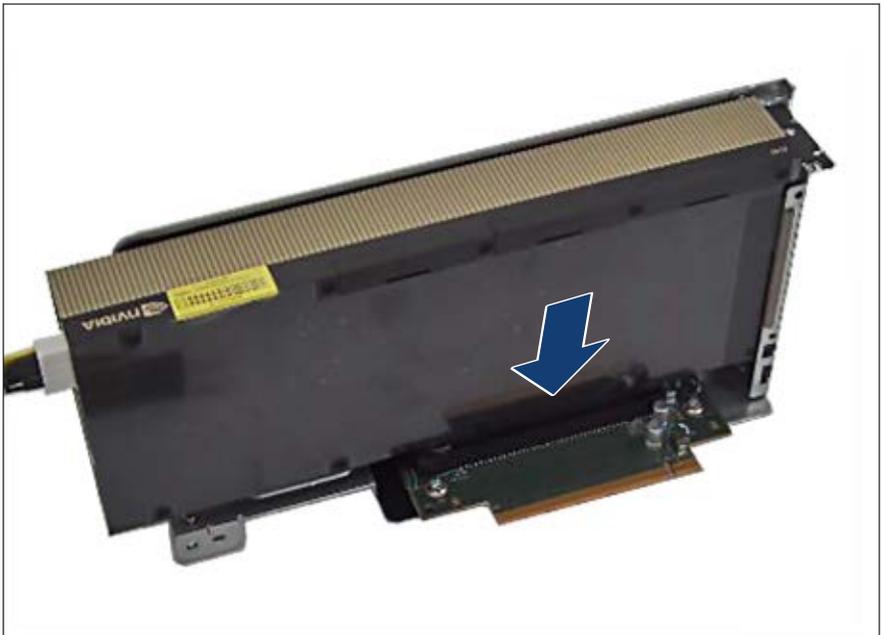


Figure 161: Installing the GPU card in a riser module



Figure 162: Removing the GPU dummy bracket

- ▶ If applicable, remove the screw (see circle).
- ▶ If applicable, remove the GPU dummy bracket.
- ▶ Carefully insert the GPU card into the PCIe slot and press down firmly until it is fully seated in the slot.

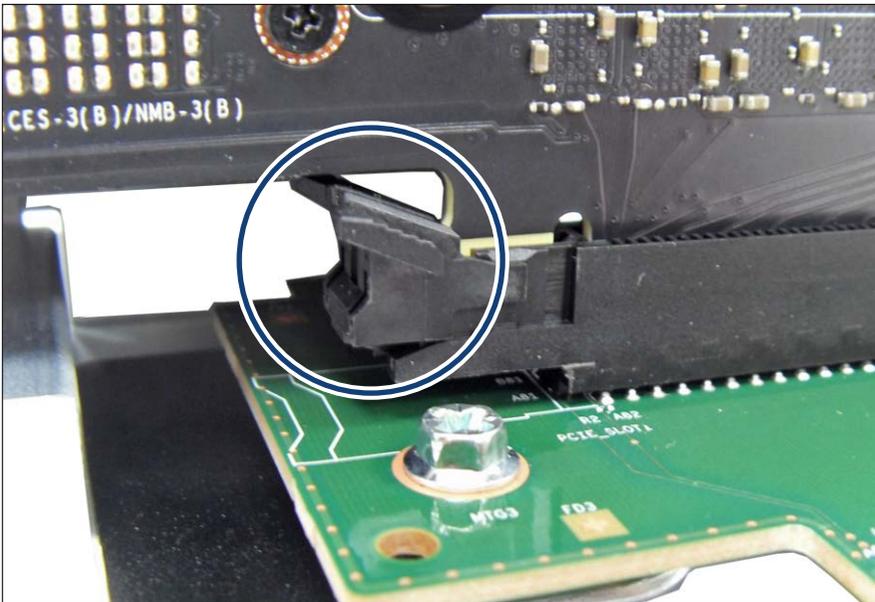


Figure 163: Locking the GPU card

- ▶ Ensure that the GPU riser module latch locks completely in the riser card (see circle).

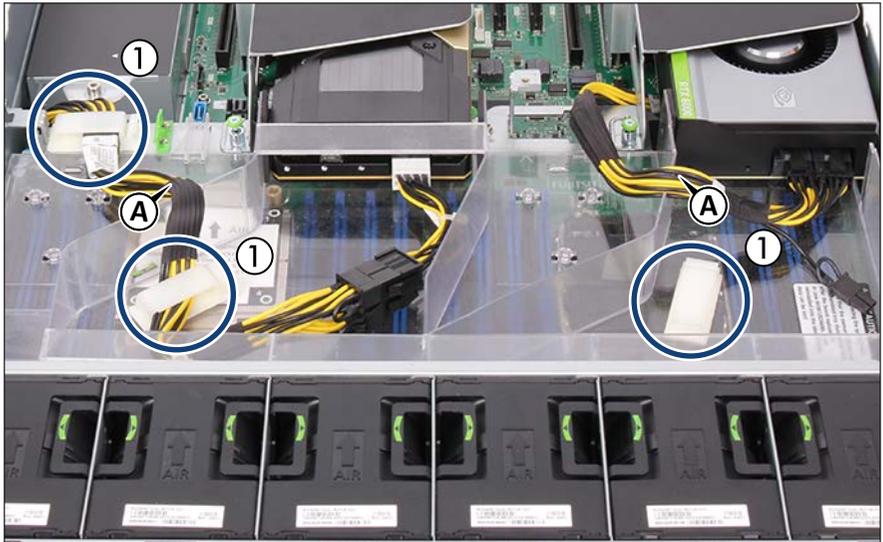


Figure 164: Running the GPU cables

- ▶ Run the GPU cables in the guide slots (A).
- ▶ Run the GPU cables through the cable clamp (1).
- ▶ Connect the GPU power cable to the system board connector "PWR 7" (riser module 2) or "PWR 8" (riser module 1).
- ▶ Connect the GPU signal cable to the system board.
- ▶ Install the crossbar, see ["Installing the crossbar" on page 84](#).
- ▶ Install the air duct, see ["Installing the air duct" on page 79](#).
- ▶ Install the corresponding riser module, see ["Installing a riser module" on page 74](#).

### Concluding steps

- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).

- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#)
- ▶ ["Updating expansion card firmware" on page 98.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 9.7.2 Removing a GPU card from a riser module



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes  
Software: 5 minutes**

<b>Tools:</b> Phillips PH2 / (+) No. 2 screw driver
---

#### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ Remove all riser modules, see ["Removing a riser module" on page 72.](#)
- ▶ ["Removing an expansion card from a riser module" on page 317.](#)
- ▶ If necessary, remove the cables from the expansion cards.
- ▶ ["Removing the air duct" on page 80.](#)
- ▶ Disconnect the GPU power cable from the system board connector.

**Removing the GPU card from a riser module (example GPU NVIDIA A16)**

**i** The GPU cards A30/A40/A100/H100/RTX A4500/RTX A6000/A30X/A100X have the same removal procedure.

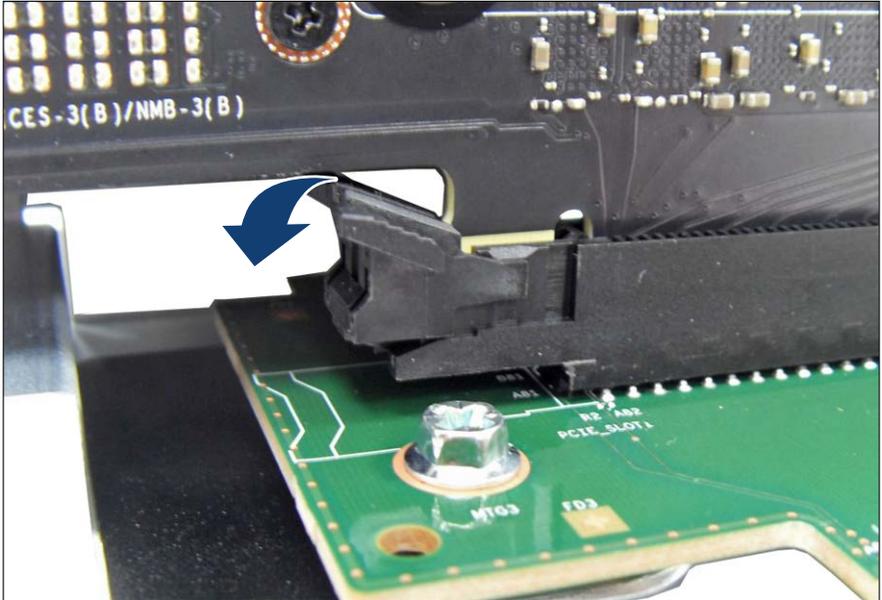


Figure 165: Unlocking the GPU latch

- ▶ Push the GPU latch to unlock it.

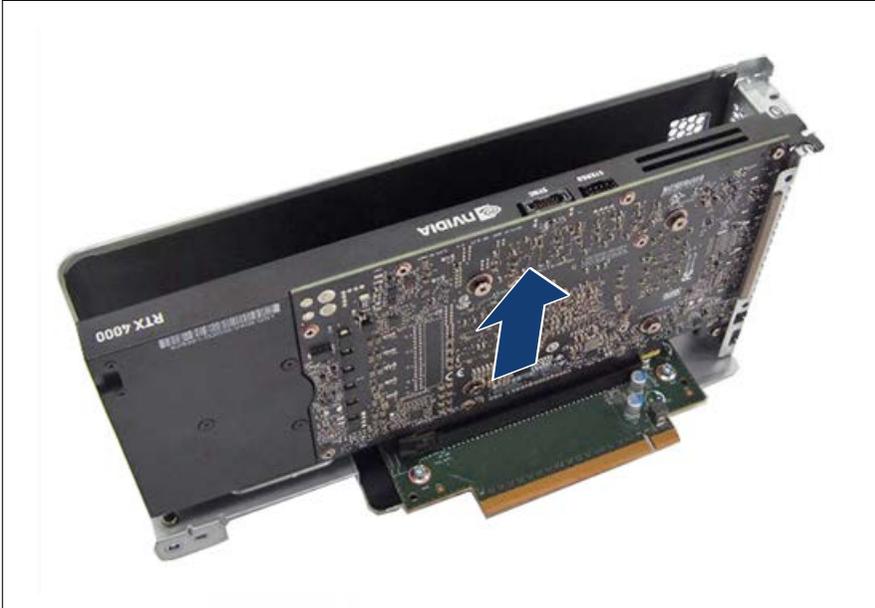


Figure 166: Removing the GPU card from a riser module

- Carefully remove the GPU card from its slot.

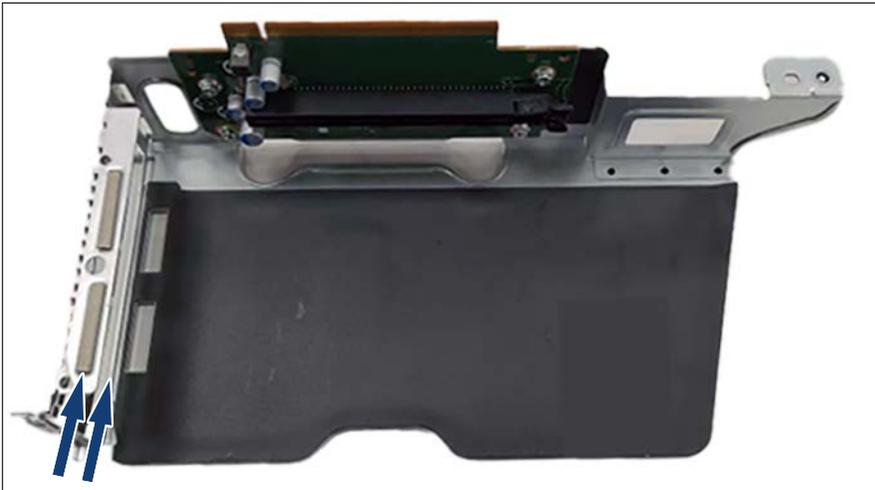


Figure 167: Installing the two slot covers

- ▶ Install the two slot covers.

### Concluding steps

- ▶ ["Installing the crossbar" on page 84.](#)
- ▶ ["Installing the air duct" on page 79.](#)
- ▶ If applicable, install the corresponding riser module, see ["Installing a riser module" on page 74.](#)
- ▶ If applicable, install the corresponding rear air grid, see ["Installing a rear air grid" on page 87.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 9.7.3 Replacing a GPU card from a riser module



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Software: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

#### Note on network settings recovery



When replacing network controllers, network configuration settings in the OS will be lost and replaced by default values. This applies to all static IP address and LAN teaming configurations.

Ensure to note down your current network settings before replacing a network controller.

### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ Remove all riser modules, see ["Removing a riser module" on page 72.](#)
- ▶ ["Removing an expansion card from a riser module" on page 317.](#)
- ▶ If necessary, remove the cables from the expansion cards.
- ▶ ["Removing the air duct" on page 80.](#)

### Removing the defective GPU card

- ▶ Remove the GPU card, see ["Removing a GPU card from a riser module" on page 290.](#)

### Installing the new GPU card

- ▶ Install the GPU card, see ["Installing a GPU card in a riser module" on page 285.](#)

### Concluding steps

- ▶ ["Reassembling" on page 59.](#)
- ▶ Connect all external cables to the expansion card(s).
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#)
- ▶ ["Updating expansion card firmware" on page 98.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 9.7.4 Replacing a riser card



**Field Replaceable Unit  
(FRU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Locating the defective component" on page 48.](#)
- ▶ Remove the corresponding riser module, see ["Removing a riser module" on page 72.](#)

### Removing the defective riser card

- ▶ Remove the GPU card, see ["Removing a GPU card from a riser module" on page 290.](#)

## Expansion cards and backup units

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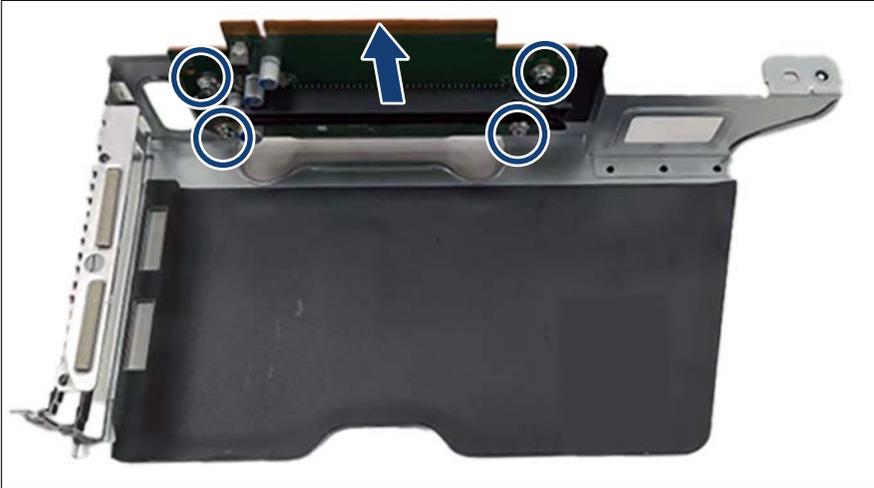


Figure 168: Removing the riser card

- ▶ Remove the four screws (see circles).
- ▶ Remove the riser card.

### Installing the new riser card

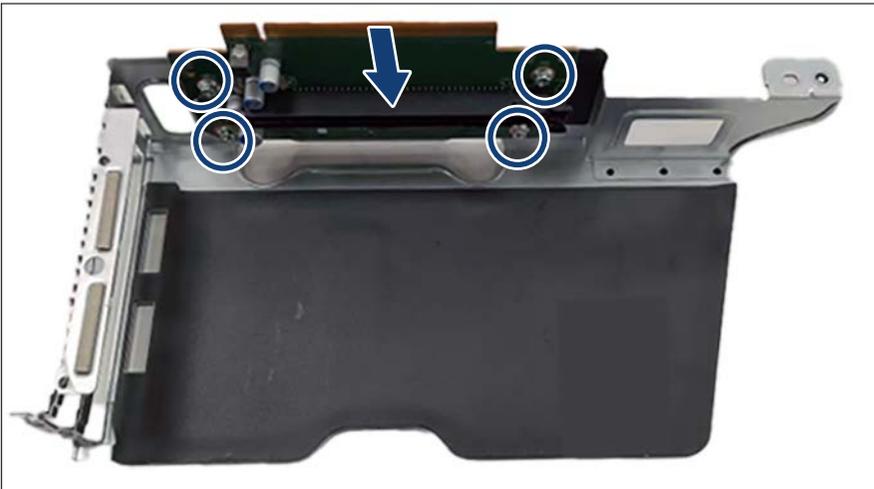


Figure 169: Installing the riser card

- ▶ Insert the riser card.
- ▶ Fasten the riser card with four screws (see circles).
- ▶ Install the GPU card, see ["Installing a GPU card in a riser module" on page 285](#).

### Concluding steps

- ▶ Install the corresponding riser module, see ["Installing a riser module" on page 74](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 9.8 Internal RAID riser module

### 9.8.1 Installing an internal RAID riser module



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**  
**Software: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver

### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89](#).
- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ ["Getting access to the component" on page 55](#).
- ▶ ["Removing the fan cage" on page 76](#).

## Expansion cards and backup units

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**i** The EP580i RAID controller needs to use this Mylar foil. If an internal RAID riser model has this Mylar foil, it must be moved from the top of the screw hole to the bottom of the screw hole before installing the EP580i RAID controller, see ["Moving the Mylar foil from the top of the screw hole to the bottom of the screw hole"](#) on page 298.

### Moving the Mylar foil from the top of the screw hole to the bottom of the screw hole



Figure 170: Moving the Mylar foil (A)

► Detach the Mylar foil from the top of the screw hole.



Figure 171: Moving the Mylar foil (B)

- ▶ Move the Mylar foil to the bottom of the screw hole.  
The Mylar foil is elastic due to its flexing properties.

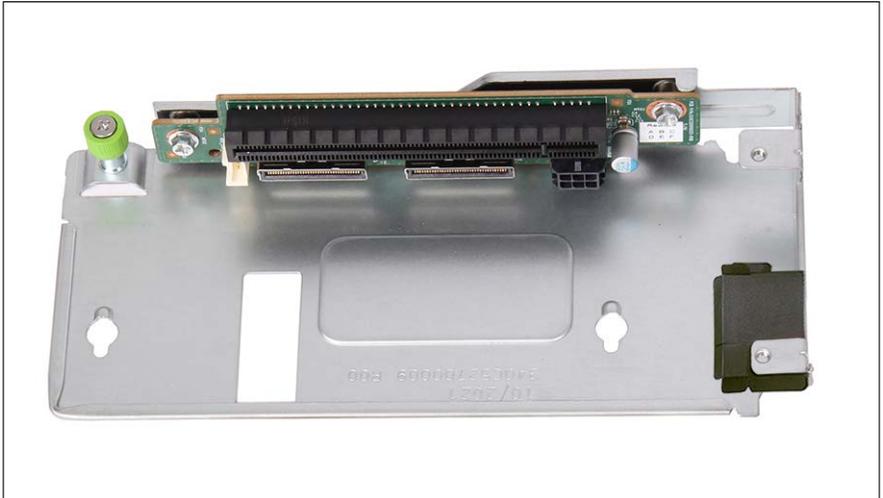


Figure 172: Mylar foil at bottom of screw hole

- ▶ Use the edges and the screw hole for assembly alignment.

### Installing the expansion card into the internal RAID riser module

- ▶ Please read the documentation supplied with the expansion card.
- ▶ If applicable, remove the slot bracket from the RAID controller, see ["Removing slot brackets" on page 252](#).

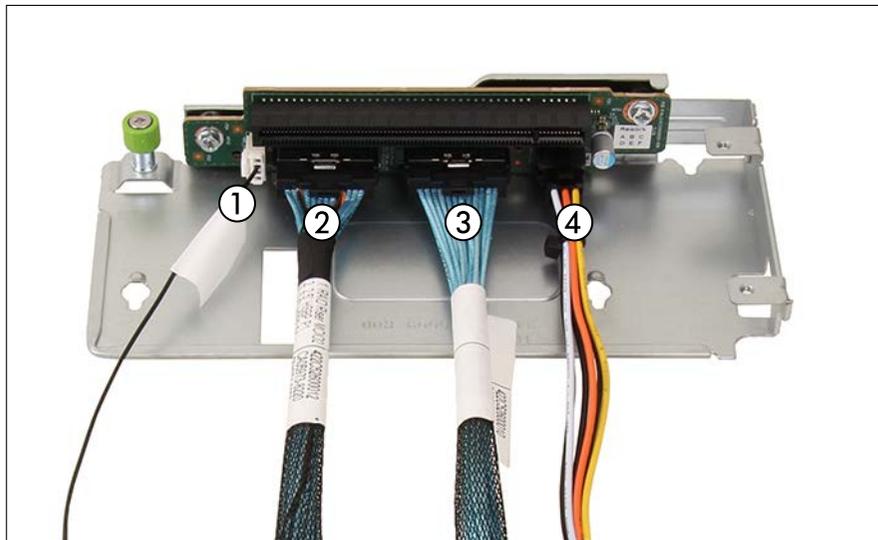


Figure 173: Connecting cables - example internal RAID riser module

► Connect the following cables:

- 1 HDD LED cable, option
- 2 SLIM SAS cable, depending on configuration
- 3 SLIM SAS cable, depending on configuration
- 4 Power cable

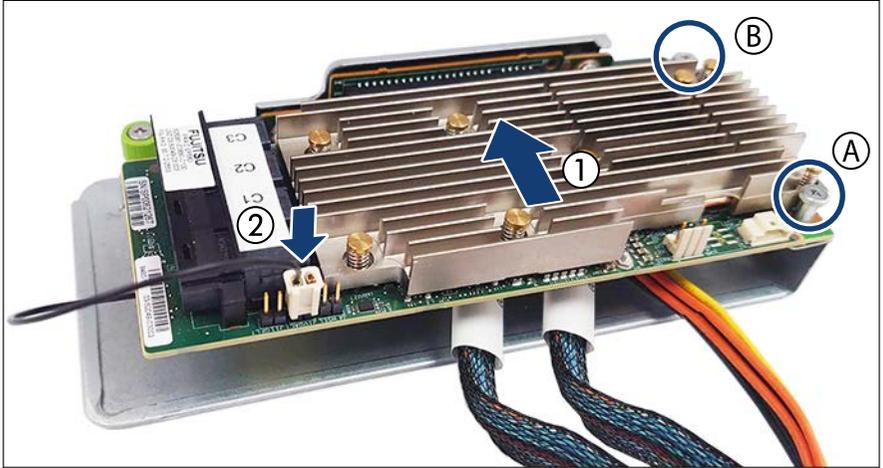


Figure 174: Installing an expansion card (example RAID EP5xxi controller)

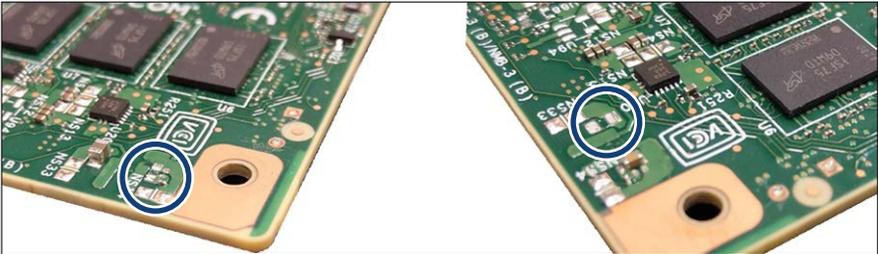
## Expansion cards and backup units

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- ▶ Carefully press the internal RAID EP5xxi controller into the riser card slot, until it clicks into place (1).



Install the Internal RAID controller in a slight angle into the riser card slot. Otherwise, a capacitor under the Internal RAID controller could interfere with the Internal RAID riser module and fall off (see circles).

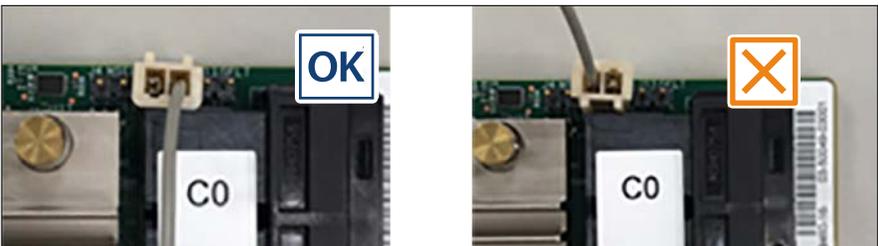


- ▶ Fasten the internal RAID controller with screws A and B.



The EP580i RAID controller is available in two variants, which are characterised by different heatsink designs. Depending on the EP580i RAID controller revision originally supplied with the server, the controller may be fastened with one or two screws. Depending on the revision of the replacement controller, you might have to fasten the controller with screw A or screws A and B. If only one screw was supplied with the server and the controller, fasten the replacement controller with screw A only.

- ▶ Connect the HDD LED cable (2). (PRAID RAID card only)



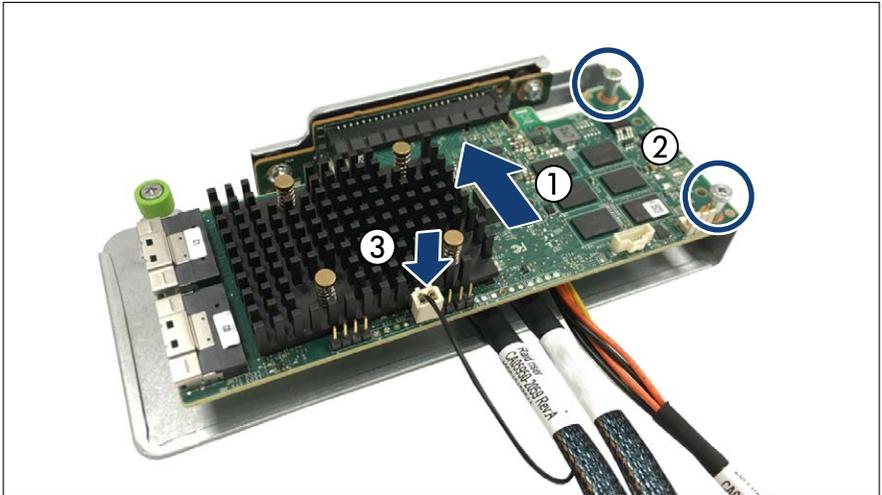
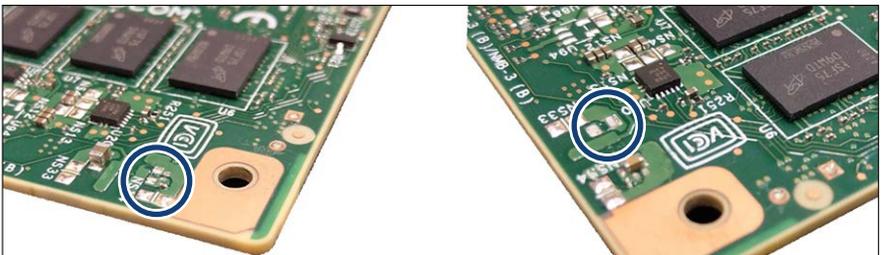


Figure 175: Installing the internal RAID controller (example RAID EP6xxi controller)

- Carefully press the internal RAID EP6xxi controller into the riser card slot, until it clicks into place (1).



Install the Internal RAID controller in a slight angle into the riser card slot. Otherwise, a capacitor under the Internal RAID controller could interfere with the Internal RAID riser module and fall off (see circles).

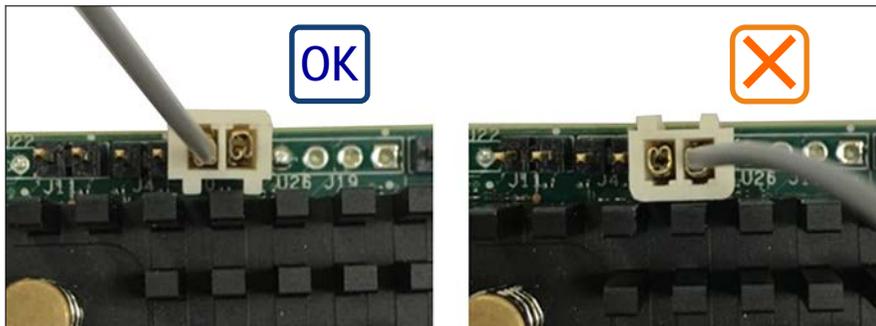


- Fasten the internal RAID controller with the two screws (2).

## Expansion cards and backup units

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- ▶ Connect the HDD LED cable (3).



## Installing the internal RAID riser module

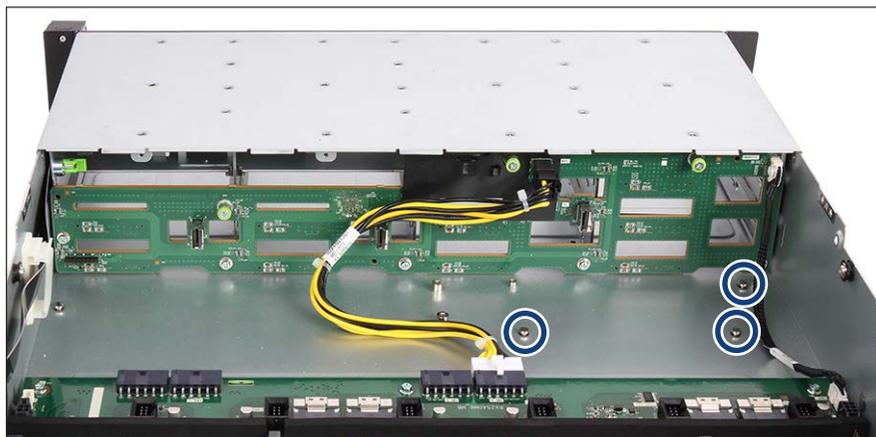


Figure 176: Bolts for the internal RAID riser module

- ▶ Notice the three bolts (see circles).

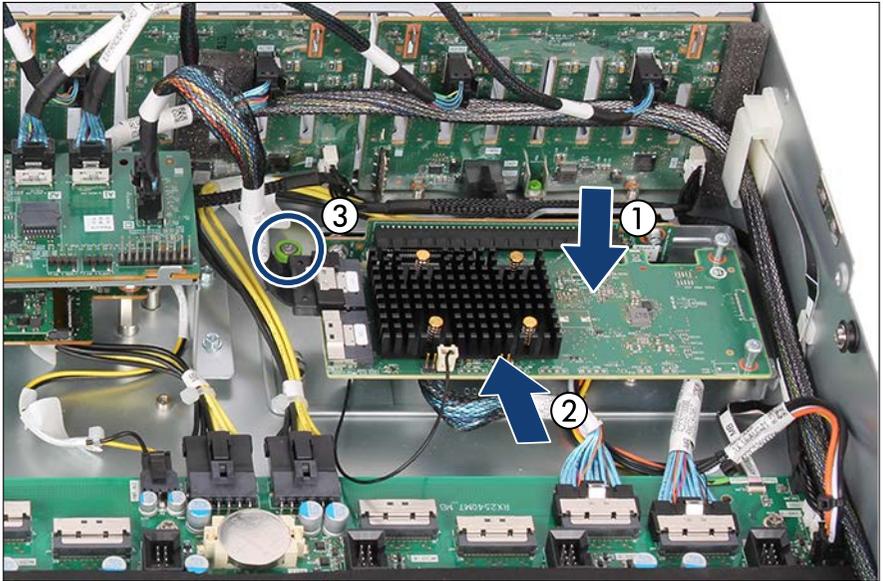


Figure 177: Installing the internal RAID riser module

- ▶ Place the internal RAID riser module on the three bolts (1).
- ▶ Push the internal RAID riser module to the front to engage the holes and the bolts (2).
- ▶ Fasten the Internal RAID riser module with the knurled screw (3).

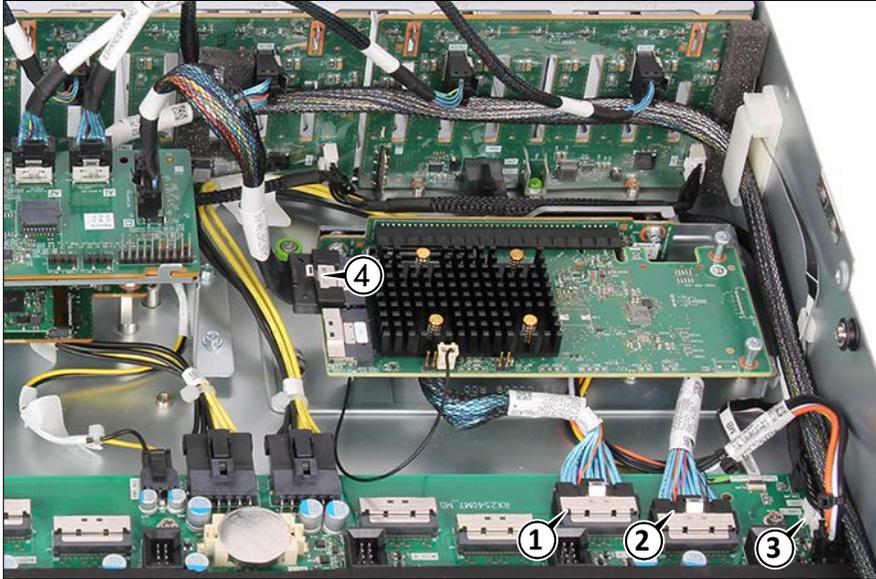


Figure 178: Connecting cables to the system board

► Connect the following cables:

- 1 Slim SAS cable to connector "MCIO2" on the system board
- 2 Slim SAS cable to connector "MCIO1" on the system board
- 3 Power cable to connector "PWR 1" on the system board
- 4 Slim SAS cable to connector "C0" / "P1" on the internal RAID controller

**i** The cables are equipped with labels showing the right connector.  
For the cable plan, see ["Appendix B" on page 569](#).

**!** **CAUTION**  
Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- Check the correct cabling using the labels on the cables and the cable plans.

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#)
- ▶ ["Updating expansion card firmware" on page 98.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 9.8.2 Removing an internal RAID riser module



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver

### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

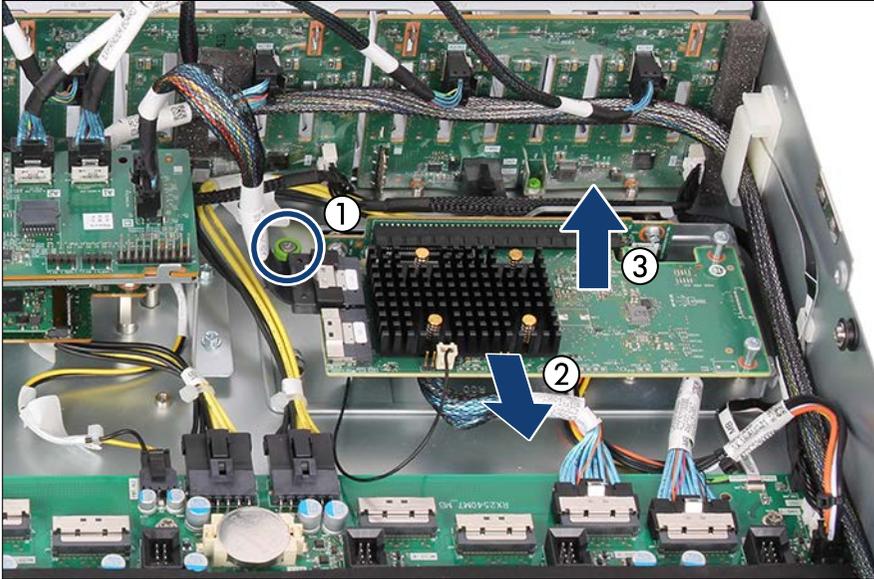


Figure 179: Removing the internal RAID riser module

- ▶ If necessary, disconnect the cables from the other components.
- ▶ Loosen the knurled screw (1).
- ▶ Push the internal RAID riser module in direction of the arrow to disengage the holes and the bolts (2).
- ▶ Take out the internal RAID riser module upward (3).
- ▶ If necessary, disconnect the cables from the internal RAID controller.

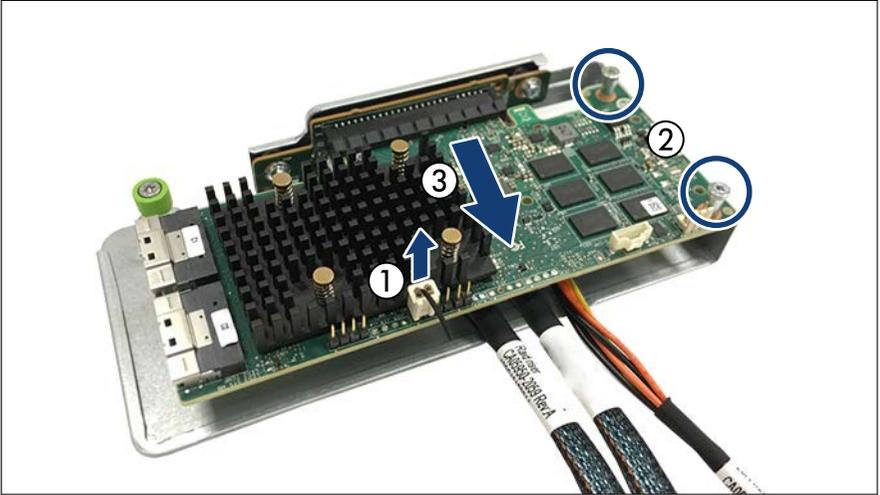
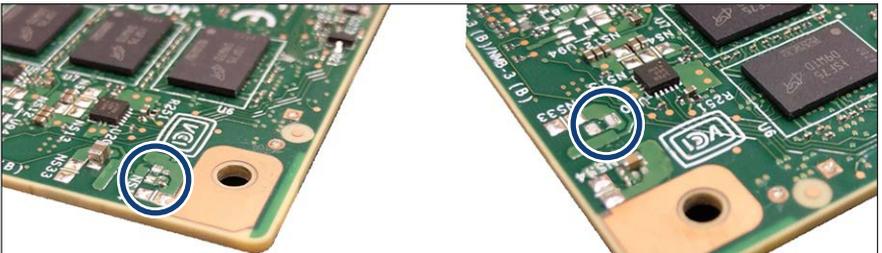


Figure 180: Removing the internal RAID controller

- ▶ Disconnect the HDD LED cable (1).
- ▶ Remove the two screws (2).
- ▶ Pull out the internal RAID controller from the riser card slot (3).



Remove the Internal RAID controller in a slight angle from the riser card slot. Otherwise, a capacitor under the Internal RAID controller could interfere with the Internal RAID riser module and fall off (see circles).



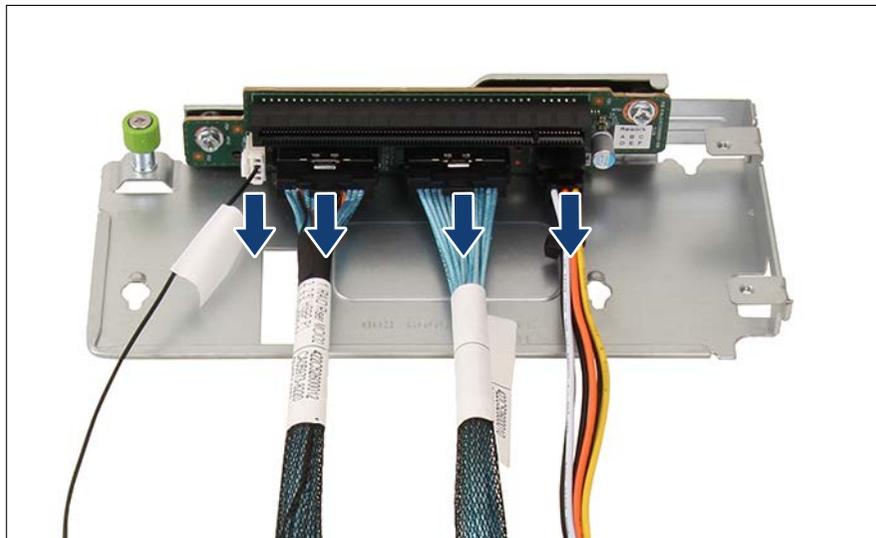


Figure 181: Disconnecting the cables

- ▶ Disconnect the four cables.

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 9.8.3 Replacing an internal RAID riser module



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Software: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

#### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)
- ▶ ["Locating the defective component" on page 48.](#)

#### Removing the defective expansion card

- ▶ Remove the internal RAID riser module, see ["Removing an internal RAID riser module" on page 307.](#)
- ▶ Remove the RAID controller, see ["Removing the internal RAID riser module" on page 308.](#)

#### Installing the new expansion card

- ▶ Install the RAID controller, see ["Installing the internal RAID riser module" on page 304.](#)
- ▶ Install the internal RAID riser module, see ["Installing the internal RAID riser module" on page 305.](#)

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ If applicable, connect external cables to the expansion card.
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Enabling replaced components in the BIOS" on page 102.](#)
- ▶ ["Updating expansion card firmware" on page 98.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 9.8.4 Replacing a riser card



**Field Replaceable Unit (FRU)**



**Hardware: 5 minutes**

<b>Tools:</b> Phillips PH2 / (+) No. 2 screw driver
---

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)
- ▶ ["Locating the defective component" on page 48.](#)

### Removing the defective riser card

- ▶ Remove the internal RAID riser module, see ["Removing an internal RAID riser module" on page 307](#).
- ▶ Remove the internal RAID riser card, see ["Removing the defective riser card" on page 313](#).

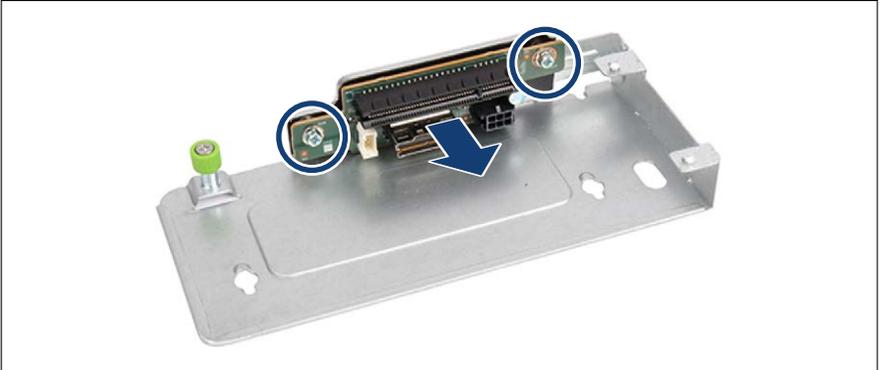


Figure 182: Removing the riser card

- ▶ Remove the two screws (see circles).
- ▶ Remove the riser card.

### Installing the new riser card

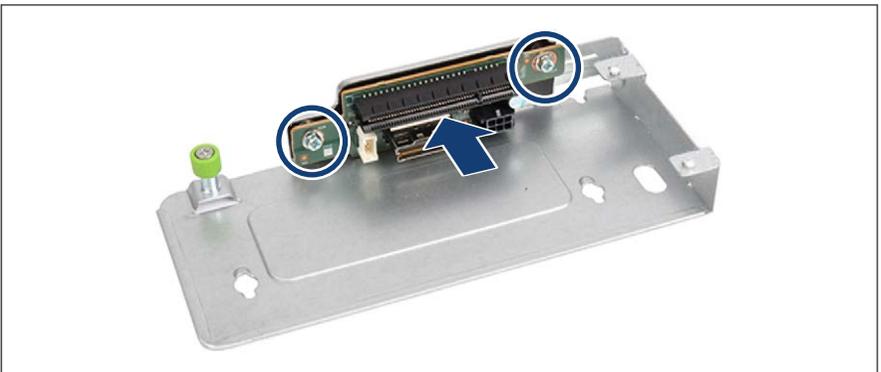


Figure 183: Installing the riser card

## Expansion cards and backup units

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- ▶ Insert the riser card.
- ▶ Fasten the riser card with two screws (see circles).
- ▶ Install the internal RAID riser card, see ["Installing the internal RAID riser module" on page 304](#).
- ▶ Install the internal RAID riser module, see ["Installing an internal RAID riser module" on page 297](#).

### Concluding steps

- ▶ ["Installing the fan cage" on page 77](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 9.9 Expansion cards in riser modules

### 9.9.1 Installing an expansion card in a riser module



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**  
**Software: 5 minutes**

- |   |
|---|
| <b>Tools:</b> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver</li><li>– Phillips PH1 / (+) No. 1 screw driver</li></ul> |
|---|

### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89](#).
- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).

- ▶ ["Getting access to the component" on page 55.](#)
- ▶ If a riser module is installed: Remove the corresponding riser module, see ["Removing a riser module" on page 72.](#)
- ▶ If no riser module is installed: Remove the corresponding rear air grid, see ["Removing a rear air grid" on page 85.](#)

### Installing the expansion card in a riser module



Figure 184: Removing the two slot covers

- ▶ Remove the two slot covers.



#### CAUTION

- ▶ Keep the slot cover for future use.
  - ▶ If the expansion card is removed and not replaced with a new one, the slot cover must be reinstalled due to cooling, to comply with applicable EMC regulations and to protect against fire.
- ▶ Please read the documentation supplied with the expansion card.
- ▶ If applicable, install a slot bracket to the expansion card, see ["Installing slot brackets" on page 249.](#)

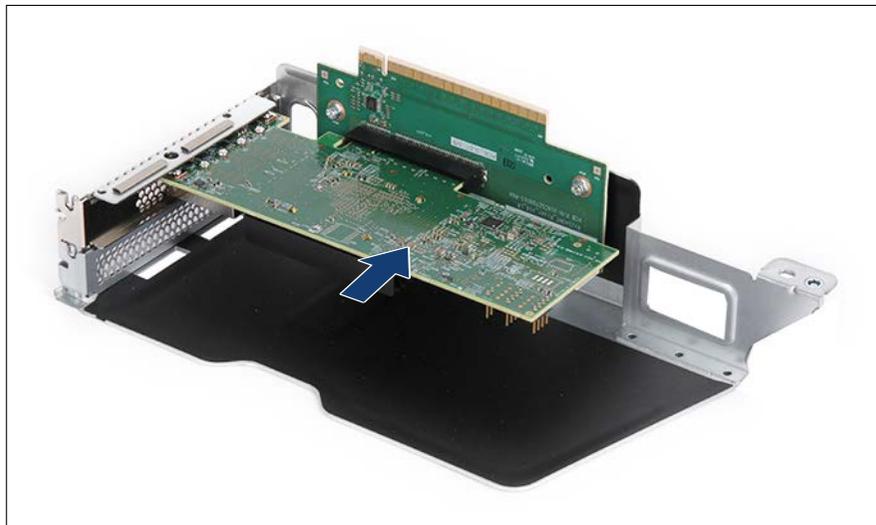


Figure 185: Installing the expansion card in a riser module

- ▶ Carefully insert the expansion card into the desired PCIe slot and press down firmly until it is fully seated in the slot.
- ▶ If applicable, install SFP+ transceiver modules into the new expansion card, see ["Installing SFP+ transceiver modules" on page 252](#).
- ▶ If applicable, connect the FBU cable to the FBU, see ["Installing an FBU" on page 325](#).



### CAUTION

Incorrect cabling may cause wrong LED identification of the HDD/SSD. Misleading LED could lead to swapping out the wrong HDD/SSD, and that will result in data loss.

- ▶ Check the correct cabling using the labels on the cables and the cable plans.

### Concluding steps

- ▶ Install the corresponding riser module, see ["Installing a riser module" on page 74](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).

- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113.](#)
- ▶ ["Updating expansion card firmware" on page 98.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 9.9.2 Removing an expansion card from a riser module



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes  
Software: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

#### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ Remove the corresponding riser module, see ["Removing a riser module" on page 72.](#)

#### Removing the expansion card from a riser module

- ▶ If necessary, disconnect the cables from the expansion card.
- ▶ If applicable, ["Removing SFP+ transceiver modules" on page 258.](#)

## Expansion cards and backup units

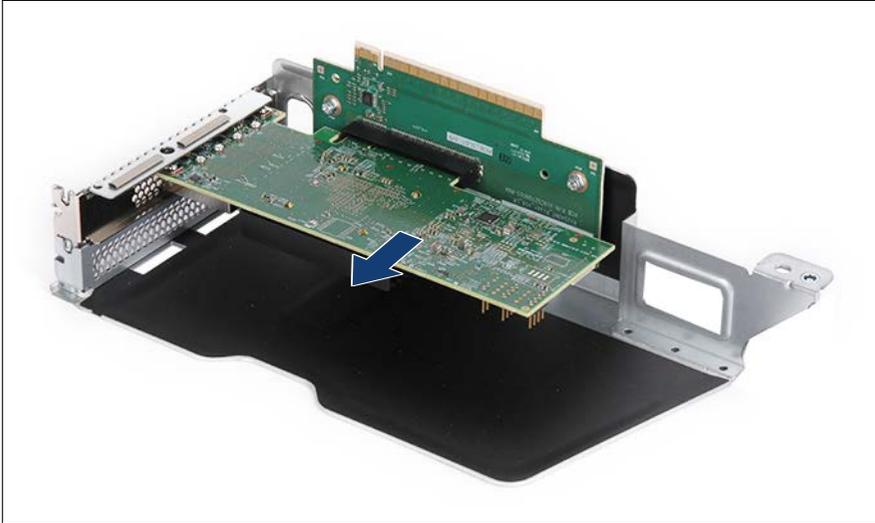


Figure 186: Removing the expansion card from a riser module

- Carefully remove the expansion card from its slot.



Figure 187: Installing the two slot covers

- If necessary, install the two slot covers.

### Concluding steps

- ▶ If applicable, install the corresponding riser module, see ["Installing a riser module" on page 74](#).
- ▶ If applicable, install the corresponding rear air grid, see ["Installing a rear air grid" on page 87](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).
- ▶ If applicable, update the system information of your server using the Chassis ID Prom Tool, see ["Using the Chassis ID Prom Tool" on page 113](#).
- ▶ ["Resuming BitLocker functionality" on page 107](#).

### 9.9.3 Replacing expansion cards from a riser module



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**  
**Software: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver

#### Note on network settings recovery



When replacing network controllers, network configuration settings in the OS will be lost and replaced by default values. This applies to all static IP address and LAN teaming configurations.

Ensure to note down your current network settings before replacing a network controller.

#### Preliminary steps

- ▶ ["Locating the defective server" on page 47](#).
- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).

## Expansion cards and backup units

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- ▶ If applicable, ["Configuring LAN teaming" on page 115.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ ["Checking boot priority" on page 93.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Locating the defective component" on page 48.](#)
- ▶ Remove the corresponding riser module, see ["Removing a riser module" on page 72.](#)

### Removing the defective expansion card

- ▶ Remove the expansion card, see ["Removing an expansion card" on page 279.](#)
- ▶ If the slot bracket on the defective expansion card is to be reused, remove it from the expansion card, see ["Removing slot brackets" on page 252.](#)

### Installing the new expansion card

- ▶ If applicable, install the slot bracket, see ["Installing slot brackets" on page 249.](#)
- ▶ Install the expansion card, see ["Installing an expansion card" on page 269.](#)

### Concluding steps

- ▶ Install the corresponding riser module, see ["Installing a riser module" on page 74.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ If applicable, connect external cables to the expansion card.
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Enabling replaced components in the BIOS" on page 102.](#)

- ▶ Inform the customer about changed WWN, MAC and SAS addresses, see ["Looking for MAC/WWN/GUID and SAS addresses"](#) on page 109.
- ▶ ["Updating the NIC configuration file in a Linux and VMware environment"](#) on page 106.
- ▶ ["Setting boot priority"](#) on page 120.
- ▶ ["Updating expansion card firmware"](#) on page 98.
- ▶ ["Resuming BitLocker functionality"](#) on page 107.
- ▶ If applicable, reconfigure your network settings in the operation system according to the original configuration of the replaced controller (expansion card or onboard).
  -  Configuration of network settings should be performed by the customer. For more information, see ["Note on network settings recovery"](#) on page 319.
- ▶ If applicable, restore LAN teaming configurations, see ["After replacing or upgrading LAN controllers"](#) on page 115.

### 9.9.4 Replacing a riser card



**Field Replaceable Unit (FRU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

#### Preliminary steps

- ▶ ["Locating the defective server"](#) on page 47.
- ▶ If applicable, ["Removing the front cover with lock"](#) on page 49.
- ▶ ["Shutting down the server"](#) on page 50.
- ▶ ["Disconnecting the power cord"](#) on page 50.
- ▶ ["Getting access to the component"](#) on page 55.
- ▶ ["Locating the defective component"](#) on page 48.

## Expansion cards and backup units

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- ▶ Remove the corresponding riser module, see ["Removing a riser module" on page 72](#).

### Removing the defective riser card

- ▶ Remove the expansion card, see ["Removing an expansion card" on page 279](#).

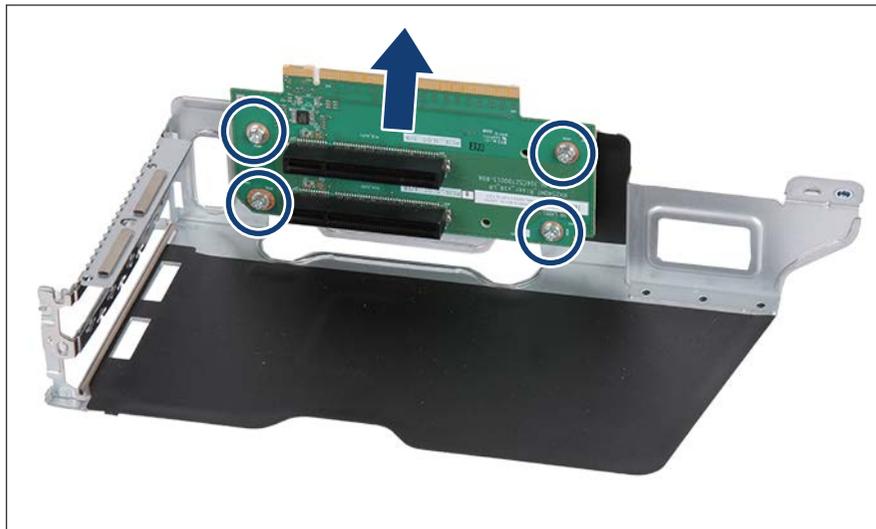


Figure 188: Removing the riser card

- ▶ Remove the four screws (see circles).
- ▶ Remove the riser card.

### Installing the new riser card

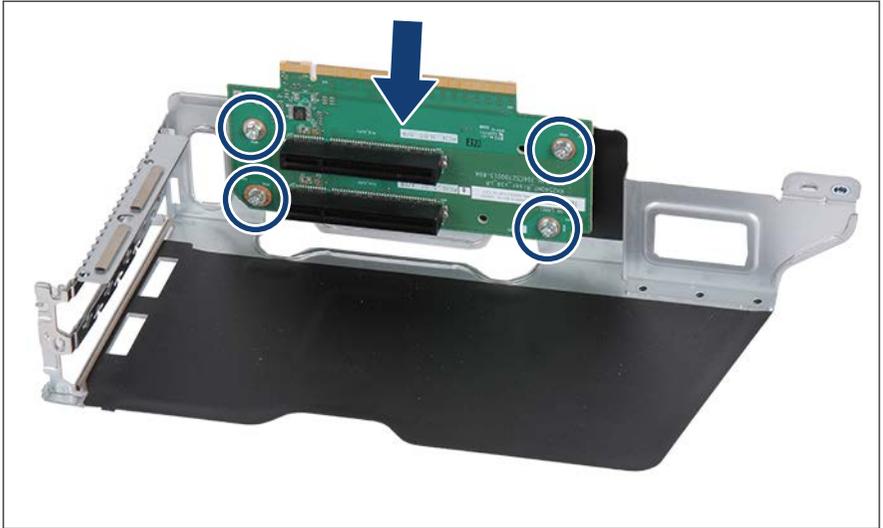


Figure 189: Installing the riser card

- ▶ Insert the riser card.
- ▶ Fasten the riser card with four screws (see circles).
- ▶ Install the expansion card, see ["Installing an expansion card" on page 269](#).

### Concluding steps

- ▶ Install the corresponding riser module, see ["Installing a riser module" on page 74](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 9.10 Flash backup unit (FBU)

### 9.10.1 Positions of the FBUs

You can install up to two FBUs.

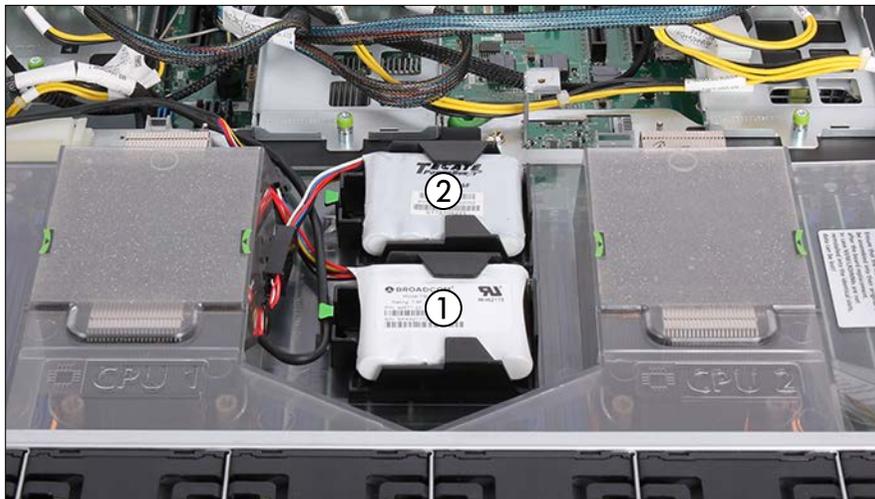


Figure 190: Positions of the FBUs - air duct

1 FBU 1

2 FBU 2

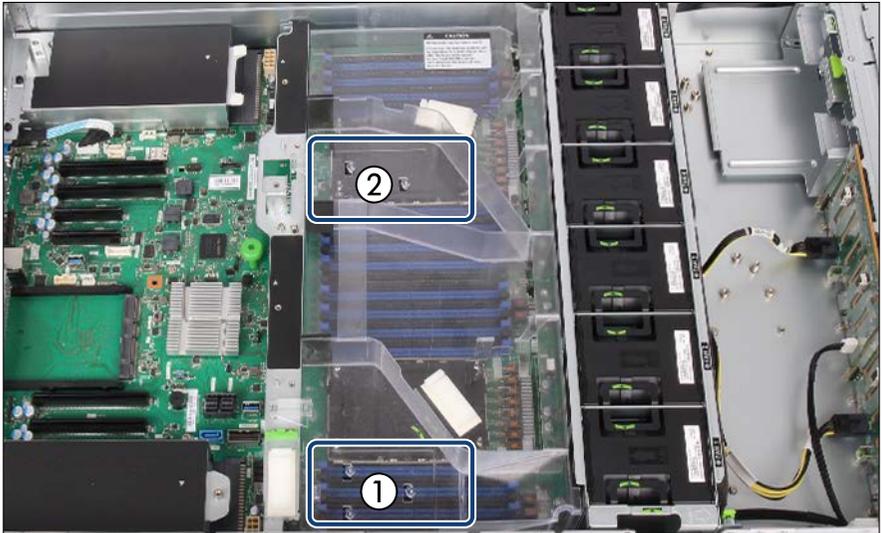


Figure 191: Positions of the FBUs - air duct

1 FBU 1

2 FBU 2

## 9.10.2 Installing an FBU



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (for cover 2)

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock"](#) on page 49.
- ▶ ["Shutting down the server"](#) on page 50.
- ▶ ["Disconnecting the power cord"](#) on page 50.
- ▶ ["Getting access to the component"](#) on page 55.

### Note for different types of FBU

There are different types of FBU, the procedure is identical.



Figure 192: FBU type 1

- ▶ Connect the FBU adapter cable (1) to the FBU cable (2).

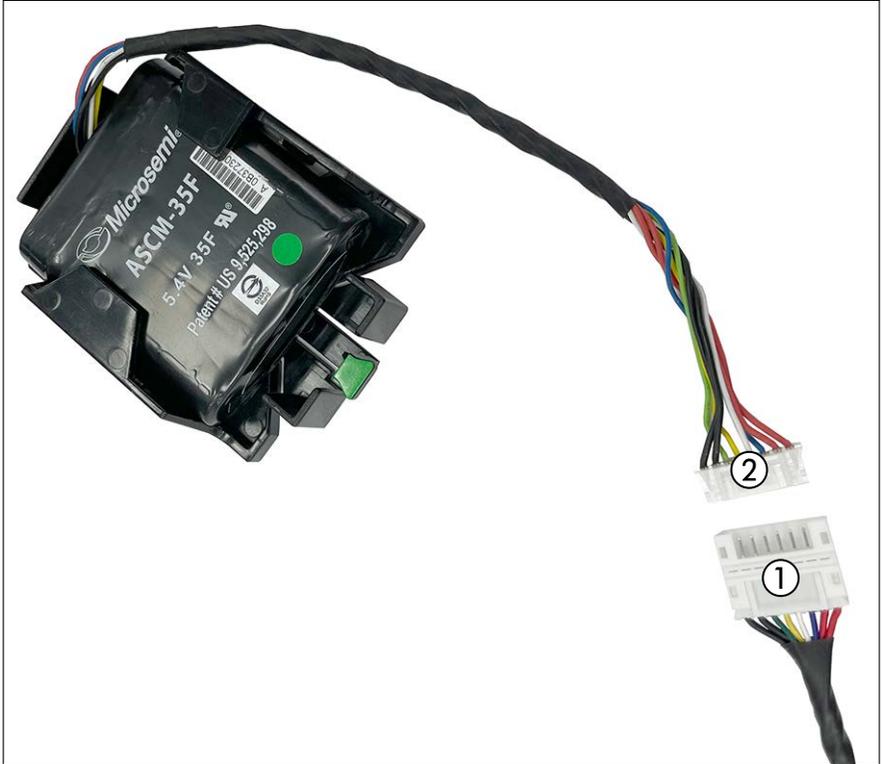


Figure 193: FBU type 2

- Depending of the configuration, connect the FBU extension cable (1) to the FBU cable (2).

## Expansion cards and backup units

### Installing the FBU in the FBU holder



Figure 194: Installing the FBU in the holder

- ▶ At a slight angle, fit the FBU under both retaining brackets of the FBU holder as shown.

Notice the right position of the FBU cable:



- ▶ Push in the FBU until it locks in place (1).
- ▶ Connect the FBU adapter cable to the FBU (2).
- ▶ If applicable, connect the FBU adapter cable to the corresponding RAID controller.

### Installing the FBU with the FBU holder

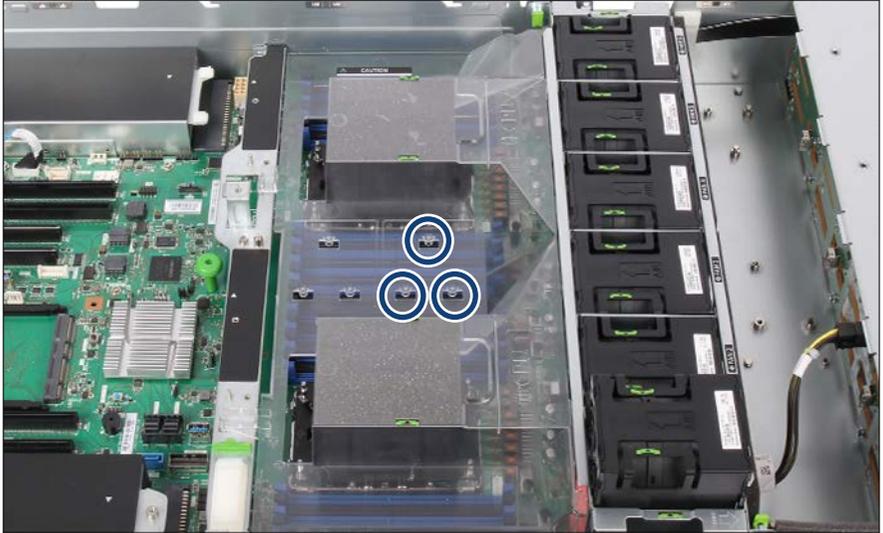


Figure 195: Bolts on the air duct

- Notice the three bolts on the air duct and key holes on the FBU holder (see circles). The FBU holder is fixed with the bolts and the keyholes on the air duct.

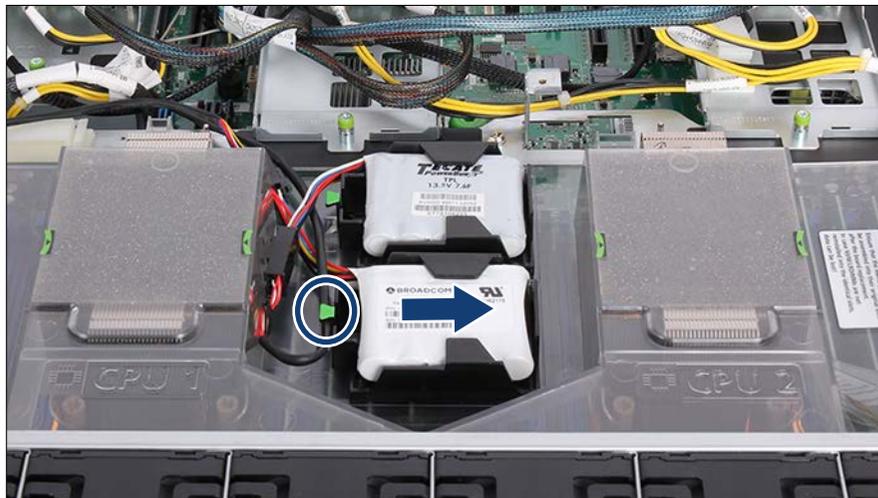


Figure 196: Installing the FBU with the FBU holder

- ▶ Insert the FBU with the holder and slide in direction of the arrow until the FBU holder engages (see circle).
- ▶ Install the RAID controller, see ["Installing an expansion card" on page 269](#).

### Concluding steps

- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).



The recalibration of the FBU starts automatically, and finishes within a few minutes.

- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

### 9.10.3 Removing an FBU



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (for cover 2)



### CAUTION

- ▶ Dispose of used battery properly. Keep away from children.
- ▶ Do not throw flash backup units into the trash can. Batteries must be disposed of in accordance with local regulations concerning special waste.

### Preliminary steps

- ▶ If applicable, "[Removing the front cover with lock](#)" on page 49.
- ▶ "[Shutting down the server](#)" on page 50.
- ▶ "[Disconnecting the power cord](#)" on page 50.
- ▶ "[Getting access to the component](#)" on page 55.

### Removing the FBU with the FBU holder

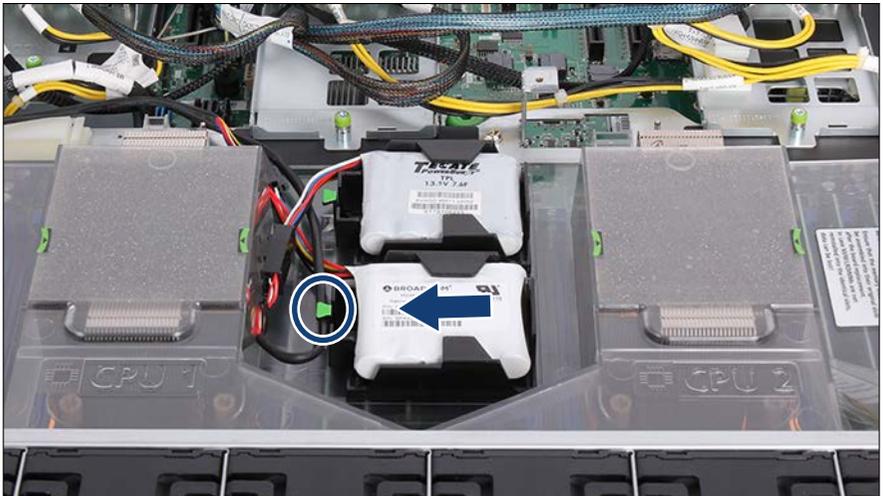


Figure 197: Removing the FBU with the FBU holder

## Expansion cards and backup units

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- ▶ Lift up the green locking handle on the holder (see circle) while sliding the holder in direction of the arrow as far as it will go.
- ▶ Remove the FBU holder from the system air duct.

### Removing the FBU



Figure 198: Removing the FBU from the holder

- ▶ Disconnect the FBU adapter cable (1).
- ▶ Remove the FBU from the holder (2).

### Concluding steps

- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.
- ▶ ["Switching on the server"](#) on page 71.
- ▶ If applicable, ["Installing the front cover with lock"](#) on page 71.

## 9.10.4 Replacing an FBU



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (for cover 2)



### CAUTION

- ▶ Dispose of used battery properly. Keep away from children.
- ▶ Do not throw flash backup units into the trash can. Batteries must be disposed of in accordance with local regulations concerning special waste.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)

### Removing the defective FBU

- ▶ Remove the FBU with the FBU holder, see ["Removing the FBU with the FBU holder" on page 331.](#)
- ▶ Remove the FBU from the FBU holder, see ["Removing the FBU from the holder" on page 332.](#)

### Installing the new FBU

- ▶ Install the FBU in the FBU holder and connect the FBU cable to the FBU, see ["Installing the FBU in the FBU holder" on page 328.](#)
- ▶ Install the FBU with the FBU holder, see ["Installing the FBU with the FBU holder" on page 329.](#)

### Concluding steps

- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)

## Expansion cards and backup units

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- ▶ ["Switching on the server" on page 71.](#)



The recalibration of the FBU starts automatically, and finishes within a few minutes.

- ▶ Verify whether the iRMC recognizes the installed FBU.
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

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# 10 Main memory

## 10.1 Safety notes



### CAUTION

- ▶ Before removing several memory modules, make sure that all memory modules can be reinstalled into their original slots. Otherwise, data may be lost.
- ▶ Do not install unsupported third party memory modules. For more information on supported memory modules, see "[Basic information](#)" on page 336. Doing so may cause electric shock, a fire, or failures.
- ▶ Memory modules remain hot after shutdown. Wait for components to cool down before installing or removing memory modules to prevent burns.
- ▶ Do not install and remove memory modules repeatedly. Doing so may cause failures.
- ▶ If the memory module has not been correctly installed, it may cause a fire. Install the memory module with attention.  
  
Pressing out the securing clips on the memory module connector will eject the installed memory module. To prevent damage and injuries eject memory modules carefully without applying excessive force.
- ▶ For more information, see "[Important information](#)" on page 33.

## 10.2 Basic information

### 10.2.1 Slots and features

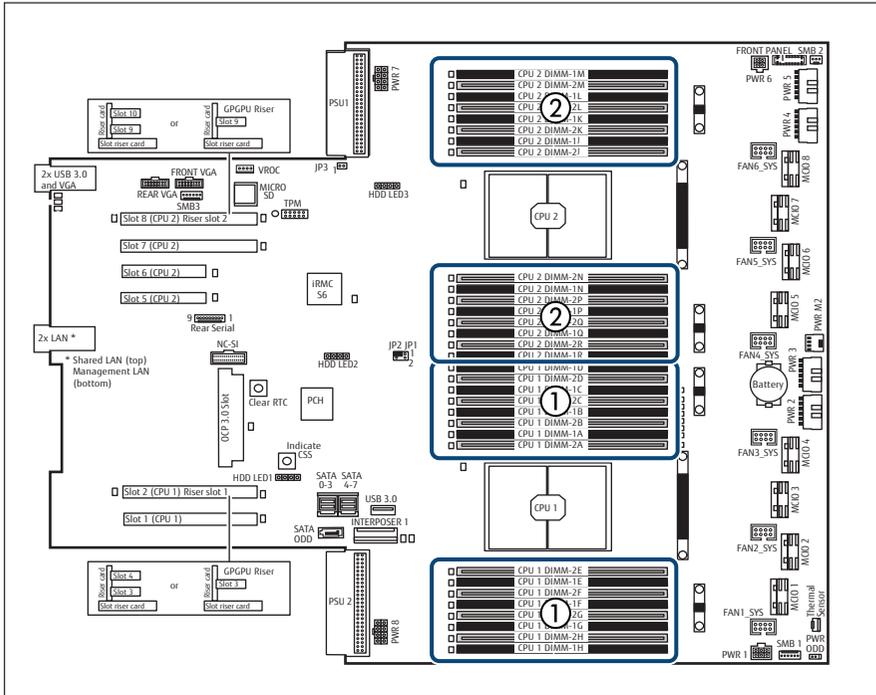


Figure 199: Slots of the main memory

- 1 CPU 1 memory slots
- 2 CPU 2 memory slots

### Memory configuration for 1DPC configuration

- Eight channel DDR5 memory architecture (per CPU), 1 DIMM slot per channel
- 16 memory DIMM sockets (8 per CPU)
- Supports non-3DS RDIMM, 3DS RDIMM and 9x4 RDIMM
- UDIMM, SODIMM and LRDIMM are not supported

- Supports DDR5 up to 4800 MT/s
- Up to 4 TB / 2 CPUs using DDR5 DIMM (256 GB x32)
- Error detection and correction (ECC)
- Single Device Data Correction (SDDC)
- ADDDC Sparing (Virtual lockstep mode)
- Channel mirroring within a socket
- Hardware memory scrubbing
- Lockstep mode is not supported by BIOS on this platform
- Rank Level Sparing is not supported

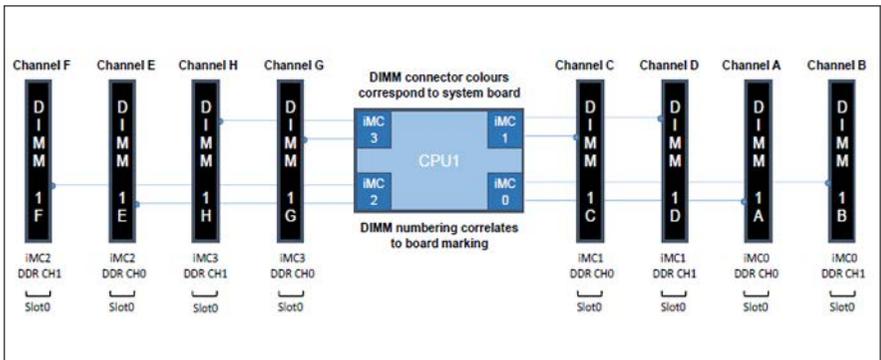


Figure 200: Memory slots of CPU 1

### Memory configuration for 2DPC configuration

- Eight channel DDR5 memory architecture (per CPU), 2 DIMM slots per channel
- 32 memory DIMM sockets (16 per CPU)
- Supports non-3DS RDIMM, 3DS RDIMM and 9x4 RDIMM
- UDIMM, SODIMM and LRDIMM are not supported
- Supports DDR5 up to 4800 MT/s
- Up to 8 TB / 2 CPUs using DDR5 DIMM (256 GB x32)
- Error detection and correction (ECC)

## Main memory

- Single Device Data Correction (SDDC)
- ADDDC Sparring (Virtual lockstep mode)
- Channel mirroring within a socket
- Hardware memory scrubbing
- Lockstep mode is not supported by BIOS on this platform
- Rank Level Sparring is not supported

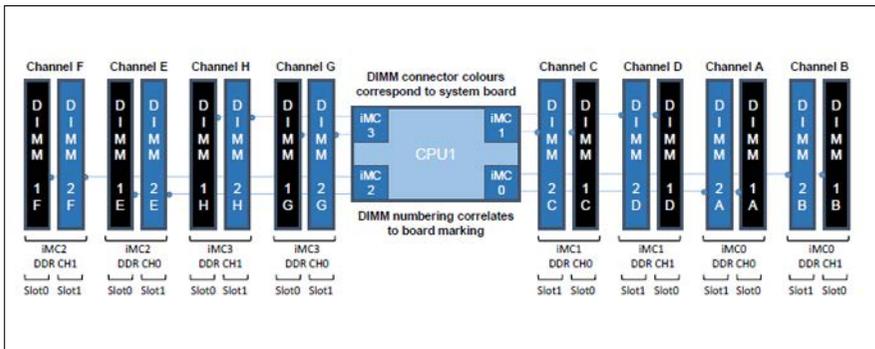


Figure 201: Memory slots of CPU 1

The notation of the CPUs, memory channels and DIMM sockets correspond to the silk print on the system board.

**i** For system relevant information, see the hardware configurator of your server available online at the following address:

[https://ts.fujitsu.com/products/standard\\_servers/index.html](https://ts.fujitsu.com/products/standard_servers/index.html)

For Japan:

<https://jp.fujitsu.com/platform/server/primergy/system/> (models on sale)

<https://jp.fujitsu.com/platform/server/primergy/product-navi/> (past models)

## 10.2.2 General memory population rules

### General memory population rules for 1DPC configuration

- All DIMMs must be DDR5 DIMMs modules.
- All DIMMs in a channel in across of a CPU socket must have the same number of ranks (unless explicitly specified otherwise).
- All DDR5 DIMMs must be in the same speed per CPU socket.
- Mixing of x8 DIMMs and x4 DIMMS is not allowed in the same channel or the same CPU socket.
- Mixing of non-3DS RDIMMs and 3DS RDIMMs is not allowed in platform.
- Mixing of 9x4 RDIMMs with other DIMMs is not allowed in platform.
- Mixing vendors in a system for RDIMMs and 3DS RDIMMs is allowed.
- DIMMs with different frequencies can be mixed in the system, but lowest frequency determines the system memory speed.
- There should be at least one DDR5 DIMM per CPU socket.
- If only one DIMM is populated in a channel, then populate it in the slot furthest away from CPU (i.e. the black slot).

DDR5 RDIMM (x4, x8)			
	Config Set A	Config Set B	Possible Rank Mixes: Slot0, Slot1
	Slot0	Slot0	
DDR CH0	x8	x4	(No Slot1 implemented)
DDR CH1	None or same as DDR CH0	None or same as DDR CH0	Single Rank Dual Rank

Figure 202: Mixing of DIMM within an iMC - RDIMM

## Main memory

DDR5 RDIMM 3DS (x4)		
	Config Set A	Possible Rank Mixes: Slot0, Slot1
	Slot0	
DDR CH0	x4	(No Slot1 implemented)
DDR CH1	None or same as DDR CH0	Quad Rank Octal Rank

Figure 203: Mixing of DIMM within an iMC - 3DS RDIMM

### General memory population rules for 2DPC configuration

- All DIMMs must be DDR5 DIMMs modules.
- All DIMMs in a channel in across of a CPU socket must have the same number of ranks (unless explicitly specified otherwise).
- All DDR5 DIMMs must be in the same speed per CPU socket.
- Mixing of x8 DIMMs and x4 DIMMS is not allowed in the same channel or the same CPU socket.
- Mixing of non-3DS RDIMMs and 3DS RDIMMs is not allowed in platform.
- Mixing of 9x4 RDIMMs with other DIMMs is not allowed in platform.
- Rank mixing is not allowed on a channel except for 1 Rank + 2 Rank combination (non 3DS) or 4 Rank + 8 Rank combination(3DS), when all 16 DIMMs for a CPU socket are populated.
- Mixing vendors in a system for RDIMMs and 3DS RDIMMs is allowed.
- DIMMs with different frequencies can be mixed in the system, but lowest frequency determines the system memory speed.
- There should be at least one DDR5 DIMM per CPU socket.
- If only one DIMM is populated in a channel, then populate it in the slot furthest away from CPU (i.e. the black slot).

		Config Set A		Config Set B		Possible Mixes: Slot0, Slot1
		Slot0	Slot1	Slot0	Slot1	
DDR CH0	Pattern1	x8	None	x4	None	Single Rank, None.
	Pattern2	x8	x8	x4	x4	Single Rank, Single Rank.
DDR CH1		None or same as DDR CH0		None or same as DDR CH0		Dual Rank, None. Dual Rank, Dual Rank. Dual Rank, Single Rank. *

\*16 DIMM for a Processor socket is populated

Figure 204: Mixing of DIMM within an iMC - RDIMM

		Config Set A		Possible Mixes: Slot0, Slot1
		Slot0	Slot1	
DDR CH0	Pattern1	x4	None	Quad Rank, None.
	Pattern2	x4	x4	Quad Rank, Quad Rank.
DDR CH1		None or same as DDR CH0		Octal Rank, None. Octal Rank, Octal Rank. Octal Rank, Quad Rank. *

\*16 DIMM for a Processor socket is populated

Figure 205: Mixing of DIMM within an iMC - 3DS RDIMM



For memory population rules, see the hardware configurator of your server, available online at the following address:

<https://www.fujitsu.com/fts/products/computing/servers/primergy/index.html>

For Japan:

<https://jp.fujitsu.com/platform/server/primergy/system/> (models on sale)

<https://jp.fujitsu.com/platform/server/primergy/product-navi/> (past models)

## 10.2.3 DDR5 only - memory population rules

### DDR5 only - memory population rules, 1DPC configuration

- Unbalanced configurations can lead to significantly reduced bandwidth because the system will fracture the memory space into multiple regions.
- If two DIMMs with different capacity are installed in one channel, the one with higher capacity has to be placed in slot 1 of a channel. E.g. 1A, 1B, ....

## Main memory

– Rank sparing mode is not supported.

**i** For more information, see the "Fujitsu Server PRIMERGY Option Product System Configuration Diagram (Notes)".

CPU type		CPU	CPU <sub>n</sub>							
Standard CPU (No HBM)	HBM CPU	iMC	0		1		2		3	
		DDR CH	0	1	0	1	0	1	0	1
		Slot	0	0	0	0	0	0	0	0
		Socket (CPU1)	1A	1B	1C	1D	1E	1F	1G	1H
		#DIMMs								
	V	0								
V	V	1	D							
V	V	1				D				
V		1		D						
V		1					D			
V	V	2	D						D	
V	V	2			D		D			
V	V	4	D	D	D	D		D		
V		6	D		D	D	D	D	D	
V		6	D	D	D		D		D	D
V		6		D	D	D	D	D		D
V		6	D	D		D		D	D	D
V	V	8*	D	D	D	D	D	D	D	D

Figure 206: Normal mode

D	DDR5 DIMM is installed
*	SGX is supported

CPU type		CPU	CPU <sub>n</sub>							
Standard CPU (No HBM)	HBM CPU	iMC	0		1		2		3	
		DDR CH	0	1	0	1	0	1	0	1
		Slot	0	0	0	0	0	0	0	0
		Socket (CPU1)	1A	1B	1C	1D	1E	1F	1G	1H
		#DIMMs								
V	V	8*	D	D	D	D	D	D	D	D

Figure 207: Mirroring mode

D	DDR5 DIMM is installed
---	------------------------

*	SGX is supported
---	------------------

The DIMM population will exactly be identical for the mirrored channels.

### DDR5 only - memory population rules, 2DPC configuration

- Unbalanced configurations can lead to significantly reduced bandwidth because the system will fracture the memory space into multiple regions.
- If two DIMMs with different capacity are installed in one channel, the one with higher capacity has to be placed in slot 1 of a channel. E.g. 1A, 1B, ....
- Channel capacities - limited to 2 different Channel capacities per processor socket. This rule is not checked by BIOS. However, violating this rule may result in populated memory not being mapped and therefore not available for system use.
- Rank sparing, ADDDC, channel mirroring, hemisphere modes are not supported with SGX.
- Rank sparing mode is not supported.
- SPR+HBM does not support hemi/SNC2 modes



For more information, see the "Fujitsu Server PRIMERGY Option Product System Configuration Diagram (Notes)".

## Main memory

CPU type		CPU	CPU <sub>n</sub>															
Standard CPU (no HBM)	HBM CPU	iMC	0		1		2		3		0		1		0		1	
		DDR CH	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
		Slot	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1															
		Socket (CPU1)	1A	2A	1B	2B	1C	2C	1D	2D	1E	2E	1F	2F	1G	2G	1H	2H
		#DIMMs																
	V	0																
V	V	1	D															
V	V	1								D								
V	V	1			D													
V	V	1										D						
V	V	2	D												D			
V	V	2					D			D								
V	V	4	D				D			D					D			
V	V	6	D				D		D		D		D		D			
V	V	6	D		D		D		D		D		D		D		D	
V	V	6			D		D		D		D		D		D		D	
V	V	6	D		D		D		D		D		D		D		D	
V	V	8*	D	D	D		D	D	D		D	D	D		D	D	D	
V	V	12	D	D	D		D	D	D		D	D	D		D	D	D	
V	V	12	D		D	D	D		D	D		D	D	D		D	D	D
V	V	16*	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

Figure 208: Normal mode

D	DDR5 DIMM is installed
*	SGX is supported

CPU type		CPU	CPU <sub>n</sub>															
Standard CPU (no HBM)	HBM CPU	iMC	0		1		2		3		0		1		0		1	
		DDR CH	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
		Slot	0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1															
		Socket (CPU1)	1A	2A	1B	2B	1C	2C	1D	2D	1E	2E	1F	2F	1G	2G	1H	2H
		#DIMMs																
V	V	8	D		D		D		D		D		D		D		D	
V	V	16	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

Figure 209: Mirroring mode

D	DDR5 DIMM is installed
---	------------------------

The DIMM population will exactly be identical for the mirrored channels.  
SGX is not supported.

## 10.3 Installing memory modules



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (for cover 2)



### CAUTION

- ▶ Use only released configurations to ensure a faultless operation of the system.
- ▶ Before changing the memory configuration, verify if the configuration is released. Please contact your sales outlet or our customer service center.

### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the air duct" on page 80.](#)

### Selecting the memory slot

- ▶ Choose the memory slot according to the configuration rules, see ["Basic information" on page 336.](#)

### Removing the memory dummy module

- ▶ If applicable, remove a dummy module, see ["Removing a memory dummy module" on page 351.](#)

### Installing a memory module

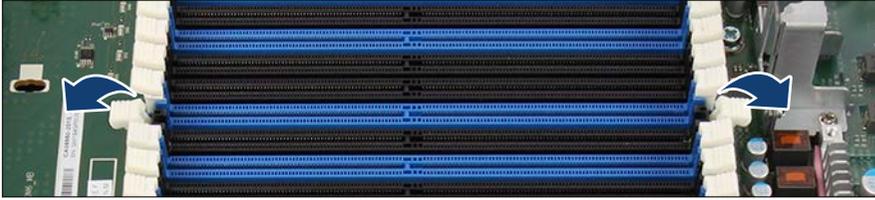


Figure 210: Opening the securing clips

- ▶ Press the securing clips on both sides of the memory slot concerned outward.
- ▶ If applicable, remove the dummy module.

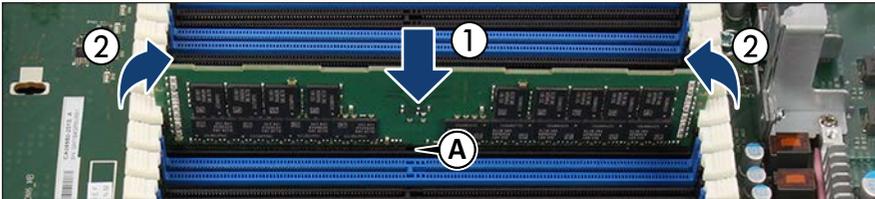


Figure 211: Installing a memory module

- ▶ Align the notch (A) on the bottom of the module with the crossbar in the slot.
- ▶ Press down on the memory module (1) until the securing clips snap into the cutouts at each end of the module (2).

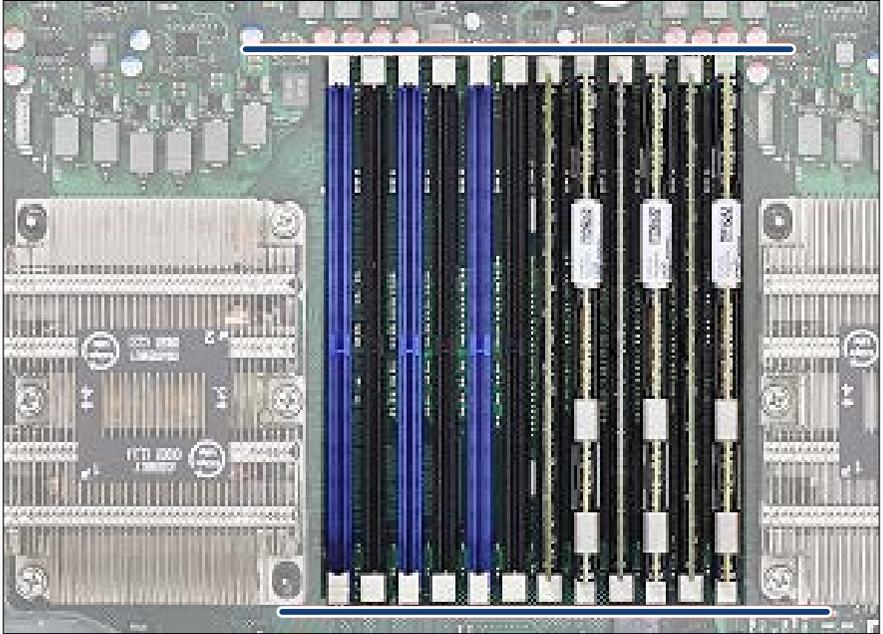


Figure 212: Correct position of securing clips

**i** To improve the contact of the memory module perform the following steps:

- ▶ Eject the memory module again by pressing out the securing clips at each end of the memory slot.
- ▶ Press down on the memory module until the securing clips snap into the cutouts at each end of the module.
- ▶ Check if all securing clips are in the correct position, see [Figure 212](#).

### Concluding steps

- ▶ ["Installing the air duct" on page 79.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)

## Main memory

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- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 10.4 Removing memory modules



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver (for cover 2)



### CAUTION

- ▶ Use only released configurations to ensure a faultless operation of the system.
- ▶ Before changing the memory configuration, verify if the configuration is released. Please contact your sales outlet or our customer service center.

### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the air duct" on page 80.](#)

## Removing a memory module

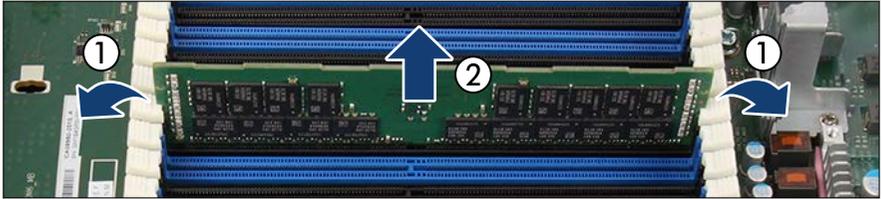


Figure 213: Removing memory modules

- ▶ Eject the desired memory module by pressing out the securing clips at each end of the memory slot (1).
- ▶ Remove the ejected memory module (2).
- ▶ If applicable, install a dummy module, see ["Installing a memory dummy module"](#) on page 351.

### Concluding steps

- ▶ ["Installing the air duct"](#) on page 79.
- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.
- ▶ ["Switching on the server"](#) on page 71.
- ▶ If applicable, ["Installing the front cover with lock"](#) on page 71.
- ▶ ["Resuming BitLocker functionality"](#) on page 107.

## 10.5 Replacing memory modules



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (for cover 2)



### CAUTION

- ▶ Use only released configurations to ensure a faultless operation of the system.
- ▶ Before changing the memory configuration, verify if the configuration is released. Please contact your sales outlet or our customer service center.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the air duct" on page 80.](#)
- ▶ ["Locating the defective component" on page 48.](#)

### Removing the defective memory module

- ▶ Remove the memory module, see ["Removing memory modules" on page 348.](#)

### Installing the new memory module

- ▶ Install the memory module, see ["Installing memory modules" on page 345.](#)

### Concluding steps

- ▶ ["Installing the air duct" on page 79.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ Verify whether the iRMC recognizes the installed memory modules.

- ▶ If applicable, "Installing the front cover with lock" on page 71.
- ▶ "Resuming BitLocker functionality" on page 107.

**i** After replacing memory modules, the **Memory Status** of them are reset to **Enabled** automatically and CSS LED is off.

If CSS LED is blinking after they are replaced, check the **Memory Status** in the **Configuration** menu of the BIOS.

## 10.6 Handling memory dummy modules

**i** It is required to install dummy modules in free memory slots. There are different dummy modules available. The variants can be mixed.

### Removing a memory dummy module

- ▶ Eject the desired dummy module by pressing out the securing clips at each end of the memory slot.
- ▶ Remove the ejected dummy module.

### Installing a memory dummy module

- ▶ Press the securing clips on both sides of the memory slot concerned outward.

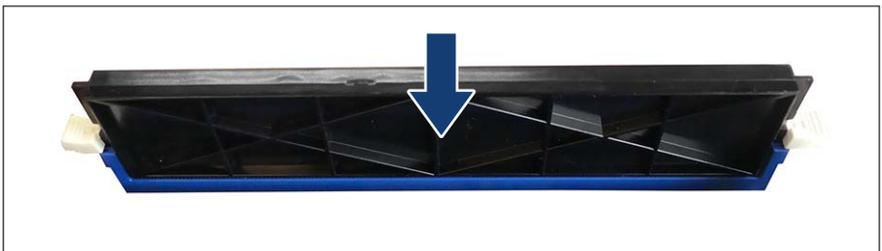


Figure 214: Installing a memory dummy module - variant 1

## Main memory

---

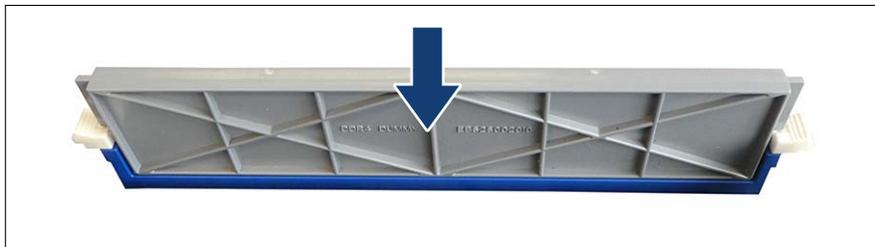


Figure 215: Installing a memory dummy module - variant 2

- ▶ Align the notch on the bottom of the module with the crossbar in the slot.
- ▶ Press down on the dummy module until the securing clips snap into the cutouts at each end of the module.



If the second CPU (CPU2) is not installed, install memory dummy modules in memory slots corresponding to the CPU2 socket or install a CPU dummy cover on the CPU2 socket.

If the CPU dummy cover is installed, the memory dummy modules cannot be installed in the memory slots, as the CPU dummy cover is installed in two memory slots located next to the socket and blocks all the memory slots from being used. The installation of the dummy cover on the second CPU slot allows you to avoid unexpected thermal conditions.

---

# 11 Processor (CPU)

## 11.1 Safety notes



### CAUTION

- ▶ Do not install unsupported CPUs. For more information on supported CPUs, see ["Basic information" on page 354](#).
- ▶ Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic sensitive devices (ESDs).
- ▶ Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- ▶ When removing or installing CPUs, be careful not to touch or bend the spring contacts on the CPU sockets.
- ▶ Never touch the underside of the CPUs. Even minor soiling such as grease from the skin can impair the CPU's operation or destroy the CPUs.
- ▶ For more information, see ["Important information" on page 33](#).

## 11.2 Basic information

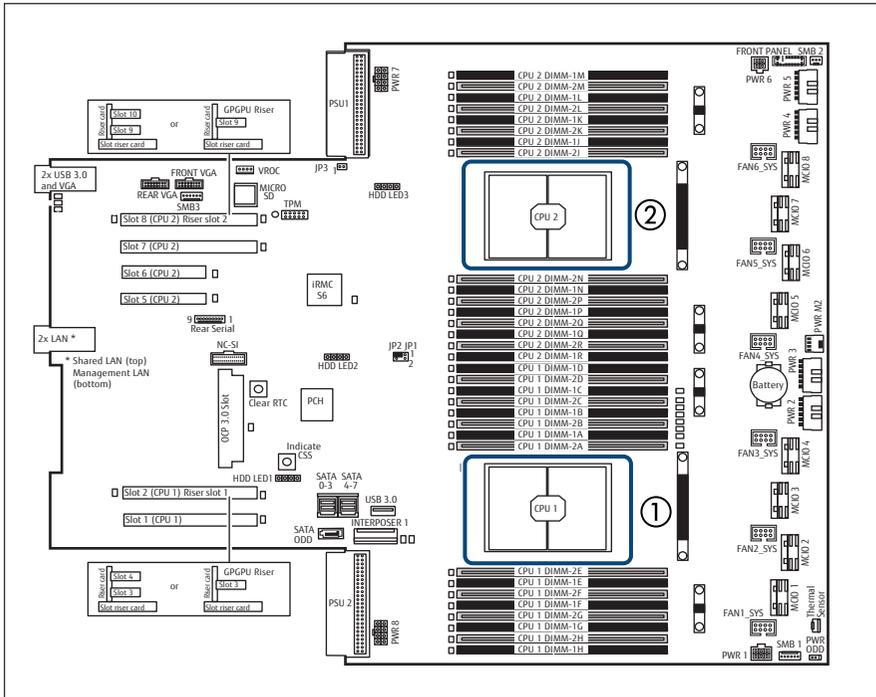


Figure 216: Overview CPU slots

- 1 CPU 1
- 2 CPU 2

### Supported CPUs

- up to two Intel® Xeon® CPUs (Platinum, Gold, Silver)
- up to 16 GT/s data rate 4 UPI channels
- both CPUs must be of the same type



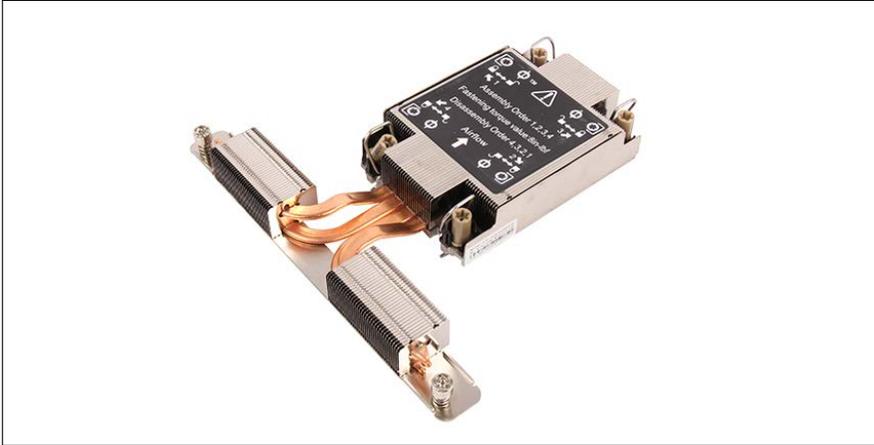


Figure 218: EVAC CPU heat sink

### 11.3 Upgrading to 2 CPUs configuration



**Upgrade and Repair Unit (URU)**



**Hardware: 15 minutes**  
**Software: 5 minutes**

- Tools:**
- Phillips PH2 / (+) No. 2 screw driver (for cover 2)
  - Torx 30 screw driver (for CPU heat sink)



#### **CAUTION**

CPUs are extremely sensitive to electrostatic discharge and therefore must always be handled with care.

- ▶ After a CPU has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface.
- ▶ Never push a CPU over a surface.



#### **CAUTION**

- ▶ Only CPUs of the same type may be used on the system board. That means the number of the internal CPU cores as well as the primary clock and the QPI frequency have to be the same.
- ▶ For dual operation, use a suitable multiprocessor OS.

### Preliminary steps

- ▶ "Suspending BitLocker functionality" on page 89.
- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.
- ▶ "Getting access to the component" on page 55.
- ▶ "Removing the air duct" on page 80.
- ▶ "Removing the CPU dummy cover" on page 369.



Save the CPU dummy cover for future use.

### Removing the CPU socket cover

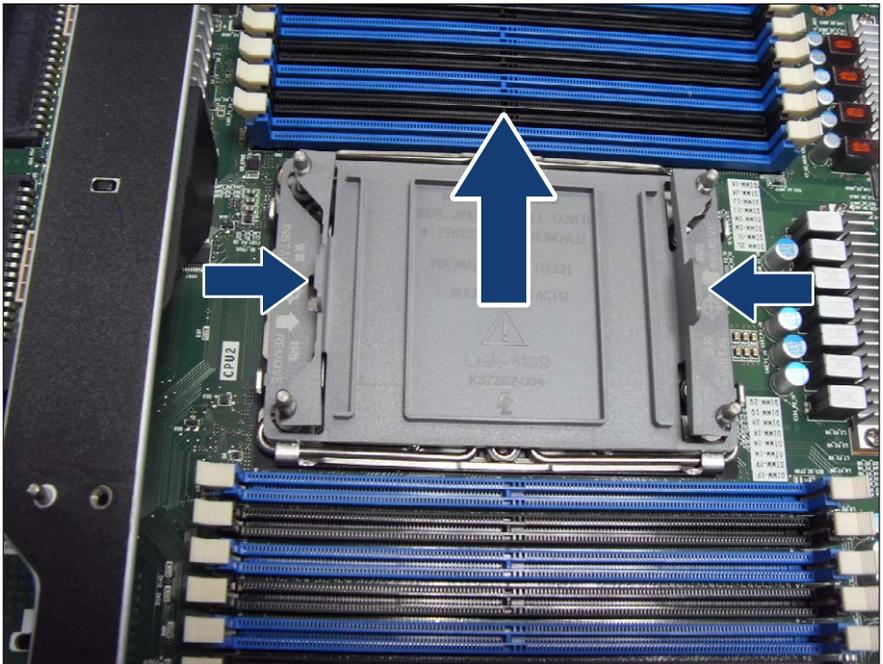


Figure 219: Removing the CPU socket cover

## Processor (CPU)

---

- ▶ Press in the latches and remove the CPU socket cover.
- ▶ Save the CPU socket cover for future use.

### Installing the CPU



#### CAUTION

When replacing a system board

- ▶ Use a magnifying glass (recommended) to inspect the socket spring contacts for damages from different angles. Do not use the spare system board if any irregularities are visible. Possible damages:
  - Contact spring is bent backwards upon itself
  - Contact spring tip position is shifted or out of alignment
- ▶ Never try to fix bent contact springs. Doing so may result in loss of electrical performance and reliability.



Figure 220: CPU in packaging

- ▶ Leave the CPU in its original packaging.



Figure 221: Installing the CPU frame on the CPU

- ▶ Click the CPU frame into the CPU. Ensure that the triangle marks on CPU and on CPU frame are on the same edge (see circles).
- ▶ Ensure that the CPU fits in its place.

### Installing the heat sink

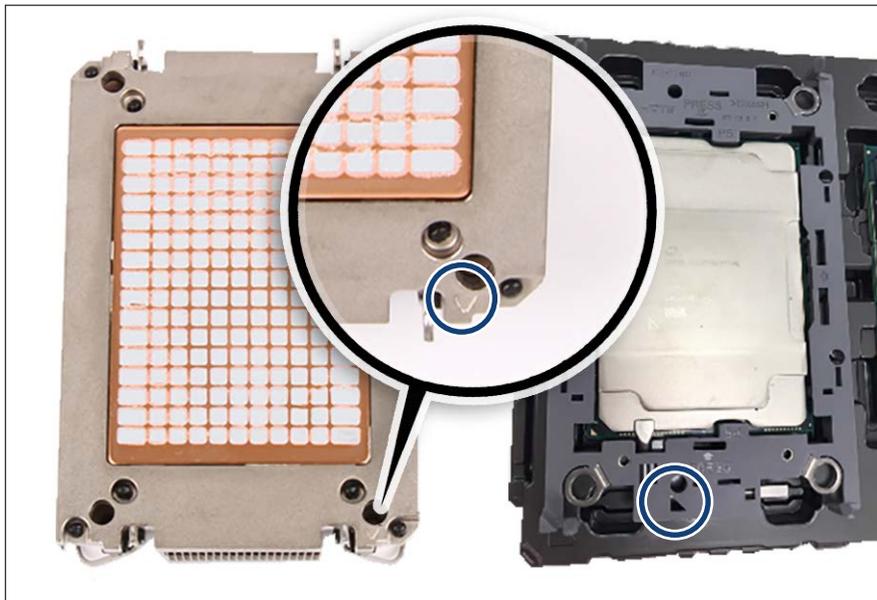


Figure 222: Marks on heat sink and CPU frame

- ▶ If applicable, remove the protective cover from the heat sink.
- ▶ If using a heat sink again, clean residual thermal paste from the heat sink surface using a lint-free cloth.
- ▶ Ensure that the triangle marks on the heat sink and on CPU frame are on the same edge (see circles).

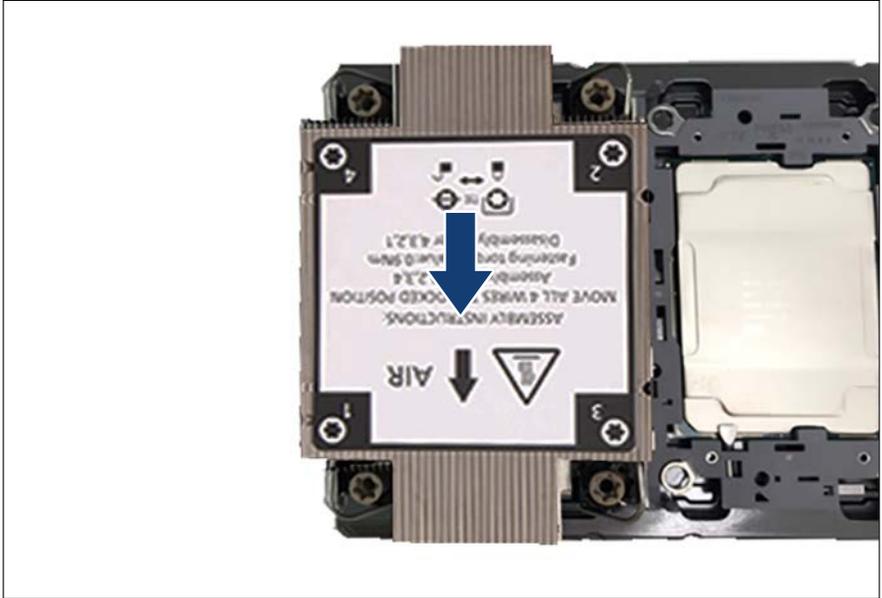


Figure 223: Installing the heat sink onto the CPU frame

- Place the heat sink onto the CPU frame.

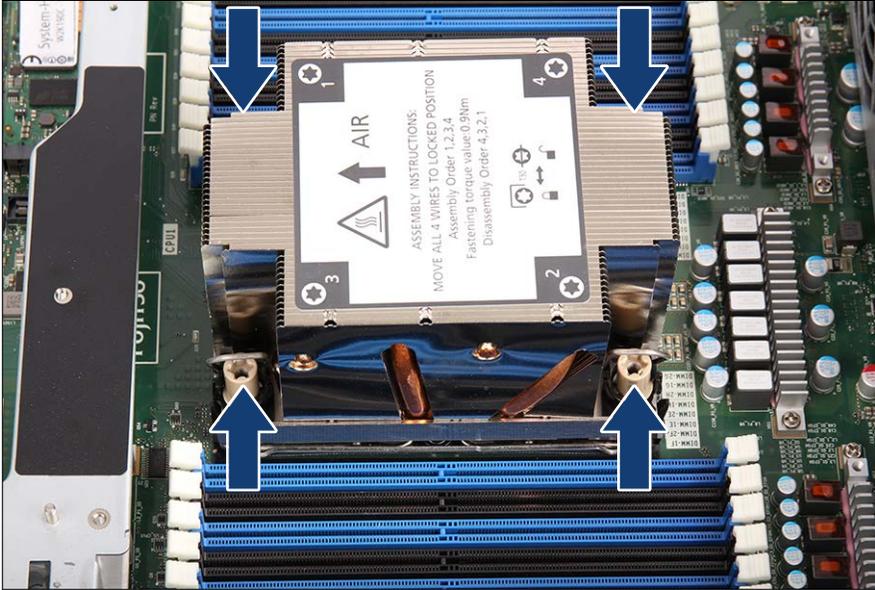


Figure 224: Installing the heat sink (A)

- ▶ Push the four latches inward (see arrows).
- ▶ Carefully place the heat sink onto the CPU socket.



Take care of air flow direction.

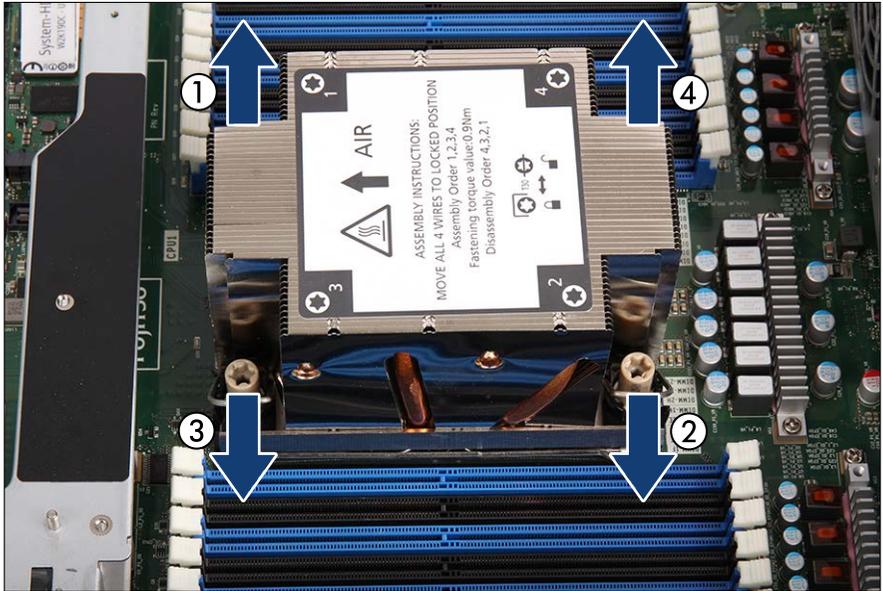


Figure 225: Installing the heat sink (B)

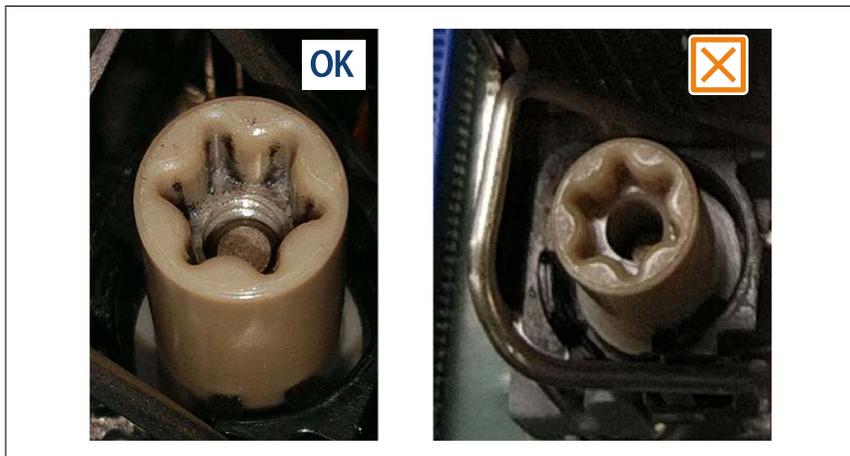
- ▶ Push the four latches outward (see arrows).
- ▶ Fasten the four captive screws in the sequence printed on the heat sink (1 to 4), by proceeding as follows:  
Torque: 0.9 Nm -1.0 Nm
  - ▶ First, tighten the captive screw 1 to 50 %, then tighten the captive screw 2 to 50 % .
  - ▶ After that, tighten the captive screw 3 to 50 %, then tighten the captive screw 4 to 50 % .
  - ▶ Finally, tighten the captive screws in the sequence 1-2-3-4 completely.

## Processor (CPU)

---

Note when tightening the screws of the CPU heat sink:

- ▶ As shown in the figure below, tighten the screws while checking the screw tip until it is visible through the screw hole.



- ▶ When you reach the above position, hold the screw driver with two fingers and tighten the screw firmly.

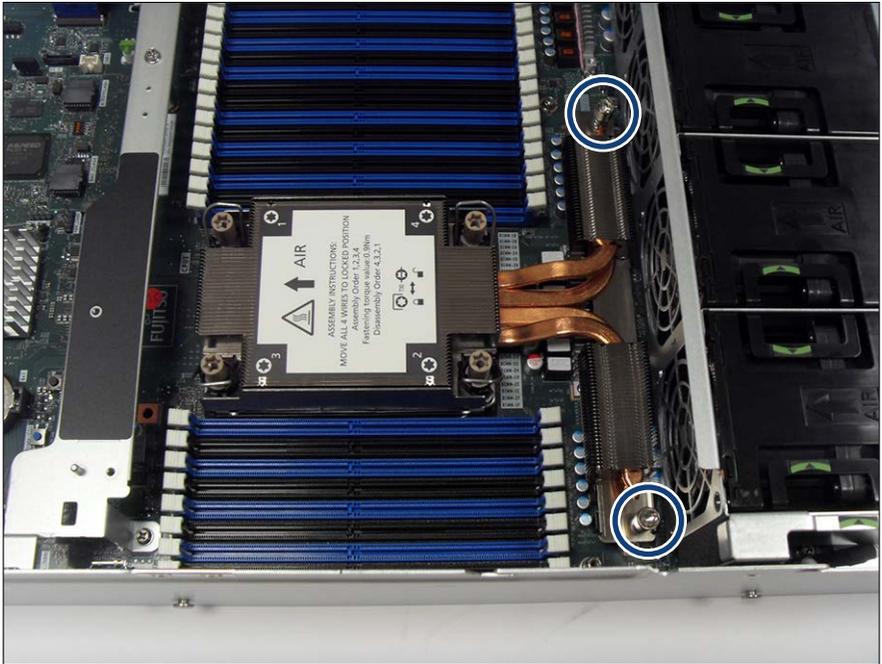


Figure 226: Installing the EVAC CPU heat sink

- ▶ Install the EVAC CPU heat sink in the same way.
- ▶ Fasten the two additional screws in any order (see circles).

Torque: 0.6 Nm

### Upgrading the main memory

- ▶ Select an adequate memory configuration for "2 CPUs populated", see ["Basic information" on page 354](#).
- ▶ Install memory modules, see ["Installing memory modules" on page 345](#).
- ▶ Install dummy memory modules in empty slots, see ["Installing memory modules" on page 345](#).

### Installing three additional fan modules

- ▶ Install three fan modules in bays 4, 5 and 6, see ["Installing the fan module" on page 244](#).

### Concluding steps

- ▶ ["Installing the air duct" on page 79.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)



When the system is powered on after a CPU has been replaced or upgraded, the Global Error indicator will start flashing with the message CPU has been changed.

This only indicates that the CPU configuration has been altered. There is no technical problem.

Proceed as follows:

- Restart your server.
  - As soon as the startup screen appears, press the [F2] function key to enter the BIOS.
  - If a password is assigned, enter the password and press [Enter].
  - Select the **Exit** menu.
  - Select **Commit settings and Exit**.
  - Verify that the Global Error indicator stops flashing.
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 11.4 Handling the CPU dummy cover

### CPU dummy cover overview



The CPU dummy cover prevents any unexpected thermal conditions.

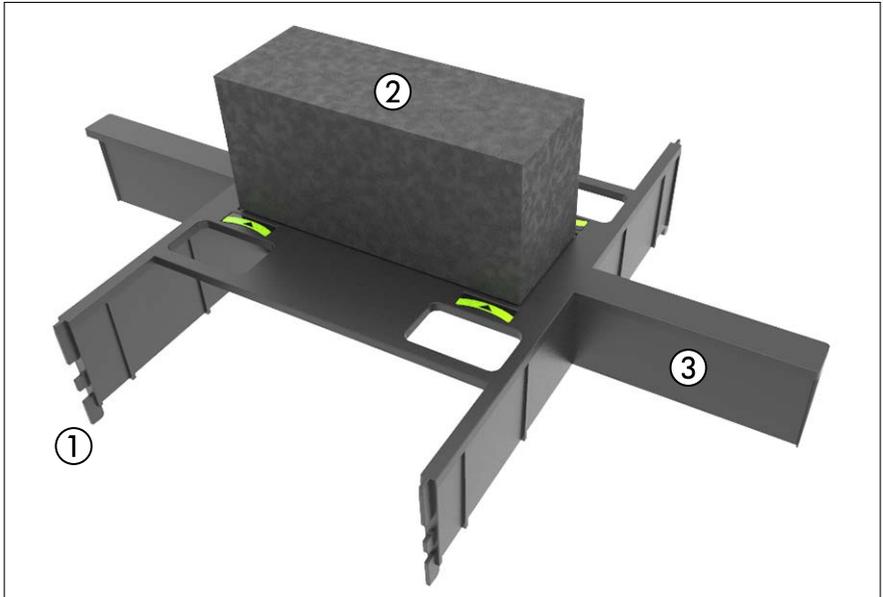


Figure 227: The CPU dummy cover

- |   |   |   |  |
|---|---|---|--|
| 1 | Clips used to hold the CPU dummy cover in place | 3 | Element blocking the unavailable memory slots from use |
| 2 | CPU dummy cover foam                            |   |  |

The CPU dummy cover is installed over the unused CPU socket and is held in place by clips (1) that are installed into the first two memory slots next to it. The purpose of the cover is to protect the CPU socket area and block the unavailable memory slots from use with two elements (3). In addition, the CPU dummy cover comes with an additional foam (2) that directs the airflow and allows you to avoid unexpected thermal conditions.

### Installing the CPU dummy cover

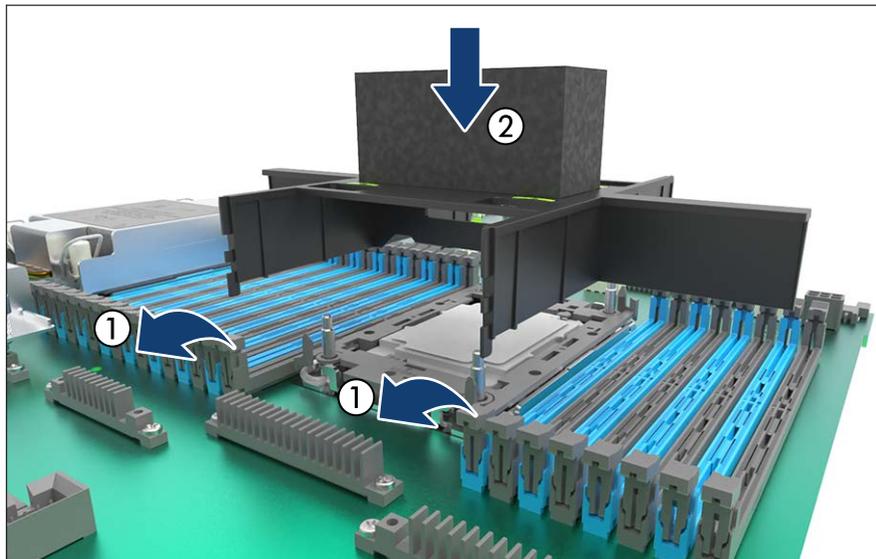


Figure 228: Installing the CPU dummy cover

- ▶ Open the securing clips at each end of the two memory slots closest to the CPU socket (1).
- ▶ Lower the CPU dummy cover onto the socket and install it in the open memory slots (2).
- ▶ Press the CPU dummy cover down to lock it in place.

## Removing the CPU dummy cover

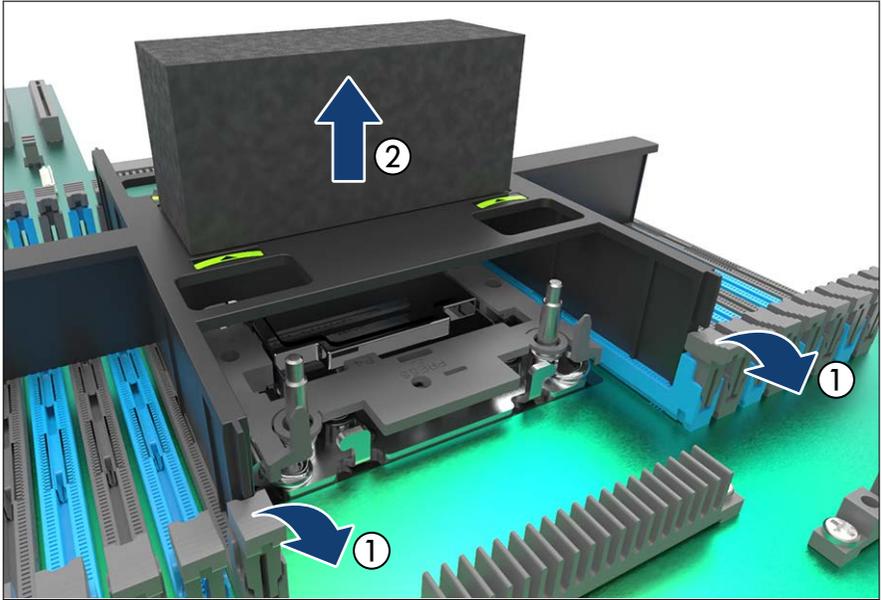


Figure 229: Removing the CPU dummy cover from the socket

- ▶ Eject the CPU dummy cover from the memory slot by pressing out the securing clips at each end of the memory slot on both sides of the CPU socket (1).
- ▶ Remove the CPU dummy cover (2) and put it aside for future use.
- ▶ If applicable, install a memory dummy module, see ["Installing a memory dummy module" on page 351](#).

## 11.5 Replacing a CPU or heat sink



**Field Replaceable Unit (FRU)**



**Hardware: 15 minutes**  
**Software: 5 minutes**

## Processor (CPU)

---

- |  |
|--|
| <b>Tools:</b> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– Torx 30 screw driver (for CPU heat sink)</li></ul> |
|--|



### CAUTION

CPUs are extremely sensitive to electrostatic discharge and therefore must always be handled with care.

- ▶ After a CPU has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface.
- ▶ Never push a CPU over a surface.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the air duct" on page 80.](#)

## Removing the heat sink

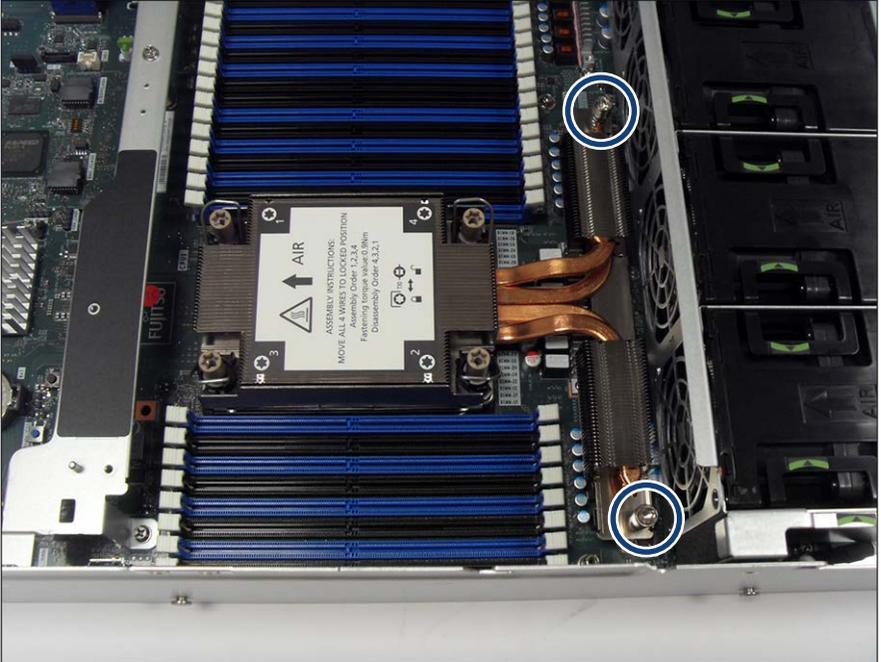


Figure 230: Removing an EVAC CPU heat sink

- First loosen the two screws of the EVAC heat sink in any order (see circles).

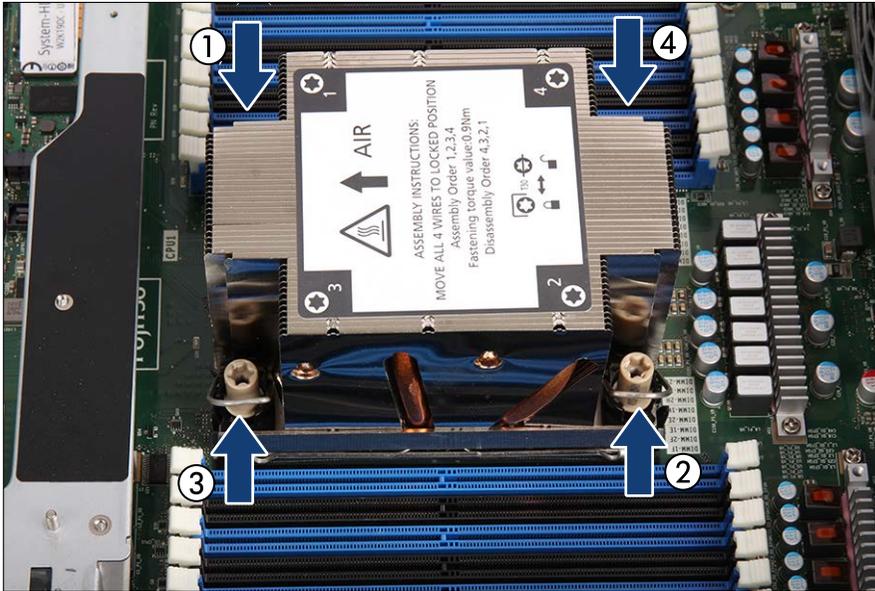


Figure 231: Removing the heat sink

- ▶ Loosen the captive screws in the sequence printed on the heat sink (1 to 4) by proceeding as follows:  
Torque: 0.9 Nm - 1.0 Nm
  - ▶ First, loosen the captive screws 4 and 3 completely.
  - ▶ Loosen the captive screws 2 and 1 completely.
- ▶ Push the four latches inward.

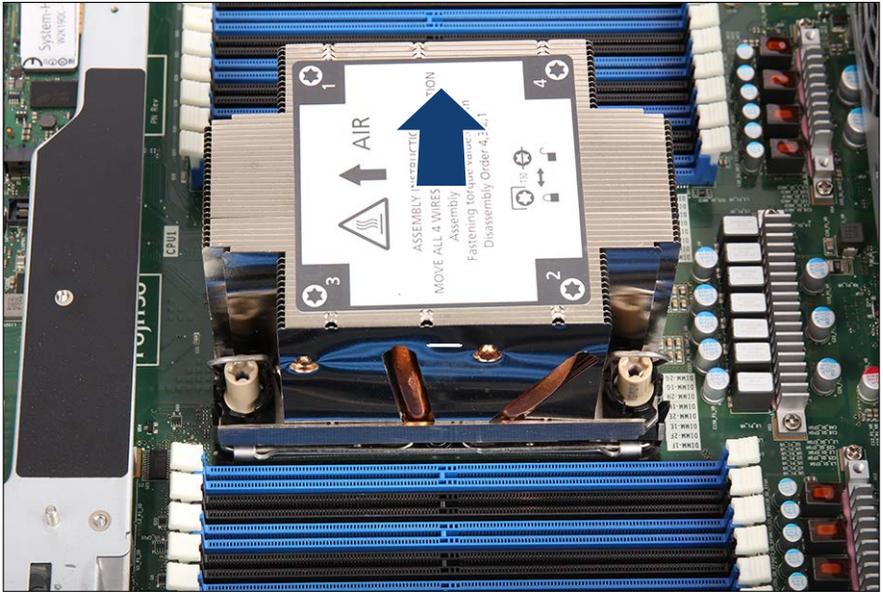


Figure 232: Lifting the heat sink

- ▶ Lift the heat sink together with the CPU frame out of the chassis.



**CAUTION**

- ▶ Pay special attention not to damage any system board components surrounding the CPU socket.

### Removing the CPU

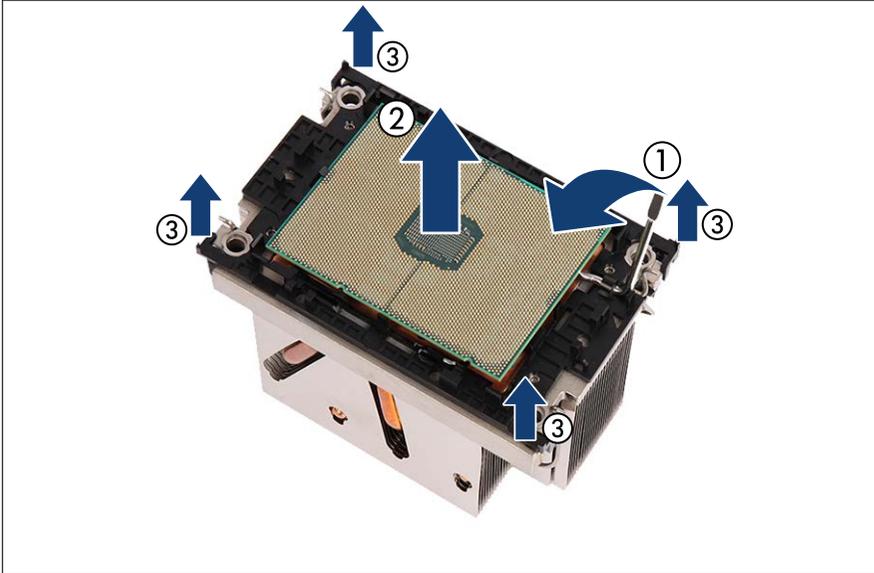


Figure 233: Removing the CPU

- ▶ Open the lever of the CPU frame to lift up the CPU (1).
- ▶ Remove the CPU from the CPU frame (2).
- ▶ Clean residual thermal paste from the CPU surface using a lint-free cloth and store the CPU in a safe place.



#### **CAUTION**

CPUs are extremely sensitive to electrostatic discharge and therefore must always be handled with care.

- ▶ After a CPU has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface.
  - ▶ Never push a CPU over a surface.
- 
- ▶ Disengage the four edges of the CPU frame and remove the CPU frame (3).

### Applying the thermal paste to the heat sink surface

- i** For Japan, the service engineer must follow the instruction provided separately.
- i** If the CPU upgrade or replacement kit contains a new heat sink, a thin layer of thermal compound has already been pre-applied to its lower surface. In this case, it isn't necessary to apply thermal paste to the heat sink lower surface.

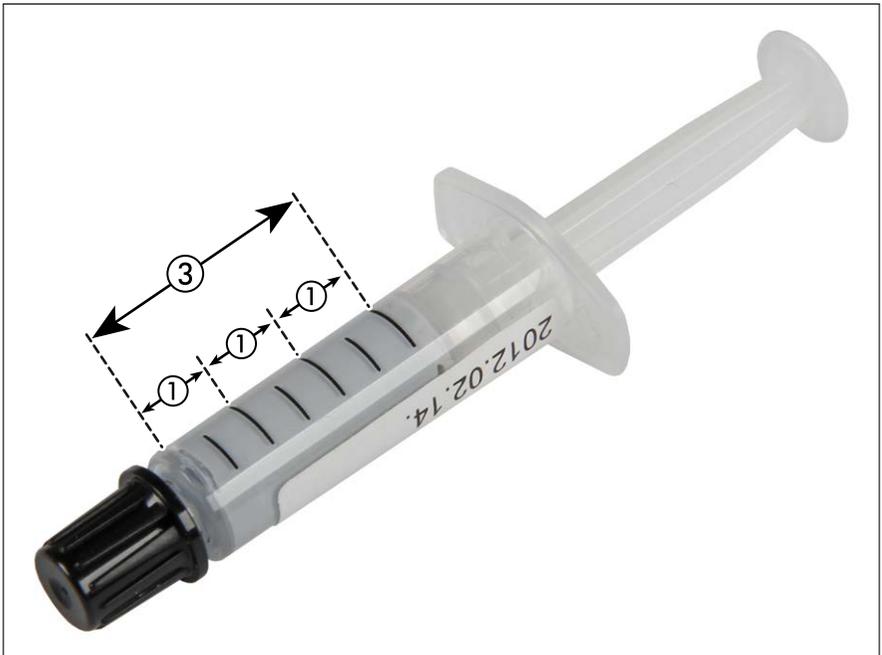


Figure 234: Thermal paste syringe

One thermal compound syringe (FSP:P304000004) contains thermal paste for three CPUs.

In order to determine the correct amount of thermal paste (equal to 1.0 gram), divide the grey area of the syringe up into three equal segments.

- i** Add graduation marks to the syringe using a permanent marker to help you apply the thermal paste.

## Processor (CPU)

---



Figure 235: Applying the thermal paste

- ▶ Apply a small point-shaped amount of thermal paste (1.0 gram, see description above) to the center of the heat sink lower surface as shown.



### **CAUTION**

- ▶ Do not mix different types of thermal paste.

## Installing the CPU and heat sink

- ▶ Confirm that the CPU model number printed on the top of the CPU fits with the requirements.
- ▶ Install the CPU, see ["Installing the CPU" on page 358](#).
- ▶ Install the heat sink, see ["Installing the heat sink" on page 360](#).

## Concluding steps

- ▶ ["Installing the air duct" on page 79](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).



When the system is powered on after a CPU has been replaced or upgraded, the Global Error indicator will start flashing with the message CPU has been changed.

This only indicates that the CPU configuration has been altered. There is no technical problem.

Proceed as follows:

- Restart your server.
  - As soon as the startup screen appears, press the [F2] function key to enter the BIOS.
  - If a password is assigned, enter the password and press [Enter].
  - Select the **Exit** menu.
  - Select **Commit settings and Exit**.
  - Verify that the Global Error indicator stops flashing.
- ▶ ["Resuming BitLocker functionality" on page 107.](#)



---

# 12 Liquid cooling (LC)

## 12.1 Safety notes



### CAUTION

- ▶ Do not install unsupported CPUs. For more information on supported CPUs, see ["Basic information" on page 354](#).
- ▶ Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic sensitive devices (ESDs).
- ▶ Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- ▶ When removing or installing CPUs, be careful not to touch or bend the spring contacts on the CPU sockets.
- ▶ Never touch the underside of the CPUs. Even minor soiling such as grease from the skin can impair the CPU's operation or destroy the CPUs.
- ▶ For more information, see ["Important information" on page 33](#).

## 12.2 Basic information

### Parts of the LC kit

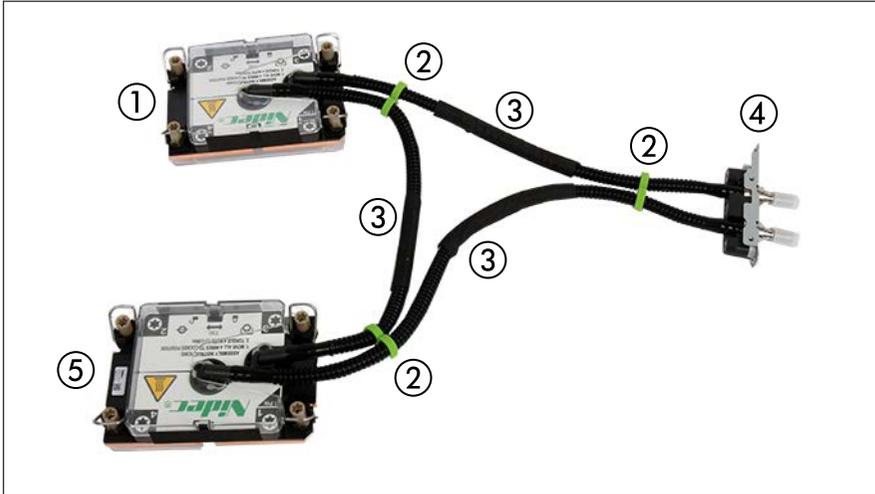


Figure 236: LC kit

- |   |                                  |   |                                  |
|---|----------------------------------|---|----------------------------------|
| 1 | LC heat sink with pump for CPU 1 | 4 | Quick connector block            |
| 2 | Cable clips                      | 5 | LC heat sink with pump for CPU 2 |
| 3 | Tubes                            |   |                                  |

## 12.3 Replacing the CPU for LC device



**Field Replaceable Unit (FRU)**



**Hardware: 15 minutes**  
**Software: 5 minutes**

- Tools:**
- Phillips PH2 / (+) No. 2 screwdriver
  - Torx 30 screwdriver



### CAUTION

CPUs are extremely sensitive to electrostatic discharge and therefore must always be handled with care.

- ▶ After a CPU has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface.
- ▶ Never push a CPU over a surface.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the air duct" on page 80.](#)
- ▶ If applicable, remove the riser module 1, see ["Removing a riser module" on page 72.](#)

### Removing the LC kit

- ▶ Remove the crossbar, see ["Removing the crossbar" on page 83.](#)
- ▶ Remove the rear air grid 2, see ["Removing the rear air grid 2" on page 86.](#)
- ▶ Remove the OCP dummy cover or the OCP module, see ["Removing the OCP dummy cover" on page 263](#) or ["Removing an OCP module" on page 265.](#)

## Liquid cooling (LC)



Figure 237: Removing the screws

- ▶ Remove the screws of the quick connector block (see circles).
- ▶ Remove the quick connector block.



Figure 238: Removing the LC heat sink (A)

- ▶ Loosen the captive screws in the sequence printed on the heat sink (1 to 4) by proceeding as follows:

Tool: Torx 30 screwdriver

Torque: 0.9 Nm

- ▶ First, loosen the captive screws 1 and 2 completely.
- ▶ Loosen the captive screws 3 and 4 completely.



Figure 239: Removing the LC heat sink (B)

- ▶ Push the four latches inward.
- ▶ Proceed for the second LC heat sink in the same way.
- ▶ Hold the LC heat sinks with both hands and lift up the complete LC kit.



**CAUTION**

- ▶ Pay special attention not to damage any system board components surrounding the CPU socket.

### Removing the CPU

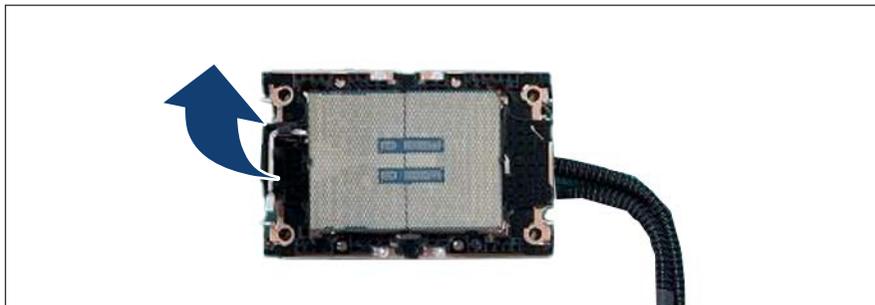


Figure 240: Removing the CPU (A)

- ▶ Open the lever of the CPU frame to lift up the CPU.

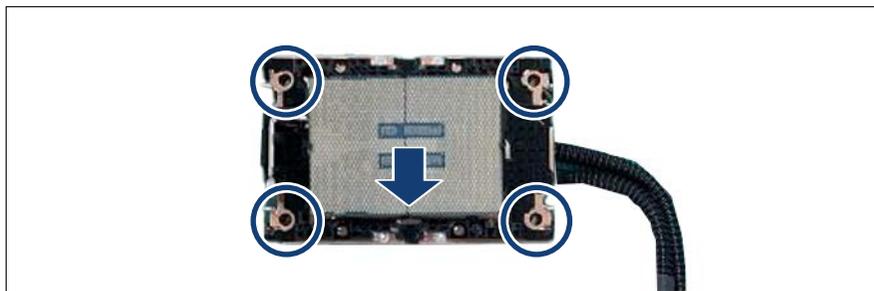


Figure 241: Removing the CPU (B)

- ▶ Disengage the four edges of the CPU frame and remove the CPU frame (see circles).
- ▶ Remove the CPU from the CPU frame.

- ▶ Clean residual thermal paste from the CPU surface using a lint-free cloth and store the CPU in a save place.



### CAUTION

CPUs are extremely sensitive to electrostatic discharge and therefore must always be handled with care.

- ▶ After a CPU has been removed from its protective sleeve or from its socket, place it upside down on a nonconducting, antistatic surface.
- ▶ Never push a CPU over a surface.

## Installing the CPU



### CAUTION

When replacing a system board

- ▶ Use a magnifying glass (recommended) to inspect the socket spring contacts for damages from different angles. Do not use the spare system board if any irregularities are visible. Possible damages:
  - Contact spring is bent backwards upon itself
  - Contact spring tip position is shifted or out of alignment
- ▶ Never try to fix bent contact springs. Doing so may result in loss of electrical performance and reliability.

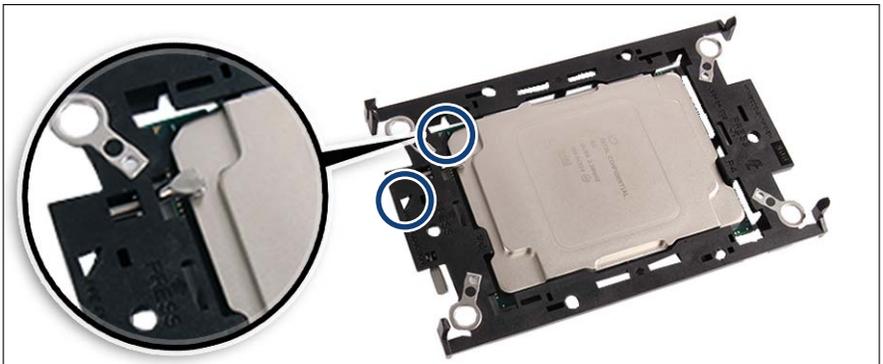


Figure 242: Installing the CPU in the CPU frame

## Liquid cooling (LC)

---

- ▶ Click the CPU into the CPU frame. Ensure that the triangle marks on the CPU and on the CPU frame are on the same edge (see close-up, circles).
- ▶ Ensure that the CPU fits in its place.

### Installing the LC kit

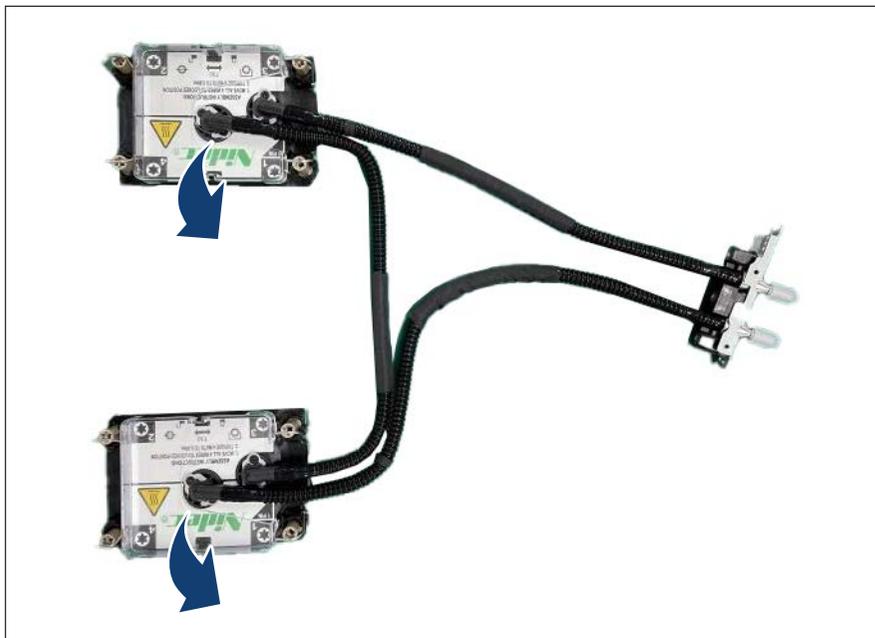


Figure 243: Turning around the heat sinks

- ▶ Turn around the LC heat sinks.
- ▶ Remove the covers from the LC heat sinks.
- ▶ Remove the protective caps from the quick connector block.

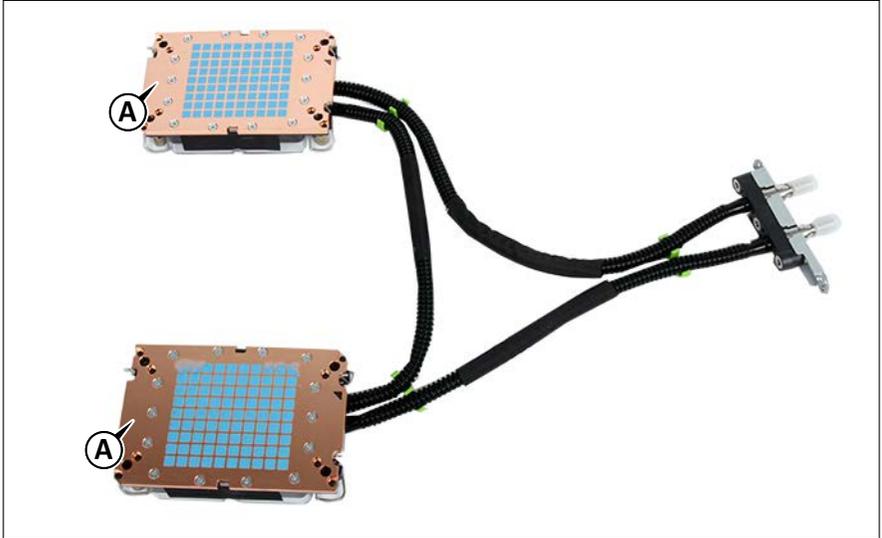


Figure 244: Bottom of the heat sinks

- ▶ Apply the thermal paste onto the bottom of the LC heat sinks (A), see ["Applying the thermal paste to the heat sink surface" on page 375.](#)

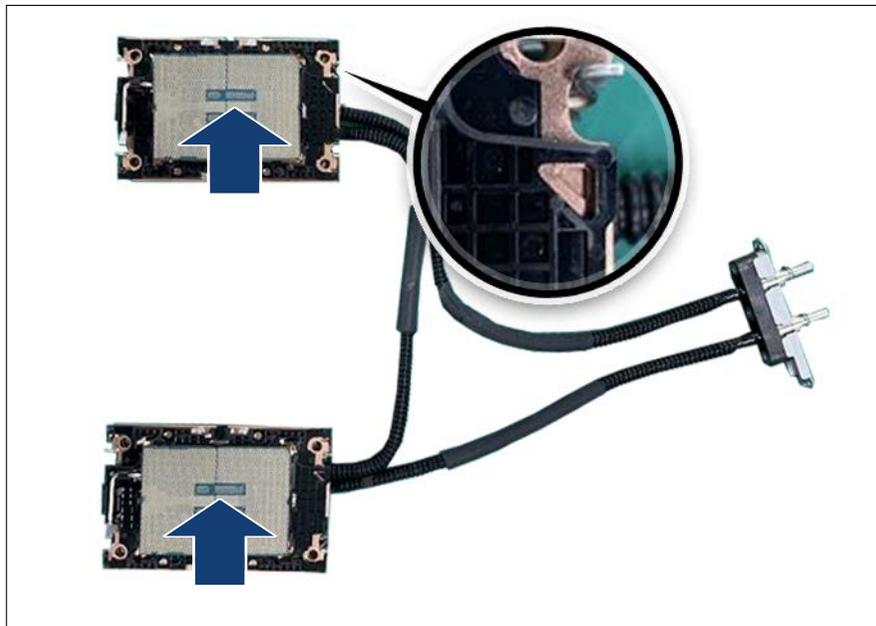


Figure 245: Installing the CPU onto the LC heat sink

- ▶ Place the CPU with the CPU frame onto the LC heat sink.
- ▶ Ensure that the triangle marks on the LC heat sink and on the CPU frame are on the same edge (see close-up).
- ▶ Prepare the second LC heat sink in the same way.
- ▶ Turn around the LC heat sinks.
- ▶ Hold the complete LC kit with both hands.
- ▶ Carefully place the LC heat sinks onto the CPU sockets on the system board.

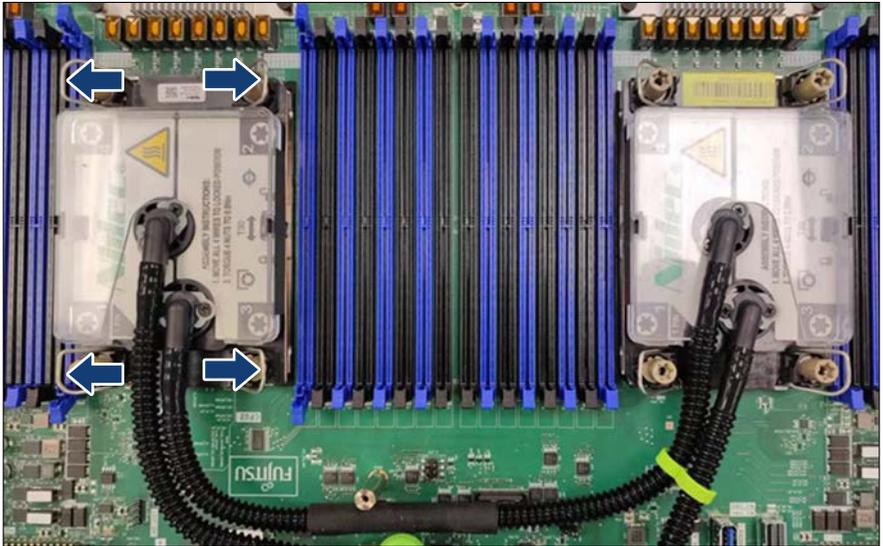


Figure 246: Installing the LC heat sink (A)

► Push the four latches outward.

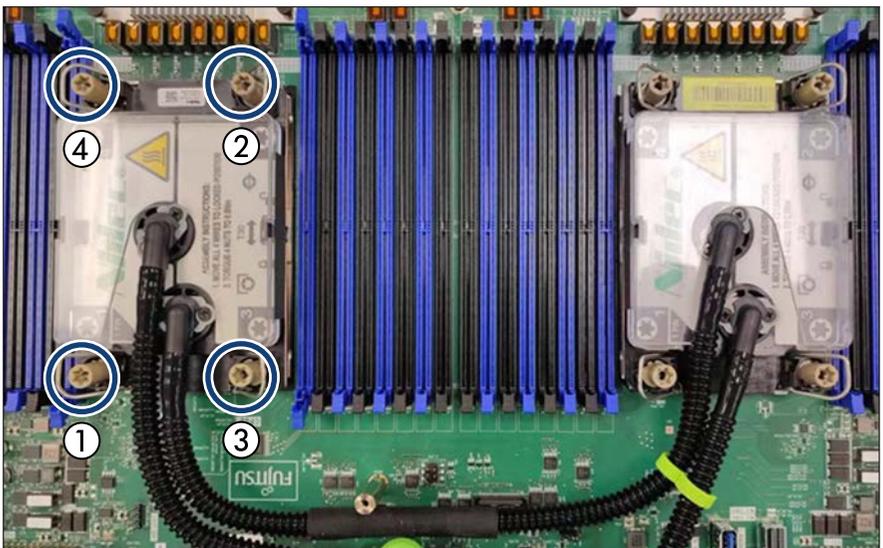


Figure 247: Installing the LC heat sink (B)

## Liquid cooling (LC)

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- ▶ Fasten the four captive screws in the sequence printed on the LC heat sink (1 to 4), by proceeding as follows:

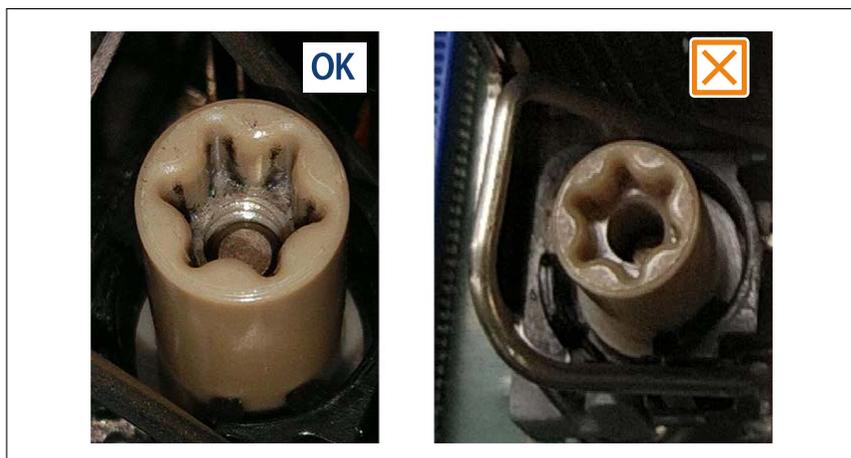
Tool: Torx 30 screwdriver

Torque: 0.9 Nm

- ▶ First, fasten the captive screws 1 and 2 completely.
- ▶ Fasten the captive screws 3 and 4 completely.
- ▶ Proceed for the second LC heat sink in the same way.

Note when tightening the screws of the LC heat sink:

- ▶ As shown in the figure below, tighten the screws while checking the screw tip until it is visible through the screw hole.



- ▶ When you reach the above position, hold the screwdriver with two fingers and tighten the screw firmly.
- ▶ Proceed for the second LC heat sink in the same way.

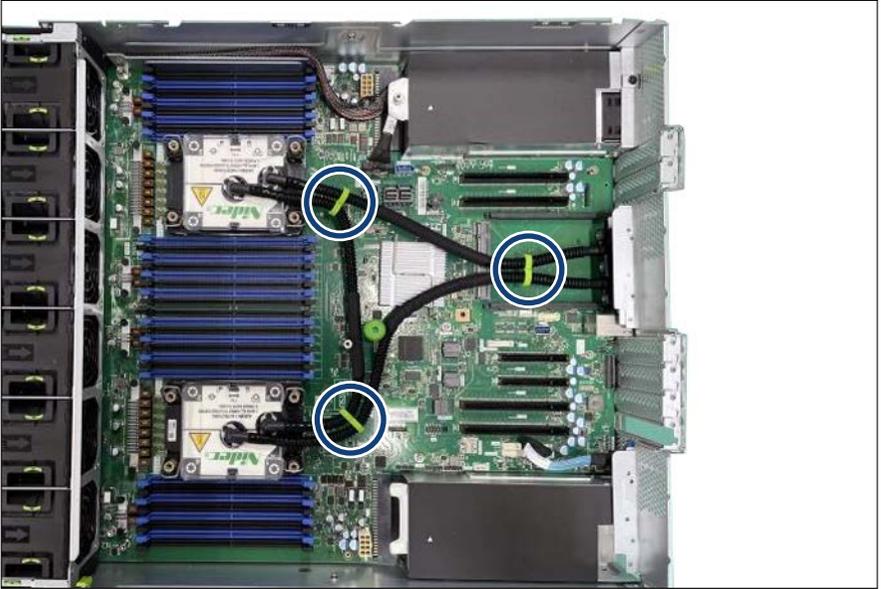


Figure 248: Running the tubes

- ▶ Run the tubes as shown.
- ▶ Fasten the tubes with the cable clips (see circles).

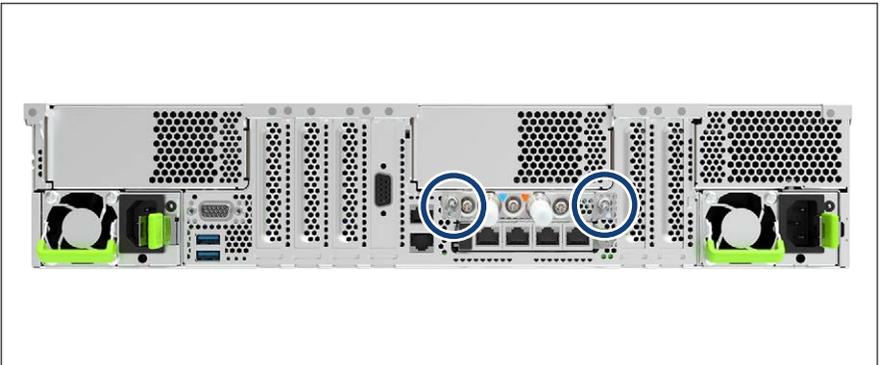


Figure 249: Installing the quick connector block

- ▶ Place the quick connector block in the chassis.
- ▶ Fasten the quick connector block with the screws (see circles).

## Liquid cooling (LC)

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- ▶ Install the OCP dummy cover or the OCP module, see ["Installing the OCP dummy cover" on page 266](#) or ["Installing an OCP module" on page 262](#).
- ▶ Install the rear air grid 2, see ["Installing the rear air grid 2" on page 88](#).
- ▶ Install the crossbar, see ["Installing the crossbar" on page 84](#).

### Concluding steps

- ▶ If applicable, install the riser module 1, see ["Installing the riser module 1" on page 74](#).
- ▶ ["Installing the air duct" on page 79](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).



When the system is powered on after a CPU has been replaced or upgraded, the Global Error indicator will start flashing with the message CPU has been changed.

This only indicates that the CPU configuration has been altered. There is no technical problem.

Proceed as follows:

- Restart your server.
  - As soon as the startup screen appears, press the [F2] function key to enter the BIOS.
  - If a password is assigned, enter the password and press [Enter].
  - Select the **Save & Exit** menu.
  - Select **Save Changes and Exit** or **Save Changes and Reset**.
  - Verify that the Global Error indicator stops flashing.
- ▶ ["Enabling replaced components in the BIOS" on page 102](#).
  - ▶ ["Resuming BitLocker functionality" on page 107](#).

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# 13 Accessible drives

## 13.1 Safety notes



### CAUTION

- ▶ Before installing an accessible drive, acquaint yourself with the drive's user documentation.
- ▶ When inserting an accessible drive into the server, ensure not to pinch or strain any connected cables.
- ▶ When installing an accessible drive, hold it by its sides. Applying force to the top of the casing may cause failures.
- ▶ When disposing of, transferring, or returning a backup drive, ensure that all backup media has been removed from the drive.
- ▶ Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).
- ▶ Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- ▶ For more information, see ["Important information" on page 33](#).

## 13.2 Basic information

Depending on the type of system, the PRIMERGY RX2540 M7 offers:

- one 5.25-inch accessible drive bay for ODDs
- one bay (optional) for an LTO drive or a RDX drive



ODD drive is not available for 12x 3.5-inch HDD versions and 24x 2.5-inch HDD/SSD versions.

LTO drive or RDX drive are not available for 3.5-inch HDD versions and 24x 2.5-inch HDD/SSD versions.

# Accessible drives



Figure 250: Accessible drives in front panel module 10x 3.5-inch HDD version

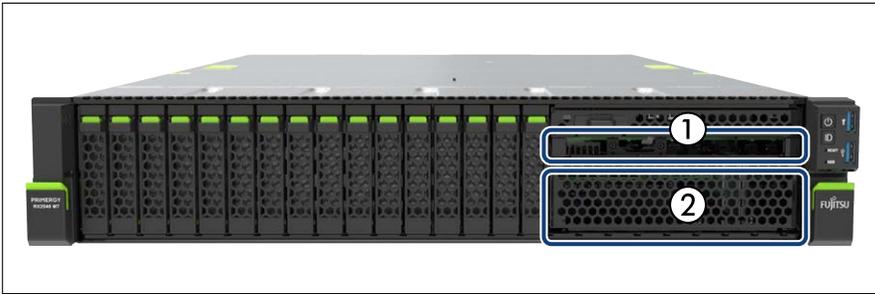


Figure 251: Accessible drives in front panel module 16x 2.5-inch HDD version

1 ODD

2 LTO drive/ RDX drive

## 13.3 Optical disk drive (ODD)

### 13.3.1 Storing the ODD latch



Figure 252: Storing the ODD latch

The ODD latch is fastened with two screws to the crossbar (see circle).

### 13.3.2 Installing the ODD (2.5-inch chassis)



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

- Tools:**
- Phillips PH2 / (+) No. 2 screw driver (for cover 2)
  - Torx Plus 6 screw driver (not valid for Japan)
  - Phillips PH1 / (+) No. 1 screw driver (Japan)

#### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)

## Accessible drives

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- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.
- ▶ "Getting access to the component" on page 55.
- ▶ "Removing the fan cage" on page 76.

### Removing the ODD dummy cover

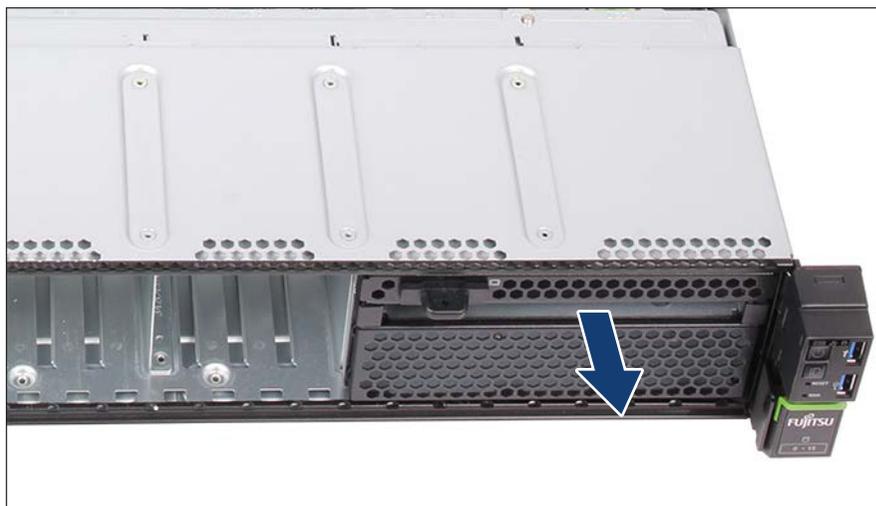


Figure 253: Removing the dummy cover

- ▶ Pull the dummy cover out of the bay.



#### CAUTION

- ▶ Keep the dummy cover for future use.
- ▶ If you remove the accessible drive again and do not replace it with a new one, the dummy cover must be reinstalled to comply with EMC regulations and to satisfy cooling requirements and fire protection measures.

## Installing the ODD

- ▶ If no ODD has been installed before:
  - ▶ Remove the two screws and take the ODD latch from the chassis (see [Figure 252](#)).

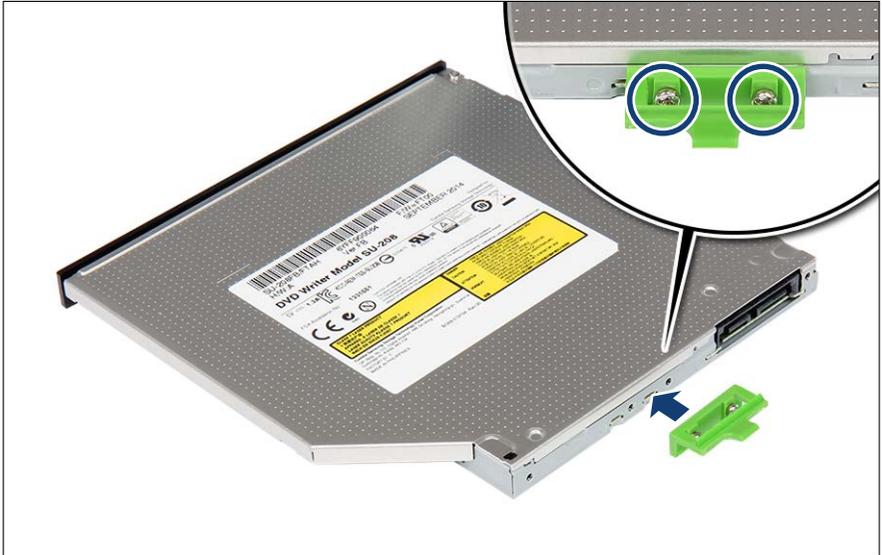


Figure 254: Installing the ODD latch on the ODD

- ▶ Fasten the ODD latch with two screws to the rear side of the ODD (see circles).

## Accessible drives



Figure 255: Installing the ODD

- ▶ Insert the ODD into the chassis (see arrow) until the ODD latch engages in the rear bracket (see close-up).

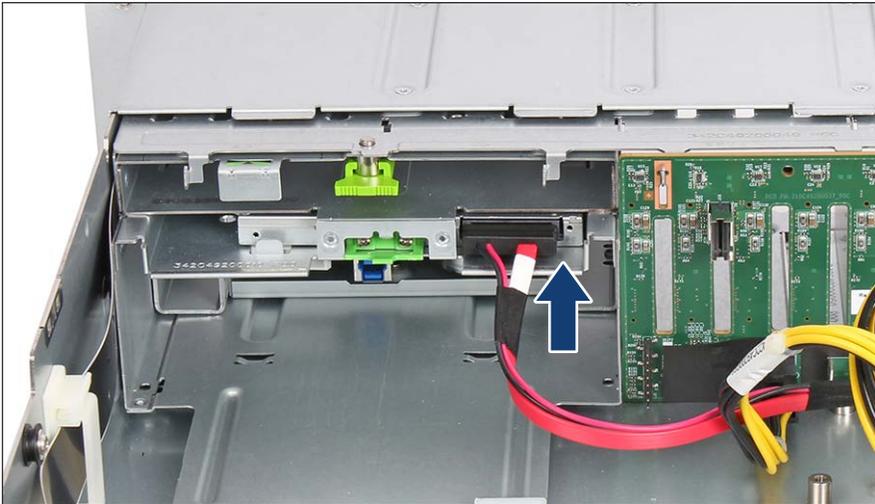


Figure 256: Connecting the cable to the ODD

- ▶ Connect the ODD cable to the ODD (see arrow).

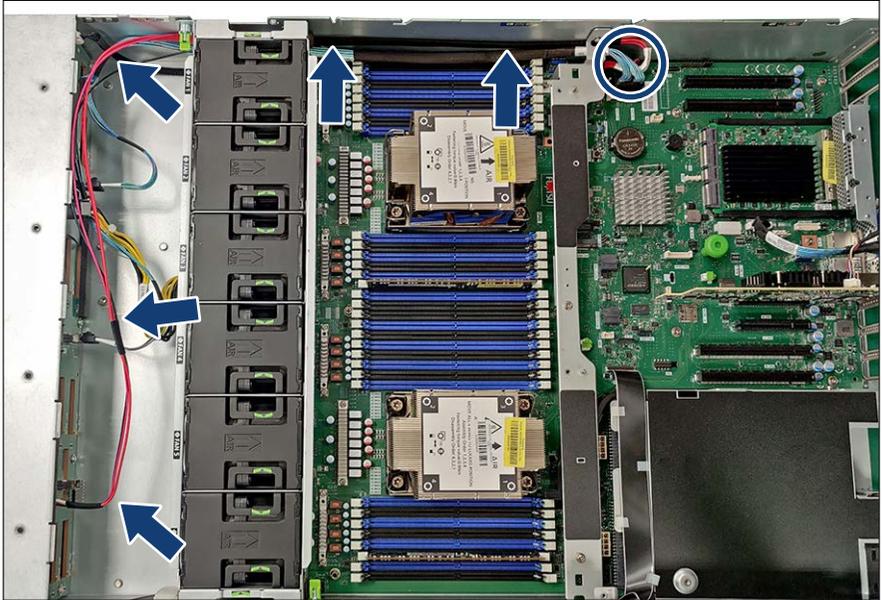


Figure 257: Routing of the ODD cable to the system board

- ▶ Route the ODD cable as shown.
- ▶ Connect the ODD cable to the connector "PWR ODD" on the system board (see circle).

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 13.3.3 Removing the ODD (2.5-inch chassis)



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

- |   |
|---|
| <p><b>Tools:</b></p> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– Torx Plus 6 screw driver (not valid for Japan)</li><li>– Phillips PH1 / (+) No. 1 screw driver (Japan)</li></ul> |
|---|

#### **Preliminary steps**

- ▶ ["Removing backup and optical disk media" on page 92.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

## Removing the ODD

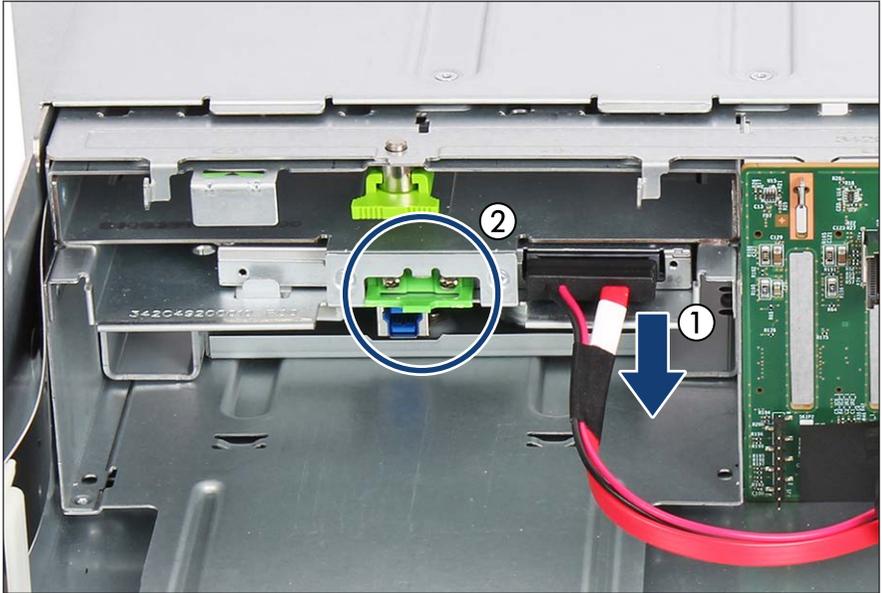


Figure 258: Removing the ODD (A)

- ▶ Disconnect the ODD cable from the ODD (1).
- ▶ Unlock the ODD latch (2).

## Accessible drives

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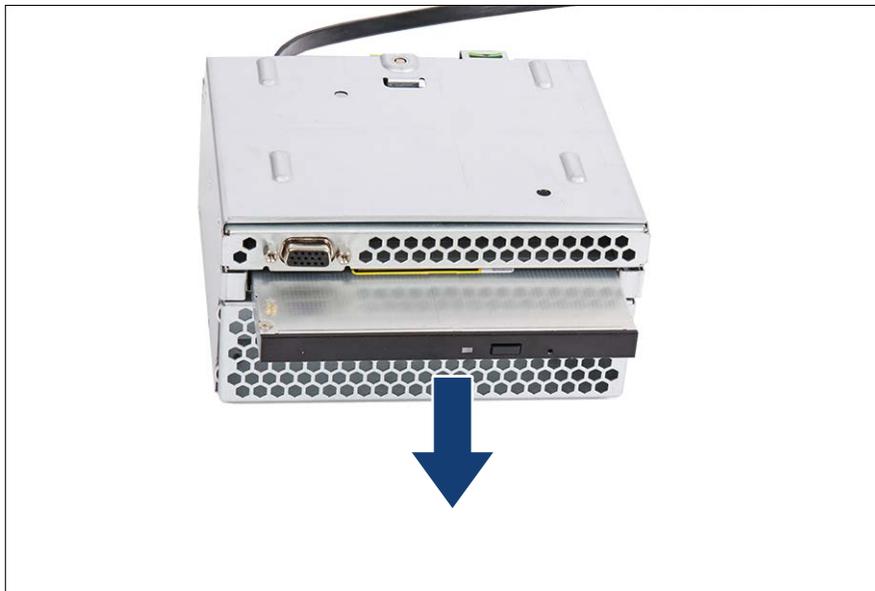


Figure 259: Removing the ODD (B)

- ▶ Remove the ODD.

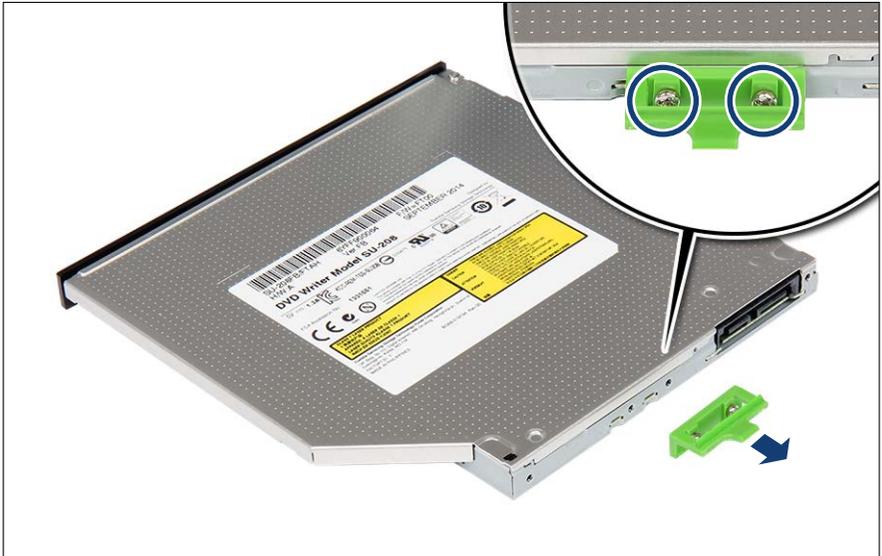


Figure 260: Removing the ODD latch from the ODD

- ▶ Remove the two screws (see circles).
- ▶ Remove the ODD latch.
- ▶ If no new ODD will be installed:
  - ▶ Fasten the ODD latch with two screws to the chassis (see [Figure 252](#)).

### Installing the ODD dummy cover



Figure 261: Installing the dummy cover

- ▶ Insert the dummy cover and push it inward until it engages at the other side.

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 13.3.4 Replacing the ODD (2.5-inch chassis)



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes**

- Tools:**
- Phillips PH2 / (+) No. 2 screw driver (for cover 2)
  - Torx Plus 6 screw driver (not valid for Japan)
  - Phillips PH1 / (+) No. 1 screw driver (Japan)

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Removing backup and optical disk media" on page 92.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ ["Checking boot priority" on page 93.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the defective ODD

- ▶ Remove the ODD, see ["Removing the ODD \(2.5-inch chassis\)" on page 400.](#)

### Installing the new ODD

- ▶ Install the ODD, see ["Installing the ODD \(2.5-inch chassis\)" on page 395.](#)

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

- ▶ ["Setting boot priority" on page 120.](#)
- ▶ Check the settings of the ODD in the BIOS and iRMC S6 web interface.
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 13.3.5 Installing the ODD (3.5-inch chassis)



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

- |   |
|---|
| <p><b>Tools:</b></p> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– Torx Plus 6 screw driver (not valid for Japan)</li><li>– Phillips PH1 / (+) No. 1 screw driver (Japan)</li></ul> |
|---|

#### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

## Removing the ODD dummy cover

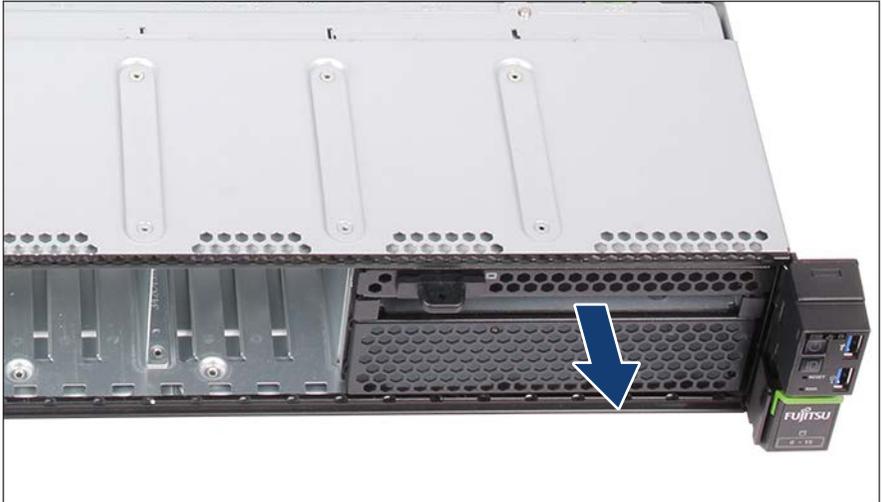


Figure 262: Removing the dummy cover

- ▶ Pull the dummy cover out of the bay.



### CAUTION

- ▶ Keep the dummy cover for future use.
- ▶ If you remove the accessible drive again and do not replace it with a new one, the dummy cover must be reinstalled to comply with EMC regulations and to satisfy cooling requirements and fire protection measures.

## Installing the ODD

- ▶ If no ODD has been installed before:
  - ▶ Remove the two screws and take the ODD latch from the chassis (see [Figure 252](#)).

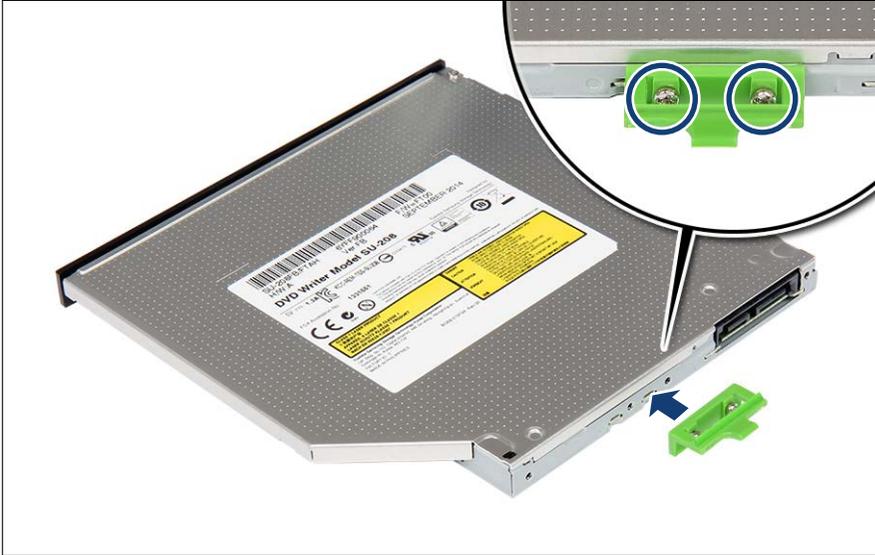


Figure 263: Installing the ODD latch on the ODD

- Fasten the ODD latch with two screws to the rear side of the ODD (see circles).

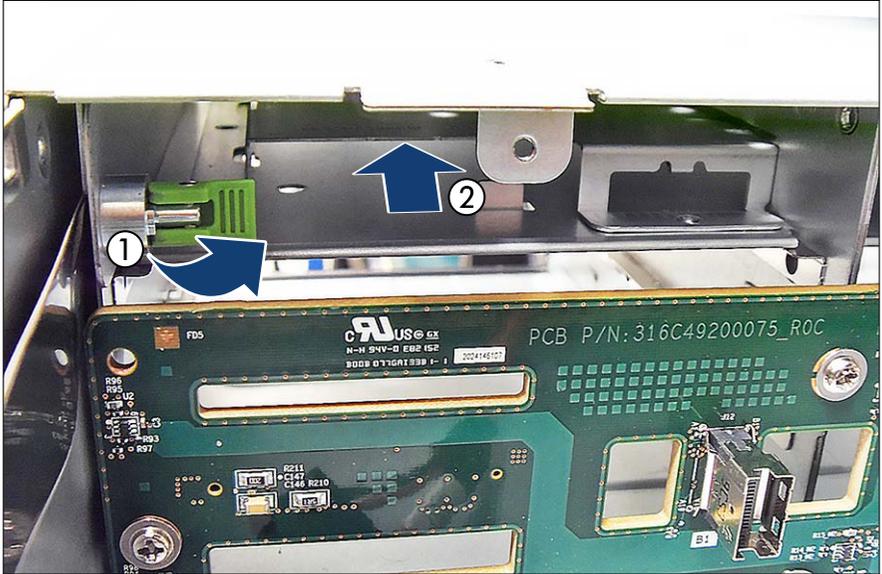


Figure 264: Removing the ODD cage

- ▶ Release the green latch located above the 3.5-inch HDD backplane to unlock the ODD cage (1).
- ▶ Push the ODD cage out of the chassis (2).

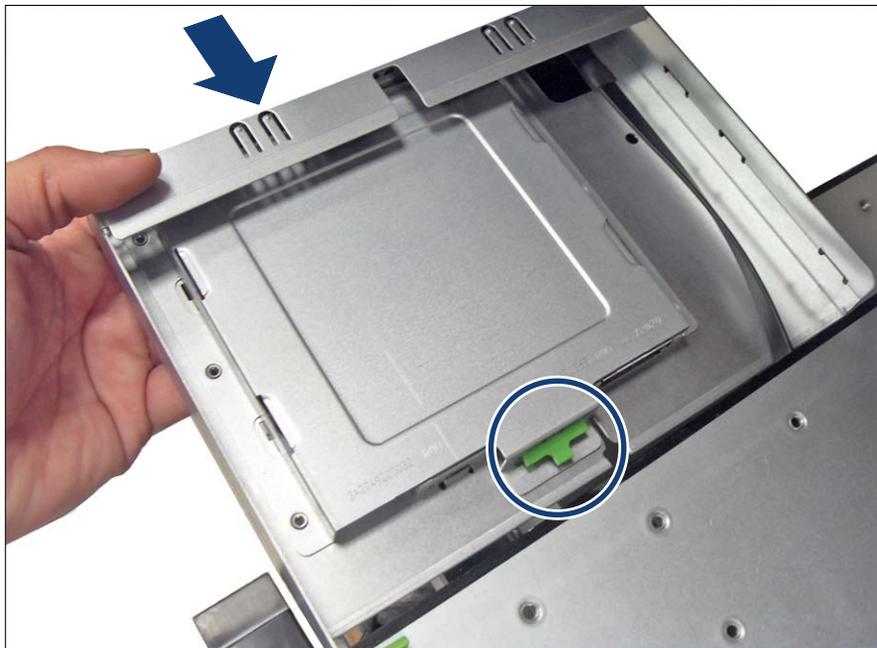


Figure 265: Installing the ODD into the ODD cage

- ▶ Install the ODD into the ODD cage (see arrow) until the ODD latch engages in the rear bracket (see circle).



Figure 266: Connecting the ODD cable

- ▶ Connect the ODD cable to the ODD.

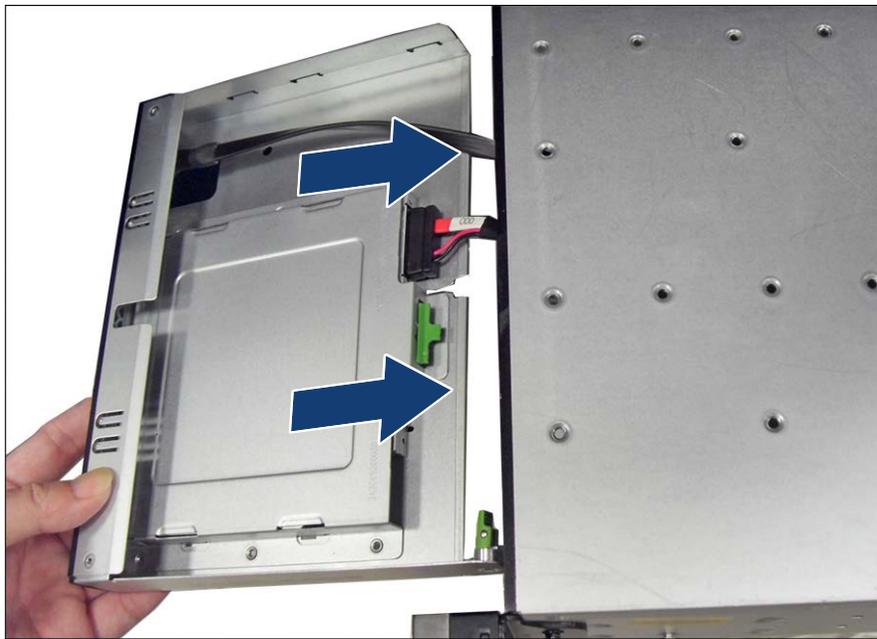


Figure 267: Installing the ODD cage

- ▶ Install the ODD cage into the chassis.

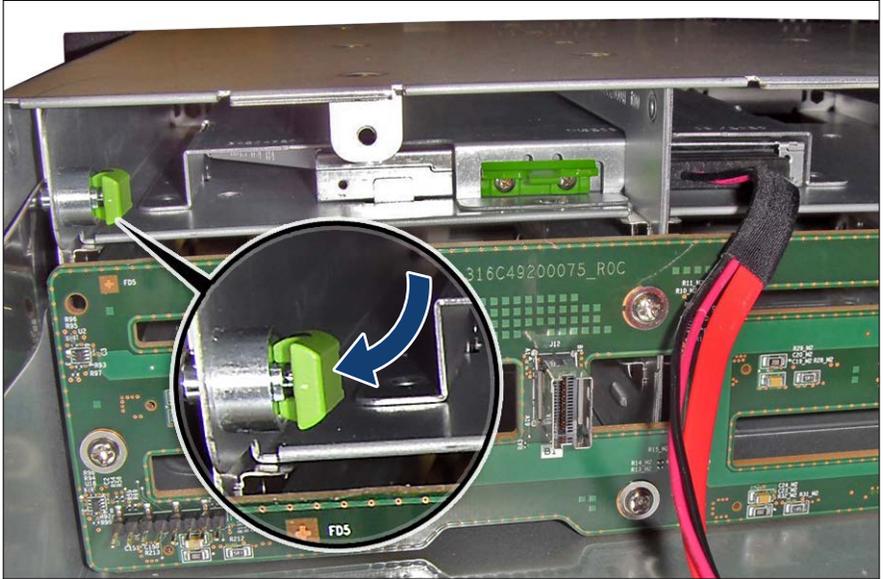


Figure 268: Locking the ODD cage

- ▶ Lock the ODD cage with the green latch (see close-up).

## Accessible drives

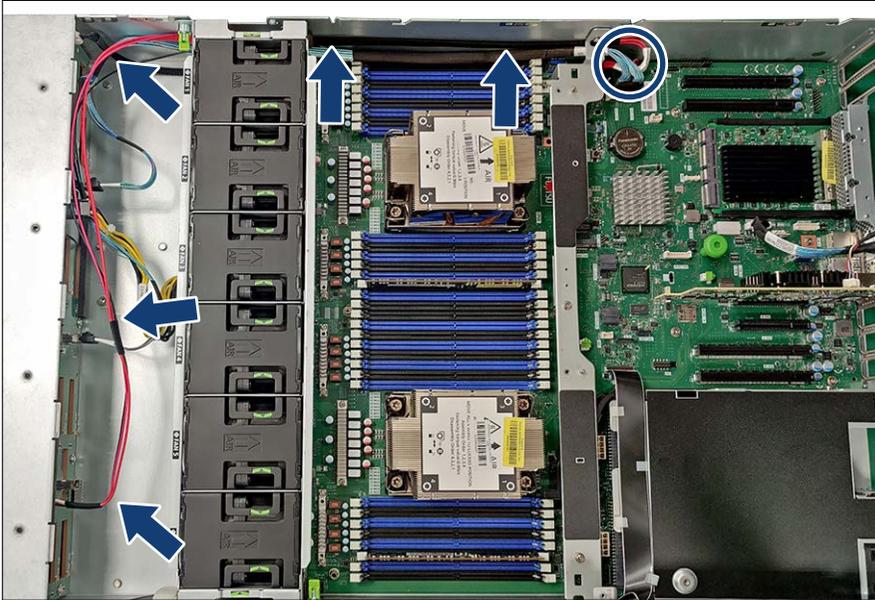


Figure 269: Routing of the ODD cable to the system board

- ▶ Route the ODD cable as shown.
- ▶ Connect the ODD cable to the connector "PWR ODD" on the system board (see circle).

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 13.3.6 Removing the ODD (3.5-inch chassis)



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

- |   |
|---|
| <p><b>Tools:</b></p> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– Torx Plus 6 screw driver (not valid for Japan)</li><li>– Phillips PH1 / (+) No. 1 screw driver (Japan)</li></ul> |
|---|

#### **Preliminary steps**

- ▶ ["Removing backup and optical disk media" on page 92.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the ODD

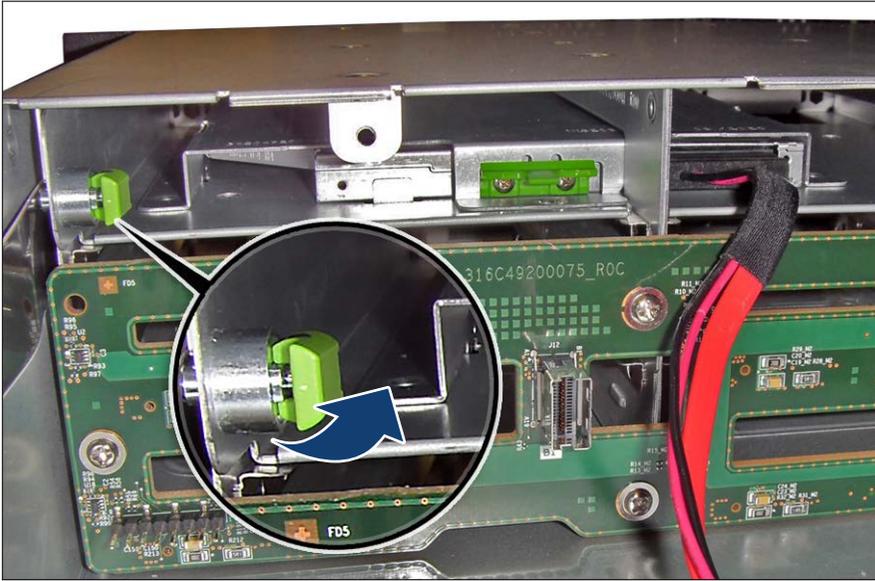


Figure 270: Unlocking the ODD cage

- ▶ Release the green latch above the 3.5-inch HDD backplane to unlock the ODD cage.

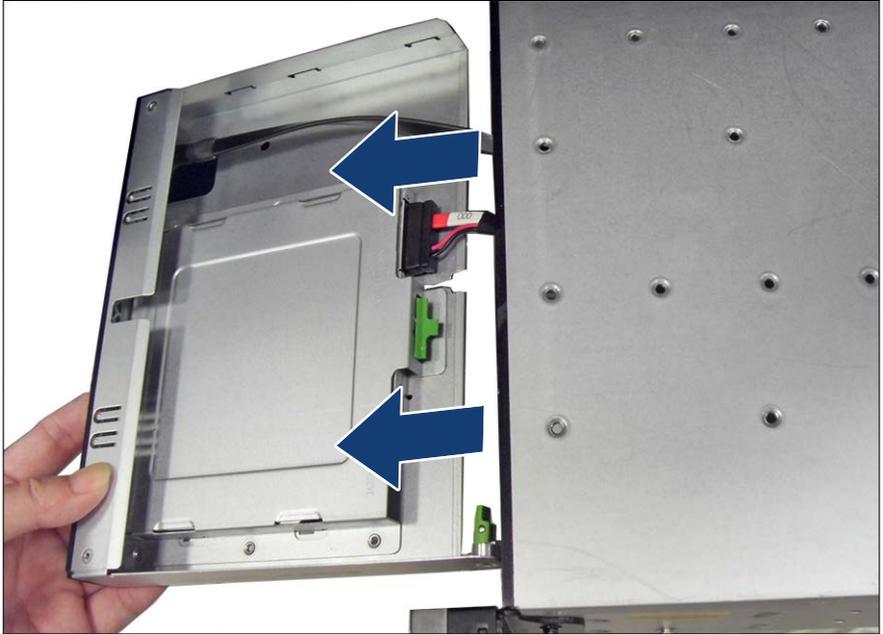


Figure 271: Removing the ODD cage

- ▶ Remove the ODD cage out of the chassis.

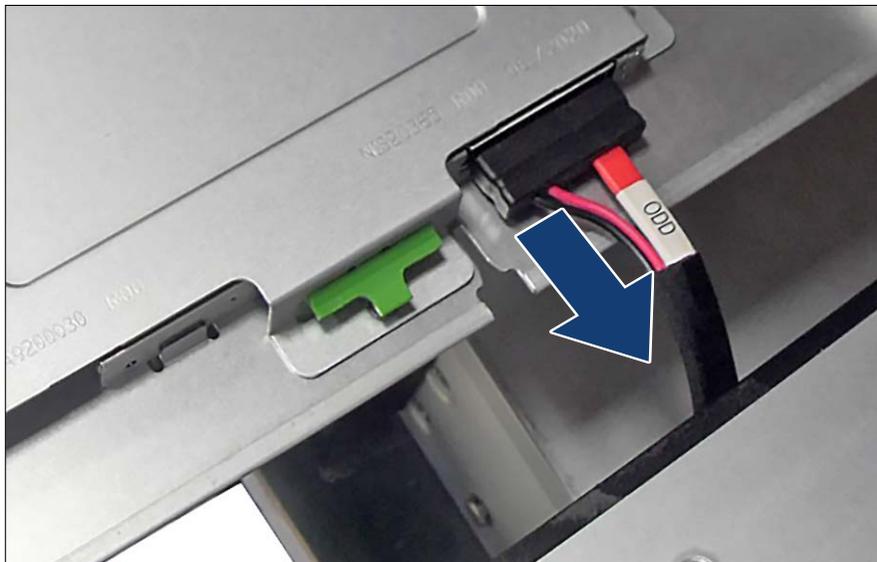


Figure 272: Disconnecting the cable from the ODD

- ▶ Disconnect the cable from the ODD.

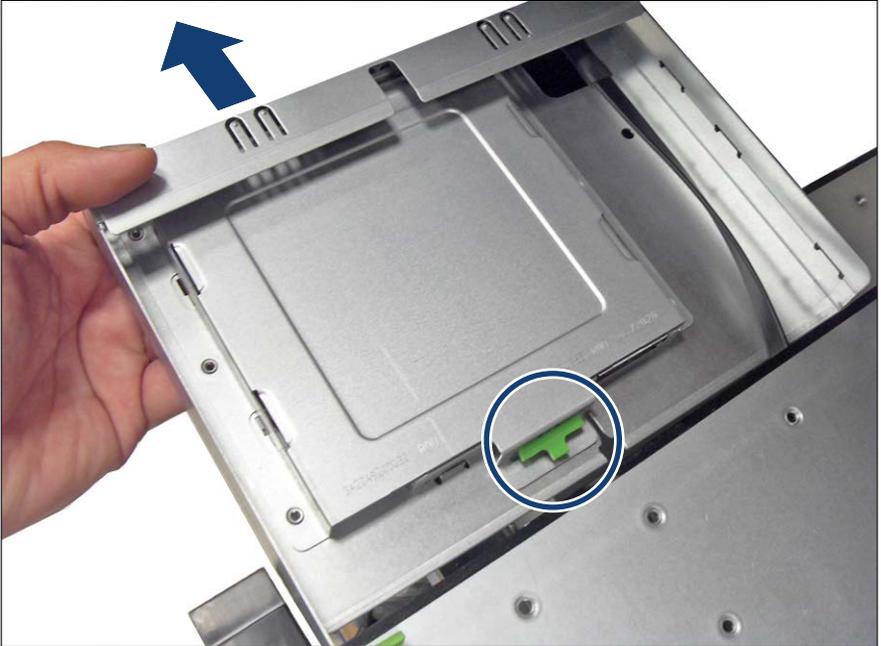


Figure 273: Removing the ODD from the ODD cage

- ▶ Unlock the ODD latch (see circle).
- ▶ Remove the ODD from the ODD cage (see arrow).

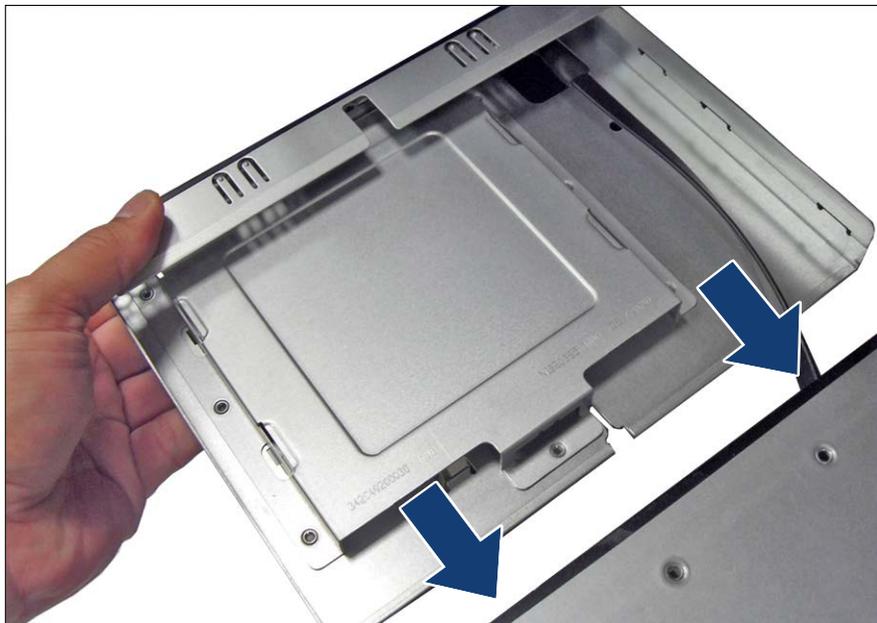


Figure 274: Installing the ODD cage

- Install the ODD cage into the chassis.

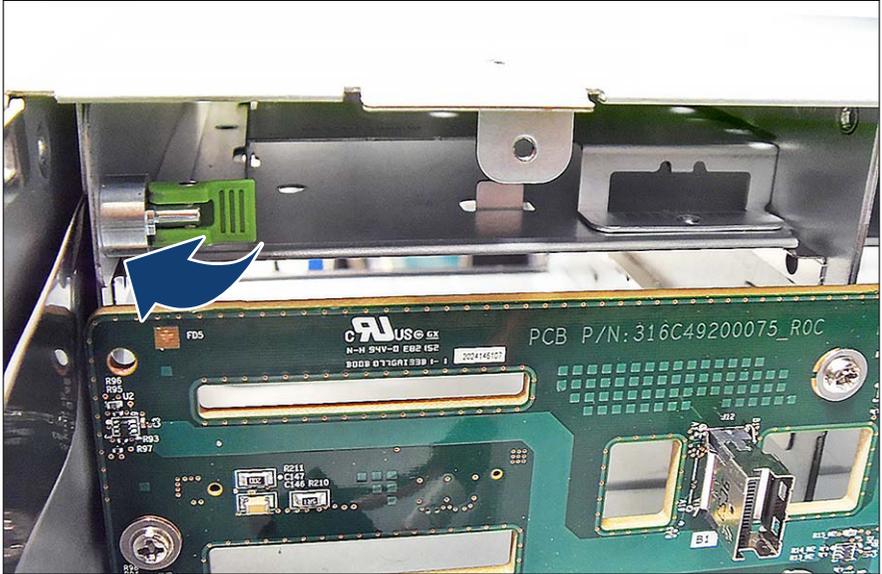


Figure 275: Locking the ODD cage

- Lock the ODD cage with the green latch.

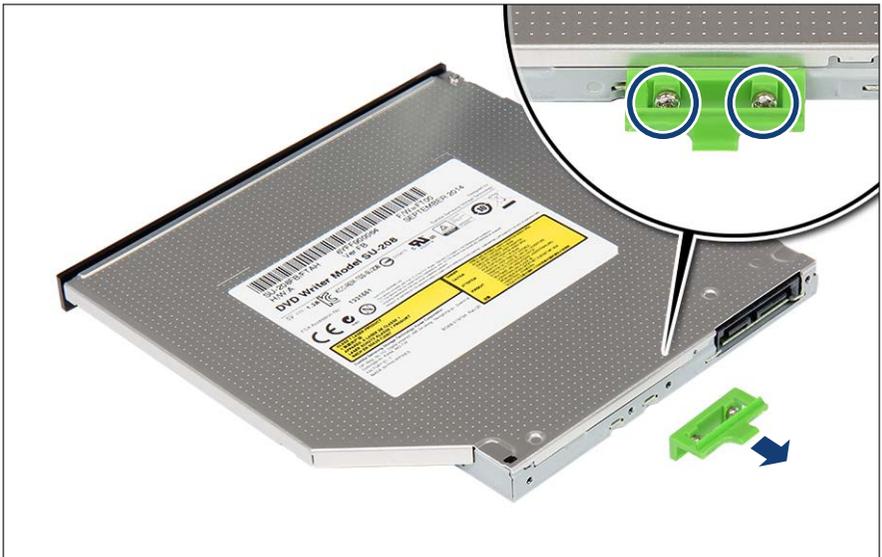


Figure 276: Removing the ODD latch from the ODD

## Accessible drives

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- ▶ Remove the two screws (see circles).
- ▶ Remove the ODD latch.
- ▶ If no new ODD will be installed:
  - ▶ Fasten the ODD latch with two screws to the chassis (see [Figure 252](#)).

## Installing the ODD dummy cover

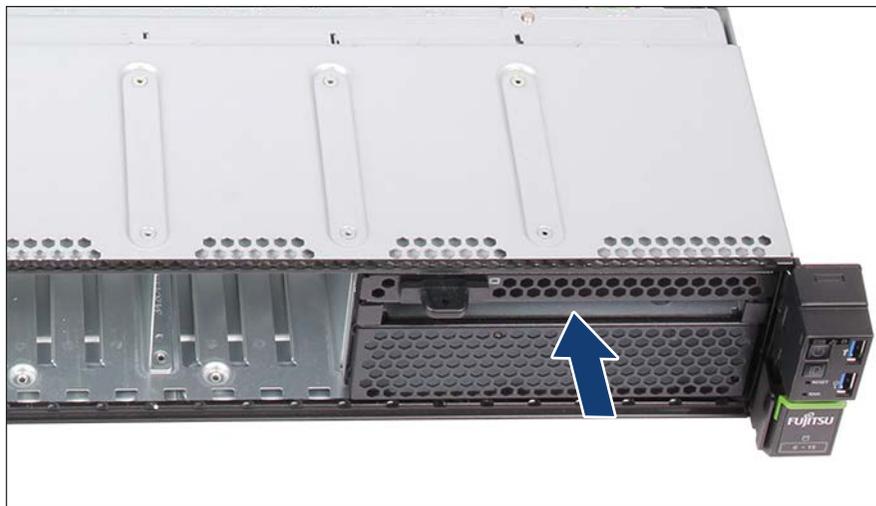


Figure 277: Installing the dummy cover

- ▶ Insert the dummy cover and push it inward until it engages at the other side.

## Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 13.3.7 Replacing the ODD (3.5-inch chassis)



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

- Tools:**
- Phillips PH2 / (+) No. 2 screw driver (for cover 2)
  - Torx Plus 6 screw driver (not valid for Japan)
  - Phillips PH1 / (+) No. 1 screw driver (Japan)

#### **Preliminary steps**

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Removing backup and optical disk media" on page 92.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ ["Checking boot priority" on page 93.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

#### **Removing the defective ODD**

- ▶ Remove the ODD, see ["Removing the ODD \(3.5-inch chassis\)" on page 415.](#)

#### **Installing the new ODD**

- ▶ Install the ODD, see ["Installing the ODD \(3.5-inch chassis\)" on page 406.](#)

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Setting boot priority" on page 120.](#)
- ▶ Check the settings of the ODD in the BIOS and iRMC S6 web interface.
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 13.4 LTO drive

### 13.4.1 Installing the LTO drive



**Upgrade and Repair Unit  
(URU)**



**Hardware: 10 minutes**

<b>Tools:</b> Phillips PH2 / (+) No. 2 screwdriver
--

### Preliminary steps

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

## Removing the front panel cage

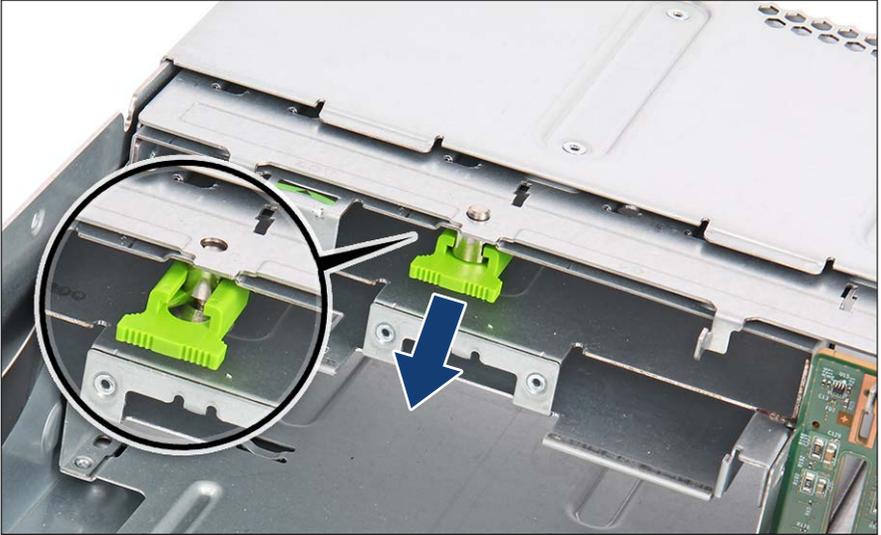


Figure 278: Removing the front panel cage (A)

- Pull the locking latch in the direction of the arrow to unlock the front panel cage (see close-up).

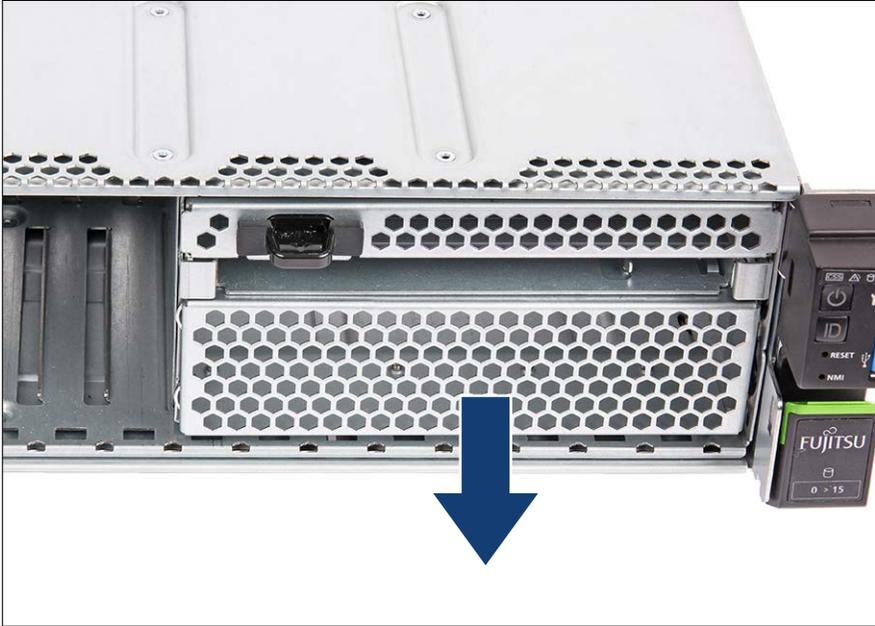


Figure 279: Removing the front panel cage (B)

- ▶ Remove the front panel cage out of its bay.

## Removing the air grid



Figure 280: Removing the air grid (A)

- ▶ Remove the four screws (see circles).



Keep the four screws - they will be reused for fixing the LTO drive.



Figure 281: Removing the air grid (B)

- ▶ Remove the air grid.



**CAUTION**

Save the dummy cover (air grid) for future use.

- ▶ Always replace dummy modules into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

## Installing an LTO drive



Figure 282: Installing the LTO drive (A)

- ▶ Insert the LTO drive into the front panel module (see arrow).
- ▶ If applicable, fasten the LTO drive with four screws (see blue and orange circles).
- ▶ In case of an LTO drive which has only three screw-holes, fasten with three screws (see blue circles).

## Accessible drives

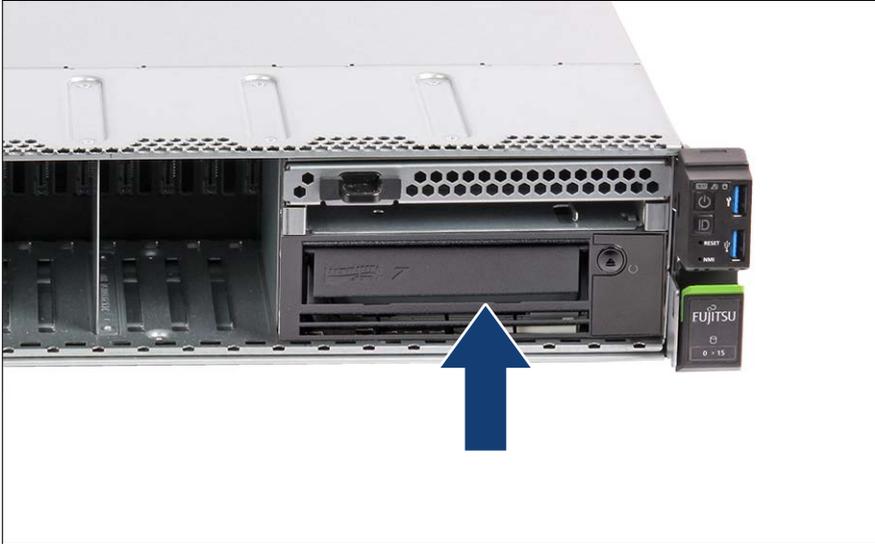


Figure 283: Installing the LTO drive (B)

- Carefully slide in the front panel module into its bay.



Figure 284: Installing the LTO drive (C)

- ▶ Push the locking latch in the direction of the arrow to lock the front panel module.

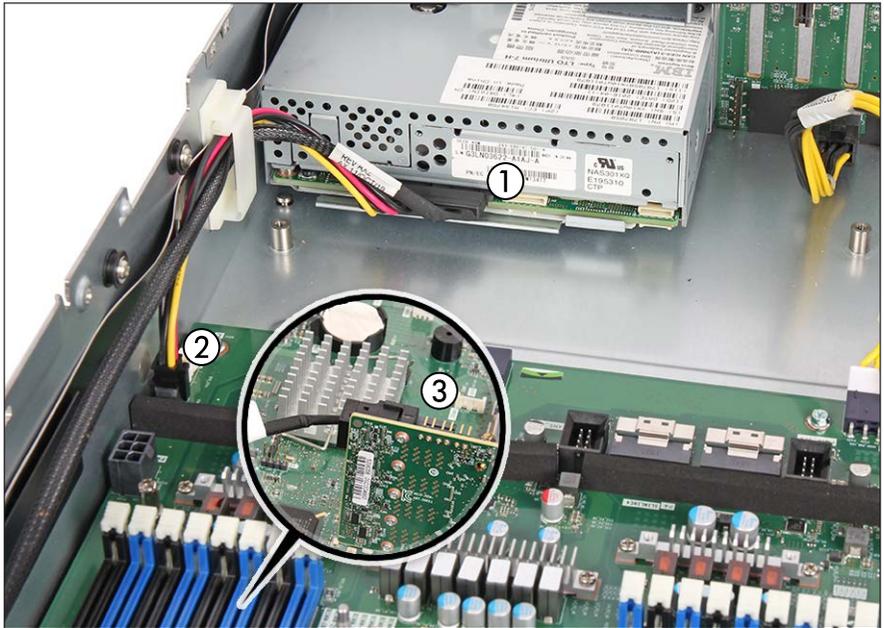


Figure 285: Connecting the cable to the LTO drive

- ▶ Connect the LTO cable to the LTO drive (1).
- ▶ Connect the end of the power cable to connector "PWR6" (2) on the system board.
- ▶ Connect the end of the SAS cable to connector "C0" (3, close-up) on the RAID card.



For the cable plan, see ["Appendix B" on page 569](#).

### Concluding steps

- ▶ ["Installing the fan cage" on page 77](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).

- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### 13.4.2 Removing the LTO drive



**Upgrade and Repair Unit  
(URU)**



**Hardware: 10 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver

#### Preliminary steps

- ▶ ["Removing backup and optical disk media" on page 92.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

## Removing the LTO drive

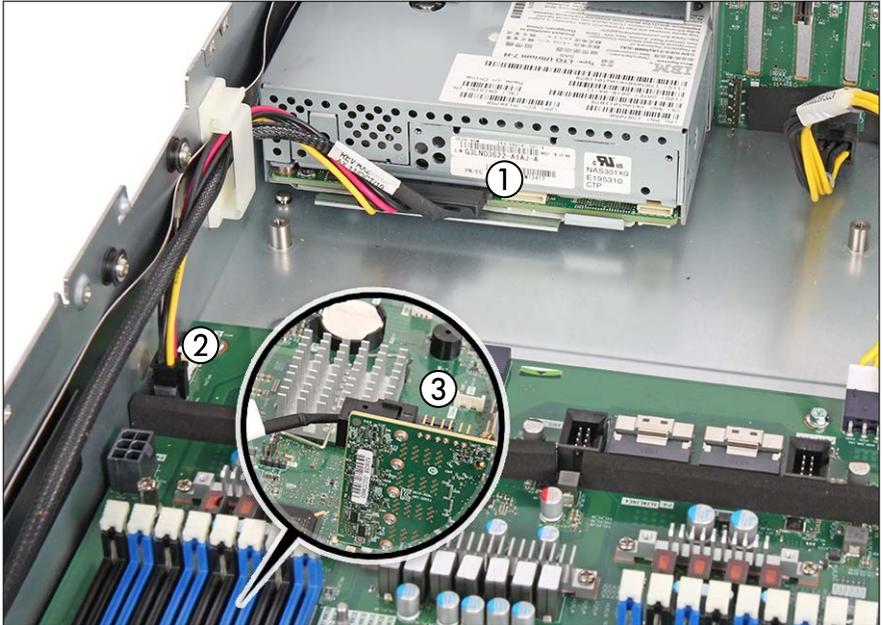


Figure 286: Disconnecting the cable from the LTO drive

- ▶ Disconnect the LTO cable from the LTO drive (1).
- ▶ Disconnect the end of the power cable from connector "PWR6" (2) on the system board.
- ▶ Disconnect the end of the SAS cable from connector "C0" (3, close-up) on the PSAS CP500i RAID card in PCIe slot 5.

## Accessible drives

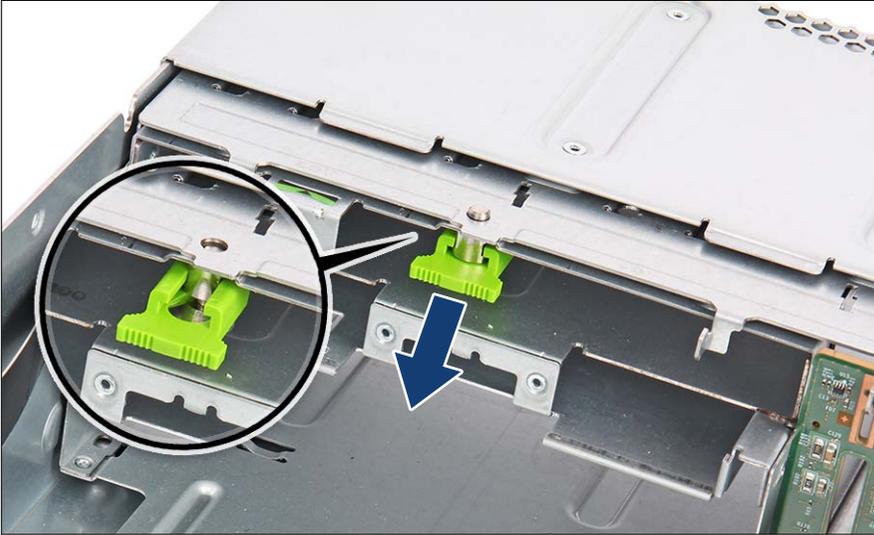


Figure 287: Removing the LTO drive (A)

- ▶ Pull the locking latch in the direction of the arrow to unlock the front panel cage.

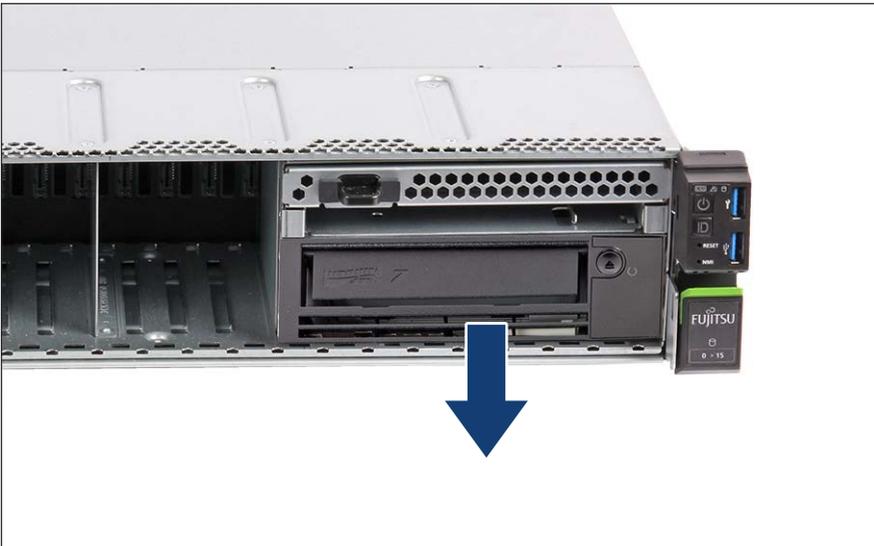


Figure 288: Removing the LTO drive (B)

- ▶ Remove the front panel cage out of its bay.



Figure 289: Removing the LTO drive (C)

- ▶ If applicable, remove four screws (see blue and orange circles).
- ▶ In case of an LTO drive which has only three screw-holes, remove three screws (see blue circles).
- ▶ Remove the LTO drive (see arrow).

### Installing the air grid



Figure 290: Installing the air grid (A)

- Install the air grid.



Figure 291: Installing the air grid (B)

- Fasten the four screws (see circles).

### Installing the front panel cage

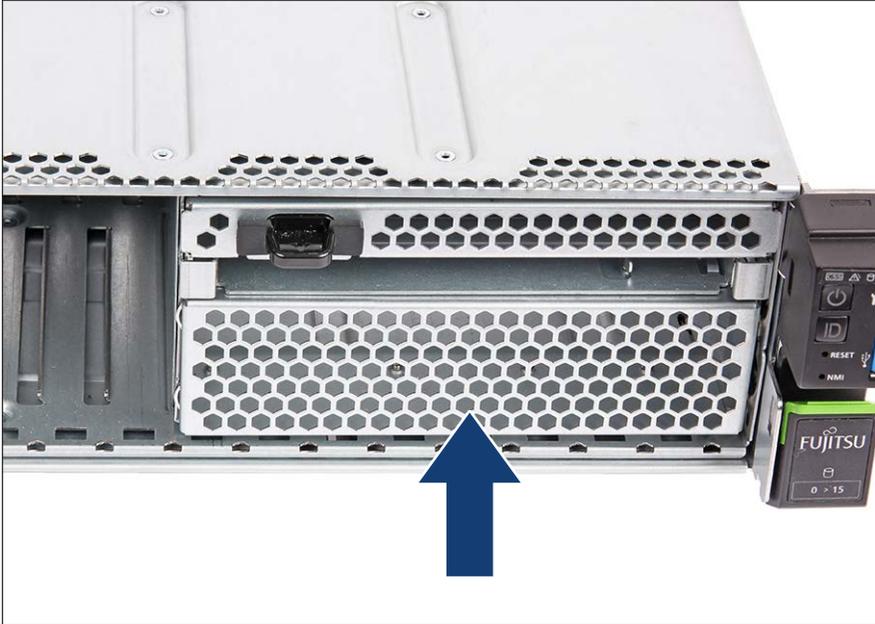


Figure 292: Installing the front panel cage (A)

- ▶ Insert the front panel cage into its bay.

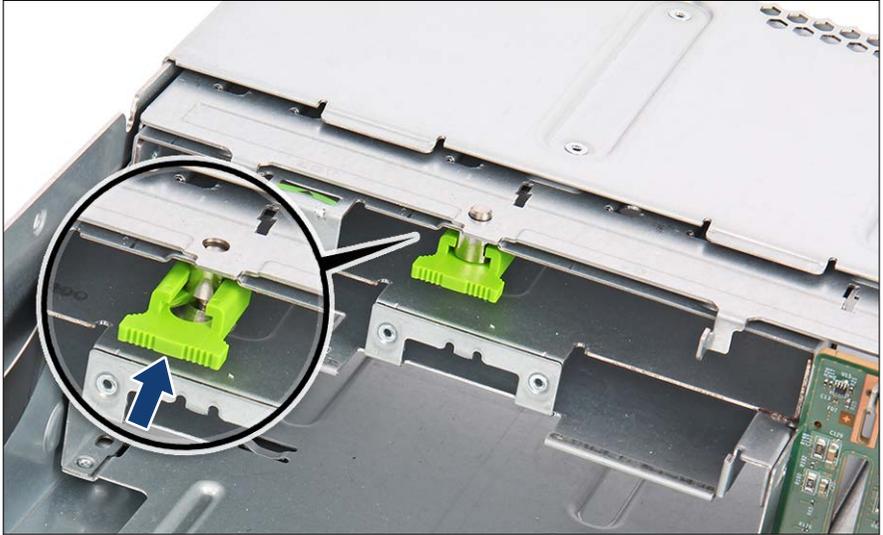


Figure 293: Installing the front panel cage (B)

- ▶ Push the locking latch in the direction of the arrow to lock the front panel cage.

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 13.4.3 Replacing the LTO drive



**Upgrade and Repair Unit  
(URU)**



**Hardware: 10 minutes**

## Accessible drives

---

**Tools:** Phillips PH2 / (+) No. 2 screwdriver

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Removing backup and optical disk media" on page 92.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the defective LTO drive

- ▶ Remove the LTO drive, see ["Removing the LTO drive" on page 432.](#)

### Installing the new LTO drive

- ▶ Install the LTO drive, see ["Installing the LTO drive" on page 424.](#)

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 13.5 RDX drive

### 13.5.1 Installing the RDX drive



**Upgrade and Repair Unit (URU)**



**Hardware: 10 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

#### **Preliminary steps**

- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the front panel cage

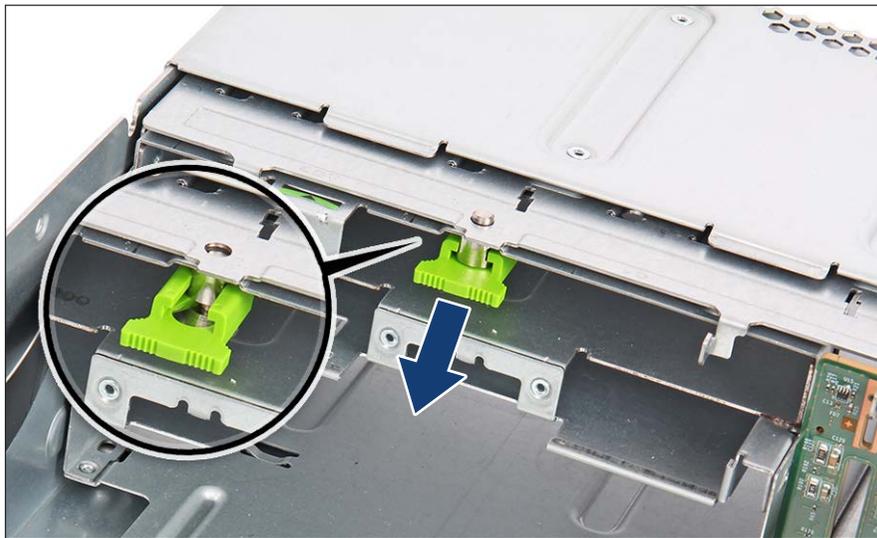


Figure 294: Removing the front panel cage (A)

- ▶ Pull the locking latch in the direction of the arrow to unlock the front panel cage (see close-up).

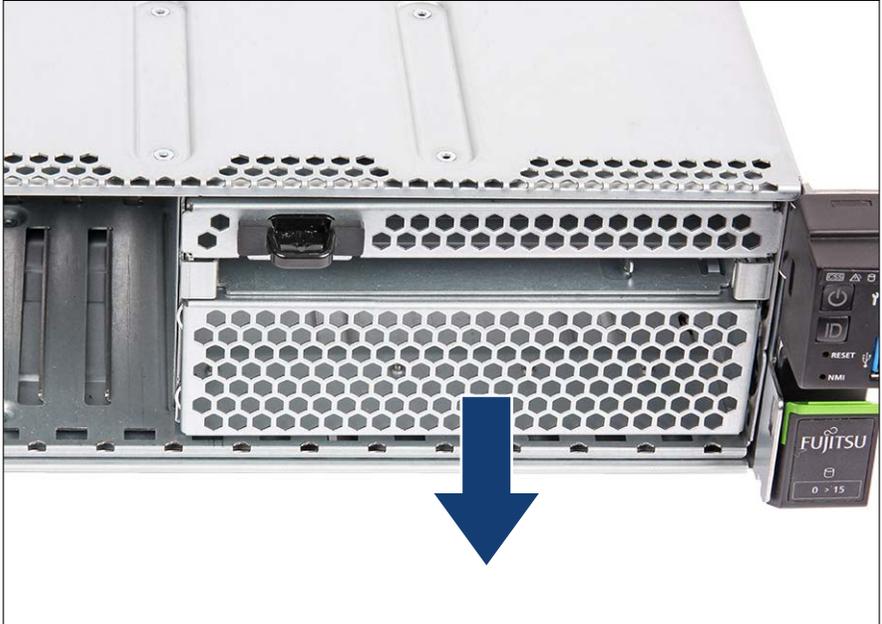


Figure 295: Removing the front panel cage (B)

- ▶ Remove the front panel cage out of its bay.

### Removing the air grid



Figure 296: Removing the air grid (A)

- ▶ Remove the four screws (see circles).



Keep the four screws - they will be reused for fixing the RDX drive.



Figure 297: Removing the air grid (B)

- ▶ Remove the air grid.



**CAUTION**

Save the dummy cover (air grid) for future use.

- ▶ Always replace dummy modules into unused drive bays to comply with applicable EMC regulations and satisfy cooling requirements.

### Installing an RDX drive



Figure 298: Installing the RDX drive (A)

- ▶ Insert the RDX drive into the front panel module (see arrow).
- ▶ Fasten the RDX drive with four screws (see circles).



Figure 299: Installing the RDX drive (B)

- Carefully slide in the front panel module into its bay.



Figure 300: Installing the RDX drive (C)

## Accessible drives

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- ▶ Push the locking latch in the direction of the arrow to lock the front panel module.

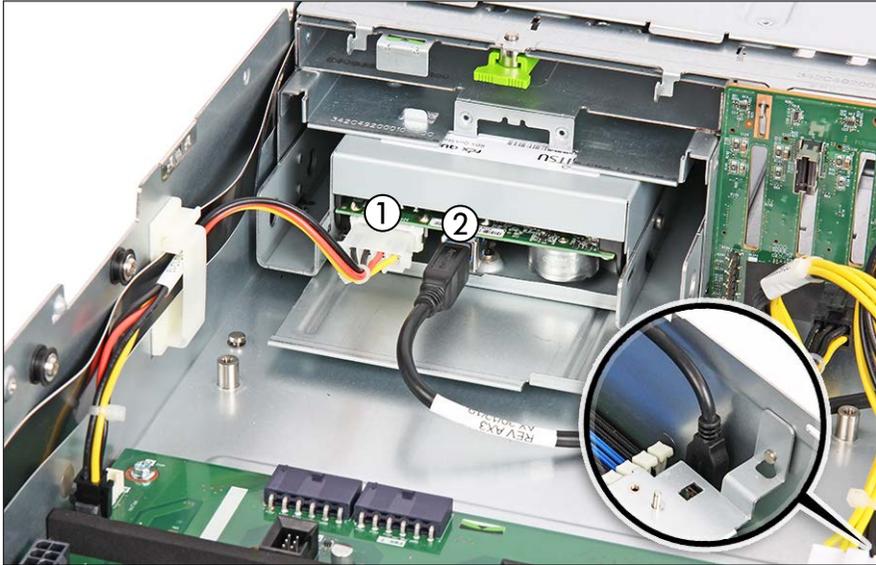


Figure 301: Connecting the cables to the RDX drive

- ▶ Connect the power cable to the RDX drive (1).
- ▶ Connect the end of the power cable to connector "PWR6" on the system board.
- ▶ Connect the USB cable to the RDX drive (2).
- ▶ Connect the end of the USB cable to connector "USB 3.0" (see close-up) on the system board.

## Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 13.5.2 Removing the RDX drive



**Upgrade and Repair Unit  
(URU)**



**Hardware: 10 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver

### Preliminary steps

- ▶ ["Removing backup and optical disk media" on page 92.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the RDX drive

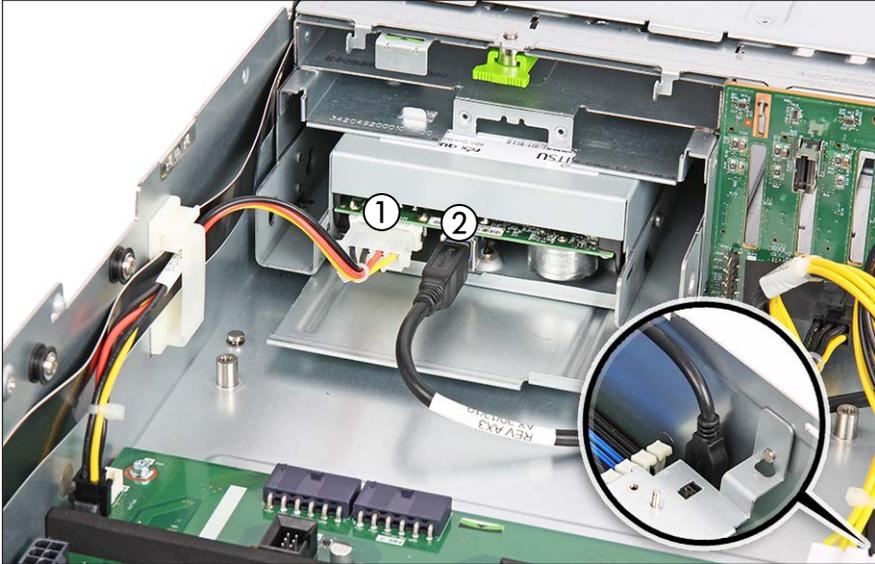


Figure 302: Disconnecting the cables from the RDX drive

- ▶ Disconnect the power cable from the RDX drive (1).
- ▶ Disconnect the end of the power cable from connector "PWR6" on the system board.
- ▶ Disconnect the USB cable from the RDX drive (2).
- ▶ Disconnect the end of the USB cable from connector "USB 3.0" (see close-up) on the system board.

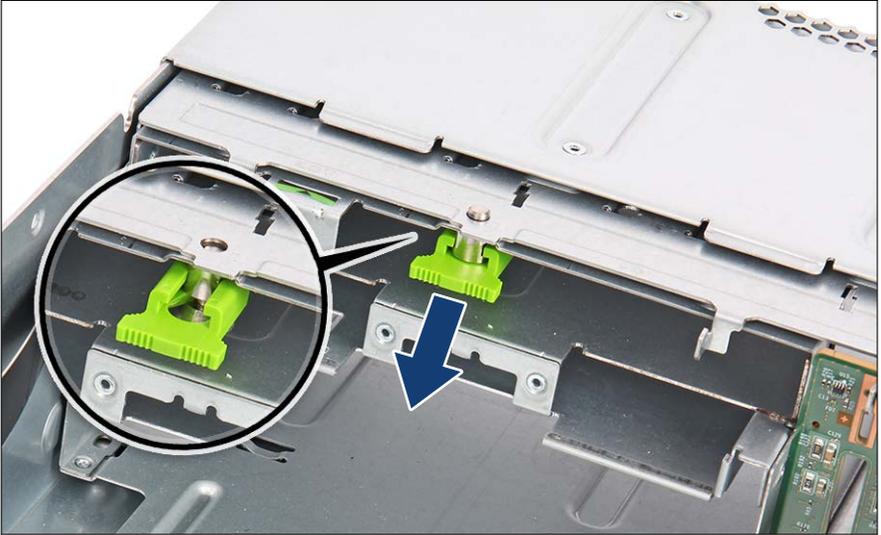


Figure 303: Removing the RDX drive (A)

- ▶ Pull the locking latch in the direction of the arrow to unlock the front panel cage.

## Accessible drives

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Figure 304: Removing the RDX drive (B)

- ▶ Remove the front panel cage out of its bay.



Figure 305: Removing the RDX drive (C)

- ▶ Remove the four screws (see circles).
- ▶ Remove the RDX drive (see arrow).

### Installing the air grid



Figure 306: Installing the air grid (A)

- Install the air grid.



Figure 307: Installing the air grid (B)

- Fasten the four screws (see circles).

### Installing the front panel cage

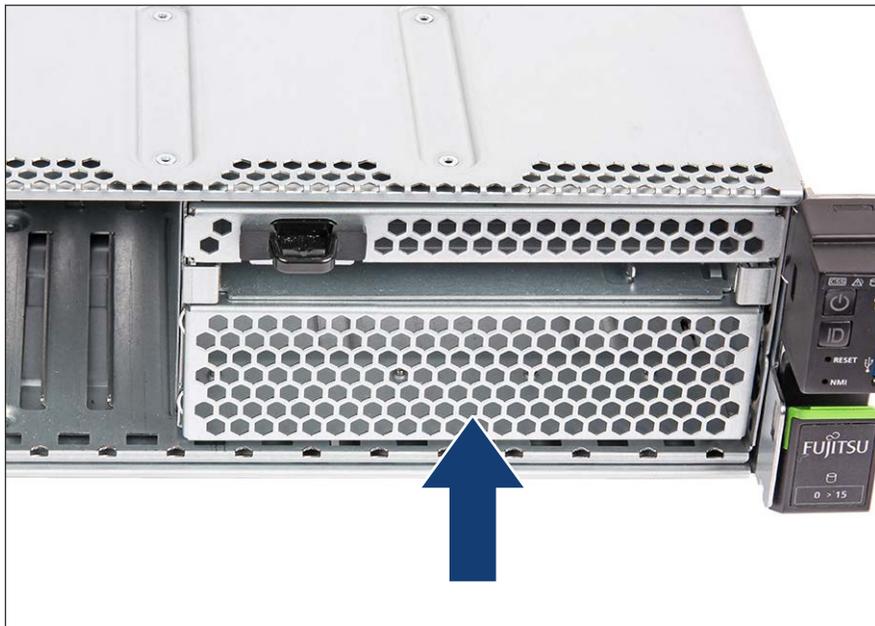


Figure 308: Installing the front panel cage (A)

- ▶ Insert the front panel cage into its bay.

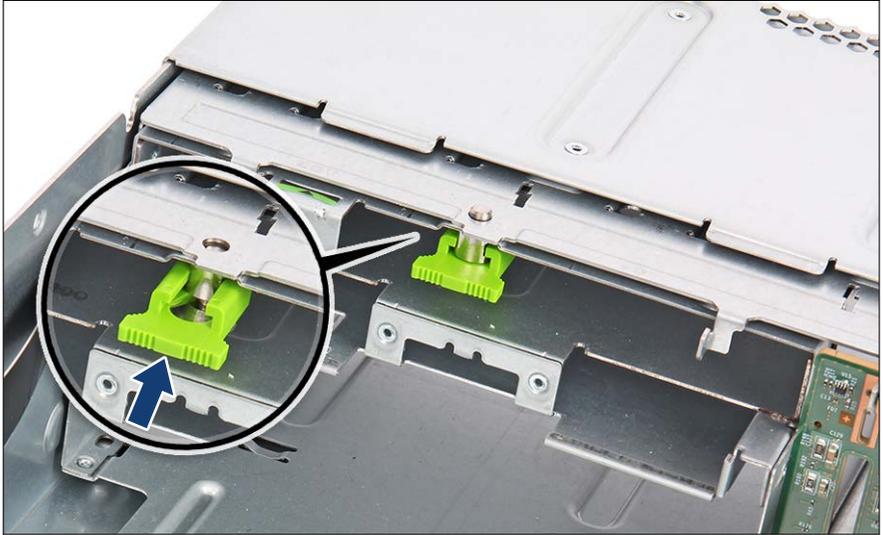


Figure 309: Installing the front panel cage (B)

- ▶ Push the locking latch in the direction of the arrow to lock the front panel cage.

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 13.5.3 Replacing the RDX drive



**Upgrade and Repair Unit  
(URU)**



**Hardware: 10 minutes**

## Accessible drives

---

**Tools:** Phillips PH2 / (+) No. 2 screwdriver

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Removing backup and optical disk media" on page 92.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

### Removing the defective RDX drive

- ▶ Remove the RDX drive, see ["Removing the RDX drive" on page 449.](#)

### Installing the new RDX drive

- ▶ Install the RDX drive, see ["Installing the RDX drive" on page 441.](#)

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

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# 14 Thermal sensor

## 14.1 Replacing the thermal sensor



**Field Replaceable Unit (FRU)**



**Hardware: 10 minutes**

<b>Tools:</b>	<ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– Phillips PH1 / (+) No. 1 screw driver (for the thermal sensor)</li></ul>
---------------	--

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ If applicable, ["Removing the riser module 2" on page 73.](#)
- ▶ ["Removing the fan cage" on page 76.](#)
- ▶ ["Removing the air duct" on page 80.](#)
- ▶ Remove all HDD modules, see ["Removing 2.5-inch HDD/SSD modules" on page 180](#) or ["Removing 3.5-inch HDD modules" on page 153.](#)



The proceeding for installing/removing is identical for the 2.5-inch or 3.5-inch HDD configuration.

### Removing the defective thermal sensor

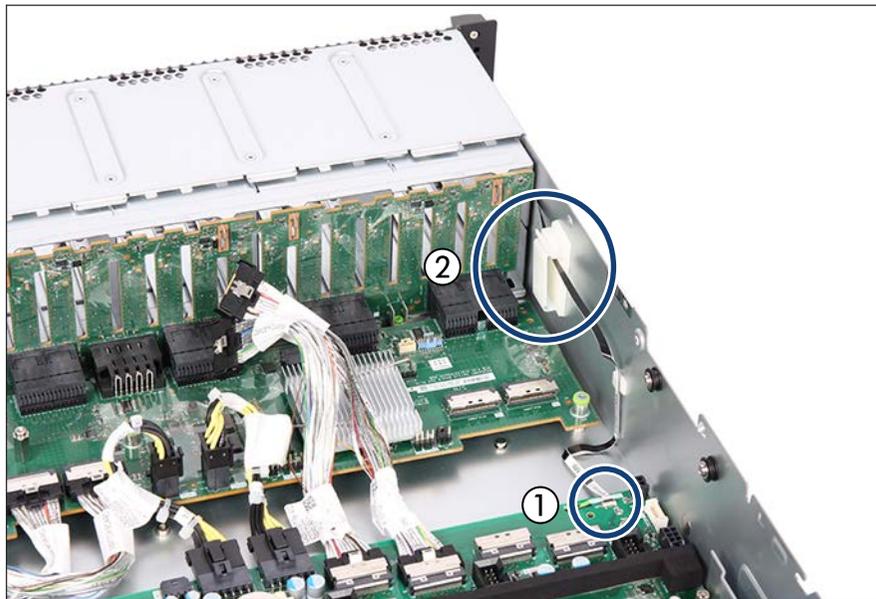


Figure 310: Disconnecting the thermal cable

- ▶ Pull up the locking bar.
- ▶ Disconnect the thermal cable from the system board (1).
- ▶ Open the cable clip (2).

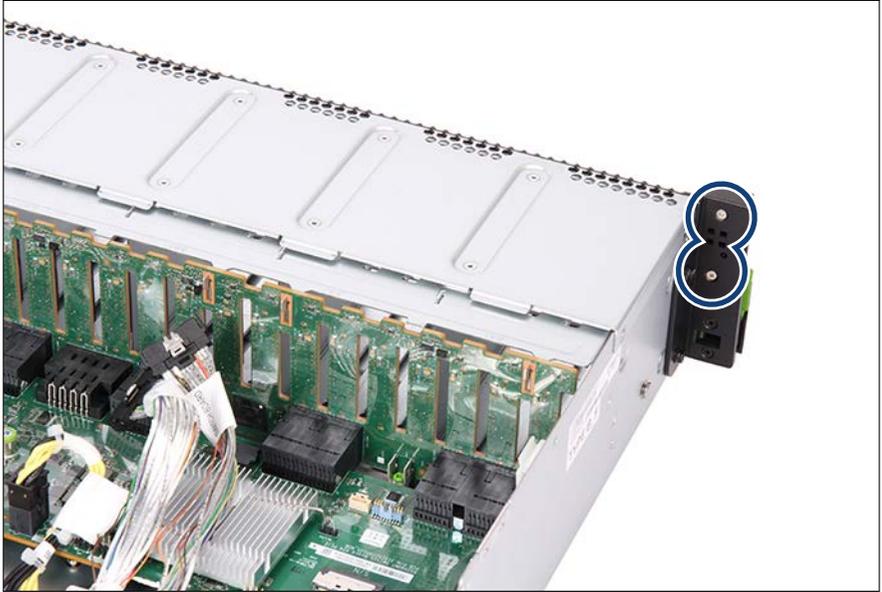


Figure 311: Removing the screws

- ▶ Remove the two screws of the thermal sensor (see circles).

## Thermal sensor

---



Figure 312: Removing the thermal sensor

- ▶ Pull the thermal sensor together with the thermal cable out of the opening.

## Installing the new thermal sensor

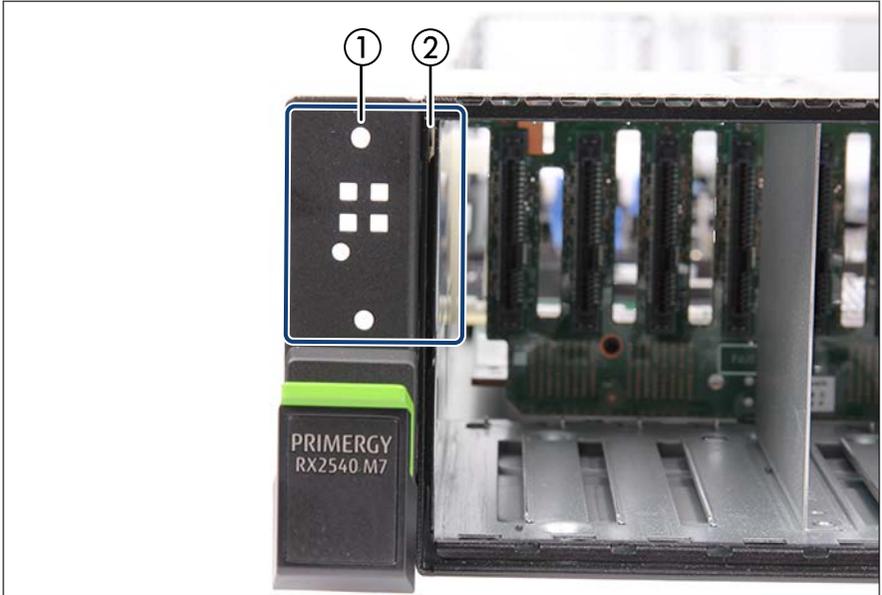


Figure 313: Breakouts and opening for the thermal sensor

1 Breakouts

2 Opening



For Japan and APAC:

The thermal sensor needs to put an ID information label on which is printed the product name and the serial number.

An ID information label is attached to the warranty of the product.

Please borrow the ID information label from the customer and put the ID information label to the spare parts of thermal sensor.

If the customer has lost the ID information label, handwrite the product name and the serial number on the blank label attached to the spare parts of thermal sensor.

## Thermal sensor

---



Figure 314: Installing the thermal sensor

- ▶ Thread the thermal cable through the opening.
- ▶ Position the thermal sensor on the ear.

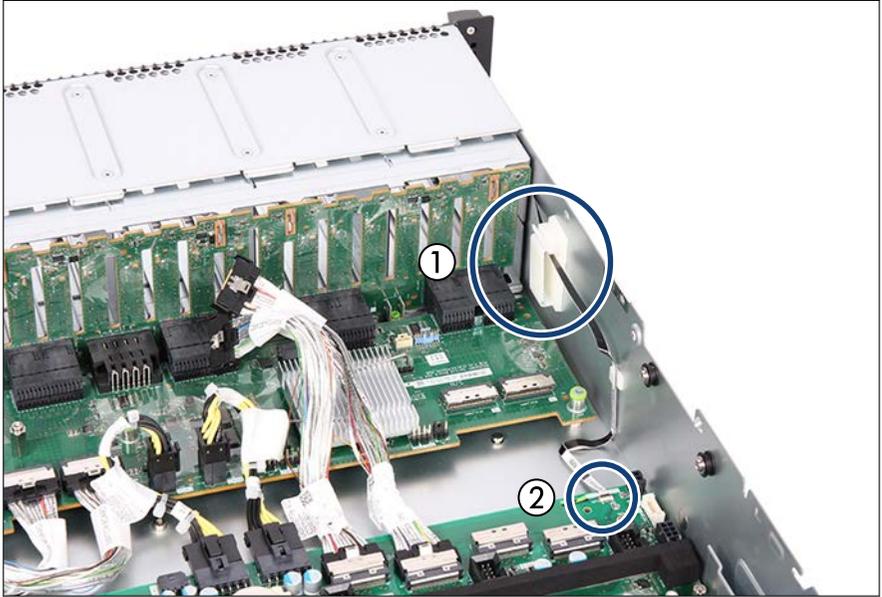


Figure 315: Disconnecting the thermal cable

- ▶ Run the thermal cable through the cable clip (1).
- ▶ Bend the cable 90 degrees by hand for easier routing.
- ▶ Connect the thermal cable to the connector "Thermal sensor" on the system board (2).
- ▶ Press down the locking bar.

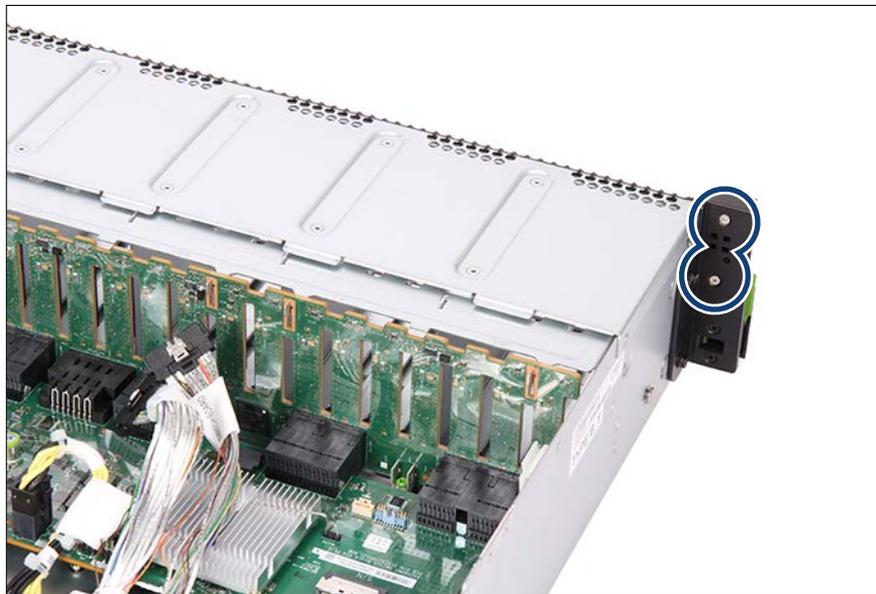


Figure 316: Fasten the thermal sensor

- ▶ Fasten the thermal sensor with two screws (see circles).

### Concluding steps

- ▶ Install all HDD modules, see ["Installing a 2.5-inch HDD/SSD module" on page 179](#) or ["Installing a 3.5-inch HDD module" on page 152](#).
- ▶ ["Installing the air duct" on page 79](#).
- ▶ ["Installing the fan cage" on page 77](#).
- ▶ If applicable, ["Installing the riser module 2" on page 75](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

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# 15 Front panel

## 15.1 Safety notes



### CAUTION

- ▶ When inserting the COP (Common Operation Panel) into the server, ensure not to pinch or strain any connected cables.
- ▶ Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).
- ▶ Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- ▶ For more information, see "[Important information](#)" on page 33.

## 15.2 Basic information

In case of a defective ambient temperature sensor, please replace Common Operation panel (COP).

### COP

The COP is mounted on the right side ear. A flat cable is used for connection to the system board.

### Front VGA (option)

A front VGA connector can be installed at the front panel of some configurations.

# 15.3 Common operation panel (COP)

## 15.3.1 Replacing the COP



**Field Replaceable Unit (FRU)**



**Hardware: 10 minutes**  
**Software: 5 minutes**

- |               |   |
|---------------|---|
| <b>Tools:</b> | <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– Phillips PH1 / (+) No. 1 screw driver (for COP)</li></ul> |
|---------------|---|

### Note on system information backup/restore

The COP contains the Chassis ID EPROM that contains system information like server name and model, housing type, serial number and manufacturing data. To avoid the loss of non-default settings when replacing the system board, a backup copy of important system configuration data is automatically stored from the system board NVRAM to the Chassis ID EPROM.



#### CAUTION

For that reason the COP and the system board should not be replaced simultaneously! In this case, the automatically restoring of the system configuration data on the system board would fail.

- ▶ If the COP and the system board are replaced at the same time, reconfigure the BIOS/iRMC and restore the system information like server name, server model, housing type, serial number and manufacturing data manually by Chassis ID Prom Tool.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ ["Removing the fan cage" on page 76.](#)

## Removing the COP



The COP and the front panel cable are combined in one spare part.

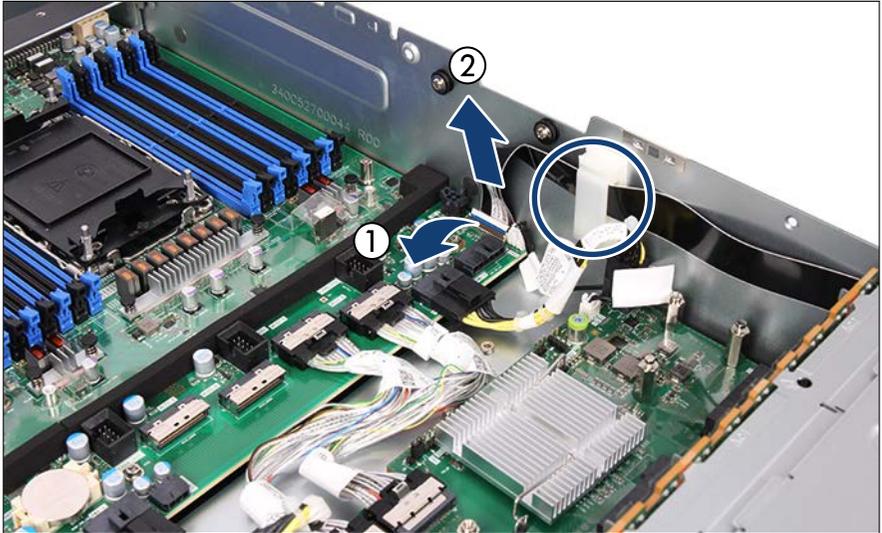


Figure 317: Removing the front panel cable

- ▶ Pull up the locking bar (1).
- ▶ Disconnect the front panel cable (2).
- ▶ Remove the front panel cable from the cable clips (see circle).



Figure 318: Removing the COP (A)

- ▶ Remove the two screws (see circles).



Figure 319: Removing the COP (B)

- ▶ Pull the COP together with the front panel cable out of the opening.

### Installing the COP



Figure 320: Installing the COP (B)

## Front panel

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- ▶ Thread the front panel cable through the opening.
- ▶ Position the COP on the ear.



Figure 321: Installing the COP (B)

- ▶ Fasten the COP with two screws (see circles).

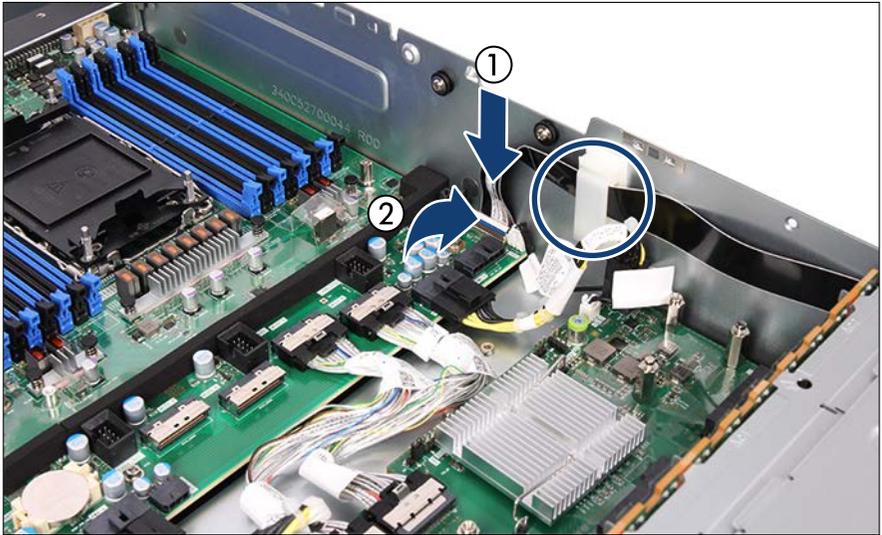


Figure 322: Installing the front panel cable

- ▶ Bend the cable 90 degrees by hand for easier routing.
- ▶ Insert the front panel cable in the cable clip (see circle).
- ▶ Insert the front panel cable in the connector "FRONT PANEL" on the system board (1).
- ▶ Press down the locking bar (2).

### Concluding steps

- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ ["Verifying system information backup or restore" on page 96.](#)
- ▶ ["Resuming BitLocker functionality" on page 107.](#)

## 15.4 Front VGA

### 15.4.1 Installing the front VGA



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

- |  |
|--|
| <p><b>Tools:</b></p> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– hexagon screw driver 5 mm (for front VGA)</li></ul> |
|--|

#### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ If applicable, ["Removing the riser module 1" on page 72.](#)
- ▶ ["Removing the fan cage" on page 76.](#)
- ▶ ["Removing the air duct" on page 80.](#)

### Removing the front VGA dummy cover

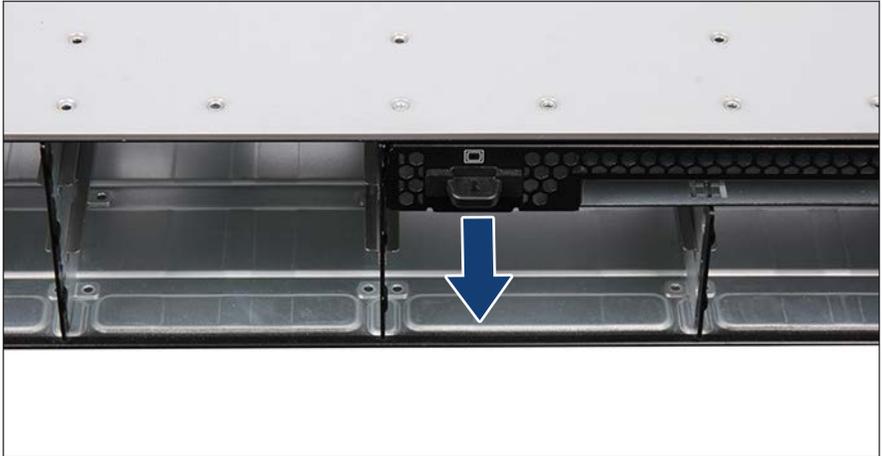


Figure 323: Removing the dummy cover

- Remove the dummy cover.

### Installing the front VGA



Figure 324: Installing the front VGA

## Front panel

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- ▶ Insert the front VGA cable from the server inside through the opening.
- ▶ Fasten the front VGA connector with the two screws (see circles).

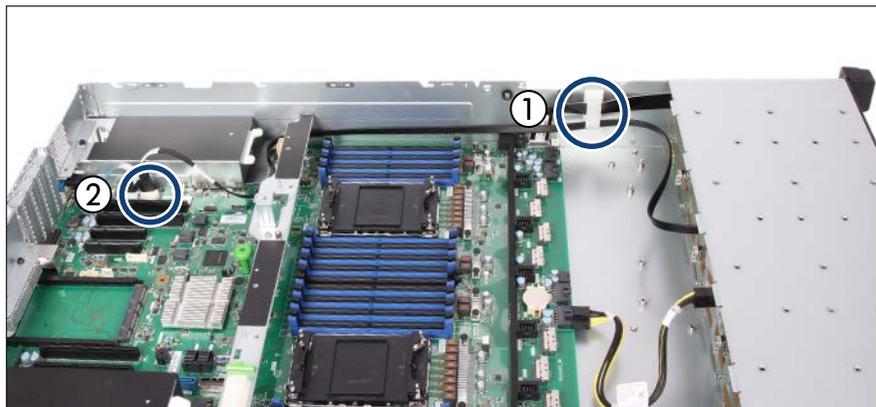


Figure 325: Installing the front VGA cable

- ▶ Insert the front VGA cable in the cable clip (1).
- ▶ Connect the front VGA cable to the system board connector "FRONT VGA" (2).

### Concluding steps

- ▶ ["Installing the air duct" on page 79.](#)
- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ If applicable, ["Installing the riser module 1" on page 74.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

## 15.4.2 Removing the front VGA



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:**

- Phillips PH2 / (+) No. 2 screw driver (for cover 2)
- hexagon screw driver 5 mm (for front VGA)

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ If applicable, ["Removing the riser module 1" on page 72.](#)
- ▶ ["Removing the fan cage" on page 76.](#)
- ▶ ["Removing the air duct" on page 80.](#)

### Removing the front VGA



Figure 326: Removing the front VGA

- ▶ Remove the two screws (see circles).
- ▶ Pull the front VGA cable out of the opening from the inner side.

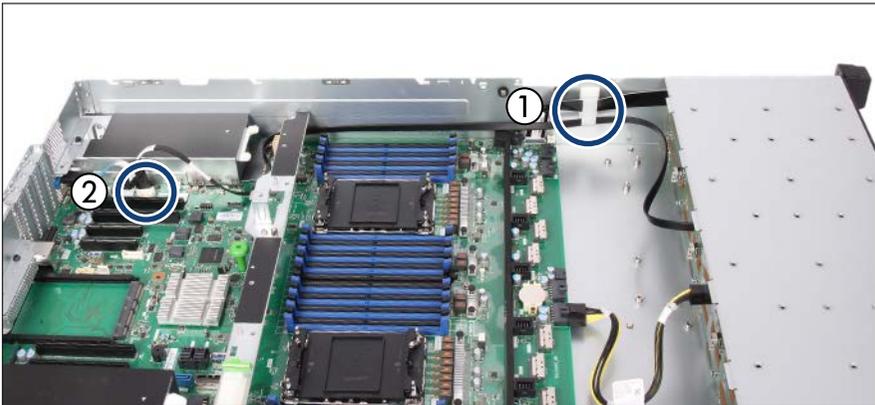


Figure 327: Removing the front VGA cable

- ▶ Remove the front VGA cable from the cable clip (1).
- ▶ Disconnect the front VGA cable from the system board connector "FRONT VGA" (2).

### Installing the front VGA dummy cover

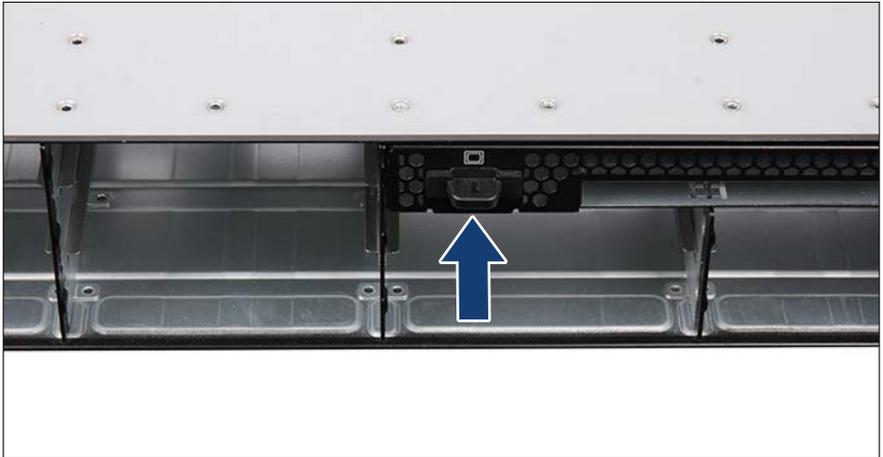


Figure 328: Installing the dummy cover

- ▶ Install the dummy cover.

### Concluding steps

- ▶ ["Installing the air duct" on page 79.](#)
- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ If applicable, ["Installing the riser module 1" on page 74.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

### 15.4.3 Replacing the front VGA



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes**

<b>Tools:</b> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screwdriver (for cover 2)</li><li>– hexagon screwdriver 5 mm (for front VGA)</li></ul>
---

#### **Preliminary steps**

- ▶ If applicable, ["Removing the front cover with lock"](#) on page 49.
- ▶ ["Shutting down the server"](#) on page 50.
- ▶ ["Disconnecting the power cord"](#) on page 50.
- ▶ ["Getting access to the component"](#) on page 55.
- ▶ If applicable, ["Removing the riser module 1"](#) on page 72.
- ▶ ["Removing the fan cage"](#) on page 76.
- ▶ ["Removing the air duct"](#) on page 80.

#### **Removing the defective front VGA**

- ▶ Remove the front VGA, see ["Removing the front VGA "](#) on page 477.

#### **Installing the new front VGA**

- ▶ Install the front VGA, see ["Installing the front VGA"](#) on page 474.

#### **Concluding steps**

- ▶ ["Installing the air duct"](#) on page 79.
- ▶ ["Installing the fan cage"](#) on page 77.
- ▶ If applicable, ["Installing the riser module 1"](#) on page 74.
- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.

- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)



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# 16 Additional interfaces

## 16.1 Safety notes



### CAUTION

▶ For more information, see ["Important information" on page 33](#).

## 16.2 Serial interface

### 16.2.1 Installing the serial interface



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

<p><b>Tools:</b></p> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– Flat screw driver</li><li>– Hexagon screw driver 5 mm</li></ul>
--

#### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ ["Getting access to the component" on page 55](#).
- ▶ Remove the riser module 1, see ["Removing a riser module" on page 72](#).
- ▶ If applicable, remove the slot bracket from PCIe slot 5, see ["Removing slot brackets" on page 252](#).

### Installing the expansion card with the serial interface

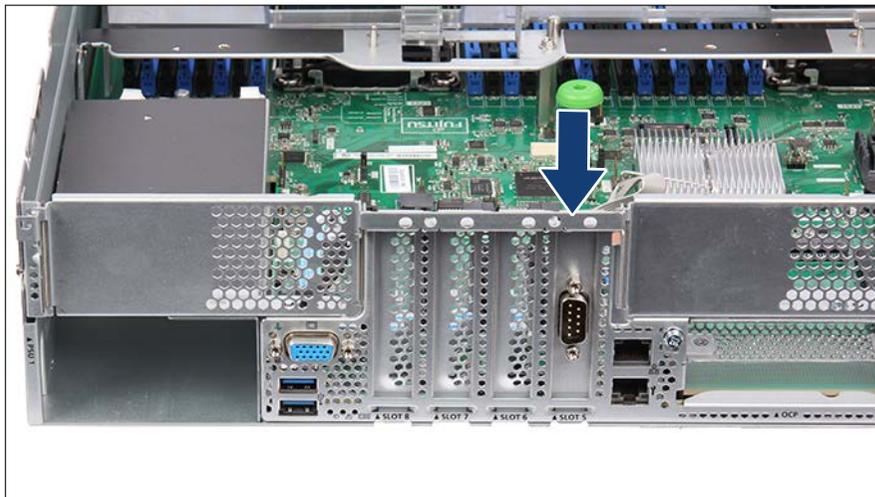


Figure 329: Installing the expansion card with the serial interface

- ▶ Install the expansion card with the serial interface into PCIe slot 5.
- ▶ Fasten the expansion card with the serial interface with the two screws.

### Connecting the serial interface



Figure 330: Serial interface

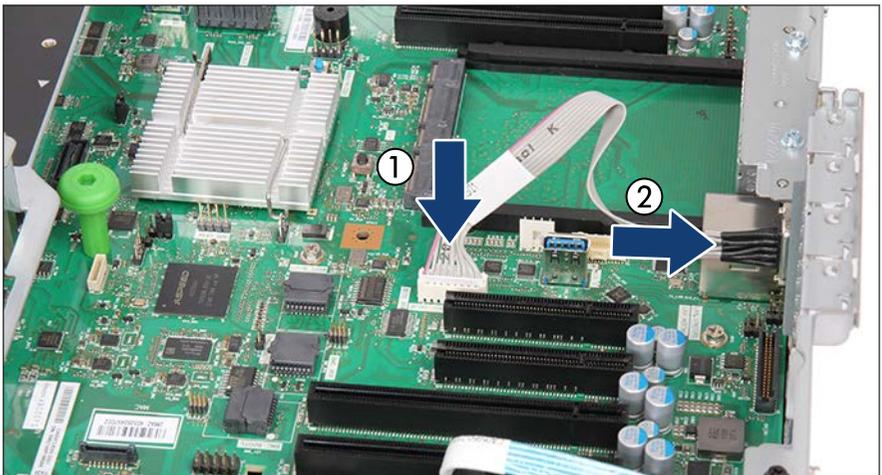


Figure 331: Installing the serial interface

## Additional interfaces

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- ▶ Connect the serial interface cable to the connector "Rear Serial" on the system board (1).
- ▶ Insert the serial interface cable into the expansion card (2).

### Concluding steps

- ▶ Install the riser module 2, see ["Installing a riser module" on page 74](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 16.2.2 Removing the serial interface



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

#### Tools:

- Phillips PH2 / (+) No. 2 screw driver (for cover 2)
- Hexagon screw driver 5 mm

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ ["Getting access to the component" on page 55](#).
- ▶ Remove the riser module 1, see ["Removing a riser module" on page 72](#).

### Disconnecting the serial interface



Figure 332: Disconnecting the serial interface

- ▶ Disconnect the serial interface cable (see circles).
- ▶ Remove the serial interface cable from the system board.

### Removing the expansion card with the serial interface

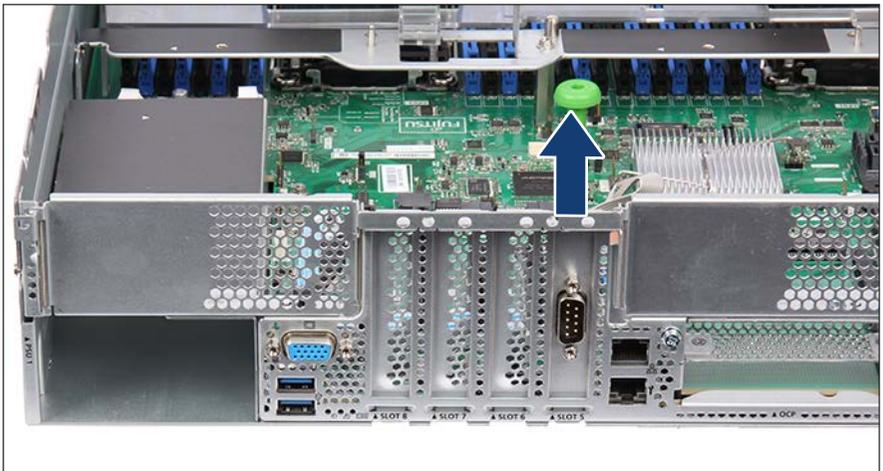


Figure 333: Removing the serial interface

## Additional interfaces

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- ▶ Loosen the two screws.
- ▶ Remove the expansion card with the serial interface.

### Concluding steps

- ▶ Install the riser module 1, see ["Installing a riser module" on page 74](#).
- ▶ If applicable, install a slot bracket in PCIe slot 5, see ["Installing the front cover with lock" on page 71](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 16.2.3 Replacing the serial interface



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

- |               |   |
|---------------|---|
| <b>Tools:</b> | <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screwdriver (for cover 2)</li><li>– hexagon screwdriver 5 mm</li></ul> |
|---------------|---|

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ ["Getting access to the component" on page 55](#).

### Removing the defective serial interface

- ▶ Remove the serial interface, see ["Removing the serial interface" on page 486](#).

## Installing the new serial interface

- ▶ Install the serial interface, see ["Installing the serial interface" on page 483](#).

## Concluding steps

- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

## 16.3 Rear VGA connector

### 16.3.1 Replacing the rear VGA connector



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:**

- Phillips PH2 / (+) No. 2 screw driver (for cover 2)
- Hexagon screw driver 5 mm

## Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ ["Getting access to the component" on page 55](#).
- ▶ Remove the riser module 2, see ["Removing a riser module" on page 72](#).

## Additional interfaces

### Removing the rear VGA



Figure 334: Removing the rear VGA connector (A)

- ▶ Remove the two hexagon bolts (see circles).

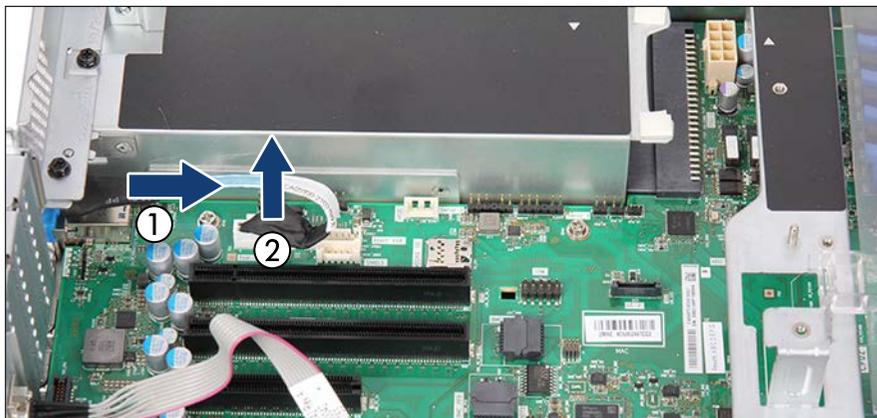


Figure 335: Removing the rear VGA connector (B)

- ▶ Remove the rear VGA connector (1).
- ▶ Remove the VGA cable from the system board (2).

## Installing the rear VGA

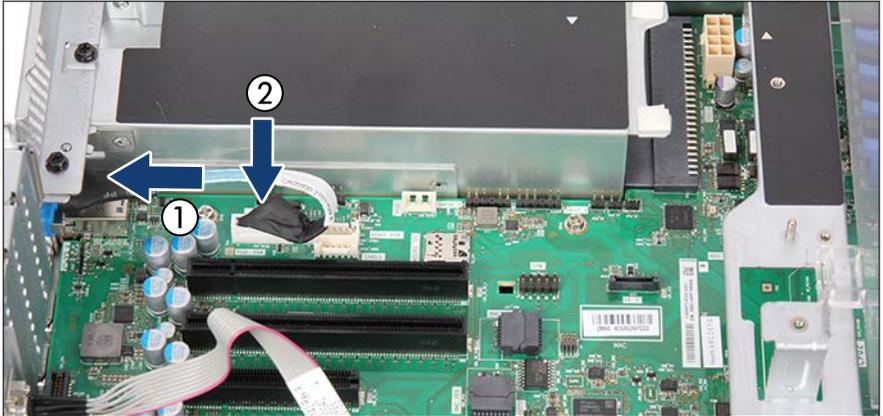


Figure 336: Installing the rear VGA connector (A)

- ▶ Insert the rear VGA connector into the chassis (1).
- ▶ Connect the VGA cable to the connector "Rear VGA" on the system board (2).



Figure 337: Installing the rear VGA connector (B)

- ▶ Fasten the rear VGA connector with two hexagon bolts (see circles).

### Concluding steps

- ▶ Install the riser module 2, see ["Installing a riser module" on page 74](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

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# 17 System board and components

## 17.1 Safety notes



### CAUTION

- ▶ Devices and components inside the server remain hot after shutdown. After shutting down the server, wait for hot components to cool down before installing or removing internal options.
- ▶ Circuit boards and soldered parts of internal options are exposed and can be damaged by static electricity. Always discharge static build-up (e.g. by touching a grounded object) before handling electrostatic-sensitive devices (ESDs).
- ▶ Do not touch the circuitry on boards or soldered parts. Hold circuit boards by their metallic areas or edges.
- ▶ For more information, see ["Important information" on page 33](#).

## 17.2 Basic information

This section provides instructions for the system board and the following components:

### – CMOS battery (CR2450)

The real-time clock is powered by a lithium coin cell (CMOS battery) when mains get lost. This cell lasts up to five years, depending on ambient temperature and use.

If the CMOS battery is depleted or falls below minimum voltage levels, it need to be replaced immediately.

### – TPM (Trusted Platform Module)

The system board is optionally equipped with a TPM. This module enables programs from third party manufacturers to store key information, for example drive encryption using Windows Bitlocker Drive Encryption.

- iRMC microSD card

The iRMC microSD card is necessary for using the embedded Lifecycle Management (eLCM) functionality of the iRMC.

- VROC module

The VROC module is necessary for using the VROC functionality. VROC provides RAID solutions for NVMe SSDs and SATA devices.

## 17.3 CMOS battery

### 17.3.1 Replacing the CMOS battery



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

<b>Tools:</b> <ul style="list-style-type: none"><li>– Phillips PH2 / (+) No. 2 screw driver (for cover 2)</li><li>– recommended: tooth pick (CMOS battery)</li></ul>
--



For this server the battery type CR2450 is used.



#### CAUTION

- ▶ The CMOS battery must be replaced with an identical battery or with a battery type recommended by the manufacturer.
- ▶ Keep lithium batteries away from children.
- ▶ Do not throw batteries into the trash can. Lithium batteries must be disposed of in accordance with local regulations concerning special waste.
- ▶ For more safety information, see "Environmental protection" in the operating manual of your server.
- ▶ **Ensure to insert the CMOS battery with the positive pole facing up!**

### Preliminary steps

- ▶ "Locating the defective server" on page 47.
- ▶ "Verifying the system time settings" on page 104.
- ▶ If applicable, "Removing the front cover with lock" on page 49.
- ▶ "Shutting down the server" on page 50.
- ▶ "Disconnecting the power cord" on page 50.
- ▶ "Getting access to the component" on page 55.
- ▶ "Removing the air duct" on page 80.

### Replacing the defective CMOS battery

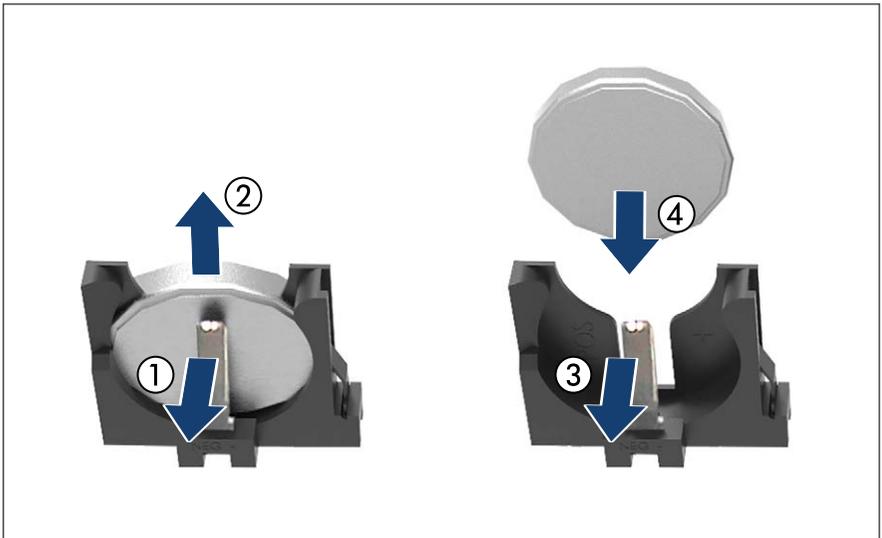


Figure 338: Replacing the CMOS battery

## System board and components

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- ▶ Press the locking spring into direction of the arrow (1), so that the CMOS battery jumps out of its socket.
- ▶ Remove the CMOS battery (2).



### CAUTION

Sharp tools such as screwdrivers might damage system board components in case of slipping.

- ▶ If the CMOS battery cannot be ejected without the help of a tool, it is recommended to use a tooth pick.
- ▶ Insert a new CMOS battery of the same type into the socket (3) and (4).

## Concluding steps

- ▶ Dispose of the CMOS battery in accordance with local regulations concerning special waste.
- ▶ ["Installing the air duct" on page 79.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ Verify that the iRMC displays voltage sensor information (BATT 3.0 V).
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ BIOS settings are automatically reloaded. Time and date must be set manually, see ["Verifying the system time settings" on page 104.](#)



## System board and components

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- Tools:**
- Phillips PH2 / (+) No. 2 screw driver (for cover 2)
  - Bit screw driver
  - TPM bit insert (\*)
- (\*) For Japan:
- TPM module fixing tool (S26361-F3552-L909)

### Preliminary steps

- ▶ In case of Windows as operating system, "[Suspending BitLocker functionality](#)" on page 89.
- ▶ If applicable, "[Removing the front cover with lock](#)" on page 49.
- ▶ "[Shutting down the server](#)" on page 50.
- ▶ "[Disconnecting the power cord](#)" on page 50.
- ▶ "[Getting access to the component](#)" on page 55.
- ▶ If applicable, "[Removing the riser module 2](#)" on page 73.
- ▶ If applicable, "[Removing an expansion card](#)" on page 279.

### Installing the TPM

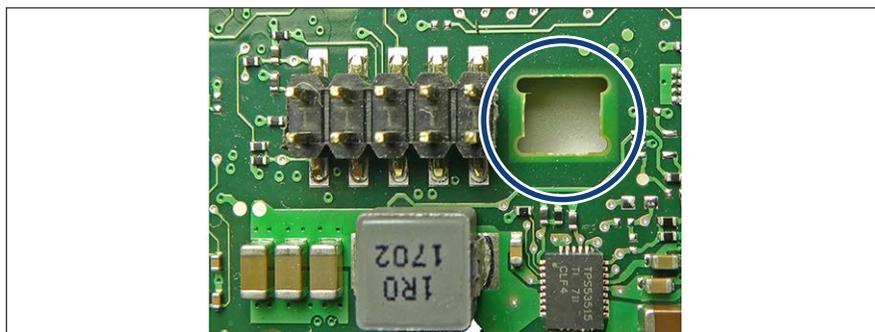


Figure 341: Position for the TPM spacer



Figure 342: Inserting the TPM spacer on the system board

- ▶ Insert the TPM spacer into the hole on the system board.



Figure 343: TPM bit insert

- ▶ Attach the TPM bit insert or TPM module fixing tool (for Japan) to a bit screwdriver.

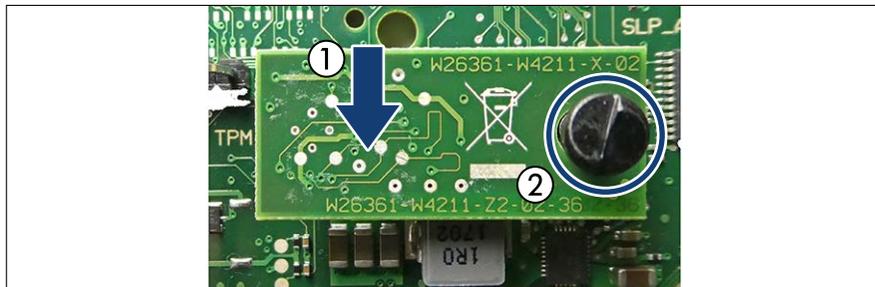


Figure 344: Installing the TPM

- ▶ Connect the TPM to the system board (1).
- ▶ Fasten the TPM with the special screw for the TPM using the TPM bit insert or TPM module fixing tool (Japan) (2).



### CAUTION

- ▶ Do not fasten the screw too firmly.
- ▶ Stop it by extent where the head of the screw lightly touches the TPM. Torque: 0.6 Nm (not used in Japan).

### Concluding steps

- ▶ If applicable, ["Installing an expansion card" on page 269.](#)
- ▶ If applicable, ["Installing the riser module 2" on page 75.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ In case of VMware (vSphere 7.0 U3 or later) environment, see ["Recovering the ESXi configuration information encryption functionality" on page 121.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)
- ▶ In case of Windows as operating system, ["Resuming BitLocker functionality" on page 107.](#)
- ▶ Enable the TPM in the system board BIOS, see ["Enabling the TPM in the system board BIOS" on page 501.](#)

### Enabling the TPM in the system board BIOS

- ▶ Switch on or restart your server.
- ▶ As soon as the startup screen appears, press the [F2] function key to enter the BIOS setup menu.
- ▶ Select the **Configuration** menu.
- ▶ Select the **Security Configuration** submenu.
- ▶ Set the **TPM Support** setting to **Enabled**.
- ▶ Under **Pending TPM operation**, select the desired TPM operation mode.
- ▶ Save your changes and exit the BIOS.



For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual.

### 17.4.4 Removing the TPM



**Field Replaceable Unit (FRU)**



**Hardware: 30 minutes**

- Tools:** Removing the system board:
- Phillips PH2 / (+) No. 2 screwdriver
  - Torx 30 screwdriver
- Removing the TPM:
- Bit screwdriver
  - flat nose pliers
  - TPM bit insert (\*)
- (\*) For Japan:
- Dedicated TPM screwdriver (CWZ8291A)



### CAUTION

- ▶ Advise your contact persons that they must provide you with all recovery keys which belong to the system to restore them in the TPM later.

### Preliminary steps



Preliminary steps are not necessary, if a system board has to be replaced and the TPM is used again.

- ▶ Before removing the TPM board, remove the BitLocker protection and decrypt the volume, see ["Removing BitLocker protection and decrypting the volume" on page 503](#).
- ▶ Disable the TPM in the system board BIOS, see ["Disabling the TPM in the system board BIOS" on page 503](#).
- ▶ ["Suspending BitLocker functionality" on page 89](#).
- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ Remove all PSUs, see ["Installing a hot-plug PSU" on page 126](#).
- ▶ If applicable, remove the OCP module, see ["Removing an OCP module" on page 265](#).
- ▶ ["Getting access to the component" on page 55](#).
- ▶ Remove all riser modules, see ["Removing a riser module" on page 72](#).
- ▶ ["Removing the air duct" on page 80](#).
- ▶ ["Removing the fan cage" on page 76](#).
- ▶ ["Removing the crossbar" on page 83](#).

### Removing BitLocker protection and decrypting the volume

- ▶ Before removing the TPM board, it is necessary to remove BitLocker protection from the computer and to decrypt the volume. Ask the system administrator to turn off BitLocker protection using the BitLocker setup wizard available either from the Control Panel or Windows Explorer:
  - ▶ Open Bitlocker Drive Encryption by clicking the **Start** button, clicking **Control Panel**, clicking **Security**, and then clicking **Bitlocker Drive Encryption**.



Administrator permission required: If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

- ▶ To turn off BitLocker and decrypt the volume, click **Turn Off BitLocker**, and then click **Decrypt the volume**.



Decrypting the volume may be time-consuming. By decrypting the volume, all of the information stored on that computer is decrypted.

For more information on how to disable BitLocker drive encryption, see the Microsoft Knowledge Base. See the Fujitsu web pages for more details.

### Disabling the TPM in the system board BIOS

- ▶ Switch on or restart your server.
- ▶ As soon as the startup screen appears, press the [F2] function key to enter the BIOS setup menu.
- ▶ Select the **Configuration** menu.
- ▶ Select the **Security Configuration** submenu.
- ▶ Set the **TPM Support** setting to **Disabled**.
- ▶ Save your changes and exit the BIOS.



For more information on how to access the BIOS and modify settings, see the corresponding BIOS Setup Utility reference manual.

### Removing the TPM

- ▶ Remove the system board, see ["Removing the defective system board" on page 524.](#)
- ▶ Lay the system board on a soft, antistatic surface with its component side facing down.

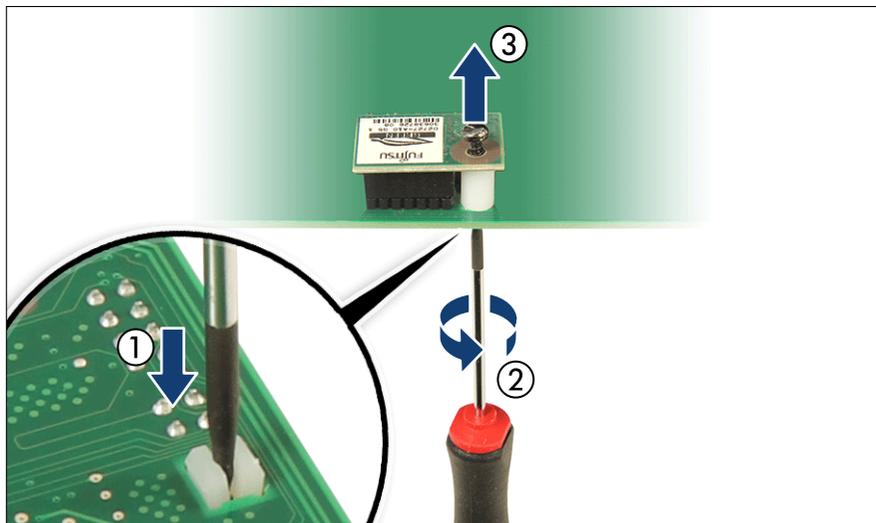


Figure 345: Removing the TPM screw

- ▶ Locate the slotted lower end of the TPM screw (1).
- ▶ Carefully loosen the TPM screw using a thin slotted screwdriver (e.g. watchmaker's screwdriver) or the dedicated TPM screwdriver (Japan) (2).



#### CAUTION

- ▶ Ensure to turn the screw **clockwise** in order to remove it.
- ▶ Slowly and carefully increase the pressure on the screw until it begins to turn. The effort when loosening the screw should be as low as possible.

Otherwise the thin metal bar may break, rendering it impossible to loosen the screw.

- ▶ Remove the TPM screw (3).
- ▶ Remove the TPM on the upper side of the system board.

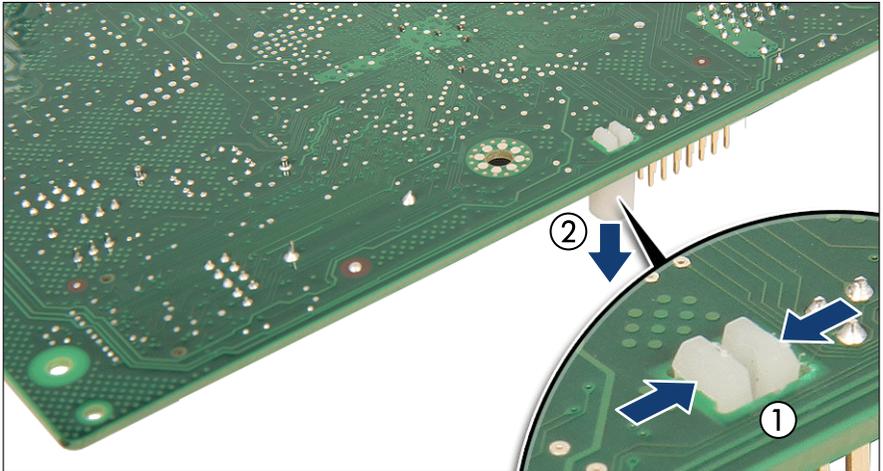


Figure 346: Removing the TPM spacer

- ▶ Using a flat nose pliers, press together the hooks on the TPM spacer (1, see close-up) and remove it from the system board (2).

**i** If the TPM is to be replaced, the TPM spacer may remain on the system board.

- ▶ Install the system board, see ["Installing the new system board" on page 527](#).

### Concluding steps

- ▶ ["Installing the crossbar" on page 84](#).
- ▶ ["Installing the fan cage" on page 77](#).
- ▶ ["Installing the air duct" on page 79](#).
- ▶ Install all riser modules, see ["Installing a riser module" on page 74](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ If applicable, install the OCP module, see ["Installing an OCP module" on page 262](#).
- ▶ Install all PSUs, see ["Installing a hot-plug PSU" on page 126](#).
- ▶ ["Connecting the power cord" on page 65](#).

- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

### 17.4.5 Replacing the TPM



**Field Replaceable Unit (FRU)**



**Hardware: 35 minutes**

**Tools:** Removing the system board:

- Phillips PH2 / (+) No. 2 screw driver
- Torx 30 screw driver

Replacing the TPM:

- Bit screw driver
- TPM bit insert (\*)
- flat nose pliers
- thin slotted screw driver (2 x 0.4 mm)(\*)

(\*) For Japan:

- TPM module fixing tool (S26361-F3552-L909)
- Dedicated TPM screw driver (CWZ8291A)



#### **CAUTION**

- ▶ Advise your contact persons that they must provide you with all recovery keys which belong to the system to restore them in the TPM later.

#### **Preliminary steps**

- ▶ ["Locating the defective server" on page 47.](#)
- ▶ ["Suspending BitLocker functionality" on page 89.](#)
- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)

- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ Remove all PSUs, see ["Removing a hot-plug PSU" on page 129.](#)
- ▶ If applicable, remove the OCP module, see ["Removing an OCP module" on page 265.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ Remove all riser modules, see ["Removing a riser module" on page 72.](#)
- ▶ ["Removing the air duct" on page 80.](#)
- ▶ ["Removing the fan cage" on page 76.](#)
- ▶ ["Removing the crossbar" on page 83.](#)

### Removing the defective TPM

- ▶ Remove the TPM, see ["Removing the TPM" on page 501.](#)
- ▶ Leave the TPM spacer on the system board when removing the defective TPM.

### Installing the new TPM



The TPM spacer is already present on the system board.

- ▶ Install the TPM, see ["Installing the TPM" on page 497.](#)

### Concluding steps

- ▶ ["Installing the crossbar" on page 84.](#)
- ▶ ["Installing the fan cage" on page 77.](#)
- ▶ ["Installing the air duct" on page 79.](#)
- ▶ Install all riser modules, see ["Installing a riser module" on page 74.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ If applicable, install the OCP module, see ["Installing an OCP module" on page 262.](#)

## System board and components

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- ▶ Install all PSUs, see ["Installing a hot-plug PSU" on page 126](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ ["Switching on the server" on page 71](#).
- ▶ Verify whether the iRMC recognizes the installed TPM.
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).
- ▶ ["Resuming BitLocker functionality" on page 107](#).



You can find information on configuring the TPM in the corresponding BIOS Setup Utility reference manual.

## 17.5 iRMC microSD card

### 17.5.1 Note for embedded Lifecycle Management (eLCM)



The iRMC microSD card is necessary for using the embedded Lifecycle Management (eLCM) functionality of the iRMC. It requires a valid eLCM license key from user purchase order and activated through the iRMC web interface.

For more information, see the "ServerView embedded Lifecycle Management (eLCM)" user guide.

### 17.5.2 Installing the iRMC microSD card



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver (for cover 2)

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock"](#) on page 49.
- ▶ ["Shutting down the server"](#) on page 50.
- ▶ ["Disconnecting the power cord"](#) on page 50.
- ▶ ["Getting access to the component"](#) on page 55.
- ▶ If applicable, remove the expansion card from slot 5 and slot 6, see ["Removing an expansion card"](#) on page 279.

### Installing the iRMC microSD card



Figure 347: iRMC microSD card

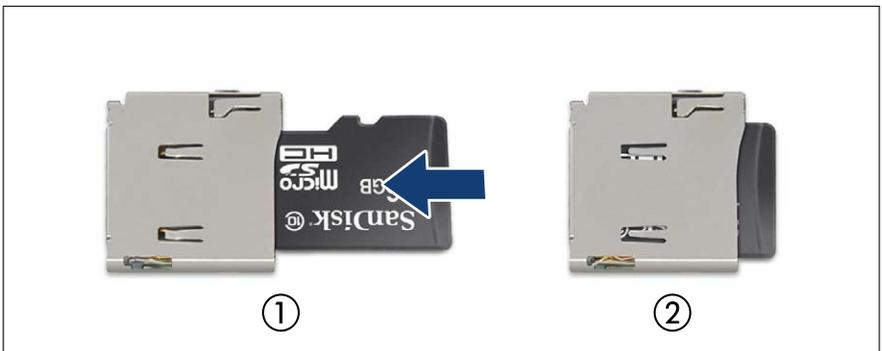


Figure 348: Installing the iRMC microSD card

## System board and components

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- ▶ With the label facing up, insert the iRMC microSD card into the microSD card slot (1) until it locks in place (2).



The onboard position of the microSD card slot can be found in ["Connectors and indicators on the system board" on page 542.](#)

### Concluding steps

- ▶ If applicable, install the expansion card in slot 5 and 6, see ["Installing an expansion card" on page 269.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)
- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

### 17.5.3 Removing the iRMC microSD card



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver (for cover 2)

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ If applicable, remove the expansion card from slot 5 and slot 6, see ["Removing an expansion card" on page 279.](#)

## Removing the iRMC microSD card

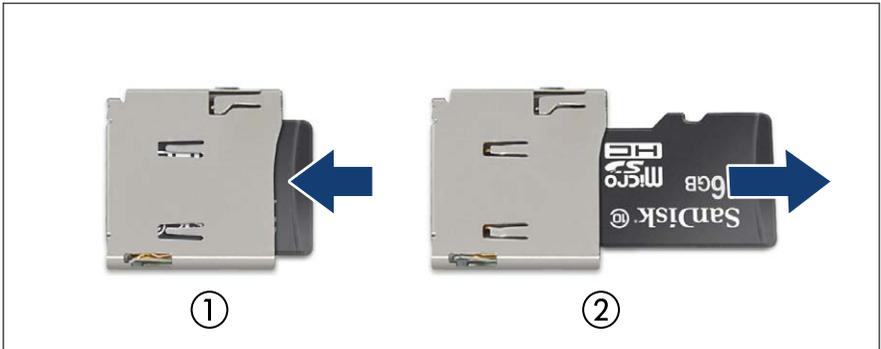


Figure 349: Removing the iRMC microSD card

- ▶ To eject the iRMC microSD card, gently push it in and then let go (1).
- ▶ Pull the iRMC microSD card straight out of its slot (2).



### **CAUTION**

(not valid for Europe, Middle East, India and Africa)

The iRMC microSD card contains customer information.

- ▶ After removing the iRMC microSD card, hand the card over to the customer.
- ▶ If the customer requests disposal of the defective microSD card, proceed as follows: Using a pair of side-cutting pliers, cut the microSD card in half.

## Concluding steps

- ▶ If applicable, install the expansion card in slot 5 and 6, see ["Installing an expansion card"](#) on page 269.
- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.
- ▶ ["Switching on the server"](#) on page 71.
- ▶ If applicable, ["Installing the front cover with lock"](#) on page 71.

### 17.5.4 Replacing the iRMC microSD card



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes**

**Software: 20 minutes**

(Firmware restore:  
depending on configuration)

<b>Tools:</b> Phillips PH2 / (+) No. 2 screw driver (for cover 2)
---

#### **Note on BIOS or iRMC S6 firmware restore feature**

iRMC S6 firmware restore feature is executed at the same time as the power cord is connected after the iRMC microSD card replacement.

If ServerView related tools are applied (i.e. ServerView Agentless Service or ServerView ESXi CIM Provider) or BIOS is executed at the same time as the power cord is connected after the iRMC microSD card replacement, see ["iRMC S6 firmware recovery guidelines after replacing an iRMC microSD card" on page 514](#) and ["BIOS recovery guidelines after replacing an iRMC microSD card" on page 514](#).

Check with the system administrator for the ServerView related tools.

#### **Preliminary steps**

- ▶ ["Locating the defective server" on page 47](#).
- ▶ If applicable, ["Removing the front cover with lock" on page 49](#).
- ▶ ["Shutting down the server" on page 50](#).
- ▶ ["Disconnecting the power cord" on page 50](#).
- ▶ ["Getting access to the component" on page 55](#).
- ▶ If applicable, remove the expansion card from slot 5 and slot 6, see ["Removing an expansion card" on page 279](#).

### Replacing the iRMC microSD card

- ▶ Remove the defective iRMC microSD card, see ["Removing the iRMC microSD card" on page 510](#).



#### **CAUTION**

(not valid for Europe, Middle East, India and Africa)

The iRMC microSD card contains customer information.

- ▶ After removing the iRMC microSD card, hand the card over to the customer.
  - ▶ If the customer requests disposal of the defective microSD card, proceed as follows: Using a pair of side-cutting pliers, cut the microSD card in half.
- ▶ Install the new iRMC microSD card, see ["Installing the iRMC microSD card" on page 508](#).
  - ▶ Proceed the steps in the recovery guidelines, see ["iRMC S6 firmware recovery guidelines after replacing an iRMC microSD card" on page 514](#) and ["BIOS recovery guidelines after replacing an iRMC microSD card" on page 514](#).

### Concluding steps

- ▶ If applicable, install the expansion card in slot 5 and 6, see ["Installing an expansion card" on page 269](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ ["Connecting the power cord" on page 65](#).
- ▶ Verify that the iRMC S6 recognizes the installed iRMC microSD card.
- ▶ Wait until the firmware restore is completed. BIOS or iRMC S6 firmware restore feature is executed at the same time as the power cord is connected after the iRMC microSD card replacement.
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).

### iRMC S6 firmware recovery guidelines after replacing an iRMC microSD card

- ▶ After replacing the iRMC microSD card and starting up the iRMC S6 firmware, confirm that the iRMC microSD card backup completion message in the iRMC S6 firmware is registered in the SEL.

<iRMC>

A backup of iRMC Firmware%1 has been successfully created on SD card.

### BIOS recovery guidelines after replacing an iRMC microSD card

Perform the following steps after replacing the iRMC microSD card on systems with and without the ServerView related tools.

- ▶ For systems with ServerView related tools (i.e. ServerView Agentless Service or ServerView ESXi CIM Provider) applied:

After replacing the iRMC microSD card, power on the server, and confirm that the iRMC microSD card transfer completion message in the BIOS is registered in SEL.

<BIOS>

BIOS backup from OS storage to SD card succeeded.



This function requires ServerView Agentless Service V10.40.08 for Windows, V10.40.10 for Linux, or later versions.

- ▶ For systems with ServerView related tools (i.e. ServerView Agentless Service or ServerView ESXi CIM Provider) non applied:

Manually update the BIOS after replacing the iRMC microSD card, see ["Updating or recovering the BIOS and iRMC S6" on page 94.](#)

## 17.6 VROC module

### 17.6.1 Position of the VROC module

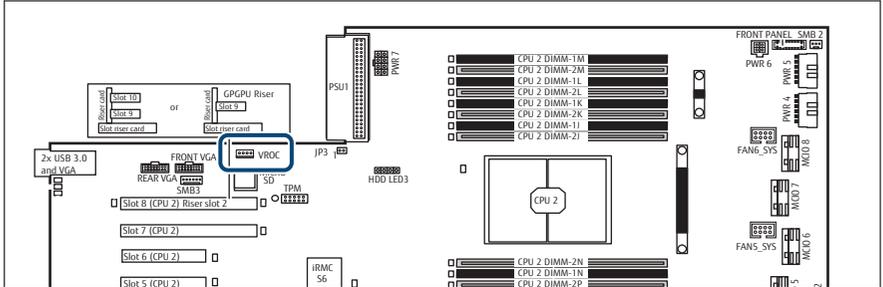


Figure 350: Position of the VROC module on the system board

### 17.6.2 Installing the VROC module



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (for cover 2)

#### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock"](#) on page 49.
- ▶ ["Shutting down the server"](#) on page 50.
- ▶ ["Disconnecting the power cord"](#) on page 50.
- ▶ ["Getting access to the component"](#) on page 55.
- ▶ Remove the riser module 2, see ["Removing a riser module"](#) on page 72.

### Installing the VROC module

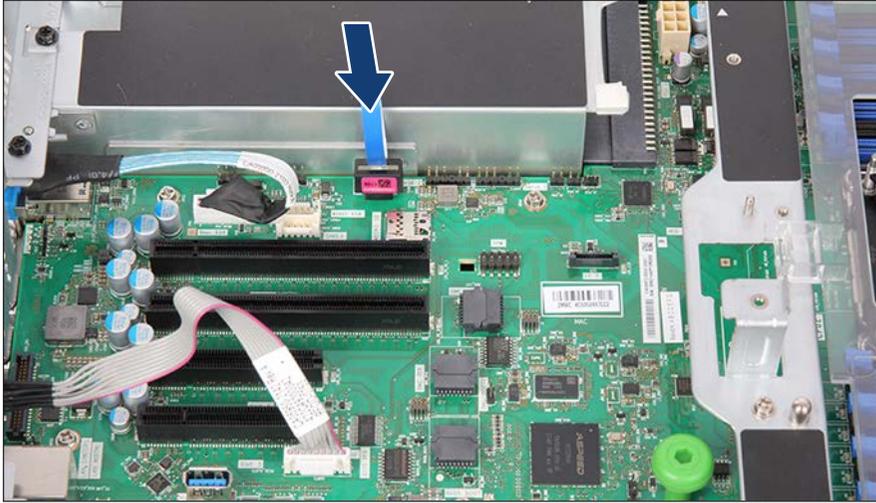


Figure 351: Installing the VROC module

- ▶ Connect the VROC module to the VROC connector on the system board.

### Concluding steps

- ▶ Install the riser module 2, see ["Installing a riser module"](#) on page 74.
- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.
- ▶ ["Switching on the server"](#) on page 71.
- ▶ If applicable, ["Installing the front cover with lock"](#) on page 71.

## 17.6.3 Removing the VROC module



**Upgrade and Repair Unit  
(URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screw driver (for cover 2)

### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock"](#) on page 49.
- ▶ ["Shutting down the server"](#) on page 50.
- ▶ ["Disconnecting the power cord"](#) on page 50.
- ▶ ["Getting access to the component"](#) on page 55.
- ▶ Remove the riser module 2, see ["Removing a riser module"](#) on page 72.

### Removing the VROC module

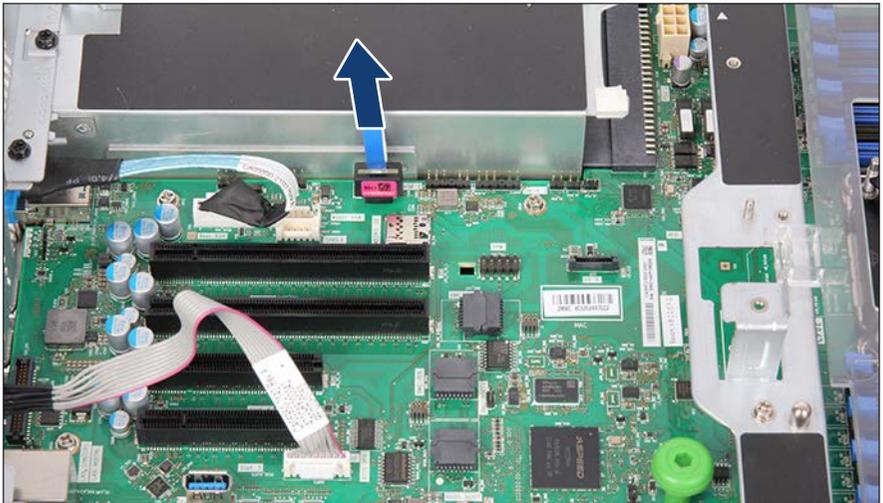


Figure 352: Removing the VROC module

- ▶ Disconnect the VROC module from the VROC connector on the system board.

### Concluding steps

- ▶ Install the riser module 2, see ["Installing a riser module"](#) on page 74.
- ▶ ["Reassembling"](#) on page 59.
- ▶ ["Connecting the power cord"](#) on page 65.
- ▶ ["Switching on the server"](#) on page 71.

- ▶ If applicable, ["Installing the front cover with lock" on page 71.](#)

### 17.6.4 Replacing the VROC module



**Upgrade and Repair Unit (URU)**



**Hardware: 5 minutes**

**Tools:** Phillips PH2 / (+) No. 2 screwdriver (for cover 2)

#### Preliminary steps

- ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ ["Getting access to the component" on page 55.](#)
- ▶ Remove the riser module 2, see ["Removing the riser module 2" on page 73.](#)

#### Replacing the VROC module

- ▶ Disconnect the VROC module from the VROC connector on the system board, see ["Removing the VROC module" on page 517.](#)
- ▶ Connect the VROC module to the VROC connector on the system board, see ["Installing the VROC module" on page 516.](#)

#### Concluding steps

- ▶ Install the riser module 2, see ["Installing the riser module 2" on page 75.](#)
- ▶ ["Reassembling" on page 59.](#)
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ ["Switching on the server" on page 71.](#)

- ▶ Verify the BIOS menu recognizes the installed VROC module.
  - ▶ From configuration menu select **Intel(R) Virtual RAID on CPU**, then verify if the **Upgrade Keyis Premium**.

For more information, see the "PRIMERGY Intel Virtual RAID on CPU (Intel VROC) User Guide".



If you fail or forget to install a VROC module, the RAID configuration is lost when you boot the OS to populate the iRMC. Therefore, the user must verify the VROC module installation using the BIOS menu.

- ▶ If applicable, "[Installing the front cover with lock](#)" on page 71.

## 17.7 System board

### 17.7.1 Replacing the system board



**Field Replaceable Unit (FRU)**



**Hardware: 40 minutes**  
**Software: 20 minutes**

(Firmware restore:  
depending on configuration)

**Tools:** Replacing the system board:

- Phillips PH2 / (+) No. 2 screwdriver
- Torx 30 screwdriver
- Magnifying glass for inspecting CPU socket springs (recommended)

Replacing the TPM:

- Bit screwdriver
- flat nose pliers
- TPM bit insert (\*)
- thin slotted screwdriver (2 x 0.4 mm) (\*)

(\*) For Japan:

- Dedicated TPM screwdriver (CWZ8291A)
- TPM module fixing tool (S26361-F3552-L909)

### Note on BIOS or iRMC S6 firmware restore feature



BIOS or iRMC S6 firmware restore feature is executed at the same time as the power cord is connected after the system board replacement.

Depending on the configuration of your server the firmware restore requires different time, see ["States of power-on indicator and time duration during firmware restore" on page 552](#):

18 - 38 minutes (systems with PFR feature).

Do not perform the following operations after connecting the power cord. Please wait for the above time to elapse.

- Remove and reinsert the power cord
- Power button on/off
- Connecting and disconnecting other cables, etc.

For more information, see ["Concluding steps" on page 527](#).

### Note on MicroSD card



The MicroSD card on the system board contains the BIOS/iRMC firmware that is running.

After replacing the system board, the operating version number will be restored based on this information. Do not replace the system board and the MicroSD card at the same time.

### Note on TPM



The system board can be equipped with an optional TPM. This module enables third party programs to store key information (e. g. drive encryption using Windows Bitlocker Drive Encryption).

If the customer is using TPM functionality, the TPM has to be removed from the defective system board and connected to the new system board. For more information, see ["Replacing the TPM" on page 506](#).

The TPM has to be enabled in the system BIOS.



### CAUTION

- ▶ Before replacing the system board, ask the customer whether TPM functionality is used.
- ▶ If the customer is using TPM functionality, remove the TPM from the old system board and install it on the new system board.
- ▶ Advise your contact persons that they must provide you with all recovery keys which belong to the system to restore them in the TPM later.

### Note on VROC module



The system board can be equipped with an optional VROC module. This module enables the RAID configuration using PCIe SSDs connected to VMD controllers.



### CAUTION

If a VROC module fails or is removed in a configuration that uses RAID with the VROC module, the RAID configuration is temporarily removed and PCIe SSDs are identified as direct-attached drives.

- ▶ Verify that the VROC module is connected before replacing the system board.
- ▶ Remove the VROC module from the defective system board and connect the VROC module to the new system board. For more information, see "[Replacing the VROC module](#)" on page 518.
- ▶ If applicable, enable the VMD controller in the BIOS.

### Note on system information backup/restore

The COP contains the Chassis ID EPROM that contains system information like server name and model, housing type, serial number and manufacturing data. To avoid the loss of non-default settings when replacing the system board, a backup copy of important system configuration data is automatically stored from the system board NVRAM to the Chassis ID EPROM.



### CAUTION

For that reason the COP and the system board must not be replaced simultaneously! In this case, restoring the system configuration data on the system board would fail.

After replacing the system board the backup data is restored from the Chassis ID EPROM to the new system board.



MAC addresses will be changed by replacing the system board. Inform the customer about that before starting these tasks. After doing these tasks, inform the customer about the changed MAC addresses.

### Notes on network settings recovery



When replacing the system board, network configuration settings in the OS will be lost and replaced by default values. This applies to all static IP address and LAN teaming configurations.

Ensure to note down your current network settings before replacing the system board.

### Preliminary steps

- ▶ ["Locating the defective server" on page 47.](#)
  - ▶ ["Suspending BitLocker functionality" on page 89.](#)
  - ▶ If applicable, ["Removing the front cover with lock" on page 49.](#)
  - ▶ ["Shutting down the server" on page 50.](#)
  - ▶ ["Disconnecting the power cord" on page 50.](#)
  - ▶ Disconnect all external cables.
  - ▶ Remove all PSUs, see ["Removing a hot-plug PSU" on page 129.](#)
  - ▶ If applicable, remove the OCP module, see ["Removing an OCP module" on page 265.](#)
  - ▶ ["Getting access to the component" on page 55.](#)
  - ▶ For a system with air cooling, proceed as follows:
    - ▶ ["Removing the air duct" on page 80.](#)
    - ▶ Remove all memory modules, see ["Removing memory modules" on page 348.](#)
- i**
- Before removing the memory modules, take a note on the installation slot number for each memory module. Ensure that you reinstall the memory modules in the slot they were located before the replacement.
- ▶ If applicable, remove all dummy memory modules, see ["Removing a memory dummy module" on page 351.](#)
  - ▶ Remove all riser modules, see ["Removing a riser module" on page 72.](#)
  - ▶ ["Removing the fan cage" on page 76.](#)
  - ▶ ["Removing the crossbar" on page 83.](#)
  - ▶ If applicable, remove all expansion cards, see ["Removing an expansion card" on page 279.](#)
  - ▶ Remove the iRMC microSD card, see ["Removing the iRMC microSD card" on page 510.](#)

## System board and components

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- ▶ If applicable, remove the VROC module, see "[Removing the VROC module](#)" on page 517.

### Removing the defective system board

- ▶ Disconnect all cables from the system board.

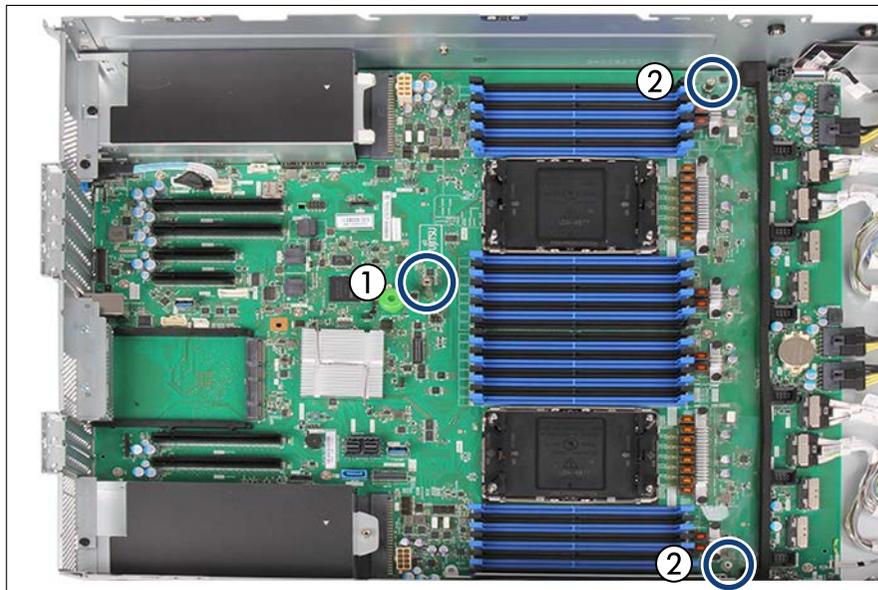


Figure 353: Position of the hexagon standoff and the specific screws

- ▶ Remove the hexagon standoff (1).
- ▶ Remove the two specific screws (2).
- ▶ Remove the memory guide sheet metal.

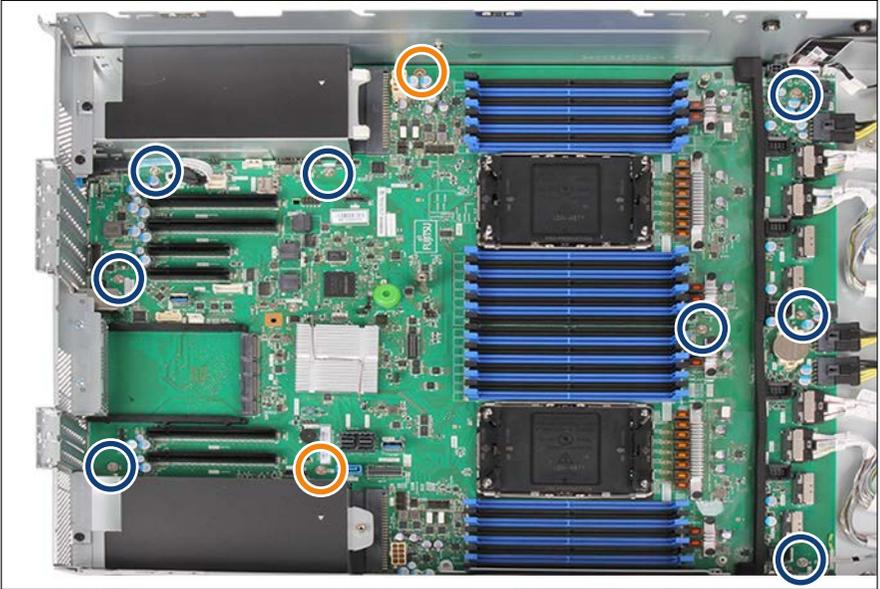


Figure 354: Position of the screws

- ▶ Remove the ten screws (see blue circles, orange circles show the centering bolts) from the system board.

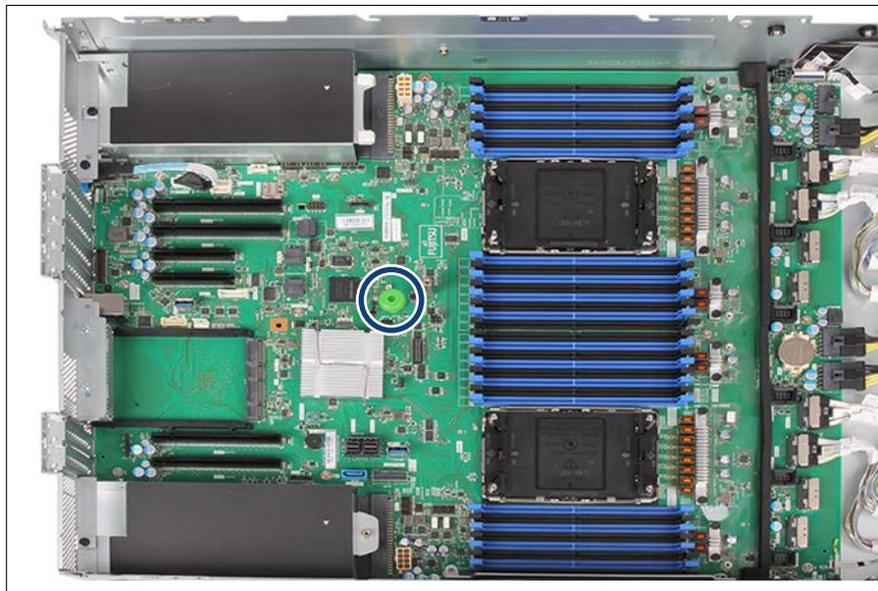


Figure 355: Touch points of the system board

- ▶ Notice the handle of the system board (see circle).
- ▶ Hold the system board on the handle and lift the system board carefully out of the chassis in a slight angle. Thereby you pull the connectors out of the I/O panel.



### CAUTION

- ▶ Always take the system board with both hands!
  - ▶ **Never lift the system board one-sided or at a heat sink, because the solder connections between the socket and the system board come under tension and increase the risk of damage and malfunction!**
  - ▶ Do not damage the EMI springs which are essential to comply with applicable EMC regulations and satisfy cooling requirements and fire protection measures.
- 
- ▶ Place the removed and the new system board on an antistatic surface.
  - ▶ Remove the TPM, see ["Removing the TPM" on page 501](#).

### Installing the new system board

- ▶ Check the settings on the new system board, see ["Onboard settings" on page 566](#).
  - ▶ Hold the system board on the touch point and insert it at a slight angle. Slide the connectors into the I/O panel.
  - ▶ Lower the system board carefully into the chassis.
  - ▶ Adjust the system board. If necessary adjust the position of the system board with a gentle twisting motion (orange circles in [Figure 354](#) show the centering bolts).
  - ▶ Fasten the system board with ten screws, see [Figure 354](#).
  - ▶ Fasten the system board with the hexagon standoff, see [Figure 353](#).
  - ▶ Fasten the system board with the two specific screws, see [Figure 354](#).
  - ▶ Install the memory guide sheet metal.
  - ▶ System with air cooling:
    - ▶ Remove the heat sink with the CPU from the defective system board, see ["Removing the heat sink" on page 371](#).
    - ▶ Remove the protective plastic cover from the CPU socket of the new system board and fit it onto the socket of the defective system board which will be sent back to spares.
-  Returned system boards without this cover probably have to be scrapped.

- ▶ Install the heat sink with the CPU on the new system board, see ["Installing the CPU and heat sink" on page 376](#).
- ▶ Connect all cables to the system board.  
For the cable plans, see ["Appendix B" on page 569](#).

### Concluding steps

- ▶ If applicable, install the TPM, see ["Installing the TPM" on page 497](#).
- ▶ If applicable, install the VROC module, see ["Installing the VROC module" on page 516](#).

## System board and components

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- ▶ Install the iRMC microSD card, see ["Installing the iRMC microSD card" on page 508](#).



Ensure that you install the iRMC microSD card that was installed in the system board before the replacement.

- ▶ If applicable, install all expansion cards, see ["Installing an expansion card" on page 269](#).
- ▶ ["Installing the crossbar" on page 84](#).
- ▶ ["Installing the fan cage" on page 77](#).
- ▶ Install all riser modules, see ["Installing a riser module" on page 74](#).
- ▶ For a system with air cooling, proceed as follows:
  - ▶ Install all memory modules, see ["Installing memory modules" on page 345](#).



Ensure that you reinstall each memory module in the slot it was located before the replacement.

- ▶ If applicable, install all dummy memory modules, see ["Handling memory dummy modules" on page 351](#).
- ▶ Only for system with air cooling: install the air duct, see ["Installing the air duct" on page 79](#).
- ▶ ["Reassembling" on page 59](#).
- ▶ If applicable, install the OCP modules, see ["Installing an OCP module" on page 262](#).
- ▶ Install all PSUs, see ["Installing a hot-plug PSU" on page 126](#).
- ▶ Connect all external cables.
- ▶ ["Connecting the power cord" on page 65](#).

- ▶ Wait until the firmware restore is completed.



BIOS or iRMC S6 firmware restore feature is executed at the same time as the power cord is connected after the system board replacement.

Depending on the configuration of your server the firmware restore requires different time, see ["States of power-on indicator and time duration during firmware restore" on page 552](#):

18 - 38 minutes (systems with PFR feature).

Do not perform the following operations after connecting the power cord. Please wait for the above time to elapse.

- Remove and reinsert the power cord
  - Power button on/off
  - Connecting and disconnecting other cables, etc.
- ▶ Check the status of the power-on indicator to verify if the firmware restore was successful, see ["States of power-on indicator and time duration during firmware restore" on page 552](#).  
If the firmware restore is successfully completed, the power-on indicator is lit white and the ID indicator is off.  
If the power-on indicator is not lit white or the ID indicator is not off, an error has occurred. Disconnect and connect the power cord and try to boot up or manually restore using the iRMC S6 Web interface. For details for manually restore, see ["Manually restore an incomplete BIOS or iRMC S6 firmware restore" on page 533](#).
  - ▶ After completion of the firmware restore, connect to the iRMC and check the SEL log files, see ["Manually restore an incomplete BIOS or iRMC S6 firmware restore"](#).
  - ▶ Reboot the system by disconnecting and connecting the power cord. After disconnecting the power cord, wait 60 seconds and connect it again.
  - ▶ ["Switching on the server" on page 71](#).
  - ▶ Check that the Customer Production firmware version is restored to the current BIOS or iRMC S6 version in the new system board using the BIOS Setup Utility.

## System board and components

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- ▶ If applicable, verify the BIOS menu recognizes the installed VROC module, see ["Replacing the VROC module" on page 518](#).
- ▶ ["Updating the NIC configuration file in a Linux and VMware environment" on page 106](#).
- ▶ If applicable, reconfigure your network settings in the operation system according to the original configuration of the replaced expansion card. Configuration of network settings should be performed by the customer, see ["Notes on network settings recovery" on page 522](#).
- ▶ If applicable, restore LAN teaming configurations, see ["After replacing or upgrading LAN controllers" on page 115](#).
- ▶ If applicable, ["Installing the front cover with lock" on page 71](#).



When the system is powered on after a CPU has been replaced or upgraded, the Global Error indicator will start flashing with the message CPU has been changed.

This only indicates that the CPU configuration has been altered. There is no technical problem.

Proceed as follows:

- Restart your server.
  - As soon as the startup screen appears, press the [F2] function key to enter the BIOS.
  - If a password is assigned, enter the password and press [Enter].
  - Select the **Exit** menu.
  - Select **Commit settings and Exit**.
  - Verify that the Global Error indicator stops flashing.
- ▶ ["Verifying the system time settings" on page 104](#).
  - ▶ ["Verifying system information backup or restore" on page 96](#).
  - ▶ Verify whether the iRMC recognizes each installed part.
  - ▶ If applicable, activate TPM functionality in the system BIOS under **Security > TPM (Security Chip) Setting > Security Chip**. For more information, see the corresponding BIOS Setup Utility reference manual.
  - ▶ ["Looking for MAC/WWN/GUID and SAS addresses" on page 109](#).

- ▶ ["Resuming BitLocker functionality" on page 107.](#)

### Messages of firmware restore in SEL log files

If the firmware restore is successfully completed, the following messages will be recorded.

- When firmware version in iRMC microSD card and firmware version of replaced system board is different:

```
...
<iRMC>: Firmware 1 has been successfully restored from SD
card.
<iRMC>: Firmware 2 has been successfully restored from SD
card.
...
The Golden Image has been successfully restored from SD
card.
...
Chassis IDPROM: BIOS restore successful
...
BIOS TFTP or HTTP/HTTPS flash OK.
...
BIOS TFTP or HTTP/HTTPS flash OK (Recovery area)
```

If firmware restore fails after system board replacement, the SEL described above is not recorded.

- When firmware version in iRMC microSD card and firmware version of replaced system board is same:

```
...
Restore of iRMC firmware 1 omitted because the already
flashed firmware has the same version
Restore of iRMC firmware 2 omitted because the already
flashed firmware has the same version
...
Restore of the Golden Image omitted because the already
flashed Golden Image has the same version
...
Chassis IDPROM: BIOS restore successful
...
BIOS TFTP or HTTP/HTTPS flash OK....
BIOS TFTP or HTTP/HTTPS flash OK (Recovery area)
```

### Manually restore an incomplete BIOS or iRMC S6 firmware restore

If the BIOS or iRMC S6 firmware restore has not completed successfully, you can restore the BIOS or iRMC S6 firmware manually through the iRMC S6 web interface.

- ▶ Log in to the iRMC S6 web interface.
- ▶ Select the **Tools** menu.
- ▶ Open the **Update** page.
- ▶ In the **BIOS Update** group, set **Update Source to Memory** and click **Start Update**. Both the active area and the recovery area can be restored.
- ▶ In the **iRMC Update** group, set **Update Source to Memory Card** and click **Start Update**. Both firmware 1 and 2 can be restored.



# 18 Appendix A

## 18.1 Mechanical overview

### 18.1.1 Server front

#### 18.1.1.1 3.5-inch HDD configuration

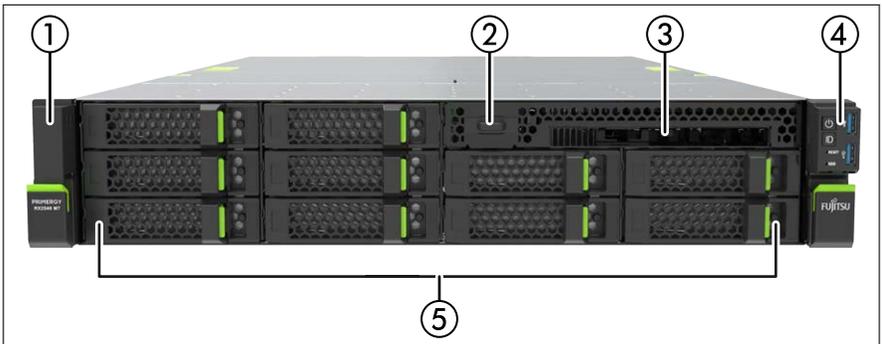


Figure 356: Front side 10x 3.5-inch HDDs/SSDs

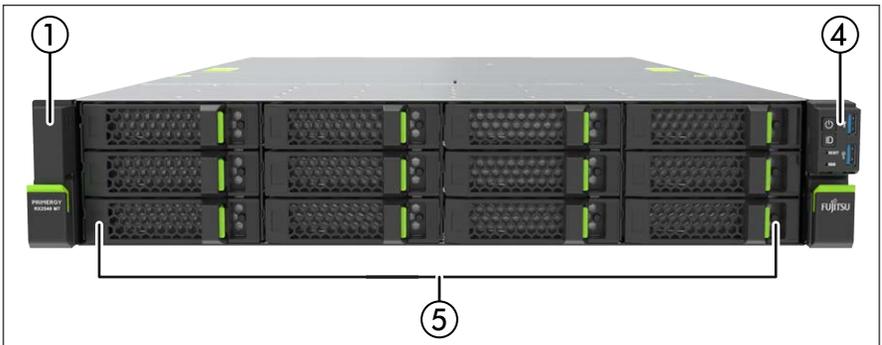


Figure 357: Front side 12x 3.5-inch HDDs/SSDs

- |                              |                          |
|------------------------------|--------------------------|
| 1 Thermal sensor             | 4 Common Operation Panel |
| 2 Front VGA (option)         | 5 HDDs / dummy modules   |
| 3 ODD (option) / dummy cover |                          |

18.1.1.2 2.5-inch HDD/SSD configuration

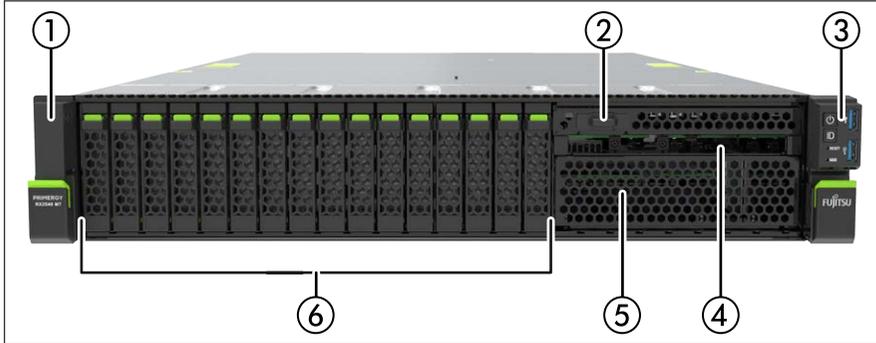


Figure 358: Front side 16x 2.5-inch HDDs / SSDs / PCIe SSDs

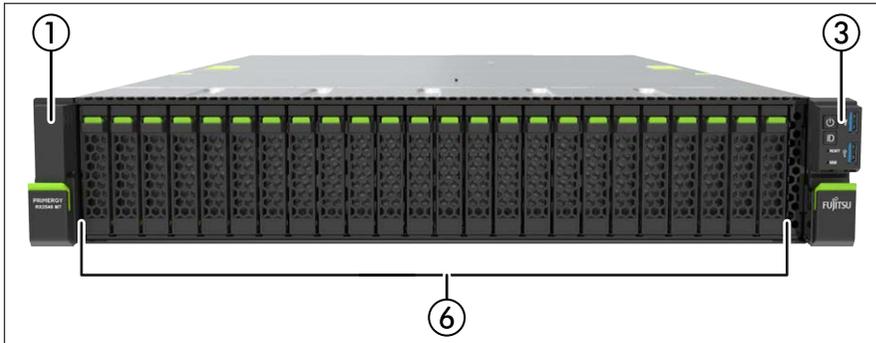


Figure 359: Front side 24x 2.5-inch HDDs / SSDs / PCIe SSDs

- |                              |   |
|------------------------------|---|
| 1 Thermal sensor             | 5 LTO drive (option) / RDX drive (option) / dummy cover |
| 2 Front VGA (option)         |   |
| 3 Common Operation Panel     | 6 HDDs / SSDs / PCIe SSDs / dummy modules               |
| 4 ODD (option) / dummy cover |   |

## 18.1.2 Server rear

### 18.1.2.1 Servers with air cooling

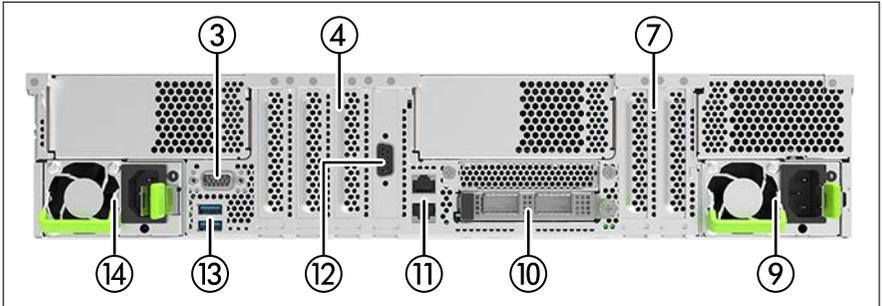


Figure 360: Server rear (standard configuration)

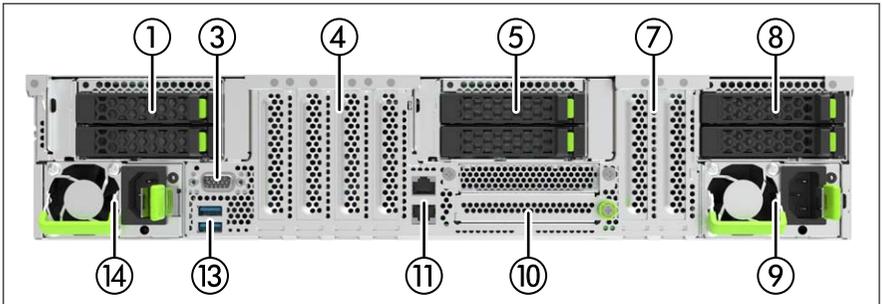


Figure 361: Server rear (configuration with rear HDD cages)

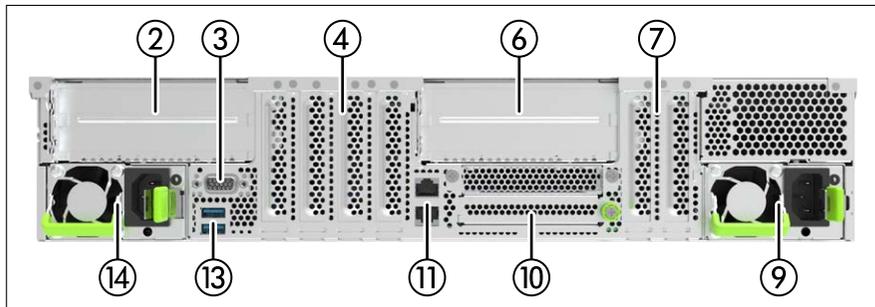


Figure 362: Server rear (configuration with riser modules)

- |   |  |    |                                   |
|---|--|----|-----------------------------------|
| 1 | HDDs / SSDs / PCIe SSDs                        | 7  | PCIe slots 1-2                    |
| 2 | PCIe slots 9 or 9/10 / riser module 2 (option) | 8  | HDDs / SSDs / PCIe SSDs           |
| 3 | Rear VGA                                       | 9  | PSU 2 (option) / dummy cover      |
| 4 | PCIe slots 5-8                                 | 10 | OCP module (option) / dummy cover |
| 5 | HDDs / SSDs / PCIe SSDs                        | 11 | Management LAN                    |
| 6 | PCIe slots 3 or 3/4 / riser module 1 (option)  | 12 | Serial interface (option)         |
|   |  | 13 | USB 3.0 (2x)                      |
|   |  | 14 | PSU 1                             |

PCIe slots 9 and 10 (2) are available when riser module 2 is installed.

PCIe slots 3 and 4 (6) are available when riser module 1 is installed.

### 18.1.2.2 Servers with liquid cooling

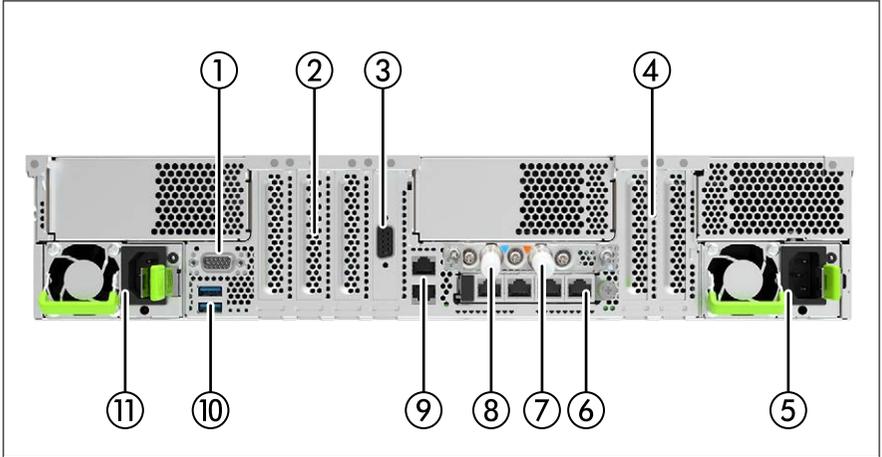


Figure 363: Server rear with liquid cooling

- |   |  |    |  |
|---|--|----|--|
| 1 | Rear VGA                               | 7  | Liquid cooling connector - liquid outlet |
| 2 | PCIe slots 5-8                         | 8  | Liquid cooling connector - liquid inlet  |
| 3 | Serial interface (option) / slot cover | 9  | Management LAN                           |
| 4 | PCIe slots 1-2                         | 10 | USB 3.0 (2x)                             |
| 5 | PSU 2 (option) / dummy cover           | 11 | PSU 1                                    |
| 6 | OCP module (option) / dummy cover      |    |  |

### 18.1.3 Server interior

#### 18.1.3.1 Servers with air cooling

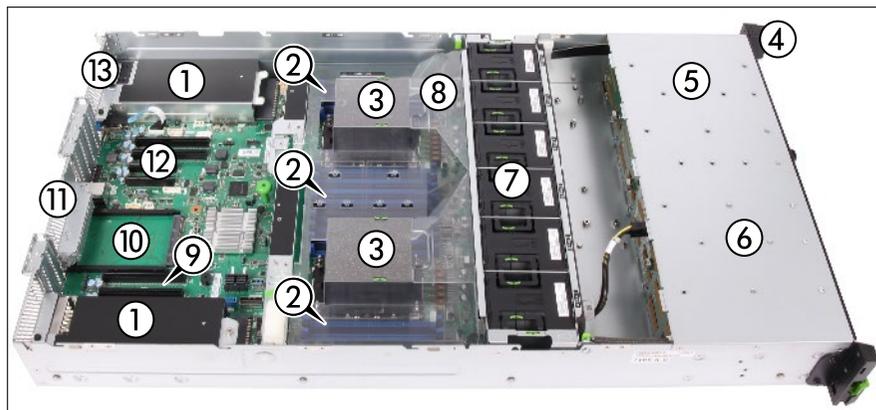


Figure 364: PRIMERGY RX2540 M7 interior

- |   |   |    |                                       |
|---|---|----|---------------------------------------|
| 1 | Up to 2 PSUs / dummy cover                            | 7  | Fan modules                           |
| 2 | Main memory   | 8  | Air duct                              |
| 3 | CPUs  | 9  | PCIe slot 1-2                         |
| 4 | Front panel module / front VGA (option) / dummy cover | 10 | OCP module (option)                   |
| 5 | ODD (option) / dummy cover                            | 11 | PCIe slots 3 or 3/4 / Riser module 1  |
| 6 | Up to 12x 3.5-inch HDDs / 24x 2.5-inch HDDs           | 12 | PCI slots 5-8                         |
|   |   | 13 | PCIe slots 9 or 9/10 / Riser module 2 |

### 18.1.3.2 Servers with liquid cooling (LC)

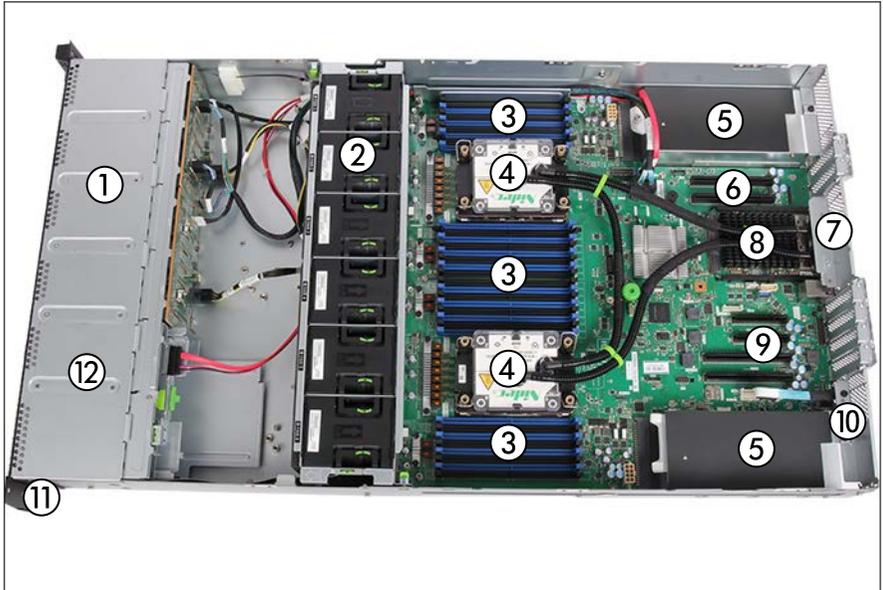


Figure 365: Server interior with liquid cooling

- |   |   |    |   |
|---|---|----|---|
| 1 | Up to 12x 3.5-inch HDDs / 24x 2.5-inch HDDs | 7  | PCIe slots 3 or 3/4 / Riser module 1                  |
| 2 | Fan modules                                 | 8  | OC module (option) / dummy cover                      |
| 3 | Main memory                                 | 9  | PCI slots 5-8   |
| 4 | CPUs with LC heat sink                      | 10 | PCIe slots 9 or 9/10 / Riser module 2                 |
| 5 | Up to 2 PSUs / dummy cover                  | 11 | Front panel module / front VGA (option) / dummy cover |
| 6 | PCIe slot 1-2                               | 12 | ODD (option) / dummy cover                            |

## 18.2 Connectors and indicators

### 18.2.1 Connectors and indicators on the system board

#### 18.2.1.1 System board D3983

-  There is one system board:
  - D3983-B100 with PFR feature

#### Onboard connectors

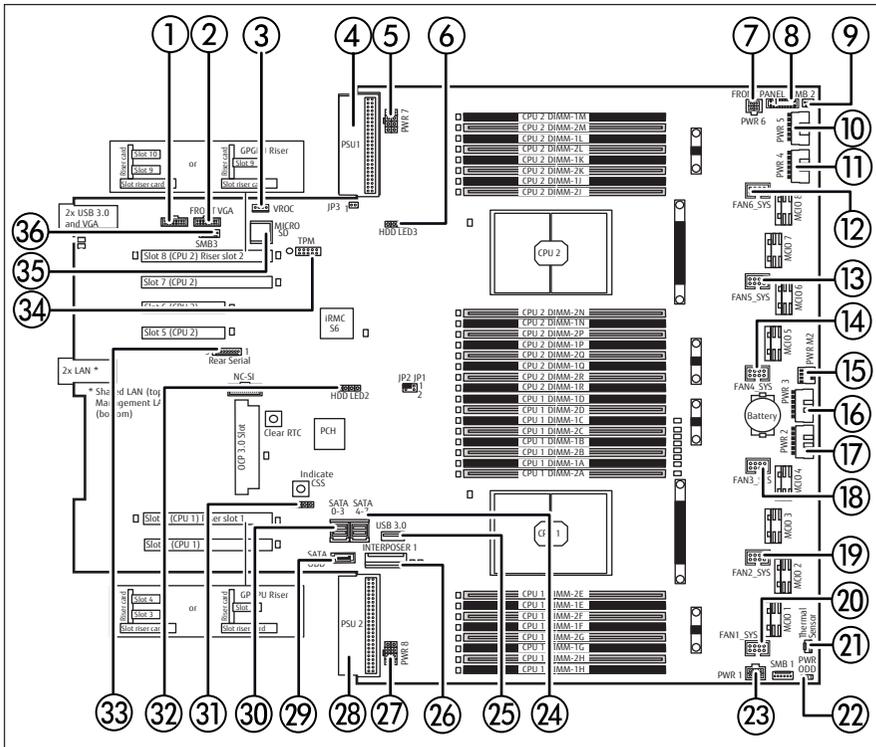


Figure 366: Internal connectors of system board D3983

<b>Pos.</b>	<b>Print</b>	<b>Description</b>
1	Rear VGA	Rear VGA connector
2	Front VGA	Rear VGA connector
3	VROC	VROC connector
4	PSU 1	Power supply connector hot-plug PSU 1
5	PWR 7	Power connector 7
6	HDD LED 3	LED activity connector 3
7	PWR 6	Power connector 6
8	FRONT PANEL	Front panel connector
9	SMB 2	
10	PWR 5	Power connector 5
11	PWR 4	Power connector 4
12	FAN6_SYS	Power connector for system fan 6
13	FAN5_SYS	Power connector for system fan 5
14	FAN4_SYS	Power connector for system fan 4
15	PWR M2	Power connector for M.2 interposer board
16	PWR 3	Power connector 3
17	PWR 2	Power connector 2
18	FAN3_SYS	Power connector for system fan 3
19	FAN2_SYS	Power connector for system fan 2
20	FAN1_SYS	Power connector for system fan 1
21	Thermal sensor	Thermal sensor connector
22	PWR ODD	ODD power connector
23	PWR 1	Power connector 1
24	SATA 4-7	SATA HDD connector
25	USB 3.0	USB 3.0 connector (internal)
26	INTERPOSER 1	M.2 interposer board connector
27	PWR 8	Power connector 8

## Appendix A

---

<b>Pos.</b>	<b>Print</b>	<b>Description</b>
28	PSU 2	Power supply connector hot-plug PSU 2
29	SATA ODD	ODD data connector
30	SATA 0-3	SATA HDD connector
31	HDD LED 1	LED activity connector 1
32	HDD LED 2	LED activity connector 2
33	Rear Serial	Rear serial connector
34	TPM	Connector for Trusted Platform Module (TPM)
35	micro SD	Slot for micro SD card
36	SMB3	

Onboard indicators and controls

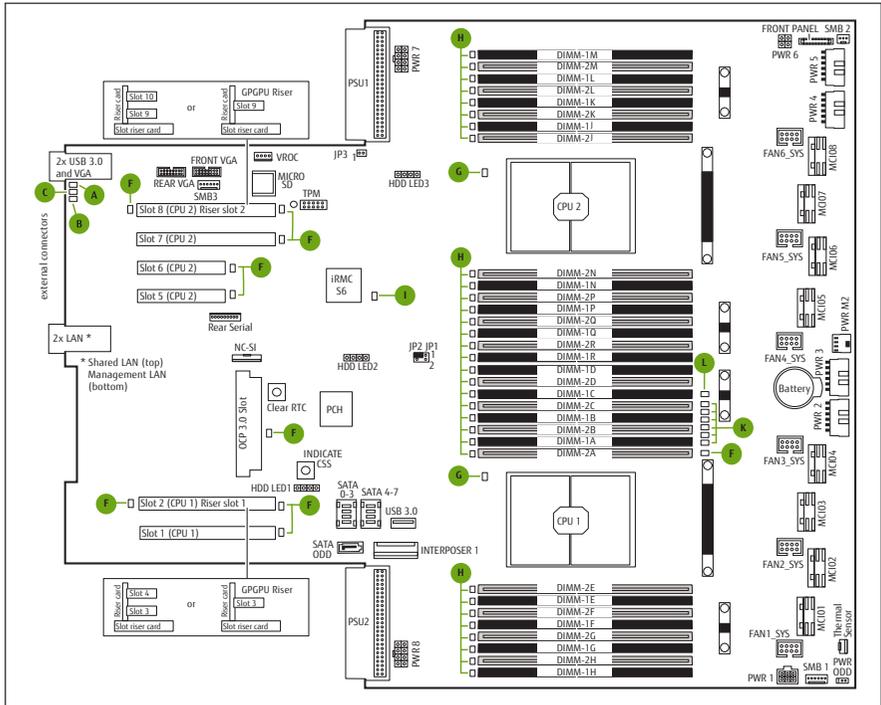


Figure 367: Onboard indicators and Indicate CSS button

- 1 Indicate CSS button

**i** LEDs A, B and C are visible from outside on the server rear. All other LEDs are only visible if the server cover has been opened.

If the server has been powered off (power plugs must be disconnected) it is possible to indicate the faulty component by pressing the indicate CSS button.

## Appendix A

---

### A - Identification

Status	Description
blue on	The server has been highlighted using iRMC S6 web interface or the ID button on the front panel for easy identification.
flashing blue	The server has been highlighted for easy identification using the iRMC S6 (AVR) with disabled local VGA output.

### B - CSS (Customer Self Service)

Status	Description
off	No critical event detected (CSS component).
orange on	Prefailure event detected (CSS component).
flashing orange	CSS component failure detected.

### C - GEL (Global Error LED)

Status	Description
off	No critical event detected (non-CSS component).
orange on	Prefailure event detected (non-CSS component).
flashing orange	Non-CSS component failure detected. Possible causes: <ul style="list-style-type: none"><li>– System is out of the specified temperature range</li><li>– Defective sensor</li><li>– CPU error</li><li>– Error detected by server management software</li></ul>

**F - Controller**

<b>Status</b>	<b>Description</b>
off	Controller okay
orange on	Controller failure

**G - CPU**

<b>Status</b>	<b>Description</b>
off	CPU okay
orange on	CPU failure

**H - Memory**

<b>Status</b>	<b>Description</b>
off	Memory module running
orange on	Memory module failure

**K - Fans**

<b>Status</b>	<b>Description</b>
off	System fan running
orange on	System fan failure

**L - Battery**

<b>Status</b>	<b>Description</b>
orange on	Battery failure

## 18.2.2 Server front

### 18.2.2.1 Connectors on the server front

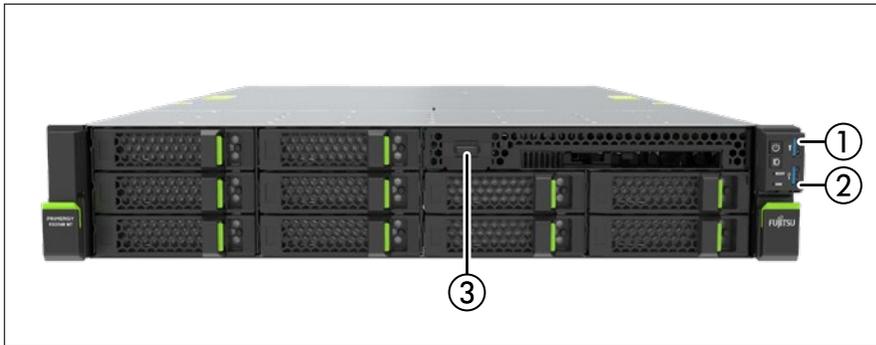


Figure 368: Connectors on the server front

- |   |                   |   |                              |
|---|-------------------|---|------------------------------|
| 1 | USB 3.0 connector | 3 | Front VGA connector (option) |
| 2 | USB 3.0 connector |   |                              |

### 18.2.2.2 Indicators on the Common Operation Panel (COP)

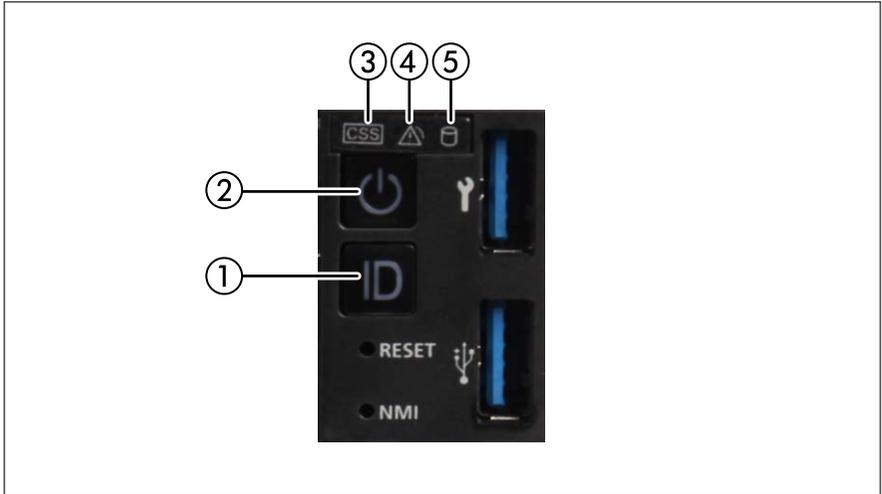


Figure 369: Indicators on the COP

- |   |   |   |                            |
|---|---|---|----------------------------|
| 1 | ID indicator                                | 3 | CSS indicator              |
| 2 | Power-on indicator / AC connected indicator | 4 | Global Error indicator     |
|   |   | 5 | HDD/SSD activity indicator |

#### ID indicator (1)

See also ["iRMC-related status signals" on page 552](#).

Status	Description
blue on	The server has been highlighted using the iRMC S6 web interface or the ID button on the front panel for easy identification.
flashing blue	The server has been highlighted for easy identification using the iRMC S6 with disabled local VGA output.

## Appendix A

---

### Power-on indicator / AC connected indicator (2)

Status	Description
off	The server is switched off and not connected to the mains.
green on	The server is switched on.
flashing white	The iRMC firmware is starting up after the server has been connected to the mains.
white on	<p>The server is switched off and connected to the mains (standby mode).</p> <p> After connecting the server to the mains, it will take about 60 seconds until the server will enter standby mode and can be switched on.</p>
exchange flashing green and white	The server has been switched on but Power Cycle Delay settings delay it from turning on for a specified time.

### CSS indicator (3)

Status	Description
off	No critical event detected (CSS component).
orange on	<p>Prefailure event detected (CSS component).</p> <p>For HDDs, see also "<a href="#">HDD prefailure detection</a>" on <a href="#">page 552</a>.</p>
flashing orange	CSS component failure detected.

### Global Error indicator (4)

See also "[iRMC-related status signals](#)" on [page 552](#).

Status	Description
off	No critical event detected (non-CSS component).
orange on	Prefailure event detected (non-CSS component).

Status	Description
flashing orange	<p>Non-CSS component failure detected.</p> <p>Possible causes:</p> <ul style="list-style-type: none"> <li>– System is out of the specified temperature range</li> <li>– Defective sensor</li> <li>– CPU error</li> <li>– Error detected by server management software</li> </ul>

### HDD/SSD activity indicator (5)

Status	Description
flashing green	Data access in progress.

**i** There are cases in which the HDD/SSD activity indicator does not flash green during data access depending on disk connection configuration. For example, if a PCIe SSD is not connected to a RAID controller, the HDD/SSD activity indicator does not flash green. Data access can be recognized at "[Access indicator \(1\)](#)" on page 557.

**i** In case of M.2 SSD (NVMe connection) is installed.

- Green on, when M.2 SSD (NVMe connection) is idle.
- Flashing green, when M.2 SSD (NVMe connection) is data access in progress.
- Green on, when M.2 SSD (NVMe connection) is idle and other disk is data access in progress.

### iRMC-related status signals

ID indicator	Global error indicator	Description
flashing blue	off	A remote connection has been established. Local VGA output has been disabled during the remote session.
flashing blue	flashing orange	An emergency flash of the iRMC firmware is in progress.



For more information about the iRMC flash procedure, see "Basic software procedures" in the "Fujitsu Server PRIMERGY RX2540 M7 Upgrade and Maintenance Manual".

### HDD prefailure detection

Depending on your hardware configuration HDD prefailure detection will be supported.

The requirements are:

- iRMC S6 Firmware
- supported OOB RAID system

#### 18.2.2.3 States of power-on indicator and time duration during firmware restore

The power-on indicator changes as follows from the time the power cord is connected until firmware restore is completed after system board replacement.

During the firmware restoration, the ID indicator flashes in blue as shown in the following table.

	<b>System state</b>	<b>Power-on indicator</b>	<b>ID indicator</b>	<b>Time</b>
a	Power cord connected	-	-	-
b	<p>iRMC boot start, iRMC firmware restore from iRMC microSD card (included golden image), iRMC restart</p> <p>Record of the following message on SEL when completion.</p> <p>When iRMC version in iRMC microSD card and iRMC version of replaced system board is different:</p> <p>iRMC Firmware %1 has been successfully restored from SD card.</p> <p>The Golden Image has been successfully restored from SD card</p> <p>When iRMC version in iRMC microSD card and iRMC version of replaced system board is same:</p> <p>Restore of iRMC firmware %1 omitted because the already flashed firmware has the same version</p>	flashing white	flashing blue	<p>About 13 minutes</p> <p>When iRMC version in iRMC microSD card and iRMC version of replaced system board is same, the time is shortened because iRMC firmware update is skipped.</p>
c	iRMC boot complete, BIOS restore prepare	white on	flashing blue	About 1 minute
d	System power (DC) on, BIOS setting initialize	green on	flashing blue	About 3 minutes

## Appendix A

	<b>System state</b>	<b>Power-on indicator</b>	<b>ID indicator</b>	<b>Time</b>
e	System reboot	white on	flashing blue	A few seconds (5-10 seconds)
f	System power (DC) on, BIOS setting restore  Record of the following message on SEL when completion.  Chassis IDPROM: BIOS restore successful	green on	flashing blue	About 3 minutes
g	System reboot	white on	flashing blue	A few seconds (5-10 seconds)
h	Active area BIOS restore from iRMC microSD card  * Load and flash Active area BIOS from the iRMC microSD card.	green on	flashing blue	About 8 minutes
i	Active area BIOS restore complete  Record of the following message on SEL when completion.  BIOS TFTP or HTTP/HTTPS flash OK	flashing green and white	flashing blue	A few seconds (5-10 seconds)
j	Active area BIOS boot check  *This check is performed because a bootable BIOS needs to be written to the recovery site.	green on	flashing blue	About 1 minute
k	System reboot	white on	flashing blue	A few seconds (5-10 seconds)

	<b>System state</b>	<b>Power-on indicator</b>	<b>ID indicator</b>	<b>Time</b>
l	Active area BIOS boot check continued	green on	flashing blue	About 3 minutes
m	Active area BIOS boot check completion Recovery area BIOS restore Attention: the Power-on indicator is not green but is reading the active area BIOS and updating the recovery area.	white on	flashing blue	About 5 minutes
n	Recovery area BIOS restore completion Record of the following message on SEL. BIOS TFTP or HTTP/HTTPS flash OK (Recovery area)	white on	blue off	-

Section d, f, h and l: the time it takes depending on memory and the number of PCI cards installed. The above is the result of actual measurement without loading a PCI card with two 8G memory modules.

From section c on, user can connect to iRMC S6 web interface.

From section d onward, the screen will be displayed on the connected display. Please check the screen.

#### 18.2.2.4 Indicator on the ODD



ODDs may have an indicator or not.

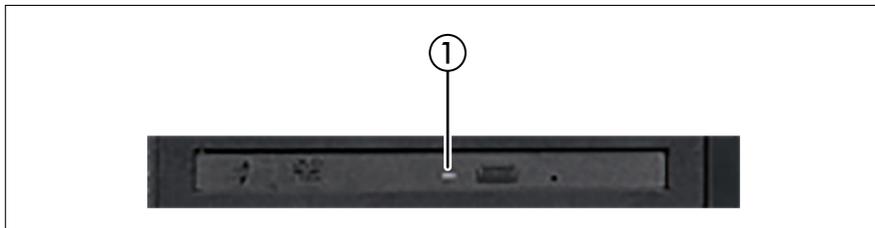


Figure 370: Indicator on the ODD (example)

- 1 Activity indicator

### Activity indicator (1)

Status	Description
off	The ODD is inactive.
green on	The storage medium is being accessed.

### 18.2.2.5 Indicators on the RDX drive



Figure 371: Indicators on the RDX drive

- 1 RDX drive Power-on indicator

**RDX drive Power-on indicator (1)**

Status	Description
off	The drive is not powered on.
green on	The drive is ready and working properly.
green flashing	The drive is ejecting media.
amber on	RDX has detected a drive failure condition. For more information, run a diagnostics application.
green on / amber flashing once eject button is pressed	Host computer is accessing the media and the user has pressed the eject button. The drive will eject the media after host access is complete.

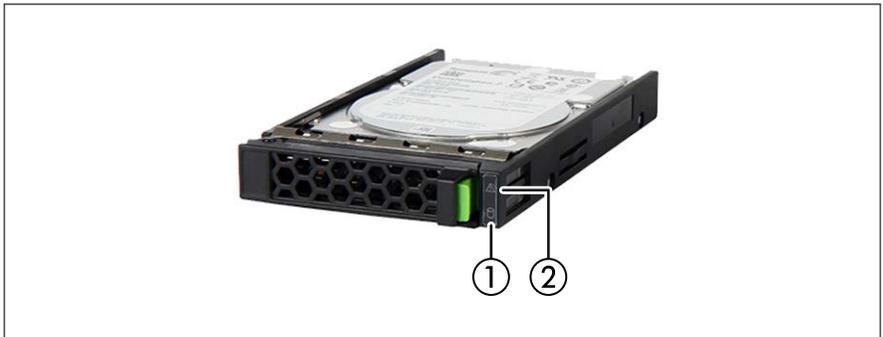
**18.2.2.6 Indicators on hot-plug HDD / SSD / PCIe SSD modules**

Figure 372: Indicators on an HDD / SSD / PCIe SSD module

1 Access indicator

2 Error indicator

**Access indicator (1)**

Status	Description
off	The HDD/SSD is inactive.
green on	The HDD/SSD being accessed.

Error indicator (2)

Status	Description
off	No HDD/SSD error detected.
orange on	An HDD/SSD error has been detected. Possible causes: <ul style="list-style-type: none"> <li>– The drive is defective and needs replacing.</li> <li>– A RAID rebuild process has failed.</li> <li>– The HDD/SSD module has not been inserted correctly.</li> </ul>
flashing orange slowly	HDD/SSD RAID rebuild is in progress. Data is being restored after replacing a drive that has been combined into a RAID array.

18.2.3 Server rear

18.2.3.1 Connectors on the server rear

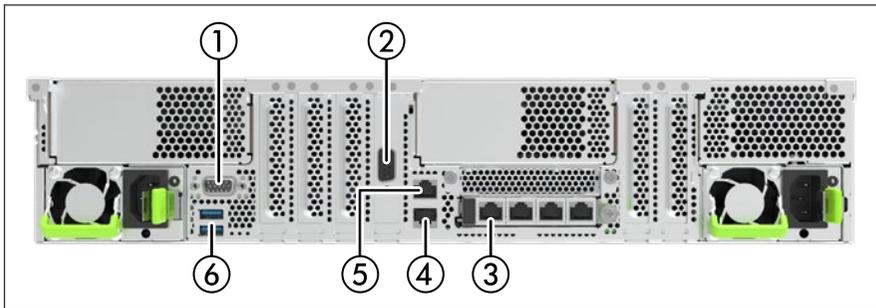


Figure 373: Connectors on the server rear

- |   |                           |   |                            |
|---|---------------------------|---|----------------------------|
| 1 | Rear VGA connector        | 4 | Management LAN connector   |
| 2 | Serial interface (option) | 5 | LAN connector (shared LAN) |
| 3 | OCP module (option)       | 6 | USB 3.0 connectors (2x)    |

**i** The serial interface (2) can be used as the standard interface or for communication with iRMC. The serial interface connector is an option.

- i** The first left connector of the OCP module (3) can be used as a shared LAN connector. OCP modules are options and available in different variants.
- i** Depending on the BIOS settings, the shared LAN connector may also be used as a management LAN connector. For more information, see the corresponding BIOS Setup Utility reference manual.
- i** Some of the devices connected require special software (e.g. drivers) (see documentation for the connected device).
- i** If an OCP module is installed, fan 1 will permanently be turned on in standby mode of the server.

### Liquid cooling configuration

- i** A LC configuration is provided on special release request only.

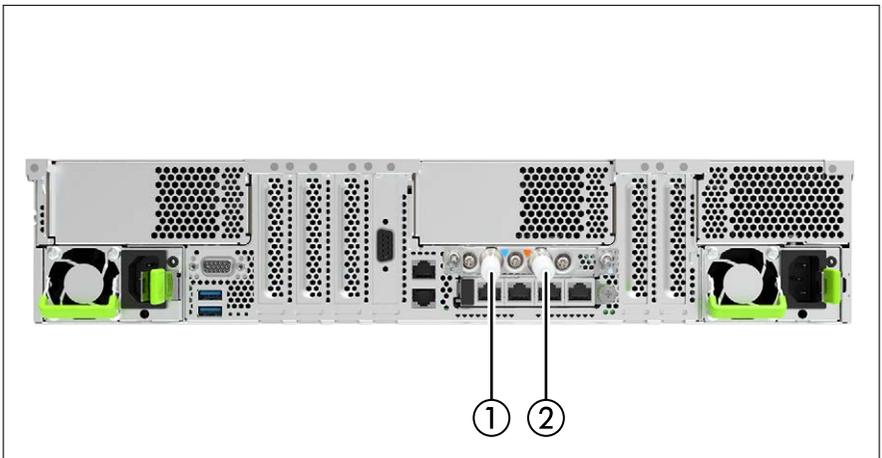


Figure 374: Quick connectors for liquid cooling

- 1 Quick connector with red marking: water outlet
- 2 Quick connector with blue marking: water inlet

### 18.2.3.2 ID, CSS and Global Error indicators

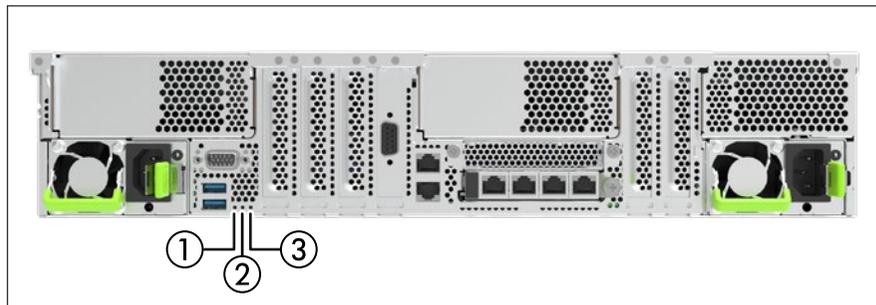


Figure 375: ID, CSS and Global Error indicators

- 1 ID indicator
- 2 Global Error indicator
- 3 CSS indicator

#### ID indicator (1)

See also ["iRMC-related status signals" on page 561](#).

Status	Description
blue on	The server has been highlighted using iRMC web interface or the ID button on the front panel for easy identification.
flashing blue	The server has been highlighted for easy identification using the iRMC (AVR) with disabled local VGA output.

#### Global Error indicator (2)

See also ["iRMC-related status signals" on page 561](#).

Status	Description
off	No critical event detected (non-CSS component).
orange on	Prefailure event detected (non-CSS component).

Status	Description
flashing orange	Non-CSS component failure detected. Possible causes: <ul style="list-style-type: none"> <li>– System is out of the specified temperature range</li> <li>– Defective sensor</li> <li>– CPU error</li> <li>– Error detected by server management software</li> </ul>

### CSS indicator (3)

Status	Description
off	No critical event detected (CSS component).
orange on	Prefailure event detected (CSS component).
flashing orange	CSS component failure detected.



Note on CSS and Global Error indicators on the COP:

If CSS and Global Error indicators are located in the same place on the COP of the server, also check the indicators on the front panel to determine if a CSS or Global Error event has been detected.



For more information on detected errors, see the System Event Log or use the iRMC web interface.

### iRMC-related status signals

ID indicator	Global error indicator	Description
flashing blue	off	A remote connection has been established. Local VGA output has been disabled during the remote session.
flashing blue	flashing orange	An emergency flash of the iRMC firmware is in progress.

**i** For more information about the iRMC flash procedure, see "Basic software procedures" in the "Fujitsu Server PRIMERGY RX2540 M7 Upgrade and Maintenance Manual".

### 18.2.3.3 LAN indicators

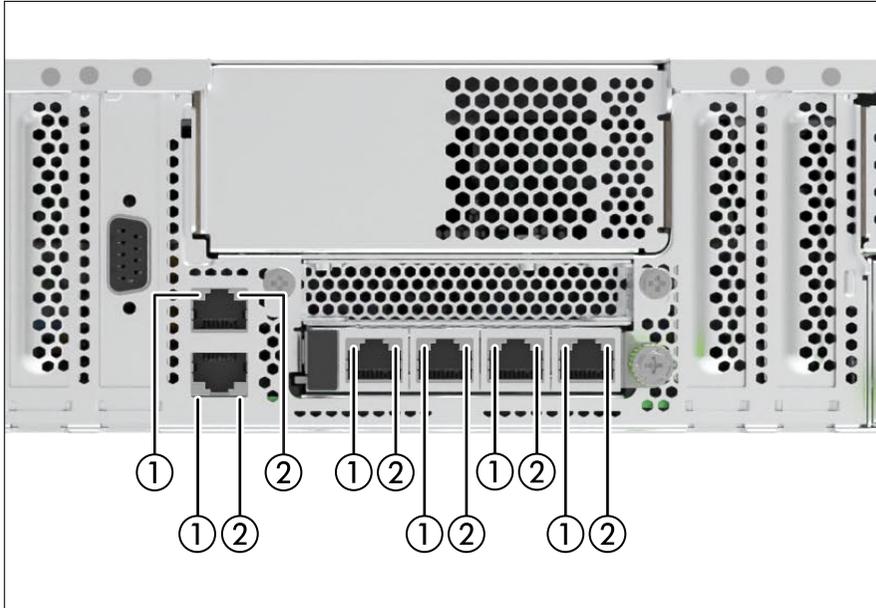


Figure 376: LAN indicators

- 1 LAN link/transfer indicator
- 2 LAN speed indicator

#### LAN link/transfer indicator (1)

Status	Description
green on	A LAN connection has been established.
off	LAN is not connected.
flashing green	LAN data transfer is in progress.

**LAN speed indicator (2)**

Status	Description
yellow on	Data traffic at a transfer rate of 1 Gbit/s.
green on	Data traffic at a transfer rate of 100 Mbit/s.
off	Data traffic at a transfer rate of 10 Mbit/s.

**Indication of LAN connection supporting Energy Efficient Ethernet (EEE mode)**

To configure the EEE mode, it is necessary that an add-in LAN card supports this mode and the connected switch supports this mode as well.

**LAN link/transfer indicator (1)**

Status	Description
short flashing green 3x, then off	A LAN connection has been established (1 Gbit or 100 Mbit) and EEE mode is active.

Table 16: LAN indicators if EEE mode is active

**LAN speed indicator (2)**

Status	Description
short flashing yellow 1x, then 2 seconds off green off	Data traffic at a transfer rate of 1 Gbit/s.
short flashing green 1x, then 2 seconds off yellow off	Data traffic at a transfer rate of 100 Mbit/s.

Table 17: LAN indicators if EEE mode is active

### 18.2.3.4 Indicator on hot-plug PSU



Figure 377: PSU status indicator (AC PSU)



Figure 378: PSU status indicator (DC PSU)

1 PSU status indicator

#### PSU status indicator (1)

Status	Description
flashing green	The server is switched off, but mains voltage is present (standby mode).
green on	The server is switched on and operating properly.

Status	Description
flashing orange	An overload has been detected. The PSU is still running, but failure might be imminent.
orange on	A PSU failure has been detected.

## 18.2.4 Acoustic indicators

### PEI Beep Codes

Pre-EFI Initialization (PEI) - memory Initialization (bootblock)

# of Beep	Description	Action
1	Memory not installed	<ul style="list-style-type: none"> <li>▶ Check if the memory module is installed.</li> <li>▶ Check if the memory module is installed correctly.</li> </ul>

### DXE Beep Codes

Driver Execution Environment (DXE) - main hardware Initialization (POST)

# of Beep	Description	Action
1	Invalid password	▶ Check for the correct password and try again. Make sure that the caps lock key is deactivated.
6	BIOS flash update is failed	<p>A processing bar and an error message is displayed on the screen.</p> <p>This beep code is only an information.</p>

# 18.3 Onboard settings

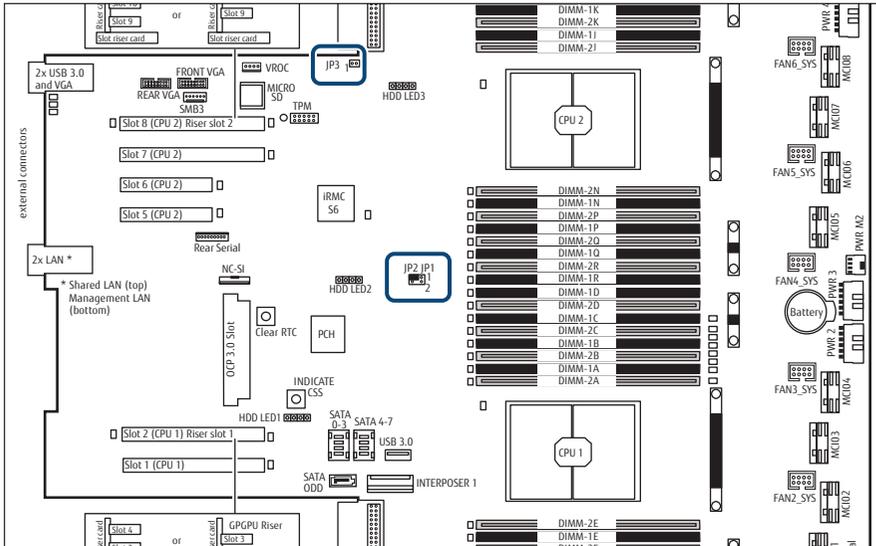


Figure 379: Position Jumper D3983

Jumper	Status	Description
JP1/JP2		Default (place to keep the jumper)
		Password Skip enabled This jumper setting will permanently delete the current BIOS password and apply default BIOS settings.
		Recovery BIOS enabled
JP3		Default
		BIOS Flash Write Protect enabled

## 18.4 Minimum startup configuration



### Field Replaceable Units (FRU)

If the server does not start up or other problems occur, it may be necessary to take the system down to its most basic configuration in order to isolate the defective component.

The minimum startup configuration consists of the following components and cables:

Component	Notes
System board	no TPM or expansion cards installed
1 CPU with CPU heat sink	installed in CPU slot CPU 1
1 memory module	installed in DIMM slot 1A
Common Operation Panel (COP)	
1 PSU	installed in PSU bay PSU 1

Table 18: Minimum startup configuration - components

Cable	Notes
Front panel cable	
Power cable	

Table 19: Minimum startup configuration - cables

- ▶ ["Shutting down the server" on page 50.](#)
- ▶ ["Disconnecting the power cord" on page 50.](#)
- ▶ Take the system down to its minimum startup configuration.
- ▶ ["Connecting the power cord" on page 65.](#)
- ▶ Connect a display to the server.
- ▶ Switch on the server, see ["Switching on the server" on page 71.](#)



### CAUTION

- ▶ Since the fan module is not included in the minimum startup configuration, the server must be shut down immediately after the diagnostic process is complete (POST phase has been passed).
- ▶ The minimum startup configuration must be used exclusively for diagnostic purposes by maintenance personnel, never in daily operation!

---

# 19 Appendix B

## 19.1 Supplied documents

The following documents are available in this appendix:

- "Cable plan for FUJITSU Server PRIMERGY RX2540 M7 Reference Manual"
- "List of Released Adapters incl. Installation sequence and priority"
- "List of screws used in PRIMERGY Servers - Assembled in Czech and Japan"

# Cable Plan for FUJITSU Server PRIMERGY RX2540 M7

Reference Manual

## Contents

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31	PYR2547R3N/PYR2547RLN Type 1-2b Int. RAID Riser CP6/EP640/EP325x - 3.5"
32	PYR2547R3N Type 1-3a Int. RAID Riser CP6/EP680i/EP780i/EP325x/CP2200-16 - 3.5"
33	PYR2547R3N Type 1-3b Int. RAID Riser EP5x0i- 3.5"
34	PYR2547RAN Type 2-5a Int. RAID Riser CP5/EP5x0i/CP2100-8i @ Expander - 3.5"
35	PYR2547RAN Type 2-5b Int. RAID Riser CP6/EP640i/EP325x @ Expander - 3.5"
36	SKD 3x
37	PYR2547R2N Type 3-1 OnBoard SATA 2.5"
38	PYR2547R2N Type 3-2a Internal RAID Riser CP5/EP5x0i/CP2100-8i - 2.5"
39	PYR2547R2N Type 3-2b Internal RAID Riser CP6/EP640i/EP325 - 2.5"
40	PYR2547R2N Type 3-3a Internal RAID Riser CP6/EP680i/EP780i - 2.5"
41	PYR2547R2N Type 3-3b Internal RAID Riser EP5x0i - 2.5"
42	PYBCBS092 Type 3-4a Int. RAID Riser & Slot1 CP5/EP5x0i/CP2100-8i - 2.5"
43	PYBCBS092 Type 3-4b Int. RAID Riser CP6/EP640i/EP325x & Slot1 CP6/EP640/EP325 - 2.5"

## Contents (cont.1)

44	PYR2547RBN/PYR2547RJN Type 3-11a Int. RAID Riser CP5/EP5x0i/CP2100-8i @ Expander 2 Bpl - 2.5"
45	PYR2547RBN/PYR2547RJN Type 3-11b Int. RAID Riser CP6/EP640i/EP325x @ Expander - 2.5"
46	SKD 4x
47	PYR2547REN Type 4-1a Int. RAID Riser & Slot1 & Slot5 CP5/EP5x0i/CP2100-8i- 2.5"
48	PYR2547REN Type 4-1b Int. RAID Riser CP6/EP640i/EP325x & Slot1 & Slot5- 2.5"
49	PYR2547REN Type 4-2a Int. RAID Riser CP6/EP680i/EP740i/EP3258/CP2200 & Slot6 - 2.5"
50	PYR2547REN Type 4-2b Int. RAID Riser & Slot6 EP540i/EP580i - 2.5"
51	PYR2547RGN Type 4-12a Int. RAID Riser CP5/EP5x0i/CP2100-8i @ Expander - 3 Bpl 2.5"
52	PYR2547RGN Type 4-12b Int. RAID Riser CP6/EP640/EP325x @ Expander - 3 Bpl 2.5"
53	PYR2547RFN Type 4-20 RAID in Riser Slot3 EP781i & OnBoard NVMe - 3 Bpl 2.5"
54	SKD 5x
55	PYR2547RHN Type 5-1 OnBoard NVMe
56	SKD 6x
57	PYR2547RCN/PYR2547RKN Type 6-1 Onboard SATA & OnBoard NVMe
58	PYR2547RCN/PYR2547RKN Type 6-2a CP5/EP5x0i/CP2100-8i + OnBoard NVMe - 1 Bpl
59	PYR2547RCN/PYR2547RKN Type 6-2b CP6/EP640i/EP325x + OnBoard NVMe - 1 Bpl
60	PYR2547RDN Type 6-4 Onboard SATA & EP680i/EP740i/EP3258/CP 2200-16i NVMe in Slot1- 2 Bpl
61	PYR2547RDN Type 6-5a Int. RAID Riser CP600/EP640/EP680/EP 325x/EP740/CP 2200 & NVMe RAID Cards in Slot1 - 2 Bpl
62	PYR2547RDN Type 6-5b Int. RAID Riser CP5/EP5x0i & NVMe RAID Cards in Slot1 - 2 Bpl
63	PYBBA24PN Type 6-6 OnBoard SATA & NVMe RAID Cards in Slot1 & 6 - 2 Bpl
64	PYBBA24PN Type 6-7a Int. RAID Riser EP 680i/EP 3258/CP 2200/EP740 & NVMe RAID Cards in Slot1 & 6 - 2 Bpl
65	PYBBA24PN Type 6-7b Int. RAID Riser CP5/EP5x0i & NVMe RAID Cards in Slot1 & 6 - 2 Bpl
66	PYBBA28P8 Type 6-8 OnBoard SATA & OnBoard 16 NVMe - 2 Bpl
67	PYBBA28P8 Type 6-9a CP5/EP5x0i/CP2100-8i & OnBoard 16 NVMe - 2 Bpl
68	PYBBA28P8 Type 6-9b CP6/EP640i/Ep325x & OnBoard 16 NVMe - 2 Bpl
69	Options
70	Option: rear 6x/4x 2.5" NVMe @ ReTimer Slot2 & 8
71	Option: rear 4x 2.5" NVMe @ RAID Slot6
72	Option: rear 6x 2.5" HDD SAS/SATA @ Expander
73	Option: rear 6x 2.5" HDD SAS/SATA @ Int. RAID
74	Option: rear 4x 2.5" HDD @ RAID Slot6 2nd Port
75	Option: rear 6x 2.5" HDD @ RAID Slot6 2nd Port
76	Option: rear 4x/6x 2.5" HDD @ EP540i/EP580i/CP2100-8i Slot6
77	Option: LTO @ CP6/EP6x0i/EP780i/Ep325x/CP2200-16i
78	Option: nVDIA BlueField2
79	Documents History

## List of cables

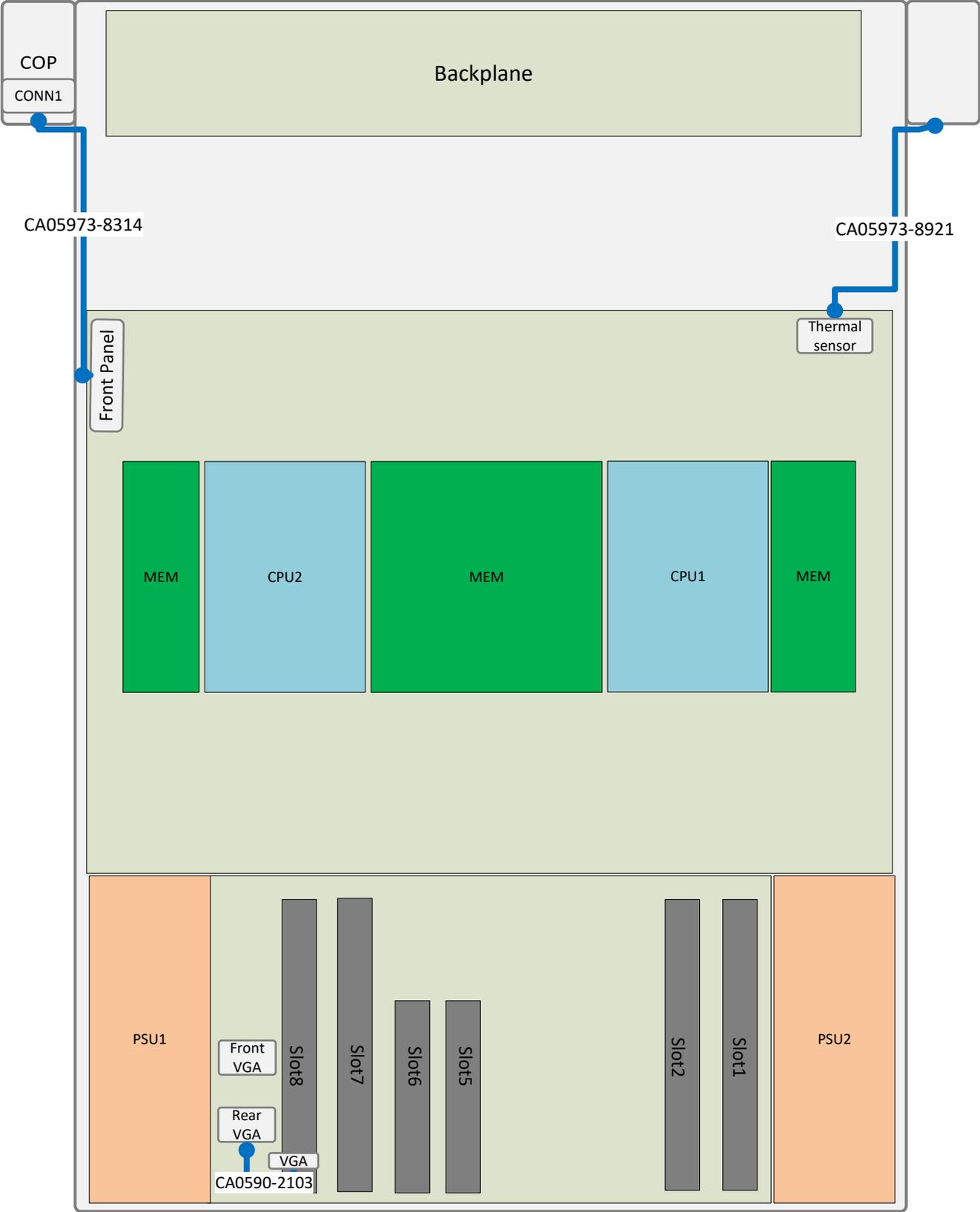
Ref	Partnumber	Naming	Part of
<b>Basic</b>			
C1	CA05973-8314	FRONT PANEL SIGNAL CABLE(MB to FRONT PANEL)	Basic
C2	CA05973-8921	Thermal Sensor Cable	Basic
C3	CA05950-2105	OOB SIGNAL CABLE(MB to HSBP)	Basic, Type 1,2
C4	CA05950-2106	OOB SIGNAL CABLE(MB to HSBP)	Type 3
C5	CA05950-2107	OOB SIGNAL CABLE(MB to HSBP)	Type 4, 6
C6	CA05950-2103	REAR VGA CABLE(INTERNAL)	Basic
C7	CA05950-2110	POWER CABLE 2X3 PITCH=3.0 (MB to internal RAID riser)	Type 1, 2,3,4
C8	CA05950-2142	REAR RS232 CABLE(INTERNAL)	Basic
C9	CA05950-2145	MB to RDX	opt
C10	CA05973-8358	FRONT VGA (MB to FRONT SIDE)	Basic
C11	CA05973-8360	ODD CABLE(MB to ODD)	Basic
<b>Power</b>			
C12	CA05950-2146	POWER CABLE 4P=>4P PITCH=3.0 (MB to LTO)	Type 3
C13	CA05973-8323	POWER CABLE 1X6=>2X3 (MB to HSBP_10_3.5_SAS)	Type 3,4,6
C14	CA05973-8324	POWER CABLE 1X6=>2X3 (MB to HSBP_8_2.5_SAS)	Type 4, 6
C15	CA05973-8325	POWER CABLE 1X6=>2x2 (MB to expander bd_40_SAS)	Type 2,3,4,5
C16	CA05973-8326	POWER CABLE 1X6 (MB to Switch board_24_PCIE)	Type 5
C17	CA05973-8348	POWER CABLE 2X4=>2X2 (PITCH=3.0)(MB to RHSBP)	opt
C18	CA05973-8349	POWER CABLE 2X4=>2X2 (PITCH=3.0)(MB to RHSBP)	opt
C19	CA05973-8351	POWER CABLE 2X2 (MB to M.2 Board)	opt
C20	CA05973-8937	POWER CABLE 1X1 for PCIE (MB to GPGPU)	opt
C21	CA05973-8938	POWER CABLE 1X1 for PCIE (MB to GPGPU)	opt
C22	CA05973-8943	POWER CABLE 1X1 for PCIE (MB to GPGPU)	opt
C73	CA05973-8320	POWER CABLE 1X1 for PCIE (MB to GPGPU)	opt
<b>Data</b>			
C23	CA05973-8315	I2C SIGNAL CABLE (MB to RHSBP) Y Cable	opt
C24	CA05973-8321	I2C SIGNAL CABLE (MB to EXPANDER)	Type2,3,4,5
C25	CA05973-8327	MCIO 8X=>8X (MB to internal RAID riser)	Type1,2,3,4,6
C26	CA05973-8328	SlimSAS 4X (INTERNAL RAID CARD to EXPANDER)	Type2,3,4
C27	CA05973-8330	SlimSAS 4X (INTERNAL RAID CARD to HSBP)	Type1,3, 4
C28	CA05973-8333	MINI SAS HD 4X+4X=>SlimSAS 4X (MB to HSBP_10_3.5_SAS)	Type1,3,6
C29	CA05973-8334	SlimSAS 4X (EXPANDER to HSBP_8_2.5_SAS)	Type3,4
C30	CA05973-8335	SlimSAS 4X (EXPANDER to HSBP_8_2.5_SAS)	Type2,3,4
C31	CA05973-8339	SlimSAS 4X (RAID CARD to HSBP_10_3.5_SAS)	Type3, 4, opt
C32	CA05973-8340	Slim SAS LP 4X to Slim SAS LP 4X (INTERNAL RAID CARD to HSBP)	Type2,4
C33	CA05973-8341	SlimSAS 4X (INTERNAL RAID CARD to HSBP)	Type4,6,
C34	CA05973-8342	SlimSAS 4X (INTERNAL RAID CARD to HSBP)	Type3,4
C35	CA05973-8343	SlimSAS 4X (INTERNAL RAID CARD to HSBP)	Type4,6,
C36	CA05973-8344	SlimSAS 4X (INTERNAL RAID CARD to HSBP)	Type3, 4

## List of cables (Cont.)

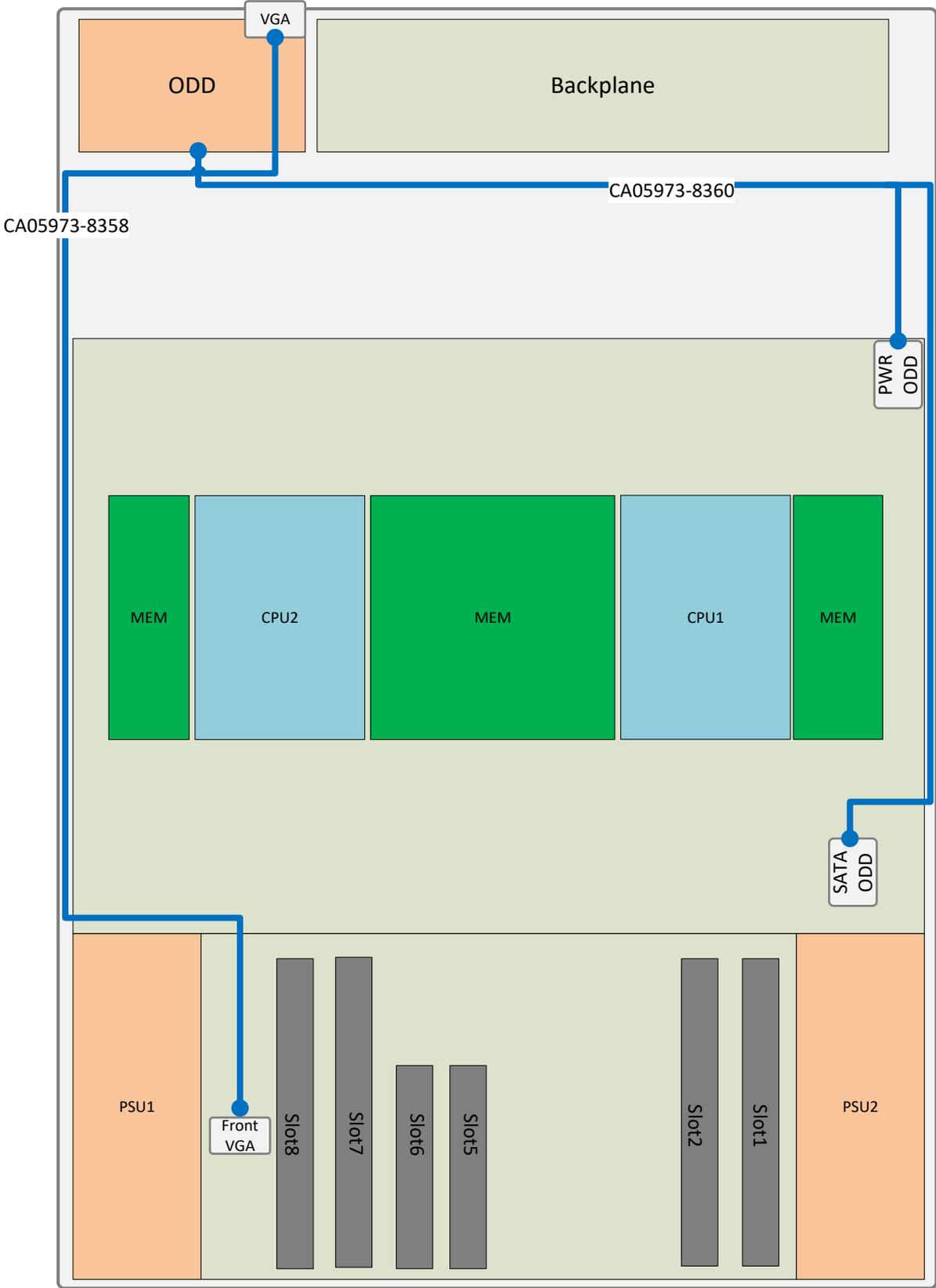
Ref	Partnumber	Naming	Part of
Data			
C37	CA05973-8346	SlimLine 8X (PCIe retimer card to RHSBP)	opt
C38	CA05973-8347	SlimSAS 4X (expander bd_40_SAS to RHSBP)	Type 4, opt
C39	CA05973-8350	SlimSAS 8X (MB to M.2 Board)	opt
C40	CA05973-8354	MINI SAS HD 4X => SlimSAS 4X (INTERNAL RAID CARD to HSBP)	Type 5, opt
C41	CA05973-9403	LED cable for 3254-8i Cable Length=350 (Rear PCIe)	opt
C42	CA05973-9402	LED cable for 3254-8i Cable Length=250 (Internal RAID)	opt
C43	CA05973-8367	SlimSAS 8X to SlimSAS 4X (2P) Y Cable	Type1,3,4,6
C44	CA05973-8368	SlimSAS 8X to SlimSAS 4X	Type1
C45	CA05973-8371	SlimSAS 8X to SlimSAS 8X	Type2,3,4
C46	CA05973-8372	SlimSAS 8X to SlimSAS 4X (2P) Y Cable	Type3,4
C47	CA05973-8374	LTO PWR and signal cable	Type 3
C48	CA05973-8375	SlimSAS 8X to SlimSAS 4X (2P) Y Cable	Type4
C49	CA05973-8378	SlimSAS 8X to SlimSAS 4X (3P) Y Cable	Type4
C50	T26139-Y4031-V107	FBU CABLE_550mm	opt
C51	CA05973-8919	FBU cable for 3254-16i Cable Length=460	opt
C52	T26139-Y4031-V108	FBU CABLE L=750mm	opt
C53	CA05973-8920	FBU CABLE L=800mm	opt
C54	CA05950-2289	HDD LED cable for Rear Internal Raid Card	opt
C55	CA05973-8903	SlimSAS 8x to LP SlimSAS 4x 1 to 2 Y cable (RAID card to RHSBP)	Type4,5
C56	CA05973-8904	SlimSAS 8x to LP SlimSAS 4x 1 to 3 Y cable (RAID card to RHSBP)	Type4,5
C57	CA05973-8905	SlimSAS 8x to LP SlimSAS 4x 1 to 2 Y cable (RAID card to HSBP)	Type4
C58	CA05973-8906	SlimSAS 8x to LP SlimSAS 4x 1 to 2 Y cable (RAID card to HSBP)	Type3,4
C59	CA05973-8907	MCIO 8x to SlimSAS 8x cable (Raid Card to RHSBP)	opt
C60	CA05973-8910	Power Cable (NVIDIA BF2 Card to MB)	opt
C61	CA05973-8279	NVIDIA BF2 SIGNAL Cable (NVIDIA Card to MB)	opt
C62	CA05973-8915	MCIO 8X (MB to HSBP_8_2.5_combo)	Type4
C63	CA05973-8916	MCIO 8X (MB to HSBP_8_2.5_combo)	Type4, 6
C64	CA05973-8917	MCIO 8X (MB to Switch board_24_PCIE)	Type5,
C65	CA05973-8331	MCIO 8x cable On board PCIE to HSBP	Type 6
C66	CA05973-8366	PRAID CP/EP 6x0i and EP780i LED cable (internal RAID)	opt
C67	CA05973-9402	MICROCHIP RAID Card LED Cable_250mm	opt
C68	CA05973-9403	MICROCHIP RAID Card LED Cable_350mm	opt
C69	CA05973-8955	From RAID Card Slim SAS 8X to HSBP MCIO 8X cable	Type6
C70	CA05973-8956	From RAID Card Slim SAS 8X to HSBP MCIO 8X cable	Type6
C71	CA05973-8958	From RAID Card Slim SAS 8X to HSBP MCIO 8X cable	Type6
C72	CA05973-8959	From RAID Card Slim SAS 8X to HSBP MCIO 8X cable	Type6

## Basics

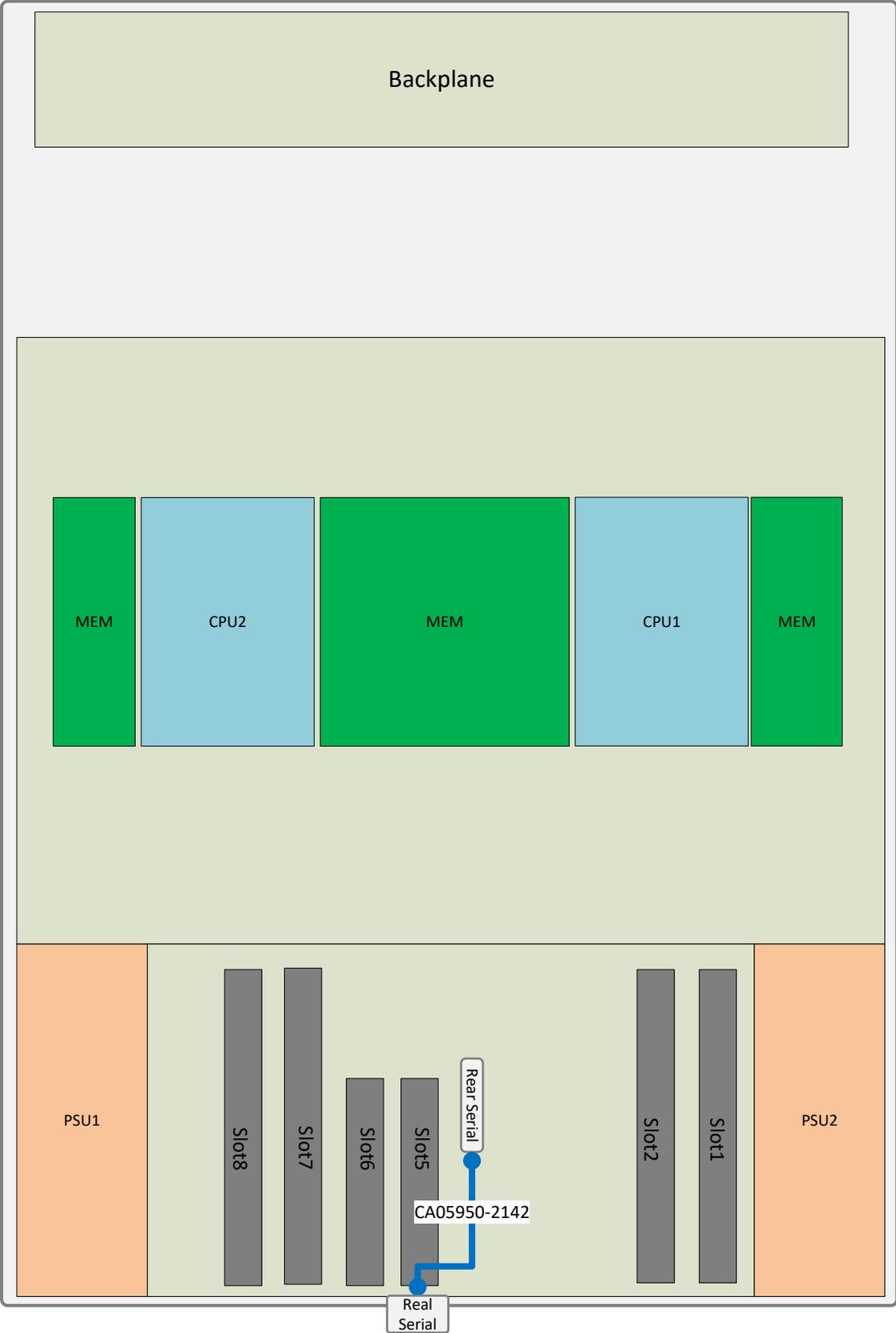
# Common Operation Panel & Thermal Sensor



Optical Disk Drive / VGA 10x3.5"/16x 2.5"



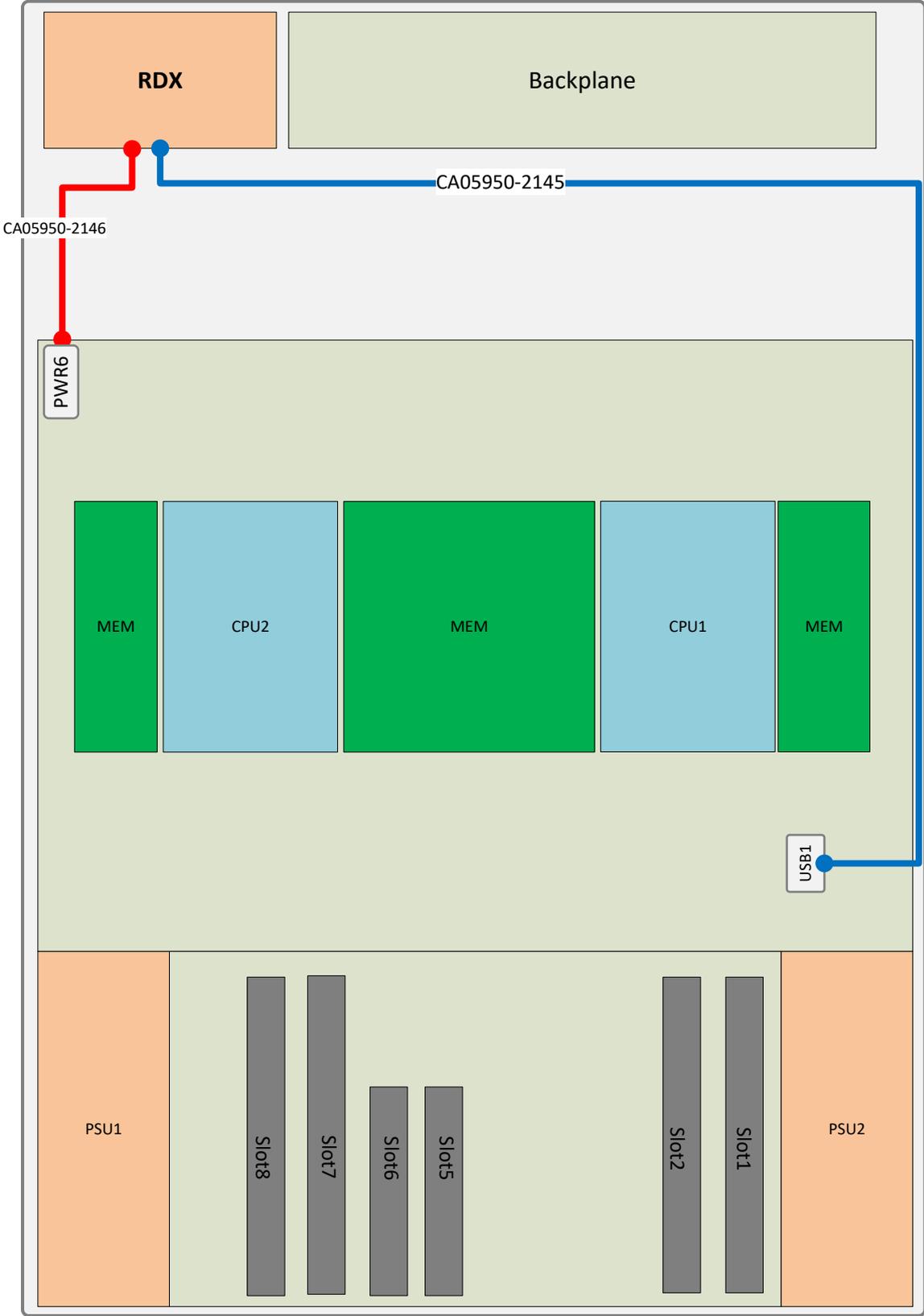
# Serial Interface



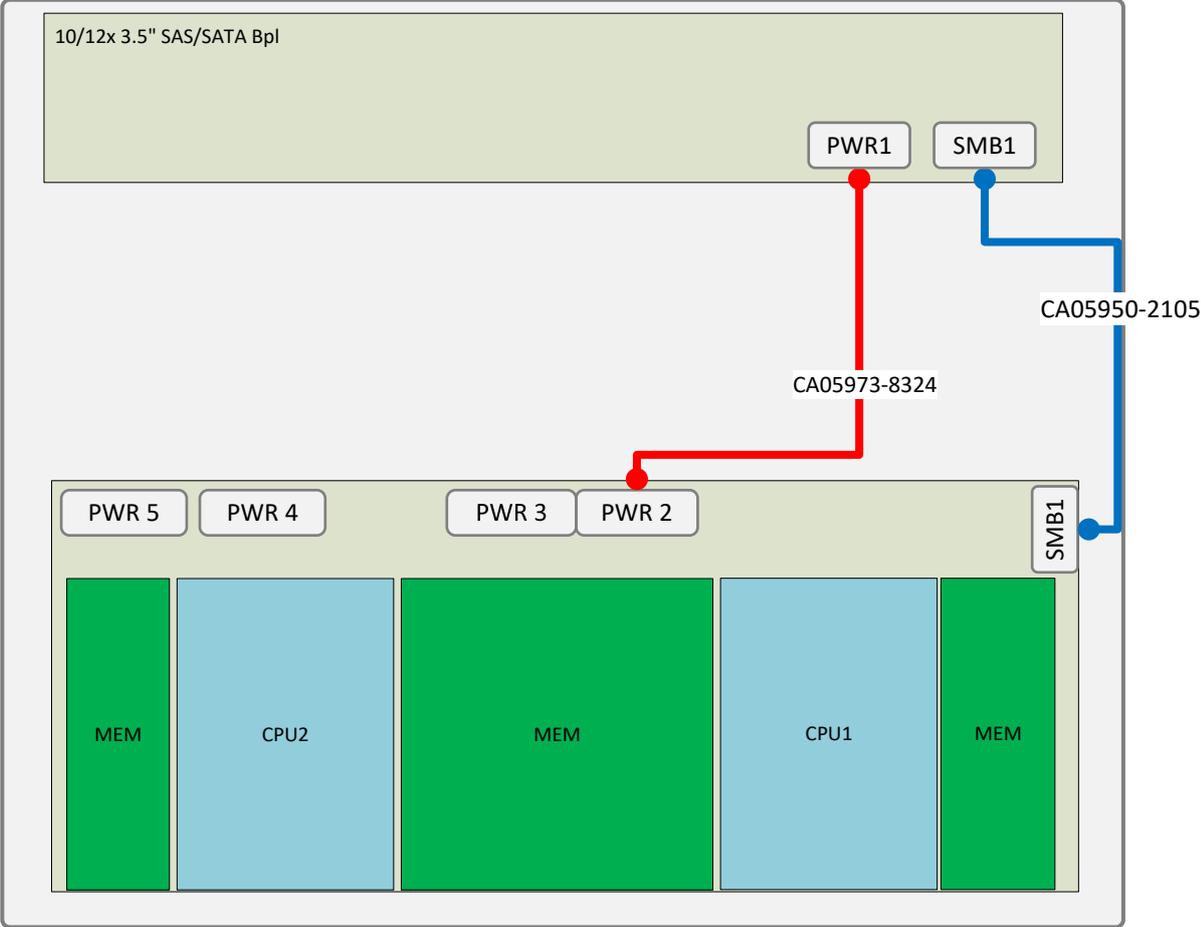
Can support into Slot 5/6/7/8

# RDX 16x 2.5"

Type 3

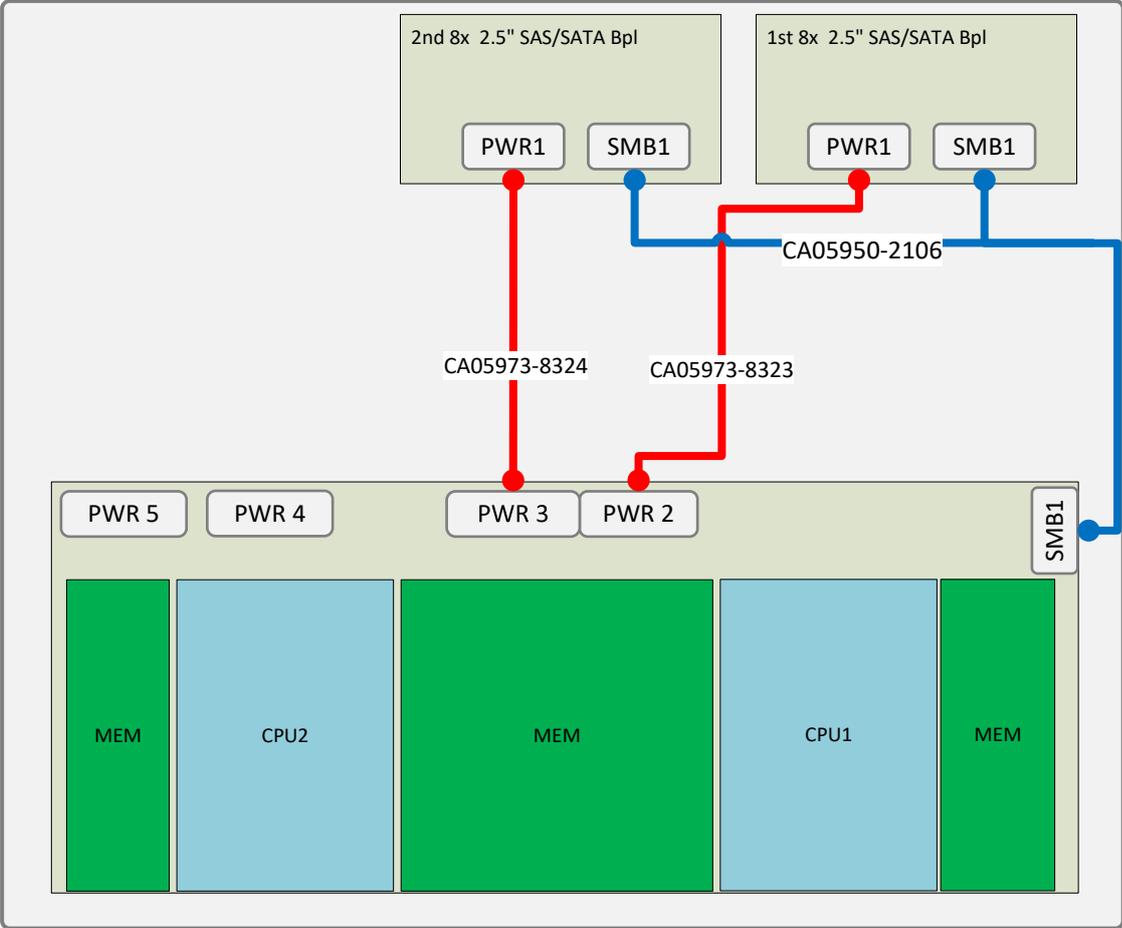


# OOB & Power 10/12x3.5"



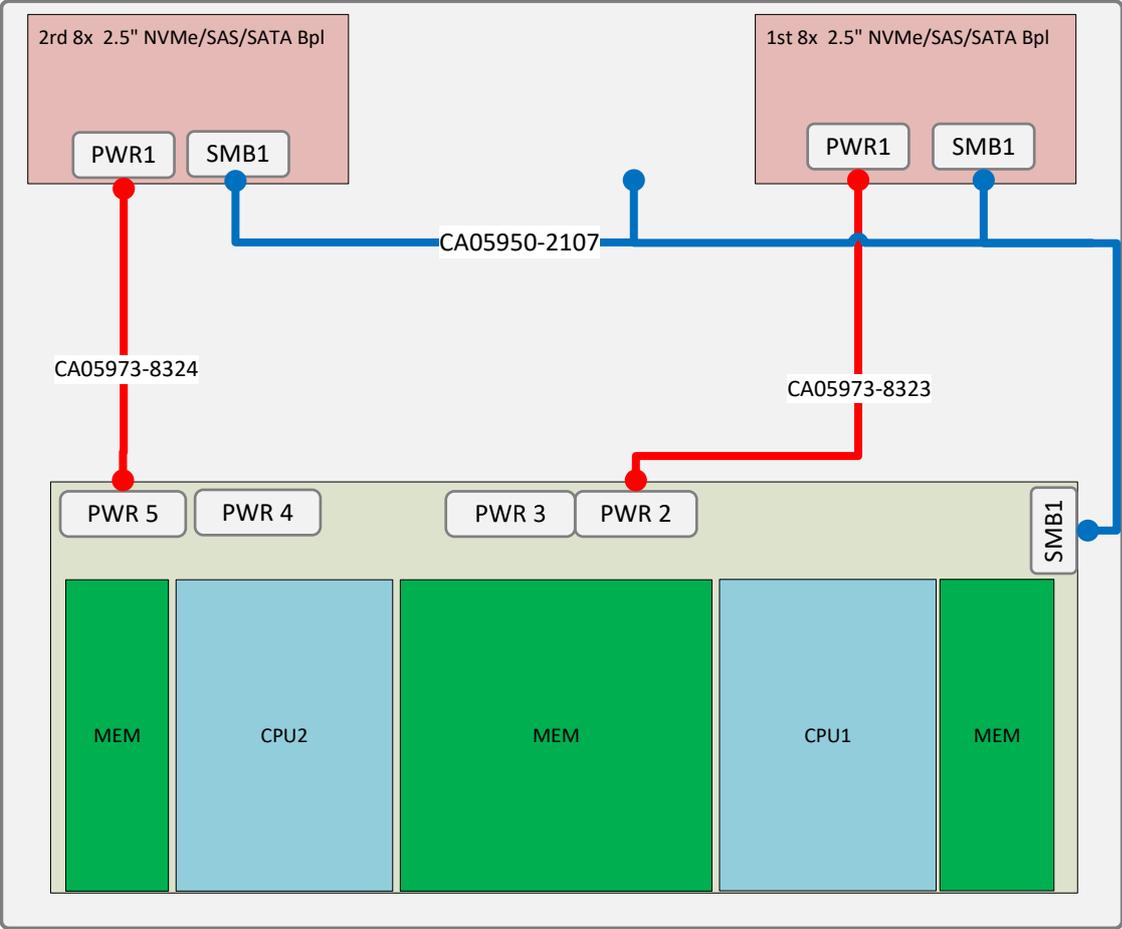
Type 1 & 2

# OOB & Power 2x 8x 2.5" Bpl 1&2



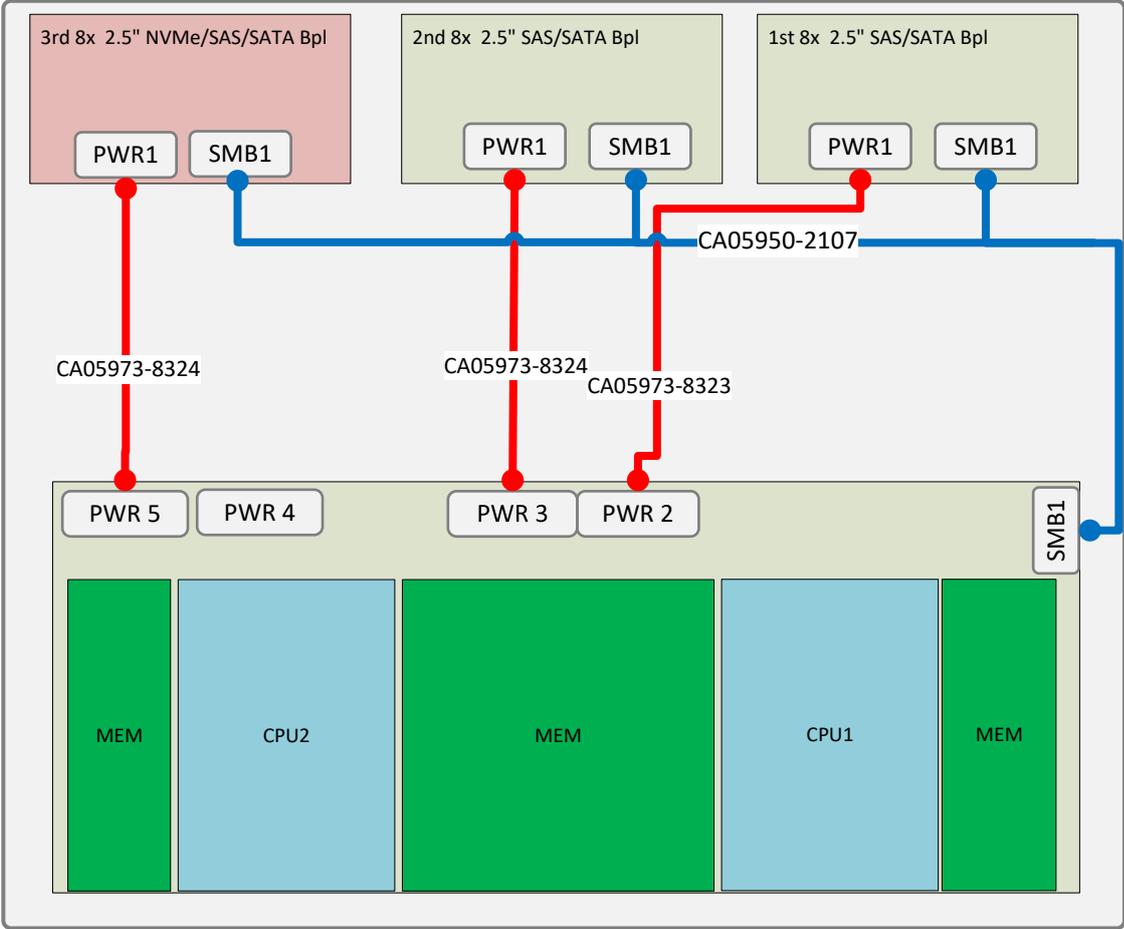
Type 3

# OOB & Power 2x 8x 2.5" Bpl 1&3



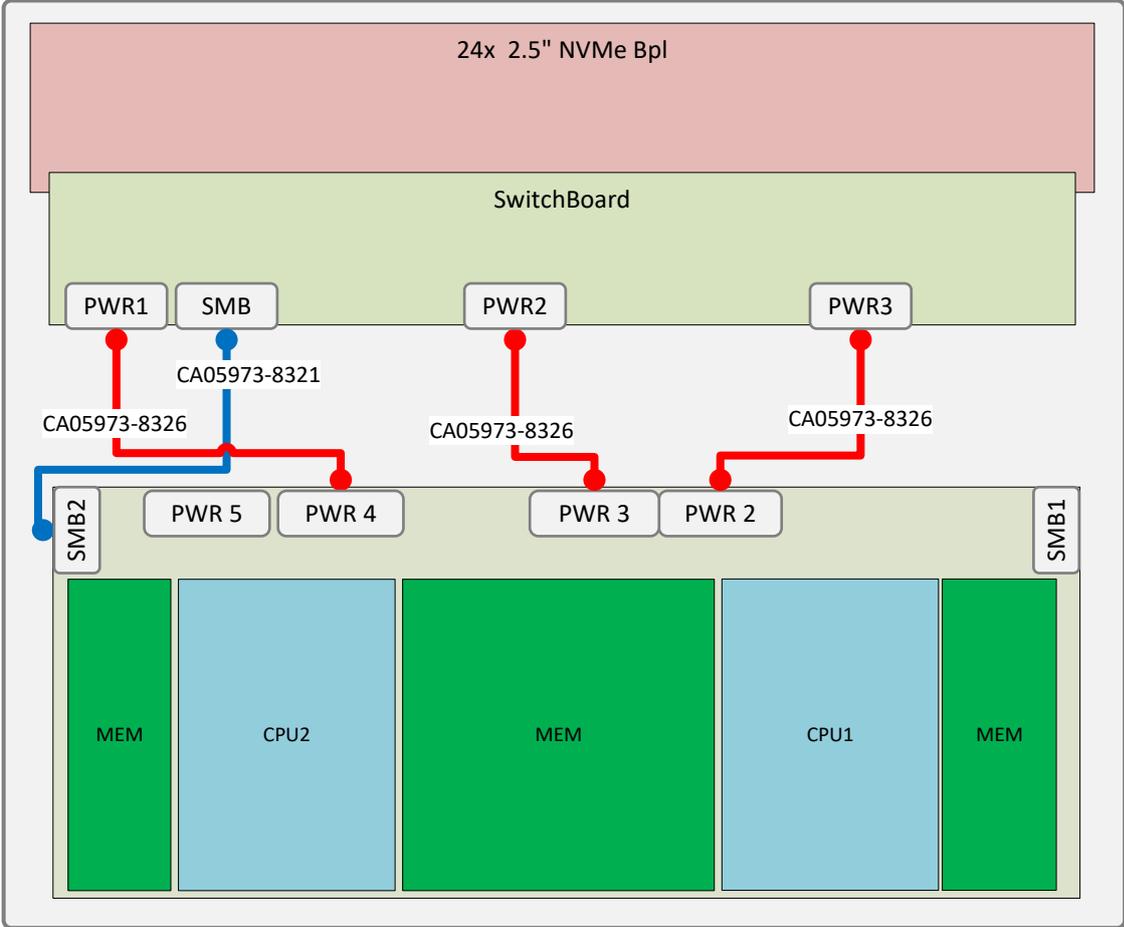
TYPE 6 - 16x SAS/ SATA/ NVME

# OOB & Power 3x 8x 2.5" Bpl



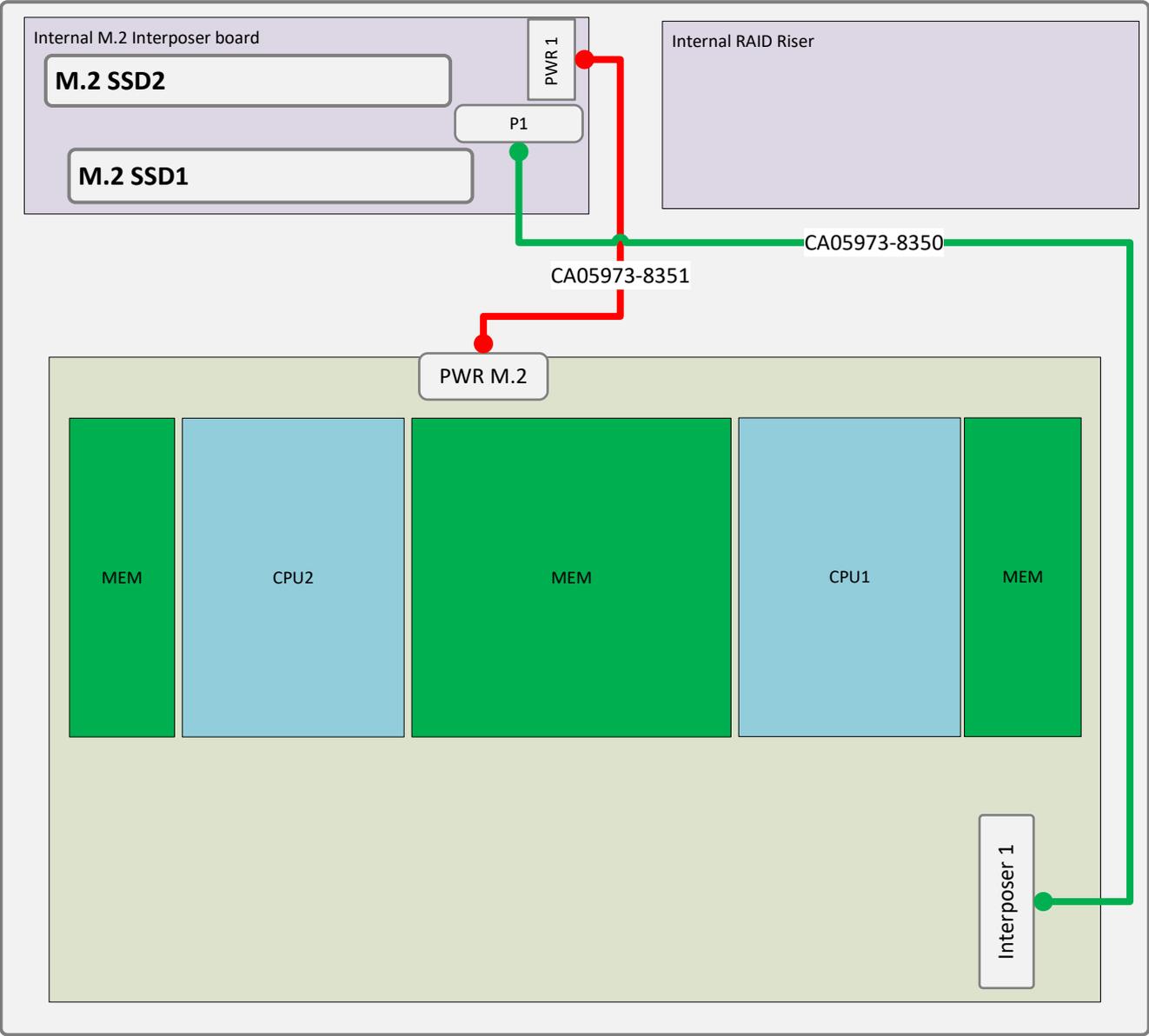
TYPE 4

# OOB & Power 24x2.5" NVMe

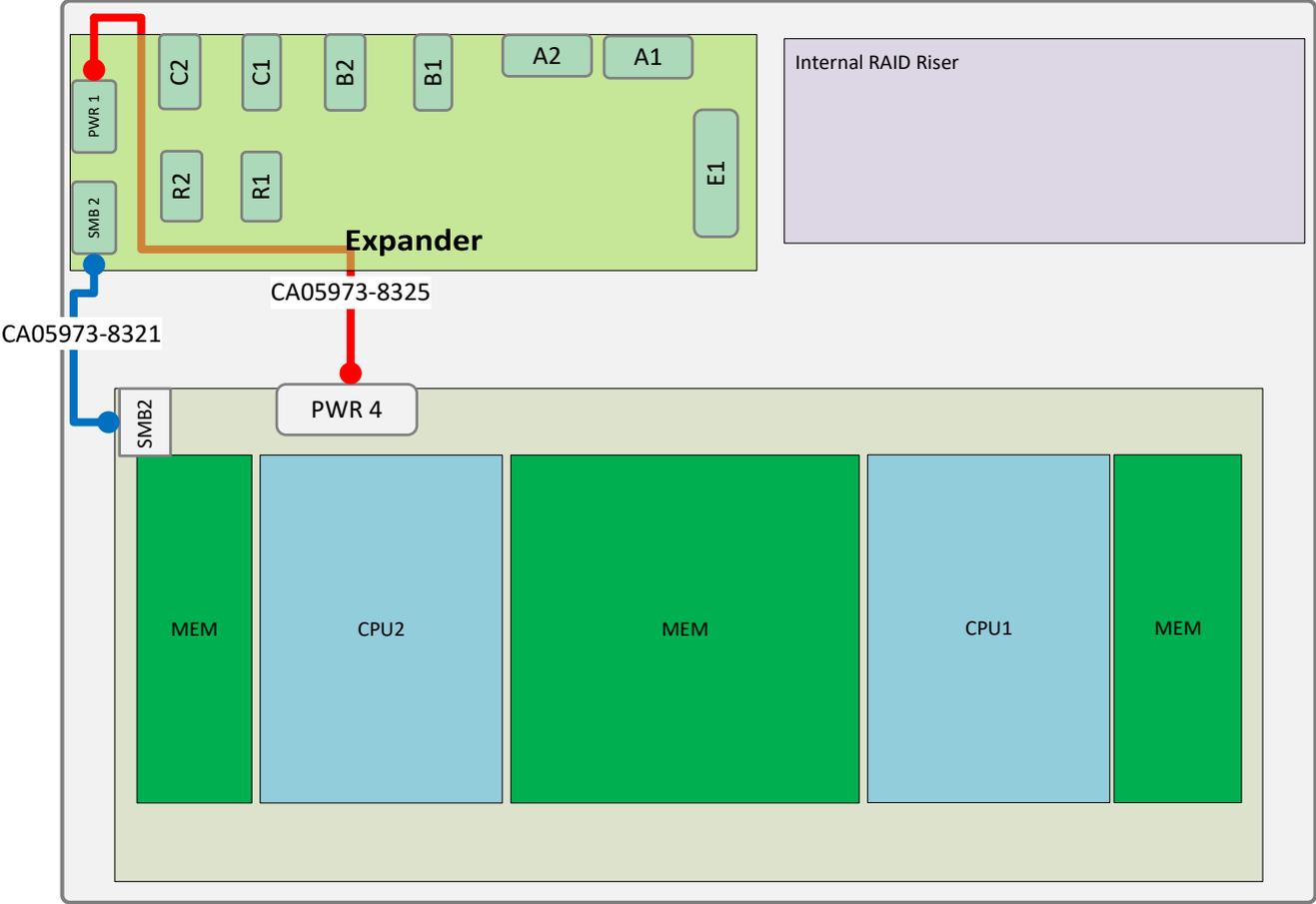


Type 5 - 24x NVMe

# Power Interposer Board @ MoBoard

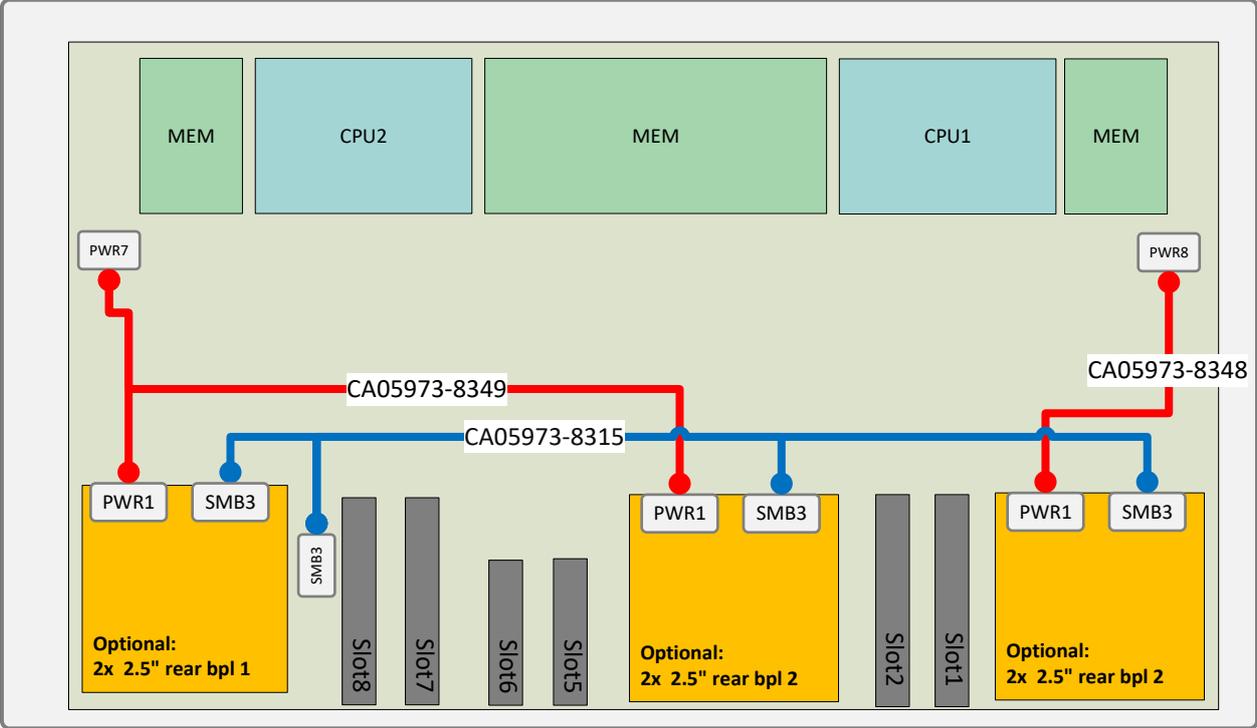
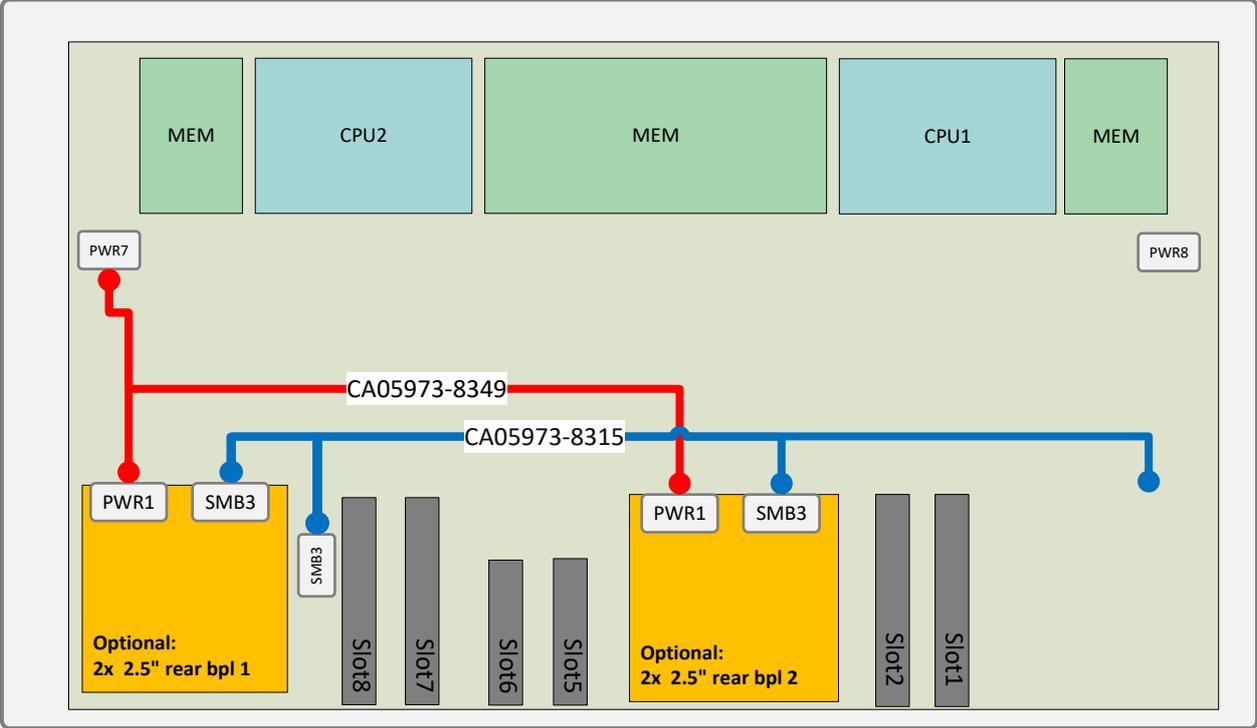


### Power Expander board



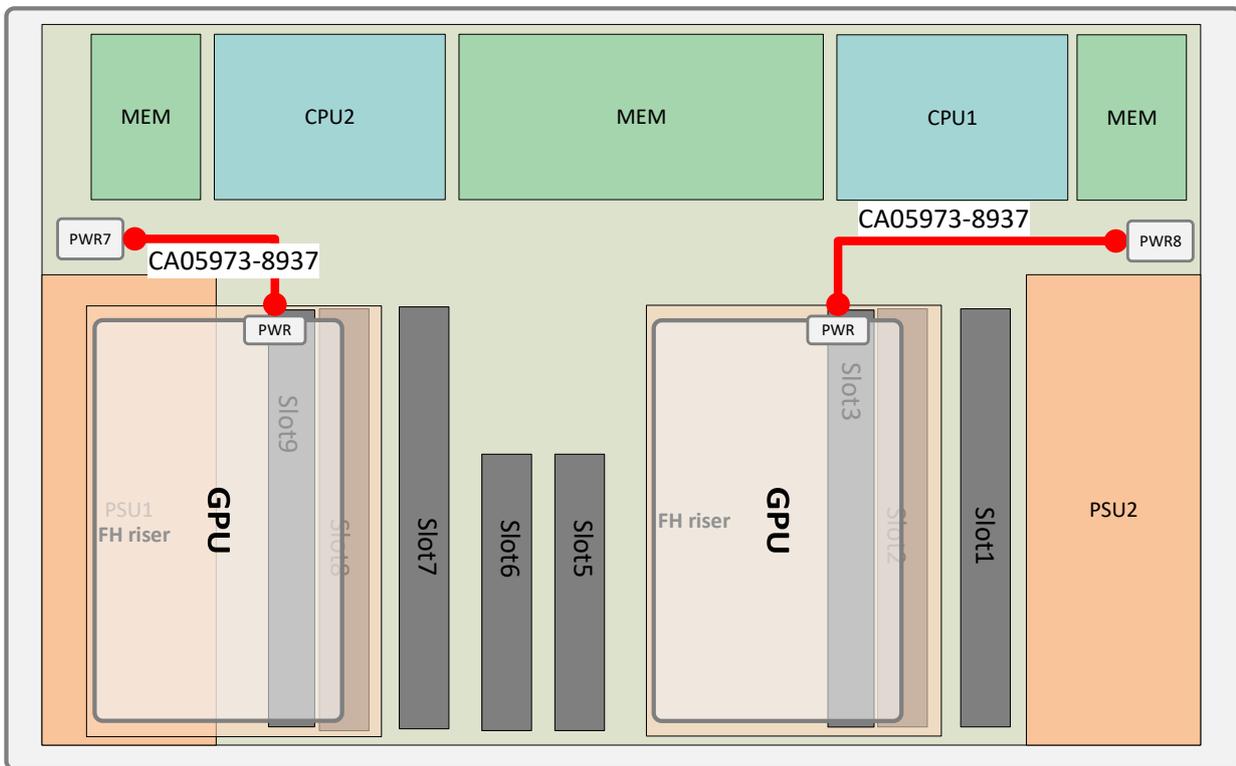
- Type 2 - 12XSAS/SATA 3.5" HDD
- Type 3 - 16x SAS/SATA 2.5"
- Type 4 - 24x SAS/SATA 2.5", NVMe Mix
- Type 5 - 24x NVMe

# OOB & Power Rear 4x/6x HDD



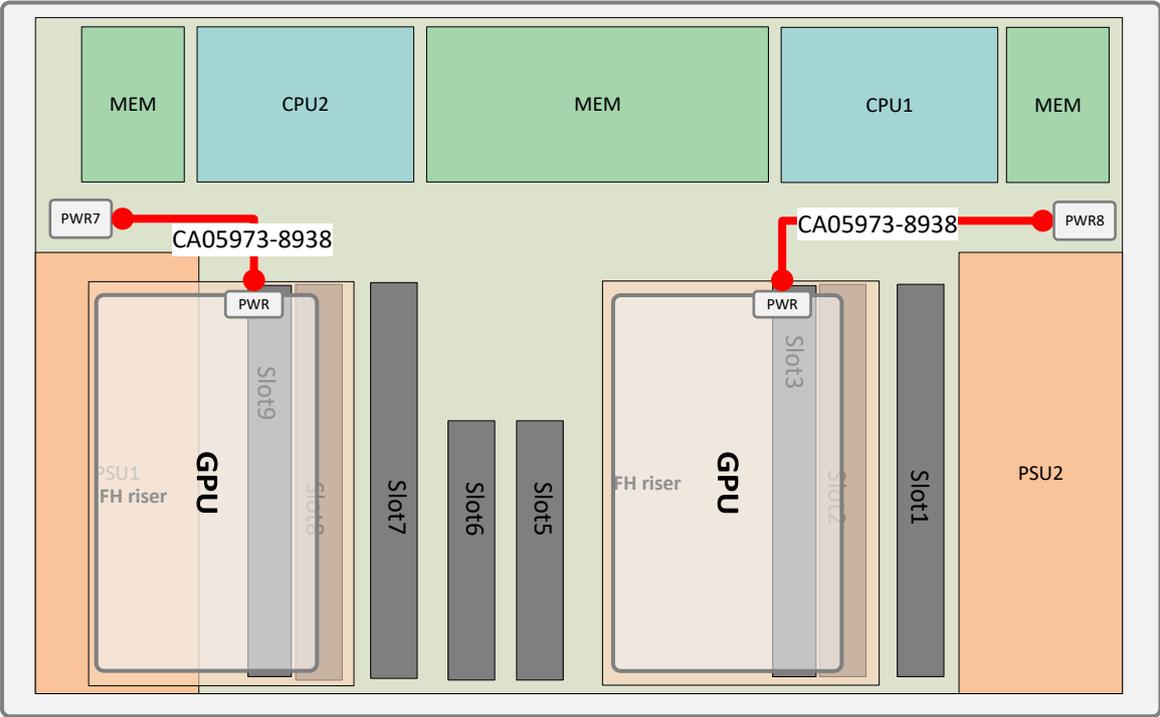
- Type 2 - 12x SAS/SATA 3.5"
- Type 3 - 16x SAS/SATA 2.5"
- Type 4 - 24x SAS/SATA 2.5", NVMe Mix

# Power GPU RTX A4500

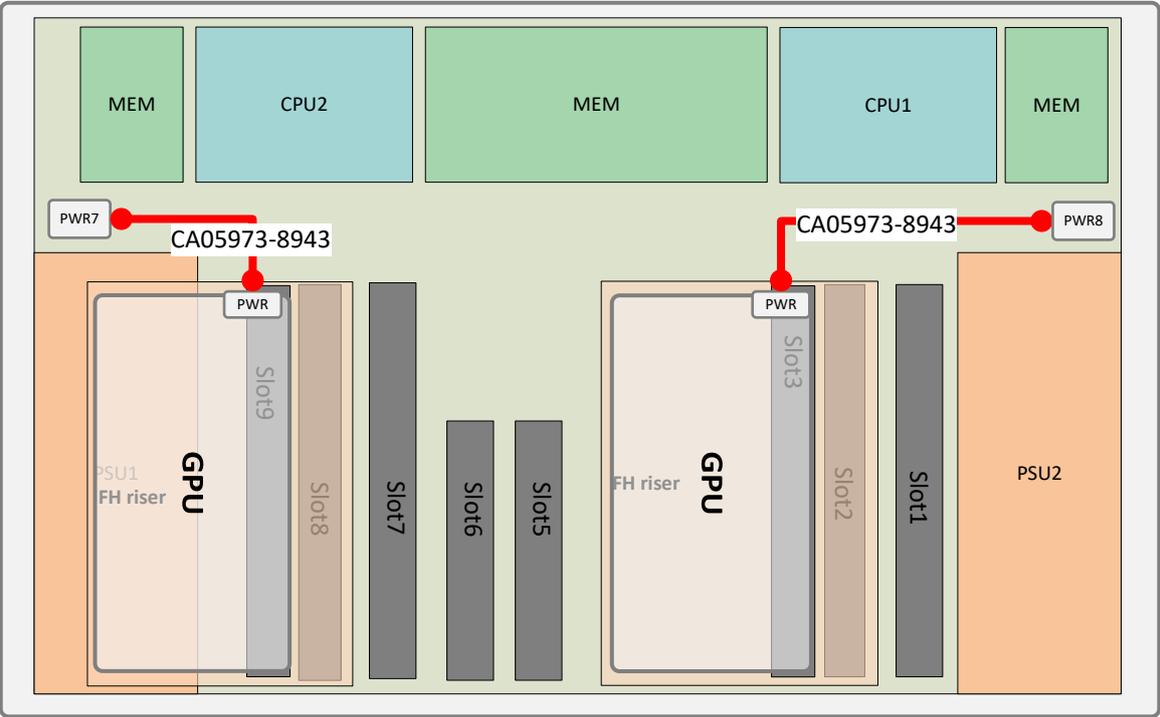


CA05973-8937 will be replaced by CA05973-8320 by running change

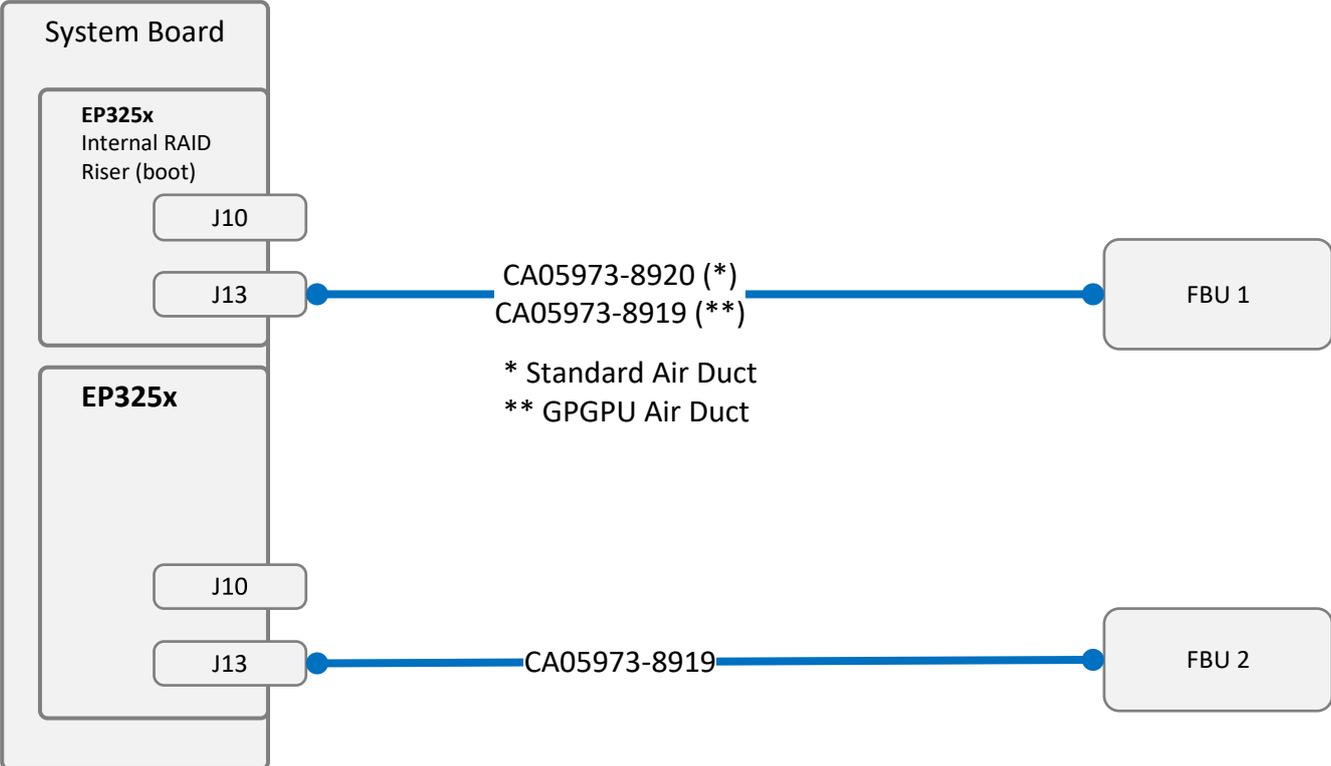
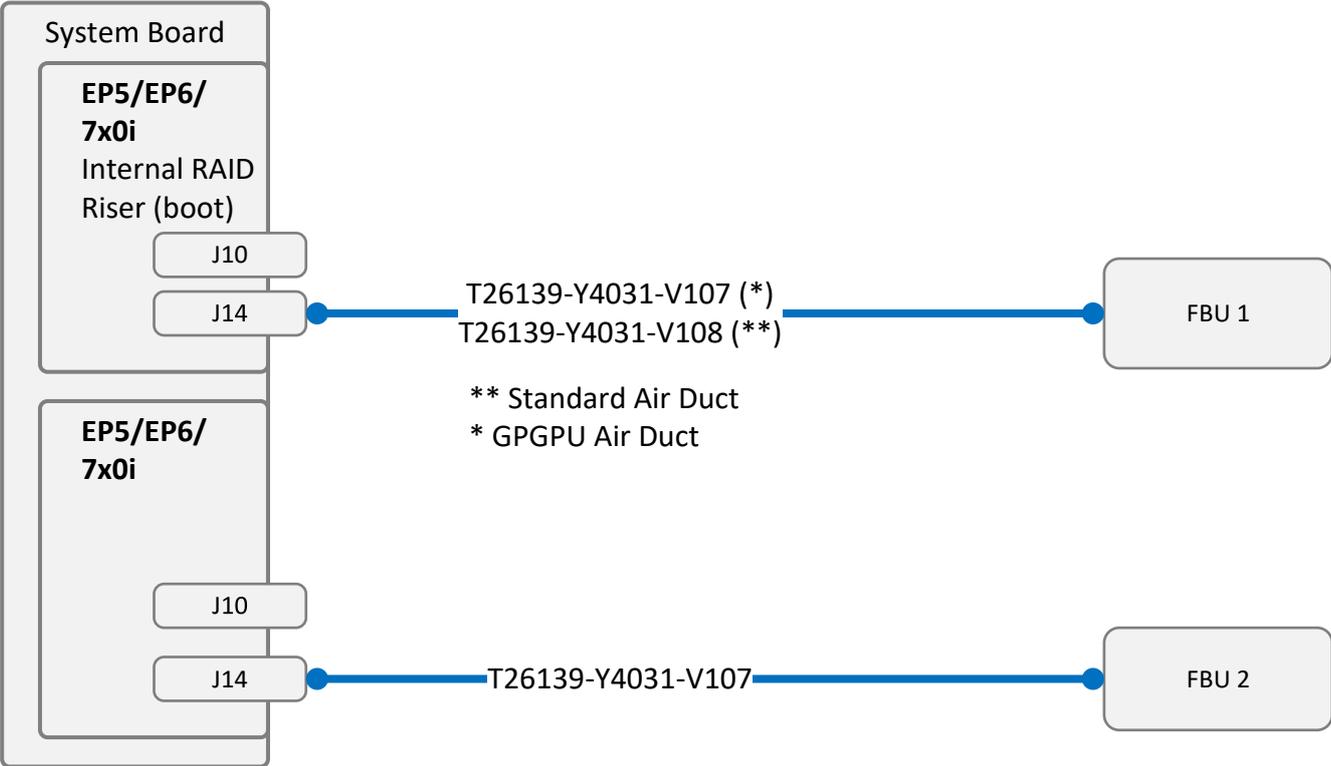
Power GPU Power GPU A30/A40/RTX A6000/A100/A16/A30X/  
A100X



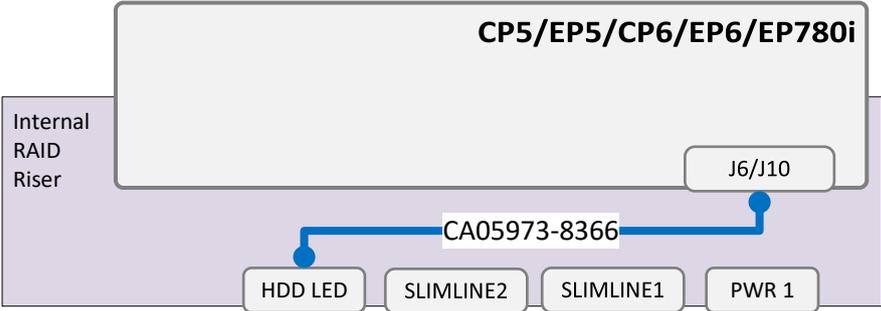
# Power GPU H100/L40/RTX 6000 Ada



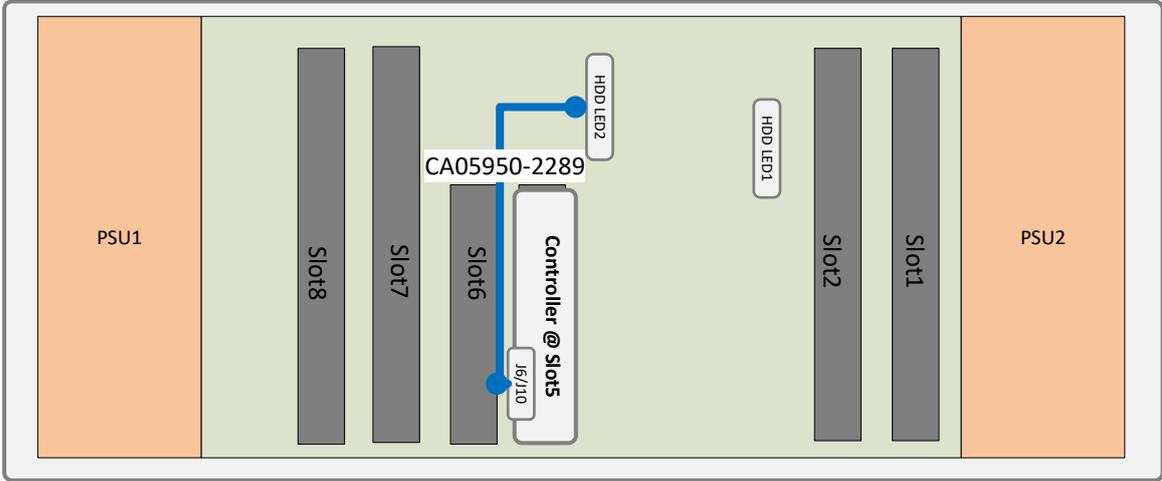
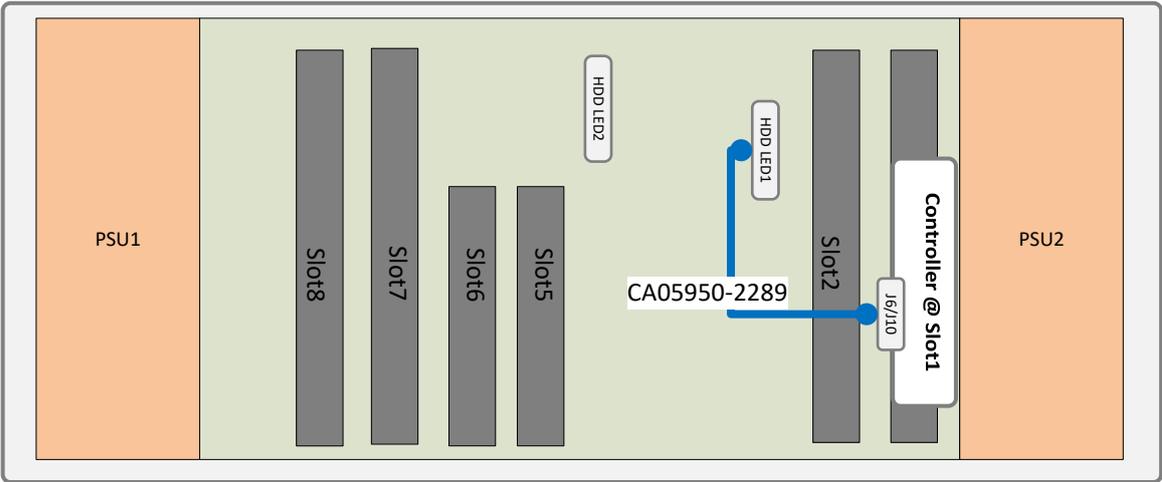
### Data FBU EP5xx/EP6xx/EP7xx



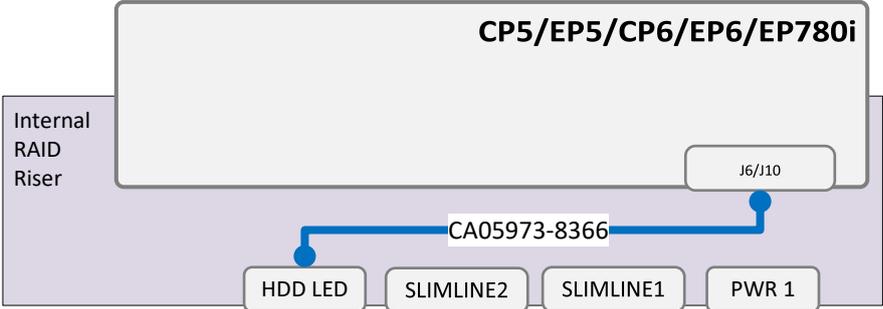
### HDD LED PRAID CP5/EP5/CP6/EP6/EP780i



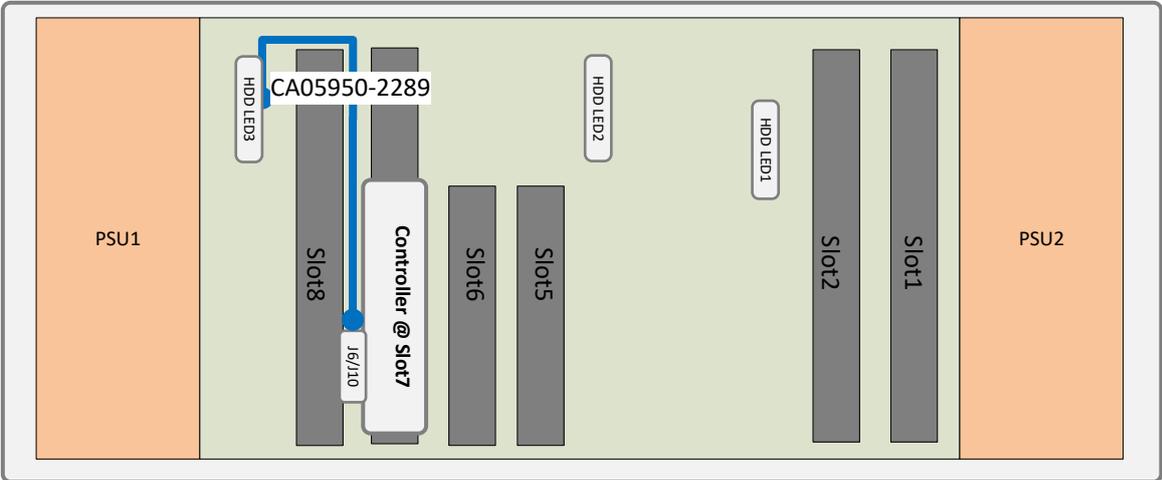
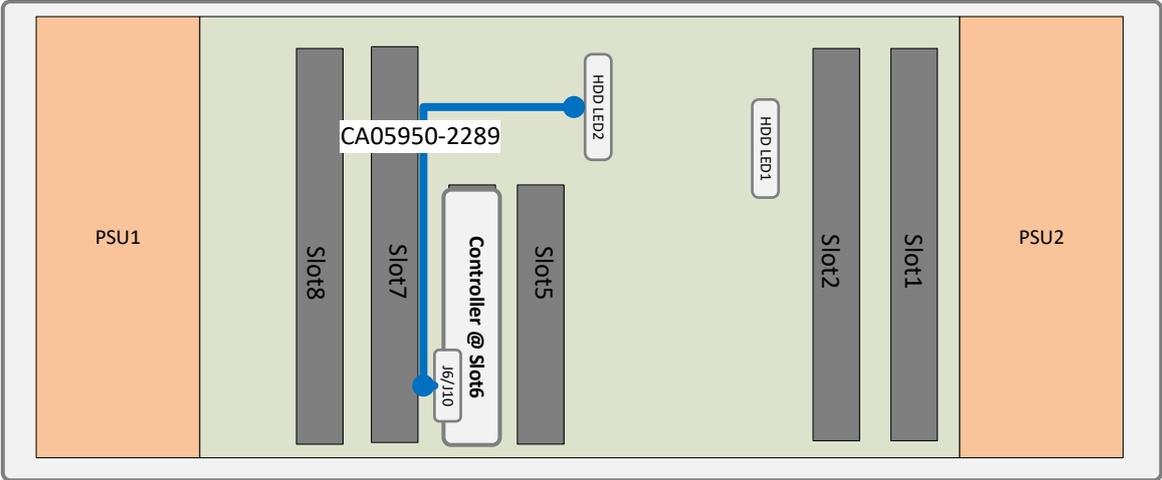
\* HDD LED connector name are different on CP5 and EP5/6/7 series  
For **CP500i** HDD LED connector is **J6**  
**EP5x0i, CP6x0i, EP6x0i and EP780i** is **J10**



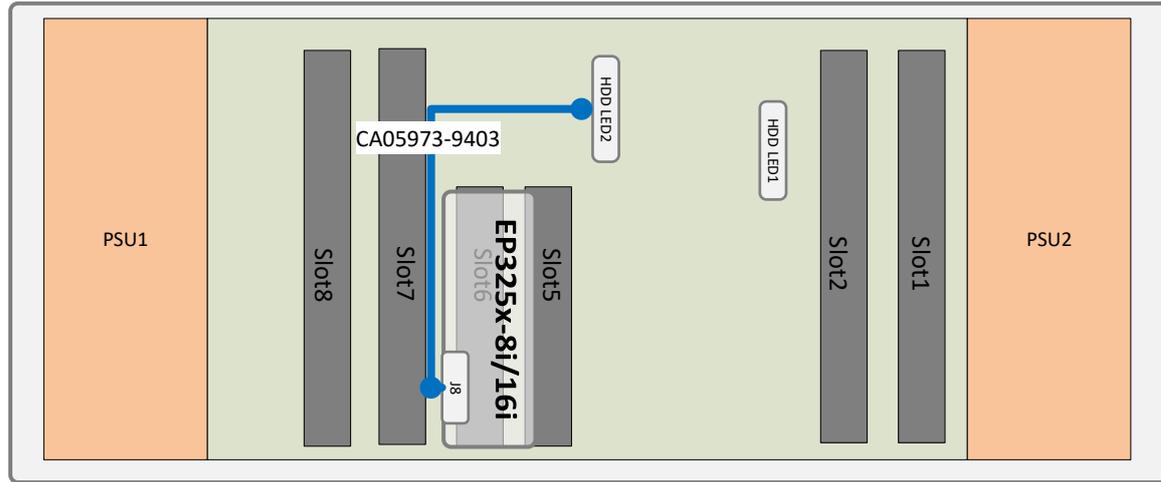
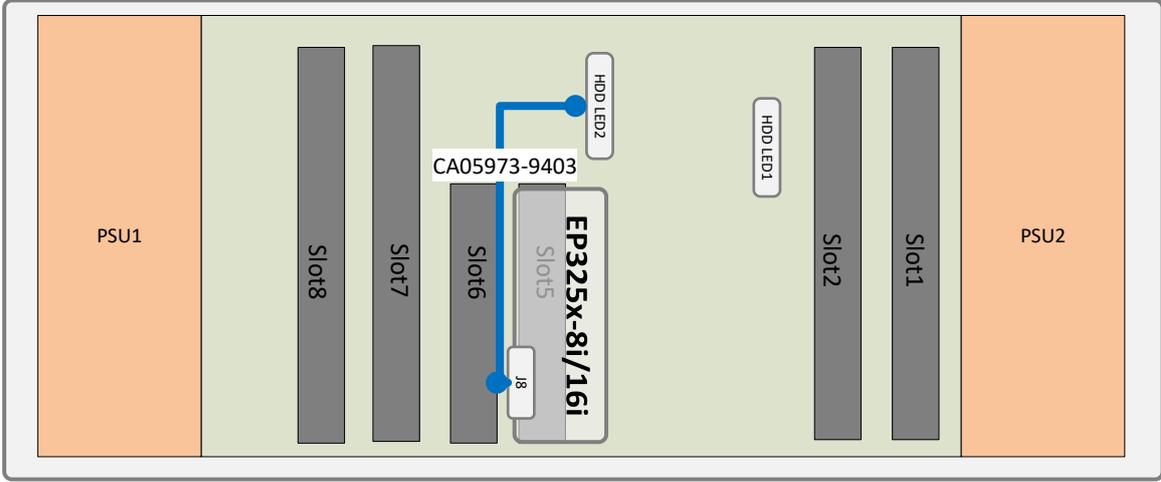
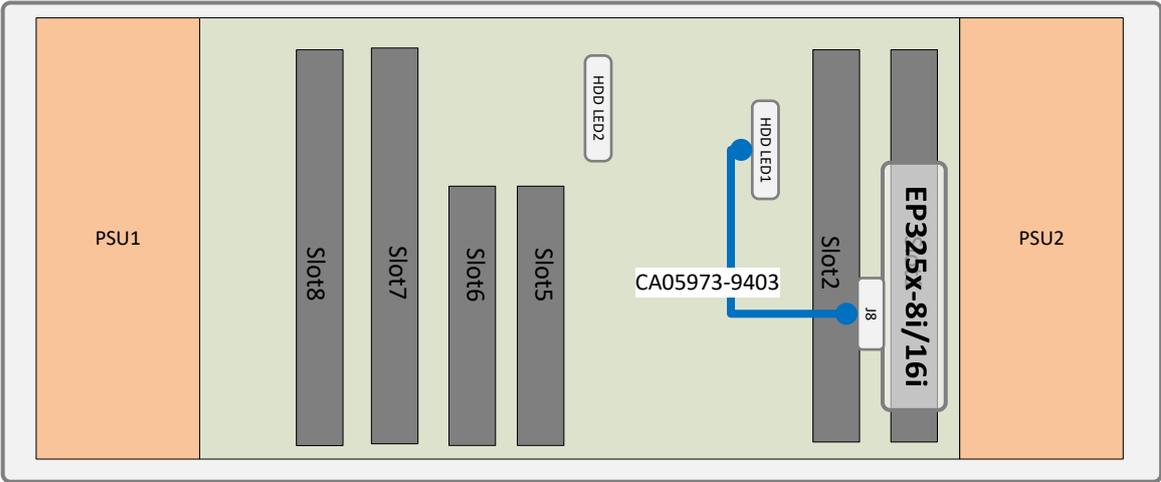
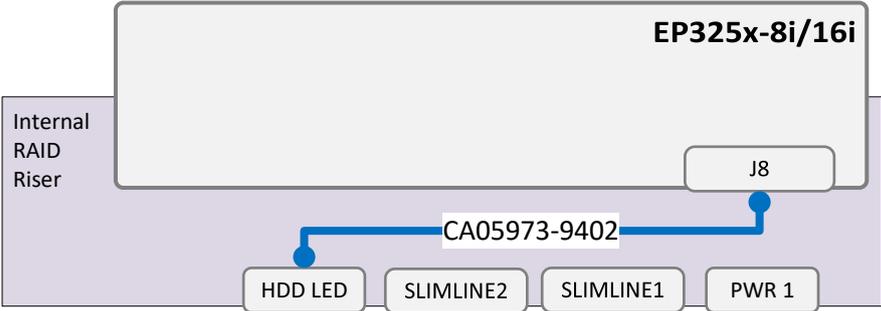
### HDD LED PRAID CP5/EP5/CP6/EP6/EP780i (cont.)



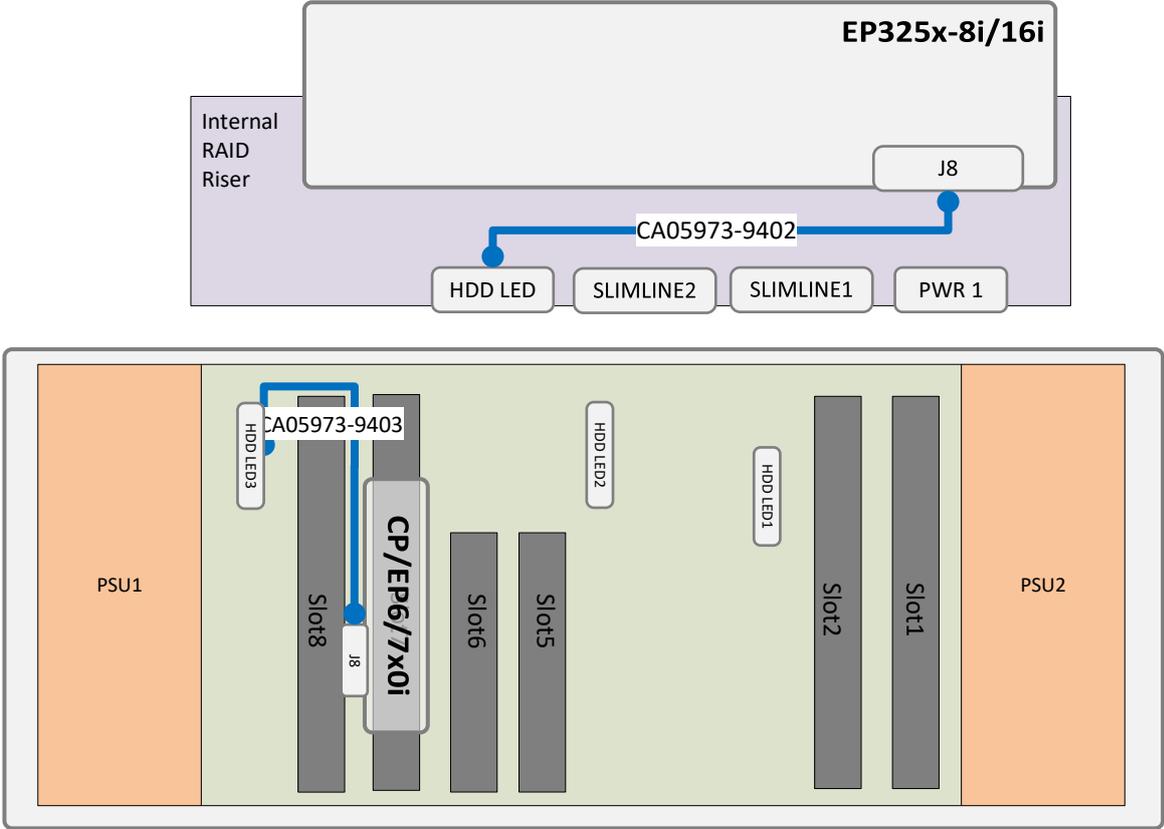
\* HDD LED connector name are different on CP5 and EP5/6/7 series  
For **CP500i** HDD LED connector is **J6**  
**EP5x0i, CP6x0i, EP6x0i, and EP780i** is **J10**



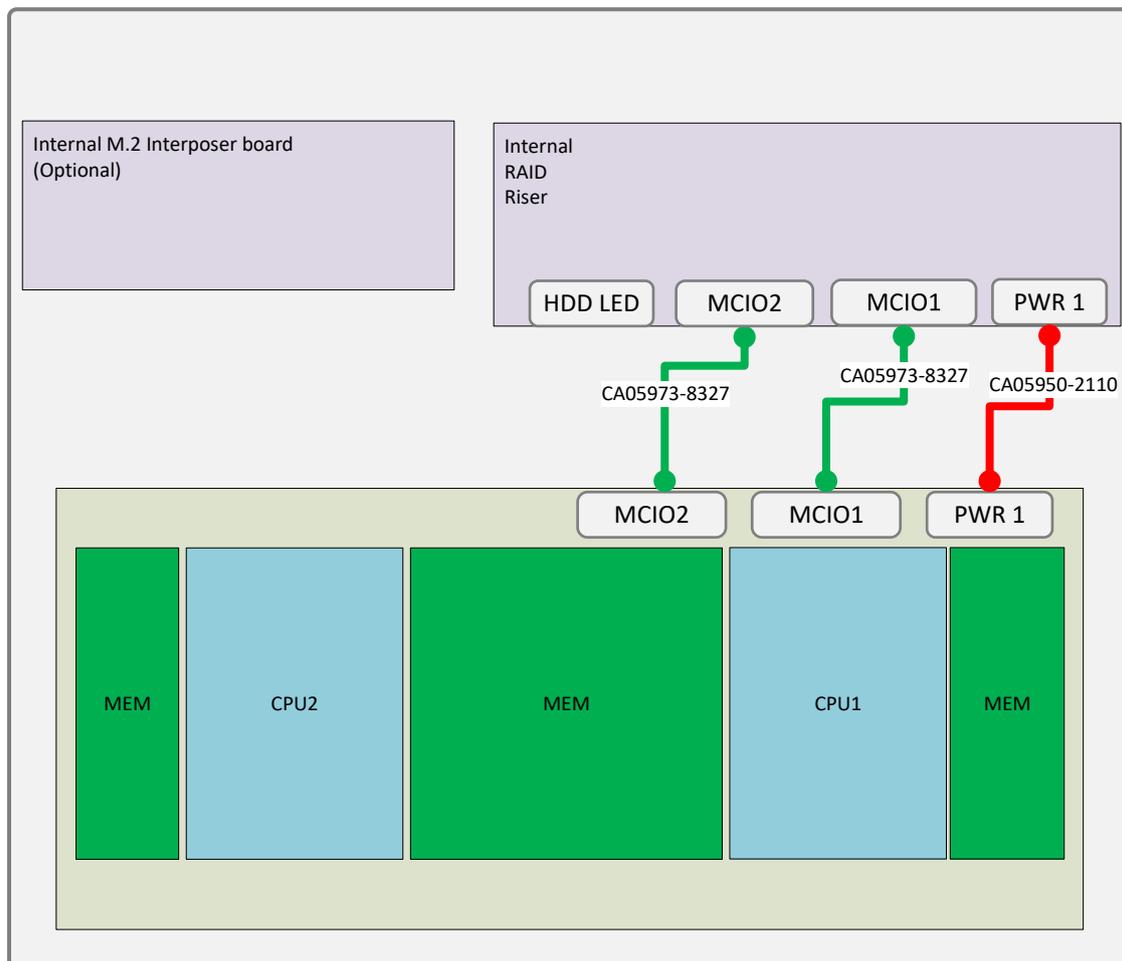
# HDD LED PRAID EP325x-8i/16i



# HDD LED PRAID EP325x-8i/16i (cont.)

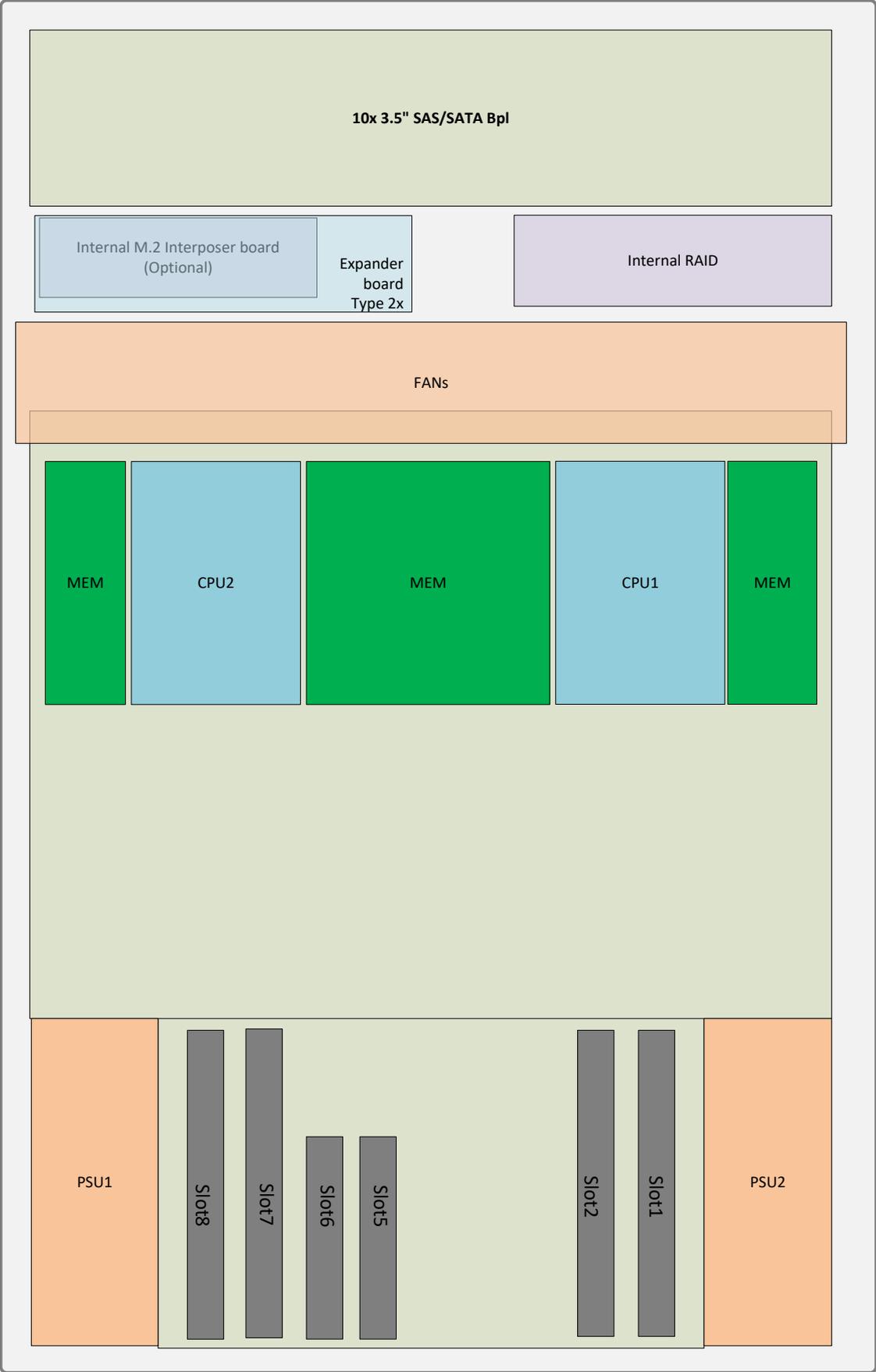


## Int. RAID Riser @ MoBoard

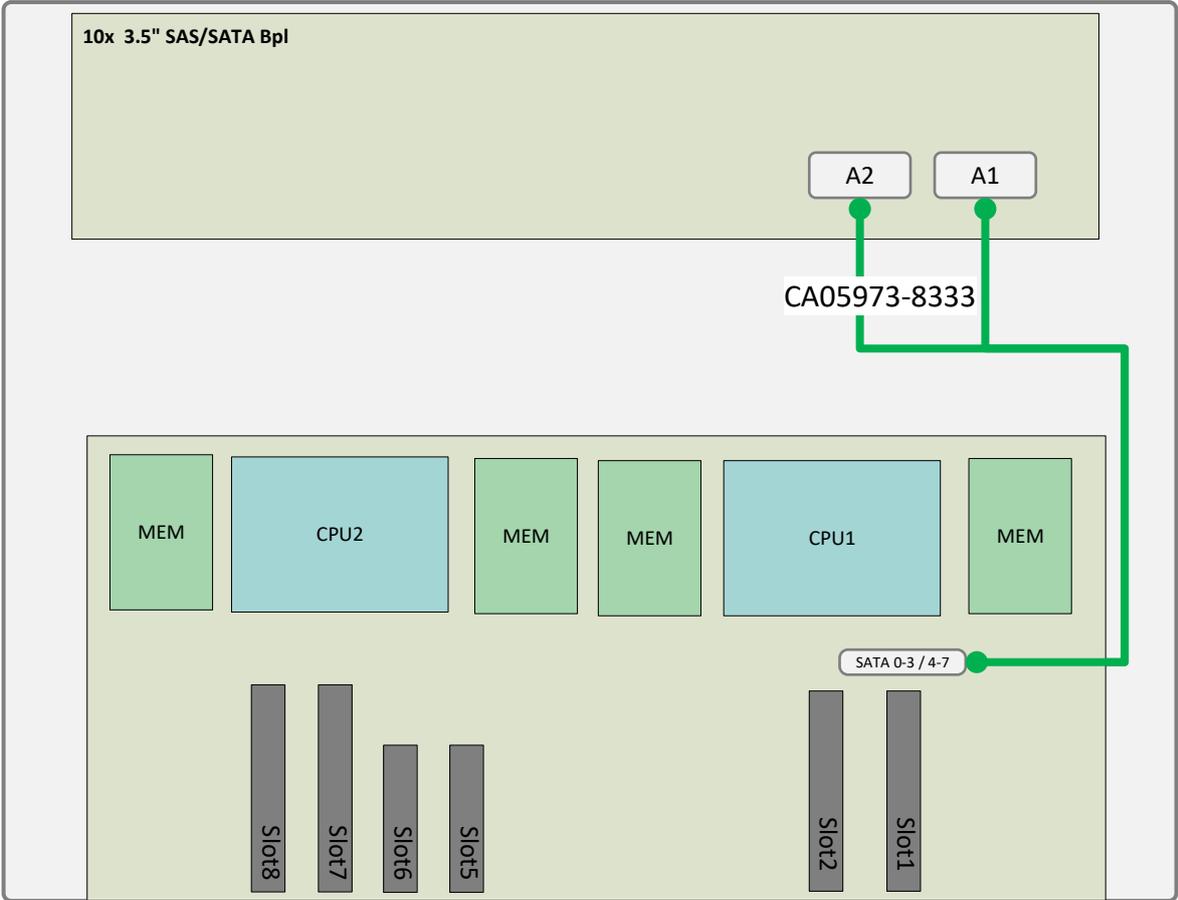


- Type 1 - 10x SAS/SATA 3.5"
- Type 2 - 12x SAS/SATA 3.5"
- Type 3 - 16x SAS/SATA 2.5"
- Type 4 - 24x SAS/SATA 2.5", NVMe Mix
- Type 6 - 16x SAS/ SATA/ NVME

SKD 1x / 2x

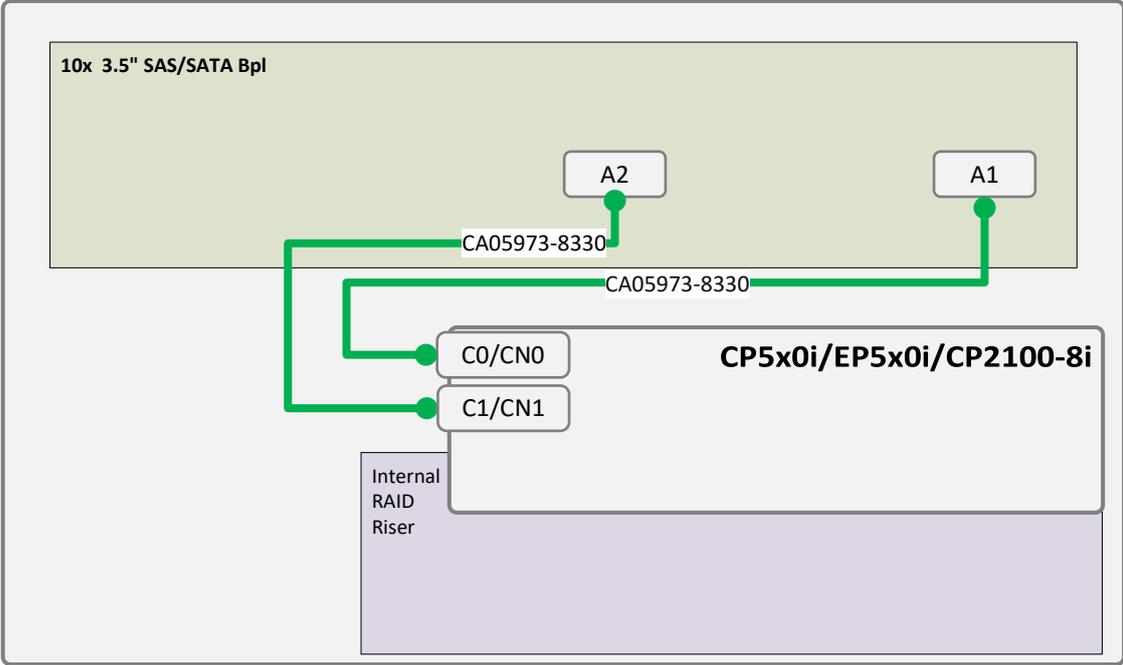


PYR2547R3N/PYR2547RLN Type 1-1 OnBoard SATA 3.5"



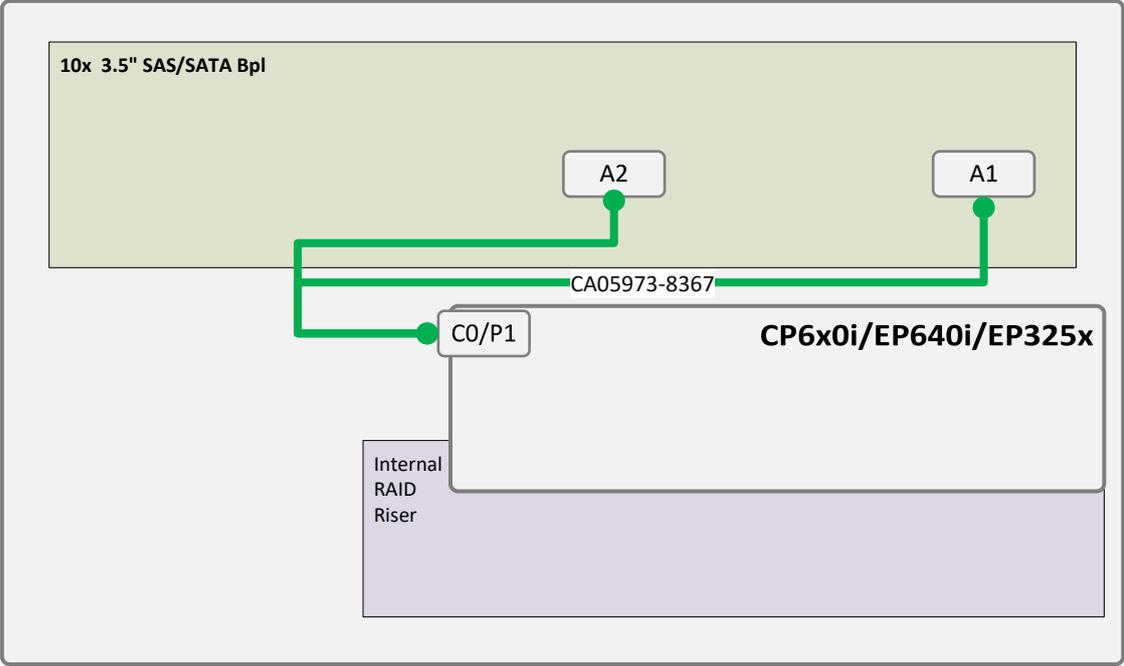
Type 1-1

PYR2547R3N/PYR2547RLN Type 1-2a Int. RAID Riser CP5x0i/  
EP5x0i/CP2100-8i - 3.5"



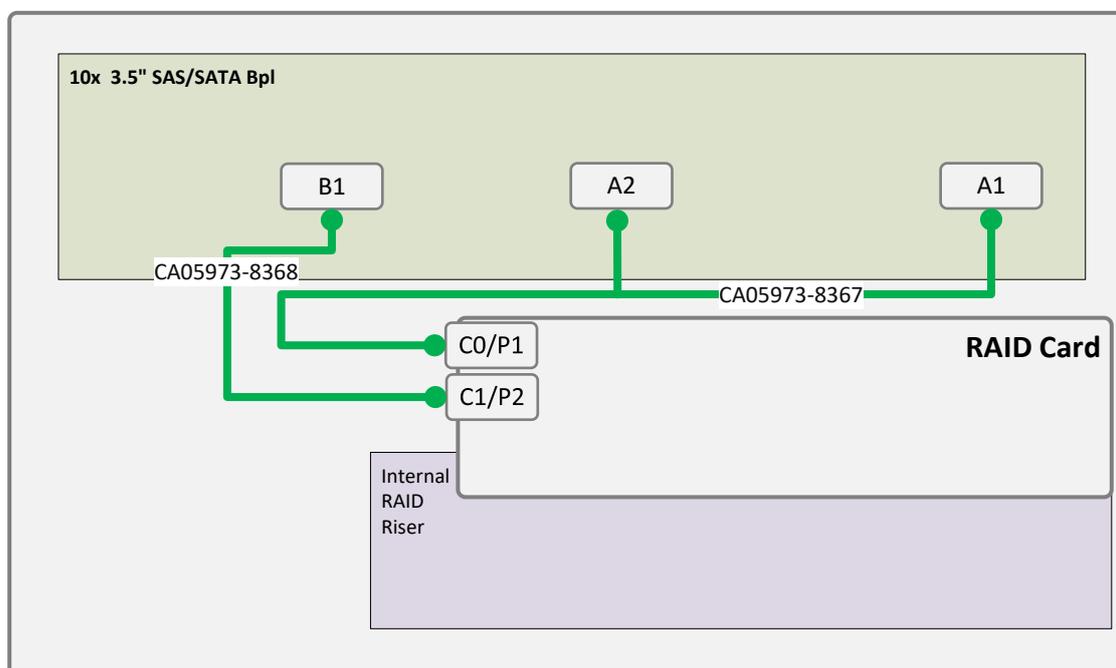
Type 1-2a

PYR2547R3N/PYR2547RLN Type 1-2b Int. RAID Riser CP6/EP640/EP325x - 3.5"



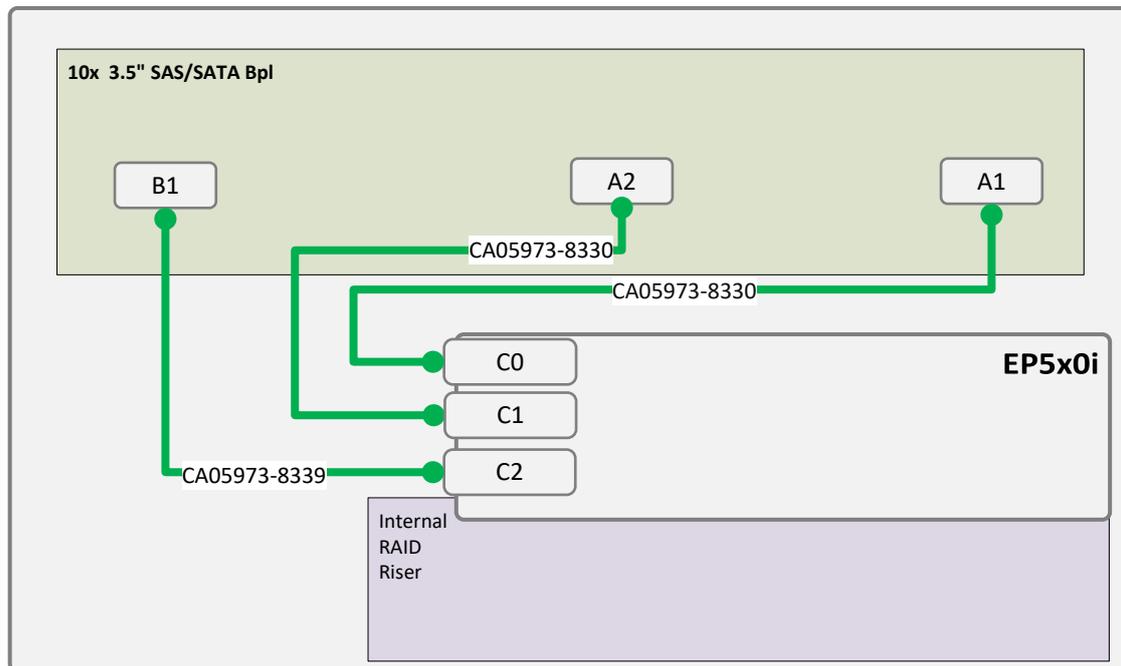
Type 1-2b

PYR2547R3N Type 1-3a Int. RAID Riser CP6/EP680i/EP780i/  
EP325x/CP2200-16 - 3.5"



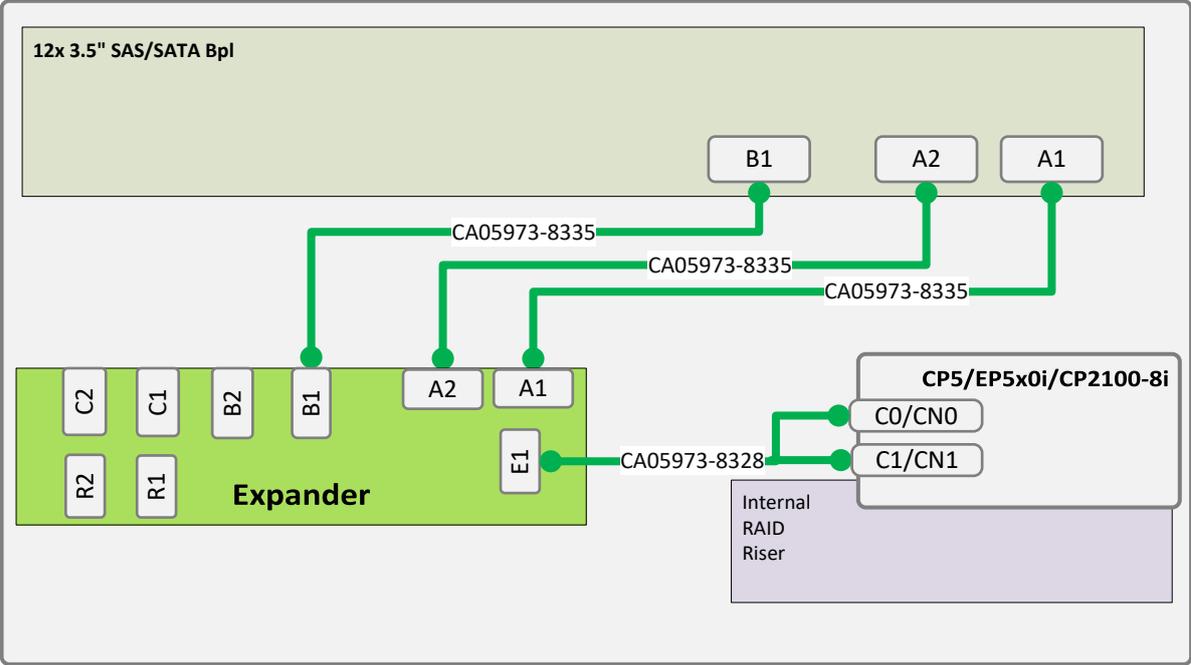
Type 1-3a

## PYR2547R3N Type 1-3b Int. RAID Riser EP5x0i- 3.5"



**Type 1-3b**

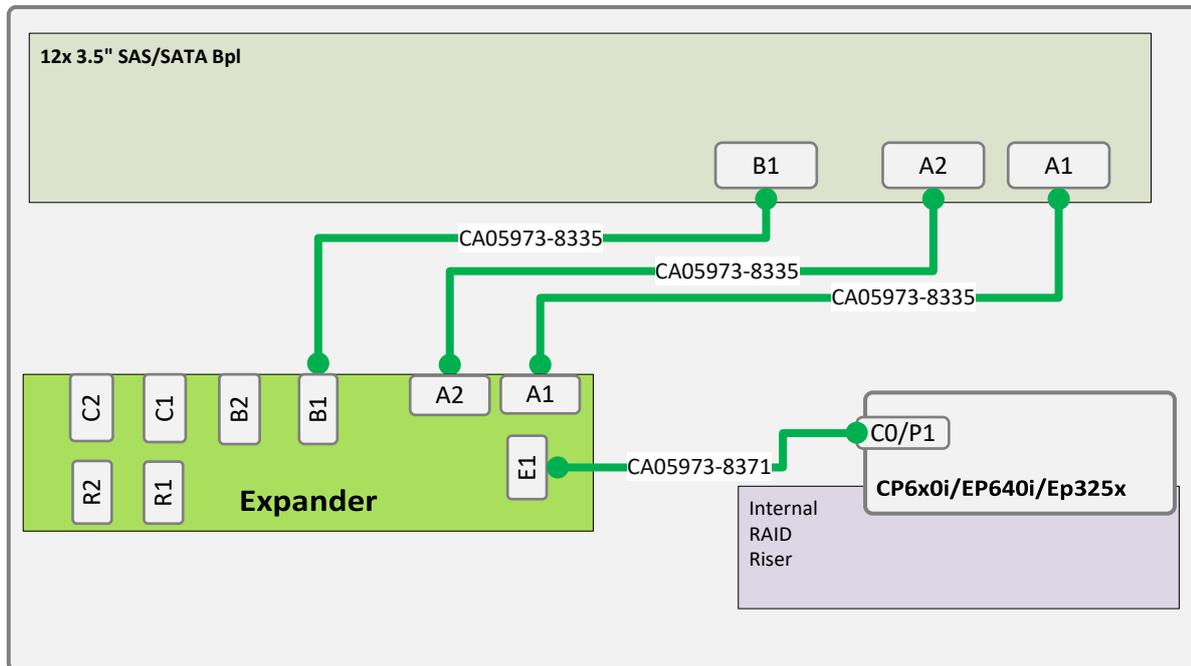
PYR2547RAN Type 2-5a Int. RAID Riser CP5/EP5x0i/CP2100-8i @ Expander - 3.5"



Type 2-5a

- Type 2-6a with „Option: rear 6x/4x 2.5" HDD SAS/SATA @ Expander"
- Type 2-7a with „Option: rear 6x/4x 2.5" NVMe @ ReTimer Slot2 & 8"
- Type 2-8a with „Option: rear 4x 2.5" NVMe @ RAID Slot6"

PYR2547RAN Type 2-5b Int. RAID Riser CP6/EP640i/EP325x @ Expander - 3.5"

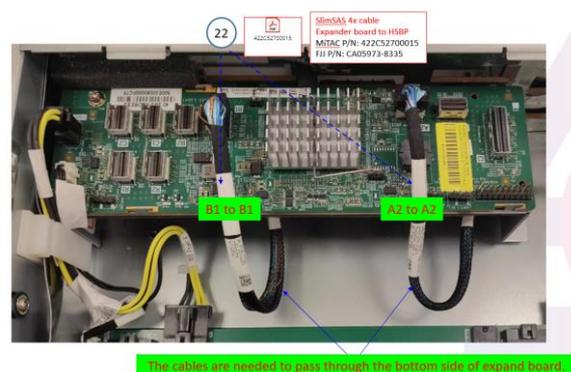


Type 2-5b

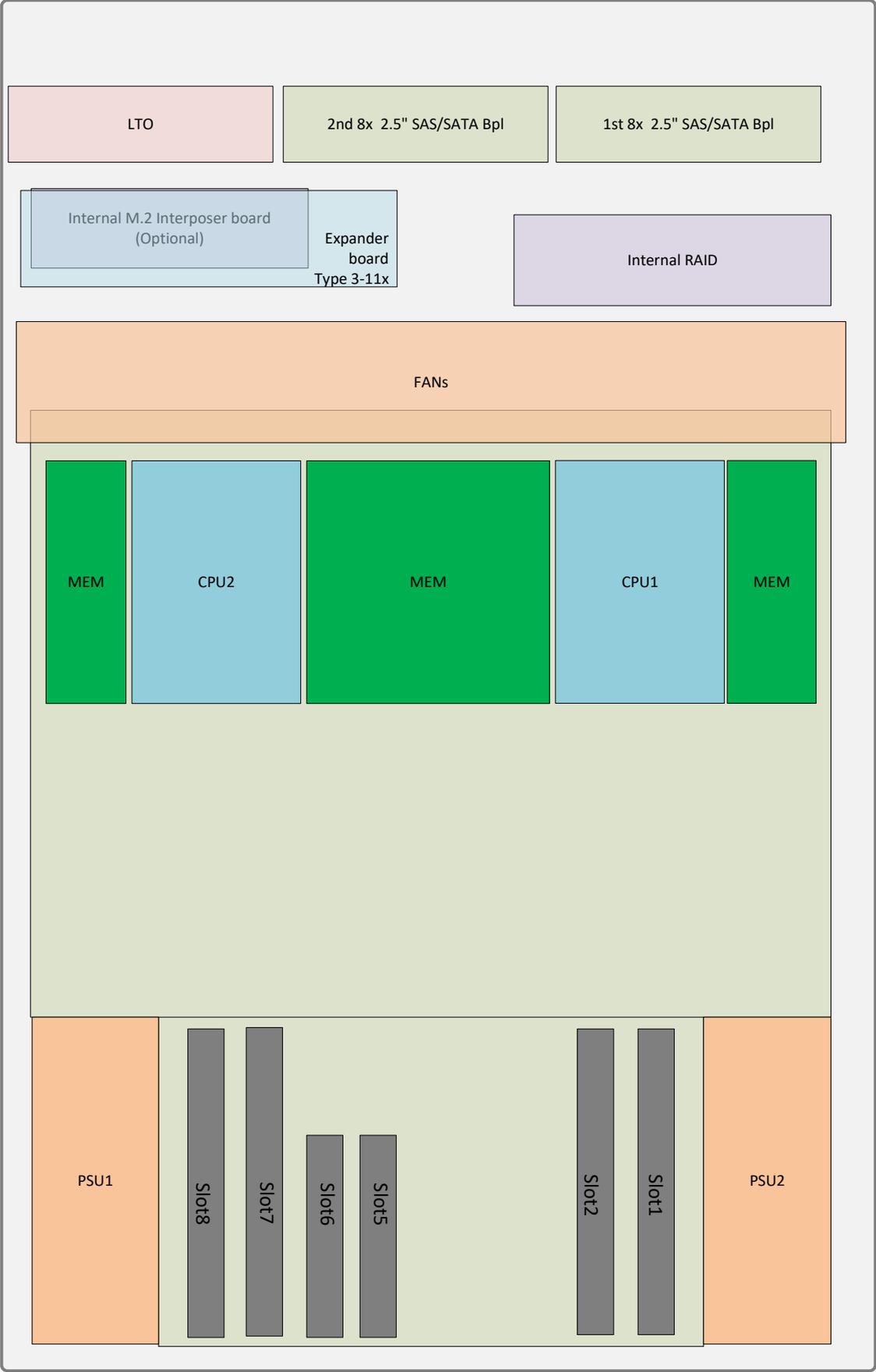
Type 2-6b with „Option: rear 6x/4x 2.5" HDD SAS/SATA @ Expander"

Type 2-7b with „Option: rear 6x/4x 2.5" NVMe @ ReTimer Slot2 & 8"

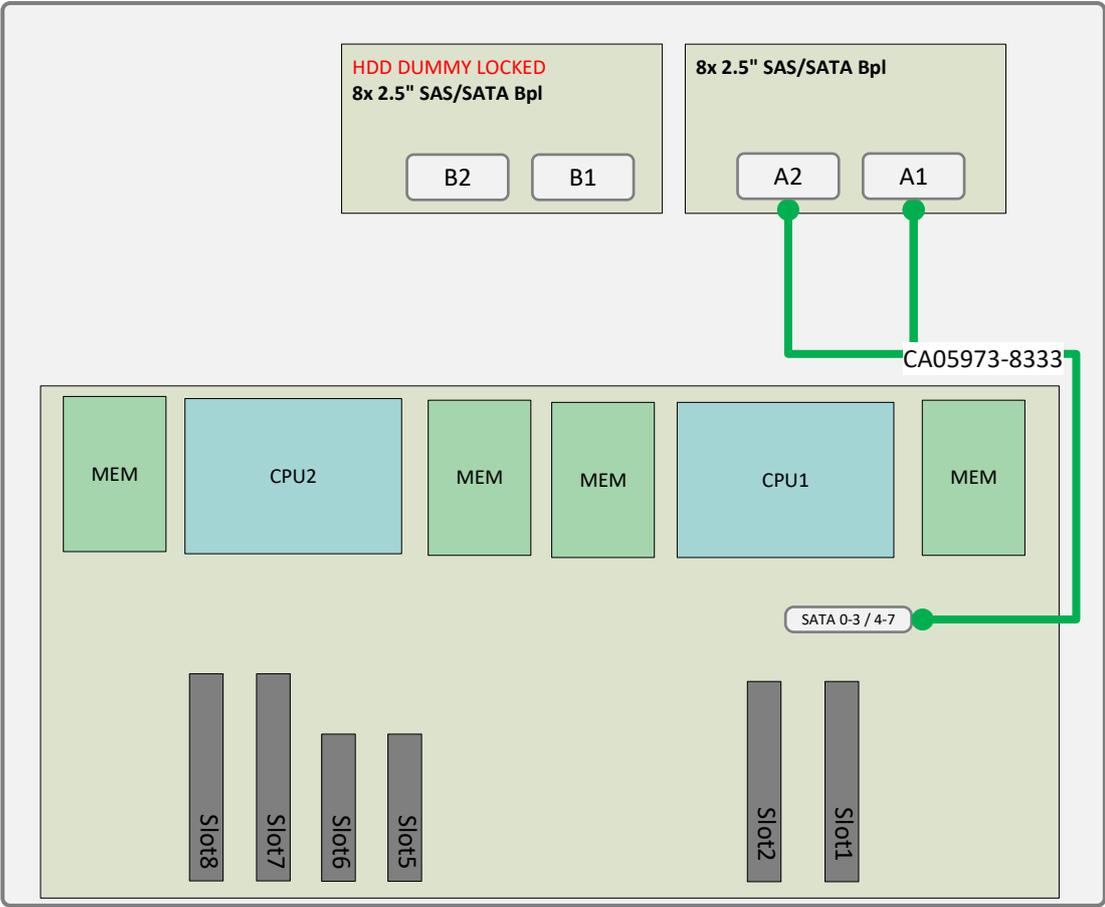
Type 2-8b with „Option: rear 4x 2.5" NVMe @ RAID Slot6"



SKD 3x



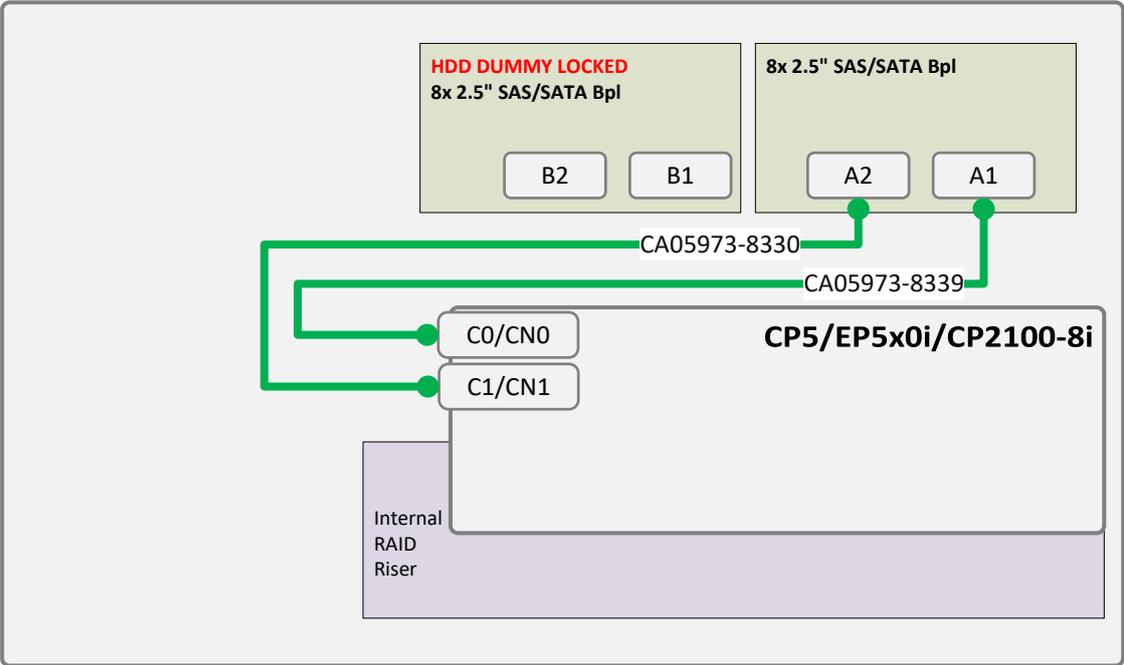
# PYR2547R2N Type 3-1 OnBoard SATA 2.5"



Type 3-1

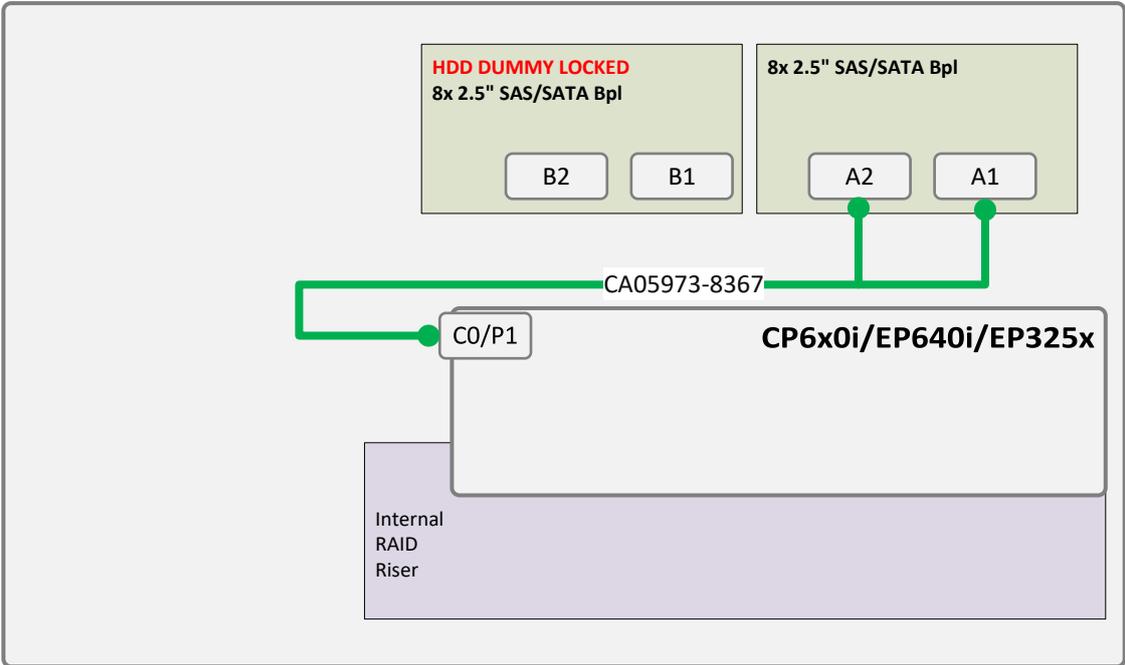
Type 3-5 with „Option: rear 4x 2.5\" NVMe @ RAID Slot6"

PYR2547R2N Type 3-2a Internal RAID Riser CP5/EP5x0i/CP2100-8i - 2.5"



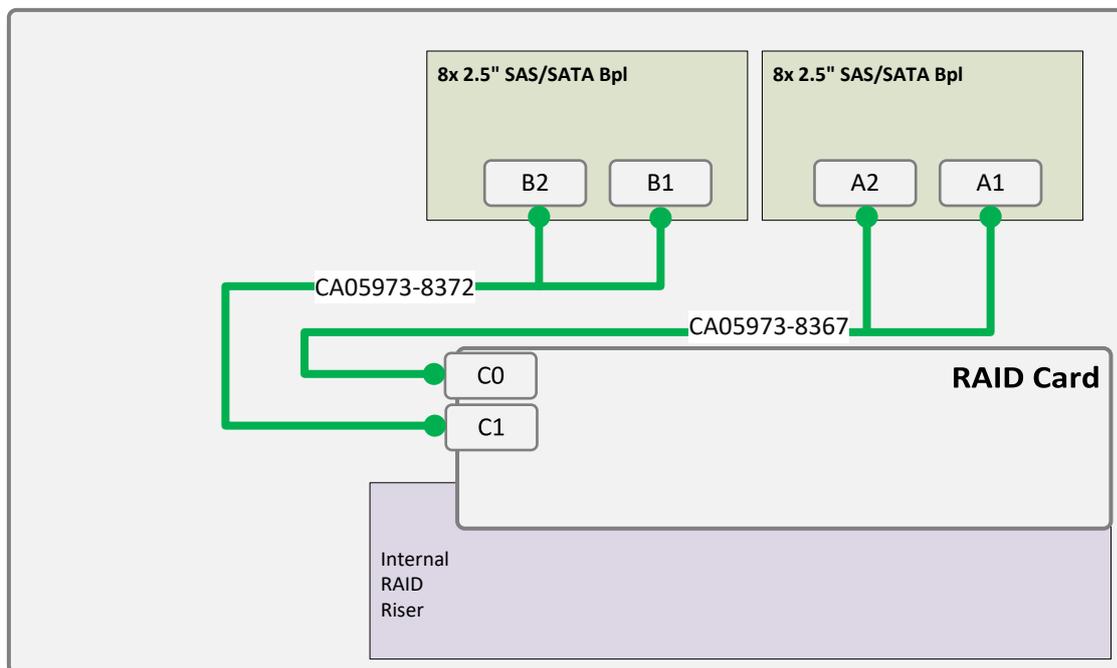
Type 3-2a

PYR2547R2N Type 3-2b Internal RAID Riser CP6/EP640i/EP325 - 2.5"



Type 3-2b

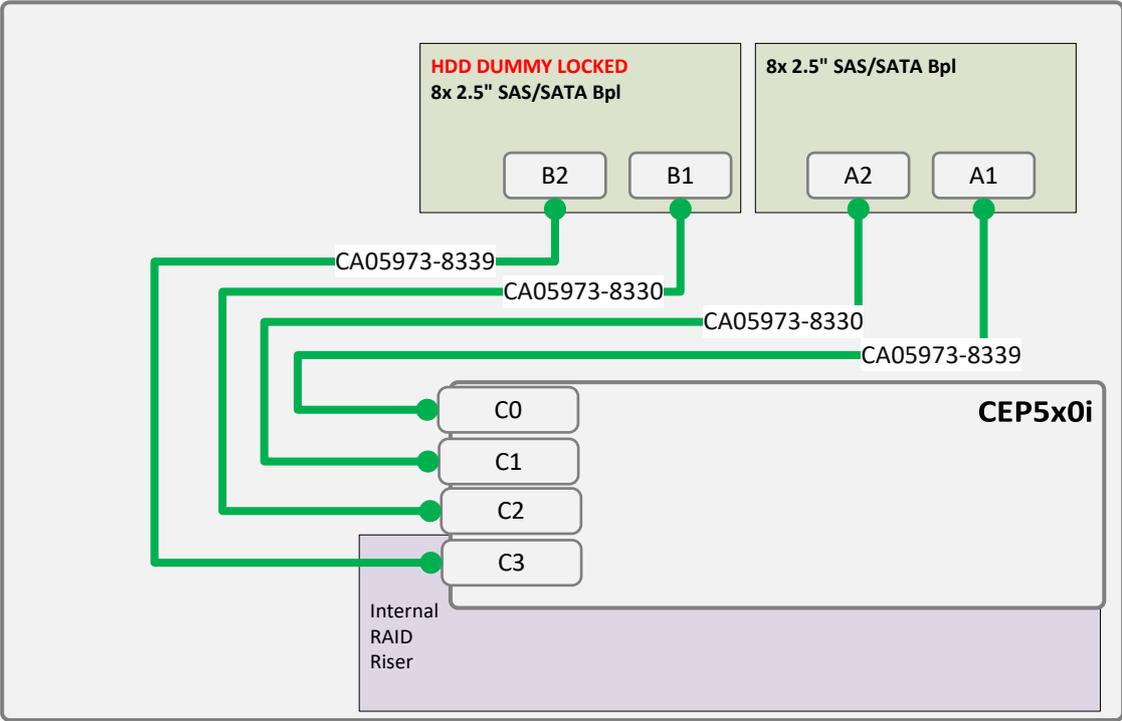
# PYR2547R2N Type 3-3a Internal RAID Riser CP6/EP680i/EP780i - 2.5"



**Type 3-3a**

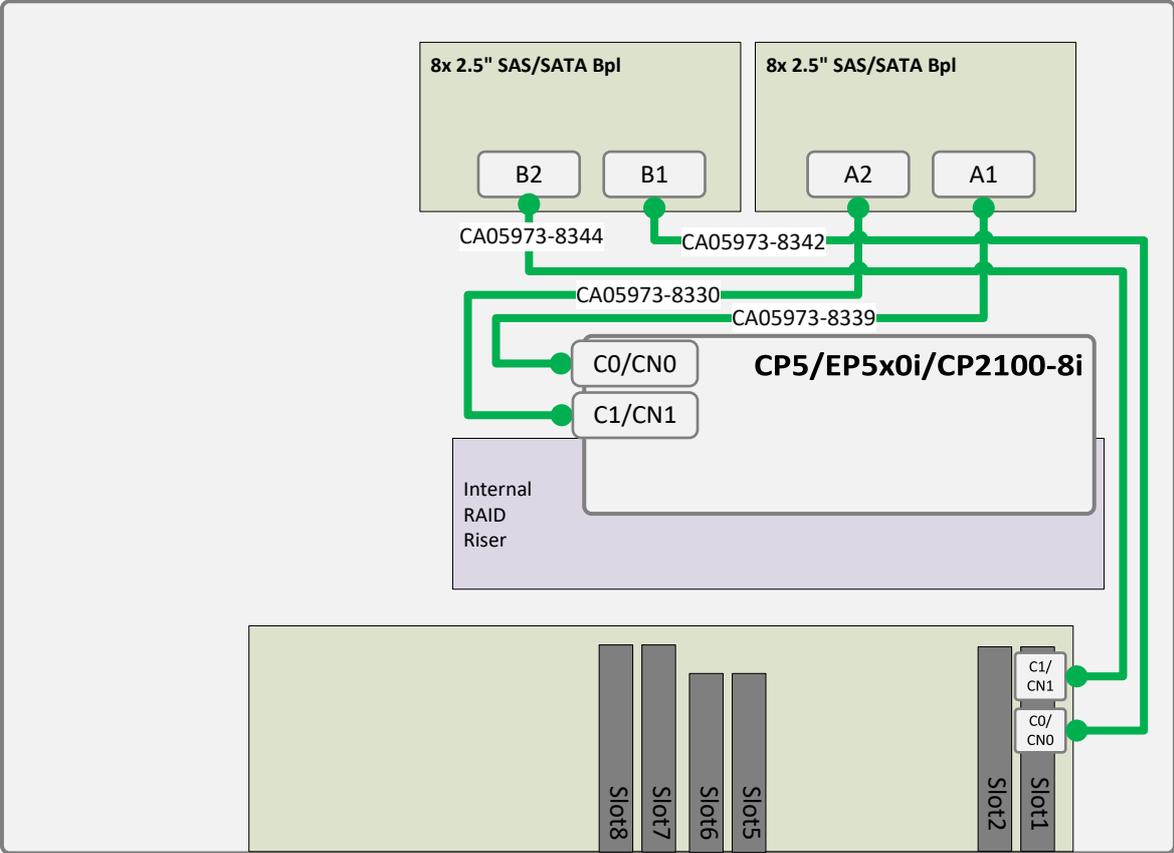
**Type 3-9 with „Option: rear 4x 2.5" NVMe @ RAID Slot6"**

# PYR2547R2N Type 3-3b Internal RAID Riser EP5x0i - 2.5"



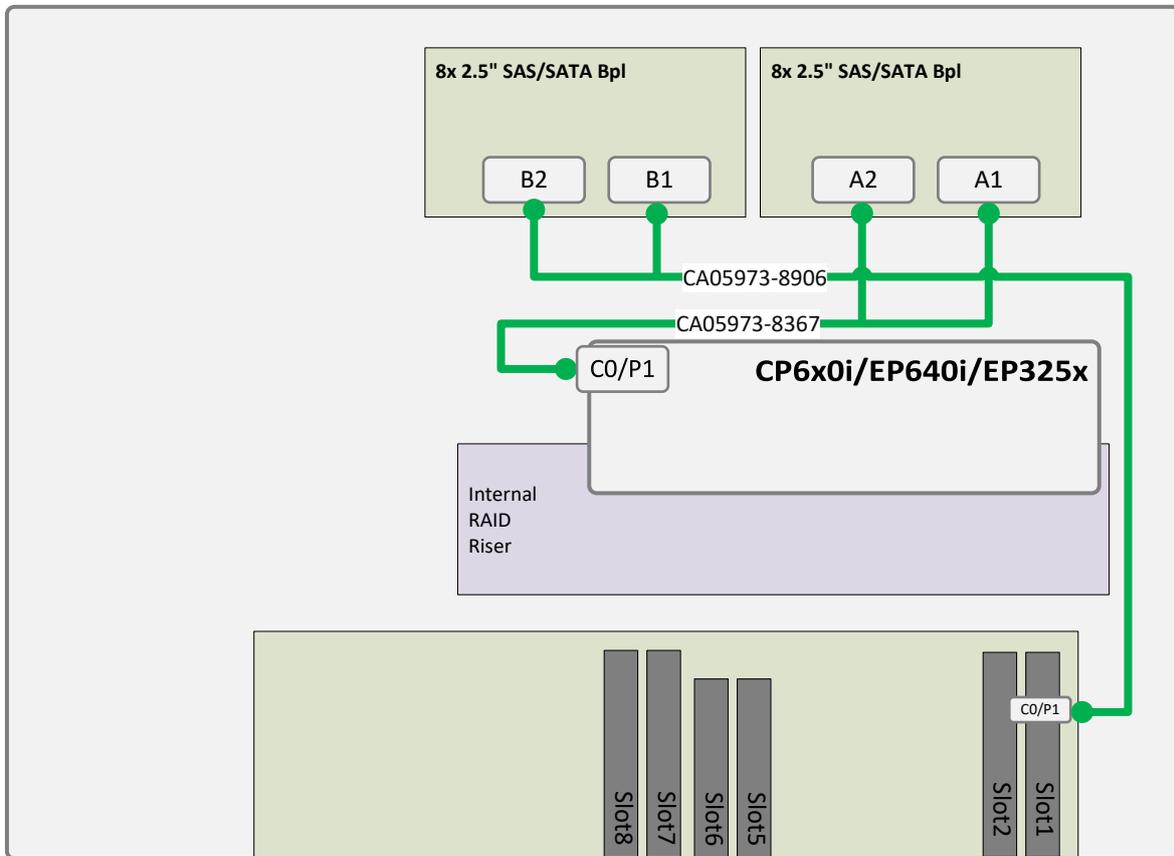
Type 3-3b

PYBCBS092 Type 3-4a Int. RAID Riser & Slot1 CP5/EP5x0i/  
CP2100-8i - 2.5"



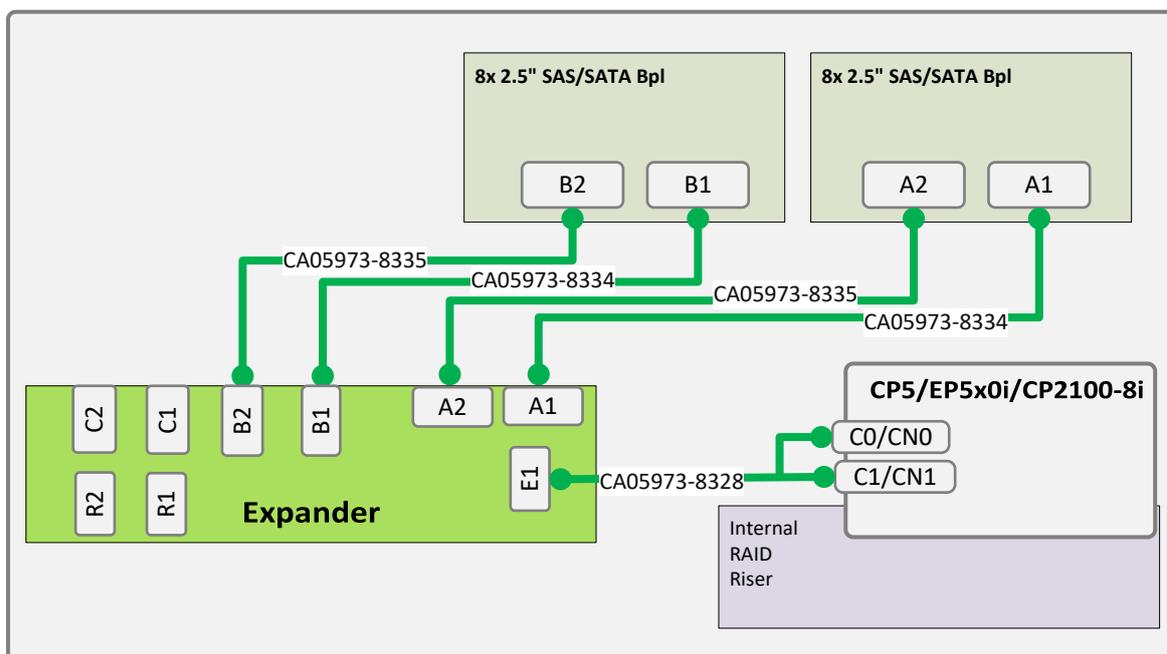
Type 3-4a

PYBCBS092 Type 3-4b Int. RAID Riser CP6/EP640i/EP325x & Slot1  
 CP6/EP640/EP325 - 2.5"



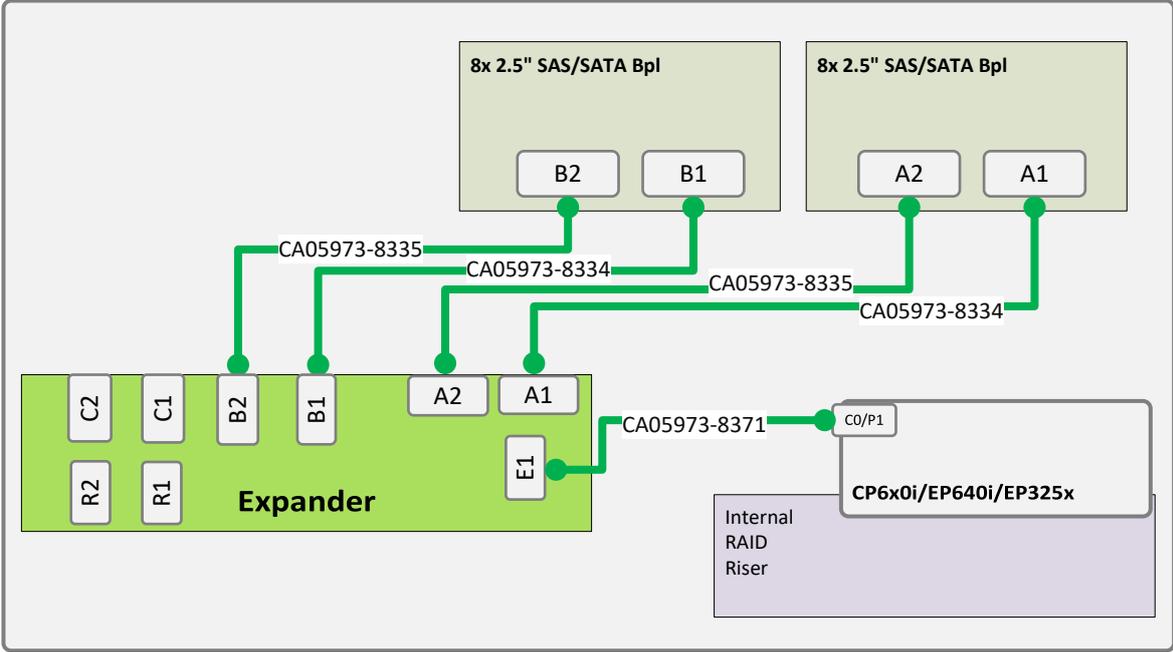
Type 3.4b

PYR2547RBN/PYR2547RJN Type 3-11a Int. RAID Riser CP5/  
EP5x0i/CP2100-8i @ Expander 2 Bpl - 2.5"



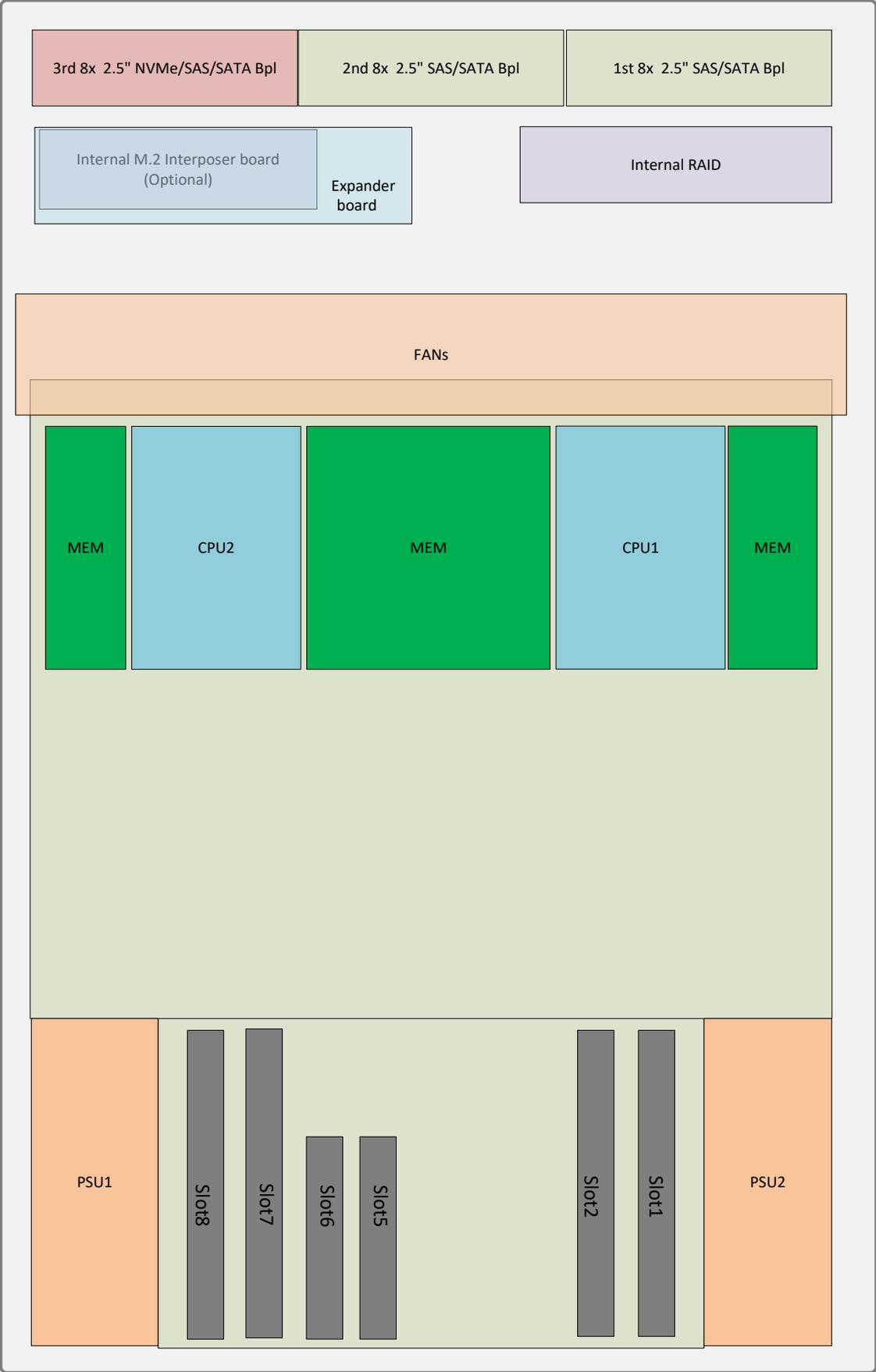
Type 3.11a

PYR2547RBN/PYR2547RJN Type 3-11b Int. RAID Riser CP6/  
EP640i/EP325x @ Expander - 2.5"

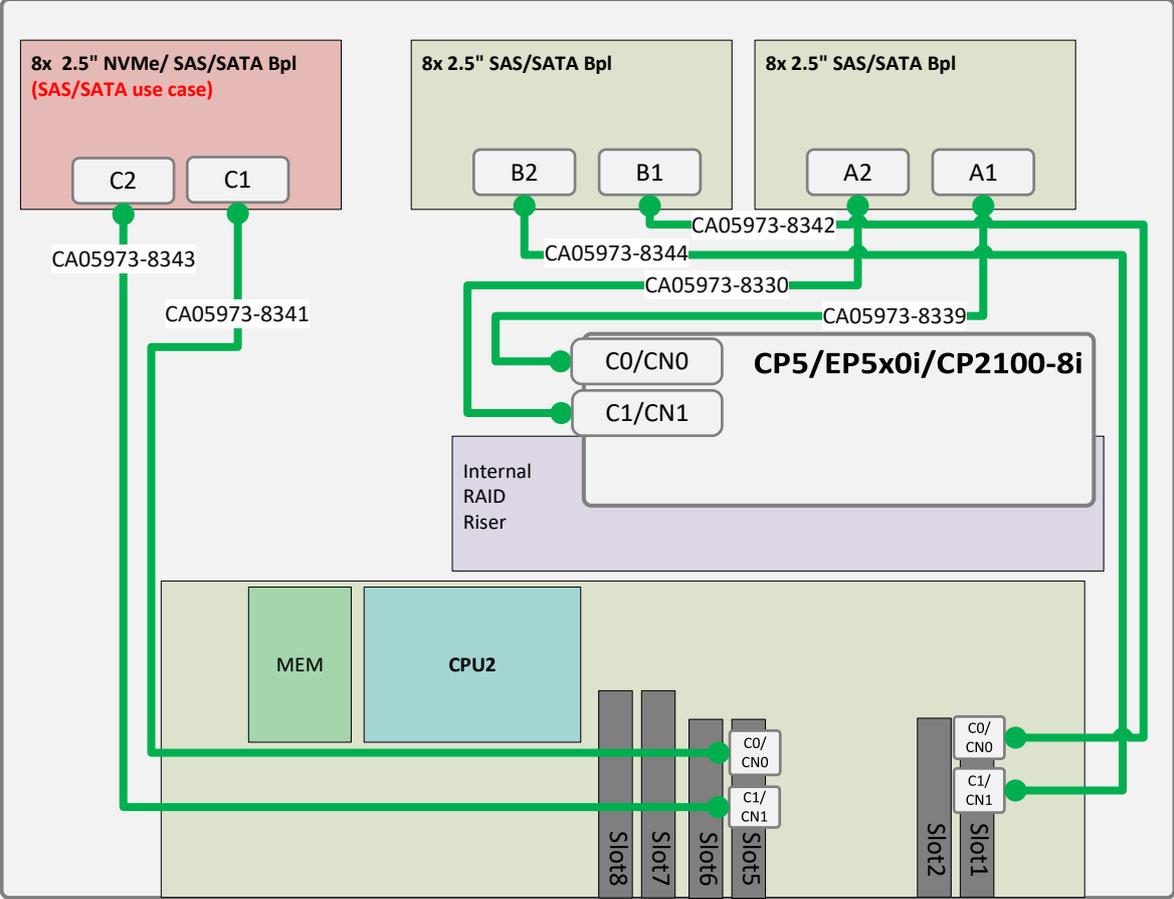


Type 3.11b

SKD 4x

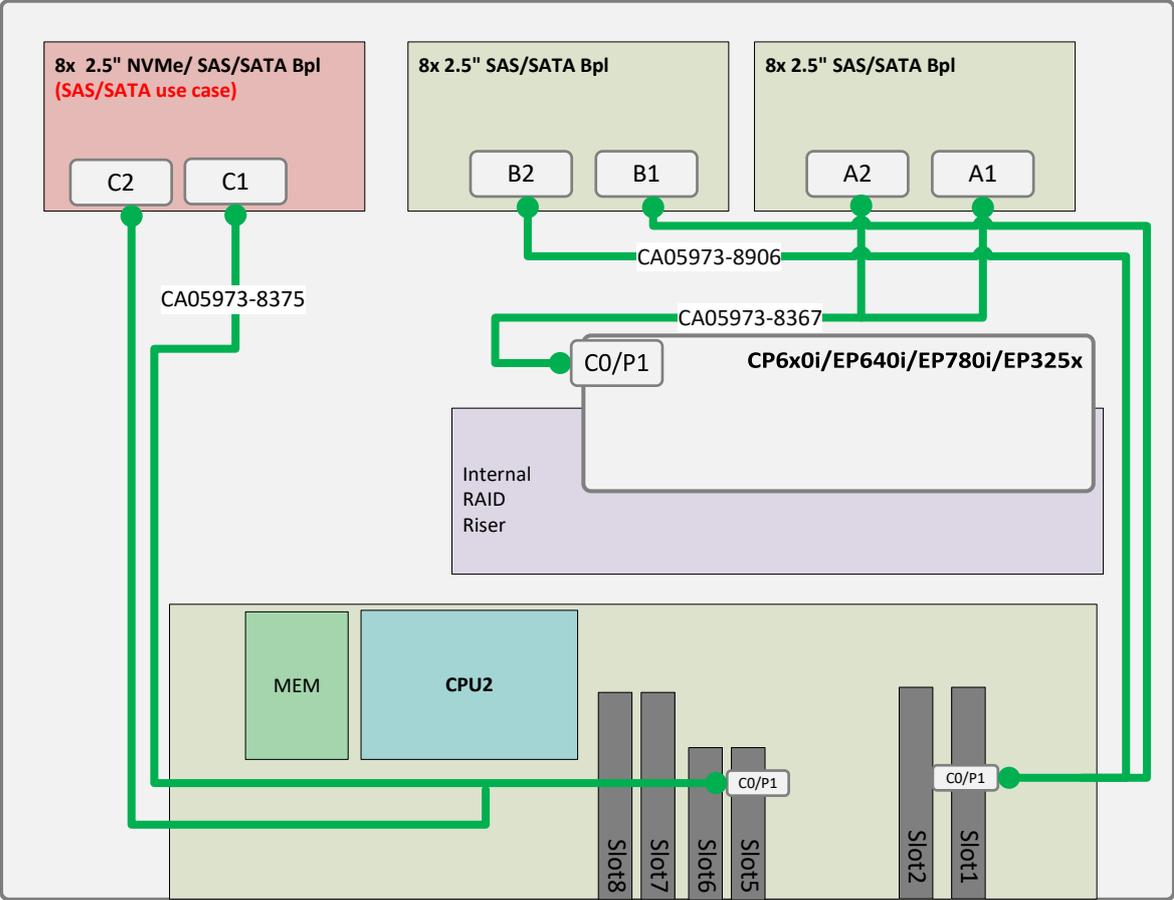


# PYR2547REN Type 4-1a Int. RAID Riser & Slot1 & Slot5 CP5/ EP5x0i/CP2100-8i- 2.5"



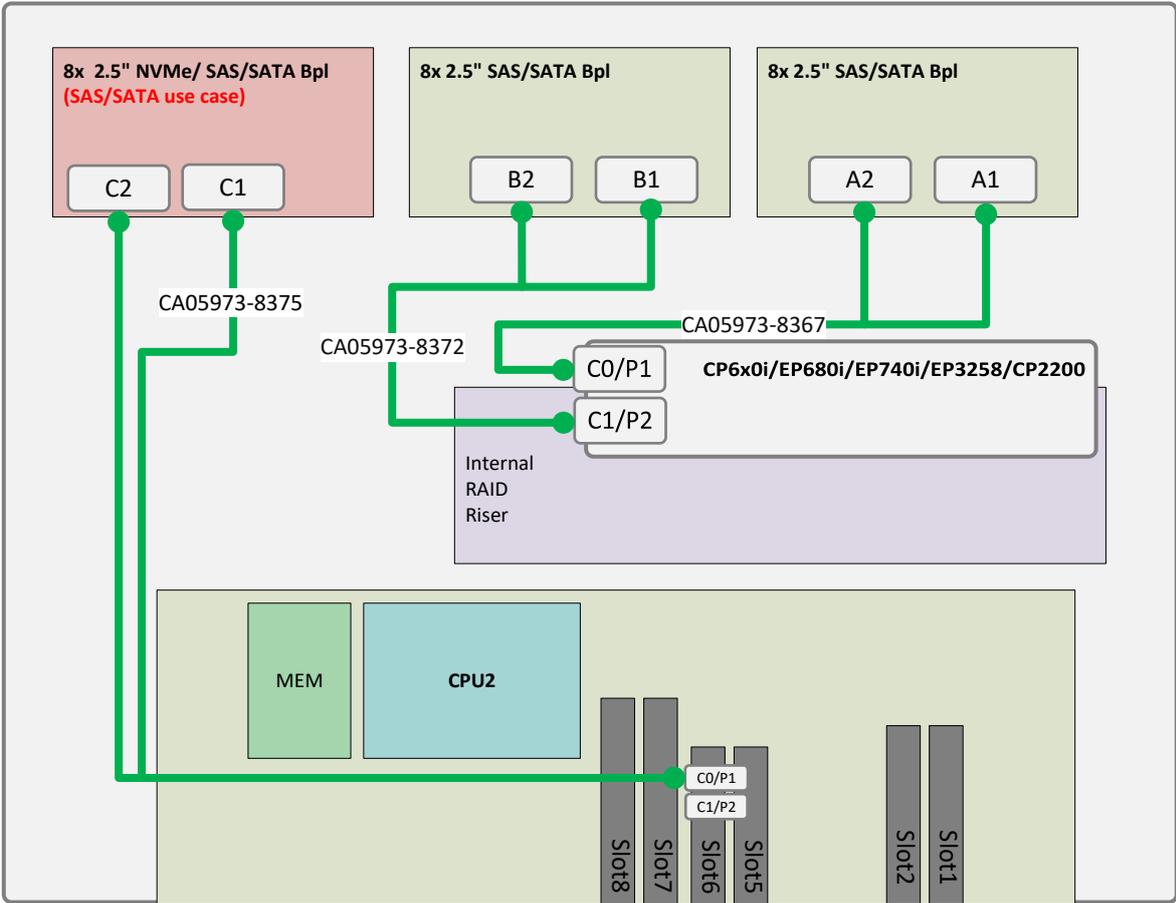
Type 4.1a

# PYR2547REN Type 4-1b Int. RAID Riser CP6/EP640i/EP325x & Slot1 & Slot5- 2.5"



Type 4.1b

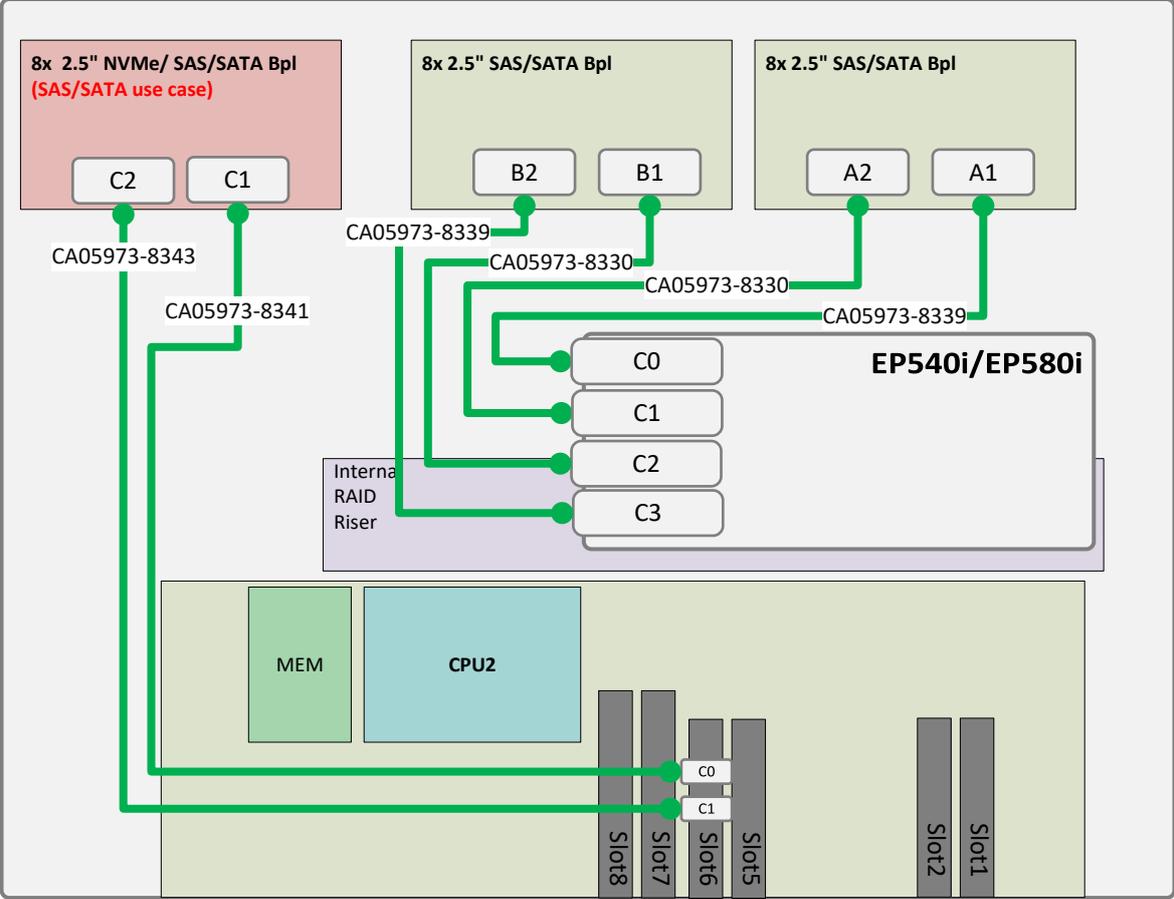
PYR2547REN Type 4-2a Int. RAID Riser CP6/EP680i/EP740i/  
EP3258/CP2200 & Slot6 - 2.5"



Type 4.2a

- Type 4-3 with „Option: rear 6x/4x 2.5" HDD SAS/SATA @ RAID Slot6 2nd Port"
- Type 4-4 with „Option: rear 6x/4x 2.5" NVMe @ ReTimer Slot2 & 8"

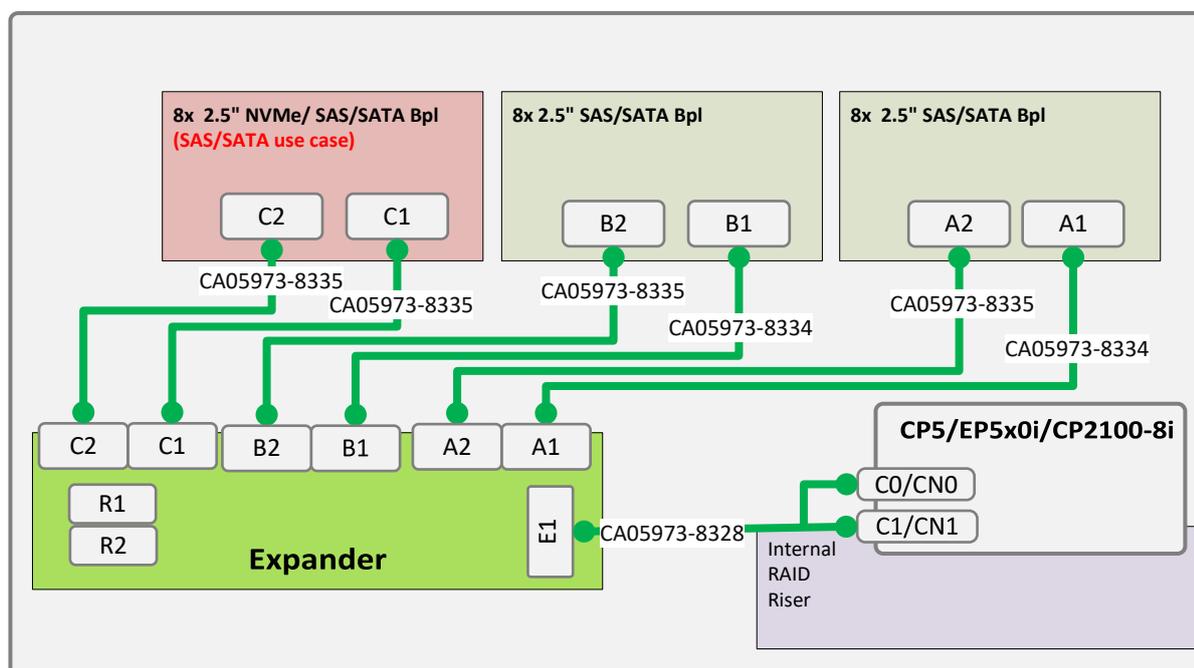
# PYR2547REN Type 4-2b Int. RAID Riser & Slot6 EP540i/EP580i - 2.5"



Type 4.2b

Type 4-3 with "Option: rear 4x/6x 2.5" HDD @ EP540i/EP580i/CP2100-8i Slot6"

PYR2547RGN Type 4-12a Int. RAID Riser CP5/EP5x0i/CP2100-8i  
@ Expander - 3 Bpl 2.5"

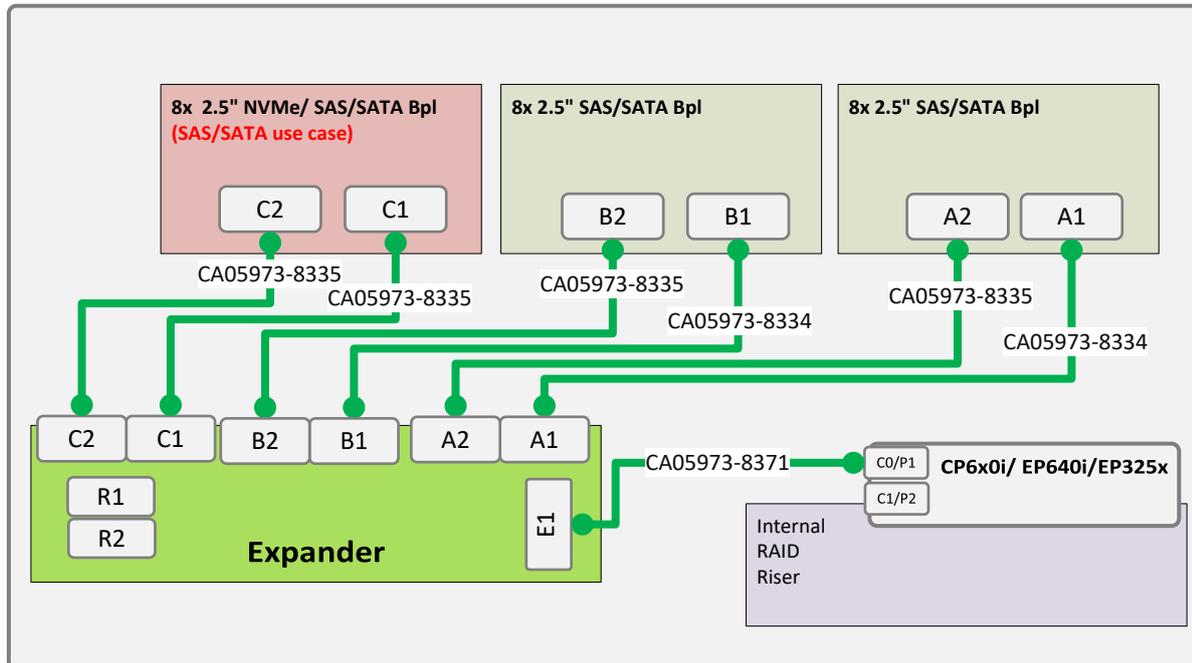


Type 4-12a

Type 4-13a with „Option: rear 6x 2.5" HDD SAS/SATA @ Expander"

Type 4-16a with „Option: rear 6x/4x 2.5" NVMe @ ReTimer Slot2 & 8"

## PYR2547RGN Type 4-12b Int. RAID Riser CP6/EP640/EP325x @ Expander - 3 Bpl 2.5"



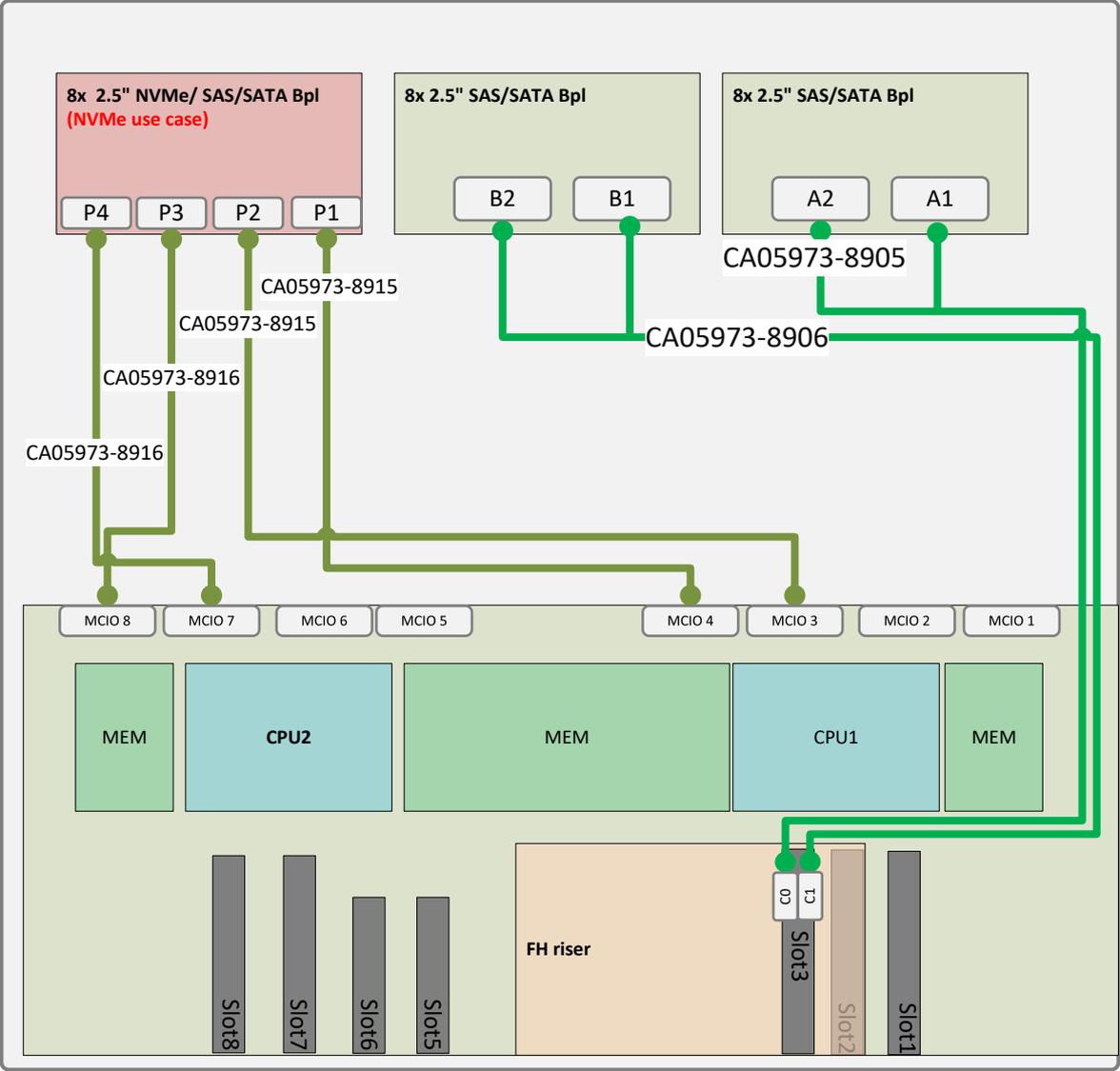
### Type 4.12b

Type 4-13b with „Option: rear 6x/4x 2.5" HDD SAS/SATA @ Expander"

Type 4-15b with „Option: rear 6x/4x 2.5" HDD SAS/SATA @ Int. RAID"

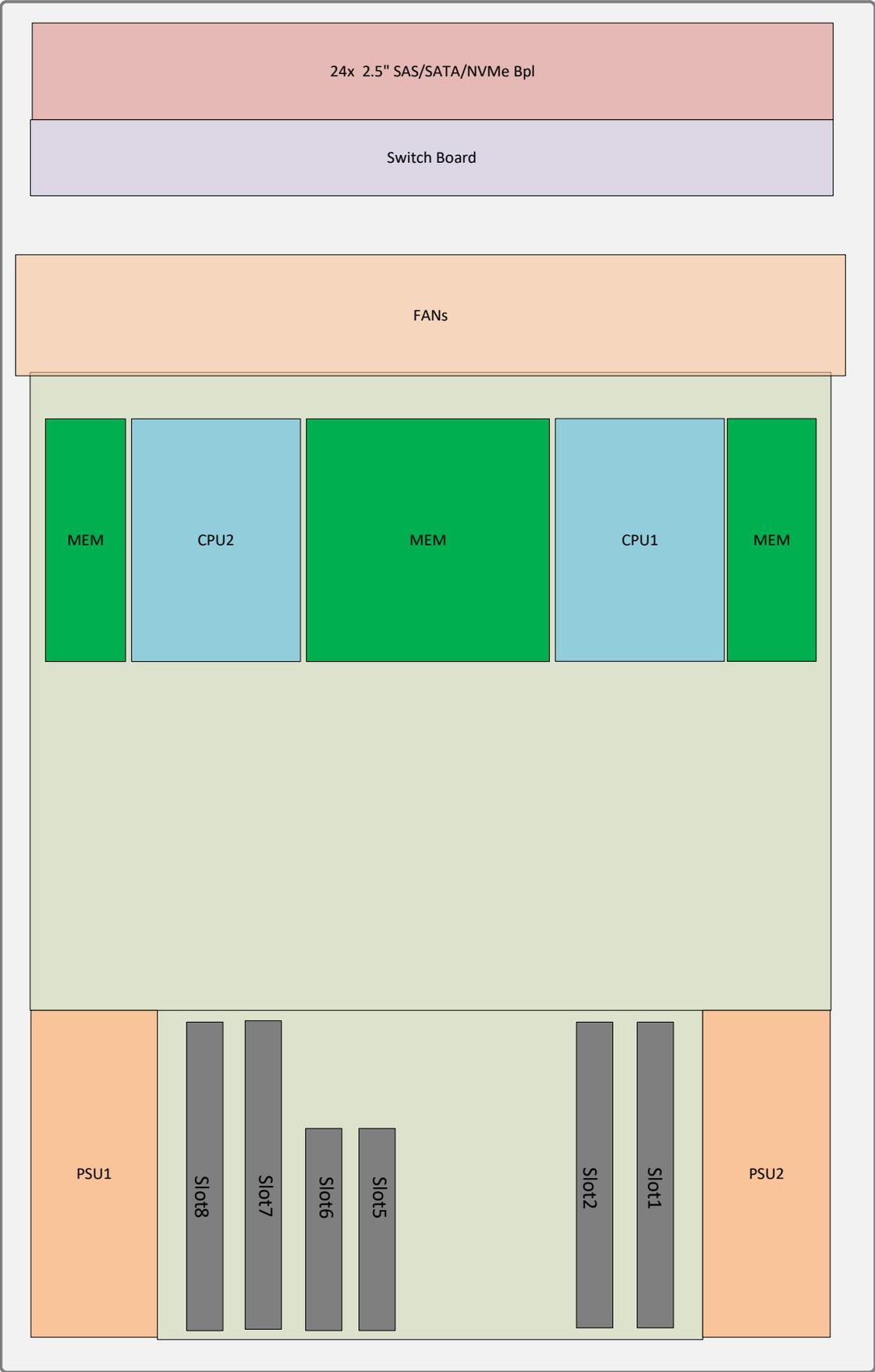
Type 4-16b with „Option: rear 6x/4x 2.5" NVMe @ ReTimer Slot2 & 8"

# PYR2547RFN Type 4-20 RAID in Riser Slot3 EP781i & OnBoard NVMe - 3 Bpl 2.5"

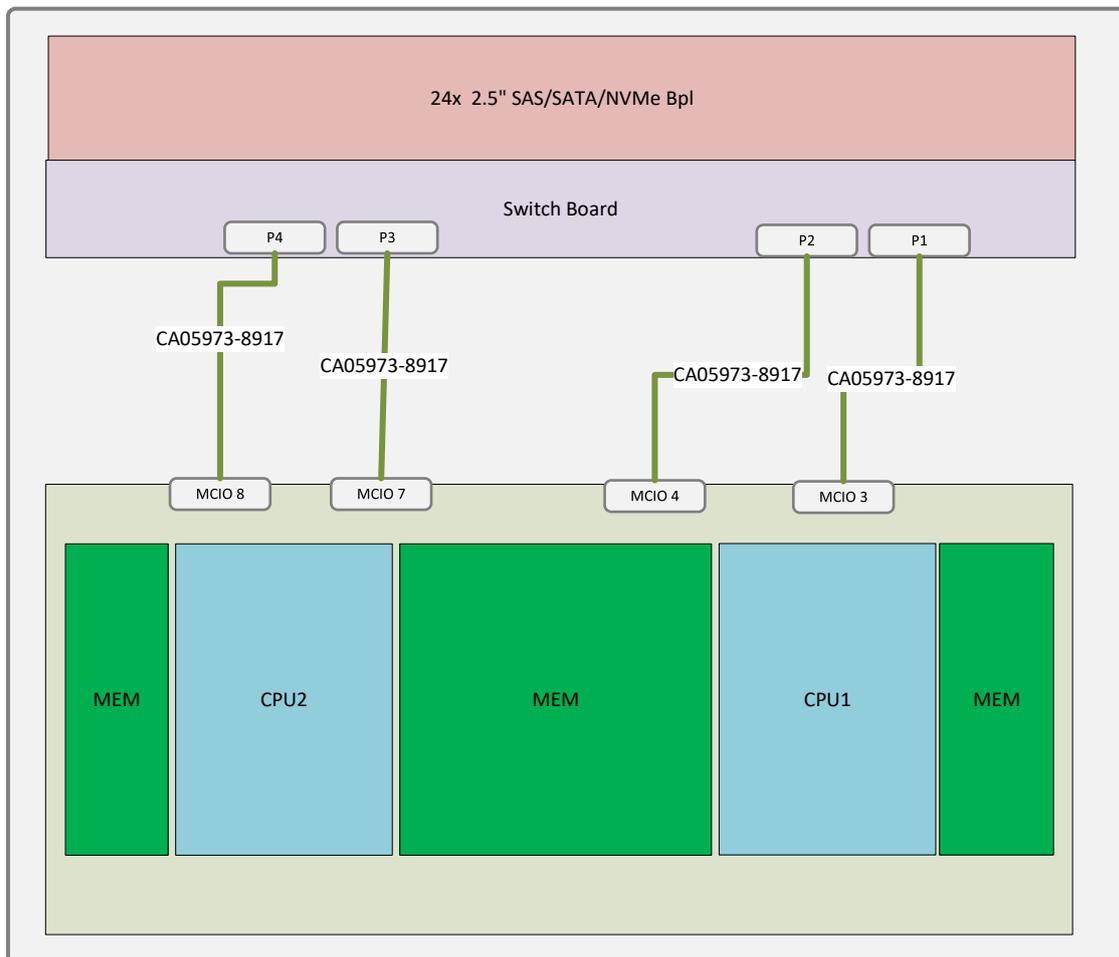


Type 4.20

SKD 5x



## PYR2547RHN Type 5-1 OnBoard NVMe



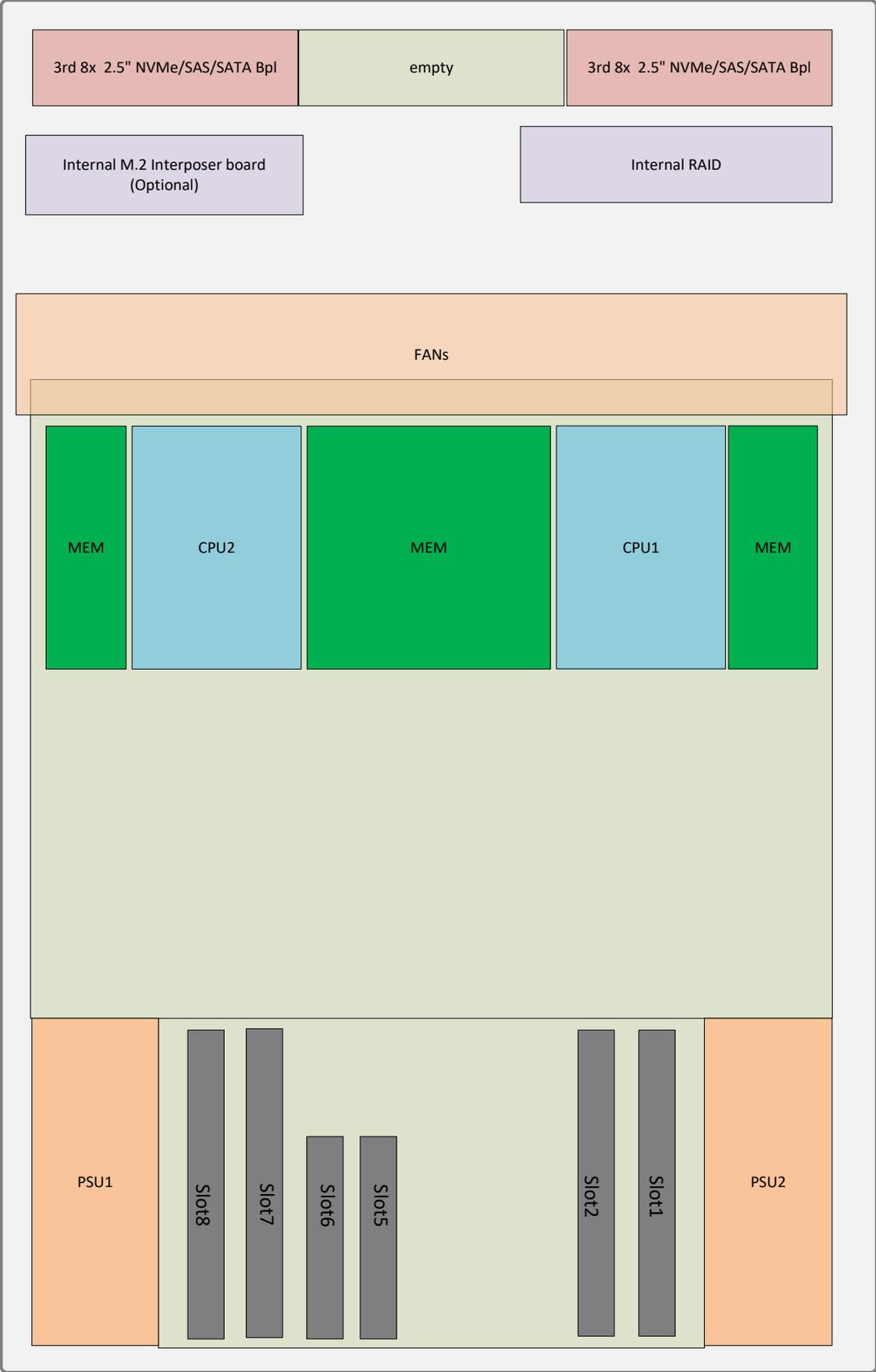
**Type 5 SKD and 5-1 24x2.5" NVMe with same basic cables**

**Type 5-2a with „Option: rear 6x/4x 2.5" HDD @ CP2100-8i Slot6"**

**Type 5-2b with „Option: rear 6x/4x 2.5" HDD @ CP6/EP640i/EP325x Slot6"**

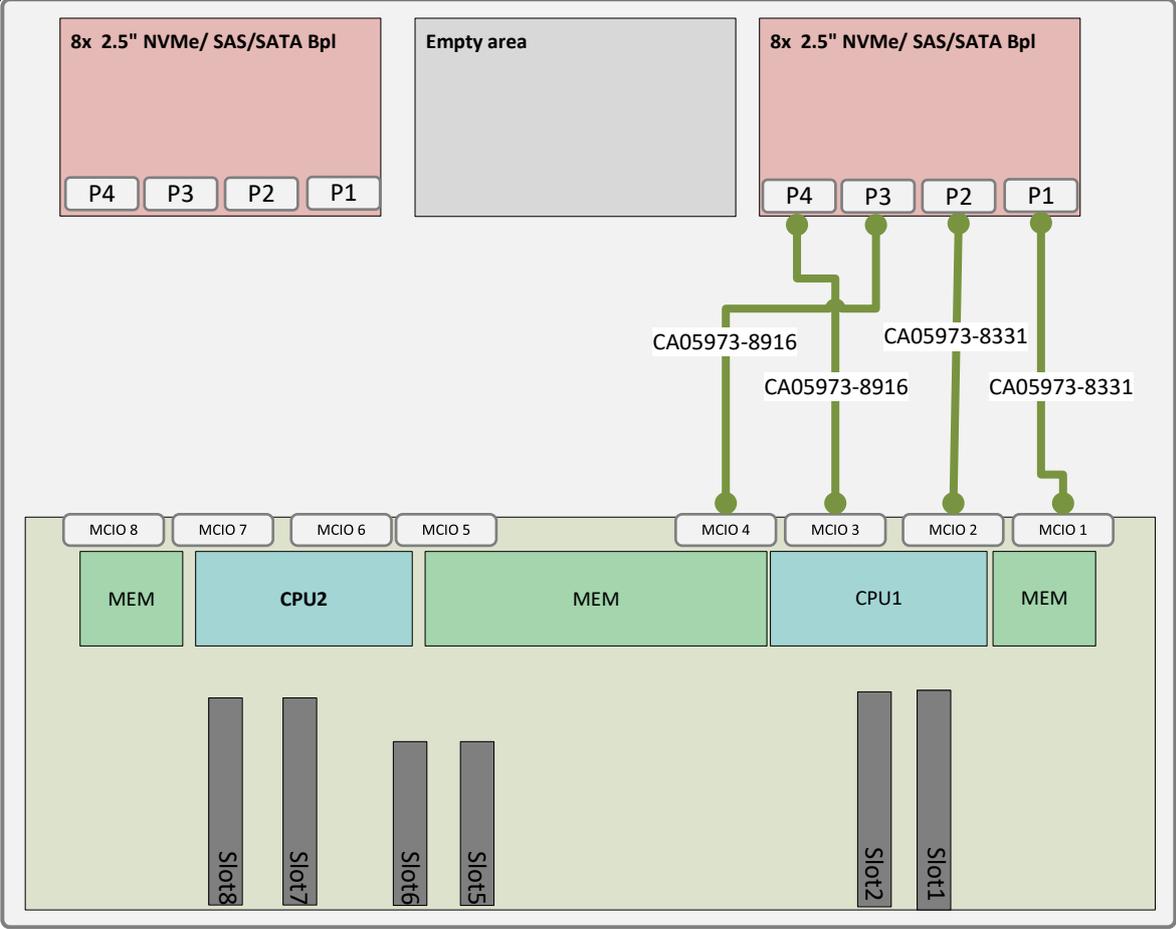
**Type 5-3 with „Option: rear 6x/4x 2.5" NVMe @ ReTimer Slot2 & 8"**

SKD 6x



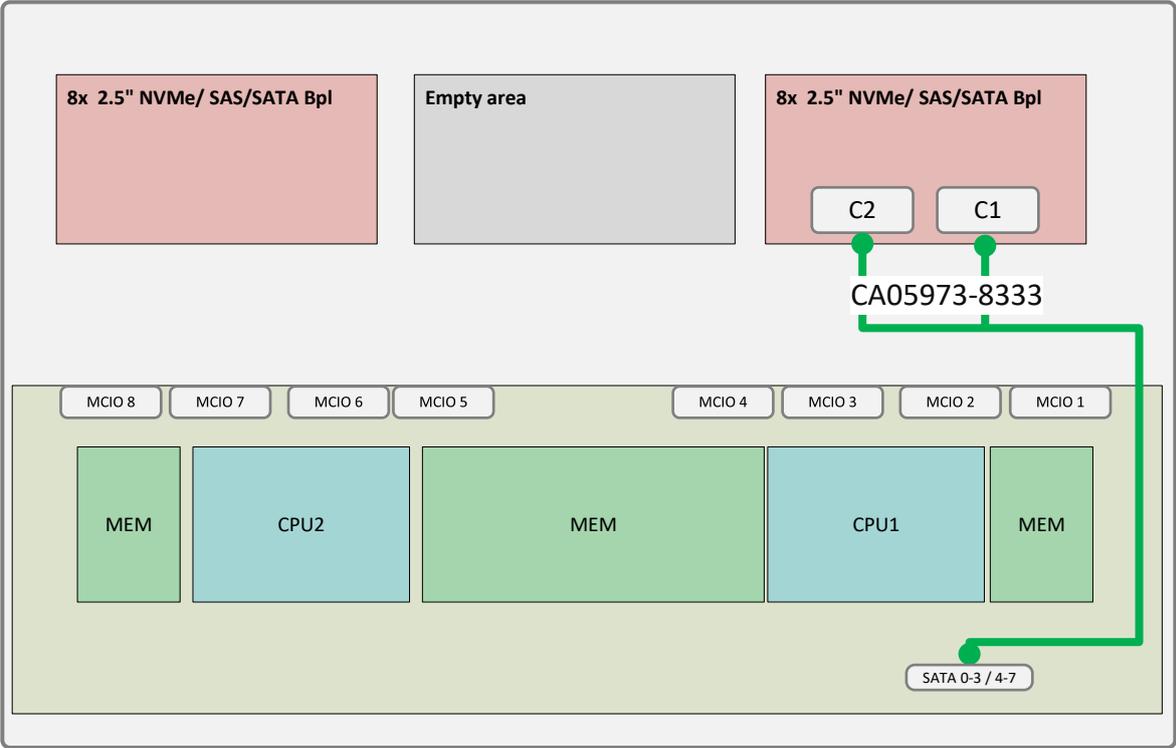
# PYR2547RCN/PYR2547RKN Type 6-1 Onboard SATA & OnBoard NVMe

1st Step



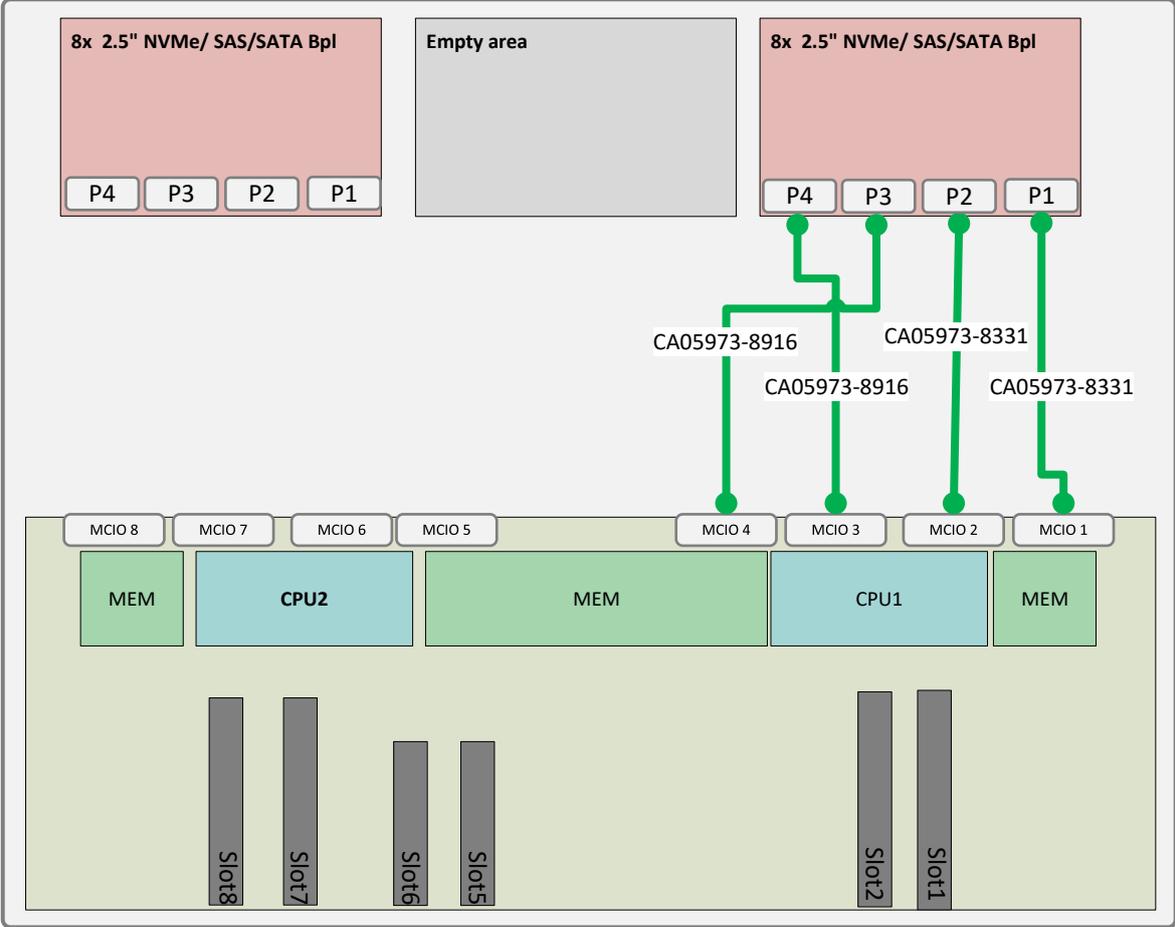
Type 6.1

2nd Step



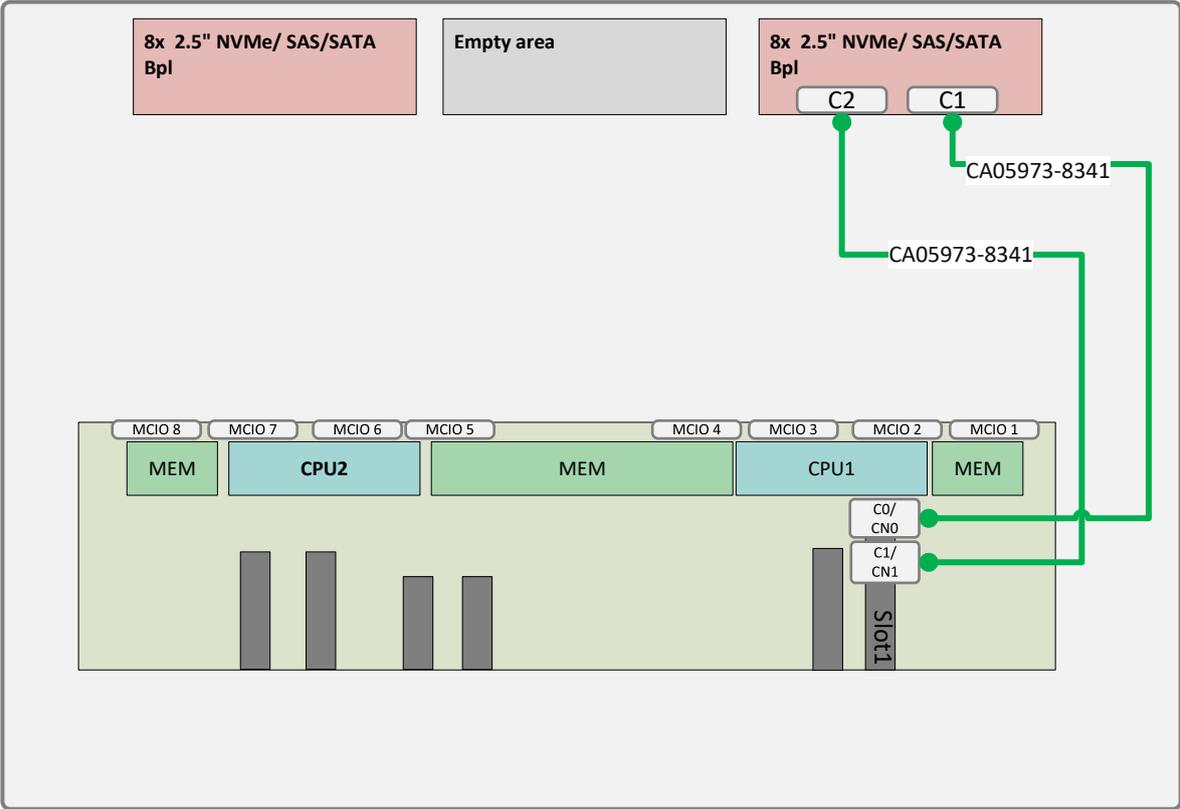
# PYR2547RCN/PYR2547RKN Type 6-2a CP5/EP5x0i/CP2100-8i + OnBoard NVMe - 1 Bpl

1st Step



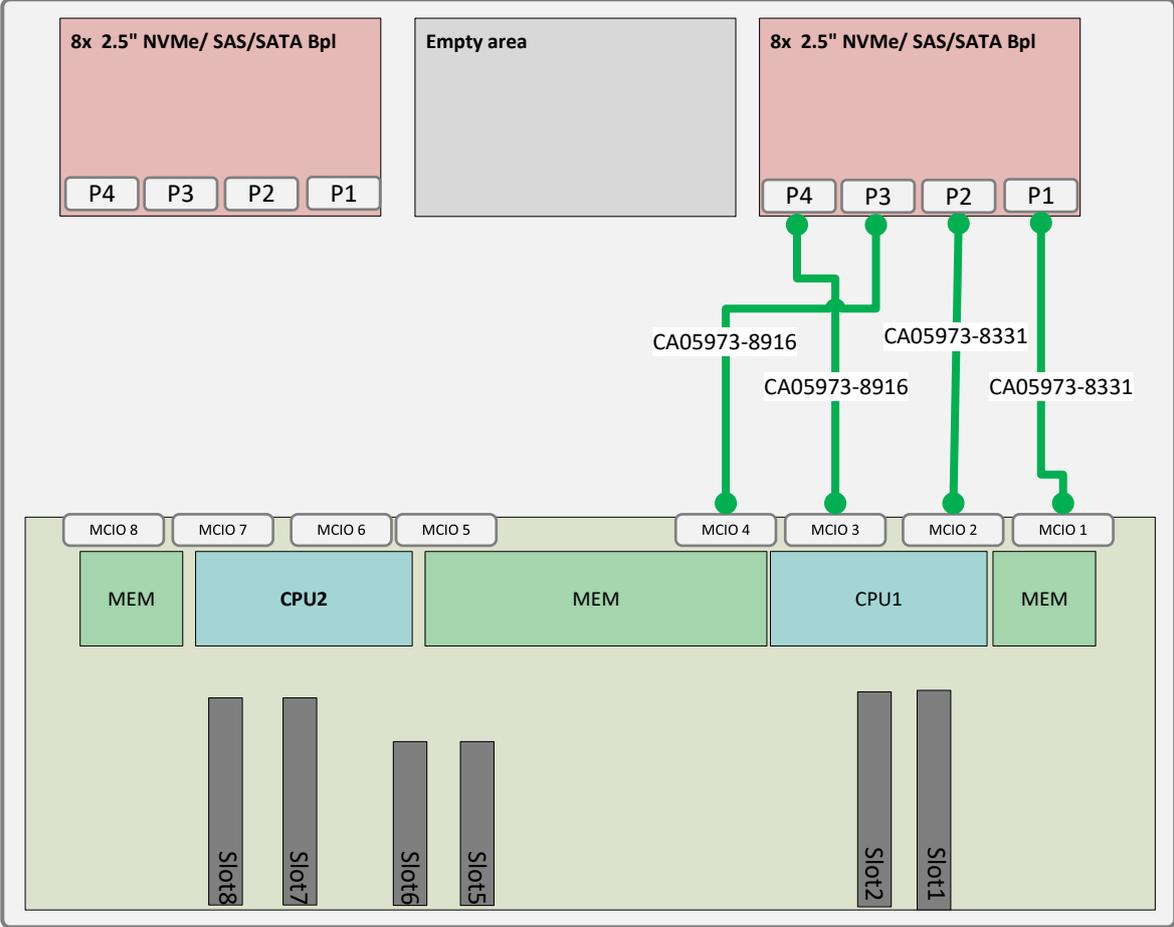
Type 6.2a

2nd Step



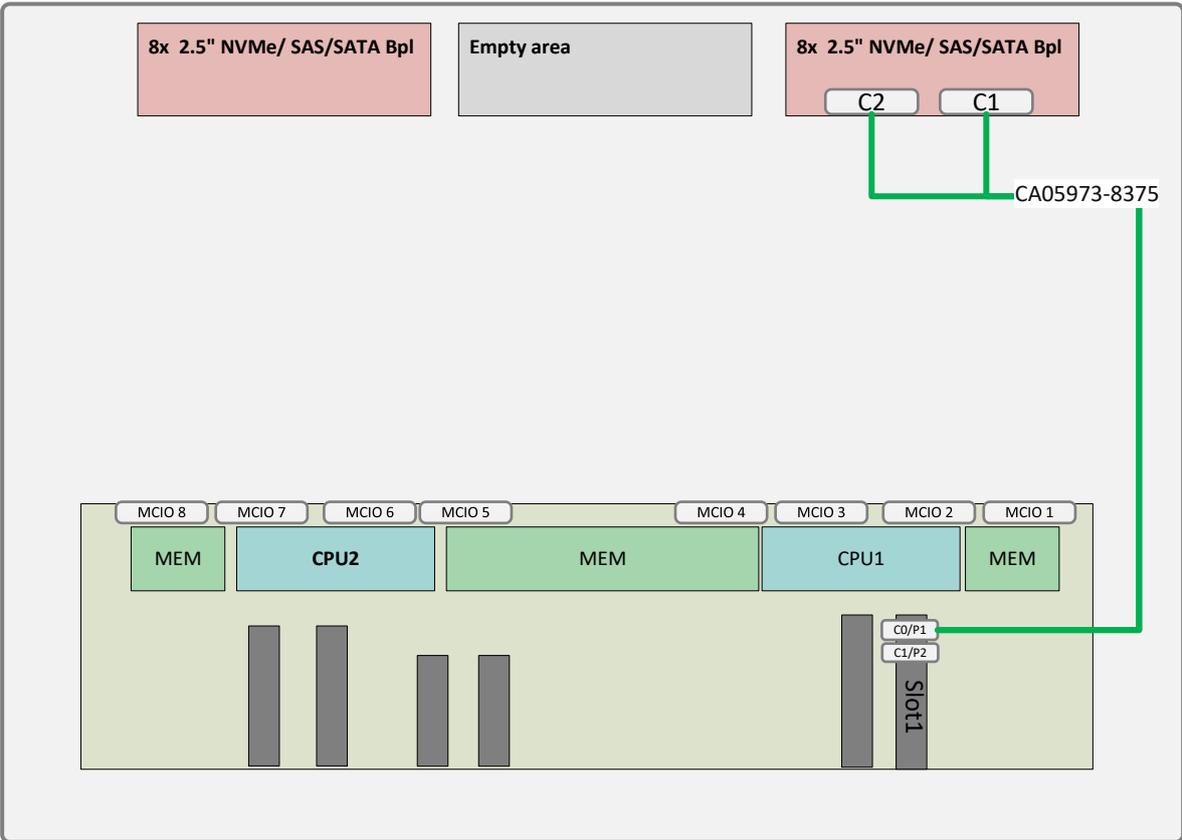
# PYR2547RCN/PYR2547RKN Type 6-2b CP6/EP640i/EP325x + OnBoard NVMe - 1 Bpl

1st Step

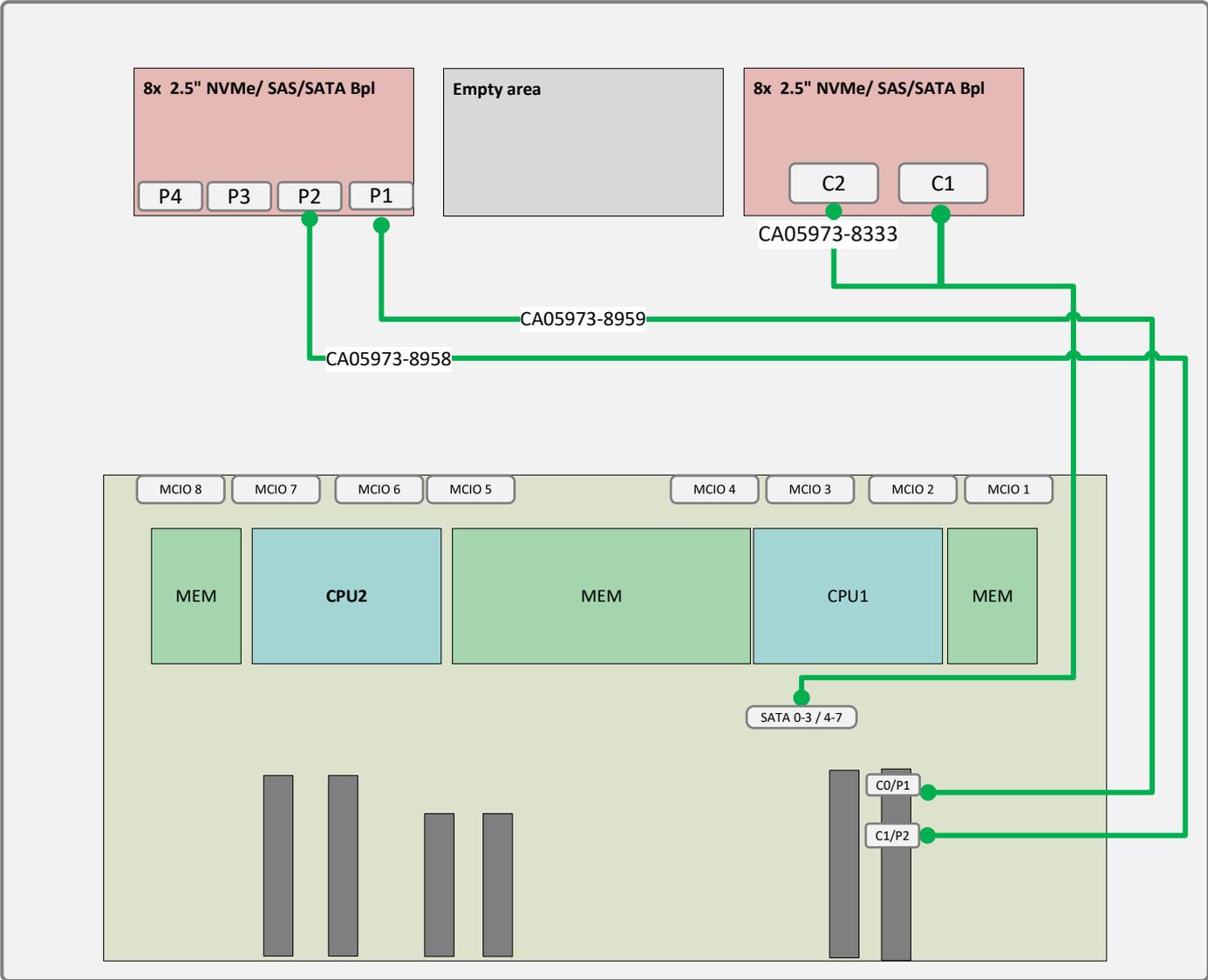


Type 6.2b

2nd Step

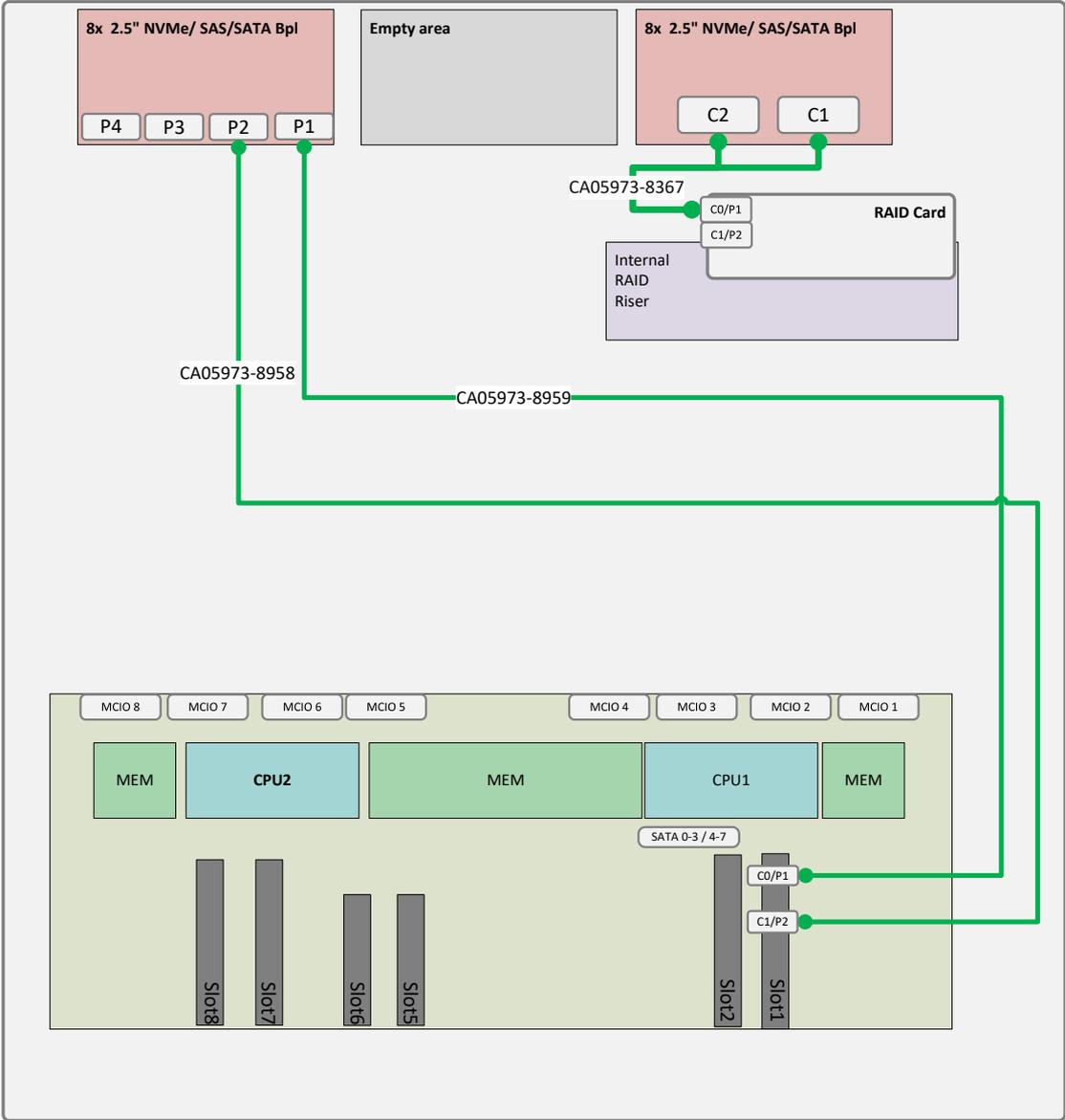


PYR2547RDN Type 6-4 Onboard SATA & EP680i/EP740i/EP3258/  
CP 2200-16i NVMe in Slot1- 2 Bpl



Type 6.4

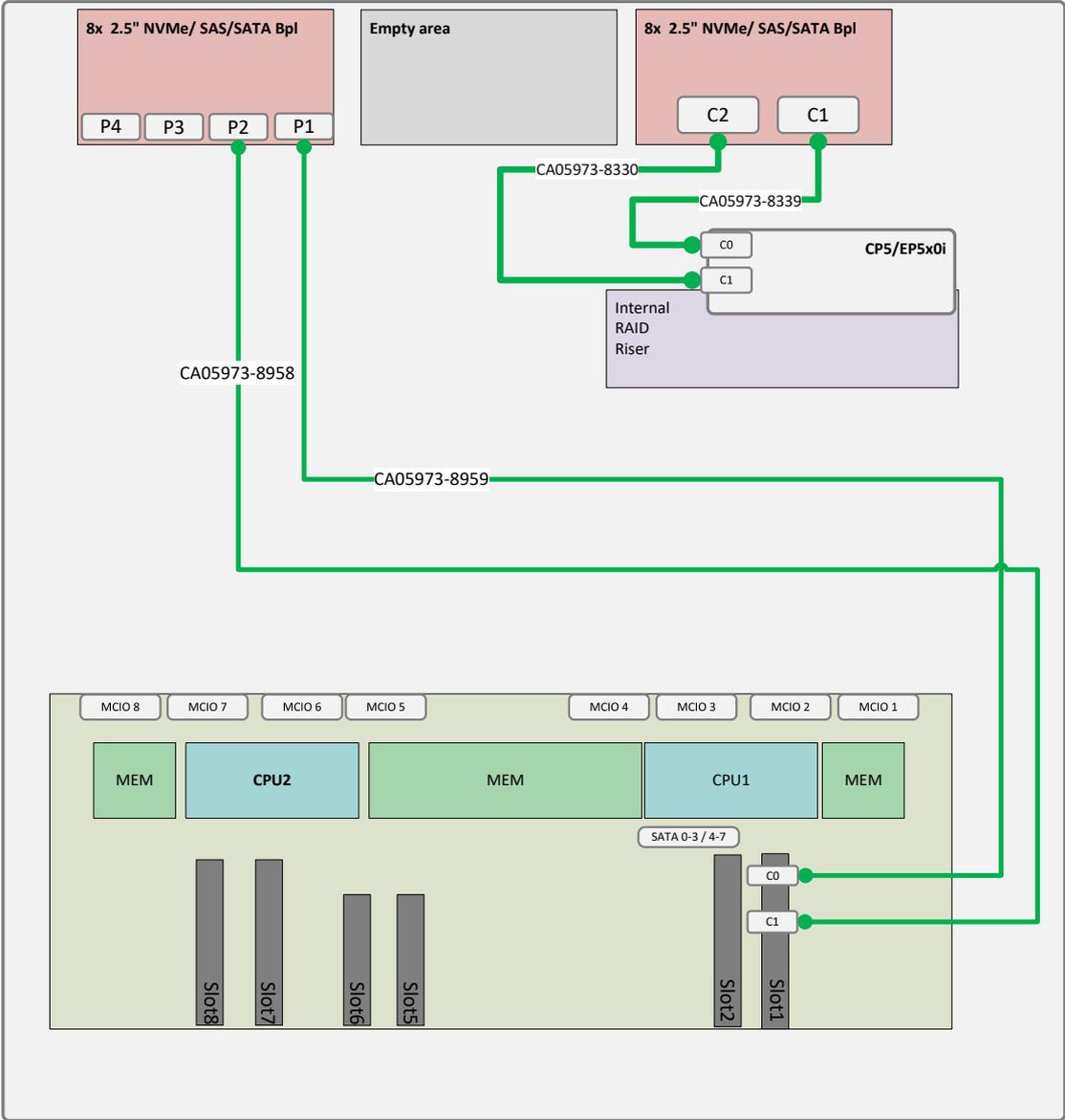
PYR2547RDN Type 6-5a Int. RAID Riser CP600/EP640/EP680/EP 325x/EP740/CP 2200 & NVMe RAID Cards in Slot1 - 2 Bpl



Type 6.5a

NVMe RAID cards @ slot 1  
CP600/EP640/EP680  
EP 325x/EP740/CP 2200

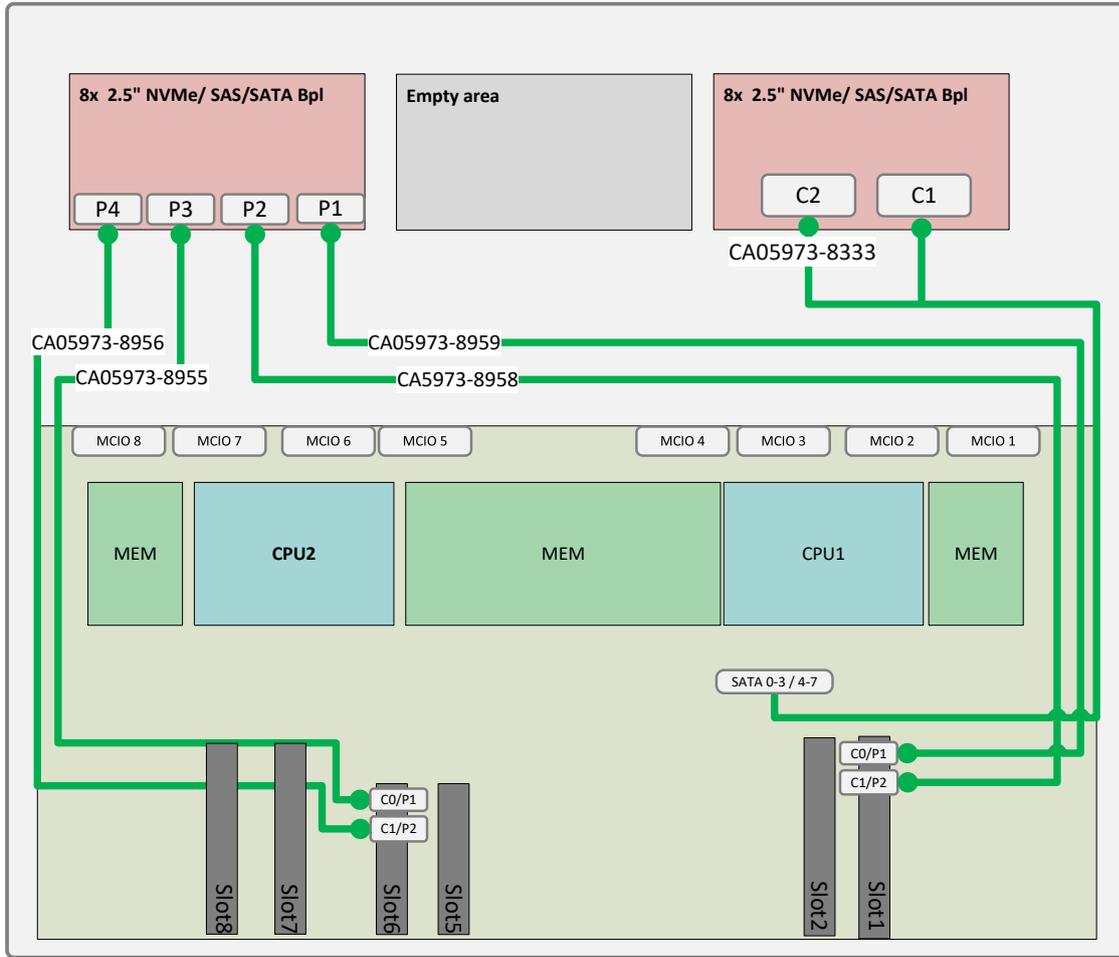
# PYR2547RDN Type 6-5b Int. RAID Riser CP5/EP5x0i & NVMe RAID Cards in Slot1 - 2 Bpl



## Type 6.5b

NVMe RAID cards EP6x0i/EP7x0i @ slot 1

PYBBA24PN Type 6-6 OnBoard SATA & NVMe RAID Cards in Slot1 & 6 - 2 Bpl



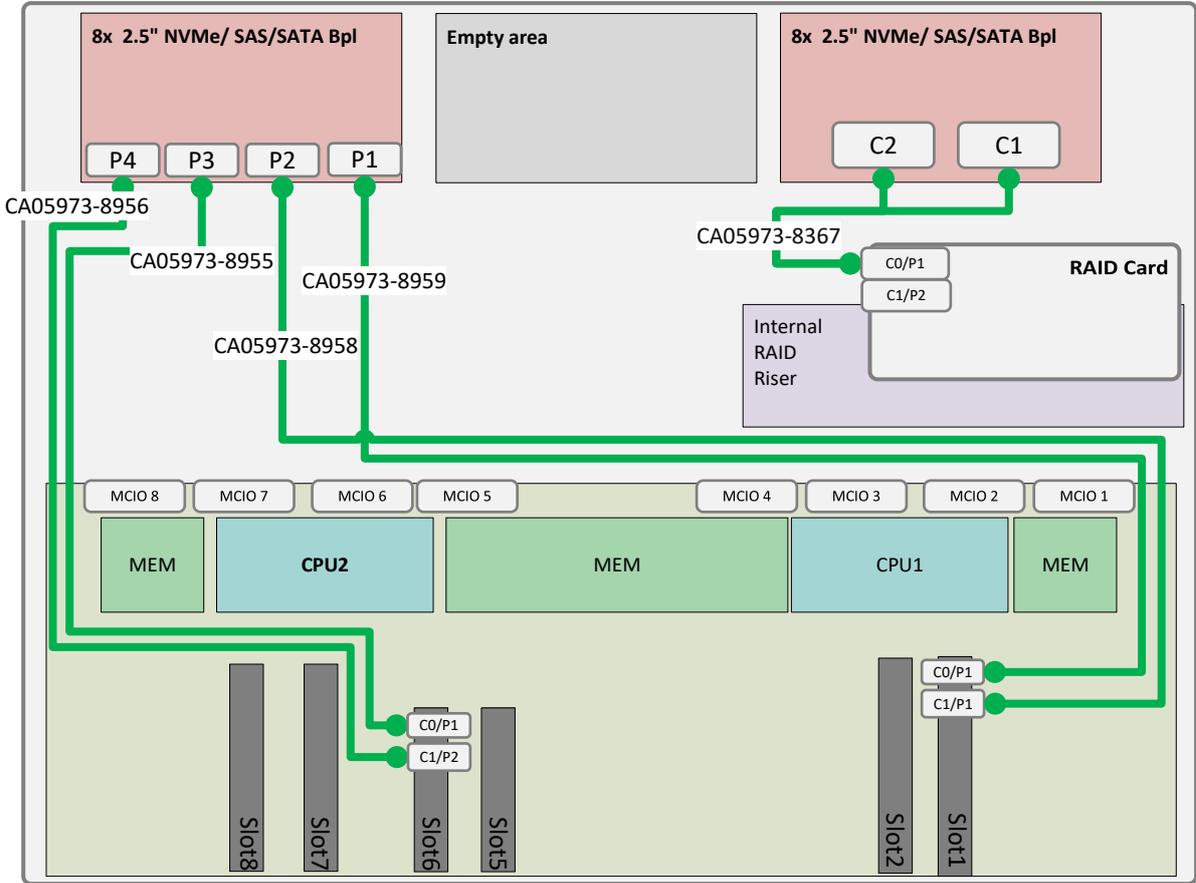
Type 6.6

NVMe RAID cards @ slot 6/slot1

NVMe RAID cards @ slot 6/slot1

EP 680i/EP 740/EP 3258/CP 2200

PYBBA24PN Type 6-7a Int. RAID Riser EP 680i/EP 3258/CP 2200/EP740 & NVMe RAID Cards in Slot1 & 6 - 2 Bpl

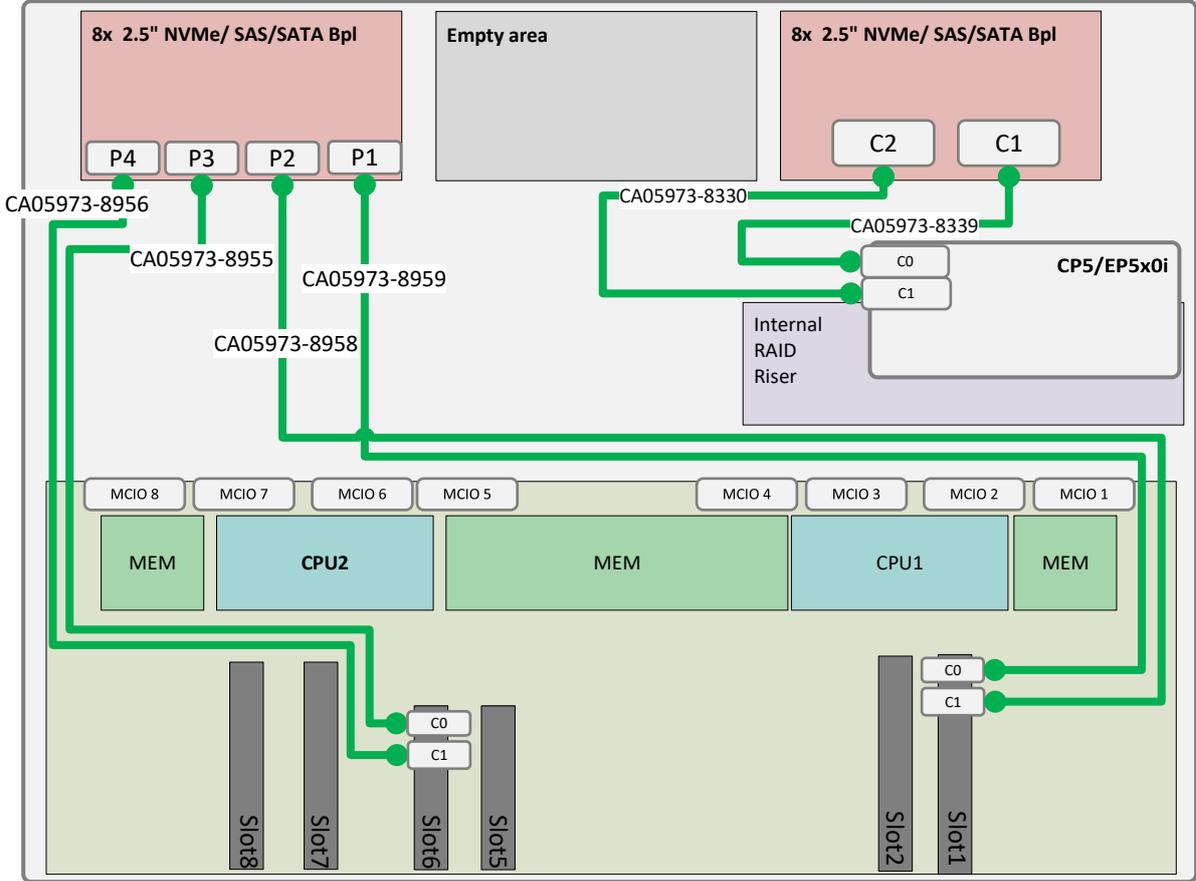


Type 6.7a

NVMe RAID cards @ slot 1/6

EP 680i/EP 3258/CP 2200/EP740

# PYBBA24PN Type 6-7b Int. RAID Riser CP5/EP5x0i & NVMe RAID Cards in Slot1 & 6 - 2 Bpl

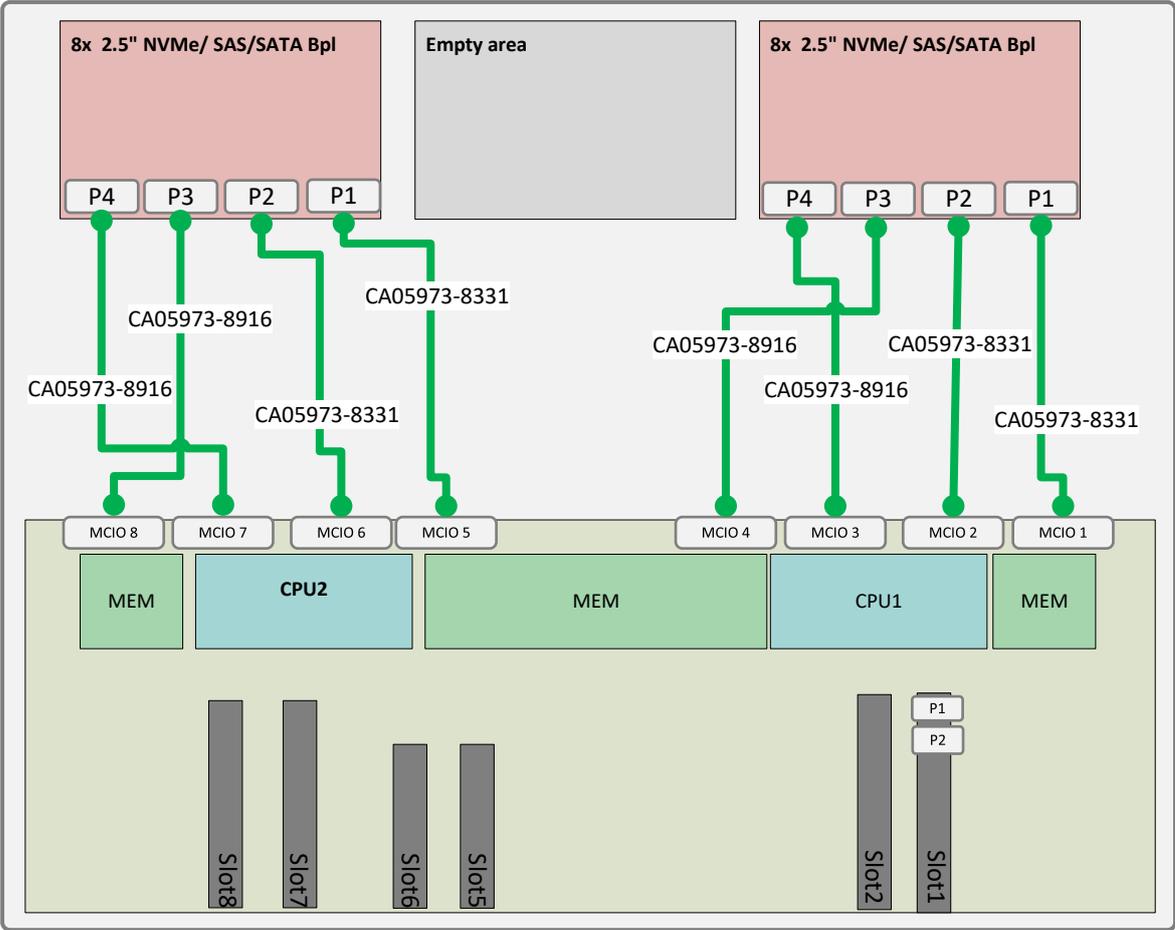


### Type 6.7b

NVMe RAID cards @ slot 1/6  
EP6x0i/EP7x0i

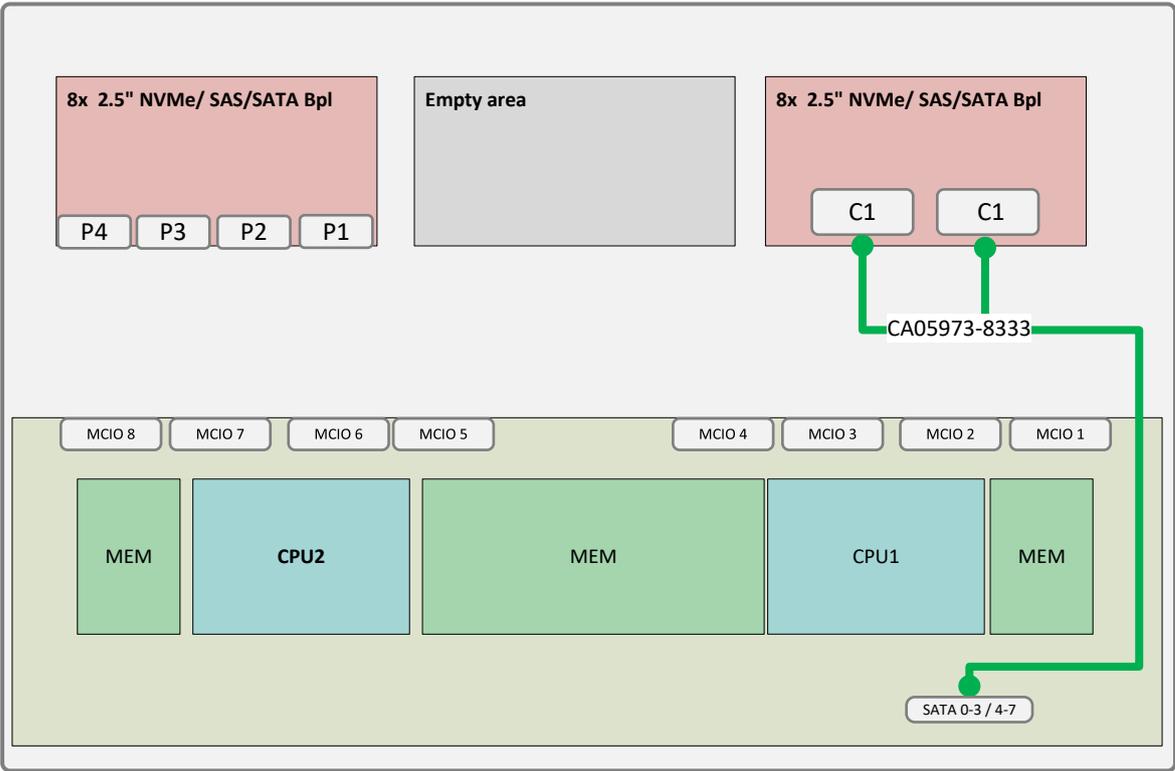
# PYBBA28P8 Type 6-8 OnBoard SATA & OnBoard 16 NVMe - 2 Bpl

1st Step

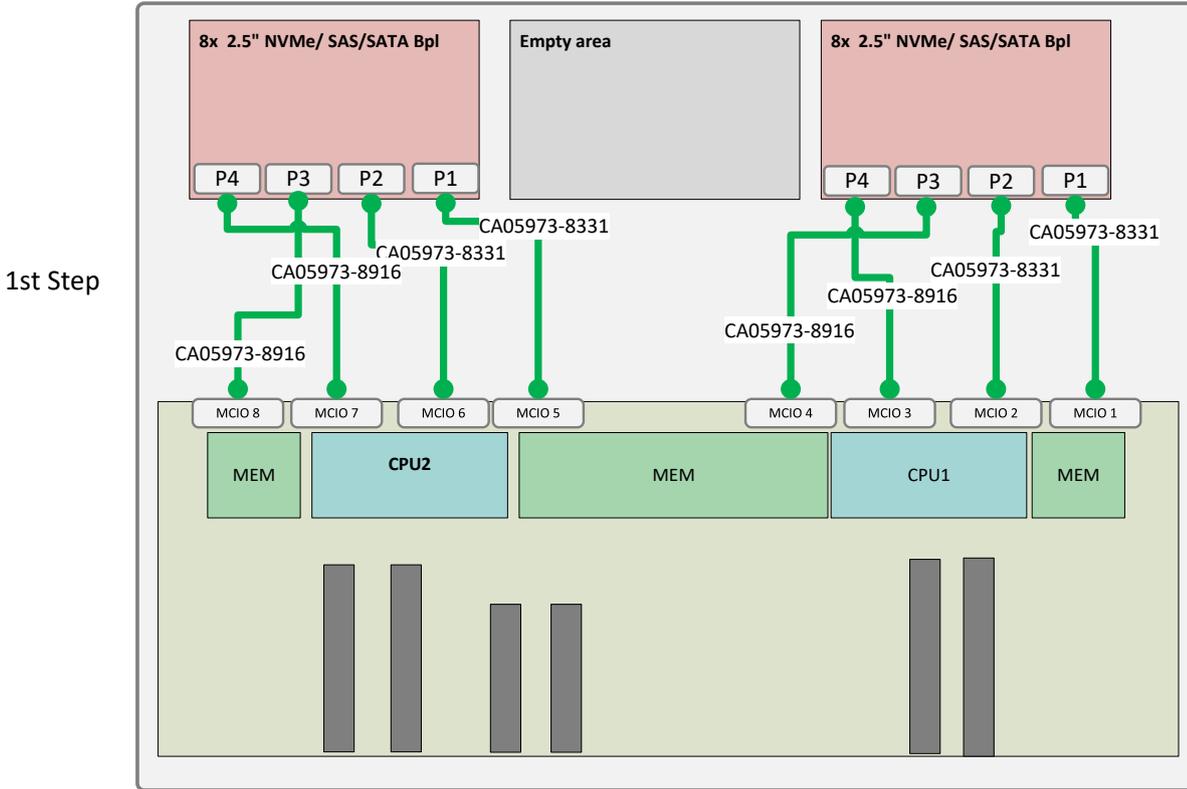


Type 6.8

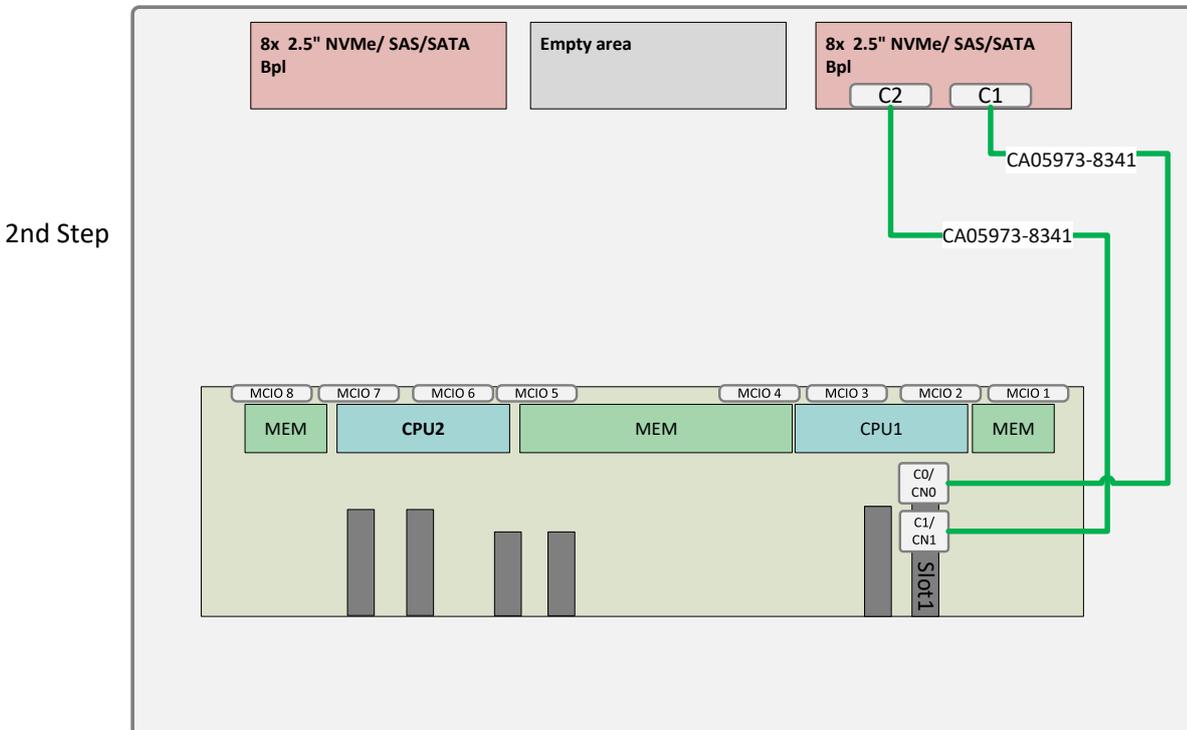
2nd Step



PYBBA28P8 Type 6-9a CP5/EP5x0i/CP2100-8i & OnBoard 16 NVMe - 2 Bpl

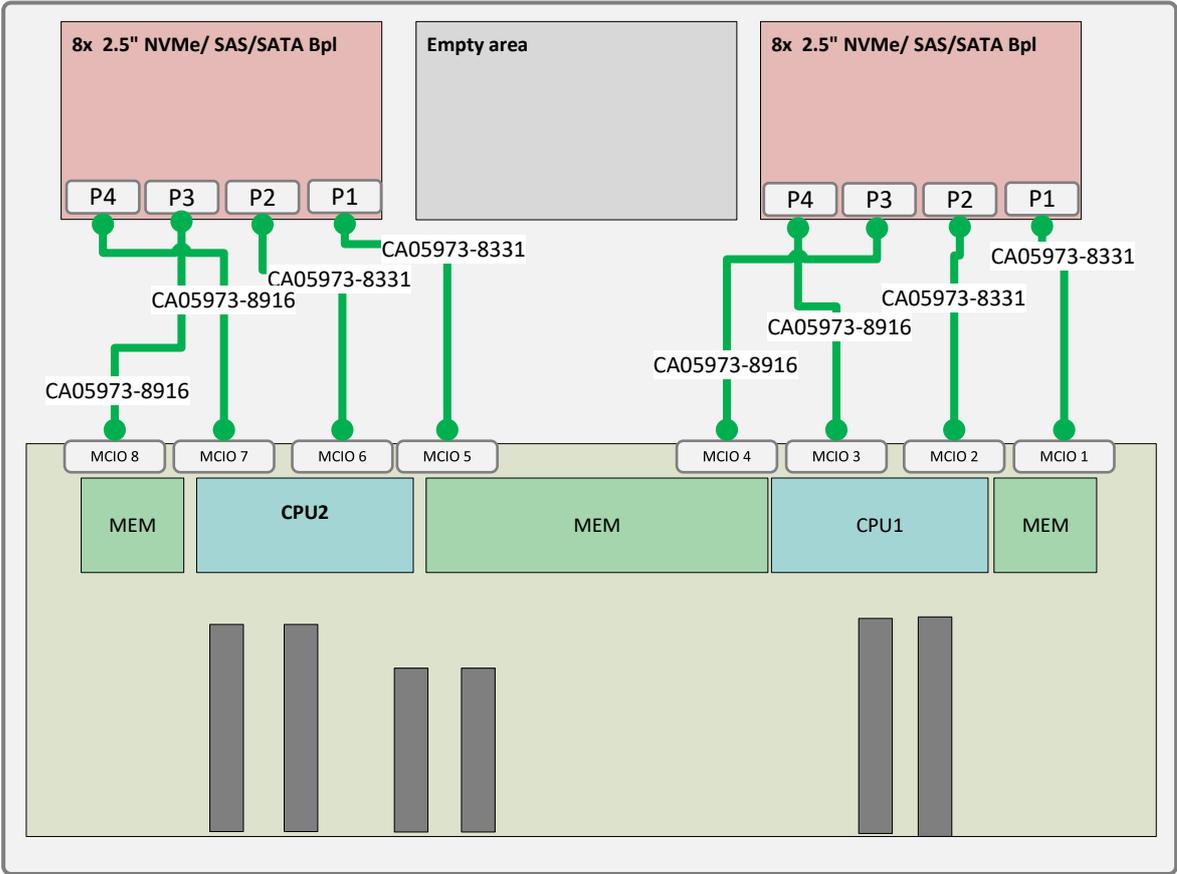


Type 6.9a



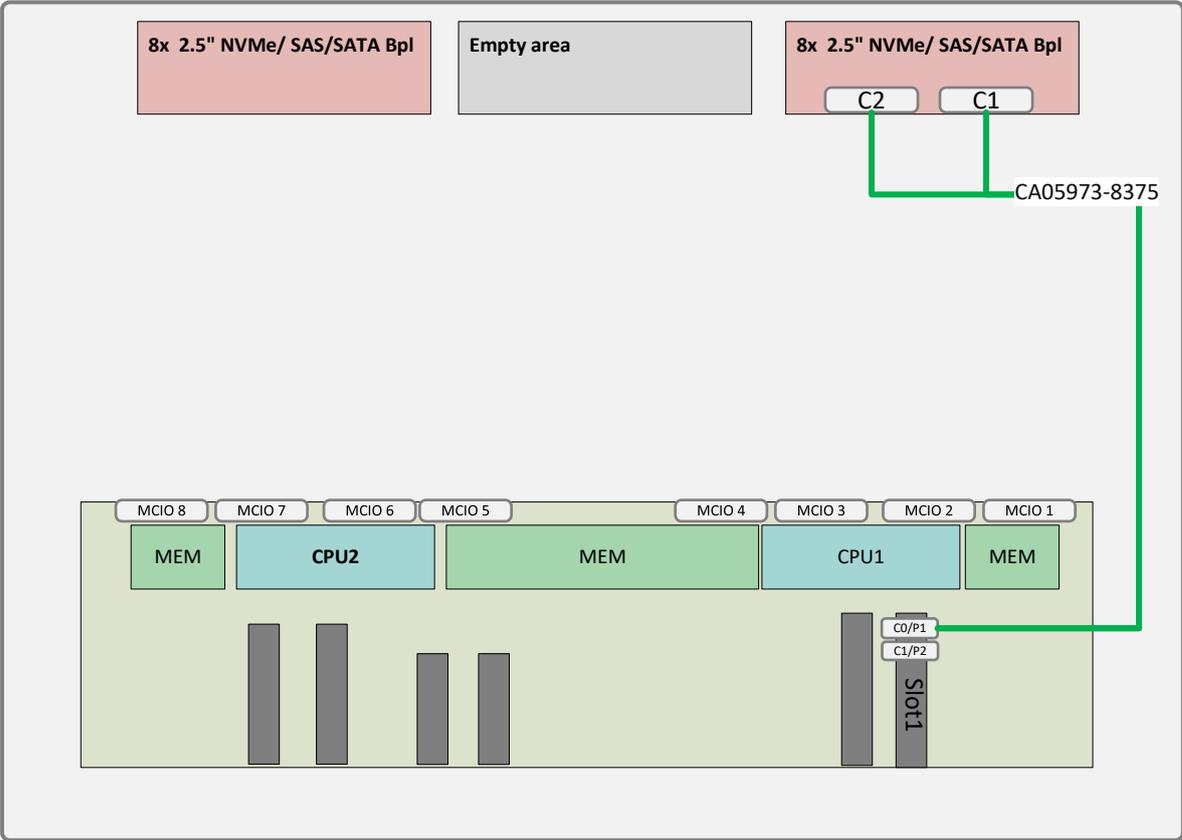
# PYBBA28P8 Type 6-9b CP6/EP640i/Ep325x & OnBoard 16 NVMe - 2 Bpl

1st Step



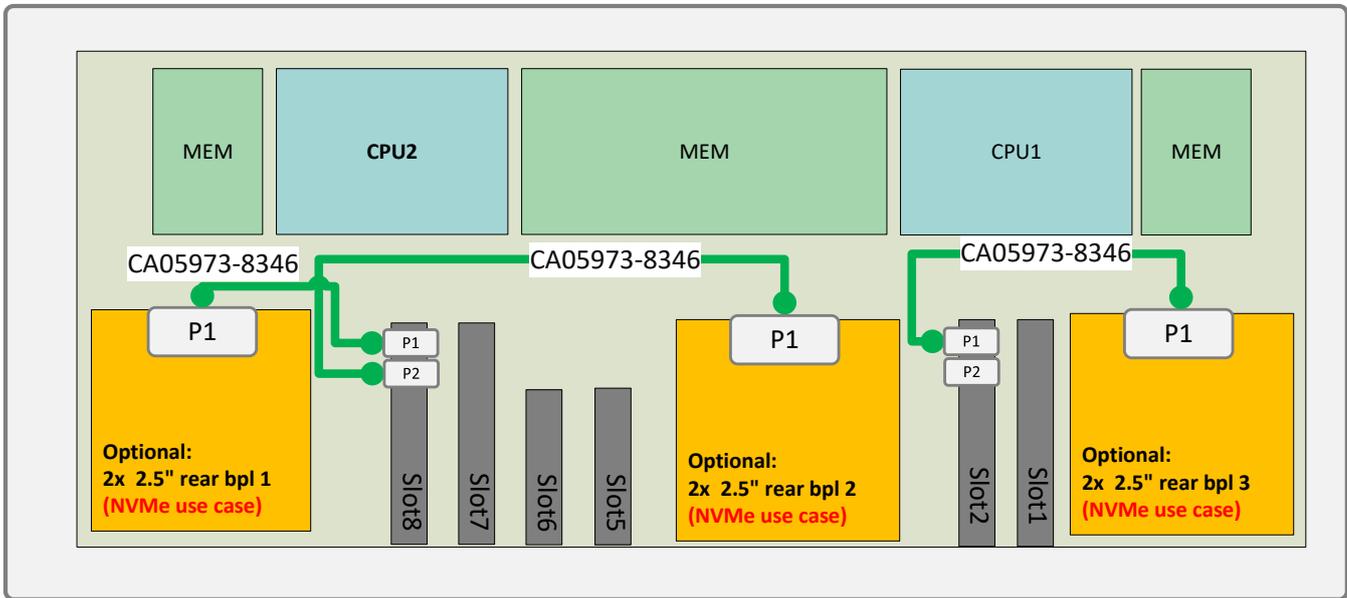
Type 6.9b

2nd Step



## Options

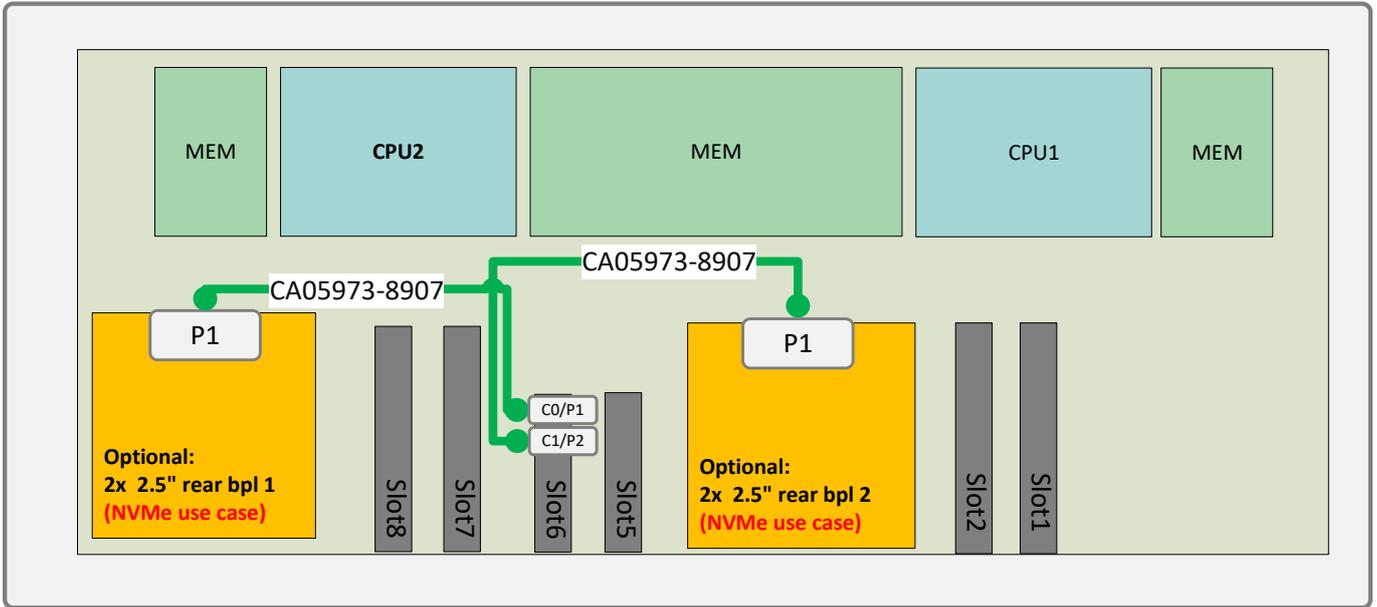
Option: rear 6x/4x 2.5" NVMe @ ReTimer Slot2 & 8



Option kit type:

- > 2-7
- > 4-4
- > 4-16
- > 5-3

Option: rear 4x 2.5" NVMe @ RAID Slot6

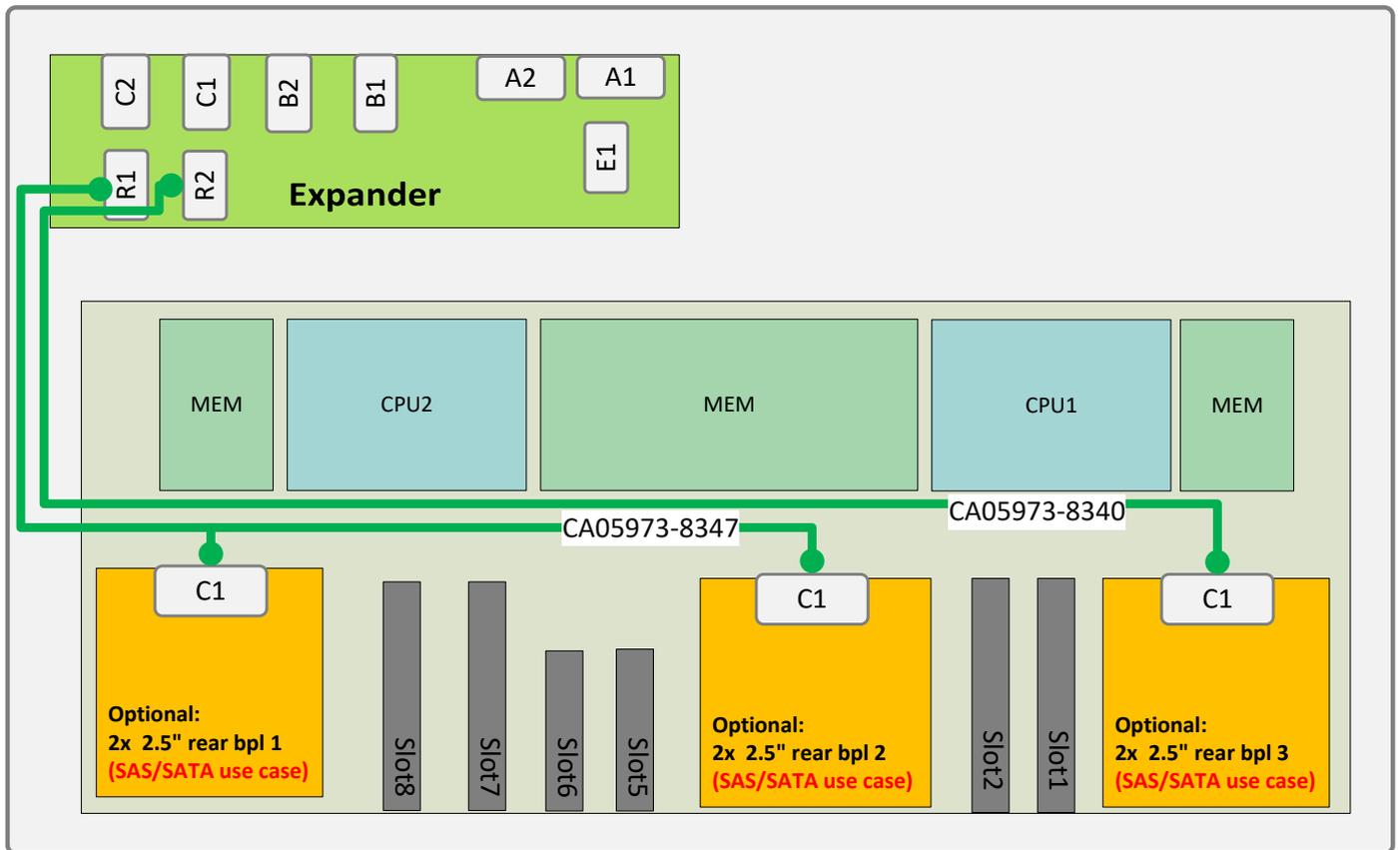


Option kit type:

- > 2-8x
- > 3-5
- > 3-9

CP2200/EP680/Ep740/EP3258

Option: rear 6x 2.5" HDD SAS/SATA @ Expander

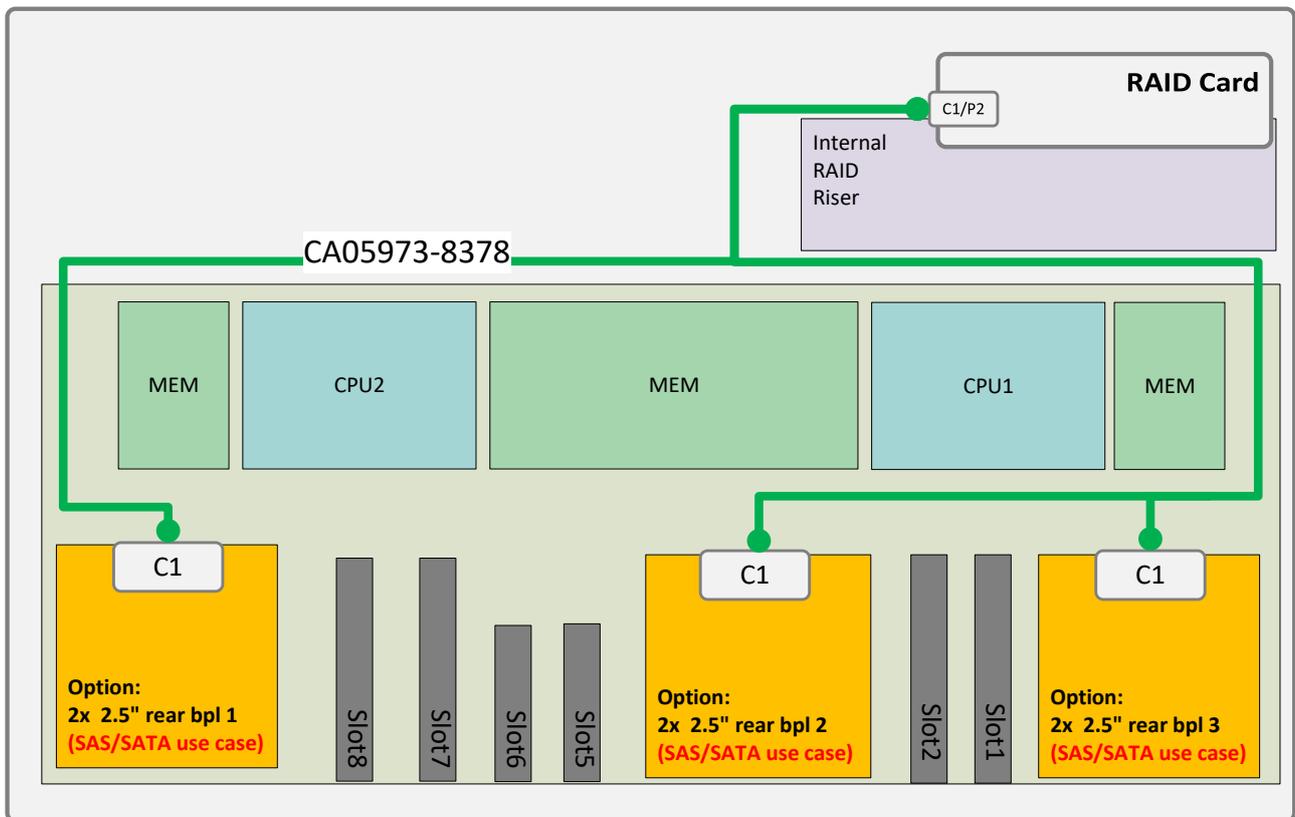


Option kit type:

-> 2-6x

-> 4-13x

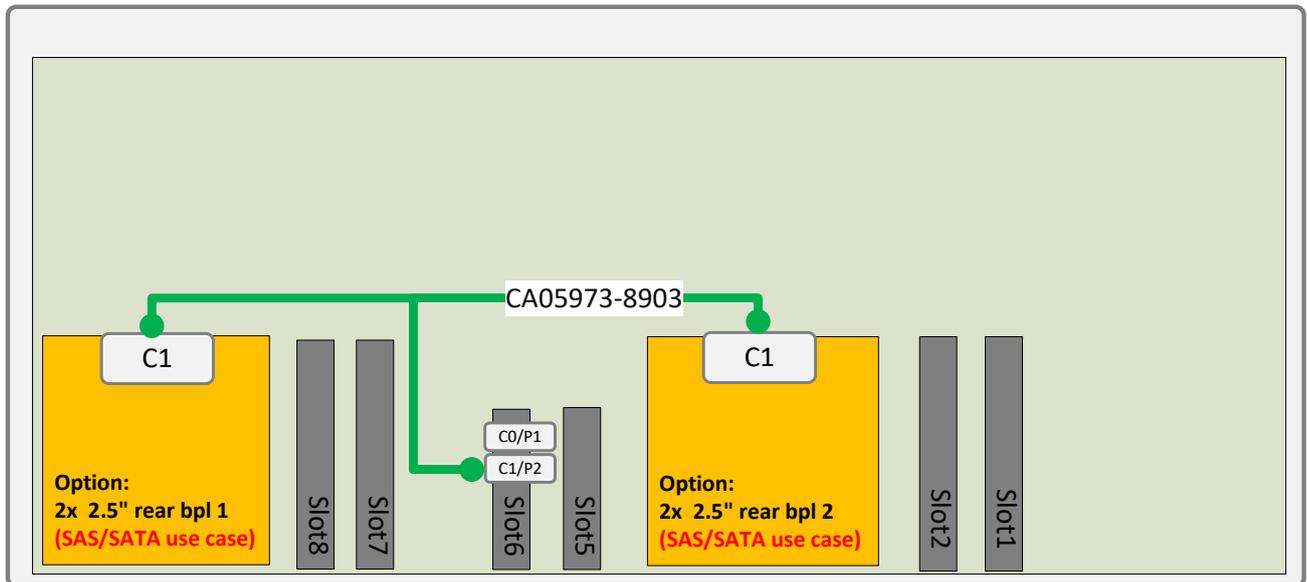
Option: rear 6x 2.5" HDD SAS/SATA @ Int. RAID



Option kit type:

-> 4-15

## Option: rear 4x 2.5" HDD @ RAID Slot6 2nd Port

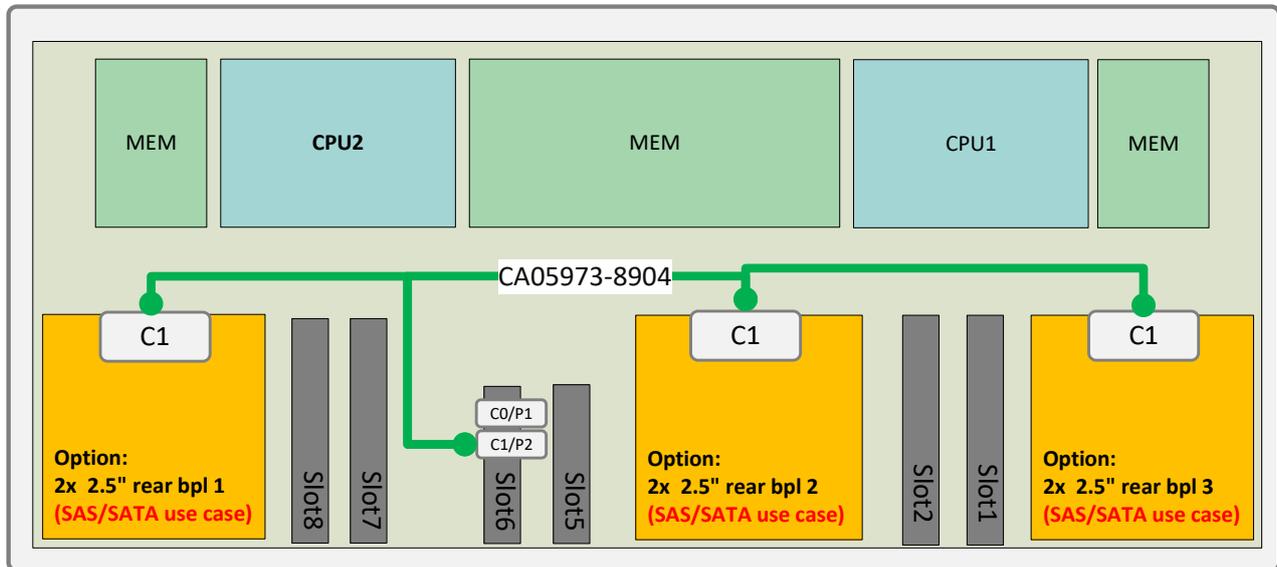


Option kit type:

-> 4-3

For 5-2b: connects to the C0/P1

## Option: rear 6x 2.5" HDD @ RAID Slot6 2nd Port

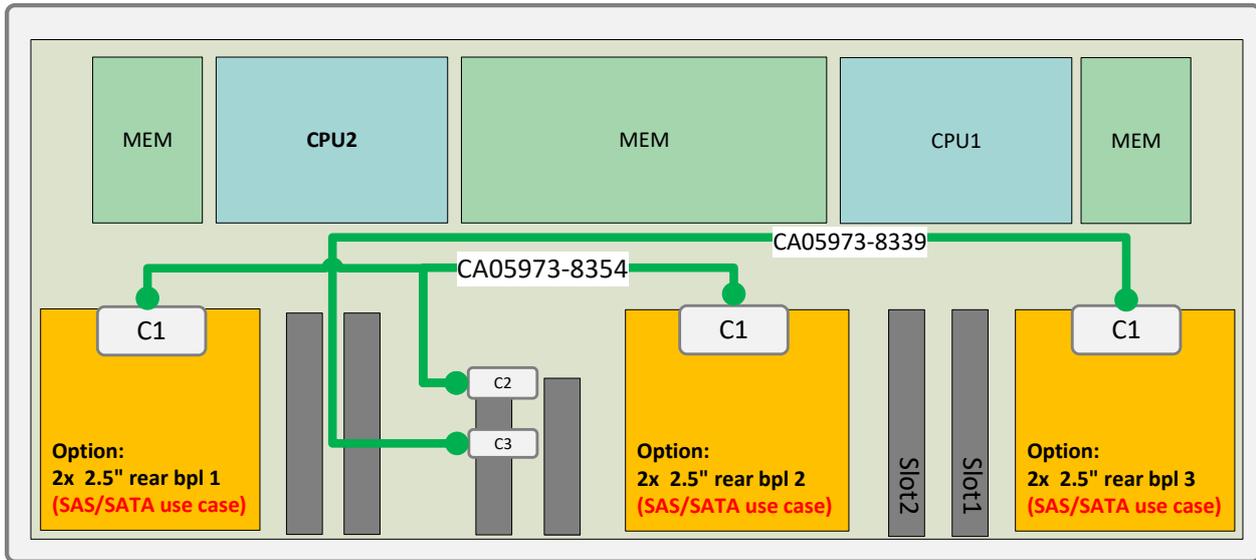


Option kit type:

-> 4-3

For 5-2b: connects to C0/P1

Option: rear 4x/6x 2.5" HDD @ EP540i/EP580i/CP2100-8i Slot6

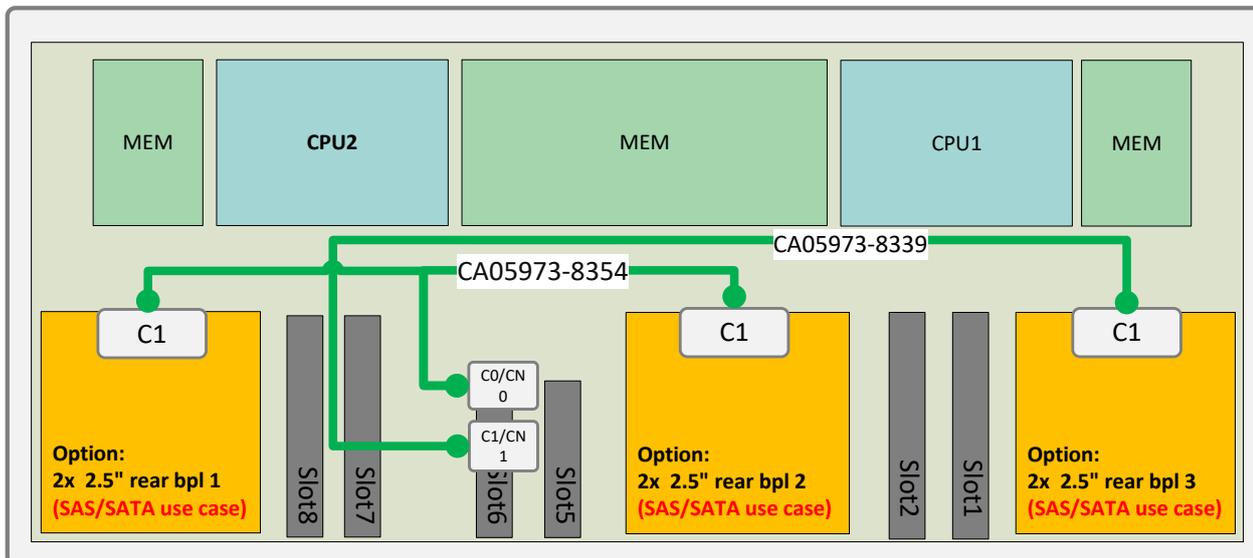


Option kit type:

-> 4-3 (EP540i/EP580i only)

For 4x HDD - CA05973-8354

For 6x HDD - CA05973-8354 + CA05973-8339



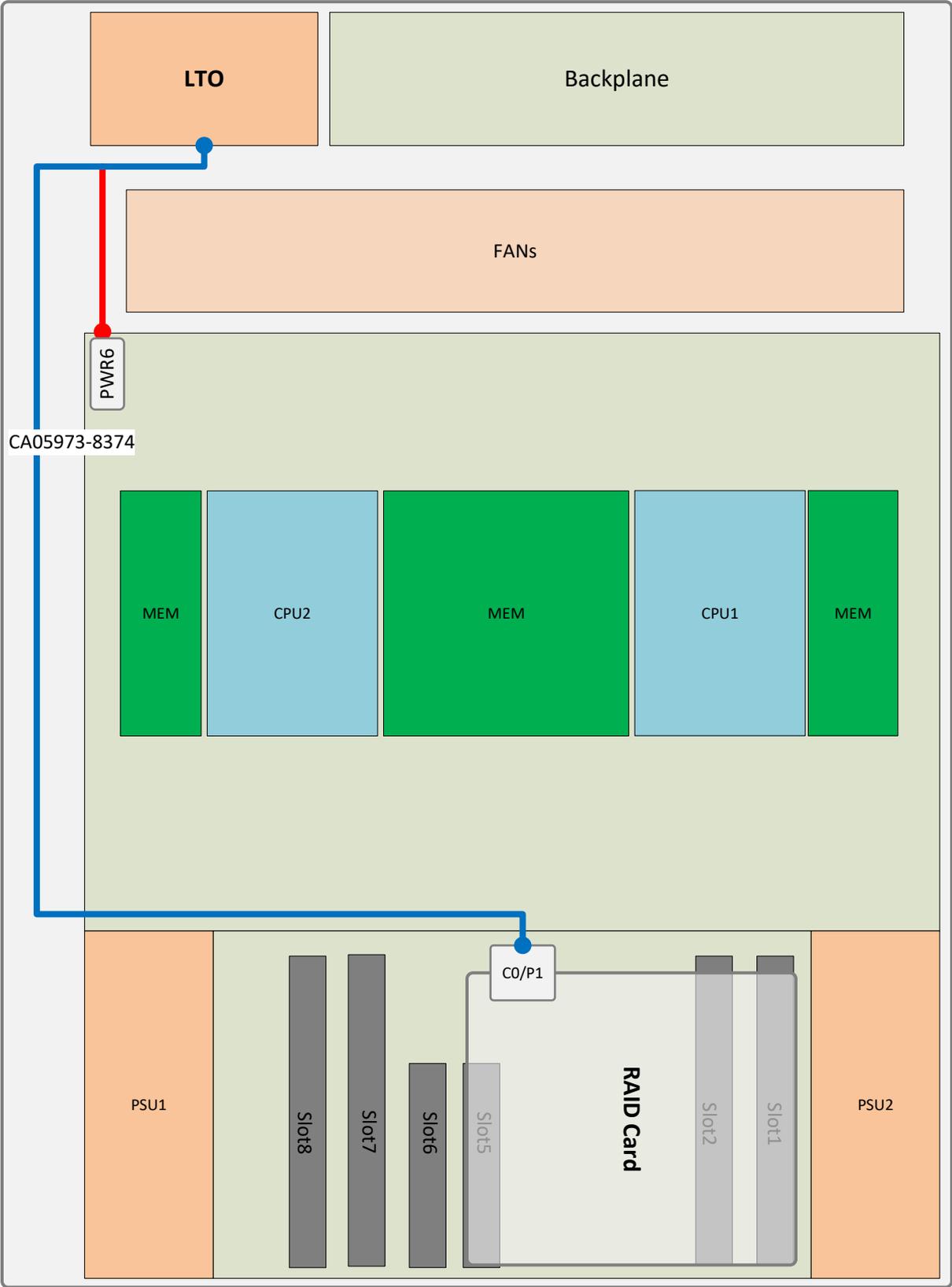
Option kit type:

-> 5-2a

For 4x HDD - CA05973-8354

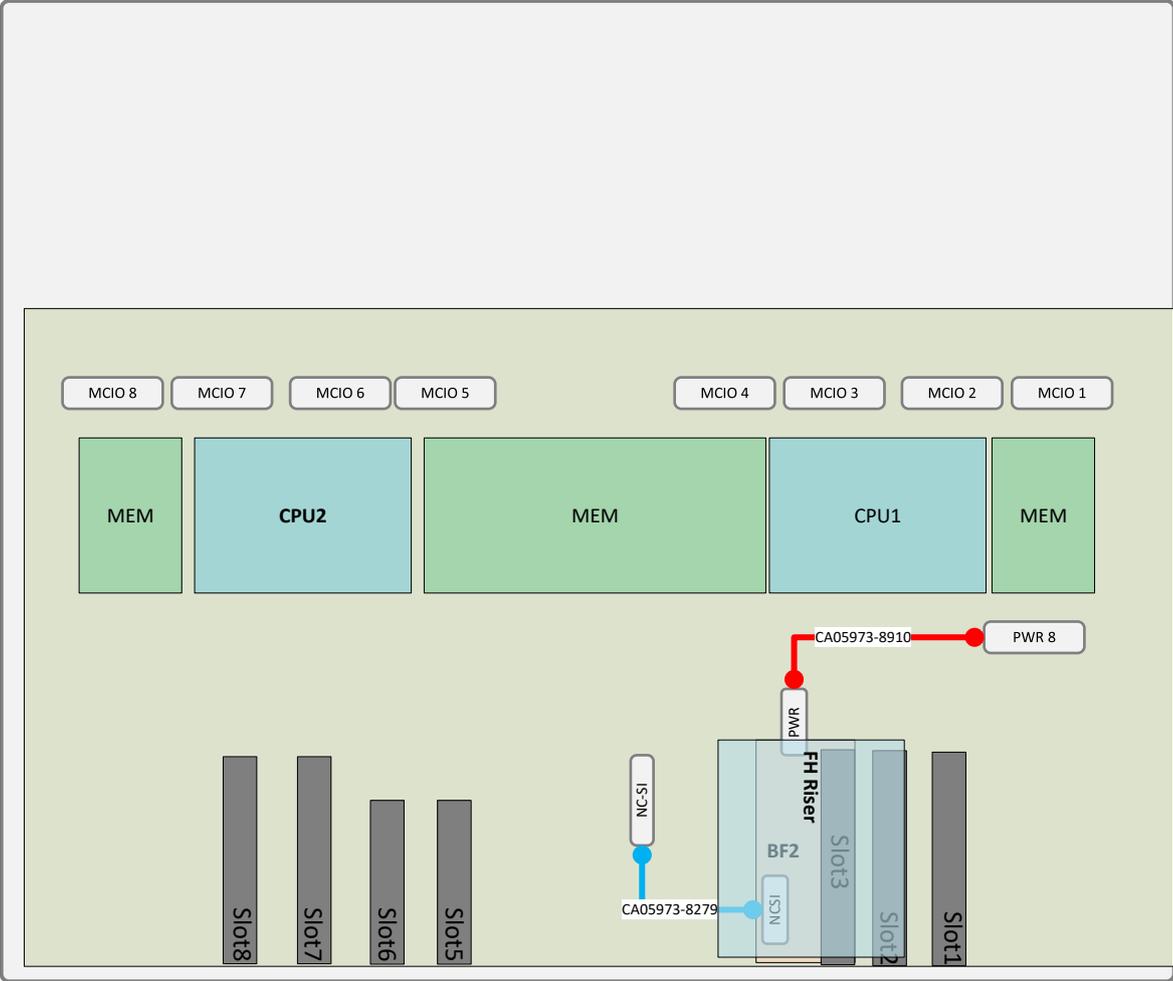
For 6x HDD - CA05973-8354 + CA05973-8339

Option: LTO @ CP6/EP6x0i/EP780i/Ep325x/CP2200-16i



\* SAS controller for LTO will be installed on slot 1, slot 2 and slot 5

Option: nVDIA BlueField2



Note: CA05973-8910 for 100G BF2

Note: CA05973-8279 cannot use on MB D3983-A100, it' s for D3983-A101 or later version





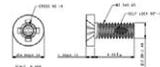
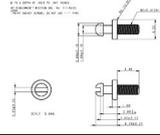
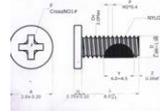
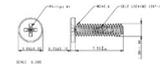
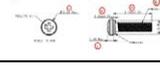
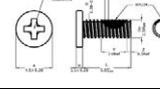
# List of all used screws for PRIMERGY Servers

**Assembled in Czech and Japan**

**March 2023**

## List of screws used in PRIMERGY Servers, assembled in WCZ or FIT

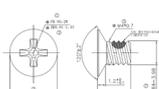
screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
S101	x	x	CA05950-3064	M1.6 x 4 mm		Phillips PH1	silver	0.2 Nm
S201	X		EOL: C26192-Y10-C62 C26192-Y10-C163	M2 x 2.5 mm		Torx 6 Plus	silver	0.2 Nm
		X	F6-SNA2-03121	M2 x3 mm		Torx 6 Plus	silver	0.2 Nm
S202	X		<del>C26192-Y10-C112</del> A3C40191083	M2 x 4 mm countersink		Phillips PH1	silver	0.09 Nm
		X	F6-SW4N2-03121	M2 x 4 mm countersink		Phillips PH1	silver	0.09 Nm
S203	X		C26192-Y10-C166	M2 x 4 mm		Torx 6 Plus	black	0.09 Nm
S204	X	X	C26192-Y10-C103 Replacement screw for A3C40137316 / LSZ: L3-25419-01	M2.5 x 4 mm		Phillips PH1 / JIS 1012 type H1	silver	0.4 Nm
S205	X	X	CA05950-3065	M2.5 x 6.5mm		Phillips PH1	silver	0.3 Nm
S206	X	X	CA05950-3066	M2 x 4.3mm		Phillips PH1	silver	0.2 Nm
S207	X	X	CA05950-3067	M2 x 4 mm countersink		Phillips PH1	black	0.09 Nm

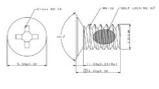
screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
S208	X	X	CA05950-3068	M2.5 x 8 mm self-tapping		Phillips PH1	black	0.4 Nm
S209	X	X		M2.5 x 6 mm		Phillips PH1	silver	0.4 Nm
S210	X	X		M2 x 4.4 mm		SLOTTED	silver	0.2 - 0.4 Nm
S211	X	X		M2 x 6 mm		Phillips PH1	silver	0.2 - 0.4 Nm
S212	X	X		M2 x 7.5 mm		Phillips PH1	silver	0.2 - 0.4 Nm
S213	X	X		M2*8.5 mm		Phillips PH1	silver	0.2 - 0.4 Nm
S214	X	X		M2.5*5 mm		Phillips PH1	silver	0.4 Nm
S215	X	X		M2 x 6.5mm		Phillips PH1	silver	0.25 Nm
S216	X	X		M2.5*3 mm		Phillips PH2	silver	0.8 Nm
S301	X		C26192-Y10-C151	M3 x 3.5 mm		hexagon head 5 mm / cross PZ2	black	0.6 Nm
		X	F6-SW2N3-05121	M3 x 5 mm with spring and washer		Phillips PH2	silver	0.6 Nm
S302	X		C26192-Y10-C102	M3 x 3.5 mm		Phillips PH1	silver	0.4 Nm

screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
		X	CA32432-0023	M3 x 3.5 mm		Phillips PH1 / JIS 1012 type H1	silver	0.4 Nm
S303	X	X	A3C40109082	M3 x 4 mm		Phillips PH1	white	0.09 Nm
S304	X		A3C40142649	M3 x 4 mm countersink		countersink Phillips PH1	silver	0.4 Nm
S305	X	X	Screws in kit: S26361-D3305-A10	<del>M3 x 4 mm</del> M3 x 3.5 mm		Phillips PH1	silver	0.4Nm
S306	X		C26192-Y10-C67	M3 x 4.5 mm		hexagon head 5 mm / cross PZ2	silver	0.6 Nm
		X	F6-SW2N3-05121	M3 x 5 mm with spring and washer		Phillips PH2	silver	0.6 Nm
S307	X		C26192-Y10-C68	M3 x 6 mm		hexagon head 5 mm / cross PZ2	silver	0.6 Nm
		X	F6-SW2N3-06121	M3 x 6 mm with spring and washer		Phillips PH2	silver	0.6 Nm
S308	X		C26192-Y10-C111	M3 x 6 mm		countersink Phillips PH1	silver	0.6 Nm
		X	F6-SSA3-06121	M3 x 6 mm		countersink Phillips PH1	silver	0.6 Nm
S309	X	X	C26192-Y10-C69	M3 x 8 mm		hexagon head 5 mm / cross PZ2	silver	0.6 Nm

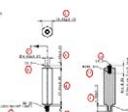
screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
S310	X		C26192-Y10-C207 same as -C67 but not "self-tapping"	M3 x 4.5 mm		hexagon head 5 mm / cross PZ2	silver	0.6 Nm
S311	X	X	C26361-B443-C220	M3 x 3.2 mm		Lens head screw cross PZ2	silver	0.2 Nm
S312	X	X	CA05950-3069	M3 x 6.7 mm		Phillips PH2	silver	0.6 Nm
S313	X	X	N/A	M3 Fastener Screw		Phillips PH2	silver	0.6 Nm
S314	X	X	N/A	M3 Captive Screw		Phillips PH2	silver	0.2 Nm
S315	X	X	CA05950-3070	M3 x 3 mm		Phillips PH1	silver	0.6 Nm
S316	X	X	CA05950-3071	M3 x 4 mm		Phillips PH2	silver	0.6 Nm
S317	X	X	CA05950-3072	M3 x 4.5 mm Ø6.0x10		Phillips PH2	silver	0.6 Nm

screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
S318	X	X	CA05950-3073	M3 x 4 mm		Phillips PH2	silver	0.6 Nm
S319	X	X	CA05950-3074	M3 x 4.5 mm		Phillips PH2	silver	0.6 ~ 0.7 Nm
S320	X	X	CA05950-3075	M3 x 5 mm		Phillips PH2	silver	0.7 Nm
S321	X	X	N/A	M3 Captive Screw		Phillips PH2	silver	0.6 Nm
S322	X	X	CA05973-9652	M3 x 6 mm		Phillips PH2	silver	0.8 Nm
S323	X	X	CA05973-8598	M3 x 8 mm		Phillips PH2	silver	0.8 Nm
S324	X	X	CA05950-3076	M3 x 9 mm		Phillips PH2	silver	0.8 Nm
S325	X	X	CA05950-3077	M3 x 2.2 mm		Phillips PH2	silver	0.6 Nm
S326	X	X	CA05973-9653	M3 x 4 mm		Phillips PH2	silver	0.6 Nm
S327	X	X	CA05950-3078	M3 x 5.5 mm		Phillips PH2	silver	0.6 Nm

screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
S328	X	X	N/A	M3 x 4.5 mm		Phillips PH2	silver	0.2 Nm
S329	X	X	A3C40242145	M3 x 5 mm		Phillips PH2	silver	0.6 Nm
S330	X	X	A3C40121520	M3 x 5 mm		Phillips PH1	black	0.6 Nm
S331	X	X	CA05950-3079	M3 x 8 mm		Phillips PH2	Silver	0.6 Nm
S332	X	X	CA05973-8491 same as -S304 but color	M3 x 4 mm		countersink Phillips PH1	black	0.4 Nm
S333	X	X	CA05950-3080	M3 x 4.5 mm Ø6.0x36		Phillips PH2	Silver	0.6 Nm
S401	X	X	CA05950-3081	M4 x 6.5 mm M4 x 7 mm		Phillips PH2	silver	0.6 Nm
S402	X	X	N/A	M4 x 5 mm		Phillips PH2	silver	0.8 Nm
S501	X	X	C26192-Y10-C209	REM 3 x 12 mm		special bit insert one-way head	black	0.6 Nm
S502	X	X	C26192-Y10-C176	REM 3 x 15 mm		special bit insert one-way head	black	0.6 Nm
S503	X	X	C26192-Y10-C174	Cross head EJOT PT 8 mm			silver	0.4 Nm

screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
S504	X		C26192-Y10-C75	UNC 6-32 x 4.8 mm		hexagon head 5 mm / cross PZ2	black	0.6 Nm
		X	CP126822-01	UNC 6-32 x 4.8 mm		hexagon head 5 mm / cross PZ2	black	0.6 Nm
S505	X		C26192-Y10-C200	UNC 6-32 x 4 mm		Phillips PH1	silver	0.6 Nm
		X	CA32432-0164 or CA32432-0170	UNC 6-32 x 4 mm		Phillips PH1 / JIS 1012 type H1	silver	0.6 Nm
S506	X	X	C26192-Y10-C211	Knurled screw M3 x 4.5 mm		Phillips PH1	black	0.2 Nm
S507	X	X	A3C40218449	Knurled screw M3 x 15 mm		Phillips PH1	silver	0.2 Nm
S508	X	X	CA05950-3082	M5 x 11 mm		Phillips PH2	black	0.6 Nm
S509	X	X	A3C40237861	SCREW #6- 32xL5.0 #2 NYLOK		Phillips PH2	silver	0.6~0.9 Nm
S510	X	X		#6-32*6 mm		Phillips PH2	silver	0.6~0.9 Nm
S511	X	X				Torx T6 driver	silver	0.2 Nm
S512				#6-32*4 mm NYLOK				0.8 Nm
S513				#6-32*4 mm				0.8 Nm

screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
<b>S514</b>				#6-32*4 mm				0.8 Nm
<b>S515</b>				#6-32*5 mm NYLOK				0.8 Nm
S601	X	X	EOL: V26827-B408-V989 V26827-B265-V5	UNC standoff 4-40 x 7.8 mm bolt: 4.9 mm total: 12.7 mm		hexagon screw driver 5 mm	silver	0.6 Nm
S602	X	X	C26192-Y1-C65	standoff M3 x 4.5 mm bolt: 5 mm total: 9.5 mm		hexagon screw driver 5 mm	silver	0.6 Nm
S603	X	X	C26192-Y1-C66	standoff M3 x 4.5 mm bolt: 8 mm total: 14 mm		hexagon screw driver 5 mm	silver	0.6 Nm
S604	X	X	C26192-Y1-C67	standoff M3 x 6 mm bolt: 12 mm total: 18 mm		hexagon screw driver 5 mm	silver	0.6 Nm
S605	X	X	C26361-B443-C210	standoff M3 x 3 mm bolt: 4.1 mm total: 7.1 mm		hexagon screw driver 5 mm	silver	0.6 Nm
S606	X	X	(for on board M.2 StandOffNut) C26361-B443-C210	standoff M3 x 3 mm bolt: 4.1 mm total: 7.1 mm		hexagon screw driver 5 mm	silver	0.3 Nm
S607	X	X	<b>CA05950-3083</b>	UNC standoff 4-40 x 7.0 mm		hexagon screw driver 5 mm	silver	0.2 Nm
S608	X	X	<b>CA05950-3084</b>	M3 x 33.6 mm + M4 x 6 mm		hexagon screw driver 7 mm	silver	1 Nm
S609	X	X	<b>CA05950-3085</b>	M3 x 37.9 mm + M4 x 7 mm		hexagon screw driver 7 mm	silver	1 Nm
S610	X	X	N/A	M3 x 5 mm		Phillips PH2	silver	0.8 Nm

screw reference number	WCZ	FIT	code number	type	photo	head tool / insert bit	color	Torque tolerance +-10%
S611	X	X	CA05950-3086	#2-32 x 12.6 mm		Phillips PH2	silver	0.2 Nm
S612	X	X	CA05950-3087	UNC standoff bolt: 5.0 mm 4-40 x 6.25 mm total: 11.25 mm		hexagon screw driver 5 mm	silver	0.6 Nm
S613	X	X	Same as S607	UNC standoff bolt: 4.8 mm 4-40 x 7.0 mm total: 11.8 mm		hexagon screw driver 5 mm	silver	0.6 Nm
S614	X	X		UNC standoff bolt: 37.8 mm 6-32 x 6 mm total: 45.3 mm		hexagon screw driver 10 mm	silver	0.6 Nm
(mechanic part in one chassis, provided by chassis vendor)	X	X	C26361-K1444-C11	M3 X 4.5 mm cheese head screw with spacer.		hexagon screw driver 5 mm / cross PZ2	silver	0.6 Nm
(screw is part of PDUAL AP200 kit)	X	X	C26361-Y10-C133	M2 x 3.5 mm		Flat head Phillips PH 0	silver	0.2 Nm

### Denotation scheme

S1xx : Screws M1x

S2xx : Screws M2x

S3xx : Screws M3x

S4xx : Screws M4x

S5xx : Screws for special application

S6xx : Bolts

### Document History:

Date	Item	Description
04. July 2017 05. July 2017	Name of a tool for fastening hexagon bolt	Old: "hexagon nut" New: " <del>hexagon spanner head</del> " hexagon screw driver
27. July 2017	S306 F6-SW2N3-06121	Changed part number of the screw
07. November 2018	Screw C26361-Y10-C133 added	Screw delivered with PDUAL AP200 kit
09. November 2018	Bolt C26361-B443-C210 Screw C26361-B443-C220	Bolt and screw for M.2 on board
09. January 2019	C26361-Y10-C133 Flat head	screw is part of PDUAL AP200 kit

Date	Item	Description
19. February 2019	: A3C40218449	Kurled screw RAID controller and RX2530 M5
10. May 2021	Adding RX25x0/RX4770 M6 ODM screws	To create some new S number screws
24. May 2021	Adding TX1330M5 ODM screws and change hexagon head tool to PH2	See yellow color update
02. June 2021	Adding CP100 screw S319 Torque 0.6 ~ 0.7 Nm	See yellow color update
07. June 2021	Update CP100 screw driver as PH2	See yellow color update
24. June 2021	Add RX1330M5 screws	See yellow color update
7. July 2021	Add TX1310M5 screws	See yellow color update
28. Dec 2021	Add RX1330M5 screws(S612/613) Add CX400M6/M7	See yellow color update See green color update
15. Jun. 2022	Correct S308/ S330 from PH2 to PH1 Add TX2550M7 screws (S332/S333) Add GX2550M7 screws (S402) Modify document title/ header line	See yellow color update
28. Dec. 2022	1. Correct S202 from C26192-Y10-C112 / SCREW M2*3 PHHILLIPS NO.1 to A3C40191083/ SCREW M2*4 PHHILLIPS NO.1 2. Correct S305 from M3x4 to M3x3.5mm 3. Correct S401 from M4x6.5 to M4x7mm 4. Correct S603 from M3x6 to M3x4.5mm	See yellow color update
23. Feb. 2023	1. Correct S317 from Ø8.0x16.5 to Ø6.0x10mm 2. Correct S333 from Ø7.5x42.5 to Ø6.0x36mm 3. Correct S607 from 4-40 x 6.5 mm to 4-40 x 7.0 mm 4. Add S323 New PN CA05973-8598 5. Re-assign correct S number for CX400M6/M7 use	See yellow color update
24. Feb. 2023	1.update S614 torque from 1 Nm to 0.6 Nm 2. S210/S211/S212/S213 change from 0.4 Nm to 0.2 ~ 0.4 Nm 2.Add S215 and S511 for CX400M6 screw	See yellow color update
07. Mar. 2023	Add RX8770M7 screws(S216/S512/S513/S514/S515) 2. Add code number (S101/S205~S208/S312/S315~S320/S324/S325/S327/S331/S333/S401/S508/S607/S608/S609/S611/S612)	See yellow color update